WSRC-RP-91866

BURIAL GROUND EXPANSION (U)

HYDROGEOLOGIC CHARACTERIZATION

SAVANNAH RIVER SITE

August 1991

Westinghouse Savannah River Company
Savannah River Site
Aiken, SC 29808

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WSRC-RP-91866

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CERTIFICATION STATEMENT
BURIAL GROUND EXPANSION
HYDROGEOLOGIC CHARACTERIZATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision or were produced by organizations or individuals known to me to be reputable and that all such attachments have undergone my thorough review. I further certify that, to the best of my knowledge, the information presented in this document is true, accurate and complete.

By: Phillip W. Albenesius, P.G.

Firm: Sirrine Environmental, Inc.

Date: August 27, 1991

Signature: 

Seal:

BURIAL GROUND EXPANSION
HYDROGEOLOGIC CHARACTERIZATION

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LIST OF ACRONYMS

ASTM	=	American Society of Testing and Materials
GSA	=	General Separations Area
HW/MW	=	Hazardous Waste/Mixed Waste
K_h	=	horizontal hydraulic conductivity
K_v	=	vertical hydraulic conductivity
msl	=	mean sea level
MWMF	=	Mixed Waste Management Facility
PVC	=	Polyvinyl Chloride
SEC	=	Sirrine Environmental Consultants
SRS	=	Savannah River Site
SWDF	=	Solid Waste Disposal Facility
UTRC	=	Upper Three Runs Creek
WSRC	=	Westinghouse Savannah River Company

EXECUTIVE SUMMARY

Sirrine Environmental Consultants (SEC) provided technical oversight of the installation of eighteen groundwater monitoring wells and six exploratory borings around the location of the Burial Ground Expansion. The borings were continuously cored and an SEC field geologist described and packaged the core. Undisturbed samples were collected during the exploration and sent to a geotechnical laboratory for testing.

Monitoring wells were developed under the supervision of Westinghouse Savannah River Company (WSRC) project personnel. The wells were slug tested by an SEC hydrogeologist who also analyzed the data.

Water level measurements were taken at all of the wells on three occasions to collect trend data and to create potentiometric maps. Monitoring well survey data, provided by a WSRC subcontractor, was used to convert water depths to elevations.

A zone of unusually high hydraulic conductivity was encountered in two borings at the same approximate elevation. Corresponding lost circulation was only partial and of the 21 holes drilled, less than ten percent encountered this zone. Therefore, the zone appears to be discontinuous.

All of the work performed by SEC personnel was supervised by a Registered Professional Geologist in the State of South Carolina. The field methods and results of all project activities are included in this report.

Section I

1.0 INTRODUCTION

The Burial Ground Expansion is being constructed as a low level radioactive waste disposal facility. Construction began in October of 1989 and the facility is scheduled to be complete by April 1992. The location encompasses 100 acres, adjacent to the existing Solid Waste Disposal Facility, in the General Separations Area of the Savannah River Site. This report presents the results of the recently completed field investigation overseen by Sirrine Environmental Consultants.

1.1 Project Scope and Objectives

Sirrine Environmental Consultants, Inc. (SEC) was retained by Westinghouse Savannah River Company (WSRC) to provide technical drilling oversight and consulting services for a hydrogeologic characterization of the Burial Ground Expansion. The project scope (dated July 24, 1990) provided by WSRC, entailed the drilling, geophysical logging and abandoning of four continuous coreholes to the "Green Clay" confining unit. The work included the collecting of undisturbed samples from low permeability zones for laboratory geotechnical analyses. The project scope also included installing twelve (12) water table wells, four (4) McBean aquifer wells and preparing a final report.

The objectives of the project were to collect hydrogeologic data on the shallow aquifers and aquitards down through the upper part of the Congaree Aquifer and to install a detection monitoring network consisting of eighteen groundwater monitoring wells. These objectives were pursued by continuously coring at six locations (BGX 1A, 2B, 4A, 7, 9 and 11) around the proposed facility and installing and testing eighteen groundwater monitoring wells (BGX1 - BGX 12). Two of the coreholes (BGX-1A and 2B) and four of the wells (BGX-1A, 1C, 2B, and 4A) are associated with another project (MWMF and OBG Assessment Wells) but the data collected are included in this

report because they surround the Burial Ground Expansion. The data were compiled and interpreted and are presented in this report.

1.2 Site Location

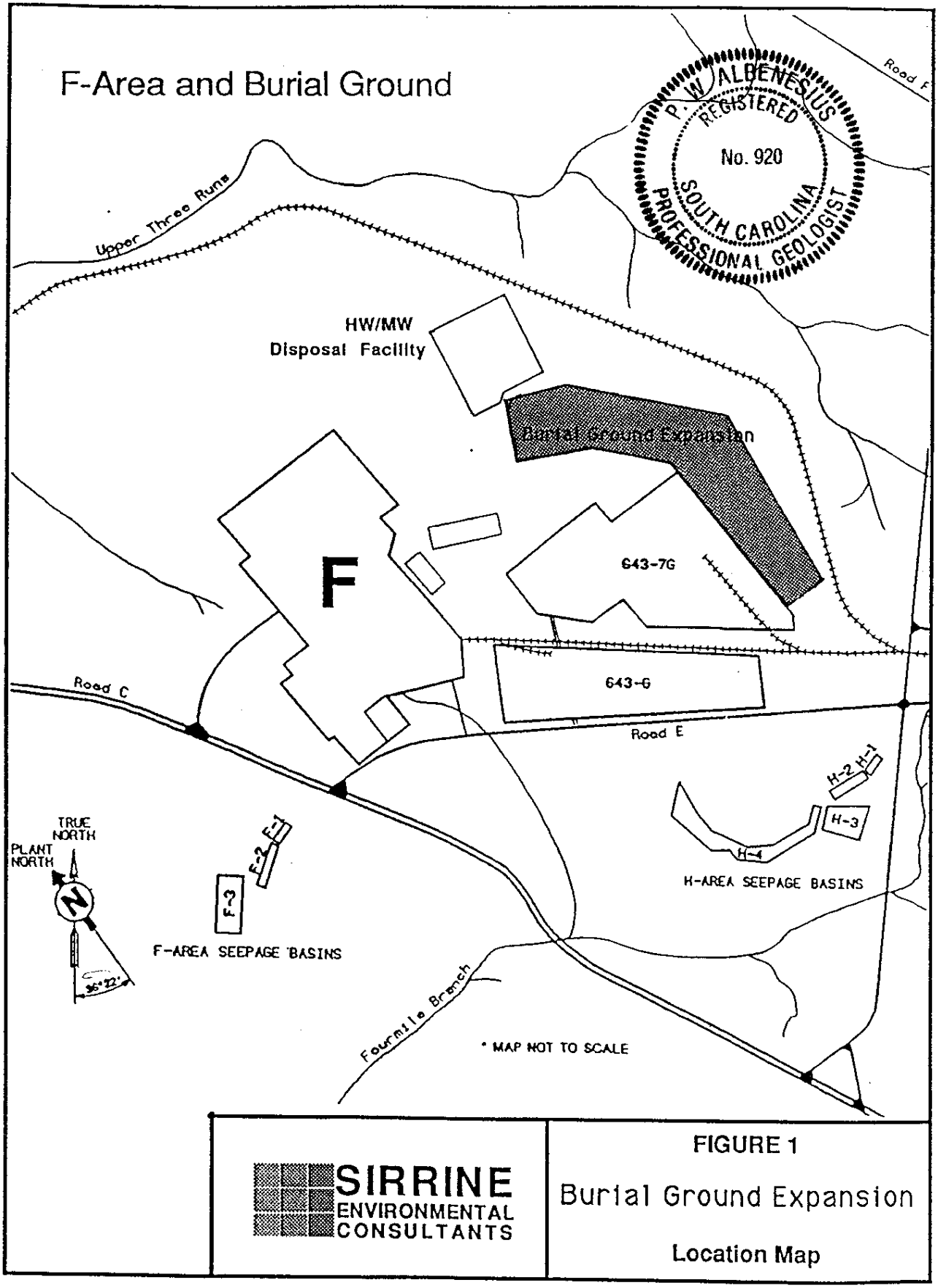
The Burial Ground Expansion is adjacent to the Solid Waste Disposal Facility (SWDF) in the General Separations Area of the Savannah River Site (SRS) (Figure 1).

1.2.1 Regional Setting

The Savannah River Site occupies a 300-square mile area within the Upper Atlantic Coastal Plain and is located approximately 30 miles southeast of the Fall Line, which marks the northeast-southwest trending boundary between the crystalline rocks of the Piedmont and the sediments of the Atlantic Coastal Plain. The Atlantic Coastal Plain sediments form a wedge of unconsolidated to semi-consolidated material which increases in thickness from zero at the Fall Line to more than 4,000 feet near the coast of South Carolina. The sediments range in age from Late Cretaceous to Holocene and dip gently to the southeast toward the sea (WSRC, 1990).

The Atlantic Coastal Plain in South Carolina is divided into three physiographic zones: the Upper, Middle, and Lower Coastal Plains. These zones trend approximately parallel to the coast and the Fall Line. The surface of the Upper Coastal Plain, which is characterized by predominantly fluvial erosion, slopes from 650 feet above mean sea level (msl) at the Fall Line to approximately 250 feet msl at the southeastern boundary.

The Upper Atlantic Coastal Plain in South Carolina is separated into two major physiographic divisions: The Aiken Plateau, in the south-central part of the state, and the Congaree Sand Hills, located in the central and north-central portion of South Carolina. The SRS facility lies on the Aiken Plateau, which is bounded by the


F-Area and Burial Ground
P. W. ALBENESIUS
REGISTERED
No. 920
SOUTH CAROLINA
PROFESSIONAL GEOLOGIST
Road F
Upper Three Runs
HW/MW
Disposal Facility
Burial Ground Expansion
F
643-7G
643-6
Road C
Road E
H-2
H-1
H-3
H-4
H-AREA SEEPAGE BASINS
TRUE
NORTH
PLANT
NORTH
N
36°22'
F-2
F-1
F-3
F-AREA SEEPAGE BASINS
Fourmile Branch
* MAP NOT TO SCALE
SIRRINE
ENVIRONMENTAL
CONSULTANTS
FIGURE 1
Burial Ground Expansion
Location Map

Savannah River to the southwest and the Congaree River to the north-northeast. The Aiken Plateau is highly dissected by streams and is characterized by broad interfluvial areas with narrow steep-sided valleys. Ground surface elevations at SRS range from approximately 100 feet msl in the stream and river valleys to 400 feet msl at the topographically highest locations on the plateau at the site.

The Savannah River forms the southwestern boundary of the SRS . The five main streams on the site are tributaries of the Savannah River and include Upper Three Runs Creek, Four Mile Creek, Pen Branch, Steel Creek, and Lower Three Runs Creek.

1.2.2 Site Description

The site of the Burial Ground Expansion (as shown in Figure 2) is an elbow shaped, cleared area of 100 acres, curving to the northwest on an interfluvial plateau in the central SRS. The site slopes from an elevation of 290 feet in the southernmost corner to an elevation of 250 feet in the northernmost corner. Runoff is to the north and east toward unnamed, ephemeral tributaries of Upper Three Runs Creek (UTRC), and to the north toward UTRC. Upper Three Runs Creek is approximately 2500 feet north of the facility boundary. The nearest perennial stream is approximately 1200 feet northeast of the boundary.

SCALE: 1" = 1000'

MN GN 3½° 62 MILS 0°23' 7 MILS
UTM GRID AND 1981 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

SIRRINE ENVIRONMENTAL CONSULTANTS

FIGURE 2
BURIAL GROUND EXPANSION
TOPOGRAPHIC SETTING

2.0 FIELD INVESTIGATION

Field work was conducted during the period between December 10, 1990, and July 12, 1991. Field activities included coring, geophysical logging, undisturbed sample collection, well installations, well development, field permeability testing and measurement of water levels.

2.1 Drilling and Geologic Sampling

Mud rotary drilling methods were used throughout the project during drilling, coring and reaming (with the exception of BGX-3D and BGX-5D which were augered). Geologic samples were obtained by coring at the six exploratory borings designated BGX-1A, 2B, 4A, 7, 9 and 11 (Figure 3). A 94 mm double-tube wireline coring system was used throughout the project. When problems were encountered with core recovery, core runs were shortened (generally two to four feet) to facilitate maximum core recovery. The overall core recovery for the project was approximately 80 percent.

The cores were extruded in the field onto a ten foot long PVC trough. After examination by an SEC field geologist, the cores were stored in plastic-impregnated, water-resistant core boxes. These boxes were labeled in the field to designate the corehole number, run number, depth of each run, length of each run and percent recovery.

Both mud rotary drilling exploration and reaming were accomplished with either a tri-cone drill bit or a wing bit, depending upon the formation lithology encountered. As during coring, the drilling fluid parameters were carefully monitored and adjusted to properly clean the borehole, enhance hole stability and reduce fluid loss.

BURIAL GROUND EXPANSION: CORE HOLE LOCATIONS

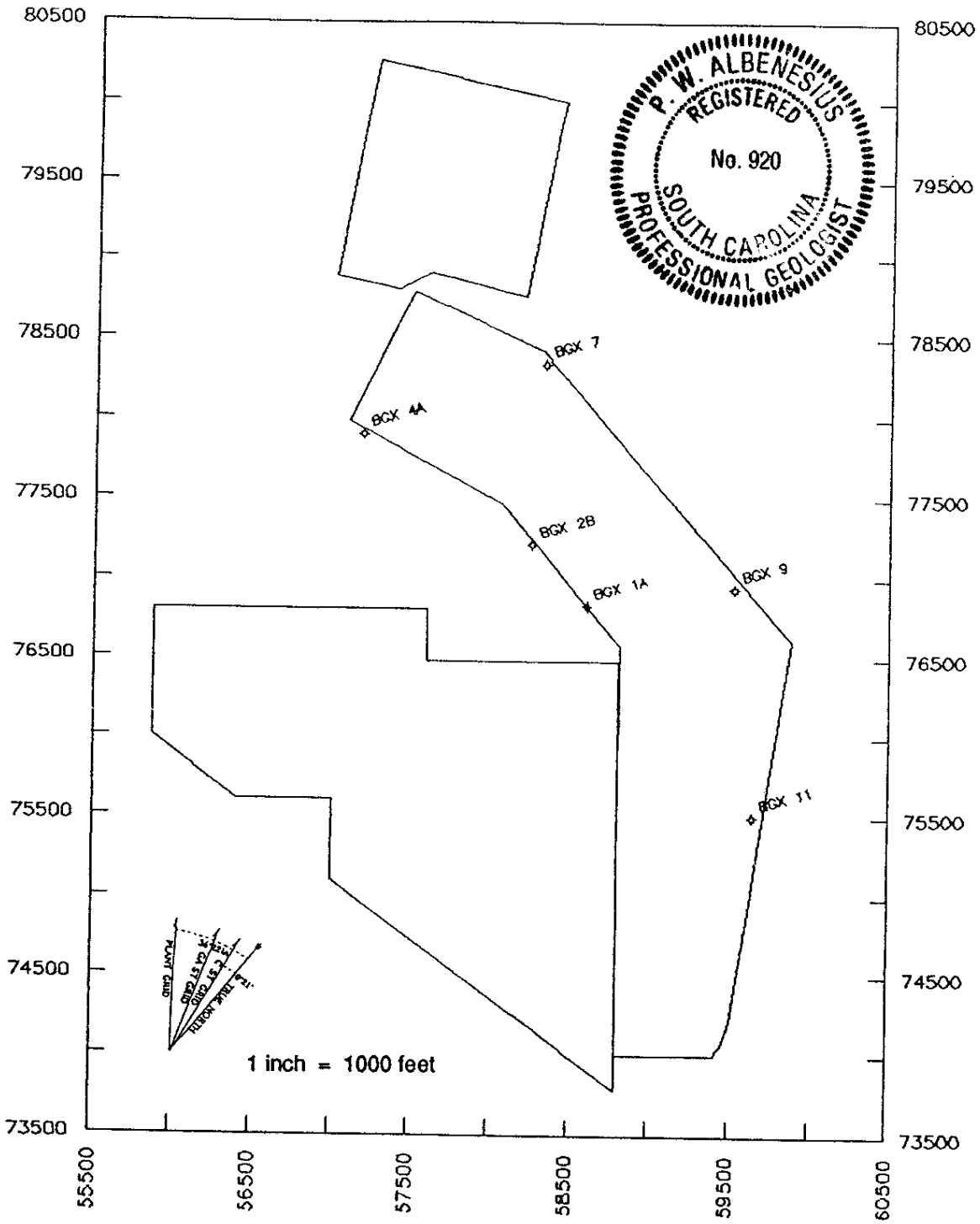


FIGURE 3

Detailed geologic logs were prepared by the SEC geologist in the field. Summarized logs are contained in Appendix B by boring number. The grain-size classifications were based upon the modified Wentworth Scale in accordance with DPSOP 254, "Hydrogeologic Data Collection Procedures," (WSRC, 1989). This classification system for grain size is summarized as follows:

Grain Size Classification	Diameter (mm)
Pebbles	4 - 64
Granules (very fine pebbles)	2 - 4
Very Coarse Sand	1 - 2
Coarse Sand	1/2 - 1
Medium Sand	1/4 - 1/2
Fine Sand	1/8 - 1/4
Very Fine Sand	1/16 - 1/8
Silt	1/256 - 1/16
Clay	< 1/256

Size fraction percentages were based upon visual inspection and comparison with percentage charts. The degree of sorting present in the sample was based upon visual analysis. The following sorting classification system was adopted:

Well Sorted	90% of sample within 2 sand size classes
Moderately Sorted	90% of sample within 3 sand size classes
Poorly Sorted	90% of sample within 4 sand size classes
Very Poorly Sorted	90% of sample within more than 4 size classes

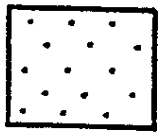
Color descriptions were based upon comparisons with a standard Munsell™ color chart. The features described on the logs consisted primarily of major sediment type, texture, color, carbonate zones, sedimentary structures, fossils and accessory minerals. In general, grain sizes, percentages, color, roundness and sphericity were described by comparison with charts.

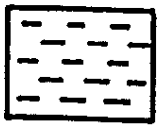
In addition to the field geologic logs, detailed core logging data sheets are contained in Appendix C. These data sheets were prepared by Savannah River Laboratory subcontract personnel using a detailed and systematic method of core logging. A key is included at the front of Appendix C to aid in reviewing the core data sheets. The sheets were utilized for this report in conjunction with the field geologic logs to analyze and interpret the subsurface data.

2.2 Geophysical Logging

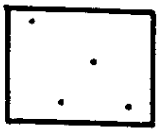
Upon completion, each corehole was geophysically logged. The geophysical logs were used in conjunction with the geologic logs for stratigraphic interpretation and selection of well screen zones. Prior to logging, the holes were conditioned by circulating clean drilling mud having a minimal sand content (<5%). After conditioning, geophysical logs were run from the bottom of the corehole upward while logging tool velocities were carefully monitored. Resistivity (long and short normal), single point resistance, gamma ray, spontaneous potential and caliper logs were obtained. The geophysical logs for each corehole are filed in Building 735-11A. Additionally, representations of the geophysical logs, in the form of composite logs that include lithology, screen zones and other information, are included in this report as Figures 4 through 11.

LEGEND

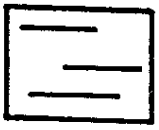

SAND

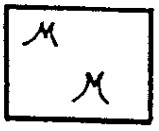

SILT


CLAY

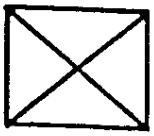

SANDY

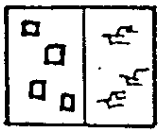

SILTY

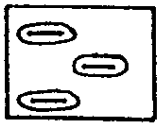

CLAYEY

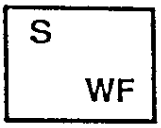

MICACEOUS


WATER TABLE

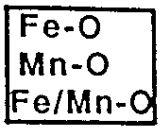

NO RECOVERY


PYRITIC/LIGNITIC

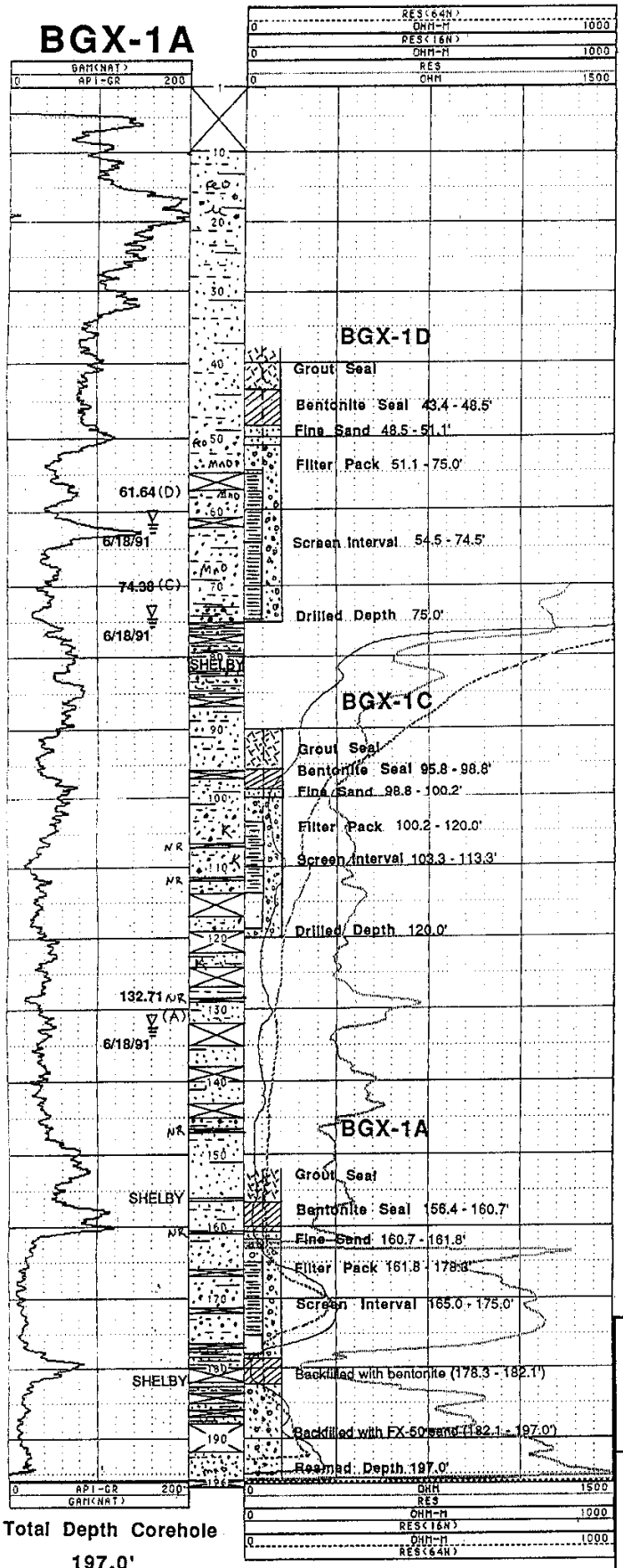

CLAY BALLS



SERICITIC/
WEATHERED
FELDSPAR



IRON or MANGANESE
OXIDE



P. W. ALBENESIUS REGISTERED No. 9?0 SOUTH CAROLINA PROFESSIONAL GEOLOGIST

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FIGURE 4

COMPOSITE LOG
BGX-1A

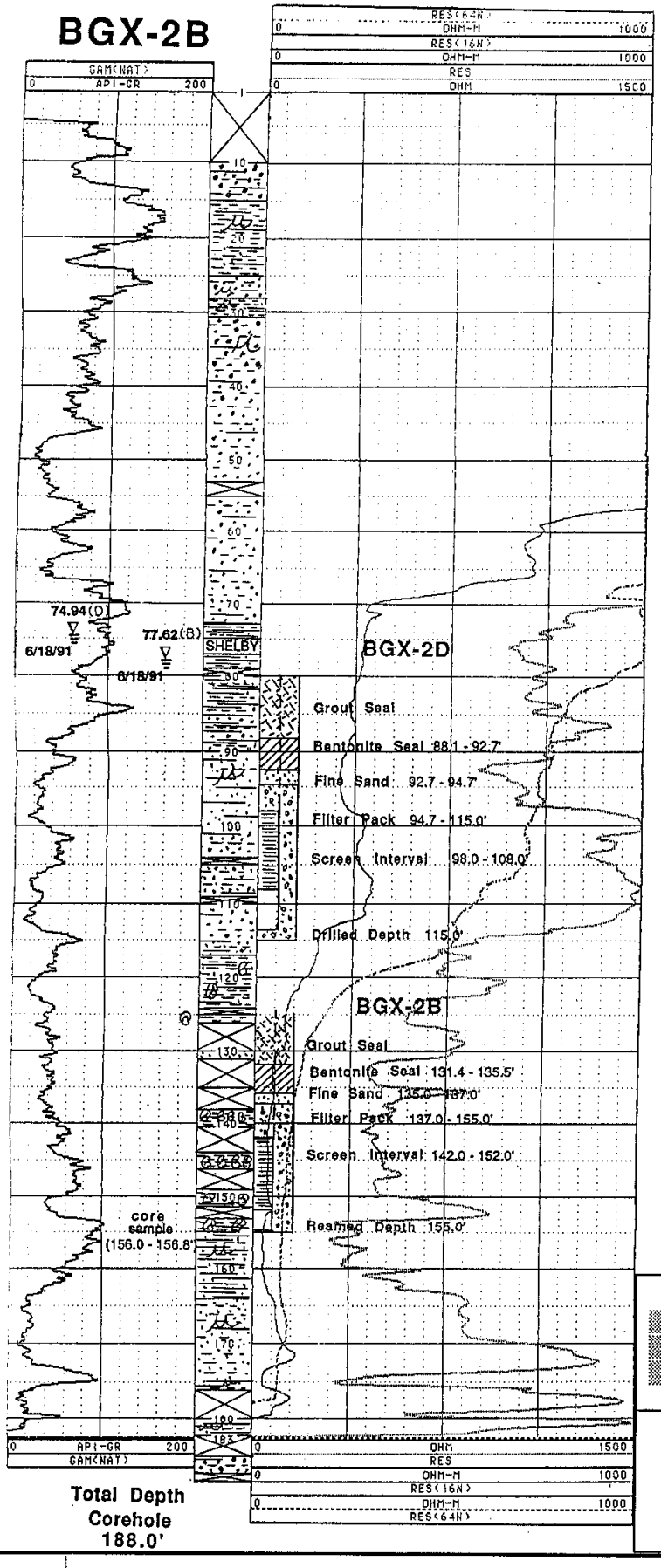

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FIGURE 5

COMPOSITE LOG BGX-2B

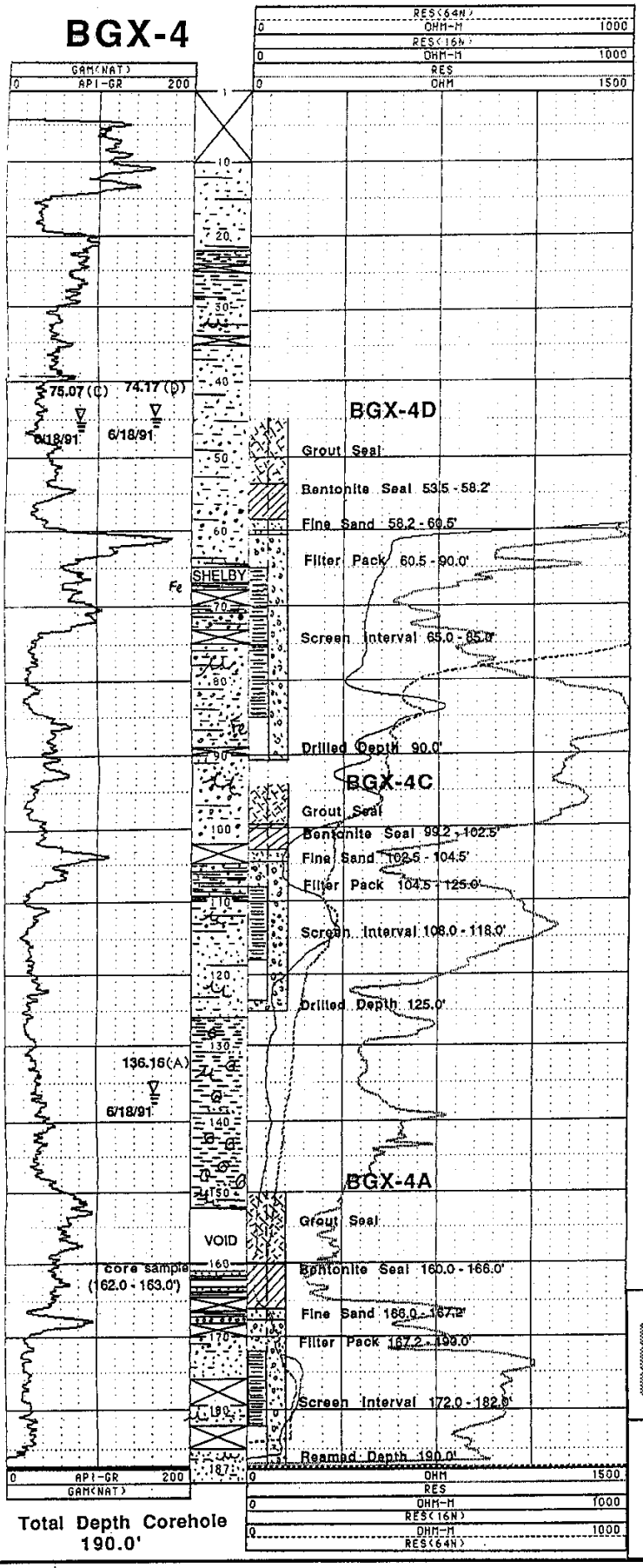

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FIGURE 6

COMPOSITE LOG BGX-4

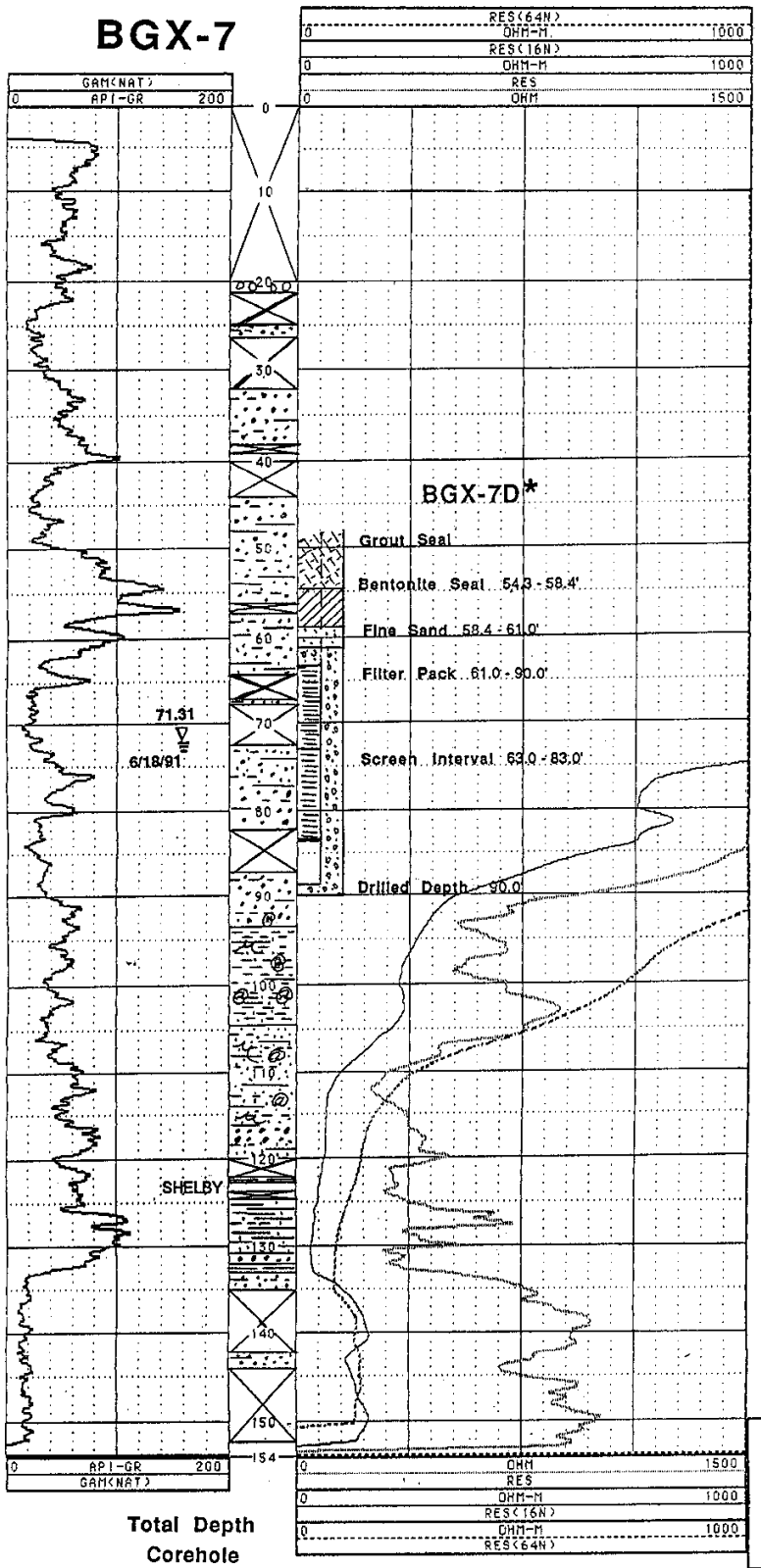

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FIGURE 7

COMPOSITE LOG
BGX-7

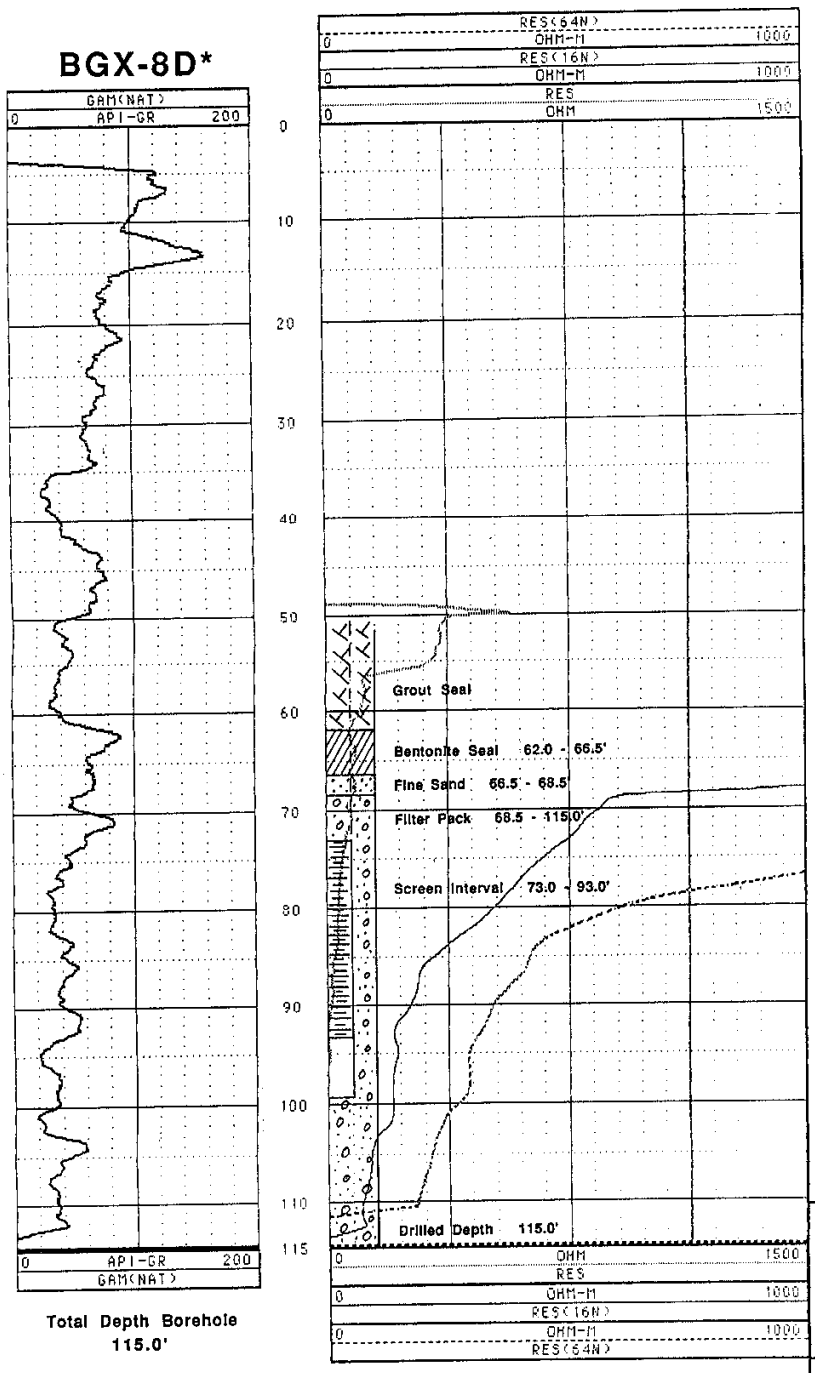

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FIGURE 8

COMPOSITE LOG
BGX-8D*

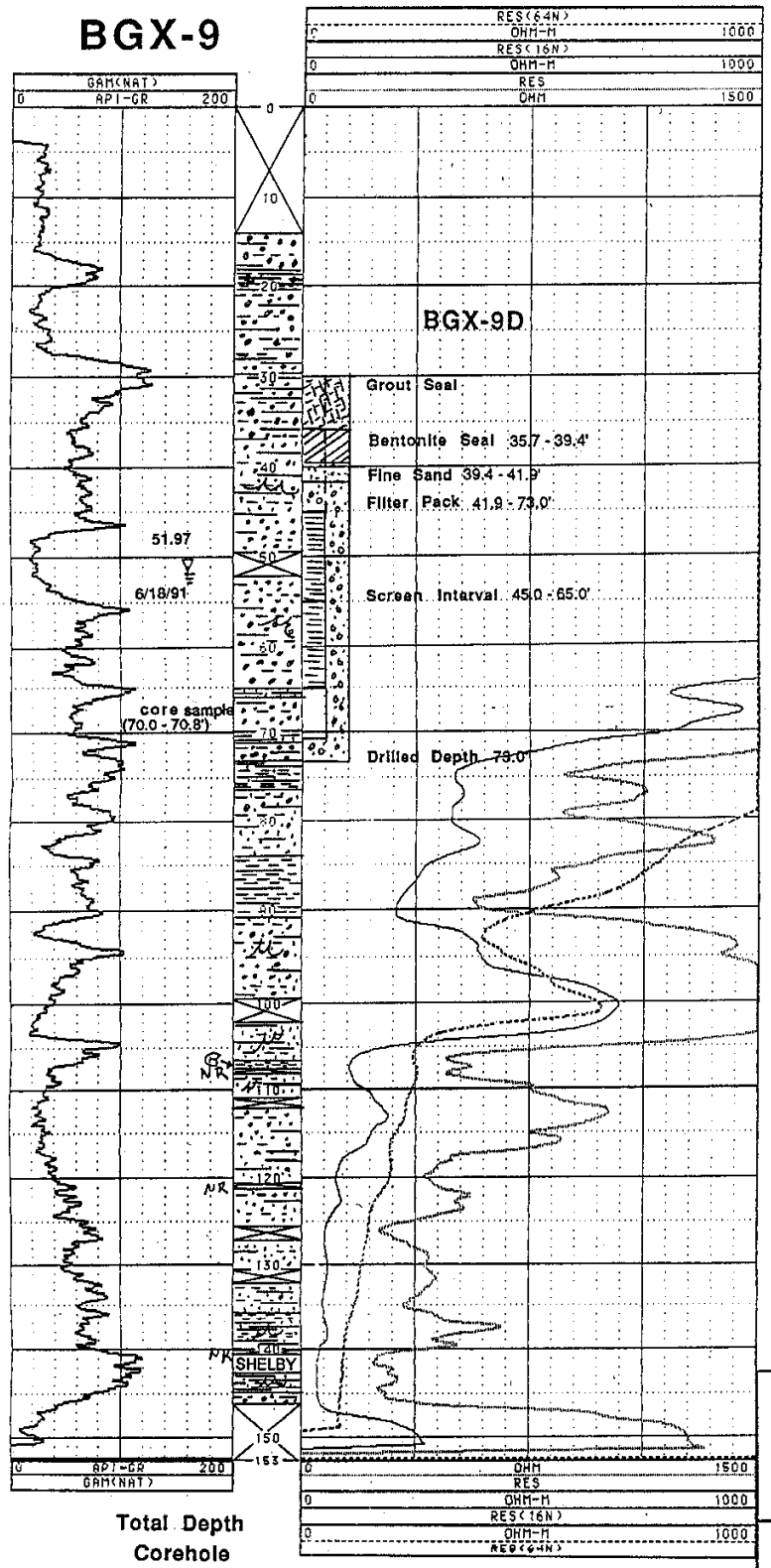

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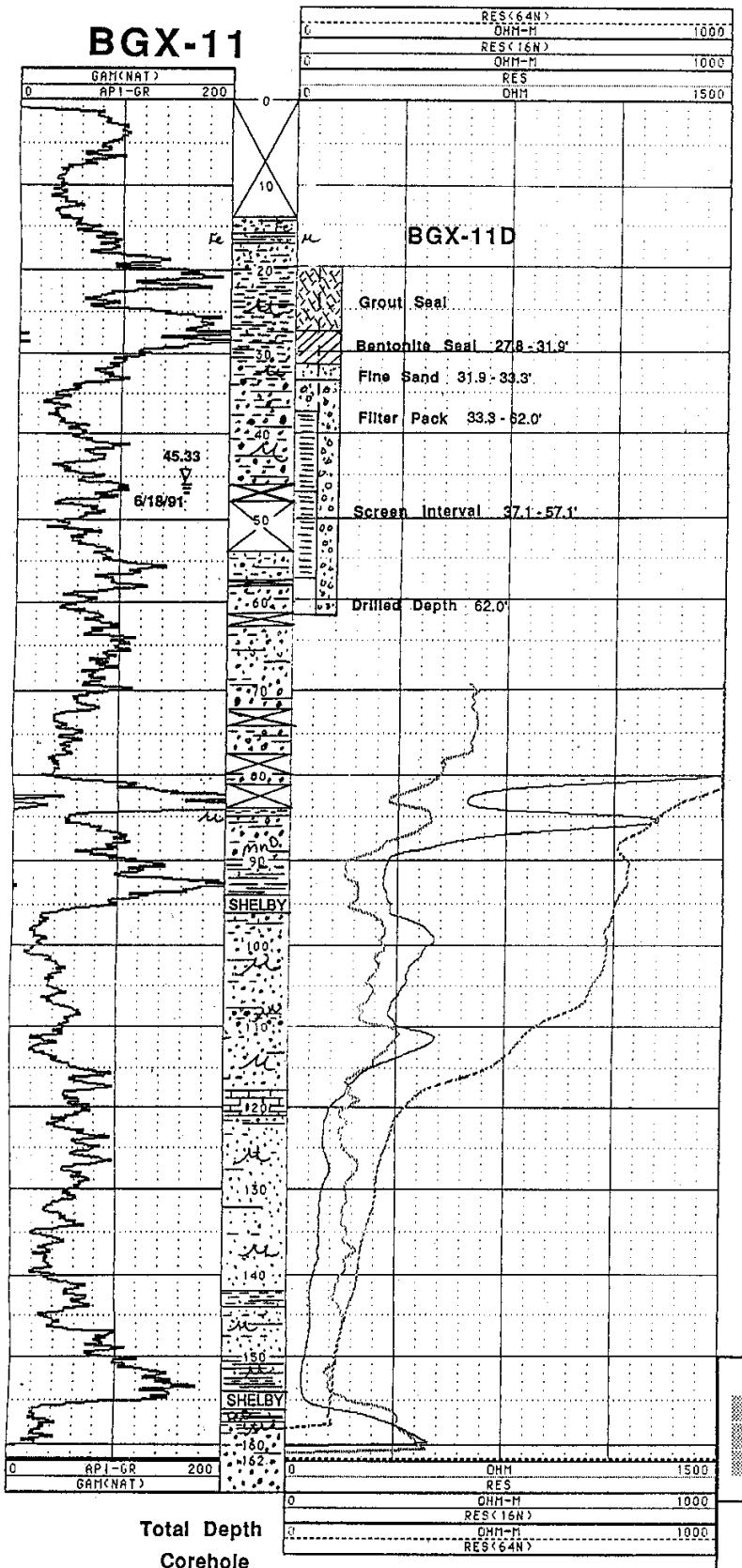
FIGURE 9

COMPOSITE LOG
BGX-9



Total Depth
Corehole
166.0'

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FIGURE 10

COMPOSITE LOG
BGX-11

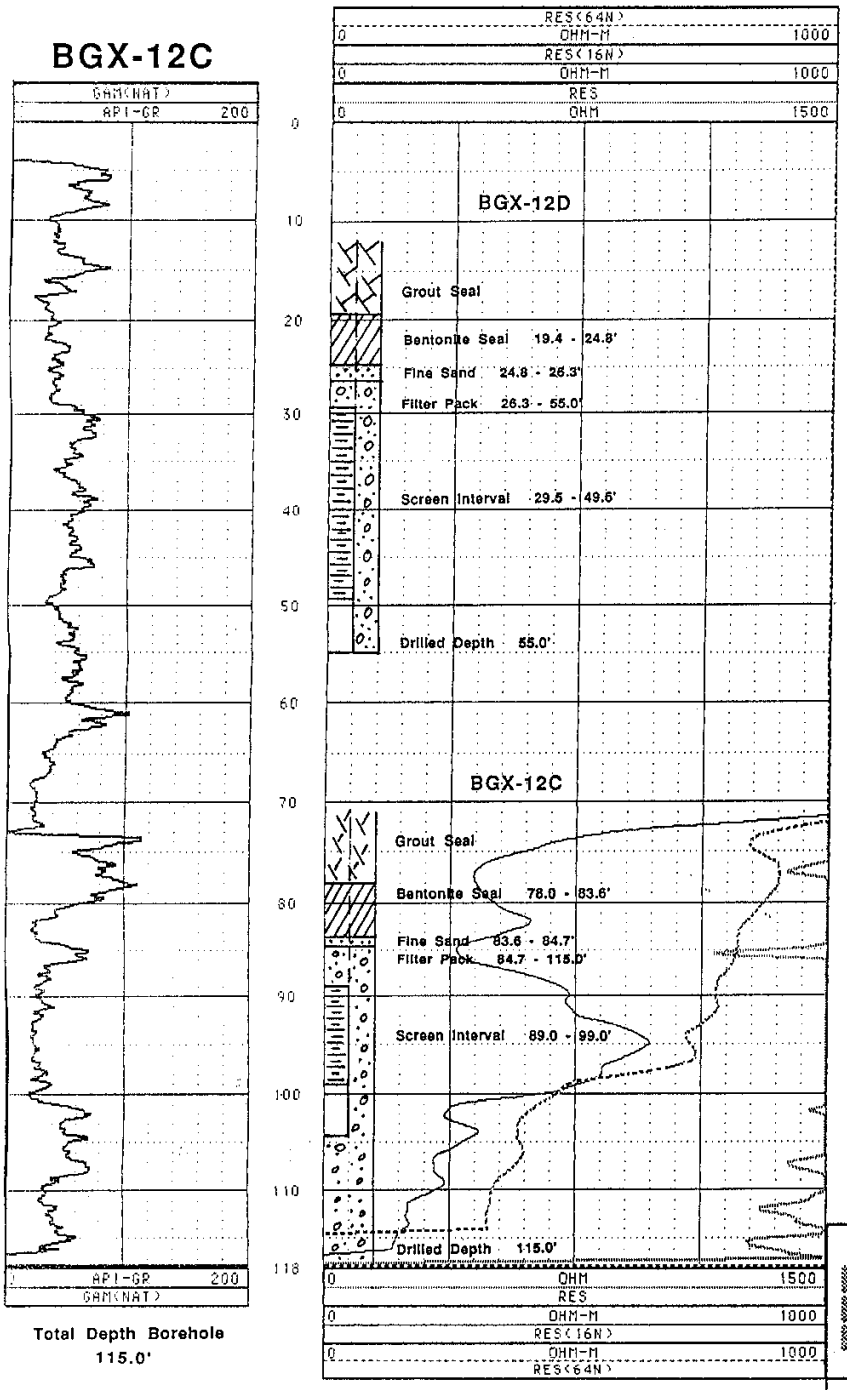

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FIGURE 11

COMPOSITE LOG
BGX-12C

2.3 Abandonment of Coreholes

Coreholes, BGX-7, BGX-9 and BGX-11, were each abandoned after the completion of geophysical logging. Abandonment was accomplished by pumping the corehole full of cement/bentonite grout, from the bottom, in accordance with DPSOP 254. Details of each abandonment were recorded on official SRS Soil Boring Installation Reports which are filed in Building 735-11A.

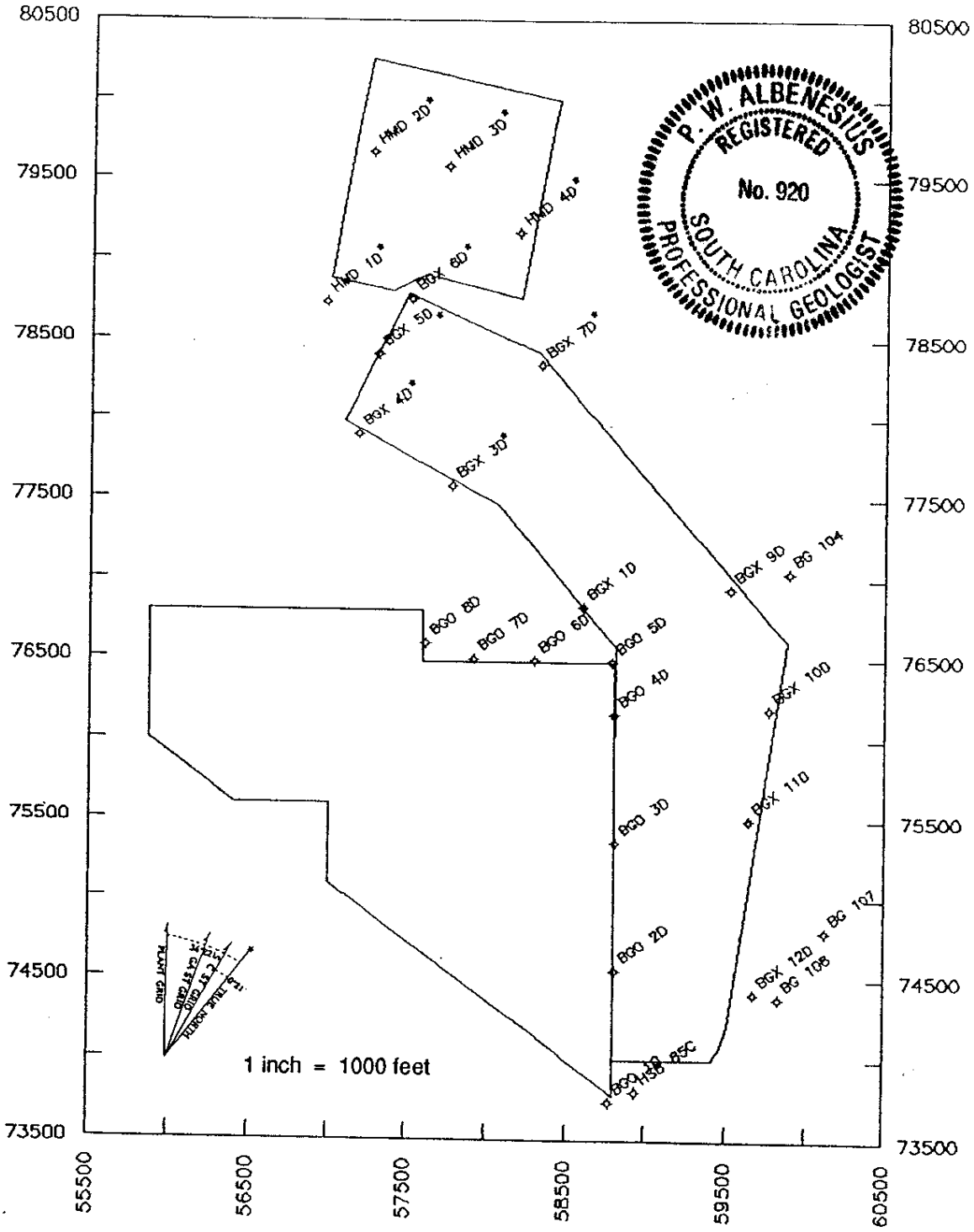
Coreholes at BGX-1A, BGX-2B and BGX-4A, were reamed to a larger diameter to accommodate the installation of monitoring wells. In cases where the corehole was deeper than the base of the well boring, the bottom of the corehole was back plugged with sand and/or bentonite pellets.

2.4 Monitoring Well Design and Installation

Five wells were installed and screened within the water table aquifer (above the Tan Clay), ten wells in the upper McBean hydrologic zone, one well in the lower McBean hydrologic zone and two wells in the Congaree aquifer. The well locations were selected by WSRC personnel based on the data collected at the six coreholes. Monitoring wells BGX-1A, 1C, 1D, 2B, 2D*, 3D*, 4A, 4C and 4D* are upgradient of the Burial Ground Expansion but downgradient of the Solid Waste Disposal Facility. All of the other BGX wells are downgradient of the expansion. Figures 12 through 15 are maps depicting the locations of the BGX wells, by hydrologic zone or aquifer, and other previously existing wells (BGO, HMD, BG, HSB) from which data were used for this report.

Monitoring well labels consist of prefix letters, a well number, and a suffix which refers to the hydrologic and/or stratigraphic interval in which the well is screened, e.g. BGX-1A. In the General Separations Area, a "D" suffix generally refers to a well

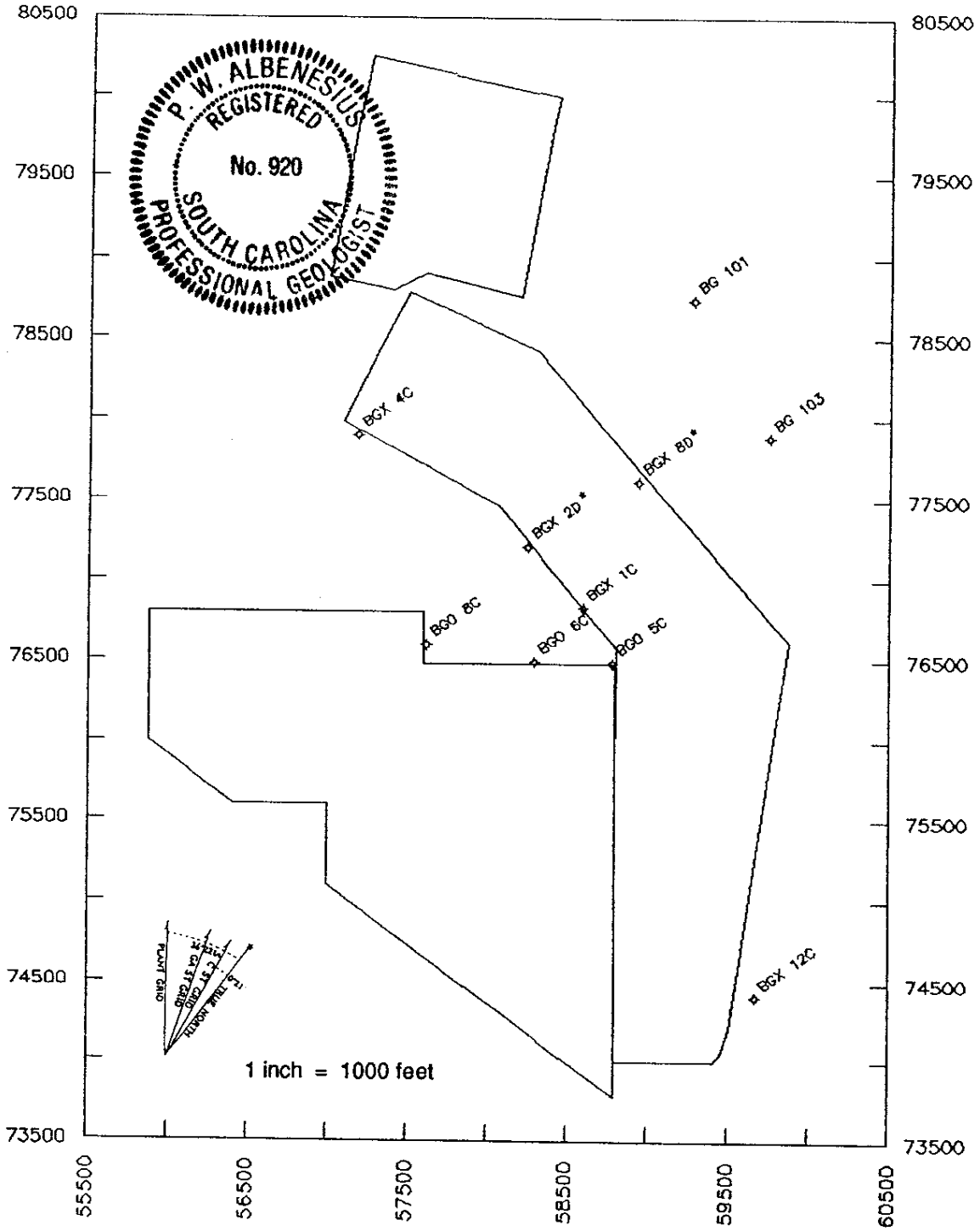
BURIAL GROUND EXPANSION: WATER TABLE WELLS



* BGO, HMD and BG wells are previously existing wells. BGX wells were installed during the Burial Ground Expansion Hydrogeologic Characterization. All depicted wells were used to generate the Water Table surface map (Fig. 21)

Figure 12

BURIAL GROUND EXPANSION: UPPER MCBEAN WELLS



* BGO and BG wells are previously existing wells. BGX wells were installed during the Burial Ground Expansion Hydrogeologic Characterization. All depicted wells were used to generate the upper McBean Potentiometric surface map (Fig. 20)

Figure 13

BURIAL GROUND EXPANSION: LOWER MCBEAN WELLS

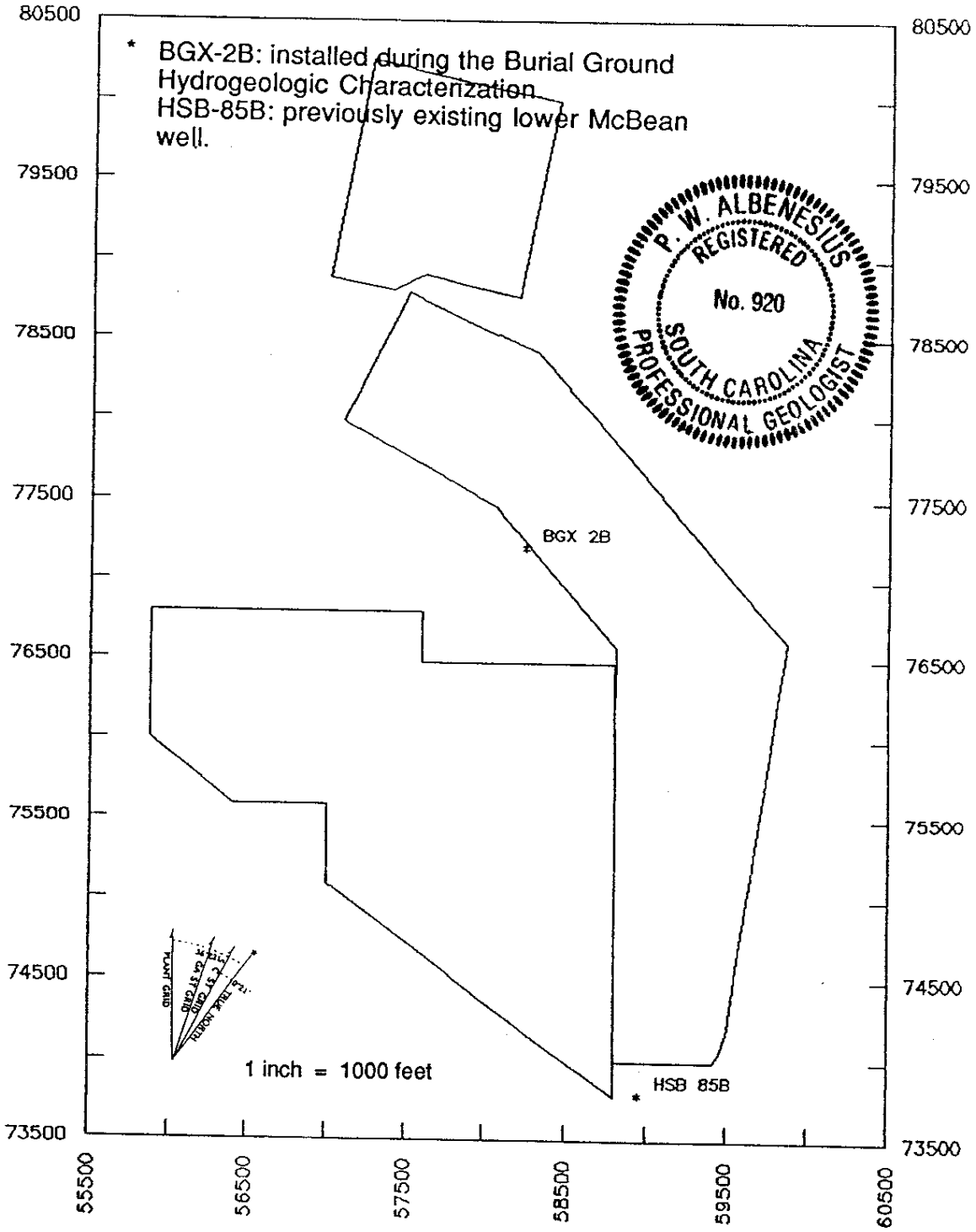


Figure 14

BURIAL GROUND EXPANSION: CONGAREE WELLS

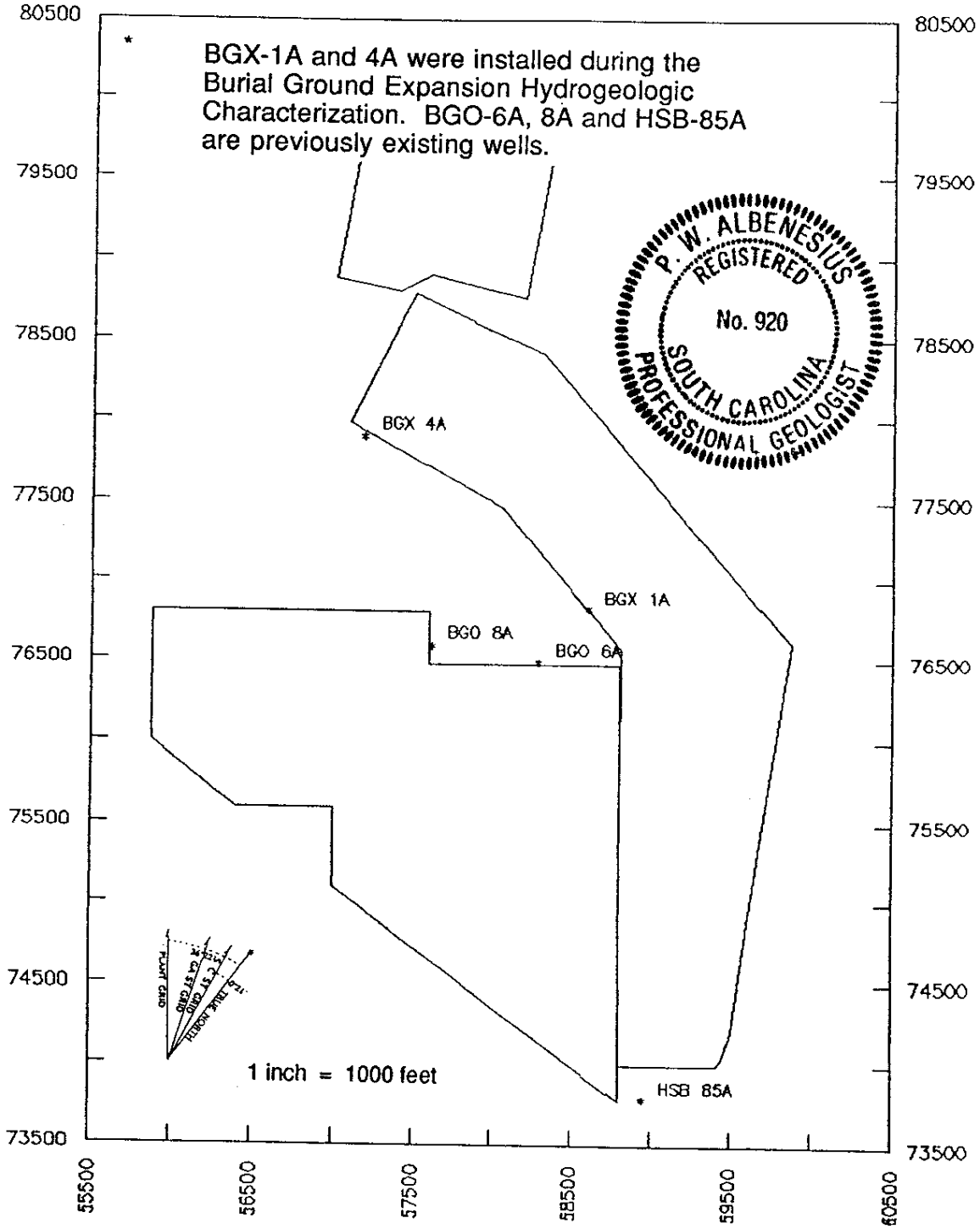


Figure 15

screened in the shallowest or water table aquifer. A "C" suffix generally refers to a well screened in the Barnwell or McBean aquifer which is the zone between the locally recognized Tan Clay and Green Clay confining units. A "B" suffix typically denotes a well screened in the lowermost part of the McBean aquifer and an "A" suffix usually denotes a Congaree aquifer well.

In this study, a unique situation exists in that some of the water table wells are screened in the McBean Aquifer, i.e. the McBean Aquifer is a water table aquifer under part of the site. These wells are denoted with a D* suffix.

All wells were constructed in accordance with standard SRS specifications (DPSOP 254) for monitoring wells and with South Carolina Well Standards and Regulations, R.61 - 71, (SCDHEC, 1985). The wells were constructed of PVC casing and slotted PVC screen. The filter pack and screen slot size combination selected for the project consisted of Foster-Dixiana FX50 commercial filter pack and 0.016-inch screen slots. Screened intervals for all wells were selected by WSRC project personnel based upon the corehole data, combined with geophysical logs and other existing geologic data. The screen lengths used in these wells were approximately 20 feet for the water table wells and ten feet for the other wells. Each well was capped at the bottom. PVC centralizers were attached at the top and bottom of the screen and at 40-foot intervals above the screen.

A filter pack was installed through a tremie pipe opposite each well screen from the bottom of the borehole, to approximately three feet above the top of the screen. A one to two foot thick fine sand cap was installed above the filter pack and a minimum four to five foot thick bentonite pellet seal was installed above the sand cap. After at least two hours of hydration time, a cement/bentonite grout cap was installed. The cap was

allowed to set for at least eight hours before further grouting. The well was then grouted from the cap upward, through a tremie pipe using a three to four percent bentonite/cement slurry. The minimum allowable cement weight was 13.2 lbs/gal. Well construction diagrams are contained in Appendix D and well construction details are presented in Table 1. Table 2 presents final survey data for the 18 monitoring wells.

One well, BGX-8D, was damaged during the installation process. It is thought that the casing collapsed during grouting. The condition was discovered by the well development crew when the bailer would not advance into the screen zone. A new well (denoted in the well records as BGX-8DR), was installed approximately 20 feet from the damaged well. The new well is designated BGX-8D* in this report. The damaged well has not yet been abandoned as of this report's publication.

2.5 Monitoring Well Development

After the installation of each well was completed, and the cement grout was allowed to cure, the well was developed under the direction of WSRC personnel. Records which included information on the pH, specific conductance, and volume of water removed from the wells, were maintained by the drilling contractor. Bottled samples from each well, representative of the initial to final development phases, were submitted by the drilling contractor to the WSRC-EPD Groundwater Monitoring Group. Available records indicate that at least one well, BGX-1A, was not fully developed. Well development records are on file at SRS Building 772-7B. Table 3 summarizes well development activity for each well, based on the development records.

