REPORT OF
Supplemental Geotechnical Exploration

Clarksburg Town Center – Phase 2A

Stormwater Management Facilities
Montgomery County, Maryland

June 19, 2002

Prepared For:

Terrabrook Clarksburg, LLC
1 Piedmont Road
Clarksburg, Maryland 20871

Attn: Mr. Jim Richmond

GTA Job No.: 020424

Prepared By:

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SC 205466
SM-950-12

GEO-TECHNOLOGY ASSOCIATES, INC.

GEOTECHNICAL AND
ENVIRONMENTAL CONSULTANTS

A Practicing ASFE Member Firm

June 19, 2002

Terrabrook Clarksburg, LLC
1 Piedmont Road
Clarksburg, MD 20871

Attn: Mr. Jim Richmond

Re: Supplemental Geotechnical Exploration
Stormwater Management Facilities
Clarksburg Town Center, Phase 2A
Montgomery County, Maryland

Dear Jim:

At your request, Geo-Technology Associates, Inc. (GTA) has performed three additional borings at the proposed locations of Stormwater Management Pond #3, and Groundwater Recharge Facility No. 10, located in Phase 2 of Clarksburg Town Center. This report includes our geotechnical findings and conclusions with regard the design and construction of the facilities. The work was performed in accordance with our proposal dated May 7, 2002.

This report is intended to supplement GTA's Stormwater Management Report dated April 19, 2002. For more detailed information regarding site conditions, geology, and proposed stormwater management and water quality facilities in Phase 2A, please consult the previous report.

The Stormwater Management Plan - Pond #3, Phase 2, and Groundwater Recharge Trenches No. 9 and 10, dated March 2002, prepared by Charles P. Johnson Associates (CPJ), were referenced for this exploration.

Subsurface Exploration

GTA's drilled three borings located in Recharge Facility No. 10, Sand Filter No. 10, and the outfall of SWM Pond #3 as described in Table A.

TABLE A
Proposed Stormwater Management and Water Quality Facilities

Facility	Boring	Cut to Bottom of Facility (ft)	Fill to Top of Embankment (ft)
Stormwater Management Pond #3	SWM - 1	15 (cut-off trench)	6
Sand Filter 10	SWM-2	17	5
Groundwater Recharge Facility No. 10	GW-25	7	N/A

The boring locations were selected and field located by CPJ at the approximate locations indicated on the Boring Location Plan provided as Figure 2 in Appendix A. The Boring Location Plan is an altered reproduction of a plan prepared by CPJ. Logs of the borings are included in Appendix B.

The borings were drilled to depths of 10 to 20 feet with a Standard Penetration Test (SPT) rig, which utilizes a hollow auger to advance the boring, and a split spoon sampler to provide soil specimens and the SPT 'N' value. SPT tests were performed and soil samples were taken at 2.5-feet intervals in the upper ten feet of each boring and at 5-feet intervals thereafter.

Soil samples collected from the borings were returned to GTA's laboratory for visual classification and limited testing. Classifications provided on the logs are visual, supplemented by available laboratory test results.

In-situ borehole permeability testing was performed in Boring GW-25 at a depth of 2.5 feet below existing surface grade. The permeability test consists of measuring the drop in water level within a solid 5-inch PVC pipe for a period of 4 hours subsequent to a 24-hour pre-soak. The PVC pipes were set in holes drilled within five feet of the referenced boring.

Subsurface Conditions

The borings encountered predominantly coarse- to fine-grained silt and sand, with varying amounts of clay and rock fragments. Clay content was generally higher in the near surface soils, while weathered rock content generally increased with depth.

Soils encountered in the upper levels of the borings included plastic silts (USCS ML) to a depth of 2.5 feet in Boring GW-25, and granular soil with plastic clay (USCS SC) to a depth of 8 feet in Borings SWM-1 and SWM-2. Below the fine-grained soils, the borings encountered predominantly coarse-grained weathered rock visually classified as USCS SM, Silty Sand. These materials consisted of medium-dense to very dense silt, sand and rock fragments, as indicated by Standard Penetration Test (SPT) 'N' values of 15 blows per foot (bpf), to 50 blows yielding 1 inch of penetration. Materials hard enough to impede advancement of the augers were not encountered in the borings.

Groundwater was not encountered in the borings. Please be advised that this exploration was performed during an extended dry period, and that groundwater levels may fluctuate due to changes in precipitation, drainage, and other factors.

