21.66 Acres +/-
Prince George County, VA

ASKING PRICE ~ $195,000

GRANT MASSIE
LAND COMPANY

Accredited Land Consultants✧Commercial Real Estate Services
REALTORS®

Represented By:

G. EDMOND MASSIE, IV
ALC, CCIM, MBA
(804) 754-3474

WILLIAM G. GRANT
ALC, VLS
(804) 754-3476

JEFFREY S. HUFF
ALC, FORESTER
(804) 750-1207

Table of Contents

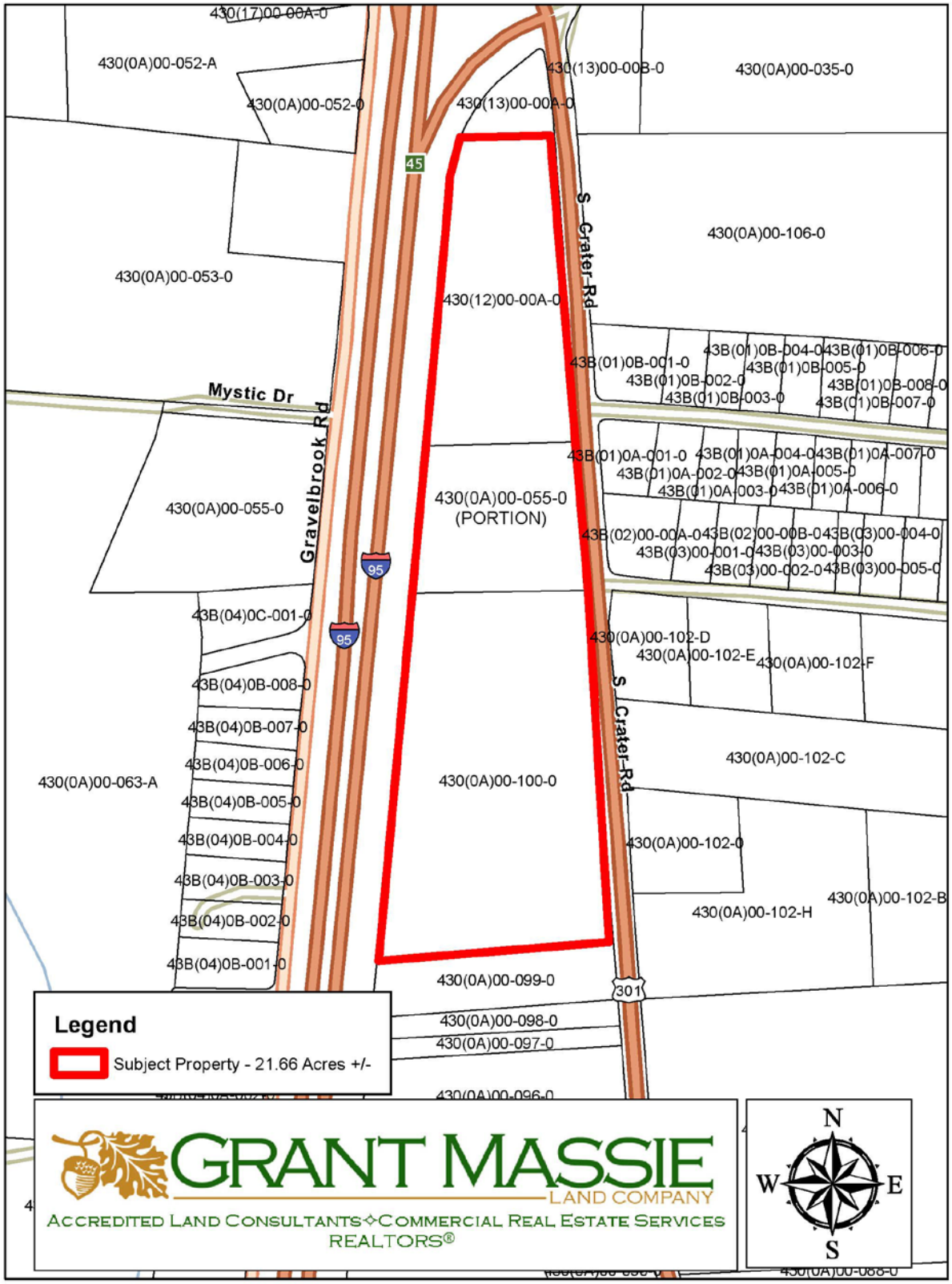
Property Description

The subject property is shown on Prince George County Tax Map as shown below. A review of the Prince George County Tax Records indicates the following:

Tax Map Number	Acreage	Tax Assessment
430(0A)00-100-0	12.16	$262,100
430(0A000-055-0 (Portion)	3.85	$191,200
430(12)00-00A-0	5.65	$221,800
	21.66	$675,100