TABLE 1

WELL CONSTRUCTION DETAILS

WELL/ COREHOLE NUMBER	DATE CORED OR INSTALLED	ORIGINAL GROUND SURFACE ELEVATION (ft)	DRILLING METHOD	DEPTH CORED FROM/TO (ft)	DEPTH REAMED AND/OR DRILLED (ft)	GEOPHY LOG	TOP OF LIQUID LEVEL PIPE ELEVATION (ft)	DEPTH TO TOP SCREEN (ft)	SCREEN LENGTH (ft)	DEPTH TO TOP SUMP (ft)	DEPTH TO BOTTOM WELL (ft)	DEPTH TO TOP FILTER (ft)	DEPTH TO TOP FINE SAND (ft)	DEPTH TO TOP SEAL (ft)	HYDRO-STRAT ZONE EXPLORED SCREENED**
BGX-1A	4-2-91	288.6	MR	10.0/197.0	197.0	I-V	291.3	165.0	10.0	175.0	177.9	161.8	160.7	156.4	AQ IIA
BGX-1C	4-24-91	288.8	MR	NC	120.0	NA	291.4	103.3	10.0	113.3	118.7	100.2	98.8	95.0	AQ IIB_1
BGX-1D	4-26-91	288.8	MR	NC	75.0	NA	291.4	54.5	20.0	74.5	75.0	51.1	48.5	43.4	AQ IIB_2
BGX-2B	2-7-91	288.8	MR	10.0/188.0	155.0	I-V	291.5	142.0	10.0	152.0	154.6	137.0	135.5	131.4	AQ IIB_1
BGX-2D*	2-28-91	288.6	MR	NC	115.0	NA	291.3	98.0	10.0	108.0	113.4	94.7	92.7	88.1	AQ IIB_1
BGX-3D*	2-6-91	288.7	A/MR	NC	95.0	NA	291.4	67.5	20.0	87.5	92.9	64.1	61.9	57.0	AQ IIB_1
BGX-4A	1-17-91	288.3	MR	10.0/190.0	190.0	I-V	291.0	172.0	10.0	182.0	187.4	167.2	166.0	160.6	AQ IIA
BGX-4C	1-21-91	288.3	MR	NC	125.0	NA	290.9	108.0	10.0	118.0	123.4	104.5	102.5	99.2	AQ IIB_1
BGX-4D*	1-28-91	288.4	MR	NC	90.0	NA	291.1	65.0	20.0	85.0	90.4	60.5	58.2	53.5	AQ IIB_1
BGX-5D*	2-4-91	282.5	A/MR	NC	98.0	NA	285.2	68.0	20.0	88.0	93.4	64.6	62.3	57.9	AQ IIB_1
BGX-6D*	4-12-91	274.5	MR	NC	90.0	NA	277.2	64.0	20.0	84.0	89.5	60.7	58.5	55.0	AQ IIB_1
BGX-7	4-4-91	--	MR	20.0/152.0	SB/G	I-V	NA	NA	NA	NA	NA	NA	NA	NA	CIIA-IIB
BGX-7D*	4-10-91	--	MR	NC	90.0	NA	--	63.0	20.0	83.0	88.5	61.0	58.4	54.3	AQ IIB_1
BGX-8D* +	5-31-91	275.7	MR	NC	115.0	I-V	278.4	73.4	20.0	93.4	98.8	68.9	66.9	62.4	AQ IIB_1
BGX-9	1-9-91	--	MR	14.0/153.0	SB/G	I-V	NA	NA	NA	NA	NA	NA	NA	NA	CIIA-IIB
BGX-9D	3-18-91	276.9	MR	NC	73.0	NA	279.6	45.0	20.0	65.0	70.4	41.9	39.4	35.7	AQ IIB_2
BGX-10D	1-23-91	274.3	MR	NC	64.0	NA	277.0	38.6	20.0	58.6	64.0	36.6	34.4	27.9	AQ IIB_2
BGX-11	12-11-90	--	MR	14.0/166.0	SB/G	I-V	NA	NA	NA	NA	NA	NA	NA	NA	CIIA-IIB
BGX-11D	1-23-91	273.8	MR	NC	62.0	NA	276.5	37.1	20.0	57.1	62.0	33.3	31.9	27.8	AQ IIB_2
BGX-12C	1-18-91	272.6	MR	NC	115.0	I-V	275.3	89.0	10.0	99.0	104.4	84.7	83.6	78.0	AQ IIB_1
BGX-12D	1-21-91	272.7	MR	NC	55.0	NA	275.4	29.5	20.0	49.5	55.0	26.3	24.8	19.4	AQ IIB_2

GEOPHYSICAL LOGS

I - Natural Gamma
II - Spontaneous Potential
III - 16"/64" Normal Resistivity
IV - Single Point Resistance
V - Caliper

NOTE:

All measurements from original ground surface
All wells constructed with screen size 0.016 in. and filter pack 0.018 - 0.022 in. (FX-50).
* D wells screened below the Tan Clay
**See Figure 17 this text
+ Replacement Well
-- Not available

ABBREVIATIONS:

A - Hollow Stem Augering
AQ - Aquifer
C - Confining Unit
NA - Not Applicable
NC - Not Cored
SB/G - Soil Boring/Grouted

TABLE 2
BURIAL GROUND EXPANSION
BGX WELL SERIES
MAY 17, 1991

MONITORING WELL SURVEY DATA

Well Number	Northing	Easting	Top of Water Level Pipe Elevation (ft. msl.)	Top of Casing Elevation (ft. msl.)	Pad Elevation (ft. msl.)
BGX-1A	76,831.89 LAT 33-17-28.68	58,590.35 LON 81-39-42.35	291.31	291.15	289.1
BGX-1C	76,820.01 LAT 33-17-28.64	58,599.83 LON 81-39-42.18	291.44	291.27	289.3
BGX-1D	76,809.54 LAT 33-17-28.61	58,608.63 LON 81-39-42.02	291.44	291.27	289.2
BGX-2B	77,203.42 LAT 33-17-29.68	58,256.46 LON 81-39-48.11	291.46	291.29	289.20
BGX-2D*	77,192.42 LAT 33-17-29.64	58,265.64 LON 81-39-47.95	291.30	291.14	289.10
BGX-3D*	77,577.03 LAT 33-17-29.85	57,780.13 LON 81-39-55.24	291.41	291.21	289.10
BGX-4A	77,879.18 LAT 33-17-28.94	57,215.58 LON 81-40-02.71	291.03	290.86	288.80
BGX-4C	77,886.15 LAT 33-17-28.92	57,202.19 LON 81-40-02.88	290.93	290.77	288.70
BGX-4D*	77,893.92 LAT 33-17-28.89	57,186.16 LON 81-40-03.09	291.06	290.88	288.80
BGX-5D*	78,401.99 LAT 33-17-33.65	57,308.64 LON 81-40-05.48	285.21	285.04	283.00
BGX-6D*	78,740.08 LAT 33-17-37.62	57,524.85 LON 81-40-05.80	277.2	277.02	275.0

TABLE 2 (cont'd)

Well Number	Northing	Easting	Top of Water Level Pipe Elevation (ft. msl.)	Top of Casing Elevation (ft. msl.)	Pad Elevation (ft. msl.)
BGX-7D*	78,349.26 LAT 33-17-39.13	58,312.75 LON 81-39-55.60	----	279.16**	277.1
BGX-8D*	77,589.61 LAT 33-17-36.78	58,942.51 LON 81-39-44.31	278.38	278.21	276.1
BGX-9D	76,935.98 LAT 33-174-34.98	59,522.11 LON 81-39-34.25	279.57	279.39	277.40
BGX-10D	76,183.33 LAT 33-17-30.42	59,765.48 LON 81-39-26.67	277.04	276.86	274.80
BGX-11D	75,300.67 LAT 33-17-22.31	59,581.42 LON 81-39-22.25	276.45	276.27	----
BGX-12C	74,427.87 LAT 33-17-15.91	59,675.30 LON 81-39-15.25	275.28	275.12	273.10
BGX-12D	74,410.88 LAT 33-17-15.77	59,674.29 LON 81-39-15.14	275.42	275.24	273.20

---- Not available

* D wells screened below the Tan Clay

** Top of casing elevation calculated by adding measured stickup to pad elevation

ABLE 3

SUMMARY OF WELL DEVELOPMENT **

Well Number	Development Method	Bailing Development (Hours)	Pumping Development (Hours)	Estimated Volume of Water Removed/Added During Development (Gallons)	pH Initial/Final	Specific Conductance Initial/Final (µMHOS/cm)
BGX-1A	B	1.0	0.0	30/0	NA/12.29	NA
BGX-1C	B/P	10.0	19.0	264/80	11.83/6.86	3730/140
BGX-1D	B/P	8.5	16.5	1000/480	6.80/6.81	140/120
BGX-2B	B/P	5.0	23.0	800/0	11.62/7.59	1370/330
BGX-2D*	B/P	15.5	13.5	NA/280	7.81/7.19	90/90
BGX-3D*	B/P	4.0	13.0	668/0	7.77/6.80	110/50
BGX-4A	B/P	7.0	14.0	2548/340	8.36/7.15	330/90
BGX-4C	B/P	4.0	11.5	500/0	6.43/7.19	90/220
BGX-4D*	B/P	3.0	18.5	750/0	9.40/7.12	160/120
BGX-5D*	B/P	4.0	12.5	490/68	6.96/NA	210/NA
BGX-6D*	B/P	2.0	28.0	2000/0	10.96/6.65	640/140
BGX-7D*	B/P	10.5	29.5	15375/0	7.51/6.70	160/40
BGX-8D*+	B/P	5.0	19.0	5400/0	6.52/8.43	550/180
BGX-9D	B/P	4.0	38.0	1300/0	7.40/5.88	190/40
BGX-10D	B/P	11.0	14.5	533/297	6.59/6.21	60/50
BGX-11D	B/P	6.0	20.0	NA/50	6.59/5.92	60/6
BGX-12C	B/P	3.5	18.5	350/40	7.12/6.01	290/60
BGX-12D	B/P	2.0	36.0	1326/1015	7.04/6.62	90/70

* D wells screened below the Tan Clay
** Based on well development records from Environmental Monitoring and Testing Corporation.
B - Bailing P - Pumping and Swabbing
\+ Replacement Well
NA = Not available

2.6 Field Permeability Testing

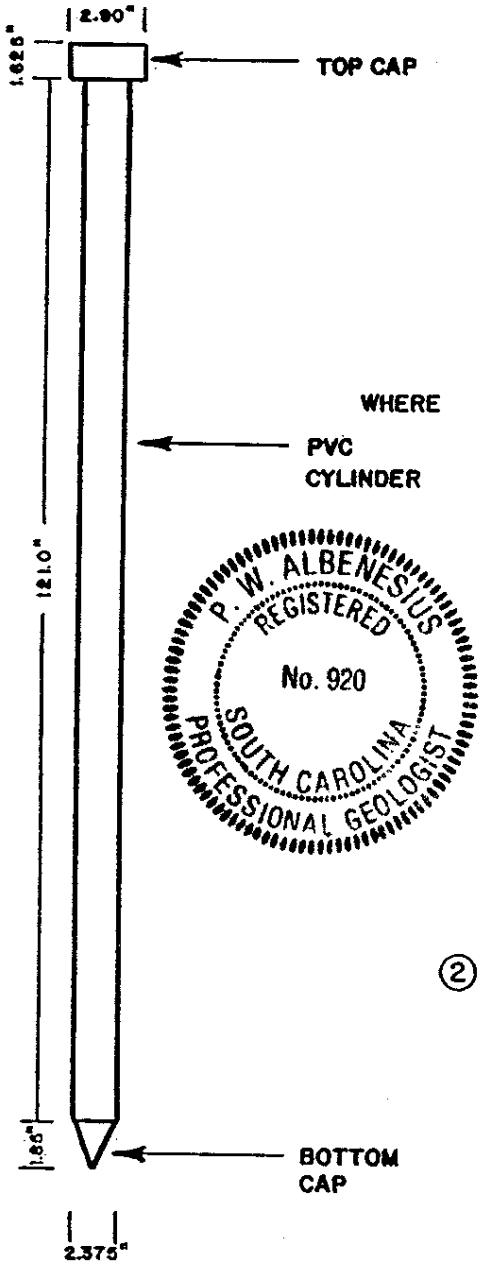
After well development was complete, 16 of the 18 wells (89%) were slug tested to estimate the hydraulic conductivity (K_h) of the screened formations. Rising head tests were conducted in the wells with screens that intersected the water table surface and falling head tests were conducted in the wells with completely submerged screens. The data were analyzed using the Bouwer and Rice method.

2.6.1 Methods

Slug tests require the instantaneous introduction (or removal) of a known volume of water to or from a well, borehole, or piezometer. A field testing system was used that consisted of a solid slug (cylinder) which could be easily set up, and did not require the introduction of foreign water into the developed wells.

A known volume of water could be immediately displaced inside the well casing upon immersion of the solid slug below the static water level. The solid slug was a cylinder constructed of ten foot long, two inch diameter PVC pipe with threaded caps on both ends. One end cap was fitted with a stainless steel lifting hook. The pipe was filled with clean sand to serve as ballast. Figure 16 shows the design of the cylinder that was used.

Two types of field permeability tests were performed to obtain estimates of hydraulic conductivity. Where the screened zones of the wells were completely saturated, falling head tests were performed by raising the water levels in the wells and then monitoring the rate of equilibration. Most of the water-table wells were constructed with well screens that were partially unsaturated. Therefore, rising head tests were performed on



① $V_I + V_2 + V_3 = V_{II}$

WHERE V_1 = VOLUME OF TOP CAP

V_2 = VOLUME OF BOTTOM CAP

V_3 = VOLUME OF CYLINDER

$V_1 = \pi r^2 h$, $r = 1.45"$, $h = 1.85"$

$= 12.2196\ in^3$

$V_2 = \frac{\pi r^2(base) \times h}{3}$

WHERE $r(base) = 1.1875"$

$h = 1.625"$

$V_2 = \frac{7.1990}{3} = 2.3997\ in^3$

$V_3 = \pi r^2 h$, $r = 1.1875"$, $h = 121.0"$

$= 536.0465\ in^3$

$V_{II} = 550.6658\ in^3$

② VERTICAL RISE IN HEAD INSIDE OF 4" ID CASING

$V = \pi r^2 h$, $h = \frac{V}{\pi r^2}$

$h = \frac{550.6658\ in^3}{12.5664\ in^2}$

$= 42.6572$ in.

$= 3.6517$ ft.

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SIRRINE ENVIRONMENTAL CONSULTANTS

FIGURE 16

SLUG TEST CYLINDER

these wells to avoid measuring the effects of saturating the dry gravel pack and formation sediments. A summary of the field procedures for each test type are discussed below.

Falling head tests were conducted in the McBean and Congaree wells and a 3/8-inch nylon rope was tied to the lifting hook of the cylinder and then lowered into the well. The cylinder was lowered to a point just above the static water level and secured. A mark was placed on the trailing end of the rope so that when lowered further the cylinder would be completely submerged, but safely above the bottom of the well. A pressure transducer was lowered near the bottom of the well below the projected insertion of the cylinder. The cylinder was then quickly lowered to the mark and secured, and water-level measurements were recorded using a digital data logger until the induced head change had equilibrated back to or near the original static water level.

In the wells with screens that crossed the water table, the rising head tests were performed by submerging the cylinder, allowing the water level to return to static conditions, then quickly pulling the cylinder out and measuring the rise in head following the induced removal of the known volume. Measurements were made in a similar manner to the falling head tests performed on the McBean and Congaree wells.

2.6.2 Data Analysis

The Bouwer and Rice Method (1976) was used in this program to analyze the slug test data. It is applicable to fully or partially penetrating wells in unconfined aquifers and assumes negligible draw down of the water table around the well and no flow above the water table.

The Bouwer and Rice equation for estimating Hydraulic Conductivity is:

$$K = \frac{r_c^2 \ln (R_e/r_w)}{2L} \times \frac{1}{t} \times \ln \frac{y_o}{y_t}$$

where, R_e = effective radial distance over which the head difference y is dissipated

r_c = radius of the section where the water level is rising. If the water level is rising within the screen,

$r_c = \sqrt{r_c^2 + n (r_w^2 - r_c^2)}$, where n = porosity of the filter material

r_w = radial distance between well center and undisturbed aquifer (r_c plus thickness of gravel envelope or developed zone outside casing)

L = height of perforated, screened, encased or otherwise open section of well through which ground water enters

y = the water level in the well below the water table

y_o = y at time zero

y_t = y at time t

t = time since y_o.

An empirical equation is used that relates Re to the geometry and boundary conditions of the system:

$$\ln \frac{R_e}{r_w} = \frac{1}{\frac{1.1}{\ln (H/r_w)} + \frac{A+B \ln [(D-H)/r_w]}{(L/r_w)}}$$

where H = vertical distance from the water table to the base of L

B = the aquifer thickness, and

A and B are dimensionless parameters found by comparing their relationship to L/r_w on a graph of curves provided by Bouwer and Rice.

The observed values of y are plotted against t on semilogarithmic paper (y on the log scale).

2.6.3 Results

Hydraulic conductivity estimates for water table wells screened above the Tan Clay ranged from 1.28×10^{-4} to 5.83×10^{-4} cm/sec (0.36 to 1.65 ft/day) and averaged 2.55×10^{-4} cm/sec (0.72 ft/day). Estimates for the upper McBean hydrologic zone (which includes wells screened across the water table and wells with submerged screens) ranged from 1.19×10^{-4} to 7.19×10^{-3} cm/sec (0.34 to 20.38 ft/day) and averaged 1.30×10^{-3} cm/sec (3.69 ft/day). The estimate for the lower McBean zone (BGX-2B) was 7.39×10^{-5} cm/sec (0.21 ft/day). In the Congaree aquifer (BGX-1A and BGX-4A), estimates ranged from 2.70×10^{-6} to 6.46×10^{-4} cm/sec (0.01 to 1.83 ft/day) and averaged 3.24×10^{-4} cm/sec (0.92 ft/day). BGX-1A was apparently only partially developed when slug tested and the K_h estimate from the well is unusually low for the Congaree aquifer. The estimate from BGX-4A, 6.46×10^{-4} cm/sec (1.83 ft/day) is a more typical number. The results are presented for each well in Table 4. Data plots of the rising and falling head tests are included in Appendix E.

2.7 Water Level Measurements

Water levels were measured in each monitoring well on three separate dates to establish trend data and to generate potentiometric maps. Several existing wells surrounding the Burial Ground Expansion were included in the measurements to provide a more complete data base, which in turn facilitated more accurate maps. Depth to water measurements were made using an electric water level tape. The depths were converted

SUMMARY OF FIELD PERMEABILITY TEST RESULTS
SLUG TEST ANALYSES - MODIFIED BOUWER-RICE METHOD
SRS BURIAL GROUND EXPANSION HYDROGEOLOGIC CHARACTERIZATION

Well Number	rc feet	rc' feet	Le feet	rw feet	Le/rw	Lw feet	H feet	yo feet	yt feet	t sec	K ft/sec	K ft/day	K cm/sec
BGX-1D	0.167	0.267	19.49	0.417	46.78	15.09	92.20	2.35	0.10	708.4	1.91E-05	1.65	5.83E-04
BGX-3D*	0.167	0.267	18.97	0.417	45.53	18.76	77.58	2.78	0.10	714.0	2.15E-05	1.85	6.54E-04
BGX-4D*	0.167	0.267	18.95	0.417	45.48	18.23	78.54	1.38	0.10	360.0	3.34E-05	2.89	1.02E-03
BGX-5D*	0.167	0.267	18.96	0.417	45.50	19.60	78.48	1.85	0.14	713.0	1.68E-05	1.45	5.13E-04
BGX-6D*	0.167	0.267	18.97	0.417	45.53	22.39	80.41	3.06	0.10	394.0	4.13E-05	3.57	1.26E-03
BGX-7D*	0.167	0.267	18.99	0.417	45.58	19.31	82.34	2.50	0.10	63.1	2.36E-04	20.38	7.19E-03
BGX-9D	0.167	0.267	18.95	0.417	45.48	20.86	86.20	0.94	0.11	2394.0	4.20E-06	0.36	1.28E-04
BGX-10D	0.167	0.267	18.95	0.417	45.48	16.30	94.91	1.48	0.10	2009.4	5.98E-06	0.52	1.82E-04
BGX-11D	Not Tested												
BGX-12D	0.167	0.267	18.95	0.417	45.48	21.13	106.03	1.38	0.16	2395.5	4.20E-06	0.36	1.28E-04
BGX-2D*	0.167	0.167	8.96	0.417	21.50	40.49	78.76	3.47	0.28	2388.0	3.90E-06	0.34	1.19E-04
BGX-8D*	Not Tested												
BGX-1C	0.167	0.167	8.92	0.417	21.41	40.98	79.59	3.49	0.11	2400.0	5.36E-06	0.46	1.63E-04
BGX-4C	0.167	0.167	8.96	0.417	21.50	50.20	77.55	3.15	0.10	986.4	1.35E-05	1.16	4.11E-04
BGX-12C	0.167	0.167	8.95	0.417	21.48	66.65	102.23	3.43	0.10	1080.0	1.29E-05	1.11	3.93E-04
BGX-2B	0.167	0.167	8.91	0.417	21.38	75.61	75.61	3.34	0.66	3565.0	2.42E-06	0.21	7.39E-05
BGX-1A	0.167	0.167	8.97	0.417	21.53	9.79	70.20	3.67	3.41	2400.0	8.87E-08	0.01	2.70E-06
BGX-4A	0.167	0.167	8.96	0.417	21.50	23.61	61.00	3.54	0.10	579.0	2.12E-05	1.83	6.46E-04

NOTES: Slug tests have been analyzed according to Bouwer and Rice (1976) and Bouwer (1989).

* **D wells that are screened below the Tan Clay are denoted with D***

to elevations using the survey data of the measuring reference points. The water depths and elevations are presented in Table 5.

2.8 Laboratory Testing

Samples of low permeability confining bed sediments were collected in each corehole. One of the project objectives was to attempt to collect undisturbed samples of the Tan Clay and the Green Clay in each exploratory boring (two recognizable confining beds in the GSA), using a Shelby tube sampler. At least one clay sample was successfully collected in each corehole and in several cases, two samples were obtained. In cases where the material to be sampled was too dense or indurated to use the Shelby tube sampler, a sample was taken from the core, and handled as if it were undisturbed. A total of ten samples were collected, eight undisturbed and two taken from the core.

All of the samples were carefully packaged and handled. The Shelby tube samples were handled, packaged and shipped in accordance with industry approved standards. In summary, the tubes were sealed at both ends using wax, maintained in an upright position (as they came out of the ground) and packaged for shipping so that they would remain upright and be carefully handled.

The two samples that were removed from the core, were handled, packaged and shipped similarly to the Shelby tube samples. The difference is that the samples were removed from the core box, wrapped in plastic, and wrapped in aluminum foil. The samples were sealed with wax and packaged in boxes made of core box material. They were appropriately labelled for upright and careful handling.

All of the samples were shipped to a soils testing laboratory and analyzed for vertical and horizontal hydraulic conductivity, moisture content, grain size and Atterburg limits. The results of the tests are contained in Table 6 and the data are included in Appendix F.

TABLE 5
SUMMARY OF WATER LEVEL ELEVATIONS
BURIAL GROUND EXPANSION

Water Table Well Number	6/11/91 Depth to Water	6/11/91 Water Elevation	6/18/91 Depth to Water	6/18/91 Water Elevation	7/12/91 Depth to Water	7/12/91 Water Elevation
BGX-1D	61.51	229.74	61.64	229.61	61.56	229.69
BGX-3D*	75.27	216.14	75.26	216.15	75.28	216.13
BGX-4D*	74.19	216.87	74.17	216.89	74.17	216.89
BGX-5D*	74.12	211.09	74.24	210.97	74.16	211.05
BGX-6D*	68.97	208.23	69.00	208.20	68.97	208.23
BGX-7D*	71.27	207.89	71.31	207.85	71.35	207.81
BGX-9D	51.88	227.69	51.97	227.60	52.03	227.54
BGX-10D	50.18	226.86	50.28	226.76	50.28	226.76
BGX-11D	–	–	–	–	–	–
BGX-12D	36.11	239.31	36.26	239.16	36.58	238.84
HMD-1D	–	–	53.24	211.43	53.36	211.31
HMD-2D	–	–	58.01	203.40	58.36	203.05
HMD-3D	–	–	56.79	202.85	57.17	202.47
HMD-4D	–	–	48.28	202.79	48.57	202.50
BG-104	–	–	–	–	Dry	Dry
BG-107	–	–	13.14	235.16	13.36	234.94
BG-108	–	–	45.68***	221.61***	28.58	238.72
BGO-1D	–	–	56.43	238.87	56.28	239.02
BGO-2D	–	–	59.20	237.90	59.10	238.00
BGO-3D	–	–	58.15	234.75	58.04	234.86
BGO-4D	–	–	66.49	231.21	66.36	231.34
BGO-5D	–	–	65.79	230.71	65.67	230.83
BGO-6D	–	–	54.55	231.15	54.46	231.24
BGO-7D	–	–	55.60	227.00	55.54	227.06
BGO-8D	–	–	56.23	227.17	56.20	227.20
HSB-85C	–	–	55.09	239.21	55.02	239.28

Upper McBean Well Number	6/11/91 Depth to Water	6/11/91 Water Elevation	6/18/91 Depth to Water	6/18/91 Water Elevation	7/12/91 Depth to Water	7/12/91 Water Elevation
BGX-1C	74.43	216.84	74.38	216.89	74.52	216.75
BGX-2D*	74.89	216.41	74.94	216.36	75.04	216.26
BGX-4C	75.12	215.81	75.07	215.86	75.10	215.83
BGX-8D*	–	–	70.48	207.21	70.65	207.25
BGX-12C	40.10	235.18	40.13	235.15	40.31	234.97
BG-101	–	–	34.89	196.51	35.32	196.08
BG-103	–	–	–	–	38.08	201.42
BGO-5C	–	–	79.00	217.30	79.16	217.14
BGO-6C	–	–	64.81	220.99	65.00	220.80
BGO-8C	–	–	64.10	219.40	64.36	218.94

TABLE 5 (cont'd)

Lower McBean Well Number	6/11/91 Depth to Water	6/11/91 Water Elevation	6/18/91 Depth to Water	6/18/91 Water Elevation	7/12/91 Depth to Water	7/12/91 Water Elevation
BGX-2B	77.97	213.49	77.62	213.84	77.74	213.72
HSB-85B	–	–	60.94	233.76	61.04	233.66
Congaree Well Number	**6/11/91 Depth to Water**	**6/11/91 Water Elevation**	**6/18/91 Depth to Water**	**6/18/91 Water Elevation**	**7/12/91 Depth to Water**	**7/12/91 Water Elevation**
BGX-1A	–	–	132.71	158.39	132.71	158.39
BGX-4A	136.22	154.81	136.16	154.87	136.14	154.89
BGO-6A	–	–	126.53	159.27	126.53	159.27
BGO-8A	–	–	127.89	155.51	127.97	155.43
HSB-85A	–	–	125.78	168.82	125.67	168.93

– not measured

* D wells that are screened below the Tan Clay

** All depths are measured from the top of the water level measuring pipe except BGX-7D*, and the BG wells which are measured from the top of casing.

*** These numbers are apparently the result of a measurement error.

TABLE 6
BURIAL GROUND EXPANSION HYDROGEOLOGIC CHARACTERIZATION
LABORATORY RESULTS FROM
LOW PERMEABILITY SEDIMENTS

Boring #	Sample Type	Date Sampled	Sample Depths (ft)	Amount Recovered (ft)	Low Perm Interval	Permeability (cm/sec) Vertical	Horizontal	Moisture Content (%)	Atterburg Limits LL	PI
BGX-1A	S	3-21-91	80.0-82.0	2.0	Tan Clay	1.2×10^{-9}	8.3×10^{-9}	64.8	122	54
BGX-2B	S	1-31-91	75.0-77.0	2.0	Tan Clay	1.5×10^{-9}	7.0×10^{-9}	73.2	132	86
	C	2-4-91	156.0-156.8	0.8	Green Clay	6.5×10^{-9}	1.4×10^{-8}	33.3	35	NP
BGX-4A	S	1-14-91	65.0-67.0	2.0	Tan Clay	2.9×10^{-9}	6.0×10^{-9}	63.2	134	92
BGX-4C	S	1-15-91	104.0-106.0	2.0	Tan Clay	2.1×10^{-8}	4.7×10^{-8}	24.9	36	12
BGX-7	S	4-4-91	123.0-124.5	0.8	Green Clay	2.3×10^{-8}	---	42.3	59	38
BGX-9	C	1-8-91	70.0-70.8	0.8	Tan Clay	3.4×10^{-8}	1.2×10^{-7}	43.5	62	37
	S	1-9-91	140.5-142.5*	1.1	Green Clay	4.4×10^{-8}	1.6×10^{-7}	26.7	31	5
BGX-11	S	2-11-91	94.0-96.0	2.0	Tan Clay	4.0×10^{-7}	---	75.8	58	14
	S	2-11-91	154.0-156.0	0.8	Green Clay	6.6×10^{-9}	3.2×10^{-8}	20.3	45	22

C = Sample taken from Core

S = Shelby Tube sample

LL = Liquid Limit

PI = Plasticity Index

NP = Not Plastic

--- Insufficient sample to run test

* Lab results record depth as 142.5 - 144.5 ft. because of error on chain of custody.

3.0 HYDROGEOLOGY

3.1 Hydrostratigraphic Nomenclature

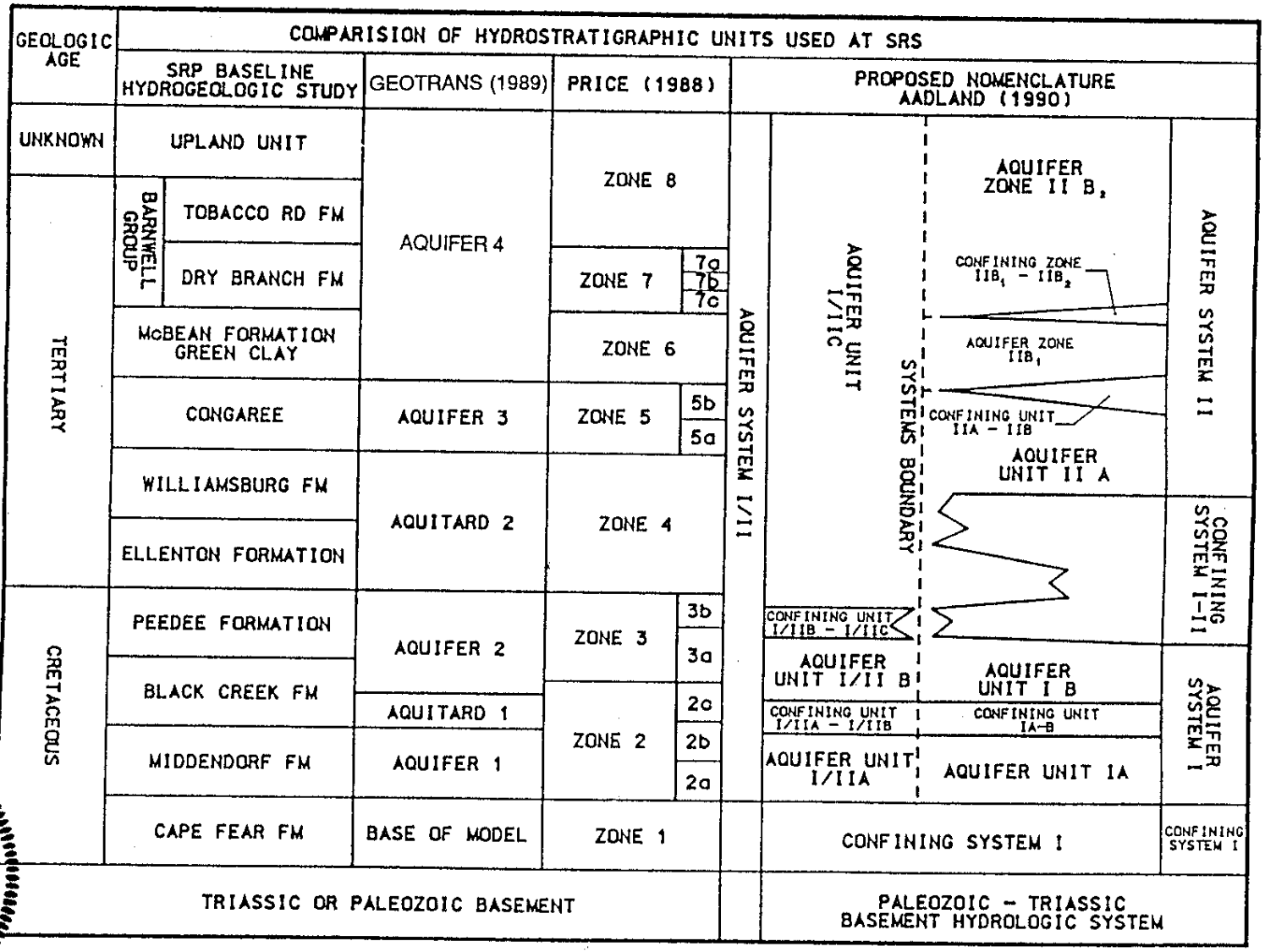
An alpha-numeric system of hydrostratigraphic nomenclature was developed by Aadland, 1990, for SRS. Figure 17 illustrates the alpha-numeric system and compares it to other hydrostratigraphic nomenclature systems developed in previous studies. For the purposes of this report, the units of interest are Aquifer Unit IIB, Confining Unit IIA-IIB and Aquifer Unit IIA.

3.2 Regional Hydrogeology

The hydrogeology and geology of the SRS and the surrounding area have been discussed in a number of published reports. Among these were Sloan (1908), Cooke (1936), Siple (1967), Nystrom and Willoughby (1982), Carter (1983), and Colquhoun et. al. (1983). In addition to the above published reports, SRS studies have produced additional detailed information. Among the more recent publications are the F & H Area Seepage Basin RCRA Part B, Permit Applications (1990), and the Defense Waste Processing Facility, Safety Analysis Report (1990).

The following section is not designed to be an exhaustive report on the hydrogeology of the SRS but is intended to provide an overview which would tie together the aspects of the stratigraphy and hydrogeology used in the performance of the Burial Ground Expansion hydrogeologic characterization. For additional information, the reader is referred to the above publications.

The Savannah River Site is located in the Upper Coastal Plain, approximately 20 miles southeast of the fall line. The Atlantic Coastal Plain is a seaward dipping wedge of unconsolidated and semi-consolidated sediments which increase in thickness from zero



SIRRINE ENVIRONMENTAL CONSULTANTS

FIGURE 17
Hydrostratigraphic Nomenclature at SRS
(Source: Aadland, 1990)

feet at the fall line to greater than 4,000 feet near the coast of South Carolina. The Savannah River Site lies on the Aiken Plateau, which is bounded by the Congaree and Savannah Rivers. The Aiken Plateau is dissected by several southwest flowing tributaries to the Savannah River, including Horse Creek, Hollow Creek, Upper Three Runs Creek, Four Mile Creek, Steel Creek and Lower Three Runs Creek. The sediments underlying the Burial Ground Expansion are approximately 1,000 feet thick and consist of sands and clays with varying silt content.

The field program at the Burial Ground Expansion explored the subsurface to a maximum depth of 197 feet below land surface. As previously mentioned, units encountered were Aquifer Unit IIB, Confining Unit IIA-IIB and Aquifer Unit IIA.

In the General Separations Area, Aquifer Unit IIA is the Congaree aquifer. It is a predominantly sand unit, exhibits relatively high hydraulic conductivity and is capable of yielding large quantities of water to wells (>100 gpm). The aquifer is laterally continuous across the entire SRS.

On a regional scale (central SRS), Confining Unit IIA-IIB is correlatable to the Green Clay and separates the underlying Aquifer Unit IIA from the overlying Aquifer Unit IIB. The Green Clay is characterized by variable lithologies ranging from a moderately dense, silty sand to a dense, compacted clay. The unit consistently exhibits very low hydraulic conductivity and is laterally continuous to the degree that it serves as a reliable marker bed in the central SRS. The Green Clay typically creates a difference in head of 60 to 80 feet between the aquifers above and below it.

Overlying Confining Unit IIA-IIB is Aquifer Unit IIB. Aquifer Unit IIB is divided into Aquifer Zones IIB_1 and IIB_2 by the Tan Clay (Confining Zone IIB_1-IIB_2) and may occur in the Santee, Dry Branch, Tobacco Road and Upland Unit Formations. The Santee Formation is typified by a lower carbonate section that ranges lithologically from a sandy unit with a low percentage carbonate matrix, to a hard, indurated, mostly pure limestone. This unit is typically not highly permeable and few wells are screened within it.

Above the carbonate section of the Santee, a sandy unit is sometimes found that is mostly fine to medium grained quartz with varying amounts of intergranular clay and clay stringers. The sand usually exhibits a higher hydraulic conductivity than the underlying carbonate section.

The Dry Branch Formation, which is included in the Barnwell Group (Huddleston and Hetrick, 1986) overlies the Santee Formation. It consists of three distinct but interfingering members. The Griffins Landing Member is a massive, thickly bedded calcareous, fossiliferous sand. The Twiggs Clay Member is described as an impure marine montmorillonite clay. The Irwinton sand consists primarily of fine to medium grained sand which may contain beds, lenses or laminae of Twiggs type clay.

The beds of clay are sometimes continuous enough to act as local confining beds. In such cases, Aquifer IIB becomes separated into an unconfined shallow aquifer (Aquifer Zone IIB_2), a semi-confining layer (Confining Zone IIB_1 -IIB_2) and an underlying semi-confined aquifer (Aquifer Zone IIB_1). This semi-confined aquifer (IIB_1) typically occurs in the Santee Formation and lowermost Dry Branch Formation with the overlying unconfined aquifer occurring in the middle to upper Dry Branch Formation and/or the Tobacco Road Formation (IIB_2).

The Tobacco Road sand overlies the Dry Branch Formation, and consists of massive, bioturbated, moderate to poorly sorted red and purple sand. Irregular clay stringers and ellipsoidal flat pebble beds are common near the base of the unit. The Upland Unit caps the areas of higher elevations at the site and consists of fluvial channel deposits of coarse gravel and poorly sorted sand interbedded with pebbles and cobbles (Nystrom and Willoughby, 1982). These deposits generally lie above the water table and therefore are unimportant as a source for groundwater. Their presence enhances recharge to underlying formations.

3.3 Site Specific Hydrogeology

Exploratory borings for the investigation penetrated Aquifer Unit IIB, Confining Unit IIA - IIB and the upper portion of Aquifer Unit IIA. The following section provides descriptions of the lithologic and hydrologic units observed beneath the site.

Aquifer Unit IIA (Congaree) is a light brown to dark yellowish orange, medium coarse sand interbedded with olive gray clay. Groundwater flow within the aquifer is to the west toward Upper Three Runs Creek. The horizontal hydraulic gradient of the aquifer is estimated to be 0.006 ft/ft in the study area (Figure 18). Based on a slug test (BGX-4A), the hydraulic conductivity of the aquifer is estimated to be 6.46×10^{-4} cm/sec or 1.83 ft/day. Using Darcy's Law and the preceding parameters, the groundwater flow velocity within the Congaree can be estimated. The equation is:

BURIAL GROUND EXPANSION: CONGAREE POTENTIOMETRIC SURFACE

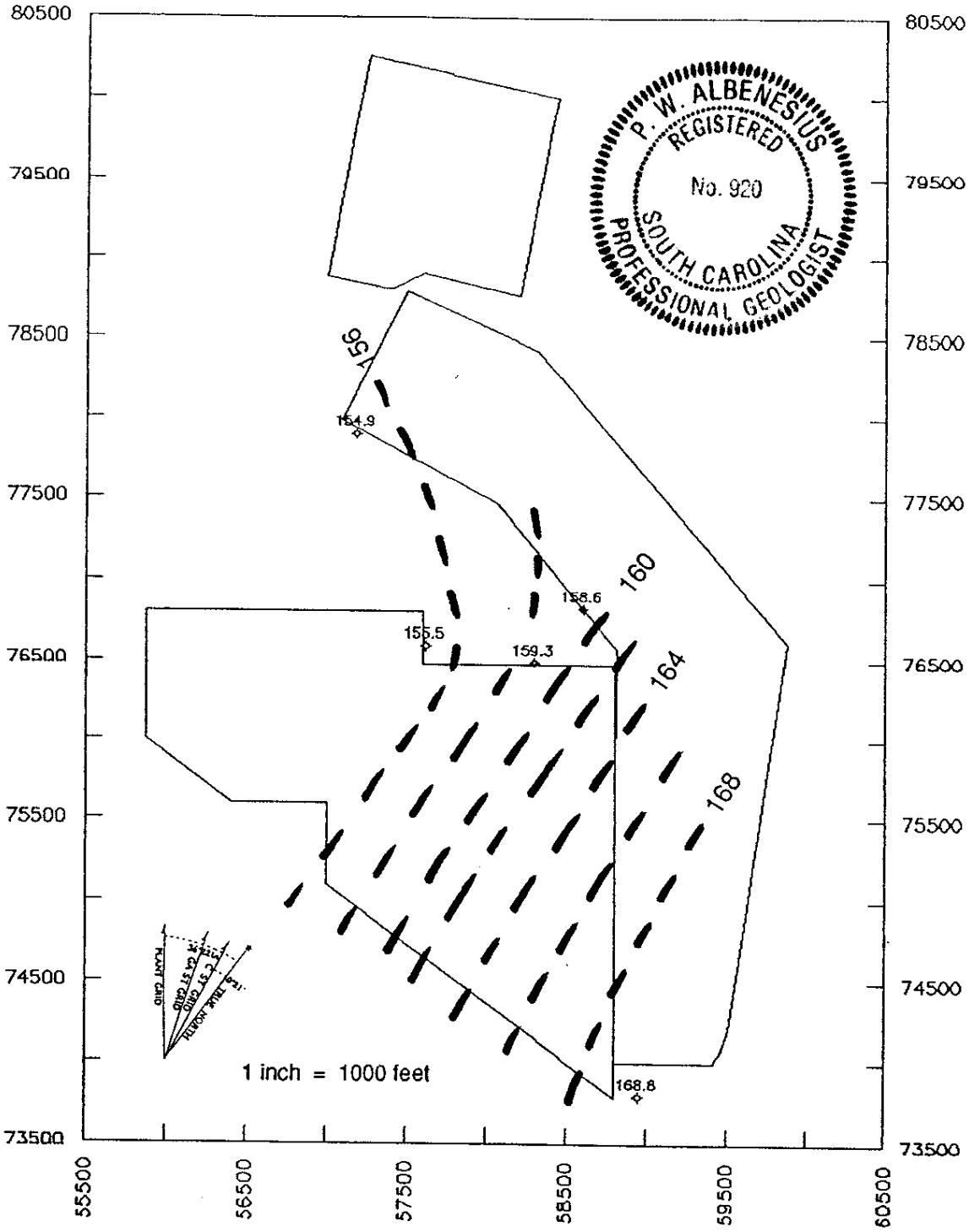


Figure 18

$V = \frac{KI}{n_e}$ where

K = hydraulic conductivity
I = hydraulic gradient (dh/dl)
n_e = effective porosity

Assuming a porosity of 0.20, the velocity is calculated to be 0.05 ft/day or 20 ft/yr.

Overlying the Congaree is Confining Unit IIA - IIB or the Green Clay. The Green Clay ranges from dark greenish gray to greenish black, sandy/clayey silt, silty/sandy clay or clayey/silty sand. The unit is micaceous, fossiliferous and partially indurated. It has a thickness of eight to twelve feet in the study area. From laboratory tests of undisturbed samples, the hydraulic conductivity of the Green Clay has been determined to range from 1.4×10^{-8} to 1.6×10^{-7} cm/sec (3.97×10^{-5} to 4.54×10^{-4} ft/day) (horizontal) and 6.5×10^{-9} to 4.4×10^{-8} cm/sec (1.84×10^{-5} to 1.25×10^{-4} ft/day) (vertical). The vertical gradient across the confining unit can be estimated by dividing the head change across it (55.33 feet from measured heads above and below the clay at BGX-2B and BGX-1A) by the unit's average thickness. This yields a gradient of 5.5 ft/ft. Using Darcy's Law in the same fashion as previously explained with an average vertical hydraulic conductivity (K_v) of 2.0×10^{-8} cm/sec (5.68×10^{-5} ft/day), the flow velocity across Confining Unit IIA - IIB is estimated to be 1.56×10^{-3} ft/day or 0.57 ft/yr.

Above the Green Clay is Aquifer Unit IIB. Aquifer Unit IIB can be separated into two zones called IIB_1 and IIB_2 by a local confining clay (Tan Clay) (Confining Zone IIB_1 - IIB_2). In simple terms, saturated sediments above the Tan Clay are Aquifer Zone IIB_2 and the corresponding poorly confined aquifer under the Tan Clay is Aquifer Zone IIB_1. When sediments above the Tan Clay are unsaturated, the aquifer between the Tan Clay and Green Clay is simply Aquifer Unit IIB. Moving northwest across the

Burial Ground Expansion, a line can be approximated that denotes where the two Aquifer Zones cease to exist and become Aquifer Unit IIB.

Aquifer Unit IIB ranges from 52 to 79 feet thick at the Burial Ground Expansion. Within the aquifer are two distinct lithologic zones. The lower zone commonly called the lower McBean is a partially indurated limestone to a pale olive to white fossiliferous silt or clay. Lost circulation was experienced in two of the coreholes while drilling through the lower McBean. In BGX-1A, the zone of lost circulation was in a clayey, fine to coarse sand and in BGX-2B, the zone was a sandy/clayey fossiliferous silt. The elevation at which circulation was lost, was the same in both borings. One well, BGX-2B, was installed in the lower McBean during this project, however, it is screened below the lost circulation zone. Potentiometric levels at BGX-2B and HSB-85B (an existing lower McBean well) are presented in Figure 19. The hydraulic conductivity of the zone was estimated from a slug test to be 7.39×10^{-5} cm/sec (0.21 ft/day).

The upper part of Aquifer Unit IIB_1, commonly called the upper McBean, is a dark yellowish orange, grayish orange to light brown, fine to coarse, silty/clayey sand. Nine wells were installed in this zone during the current project; BGX 2D*, 3D*, 4D*, 5D*, 6D*, 7D*, 8D*, 1C, 4C, and 12C. The horizontal hydraulic gradient within the zone is estimated to be 0.01 ft/ft based on the estimated potentiometric surface (Figure 20). Figure 20 represents both semi-confined conditions in the south and water table conditions in the north. The hydraulic conductivity of the zone ranges from 1.19×10^{-4} to 7.19×10^{-3} cm/sec (0.34 to 20.38 ft/day) and averages 1.30×10^{-3} cm/sec (3.69 ft/day). Again, using Darcy's Law, the lateral flow rate within the zone can be estimated. Using the average hydraulic conductivity, a gradient of 0.01 and a porosity of 0.20, the flow rate is estimated to be 0.18 ft/day or 65.7 ft/year.

BURIAL GROUND EXPANSION: LOWER MCBEAN POTENTIOMETRIC VALUES

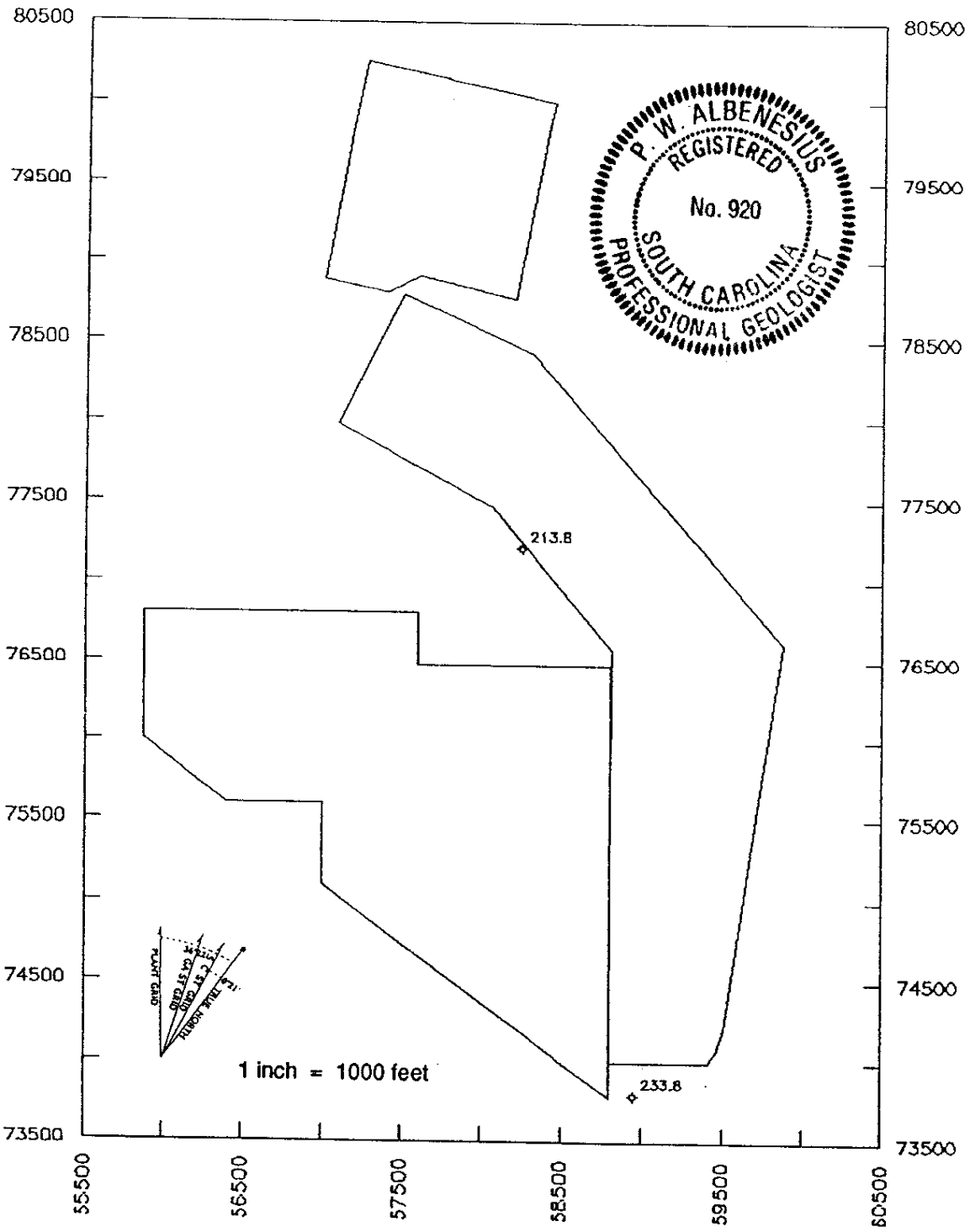


Figure 19

BURIAL GROUND EXPANSION: UPPER MCBEAN POTENTIOMETRIC SURFACE

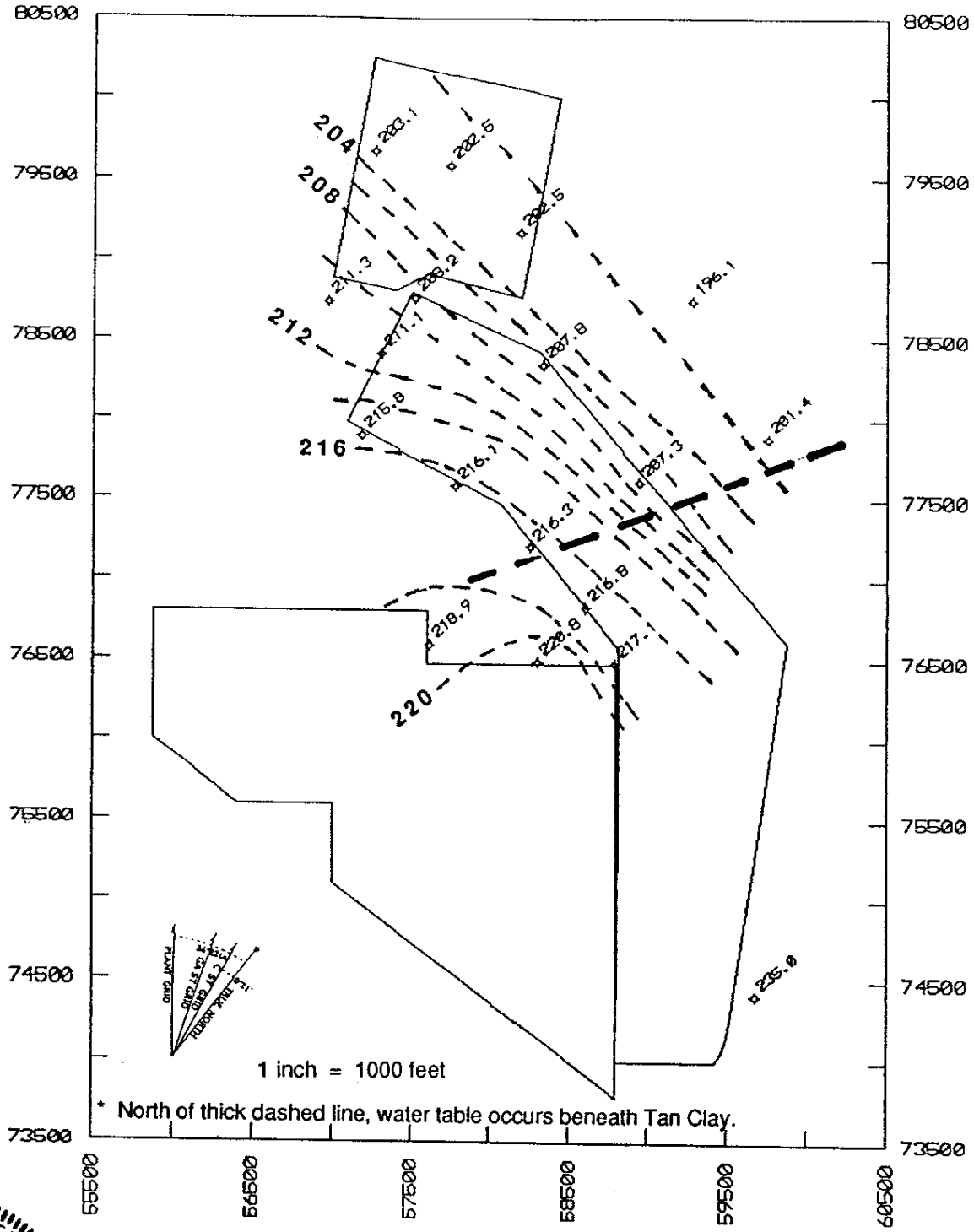


Figure 20

The vertical gradient with Aquifer Unit IIB_1 based on head measurements at BGX-2B and BGX-2D, is 0.058 ft/ft. In unconsolidated sediments, it is common for the vertical hydraulic conductivity to be 1/5 to 1/10 that of the horizontal (Bouwer, 1978). Using 1/5 of the average horizontal hydraulic conductivity (0.74 ft/day) and a porosity of 0.20, the vertical flow velocity is estimated to be 0.21 ft/day or 78.33 ft/year. This indicates that the potential for flow within Aquifer Zone IIB_1 is very similar in both the horizontal and vertical directions.

Above Aquifer Zone IIB_1 is a water table aquifer. In the southern half of the site the water table occurs in Aquifer Zone IIB_2 and in the northern half it occurs in IIB_1. An interbedded zone of clay and sand that is apparently laterally continuous across the site, separates IIB_2 and IIB_1. This is the Tan Clay or Confining Zone IIB_1 - IIB_2. Laboratory analyses of undisturbed samples of the Tan Clay yielded a range of hydraulic conductivity from 6.0×10^{-9} to 1.2×10^{-7} cm/sec (1.70×10^{-5} to 3.4×10^{-4} ft/day) in the horizontal direction and 1.2×10^{-9} to 4.0×10^{-7} cm/sec (3.40×10^{-6} to 1.13×10^{-3} ft/day) in the vertical direction, with an average of 3.77×10^{-8} cm/sec (1.07×10^{-4} ft/day) horizontal and 7.68×10^{-8} cm/sec (2.18×10^{-4} ft/day) vertical.

Based on slug tests, hydraulic conductivity estimates in the portion of the water table aquifer that occurs above the Tan Clay (BGX-1D, 9D, 10D and 12D), ranged from 1.28×10^{-4} to 5.83×10^{-4} cm/sec (0.36 to 1.65 ft/day) and averaged 2.55×10^{-4} cm/sec (0.72 ft/day). The water table surface is depicted on Figure 21. Data from wells screened opposite the water table surface were used to generate this map, although as previously discussed, the water table crosses Confining Zone IIB_1 - IIB_2 and occurs in Aquifer Zones IIB_1 and IIB_2. The map indicates a horizontal gradient

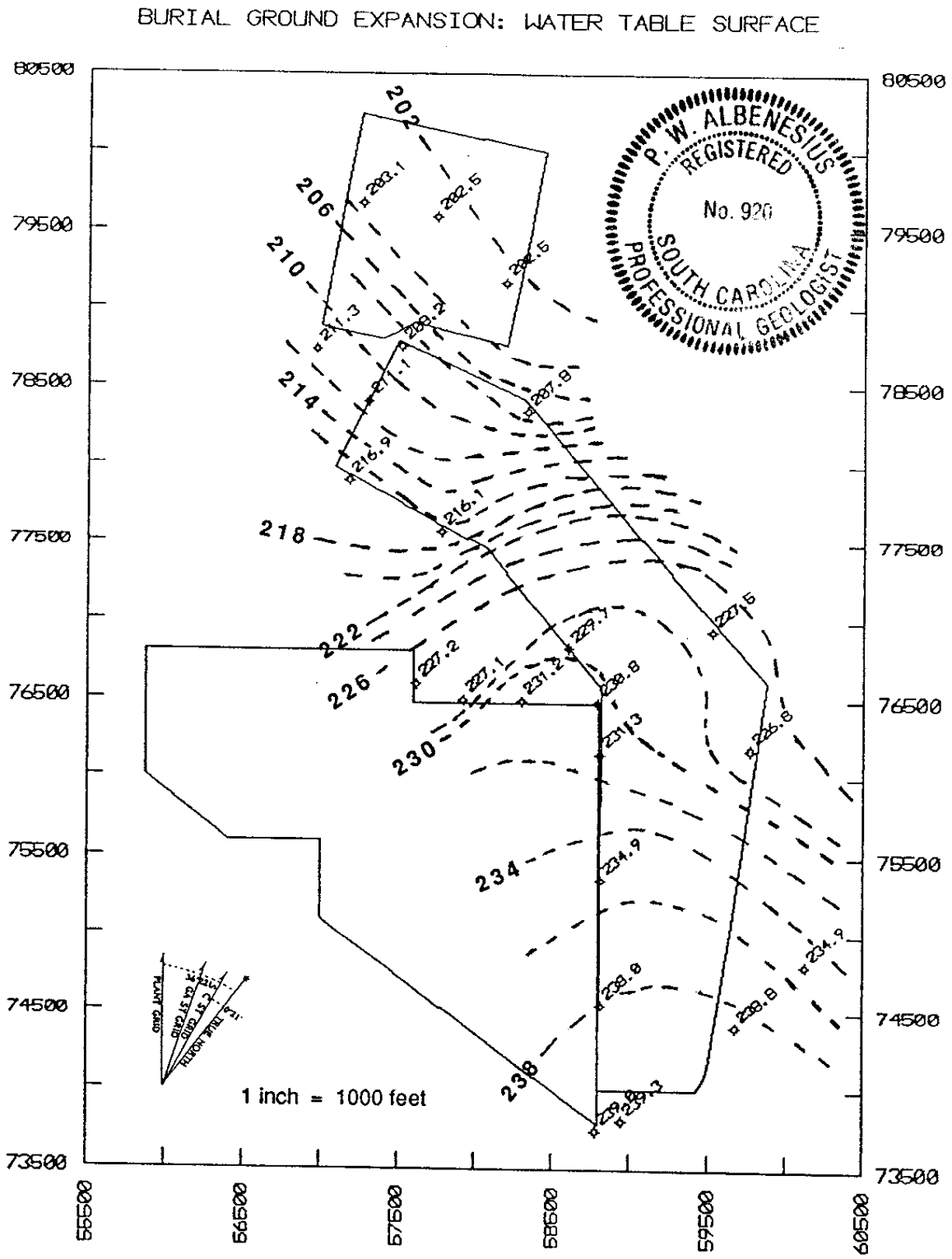

BURIAL GROUND EXPANSION: WATER TABLE SURFACE
80500
79500
78500
77500
76500
75500
74500
73500
55500
56500
57500
58500
59500
60500
202
206
210
214
218
222
226
230
234
238
P. W. ALBENESIUS
REGISTERED
No. 920
SOUTH CAROLINA
PROFESSIONAL GEOLOGIST
1 inch = 1000 feet

Figure 21

ranging from 0.0035 ft/ft to 0.018 ft/ft with a flow direction to the north and northwest toward Upper Three Runs Creek and to the east toward an ephemeral tributary.

Aquifer Zone IIB_2 is part of the Dry Branch Formation in the southern half of the site and becomes unsaturated (ceases to exist) in the northern half, where the water table crosses the Tan Clay and occurs in Aquifer Unit IIB (McBean).

The Vadose zone overlies the water table and it includes the Dry Branch and Tobacco Road Formations. It is described as a moderate reddish brown, pale red purple and dark yellowish orange, fine to very coarse sand to clayey/silty sand grading into a silty/sandy clay and clayey/sandy silt. Its thickness is from 40 to 70 feet and varies with the seasonal fluctuation of the water table surface.

4.0 SUMMARY AND CONCLUSIONS

Six coreholes and eighteen groundwater monitoring wells were installed during the Burial Ground Expansion Hydrogeologic Characterization. Four hydrologic zones were screened and hydraulically tested and will be monitored as part of the detection monitoring program at the facility. The four zones from deepest to shallowest are the Congaree (Aquifer Unit IIA), the lower McBean (Aquifer Zone IIB_1), the upper McBean (Aquifer Zone IIB_1) and the water table aquifer (Aquifer Zones IIB_1 and IIB_2).

Lithologies encountered during the exploration phase were typical for the aquifers and confining units in the central SRS. Composite logs which combine geophysical logs with lithologic logs are included in the report and condensed geologic logs derived from the field logs are included as an appendix.

Lost circulation was experienced while drilling two of the coreholes (BGX-1A and BGX-2B) at an elevation of about 170 feet msl. No wells were screened in this zone, so no estimates of its hydraulic conductivity can be made. In both holes, the circulation loss was partial and because the zone was not encountered in any other borings, it is probably discontinous and has a low significance with respect to contaminant transport.

All monitoring wells were installed in accordance with DPSOP 254 "Hydrogeologic Data Collection Procedures". Screen zones were selected by WSRC project personnel based on a review of field data. One well, BGX-8D, was damaged during installation and was replaced by a new well (BGX-8D*). As of the publication of this report, the damaged well has not been abandoned.

Sixteen of the eighteen wells were slug tested. Average hydraulic conductivity (K_h) estimates from the slug tests for the different aquifers are:

Congaree	6.46×10^{-4} cm/sec	(1.83 ft/day)
lower McBean	7.39×10^{-5} cm/sec	(0.21 ft/day)
upper McBean	1.30×10^{-3} cm/sec	(3.69 ft/day)
Water Table (above the Tan Clay)	2.55×10^{-4} cm/sec	(0.72 ft/day)

These estimates are fairly typical for the lithologies encountered. One K_h estimate (BGX-1A) was unusually low and is apparently attributable to incomplete well development.

Undisturbed samples were collected from the Tan Clay (Confining Zone IIB_1 - IIB_2) and the Green Clay (Confining Unit IIA - IIB). These samples were sent to a geotechnical laboratory and analyzed for vertical and horizontal hydraulic conductivity, moisture content and Atterburg limits.

The hydraulic conductivity of the Tan Clay ranged from 6.0×10^{-9} to 1.2×10^{-7} cm/sec (1.7×10^{-5} to 3.4×10^{-4} ft/day) (horizontal) and 1.2×10^{-9} to 4.0×10^{-7} cm/sec (3.4×10^{-6} to 1.1×10^{-3} ft/day) (vertical). For the Green Clay, the horizontal hydraulic conductivity ranged from 1.4×10^{-8} to 1.6×10^{-7} cm/sec (4.0×10^{-5} to 4.5×10^{-4} ft/day) and the vertical hydraulic conductivity ranged from 6.5×10^{-9} to 4.4×10^{-8} cm/sec (1.8×10^{-5} to 1.3×10^{-4} ft/day).

The collection of these geologic and hydrologic data along with the installation of eighteen new monitoring wells will enhance the ongoing study of the geology and

groundwater at the Solid Waste Disposal Facility. It will also provide the basis for the detection monitoring program at the Burial Ground Expansion.

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APPENDIX A

PROJECT SCOPE

JULY 24, 1990
BURIAL GROUND EXPANSION
HYDROGEOLOGIC CHARACTERIZATION

To obtain a more complete hydrogeologic characterization of the burial ground expansion facility, the following amendment to the program plan, issued 6-9-89, is required. This narrative presents these modifications and reasons for their implementation.

Initially, four pilot cores will be drilled, one each, near BGX4, BGX7, BGX9, and BGX11. These will be cored to the "green clay" for stratigraphic control to eliminate any questions concerning screen zones, pack depths, and other well installation requirements . The coreholes will be geophysically logged and then grouted back to surface. The coreholes should be coordinated with the HW/MW coreholes required in the hydrogeologic characterization of that site. This will facilitate the drilling rig better and also allow adequate time to interpret the geophysical logs and core data from the field to make the correct decisions in the installation of the well. Undisturbed samples will be taken from all significant zones of low permeability.

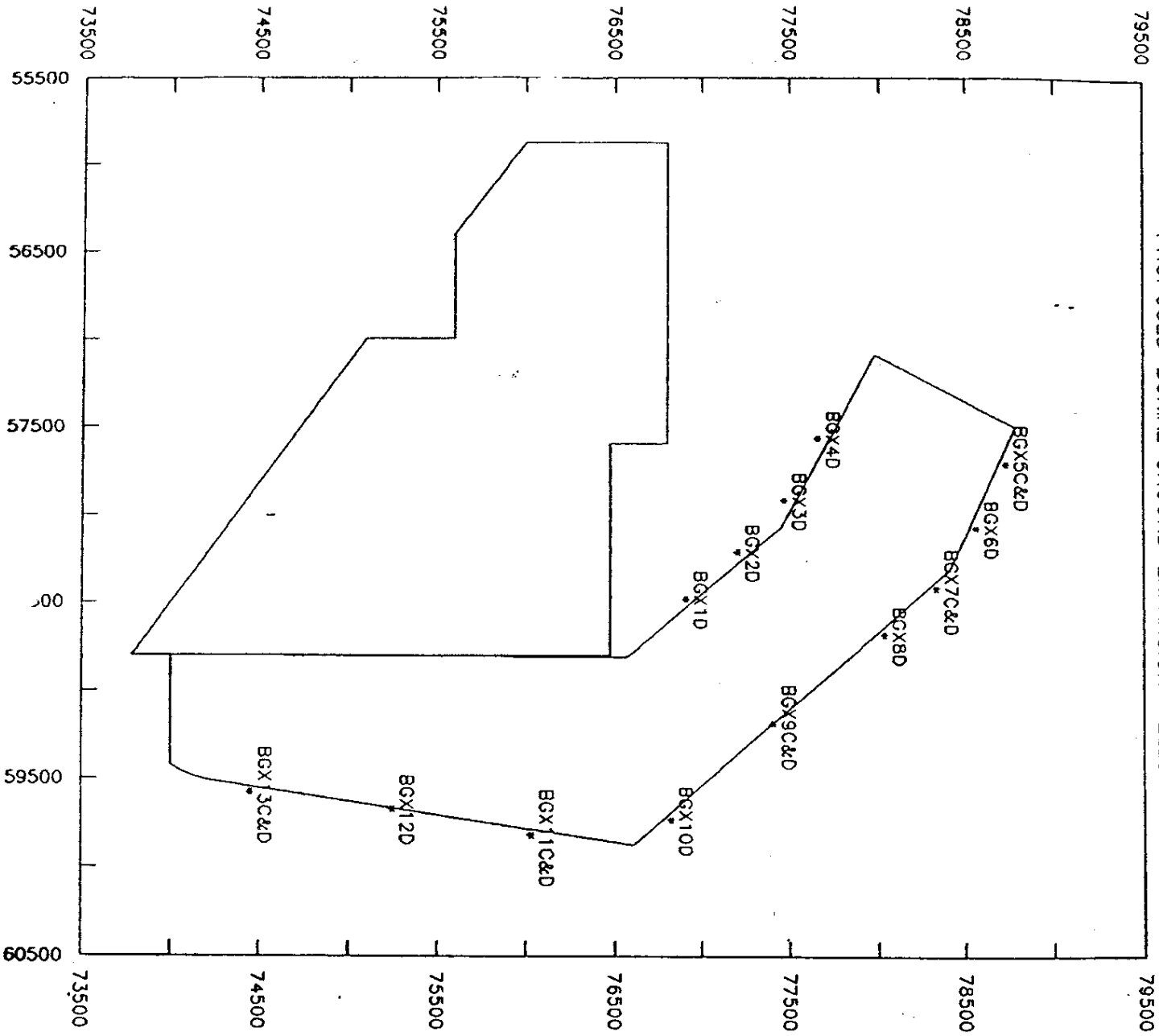
Rearranging the well distribution of the proposed burial ground expansion monitoring system (fig.1), results in a much more efficient means to monitor any possible contamination coming from the facility (fig.2). Elimination of two upgradient McBean wells is also appropriate.

McBean wells (series c on fig.2) to be installed will not require coring or geophysical logging, due to the coring and logging of the offset pilot holes. If any questions arise concerning depth, logging may be necessary. This will be decided in each individual case.

Water table wells will be installed as outlined in the program plan.

A final report completed by the Technical Oversight Consulting Company should contain the following:

-Cross sections.
-Field geologic logs.
-Results of lab tests.
-Slug tests results and analysis.
-Well construction details.
-A short discussion of stratigraphy as it pertains to contaminant transport.


PROPOSED BURIAL GROUND EXPANSION WELLS
73500
74500
75500
76500
77500
78500
79500
55500
56500
57500
59500
60500
BGX1D
BGX2D
BGX3D
BGX4D
BGX5C&D
BGX6D
BGX7C&D
BGX8D
BGX9C&D
BGX10D
BGX11C&D
BGX12D
BGX13C&D

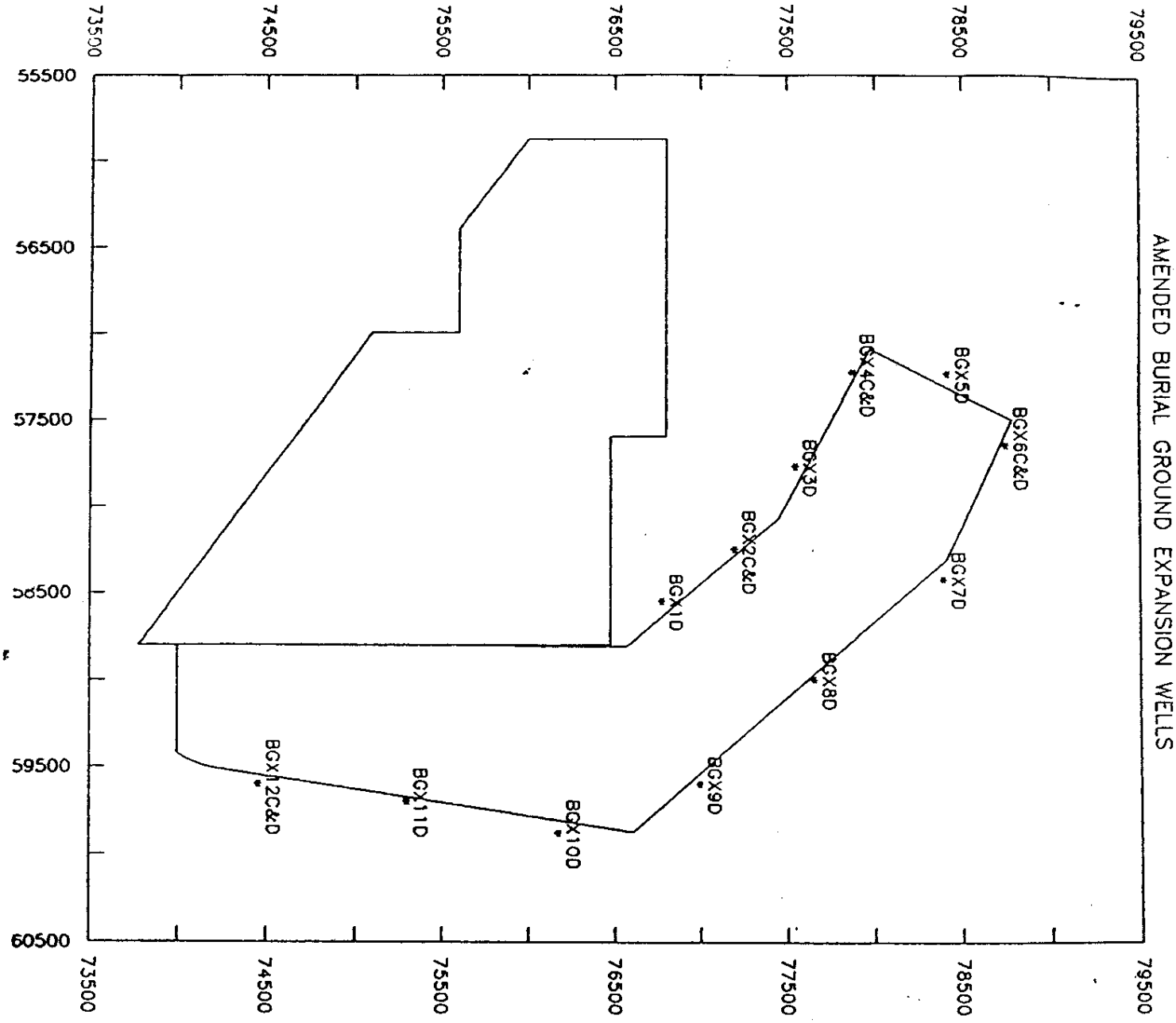

AMENDED BURIAL GROUND EXPANSION WELLS
73500
74500
75500
76500
77500
78500
79500
55500
56500
57500
59500
60500
BGX1D
BGX2C&D
BGX3D
BGX4C&D
BGX5D
BGX6C&D
BGX7D
BGX8D
BGX9D
BGX10D
BGX11D
BGX12C&D

TABLE I

SRP COORDINATES FOR BURIAL GROUND EXPANSION WELLS

WELL	NORTH	EAST
BGX 1D	76775	58550
BGX 2C&D	77200	58250
BGX 3D	77550	57775
BGX 4C&D	77880	57225
BGX 5D	78425	57235
BGX 6C&D	78750	57650
BGX 7D	78400	58425
BGX 8D	77660	59000
BGX 9D	77000	59600
BGX 10D	76175	59880
BGX 11D	75300	59700
BGX 12C&D	74460	59600

D wells will be approximately 75 feet deep.
C wells will be approximately 150 feet deep.

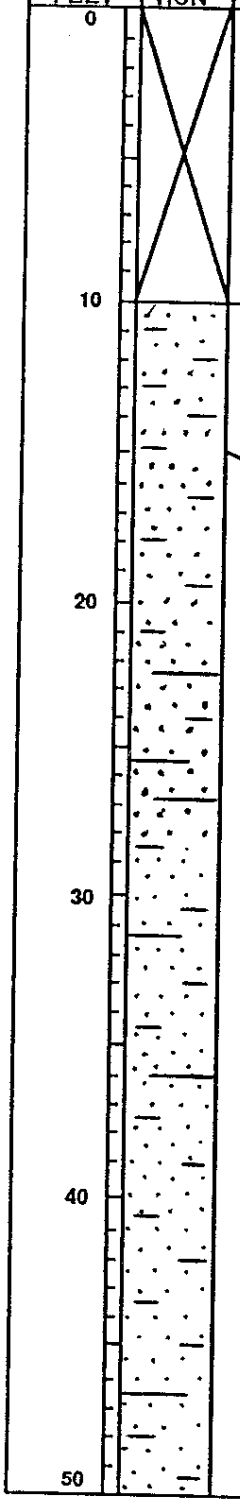
Appendix B

APPENDIX B

GEOLOGIC LOGS

GEOLOGIC LOG

PROJECT	SRS COORDINATES	DATE	SHEET
MWMF and OBG Groundwater Assessment Wells	N 76821 E 58600	3-19-91	1 OF 4
	REFERENCE DATUM: 288.8 ft msl	DRILLING CONTRACTOR: EMTC	
WELL NO.: BGX-1A	GRAIN SIZE CLASSIFICATION: Modified Wentworth	LOGGED BY: A. Stevenson	



LITHOLOGIC DESCRIPTION - Core

Drilled Pilot Hole to 10.0 feet to accommodate core barrel.

