BOOTH MOUNTAIN WASTEWATER TREATMENT SYSTEM
EXPLANATION REPORT

Prepared By:

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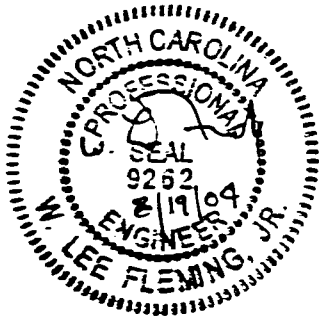
919/833-1234



Prepared: August, 2004

BOOTH MOUNTAIN DEVELOPMENT PROJECT
WATER RECLAMATION SYSTEM EXPLANATION REPORT

I. INTRODUCTION

The Booth Mountain Project is planned to be a residential development in Chatham County, North Carolina. The development will consist of single family residences and an amenities center. It is anticipated that these activities will generate domestic wastewater with a strength of 200 mg/l BOD5, 200 mg/l Total Suspended Solids, 25 mg/l Ammonia, and 100,000/100 ml Fecal Coliform. These levels are typical for conventional domestic wastewater. If any of the amenity facilities are expected to discharge wastewater into the collection system above these levels, then pretreatment in the form of grease traps or other facilities will be required.

According to the developer, about 180 lots could be served by this wastewater system. The residential flow is expected to be 64,800 gallons per day and the amenities facilities may contribute and additional 1,200 gallons per day. The total flow into the reclamation facility is expected to be approximately 66,000 gallons per day.

There are no known public wastewater systems in Chatham County which could provide the service needed for the development. Even if a hybrid system were considered, which would treat the raw sewerage at the development site and deliver partially treated effluent to a permitted wastewater treatment facility, none was believed to exist which could accommodate the projected flow of 66,000 gallons per day. Next, the alternative of applying for an National Pollutant Discharge Elimination System (NPDES) permit was considered. With current State regulations, the developer must first show that there are no alternatives to the discharge before the Division of Water Quality (DWQ) would even consider this option. Knowing that a spray irrigation system might be possible, and also knowing that there is currently a great deal of concern about the discharge of nutrients into the tributaries of Jordan Lake, the option of an NPDES permit was eliminated.

After a review of the various alternatives, an investigation was undertaken to determine if the use of a spray irrigation system was a viable alternative. Based on preliminary studies by S&EC, Inc. and Mr. Edwin Andrews, PG, it appears that the property contains sufficient open lands such as grassy and tree covered areas which might be used for the final disposal locations for the reclaimed water. These preliminary reports find that the application of this effluent should meet the requirements of the Environmental Management Commission's regulations governing reclaimed water irrigation systems.

After reviewing the design requirements, development needs, and operational requirements of the reclamation facility, it was determined that the facility does not need to be installed in phases. The 70,000 gpd plant will be installed as the project is developed and this will be the complete wastewater facility for the whole project. In addition, the complete 5 day upset and the 110 day inclement weather storage ponds will be constructed at the same time.

II. SUBMITTAL DOCUMENTS

To support the spray irrigation plan, a series of documents will prepared. The following list outlines these documents which will accompany a permit application to the DWQ:

Reclamation facility:
- WT-1 Facility site plan
- WT-2 70,000 gpd facility plan
- WT-3 70,000 gpd sections & details
- WT-4 Details & pump station
- WT-5 Force main route & storage pond layout
- WT-6 Details of construction

Specifications - 70,000 GPD facility
Soils Investigation
Hydrogeologic Investigation
Agronomic Investigation
Irrigation Design
- Irrigation Land Layout W\ Spray Area
- Irrigation Land Layout W\ Spray Irrigation

Development
- Development Plan

In order to investigate and design this project, using irrigation on common lands, the following personnel were retained:

HYDROGEOLOGIC INVESTIGATIONS
Mr. Ed Andrews, PG Hydrogeologist
Edwin Andrews & Associates
P.O. Box 30653
Raleigh, N.C. 27622
919/781-8395