Based on the in-situ permeability testing, an average infiltration rate of 1.4 inches per hour at was recorded at a depth of 2.5 feet in Boring GW-25. Results of the permeability testing are shown on the boring log. Please refer to the boring logs, and Tables C and D, Summary of Subsurface Data and Summary of Proposed Excavation presented in Appendix B. Please note that data collected during GTA's previous exploration has been included in the tables, so a complete summary could be provided.

Laboratory Testing

Selected samples recovered from the borings were submitted for limited laboratory analysis, including natural moisture determination and testing for mechanical properties. The soils were classified in accordance with the United Sates Department of Agriculture (USDA), Unified (USCS), and American Association of State Highway and Transportation Officials (AASHTO) Classification Systems.

Two SPT jar samples were selected for grain size and index property testing. The results of these tests are summarized in Table A. Please refer to the laboratory test results included Appendix C for additional information.

TABLE B
SUMMARY OF SOIL CLASSIFICATIONS

Boring #	Depth (ft)	Liquid Limit	Plasticity Index	Unified Classification	USDA Classification	AASHTO Classification
SWM-2	0 – 1.5	46	19	SC, Clay and Silt and Sand	--	A-7-6
GW-25	2.5 – 4	NP*	NP	SM, Sand and Gravel, little Silt	Sandy Clay Loam	A-2-7

*Indicates Non-Plastic Soil

Conclusions and Recommendations

Based upon the results of GTA's exploration it is our opinion that construction of the proposed stormwater management facilities is feasible, given that the following recommendations are observed, and that the standard level of care is maintained during construction. GTA's preliminary recommendations are provided in the following paragraphs.

1. Groundwater Recharge Facilities

Based on the boring data, the proposed recharge trench can be excavated using standard excavation techniques. Groundwater is not expected to impact construction of the facility.

Based on the field and laboratory data, recharge of groundwater is generally feasible at Recharge Facility No. 10. The Maryland Department of Environment (MDE) recommends a vertical buffer of 2 to 4 feet between the infiltration invert and groundwater or rock. Standards for infiltration practices adopted by Montgomery County state that the minimum acceptable average infiltration rate for stormwater management and water quality applications, as indicated by borehole permeability testing, is 0.52 inch per hour. Based on the results of field and laboratory testing, infiltration stormwater management techniques are considered feasible at the location of Recharge Facility No. 10.

2. Pond and Sand Filter Construction

The following comments are intended to supplement conclusions and recommendations regarding construction of SWM Pond #3 provided in GTA's previous report. GTA's conclusions regarding material types, embankment and cutoff trench construction as provided in GTA's report dated April 19, 2002 remains unchanged.

Based on the data from Borings SWM-1 and SWM-2, excavations up to 12 feet in these areas can be generally be accomplished be standard means, such as scraping and ripping. Dense to very dense materials are expected below a depth of 12 feet. Based on the previous exploration, excavations near Boring SWM-3, located in the boring area of SWM Pond 3, will likely encounter very dense materials below 7 feet. Materials sufficiently dense to coarse refusal of the auger were not encountered in borings located in the pond are to the depth explored.

LIMITATIONS

This report has been prepared for the exclusive use of Terrabrook Clarksburg, LLC, in accordance with generally accepted geotechnical engineering practice. No other warranty, express or implied, is made.

The analysis and recommendations contained in this report are based on the data obtained from limited observation and testing of the surface materials. The test borings indicate soil conditions only at specific locations and times, and only to the depths penetrated. They do not necessarily reflect strata variations that may exist between the test boring locations. Consequently, the analysis and recommendations must be considered preliminary until the subsurface conditions can be verified by direct observation at the time of construction. If variations in subsurface conditions from those described are noted during construction, recommendations in this report may need to be re-evaluated.

In the event that any changes in the nature, design, or location of the facilities are planned, the conclusions and recommendations contained in this report should not be considered valid unless the changes are reviewed and conclusions of this report are verified in writing. Geo-Technology Associates, Inc. is not responsible for any claims, damages, or liability associated with interpretation of subsurface data or reuse of the subsurface data or engineering analysis without the express written authorization of Geo-Technology Associates, Inc.

In accordance with the guidelines of ASFE/The Association of Engineering firms Practicing in the Geosciences, it is recommended that Geo-Technology Associates, Inc. be retained to provide continuous soils engineering services for this project. Participation of GTA will facilitate compliance with GTA's recommendations, and allow changes to be made in these recommendations, in the event that subsurface conditions are found to vary from those anticipated prior to the start of construction.