Sand, silty/clayey (40-50%), fine to very coarse, moderate red to grayish red with grayish red purple to reddish brown with pale yellowish orange, white clay specks to laminae (weathered feldspars 0.01 to 0.1 ft. thick), occasional grayish orange clay laminae (0.05 ft thick), moderately sorted, subangular to subrounded, micaceous (2-5%), trace heavy minerals Iron Oxide staining, soft to firm, moist to dry.

- silty (30-40%), very fine grained, pebbles from 14-15 feet.
- granule bed (0.1 - 0.2 ft thick).
- fine, dark yellowish orange, well sorted, white clay streaks 25-27 feet.
- silt/clay (35-45%) matrix with white clay balls (.03 ft thick), medium to coarse to very coarse, moderately sorted, trace micas, saturated.
- silt/clay (20-40%), pink clay beds/balls (.1 - .15 ft/.05 ft), with white clay specks (kaolinite).
- medium to coarse.
- silt/clay (30-45%), clay is streaked throughout in matrix giving streak/spotted appearance, medium to very coarse, granules (10%), moderately sorted, moist.
- silt/clay (35%), micaceous (2-3%).
- clay laminations (kaolinite).

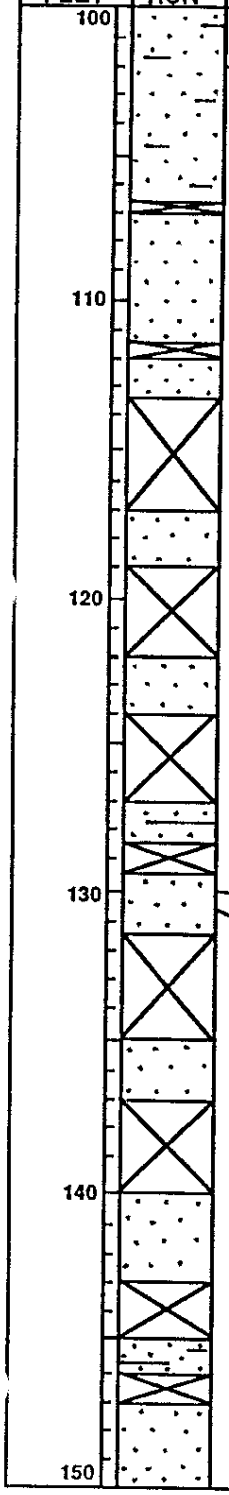
GEOLOGIC LOG

PROJECT	SRS COORDINATES	DATE	SHEET
MWMF and OBG Groundwater Assessment Wells	N 76821 E 58600	3-20-91	2 OF 4
	REFERENCE DATUM: 288.8 ft msl	DRILLING CONTRACTOR: EMTC	
WELL NO.: BGX-1A	GRAIN SIZE CLASSIFICATION: Modified Wentworth	LOGGED BY: A. Stevenson/W. Joyce	

DEPTH, FEET	CORE RUN	LITHOLOGIC DESCRIPTION - Core
50		• dusky reddish brown interval (50.2 - 50.3 ft), Iron Oxide grains/stains. • pale pink clay bed with Iron Oxide silt stringers 51.1-51.3 ft.
		• silt (10-15%), medium to coarse, dark yellowish orange with very dusky brown Manganese Oxide spots, well sorted, saturated. • light brown to reddish brown, Iron Oxide staining.
60		• dark brown.
		Note: Tan Clay. Sand, silty/clayey (20-50%), medium to coarse, pale yellowish brown and yellowish gray with white clay streaks (kaolinitic), well sorted, subangular to subrounded, trace heavy minerals, trace micas, firm, moist. • medium with coarse and very coarse, moderately sorted, Manganese Oxide clusters common (dusky purple), firm to very firm, dry.
70		• silty/clayey (30-40%), medium, well sorted, soft, saturated.
		Interbedded sand as above and clay, grayish orange sand, dark yellowish orange clay, plastic to brittle, beds 0.1 ft thick.
		Sand, silt/clay (<5%), coarse with some granules, yellowish gray, well sorted, subangular to subrounded, trace heavy minerals, trace micas, soft, saturated. • clay (15%), matrix and stringers, medium to fine, dark yellowish orange, trace Manganese Oxide.
80		NOTE: Tan Clay at 78.9 ft. Push shelby tube at 80-82 ft. Clay, silt (5%), tan to dark yellowish orange, firm to hard, dry to moderately moist, separates along bedding planes, trace Manganese Oxide, brittle in parts.
		Sand, clay (10-15%), in matrix with clay stringers and thin laminae, medium to coarse, with occasional coarse to granules, dark yellowish orange to grayish orange to moderate yellowish brown, moderately sorted, subangular to subrounded, pockets of Manganese Oxide and Iron Oxide, thin (kaolinitic) white clayey stringers at 85.0 ft. • clay/silt (40%), very fine to medium, trace micas, yellowish gray clay.
90		• clay/silt (20%), very fine to fine, well sorted. • clay/silt (20-25%), abundant clay (kaolinitic) stringers.
100		

GEOLOGIC LOG

PROJECT	SRS COORDINATES	DATE	SHEET
MWMF and OBG Groundwater Assessment Wells	N 76821 E 58600	3-21-91	3 OF 4
	REFERENCE DATUM: 288.8 ft msl	DRILLING CONTRACTOR: EMTC	
WELL NO.: BGX-1A	GRAIN SIZE CLASSIFICATION: Modified Wentworth	LOGGED BY: W. Joyce	



LITHOLOGIC DESCRIPTION - Core

- clay/silt (30-40%), yellowish gray to pale olive with black mottling from Manganese Oxide, dry to moderately moist.
- clay/silt (20-30%), fine to medium grading to medium to coarse with occasional very coarse to granules, pale olive grading to grayish orange to moderate yellowish brown (Iron Oxide staining), moderately to poorly sorted, subangular to subrounded, trace Manganese Oxide, white dry kaolinitic matrix at 105.0 - 106.0 ft.
- fine to medium to coarse, grayish orange, moderately sorted, loose, unconsolidated.

Note: Lost circulation temporarily at 117.0 ft, regained 50-60%.

- no clay in matrix, fine to medium with occasional coarse, well to moderately sorted.

Note: Coring with less than 30% returns.

- clay (10-15%), kaolinitic, in matrix, medium grading to fine to very fine, trace fine grained Manganese Oxide.
- clay (15-20%), micaceous.

Note: Samples include trace of lost circulation material.

- clay (10%), more medium.

Note: Lost circulation at 129.5 ft. temporarily.

- dark yellowish orange, partially cemented in thin beds.
- very fine to fine, yellowish gray, soft, saturated.
- trace of Manganese Oxide.
- pebbles and granules in upper 0.4 ft.

Note: Still getting low (20-30%) returns.

- clayey/silt (35-45%).
- medium to coarse, grayish orange with pale yellowish brown mottling, unconsolidated (loose).
- fine to medium, light olive brown to dusky yellow, partially indurated.

GEOLOGIC LOG

PROJECT	SRS COORDINATES	DATE	SHEET
MWMF and OBG Groundwater Assessment Wells	N 76821 E 58600	3-21-91	4 OF 4
	REFERENCE DATUM: 288.8 ft msl	DRILLING CONTRACTOR: EMTC	
WELL NO.: BGX-1A	GRAIN SIZE CLASSIFICATION: Modified Wentworth	LOGGED BY: W. Joyce	

DEPTH, FEET	CORE RUN	LITHOLOGIC DESCRIPTION - Core
150		• clay/silt (15-20%), in matrix, very fine to fine.
		Note: Green Clay. Sand, clay/silt (25%), very fine to fine, dark greenish gray, subrounded, well sorted, trace Manganese Oxide, very hard, moderately dry, partially indurated, micaceous, silt content varies. • clay (15-20%), indurated at 155.8 ft. Note: Push shelby tube at 156.0 - 156.25 ft. • clay/silt (25-30%), silty/clay content increases slightly in places with less silt and increase in hardness in others.
160		• fine to medium with occasional coarse, moderately sorted.
		Clay, very sandy, greenish black, firm to hard, silty, dry. Note: Still getting low (20-30%) returns.
		Sand, clay (15%), in matrix, fine to medium to coarse, dark greenish gray, subrounded to subangular, moderately sorted, trace micas, slightly silty. Note: Suspected Wharley Hill Contact at 161.0 ft.
		Sand, clay (0-5%), in matrix, medium to coarse, light brown grading to dark yellowish orange, well sorted, subangular to subrounded, saturated. Note: Suspected Congaree Contact at 164.8 ft.
170		• silt (5%), grayish orange. Note: Still getting low returns.
		Clay, olive gray, moist, slightly silty, sandy in upper 0.5 ft, fine, firm, trace micas, grades to tan, moderately dry, brittle clay from 179.8 - 180.0 ft.
180		Pushed shelby tube at 182.0 - 182.66 ft.
		Sand, silt (5%), medium to coarse, dark yellowish orange, well sorted, subangular to subrounded, trace very fine Manganese Oxide.
		Clay, slightly sandy, light olive gray, moderately dry to moist, brittle, interbedded Iron Oxide staining.
190		• as above at 182.66 ft.
		Total Depth of Exploration 197.0 feet.
200		

GEOLOGIC LOG

PROJECT	SRS COORDINATES	DATE	SHEET
MWMF and OBG Groundwater Assessment Wells	N 77203 E 58256	1-31-91	1 OF 4
	REFERENCE DATUM: 288.4 ft msl	DRILLING CONTRACTOR: EMTC	
WELL NO.: BGX-2B	GRAIN SIZE CLASSIFICATION: Modified Wentworth	LOGGED BY: M. D. Hill	

DEPTH, FEET	CORE RUN	LITHOLOGIC DESCRIPTION - Core
0		
		Drilled Pilot hole to 10.0 ft to accommodate core barrel.
10		Sand, clayey/silty (40-50%), medium to coarse, mottled dark yellowish orange to moderate reddish brown, well sorted, subangular to subrounded, trace heavy minerals, dry to moist.
		Silt, clay (20%), sand (10-20%), mottled moderate reddish brown with dusky red to pale pink and dark yellowish orange, micaceous (5-10%), trace heavy minerals, dry to moist; clay occurs as thin stringers.
20		• clay (20-30%).
		Sand, silty/clayey (30%), medium to coarse, moderate red to moderate reddish brown, well sorted, subangular to subrounded, micaceous (2-5%), trace heavy minerals, moist to saturated.
		Interbedded Silt and Clay, sand (10-20%), silt is dark yellowish orange, clay is white to pinkish gray, micaceous (2-5%), stiff, plastic, moist, beds 0.01 - 0.9 ft.
30		Sand, silty/clayey (40-50%), medium to coarse, dark yellowish orange to white, well sorted, subangular to subrounded, micaceous (2-5%), trace heavy minerals, moist.
40		• silt/clay (20-25%), fine to coarse, moderate reddish brown, saturated.
		• thin clay stringers.
50		

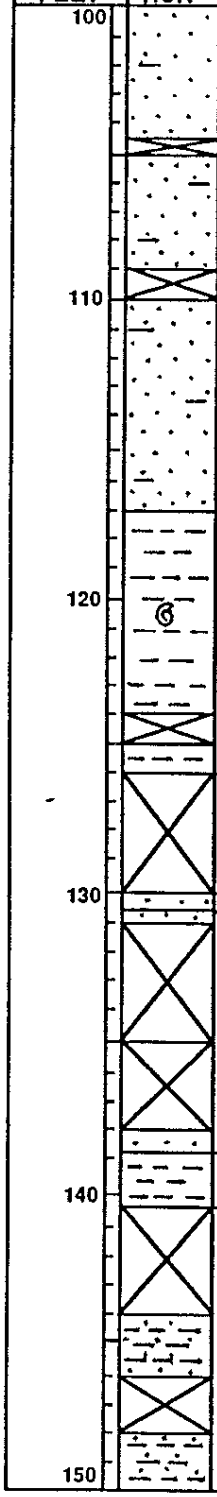
GEOLOGIC LOG

PROJECT	SRS COORDINATES	DATE	SHEET
MWMF and OBG Groundwater Assessment Wells	N 77203 E 58256	1-31-91	2 OF 4
	REFERENCE DATUM: 288.4 ft msl	DRILLING CONTRACTOR: EMTC	
WELL NO.: BGX-2B	GRAIN SIZE CLASSIFICATION: Modified Wentworth	LOGGED BY: M. D. Hill	

DEPTH, FEET	CORE RUN	LITHOLOGIC DESCRIPTION - Core
50		• medium to coarse, moderate brown.
60		• dark yellowish orange to moderate red.
		• moderate brown to dusky brown.
70		• silty/clayey (30%), as thin laminae, fine to medium, well rounded pebbles at 70 feet.
		Clay, silt/sand (0-10%), dark yellowish orange with dusky brown stringers, stiff, plastic, sand portion very fine. Note: Shelby tube pushed from 75-77 ft.
80		• silty (30%), sand (0-5%), pale olive to moderate brown, micaceous (2%), conchoidal fracturing, brittle, dry.
		• medium sand interbeds.
90		Sand, clayey/silt (40-50%), very fine to fine, dusky yellow to pale red purple to white, well sorted, subangular, subrounded, fossiliferous, chalky, micaceous (2-5%), trace heavy minerals, moist to saturated.
		• pale olive to white.
100		

GEOLOGIC LOG

PROJECT	SRS COORDINATES	DATE	SHEET
MWMF and OBG Groundwater Assessment Wells	N 77203 E 58256	1-31-91	3 OF 4
	REFERENCE DATUM: 288.4 ft msl	DRILLING CONTRACTOR: EMTC	
WELL NO.: BGX-2B	GRAIN SIZE CLASSIFICATION: Modified Wentworth	LOGGED BY: M. D. Hill	



LITHOLOGIC DESCRIPTION - Core

- silt/clay (10-20%), medium, moderate reddish brown, trace micas, saturated.
- silt/clay (30%), fine to coarse, pale olive to white to light brown, moderately sorted, dry to moist.
- same sand as above at 101.0 ft with color changes from pale olive and pale pink (112.0 ft) to white (114.0 ft).
- same sand as above at 105.0 ft.

Silt, clayey (30%), sand (20%), pale olive to white, fossiliferous (reacts slightly with HCl), trace heavy minerals, chalky moist. Note: Lost circulation at 120.0 ft.

- dark yellowish orange.
- pale olive and white, some partial cementation, fossils only react to HCl when powdered (dolomite replacement?).

Sand, silty/clayey (20-35%), very fine, pale olive, well sorted, subangular to subrounded, trace heavy minerals, trace fossils, trace micas, moist to saturated.

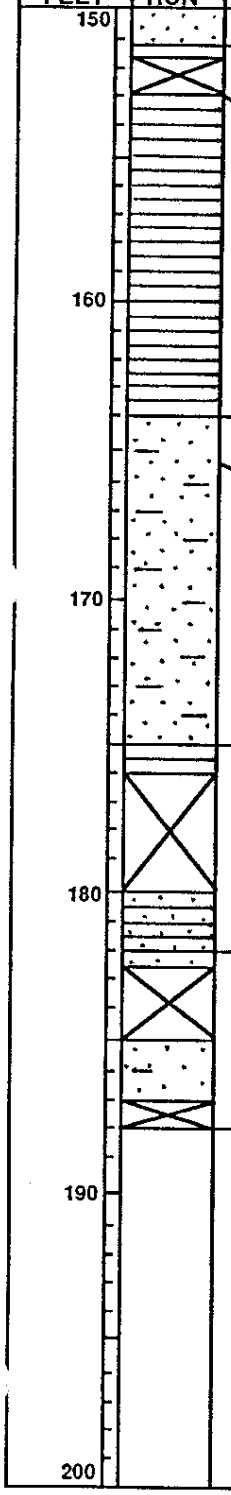
Cemented shell hash, dolomite replacement, pale olive to white, with unconsolidated sand (30%), fine to medium, light brown.

Silt, clayey (30%), sand (0-10%), very fine, dusky yellow to light olive brown, trace micas, trace heavy minerals, moist to saturated.

- same cemented material as above at 130.5 ft interbedded with silt from above at 138.75 ft.

GEOLOGIC LOG

PROJECT	SRS COORDINATES	DATE	SHEET
MWMF and OBG Groundwater Assessment Wells	N 77203 E 58256	1-31-91	4 OF 4
	REFERENCE DATUM: 288.4 ft msl	DRILLING CONTRACTOR: EMTC	
WELL NO.: BGX-2B	GRAIN SIZE CLASSIFICATION: Modified Wentworth	LOGGED BY: M. D. Hill	



LITHOLOGIC DESCRIPTION - Core

Clay, silty (30-40%), sand (10-20%), very fine, greenish black to dark greenish gray, micaceous (2-5%), trace heavy minerals, plastic, dry to moist, partial cementation.

Note: Green Clay.

- unconsolidated, silty clay interbedded with cemented, fossiliferous sandy silt.
- sandy (20-30%).

Sand, silty/clayey (40-50%), fine, dark greenish gray, well sorted, subangular to subrounded, micaceous (2-5%), trace heavy minerals, saturated.

- fine to medium.

Clay, as above at 151.2 ft, color change to light olive brown at 175.8 ft.

- interbedded clay and sand as above at 164.0 ft.

Note: Coring blind, no returns.

Sand, silt/clay (20-40%), medium to coarse, light to moderate brown with light gray clay stringers, well sorted, trace heavy minerals, trace micas, some Iron Oxide staining, saturated.

Total Depth of Exploration 188.0 feet.

GEOLOGIC LOG

PROJECT	SRS COORDINATES	DATE	SHEET
Burial Ground Expansion	N 77577 E 57780	1-25-91	1 OF 2
	REFERENCE DATUM: 288.1 ft msl	DRILLING CONTRACTOR: EMTC	
WELL NO.: BGX-3D*	GRAIN SIZE CLASSIFICATION: Modified Wentworth	LOGGED BY: L. Bienkowski	

DEPTH, FEET	CORE RUN	LITHOLOGIC DESCRIPTION - Hollow Stem Augering
0		Samples collected from augers every 10.0 ft.
10		Silt, sandy (30%), clay (0-5%) fine to coarse, reddish brown to dark yellowish orange, dry to moist.
20		Sand, silty/clayey (25-30%) coarse to fine, yellowish gray, dark yellowish orange, dusky red, to yellowish brown, dark yellowish brown and grayish red, poorly sorted, some lenses with higher clay content, moist.
30		
40		Sand, silt/clay (5-15%), medium to coarse, reddish brown, reddish orange and dark yellowish orange, well sorted, moist.
50		

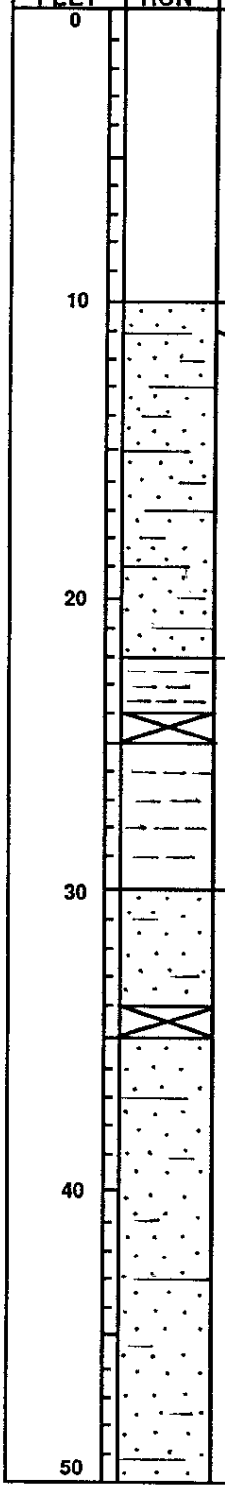
GEOLOGIC LOG

PROJECT	SRS COORDINATES	DATE	SHEET
Burial Ground Expansion	N 77577 E 57780	1-25-91	2 OF 2
	REFERENCE DATUM: 288.1 ft msl	DRILLING CONTRACTOR: EMTC	
WELL NO.: BGX-3D*	GRAIN SIZE CLASSIFICATION: Modified Wentworth	LOGGED BY: L. Bienkowski	

DEPTH, FEET	CORE RUN	LITHOLOGIC DESCRIPTION - Hollow Stem Auger and Mud Rotary
50		• coarse to very coarse.
60		**Sand**, clay/silt (10-15%), fine to very coarse, dark yellowish orange and dusky red, poorly sorted, occasional clay nodules, moist.
70		**Clay**, sandy (30%), silt (15-25%), medium to coarse, dark yellowish orange, reddish brown, dusky red, and white, well sorted, trace micas, moist.
		Sand, clayey/silty (20-35%), medium to coarse, dark yellowish orange, well sorted, saturated.
		T. D. Hollow Stem Auger. Switch to Mud Rotary.
80		**Sand**, (clay 0-5%), fine to very coarse, dark yellowish orange, poorly sorted, subangular to subrounded, trace of tan clay and Manganese Oxide.
90		• trace of dark yellowish orange and moderate reddish orange clay and Iron oxide.
		Total Depth of Exploration 95 feet.
100		

GEOLOGIC LOG

PROJECT	SRS COORDINATES	DATE	SHEET
MWMF and OBG Groundwater Assessment Wells	N 77879 E 57216	1-10-91	1 OF 4
	REFERENCE DATUM: 288.1 ft msl	DRILLING CONTRACTOR: EMTC	
WELL NO.: BGX-4A	GRAIN SIZE CLASSIFICATION: Modified Wentworth	LOGGED BY: M. D. Hill	



LITHOLOGIC DESCRIPTION - Core

Drill Pilot hole to 10.0 ft to begin coring.

Sand, silty/clayey (40-50%), fine to medium, mottled reddish brown, dark yellowish orange, and light brown, well sorted, subangular to subrounded, trace heavy minerals, trace micas, dry.

- yellowish gray as clay streamers/stringers.
- clay stringers thicker (0.1 ft thick).

Silt, clayey (30-40%), sandy (0-10%), dark yellowish orange with bands of very dusky red purple to pale pink and grayish red, firm; sand portion fine.

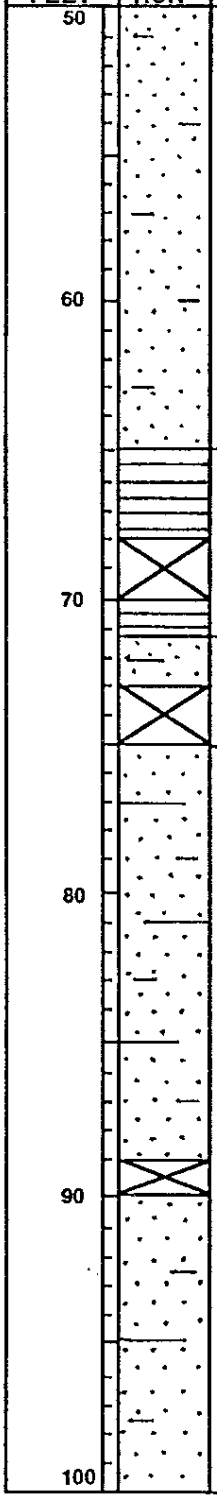
- sand (10%), white clay stringers in dark yellowish orange, micaceous (2%).

Sand, silty/clayey (20-30%), fine to medium, dark yellowish orange with thin white clay stringers and some moderate red, well sorted, subangular to subrounded, micaceous (2%), trace heavy minerals, moist.

- alternates between moderate red and dark yellowish orange with white.
- minus white clay stringers.
- with white clay stringers.

GEOLOGIC LOG

PROJECT	SRS COORDINATES	DATE	SHEET
MWMF and OBG Groundwater Assessment Wells	N 77879 E 57216	1-11-91	2 OF 4
	REFERENCE DATUM: 288.1 ft msl	DRILLING CONTRACTOR: EMTC	
WELL NO.: BGX-4A	GRAIN SIZE CLASSIFICATION: Modified Wentworth	LOGGED BY: M. D. Hill	



LITHOLOGIC DESCRIPTION - Core

- coarse.
- medium.

Clay, silt/sand (20%), coarse sand in stringers, yellowish gray with reddish brown, stiff, plastic, some iron oxide staining, micaceous (2%). Note: Pushed shelby tube 65.0-67.0 ft (Tan Clay).

- dark laminations (very dusky purple and brownish black) at 71.0 feet.

Sand, clayey/silty (30%), medium to coarse, grayish orange pink to pale yellowish brown, well sorted, subangular to subrounded, pale greenish yellow to pale olive clay laminae, trace heavy minerals, trace micas, stiff, dry to moist.

- micaceous (2%).
- grades to fine to medium , "cleaner" sand between clay laminae, moist to saturated.
- alternates between medium/coarse and fine/medium.
- dark yellowish orange, Iron Oxide staining and heavy mineral stringers from 84-85 ft.
- "clean" lenses are more "flowing".
- silt/clay (20%), fine to medium, some dusky brown to pale yellowish green stringers, micaceous (2%), moist to saturated.
- coarse to medium.

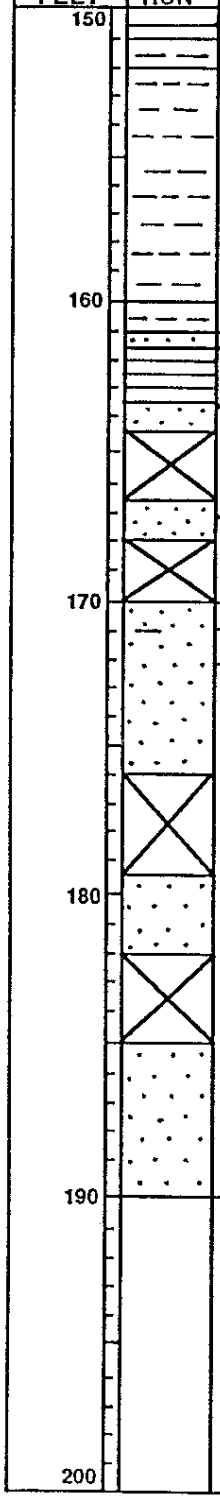
GEOLOGIC LOG

PROJECT	SRS COORDINATES	DATE	SHEET
MWMF and OBG Groundwater Assessment Wells	N 77879 E 57216	1-14-91	3 OF 4
	REFERENCE DATUM: 288.1 ft msl	DRILLING CONTRACTOR: EMTC	
WELL NO.: BGX-4A	GRAIN SIZE CLASSIFICATION: Modified Wentworth	LOGGED BY: M. D. Hill	

DEPTH, FEET	CORE RUN	LITHOLOGIC DESCRIPTION - Core
100		
		Clay, sandy/silty (30-40%), medium sand, light brown with pale yellowish green streaks, trace heavy minerals, micaceous (2%), stiff, dry.
110		**Sand**, silty/clayey (30-40%), medium grading to fine at 114.0 ft., light brown, dark yellowish orange, pale yellowish green, and dusky brown (heavy minerals), well sorted, subangular to subrounded, micaceous (2%), moist to saturated.
		• silty/clayey (20-40%), very fine, pale greenish yellow to pale olive and pale yellowish orange, saturated.
120		• mostly pale olive.
		Silt, sand and clay (10-20%), pale greenish yellow, fossiliferous, partially cemented (some cemented laminae .02 feet thick), trace heavy minerals, carbonate material reacts with HCl, moist.
130		
140		• cemented, fossiliferous (only slightly fizzing so may be some SiO_2 cementing), harder than previous, medium gray with larger shell fragments.
		• some unconsolidated layers between cemented layers.
150		

GEOLOGIC LOG

PROJECT	SRS COORDINATES	DATE	SHEET
MWMF and OBG Groundwater Assessment Wells	N 77879 E 57216	1-15-91	4 OF 4
	REFERENCE DATUM: 288.1 ft msl	DRILLING CONTRACTOR: EMTC	
WELL NO.: BGX-4A	GRAIN SIZE CLASSIFICATION: Modified Wentworth	LOGGED BY: M. D. Hill	



LITHOLOGIC DESCRIPTION - Core

Note: Green Clay

Silt, clayey (30-40%), sandy (10%), dark greenish gray, trace of fossils, micaceous (2%), moist; sand portion fine grained.

Note: lost circulation.

Note: Regained circulation.

Sand, silty (30-40%), clay (0-10%), fine to medium, greenish black, well sorted, subangular to subrounded, micaceous (2%), trace heavy minerals, moist to saturated.

Clay, silty (30%), sandy (10%), partially cemented, fissile, greenish black, soft layers and sandy layers (fine) in between cemented layers, micaceous (2%), trace of fossils.

Note: Shelby tube pushed from 162.0 - 163.0 feet.

Sand, silt/clay (0-10%), fine, pale yellowish brown, well sorted, subangular to subrounded, trace heavy minerals, trace micas, moist to saturated.

- silt/clay (20%), very coarse, greenish black, partially cemented/lithified, moist to saturated.
- medium to very coarse, well to moderately sorted.
- clay/silt (20-30%), medium to coarse, grayish brown well sorted, clay stringers.
- silt/clay (10%), dark yellowish orange.
- silt (0-10%), fine to very fine, very pale orange to pale yellowish brown, micaceous (2-5%), saturated, "flowing" sand.
- color changes to dark yellowish orange and alternates with very pale orange and pale yellowish brown.

Total Depth of Exploration 190.0 feet.

GEOLOGIC LOG

PROJECT	SRS COORDINATES	DATE	SHEET
Burial Ground Expansion	N 78402 E 57309	4-12-91	1 OF 2
	REFERENCE DATUM: 282.8 ft msl	DRILLING CONTRACTOR: EMTC	
WELL NO.: BGX-5D*	GRAIN SIZE CLASSIFICATION: Modified Wentworth	LOGGED BY: W. D. Joyce	

DEPTH, FEET	CORE RUN	LITHOLOGIC DESCRIPTION - Hollow Stem Augering
0		**Silt,** clay (15%), sand (15%), very fine to fine, light brown to pale reddish brown, well sorted, subrounded.
		• clay (10-15%), sand (25-30%), very fine to medium, dark yellowish brown, moderately sorted, subangular to subrounded.
10		• clay (0-5%), sand (20-25%), very fine to fine, moderate reddish brown, well sorted.
		Clay, silty (25-30%), sand (5%), moderate to pale reddish brown with dark yellowish orange mottling, dry, brittle, firm.
20		**Sand,** silty/clay (30-35%), very fine to medium with occasional very coarse, light brown, moderate reddish orange and dark yellowish orange, moderately sorted, subangular to subrounded.
30		• silt/clay (30-40%). Note: Drilling response indicates a clay.
		• silt/clay (30-45%), fine to coarse, moderate yellowish brown, clay stringers. Note: Drilling response indicates an intermittent clay with sand
		• silt/clay (25-30%), fine to medium, well sorted. Note: Drilling response indicates a sand.
40		• silt (15%), fine to coarse, moderately sorted, no clay present.
50		• silt (15-20%), fine to medium, well sorted.

GEOLOGIC LOG

PROJECT	SRS COORDINATES	DATE	SHEET
Burial Ground Expansion	N 78402 E 57309	4-12-91	2 OF 2
	REFERENCE DATUM: 282.8 ft msl	DRILLING CONTRACTOR: EMTC	
WELL NO.: BGX-5D*	GRAIN SIZE CLASSIFICATION: Modified Wentworth	LOGGED BY: W. D. Joyce	

DEPTH, FEET	CORE RUN	LITHOLOGIC DESCRIPTION - Hollow Stem Augering
50		
		• silt/clay (15-20%), fine to very coarse.
60		
		Note: Sample coming up wet; moist at 63 feet.
		• silt (20%), moist to wet.
70		• trace of clay.
		• silt/clay (30%), fine to coarse with occasional very coarse, wet.
80		• clayey (30-35%).
		• silt/clay (20-30%), fine to very coarse.
90		• fine to medium, well sorted, trace heavy minerals.
100		**Total Depth of Exploration 98.0 feet**

GEOLOGIC LOG

PROJECT	SRS COORDINATES	DATE	SHEET
Burial Ground Expansion	N 78751 E 57522	4-12-91	1 OF 2
	REFERENCE DATUM: 274.4 ft msl	DRILLING CONTRACTOR: EMTC	
WELL NO.: BGX-6D*	GRAIN SIZE CLASSIFICATION: Modified Wentworth	LOGGED BY: M. D. Hill	

DEPTH, FEET	CORE RUN	LITHOLOGIC DESCRIPTION - Mud Rotary
0		
10		**Sand,** silty/clayey (20-40%), fine to medium, moderate reddish brown, well sorted, subangular to subrounded, trace heavy minerals, trace micas.
		• clay stringers (dark yellowish orange to yellowish gray).
20		
30		• fine to very coarse, moderately sorted.
40		
50		• silty/clayey (40-50%), clay in matrix and in stringers.

GEOLOGIC LOG

PROJECT	SRS COORDINATES	DATE	SHEET
Burial Ground Expansion	N 78751 E 57522	4-12-91	2 OF 2
	REFERENCE DATUM: 274.4 ft msl	DRILLING CONTRACTOR: EMTC	
WELL NO.: BGX-6D*	GRAIN SIZE CLASSIFICATION: Modified Wentworth	LOGGED BY: M. D. Hill	

DEPTH, FEET	CORE RUN	LITHOLOGIC DESCRIPTION - Mud Rotary
50		
60		• increase in clay stringers, (Tan Clay).
		• less clay and silt, "cleaner" sand.
70		• as above at 60 feet.
		• silt/clay (0-10%), coarse to very coarse, light brown, well sorted.
80		
90		**Total Depth of Exploration 90.0 feet.**
100		

GEOLOGIC LOG

PROJECT	SRS COORDINATES	DATE	SHEET
Burial Ground Expansion	N 78336 E 58331	4-2-91	1 OF 4
	REFERENCE DATUM: 273.7 ft msl	DRILLING CONTRACTOR: EMTC	
WELL NO.: BGX-7	GRAIN SIZE CLASSIFICATION: Modified Wentworth	LOGGED BY: M. D. Hill	

DEPTH, FEET	CORE RUN	LITHOLOGIC DESCRIPTION - Core
0		
10		**Drill Pilot hole to 10.0 feet to begin Coring** Note: No recovery due to soft surface conditions at the site. Mud bubbling up from the ground approximately 6 feet away. Decided to set surface casing - 12 in diameter pvc in 15 in diameter hole to 20 feet bls.
20		Gravel from above.
30		Sand, silt/clay (10-25%), medium to coarse, mottled light brown, moderate reddish brown and dark yellowish orange, well sorted, subangular to subrounded, trace heavy minerals, saturated. Note: Gravel still evident at top of run.
40		clay (5%) in stringers, bands of color. Note: No more gravel.
50		

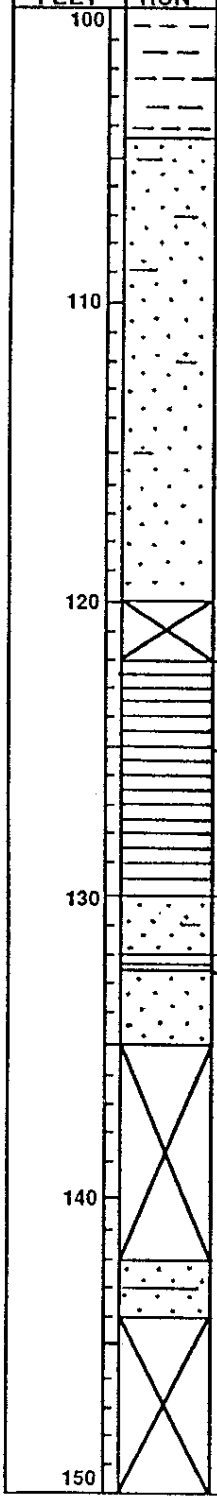
GEOLOGIC LOG

PROJECT	SRS COORDINATES	DATE	SHEET
Burial Ground Expansion	N 78336 E 58331	4-3-91	2 OF 4
	REFERENCE DATUM: 273.7 ft msl	DRILLING CONTRACTOR: EMTC	
WELL NO.: BGX-7	GRAIN SIZE CLASSIFICATION: Modified Wentworth	LOGGED BY: M. D. Hill	

DEPTH, FEET	CORE RUN	LITHOLOGIC DESCRIPTION - Core
50		• silty/clay (30-50%) in thin laminae (0.1 ft thick), moist to saturated. • thicker clay laminae (0.1-0.2 ft thick), more colors - black, light brownish grey, grayish red, and pale red brown. • Alternates between clay laminae (firm) and almost no clay (soft).
60		• same sand as above at 44.0 ft.
70		• silt/clay (20-30%) in stringers, fine to medium, dark yellowish orange, grayish orange, light brown and black, well sorted, subangular to subrounded, trace heavy minerals, trace micas, firm, moist to saturated. • some coarse.
80		
90		• more silt and clay laminae. • thin laminae of shell fagments (0.01-0.02 ft thick).
100		Silt, sandy (10-20%), light brown with pale greenish yellow to pale olive thin clay stringers, micaceous (2%), trace heavy minerals; sand portion very fine to fine. • sandy (30%), clay stringers (20%), add grayish orange and dark yellowish orange bands of color. • some coarse sand, clay stringers are brittle. • sandy (20-30%), clay (10%), yellowish gray to light greenish gray; sand is very fine.

GEOLOGIC LOG

PROJECT	SRS COORDINATES	DATE	SHEET
Burial Ground Expansion	N 78336 E 58331	4-3-91	3 OF 4
	REFERENCE DATUM: 273.7 ft msl	DRILLING CONTRACTOR: EMTC	
WELL NO.: BGX-7	GRAIN SIZE CLASSIFICATION: Modified Wentworth	LOGGED BY: M. D. Hill	



DEPTH, FEET	CORE RUN	LITHOLOGIC DESCRIPTION - Core
100		• grayish orange, dark yellowish orange, very pale orange and yellowish gray to light greenish gray. • some cemented layers (0.1-0.2 feet thick), broken shell fragments, coarser sand.
		Sand, silty/clayey (30%), very fine, clay in thin laminae (0.01-0.1 feet thick), light brown with grayish orange and pale olive/clay, well sorted, subangular to subrounded, heavy minerals, micaceous (2%), fossils (broken shell fragments in partially cemented layers as above), clay is brittle, firm, moist.
110		• fewer and thinner clay stringers, less fossils and cemented layers.
		Note: Hard Drilling
		• silt (0-5%), medium to coarse, grayish orange, saturated to "flowing", "clean" sand. • same sand as above at 116.0 feet.
120		Note: Contact with Green Clay
		Clay, silt and sand (0-10%), soft, plastic, dark greenish gray to greenish black, micaceous (5%), cemented and fossiliferous zone at 122.5-122.7 feet.
		Note: Push shelby tube from 123.0-124.5 feet.
		• slightly more sandy (10-20%), no cemented/fossiliferous zones; sand is fine.
130		Sand, clayey/silty(30-40%), medium to very coarse, light brown with pale olive stringers (clay), well to moderately sorted, subangular to subrounded, trace heavy minerals, trace micas, moist.
		Clay, as above at 122.0 feet.
		Sand, silt and clay (0-10%), medium to coarse, dark yellowish orange and grayish orange, banded appearance, well sorted, subangular to subrounded, trace heavy minerals, trace micas, saturated.
140		• thin light gray clay stringers.
150		

GEOLOGIC LOG

PROJECT	SRS COORDINATES	DATE	SHEET
Burial Ground Expansion	N 78336 E 58331	4-4-91	4 OF 4
	REFERENCE DATUM: 273.7 ft msl	DRILLING CONTRACTOR: EMTC	
WELL NO.: BGX-7	GRAIN SIZE CLASSIFICATION: Modified Wentworth	LOGGED BY: M. D. Hill	

DEPTH, FEET	CORE RUN	LITHOLOGIC DESCRIPTION - Core
150	X	
		Total Depth of Exploration 152.0 feet.
160		
170		
180		
190		
200		

GEOLOGIC LOG

PROJECT	SRS COORDINATES	DATE	SHEET
Burial Ground Expansion	N 77610 E 58942	4-16-91	1 OF 3
	REFERENCE DATUM: 275.4 ft msl	DRILLING CONTRACTOR: EMTC	
WELL NO.: BGX-8D*	GRAIN SIZE CLASSIFICATION: Modified Wentworth	LOGGED BY: M. D. Hill	

DEPTH, FEET	CORE RUN	LITHOLOGIC DESCRIPTION - Mud Rotary
0		
10		**Sand**, silty/clayey (10-30%), fine to very coarse, moderate reddish brown, subangular to subrounded, trace heavy minerals, trace micas, clay in matrix.
20		• less very coarse, clay in stringers (white and moderate red).
30		• silt/clay (10-20%), medium to coarse, light brown, well sorted, clay stringers as above, but "cleaner" sand.
40		
50		• silty/clayey (40-50%), increase clayey stringers.

GEOLOGIC LOG

PROJECT	SRS COORDINATES	DATE	SHEET
Burial Ground Expansion	N 77610 E 58942	4-16-91	2 OF 3
	REFERENCE DATUM: 275.4 ft msl	DRILLING CONTRACTOR: EMTC	
WELL NO.: BGX-8D*	GRAIN SIZE CLASSIFICATION: Modified Wentworth	LOGGED BY: M. D. Hill	

DEPTH, FEET	CORE RUN	LITHOLOGIC DESCRIPTION - Mud Rotary
50		
60		
		Clay, silty/sandy (30%), medium to coarse, dark yellowish orange to light brown, plastic. (Tan Clay).
70		
		Sand, silty/clayey (30-40%), fine, well sorted, subangular to subrounded, clay in laminae, trace heavy minerals, trace micas.
80		
90		
100		• less silt/clay (20-35%), medium, moderate reddish brown, "cleaner"sand.

GEOLOGIC LOG

PROJECT	SRS COORDINATES	DATE	SHEET
Burial Ground Expansion	N 77610 E 58942	4-16-91	3 OF 3
	REFERENCE DATUM: 275.4 ft msl	DRILLING CONTRACTOR: EMTC	
WELL NO.: BGX-8D*	GRAIN SIZE CLASSIFICATION: Modified Wentworth	LOGGED BY: M. D. Hill	

DEPTH, FEET	CORE RUN	LITHOLOGIC DESCRIPTION - Mud Rotary
100		
110		
120		Total Depth of Exploration 120.0 feet.
130		
140		
150		

GEOLOGIC LOG

PROJECT	SRS COORDINATES	DATE	SHEET
Burial Ground Expansion	N 76936 E 59522	1-7-91	1 OF 4
	REFERENCE DATUM: 276.4 ft msl	DRILLING CONTRACTOR: EMTC	
WELL NO.: BGX-9	GRAIN SIZE CLASSIFICATION: Modified Wentworth	LOGGED BY: M. D. Hill	

DEPTH, FEET	CORE RUN	LITHOLOGIC DESCRIPTION - Core
0		
10		Drilled Pilot Hole to 14.0 feet to begin coring.
		Sand, clayey/silty (20-40%), very coarse, mottled colors - pale red to grayish pink, light brown, white and pale blue (clay), well sorted, subangular to subrounded, trace heavy minerals, trace micas, moist.
		Clay, silt and sand (10-20%), in layers, mottled grayish red purple, dusky red, bluish white and light bluish gray, trace heavy minerals, trace micas, stiff, hard, plastic.
20		Sand, silty/clayey (10-30%), coarse to very coarse, moderate reddish brown, well sorted, subangular to subrounded, trace heavy minerals, trace micas, Iron Oxide staining, moist to saturated.
		silty/clayey (30-50%), medium to coarse, pale purple, moderate orange pink and white, chalky appearance, dry to moist.
30		Interbedded silt and clay, sandy (20-30%), in thin laminae, dark yellowish orange, moderate reddish orange, white, and moderate red, trace heavy minerals, trace micas, stiff, plastic, dry to moist.
		Sand, silty/clayey (30-40%), medium to coarse, dark yellowish orange with white clay stringers, well sorted, subangular to subrounded, trace heavy minerals, trace micas, chalky, dry to moist.
40		
50		

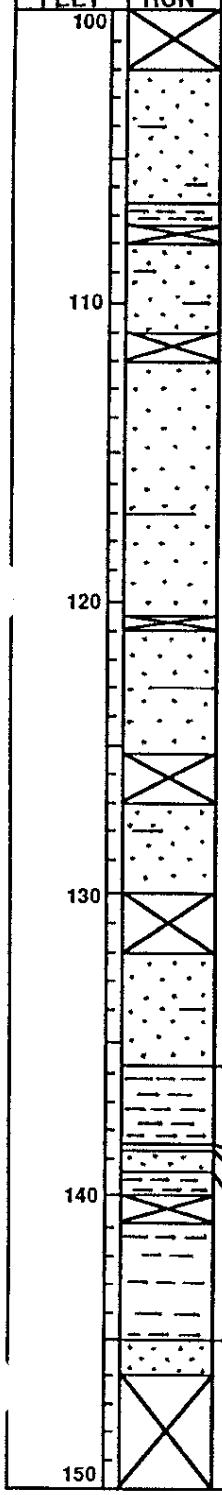
GEOLOGIC LOG

PROJECT	SRS COORDINATES	DATE	SHEET
Burial Ground Expansion	N 76936 E 59522	1-8-91	2 OF 4
	REFERENCE DATUM: 276.4 ft msl	DRILLING CONTRACTOR: EMTC	
WELL NO.: BGX-9	GRAIN SIZE CLASSIFICATION: Modified Wentworth	LOGGED BY: M. D. Hill	

DEPTH, FEET	CORE RUN	LITHOLOGIC DESCRIPTION - Core
50		• silty/clay (40-50%), medium with some coarse, moderate red to grayish orange, micaceous (2%), some clayey laminae, saturated.
60		• less silt and clay (10-20%), coarse. • medium to coarse, laminated colors.
		Clay, silty and sandy (30-40%), in laminae, hard, stiff, plastic, light brown, trace heavy minerals, trace micas.
		Sand, as above at 64.0 ft, some well rounded quartz pebbles, dark yellowish orange.
70		Clay, silty and sandy (20-30%), in laminae, dark yellowish orange, dark colored sand, stiff, plastic.
		Sand, as above at 66.0 ft.
		Interbedded silt and clay, (0.01 - 0.1ft thick laminae), sand (10%), dark yellowish orange clay and light brown silt, stiff, plastic.
80		Sand, silty/clayey (30%), fine to very coarse, dark yellowish orange to grayish orange with dusky brown (heavy minerals), moderately sorted, subangular to subrounded, micaceous (2%), moist, firm. • less clay (10-20%), "cleaner" sand. • silty/clay (30-50%), very fine to fine, well sorted.
		Silt, clayey (30%), sandy (10-20%), dark yellowish orange to grayish orange with dusky brown (heavy minerals), micaceous (2-5%), firm, dry to moist; sand portion very fine.
90		Interbedded silt and clay as at 73.0 feet.
		Sand, silty/clayey (20-30%), fine to medium with coarse, moderate reddish orange with moderate brown, well to moderately sorted, subangular to subrounded, trace heavy minerals, micaceous (2%), firm, moist. • silt/clay (10-30%), medium to coarse, dusky orange to light brown, well sorted, saturated. • same as above at 91.0 feet. • same as above at 92.0 feet.
100		

GEOLOGIC LOG

PROJECT	SRS COORDINATES	DATE	SHEET
Burial Ground Expansion	N 76936 E 59522	1-8-91	3 OF 4
	REFERENCE DATUM: 276.4 ft msl	DRILLING CONTRACTOR: EMTC	
WELL NO.: BGX-9	GRAIN SIZE CLASSIFICATION: Modified Wentworth	LOGGED BY: M. D. Hill	



LITHOLOGIC DESCRIPTION - Core

- silt/clay (0-10%), coarse, moderate red and pale yellowish brown.
- clayey/silty (20-30%), very fine to fine with some coarse, dusky brown to light brown, yellowish gray to pale greenish yellow, well to moderately sorted, firm, some clay laminae, moist.

Silt, clayey (20-30%), sandy (20%), colors as above except dusky brown spots instead of lenses, shell hash at top of layer, micaceous (2-5%), firm, dry to moist; sand portion fine.

Sand, silty/clayey (30-50%), very fine, light brown, well sorted, subangular to subrounded, micaceous (2-5%), trace heavy minerals, saturated.

- silt/clay (10-15%), fine to medium to coarse, dark yellowish orange, dusky yellow thin clay laminae, well to moderately sorted.
- clay (20%), pale yellow.
- clay (35-40%), very fine to fine with occasional granules, grayish yellow with dark yellowish orange mottling, well consolidated sandstone pieces.
- clay (30%), dark yellowish orange to yellowish gray, interbedded with thin laminae of clay (yellowish gray, sandy, soft, malleable), occasional kaolinitic clay (brittle).
- clay/silt (20-30%), very fine to medium, occasional well consolidated sand included.
- silty/clayey (20-30%), very fine with some coarse, thin laminae of light olive gray, well sorted, moist.

Silt, clayey/sandy (30-40%), coarse, dark greenish gray to greenish black, partially cemented sand layers (0.1 - 0.2 feet thick), micaceous (2-5%), firm, dry.
- sand and clay (0-5%), light brown to yellowish gray, very fine, dry to moist.

Clay, light olive gray and light brown.

Sand, as above at 132.0 feet.

Silt, as above at 136.0 feet (Green Clay). Note Push shelby tube 140.5 to 142.5 feet.

Sand, silty/clayey (20-30%), coarse to very coarse, moderate red to light brown with yellowish gray clay lenses, well sorted, subangular to subrounded, trace heavy minerals, trace micas, some clayey and silty lenses and some "clean" sand lenses, moist to saturated.

GEOLOGIC LOG

PROJECT	SRS COORDINATES	DATE	SHEET
Burial Ground Expansion	N 76936 E 59522	1-9-91	4 OF 4
	REFERENCE DATUM: 276.4 ft msl	DRILLING CONTRACTOR: EMTC	
WELL NO.: BGX-9	GRAIN SIZE CLASSIFICATION: Modified Wentworth	LOGGED BY: M. D. Hill	

DEPTH, FEET	CORE RUN	LITHOLOGIC DESCRIPTION - Core
150	X	
		Total Depth of Exploration 152.5 feet.
160		
170		
180		
190		
200		

GEOLOGIC LOG

PROJECT	SRS COORDINATES	DATE	SHEET
Burial Ground Expansion	N 75500 E 59640	12-10-90	1 OF 4
	REFERENCE DATUM: 276.7 ft msl	DRILLING CONTRACTOR: EMTC	
WELL NO.: BGX-11	GRAIN SIZE CLASSIFICATION: Modified Wentworth	LOGGED BY: M. D. Hill	

DEPTH, FEET	CORE RUN	LITHOLOGIC DESCRIPTION - Core
0		
10		**Drill Pilot hole to 14.0 feet to begin coring.**
		Sand, clayey/silt (35-50%), fine to coarse, moderate reddish brown, moderately sorted, subrounded to subangular, trace heavy minerals, trace micas, Iron Oxide staining, moist.
		Clay, silt(10-20%), sand (10%), bands of pale red purple, light brown, dark yellowish brown and light greenish gray, micaceous (2-5%), trace heavy minerals, Iron Oxide staining, plastic; sand portion fine.
20		**Sand**, silty/clayey (40-50%), fine to very coarse with some pebble sized quartz, pale red purple to pale pink, light greenish gray and pale yellowish orange, moderately to poorly sorted, micaceous (5-10%), trace heavy minerals, chalky, moist.
		Silt, clayey (30%), sand (10-20%), bands of pale red purple to dusky red, light brown, dark yellowish orange, and light greenish gray, micaceous (10%), trace heavy minerals, moist; sand portion fine. • more clay (30-40%), dark yellowish orange with white clay laminae, chalky. • more sandy (30-40%), fine to very coarse.
30		
40		**Sand**, (grades into) silty/clayey (50%), medium to coarse, dark yellowish orange with white clayey laminae, well sorted, subangular to subrounded, micaceous (2%), trace of heavy minerals, moist. **Note**: No recovery.
50		

GEOLOGIC LOG

PROJECT	SRS COORDINATES	DATE	SHEET
Burial Ground Expansion	N 75500 E 59640	12-10-90	2 OF 4
	REFERENCE DATUM: 276.7 ft msl	DRILLING CONTRACTOR: EMTC	
WELL NO.: BGX-11	GRAIN SIZE CLASSIFICATION: Modified Wentworth	LOGGED BY: M. D. Hill	

DEPTH, FEET	CORE RUN	LITHOLOGIC DESCRIPTION - Core
50		• fine to medium, dark yellowish orange with pale red purple, dusky red, very light gray clay laminae (0.01 - 0.1 ft thick). • silt/clay (35-45%), light greenish gray clay stringers.
60		• silt/clay (20-30%), medium, dark yellowish orange to moderate reddish brown, Iron Oxide staining.
		• silt/clay (20%), fine to medium.
70		• clayey/silt (30-40%), fine to very coarse, with some granules, moderately sorted, clayey laminae and sand laminae.
		• fewer clayey laminae.
80		
		Silt, clayey (30-40%), moderate brown with grayish orange clay laminae, micaceous (2-5%), trace heavy minerals, plastic, Manganese Oxide concretions.
		Sand, clayey/silt (30-40%), medium to coarse, dark yellowish orange to moderate brown, well sorted, subangular to subrounded, trace heavy minerals, trace micas, clayey laminae, Manganese Oxide concretions, moist.
90		Clay, sand and silt (0-5%), in thin laminae, yellowish gray with dusky brown staining, trace micas, trace heavy minerals, brittle, dry. Note: Shelby tube pushed from 94.0 - 96.0 ft.
		Sand, clayey (25-30%), silt (10-20%), fine to medium, grayish orange with bands of light brown (clay), subangular to subrounded, micaceous (2-5%), trace heavy minerals, moist.
100		

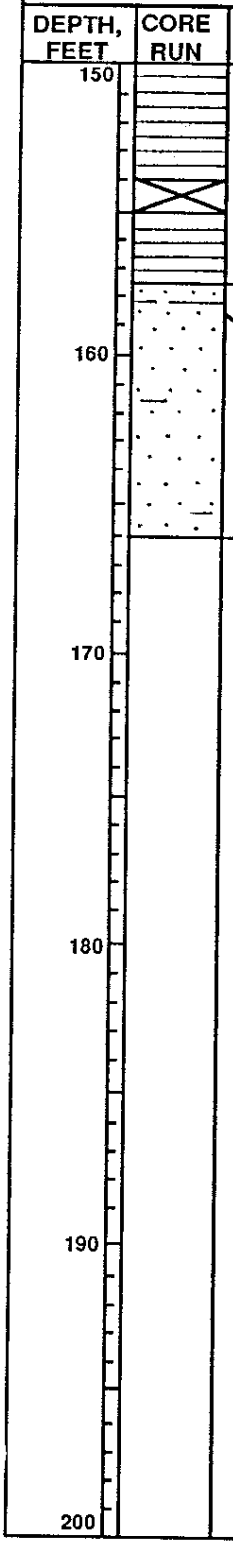
GEOLOGIC LOG

PROJECT	SRS COORDINATES	DATE	SHEET
Burial Ground Expansion	N 75500 E 59640	12-11-90	3 OF 4
	REFERENCE DATUM: 276.7 ft msl	DRILLING CONTRACTOR: EMTC	
WELL NO.: BGX-11	GRAIN SIZE CLASSIFICATION: Modified Wentworth	LOGGED BY: M. D. Hill	

DEPTH, FEET	CORE RUN	LITHOLOGIC DESCRIPTION - Core
100		• silt/clay (20%).
		• less dark colored layers.
		• silty/clayey (50%), fine to very coarse, grayish yellow to dusky yellow, well to moderately sorted.
110		• clayey/silty (30-50%), coarse to very coarse, pale red with light brown and blackish red, well sorted, Manganese Oxide staining and concretions.
		• same sand as above at 100.0 ft.
		• clayey (30-40%), silt (10-20%), fine with some medium to coarse, moderate yellowish brown with bands of yellows and browns, stiff, saturated.
		Limestone, sandy, siliceous, dusky brown traces.
120		Sand, as above at 117.0 feet.
		• silty/clay (30-40%), clay in streamers, very fine to fine, pale yellowish orange with pale olive and browns and yellows, micaceous (5%).
130		• more clay (20%), dark yellowish orange, some cementing.
140		Silt, clayey/sandy (20-40%), clay in laminae, light brown with yellowish gray, micaceous (5-10%), trace heavy minerals, moist, sand portion is very fine.
		Sand, silty/clayey (40-50%), very fine to fine, pale yellowish orange with grayish orange, yellowish gray and very pale orange, well sorted, subangular to subrounded, trace heavy minerals, micaceous (5-10%), clay in laminae.
150		

GEOLOGIC LOG

PROJECT	SRS COORDINATES	DATE	SHEET
Burial Ground Expansion	N 75500 E 59640	12-11-90	4 OF 4
	REFERENCE DATUM: 276.7 ft msl	DRILLING CONTRACTOR: EMTC	
WELL NO.: BGX-11	GRAIN SIZE CLASSIFICATION: Modified Wentworth	LOGGED BY: M. D. Hill	



LITHOLOGIC DESCRIPTION - Core

Clay, sand and silt (10-20%), dark greenish gray, cemented sands, micaceous (5%), hard, stiff, plastic; sand is fine to medium. **Note**: Shelby tube pushed from 154.0 to 155.0 ft.

Sand, clayey/silty (40-50%), coarse to very coarse, moderate reddish brown, dusky red, dark yellowish orange and light greenish gray (clay laminae), well sorted, subangular to subrounded, micaceous (5%), trace heavy minerals, Iron Oxide staining, dry.

- silt/clay (5-10%), medium to coarse, saturated

Total Depth of Exploration 166.0 feet

Appendix C

APPENDIX C

CORE LOGGING DATA SHEETS

KEY TO CORE LOGGING DATA SHEETS

AREA	=	Well Name Prefix
NO	=	Well Number
SCR	=	Screen Zone
DEPTH	=	Depth of Sample
REC	=	Recovery
IND	=	Induration
COLOR	=	Color
STRUCTURE	=	Sedimentary Structures
% GR	=	% Gravel
% SD	=	% Sand
% MD	=	% Mud
MX	=	Maximum Grain Size
MD	=	Modal Grain Size
R	=	Roundness
% CG	=	% Carbonate Gravel
% CS	=	% Carbonate Sand
% CM	=	% Carbonate Mud
% CMT	=	% Cement
% CAR	=	% Total Carbonate
NAME	=	Lithologic Name
SO	=	Sorting
%POR	=	% Porosity
TYPE	=	Type of Porosity
% MUS	=	% Muscovite
% GLA	=	% Glauconite
% LIG	=	% Lignite
% SUL	=	% Sulphides
H	=	Heavy Minerals
FOSSILS	=	Fossils

AREA	NO	SCR	DEPTH	REC	IND	COLOR	STRUCTURE	%GR	%SD	%MD	MX	MD	R	%CG	%CS	%CM	%CMT	%CAR	NAME	SO	%POR	TYPE	%MUS	%GLA	%LIG	%SUL	H	FOSSILS
BGX	001	A	1	0																								
BGX	001	A	2	0																								
BGX	001	A	3	0																								
BGX	001	A	4	0																								
BGX	001	A	5	0																								
BGX	001	A	6	0																								
BGX	001	A	7	0																								
BGX	001	A	8	0																								
BGX	001	A	9	0																								
BGX	001	A	10	0																								
BGX	001	A	11		2	MOR		4	86	10	GR	M	3					0	SD	P	M	BP	2	0	0	0	C	
BGX	001	A	12		2	DPURE	BALYE	3	87	10	GR	F	3					0	SD	M	M	BP	3	0	0	0	C	
BGX	001	A	13		1	MREBR		.1	85	15	GR	M	3					0	SD	M	M	BP	2	0	0	0	C	
BGX	001	A	14		2	DREBR	BAMPU	10	75	15	GR	C	4					0	SD	P	M	BP	2	0	0	0	C	
BGX	001	A	15		2	DREBR	BAMPU	25	45	30	LP	M	3					0	PBCLSD	P	P	BP	5	0	0	0	C	
BGX	001	A	16		2	MREBR	VARLPU	.1	92	8	GR	F	3					0	SD	M	M	BP	8	0	0	0	A	
BGX	001	A	17		2	LPU	VARREBR	.1	90	10	GR	F	3					0	SD	M	G	BP	10	0	0	0	A	
BGX	001	A	18		2	MREPU	VARREBR	0	90	10	VC	F	3					0	SD	M	M	BP	8	0	0	0	A	
BGX	001	A	19		2	MORYE	BAMREPU	0	90	10	VC	F	3					0	SD	M	M	BP	6	0	0	0	A	
BGX	001	A	20		2	MREPU		5	80	15	GR	F	3					0	SD	P	M	BP	10	0	0	0	A	
BGX	001	A	21		2	MBRYE	BAMREPU	.1	90	10	GR	F	3					0	SD	M	M	BP	8	0	0	0	A	
BGX	001	A	22		2	LORYE		.1	90	10	GR	F	3					0	SD	M	M	BP	7	0	0	0	A	
BGX	001	A	23		1	LORYE	MTMOR	0	92	8	VC	F	3					0	SD	M	G	BP	6	0	0	0	A	
BGX	001	A	24		2	LORYE		.1	90	10	GR	F	3					0	SD	M	G	BP	5	0	0	0	A	
BGX	001	A	25		2	LBRYE		3	87	10	GR	F	3					0	SD	P	G	BP	6	0	0	0	A	
BGX	001	A	26		2	LBRYE		5	80	15	GR	F	3					0	SD	P	M	BP	5	0	0	0	A	
BGX	001	A	27		2	DYEOR		5	85	10	GR	F	3					0	SD	P	M	BP	5	0	0	0	A	
BGX	001	A	28		2	MBRYE		10	80	10	GR	M	3					0	SD	P	M	BP	3	0	0	0	A	
BGX	001	A	29		2	DBRYE	MTWH	20	70	10	GR	F	3					0	SD	P	M	BP	3	0	0	0	C	
BGX	001	A	30		2	MBROR		15	75	10	GR	F	3					0	SD	P	M	BP	4	0	0	0	A	
BGX	001	A	31		2	MBROR	ILPUCL	0	80	20	C	F	3					0	SD	P	M	BP	2	0	0	0	A	
BGX	001	A	32		2	MBROR	IWHCL	0	70	30	VC	F	3					0	CLSD	P	M	BP	.1	0	0	0	A	
BGX	001	A	33		2	MBROR	ILPUCL	0	65	35	C	F	3					0	CLSD	P	M	BP	.1	0	0	0	C	
BGX	001	A	34		1	DYEOR		5	80	15	GR	M	3					0	SD	M	G	BP	1	0	0	0	C	
BGX	001	A	35	6	1	DYEOR		5	88	7	GR	M	3					0	SD	M	E	BP	1	0	0	0	C	
BGX	001	A	36		2	DYEOR	VARWH	7	83	10	LP	M	3					0	SD	M	G	BP	2	0	0	0	C	
BGX	001	A	37		2	DYEOR	VARWH	5	85	10	GR	M	3					0	SD	M	G	BP	2	0	0	0	C	
BGX	001	A	38		2	DYEOR	VARWHOR	5	85	10	GR	M	3					0	SD	M	G	BP	2	0	0	0	C	

AREA	NO	SCR	DEPTH	REC	IND	COLOR	STRUCTURE	%GR	%SD	%MD	MX	MD	R	%CG	%CS	%CM	%CMT	%CAR	NAME	SO	%POR	TYPE	%MUS	%GLA	%LIG	%SUL	H	FOSSILS
BGX	001	A	39		2	DYEOR	WSPWH	15	75	10	LP	M	3					0	SD	P	G	BP	2	0	0	0	A	
BGX	001	A	40		2	DYEOR	BAWH	7	83	10	GR	M	3					0	SD	M	G	BP	2	0	0	0	A	
BGX	001	A	41		2	DYEOR	BAWH	.1	90	10	GR	M	3					0	SD	M	G	BP	1	0	0	0	C	
BGX	001	A	42		2	DYEOR	BAWH	.1	90	10	GR	M	3					0	SD	M	G	BP	2	0	0	0	A	
BGX	001	A	43		2	DYEOR	VARREOR	1	89	10	GR	M	3					0	SD	M	G	BP	2	0	0	0	A	
BGX	001	A	44		2	DYEOR	WSPWH	1	91	8	GR	M	3					0	SD	M	G	BP	2	0	0	0	A	
BGX	001	A	45		2	DYEOR	WSPWH	3	87	10	GR	M	3					0	SD	M	G	BP	1	0	0	0	A	
BGX	001	A	46		2	DYEOR	WSPWH	5	80	15	GR	M	3					0	SD	M	G	BP	2	0	0	0	A	
BGX	001	A	47		2	DYEOR	MTYEWH	5	80	15	GR	M	3					0	SD	M	G	BP	2	0	0	0	A	
BGX	001	A	48		2	DYEOR	MTREOR	5	85	10	GR	M	3					0	SD	M	G	BP	2	0	0	0	A	
BGX	001	A	49		2	DYEOR	MTWH	3	82	15	GR	M	3					0	SD	M	G	BP	1	0	0	0	A	
BGX	001	A	50		2	DYEOR	MTWH	0	90	10	VC	M	3					0	SD	M	G	BP	1	0	0	0	C	
BGX	001	A	51		2	DYEOR	IFSWHCL	5	75	20	GR	M	4					0	SD	P	M	BP	1	0	0	0	C	
BGX	001	A	52		2	DYEOR	IFSWHCL	5	80	15	GR	C	4					0	SD	P	G	BP	1	0	0	0	C	
BGX	001	A	53		1	MREBR	VARDYE	8	84	8	LP	C	3					0	SD	M	E	BP	.1	0	0	0	C	
BGX	001	A	54		1	MREBR		7	86	7	GR	C	3					0	SD	M	E	BP	.1	0	0	0	C	
BGX	001	A	55		1	MREBR	MTDYE	10	83	7	LP	C	4					0	SD	M	E	BP	.1	0	0	0	C	
BGX	001	A	56	0																								
BGX	001	A	57	0																								
BGX	001	A	58		1	MORBR		8	85	7	GR	C	4					0	SD	M	E	BP	.1	0	0	0	C	
BGX	001	A	59		1	MBROR		10	83	7	GR	C	4					0	SD	M	E	BP	.1	0	0	0	C	
BGX	001	A	60		1	MBROR		10	82	8	GR	C	3					0	SD	M	E	BP	.1	0	0	0	C	
BGX	001	A	61		1	DYEOR		8	85	7	GR	C	3					0	SD	M	E	BP	.1	0	0	0	C	
BGX	001	A	62		1	DYEOR		10	80	10	GR	M	3					0	SD	M	G	BP	.1	0	0	0	C	
BGX	001	A	63		2	DYEOR		5	80	15	GR	M	3					0	SD	M	G	BP	.1	0	0	0	C	
BGX	001	A	64		2	MORGN		5	70	25	GR	M	3					0	CLSD	P	M	BP	.1	0	0	0	C	
BGX	001	A	65		2	LGYGN	MTWH	10	70	20	LP	M	3					0	SD	P	M	BP	.1	0	0	0	C	
BGX	001	A	66		2	LGYGN	MTWH	7	73	20	GR	M	3					0	SD	P	P	BP	1	0	0	0	C	
BGX	001	A	67		2	MYEBR	BAGNMTOR	3	82	15	GR	M	3					0	SD	M	G	BP	1	0	0	0	C	
BGX	001	A	68		2	LGNBR	VARDBR	5	85	10	GR	M	3					0	SD	M	G	BP	.1	0	0	0	C	
BGX	001	A	69		2	MYEBR		7	83	10	GR	M	3					0	SD	M	M	BP	1	0	0	0	C	
BGX	001	A	70		2	MGYBR	VARLYETA	10	80	10	LP	M	3					0	SD	P	M	BP	.1	0	0	0	C	
BGX	001	A	71		1	LGNOR	BALBR	10	75	15	LP	C	4					0	SD	P	M	BP	.1	0	0	0	C	
BGX	001	A	72		1	LGNOR	VARLBR	10	80	10	LP	C	4					0	SD	P	G	BP	.1	0	0	0	C	
BGX	001	A	73		2	MYETA	IYETACL	3	52	45	GR	M	3					0	CLSD	P	M	BP	1	0	0	0	C	
BGX	001	A	74		2	MYEOR		5	85	10	GR	M	4					0	SD	M	G	BP	1	0	0	0	C	
BGX	001	A	75		1	DYEOR		7	85	8	GR	M	4					0	SD	M	E	BP	.1	0	0	0	R	
BGX	001	A	76	0																								

AREA	NO	SCR	DEPTH	REC	IND	COLOR	STRUCTURE	%GR	%SD	%MD	MX	MD	R	%CG	%CS	%CM	%CMT	%CAR	NAME	SO	%POR	TYPE	%MUS	%GLA	%LIG	%SUL	H	FOSSILS
BGX	001	A	77		2	DORYE		3	82	15	GR	C	4					0	SD	M	M	BP	1	0	0	0	C	
BGX	001	A	78	0																								
BGX	001	A	79		2	MYETA	IYETACL	0	45	55	VC	CL	3					0	SDCL	V	P	BP	1	0	0	0	C	
BGX	001	A	80		2	MYETA	ISD	0	10	90	F	CL	3					0	CL	V	P	MI	1	0	0	0	R	
BGX	001	A	81	0																								
BGX	001	A	82	0																								
BGX	001	A	83		2	MYEOR	BAMGNOR	10	70	20	GR	M	3					0	SD	P	M	BP	1	0	0	0	C	
BGX	001	A	84		2	DYEOR		3	72	25	GR	M	3					0	CLSD	P	M	BP	1	0	0	0	C	
BGX	001	A	85		2	DYEOR		5	85	10	GR	M	3					0	SD	M	M	BP	1	0	0	0	C	
BGX	001	A	86	5	2	DYETA		1	74	25	GR	M	3					0	CLSD	P	P	BP	1	0	0	0	C	
BGX	001	A	87	0																								
BGX	001	A	88		2	MYEBR	VARYETA	3	67	30	GR	M	3					0	CLSD	P	P	BP	1	0	0	0	C	
BGX	001	A	89		3	MGYOR	VARYETA	2	73	25	GR	M	3					0	CLSD	P	M	BP	1	0	0	0	C	
BGX	001	A	90		3	MYETA	VARLOR	1	74	25	GR	M	3					0	CLSD	P	M	BP	2	0	0	0	C	
BGX	001	A	91		2	LGNOR	VARBR	2	73	25	GR	M	3					0	CLSD	P	M	BP	1	0	0	0	C	
BGX	001	A	92		3	LGNOR	VARYETA	0	85	15	C	M	3					0	SD	M	M	BP	2	0	0	0	C	
BGX	001	A	93		2	DYEOR	VARLGYTA	0	85	15	VC	M	3					0	SD	M	M	BP	3	0	0	0	C	
BGX	001	A	94		2	DYEOR	IYETACL	0	90	10	C	M	3					0	SD	M	M	BP	4	0	0	0	C	
BGX	001	A	95		2	DYEOR	WSPTACL	0	85	15	VC	M	3					0	SD	M	M	BP	2	0	0	0	C	
BGX	001	A	96		2	DYEOR	WSPYECL	0	85	15	VC	M	3					0	SD	M	M	BP	3	0	0	0	C	
BGX	001	A	97	0																								
BGX	001	A	98		2	MYEOR	IYETACL	0	70	30	C	F	3					0	CLSD	P	P	BP	1	0	0	0	C	
BGX	001	A	99		3	LYEOR	IYETACL	0	70	30	C	F	3					0	CLSD	P	P	BP	2	0	0	0	C	
BGX	001	A	100		3	LYEOR	IYETACL	0	65	35	C	F	3					0	CLSD	P	P	BP	2	0	0	0	C	
BGX	001	A	101		3	LGN	WSPDBR	0	60	40	VC	F	3					0	CLSD	P	P	BP	3	0	0	0	R	
BGX	001	A	102		3	LGN	WSPDBR	0	60	40	VC	F	3					0	CLSD	P	P	BP	2	0	0	0	R	
BGX	001	A	103		3	LGN	MTDBR	5	70	25	GR	M	3					0	CLSD	P	P	BP	1	0	0	0	C	
BGX	001	A	104		2	MYEBR		10	80	10	GR	M	3					0	SD	P	M	BP	2	0	0	0	C	
BGX	001	A	105		2	MYEBR		15	70	15	GR	M	3					0	SD	P	M	BP	1	0	0	0	C	
BGX	001	A	106		2	MGNBR	MTWH	15	60	25	LP	F	3					0	CLSD	P	P	BP	1	0	0	0	C	
BGX	001	A	107		2	LGN	MTDGNBR	25	45	30	LP	F	4					0	PBCLSD	V	P	BP	1	0	0	0	C	
BGX	001	A	108		2	MPIBR	VARLGN	25	55	20	LP	F	3					0	PBSD	P	P	BP	1	0	0	0	C	
BGX	001	A	109		2	MGNTA	MTWH	25	55	20	LP	M	4					0	PBSD	P	M	BP	1	0	0	0	C	
BGX	001	A	110		1	MGNYE		10	81	9	GR	C	3					0	SD	M	G	BP	1	0	0	0	C	
BGX	001	A	111		1	MBRYE		10	80	10	GR	C	4					0	SD	M	M	BP	1	0	0	0	C	
BGX	001	A	112	8	1	MBRYE		8	85	7	GR	C	3					0	SD	M	M	BP	1	0	0	0	C	
BGX	001	A	113		1	LPIBR		7	86	7	GR	C	4					0	SD	M	M	BP	1	0	0	0	C	
BGX	001	A	114	8	2	MBRYE		10	80	10	LP	C	4					0	SD	P	M	BP	1	0	0	0	C	