RECLAMATION FACILITY DESIGN
Mr. W. Lee Fleming, Jr. PE
W. Lee Fleming, Jr. Engineering
601 Oberlin Road, Suite 200
Raleigh, N.C. 27605
919/833-1234

IRRIGATION DESIGN
Mr. Mark Ashness, PE
CE Group, Inc.
1051 Pemberton Hill Road, Ste. 201
Apex, N.C. 27502
919/367-8790

SOILS INVESTIGATIONS
Mr. Jim Beeson
S&EC, Inc.
3109 Spring Forest Rd
Raleigh, N.C. 27616
919/872-2660

III. EXPLANATION OF THE RECLAMATION FACILITY PROCESS

The reclamation facility will utilize DWQ required components to achieve a level of treatment necessary for "reclaimed water system" spray irrigation. The following treatment levels will be required based on current State Regulations:

	Daily Maximum	Monthly Average
BOD5	15 mg/l	10 mg/l
Total Suspended Solids	10 mg/l	5 mg/l
Ammonia	6 mg/l	4 mg/l
Fecal Coliform	25/100 ml	14/100 ml (Geometric mean)
Turbidity	10 NTU	

As required by 15A NCAC 2H.0200, the facility will produce a tertiary effluent. It will consist of an equalization chamber with a capacity at least 25 percent of the design average daily flow, aeration chambers, clarification tanks, filtration units, and disinfection units with ultraviolet and chlorine systems. Each of these systems will be sized using the State's criteria for tertiary treatment.

Wastewater will flow from the development's collection system and enter the facility through a bar screen for the removal of rough material such as rags and sticks. For the conventional treatment facility, the incoming flow will be "feed" into the plant and then equally divided between treatment trains for aeration, clarification, and filtration (each train will be sized to treat 50% of the incoming wastewater flow). The purpose of the installation of two (2) treatment trains for several of the plant components is to provide an increased reliability in the reclamation facility and to satisfy the need for dual trains as required by the EMC for irrigation on reclaimed water projects. The incoming sewerage will be discharged into an equalization chamber where a constant delivery of flow will be sent into the plant. This chamber uses pumps and a control box to "feed" the aeration chambers with a constant flow rate. The aeration chambers will aerate the sewerage to reduce the strength of the wastewater by biological activity. After aeration, a majority of the solids will be removed by settling in the clarifiers. These chambers will collect the settled solids and return the sludge to either the sludge holding chamber or the aeration chambers. Once the larger solids are removed in the clarifiers, the wastes will be exposed to chlorine disinfection for the first of two process for the removal of fecal coliform. Next, the wastewater will be processed through a tertiary filter for the removal virtually all of the remaining suspended solids. Finally, the treated wastes will be disinfected using an ultra-violet disinfection system for the final reduction of fecal coliform. In addition to the aforementioned units, the plant will also be equipped with an on-site standby generator to serve as a power backup if primary power is lost. Also, the facility will be served by a sludge hauling contractor who will remove the accumulated sludge from the aerated sludge holding chamber and apply the stabilized sludge to approved disposal sites. A local sludge contractor has been contacted and a letter

has received which indicated their willingness to add this facility to their permit once the plant is constructed. A copy of this letter is attached to this report.

Finally, the treated reclaimed water will be delivered to two types of ponds for spray and storage. These ponds are capable of holding 5 days and 110 days of plant effluent respectively. Using these ponds, the plant operator will be able to control the application rate to the irrigation areas. The 5 day pond is to be used to contain any upset of the plant's effluent and the 110 day pond is available for storage of treated effluent during wet, freezing, windy, or wet ground conditions. Normally, the 110 day pond will be almost empty in the fall of each year so that the storage volume will be available when needed.

A sketch of the reclamation facility process and relationship of the facility to the storage ponds is attached to this report. The sketch labels the facility components being proposed and shows the connections from the facility to the two types of ponds.