This report and the attached logs are instruments of service. If certain conditions or items are noted during our investigation, Geo-Technology Associates, Inc. may be required by prevailing statutes to notify and provide information to regulatory or enforcement agencies. Geo-Technology Associates, Inc. will notify our Client should a required disclosure condition exist.

This report was prepared by Geo-Technology Associates, Inc. (GTA) for the sole and exclusive use of Geo-Technology Associates, Inc. and Terrabrook Clarksburg, LLC. Use and reproduction of this report by any other person without the expressed written permission of GTA and Terrabrook Clarksburg, LLC is unauthorized and such use is at the sole risk of the user.

Thank you for the opportunity to assist with this project. This report transmits our findings to date. Should you have any questions or require additional information, please do not hesitate to contact our office.

Very truly yours,
GEO-TECHNOLOGY ASSOCIATES, INC.

Scott C. Rowe
Staff Engineer

J. Patrick Klima, P.E.
Vice President

STATE OF MARYLAND
RAVINDRA RAJAPUTRA
No. 24495
PROFESSIONAL ENGINEER

S:\JOB-FILE\A THRU I\CLARKSBURG TC PHASE II\SWM PHASE 2 SUPPLEMENTAL.DOC
J.O# 020424

cc: Mr. Jeff Strulic - CPJ

Important Information About Your

Geotechnical Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

The following information is provided to help you manage your risks.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared *solely* for the client. *No one except you* should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one—not even you*—should apply the report for any purpose or project except the one originally contemplated.

A Geotechnical Engineering Report Is Based on A Unique Set of Project-Specific Factors

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, *do not rely on a geotechnical engineering report* that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,
- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions *only* at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an *opinion* about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