AREA	NO	SCR	DEPTH	REC	IND	COLOR	STRUCTURE	%GR	%SD	%MD	MX	MD	R	%CG	%CS	%CM	%CMT	%CAR	NAME	SO	%POR	TYPE	%MUS	%GLA	%LIG	%SUL	H	FOSSILS
BGX	001	A	115	0																								
BGX	001	A	116	0																								
BGX	001	A	117	0																								
BGX	001	A	118		2	LGYTA		5	87	8	GR	C	4					0	SD	M	G	BP	1	0	0	0	C	
BGX	001	A	119		1	LGNGY		7	89	4	GR	C	4					0	SD	M	E	BP	1	0	0	0	C	
BGX	001	A	120	0																								
BGX	001	A	121	0																								
BGX	001	A	122	0																								
BGX	001	A	123		2	MTAOR	WSPWH	.1	75	25	GR	M	3					0	CLSD	P	P	BP	2	.1	0	0	C	
BGX	001	A	124		2	MGNTA	MTLBR	.1	90	10	GR	F	3					0	SD	M	M	BP	2	.1	0	0	C	
BGX	001	A	125	0																								
BGX	001	A	126	0																								
BGX	001	A	127	0																								
BGX	001	A	128		2	DYEOR	WSPWH	.1	90	10	GR	F	3					0	SD	M	M	BP	2	0	0	0	C	
BGX	001	A	129		2	MGNYE		0	90	10	VC	F	3					0	SD	M	M	BP	1	0	0	0	C	
BGX	001	A	130	6	2	LPITA		0	85	15	C	F	3	0	99	0	0	.1	SD	P	M	BP	1	0	0	0	C	
BGX	001	A	131		1	LPIGY	ICTSD	0	92	8	C	F	3					0	SD	W	E	BP	1	0	0	0	A	
BGX	001	A	132		1	LGNGY		0	93	7	C	M	3					0	SD	M	G	BP	.1	0	0	0	A	
BGX	001	A	133	0																								
BGX	001	A	134	0																								
BGX	001	A	135	0																								
BGX	001	A	136		3	MGNYE	ICTSD	0	80	20	C	F	3				3	0	SD	M	M	BP	1	0	0	0	C	
BGX	001	A	137		2	MTAYE		0	80	20	C	F	3	0	99	0	0	1	CASD	M	M	BP	1	.1	0	0	C	
BGX	001	A	138	0																								
BGX	001	A	139	0																								
BGX	001	A	140	0																								
BGX	001	A	141		4	MPITA		0	80	20	VC	F	3	0	99	1	0	3	CASD	M	P	BP	.1	.1	0	0	C	PL
BGX	001	A	142		2	LGNTA		0	85	15	VC	F	4					0	SD	M	M	BP	1	0	0	0	C	
BGX	001	A	143		1	LGNYE	ICTSD	0	90	10	VC	F	4				3	0	SD	M	M	BP	1	0	0	0	C	
BGX	001	A	144	3	1	LGNYE		0	90	10	VC	F	4					0	SD	M	M	BP	2	.1	0	0	C	
BGX	001	A	145	0																								
BGX	001	A	146		2	LGNTA	ICTSD	0	90	10	C	M	4				5	0	SD	M	M	BP	2	0	0	0	C	
BGX	001	A	147	4	3	LGN	ICTSD	.1	90	10	GR	M	4				2	0	SD	M	M	BP	1	.1	0	0	C	
BGX	001	A	148		1	LBR	MTDBR	7	88	5	GR	C	4					0	SD	M	E	BP	.1	0	0	0	C	
BGX	001	A	149		1	LBR	MTDBR	10	86	4	GR	C	4	0	99	0	0	.1	SD	M	E	BP	.1	0	0	0	C	YE
BGX	001	A	150		2	LGN		0	85	15	VC	F	3					0	SD	M	M	BP	1	.1	0	0	C	
BGX	001	A	151		3	MBRYE	PUCLBICL	0	90	10	VC	F	3	0	99	0	0	.1	SD	M	M	BP	1	1	0	0	C	
BGX	001	A	152		3	DGYGN		.1	85	15	GR	F	3					0	SD	M	M	BP	1	3	0	.1	C	

AREA	NO	SCR	DEPTH	REC	IND	COLOR	STRUCTURE	%GR	%SD	%MD	MX	MD	R	%CG	%CS	%CM	%CMT	%CAR	NAME	SO	%POR	TYPE	%MUS	%GLA	%LIG	%SUL	H	FOSSILS
BGX	001	A	153		3	DGYGN		0	85	15	C	VF	3					0	SD	M	M	BP	2	7	.1	2	C	
BGX	001	A	154		3	MGYGN		0	90	10	M	VF	3					0	SD	M	M	BP	1	2	1	2	C	
BGX	001	A	155		3	MGYGN		0	90	10	M	VF	3					0	SD	M	M	BP	1	2	1	.1	C	
BGX	001	A	156		3	MGYGN		0	95	5	C	VF	3				3	0	SD	W	G	BP	1	3	0	0	C	
BGX	001	A	157	9	3	MGY	ICTSD	0	93	7	C	VF	3				10	0	SD	W	M	BP	1	5	0	0	C	
BGX	001	A	158		3	DBKGN		0	70	30	VC	F	4					0	GLCLSD	P	P	BP	2	25	0	0	C	
BGX	001	A	159		2	DGN		0	60	40	VC	F	3					0	CLSD	P	P	BP	2	10	0	3	R	
BGX	001	A	160		2	DGN		0	40	60	VC	CL	3					0	SDCL	P	P	MI	1	15	0	7	R	
BGX	001	A	161	9	2	DGN		.1	40	60	GR	CL	3					0	SDCL	P	P	MI	1	20	0	3	R	
BGX	001	A	162		2	DGN		0	75	25	VC	F	3					0	CLSD	M	M	BP	1	15	0	5	C	
BGX	001	A	163		2	DBKGN		2	90	8	GR	M	3					0	SD	M	G	BP	1	5	0	3	C	
BGX	001	A	164		2	DBKGN		.1	90	10	GR	M	3					0	SD	M	M	BP	2	.1	0	2	C	
BGX	001	A	165		2	DBKGN		0	85	15	C	M	3					0	SD	M	M	BP	3	0	.1	2	C	
BGX	001	A	166		1	DREOR		0	85	15	VC	M	3					0	SD	M	M	BP	1	0	0	0	C	
BGX	001	A	167	0																								
BGX	001	A	168		2	MYEOR		1	92	7	GR	M	3					0	SD	W	G	BP	1	0	0	0	C	
BGX	001	A	169		1	MYEOR		.1	95	5	GR	M	4					0	SD	W	E	BP	1	0	0	0	C	
BGX	001	A	170		1	MYEOR		.1	95	5	GR	M	3					0	SD	W	E	BP	1	0	0	0	C	
BGX	001	A	171		2	MYEOR		0	96	4	VC	M	3					0	SD	W	E	BP	2	0	0	0	C	
BGX	001	A	172	2	1	MYEOR		0	96	4	VC	M	3					0	SD	W	E	BP	2	0	0	0	C	
BGX	001	A	173		1	DYEOR		.1	95	5	GR	M	3					0	SD	W	E	BP	2	0	0	0	C	
BGX	001	A	174		1	DYEOR	BDORBR	3	92	5	GR	M	3					0	SD	M	E	BP	1	0	0	0	C	
BGX	001	A	175		1	DYEOR		5	90	5	GR	M	3					0	SD	M	E	BP	1	0	0	0	C	
BGX	001	A	176		1	DYEOR		8	86	6	GR	M	3					0	SD	M	E	BP	2	0	0	0	C	
BGX	001	A	177	1	1	MGYYE		7	87	6	GR	M	3					0	SD	M	E	BP	1	0	0	0	R	
BGX	001	A	178		2	DOR	IDBRCL	3	62	35	GR	M	3					0	SD	M	G	BP	1	0	0	.1	R	
BGX	001	A	179		2	DGYGN	FS	0	25	75	C	CL	3					0	CLSD	P	P	BP	1	0	0	.1	R	
BGX	001	A	180		3	DGYGN	FS	0	15	85	F	CL	3					0	SDCL	V	P	MI	1	0	0	7	R	
BGX	001	A	181	0														0	CL	V	P	MI	2	0	0	5	R	
BGX	001	A	182	0																								
BGX	001	A	183	4	1	DYEOR		2	88	10	GR	M	3					0	SD	M	G	BP	2	0	0	0	C	
BGX	001	A	184	4	2	DYEOR	WSPLGYCL	4	76	20	GR	M	3					0	SD	P	M	BP	2	0	0	0	C	
BGX	001	A	185	0																								
BGX	001	A	186		2	LGYYE	BDYEOR	.1	95	5	GR	M	3					0	SD	M	E	BP	3	0	0	0	C	
BGX	001	A	187	0																								
BGX	001	A	188		2	MYEBR	IFSGYCL	2	83	15	GR	M	4					0	SD	M	E	BP	3	0	0	0	C	
BGX	001	A	189	0																								
BGX	001	A	190	0																								

AREA	NO	SCR	DEPTH	REC	IND	COLOR	STRUCTURE	%GR	%SD	%MD	MX	MD	R	%CG	%CS	%CM	%CMT	%CAR	NAME	SO	%POR	TYPE	%MUS	%GLA	%LIG	%SUL	H	FOSSILS
BGX	001	A	191	0																								
BGX	001	A	192	0																								
BGX	001	A	193		2	MGYOR		.1	95	5	GR	M	3					0	SD	M	E	BP	3	0	0	0	C	
BGX	001	A	194		2	MGYOR		.1	95	5	VC	M	3					0	SD	M	E	BP	3	0	0	0	C	
BGX	001	A	195		1	DGYOR		0	93	7	VC	M	3					0	SD	W	E	BP	5	.1	0	.1	C	
BGX	001	A	196		1	LBRGY		0	95	5	VC	C	4					0	SD	W	E	BP	8	.1	0	.1	C	
BGX	001	A	197	0																								

AREA	NO	SCR	DEPTH	REC	IND	COLOR	STRUCTURE	%GR	%SD	%MD	MX	MD	R	%CG	%CS	%CM	%CMT	%CAR	NAME	SO	%POR	TYPE	%MUS	%GLA	%LIG	%SUL	H	FOSSILS
BGX	2	B	1	0																								
BGX	2	B	2	0																								
BGX	2	B	3	0																								
BGX	2	B	4	0																								
BGX	2	B	5	0																								
BGX	2	B	6	0																								
BGX	2	B	7	0																								
BGX	2	B	8	0																								
BGX	2	B	9	0																								
BGX	2	B	10	0																								
BGX	2	B	11		2	LGNOR		7	63	30	GR	F	3					0	CLSD	P	P	BP	2	0	0	0	C	
BGX	2	B	12		2	DGNOR	MTORRE	5	80	15	GR	M	4					0	SD	P	M	BP	2	0	0	0	C	
BGX	2	B	13		2	DYEOR		8	72	20	GR	C	4					0	SD	P	P	BP	3	0	0	0	C	
BGX	2	B	14		2	DRE	MTLYEGY	10	65	25	GR	M	3					0	CLSD	P	P	BP	5	0	0	0	C	
BGX	2	B	15		1	DREOR	MTLBROR	2	83	15	GR	M	3					0	SD	M	M	BP	5	0	0	0	C	
BGX	2	B	16		2	DRE	MTWH	0	80	20	C	F	3					0	SD	P	M	BP	10	0	0	0	A	
BGX	2	B	17		2	DREOR		0	85	15	C	F	3					0	SD	P	M	BP	10	0	0	0	A	
BGX	2	B	18		2	DOR	BMORYE	0	90	10	M	F	3					0	SD	M	M	BP	10	0	0	0	A	
BGX	2	B	19		2	DRE	BMORYE	0	85	15	C	F	3					0	SD	P	M	BP	8	0	0	0	A	
BGX	2	B	20		2	DGYOR	MTPU	0	90	10	M	F	3					0	SD	M	M	BP	10	0	0	0	A	
BGX	2	B	21		2	LREOR		7	68	25	GR	F	3					0	CLSD	P	P	BP	8	0	0	0	C	
BGX	2	B	22		2	LREOR		3	72	15	GR	F	3					0	SD	P	M	BP	8	0	0	0	A	
BGX	2	B	23		2	MORTA	MTREOR	3	72	25	GR	F	3					0	CLSD	P	P	BP	10	0	0	0	C	
BGX	2	B	24		2	MORTA		5	85	10	GR	F	3					0	SD	M	M	BP	10	0	0	0	A	
BGX	2	B	25		1	DREBR	WSPWH	5	80	15	GR	F	3					0	SD	P	M	BP	5	0	0	0	A	
BGX	2	B	26		2	DPUOR		15	70	15	LP	F	3					0	SD	P	M	BP	5	0	0	0	A	
BGX	2	B	27		1	DOR		1	92	7	GR	M	4					0	SD	M	G	BP	1	0	0	0	A	
BGX	2	B	28		1	DBROR		8	82	10	GR	C	4					0	SD	P	G	BP	1	0	0	0	C	
BGX	2	B	29		2	DTA	IWHCLBPU	0	75	25	C	VF	3					0	CLSD	P	M	BP	1	0	0	0	A	
BGX	2	B	30		2	DTA	WSPWHCL	0	70	30	C	F	3					0	CLSD	P	P	BP	2	0	0	0	C	
BGX	2	B	31		2	DORTA	ICLSD	2	63	35	GR	F	3					0	CLSD	P	P	BP	2	0	0	0	C	
BGX	2	B	32		2	DTA	WSPWH	10	82	8	GR	M	4					0	SD	P	G	BP	3	0	0	0	C	
BGX	2	B	33		2	DYEOR	WSPWH	5	85	10	GR	F	3					0	SD	M	M	BP	3	0	0	0	A	
BGX	2	B	34		2	MTA	WSPWH	3	87	10	GR	F	3					0	SD	M	M	BP	4	0	0	0	A	
BGX	2	B	35		2	DYEOR	WSPWH	2	90	8	GR	F	3					0	SD	M	M	BP	2	0	0	0	A	
BGX	2	B	36		2	DYEOR	CLBWSPWH	7	84	9	GR	M	3					0	SD	M	M	BP	2	0	0	0	A	
BGX	2	B	37		2	DYEOR	WSPWH	3	89	8	GR	M	3					0	SD	M	M	BP	2	0	0	0	A	
BGX	2	B	38		2	DYEOR	WSPWH	2	91	7	GR	M	3					0	SD	M	M	BP	2	0	0	0	A	

AREA	NO	SCR	DEPTH	REC	IND	COLOR	STRUCTURE	%GR	%SD	%MD	MX	MD	R	%CG	%CS	%CM	%CMT	%CAR	NAME	SO	%POR	TYPE	%MUS	%GLA	%LIG	%SUL	H	FOSSILS
BGX	2	B	39		2	DYEOR	WSPWH	7	84	9	GR	F	3					0	SD	M	M	BP	3	0	0	0	A	
BGX	2	B	40		2	DYEOR	WSPWH	3	89	8	GR	F	3					0	SD	M	M	BP	4	0	0	0	A	
BGX	2	B	41		2	DYEOR	WSPWH	3	89	8	GR	M	3					0	SD	M	M	BP	3	0	0	0	C	
BGX	2	B	42		2	MTA	WSPWH	4	88	8	GR	M	3					0	SD	M	M	BP	2	0	0	0	A	
BGX	2	B	43		2	MTA	MTLRE	5	85	10	GR	M	3					0	SD	M	M	BP	2	0	0	0	C	
BGX	2	B	44		2	MTA	WSPWH	5	85	10	GR	M	3					0	SD	M	M	BP	2	0	0	0	A	
BGX	2	B	45		2	MTA	WSPWH	5	80	15	GR	M	3					0	SD	M	M	BP	1	0	0	0	C	
BGX	2	B	46		2	MREBR	WSPWH	4	86	10	GR	M	3					0	SD	M	G	BP	2	0	0	0	C	
BGX	2	B	47		2	MREBR		3	87	10	GR	M	3					0	SD	M	G	BP	2	0	0	0	C	
BGX	2	B	48		2	DYEOR	WSPWHCL	3	87	10	GR	M	3					0	SD	M	G	BP	2	0	0	0	C	
BGX	2	B	49		2	DYEOR	WSPWHCL	5	80	15	LP	M	4					0	SD	P	M	BP	2	0	0	0	C	
BGX	2	B	50		2	DYEOR	WSPWHCL	7	78	15	LP	M	4					0	SD	P	M	BP	2	0	0	0	C	
BGX	2	B	51		1	MORBR		7	88	5	GR	C	4					0	SD	M	E	BP	2	0	0	0	C	
BGX	2	B	52		1	MORBR		5	91	4	GR	C	4					0	SD	M	E	BP	2	0	0	0	C	
BGX	2	B	53		1	MORBR		5	90	5	GR	C	4					0	SD	M	E	BP	.1	0	0	0	C	
BGX	2	B	54	0																								
BGX	2	B	55	0																								
BGX	2	B	56		1	MORBR		10	84	6	GR	C	4					0	SD	M	G	BP	.1	0	0	0	C	
BGX	2	B	57		1	MOR		7	85	8	GR	C	4					0	SD	M	G	BP	1	0	0	0	C	
BGX	2	B	58		1	MOR	BDOR	5	89	6	GR	C	4					0	SD	M	E	BP	.1	0	0	0	C	
BGX	2	B	59		1	DYEOR		5	87	8	GR	C	4					0	SD	M	E	BP	.1	0	0	0	C	
BGX	2	B	60		1	DYEOR		7	86	7	GR	C	4					0	SD	M	E	BP	.1	0	0	0	C	
BGX	2	B	61		2	DYE		5	85	10	GR	M	3					0	SD	M	M	BP	.1	0	0	0	C	
BGX	2	B	62		2	MORYE		8	77	15	GR	M	3					0	SD	P	M	BP	1	0	0	0	C	
BGX	2	B	63		2	MREOR	MTORBK	8	77	15	LP	M	3					0	SD	P	M	BP	1	0	0	0	C	
BGX	2	B	64		2	DYEOR		7	88	5	GR	M	3					0	SD	M	E	BP	1	0	0	0	C	
BGX	2	B	65		2	MBROR	VARORBR	7	83	10	GR	M	3					0	SD	M	G	BP	.1	0	0	0	C	
BGX	2	B	66		2	MBROR		10	80	10	LP	M	3					0	SD	P	G	BP	1	0	0	0	C	
BGX	2	B	67		2	DYEOR	BREOR	15	78	7	LP	C	4					0	SD	P	G	BP	.1	0	0	0	C	
BGX	2	B	68		1	DYEOR		15	77	8	LP	C	3					0	SD	P	G	BP	.1	0	0	0	C	
BGX	2	B	69		1	DYEOR		3	89	8	LP	M	3					0	SD	M	G	BP	.1	0	0	0	C	
BGX	2	B	70		1	DYEOR		5	85	10	GR	M	3					0	SD	M	G	BP	1	0	0	0	C	
BGX	2	B	71		2	DYEOR	ICL	15	70	15	LP	M	3					0	SD	P	G	BP	2	0	0	0	C	
BGX	2	B	72		2	DYEOR		6	87	7	LP	M	3					0	SD	M	E	BP	2	0	0	0	A	
BGX	2	B	73		2	DYEOR		7	86	7	GR	M	3					0	SD	M	E	BP	2	0	0	0	A	
BGX	2	B	74		3	DYEOR	FS	0	7	93	M	CL	3					0	CL	V	P	MI	.1	0	0	0	C	
BGX	2	B	75		3	MTA	FS	0	10	90	C	CL	3					0	CL	V	P	MI	1	0	0	0	C	
BGX	2	B	76	0																								

AREA	NO	SCR	DEPTH	REC	IND	COLOR	STRUCTURE	%GR	%SD	%MD	MX	MD	R	%CG	%CS	%CM	%CMT	%CAR	NAME	SO	%POR	TYPE	%MUS	%GLA	%LIG	%SUL	H	FOSSILS
BGX	2	B	77	0																								
BGX	2	B	78		3	LGNTA	WSPSDFS	.1	20	80	GR	CL	3					0	CL	V	P	MI	.1	0	0	0	R	
BGX	2	B	79		3	MGNTA	WSPSDFS	0	15	85	C	CL	3					0	CL	P	P	BP	1	0	0	0	R	
BGX	2	B	80	0																								
BGX	2	B	81		3	MTA	ISD	0	15	85	M	CL	3					0	CL	V	P	MI	.1	0	0	0	C	
BGX	2	B	82		3	MTA	ISD	0	20	80	C	ST	3					0	CL	V	P	MI	1	0	0	0	C	
BGX	2	B	83		3	LGNTA	MTDBR	.1	40	60	GR	ST	2					0	SDCL	V	P	MI	1	0	0	0	C	
BGX	2	B	84		3	LGNTA	MTMBR	1	54	45	LP	ST	3					0	CLSD	P	P	BP	1	0	0	0	C	
BGX	2	B	85		3	LGNTA	FSBMBR	0	15	85	M	ST	3					0	CL	V	P	MI	.1	0	0	0	C	
BGX	2	B	86		3	LGNTA	FS	0	20	80	C	ST	2					0	CL	V	P	MI	1	0	0	0	C	
BGX	2	B	87		3	MGNTA	FS	0	20	80	C	ST	2					0	CL	V	P	MI	1	0	0	0	C	
BGX	2	B	88		3	MYEBR	ICLFS	5	50	45	LP	M	4					0	CLSD	V	P	BP	.1	0	0	0	C	
BGX	2	B	89		3	MYEBR	BMBR	7	58	35	LP	M	4					0	CLSD	V	P	BP	.1	0	0	0	C	
BGX	2	B	90		2	DYEOR		10	55	35	LP	M	4					0	CLSD	V	P	BP	1	0	0	0	C	
BGX	2	B	91		2	MYEBR	MTLYETA	5	70	25	LP	M	3					0	CLSD	P	P	BP	1	.1	0	0	C	
BGX	2	B	92		2	LYEBR	MTLGN	5	85	10	GR	M	4					0	SD	P	M	BP	1	.1	0	0	C	
BGX	2	B	93		2	LYEBR		5	80	15	GR	M	4					0	SD	M	M	BP	1	.1	0	0	C	
BGX	2	B	94		2	LGYGN		7	78	15	GR	M	3					0	SD	P	M	BP	2	.1	0	0	C	
BGX	2	B	95		2	LPIGY	ICL	10	70	20	GR	M	3					0	SD	P	P	BP	1	0	0	0	C	
BGX	2	B	96		2	LGYGN		5	80	15	GR	M	3					0	SD	P	M	BP	1	.1	0	0	C	
BGX	2	B	97		2	LGN	ICL	5	85	10	GR	M	4					0	SD	P	M	BP	2	.1	0	0	C	
BGX	2	B	98		2	LORGY		3	89	8	GR	M	4					0	SD	M	G	BP	2	0	0	0	C	
BGX	2	B	99		2	LGN		5	85	10	GR	M	4					0	SD	M	G	BP	1	.1	0	0	C	
BGX	2	B	100		2	LGN		5	85	10	GR	M	4					0	SD	M	G	BP	1	.1	0	0	C	
BGX	2	B	101		2	LYEGN	ICLWSPBK	5	60	35	LP	C	3					0	CLSD	P	P	BP	.1	0	0	0	C	
BGX	2	B	102		1	DYEOR		10	82	8	GR	M	4					0	SD	M	M	BP	.1	0	0	0	C	
BGX	2	B	103		1	DYEOR		10	83	7	GR	M	4					0	SD	M	M	BP	.1	0	0	0	C	
BGX	2	B	104		2	MGYOR		5	80	15	LP	M	4					0	SD	M	M	BP	.1	0	0	0	C	
BGX	2	B	105	3	1	LBR		5	85	10	GR	M	4					0	SD	M	G	BP	.1	0	0	0	C	
BGX	2	B	106		2	LORBR		7	73	20	LP	M	3					0	SD	P	M	BP	1	0	0	0	C	
BGX	2	B	107		2	MGYBR	IPB	10	75	15	LP	M	3					0	SD	P	M	BP	1	0	0	0	C	
BGX	2	B	108		2	MGYBR		8	77	15	LP	M	3					0	SD	P	M	BP	1	0	0	0	C	
BGX	2	B	109		1	LGYOR		10	75	15	LP	M	3					0	SD	P	M	BP	1	0	0	0	C	
BGX	2	B	110	0																								
BGX	2	B	111		1	MGYOR		5	87	8	GR	C	4					0	SD	M	G	BP	.1	0	0	0	C	
BGX	2	B	112		1	MGYOR		3	89	8	GR	C	4					0	SD	M	G	BP	.1	0	0	0	C	
BGX	2	B	113		2	MYEOR		8	82	10	LP	C	4					0	SD	M	G	BP	.1	0	0	0	C	
BGX	2	B	114		2	MGYOR		5	85	10	GR	M	4					0	SD	M	G	BP	.1	0	0	0	C	

AREA	NO	SCR	DEPTH	REC	IND	COLOR	STRUCTURE	%GR	%SD	%MD	MX	MD	R	%CG	%CS	%CM	%CMT	%CAR	NAME	SO	%POR	TYPE	%MUS	%GLA	%LIG	%SUL	H	FOSSILS
BGX	2	B	115		1	LGYOR		5	80	10	GR	M	4					0	SD	M	G	BP	.1	0	0	0	C	
BGX	2	B	116		1	LBRTA	ITACL	5	70	25	GR	M	4					0	CLSD	P	G	BP	.1	0	0	0	C	
BGX	2	B	117		1	LBR		.1	90	10	GR	M	3					0	SD	W	G	BP	.1	0	0	0	A	
BGX	2	B	118		2	LGNGY		5	65	30	GR	M	4					0	CLSD	P	P	BP	.1	0	0	0	A	
BGX	2	B	119		2	LGYGN		7	63	30	GR	M	4					0	CLSD	P	P	BP	.1	0	0	0	C	
BGX	2	B	120		2	LGYGN		5	70	25	GR	M	4	0	99	0	0	.1	CLSD	P	P	BP	.1	.1	0	0	C	ESPL
BGX	2	B	121		2	LGYGN		5	85	10	GR	M	4	0	90	10	0	3	CASD	M	G	BP	0	.1	0	0	C	ES
BGX	2	B	122		2	LGYTA		0	75	25	VC	F	3	10	75	15	0	7	CACLSD	P	P	BP	.1	.1	0	0	C	PLES
BGX	2	B	123		2	DYEOR	ISDSL	5	85	10	GR	F	3	35	25	40	8	30	CASLSD	P	M	BP	.1	0	0	0	C	PLYE
BGX	2	B	124		2	DYEOR	ISDSL	5	85	10	GR	F	3	35	25	40	8	30	CASLSD	P	M	BP	.1	0	0	0	C	PLYE
BGX	2	B	125	0																								
BGX	2	B	126		2	MYETA	ISDSL	5	80	15	GR	M	4	35	25	40	8	20	SLSD	P	M	BP	.1	0	0	0	C	PLYE
BGX	2	B	127	0																								
BGX	2	B	128	0																								
BGX	2	B	129	0																								
BGX	2	B	130	0																								
BGX	2	B	131		4	MREWH	ISD	15	80	5	LP	VC	4	35	25	40	30	75	SDSL	P	M	MO	0	0	0	0	R	PL
BGX	2	B	132	0																								
BGX	2	B	133	0																								
BGX	2	B	134	0																								
BGX	2	B	135	0																								
BGX	2	B	136	0																								
BGX	2	B	137	0																								
BGX	2	B	138	0																								
BGX	2	B	139		4	LTA	ISD	0	90	10	C	F	3				30	0	CTSD	M	P	MI	2	0	0	0	C	
BGX	2	B	140		2	MGNOR		0	80	20	C	F	3					0	SD	P	M	BP	3	0	0	0	A	
BGX	2	B	141	5	2	MGNOR	ICTSD	0	75	25	C	F	3				25	0	CLSD	P	M	BP	3	0	0	0	A	
BGX	2	B	142	0																								
BGX	2	B	143	0																								
BGX	2	B	144	0																								
BGX	2	B	145		4	DYEOR	ICTCLSD	0	75	25	C	F	3				15	0	CLSD	P	M	BP	1	0	0	0	C	
BGX	2	B	146		3	DYEOR		0	85	15	C	F	3				5	0	SD	M	G	BP	1	0	0	0	A	
BGX	2	B	147	0																								
BGX	2	B	148	0																								
BGX	2	B	149	0																								
BGX	2	B	150		1	DYETA	BDKGN	1	74	25	GR	F	3					0	CLSD	P	M	BP	.1	0	0	0	C	
BGX	2	B	151		2	MORTA		15	25	60	LP	M	4					0	SDCL	P	M	BP	1	1	0	.1	C	
BGX	2	B	152	4	2	DBKGN	ICTSLSD	.1	40	60	GR	ST	3	75	25	0	25	20	CTSLSD	V	P	MI	2	3	0	.1	C	PL

AREA	NO	SCR	DEPTH	REC	IND	COLOR	STRUCTURE	%GR	%SD	%MD	MX	MD	R	%CG	%CS	%CM	%CMT	%CAR	NAME	SO	%POR	TYPE	%MUS	%GLA	%LIG	%SUL	H	FOSSILS
BGX	2	B	153	0																								
BGX	2	B	154		4	DGNGY		0	95	5	VC	F	4				30	0	CTSD	W	P	MI	1	5	0	.1	C	
BGX	2	B	155		4	DGNGY		5	90	5	GR	F	4	80	20	0	25	35	CTSLSD	P	E	MO	1	2	0	.1	C	PLGA
BGX	2	B	156		3	DGN	ICTSD	0	45	55	VC	ST	4					0	GLSDCL	V	P	MI	2	25	0	2	C	
BGX	2	B	157	0																								
BGX	2	B	158		2	DGN		5	70	25	GR	F	3					0	CLSD	P	M	BP	3	5	0	1	C	
BGX	2	B	159		3	DGN		3	72	25	GR	F	3					0	CLSD	P	P	BP	3	7	0	1	C	
BGX	2	B	160		2	DBKGN		5	70	25	GR	M	4					0	GLCLSD	P	M	BP	2	25	.1	3	C	
BGX	2	B	161		3	DBKGN		5	70	25	GR	M	4					0	GLCLSD	P	M	BP	2	25	0	2	C	
BGX	2	B	162		3	MBKGN	ICTST	0	20	80	M	ST	3				5	0	SDCL	V	P	BP	3	2	0	1	C	
BGX	2	B	163		3	DGNGY	ICTSD	2	78	20	GR	F	4				5	0	SD	P	M	BP	3	2	0	.1	C	
BGX	2	B	164		2	DGNGY	ICL	0	80	20	VC	F	4					0	SD	P	M	BP	4	.1	0	.1	C	
BGX	2	B	165		2	DBKGN		10	82	8	GR	M	4					0	SD	M	G	BP	5	1	0	.1	C	
BGX	2	B	166		2	MBKGN		5	87	8	GR	M	4					0	SD	M	G	BP	3	.1	0	.1	C	
BGX	2	B	167		1	MBKGN	ICL	5	80	15	GR	M	4					0	SD	M	M	BP	4	5	0	2	C	
BGX	2	B	168		1	MBKGN		5	85	10	GR	M	4					0	SD	M	G	BP	4	0	0	2	C	
BGX	2	B	169		1	MBKGN		7	83	10	GR	M	4					0	SD	M	G	BP	3	0	0	1	C	
BGX	2	B	170		1	MBKGN		3	87	10	GR	M	4	0	99	0	0	.1	SD	M	E	BP	3	0	0	1	C	YE
BGX	2	B	171		2	MBKGN	TACLB	5	87	8	GR	C	4					0	SD	M	E	BP	4	0	0	.1	C	
BGX	2	B	172		2	DBKGN	TACLB	5	70	25	GR	M	4	0	99	0	0	.1	CLSD	P	M	BP	3	.1	0	1	C	YE
BGX	2	B	173		2	DBKGN		3	87	10	GR	M	4					0	SD	M	G	BP	3	0	0	1	C	
BGX	2	B	174		2	DBKGN		2	88	10	GR	M	4					0	SD	M	G	BP	2	0	0	.1	C	
BGX	2	B	175		1	DGN	MTTA	5	85	10	GR	M	4					0	SD	M	G	BP	3	0	0	1	C	
BGX	2	B	176		3	DBKGN	BTAISD	.1	15	85	GR	CL	4					0	CL	V	P	MI	2	0	0	1	C	
BGX	2	B	177	0																								
BGX	2	B	178	0																								
BGX	2	B	179	0																								
BGX	2	B	180	0																								
BGX	2	B	181		1	MGYGN		5	87	8	GR	M	3					0	SD	M	E	BP	1	0	0	.1	C	
BGX	2	B	182		2	DGN	BDTACLB	7	63	30	GR	M	3					0	CLSD	P	M	BP	2	.1	0	.1	C	
BGX	2	B	183	6	2	DGYTA	IFSCL	5	65	30	GR	M	3					0	CLSD	P	M	BP	.1	0	0	0	C	
BGX	2	B	184	0																								
BGX	2	B	185	0																								
BGX	2	B	186		1	DGYYE		4	81	15	GR	M	3					0	SD	M	M	BP	.1	0	0	0	C	
BGX	2	B	187		2	DGYYE		5	80	15	GR	M	3					0	SD	M	M	BP	.1	0	0	0	C	
BGX	2	B	188	0																								

AREA	NO	SCR	DEPTH	REC	IND	COLOR	STRUCTURE	%GR	%SD	%MD	MX	MD	R	%CG	%CS	%CM	%CMT	%CAR	NAME	SO	%POR	TYPE	%MUS	%GLA	%LIG	%SUL	H	FOSSILS
BGX	4	A	1	0																								
BGX	4	A	2	0																								
BGX	4	A	3	0																								
BGX	4	A	4	0																								
BGX	4	A	5	0																								
BGX	4	A	6	0																								
BGX	4	A	7	0																								
BGX	4	A	8	0																								
BGX	4	A	9	0																								
BGX	4	A	10	0																								
BGX	4	A	11		1	MBR	MTDYE	5	80	15	LP	M	3					0	SD	M	M	BP	.1	0	0	0	C	
BGX	4	A	12		2	MBR	MTDYE	25	65	10	GR	M	3					0	PBSD	M	M	BP	.1	0	0	0	C	
BGX	4	A	13		1	DOR		10	65	25	GR	M	3					0	CLSD	P	P	BP	1	0	0	0	C	
BGX	4	A	14		2	DBRRE	MTREGY	7	33	60	LP	CL	3					0	SDCL	V	P	BP	.1	0	0	0	C	
BGX	4	A	15		2	DREBR	MTGY	5	60	35	GR	C	4					0	CLSD	P	M	BP	1	0	0	0	C	
BGX	4	A	16		2	MBROR	ILGYCL	5	80	15	GR	VC	4					0	SD	M	G	BP	.1	0	0	0	C	
BGX	4	A	17		2	MYEOR	MTREBR	5	85	10	GR	C	4					0	SD	M	G	BP	.1	0	0	0	C	
BGX	4	A	18		2	LBROR		5	85	10	GR	C	4					0	SD	M	G	BP	.1	0	0	0	C	
BGX	4	A	19		1	MORBR		5	80	15	GR	C	4					0	SD	M	G	BP	1	0	0	0	C	
BGX	4	A	20		1	MORBR		7	83	10	GR	VC	4					0	SD	P	G	BP	1	0	0	0	C	
BGX	4	A	21		2	DOR		5	87	8	GR	C	4					0	SD	M	G	BP	2	0	0	0	C	
BGX	4	A	22		2	DOR	PUCLB	7	83	10	GR	C	4					0	SD	M	G	BP	3	0	0	0	C	
BGX	4	A	23		1	MREBR	PUCLB	5	80	15	GR	C	4					0	SD	P	G	BP	5	0	0	0	C	
BGX	4	A	24		2	DPUOR	MTPUICL	10	40	50	LP	CL	4					0	SDCL	V	P	MI	5	0	0	0	C	
BGX	4	A	25	0																								
BGX	4	A	26		2	LORYE	WSPWH	2	83	15	GR	F	3					0	SD	M	M	BP	3	0	0	0	C	
BGX	4	A	27		2	LORYE		8	82	10	GR	F	3					0	SD	M	G	BP	3	0	0	0	C	
BGX	4	A	28		2	LORYE		5	89	6	GR	M	3					0	SD	M	G	BP	3	0	0	0	C	
BGX	4	A	29		2	LORYE		5	87	8	GR	M	3					0	SD	M	G	BP	2	0	0	0	C	
BGX	4	A	30		2	LORYE		3	91	6	GR	M	3					0	SD	M	G	BP	2	0	0	0	C	
BGX	4	A	31		2	LORYE		1	94	5	GR	M	3					0	SD	M	G	BP	1	0	0	0	C	
BGX	4	A	32		2	LORYE		2	93	5	GR	M	3					0	SD	M	G	BP	1	0	0	0	C	
BGX	4	A	33		2	LORYE		2	93	5	GR	M	3					0	SD	M	G	BP	1	0	0	0	C	
BGX	4	A	34		2	LORYE		3	90	7	GR	M	4					0	SD	M	G	BP	2	0	0	0	C	
BGX	4	A	35	0																								
BGX	4	A	36		1	LORYE	BMRE	0	94	6	VC	M	3					0	SD	W	G	BP	1	0	0	0	C	
BGX	4	A	37		2	MRE		1	93	6	GR	M	4					0	SD	W	G	BP	.1	0	0	0	C	
BGX	4	A	38		2	MRE		2	91	7	GR	M	4					0	SD	M	G	BP	1	0	0	0	C	

AREA	NO	SCR	DEPTH	REC	IND	COLOR	STRUCTURE	%GR	%SD	%MD	MX	MD	R	%CG	%CS	%CM	%CMT	%CAR	NAME	SO	%POR	TYPE	%MUS	%GLA	%LIG	%SUL	H	FOSSILS
BGX	4	A	39		2	DREOR	ICLFS	5	70	25	GR	M	3					0	CLSD	P	M	BP	2	0	0	0	C	
BGX	4	A	40		2	DREBR		2	90	8	GR	M	3					0	SD	M	G	BP	3	0	0	0	C	
BGX	4	A	41		2	DYE		0	93	7	VC	M	3					0	SD	M	G	BP	2	0	0	0	C	
BGX	4	A	42		2	MREBR	MTDYE	5	85	10	GR	M	3					0	SD	M	G	BP	.1	0	0	0	C	
BGX	4	A	43		2	DREYE	MTREBR	2	90	8	GR	M	3					0	SD	W	G	BP	.1	0	0	0	C	
BGX	4	A	44		1	DYETA		5	85	10	GR	M	3					0	SD	M	G	BP	.1	0	0	0	C	
BGX	4	A	45		1	MBROR	MTREBR	8	82	10	GR	C	4					0	SD	M	G	BP	.1	0	0	0	C	
BGX	4	A	46		1	DYE	MTREBR	10	80	10	GR	C	4					0	SD	M	G	BP	.1	0	0	0	C	
BGX	4	A	47		1	DREYE	VARDYEOR	15	70	15	GR	C	4					0	SD	P	G	BP	.1	0	0	0	C	
BGX	4	A	48		1	DREOR	VARDYEOR	7	78	15	GR	C	4					0	SD	P	G	BP	.1	0	0	0	C	
BGX	4	A	49		1	MBRRE		5	80	15	GR	C	4					0	SD	M	G	BP	.1	0	0	0	C	
BGX	4	A	50		1	DYEOR		5	80	15	GR	C	4					0	SD	M	G	BP	.1	0	0	0	C	
BGX	4	A	51		2	MOR		7	78	15	GR	C	4					0	SD	P	G	BP	1	0	0	0	C	
BGX	4	A	52		2	MOR		5	80	15	GR	C	4					0	SD	M	G	BP	.1	0	0	0	C	
BGX	4	A	53		1	MYEOR		10	80	10	GR	M	4					0	SD	M	G	BP	.1	0	0	0	C	
BGX	4	A	54		1	MYEOR		8	82	10	GR	M	4					0	SD	M	G	BP	.1	0	0	0	C	
BGX	4	A	55		1	MYEOR		2	88	10	GR	M	4					0	SD	M	G	BP	.1	0	0	0	C	
BGX	4	A	56		2	MYEOR		7	85	8	GR	M	4					0	SD	M	G	BP	.1	0	0	0	C	
BGX	4	A	57		2	MYEOR		3	89	8	GR	M	4					0	SD	M	G	BP	.1	0	0	0	C	
BGX	4	A	58		1	DYEOR		5	89	6	GR	M	4					0	SD	M	G	BP	1	0	0	0	C	
BGX	4	A	59		1	DYEOR	BREBR	15	77	8	GR	C	4					0	SD	M	G	BP	.1	0	0	0	C	
BGX	4	A	60		1	DYEOR		25	67	8	LP	C	4					0	SD	P	G	BP	.1	0	0	0	C	
BGX	4	A	61		1	DORYE		8	84	8	GR	C	4					0	PBSD	P	M	BP	.1	0	0	0	C	
BGX	4	A	62		1	DORYE		3	89	8	GR	M	4					0	SD	M	G	BP	.1	0	0	0	C	
BGX	4	A	63		1	DORYE		5	85	10	GR	C	4					0	SD	M	G	BP	1	0	0	0	C	
BGX	4	A	64		1	DORYE	MTLPU	5	85	10	LP	C	4					0	SD	M	G	BP	.1	0	0	0	C	
BGX	4	A	65		2	DORTA	ISDBREBR	.1	40	60	GR	CL	4					0	SDCL	V	P	MI	1	0	0	0	C	
BGX	4	A	66	0																								
BGX	4	A	67	0																								
BGX	4	A	68	9	2	LORYE	ISDCLFS	0	25	75	VC	CL	3					0	SDCL	V	P	MI	.1	0	0	0	C	
BGX	4	A	69	0																								
BGX	4	A	70	0																								
BGX	4	A	71		2	MYEOR	MTLGY	0	35	65	VC	ST	4					0	SDCL	V	P	BP	1	0	0	0	C	
BGX	4	A	72		3	DYEBR	ICL	10	50	40	GR	ST	4					0	CLSD	P	P	BP	1	0	0	0	C	
BGX	4	A	73		3	LPIBR	ILGNCL	7	68	25	GR	M	4					0	CLSD	P	M	BP	2	0	0	0	C	
BGX	4	A	74	0																								
BGX	4	A	75	0																								
BGX	4	A	76		3	LBRGN	ILGNCL	10	60	30	LP	CL	4					0	CLSD	P	P	BP	4	0	0	0	C	

AREA	NO	SCR	DEPTH	REC	IND	COLOR	STRUCTURE	%GR	%SD	%MD	MX	MD	R	%CG	%CS	%CM	%CMT	%CAR	NAME	SO	%POR	TYPE	%MUS	%GLA	%LIG	%SUL	H	FOSSILS
BGX	4	A	77		3	LPIGN	MTPIBR	5	75	20	GR	C	4					0	SD	P	P	BP	4	0	0	0	C	
BGX	4	A	78		2	LPIGN	MTPIBR	2	90	8	GR	M	3					0	SD	M	M	BP	4	0	0	0	C	
BGX	4	A	79		2	LPIBR	MTLGN	1	91	8	GR	M	3					0	SD	M	G	BP	3	0	0	0	C	
BGX	4	A	80		2	LGNBR	MTLGN	2	88	10	GR	M	3					0	SD	M	M	BP	1	0	0	0	C	
BGX	4	A	81		2	LGNBR	MTLGN	5	80	15	GR	M	3					0	SD	M	M	BP	1	0	0	0	C	
BGX	4	A	82		2	LGNBR	MTLGN	3	82	15	GR	M	3					0	SD	M	M	BP	1	0	0	0	C	
BGX	4	A	83		1	LGYBR	ILGNCL	5	80	15	GR	M	3					0	SD	M	M	BP	1	0	0	0	C	
BGX	4	A	84		2	LGYBR		5	85	10	GR	C	3					0	SD	M	G	BP	.1	0	0	0	C	
BGX	4	A	85		1	DTABR	ITACL	5	80	15	GR	C	4					0	SD	P	M	BP	1	0	0	0	C	
BGX	4	A	86		1	LBR		10	82	8	GR	C	4					0	SD	M	G	BP	1	0	0	0	C	
BGX	4	A	87		1	MBR		10	82	8	GR	C	4					0	SD	M	G	BP	1	0	0	0	C	
BGX	4	A	88		2	DYEOR		10	80	10	GR	C	4					0	SD	M	G	BP	2	0	0	0	C	
BGX	4	A	89		2	DYEOR		0	92	8	C	M	3					0	SD	W	E	BP	2	0	0	0	C	
BGX	4	A	90	0																								
BGX	4	A	91		2	DYEOR	WSPBK	0	93	7	VC	M	4					0	SD	W	G	BP	1	0	0	0	C	
BGX	4	A	92		2	DYEOR		0	91	9	VC	M	4					0	SD	W	G	BP	1	0	0	0	C	
BGX	4	A	93		2	DYEOR	WSPLYEOR	0	90	10	VC	M	4					0	SD	W	G	BP	2	0	0	0	A	
BGX	4	A	94		2	DYEOR		0	93	7	VC	M	4					0	SD	W	G	BP	2	0	0	0	C	
BGX	4	A	95		1	LBROR		3	87	10	GR	M	4					0	SD	M	G	BP	2	0	0	0	C	
BGX	4	A	96		2	LBR		15	60	25	LP	C	4					0	CLSD	P	P	BP	1	0	0	0	C	
BGX	4	A	97		2	LGYBR		10	75	15	LP	C	4					0	SD	P	M	BP	1	0	0	0	C	
BGX	4	A	98		1	LBR		10	80	10	LP	C	4					0	SD	M	G	BP	2	0	0	0	C	
BGX	4	A	99		1	LBR		5	85	10	GR	C	4					0	SD	M	G	BP	2	0	0	0	C	
BGX	4	A	100		1	LBR		7	78	15	GR	M	4					0	SD	P	G	BP	1	0	0	0	C	
BGX	4	A	101		1	MBR		10	82	8	GR	M	4					0	SD	M	E	BP	1	0	0	0	C	
BGX	4	A	102		1	MBR		5	87	8	GR	M	3					0	SD	M	E	BP	1	0	0	0	C	
BGX	4	A	103	0																								
BGX	4	A	104	0																								
BGX	4	A	105	0																								
BGX	4	A	106		2	MYEBR		3	82	15	GR	M	4					0	SD	M	M	BP	1	0	0	0	C	
BGX	4	A	107		3	MYEBR	WSPLYEBR	0	40	60	VC	CL	3					0	SDCL	V	P	BP	1	0	0	0	C	
BGX	4	A	108		2	MBR		5	65	30	GR	M	4					0	CLSD	P	M	BP	2	0	0	0	C	
BGX	4	A	109		2	MYEBR	WSPLYEBR	3	72	25	GR	M	4					0	CLSD	P	M	BP	2	0	0	0	C	
BGX	4	A	110		2	MYEOR		5	70	25	GR	M	4	0	99	0	0	.1	CLSD	P	M	BP	1	0	0	0	C	
BGX	4	A	111		2	DYEOR	MTBK	10	65	25	GR	M	4					0	CLSD	P	M	BP	2	0	0	0	C	
BGX	4	A	112		2	DYEOR	BBRGY	10	75	15	GR	M	4					0	SD	P	M	BP	3	0	0	0	C	
BGX	4	A	113		1	MGYBR	ISD	10	85	5	GR	M	4					0	SD	M	G	BP	2	0	0	0	A	
BGX	4	A	114		1	MBRGY	BLBR	2	95	3	GR	M	3					0	SD	W	E	BP	2	0	0	0	C	

AREA	NO	SCR	DEPTH	REC	IND	COLOR	STRUCTURE	%GR	%SD	%MD	MX	MD	R	%CG	%CS	%CM	%CMT	%CAR	NAME	SO	%POR	TYPE	%MUS	%GLA	%LIG	%SUL	H	FOSSILS
BGX	4	A	115		2	MYEBR	BBRGY	2	88	10	GR	M	4					0	SD	M	G	BP	2	0	0	0	C	
BGX	4	A	116		2	MYEBR	WSPYEOR	2	88	10	GR	M	4					0	SD	M	G	BP	1	0	0	0	C	
BGX	4	A	117		1	MYEBR		0	94	6	C	F	3					0	SD	W	E	BP	3	0	0	0	C	
BGX	4	A	118		1	LGY		0	96	4	VC	F	3					0	SD	W	E	BP	5	0	0	0	C	
BGX	4	A	119		1	LGY		0	97	3	VC	F	3					0	SD	W	E	BP	5	0	0	0	C	
BGX	4	A	120		1	LGY		0	97	3	VC	F	3					0	SD	W	E	BP	5	0	0	0	C	
BGX	4	A	121		2	LGNGY		0	95	5	VC	F	4					0	SD	W	E	BP	5	.1	0	0	C	
BGX	4	A	122		2	MBR		0	95	5	C	F	3	0	99	0	0	.1	SD	W	E	BP	5	0	0	0	C	
BGX	4	A	123		2	LGNBR	BLBR	0	95	5	VC	F	3					0	SD	W	E	BP	4	.1	0	0	A	
BGX	4	A	124		2	LBRGN	XB	0	95	5	C	F	3	0	99	0	0	.1	SD	W	E	BP	4	1	0	0	C	YE
BGX	4	A	125		2	LGNBR	XB	0	90	10	VC	F	4	0	99	.1	0	5	SLSD	M	G	BP	2	1	0	0	C	YE
BGX	4	A	126		2	DYEGN		0	93	7	VC	VF	3	0	93	7	0	3	CASD	M	G	BP	3	2	0	0	C	YE
BGX	4	A	127		2	DYEGN		0	92	8	VC	VF	3	0	95	5	0	3	CASD	M	G	BP	2	1	0	0	C	YE
BGX	4	A	128		2	LYEGN		0	94	6	VC	F	3	0	85	15	0	20	MCCASD	M	M	BP	1	1	0	0	C	YE
BGX	4	A	129		2	LYEGN		0	96	4	VC	F	3	.1	80	20	.1	20	MCCASD	M	M	BP	1	2	0	0	C	YE
BGX	4	A	130		2	LYEGN		0	95	5	VC	F	4	.1	80	20	2	20	MCCASD	M	M	BP	.1	1	0	0	C	YE
BGX	4	A	131		2	LTA		0	93	7	VC	F	4	.1	75	25	3	30	MCCASD	M	M	BP	.1	.1	0	0	C	PL
BGX	4	A	132		3	LTA		0	95	5	VC	F	4	0	75	25	1	30	MCCASD	M	M	BP	.1	.1	0	0	C	YE
BGX	4	A	133		3	LGNTA		0	95	5	VC	F	4	0	75	25	1	30	MCCASD	M	M	BP	.1	.1	0	0	C	PL
BGX	4	A	134		3	LGNTA		0	94	6	VC	F	3	.1	80	20	0	30	MCCASD	M	M	BP	.1	.1	0	0	C	PL
BGX	4	A	135		3	LGNTA		0	94	6	VC	F	3	.1	80	20	1	30	MCCASD	M	M	BP	.1	.1	0	0	C	PL
BGX	4	A	136		3	MTA		0	95	5	VC	F	3	0	75	25	0	30	MCCASD	M	M	BP	.1	.1	0	0	C	ES
BGX	4	A	137		3	MGNTA		0	95	5	VC	F	3	1	74	25	0	30	MCCASD	M	M	BP	.1	1	0	0	C	PL
BGX	4	A	138		3	MGNTA		0	95	5	VC	F	3	0	75	25	.1	30	MCCASD	M	M	BP	.1	1	0	0	C	YE
BGX	4	A	139		3	MGNTA		1	93	6	GR	F	3	0	80	20	0	30	MCCASD	M	M	BP	.1	1	0	0	C	PL
BGX	4	A	140		3	MTA		.1	94	6	GR	F	3	.1	80	20	0	30	MCCASD	M	M	BP	.1	2	0	0	C	PL
BGX	4	A	141		3	MTA		2	93	5	GR	F	3	.1	75	25	.1	30	MCCASD	P	M	BP	.1	1	0	0	C	PLES
BGX	4	A	142		3	MYETA		2	92	6	GR	M	3	.1	75	25	5	35	MCCASD	P	M	BP	.1	1	0	0	C	PL
BGX	4	A	143		3	MYETA		2	92	6	GR	M	3	10	65	25	25	35	SLMCCASD	P	M	BP	.1	2	0	.1	C	PL
BGX	4	A	144		3	MGNGY		.1	95	5	GR	F	3	10	60	30	30	40	SLMCCASD	P	M	BP	.1	3	0	.1	C	PLES
BGX	4	A	145		3	MGNGY		.1	95	5	GR	F	3	10	60	30	30	40	SLMCCASD	P	M	BP	.1	3	0	.1	C	PLES
BGX	4	A	146		4	MGNGY		0	97	3	VC	F	4	25	50	25	25	40	SLMCCASD	P	M	MO	1	5	0	.1	C	PL
BGX	4	A	147		4	MGNGY		3	92	5	GR	F	4	30	40	30	30	40	MCSLCASD	P	M	MO	1	7	0	.1	C	PLES
BGX	4	A	148		3	LGNGY		3	93	4	GR	M	3	25	25	50	50	60	SDSLMC	P	M	MO	.1	7	0	.1	R	PL
BGX	4	A	149		4	LGNGY		1	95	4	GR	F	3	25	25	50	50	60	SDSLMC	P	M	MO	.1	5	0	.1	R	PL
BGX	4	A	150		3	LGNGY		1	95	4	GR	F	3	15	25	60	60	70	SDSLMC	P	M	MO	.1	5	0	.1	C	GAPL
BGX	4	A	151		3	MGNGY		5	90	5	GR	F	3	15	35	50	.1	60	SDCAMC	P	M	MO	2	10	0	2	C	PLYE
BGX	4	A	152		2	DGN		5	80	15	GR	F	3	0	99	0	0	.1	SD	M	M	BP	5	10	0	3	C	YE

AREA	NO	SCR	DEPTH	REC	IND	COLOR	STRUCTURE	%GR	%SD	%MD	MX	MD	R	%CG	%CS	%CM	%CMT	%CAR	NAME	SO	%POR	TYPE	%MUS	%GLA	%LIG	%SUL	H	FOSSILS
BGX	4	A	153	0																								
BGX	4	A	154	0																								
BGX	4	A	155	0																								
BGX	4	A	156	0																								
BGX	4	A	157	0																								
BGX	4	A	158	0																								
BGX	4	A	159	0																								
BGX	4	A	160	0																								
BGX	4	A	161		1	DGN		0	70	30	C	F	3					0	CLSD	P	M	BP	3	10	0	.1	C	
BGX	4	A	162		1	DGN	ICTSDCL	10	65	25	LP	M	3					0	GLCLSD	P	M	BP	2	25	0	3	C	
BGX	4	A	163	0																								
BGX	4	A	164		3	DGN	ICTSDCL	0	25	75	M	CL	3				20	0	SDCL	V	P	MI	3	5	0	3	R	
BGX	4	A	165		2	DGN	FS	0	20	80	C	CL	3					0	CL	V	P	MI	3	.1	0	2	R	
BGX	4	A	166	0																								
BGX	4	A	167	8	2	DGN	ICL	5	80	15	GR	F	3					0	SD	M	M	BP	3	.1	0	5	C	
BGX	4	A	168		2	DGN		25	65	10	LP	C	3	99	0	0	0	.1	PBSD	P	G	BP	3	.1	0	7	C	YE
BGX	4	A	169	0																								
BGX	4	A	170	0																								
BGX	4	A	171		2	DBRGN		10	80	10	LP	M	3					0	SD	P	G	BP	3	5	.1	1	C	
BGX	4	A	172		2	DYEBR	ICLPB	25	60	15	LP	M	3					0	PBSD	P	M	BP	2	0	0	0	C	YE
BGX	4	A	173		1	DORYE	MTDREYE	5	87	8	LP	M	4					0	SD	M	G	BP	2	0	0	0	C	
BGX	4	A	174		1	DORYE		7	85	8	LP	M	4					0	SD	M	G	BP	2	0	0	0	C	
BGX	4	A	175		2	DORYE		2	90	8	LP	M	4					0	SD	M	G	BP	3	.1	0	0	C	
BGX	4	A	176		1	DGYYE		3	90	7	GR	C	4	25	73	2	.1	10	CASD	M	G	BP	3	2	0	.1	C	YE
BGX	4	A	177	0																								
BGX	4	A	178	0																								
BGX	4	A	179	0																								
BGX	4	A	180	4	1	MGYYE		0	95	5	VC	M	3					0	SD	W	E	BP	4	0	0	0	C	
BGX	4	A	181		1	MGYYE		0	93	7	VC	M	3					0	SD	W	E	BP	3	0	0	0	C	
BGX	4	A	182		1	MGYYE		0	95	5	VC	M	4					0	SD	W	E	BP	4	0	0	0	C	
BGX	4	A	183	0																								
BGX	4	A	184	0																								
BGX	4	A	185	0																								
BGX	4	A	186		2	LGNYE	WSPLGYCL	0	92	8	VC	M	4					0	SD	W	G	BP	4	0	0	0	C	
BGX	4	A	187		2	MORYE	WSPLGYCL	0	90	10	C	M	3					0	SD	W	G	BP	5	0	0	0	C	
BGX	4	A	188		2	LGNYE		0	94	6	C	M	3					0	SD	W	E	BP	4	0	0	0	C	
BGX	4	A	189		1	LGNYE		0	94	6	VC	M	3					0	SD	W	E	BP	4	0	0	0	C	
BGX	4	A	190		1	LGNYE		0	92	8	VC	M	3					0	SD	W	G	BP	5	0	0	0	C	

AREA	NO	SCR	DEPTH	REC	IND	COLOR	STRUCTURE	%GR	%SD	%MD	MX	MD	R	%CG	%CS	%CM	%CMT	%CAR	NAME	SO	%POR	TYPE	%MUS	%GLA	%LIG	%SUL	H	FOSSILS
BGX	7		1	0																								
BGX	7		2	0																								
BGX	7		3	0																								
BGX	7		4	0																								
BGX	7		5	0																								
BGX	7		6	0																								
BGX	7		7	0																								
BGX	7		8	0																								
BGX	7		9	0																								
BGX	7		10	0																								
BGX	7		11	0																								
BGX	7		12	0																								
BGX	7		13	0																								
BGX	7		14	0																								
BGX	7		15	0																								
BGX	7		16	0																								
BGX	7		17	0																								
BGX	7		18	0																								
BGX	7		19	0																								
BGX	7		20	0																								
BGX	7		21	0																								
BGX	7		22	0																								
BGX	7		23	0																								
BGX	7		24	0																								
BGX	7		25	0																								
BGX	7		26		1	DORRE	MTDORYE	3	82	15	GR	C	4					0	SD	P	G	BP	0	0	0	0	C	
BGX	7		27	0																								
BGX	7		28	0																								
BGX	7		29	0																								
BGX	7		30	0																								
BGX	7		31	0																								
BGX	7		32	0																								
BGX	7		33		2	MREOR		0	85	15	VC	M	3					0	SD	M	G	BP	.1	0	0	0	C	
BGX	7		34		2	MREOR		0	85	15	VC	M	3					0	SD	M	G	BP	.1	0	0	0	C	
BGX	7		35		1	MORYE	VARDREOR	1	89	10	GR	M	3					0	SD	M	G	BP	0	0	0	0	C	
BGX	7		36		1	MORYE	VARDREOR	5	80	15	GR	M	3					0	SD	P	G	BP	0	0	0	0	C	
BGX	7		37		1	DREOR	VARDYEOR	15	60	25	LP	C	4					0	CLSD	P	M	BP	.1	0	0	0	C	
BGX	7		38		1	DYE	ICL	7	48	45	LP	CL	4					0	CLSD	V	P	BP	.1	0	0	0	C	

AREA	NO	SCR	DEPTH	REC	IND	COLOR	STRUCTURE	%GR	%SD	%MD	MX	MD	R	%CG	%CS	%CM	%CMT	%CAR	NAME	SO	%POR	TYPE	%MUS	%GLA	%LIG	%SUL	H	FOSSILS
BGX	7		39	0																								
BGX	7		40		1	DYEOR		0	94	6	VC	M	4					0	SD	M	E	BP	0	0	0	0	R	
BGX	7		41	0																								
BGX	7		42	0																								
BGX	7		43	0																								
BGX	7		44	0																								
BGX	7		45		1	DYEOR	WSPIWHCL	1	92	7	GR	M	4					0	SD	M	G	BP	0	0	0	0	R	
BGX	7		46		1	DBROR	WSPIWHCL	5	86	9	LP	C	4					0	SD	P	G	BP	.1	0	0	0	C	
BGX	7		47		1	DYEOR		2	91	7	GR	C	4					0	SD	P	G	BP	0	0	0	0	C	
BGX	7		48		1	DYEOR		3	90	7	GR	C	4					0	SD	P	G	BP	0	0	0	0	C	
BGX	7		49		1	DYEOR		1	92	7	GR	C	4					0	SD	M	G	BP	0	0	0	0	C	
BGX	7		50		1	DYEOR		1	91	8	GR	C	3					0	SD	P	G	BP	.1	0	0	0	C	
BGX	7		51		1	DYEOR		2	78	20	LP	C	4					0	SD	P	M	BP	.1	0	0	0	C	
BGX	7		52		1	DYEOR		.1	85	15	GR	C	4					0	SD	P	M	BP	.1	0	0	0	C	
BGX	7		53		2	DYETA	BLGY	.1	20	80	LP	CL	3					0	CL	V	P	MI	.1	0	0	0	R	
BGX	7		54		2	MREOR	BDREBLGY	2	68	30	GR	M	4					0	CLSD	P	P	BP	.1	0	0	0	R	
BGX	7		55		2	MREOR		10	65	25	LP	M	3					0	CLSD	P	P	BP	.1	0	0	0	C	
BGX	7		56		2	MBRYE		15	60	25	LP	M	3					0	CLSD	P	P	BP	.1	0	0	0	C	
BGX	7		57	0																								
BGX	7		58		2	LBRYE		5	85	10	GR	C	4					0	SD	P	G	BP	.1	0	0	0	C	
BGX	7		59		1	MYETA		3	82	15	GR	M	4					0	SD	P	M	BP	.1	0	0	0	C	
BGX	7		60		2	MREOR		.1	65	35	GR	M	3					0	CLSD	P	P	BP	.1	0	0	0	R	
BGX	7		61		1	MOR		0	93	7	VC	M	3					0	SD	W	E	BP	1	0	0	0	C	
BGX	7		62		1	MOR		0	93	7	VC	M	3					0	SD	W	E	BP	.1	0	0	0	C	
BGX	7		63		1	MOR		1	91	8	GR	C	3					0	SD	M	G	BP	1	0	0	0	C	
BGX	7		64		1	MOR		0	92	8	VC	M	3					0	SD	M	G	BP	.1	0	0	0	C	
BGX	7		65	0																								
BGX	7		66	0																								
BGX	7		67	0																								
BGX	7		68	3	1	DYEOR		0	92	8	VC	M	3					0	SD	M	G	BP	.1	0	0	0	C	
BGX	7		69	0																								
BGX	7		70	0																								
BGX	7		71	0																								
BGX	7		72	0																								
BGX	7		73		2	MOR		1	92	7	GR	M	3					0	SD	M	G	BP	.1	0	0	0	C	
BGX	7		74		2	MOR		0	93	7	VC	M	3					0	SD	M	G	BP	.1	0	0	0	C	
BGX	7		75		2	MYEOR		5	85	10	GR	M	3					0	SD	M	G	BP	.1	0	0	0	C	
BGX	7		76		2	DYEOR		1	91	8	GR	M	4					0	SD	M	G	BP	.1	0	0	0	C	

AREA	NO	SCR	DEPTH	REC	IND	COLOR	STRUCTURE	%GR	%SD	%MD	MX	MD	R	%CG	%CS	%CM	%CMT	%CAR	NAME	SO	%POR	TYPE	%MUS	%GLA	%LIG	%SUL	H	FOSSILS
BGX	7		77		2	DYEOR		7	83	10	LP	M	4					0	SD	P	M	BP	.1	0	0	0	C	
BGX	7		78	8	1	MGYOR		5	80	15	LP	M	4					0	SD	P	M	BP	.1	0	0	0	C	
BGX	7		79		2	MYETA		10	82	8	LP	C	4					0	SD	M	G	BP	.1	0	0	0	C	
BGX	7		80		1	DYEOR		25	65	10	LP	C	4					0	PBSD	P	M	BP	.1	0	0	0	C	
BGX	7		81		1	MBROR		15	70	15	LP	M	3					0	SD	P	M	BP	.1	0	0	0	C	
BGX	7		82		1	MGYOR		7	86	7	GR	M	3					0	SD	P	G	BP	.1	0	0	0	C	
BGX	7		83	0																								
BGX	7		84	0																								
BGX	7		85	0																								
BGX	7		86	0																								
BGX	7		87	0																								
BGX	7		88		2	DBKOR		10	83	7	LP	M	3					0	SD	P	G	BP	.1	0	0	0	C	
BGX	7		89		2	MBKOR		5	80	15	GR	M	3					0	SD	P	M	BP	.1	0	0	0	C	
BGX	7		90		2	MBKOR		.1	75	25	GR	M	3					0	CLSD	P	P	BP	.1	0	0	0	C	
BGX	7		91		2	DYEOR		0	85	15	VC	M	3					0	SD	M	M	BP	1	0	0	0	C	
BGX	7		92		2	DYEBR	BDBR	.1	60	40	GR	M	3					0	CLSD	P	P	BP	.1	0	0	0	C	
BGX	7		93		2	MYEBR		5	85	10	LP	M	3	15	85	0		1	SLSD	P	G	BP	.1	0	0	0	C	PL
BGX	7		94		2	MGYOR	ISLSD	10	83	7	LP	M	3	20	80	0	.1	3	SLSD	P	G	BP	.1	0	0	0	C	GAPL
BGX	7		95		2	DYEOR	CLB	1	94	5	LP	F	3					0	SD	W	E	BP	1	0	0	0	C	
BGX	7		96		2	MYEBR		.1	95	5	GR	F	4					0	SD	W	E	BP	3	0	0	0	A	
BGX	7		97		2	DYEOR	BLGNGY	1	89	10	GR	F	4					0	SD	M	G	BP	1	0	0	0	A	
BGX	7		98		2	DYEOR	VARLYEGY	2	83	15	GR	M	4					0	SD	M	M	BP	1	0	0	0	C	
BGX	7		99		2	MYEOR	CLB	0	90	10	VC	F	4				.1	0	SD	W	G	BP	.1	0	0	0	C	YE
BGX	7		100		2	LGNGY	VARMYEOR	0	95	5	C	F	4	0	99	0		.1	SD	W	E	BP	1	0	0	0	A	YE
BGX	7		101		2	MTA		0	96	4	VC	F	4					0	SD	W	E	BP	3	0	0	0	A	
BGX	7		102		2	MTA		0	97	3	C	F	4					0	SD	W	E	BP	2	0	0	0	A	
BGX	7		103		2	LYEOR		0	96	4	C	F	3					0	SD	W	E	BP	2	0	0	0	A	
BGX	7		104		2	LGYYE		0	96	4	C	F	4					0	SD	W	E	BP	1	0	0	0	A	
BGX	7		105		2	LYEGY	ICTSD	0	95	5	VC	M	3					0	SD	W	G	BP	1	0	0	0	C	
BGX	7		106		2	LYEOR	MTLYEGY	3	89	8	GR	F	3					0	SD	M	G	BP	.1	0	0	0	A	
BGX	7		107		2	LGYGN	VARMBROR	0	95	5	VC	F	3				1	0	SD	W	G	BP	1	0	0	0	A	SP
BGX	7		108		2	DOR	WSPLGNGY	.1	80	20	GR	M	3					0	SD	M	M	BP	1	0	0	0	C	
BGX	7		109		2	DOR	WSPLGNGY	0	80	20	VC	F	3				.1	0	SD	M	M	BP	1	.1	0	0	C	
BGX	7		110		2	MOR	WSPLGNGY	.1	85	15	GR	F	3				1	0	SD	M	M	BP	1	1	0	0	C	GASPOS
BGX	7		111		2	LOR	WSPLGY	0	75	25	C	F	3					0	CLSD	P	M	BP	1	.1	0	0	C	
BGX	7		112		2	LOR	WSPLGNGY	.1	80	20	GR	F	4					0	SD	P	M	BP	1	.1	0	0	C	
BGX	7		113		2	LOR	WSPGY	0	80	20	VC	F	4					0	SD	M	M	BP	1	.1	0	0	C	
BGX	7		114		2	DGYOR	ICTSD	0	90	10	VC	F	4				1	0	SD	M	M	BP	1	.1	0	0	C	

AREA	NO	SCR	DEPTH	REC	IND	COLOR	STRUCTURE	%GR	%SD	%MD	MX	MD	R	%CG	%CS	%CM	%CMT	%CAR	NAME	SO	%POR	TYPE	%MUS	%GLA	%LIG	%SUL	H	FOSSILS
BGX	7		115		2	DYEOR		.1	90	10	GR	F	4					0	SD	M	M	BP	1	.1	0	0	C	
BGX	7		116		2	DGYOR	ICTSD	0	90	10	VC	F	3				1	0	SD	M	G	BP	1	0	0	0	C	
BGX	7		117		1	MGYOR	ICTSD	0	92	8	VC	F	3				3	0	SD	M	G	BP	1	.1	0	0	C	
BGX	7		118		1	MGYOR	ICTSD	.1	90	10	GR	F	3				1	0	SD	M	G	BP	1	.1	0	0	C	
BGX	7		119		2	DGYOR		3	87	10	GR	F	4				.1	0	SD	M	G	BP	2	.1	0	0	C	
BGX	7		120	9	2	DGYOR	ICTSD	.1	90	10	GR	F	3				4	0	SD	M	G	BP	2	.1	0	0	C	YESP
BGX	7		121	0																								
BGX	7		122	0																								
BGX	7		123		2	DGYGN	ICTSDBL	0	30	70	C	ST	3				3	0	SDBLCL	V	P	MI	2	10	0	.1	R	PLGA
BGX	7		124	0																								
BGX	7		125	6	2	MGYGN		0	20	80	C	CL	3					0	GLCL	V	P	MI	3	25	0	1	C	
BGX	7		126		2	DBKGN		2	63	35	LP	F	3					0	GLCLSD	P	P	BP	5	25	0	3	C	
BGX	7		127		2	DBKGN		.1	70	30	GR	F	3					0	GLCLSD	P	P	BP	5	25	0	3	C	
BGX	7		128		2	DBKGN		.1	70	30	LP	F	3					0	GLCLSD	P	P	BP	5	25	0	5	C	
BGX	7		129		3	DBKGN		0	75	25	VC	F	3					0	CLSD	P	P	BP	7	15	0	3	C	
BGX	7		130		2	MBKGN		0	65	35	VC	VF	3					0	CLSD	P	P	BP	7	15	0	4	C	
BGX	7		131		2	DBKGN		7	63	30	GR	F	3					0	CLSD	P	P	BP	7	15	0	2	C	
BGX	7		132		2	DGNOR	WSPLGNCL	3	67	30	LP	M	3					0	CLSD	P	P	BP	2	10	0	0	C	BR
BGX	7		133		1	DGYGN		1	59	40	LP	F	3				1	0	CLSD	P	P	BP	5	10	0	1	C	
BGX	7		134		1	MYEOR		2	92	6	GR	M	3					0	SD	W	E	BP	1	0	0	0	C	
BGX	7		135		1	MYEOR		.1	90	10	VC	M	3					0	SD	W	G	BP	.1	0	0	0	C	
BGX	7		136	0																								
BGX	7		137	0																								
BGX	7		138	0																								
BGX	7		139	0																								
BGX	7		140	0																								
BGX	7		141	0																								
BGX	7		142	0																								
BGX	7		143		2	DYEOR	LGYCLB	.1	93	7	LP	M	3					0	SD	W	E	BP	.1	0	0	0	C	
BGX	7		144		1	DYEOR	LGYCLB	.1	95	5	LP	M	3					0	SD	W	E	BP	.1	0	0	0	C	
BGX	7		145	0																								
BGX	7		146	0																								
BGX	7		147	0																								
BGX	7		148	0																								
BGX	7		149	0																								
BGX	7		150	0																								
BGX	7		151	0																								
BGX	7		152	0																								