As indicated previously, this reclamation facility contains many redundant units to allow continued operation in the case of equipment or power failure. The following items are examples of these redundant or backup systems:

1. The aeration, clarification, and filtration systems are provided in parallel trains; each with the ability to treat 50% of the incoming wastewater.
2. All pumps and aeration devices will be provided with a backup unit. As an example, the pumps in the equalization chamber will be sized to pump the desired rate and if one of the pumps fail to operate, then the second pump will be able to pump the incoming wastewater at the desire rate. There will be a lag pump on float which will turn this pump on if the first pump fails to activate.
3. The mud well pumps will be provide a backup system similar to the equalization chamber pumping system.
4. The facility will be provided with backup power supply by of a pad mounted generator. Further, to ensure that the generator will provide the required power, even if there are no personnel on the site, there will be an automatic transfer switch which will activate the generator in the case of a power loss.
5. The facility will be provided with a separate pond to be used as an upset pond if problems are found with the plant's effluent. This pond will be sized to contain 5 full days of effluent at the design rate. All partially treated effluent will be routed to this pond for future treatment once the problems are resolved with the treatment process. More information is offered on this pond later in this report.
6. Night lighting will be provided for the facility site to allow the operator to have proper access to the treatment units in the dark. Further, ground faulted electrical receptacles will be provided at all control panels for operation of hand held equipment.

In addition to the conventional treatment components, the Booth Mountain reclamation facility will be designed to provide a reduction of the phosphorus level in the effluent. Phosphorus reduction will be provided to ensure that the phosphorus loadings to the irrigated areas are consistent with the agronomic needs of the vegetative cover. In order to reduce the phosphorus level in the effluent, a chemical precipitation system will be installed. This system will consist of a chemical storage tank with spill containment, dual chemical feed pumps, delivery pipe, and liquid discharge pipe into the equalization

chamber. Using this type of system, a greater quantity of sludge will be generated compared to the amount normally generated from domestic treatment plants. The plant's sludge storage chamber will be sized to accommodate this larger sludge volume.

Also, the reclamation facility will be designed with the ability to reduce the levels of total nitrogen in the plant's effluent. This treatment will occur by the use of anoxic zones within each of the aeration chambers. Each of the anoxic zones will be equipped with mixers and transfer pumps to keep the chamber contents mixed and to allow the movement of sludge and chamber contents to other zones within the treatment process. Nitrogen reduction is being provided to ensure that the nitrogen loading to the irrigated areas are consistent with the agronomic needs of the vegetative cover.

The proposed location of the reclamation facility was selected to be within the irrigation area to allow it's placement to be as remote as possible. The closest dwelling units to the treatment facility will be those within the project. Once the plant is constructed, there will be two primary sources of odor. The incoming pipes will discharge the wastewater from long force mains. These pipes may release odor due to the long length of retention of the wastewater. In this case, the odor can be reduced by the injection or input of chemicals at the pump stations. This injection has proven successful in the past in reduction of odors from pipeline wastes.

Also, there is a potential for odor to be generated when the stored sludge is stabilized prior to removal by a sludge contractor. There are several operation actions which might be incorporated to reduce or eliminate this odor generation if it becomes a problem. First, the sludge could be dewatered on site or taken to a dewatering contractor. This sludge could then be made into a composted material. This process would prevent the need to stabilize the sludge on the plant site. Next, the stored sludge might be stabilized at night. Another odor reduction method might be to stabilize the sludge in an off-site storage vessel which would be operated by the sludge hauler if he adds such a service. Finally, if on-site odor persists, then a liquid or solid fragrance might be used to reduce the sludge odor during stabilization.

IV. RECLAMATION FACILITY MONITORING

The reclamation facility must be monitored on a regular basis. This monitoring will be conducted by a Certified Laboratory and will report the results to the DWQ. The monitoring requirements will be stated in the issued non-discharge permit. In past permits, the monitoring of the facility included sampling for BOD5, Total Suspended Solids, Ammonia, Turbidity, Fecal Coliform, Dissolved Oxygen, pH, and Flow. In addition, the self-monitoring forms require the operator to confirm the dates that they are on the facility site and the time of day which the visits occurs. Finally, for the non-discharge permits issued for irrigation, the permits require self-monitoring data to be submitted which relate to the amount and location of irrigation. This data is provided on a daily basis and reports the irrigation amounts and irrigation rates applied, the daily rainfall, the levels of the storage ponds, and other information relating to the storage and irrigation of the treated effluent.