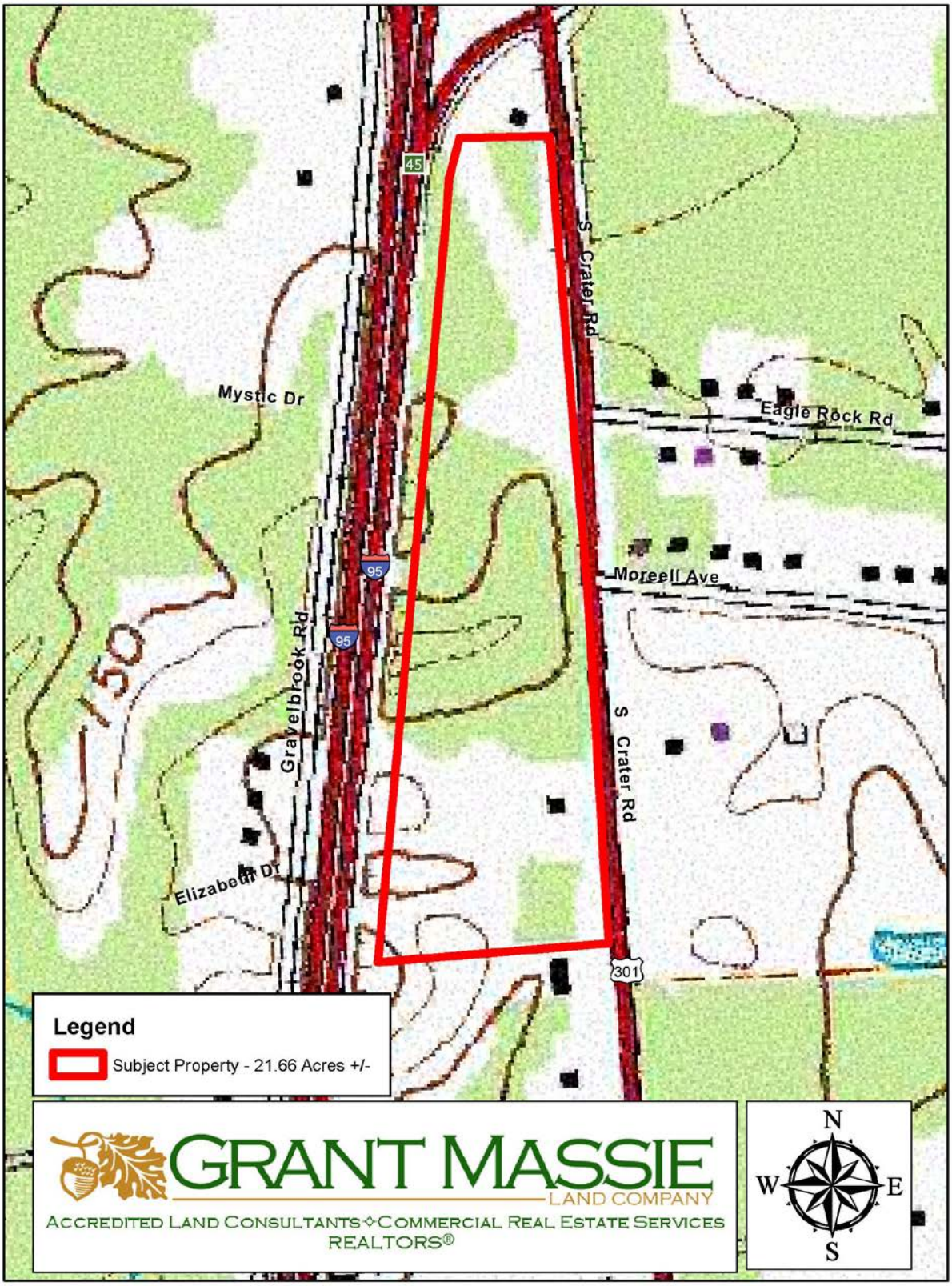
The subject property is currently zoned B-1(Business). There is long frontage on Route 301 (South Crater Road). The parcels are wooded with some timber value.