AREA	NO	SCR	DEPTH	REC	IND	COLOR	STRUCTURE	%GR	%SD	%MD	MX	MD	R	%CG	%CS	%CM	%CMT	%CAR	NAME	SO	%POR	TYPE	%MUS	%GLA	%LIG	%SUL	H	FOSSILS
BGX	9		1	0																								
BGX	9		2	0																								
BGX	9		3	0																								
BGX	9		4	0																								
BGX	9		5	0																								
BGX	9		6	0																								
BGX	9		7	0																								
BGX	9		8	0																								
BGX	9		9	0																								
BGX	9		10	0																								
BGX	9		11	0																								
BGX	9		12	0																								
BGX	9		13	0																								
BGX	9		14	0																								
BGX	9		15		1	MBR		25	60	15	LP	C	4					0	PBSD	P	M	BP	1	0	0	0	C	
BGX	9		16		1	LBR	CLB	7	78	15	GR	C	4					0	SD	P	M	BP	1	0	0	0	C	
BGX	9		17		2	LBROR	CLB	5	80	15	GR	C	4					0	SD	P	M	BP	1	0	0	0	C	
BGX	9		18		2	LBROR		8	67	25	GR	M	4					0	CLSD	P	P	BP	1	0	0	0	C	
BGX	9		19		3	MPU		0	20	80	M	CL	3					0	CL	V	P	MI	1	0	0	0	C	
BGX	9		20		2	MBRPU	ISD	0	40	60	VC	ST	3					0	SDCL	V	P	MI	2	0	0	0	C	
BGX	9		21		2	DBR	IPUCL	10	65	25	GR	C	4					0	CLSD	P	M	BP	1	0	0	0	C	
BGX	9		22		1	LPUBR	ICL	20	55	25	LP	M	4					0	CLSD	P	M	BP	3	0	0	0	C	
BGX	9		23		1	LPU		5	85	10	GR	M	4					0	SD	M	M	BP	4	0	0	0	C	
BGX	9		24		1	LPUBR		7	83	10	GR	M	4					0	SD	M	M	BP	4	0	0	0	C	
BGX	9		25		1	LPUBR		7	83	10	GR	M	4					0	SD	M	M	BP	5	0	0	0	C	
BGX	9		26		1	LBRYE	VARLPU	25	65	10	LP	C	4					0	PBSD	P	M	BP	3	0	0	0	C	
BGX	9		27		1	LGYYE		15	75	10	GR	M	4					0	SD	P	M	BP	4	0	0	0	C	
BGX	9		28		2	MBRYE		15	70	15	GR	M	4					0	SD	P	M	BP	5	0	0	0	C	
BGX	9		29		1	LGYYE		10	70	20	GR	M	3					0	SD	P	M	BP	5	0	0	0	C	
BGX	9		30		2	DRE	IPUCL	2	73	25	GR	F	3					0	CLSD	P	M	BP	2	0	0	0	C	
BGX	9		31		2	DYE	IPUCL	0	70	30	VC	F	3					0	CLSD	P	P	BP	3	0	0	0	A	
BGX	9		32		2	DYE	IWHCL	3	72	25	GR	F	3					0	CLSD	P	P	BP	2	0	0	0	C	
BGX	9		33		2	DYE	WSPWH	15	70	15	GR	M	4					0	SD	P	M	BP	2	0	0	0	C	
BGX	9		34		2	DYE	WSPWH	15	70	15	GR	M	4					0	SD	P	M	BP	1	0	0	0	C	
BGX	9		35		2	DORYE		15	70	15	GR	M	4					0	SD	P	M	BP	1	0	0	0	C	
BGX	9		36		2	DORYE		10	80	10	GR	M	4					0	SD	M	M	BP	1	0	0	0	C	
BGX	9		37		2	MREOR		7	83	10	GR	M	3					0	SD	M	M	BP	1	0	0	0	C	
BGX	9		38		2	MRE		3	87	10	GR	M	4					0	SD	M	M	BP	2	0	0	0	C	

AREA	NO	SCR	DEPTH	REC	IND	COLOR	STRUCTURE	%GR	%SD	%MD	MX	MD	R	%CG	%CS	%CM	%CMT	%CAR	NAME	SO	%POR	TYPE	%MUS	%GLA	%LIG	%SUL	H	FOSSILS
BGX	9		39		2	MRE		5	80	15	GR	M	4					0	SD	M	M	BP	2	0	0	0	C	
BGX	9		40		2	MRE		2	88	10	GR	M	4					0	SD	M	M	BP	2	0	0	0	C	
BGX	9		41		2	MREOR	MTREBR	3	82	15	GR	F	3					0	SD	M	M	BP	1	0	0	0	C	
BGX	9		42		1	DYE		3	87	10	GR	F	3					0	SD	M	M	BP	.1	0	0	0	C	
BGX	9		43		2	MGYYE		2	83	15	GR	M	3					0	SD	M	M	BP	.1	0	0	0	C	
BGX	9		44		2	MGYYE	MTREBR	2	83	15	GR	M	3					0	SD	M	M	BP	.1	0	0	0	C	
BGX	9		45		2	MREOR		2	83	15	GR	M	3					0	SD	M	M	BP	.1	0	0	0	C	
BGX	9		46		2	MREOR		2	88	10	GR	M	3					0	SD	M	G	BP	.1	0	0	0	C	
BGX	9		47		2	MREOR	VARREBR	.1	75	25	GR	M	3					0	CLSD	P	M	BP	.1	0	0	0	C	
BGX	9		48		1	DORYE		5	90	5	GR	C	4					0	SD	W	E	BP	.1	0	0	0	C	
BGX	9		49		1	DORYE		5	87	8	GR	C	4					0	SD	M	G	BP	.1	0	0	0	C	
BGX	9		50	4	1	DORYE		2	90	8	GR	C	4					0	SD	W	G	BP	.1	0	0	0	C	
BGX	9		51	0																								
BGX	9		52	0																								
BGX	9		53		1	DORYE		5	87	8	GR	C	4					0	SD	M	G	BP	.1	0	0	0	C	
BGX	9		54		1	MREBR	VARYEOR	3	87	10	GR	M	3					0	SD	M	G	BP	.1	0	0	0	C	
BGX	9		55		2	MREBR		5	80	15	GR	M	3					0	SD	M	G	BP	.1	0	0	0	C	
BGX	9		56		2	MORTA		10	70	20	GR	M	3					0	SD	P	M	BP	1	0	0	0	C	
BGX	9		57		2	MORTA		5	85	10	GR	M	3					0	SD	M	G	BP	1	0	0	0	C	
BGX	9		58		2	DORYE		10	82	8	GR	M	3					0	SD	M	G	BP	1	0	0	0	C	
BGX	9		59		2	MREBR	VARDORYE	5	85	10	GR	M	3					0	SD	M	G	BP	1	0	0	0	C	
BGX	9		60		2	MREBR		5	85	10	GR	M	4					0	SD	M	G	BP	1	0	0	0	C	
BGX	9		61		2	MREBR	WSPDORYE	5	87	8	GR	M	3					0	SD	M	G	BP	1	0	0	0	C	
BGX	9		62		2	MREOR		15	77	8	GR	M	3					0	SD	P	G	BP	1	0	0	0	C	
BGX	9		63		1	MORBR		15	77	8	GR	M	3					0	SD	P	G	BP	1	0	0	0	C	
BGX	9		64		1	MGNOR		25	65	10	LP	C	4					0	PBSD	P	G	BP	1	0	0	0	C	
BGX	9		65		2	DORYE	IPICL	8	67	25	LP	C	4					0	CLSD	P	M	BP	.1	0	0	0	C	
BGX	9		66		2	DORYE	IPICL	8	67	25	LP	C	4					0	CLSD	P	M	BP	.1	0	0	0	C	
BGX	9		67		2	DGYYE	BBKYE	8	77	15	LP	C	4					0	SD	M	G	BP	.1	0	0	0	C	
BGX	9		68		1	DGYYE		10	80	10	LP	C	4					0	SD	M	G	BP	.1	0	0	0	C	
BGX	9		69		1	MGYOR		10	80	10	LP	C	3					0	SD	M	G	BP	.1	0	0	0	C	
BGX	9		70		1	MBROR		7	85	8	LP	C	3					0	SD	M	G	BP	.1	0	0	0	C	
BGX	9		71	0																								
BGX	9		72		1	MORBR		5	80	15	LP	M	4					0	SD	M	G	BP	.1	0	0	0	C	
BGX	9		73		2	MBRTA	ISDCL	7	63	30	GR	CL	3					0	CLSD	P	M	BP	.1	0	0	0	C	
BGX	9		74		2	MTA	ISDICL	0	45	55	C	CL	3					0	SDCL	P	P	BP	.1	0	0	0	C	
BGX	9		75		2	LTA	ISDICL	0	45	55	M	CL	3					0	SDCL	P	P	BP	.1	0	0	0	C	
BGX	9		76		2	MGYTA		3	82	25	GR	C	3					0	CLSD	P	P	BP	.1	0	0	0	C	

AREA	NO	SCR	DEPTH	REC	IND	COLOR	STRUCTURE	%GR	%SD	%MD	MX	MD	R	%CG	%CS	%CM	%CMT	%CAR	NAME	SO	%POR	TYPE	%MUS	%GLA	%LIG	%SUL	H	FOSSILS
BGX	9		77		2	MGYTA		4	81	15	GR	C	4					0	SD	P	M	BP	.1	0	0	0	C	
BGX	9		78		2	LYETA		5	80	15	GR	M	4					0	SD	P	M	BP	.1	0	0	0	C	
BGX	9		79		2	LYEBR	VARORTA	5	70	25	GR	M	4					0	CLSD	P	P	BP	.1	0	0	0	C	
BGX	9		80		2	LYEBR	VARTA	5	65	30	GR	M	4					0	CLSD	P	P	BP	.1	0	0	0	C	
BGX	9		81		2	LYEBR	VARYETA	3	72	25	GR	M	4					0	CLSD	P	P	BP	1	0	0	0	C	
BGX	9		82		2	LYEBR		3	87	10	GR	M	4					0	SD	M	G	BP	1	0	0	0	C	
BGX	9		83		2	LYEBR		1	91	8	GR	M	4					0	SD	M	G	BP	2	0	0	0	C	
BGX	9		84		2	LYEBR		2	91	7	GR	M	4					0	SD	M	G	BP	.1	0	0	0	C	
BGX	9		85		2	MYETA	MTBK	3	72	25	GR	M	4					0	CLSD	P	M	BP	1	0	0	0	C	
BGX	9		86		2	MYETA	WSPBK	0	85	15	VC	F	4					0	SD	M	M	BP	2	0	0	0	C	
BGX	9		87		2	MYETA		0	80	20	C	F	3					0	SD	M	M	BP	3	0	0	0	C	
BGX	9		88		2	MYETA		0	85	15	C	F	3					0	SD	M	M	BP	2	0	0	0	C	
BGX	9		89		2	MYETA		0	70	30	C	F	3					0	CLSD	P	P	BP	.1	0	0	0	C	
BGX	9		90		3	MYETA		0	60	40	VC	CL	3					0	CLSD	V	P	BP	.1	0	0	0	C	
BGX	9		91		3	LBRTA		3	57	40	GR	CL	4					0	CLSD	V	P	BP	.1	0	0	0	C	
BGX	9		92		2	LBR		5	80	15	GR	M	3					0	SD	M	M	BP	1	0	0	0	C	
BGX	9		93		1	LBR	ISDCL	55	35	10	LP	GR	4					0	SDPB	P	E	BP	.1	0	0	0	C	
BGX	9		94		2	LBR		10	75	15	GR	M	3					0	SD	M	M	BP	1	0	0	0	C	
BGX	9		95		2	LBR		10	65	25	LP	M	4					0	CLSD	P	P	BP	.1	0	0	0	C	
BGX	9		96		2	LBR		10	80	10	LP	M	4					0	SD	P	M	BP	.1	0	0	0	C	
BGX	9		97		1	LBR		20	72	8	GR	C	4					0	SD	P	G	BP	.1	0	0	0	C	
BGX	9		98		1	LBR		15	77	8	GR	C	4					0	SD	P	G	BP	.1	0	0	0	C	
BGX	9		99		1	LBR		25	67	8	LP	C	4					0	PBSD	P	G	BP	.1	0	0	0	C	
BGX	9		100	3	1	LBR		25	66	9	LP	C	4					0	PBSD	P	G	BP	.1	0	0	0	C	
BGX	9		101		0																							
BGX	9		102		0																							
BGX	9		103		1	MBRRE		10	85	5	LP	C	4					0	SD	M	E	BP	.1	0	0	0	C	
BGX	9		104		2	MORBR	MTBK	5	80	15	GR	M	3					0	SD	P	M	BP	1	0	0	0	C	
BGX	9		105		2	DORBR	MTBK	15	50	35	LP	M	3					0	CLSD	P	P	BP	1	.1	0	0	C	
BGX	9		106		2	MOR	WSPBK	15	75	10	GR	M	4					0	SD	P	G	BP	1	0	0	0	C	
BGX	9		107		2	MGNOR	ISDSL	5	85	10	GR	M	4	80	20	0	0	3	SLSD	M	G	BP	1	0	0	0	C	PL
BGX	9		108	4	2	MORGN		5	85	10	GR	M	4					0	SD	M	G	BP	1	0	0	0	C	
BGX	9		109		1	MBR		0	92	8	VC	M	4					0	SD	W	E	BP	2	0	0	0	C	
BGX	9		110		2	MBR		7	83	10	GR	M	3					0	SD	M	E	BP	3	0	0	0	C	
BGX	9		111		1	MBR		8	84	8	GR	M	4					0	SD	M	E	BP	2	0	0	0	C	
BGX	9		112		0																							
BGX	9		113		1	MBR		7	87	6	GR	C	4					0	SD	M	E	BP	2	0	0	0	C	
BGX	9		114		1	MBR		5	87	8	GR	M	4					0	SD	M	E	BP	2	0	0	0	C	

AREA	NO	SCR	DEPTH	REC	IND	COLOR	STRUCTURE	%GR	%SD	%MD	MX	MD	R	%CG	%CS	%CM	%CMT	%CAR	NAME	SO	%POR	TYPE	%MUS	%GLA	%LIG	%SUL	H	FOSSILS
BGX	9		115		1	MBR	ICL	1	91	8	GR	M	4					0	SD	M	E	BP	3	0	0	0	C	
BGX	9		116		1	MBR		0	92	8	VC	M	4					0	SD	W	E	BP	3	0	0	0	C	
BGX	9		117		1	MBR		0	92	8	VC	M	4					0	SD	W	E	BP	4	0	0	0	C	
BGX	9		118		1	LGN	BLBR	0	90	10	VC	M	4					0	SD	W	G	BP	2	0	0	0	C	
BGX	9		119		2	LYETA	WSPLGY	.1	80	20	GR	M	4					0	SD	M	M	BP	2	0	0	0	C	
BGX	9		120		2	MBRTA	VARDYEOR	0	85	15	VC	F	3					0	SD	M	G	BP	2	0	0	0	C	
BGX	9		121	8	2	LGNYE		.1	80	20	GR	M	3					0	SD	P	M	BP	1	.1	0	0	C	
BGX	9		122		2	MGNOR	WSPCL	.1	75	25	GR	M	4					0	CLSD	P	M	BP	2	.1	0	0	C	
BGX	9		123		2	MGNOR	ISDCL	1	74	25	GR	M	4					0	CLSD	P	M	BP	3	.1	0	0	C	
BGX	9		124		2	MGNOR	WSPSDCL	.1	75	25	GR	M	4					0	CLSD	P	M	BP	2	.1	0	0	C	
BGX	9		125		2	MGNYE	WSPSDCL	0	75	25	VC	M	4					0	CLSD	P	M	BP	2	.1	0	0	C	
BGX	9		126	5	2	MGNYE		0	75	25	VC	M	4					0	CLSD	P	M	BP	1	.1	0	0	C	
BGX	9		127		0																							
BGX	9		128		2	MGNHY	WSPCL	0	85	15	VC	M	4					0	SD	M	G	BP	3	.1	0	0	C	
BGX	9		129		2	LGNOR	WSPCL	0	85	15	VC	M	4	99	0	0	0	.1	SD	M	G	BP	2	.1	0	0	C	GA
BGX	9		130		2	LGNOR	WSPCL	0	85	15	VC	M	4					0	SD	M	G	BP	3	.1	0	0	C	
BGX	9		131	3	2	DYEOR	WSPLGY	0	90	10	VC	M	4					0	SD	W	G	BP	2	.1	0	0	C	
BGX	9		132	0																								
BGX	9		133		2	DYEOR	WSPLGY	0	80	20	VC	M	4					0	SD	M	M	BP	2	.1	0	0	C	
BGX	9		134		2	DYEOR	WSPMGY	0	85	15	VC	F	4					0	SD	M	M	BP	3	.1	0	0	C	
BGX	9		135		2	LGNOR	ILGYCL	5	75	20	LP	M	4					0	SD	P	M	BP	5	1	0	0	C	
BGX	9		136		2	MOR	WSPGLY	1	84	15	GR	M	4	99	0	0	0	.1	SD	M	M	BP	5	3	0	0	C	GA
BGX	9		137		2	DGYGN	ICTBLSD	2	88	10	GR	VF	4	80	20	0	5	15	BLSD	M	G	BP	6	5	0	.1	C	PLGA
BGX	9		138		2	LGNOR	ICTBLSD	0	90	10	C	VF	4	80	20	0	5	15	BLSD	M	G	BP	5	8	0	.1	C	PLGA
BGX	9		139		2	LGNOR	ICL	3	72	25	GR	F	3					0	CLSD	P	M	BP	4	8	0	.1	C	
BGX	9		140		3	DGYGN	WSPDOR	7	68	25	GR	F	3					0	CLSD	P	M	BP	5	15	0	3	C	
BGX	9		141	0																								
BGX	9		142	0																								
BGX	9		143	8	2	DGYGN		5	70	25	GR	F	3					0	CLSD	P	M	BP	5	10	0	3	C	
BGX	9		144		2	DGYGN		5	70	25	LP	F	3					0	CLSD	P	M	BP	5	10	0	3	C	
BGX	9		145		3	DBKGN		7	58	35	LP	M	3					0	CLSD	P	M	BP	3	7	0	2	C	
BGX	9		146		2	DYEOR	WSPLGN	15	60	25	LP	C	4	0	99	0	0	.1	CLSD	P	M	BP	.1	2	0	0	C	YE
BGX	9		147	0																								
BGX	9		148	0																								
BGX	9		149	0																								
BGX	9		150	0																								
BGX	9		151	0																								
BGX	9		152	0																								

AREA	NO	SCR	DEPTH	REC	IND	COLOR	STRUCTURE	%GR	%SD	%MD	MX	MD	R	%CG	%CS	%CM	%CMT	%CAR	NAME	SO	%POR	TYPE	%MUS	%GLA	%LIG	%SUL	H	FOSSILS
BGX	011		1	0																								
BGX	011		2	0																								
BGX	011		3	0																								
BGX	011		4	0																								
BGX	011		5	0																								
BGX	011		6	0																								
BGX	011		7	0																								
BGX	011		8	0																								
BGX	011		9	0																								
BGX	011		10	0																								
BGX	011		11	0																								
BGX	011		12	0																								
BGX	011		13	0																								
BGX	011		14	0																								
BGX	011		15		1	DYE		2	83	15	GR	M	4					0	SD	M	M	BP	.1	0	0	0	C	
BGX	011		16		2	DYE		3	77	20	GR	M	4					0	SD	P	M	BP	2	0	0	0	C	
BGX	011		17		3	LPU	BWHICL	5	65	30	GR	CL	3					0	CLSD	P	P	BP	10	0	0	0	C	
BGX	011		18		2	LWHYE		15	70	15	GR	M	4					0	CLSD	P	M	BP	10	0	0	0	C	
BGX	011		19		2	LYEBR	MTPU	10	65	25	LP	F	3					0	CLSD	P	M	BP	8	0	0	0	C	
BGX	011		20		2	LPUBR	MTWH	.1	75	25	GR	F	3					0	CLSD	P	M	BP	10	0	0	0	A	
BGX	011		21		2	LPUBR		0	75	25	C	F	3					0	CLSD	P	M	BP	10	0	0	0	C	
BGX	011		22		2	LPUBR		0	75	25	VC	F	3					0	CLSD	P	M	BP	10	0	0	0	A	
BGX	011		23		2	MWHBR	WSPWH	0	80	20	VC	M	3					0	SD	M	M	BP	10	0	0	0	A	
BGX	011		24		2	MWHBR	WSPWH	0	80	20	VC	F	3					0	SD	P	P	BP	8	0	0	0	C	
BGX	011		25		2	LREPU	VARWHYE	3	62	35	GR	F	3					0	CLSD	P	P	BP	7	0	0	0	C	
BGX	011		26		2	DYEOR		3	67	30	GR	F	3					0	CLSD	P	P	BP	8	0	0	0	C	
BGX	011		27		2	DYEOR	MTREBR	3	67	30	GR	F	3					0	CLSD	P	P	BP	8	0	0	0	C	
BGX	011		28		2	DREBR		3	62	35	GR	F	3					0	CLSD	P	P	BP	8	0	0	0	C	
BGX	011		29		2	MYEOR	MTRE	3	57	40	GR	F	3					0	CLSD	P	P	BP	5	0	0	0	C	
BGX	011		30		2	MYEOR	MTWH	2	58	40	GR	F	3					0	CLSD	P	P	BP	4	0	0	0	C	
BGX	011		31		2	MYEOR	MTWH	3	67	30	GR	F	3					0	CLSD	P	P	BP	5	0	0	0	C	
BGX	011		32		2	MYEOR	WSPWH	5	65	30	GR	F	3					0	CLSD	P	P	BP	4	0	0	0	C	
BGX	011		33		2	MYEOR	MTWH	5	65	30	GR	M	4					0	CLSD	P	P	BP	3	0	0	0	C	
BGX	011		34		2	MYEOR	MTWH	10	65	25	LP	M	4					0	CLSD	P	P	BP	3	0	0	0	C	
BGX	011		35		2	MYEOR	MTWH	7	73	20	GR	M	4					0	SD	P	M	BP	2	0	0	0	C	
BGX	011		36		2	MYEOR	WSPWH	8	77	15	GR	M	4					0	SD	P	M	BP	.1	0	0	0	C	
BGX	011		37		2	MYEOR		7	78	15	GR	M	4					0	SD	P	M	BP	.1	0	0	0	C	
BGX	011		38		2	MYEOR		7	78	15	GR	M	4					0	SD	P	M	BP	1	0	0	0	C	

AREA	NO	SCR	DEPTH	REC	IND	COLOR	STRUCTURE	%GR	%SD	%MD	MX	MD	R	%CG	%CS	%CM	%CMT	%CAR	NAME	SO	%POR	TYPE	%MUS	%GLA	%LIG	%SUL	H	FOSSILS
BGX	011		39		2	MYEOR	WSPWH	5	85	10	GR	M	4					0	SD	M	M	BP	1	0	0	0	C	
BGX	011		40		2	MYEOR	WSPWH	5	80	15	GR	M	4					0	SD	M	M	BP	1	0	0	0	C	
BGX	011		41		2	MYEOR	WSPWH	7	73	20	GR	M	4					0	SD	P	M	BP	1	0	0	0	C	
BGX	011		42		2	MYEOR	WSPWH	5	70	25	GR	M	4					0	CLSD	P	M	BP	1	0	0	0	C	
BGX	011		43		2	LYEOR	WSPWH	5	65	30	GR	M	4					0	CLSD	P	M	BP	1	0	0	0	C	
BGX	011		44		2	LYEOR		5	70	25	GR	M	4					0	CLSD	P	M	BP	2	0	0	0	C	
BGX	011		45		2	LYEOR		5	80	15	GR	M	4					0	SD	M	M	BP	1	0	0	0	C	
BGX	011		46		2	LYEOR		5	85	10	GR	M	4					0	SD	M	M	BP	1	0	0	0	C	
BGX	011		47	0																								
BGX	011		48	0																								
BGX	011		49	0																								
BGX	011		50	0																								
BGX	011		51	0																								
BGX	011		52	0																								
BGX	011		53	0																								
BGX	011		54	0																								
BGX	011		55		2	DYEOR	ICL	5	65	30	GR	M	4					0	CLSD	P	P	BP	1	0	0	0	C	
BGX	011		56		2	DYEOR	ICL	2	68	30	GR	M	4					0	CLSD	P	P	BP	1	0	0	0	C	
BGX	011		57		2	MYETA	ICL	5	75	20	GR	M	3					0	SD	P	M	BP	.1	0	0	0	C	
BGX	011		58		2	MYETA	ICLSD	5	80	15	GR	M	3					0	SD	M	M	BP	.1	0	0	0	C	
BGX	011		59		2	MYETA	ICL	10	65	25	GR	M	3					0	CLSD	P	M	BP	.1	0	0	0	C	
BGX	011		60		1	DYEOR		5	85	10	GR	M	4					0	SD	M	G	BP	.1	0	0	0	C	
BGX	011		61		1	DYEOR	MTREBR	8	77	15	GR	M	3					0	SD	P	G	BP	.1	0	0	0	C	
BGX	011		62		1	DYEOR	MTREBR	10	75	15	GR	M	3					0	SD	P	G	BP	.1	0	0	0	C	
BGX	011		63	0																								
BGX	011		64		2	DYEOR		7	85	8	GR	M	3					0	SD	M	G	BP	.1	0	0	0	C	
BGX	011		65		2	DYEOR		3	90	7	GR	M	3					0	SD	M	G	BP	.1	0	0	0	C	
BGX	011		66		2	DYEOR		7	83	10	GR	M	3					0	SD	M	G	BP	.1	0	0	0	C	
BGX	011		67		2	DYEOR		5	85	10	GR	M	4					0	SD	M	G	BP	.1	0	0	0	C	
BGX	011		68		2	DYEOR		3	87	10	GR	M	4					0	SD	M	G	BP	.1	0	0	0	C	
BGX	011		69		1	DYEOR		20	73	7	LP	M	4					0	SD	P	G	BP	.1	0	0	0	C	
BGX	011		70		1	DYEOR	ICLSD	.1	75	25	GR	F	4					0	CLSD	P	M	BP	1	0	0	0	C	
BGX	011		71		1	DYEOR		25	67	8	LP	C	4					0	PBSD	P	G	BP	.1	0	0	0	C	
BGX	011		72		1	DYEOR		15	77	8	LP	VC	4					0	SD	P	G	BP	.1	0	0	0	C	
BGX	011		73	0																								
BGX	011		74	0																								
BGX	011		75		1	DYEOR		10	82	8	LP	C	4					0	SD	M	G	BP	.1	0	0	0	C	
BGX	011		76		1	DYEOR		25	65	10	C	4						0	PBSD	P	G	BP	.1	0	0	0	C	

AREA	NO	SCR	DEPTH	REC	IND	COLOR	STRUCTURE	%GR	%SD	%MD	MX	MD	R	%CG	%CS	%CM	%CMT	%CAR	NAME	SO	%POR	TYPE	%MUS	%GLA	%LIG	%SUL	H	FOSSILS
BGX	011		77		1	DYEOR		20	70	10	LP	C	4					0	SD	P	G	BP	.1	0	0	0	C	
BGX	011		78	7	1	MYEOR		15	77	8	LP	C	4					0	SD	P	G	BP	.1	0	0	0	C	
BGX	011		79	0																								
BGX	011		80	0																								
BGX	011		81	9	1	MYEOR		15	79	6	GR	C	4					0	SD	P	E	BP	.1	0	0	0	C	
BGX	011		82	0																								
BGX	011		83	0																								
BGX	011		84	0																								
BGX	011		85		2	DORTA	WSPLTA	0	75	25	C	F	4					0	CLSD	P	M	BP	1	0	0	0	C	
BGX	011		86		2	MOR		5	87	8	GR	C	4					0	SD	M	G	BP	.1	0	0	0	C	
BGX	011		87		2	MOR		4	88	8	GR	C	4					0	SD	M	G	BP	.1	0	0	0	C	
BGX	011		88		2	MOR		5	85	10	LP	M	3					0	SD	M	G	BP	.1	0	0	0	C	
BGX	011		89		2	MYEOR		7	68	25	GR	M	3					0	CLSD	P	P	BP	.1	0	0	0	C	
BGX	011		90		2	DYEOR		3	87	10	GR	M	3					0	SD	M	G	BP	1	0	0	0	C	
BGX	011		91		3	MTA	WSPBRFS	0	25	75	M	CL	3					0	SDCL	V	P	MI	.1	0	0	0	R	
BGX	011		92		3	MTA	FS	0	15	85	M	CL	3					0	CL	V	P	MI	.1	0	0	0	R	
BGX	011		93		3	LGNTA		0	15	85	VC	CL	3					0	CL	V	P	MI	.1	0	0	0	R	
BGX	011		94		2	LGNTA		0	25	75	VC	CL	3					0	SDCL	V	P	MI	.1	0	0	0	R	
BGX	011		95	0																								
BGX	011		96	0																								
BGX	011		97		2	LYETA	BBK	5	55	40	LP	CL	4					0	CLSD	P	P	BP	.1	0	0	0	C	
BGX	011		98		2	LYETA	BBK	10	75	15	GR	C	3					0	SD	P	M	BP	.1	0	0	0	C	
BGX	011		99		2	DYEBR		5	85	10	GR	M	3					0	SD	P	M	BP	.1	0	0	0	C	
BGX	011		100		1	DYEBR		10	83	7	GR	C	3					0	SD	M	G	BP	.1	0	0	0	C	
BGX	011		101		2	DYEOR		2	83	15	GR	M	3					0	SD	M	M	BP	.1	0	0	0	C	
BGX	011		102		2	MYEBR	VARBKBR	5	85	10	GR	C	4					0	SD	M	G	BP	.1	0	0	0	C	
BGX	011		103		2	DYEOR		5	80	15	GR	M	4					0	SD	M	G	BP	.1	0	0	0	C	
BGX	011		104		2	DYEBR		5	85	10	GR	M	4					0	SD	M	G	BP	.1	0	0	0	C	
BGX	011		105		2	DYETA		0	90	10	VC	M	4					0	SD	M	G	BP	1	0	0	0	C	
BGX	011		106		2	DYETA		.1	75	25	GR	M	3					0	CLSD	P	M	BP	1	0	0	0	C	
BGX	011		107		2	DYEOR		.1	85	15	GR	M	4					0	SD	M	M	BP	2	0	0	0	C	
BGX	011		108		2	DYEOR		7	87	15	GR	M	4					0	SD	P	M	BP	1	0	0	0	C	
BGX	011		109		2	DYEOR		10	75	15	LP	M	3					0	SD	P	M	BP	1	0	0	0	C	
BGX	011		110		2	MORBR	ICLSD	20	55	25	LP	M	4					0	CLSD	P	M	BP	.1	0	0	0	C	
BGX	011		111		1	MBR		15	75	10	LP	C	4					0	SD	P	M	BP	.1	0	0	0	C	
BGX	011		112		1	MBR		15	80	5	LP	C	4					0	SD	P	G	BP	.1	0	0	0	C	
BGX	011		113		1	MBR	VARDBR	10	85	5	GR	C	4					0	SD	M	G	BP	1	0	0	0	C	
BGX	011		114		1	MBR		5	85	10	GR	C	4					0	SD	M	G	BP	1	0	0	0	C	

AREA	NO	SCR	DEPTH	REC	IND	COLOR	STRUCTURE	%GR	%SD	%MD	MX	MD	R	%CG	%CS	%CM	%CMT	%CAR	NAME	SO	%POR	TYPE	%MUS	%GLA	%LIG	%SUL	H	FOSSILS
BGX	011		115		1	LBR		5	90	5	GR	C	4					0	SD	M	G	BP	1	0	0	0	C	
BGX	011		116		1	LBR		10	80	10	LP	M	3					0	SD	P	M	BP	1	0	0	0	C	
BGX	011		117		2	DBR	MTBKBR	15	70	15	LP	M	3	0	99	0	0	.1	SD	P	M	BP	.1	0	0	0	C	YE
BGX	011		118		3	DBR	ICL	20	45	35	LP	CL	3	0	99	0	0	5	CACLSD	P	P	BP	1	0	0	0	C	PL
BGX	011		119		3	MWHBR		5	65	30	GR	M	4	3	87	10	2	10	CTCASD	P	M	BP	1	0	0	0	C	ESPL
BGX	011		120		2	LGNBR	BWHBR	5	65	30	GR	M	4	3	82	15	0	10	CACLSD	P	P	BP	1	0	0	0	C	YE
BGX	011		121		2	MWHBR		5	85	10	GR	M	4	10	65	25	0	30	MCCASD	P	M	BP	1	0	0	0	C	PLYE
BGX	011		122		2	LBRWH		7	63	30	LP	M	4	20	80	0	0	10	CACLSD	P	M	BP	1	0	0	0	C	PLYE
BGX	011		123		2	LGNBR		10	65	25	LP	F	4	0	99	0	0	2	CACLSD	P	M	BP	1	0	0	0	C	YE
BGX	011		124		2	LGNOR		5	85	10	LP	F	4	0	99	0	0	2	CASD	M	G	BP	2	0	0	0	C	YE
BGX	011		125		2	LYEOR	ICL	0	90	10	C	F	4	0	0	0	2	0	SD	W	G	BP	2	0	0	0	C	
BGX	011		126		2	LGNOR	ICTBLSD	0	90	10	C	F	4	80	20	0	3	5	CTBLSD	W	G	BP	1	0	0	0	C	PL
BGX	011		127		2	DYEOR	BLGNTA	0	90	10	VC	F	4	10	90	0	0	2	BLSD	W	G	BP	1	0	0	0	C	GAYE
BGX	011		128		2	LGNTA		0	93	7	VC	F	4					0	SD	W	G	BP	1	0	0	0	C	
BGX	011		129		2	LGNOR		0	93	7	VC	F	4					0	SD	W	G	BP	2	0	0	0	A	
BGX	011		130		2	LGNOR		0	95	5	VC	F	4					0	SD	W	G	BP	2	0	0	0	A	
BGX	011		131		2	LGNOR		0	92	8	VC	F	3					0	SD	W	G	BP	1	0	0	0	C	
BGX	011		132		2	DYEOR		0	85	15	VC	F	3					0	SD	M	M	BP	1	0	0	0	C	
BGX	011		133		2	DYEOR		.1	85	15	GR	F	3					0	SD	M	M	BP	2	0	0	0	C	
BGX	011		134		2	DYEOR		0	80	20	C	F	3					0	SD	M	M	BP	.1	0	0	0	C	
BGX	011		135		2	DYEOR		0	85	15	VC	F	3					0	SD	M	M	BP	1	.1	0	0	C	
BGX	011		136		2	DYEOR	WSPLGY	0	85	15	VC	F	3					0	SD	M	M	BP	1	.1	0	0	C	
BGX	011		137		2	DYEOR		0	85	15	C	F	4					0	SD	M	M	BP	1	0	0	0	C	
BGX	011		138		2	DYEOR		0	90	10	C	F	4					0	SD	W	G	BP	1	.1	0	0	C	
BGX	011		139		2	DYEOR		0	92	8	VC	M	4					0	SD	W	G	BP	1	.1	0	0	C	
BGX	011		140		2	DYEOR		0	94	6	C	M	4					0	SD	W	G	BP	1	.1	0	0	C	
BGX	011		141		2	DYEOR		0	92	8	C	M	4					0	SD	W	G	BP	2	.1	0	0	C	
BGX	011		142		2	DYEOR		0	90	10	VC	M	4					0	SD	M	M	BP	2	1	0	0	C	
BGX	011		143		2	MOR	WSPLGY	0	80	20	VC	M	4					0	SD	M	M	BP	2	.1	0	0	C	
BGX	011		144		2	MOR	WSPLGY	0	85	15	VC	M	4					0	SD	M	M	BP	1	.1	0	0	C	
BGX	011		145		2	DYEOR		.1	85	15	GR	M	4	0	99	0	0	.1	SD	M	M	BP	2	.1	0	0	C	PL
BGX	011		146		2	DYEOR		.1	85	15	GR	M	4					0	SD	M	M	BP	1	.1	0	0	C	
BGX	011		147		2	DYEOR		2	83	15	GR	M	4	0	99	0	0	.1	SD	M	M	BP	1	1	0	0	C	YE
BGX	011		148		2	DYEOR		3	82	15	GR	M	4	0	99	0	0	.1	SD	M	M	BP	1	2	0	0	C	PL
BGX	011		149		2	DYEOR		3	72	25	GR	M	4					0	CLSD	P	M	BP	2	4	0	.1	C	
BGX	011		150		2	DYEOR		5	80	15	GR	M	4	0	99	0	0	.1	SD	P	M	BP	2	2	0	2	C	PL
BGX	011		151		3	DBKGN		5	40	55	GR	ST	4					0	SDCL	V	M	BP	2	7	0	1	C	
BGX	011		152		3	DBKGN		5	55	40	GR	M	4					0	CLSD	P	M	BP	4	10	0	3	C	

AREA	NO	SCR	DEPTH	REC	IND	COLOR	STRUCTURE	%GR	%SD	%MD	MX	MD	R	%CG	%CS	%CM	%CMT	%CAR	NAME	SO	%POR	TYPE	%MUS	%GLA	%LIG	%SUL	H	FOSSILS
BGX	011		153		3	DBKGN		3	67	30	GR	ST	4					0	CLSD	P	M	BP	2	15	0	3	C	
BGX	011		154		3	DBKGN	WSPLTA	5	10	85	LP	CL	4					0	GLCL	V	P	MI	.1	25	0	.1	C	
BGX	011		155	0																								
BGX	011		156	0																								
BGX	011		157		3	DBKGN		3	25	72	GR	CL	4					0	GLSDCL	V	P	MI	.1	25	0	.1	C	
BGX	011		158		3	DOR	ICL	20	55	25	LP	M	3					0	CLSD	V	M	BP	.1	15	0	.1	C	
BGX	011		159		2	DOR	ICL	15	70	15	GR	M	3					0	SD	P	M	BP	.1	0	0	0	C	
BGX	011		160		1	DYEOR		6	89	5	LP	C	3					0	SD	M	E	BP	.1	0	0	0	C	
BGX	011		161		1	MOR		7	88	5	GR	C	3					0	SD	M	E	BP	.1	0	0	0	C	
BGX	011		162		1	MOR		20	75	5	LP	C	3					0	SD	P	E	BP	.1	0	0	0	C	
BGX	011		163		1	DYEOR		25	70	5	LP	C	3					0	PBSD	P	E	BP	.1	0	0	0	C	
BGX	011		164		1	DYEOR		30	65	5	LP	C	3					0	PBSD	P	E	BP	.1	0	0	0	C	
BGX	011		165		1	DYEOR		5	90	5	LP	C	4					0	SD	W	E	BP	.1	0	0	0	C	
BGX	011		166		1	DYEOR		15	79	6	LP	C	4					0	SD	P	E	BP	.1	0	0	0	C	

Appendix D

APPENDIX D

WELL CONSTRUCTION DIAGRAMS

OSR 30-5
(Rev 12/89)

MONITORING WELL CONSTRUCTION DETAILS

DRILLING SUBCONTRACTOR EMTC

WELL NUMBER BGX-1A

DRILLER Jim Hall

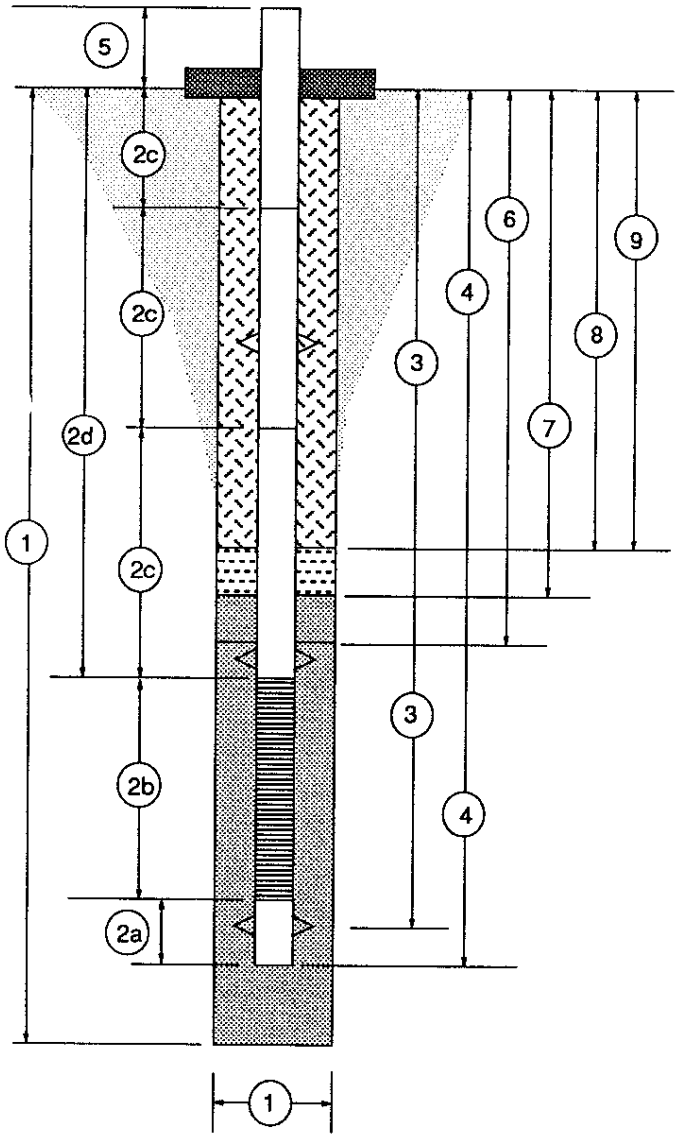
SRS COORDINATES N 76831.89 E 58590.35

DATE OF INSTALLATION 4/2/91

SANITARY SEAL ELEVATION 291.15

TECH. O.S./CO. NAME W. Joyce/Sirrine

NOTE: ALL MEASUREMENTS ARE FROM GROUND SURFACE AT START OF BORING – MEASUREMENTS TO NEAREST 0.1 FOOT.



1) Total drilled depth/hole diameter 197.0 ft/ 9 7/8 in

2) Casing/Screen Tally (Measured to Nearest 0.01 Foot)

(a) Sump & Plug Length 2.90 ft

(b) Screen Length 10.02 ft

(c) Casing Joint Lengths (Measured in up-hole Sequence From Top of Screen) 0.29 (Johnson casing adapter),
10.00, 9.99, 10.00, 10.00, 10.00, 10.00, 9.99, 10.00, 9.98,
10.01, 10.00, 10.00, 9.99, 10.01, 10.00, 10.00, 4.74 ft

(d) Depth of Top of Screen 165.00 ft

3) Depths to Centralizers 5.0, 44.0, 84.0, 124.0, 163.7, 176.0 ft

4) Total Depth of Installed Well 177.9 ft

5) Casing Stick Up (Standard 2.5' A.G.S.) 2.5 ft

6) Depth to Top of Filter Pack 161.8 ft

7) Depth to Top of Fine Sand Seal 160.7 ft

8) Depth to Top of Bentonite Seal 156.4 ft

9) Thickness of Grout 156.4 ft

OSR 30-5
(Rev 12/89)

MONITORING WELL CONSTRUCTION DETAILS

ILLING SUBCONTRACTOR **EMTC**

WELL NUMBER **BGX-1C**

DRILLER **Steve Reese**

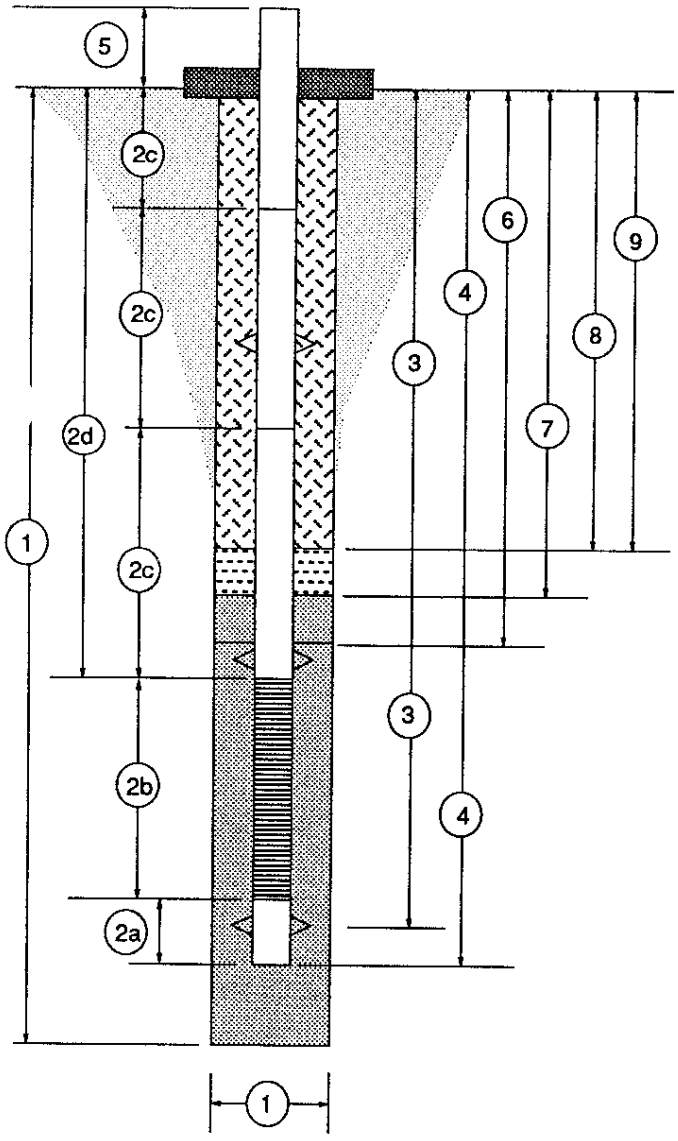
SRS COORDINATES **N 76820.01 E 58599.83**

DATE OF INSTALLATION **4/24/91**

SANITARY SEAL ELEVATION **291.27**

TECH. O.S./CO. NAME **M. D. Hill/Sirrine**

NOTE: ALL MEASUREMENTS ARE FROM GROUND SURFACE AT START OF BORING -- MEASUREMENTS TO NEAREST 0.1 FOOT.



1) Total drilled depth/hole diameter **120.0 ft/9 7/8 in**

2) Casing/Screen Tally (Measured to Nearest 0.01 Foot)

(a) Sump & Plug Length **5.39 ft**

(b) Screen Length **10.02 ft**

(c) Casing Joint Lengths (Measured in up-hole Sequence From Top of Screen) **0.29 (Monoflex casing adapter), 10.04, 10.05, 10.05, 10.05, 10.06, 10.05, 10.05, 10.07, 10.07, 10.05, 2.47 ft.**

(d) Depth of Top of Screen **103.30 ft**

3) Depths to Centralizers **11.0, 22.0, 62.0, 102.0, 114.0 ft**

4) Total Depth of Installed Well **118.7 ft**

5) Casing Stick Up (Standard 2.5' A.G.S.) **2.5 ft**

6) Depth to Top of Filter Pack **100.2 ft**

7) Depth to Top of Fine Sand Seal **98.8 ft**

8) Depth to Top of Bentonite Seal **95.0 ft**

9) Thickness of Grout **95.0 ft**

DSR 30-5
(Rev 12/89)

MONITORING WELL CONSTRUCTION DETAILS

ILLING SUBCONTRACTOR **EMTC**

WELL NUMBER **BGX-1D**

DRILLER **Steve Reese**

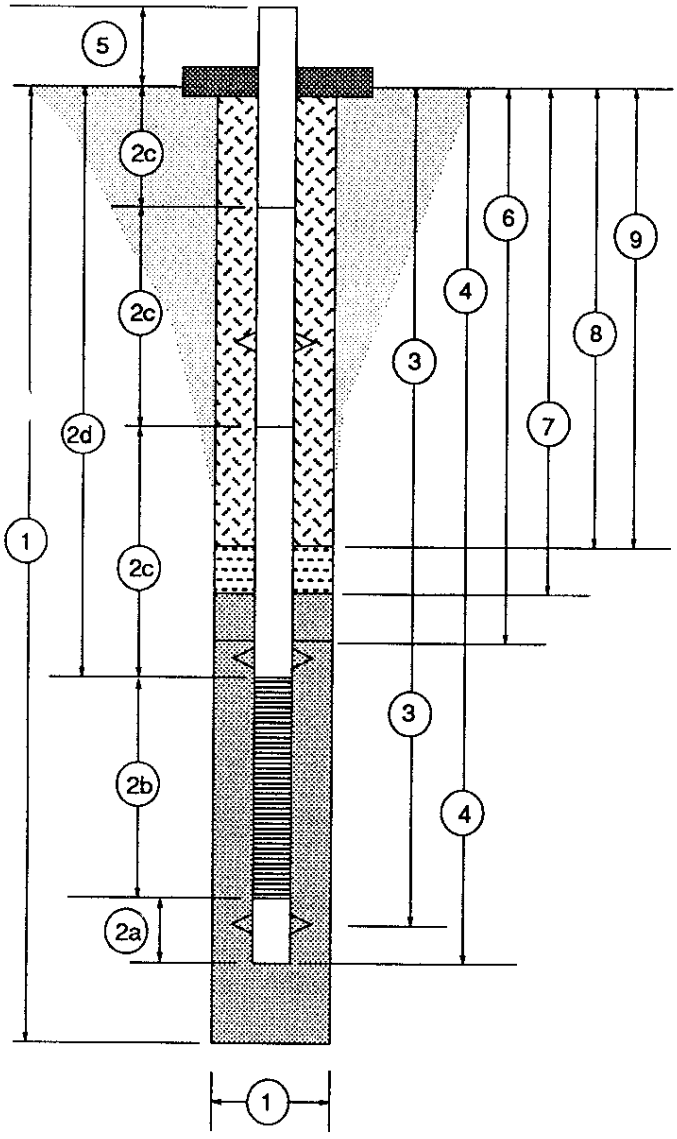
SRS COORDINATES **N 76809.54 E 58608.63**

DATE OF INSTALLATION **4/26/91**

SANITARY SEAL ELEVATION **291.27**

TECH. O.S./CO. NAME **M. D. Hill/Sirrine**

NOTE: ALL MEASUREMENTS ARE FROM GROUND SURFACE AT START OF BORING – MEASUREMENTS TO NEAREST 0.1 FOOT.



1) Total drilled depth/hole diameter **75.0 ft/9 7/8 in**

2) Casing/Screen Tally (Measured to Nearest 0.01 Foot)

(a) Sump & Plug Length **0.48 ft (no sump)**

(b) Screen Length **20.00 ft**

(c) Casing Joint Lengths (Measured in up-hole Sequence From Top of Screen) **0.31 (Johnson casing adapter), 9.99, 9.98, 9.98, 9.99, 9.98, 4.27 ft**

(d) Depth of Top of Screen **54.50 ft**

3) Depths to Centralizers **13.0, 53.0 ft**

4) Total Depth of Installed Well **75.0 ft**

5) Casing Stick Up (Standard 2.5' A.G.S.) **2.5 ft**

6) Depth to Top of Filter Pack **51.1 ft**

7) Depth to Top of Fine Sand Seal **48.5 ft**

8) Depth to Top of Bentonite Seal **43.4 ft**

9) Thickness of Grout **43.4 ft**

OSR 30-5
(Rev 12/89)

MONITORING WELL CONSTRUCTION DETAILS

'ILLING SUBCONTRACTOR EMTC

WELL NUMBER BGX-2B

DRILLER Steve Reese

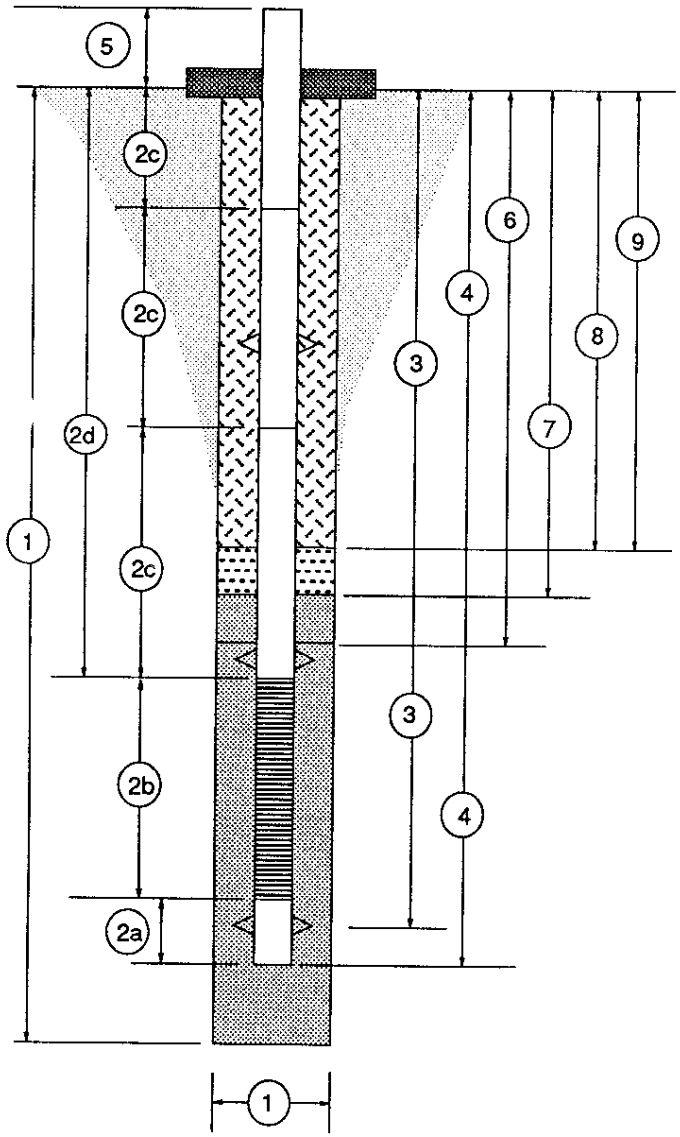
SRS COORDINATES N 77203.42 E 58256.46

DATE OF INSTALLATION 2/7/91

SANITARY SEAL ELEVATION 291.29

TECH. O.S./CO. NAME M. D. Hill/Sirrine

NOTE: ALL MEASUREMENTS ARE FROM GROUND SURFACE AT START OF BORING – MEASUREMENTS TO NEAREST 0.1 FOOT.



1) Total drilled depth/hole diameter 155.0 ft/ 9 7/8 in

2) Casing/Screen Tally (Measured to Nearest 0.01 Foot)

(a) Sump & Plug Length 2.65 ft

(b) Screen Length 9.95 ft

(c) Casing Joint Lengths (Measured in up-hole Sequence From Top of Screen) 10.03, 10.00, 10.01, 10.01, 10.00, 10.02., 10.03, 9.99, 10.01, 10.01, 10.00, 9.99, 10.00, 10.03, 1.87 ft

(d) Depth of Top of Screen 142.00 ft

3) Depths to Centralizers 21.0, 61.0, 101.0, 141.0, 152.0 ft

4) Total Depth of Installed Well 154.6 ft

5) Casing Stick Up (Standard 2.5' A.G.S.) 2.5 ft

6) Depth to Top of Filter Pack 137.0 ft

7) Depth to Top of Fine Sand Seal 135.5 ft

8) Depth to Top of Bentonite Seal 131.4 ft

9) Thickness of Grout 131.4 ft

OSR 30-5
(Rev 12/89)

MONITORING WELL CONSTRUCTION DETAILS

.ILLING SUBCONTRACTOR **EMTC**

WELL NUMBER **BGX-2D***

DRILLER **Bave Cunningham**

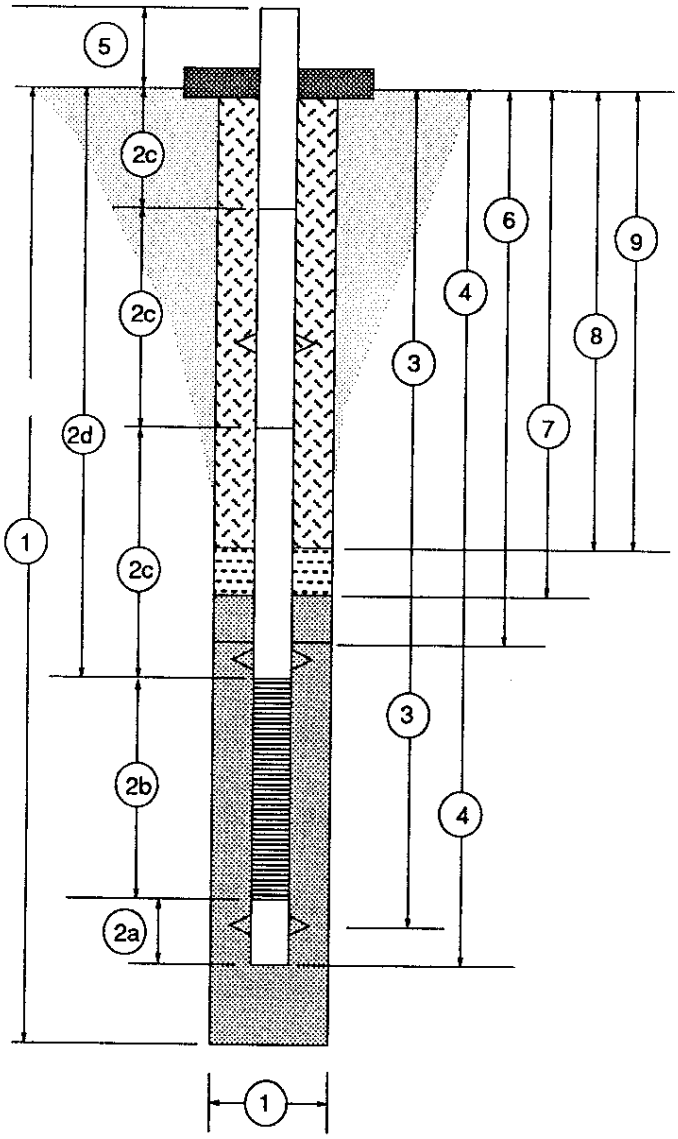
SRS COORDINATES **N 77192.42 E 58265.64**

DATE OF INSTALLATION **2/28/91**

SANITARY SEAL ELEVATION **291.14**

TECH. O.S./CO. NAME **W. Joyce/Sirrine**

NOTE: ALL MEASUREMENTS ARE FROM GROUND SURFACE AT START OF BORING – MEASUREMENTS TO NEAREST 0.1 FOOT.



1) Total drilled depth/hole diameter **115.0 ft/ 9 7/8 in**

2) Casing/Screen Tally (Measured to Nearest 0.01 Foot)

(a) Sump & Plug Length **5.38 ft**

(b) Screen Length **10.00 ft**

(c) Casing Joint Lengths (Measured in up-hole Sequence From Top of Screen) **10.01, 10.01, 9.99, 10.03, 10.02, 9.98, 5.02, 5.02, 5.01, 5.01, 10.01, 7.89 ft**

(d) Depth of Top of Screen **98.00 ft**

3) Depths to Centralizers **17.0, 57.0, 97.0, 109.0 ft**

4) Total Depth of Installed Well **113.4 ft**

5) Casing Stick Up (Standard 2.5' A.G.S.) **2.5 ft**

6) Depth to Top of Filter Pack **94.7 ft**

7) Depth to Top of Fine Sand Seal **92.7 ft**

8) Depth to Top of Bentonite Seal **88.1 ft**

9) Thickness of Grout **88.1 ft**

OSR 30-5
(Rev 12/89)

MONITORING WELL CONSTRUCTION DETAILS

ILLING SUBCONTRACTOR **EMTC**

WELL NUMBER **BGX-3D***

DRILLER **Jim Hall**

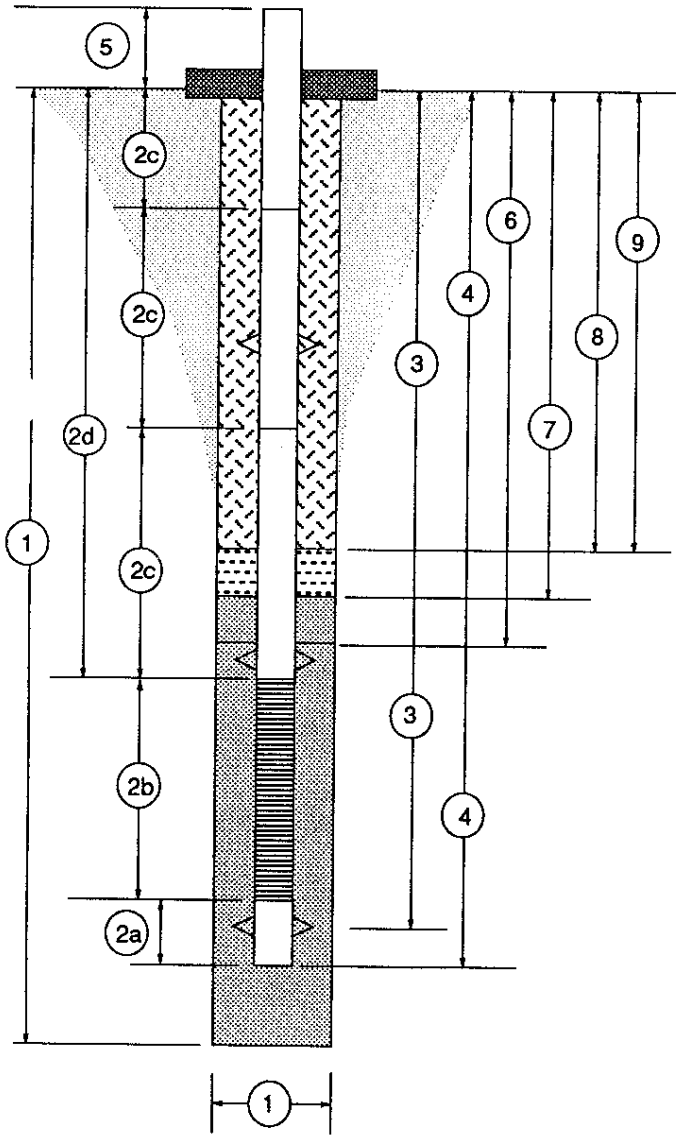
SRS COORDINATES **N 77577.03 E 57780.13**

DATE OF INSTALLATION **2/6/91**

SANITARY SEAL ELEVATION **291.21**

TECH. O.S./CO. NAME **W. Joyce/Sirrine**

NOTE: ALL MEASUREMENTS ARE FROM GROUND SURFACE AT START OF BORING – MEASUREMENTS TO NEAREST 0.1 FOOT.



1) Total drilled depth/hole diameter **95.0 ft/ 9 7/8 in**

2) Casing/Screen Tally (Measured to Nearest 0.01 Foot)

(a) Sump & Plug Length **5.40 ft**

(b) Screen Length **20.01 ft**

(c) Casing Joint Lengths (Measured in up-hole Sequence From Top of Screen) **10.02, 10.01, 10.01, 10.01, 10.01, 10.00, 7.44 ft**

(d) Depth of Top of Screen **67.50 ft**

3) Depths to Centralizers **5.0, 26.5, 66.5, 88.5 ft**

4) Total Depth of Installed Well **92.9 ft**

5) Casing Stick Up (Standard 2.5' A.G.S.) **2.5 ft**

6) Depth to Top of Filter Pack **64.1 ft**

7) Depth to Top of Fine Sand Seal **61.9 ft**

8) Depth to Top of Bentonite Seal **57.0 ft**

9) Thickness of Grout **57.0 ft**

OSR 30-5
(Rev 12/89)

MONITORING WELL CONSTRUCTION DETAILS

.ILLING SUBCONTRACTOR EMTC

WELL NUMBER BGX-4A

DRILLER Steve Reese

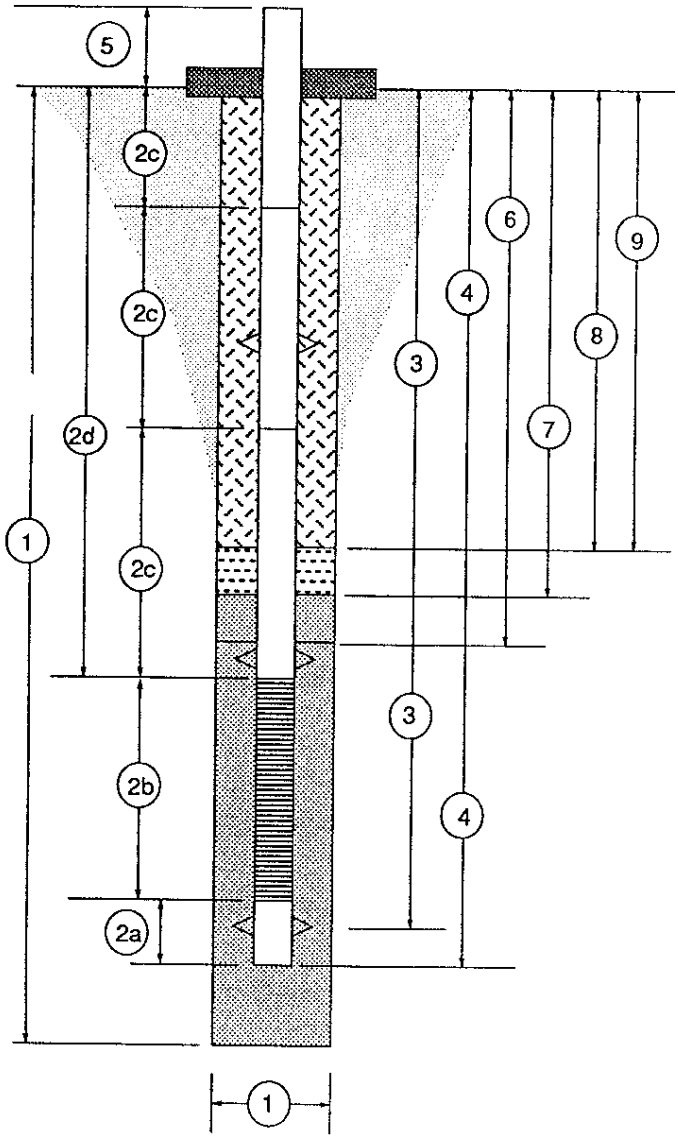
SRS COORDINATES N 77879.18 E 57215.58

DATE OF INSTALLATION 1/17/91

SANITARY SEAL ELEVATION 290.86

TECH. O.S./CO. NAME M. D. Hill/Sirrine

NOTE: ALL MEASUREMENTS ARE FROM GROUND SURFACE AT START OF BORING – MEASUREMENTS TO NEAREST 0.1 FOOT.



1) Total drilled depth/hole diameter 190.0 ft/ 9 7/8 in

2) Casing/Screen Tally (Measured to Nearest 0.01 Foot)

(a) Sump & Plug Length 5.39 ft

(b) Screen Length 10.00 ft

(c) Casing Joint Lengths (Measured in up-hole Sequence From Top of Screen) 10.01, 10.01, 10.01, 10.01, 10.00, 10.01, 10.02, 10.02, 10.00, 10.00, 10.01, 10.00, 10.00, 10.00, 10.00, 10.00, 10.00, 1.90 ft

(d) Depth of Top of Screen 172.00 ft

3) Depths to Centralizers 11.0, 51.0, 91.0, 131.0, 171.0, 183.0 ft

4) Total Depth of Installed Well 187.4 ft

5) Casing Stick Up (Standard 2.5' A.G.S.) 2.5 ft

6) Depth to Top of Filter Pack 167.2 ft

7) Depth to Top of Fine Sand Seal 166.0 ft

8) Depth to Top of Bentonite Seal 160.0 ft

9) Thickness of Grout 160.0 ft

OSR 30-5
(Rev 12/89)

MONITORING WELL CONSTRUCTION DETAILS

LLING SUBCONTRACTOR EMTC

WELL NUMBER BGX-4C

DRILLER Steve Reese

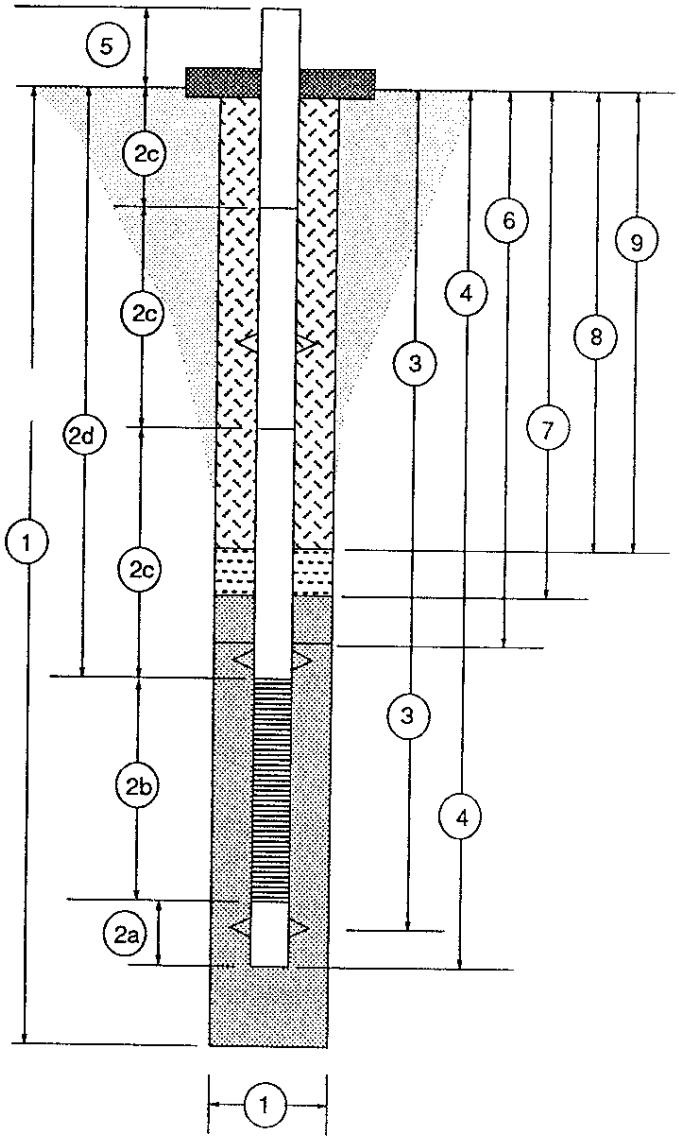
SRS COORDINATES N 77886.15 E 57202.19

DATE OF INSTALLATION 1/21/91

SANITARY SEAL ELEVATION 290.77

TECH. O.S./CO. NAME M. D. Hill/Sirrine

NOTE: ALL MEASUREMENTS ARE FROM GROUND SURFACE AT START OF BORING – MEASUREMENTS TO NEAREST 0.1 FOOT.



1) Total drilled depth/hole diameter 125.0 ft/ 9 7/8 in

2) Casing/Screen Tally (Measured to Nearest 0.01 Foot)

(a) Sump & Plug Length 5.40 ft

(b) Screen Length 10.00 ft

(c) Casing Joint Lengths (Measured in up-hole Sequence From Top of Screen) 10.00, 10.02, 10.00, 10.01, 10.00, 10.02, 10.01, 10.00, 10.01, 10.00, 7.93 ft

(d) Depth of Top of Screen 108. 00 ft

3) Depths to Centralizers 7.0, 27.0, 67.0, 107.0, 119.0 ft

4) Total Depth of Installed Well 123.4 ft

5) Casing Stick Up (Standard 2.5' A.G.S.) 2.5 ft

6) Depth to Top of Filter Pack 104.5 ft

7) Depth to Top of Fine Sand Seal 102.5 ft

8) Depth to Top of Bentonite Seal 99.2 ft

9) Thickness of Grout 99.2 ft

OSR 30-5
(Rev 12/89)

MONITORING WELL CONSTRUCTION DETAILS

DRILLING SUBCONTRACTOR EMTC

WELL NUMBER BGX-4D*

DRILLER Steve Reese

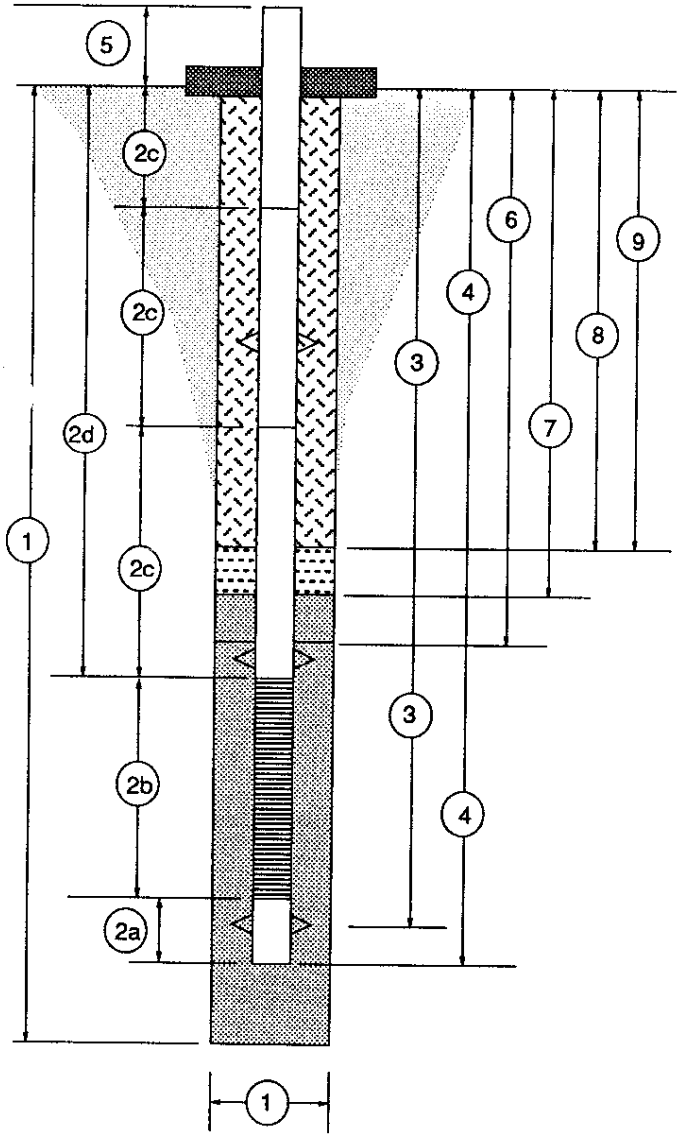
SRS COORDINATES N 77893.92 E 57186.16

DATE OF INSTALLATION 1/28/91

SANITARY SEAL ELEVATION 290.88

TECH. O.S./CO. NAME M. D. Hill/Sirrine

NOTE: ALL MEASUREMENTS ARE FROM GROUND SURFACE AT START OF BORING – MEASUREMENTS TO NEAREST 0.1 FOOT.