In addition to the monthly monitoring of the reclamation facility effluent, the plant will be equipped with a meter which will provided constant monitoring of the plant's turbidity. If during the operation of the facility, the turbidity lever reaches 6 NTU, an auto dialer will activate and call the plant operator. With this notice, the operator can travel to the facility, make all necessary corrections, and if the turbidity level

remains below the State's maximum level of 10 NTU, then no water will need to be diverted to the upset pond. If, on the other hand, the level of turbidity reaches 10 NTU, the operator will redirect the effluent from the storage pond to the 5 day upset pond. Only after the turbidity level goes below 10 NTU will the operator again allow the effluent to be transferred to the irrigation ponds.

Also, DWQ will require that the reclamation facility and irrigation system be operated by certified operators. The operators must be on 24 hour call, visit the plant on a regular basis, and must be available to direct irrigation operations as needed and required by the issued permit and operator certification.

V. CONCLUSION

This report has discussed the wastewater disposal system proposed for the Booth Mountain project in Chatham County, North Carolina. The supporting information includes favorable determinations that the soils will be satisfactory for the application of reclaimed water the average rates specified. DWQ must review the submitted information and determine if a non-discharge permit can be issued. This process will involve a detailed review of the technical documents, reports, and other submitted information. If the DWQ review indicates that the system will perform as stated, a non-discharge permit is expected to be issued for a period of approximately 5 years. With satisfactory operation and maintenance, the Booth Mountain wastewater system should provide the development with reliable sewer service.

SLUDGE DISPOSAL LETTER

Granville Farms, Inc.
P.O. Box 58477
Raleigh, N. C. 27658

"Specializing in residual land application management"

August 12, 2004

To: Lee Fleming Engineering

From: J. Bryan Smith
Granville Farms, Inc

Subject: To add Booth Mountain (Chatham County) Proposed Project WWTP to Granville Farms, Inc. permit for sludge land application.

Reference: Permit number: DWQ0000838
Biosolids will be land applied to package plants sites.

GFI will make application to the division of Water Quality to add the above project to GFI permit. Data needed will be discussed after completion of plant construction.