Tax Map

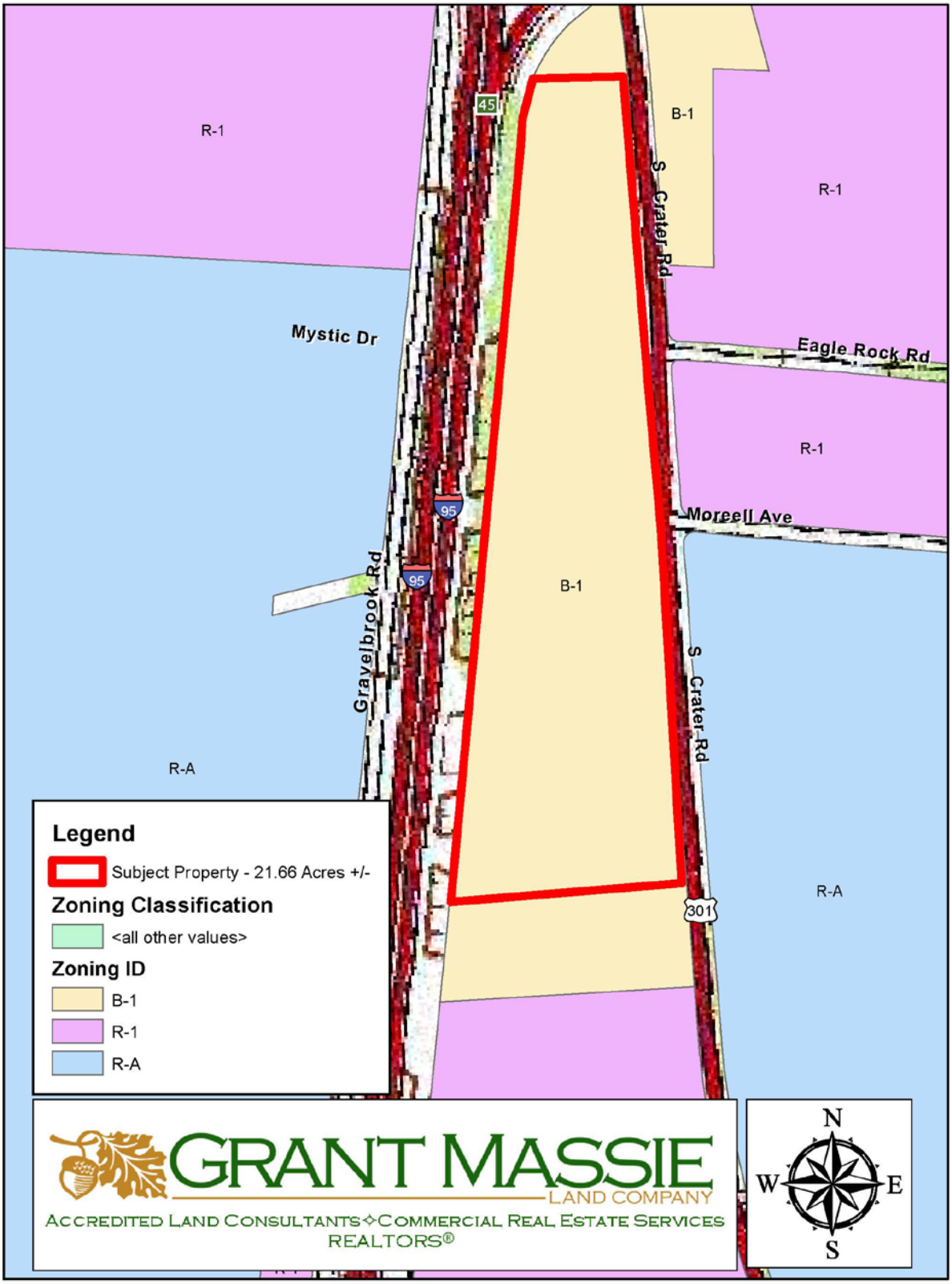

430(17)00-00A-0
430(0A)00-052-A
430(0A)00-052-0
430(13)00-00B-0
430(13)00-00A-0
430(0A)00-035-0
45
S Crater Rd
430(0A)00-106-0
430(0A)00-053-0
430(12)00-00A-0
43B(01)0B-001-0
43B(01)0B-004-0
43B(01)0B-006-0
43B(01)0B-005-0
43B(01)0B-002-0
43B(01)0B-008-0
43B(01)0B-003-0
43B(01)0B-007-0
Mystic Dr
Gravelbrook Rd
43B(01)0A-001-0
43B(01)0A-004-0
43B(01)0A-007-0
43B(01)0A-002-0
43B(01)0A-005-0
43B(01)0A-003-0
43B(01)0A-006-0
430(0A)00-055-0
430(0A)00-055-0
(PORTION)
43B(02)00-00A-0
43B(02)00-00B-0
43B(03)00-004-0
43B(03)00-001-0
43B(03)00-003-0
43B(03)00-002-0
43B(03)00-005-0
95
95
43B(04)0C-001-0
430(0A)00-102-D
430(0A)00-102-E
430(0A)00-102-F
43B(04)0B-008-0
43B(04)0B-007-0
S Crater Rd
430(0A)00-102-C
43B(04)0B-006-0
430(0A)00-063-A
430(0A)00-100-0
43B(04)0B-005-0
43B(04)0B-004-0
430(0A)00-102-0
43B(04)0B-003-0
430(0A)00-102-B
43B(04)0B-002-0
430(0A)00-102-H
43B(04)0B-001-0
430(0A)00-099-0
301
430(0A)00-098-0
430(0A)00-097-0
Legend
Subject Property - 21.66 Acres +/-
GRANT MASSIE
LAND COMPANY
ACCREDITED LAND CONSULTANTS✧COMMERCIAL REAL ESTATE SERVICES
REALTORS®
N
W
E
S