APPENDIX A

FIGURES

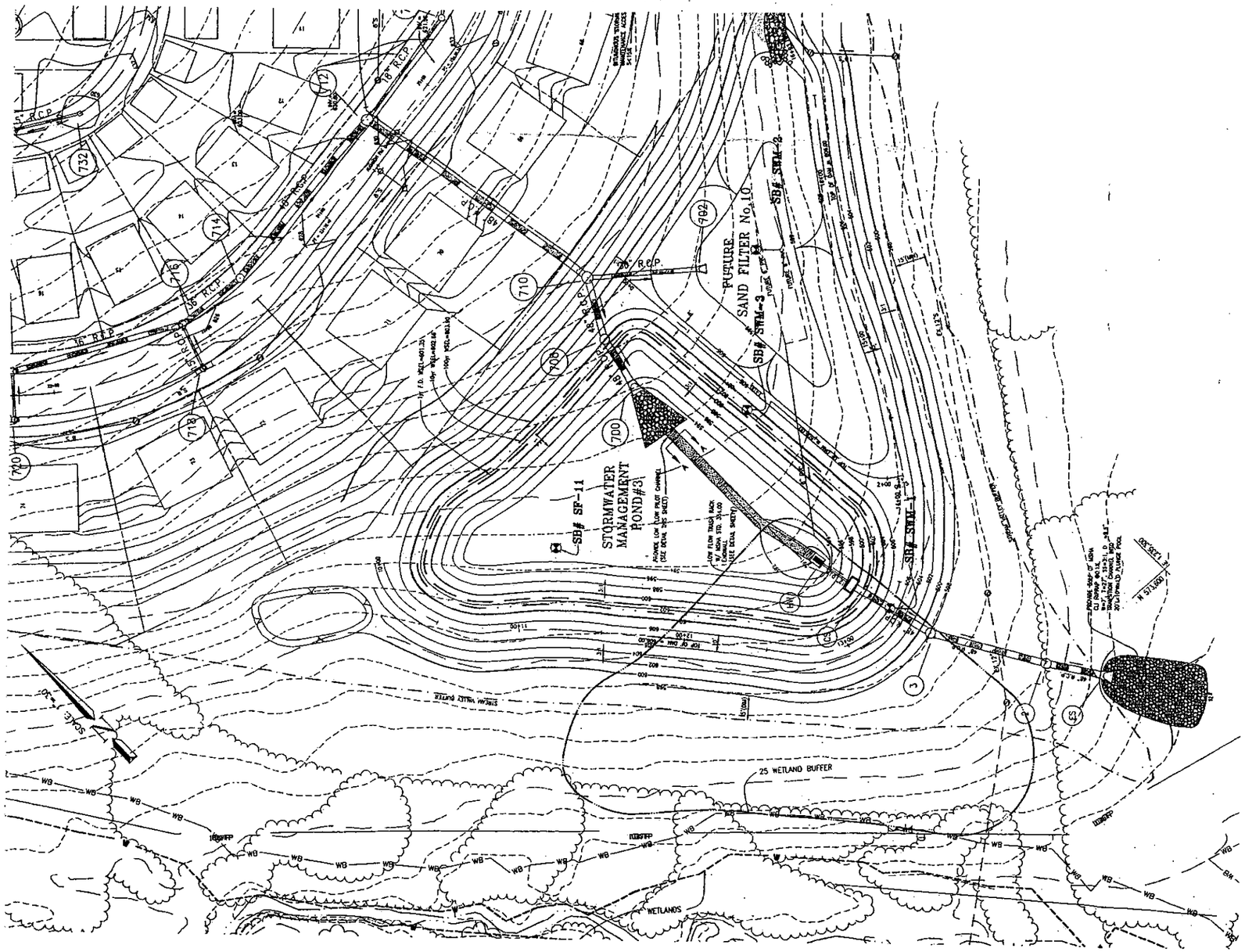

Figure 1

LEGEND:

⊕ = APPROXIMATE BORING LOCATION, PERFORMED BY GTA, MAY 2002.

NOTES:

BASE MAP DEVELOPED FROM A SITE PLAN PREPARED BY CPJ.

GEO-TECHNOLOGY ASSOCIATES, INC.
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Clarksburg Town Center Phase 2-A

BORING LOCATION PLAN

Montgomery County, Maryland

SCALE	DATE	DRAWN BY	DESIGN BY	REVIEW BY	JOB NO.
NTS	May 2002	SCR	---	JPK	020424

Figure 2

LEGEND:

⊕ = APPROXIMATE BORING LOCATION, PERFORMED BY GTA, MAY 2002.

NOTES:

BASE MAP DEVELOPED FROM A SITE PLAN PREPARED BY CPJ.

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Clarksburg Town Center Phase 2-A

BORING LOCATION PLAN

Montgomery County, Maryland

SCALE	DATE	DRAWN BY	DESIGN BY	REVIEW BY	JOB NO.
NTS	May 2002	SCR	---	JPK	020424

APPENDIX B

SOIL BORING LOGS

FIELD CLASSIFICATION SYSTEM FOR SOIL EXPLORATION

NON COHESIVE SOILS
(Silt, Sand, Gravel and Combinations)

Density

Very Loose	- 5 blows/ft. or less
Loose	- 6 to 10 blows/ft.
Medium Dense	- 11 to 30 blows/ft.
Dense	- 31 to 50 blows/ft.
Very Dense	- 51 blows/ft. or more

Relative Proportions

Descriptive Term	Percent
Trace	1 - 10
Little	11 - 20
Some	21 - 35
And	36 - 50

Particle Size Identification

Boulders		- 8-inch diameter or more
Cobbles		- 3- to 8-inch diameter
Gravel	- Coarse	- 1 to 3 inch
	- Medium	- 1/2 to 1 inch
	- Fine	- 1/4 to 1/2 inch
Sand	- Coarse	- 0.6mm to 1/4 inch
	- Medium	- 0.2 mm to 0.6 mm
	- Fine	- 0.05 mm to 0.2 mm
		- 0.06 mm to 0.002 mm

COHESIVE SOILS
(Clay and Silt Combinations)

Consistency

Very Soft	- 3 blow/ft.
Soft	- 4 to 5 blows/ft.
Medium Stiff	- 6 to 10 blows/ft.
Stiff	- 11 to 15 blows/ft.
Very Stiff	- 16 to 30 blows/ft.
Hard	- 31 blows/ft. or more

Plasticity

Degree of Plasticity	Plasticity Index
None to slight	0 - 4
Slight	5 - 7
Medium	8 - 50
High to Very High	Over 50