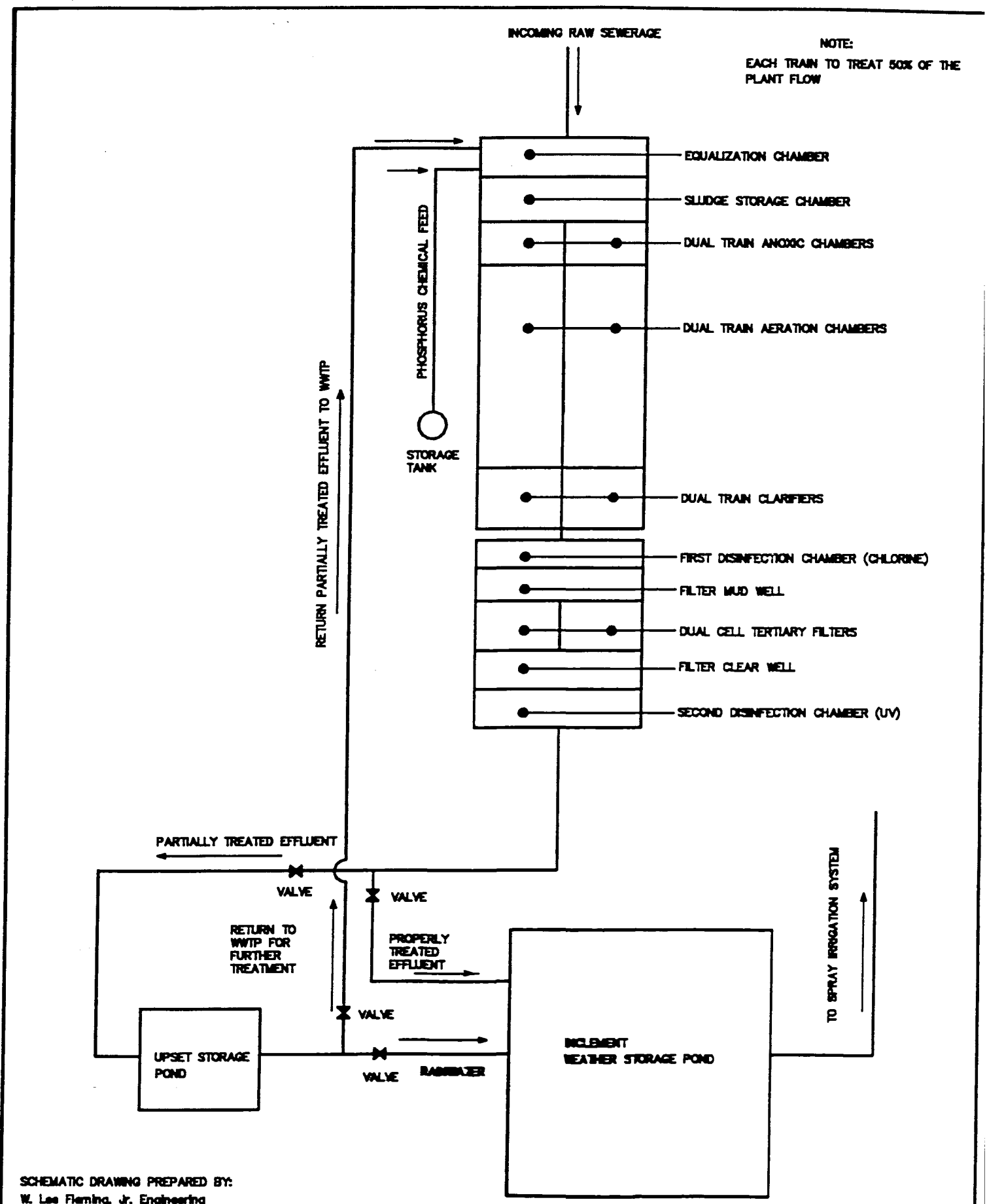
Any questions or additional information needed you may contact me. 252-903-0390 or fax 919-781-9766.

Thanks

J Bryan Smith

Granville Farms, Inc.

PRELIMINARY WWTP SCHEMATIC



SCHEMATIC DRAWING PREPARED BY:
W. Lee Fleming, Jr. Engineering
503 Oberlin Rd. Ste. 204
Raleigh, N.C. 27605
Phone: 919/833-1234
FAX: 919/833-1105

PRELIMINARY BOOTH MOUNTAIN WATER RECLAMATION FACILITY SCHEMATIC

NOT TO SCALE

DATE PREPARED: AUGUST 17, 2004

HYDROGEOLOGY
GEOLOGY

ENVIRONMENTAL SCIENCES
SOILS

EDWIN ANDREWS & ASSOCIATES, P.C.
CONSULTING HYDROGEOLOGISTS
P.O. BOX 30653
RALEIGH, N.C. 27622 - 0653
PHONE: (919) 783 - 8395
FAX: (919) 783 - 0151

August 18, 2004

Mr. Michael F. Whitehead, President
MacGregor Development Company
201 Shannon Oaks Circle
Suite 201
Cary, N.C. 27515

Re: Preliminary Soil Assessment for Reuse
Phase I - +/-40 Acre Irrigation Area - Booth Mountain, Chatham County, N.C.
Project No. RW 1704