Aerial Photograph

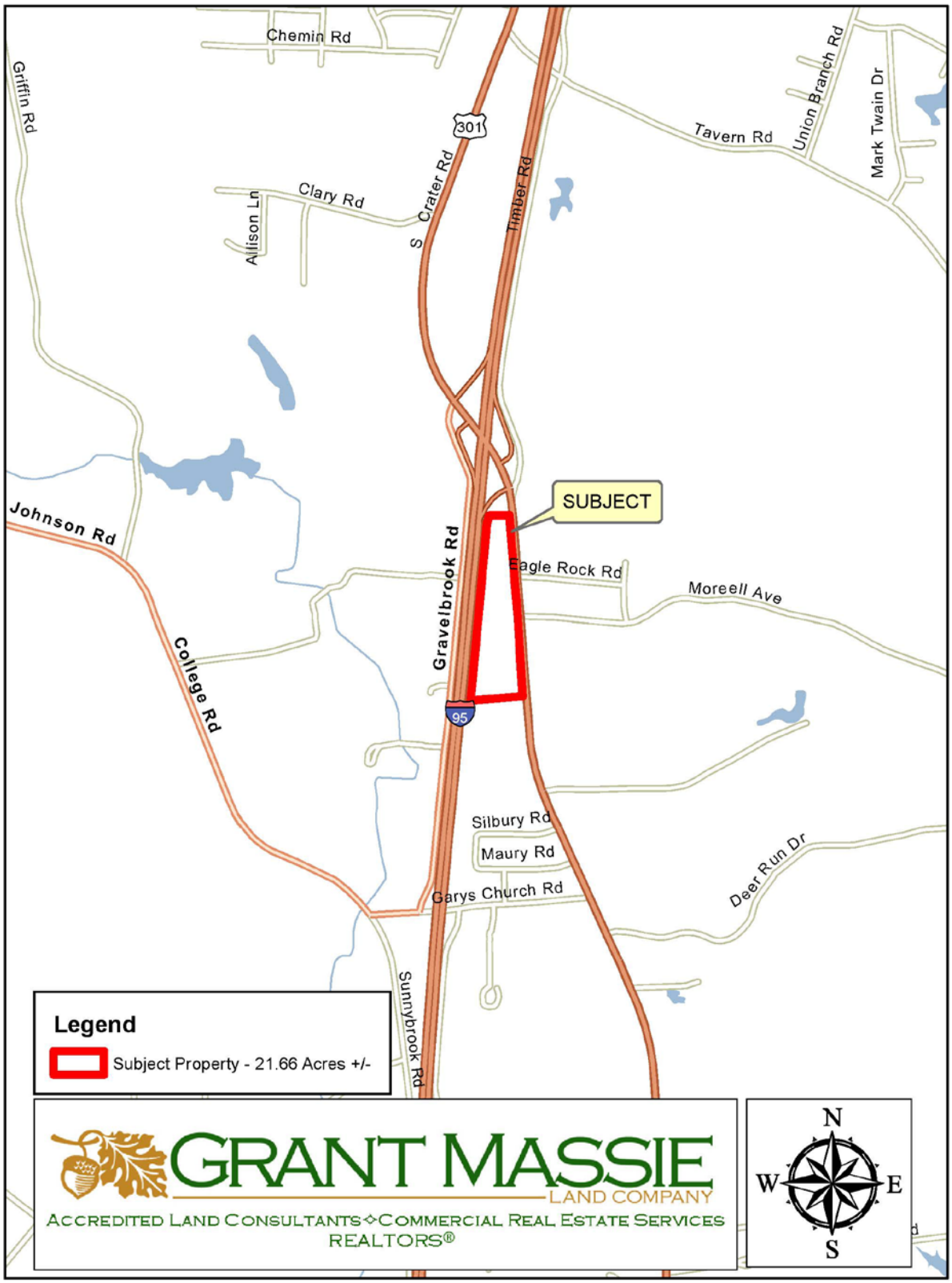
Topographic Map



Zoning Map

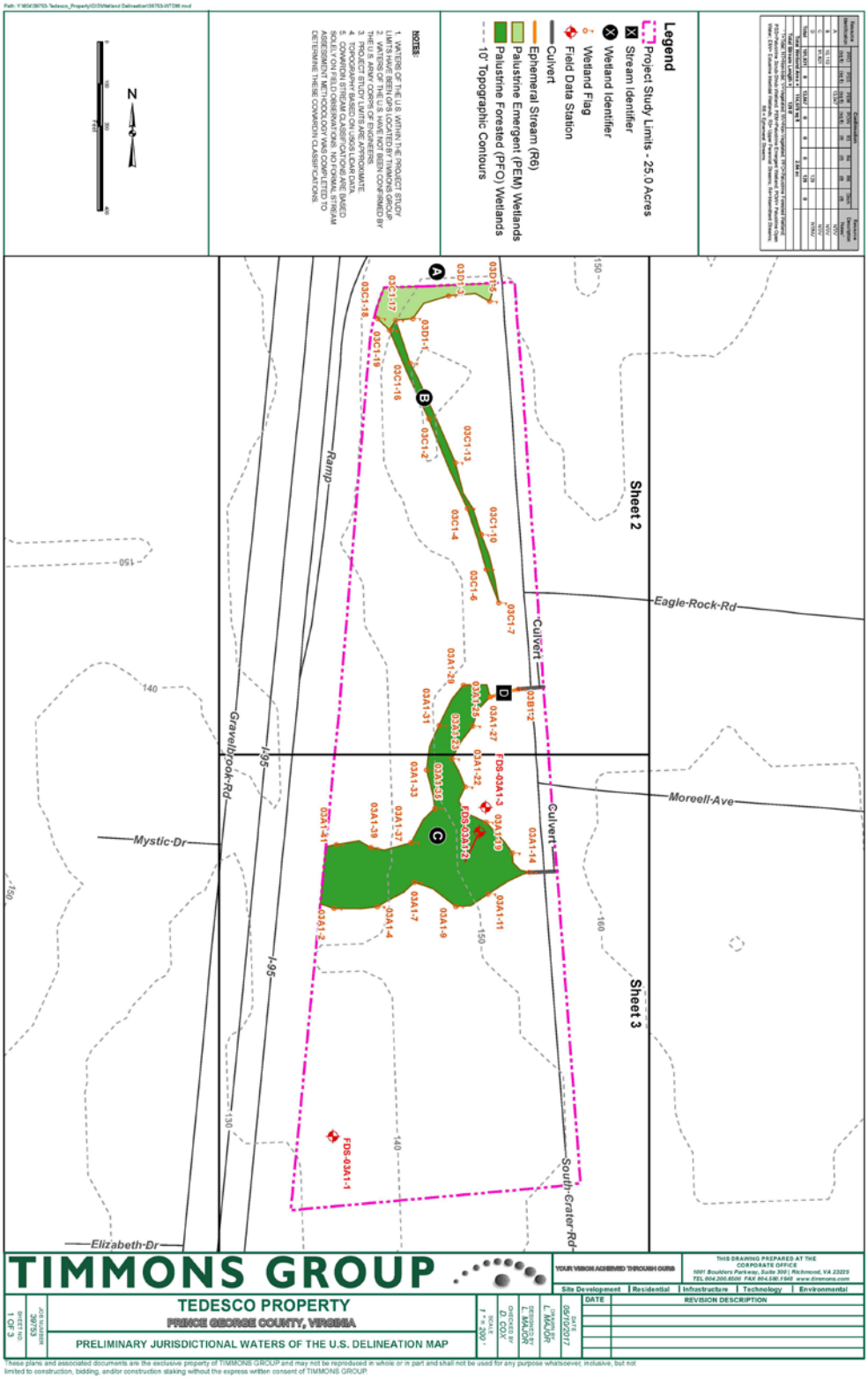

R-1
45
B-1
S Crater Rd
R-1
Mystic Dr
Eagle Rock Rd
R-1
95
Morrell Ave
95
B-1
Gravelbrook Rd
S Crater Rd
R-A
R-A
301
Legend
Subject Property - 21.66 Acres +/-
Zoning Classification
<all other values>
Zoning ID
B-1
R-1
R-A
GRANT MASSIE
LAND COMPANY
ACCREDITED LAND CONSULTANTS✧COMMERCIAL REAL ESTATE SERVICES
REALTORS®
N
W
E
S