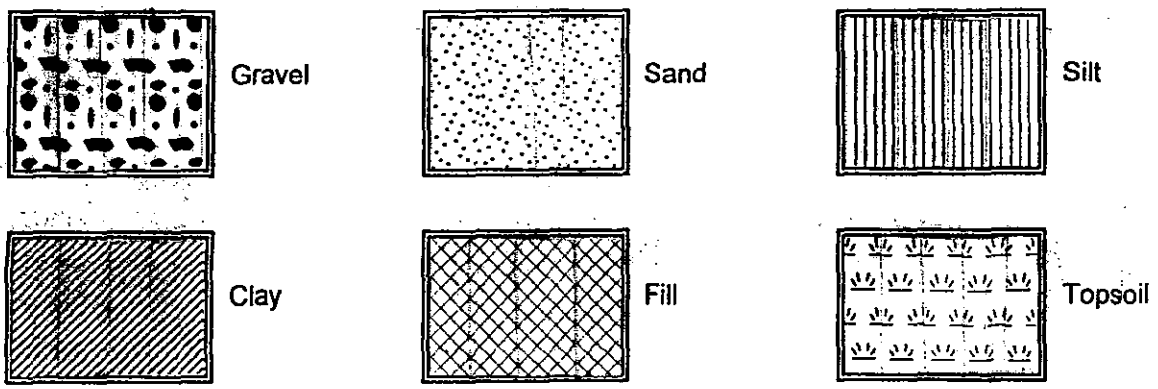
Classification on logs are made by visual inspection.

Standard Penetration Test - Driving a 2.0" O.D., 1 3/8" I.D., sampler a distance of one foot into undisturbed soil with a 140-pound hammer free falling a distance of 30 inches. It is customary to drive the spoon 6 inches to seat into undisturbed soil, then perform the test. The number of hammer blows for seating the spoon and making the tests are recorded for each 6 inches of penetration on the drill log. The standard penetration test results can be obtained by adding at last two figures.

Strata Changes - In the column "Soil Descriptions" on the drill log, the horizontal lines represent approximate strata changes.

Groundwater observations were made at the times indicated. Porosity of soil strata, weather conditions, site topography, etc. may cause changes in the water levels indicated on the logs.

Graphic Legend:



LOG OF BORING NO. SWM-1

PROJECT: **Clarksburg Town Center**
PROJECT NO: **020424**
PROJECT LOCATION: **Montgomery County, Maryland**

WATER LEVEL: ▽ **Dry** ▼ _____ ▼ _____
DATE: **05/10/02** _____ _____
CAVED (ft): **12.0** _____ _____

DATE STARTED: **May 9, 2002**
DATE COMPLETED: **May 9, 2002**
DRILLING CONTRACTOR: **GTA**
DRILLER: **GTA**
DRILLING METHOD: **HSA**
SAMPLING METHOD: **Split Spoon**

GROUND SURFACE ELEVATION: **600.7**
DATUM: **MSL**
EQUIPMENT: **CME 45**
LOGGED BY: **S.C./B.W.**
CHECKED BY: **S.R./P.L.**

SAMPLE NUMBER	SAMPLE DEPTH (ft)	SAMPLE RECOVERY (in)	SAMPLE BLOWS/6 inches	N (blows/ft)	ELEVATION (ft)	DEPTH (ft)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
					600.7	0				
1	0.0	10	6-5-5	11			SC		Brown, to red brown, moist, stiff, CLAY & SILT and coarse to fine SAND, little medium to fine Rock Fragments. AASHTO: A-7-6	Topsoil: 8.0 in. Water Not Encountered While Drilling.
2	2.5	18	3-5-5	11						
3	5.0	18	4-6-7	13		5				
					592.2					
4	8.5	18	18	16			SM		Gray brown to gray, moist to dry, medium dense to very dense, coarse to fine SAND, some medium fine Rock Fragments, little Silt. AASHTO: A-1-b	
						10				
5	13.5	1	1	50/1"						
						15				
					582.2					
6	18.5	1	1	50/1"					Bottom of Hole at 18.5 Feet.	
										Coordinates: N: E:

NOTES:

OBG 020424.GPJ 6/19/02

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Annapolis Junction, MD 20701

LOG OF BORING NO. SWM-1

LOG OF BORING NO. SWM-2

PROJECT: **Clarksburg Town Center**
PROJECT NO: **020424**
PROJECT LOCATION: **Montgomery County, Maryland**

WATER LEVEL: ▽ Dry ▼ Dry ▽
DATE: 05/09/02 05/10/02
CAVED (ft): 12.5

DATE STARTED: **May 10, 2002**
DATE COMPLETED: **May 10, 2002**
DRILLING CONTRACTOR: **GTA**
DRILLER: **GTA**
DRILLING METHOD: **HSA**
SAMPLING METHOD: **Split Spoon**