1) Total drilled depth/hole diameter 90.0 ft/ 9 7/8 in

2) Casing/Screen Tally (Measured to Nearest 0.01 Foot)

(a) Sump & Plug Length 5.42 ft

(b) Screen Length 19.99 ft

(c) Casing Joint Lengths (Measured in up-hole Sequence From Top of Screen) 10.00, 10.00, 9.98, 9.99, 10.00, 10.00, 5.03 ft

(d) Depth of Top of Screen 65.00 ft

3) Depths to Centralizers 24.0, 64.0, 86.0 ft

4) Total Depth of Installed Well 90.4 ft

5) Casing Stick Up (Standard 2.5' A.G.S.) 2.5 ft

6) Depth to Top of Filter Pack 60.5 ft

7) Depth to Top of Fine Sand Seal 58.2 ft

8) Depth to Top of Bentonite Seal 53.5 ft

9) Thickness of Grout 53.5 ft

OSR 30-5
(Rev 12/89)

MONITORING WELL CONSTRUCTION DETAILS

.ILLING SUBCONTRACTOR EMTC

WELL NUMBER BGX-5D*

DRILLER Jim Hall

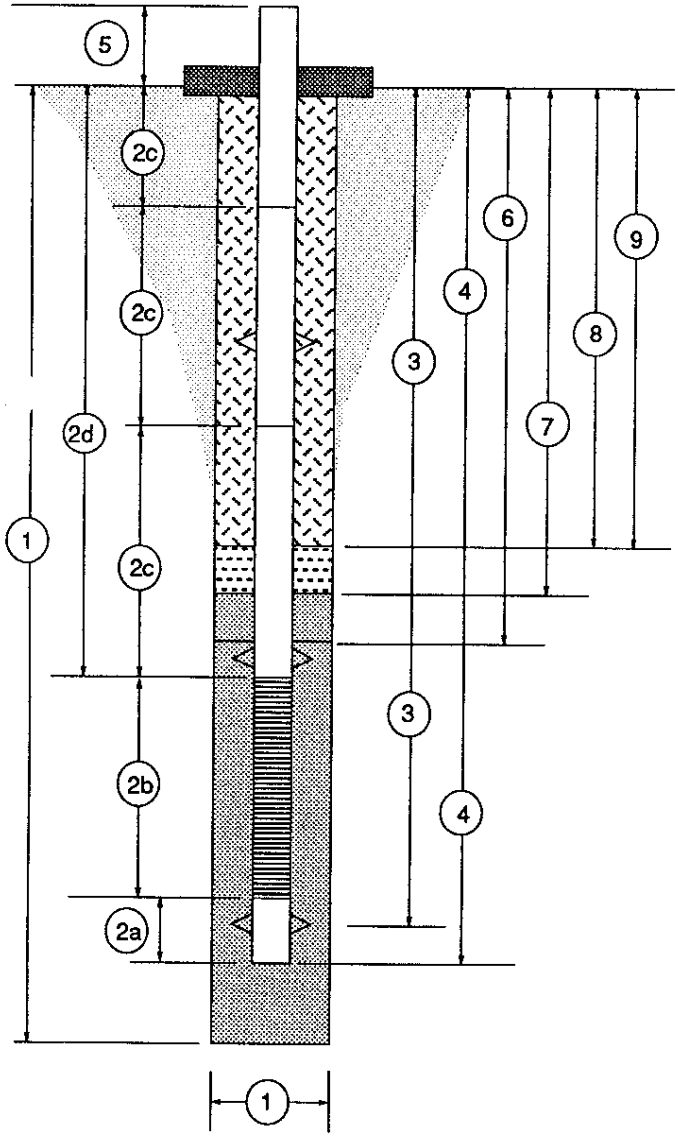
SRS COORDINATES N 78401.99 E 57308.64

DATE OF INSTALLATION 2/4/91

SANITARY SEAL ELEVATION 285.04

TECH. O.S./CO. NAME W. Joyce/Sirrine

NOTE: ALL MEASUREMENTS ARE FROM GROUND SURFACE AT START OF BORING – MEASUREMENTS TO NEAREST 0.1 FOOT.



1) Total drilled depth/hole diameter 98.0 ft/ 9 7/8 in

2) Casing/Screen Tally (Measured to Nearest 0.01 Foot)

(a) Sump & Plug Length 5.39 ft

(b) Screen Length 20.02 ft

(c) Casing Joint Lengths (Measured in up-hole Sequence From Top of Screen) 10.00, 10.01, 10.01, 10.01, 10.00, 10.02, 7.95 ft

(d) Depth of Top of Screen 68.00 ft

3) Depths to Centralizers 5.0, 27.0, 67.0, 89.0 ft

4) Total Depth of Installed Well 93.4 ft

5) Casing Stick Up (Standard 2.5' A.G.S.) 2.5 ft

6) Depth to Top of Filter Pack 64.6 ft

7) Depth to Top of Fine Sand Seal 62.3 ft

8) Depth to Top of Bentonite Seal 57.9 ft

9) Thickness of Grout 57.9 ft

OSR 30-5
(Rev 12/89)

MONITORING WELL CONSTRUCTION DETAILS

ILLING SUBCONTRACTOR EMTC

WELL NUMBER BGX-6D*

DRILLER Steve Reese

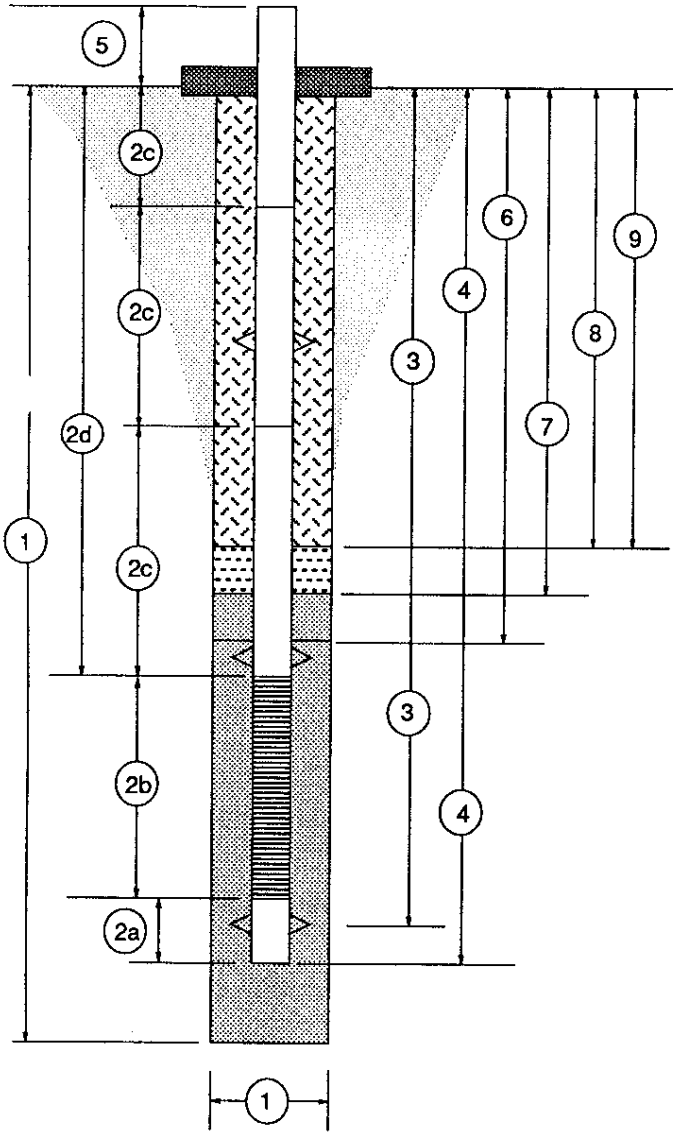
SRS COORDINATES N 78740.08 E 57524.85

DATE OF INSTALLATION 4/12/91

SANITARY SEAL ELEVATION 277.02

TECH. O.S./CO. NAME M. D. Hill/Sirrine

NOTE: ALL MEASUREMENTS ARE FROM GROUND SURFACE AT START OF BORING – MEASUREMENTS TO NEAREST 0.1 FOOT.



1) Total drilled depth/hole diameter 90.0 ft/ 9 7/8 in

2) Casing/Screen Tally (Measured to Nearest 0.01 Foot)

(a) Sump & Plug Length 5.50 ft

(b) Screen Length 20.01 ft

(c) Casing Joint Lengths (Measured in up-hole Sequence From Top of Screen) 0.29 (Johnson casing adapter),

10.01, 10.01, 10.00, 10.01, 10.01, 10.02, 3.66 ft

(d) Depth of Top of Screen 64.00 ft

3) Depths to Centralizers 9.2, 23.0, 63.0, 85.0 ft

4) Total Depth of Installed Well 89.5 ft

5) Casing Stick Up (Standard 2.5' A.G.S.) 2.5 ft

6) Depth to Top of Filter Pack 60.7 ft

7) Depth to Top of Fine Sand Seal 58.5 ft

8) Depth to Top of Bentonite Seal 55.0 ft

9) Thickness of Grout 55.0 ft

OSR 30-5
(Rev 12/89)

MONITORING WELL CONSTRUCTION DETAILS

ILLING SUBCONTRACTOR EMTC

WELL NUMBER BGX-7D*

DRILLER Steve Reese

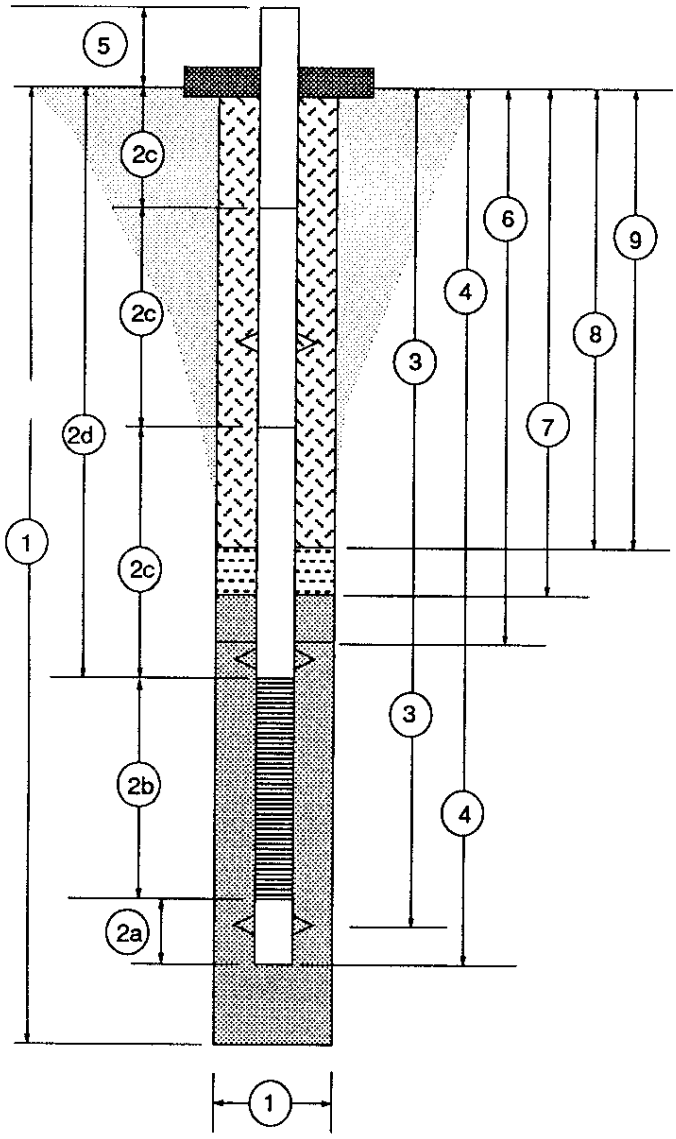
SRS COORDINATES N 78349.26 E 58312.75

DATE OF INSTALLATION 4/10/91

SANITARY SEAL ELEVATION Not Available

TECH. O.S./CO. NAME M. D. Hill/Sirrine

NOTE: ALL MEASUREMENTS ARE FROM GROUND SURFACE AT START OF BORING – MEASUREMENTS TO NEAREST 0.1 FOOT.



1) Total drilled depth/hole diameter 19.0 ft/ 14 3/4 in
90.0 ft/ 9 7/8 in

2) Casing/Screen Tally (Measured to Nearest 0.01 Foot)

(a) Sump & Plug Length 5.51 ft

(b) Screen Length 20.03 ft

(c) Casing Joint Lengths (Measured in up-hole Sequence From Top of Screen) 0.29 (Johnson casing adapter),
9.99, 10.00, 10.00, 9.99, 9.98, 9.98, 2.77 ft

(d) Depth of Top of Screen 63.00 ft

3) Depths to Centralizers 7.5, 22.0, 62.0, 84.0 ft

4) Total Depth of Installed Well 88.5 ft

5) Casing Stick Up (Standard 2.5' A.G.S.) 2.5 ft

6) Depth to Top of Filter Pack 61.0 ft

7) Depth to Top of Fine Sand Seal 58.4 ft

8) Depth to Top of Bentonite Seal 54.3 ft

9) Thickness of Grout 54.3 ft

OSR 30-5
(Rev 12/89)

MONITORING WELL CONSTRUCTION DETAILS

.ILLING SUBCONTRACTOR **EMTC**

WELL NUMBER **BGX-8D***

DRILLER **Bave Cunningham**

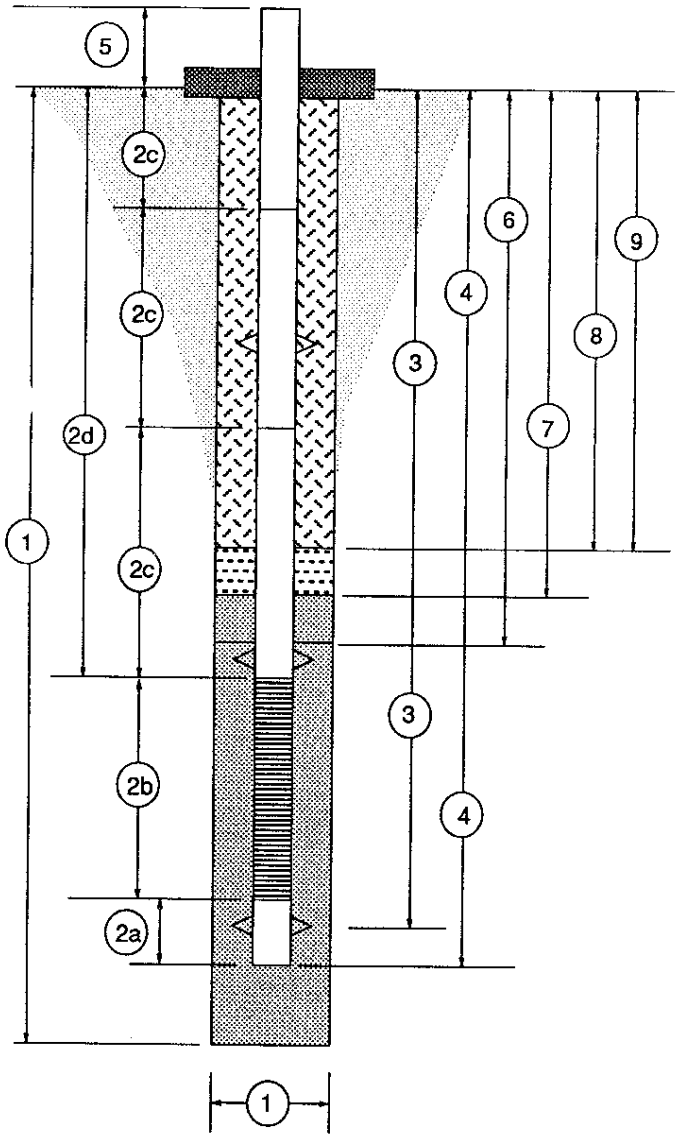
SRS COORDINATES **N 77589.61 E 58942.51**

DATE OF INSTALLATION **5-31-91**

SANITARY SEAL ELEVATION **278.21**

TECH. O.S./CO. NAME **R. Enright/Sirrine**

NOTE: ALL MEASUREMENTS ARE FROM GROUND SURFACE AT START OF BORING – MEASUREMENTS TO NEAREST 0.1 FOOT.



1) Total drilled depth/hole diameter **115.0 ft/10.0 in**

2) Casing/Screen Tally (Measured to Nearest 0.01 Foot)

(a) Sump & Plug Length **5.34 ft**

(b) Screen Length **20.04 ft**

(c) Casing Joint Lengths (Measured in up-hole Sequence From Top of Screen) **10.02, 9.99, 10.01, 9.98, 10.02, 10.01, 10.01, 2.96 ft**

(d) Depth of Top of Screen **73.40 ft**

3) Depths to Centralizers **6.9, 31.9, 71.4, 95.4 ft**

4) Total Depth of Installed Well **98.8 ft**

5) Casing Stick Up (Standard 2.5' A.G.S.) **2.50 ft**

6) Depth to Top of Filter Pack **68.9 ft**

7) Depth to Top of Fine Sand Seal **66.9 ft**

8) Depth to Top of Bentonite Seal **62.4 ft**

9) Thickness of Grout **62.4 ft**

OSR 30-5
(Rev 12/89)

MONITORING WELL CONSTRUCTION DETAILS

DRILLING SUBCONTRACTOR EMTC

WELL NUMBER BGX-9D

DRILLER Jim Hall

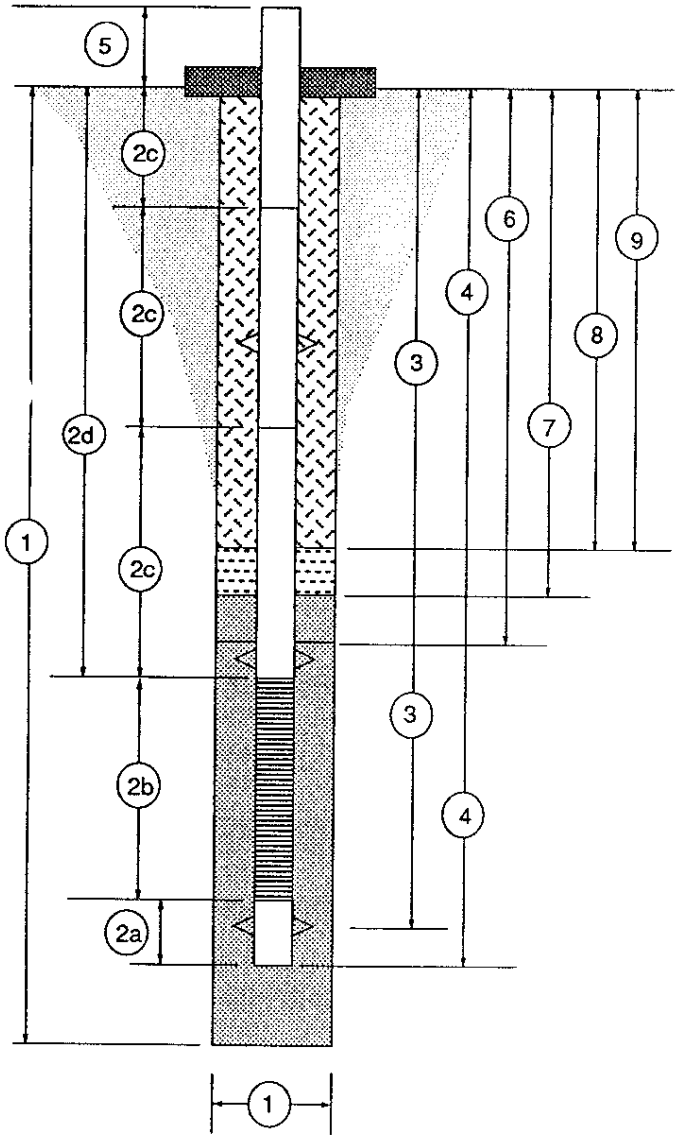
SRS COORDINATES N 76935.98 E 59522.11

DATE OF INSTALLATION 3/18/91

SANITARY SEAL ELEVATION 279.39

TECH. O.S./CO. NAME A. Stevenson/Sirrine

NOTE: ALL MEASUREMENTS ARE FROM GROUND SURFACE AT START OF BORING – MEASUREMENTS TO NEAREST 0.1 FOOT.



1) Total drilled depth/hole diameter 73.0 ft/ 9 7/8 in

2) Casing/Screen Tally (Measured to Nearest 0.01 Foot)

(a) Sump & Plug Length 5.38 ft

(b) Screen Length 20.01 ft

(c) Casing Joint Lengths (Measured in up-hole Sequence From Top of Screen) 10.01, 10.01, 10.01, 10.00, 4.97 ft

(d) Depth of Top of Screen 45.00 ft

3) Depths to Centralizers 4.0, 44.0, 66.0 ft

4) Total Depth of Installed Well 70.4 ft

5) Casing Stick Up (Standard 2.5' A.G.S.) 2.5 ft

6) Depth to Top of Filter Pack 41.9 ft

7) Depth to Top of Fine Sand Seal 39.4 ft

8) Depth to Top of Bentonite Seal 35.7 ft

9) Thickness of Grout 35.7 ft

DSR 30-5
(Rev 12/89)

MONITORING WELL CONSTRUCTION DETAILS

DRILLING SUBCONTRACTOR EMTC

WELL NUMBER BGX-10D

DRILLER Jim Hall

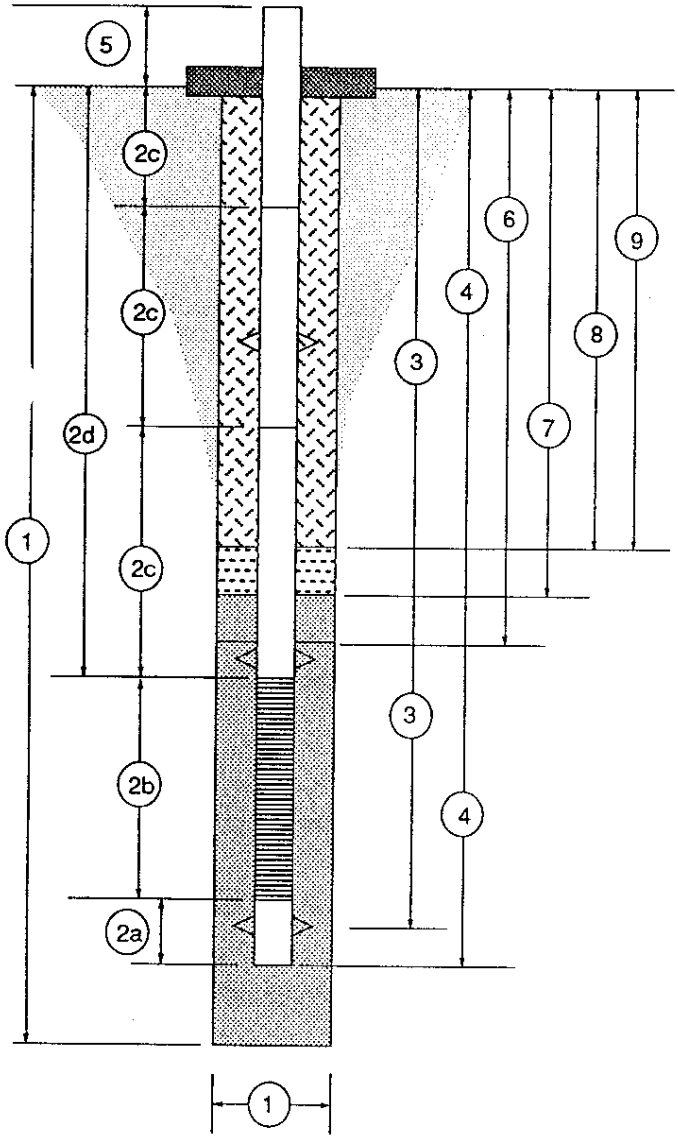
SRS COORDINATES N 76183.33 E 59765.48

DATE OF INSTALLATION 1/23/91

SANITARY SEAL ELEVATION 276.86

TECH. O.S./CO. NAME L. Bienkowski/Sirrine

NOTE: ALL MEASUREMENTS ARE FROM GROUND SURFACE AT START OF BORING – MEASUREMENTS TO NEAREST 0.1 FOOT.



1) Total drilled depth/hole diameter 64.0 ft/ 9 7/8 in

2) Casing/Screen Tally (Measured to Nearest 0.01 Foot)

(a) Sump & Plug Length 5.41 ft

(b) Screen Length 20.00 ft

(c) Casing Joint Lengths (Measured in up-hole Sequence From Top of Screen) 10.01, 10.00, 9.99, 8.58 ft

(d) Depth of Top of Screen 38.58 ft

3) Depths to Centralizers 3.9, 38.6, 59.6 ft

4) Total Depth of Installed Well 64.0 ft

5) Casing Stick Up (Standard 2.5' A.G.S.) 2.5 ft

6) Depth to Top of Filter Pack 35.6 ft

7) Depth to Top of Fine Sand Seal 34.4 ft

8) Depth to Top of Bentonite Seal 27.9 ft

9) Thickness of Grout 27.9 ft

OSR 30-5
(Rev 12/89)

MONITORING WELL CONSTRUCTION DETAILS

DRILLING SUBCONTRACTOR EMTC

WELL NUMBER BGX-11D

DRILLER Jim Hall

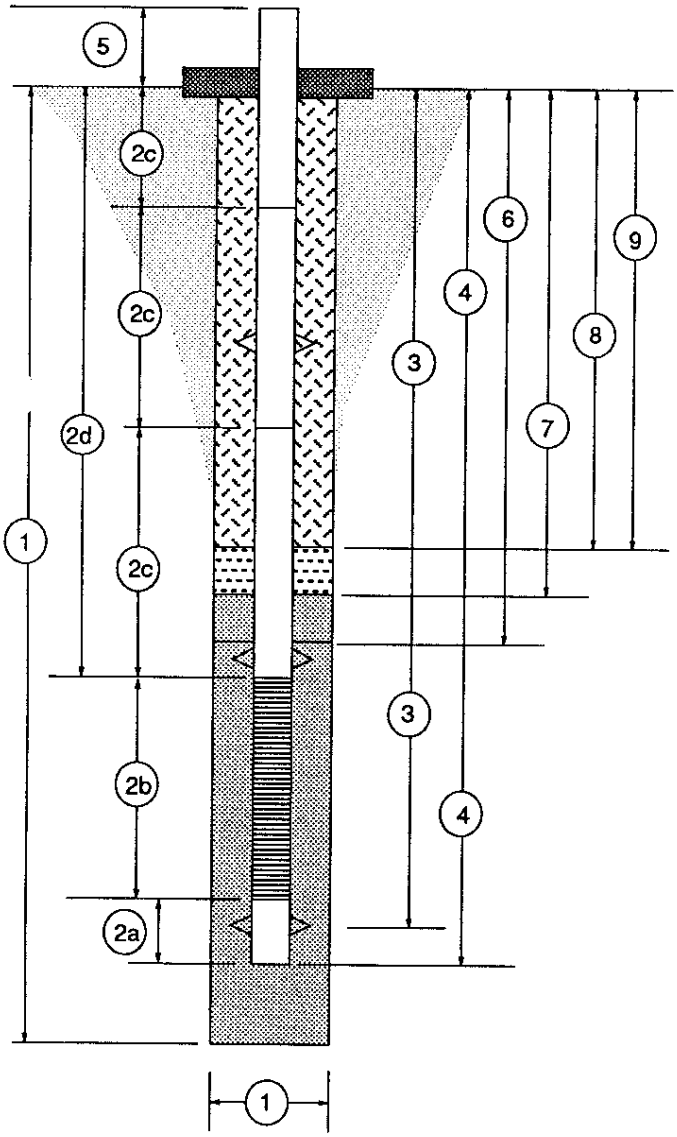
SRS COORDINATES N 75300.67 E 59581.42

DATE OF INSTALLATION 1/23/91

SANITARY SEAL ELEVATION 276.27

TECH. O.S./CO. NAME L. Bienkowski/Sirrine

NOTE: ALL MEASUREMENTS ARE FROM GROUND SURFACE AT START OF BORING – MEASUREMENTS TO NEAREST 0.1 FOOT.



1) Total drilled depth/hole diameter 62.0 ft/ 9 7/8 in

2) Casing/Screen Tally (Measured to Nearest 0.01 Foot)

(a) Sump & Plug Length 4.93 ft

(b) Screen Length 20.01 ft

(c) Casing Joint Lengths (Measured in up-hole Sequence From Top of Screen) 10.00, 10.01, 10.00, 7.05 ft

(d) Depth of Top of Screen 37.06 ft

3) Depths to Centralizers 3.0, 36.1, 58.1 ft

4) Total Depth of Installed Well 62.0ft

5) Casing Stick Up (Standard 2.5' A.G.S.) 2.5 ft

6) Depth to Top of Filter Pack 33.3 ft

7) Depth to Top of Fine Sand Seal 31.9 ft

8) Depth to Top of Bentonite Seal 27.8 ft

9) Thickness of Grout 27.8 ft

OSR 30-5
(Rev 12/89)

MONITORING WELL CONSTRUCTION DETAILS

ILLING SUBCONTRACTOR EMTC

WELL NUMBER BGX-12C

DRILLER Jim Hall

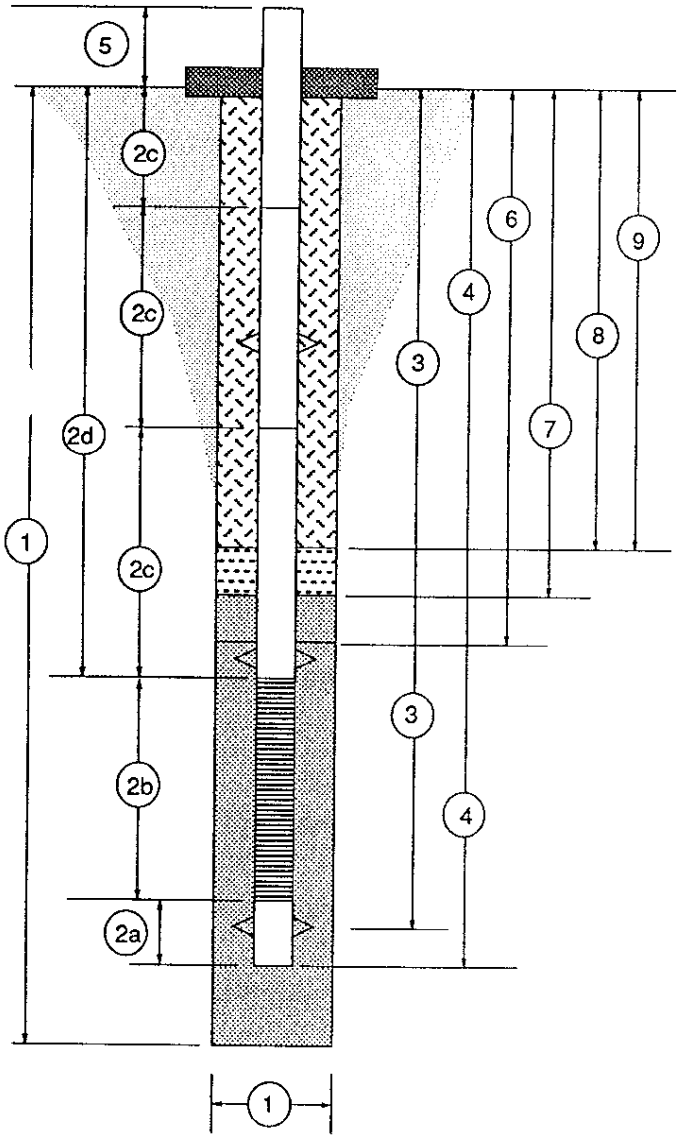
SRS COORDINATES N 74427.87 E 59675.30

DATE OF INSTALLATION 1/18/91

SANITARY SEAL ELEVATION 275.12

TECH. O.S./CO. NAME L. Blenkowski/Sirrine

NOTE: ALL MEASUREMENTS ARE FROM GROUND SURFACE AT START OF BORING – MEASUREMENTS TO NEAREST 0.1 FOOT.



1) Total drilled depth/hole diameter 115.0 ft/ 9 7/8 in

2) Casing/Screen Tally (Measured to Nearest 0.01 Foot)

(a) Sump & Plug Length 5.40 ft

(b) Screen Length 10.01 ft

(c) Casing Joint Lengths (Measured in up-hole Sequence From Top of Screen) 10.00, 10.00, 10.00, 10.00, 10.00, 10.00, 10.00, 10.00, 9.00 ft

(d) Depth of Top of Screen 89.00 ft

3) Depths to Centralizers 8.0, 48.0, 88.0, 100.1 ft

4) Total Depth of Installed Well 104.4 ft

5) Casing Stick Up (Standard 2.5' A.G.S.) 2.5 ft

6) Depth to Top of Filter Pack 84.7 ft

7) Depth to Top of Fine Sand Seal 83.6 ft

8) Depth to Top of Bentonite Seal 78.0 ft

9) Thickness of Grout 78.0 ft

OSR 30-5
(Rev 12/89)

MONITORING WELL CONSTRUCTION DETAILS

.LLING SUBCONTRACTOR EMTC

DRILLER Jim Hall

DATE OF INSTALLATION 1/21/91

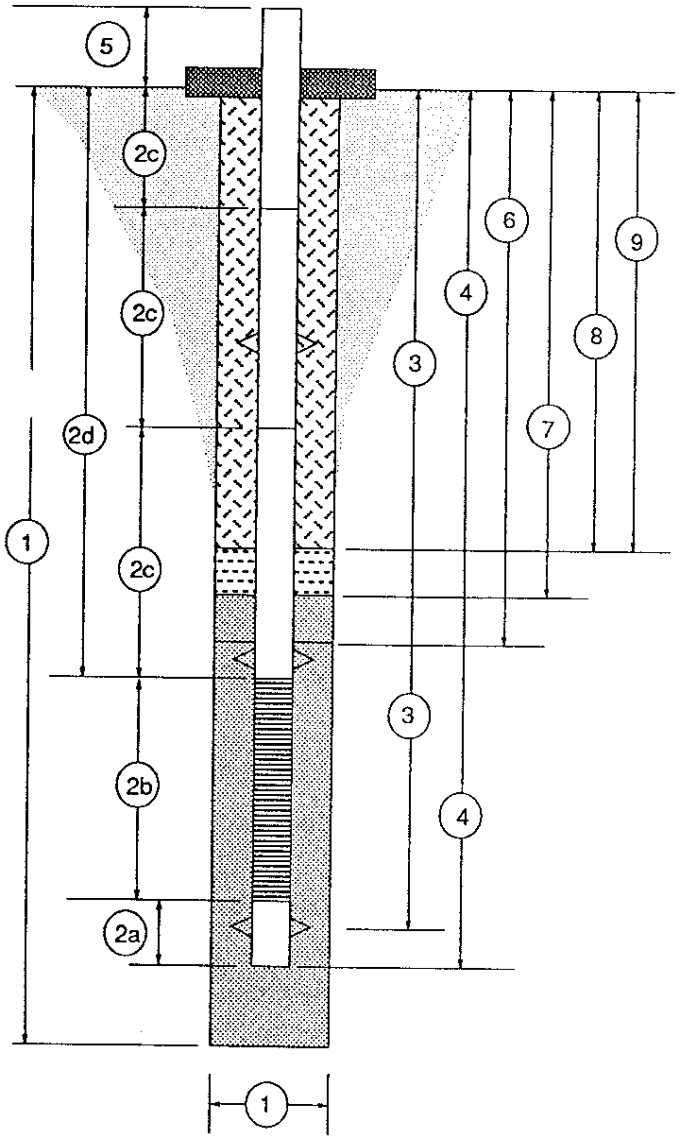
TECH. O.S./CO. NAME L. Bienkowski/Sirrine

WELL NUMBER BGX-12D

SRS COORDINATES N 74410.88 E 59674.29

SANITARY SEAL ELEVATION 275.24

NOTE: ALL MEASUREMENTS ARE FROM GROUND SURFACE AT START OF BORING – MEASUREMENTS TO NEAREST 0.1 FOOT.



1) Total drilled depth/hole diameter 55.0 ft/ 9 7/8 in

2) Casing/Screen Tally (Measured to Nearest 0.01 Foot)

(a) Sump & Plug Length 5.44ft

(b) Screen Length 20.03 ft

(c) Casing Joint Lengths (Measured in up-hole Sequence From Top of Screen) 10.00, 10.00, 9.53 ft

(d) Depth of Top of Screen 29.53 ft

3) Depths to Centralizers 4.0, 28.5, 50.9 ft

4) Total Depth of Installed Well 55.0 ft

5) Casing Stick Up (Standard 2.5' A.G.S.) 2.5 ft

6) Depth to Top of Filter Pack 26.3 ft

7) Depth to Top of Fine Sand Seal 24.8 ft

8) Depth to Top of Bentonite Seal 19.4 ft

9) Thickness of Grout 19.4 ft

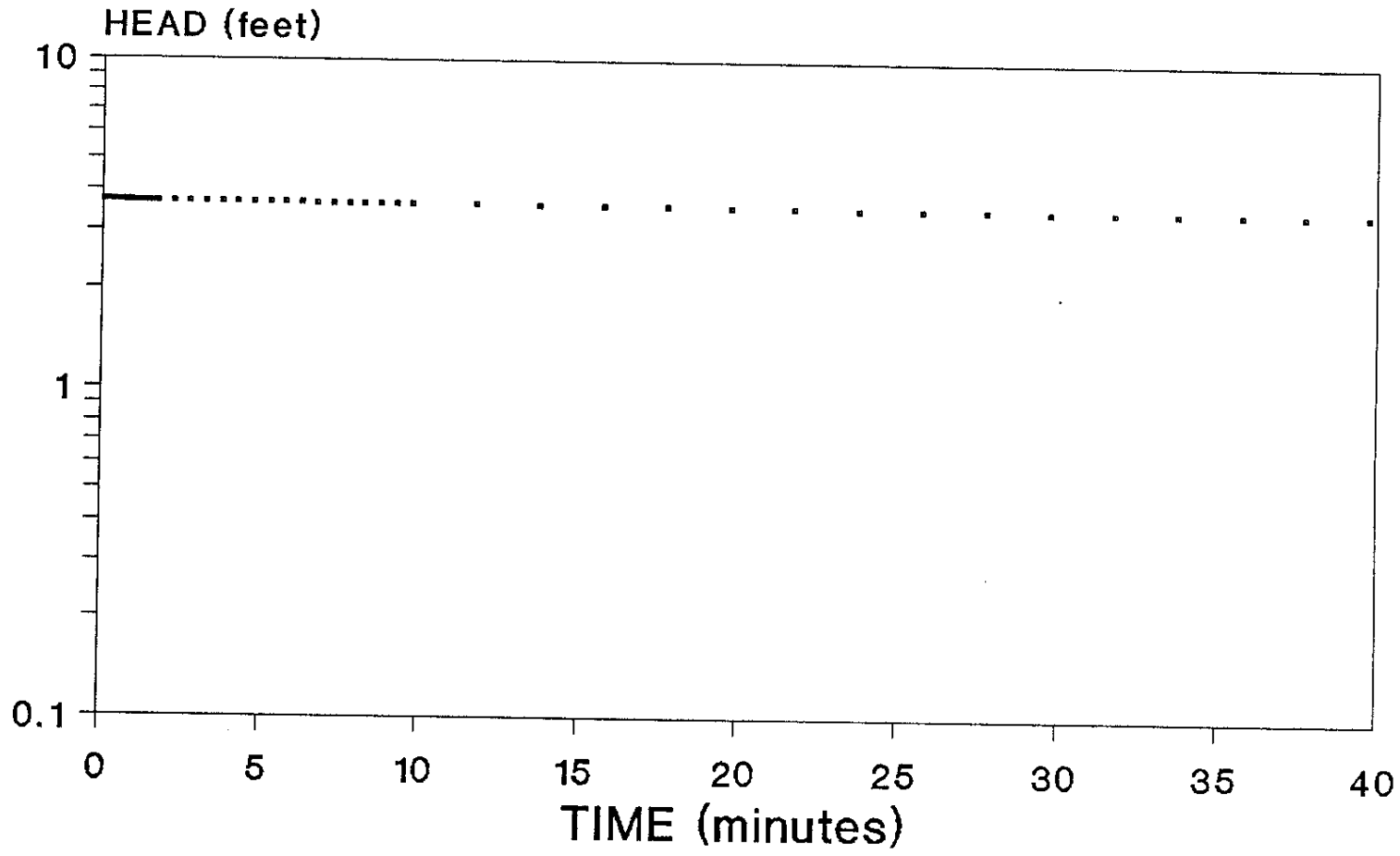
Appendix E

APPENDIX E

FIELD PERMEABILITY TEST DATA

BGX-1A

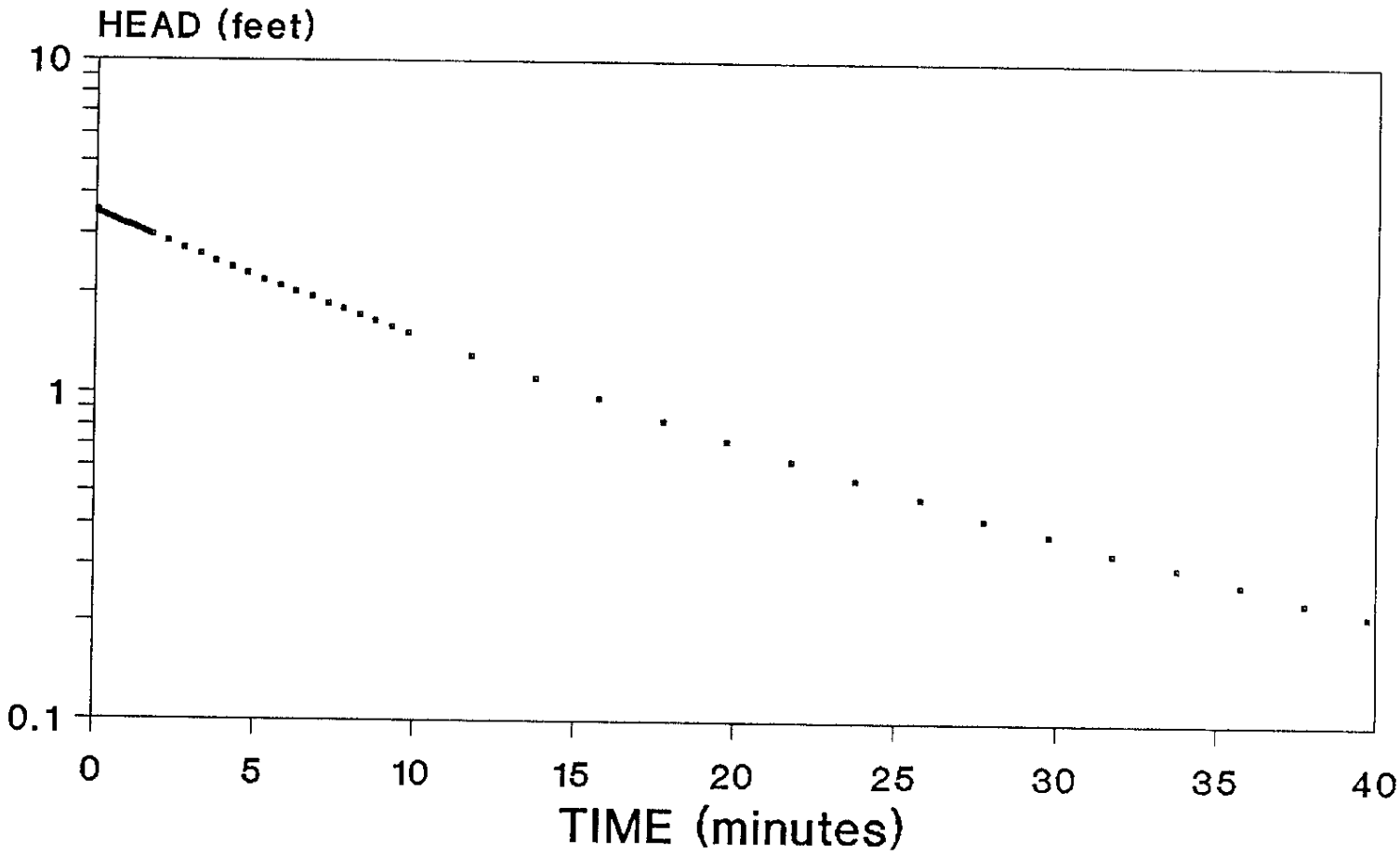
Falling Head Slug Test



NOTE: Available records indicate that this well was only partially developed.