Location Map



Preliminary Wetlands Delineation

(Unconfirmed by the U.S. Army Corps of Engineers)



Soils Report

Preliminary Soils Analysis and Infiltration Testing
Proposed On-Site Sewage Disposal System
TP430(0A)00-100-0, 430(0A)00-055-0 & 430(12)00-00A-0
South Crater Road
Prince George County, Virginia

Client:
Timmons Group
Prince George, Virginia

June 7, 2017

11901 Old Stage Road, Chester, VA 23836
Ph: 804-541-1436 Fax: 804-541-1437

June 7, 2017

Timmons Group
Attn: Mr. Derrick Johnson, P.E.
4701 Owens Way; Suite 900
Prince George, Virginia 23875

RE: Onsite Sewage Disposal System Feasibility Study
TP# 430(0A)00-100-0, 430(0A)00-055-0 & 430(12)00-00A-0
South Crater Road
Prince George County, Virginia
Project No. 2017234

Dear Mr. Johnson,

Geo-Solutions is pleased to present the results of our soil texture and infiltration analysis with respect to potential use of portions of the above referenced properties for onsite sewage disposal. You have indicated that zoning would allow up to 6000 gallons per day of wastewater usage for the potential development.

Please do not hesitate to contact Geo-Solutions if you have any questions regarding the findings presented within this report. Geo-Solutions greatly appreciates the opportunity to serve as your soils and onsite sewage consultant on this project and we look forward to a continued successful working relationship.

Sincerely,

GEO-SOLUTIONS

Brent E. Johnson; P.E., P.G., AOSE
President

Shannon D. Hill; P.E., LPSS, AOSE
Project Manager

COMMONWEALTH OF VIRGINIA
BRENT E. JOHNSON
No. 1048
6/7/17
ALTERNATIVE ONSITE SOIL EVALUATOR

11901 Old Stage Road, Chester, VA 23836
Ph: 804-541-1436 Fax: 804-541-1437

TABLE OF CONTENTS

APPENDICES

1.0 INTRODUCTION AND PROJECT SCOPE

Our scope of services for this project included the review of published soil surveys, maps, and literature generated by the Natural Resources Conservation Service (NRCS) to obtain information regarding the soil properties and potential limiting factors or restrictions with regard to the mapped soil series encountered onsite and how those soils could be applied towards the use of onsite septic and treating effluent. Following a literature and map review, Geo-Solutions conducted a site walkover and investigation to include advancement of soil borings to evaluate soil conditions for soil texture, estimated soil percolation/infiltration rates, and depths to seasonal water table. Saturated conductivity (Ksat) testing was also performed in two locations to obtain actual empirical data for rates at which water infiltrates the soil stratum at potential installation depths. The following report contains our observations, conclusions, and recommendations.

2.0 SITE DESCRIPTION

The area of interest consists of three adjacent parcels identified as Tax Map ID: 430(0A)00-100-0, 430(0A)00-055-0 & 430(12)00-00A-0, totaling in areas of 21.5 Acres. The combined property is located to the west of South Crater Road in Prince George County. The project site is currently wooded and undeveloped.

3.0 ONSITE SOIL ELVAUATION AND KSAT RESULTS

On June 1 and June 2, 2017, Geo-Solutions performed soil evaluations and Ksat infiltration testing on the subject parcel for the ability to potentially use the onsite soils as a dispersal media for effluent. The subject parcels were evaluated by Virginia licensed Authorized Onsite Soil Evaluators (AOSE) in accordance with the current regulations of the Virginia Department of Health.

A total of eleven (11) soil borings were advanced on the combined parcels to a depth of five feet utilizing a manual hand auger with a 2 ¾" auger bucket. Soil textures, colors, and depths to seasonal water table were noted and recorded at the time of our evaluation. The locations of the borings were selected based on estimated boundaries between series, as shown on soil maps of Prince George County provided by the NRCS. Boring locations were also advanced in a manner as to obtain a representative sample of soils onsite and to gather information to assist in the determination of the feasibility of using the site for mass drainfields and what capacity of effluent (GPD) the land area may potentially be able to accommodate.

A field log of the soils encountered at the completion of the soil borings was prepared by an AOSE onsite. Field logs completed onsite contain information pertaining to soil classification, texture, and seasonal water table indicators such as redoximorphic features

and chroma II depletions. (See Appendix II – Boring Logs).