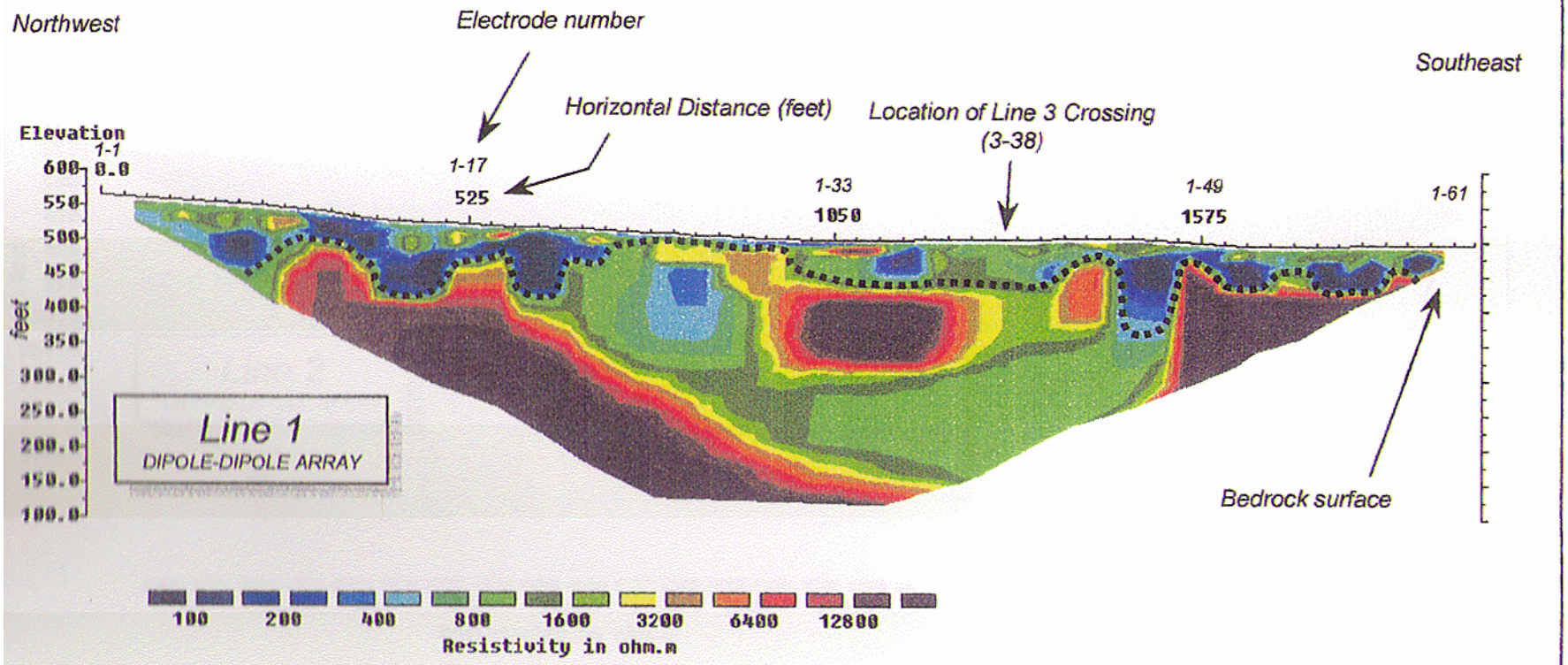
Dear Mr. Whitehead:

The site analysis for the proposed irrigation of reclaimed water on wooded land at Booth Mountain, Chatham County, North Carolina, confirms that the site can accommodate 66,000 gallons per day of reclaimed water at a minimum loading rate of 0.42 inch per week on 40 acres. The soils were mapped irrigation by Soil and Environmental Consultants, Inc. on the proposed site to evaluate the unmodified soil that will support the. The geology and hydrogeologic framework of the site was evaluated by Edwin Andrews & Associates, P.C., with the assistance of ATS International, for fracture trace analysis and resistivity analysis. Using this information the depth to bedrock was mapped and the site was investigated to determine if major fractures could be identified. Test borings were completed by Graham and Currie Well Drilling (completion reports attached) (Figure No. 1, Site Map).

Based on an overlay and interpolation of the S&EC (Soil and Environmental Consultants, Inc.) soil map with the proposed irrigation map, six soil series were identified (Figure No. 2, Soil Map). These soil associations were described using the NRCS Official Soil Series Descriptions, as:

- Appling well drained moderately permeable soil comprises 3.75 irrigated acres. This sandy loam, located on a 4 percent slope is fine, kaolinitic, Typic Kanhapludult. This pedon contains a clay Bt_2 horizon reported to extend from 19 to 35 inches with a published permeability from 0.6 to 2.0 inches per hour.