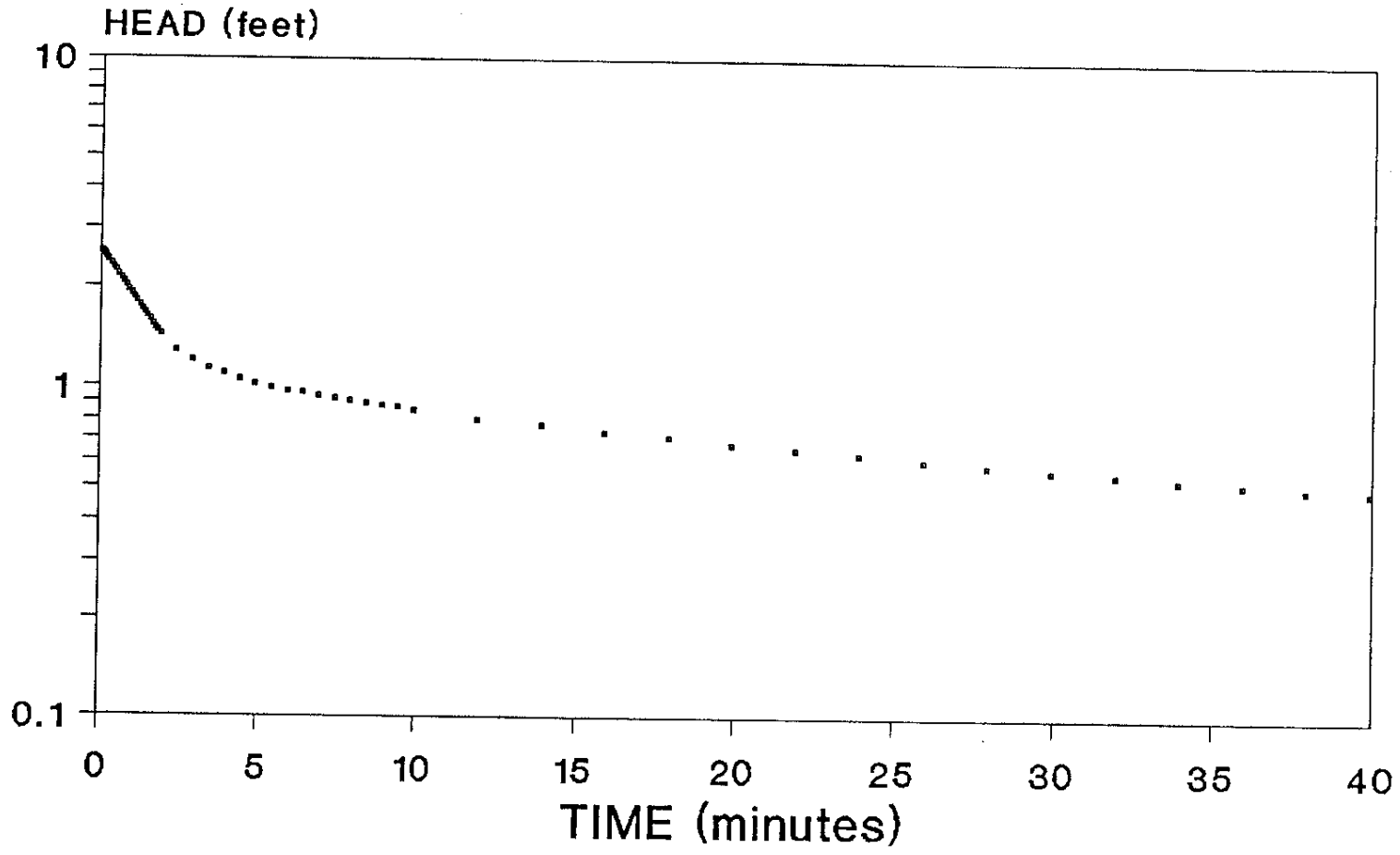
BGX-1C

Falling Head Slug Test



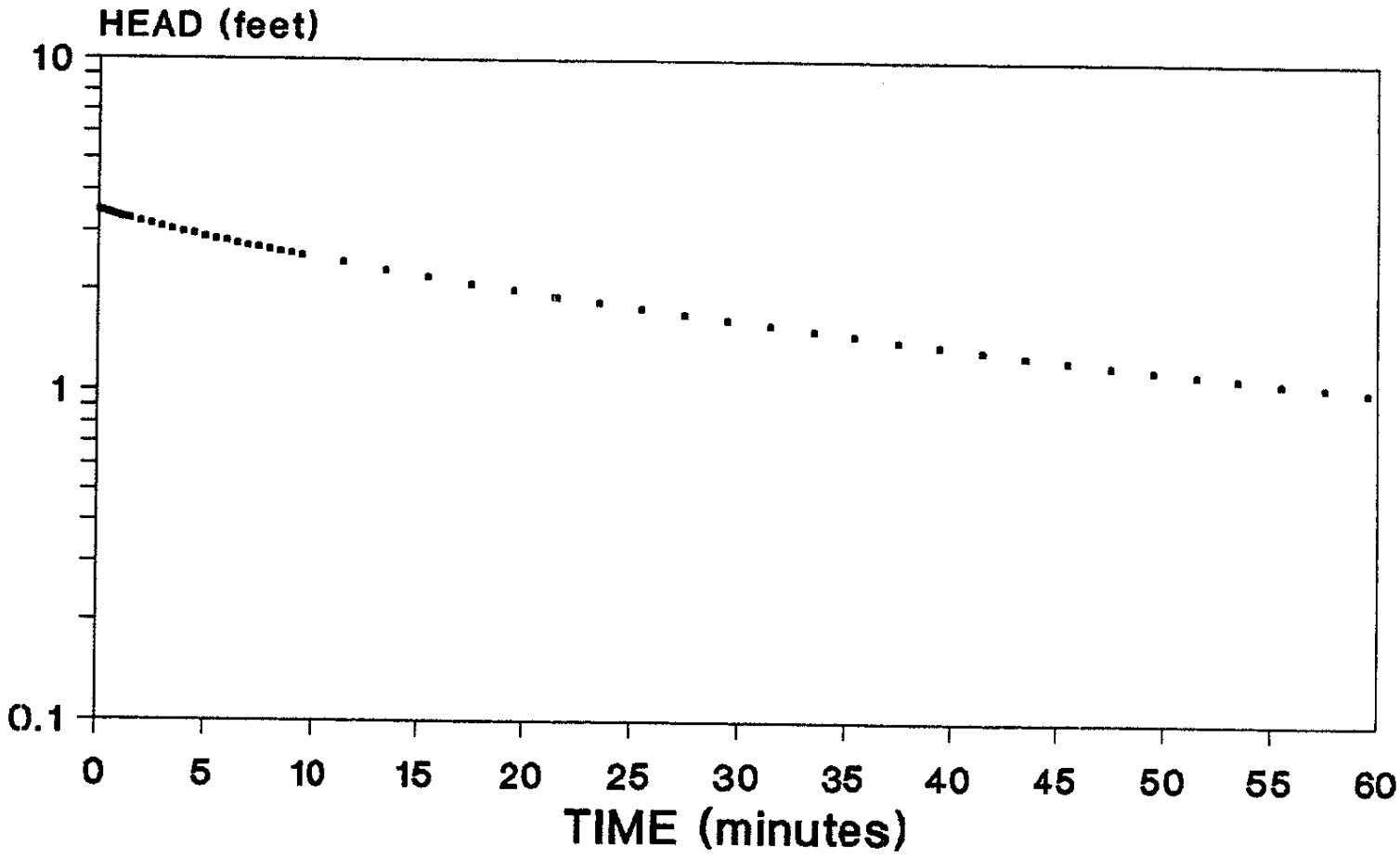
BGX-1D

Rising Head Slug Test



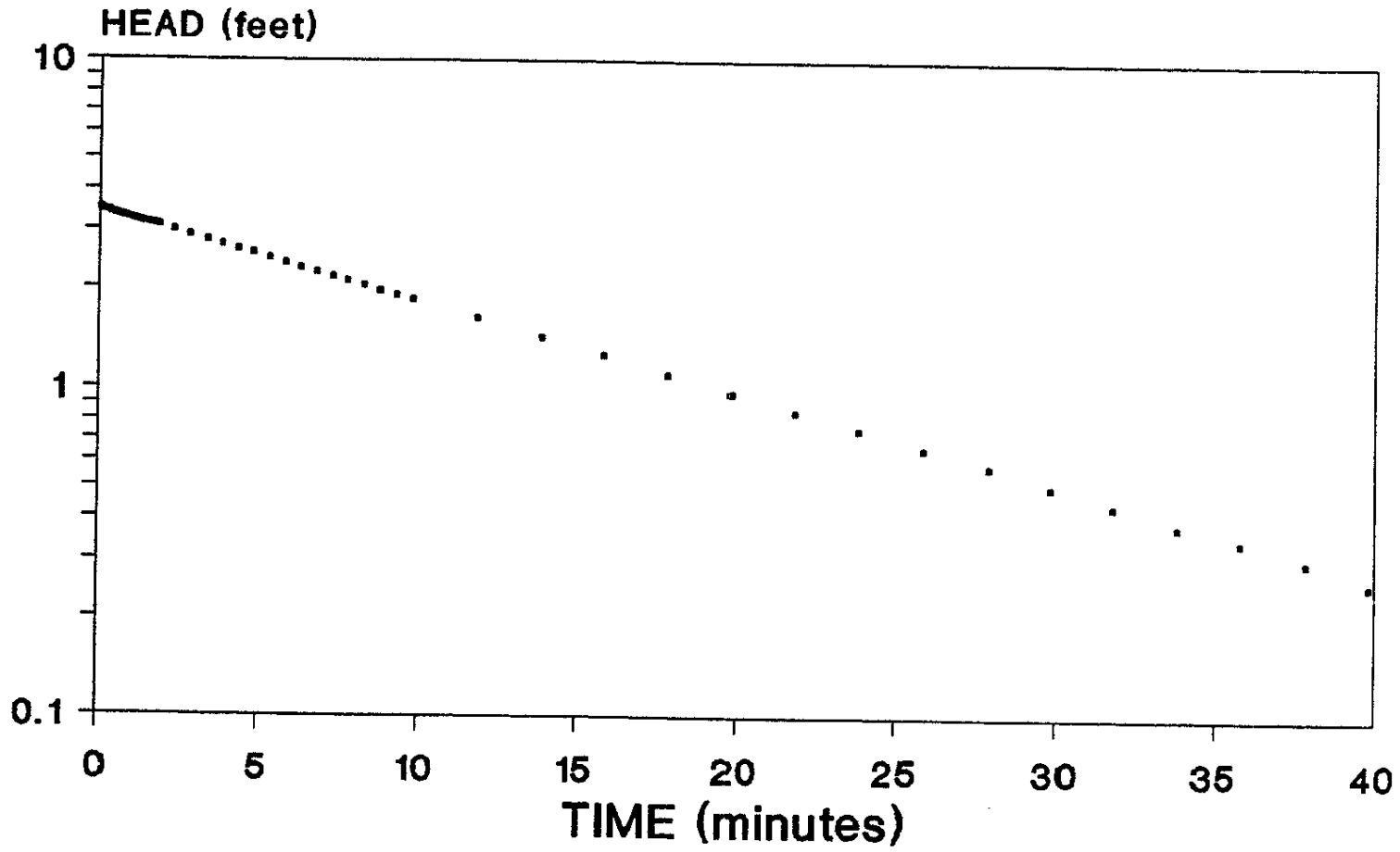
BGX-2B

Falling Head Slug Test



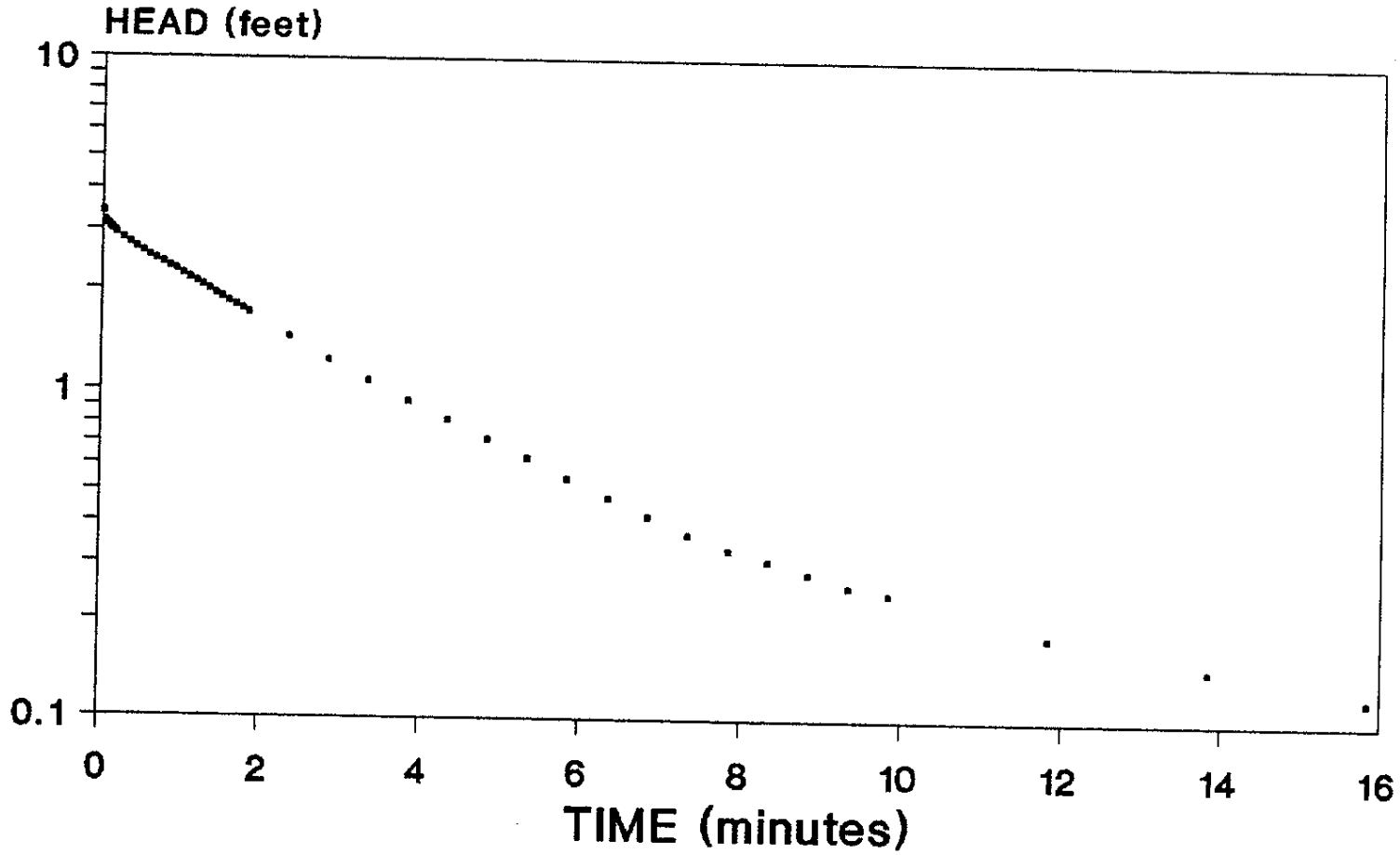
BGX-2D *

Falling Head Slug Test



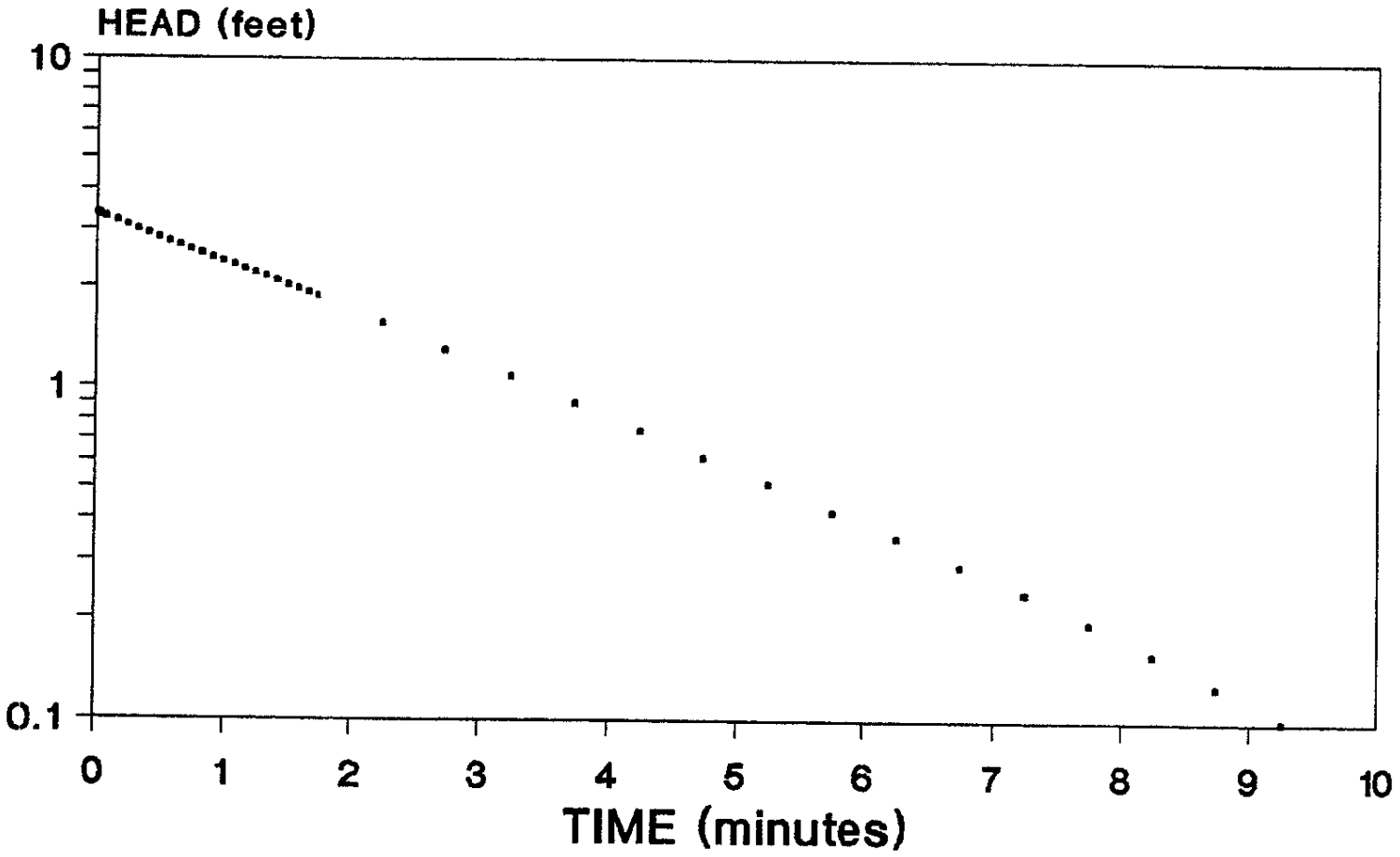
BGX-3D *

Rising Head Slug Test



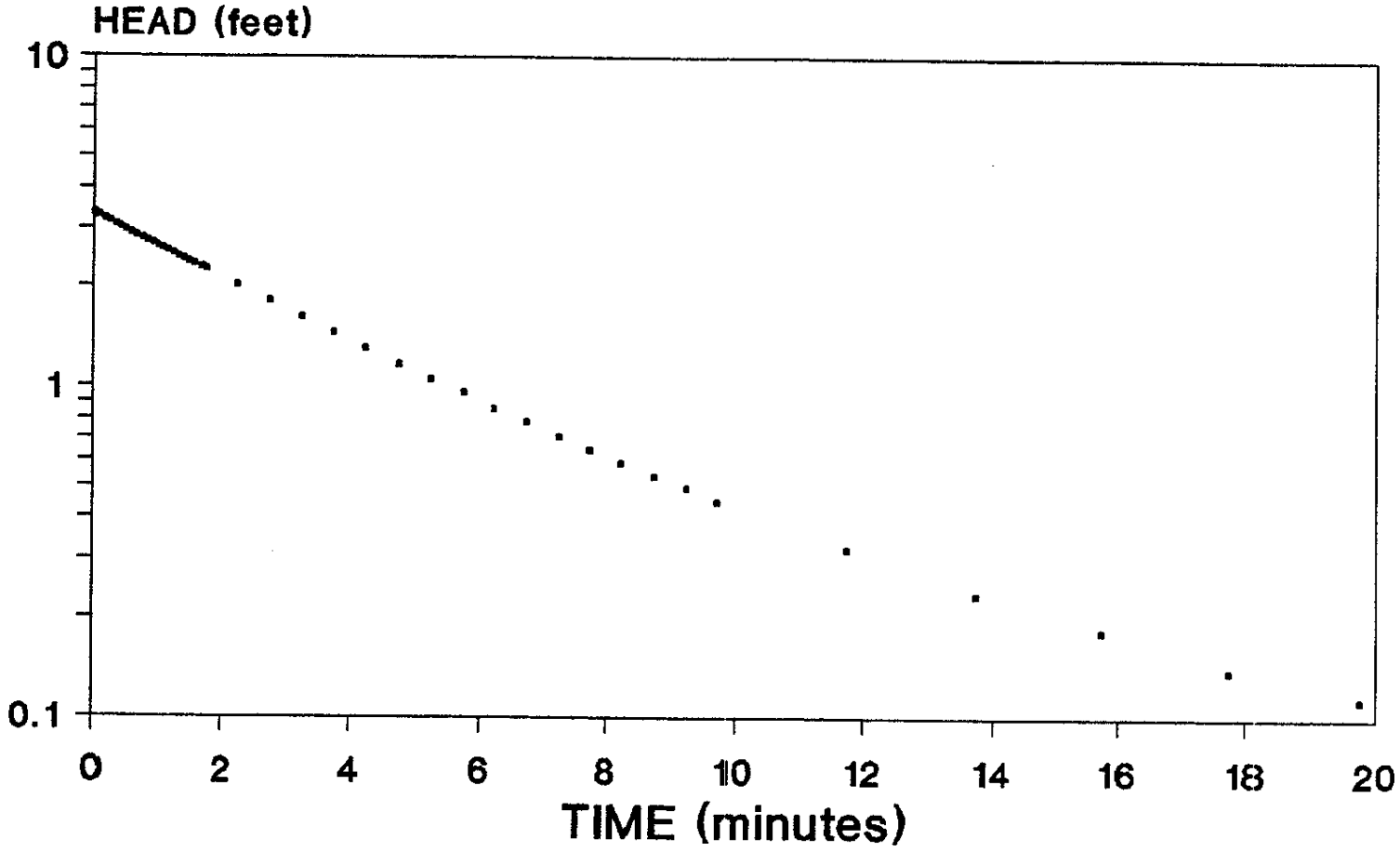
BGX-4A

Falling Head Slug Test



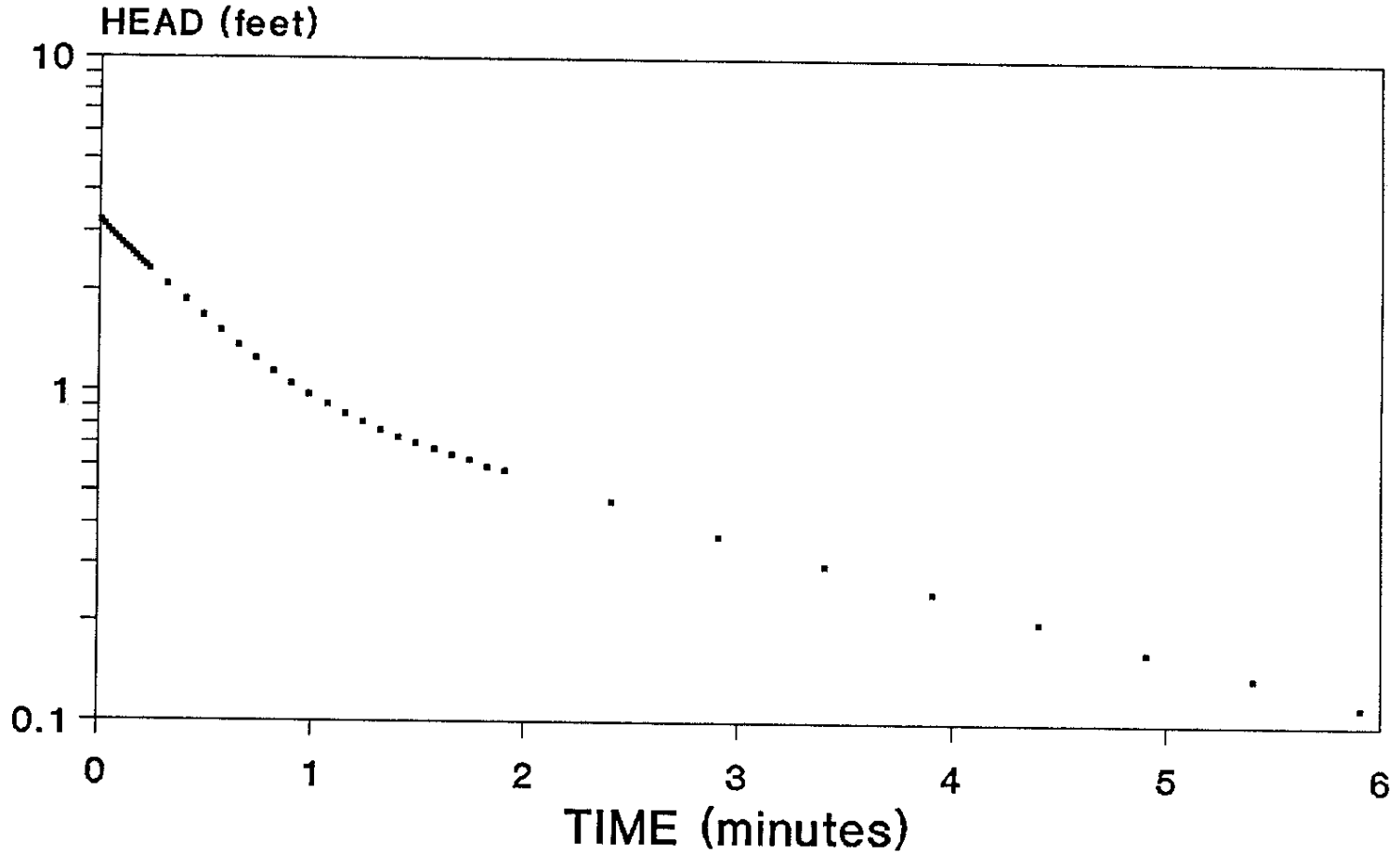
BGX-4C

Falling Head Slug Test



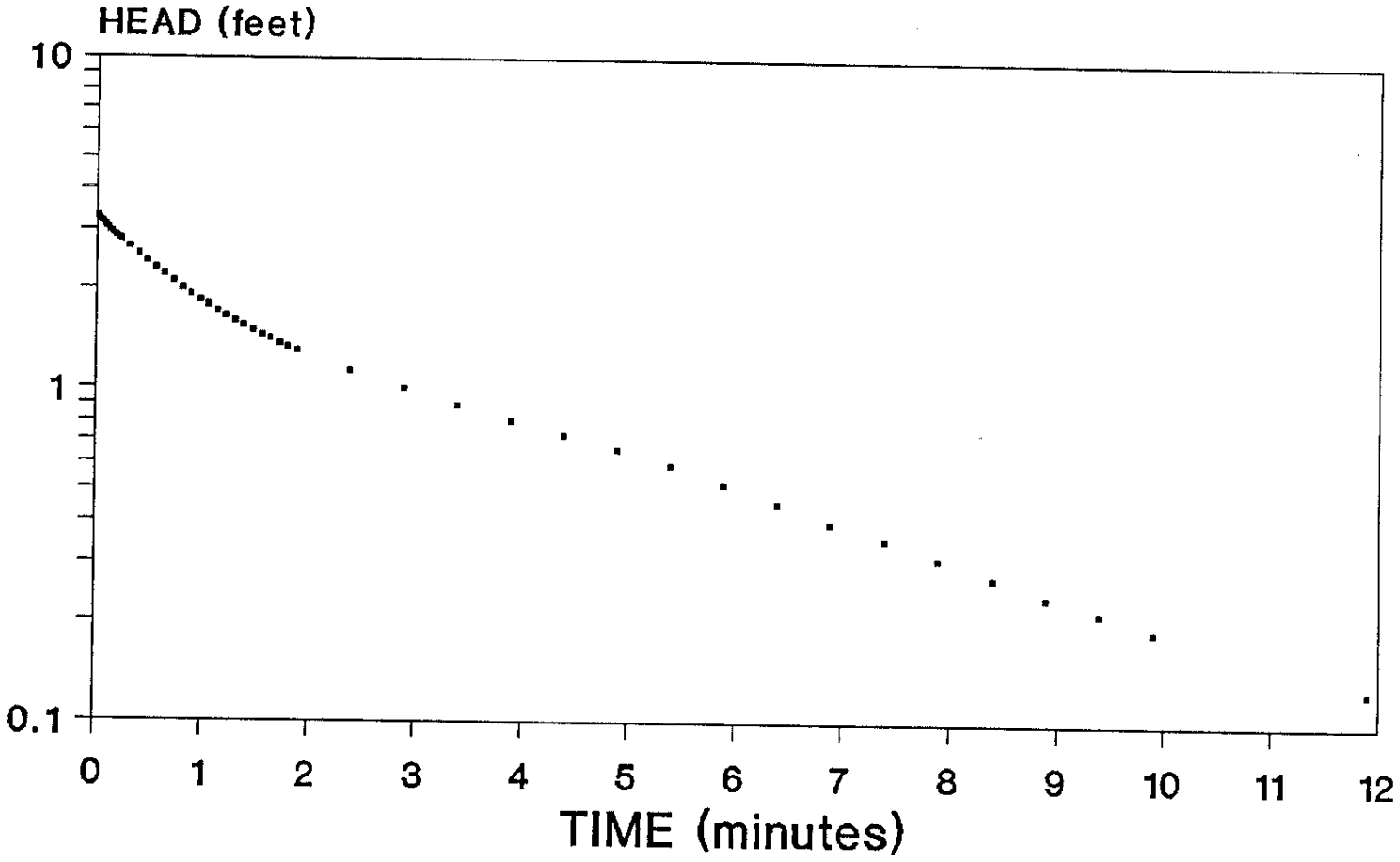
BGX-4D *

Rising Head Slug Test



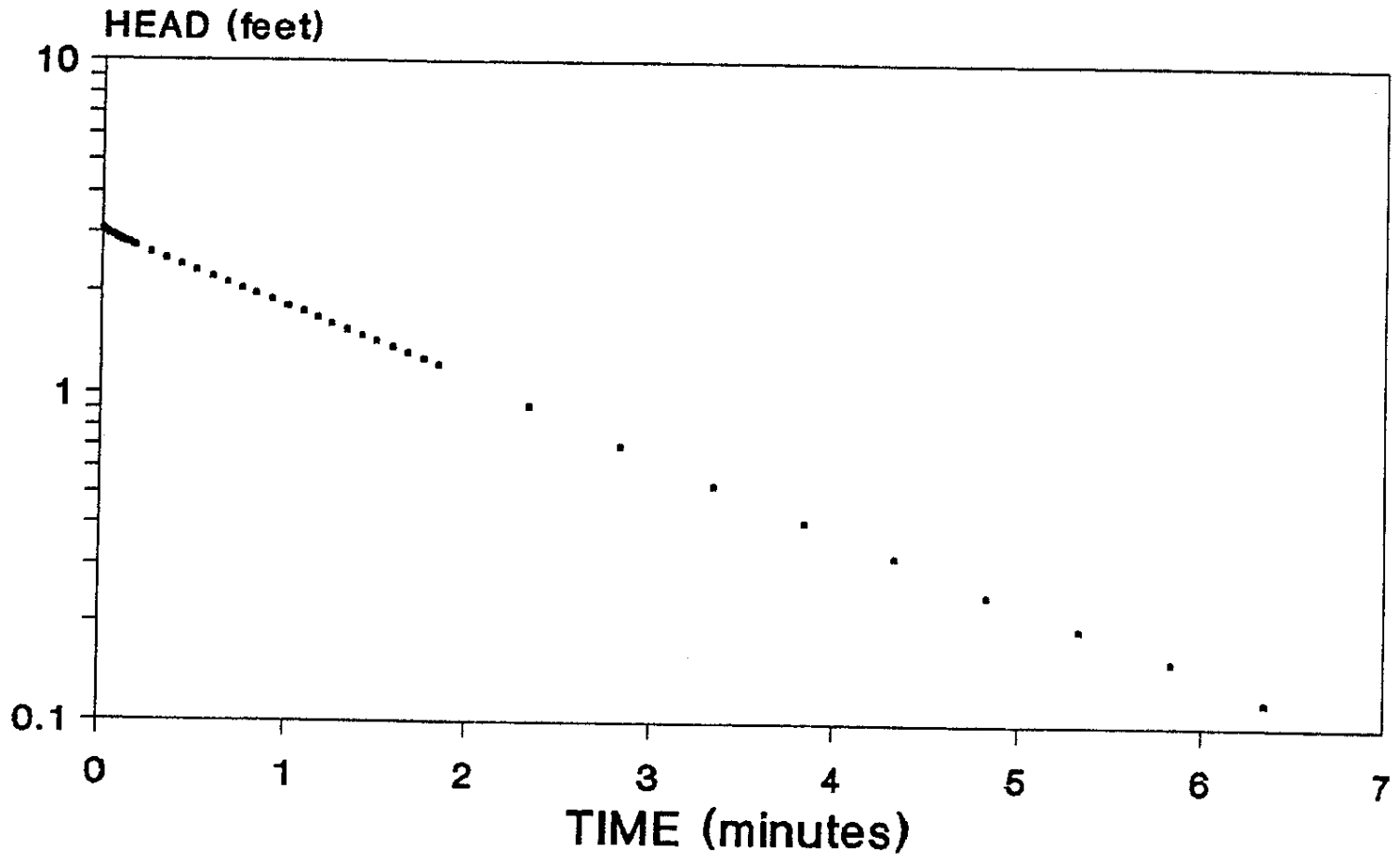
BGX-5D *

Rising Head Slug Test



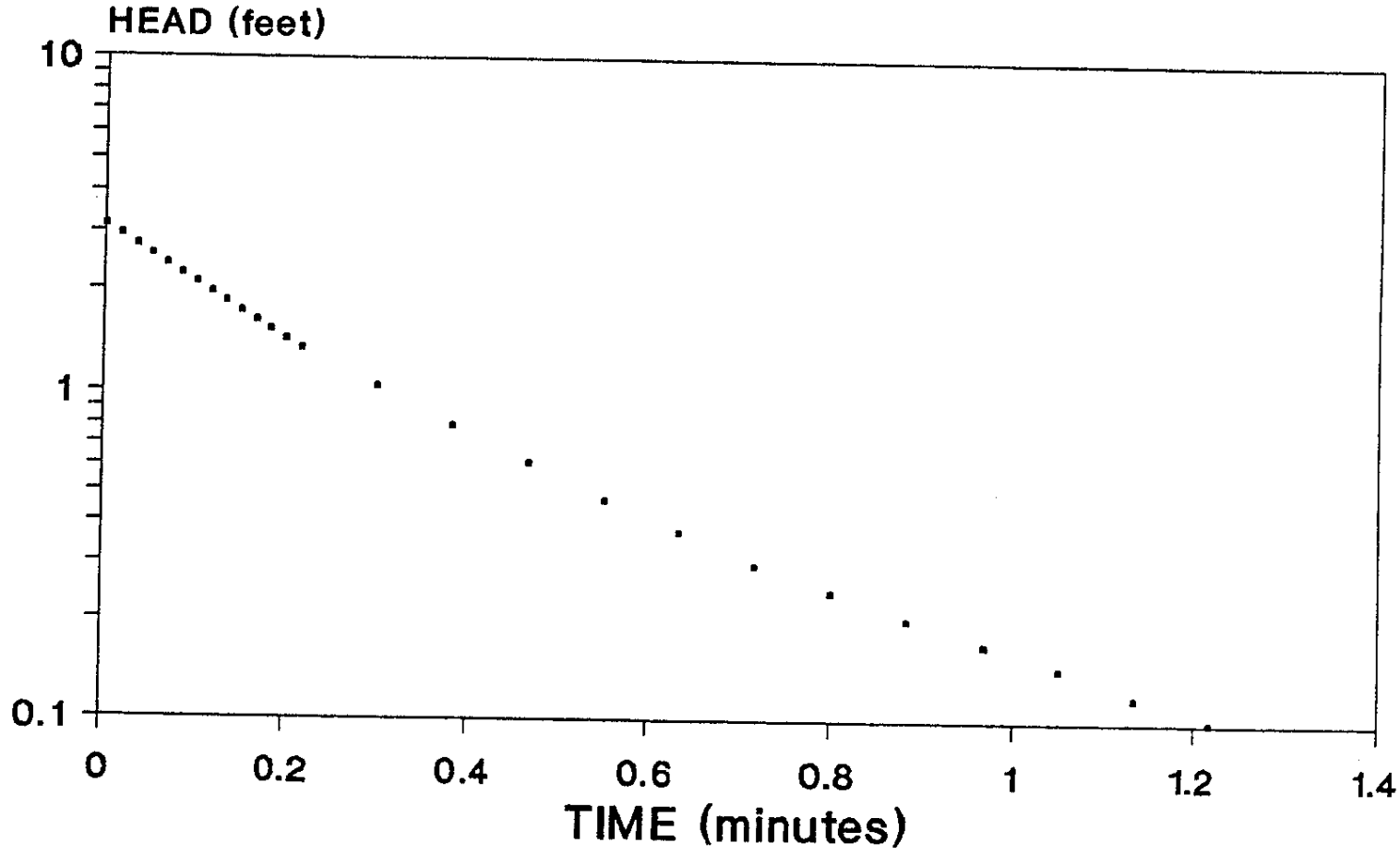
BGX-6D *

Rising Head Slug Test



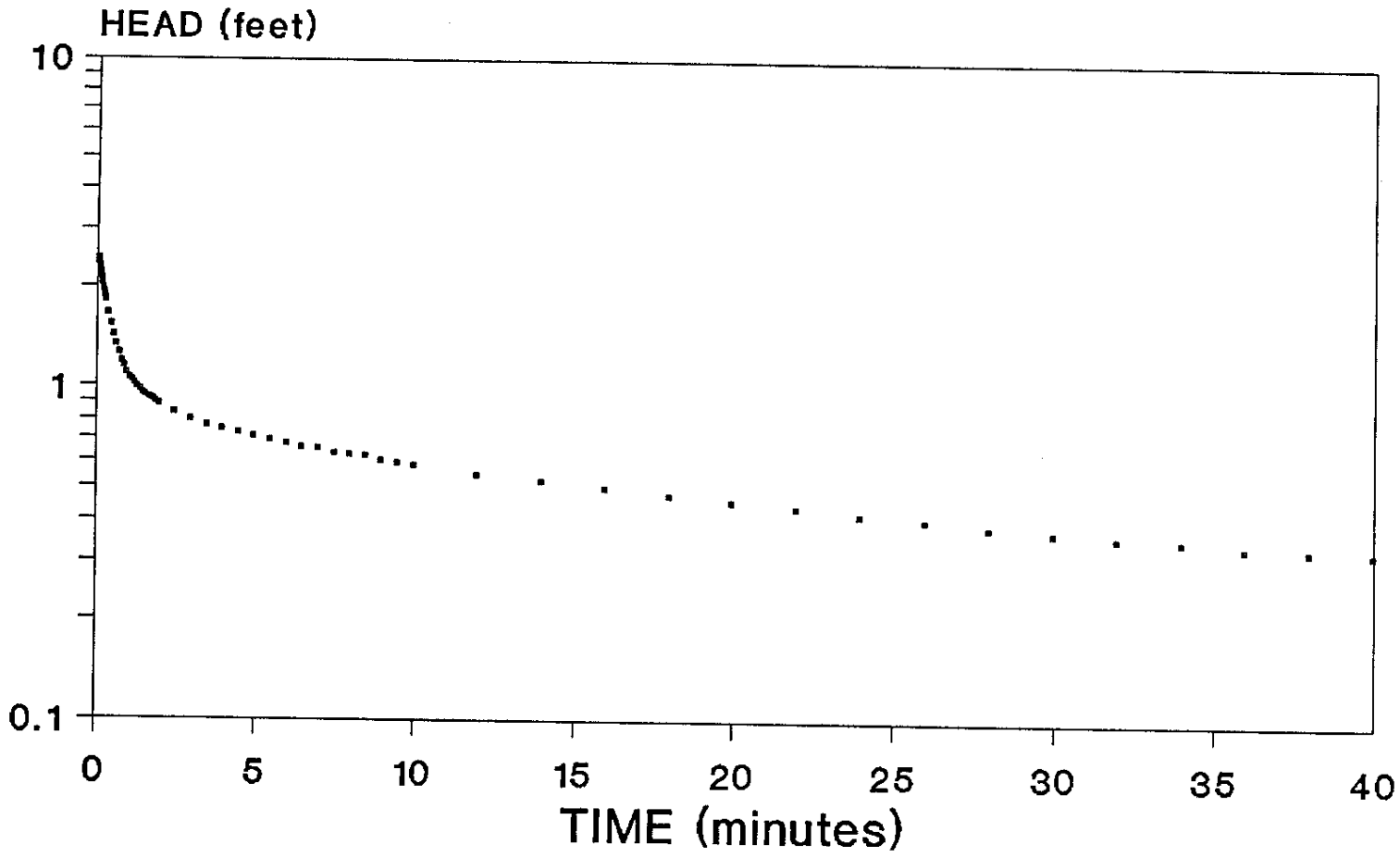
BGX-7D *

Rising Head Slug Test

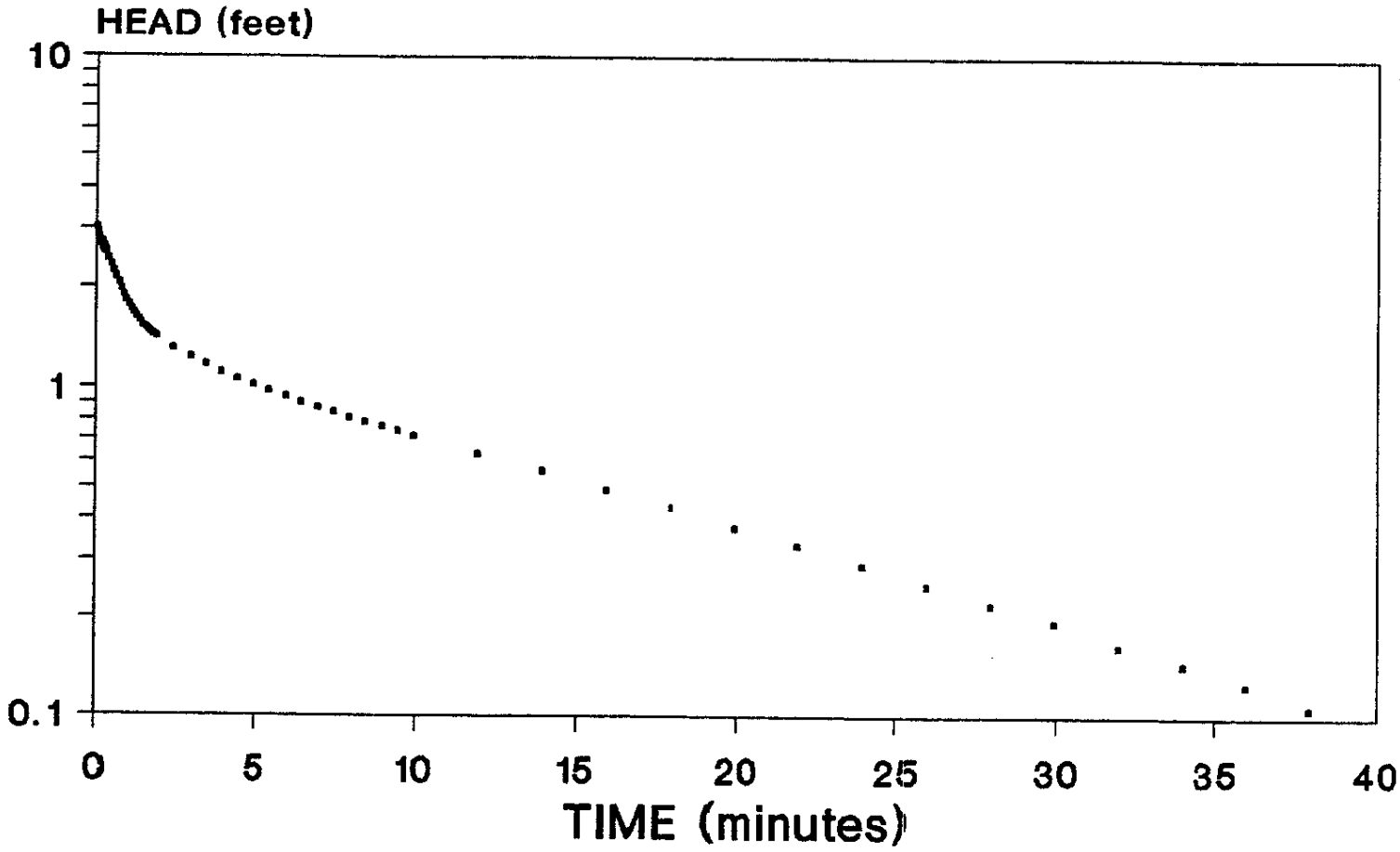


BGX-9D

Rising Head Slug Test

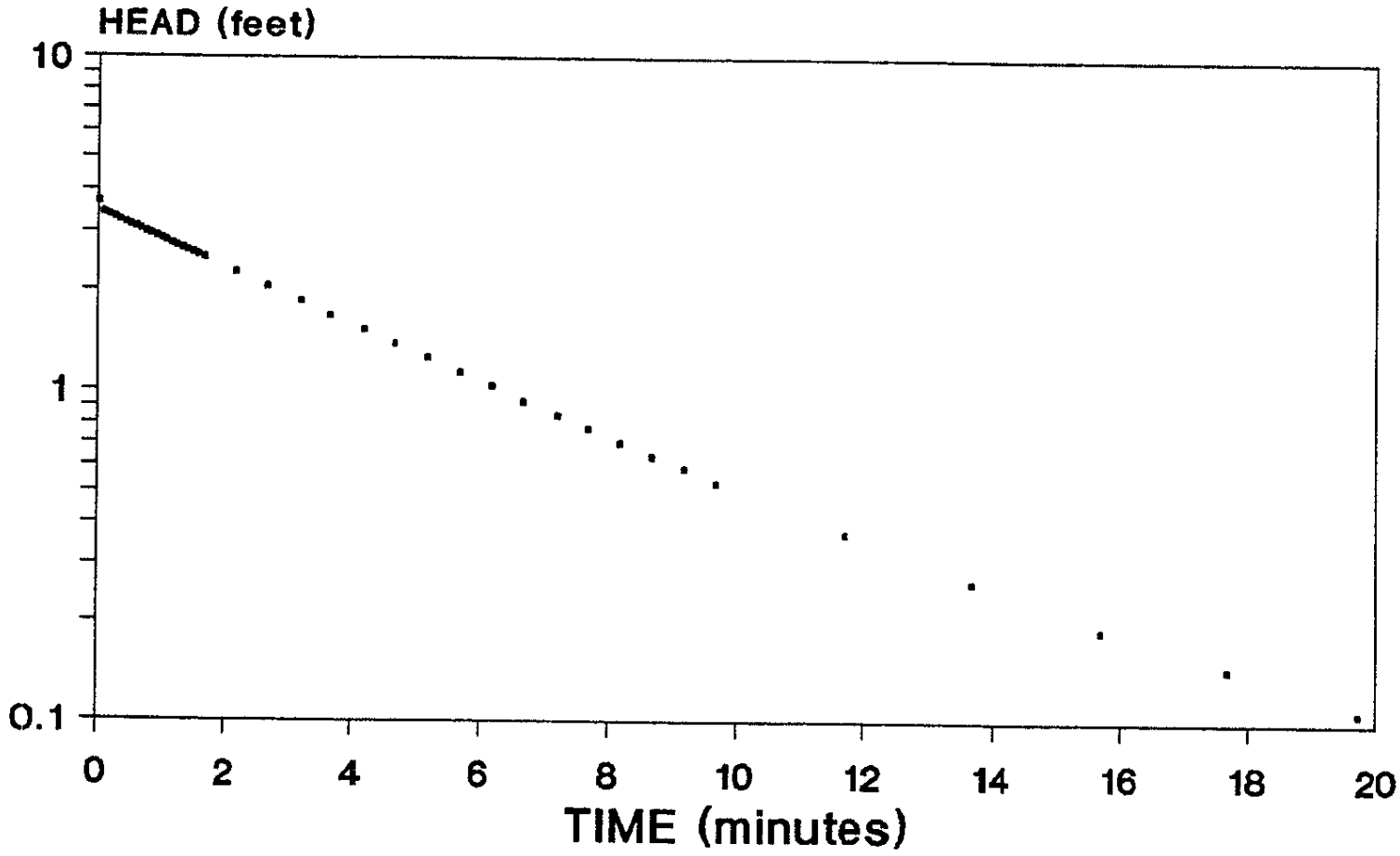


BGX-10D
Rising Head Slug Test



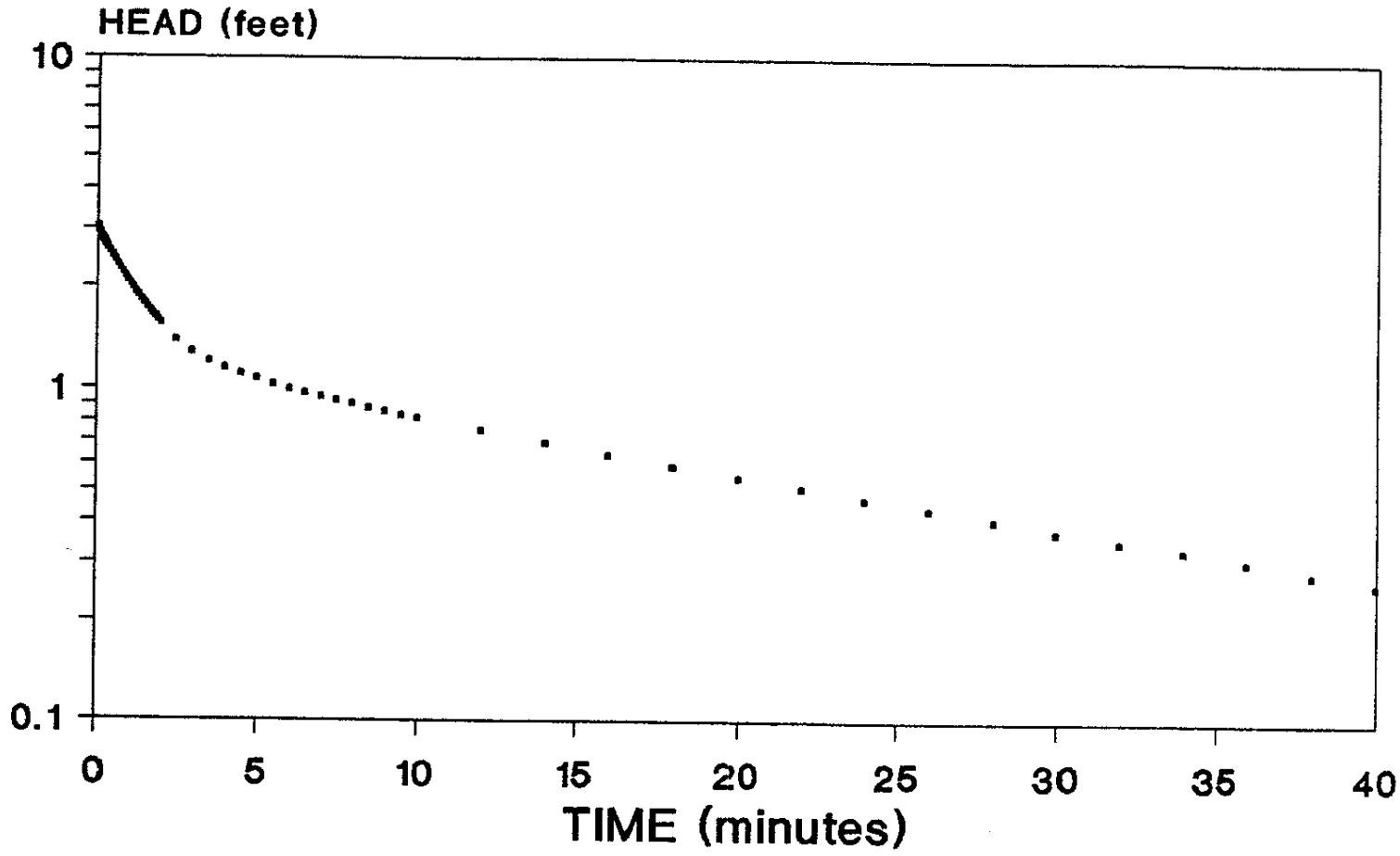
BGX-12C

Falling Head Slug Test



BGX-12D

Rising Head Slug Test



APPENDIX F

LABORATORY DATA FROM LOW PERMEABILITY SEDIMENTS

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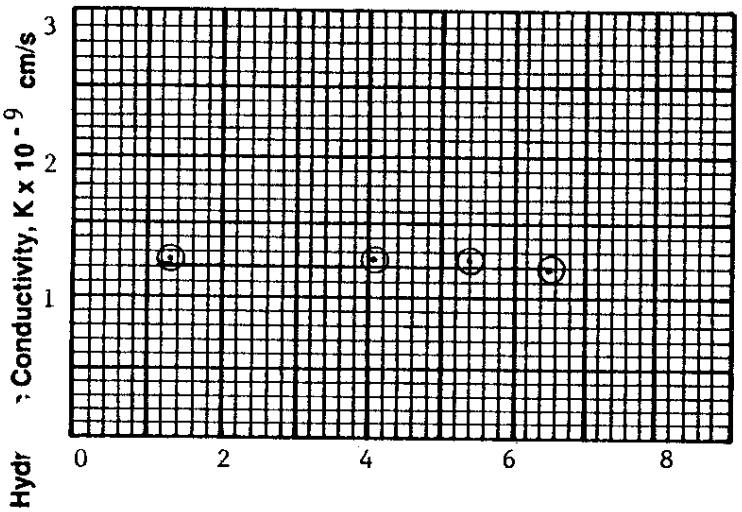
CONTROLLED GRADIENT

PERMEABILITY TEST REPORT

PROJECT BGX Hydro Characterziation/G0506	**JOB NO.** 10357-A		**REPORT NO.** 49945
DATE 06/13/91	**BORING** BGX-1A	**DEPTH/ELEV.** 80'-82'	**REVIEWED**
TEST PROCEDURE EM1110-2-1906 Appendix VII		Sample Vertical	
SPECIMEN DESCRIPTION Tan silty clay		**SPECIMEN DIAMETER, In.** 1.40	
		SPECIMEN HEIGHT, In. 1.00	

INDEX PROPERTIES	**LL** 122	**PI** 54	G_s 2.54	**Fines, %** 96



SPECIMEN NO.			1	2	3
INITIAL	WATER CONTENT, %	Wo	64.8	–	–
	DRY DENSITY, PCF	Ydo	59.6	–	–
	SATURATION, %	So	99.3	–	–
	VOID RATIO	eo	1.660	–	–
AFTER CONSOLIDATION	WATER CONTENT, %	Wc	59.5	–	–
	DRY DENSITY, PCF	Ydc	63.1	–	–
	SATURATION, %	Sc	100	–	–
	VOID RATIO	ec	1.513	–	–
	FINAL BACK PRESSURE, PSI	Uo	20.0	–	–
	EFFECTIVE CONSOLIDATION PRESSURE, PSI	$\bar{\sigma}_z$	52.8	–	–
PERMEATION	PORE PRESSURE DIFFERENCE, PSI	ΔUo	7.2	–	–
	HYDRAULIC GRADIENT	I	200	–	–
	AVG. TEMP. PERMEANT, C°	T	20	–	–
	TOTAL FLOW, CC	Qc	1.0	–	–
	TOTAL FLOW PORE VOLUMES, %	Qp	6.5	–	–

	SPECIMEN NUMBER		
	1	2	3
HYDRAULIC CONDUCTIVITY, K x 10 - 9 cm/s	1.2	–	–

PERMEANT PROPERTIES	
PERMEANT DESCRIPTION Deaired tap water	
Specific Wt., DYNES 1.7×10^{-2}	**VISCOSITY, POISE** 0.01005

REMOLDED SOIL PROPERTIES	
TEST PROCEDURE: N.A.	
MAXIMUM DRY DENSITY, PCF –	**OPTIMUM MOISTURE CONTENT, %** –

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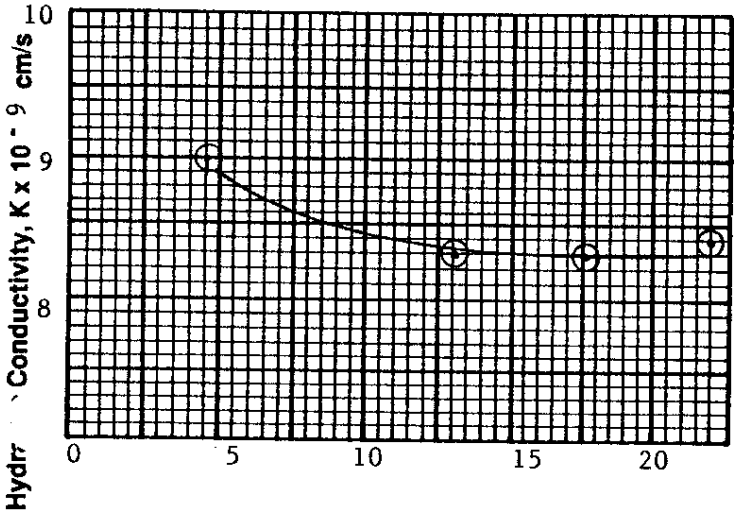
CONTROLLED GRADIENT
PERMEABILITY TEST REPORT

PROJECT BGX Hydro Characterization/G0506	**JOB NO.** 10357-A		**REPORT NO.** 49945
DATE 06/13/91	**BORING** BGX-1A	**DEPTH/ELEV.** 80'-82'	**REVIEWED**
TEST PROCEDURE EM1110-2-1906 Appendix VII		Sample	Horizontal
SPECIMEN DESCRIPTION Tan silty clay		**SPECIMEN DIAMETER, In.** 1.40	
		SPECIMEN HEIGHT, In. 1.00	

INDEX PROPERTIES	**LL** 122	**PI** 54	G_s 2.54	**Fines, %** 96



SPECIMEN NO.			1	2	3
INITIAL	WATER CONTENT, %	Wo	62.3	–	–
	DRY DENSITY, PCF	Ydo	61.6	–	–
	SATURATION, %	So	100	–	–
	VOID RATIO	eo	1.571	–	–
AFTER CONSOLIDATION	WATER CONTENT, %	Wc	54.6	–	–
	DRY DENSITY, PCF	Ydc	66.4	–	–
	SATURATION, %	Sc	100	–	–
	VOID RATIO	ec	1.387	–	–
	FINAL BACK PRESSURE, PSI	Uo	25.0	–	–
	EFFECTIVE CONSOLIDATION PRESSURE, PSI	$\bar{\sigma}_3$	54.1	–	–
PERMEATION	PORE PRESSURE DIFFERENCE, PSI	ΔUo	3.6	–	–
	HYDRAULIC GRADIENT	I	100	–	–
	AVG. TEMP. PERMEANT, C°	T	20	–	–
	TOTAL FLOW, CC	Qc	3.4	–	–
	TOTAL FLOW PORE VOLUMES, %	Qp	22	–	–

	SPECIMEN NUMBER		
	1	2	3
HYDRAULIC CONDUCTIVITY, K x 10^{-9} cm/s	8.3	–	–

PERMEANT PROPERTIES

PERMEANT DESCRIPTION

Deaired tap water

Specific Wt., DYNES 1.7×10^{-2}	**VISCOSITY, POISE** 0.01005

REMOLDED SOIL PROPERTIES

TEST PROCEDURE:

N.A.

MAXIMUM DRY DENSITY, PCF –	**OPTIMUM MOISTURE CONTENT, %** –

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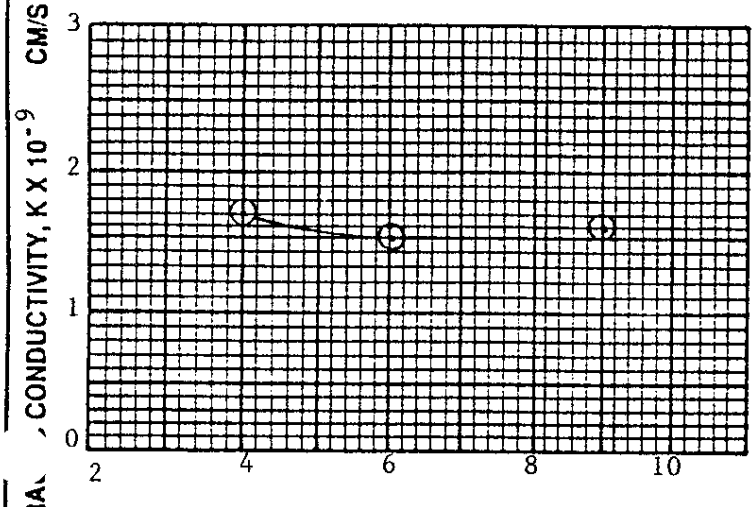
CONTROLLED GRADIENT PERMEABILITY TEST REPORT

PROJECT Burial Ground Expansion Hydro Characterization/G0506		**JOB NO.** 10357-A	**REPORT NO.** 47618
DATE 4/25/91	**BORING** BGX-2B	**DEPTH/ELEV.** 75'-77'	**SAMPLE NO.** Vertical
TEST PROCEDURE EM1110-2-1906 App. VII		**SAMPLE TYPE** UD	**REVIEWED**

SOIL DESCRIPTION
Dark yellow clay with some silt and with a trace of sand

SPECIMEN DIAMETER, IN. 1.40
SPECIMEN HEIGHT, IN. 1.00

INDEX PROPERTIES	**LL** 132	**PI** 86	G_s 2.65	**FINES, %** 94



	SPECIMEN NUMBER		
	1	2	3
HYDRAULIC CONDUCTIVITY, K x 10⁻⁹ CM/S	1.5	–	–

SPECIMEN NUMBER			1	2	3
INITIAL	WATER CONTENT, %	W_o	73.2	–	–
	DRY DENSITY, PCF	Yd_o	55.1	–	–
	SATURATION, %	S_o	97.0	–	–
	VOID RATIO	e_o	2.001	–	–
AFTER CONSOLIDATION	WATER CONTENT, %	W_c	69.2	–	–
	DRY DENSITY, PCF	Yd_c	58.3	–	–
	SATURATION, %	S_c	100	–	–
	VOID RATIO	e_c	1.836	–	–
	FINAL BACK PRESSURE, PSI	U_o	30.0	–	–
	EFFECTIVE CONSOLIDATION PRESSURE, PSI	$\sigma 3$	46.3	–	–
PERMEATION	PORE PRESSURE DIFFERENCE, PSI	ΔU_o	18.1	–	–
	HYDRAULIC GRADIENT	I	400	–	–
	AVG. TEMP. PERMEANT, C°	T	20	–	–
	TOTAL FLOW, CC	Q_c	1.5	–	–
	TOTAL FLOW PORE VOLUMES, %	Q_p	9	–	–

PERMEANT PROPERTIES

PERMEANT DESCRIPTION
Deaired Tap Water

SPECIFIC WT., DYNES	VISCOSITY, POISE
1.7×10^{-2}	0.01005

REMOLDED SOIL PROPERTIES

TEST PROCEDURE:
N.A.

MAXIMUM DRY DENSITY, PCF	OPTIMUM MOISTURE CONTENT, %
–	–

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CONTROLLED GRADIENT

PERMEABILITY TEST REPORT

PROJECT Burial Ground Expansion Hydro Characterization/G0506		JOB NO. 10357-A	REPORT NO. 47618
DATE 4/25/91	BORING BGX-2B	DEPTH/ELEV. 75'-77'	SAMPLE NO. Horizontal
TEST PROCEDURE EM1110-2-1906 App.VII		SAMPLE TYPE UD	REVIEWED

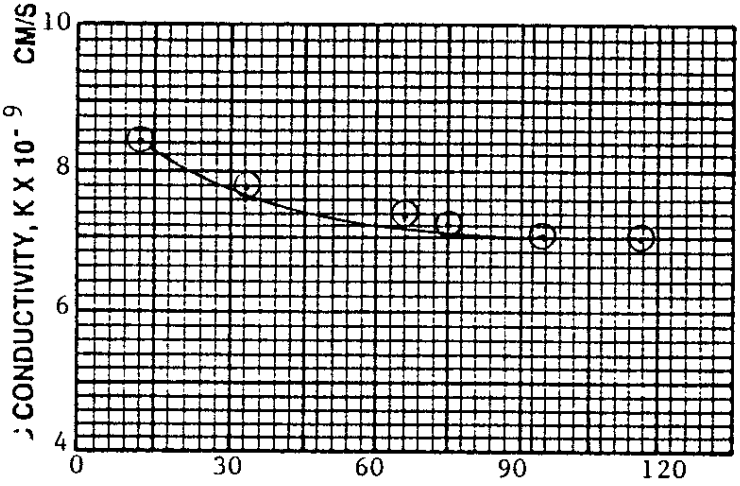
SOIL DESCRIPTION

Dark yellow clay with some silt and with a trace of sand

SPECIMEN DIAMETER, IN. 1.40

SPECIMEN HEIGHT, IN. 1.00

INDEX PROPERTIES	LL 132	PI 86	G_s 2.65	FINES, % 94



SPECIMEN NUMBER			1	2	3
INITIAL	WATER CONTENT, %	W_o	73.2	–	–
	DRY DENSITY, PCF	Yd_o	55.1	–	–
	SATURATION, %	S_o	97.0	–	–
	VOID RATIO	e_o	2.001	–	–
AFTER CONSOLIDATION	WATER CONTENT, %	W_c	69.2	–	–
	DRY DENSITY, PCF	Yd_c	58.3	–	–
	SATURATION, %	S_c	100	–	–
	VOID RATIO	e_c	1.836	–	–
	FINAL BACK PRESSURE, PSI	U_o	30.0	–	–
	EFFECTIVE CONSOLIDATION PRESSURE, PSI	$\sigma 3$	46.3	–	–
PERMEATION	PORE PRESSURE DIFFERENCE, PSI	ΔU_o	18.1	–	–
	HYDRAULIC GRADIENT	I	400	–	–
	AVG. TEMP. PERMEANT, C°	T	20	–	–
	TOTAL FLOW, CC	Q_c	19.6	–	–
	TOTAL FLOW PORE VOLUMES, %	Q_p	116	–	–

	SPECIMEN NUMBER		
	1	2	3
HYDRAULIC CONDUCTIVITY, K x 10⁻⁹ CM/S	7.0	–	–

PERMEANT PROPERTIES

PERMEANT DESCRIPTION

Deaired Tap Water

SPECIFIC WT., DYNES	VISCOSITY, POISE
1.7×10^{-2}	0.01005

REMOLDED SOIL PROPERTIES

TEST PROCEDURE:

N.A.

MAXIMUM DRY DENSITY, PCF	OPTIMUM MOISTURE CONTENT, %
–	–

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CONTROLLED GRADIENT

PERMEABILITY TEST REPORT

PROJECT Burial Ground Expansion Hydro Characterization/G0506		**JOB NO.** 10357-A	**REPORT NO.** 47618
DATE 4/25/91	**BORING** BGX-2B	**DEPTH/ELEV.** 156'-156.8'	**SAMPLE NO.** Vertical
TEST PROCEDURE EM1110-2-1906 App.VII		**SAMPLE TYPE** UD	**REVIEWED**

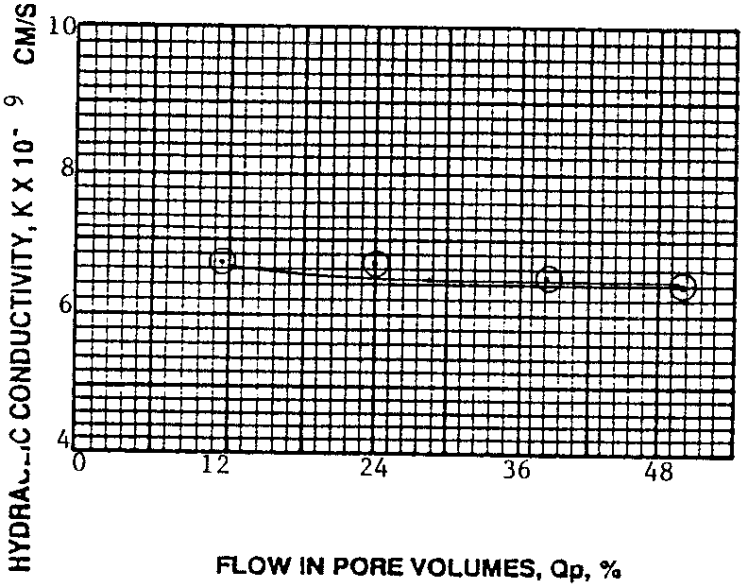
SOIL DESCRIPTION

Gray and black silty fine to medium sand

SPECIMEN DIAMETER, IN. 1.40

SPECIMEN HEIGHT, IN. 1.00

INDEX PROPERTIES	**LL** 35	**PI** N.P.	G_s 2.67	**FINES, %** 39



SPECIMEN NUMBER			1	2	3
INITIAL	WATER CONTENT, %	W_o	33.3	–	–
	DRY DENSITY, PCF	Yd_o	87.2	–	–
	SATURATION, %	S_o	98.6	–	–
	VOID RATIO	e_o	0.895	–	–
AFTER CONSOLIDATION	WATER CONTENT, %	W_c	27.0	–	–
	DRY DENSITY, PCF	Yd_c	96.4	–	–
	SATURATION, %	S_c	100	–	–
	VOID RATIO	e_c	0.714	–	–
	FINAL BACK PRESSURE, PSI	U_o	30.0	–	–
	EFFECTIVE CONSOLIDATION PRESSURE, PSI	$\sigma 3$	85.2	–	–
PERMEATION	PORE PRESSURE DIFFERENCE, PSI	ΔU_o	1.8	–	–
	HYDRAULIC GRADIENT	i	50	–	–
	AVG. TEMP. PERMEANT, C°	T	20	–	–
	TOTAL FLOW, CC	Q_c	6	–	–
	TOTAL FLOW PORE VOLUMES, %	Q_p	50	–	–

	SPECIMEN NUMBER		
	1	2	3
HYDRAULIC CONDUCTIVITY, K x 10⁻⁹ CM/S	6.5	–	–

PERMEANT PROPERTIES	
PERMEANT DESCRIPTION: Deaired Tap Water	
SPECIFIC WT., DYNES 1.7×10^{-2}	VISCOSITY, POISE 0.01005

REMOLDED SOIL PROPERTIES	
TEST PROCEDURE: N.A.	
MAXIMUM DRY DENSITY, PCF _	OPTIMUM MOISTURE CONTENT, % _

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PERMEABILITY TEST REPORT

PROJECT Burial Ground Expansion Hydro Characterization/G0506		**JOB NO.** 10357-A	**REPORT NO.** 47618
DATE 4/25/91	**BORING** BGX-2B	**DEPTH/ELEV.** 156'-156.8'	**SAMPLE NO.** Horizontal
TEST PROCEDURE EM1110-2-1906 App.VII		**SAMPLE TYPE** UD	**REVIEWED**

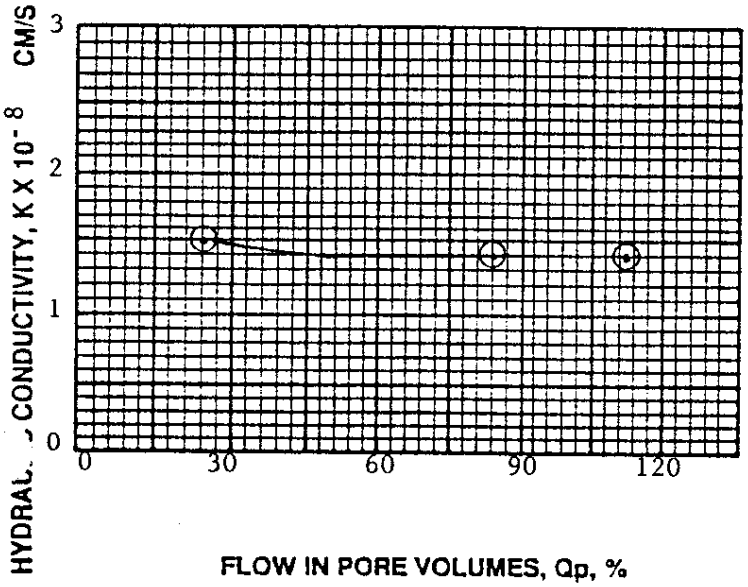
SOIL DESCRIPTION

Gray and black silty fine to medium sand

SPECIMEN DIAMETER, IN. 1.40

SPECIMEN HEIGHT, IN. 1.00

INDEX PROPERTIES	**LL** 35	**PI** N.P.	G_s 2.65	**FINES, %** 39



SPECIMEN NUMBER			1	2	3
INITIAL	WATER CONTENT, %	W_o	33.3	–	–
	DRY DENSITY, PCF	Yd_o	86.1	–	–
	SATURATION, %	S_o	96.0	–	–
	VOID RATIO	e_o	0.921	–	–
AFTER CONSOLIDATION	WATER CONTENT, %	W_c	27.9	–	–
	DRY DENSITY, PCF	Yd_c	95.1	–	–
	SATURATION, %	S_c	100	–	–
	VOID RATIO	e_c	0.738	–	–
	FINAL BACK PRESSURE, PSI	U_o	30.0	–	–
	EFFECTIVE CONSOLIDATION PRESSURE, PSI	$\sigma 3$	85.2	–	–
PERMEATION	PORE PRESSURE DIFFERENCE, PSI	ΔU_o	1.8	–	–
	HYDRAULIC GRADIENT	I	50	–	–
	AVG. TEMP. PERMEANT, C°	T	20	–	–
	TOTAL FLOW, CC	Q_c	13.5	–	–
	TOTAL FLOW PORE VOLUMES, %	Q_p	112	–	–

	SPECIMEN NUMBER		
	1	2	3
HYDRAULIC CONDUCTIVITY, K x 10⁻⁸ CM/S	1.4	–	–

PERMEANT PROPERTIES

PERMEANT DESCRIPTION

Deaired Tap Water

SPECIFIC WT., DYNES	VISCOSITY, POISE
1.7×10^{-2}	0.01055

REMOLDED SOIL PROPERTIES

TEST PROCEDURE:

N.A.

MAXIMUM DRY DENSITY, PCF	OPTIMUM MOISTURE CONTENT, %
–	–

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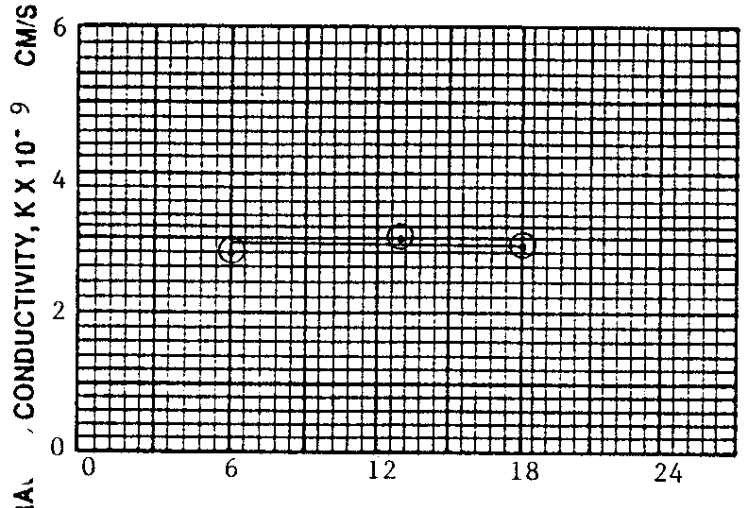
PERMEABILITY TEST REPORT

PROJECT Burial Ground Expansion Hydro Characterization / G0506		**JOB NO.** 10357-A	**REPORT NO.** 47618
DATE 4/25/91	**BORING** BGX-4A	**DEPTH/ELEV.** 65'- 67'	**SAMPLE NO.** Vertical
TEST PROCEDURE EM1110-2-1906 Appendix VII		**SAMPLE TYPE** UD	**REVIEWED**
SOIL DESCRIPTION Yellow clay with a trace of silt & sand			**SPECIMEN DIAMETER, IN.** 1.40
			SPECIMEN HEIGHT, IN. 1.00
INDEX PROPERTIES	**LL** 134	**PI** 92	G_s 2.66 **FINES, %** 90



SPECIMEN NUMBER			1	2	3
INITIAL	WATER CONTENT, %	W_o	63.2	–	–
	DRY DENSITY, PCF	Yd_o	61.8	–	–
	SATURATION, %	S_o	99.7	–	–
	VOID RATIO	e_o	1.686	–	–
AFTER CONSOLIDATION	WATER CONTENT, %	W_c	53.8	–	–
	DRY DENSITY, PCF	Yd_c	68.3	–	–
	SATURATION, %	S_c	100	–	–
	VOID RATIO	e_c	1.430	–	–
	FINAL BACK PRESSURE, PSI	U_o	20.0	–	–
	EFFECTIVE CONSOLIDATION PRESSURE, PSI	$\sigma 3$	46.6	–	–
PERMEATION	PORE PRESSURE DIFFERENCE, PSI	ΔU_o	14.4	–	–
	HYDRAULIC GRADIENT	I	400	–	–
	AVG. TEMP. PERMEANT, C°	T	20	–	–
	TOTAL FLOW, CC	Q_c	3.0	–	–
	TOTAL FLOW PORE VOLUMES, %	Q_p	18	–	–

	SPECIMEN NUMBER		
	1	2	3
HYDRAULIC CONDUCTIVITY, K x 10⁻⁹ CM/S	2.9	–	–

PERMEANT PROPERTIES

PERMEANT DESCRIPTION

Deaired tap water

SPECIFIC WT., DYNES 1.7×10^{-2}	VISCOSITY, POISE 0.01005

REMOLDED SOIL PROPERTIES

TEST PROCEDURE:

N.A.

MAXIMUM DRY DENSITY, PCF –	OPTIMUM MOISTURE CONTENT, % –

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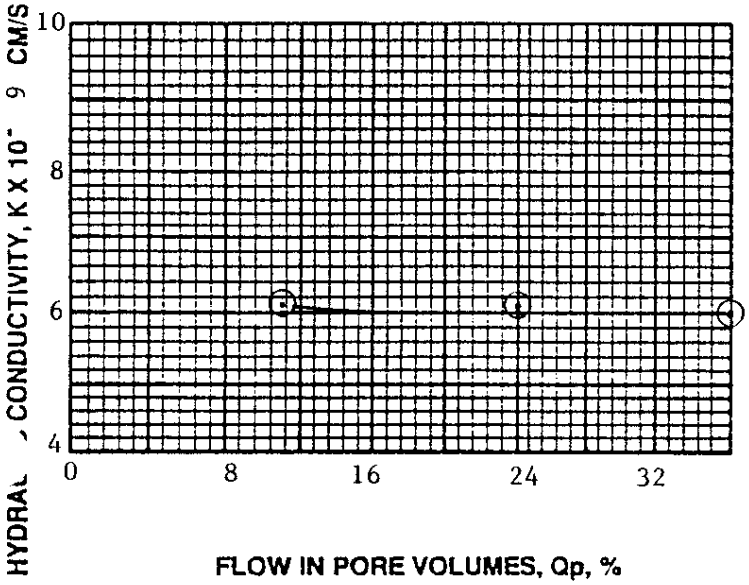
PERMEABILITY TEST REPORT

PROJECT Burial Ground Expansion Hydro Characterization/GO506		JOB NO. 10357-A	REPORT NO. 47618
DATE 04/25/91	BORING BGX-4A	DEPTH/ELEV. 65'-67'	SAMPLE NO. Horizontal
TEST PROCEDURE EM1110-2-1906 Appendix VII		SAMPLE TYPE UD	REVIEWED

SOIL DESCRIPTION: Yellow clay with a trace of silt and sand	SPECIMEN DIAMETER, IN. 1.40
	SPECIMEN HEIGHT, IN. 1.00

INDEX PROPERTIES	LL	PI	G_s	FINES, %
	134	92	2.66	90



SPECIMEN NUMBER			1	2	3
INITIAL	WATER CONTENT, %	W_o	63.2	–	–
	DRY DENSITY, PCF	Yd_o	61.8	–	–
	SATURATION, %	S_o	99.7	–	–
	VOID RATIO	e_o	1.686	–	–
AFTER CONSOLIDATION	WATER CONTENT, %	W_c	53.8	–	–
	DRY DENSITY, PCF	Yd_c	68.3	–	–
	SATURATION, %	S_c	100	–	–
	VOID RATIO	e_c	1.430	–	–
	FINAL BACK PRESSURE, PSI	U_o	20.0	–	–
	EFFECTIVE CONSOLIDATION PRESSURE, PSI	$\sigma 3$	46.6	–	–
PERMEATION	PORE PRESSURE DIFFERENCE, PSI	ΔU_o	14.4	–	–
	HYDRAULIC GRADIENT	I	400	–	–
	AVG. TEMP. PERMEANT, C°	T	20	–	–
	TOTAL FLOW, CC	Q_c	5.7	–	–
	TOTAL FLOW PORE VOLUMES, %	Q_p	3.6	–	–

	SPECIMEN NUMBER		
	1	2	3
HYDRAULIC CONDUCTIVITY, K x 10⁻⁹ CM/S	6.0	–	–

PERMEANT PROPERTIES	
PERMEANT DESCRIPTION: Deaired tap water	
SPECIFIC WT., DYNES 1.7×10^{-2}	VISCOSITY, POISE 0.01005

REMOLDED SOIL PROPERTIES	
TEST PROCEDURE: N.A.	
MAXIMUM DRY DENSITY, PCF –	OPTIMUM MOISTURE CONTENT, % –

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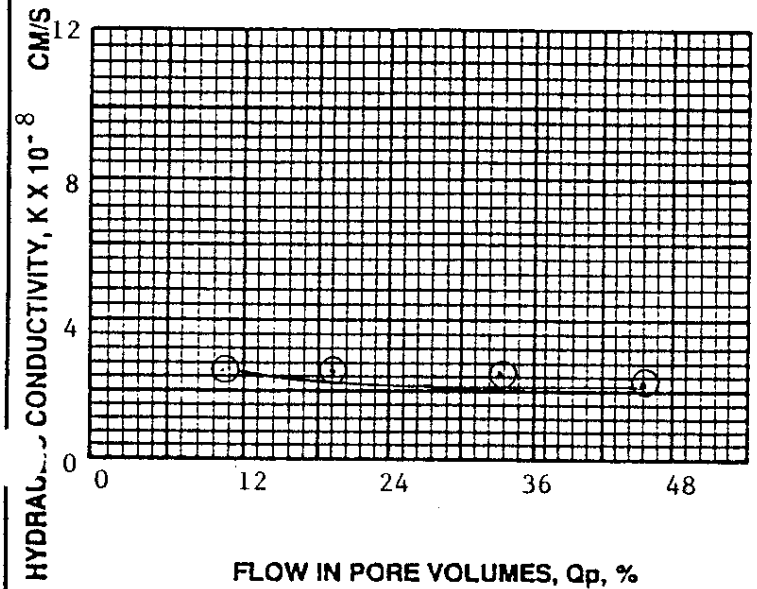
CONTROLLED GRADIENT PERMEABILITY TEST REPORT

PROJECT Burial Ground Expansion Hydro Characterization/G0506		**JOB NO.** 10357-A	**REPORT NO.** 47618
DATE 04/24/91	**BORING** BGX-4C	**DEPTH/ELEV.** 104'-106'	**SAMPLE NO.** Vertical
TEST PROCEDURE EM1110-2-1906 Appendix VII		**SAMPLE TYPE** UD	**REVIEWED**
SOIL DESCRIPTION Tan, gray & black clayey fine to medium sand			**SPECIMEN DIAMETER, IN.** 1.40
			SPECIMEN HEIGHT, IN. 1.00
INDEX PROPERTIES	**LL** 36	**PI** 12	G_s 2.63 **FINES, %** 27



SPECIMEN NUMBER			1	2	3
INITIAL	WATER CONTENT, %	W_o	24.9	–	–
	DRY DENSITY, PCF	Yd_o	94.8	–	–
	SATURATION, %	S_o	89.6	–	–
	VOID RATIO	e_o	0.731	–	–
AFTER CONSOLIDATION	WATER CONTENT, %	W_c	22.6	–	–
	DRY DENSITY, PCF	Yd_c	102.9	–	–
	SATURATION, %	S_c	100	–	–
	VOID RATIO	e_c	0.594	–	–
	FINAL BACK PRESSURE, PSI	U_o	35.0	–	–
	EFFECTIVE CONSOLIDATION PRESSURE, PSI	$\sigma 3$	71.4	–	–
PERMEATION	PORE PRESSURE DIFFERENCE, PSI	ΔU_o	1.8	–	–
	HYDRAULIC GRADIENT	I	50	–	–
	AVG. TEMP. PERMEANT, C°	T	20	–	–
	TOTAL FLOW, CC	Q_c	4.9	–	–
	TOTAL FLOW PORE VOLUMES, %	Q_p	6	–	–

	SPECIMEN NUMBER		
	1	2	3
HYDRAULIC CONDUCTIVITY, K x 10⁻⁸ CM/S	2.1	–	–

PERMEANT PROPERTIES	
PERMEANT DESCRIPTION: Deaired tap water	
SPECIFIC WT., DYNES 1.7×10^{-2}	VISCOSITY, POISE 0.01005

REMOLDED SOIL PROPERTIES	
TEST PROCEDURE: N.A.	
MAXIMUM DRY DENSITY, PCF –	OPTIMUM MOISTURE CONTENT, % –

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CONTROLLED GRADIENT PERMEABILITY TEST REPORT

PROJECT Burial Ground Expansion Hydro Characterization/G0506		JOB NO. 10357-A	REPORT NO. 47618
DATE 04/24/91	BORING BGX-4C	DEPTH/ELEV. 104'-106'	SAMPLE NO. HORIZONTAL
TEST PROCEDURE EM1110-2-1906 Appendix VII		SAMPLE TYPE UD	REVIEWED

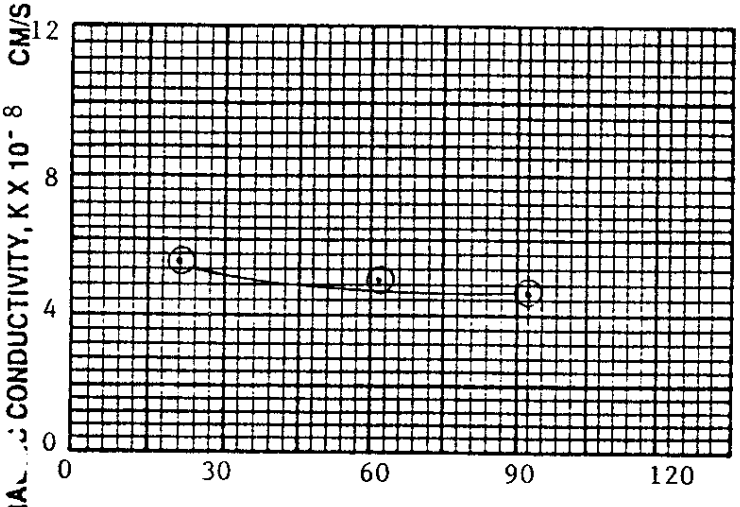
SOIL DESCRIPTION

Tan-gray & black clayey fine to medium sand

SPECIMEN DIAMETER, IN. 1.40

SPECIMEN HEIGHT, IN. 1.00

INDEX PROPERTIES	LL 36	PI 12	G_s 2.63	FINES, % 27



SPECIMEN NUMBER			1	2	3
INITIAL	WATER CONTENT, %	W_o	24.9	–	–
	DRY DENSITY, PCF	Yd_o	93.6	–	–
	SATURATION, %	S_o	87.1	–	–
	VOID RATIO	e_o	0.753	–	–
AFTER CONSOLIDATION	WATER CONTENT, %	W_c	24.1	–	–
	DRY DENSITY, PCF	Yd_c	100.4	–	–
	SATURATION, %	S_c	100	–	–
	VOID RATIO	e_c	0.634	–	–
	FINAL BACK PRESSURE, PSI	U_o	35.0	–	–
	EFFECTIVE CONSOLIDATION PRESSURE, PSI	$\sigma 3$	71.4	–	–
PERMEATION	PORE PRESSURE DIFFERENCE, PSI	ΔU_o	1.8	–	–
	HYDRAULIC GRADIENT	I	50	–	–
	AVG. TEMP. PERMEANT, C°	T	20	–	–
	TOTAL FLOW, CC	Q_c	10.1	–	–
	TOTAL FLOW PORE VOLUMES, %	Q_p	93	–	–

	SPECIMEN NUMBER		
	1	2	3
HYDRAULIC CONDUCTIVITY, K x 10^{-8} CM/S	4.7	–	–

PERMEANT PROPERTIES

PERMEANT DESCRIPTION

Deaired tap water

SPECIFIC WT., DYNES	1.7×10^{-2}	VISCOSITY, POISE	0.01005

REMOLDED SOIL PROPERTIES

TEST PROCEDURE:

N.A.

MAXIMUM DRY DENSITY, PCF	–	OPTIMUM MOISTURE CONTENT, %	–

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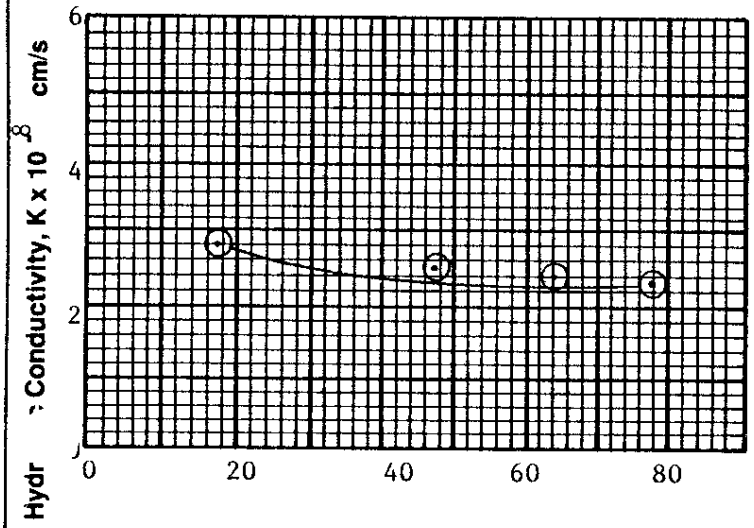
CONTROLLED GRADIENT
PERMEABILITY TEST REPORT

PROJECT BGX Hydro Characterization/G0506	**JOB NO.** 10357-A	**REPORT NO.** 49945	
DATE 06/13/91	**BORING** BGX-7	**DEPTH/ELEV.** 123'-124.5'	**REVIEWED**
TEST PROCEDURE EM1110-2-1906 Appendix VII		Sample Vertical*	
SPECIMEN DESCRIPTION Greenish black sandy silty clay		**SPECIMEN DIAMETER, In.**	
		SPECIMEN HEIGHT, In.	

INDEX PROPERTIES	**LL** 59	**PI** 38	G_s 2.53	**Fines, %** 74



*Only vertical permeability test was performed due to insufficient sample

	SPECIMEN NUMBER		
	1	2	3
HYDRAULIC CONDUCTIVITY, K x 10^{-8} cm/s	2.3	–	–

	SPECIMEN NO.		1	2	3
INITIAL	WATER CONTENT, %	Wo	42.3	–	–
	DRY DENSITY, PCF	Ydo	77.2	–	–
	SATURATION, %	So	100	–	–
	VOID RATIO	eo	1.045	–	–
AFTER CONSOLIDATION	WATER CONTENT, %	Wc	34.9	–	–
	DRY DENSITY, PCF	Ydc	83.8	–	–
	SATURATION, %	Sc	100	–	–
	VOID RATIO	ec	0.883	–	–
	FINAL BACK PRESSURE, PSI	Uo	20.0	–	–
	EFFECTIVE CONSOLIDATION PRESSURE, PSI	$\bar{\sigma}_z$	69.8	–	–
PERMEATION	PORE PRESSURE DIFFERENCE, PSI	ΔUo	3.6	–	–
	HYDRAULIC GRADIENT	I	100	–	–
	AVG. TEMP. PERMEANT, C°	T	20	–	–
	TOTAL FLOW, CC	Qc	10.1	–	–
	TOTAL FLOW PORE VOLUMES, %	Qp	78	–	–

PERMEANT PROPERTIES

PERMEANT DESCRIPTION
Deaired tap water

Specific Wt., DYNES 1.7×10^{-2}	**VISCOSITY, POISE** 0.01005

REMOLDED SOIL PROPERTIES

TEST PROCEDURE:
N.A.

MAXIMUM DRY DENSITY, PCF –	**OPTIMUM MOISTURE CONTENT, %** –

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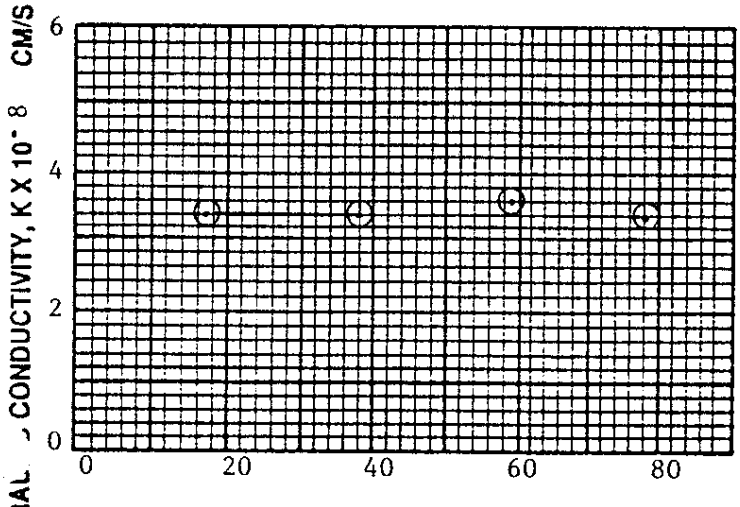
PERMEABILITY TEST REPORT

PROJECT Burial Ground Expansion Hydro Characterization/G0506		**JOB NO.** 10357-A	**REPORT NO.** 47618
DATE 04/25/91	**BORING** BGX-9	**DEPTH/ELEV.** 70'-70.8'	**SAMPLE NO.** Vertical
TEST PROCEDURE EM111-02-1906 Appendix VII		**SAMPLE TYPE** UD	**REVIEWED**
SOIL DESCRIPTION Yellow clayey fine to medium sand with some silt			**SPECIMEN DIAMETER, IN.** 1.40
			SPECIMEN HEIGHT, IN. 1.00
INDEX PROPERTIES	**LL** 62	**PI** 37	G_s 2.66 **FINES, %** 50



SPECIMEN NUMBER			1	2	3
INITIAL	WATER CONTENT, %	W_o	43.5	–	–
	DRY DENSITY, PCF	Yd_o	72.6	–	–
	SATURATION, %	S_o	90.0	–	–
	VOID RATIO	e_o	1.286	–	–
AFTER CONSOLIDATION	WATER CONTENT, %	W_c	38.8	–	–
	DRY DENSITY, PCF	Yd_c	81.7	–	–
	SATURATION, %	S_c	100	–	–
	VOID RATIO	e_c	1.033	–	–
	FINAL BACK PRESSURE, PSI	U_a	30.0	–	–
	EFFECTIVE CONSOLIDATION PRESSURE, PSI	$\sigma 3$	47.7	–	–
PERMEATION	PORE PRESSURE DIFFERENCE, PSI	ΔU_o	3.6	–	–
	HYDRAULIC GRADIENT	I	100	–	–
	AVG. TEMP. PERMEANT, C°	T	20	–	–
	TOTAL FLOW, CC	Q_c	11.1	–	–
	TOTAL FLOW PORE VOLUMES, %	Q_p	78	–	–

	SPECIMEN NUMBER		
	1	2	3
HYDRAULIC CONDUCTIVITY, K x 10 - 8 CM/S	3.4	–	–

PERMEANT PROPERTIES	
PERMEANT DESCRIPTION: Deaired tap water	
SPECIFIC WT., DYNES 1.7×10^{-2}	VISCOSITY, POISE 0.01005

REMOLDED SOIL PROPERTIES	
TEST PROCEDURE: N.A.	
MAXIMUM DRY DENSITY, PCF –	OPTIMUM MOISTURE CONTENT, % –

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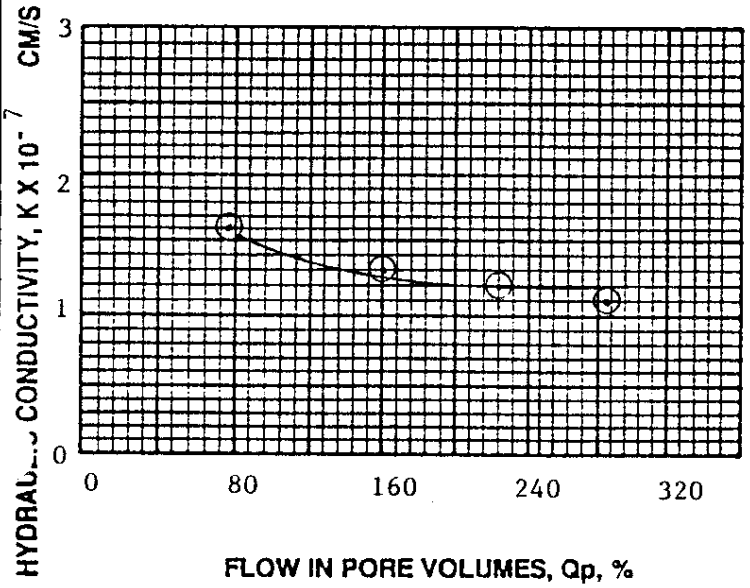
CONTROLLED GRADIENT PERMEABILITY TEST REPORT

PROJECT Burial Ground Expansion Hydro Characterization/C0506		JOB NO. 10357-A	REPORT NO. 47618
DATE 04/25/91	BORING BGX-9	DEPTH/ELEV. 70'-70.8'	SAMPLE NO. Horizontal
TEST PROCEDURE EM1110-2-1906 Appendix VII		SAMPLE TYPE UD	REVIEWED
SOIL DESCRIPTION: Yellow clayey fine to medium sand with some silt			SPECIMEN DIAMETER, IN. 1.40
			SPECIMEN HEIGHT, IN. 1.00
INDEX PROPERTIES	LL 62	PI 37	G_s 2.66
			FINES, % 50



SPECIMEN NUMBER			1	2	3
INITIAL	WATER CONTENT, %	W_o	43.5	–	–
	DRY DENSITY, PCF	Yd_o	72.6	–	–
	SATURATION, %	S_o	90.0	–	–
	VOID RATIO	e_o	1.286	–	–
AFTER CONSOLIDATION	WATER CONTENT, %	W_c	38.8	–	–
	DRY DENSITY, PCF	Yd_c	81.7	–	–
	SATURATION, %	S_c	100	–	–
	VOID RATIO	e_c	1.033	–	–
	FINAL BACK PRESSURE, PSI	U_o	30.0	–	–
	EFFECTIVE CONSOLIDATION PRESSURE, PSI	$\sigma 3$	47.7	–	–
PERMEATION	PORE PRESSURE DIFFERENCE, PSI	ΔU_o	3.6	–	–
	HYDRAULIC GRADIENT	I	100	–	–
	AVG. TEMP. PERMEANT, C°	T	20	–	–
	TOTAL FLOW, CC	Q_c	40.5	–	–
	TOTAL FLOW PORE VOLUMES, %	Q_p	285	–	–

	SPECIMEN NUMBER		
	1	2	3
HYDRAULIC CONDUCTIVITY, K x 10⁻⁷ CM/S	1.2	–	–

PERMEANT PROPERTIES	
PERMEANT DESCRIPTION: Deaired tap water	
SPECIFIC WT., DYNES 1.7×10^{-2}	VISCOSITY, POISE 0.01005

REMOLDED SOIL PROPERTIES	
TEST PROCEDURE: N.A.	
MAXIMUM DRY DENSITY, PCF –	OPTIMUM MOISTURE CONTENT, % –

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CONTROLLED GRADIENT PERMEABILITY TEST REPORT

PROJECT Burial Ground Expansion Hydro Characterization/G0506		**JOB NO.** 10357-A	**REPORT NO.** 47618
DATE 04/24/91	**BORING** BGX-9	**DEPTH/ELEV.** 102.5'-104.5'	**SAMPLE NO.** Vertical
TEST PROCEDURE EM1110-2-1906 Appendix VII		**SAMPLE TYPE** UD	**REVIEWED**

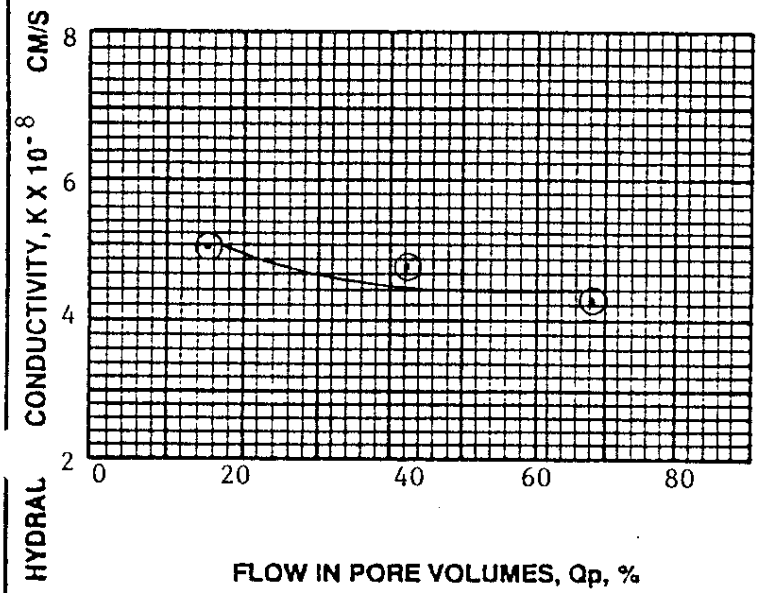
SOIL DESCRIPTION

Gray & black clayey fine sand with some silt

SPECIMEN DIAMETER, IN. 1.40

SPECIMEN HEIGHT, IN. 1.00

INDEX PROPERTIES	**LL** 31	**PI** 5	G_s 2.63	**FINES, %** 44



SPECIMEN NUMBER			1	2	3
INITIAL	WATER CONTENT, %	W_o	26.7	–	–
	DRY DENSITY, PCF	Yd_o	95.2	–	–
	SATURATION, %	S_o	97.2	–	–
	VOID RATIO	e_o	0.724	–	–
AFTER CONSOLIDATION	WATER CONTENT, %	W_c	23.4	–	–
	DRY DENSITY, PCF	Yd_c	101.7	–	–
	SATURATION, %	S_c	100	–	–
	VOID RATIO	e_c	0.614	–	–
	FINAL BACK PRESSURE, PSI	U_o	25.0	–	–
	EFFECTIVE CONSOLIDATION PRESSURE, PSI	$\sigma 3$	64.2	–	–
PERMEATION	PORE PRESSURE DIFFERENCE, PSI	ΔU_o	1.8	–	–
	HYDRAULIC GRADIENT	I	50	–	–
	AVG. TEMP. PERMEANT, C°	T	20	–	–
	TOTAL FLOW, CC	Q_c	7.2	–	–
	TOTAL FLOW PORE VOLUMES, %	Q_p	68	–	–

	SPECIMEN NUMBER		
	1	2	3
HYDRAULIC CONDUCTIVITY, K x 10⁻⁸ CM/S	4.4	–	–

PERMEANT PROPERTIES

PERMEANT DESCRIPTION

Deaired tap water

SPECIFIC WT., DYNES	VISCOSITY, POISE
1.7×10^{-2}	0.01005

REMOLDED SOIL PROPERTIES

TEST PROCEDURE:

N.A.