A total of two (2) infiltration (Ksat) tests were conducted to obtain actual percolation rates of soils onsite. Ksat borings were advanced using a 3" manual soil auger bucket, and testing was performed using a Johnson Permeameter. All testing was done in general accordance with the manufacturer's guidelines. Infiltration testing was focused on the soil series with the most suitability for handling septic effluent and in those areas that met the setbacks to seasonal water table as provided by the Health Department regulations. Below is a table abbreviating the results of our Ksat testing. (See Appendix III – Ksat Testing)

Ksat ID	Borehole ID	USDA Classification	Depth of Ksat Test	Rate of Infiltration (minutes per inch)
K-1	BH-9	Sandy Clay Loam	24 inches	~ 90 mpi
K-2	BH-4	Clay Loam	36 inches	~ 110 mpi

5.0 CONCLUSIONS

It is our understanding that proposed development may include a commercial or retail facility with up to 6000gpd of wastewater usage. The soils encountered onsite were unsuitable for installation of a conventional septic tank effluent in-ground system due to shallow depth to seasonal groundwater. However, the soils across the vast majority of the site will support a TL2 or TL3 level of pretreated effluent dispersed to a shallow placed drip dispersal system. Based on our onsite soils evaluation and infiltration testing, hydraulic loading rates, and level of treatment, it is our opinion that the subject parcels should be able to service the following gallons per day of residential strength effluent (See table below). If wastewater strengths are elevated, additional treatment and/or larger dispersal areas may be needed. Our field testing indicates that installation depths across the majority of the site should not exceed 12 inches below grade and percolation rates of 90-110mpi should be utilized for sizing purposes.

Zone Location	Area in Acres	Percolation Rate	Hydraulic Loading Rate	Installation Depth	Onsite Sewage Rating	Effluent Capacity Gallons Per Day
Zone #1	15	90-110 mpi	0.12	6-12 inches	Somewhat Limited	10,000+ GPD

It should be noted that typically an area for the primary drainfield as well an area for a reserve drainfield must be identified prior to permitting. Reserve drainfield areas can range from 50% to 100% of the primary design.

Alternative pretreatment systems of this size and type require perpetual maintenance contracts to be upheld by the property owner.

In conclusion, the soils encountered onsite are somewhat limited for installation of an on-site sewage disposal system. The site will require secondary or tertiary pretreatment of all effluent and will require specialized shallow placed pressure dispersal systems. The large nature of the site however, may allow for the dispersal of large volumes up to 6000 gallons per day.

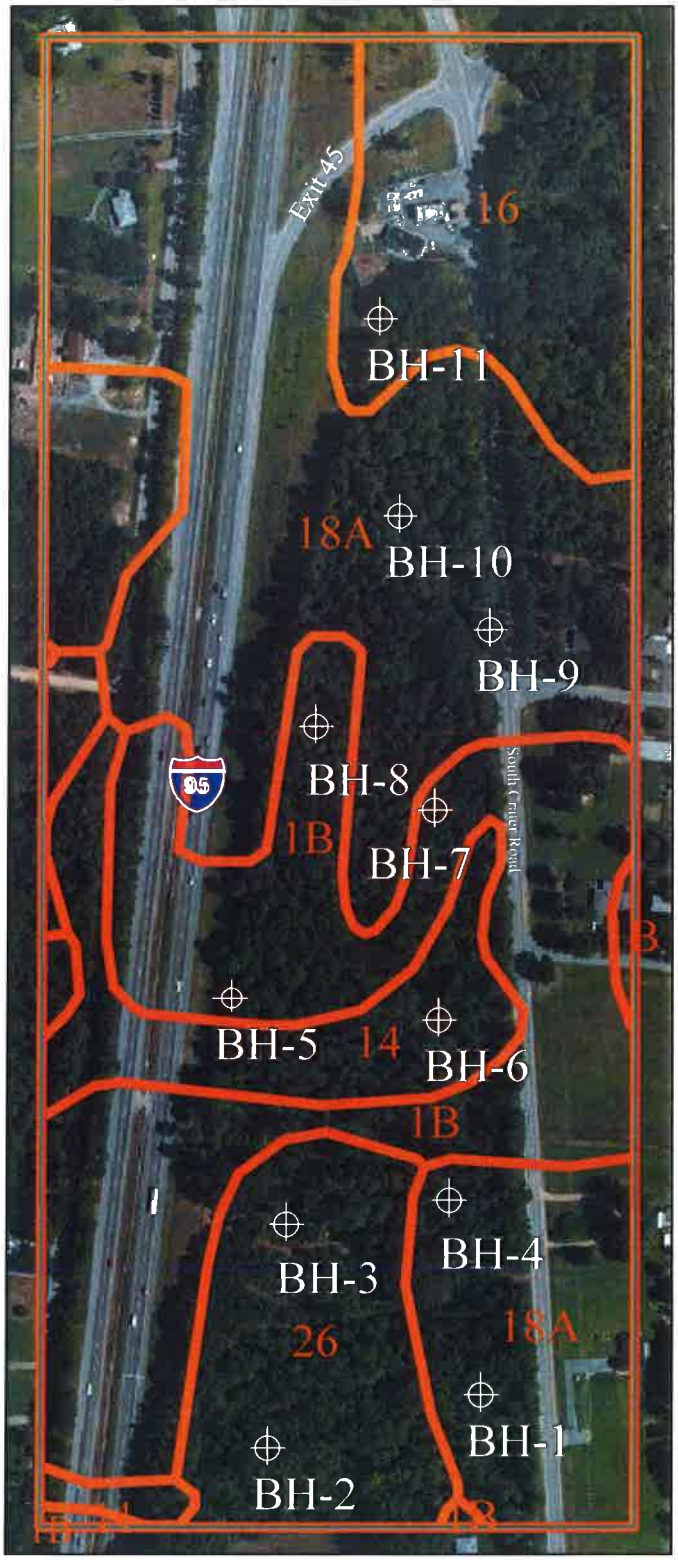
6.0 LIMITATIONS

This report was prepared in accordance with generally accepted standards of practice for soil science and soil evaluation services for onsite septic systems. No other warranty, either expressed or implied, is made. This report is not to be reproduced, either in whole or in part, without written consent from Geo-Solutions. Our conclusions and recommendations are based upon information provided to us by others, our site observations, and professional judgment. To the best of our knowledge, information provided by others is true and correct, unless otherwise noted; however, Geo-Solutions is not responsible for the accuracy of information provided by others. Our on-site observations pertain only to specific locations at specific times on specific dates. Our observations and conclusions do not reflect variations in subsurface conditions that may exist between sampling locations, in unexplored areas of the site, or at times other than those represented by our observations. Also, latitude and longitudinal coordinates of boring locations were obtained by a handheld GPS and should be considered approximate and not to the margin of error of survey accuracy.