GROUND SURFACE ELEVATION: **612.4**
DATUM: **MSL**
EQUIPMENT: **CME 45**
LOGGED BY: **S.C./B.W.**
CHECKED BY: **S.R./P.L.**

SAMPLE NUMBER	SAMPLE DEPTH (ft)	SAMPLE RECOVERY (in)	SAMPLE BLOWS/6 inches	N (blows/ft)	ELEVATION (ft)	DEPTH (ft)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
					612.4	0				
1	0.0	12	3-4-3	7			SC		Brown to red-brown, moist, loose to medium dense, CLAY & SILT and coarse to fine Sand, little fine Gravel. AASHTO: A-7-6	Topsoil: 9.0 in. Water Not Encountered While Drilling.
2	2.5	18	5-7-8	15						
3	5.0	10	5-6-6	12		5				
					603.9					
4	8.5	18	14-7-8	15			SM		Gray to gray-brown, dry, medium dense to very dense, coarse to fine SAND, some medium to fine Rock Fragments, little Silt. AASHTO: A-1-b	
						10				
5	13.5	5	18-50/5"	50/5"						
						15				
					593.9					
6	18.5	18	9-7-8	15			ML		Gray-brown, dry, stiff, SILT, some coarse to fine SAND, little medium to fine Rock Fragments.	
					592.4	20			Bottom of Hole at 20.0 Feet.	Coordinates: N: E:

NOTES:

GEO-TECHNOLOGY ASSOCIATES, INC.
9090 Junction Drive, Suite 9
Annapolis Junction, MD 20701

LOG OF BORING NO. SWM-2

LOG OF BORING NO. GW-25

PROJECT: **Clarksburg Town Center**
PROJECT NO: **020424**
PROJECT LOCATION: **Montgomery County, Maryland**

WATER LEVEL: ▽ Dry ▼ Dry ▼
DATE: 05/09/02 05/10/02
CAVED (ft): 5.8

DATE STARTED: **May 9, 2002**
DATE COMPLETED: **May 9, 2002**
DRILLING CONTRACTOR: **GTA**
DRILLER: **GTA**
DRILLING METHOD: **HSA**
SAMPLING METHOD: **Split Spoon**

GROUND SURFACE ELEVATION: **687.6**
DATUM: **MSL**
EQUIPMENT: **CME 45**
LOGGED BY: **S.C./B.W.**
CHECKED BY: **S.R./P.L.**

SAMPLE NUMBER	SAMPLE DEPTH (ft)	SAMPLE RECOVERY (in)	SAMPLE BLOWS/6 inches	N (blows/ft)	ELEVATION (ft)	DEPTH (ft)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
1	0.0	12	2-4-4	8	687.6	0	ML		Brown, moist, medium stiff, SILT & CLAY, some coarse to fine Sand, trace to fine Gravel. AASHTO: A-4	Topsoil: 11.0 in.
2	2.5	18	5-6-6	12	685.1		SM		Gray, dry, medium dense to dense, coarse to fine SAND, some medium to fine Gravel, little Silt. AASHTO: A-1-b	Water Not Encountered While Drilling.
3	5.0	18	10-8-17	25		5				
4	8.5	18	14-18-26	44	677.6	10			Bottom of Hole at 10.0 Feet. Borehole Permeability Test at 2.5 Feet. Hour / Water Level Drop (in) 1 — 1.5 2 — 2.0 3 — 1.6 4 — 0.6 Average Infiltration Rate = 1.4 in/hr.	Coordinates: N: E:

NOTES:

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Annapolis Junction, MD 20701