MAXIMUM DRY DENSITY, PCF	OPTIMUM MOISTURE CONTENT, %
–	–

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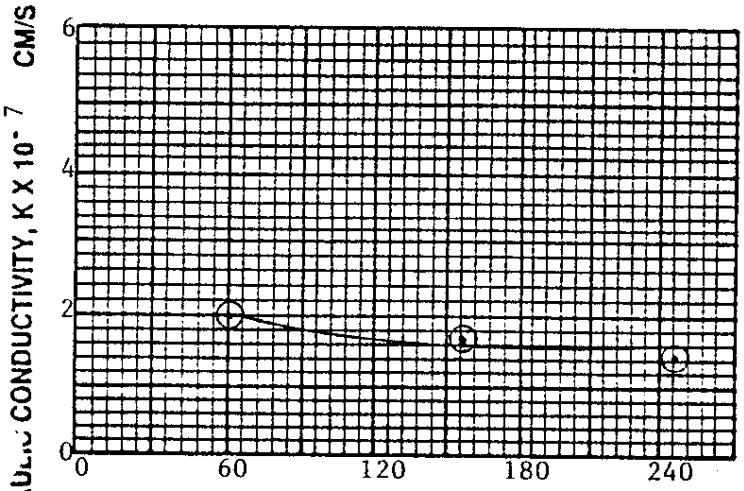
CONTROLLED GRADIENT

PERMEABILITY TEST REPORT

PROJECT Burial Ground Expansion Hydro Characterization/G0506		**JOB NO.** 10357-A	**REPORT NO.** 47618
DATE 04/24/91	**BORING** BGX-9	**DEPTH/ELEV.** 102.5'-104.5'	**SAMPLE NO.** Horizontal
TEST PROCEDURE EM1110-2-1906 Appendix VII		**SAMPLE TYPE** UD	**REVIEWED**
SOIL DESCRIPTION Gray & black clayey fine sand with some silt			**SPECIMEN DIAMETER, IN.** 1.40
			SPECIMEN HEIGHT, IN. 1.00
INDEX PROPERTIES	**LL** 31	**PI** 5	G_s 2.63 **FINES, %** 44



SPECIMEN NUMBER			1	2	3
INITIAL	WATER CONTENT, %	W_o	26.7	–	–
	DRY DENSITY, PCF	Yd_o	95.0	–	–
	SATURATION, %	S_o	96.7	–	–
	VOID RATIO	e_o	0.728	–	–
AFTER CONSOLIDATION	WATER CONTENT, %	W_c	23.8	–	–
	DRY DENSITY, PCF	Yd_c	101.0	–	–
	SATURATION, %	S_c	100	–	–
	VOID RATIO	e_c	0.625	–	–
	FINAL BACK PRESSURE, PSI	U_o	25.0	–	–
	EFFECTIVE CONSOLIDATION PRESSURE, PSI	$\sigma 3$	64.2	–	–
PERMEATION	PORE PRESSURE DIFFERENCE, PSI	ΔU_o	1.8	–	–
	HYDRAULIC GRADIENT	I	50	–	–
	AVG. TEMP. PERMEANT, C°	T	20	–	–
	TOTAL FLOW, CC	Q_c	26.2	–	–
	TOTAL FLOW PORE VOLUMES, %	Q_p	247	–	–

	SPECIMEN NUMBER		
	1	2	3
HYDRAULIC CONDUCTIVITY, K x 10^{-7} CM/S	1.6	–	–

PERMEANT PROPERTIES	
PERMEANT DESCRIPTION: Deaired tap water	
SPECIFIC WT., DYNES 1.7×10^{-2}	VISCOSITY, POISE 0.01005

REMOLDED SOIL PROPERTIES	
TEST PROCEDURE: N.A.	
MAXIMUM DRY DENSITY, PCF –	OPTIMUM MOISTURE CONTENT, % –

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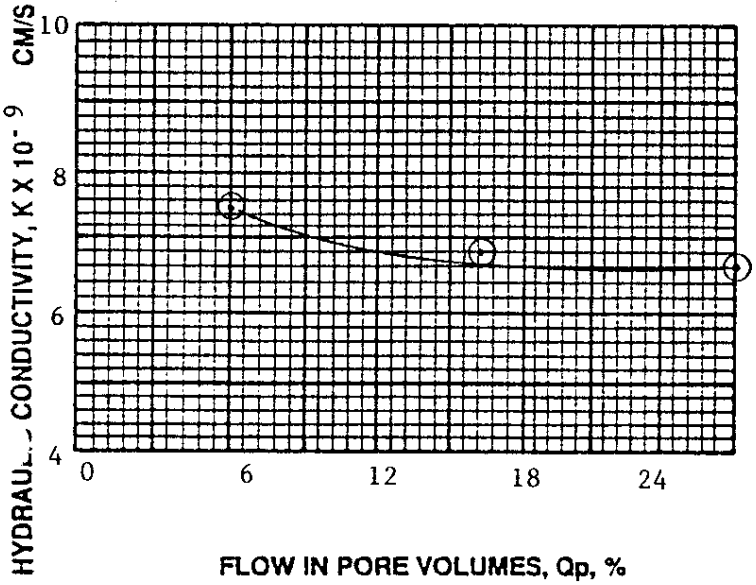
CONTROLLED GRADIENT PERMEABILITY TEST REPORT

PROJECT Burial Ground Expansion Hydro Characterization/G0506		JOB NO. 10357-A	REPORT NO. 47618
DATE 04/24/91	BORING BGX-11	DEPTH/ELEV. 154'-156'	SAMPLE NO. Vertical
TEST PROCEDURE EM1110-2-1906 Appendix VII		SAMPLE TYPE UD	REVIEWED
SOIL DESCRIPTION			SPECIMEN DIAMETER, IN. 1.40
Gray & black clayey sand with some silt			SPECIMEN HEIGHT, IN. 1.00
INDEX PROPERTIES	LL 45	PI 22	G_s 2.66
			FINES, % 40



SPECIMEN NUMBER			1	2	3
INITIAL	WATER CONTENT, %	W_o	20.3	–	–
	DRY DENSITY, PCF	Yd_o	99.0	–	–
	SATURATION, %	S_o	80.0	–	–
	VOID RATIO	e_o	0.677	–	–
AFTER CONSOLIDATION	WATER CONTENT, %	W_c	21.7	–	–
	DRY DENSITY, PCF	Yd_c	105.2	–	–
	SATURATION, %	S_c	100	–	–
	VOID RATIO	e_c	0.577	–	–
	FINAL BACK PRESSURE, PSI	U_o	40.0	–	–
	EFFECTIVE CONSOLIDATION PRESSURE, PSI	$\sigma 3$	79.1	–	–
PERMEATION	PORE PRESSURE DIFFERENCE, PSI	ΔU_o	4.5	–	–
	HYDRAULIC GRADIENT	I	125	–	–
	AVG. TEMP. PERMEANT, C°	T	20	–	–
	TOTAL FLOW, CC	Q_c	2.7	–	–
	TOTAL FLOW PORE VOLUMES, %	Q_p	27	–	–

	SPECIMEN NUMBER		
	1	2	3
HYDRAULIC CONDUCTIVITY, K x 10⁻⁹ CM/S	6.6	–	–

PERMEANT PROPERTIES	
PERMEANT DESCRIPTION	
Deaired tap water	
SPECIFIC WT., DYNES 1.7×10^{-2}	VISCOSITY, POISE 0.01005

REMOLDED SOIL PROPERTIES	
TEST PROCEDURE:	
N.A.	
MAXIMUM DRY DENSITY, PCF –	OPTIMUM MOISTURE CONTENT, % –

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CONTROLLED GRADIENT PERMEABILITY TEST REPORT

PROJECT Burial Ground Expansion Hydro Characterization/G0506		**JOB NO.** 10357-A	**REPORT NO.** 47618
DATE 04/25/91	**BORING** BGX-11	**DEPTH/ELEV.** 154'-156'	**SAMPLE NO.** Horizontal
TEST PROCEDURE EM1110-2-1906 Appendix VII		**SAMPLE TYPE** UD	**REVIEWED**

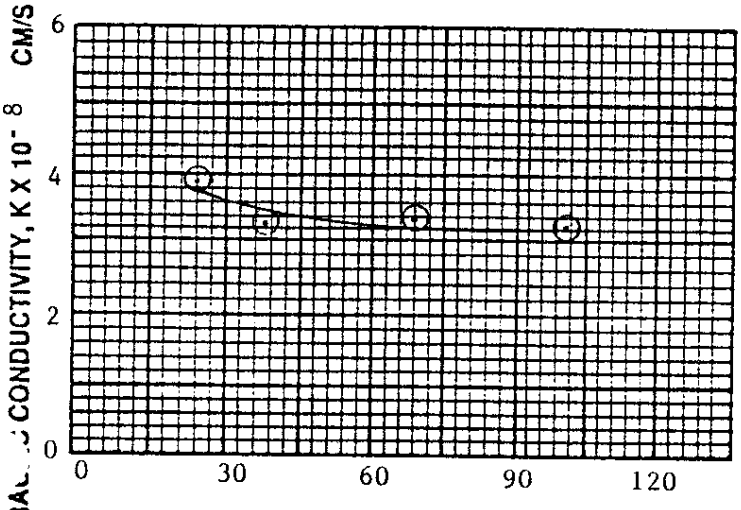
SOIL DESCRIPTION

Gray & black clayey sand with some silt

SPECIMEN DIAMETER, IN. 1.40

SPECIMEN HEIGHT, IN. 1.00

INDEX PROPERTIES	**LL** 45	**PI** 22	G_s 2.66	**FINES, %** 40



	SPECIMEN NUMBER		
	1	2	3
HYDRAULIC CONDUCTIVITY, K x 10⁻⁸ CM/S	3.2	–	–

SPECIMEN NUMBER			1	2	3
INITIAL	WATER CONTENT, %	W_o	20.3	–	–
	DRY DENSITY, PCF	Yd_o	99.0	–	–
	SATURATION, %	S_o	80.0	–	–
	VOID RATIO	e_o	0.677	–	–
AFTER CONSOLIDATION	WATER CONTENT, %	W_c	21.7	–	–
	DRY DENSITY, PCF	Yd_c	105.2	–	–
	SATURATION, %	S_c	100	–	–
	VOID RATIO	e_c	0.577	–	–
	FINAL BACK PRESSURE, PSI	U_o	40.0	–	–
	EFFECTIVE CONSOLIDATION PRESSURE, PSI	$\sigma 3$	79.1	–	–
PERMEATION	PORE PRESSURE DIFFERENCE, PSI	ΔU_o	4.5	–	–
	HYDRAULIC GRADIENT	I	125	–	–
	AVG. TEMP. PERMEANT, C°	T	20	–	–
	TOTAL FLOW, CC	Q_c	10.3	–	–
	TOTAL FLOW PORE VOLUMES, %	Q_p	101	–	–

PERMEANT PROPERTIES

PERMEANT DESCRIPTION

Deaired tap water

SPECIFIC WT., DYNES	VISCOSITY, POISE
1.7×10^{-2}	0.01005

REMOLDED SOIL PROPERTIES

TEST PROCEDURE:

N.A.

MAXIMUM DRY DENSITY, PCF	OPTIMUM MOISTURE CONTENT, %
–	–

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CONTROLLED GRADIENT

PERMEABILITY TEST REPORT

PROJECT Burial Ground Expansion Hydro Characterization/G0506		JOB NO. 10357-A	REPORT NO. 47618
DATE 04/25/91	BORING BGX-11	DEPTH/ELEV. 94'-96'	SAMPLE NO. Vertical
TEST PROCEDURE EM1110-2-1906 Appendix VII		SAMPLE TYPE UD	REVIEWED

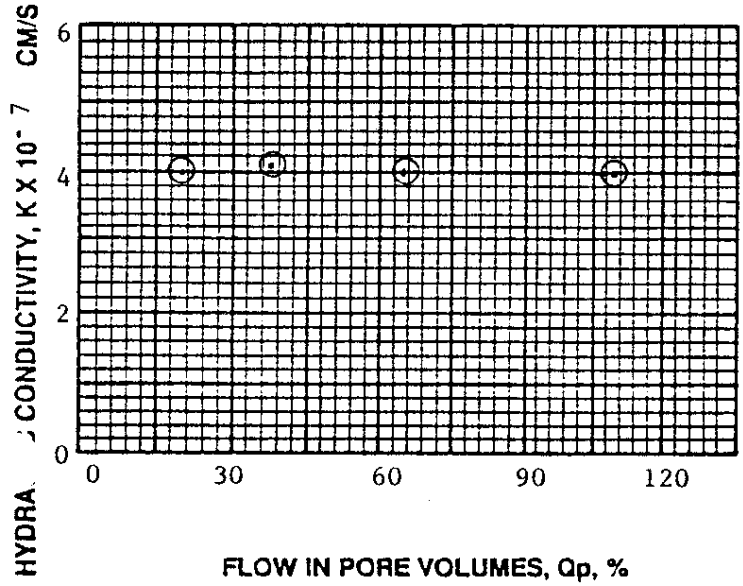
SOIL DESCRIPTION

Yellow & white clayey fine sand with some silt

SPECIMEN DIAMETER, IN. 2.87

SPECIMEN HEIGHT, IN. 2.48

INDEX PROPERTIES	LL	PI	G_s	FINES, %
	58	14	2.72	48



	SPECIMEN NUMBER		
	1	2	3
HYDRAULIC CONDUCTIVITY, K x 10⁻⁷ CM/S	4.0	–	–

SPECIMEN NUMBER			1	2	3
INITIAL	WATER CONTENT, %	W_o	75.8	–	–
	DRY DENSITY, PCF	Yd_o	55.1	–	–
	SATURATION, %	S_o	99.1	–	–
	VOID RATIO	e_o	2.088	–	–
AFTER CONSOLIDATION	WATER CONTENT, %	W_c	73.9	–	–
	DRY DENSITY, PCF	Yd_c	56.4	–	–
	SATURATION, %	S_c	100	–	–
	VOID RATIO	e_c	2.010	–	–
	FINAL BACK PRESSURE, PSI	U_o	40.0	–	–
	EFFECTIVE CONSOLIDATION PRESSURE, PSI	$\sigma 3$	41.0	–	–
PERMEATION	PORE PRESSURE DIFFERENCE, PSI	ΔU_o	1.8	–	–
	HYDRAULIC GRADIENT	I	50	–	–
	AVG. TEMP. PERMEANT, C°	T	20	–	–
	TOTAL FLOW, CC	Q_c	195	–	–
	TOTAL FLOW PORE VOLUMES, %	Q_p	110	–	–

PERMEANT PROPERTIES

PERMEANT DESCRIPTION

Deaired tap water

SPECIFIC WT., DYNES	VISCOSITY, POISE
1.7×10^{-2}	0.01005

REMOLDED SOIL PROPERTIES

TEST PROCEDURE:

N.A.

MAXIMUM DRY DENSITY, PCF	OPTIMUM MOISTURE CONTENT, %
–	–

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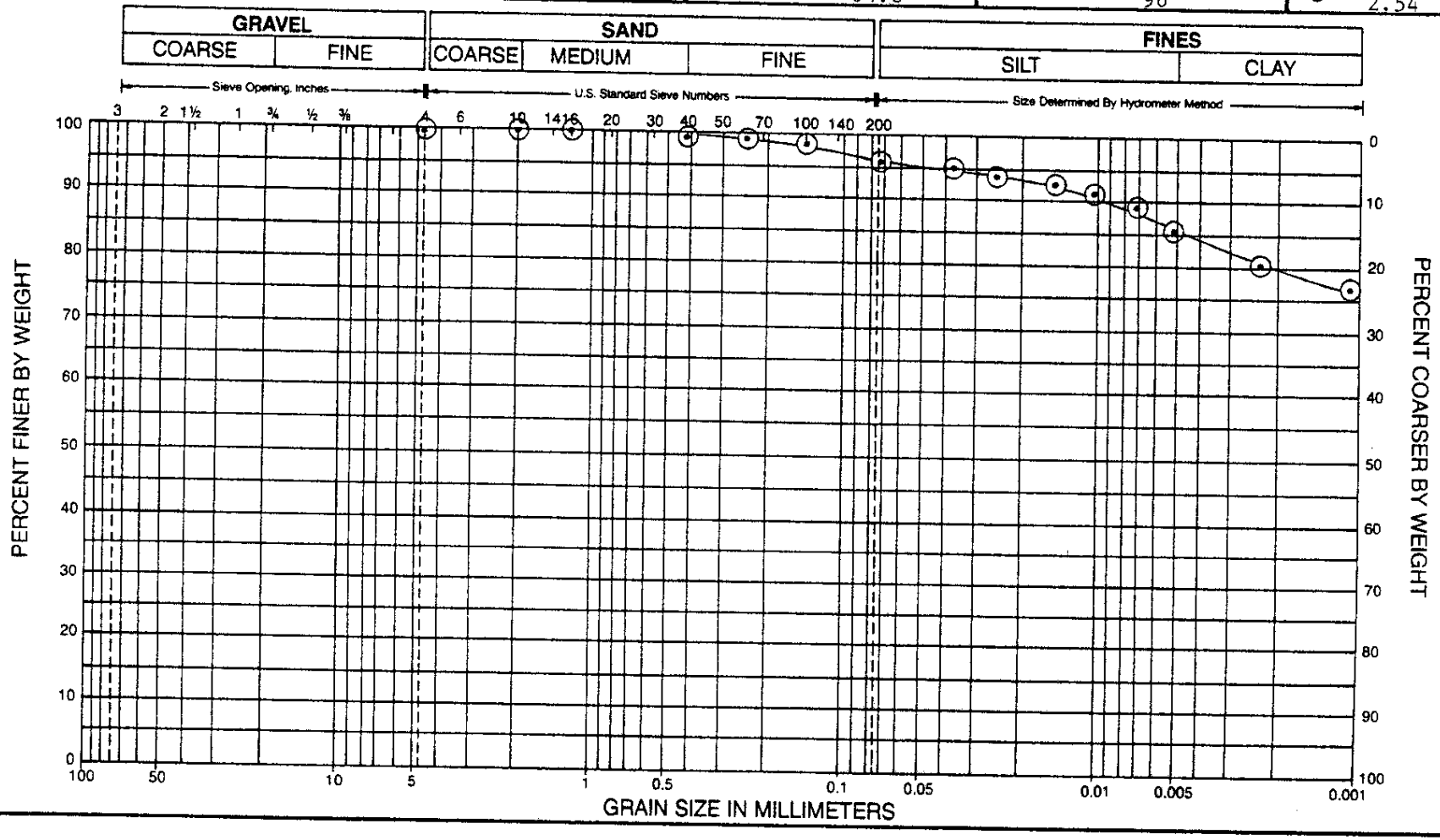
GRAIN SIZE DISTRIBUTION TEST REPORT

PROJECT BGX Hydro Characterization/G0506		**JOB NO.** 10357-A	**REPORT NO.** 49945
DATE 06/13/91	**BORING/PIT NO.** BGX-1A	**DEPTH/ELEV.** 80'-82'	**REVIEWED**
TEST PROCEDURE ASTM D422		**SAMPLE TYPE** UD	**SAMPLE NO.** –
SOIL DESCRIPTION Tan silty clay			

INDEX PROPERTIES	**LL**	**PI**	**MC, %**	**FINES, %**	**G_S**
	122	54	64.8	96	2.54



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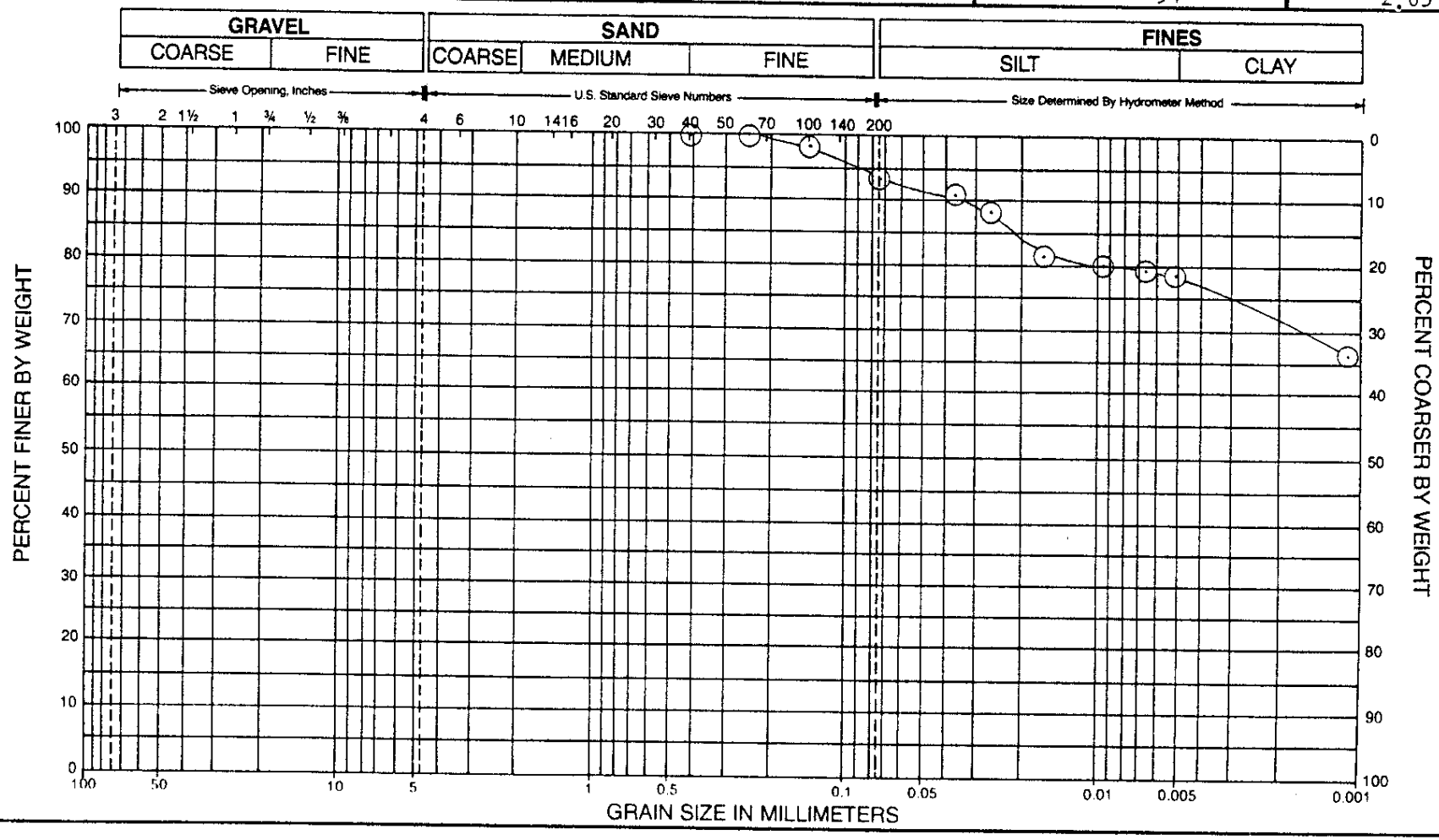
GRAIN SIZE DISTRIBUTION TEST REPORT

PROJECT Burial Ground Expansion Hydro Characterization/G0506		**JOB NO.** 10357-A	**REPORT NO.** 47618
DATE 04/25/91	**BORING/PIT NO.** BGX-2B	**DEPTH/ELEV.** 75'-77'	**REVIEWED**
TEST PROCEDURE ASTM D422		**SAMPLE TYPE** UD	**SAMPLE NO.** -
SOIL DESCRIPTION Dark yellow clay with some silt & with a trace sand			

INDEX PROPERTIES	**LL** 132	**PI** 86	**MC, %** 73.2	**FINES, %** 94	**G_S** 2.65



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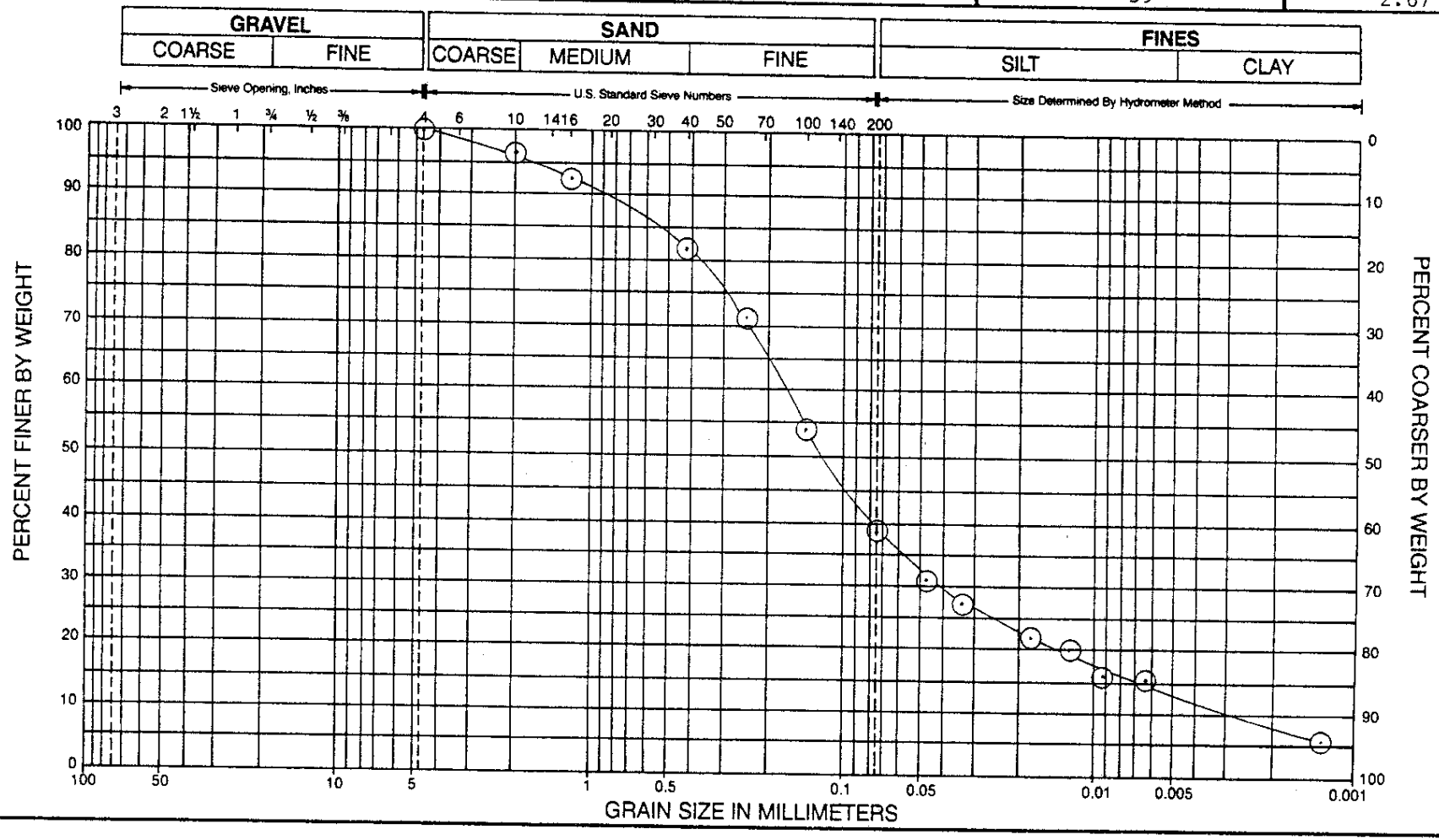
GRAIN SIZE DISTRIBUTION TEST REPORT

PROJECT Burial Ground Expansion Hydro Characterization/G0506		**JOB NO.** 10357-A	**REPORT NO.** 47618
DATE 04/25/91	**BORING/PIT NO.** BGX-2B	**DEPTH/ELEV.** 156'-156.8'	**REVIEWED**
TEST PROCEDURE ASTM D 422		**SAMPLE TYPE** UD	**SAMPLE NO.** –
SOIL DESCRIPTION Gray & black silty fine to medium sand			
INDEX PROPERTIES	**LL** 35	**PI** N.P.	**MC, %** 33.3	**FINES, %** 39	**G_S** 2.67



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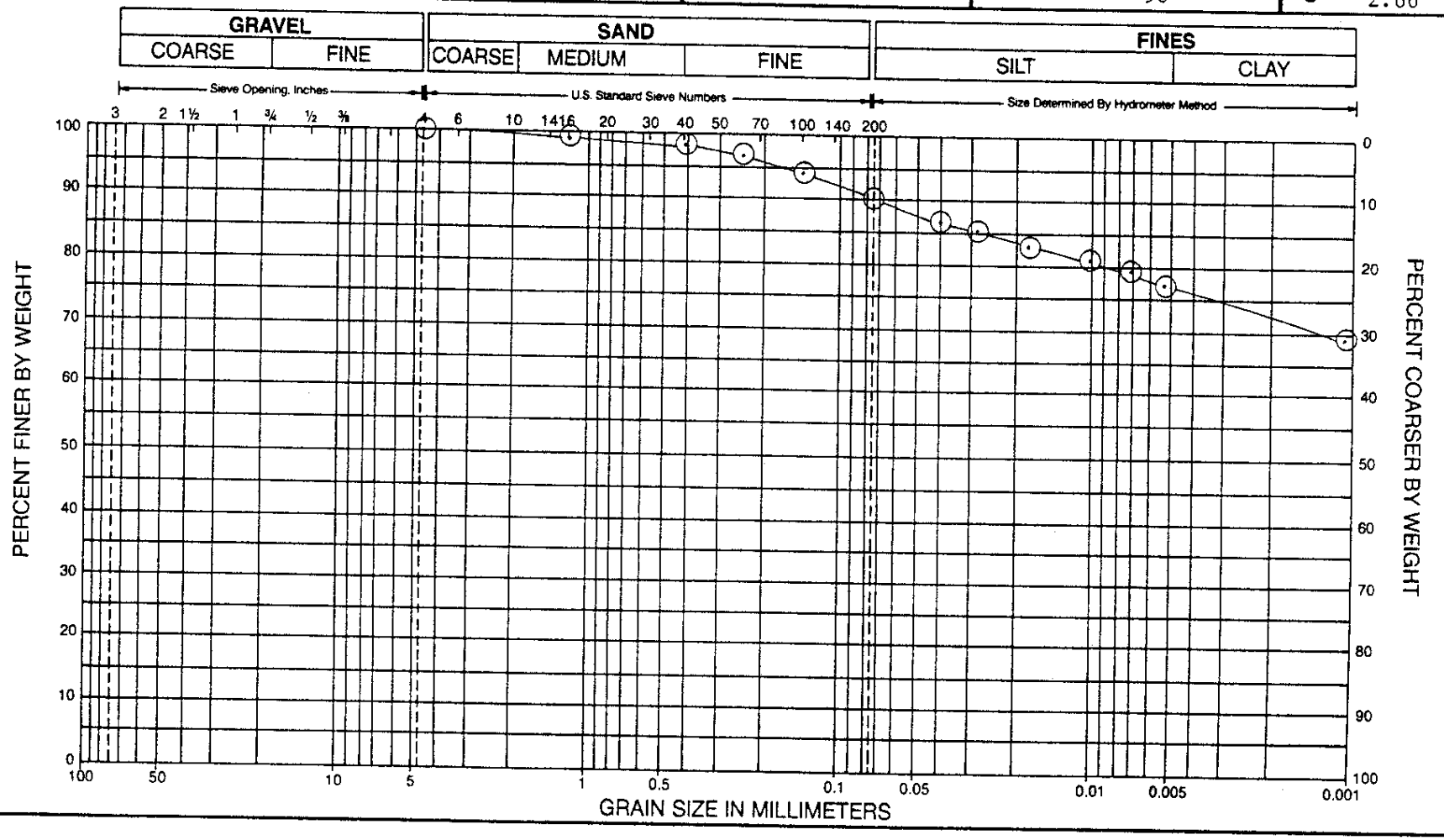
GRAIN SIZE DISTRIBUTION TEST REPORT

PROJECT Burial Ground Expansion Hydro Characterization/G0506		**JOB NO.** 10357-A	**REPORT NO.** 47618
DATE 04/25/91	**BORING/PIT NO.** BGX-4A	**DEPTH/ELEV.** 65'-67'	**REVIEWED**
TEST PROCEDURE ASTM D 422		**SAMPLE TYPE** UD	**SAMPLE NO.** -
SOIL DESCRIPTION Yellow clay with a trace of silt and sand			
INDEX PROPERTIES	**LL** 134	**PI** 92	**MC, %** 63.2
			FINES, % 90
			G_S 2.66



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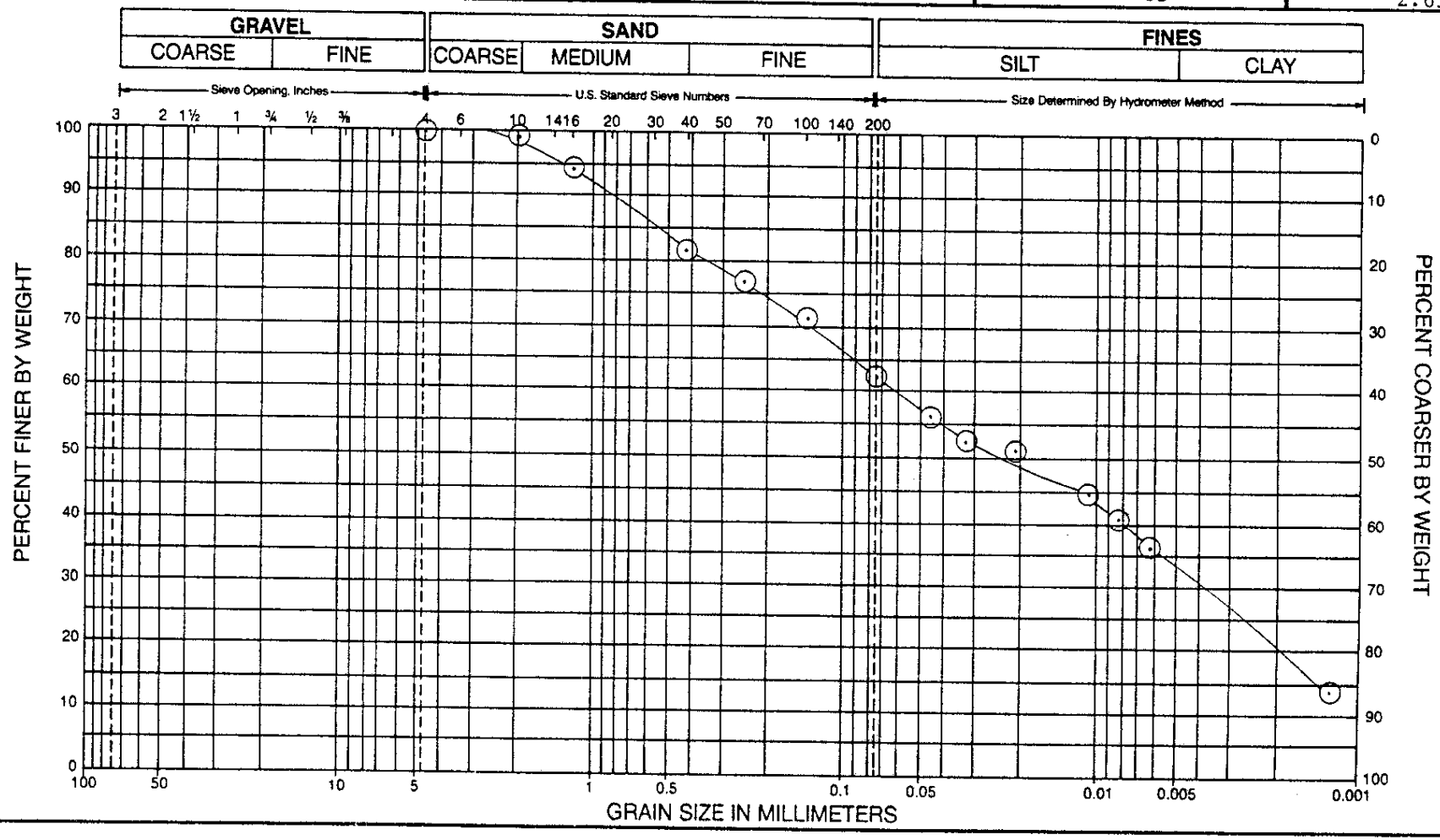
GRAIN SIZE DISTRIBUTION TEST REPORT

PROJECT Burial Ground Expansion Hydro Characterization/G0506		**JOB NO.** 10357-A	**REPORT NO.** 47618
DATE 04/25/91	**BORING/PIT NO.** BGX-4A	**DEPTH/ELEV.** 162'-163'	**REVIEWED**
TEST PROCEDURE ASTM D 422		**SAMPLE TYPE** UD	**SAMPLE NO.**
SOIL DESCRIPTION Gray & black sandy clayey silt			
INDEX PROPERTIES	**LL** 101	**PI** 44	**MC, %** -	**FINES, %** 63	**G_S** 2.65



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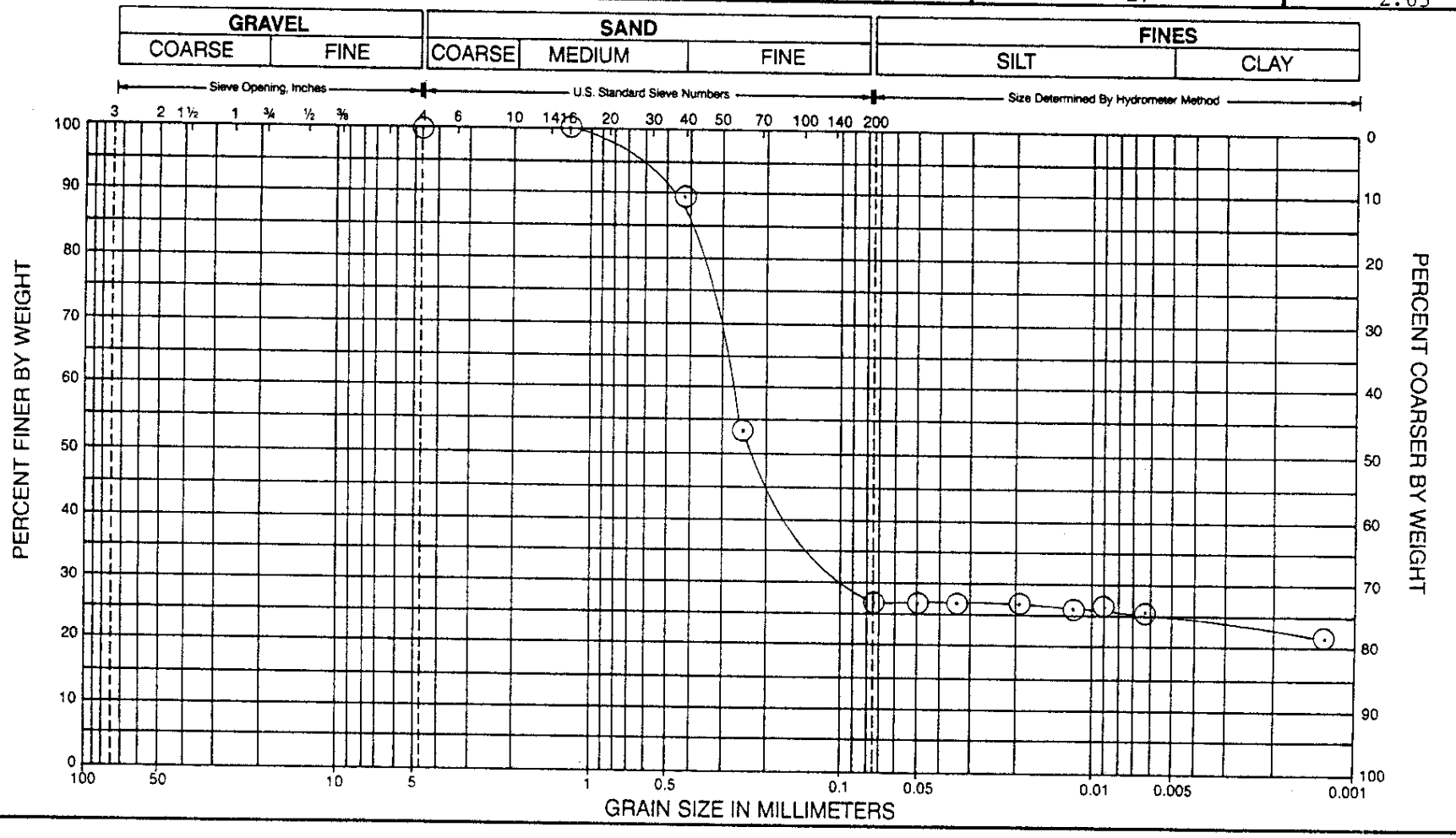
GRAIN SIZE DISTRIBUTION TEST REPORT

PROJECT Burial Ground Expansion Hydro Characterization/G0506		**JOB NO.** 10357-A	**REPORT NO.** 47618
DATE 04/25/91	**BORING/PIT NO.** BGX-4C	**DEPTH/ELEV.** 104'-106'	**REVIEWED**
TEST PROCEDURE ASTM D 422		**SAMPLE TYPE** UD	**SAMPLE NO.** –
SOIL DESCRIPTION Tan, gray & black clayey fine to medium sand			

INDEX PROPERTIES	**LL** 36	**PI** 12	**MC, %** 24.9	**FINES, %** 27	G_S 2.63



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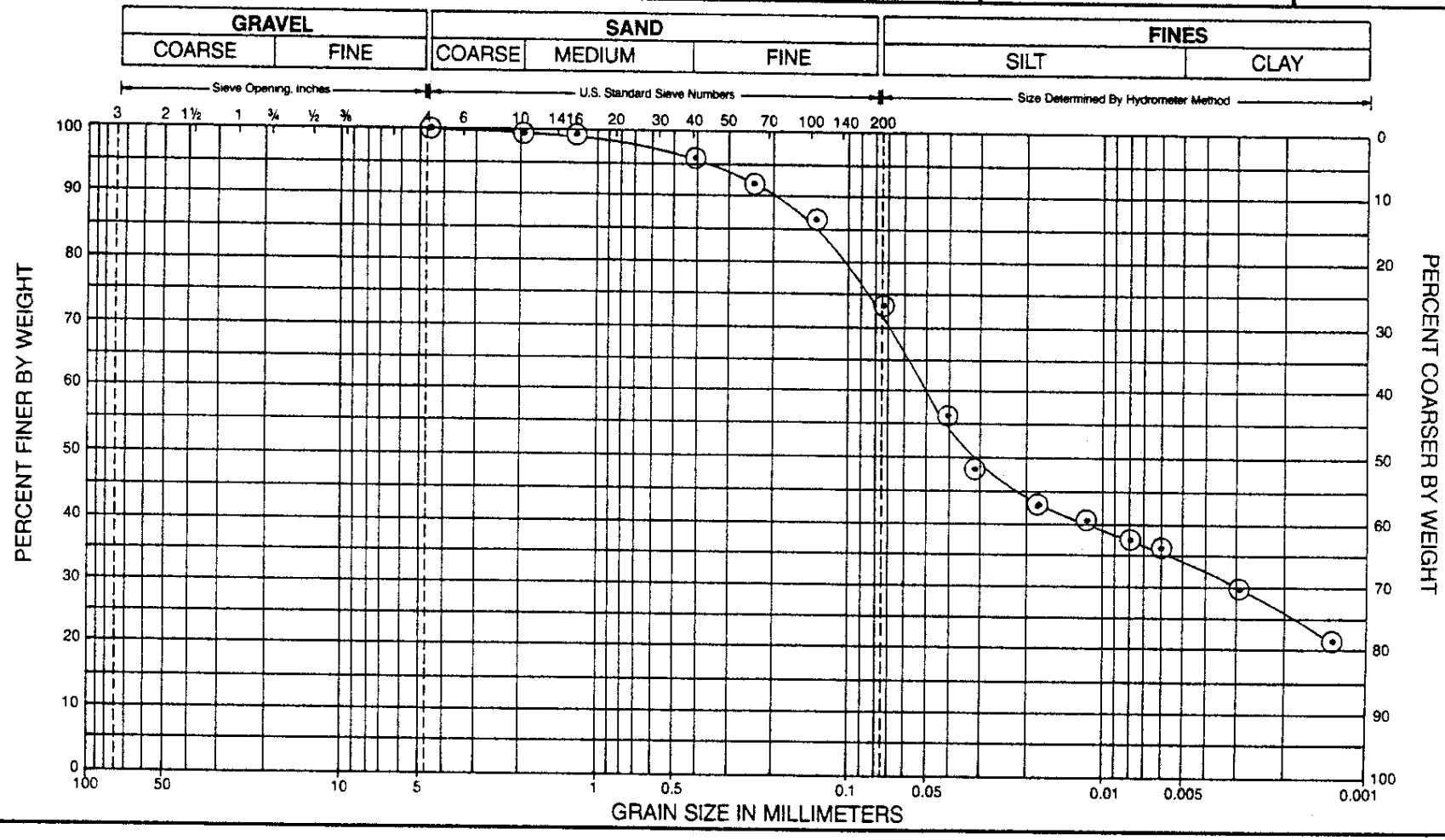
GRAIN SIZE DISTRIBUTION TEST REPORT

PROJECT BGX Hydro Characterization/G0506		**JOB NO.** 10357-A	**REPORT NO.** 49945
DATE 06/13/91	**BORING/PIT NO.** BGX-7	**DEPTH/ELEV.** 123'-124.5'	**REVIEWED**
TEST PROCEDURE ASTM D422		**SAMPLE TYPE** UD	**SAMPLE NO.** –
SOIL DESCRIPTION Greenish black sandy silty clay			

INDEX PROPERTIES	**LL** 59	**PI** 38	**MC, %** 42.3	**FINES, %** 74	**G_S** 2.53



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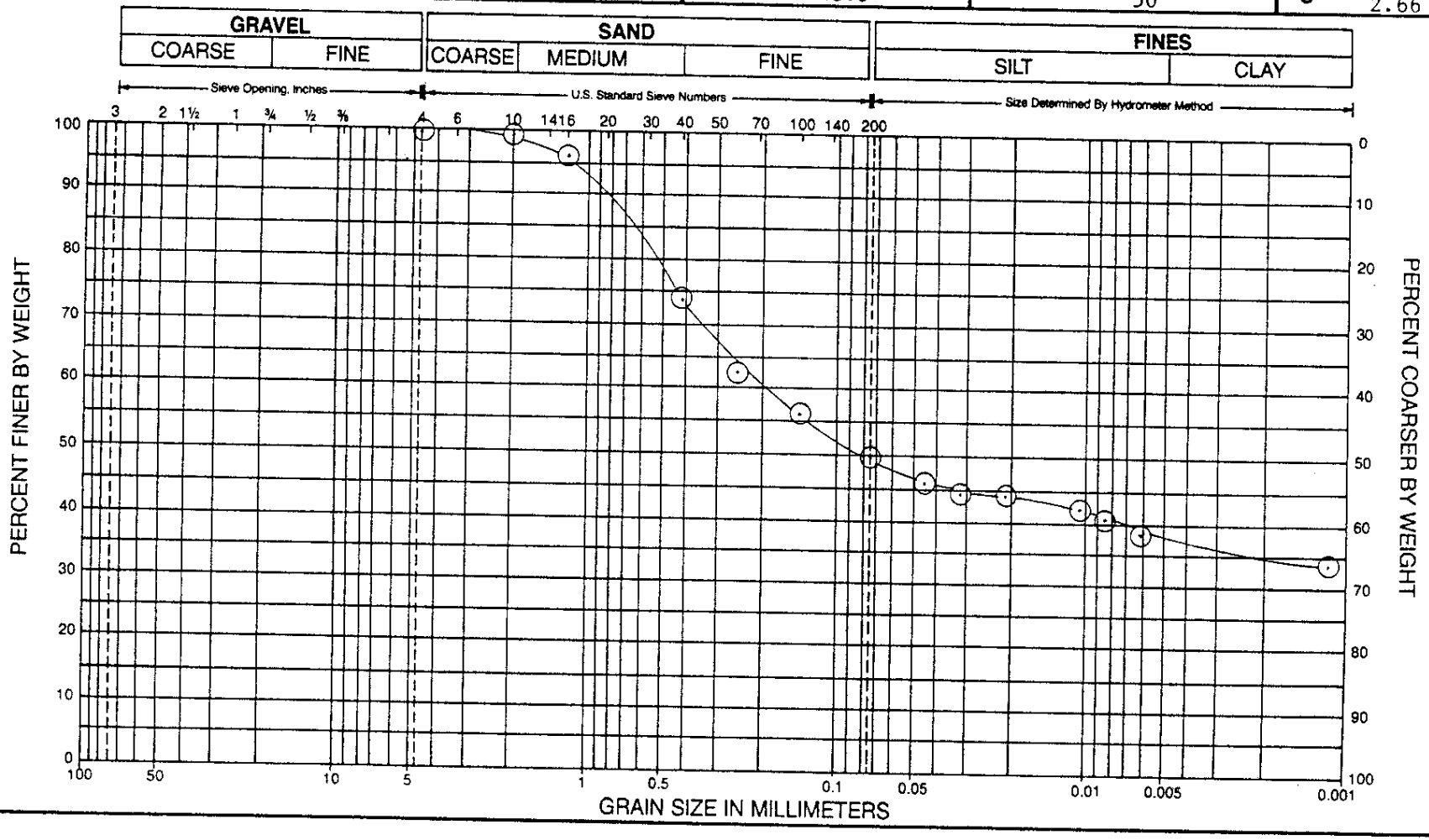
GRAIN SIZE DISTRIBUTION TEST REPORT

PROJECT Burial Ground Expansion Hydro Characterization/G0506		**JOB NO.** 10357-A	**REPORT NO.** 47618
DATE 04/25/91	**BORING/PIT NO.** BGX-9	**DEPTH/ELEV.** 70'-70.8'	**REVIEWED**
TEST PROCEDURE ASTM D 422		**SAMPLE TYPE** UD	**SAMPLE NO.**
SOIL DESCRIPTION Yellow clayey fine to medium sand with some silt			
INDEX PROPERTIES	**LL** 62	**PI** 37	**MC, %** 43.5
FINES, % 50	**G_S** 2.66		



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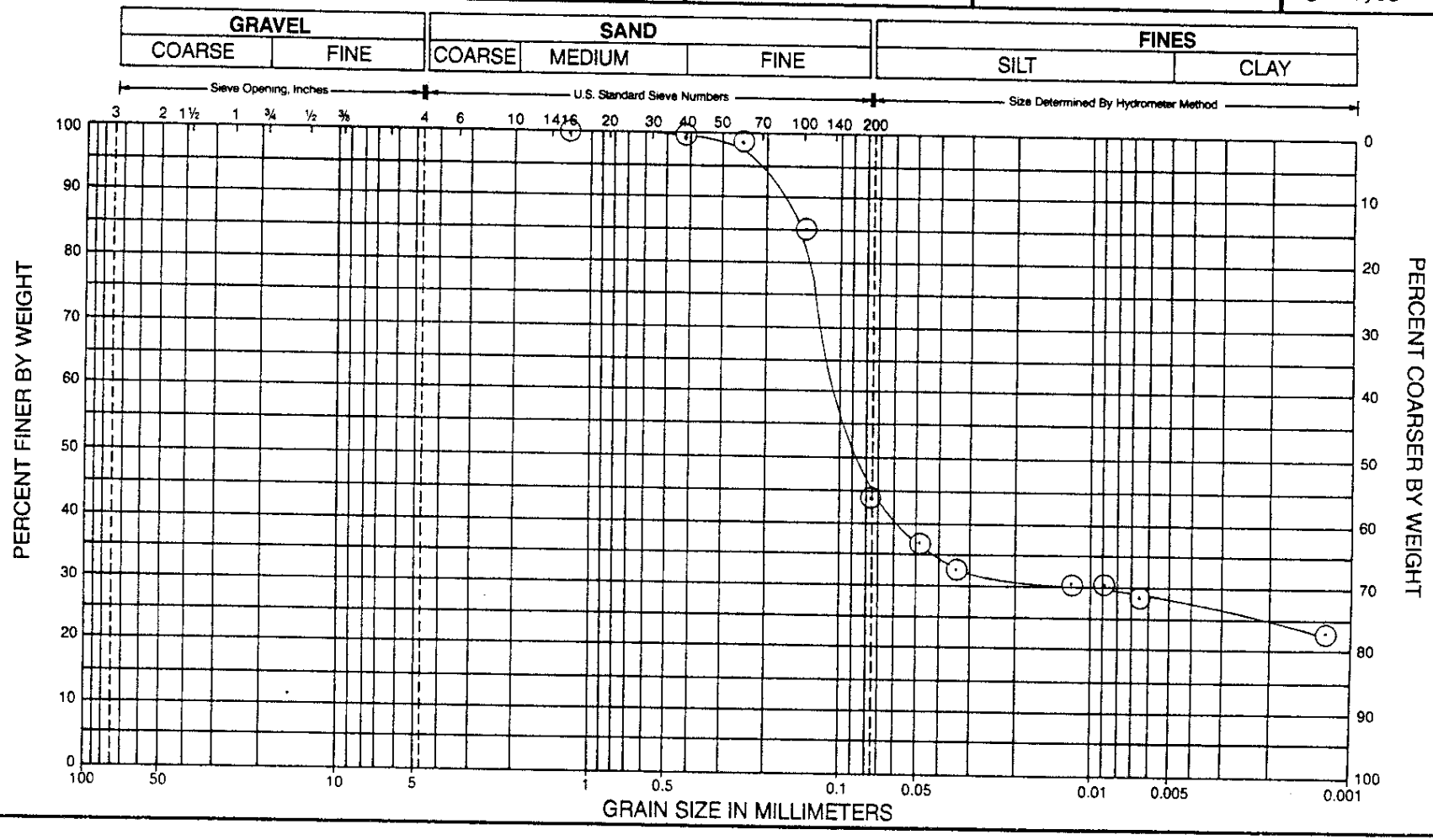
GRAIN SIZE DISTRIBUTION TEST REPORT

PROJECT Burial Ground Expansion Hydro Characterization/G0506		**JOB NO.** 10357-A	**REPORT NO.** 47618
DATE 04/25/91	**BORING/PIT NO.** BGX - 9	**DEPTH/ELEV.** 102'-104.5'	**REVIEWED**
TEST PROCEDURE ASTM D 422		**SAMPLE TYPE** UD	**SAMPLE NO.** –
SOIL DESCRIPTION Gray & black clayey fine sand with some silt			
INDEX PROPERTIES	**LL** 31	**PI** 5	**MC, %** 26.7	**FINES, %** 44	G_S 2,63



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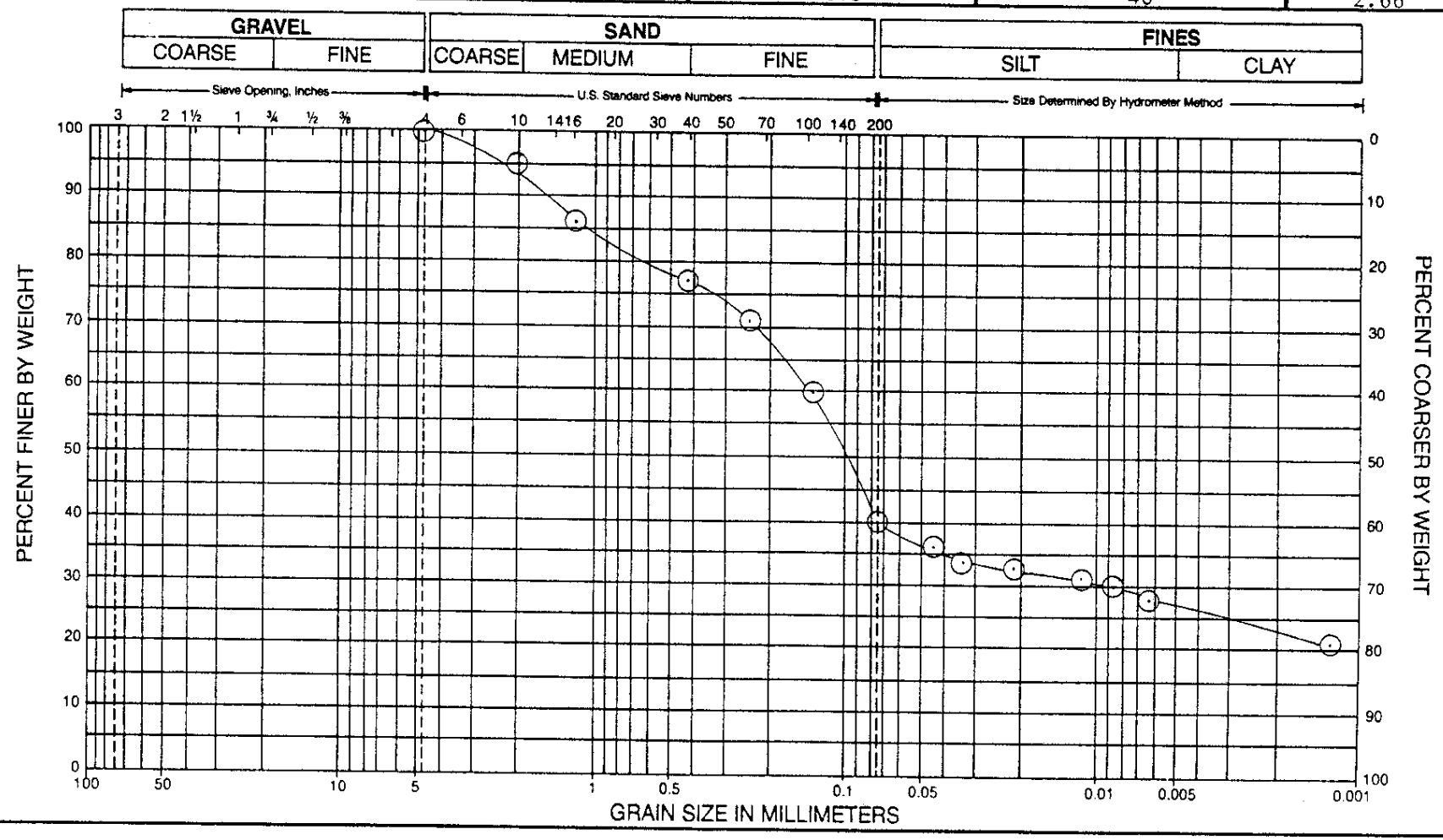
GRAIN SIZE DISTRIBUTION TEST REPORT

PROJECT Burial Ground Expansion Hydro Characterization/G0506		**JOB NO.** 10357-A	**REPORT NO.** 47618
DATE 04/25/91	**BORING/PIT NO.** BGX-11	**DEPTH/ELEV.** 154'-156'	**REVIEWED**
TEST PROCEDURE ASTM D422		**SAMPLE TYPE** UD	**SAMPLE NO.** —
SOIL DESCRIPTION Gray & black clayey sand with some silt			
INDEX PROPERTIES	**LL** 45	**PI** 22	**MC, %** 20.3
FINES, % 40	**G_S** 2.66		



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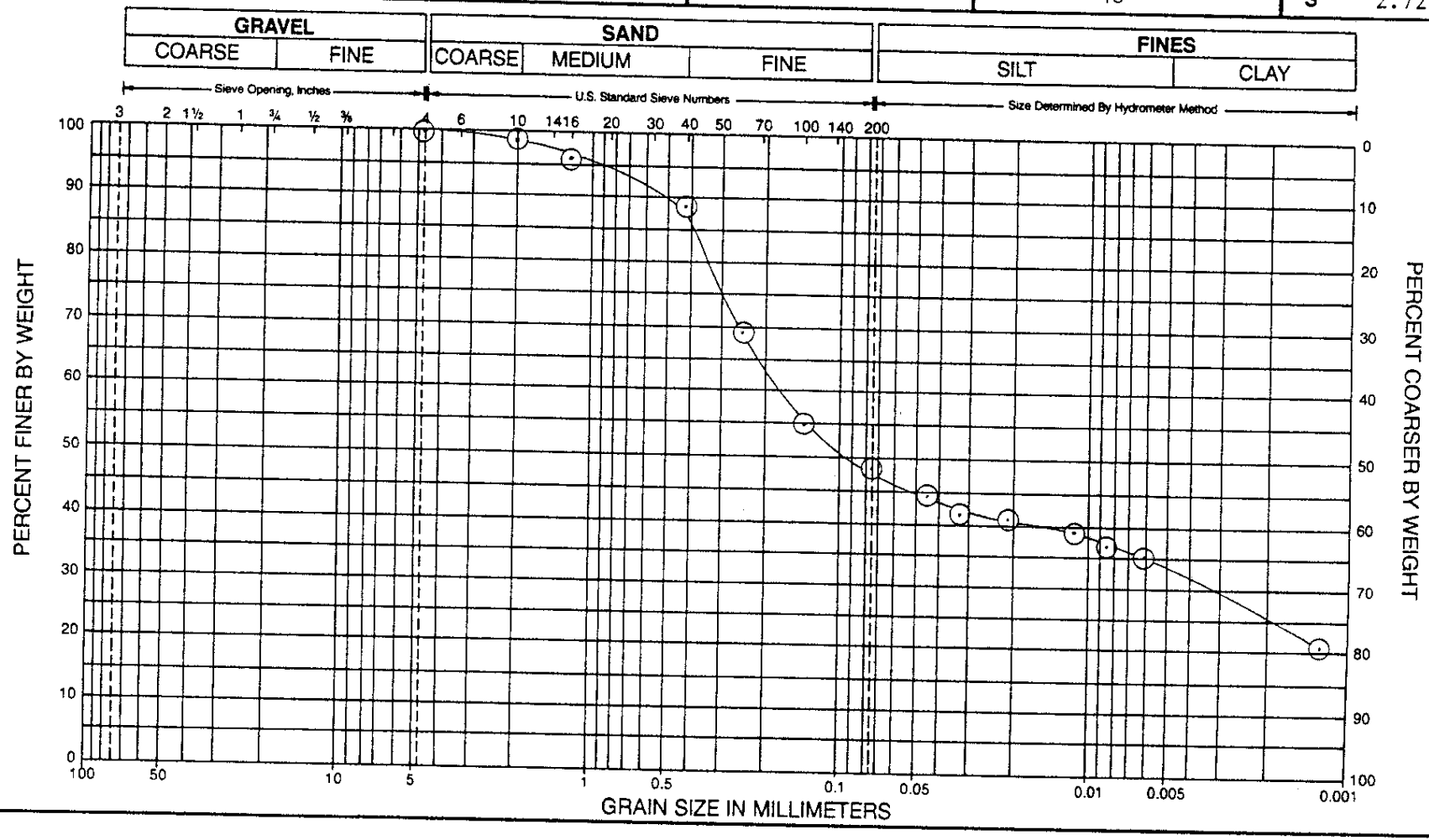
GRAIN SIZE DISTRIBUTION TEST REPORT

PROJECT Burial Ground Expansion Hydro Characterizations/G0506		**JOB NO.** 10357-A	**REPORT NO.** 47618
DATE 04/25/91	**BORING/PIT NO.** BGX-11	**DEPTH/ELEV.** 94'-96'	**REVIEWED**
TEST PROCEDURE ASTM D422		**SAMPLE TYPE** UD	**SAMPLE NO.** -
SOIL DESCRIPTION Yellow & white clayey fine sand with some silt			
INDEX PROPERTIES	**LL** 58	**PI** 14	**MC, %** 75.8
			FINES, % 48
			G_S 2.72



CONTROLLED GRADIENT PERMEABILITY TEST PROCEDURES EM 1110-2-1906, APPENDIX VII

A controlled gradient permeability test was performed on selected soil to determine the hydraulic conductivity, K. The test was performed in a triaxial testing device. A single 4-inch long section of an undisturbed sample was cut from the undisturbed sample tube or the core sample. The sample was then trimmed both in horizontal and vertical positions into a cylinder approximately 1 inch tall and 1.4 inches in diameter or 2.8 inches in diameter, and 3 inches tall.

Each specimen was encased in a rubber membrane and placed in separate plexiglass compression chambers. The specimen was sandwiched in the rubber membrane between porous stones, a plexiglass pedestal and plexiglass top that are connected via high pressure tubing to an air over water pressure panel. Deaired tap water was then added to the chamber and to burettes that are connected to the specimen's plexiglass base pedestal and plexiglass tap cap. All high pressure tubing lines and porous stones were deaired, by charging deaired water from the burettes into the back-pressure system. The specimen was allowed to seepage saturate under a controlled gradient and controlled effective confining pressure by applying a vacuum to the back-pressure outflow line. Following seepage saturation, the specimen was back-pressure saturated, then allowed to consolidate to the desired effective consolidation pressure. Maintaining the effective consolidation pressure on the outflow back-pressure line, the inflow pressure was increased until the desired gradient was obtained. Deaired tap water was then allowed to permeate through the specimen. Permeation was continued until the flow rate stabilized.

Volume change measurements were made throughout the testing process with calibrated burettes. Pore pressures were measured with an electronic manometer connected to the base of the specimen. The hydraulic conductivity was computed using a constant head equation. The specimen data and results are presented on the attached Controlled Gradient Permeability Test Report sheets.

GRAIN SIZE TEST PROCEDURES
ASTM D-422, EM 1110-2-1906, APPENDIX V

The grain size distribution of soil particles in a specimen is recognized as an indicator of certain physical properties including permeability, compaction characteristics, consolidation, shrinkage and swell characteristics, liquification characteristics and numerous other engineering related properties. The soil specimen is prepared and tested to determine the percentages of particles within a range of selected sizes. The measured cumulative quantities for each size are depicted on a graph that shows a distribution of gradations. The distribution of particles larger than 75 microns (retained on No. 200 sieve) is determined by sieving, while the smaller particle sizes are measured by a sedimentation process, using a hydrometer to secure the necessary data.

The soil specimen is prepared by either drying or using a wet method. The wet method is used when the soil specimen may have properties that change if the sample is dry prepared, such as high plasticity clay or silt.

After preparation, the coarse material (material retained on the No. 200 sieve) is dried and then is passed through a series of nested sieves. The portion retained on each sieve is weighed, and the percent of the total sample retained on each sieve is computed and plotted on the attached Grain Size Distribution Sheets.

The fine grained soil distribution (silt and clay size particles) is determined using a hydrometer. The prepared soil specimen is placed in suspension using distilled water and dispersing agent. The density of the solution is measured with the hydrometer over selected time intervals, and the particle size and weights are computed using Stoke's law. These values give a curve or distribution for various particle sizes of microscopic silt and clay size particles. If the distribution of silt and clay size particles has been determined for selected soil strata, these data are presented as an extension to the curve depicting the grain size distribution of the soil fraction coarser than the No. 200 sieve. These plots are attached on the Grain Size Distribution Sheets.

ATTERBERG LIMITS DETERMINATION
ASTM D-4318, EM 1110-2-1906, APPENDIX III

Representative samples were subjected to Atterberg limits testing to determine the soil's plasticity characteristics. The plasticity index (PI) is the range of moisture content over which the soil deforms as a plastic material. It is bracketed by the liquid limit (LL) and the plastic limit (PL). The liquid limit is the moisture content at which the soil becomes sufficiently "wet" to flow as a heavy viscous fluid. To determine the liquid limit, a soil specimen at its natural moisture content is first wash sieved over a No. 40 sieve. The materials finer than the No. 40 sieve are retained and dried back so that the soil exists in a heavy viscous fluid state. A portion of this soil is then placed in a brass cup of standardized dimensions, and a groove made through the middle of the soil specimen with a grooving tool of standardized dimensions. The cup is attached to a cam that lifts the cup 10 mm, and then allows the cup to fall and strike a rubber base of standardized hardness. The cam is rotated at about 2 cps until the two halves of the soil specimen come in contact at the bottom of the groove along a distance of 13 mm. The number of blows required to make this degree of contact is recorded, and a portion of the specimen is subjected to a moisture content determination. The remainder of the specimen is allowed to air dry for a modest interval, and the grooving process and cam action process repeated. This testing sequence is repeated until more than 25 blows is required to make the groove contact the required distance. The number of blows vs. moisture content is then plotted on arithmetic graph paper, and the moisture content corresponding to 25 blows is designated the liquid limit.

The plastic limit (PL) is the lowest moisture content at which the soil is sufficiently plastic to be manually rolled into threads $^1/_8$" in diameter. It is determined by taking a pat of soil remaining from the liquid limit test, and repeatedly rolling, kneading, and air drying the specimen until the soil breaks into threads about 3.2 mm in diameter and 3 to 10 mm long. The moisture content of these soil threads is then determined, and is designated the plastic limit. The results of these tests are presented on the attached Soil Data Summary Sheets.