APPENDIX I

BORING LOCATION FIGURE

11901 Old Stage Road, Chester, VA 23836
Ph: 804-541-1436 Fax: 804-541-1437



⊕ BH-1 HAND AUGER LOCATION

Feasibility Study -Exit 45, Prince George	
Date: 6/07/2017	Project #: 2017234
Geo-Solutions 11901 Old Stage Road Chester, VA 23836	

= Unsuitable

= Limited
TL-2 or TL-3
Pretreated

⊕ BH-1 HAND AUGER LOCATION

Feasibility Study -Exit 45, Prince George	
Date: 6/07/2017	Project #: 2017234
Geo-Solutions 11901 Old Stage Road Chester, VA 23836	

APPENDIX II

BORING LOGS

11901 Old Stage Road, Chester, VA 23836
Ph: 804-541-1436 Fax: 804-541-1437

Date of Evaluation: 6/1 & 2/2017 South Crater Road

SOIL EVALUATION REPORT

Hole #	Horizon	Depth (in)	Description of color, texture, etc.	Texture Group
BH-1	A	0-6	10YR 4/2 dark grayish brown; sandy loam; friable	IIa
	E	6-12	10YR 5/3 brown; sandy clay loam; friable	IIb
	EB	12-18	10YR 6/3 pale brown, sandy clay loam; friable	IIb
	Bt1	18-26	10YR 6/6 brownish yellow, very moist, clay loam	III
	Bt2	26-46	10YR 5/6 yellowish brown with 7.5YR 5/6 strong brown redox at 26"; clay loam	III
	Bt3	46-60	10YR 5/6 yellowish brown with 7.5YR 5/6 strong brown and 2.5YR 5/8 red redox and 10YR 7/1 light gray depletions at 46", very moist, clay loam	III
BH-2	A	0-4	10YR 4/2 dark grayish brown; sandy loam; friable	IIa
	E	4-12	10YR 5/3 brown; sandy loam; friable	IIa
	Bt	12-48	10YR 5/6 yellowish brown with 7.5YR 5/6 strong brown and 2.5YR 5/8 red redox and 10YR 7/1 light gray depletions at 34", very moist, clay loam	IIb
BH-3	A	0-4	10YR 4/2 dark grayish brown; sandy loam; friable	IIa
	E	4-11	10YR 5/3 brown; sandy loam; friable	IIa
	Bt	11-48	10YR 5/6 yellowish brown with 7.5YR 5/6 strong brown and 2.5YR 5/8 red redox and 10YR 7/1 light gray depletions at 32", very moist, clay loam; free water at 42"	IIb
BH-4	A	0-4	10YR 4/2 dark grayish brown; sandy loam; friable	IIa
	E	4-12	10YR 5/3 brown; sandy clay loam; friable	IIb
	Bt1	12-42	10YR 5/6 yellowish brown with 10YR 7/4 very pale brown, clay loam	III
	Bt2	42-60	10YR 5/6 yellowish brown with 10YR 7/4 very pale brown, clay loam with 10YR 7/1 light gray depletions at 42"	
BH-5	A	0-2	10YR 4/2 dark grayish brown; sandy loam; friable	IIa
	E	2-10	10YR 6/3 pale brown; sandy clay loam; friable	IIb
	EB	10-20	10YR 7/3 very pale brown, sandy clay loam; friable	IIb
	Bt1	20-26	10YR 6/6 brownish yellow, very moist, sandy clay loam	IIb
	Bt2	26-36	10YR 5/6 yellowish brown with 10YR 6/2 lt.	III

			brownish gray depletions at 28", clay loam	
	Bt3	36-60	10YR 6/8 brownish yellow with 7.5YR 5/6 strong brown redox and 10YR 7/1 light gray depletions, very moist, clay	IV
BH-6	A	0-4	10YR 4/2 dark grayish brown; sandy loam; friable	IIa
	E	4-16	2.5YR 4/3 reddish brown; sandy clay loam; friable with 7.5YR 5/4 brown redox	IIb
	Bt1	16-36	10YR 7/4 very pale brown and 7.5YR 6/6 reddish yellow redox, sandy clay loam; friable	IIb
	Bt2	36-60	10YR 7/4 very pale brown and 7.5YR 6/6 reddish yellow redox, sandy clay loam; friable, 10YR 7/1 lt gray depletions at 36"; Free water at 22"	IIb
BH-7	A	0-4	10YR 4/2 dark grayish brown; sandy loam; friable	IIa
	E	4-14	2.5YR 4/3 reddish brown; sandy clay loam; friable with 7.5YR 5/4 brown redox	IIb
	Bt1	14-35	10YR 7/4 very pale brown and 7.5YR 6/6 reddish yellow redox, sandy clay loam; friable	IIb
	Bt2	35-60	10YR 7/4 very pale brown and 7.5YR 6/6 reddish yellow redox, sandy clay loam; friable, 10YR 7/1 lt gray depletions at 36"; Free water at 36"	IIb
BH-8	A	0-3	10YR 4/2 dark grayish brown; sandy loam; friable	IIa
	EB	3-20	10YR 7/4 very pale brown; light sandy clay loam; friable	IIb
	Bt1	20-26	10YR 6/6 brownish yellow, sandy clay loam	IIb
	Bt2	26-60	10YR 6/8 brownish yellow with 7.5YR 5/8 strong brown redox, sandy clay loam; 10YR 7/1 lt gray depletions at 29"	IIb
BH-9	A	0-4	10YR 4/2 dark grayish brown; sandy loam; friable	IIa
	EB	4-18	10YR 7/4 very pale brown; light sandy clay loam; friable	IIb
	Bt1	18-30	10YR 6/6 brownish yellow with 7.5YR 6/8 strong brown redox, sandy clay loam	IIb
	Bt2	30-60	7.5YR 7/8 reddish yellow with 10YR 7/2 light gray depletions at 32", sandy clay loam	IIb
BH-10	A	0-4	10YR 4/2 dark grayish brown; sandy loam; friable	IIa
	EB	4-18	10YR 7/4 very pale brown; light sandy clay loam; friable	IIb