LOG OF BORING NO. GW-25

APPENDIX C

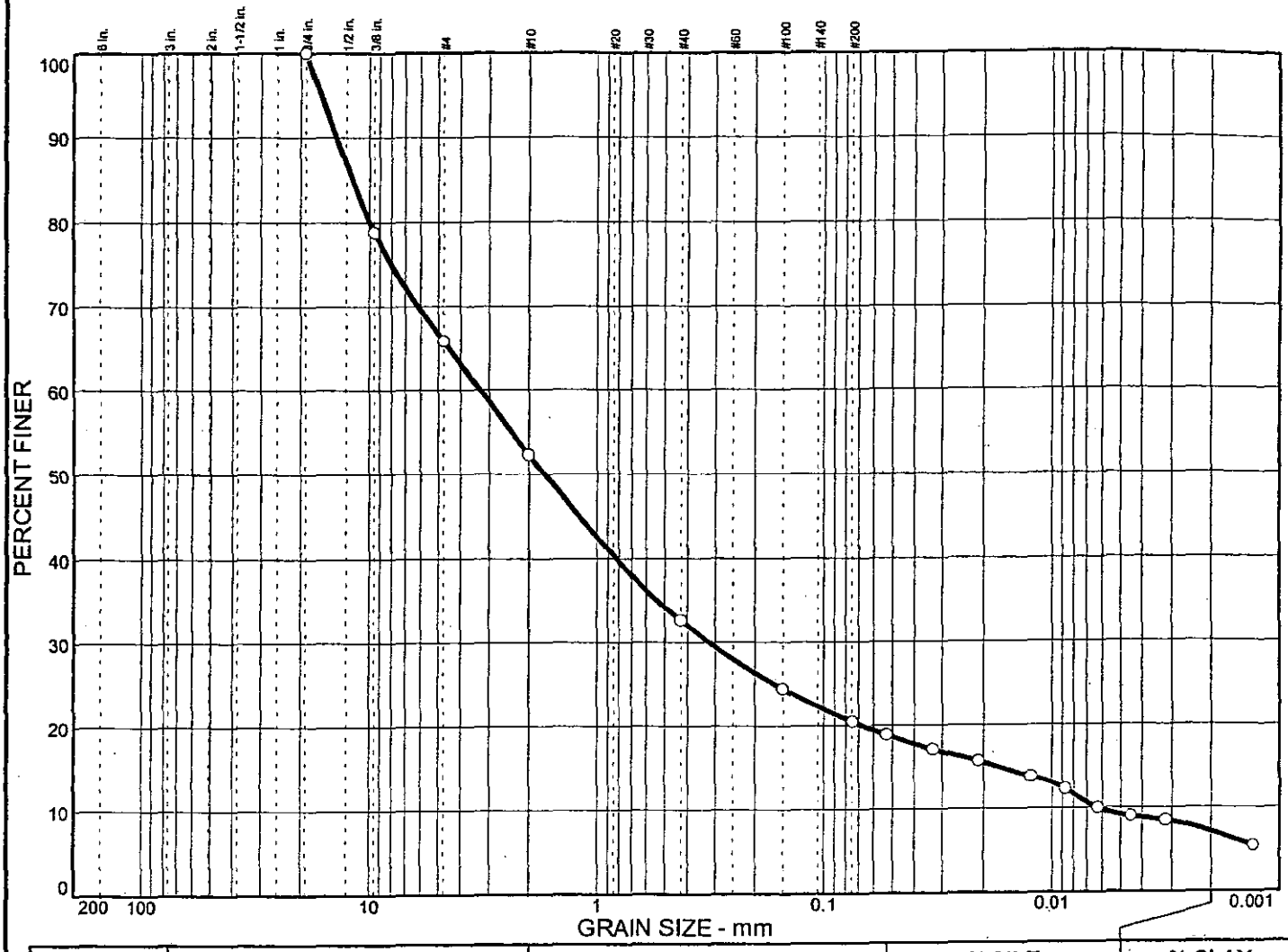
LABORATORY TEST RESULTS

GEO-TECHNOLOGY ASSOCIATES, INC.
Natural Moisture Content Summary

Clarksburg T.C.
May 21, 2002
020424

BORING #	SAMPLE #	DEPTH (FT)	NATURAL MOISTURE CONTENT %
GW-25	S-1	0.0-1.5	17.0
	S-2	2.5-4.0	12.4
	S-3	5.0-6.5	2.7
	S-4	8.5-10.0	4.2
SWM-2	S-1	0.0-1.5	18.5

PARTICLE SIZE DISTRIBUTION TEST REPORT



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
○	0.0	47.7	33.4	11.8	7.1

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	NP	NP	12.0	3.29	1.71	0.320	0.0171	0.0063	4.95	522.64

MATERIAL DESCRIPTION	USCS	AASHTO
○ Brown fine GRAVEL, some coarse to fine Sand, little Silt.	SM	A-1-b

Project No. 020424 **Client:**

Project: Clarksburg T.C.

○ **Source:** GW-25 **Sample No.:** S-2 **Elev./Depth:** 2.5'-4.0'

Remarks:

○ Natural Moisture: 12.4%

USDA: Sandy loam

May 20, 2002

PARTICLE SIZE DISTRIBUTION TEST REPORT

GEO-TECHNOLOGY ASSOCIATES, INC.