	Bt1	18-37	10YR 6/6 brownish yellow with 7.5YR 6/8 strong brown redox @ 32”, sandy clay loam	IIb
	Bt2	37-60	7.5YR 7/8 reddish yellow with 10YR 7/2 light gray depletions at 44”, clay loam	III
BH-11	A	0-4	10YR 4/2 dark grayish brown; sandy loam; friable	IIa
	EB	4-16	10YR 7/4 very pale brown; light sandy clay loam; friable	IIb
	Bt1	16-37	10YR 6/6 brownish yellow with 7.5YR 6/8 strong brown redox @ 33”, sandy clay loam	IIb
	Bt2	37-60	7.5YR 7/8 reddish yellow with 10YR 7/2 light gray depletions at 42”, clay loam	III

APPENDIX III

KSAT TESTING

11901 Old Stage Road, Chester, VA 23836
Ph: 804-541-1436 Fax: 804-541-1437

Geo-Solutions	SATURATED HYDRAULIC CONDUCTIVITY WORKSHEET	Sheet No.:

Project Name.:	South Crater Road	**Parcel…….....:**		**Terminology and Solution**	
Boring No…...:	K-1 next to BH-9	**Date……..…...:**	06/02/17	Ksat :	Saturated hydraulic conductivity
Investigators.:	Rainer Haggerty	**File Name……...:**		Q:	Steady-state rate of water flow into the soil
Boring Depth.:	24"	**WCU Base. Ht. h:**	15.0 **cm**	H:	Constant height of water in borehole
Boring Dia…..:	3.00	**WCU Susp. Ht. S:**	10.0 **cm**	r:	Radius of cylindrical borehole
Boring Rad. (r):	1.50	**Const. Wtr. Ht. H:**	25.0 **cm**	Ksat = Q[sinh-1(H/r) - $(r^2/H^2+1)^{.5}$ + r/H] / $(2piH^2)$	[Glover R. E.]

VOLUME (ml)	Volume Out (ml) [a]	Time [min] [b]		Flow Rate Q (ml/min) [a/b]	---------- Ksat Equivalent Values----------				
					(cm/min)	(cm/sec)	(cm/day)	(in/hr)	(ft/day)
2000									
1710	290		10.00	29.00	0.019	3.16E-04	27.3	0.448	0.90
1710									
1620	90		10.00	9.00	0.006	9.80E-05	8.5	0.139	0.28
1620									
1570	50		10.00	5.00	0.003	5.44E-05	4.7	0.077	0.15
1570									
1530	40		10.00	4.00	0.003	4.36E-05	3.8	0.062	0.12
1530									
1490	40		10.00	4.00	0.003	4.36E-05	3.8	0.062	0.12
1490									
1450	40		10.00	4.00	0.003	4.36E-05	3.8	0.062	0.12

Geo-Solutions	SATURATED HYDRAULIC CONDUCTIVITY WORKSHEET	Sheet No.:

Project Name.:	South Crater Road	**Parcel…….....:**		**Terminology and Solution**	
Boring No…...:	K-2 next to BH-4	**Date……..…...:**	06/02/17	Ksat :	Saturated hydraulic conductivity
Investigators.:	Rainer Haggerty	**File Name……...:**		Q:	Steady-state rate of water flow into the soil
Boring Depth.:	36"	**WCU Base. Ht. h:**	15.0 **cm**	H:	Constant height of water in borehole
Boring Dia…..:	3.00	**WCU Susp. Ht. S:**	10.0 **cm**	r:	Radius of cylindrical borehole
Boring Rad. (r):	1.50	**Const. Wtr. Ht. H:**	25.0 **cm**	Ksat = $Q[\sinh\text{-}1(H/r) - (r^2/H^2+1)^{.5} + r/H] / (2\pi H^2)$	[Glover R. E.]

VOLUME (ml)	Volume Out (ml) [a]	Time [min] [b]		Flow Rate Q (ml/min) [a/b]	---------- Ksat Equivalent Values----------				
					(cm/min)	(cm/sec)	(cm/day)	(in/hr)	(ft/day)
2000									
1790	210		10.00	21.00	0.014	2.29E-04	19.8	0.324	0.65
1790									
1710	80		10.00	8.00	0.005	8.71E-05	7.5	0.123	0.25
1710									
1640	70		10.00	7.00	0.005	7.62E-05	6.6	0.108	0.22
1640									
1590	50		10.00	5.00	0.003	5.44E-05	4.7	0.077	0.15
1590									
1560	30		10.00	3.00	0.002	3.27E-05	2.8	0.046	0.09
1560									
1530	30		10.00	3.00	0.002	3.27E-05	2.8	0.046	0.09