Plate 3

PARTICLE SIZE DISTRIBUTION TEST REPORT

	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
○	0.0	11.3	39.1	49.6	

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	46	19	3.37	0.355	0.0801					

MATERIAL DESCRIPTION	USCS	AASHTO
○ Red brown CLAY & SILT and coarse to fine SAND, little fine Gravel.	SC	A-7-6(7)

Project No. 020424 **Client:**

Project: Clarksburg T.C.

○ **Source:** SWM-2 **Sample No.:** S-1 **Elev./Depth:** 0.0'-1.5'

Remarks:

○ Natural Moisture: 18.5%

May 20, 2002

PARTICLE SIZE DISTRIBUTION TEST REPORT

GEO-TECHNOLOGY ASSOCIATES, INC.

Plate 4

Table C
Summary of Subsurface Data
Clarksburg Town Center, Phase 2

Boring Number	Total Depth (ft)	Surface Elevation (ft MSL)	Topsoil (in)	Approx. Depth to Very Dense Materials (ft)	Approx. Elevation of Very Dense Materials (ft MSL)	Approx. Elevation of Refusal (ft MSL)
GW-9	20	667.3	12	17	650.3	--
GW-10	15	681.0	10	12	669	--
GW-11	14.5	637.2	11	8	629.2	622.7
GW-12*	26	676.0	8	12	664	650.0
GW-13	20	672.3	7	12	660.3	--
GW-14	10	700.4	0	2	698.4	690.4
GW-15**	21	631.2	14	Not encountered	N/A	610.2
GW-16	15	639.6	12	15	624.6	--
GW-17	20	618.1	8	12	606.1	--
GW-18	28	667.0	8	8	659	639.0
GW-19	14.5	668.2	8	2	666.2	653.7
GW-20	8.5	698.3	7	5	693.3	689.8
GW-21	14	679.0	20	8	671	--
GW-22	12	684.0	5	Not encountered	N/A	--
GW-23	12	630.0	10	2	628	--
GW-24	15	668.5	12	Not encountered	N/A	--
GW-25	10	687.6	11	Not encountered	N/A	--
SWM-1	18.5	600.7	8	12	588.7	--
SWM-2	20	612.4	9	12	600.4	--
SWM-3	15	610.6	14	7	603.6	--
SF-10	15	640.4	12	12	628.4	--
SF-11	16	604.0	8	13	591	--

*Perched groundwater encountered at 3.7 feet in Boring GW-12
**Groundwater encountered at 6.8 feet in Boring GW-15

Table D
Summary of Proposed Excavation
Clarksburg Town Center, Phase 2
(Revised June 14, 2002)

Facility	Proposed Facility Invert (ft MSL)	Approx. Elevation of Very Dense Materials (ft MSL)	Approx. Elevation of Auger Refusal (ft MSL)	Depth of Cut Below Existing Grade (ft)	Depth of Cut Through Very Dense Materials (ft)	Depth of Cut Below Auger Refusal (ft)
GW-9	662.0	650.3	--	5.3	--	--
GW-10	680.0	669	--	1.0	--	--
GW-11	626.0	629.2	622.7	11.2	3.2	--
GW-12*	658.0	664	650.0	18.0	6.0	--
GW-13	661.0	660.3	--	11.3	--	--
GW-14	682.0	698.4	690.4	18.4	16.4	8.4
GW-15	622.0	N/A	610.2	9.2	--	--
GW-16**	630.0	624.6	--	9.6	--	--
GW-17	610.0	606.1	--	8.1	--	--
GW-18	642.0	659	639.0	25.0	17.0	--
GW-19	662.0	666.2	653.7	6.2	4.2	--
GW-20	682.3	693.3	689.8	16.0	11.0	7.5
GW-21	674.0	671	--	5.0	--	--
GW-22	680.0	N/A	--	4.0	--	--
GW-23	625.0	628	--	5.0	3.0	--
GW-24	665.0	N/A	--	3.5	--	--
GW-25	681.3	N/A	--	6.3	--	--
SWM-1	585.0	588.7	--	15.7	3.7	--
SWM-2	596.0	600.4	--	16.4	--	--
SWM-3	594.0	603.6	--	16.6	9.6	--
SF-10	635.0	628.4	--	5.4	--	--
SF-11	598.0	591	--	6.0	--	--

*Perched Water Encountered at 3.7 Feet

**Groundwater Encountered at 6.8 Feet