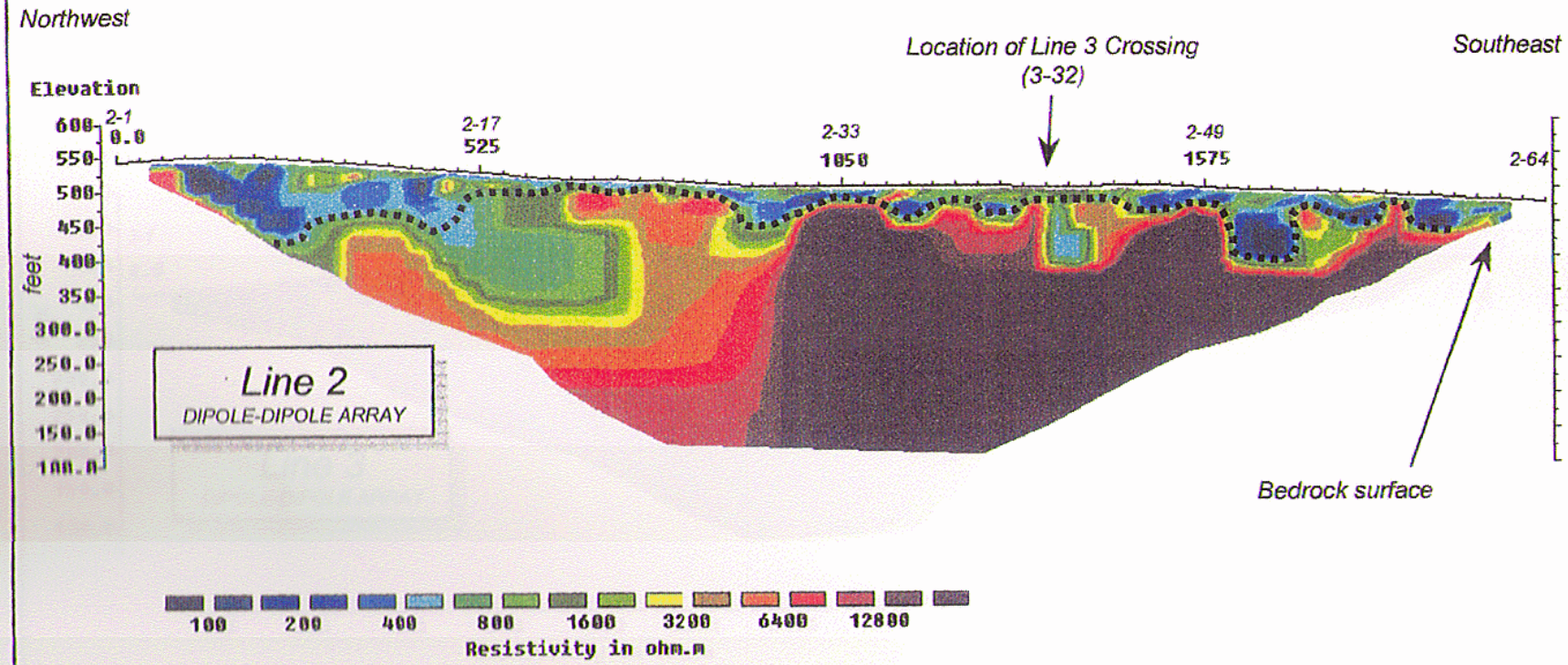
- Vance series consists of well drained, slowly permeable soils comprising 7.97 irrigated acres. This sandy loam is encountered on slopes ranging from 2 to 25%. The soil described as fine.



Report Title:	*Bedrock and Fracture study for Boothe Hill, Chatham County, NC*
File Name:	*Boothe Hill topo ls.ppt*
Date:	*7/2/04*
Draftsman:	*LJP*

Figure 4. Resistivity section for Line 1 illustrating the interpreted soil-bedrock interface.

ATS **International**
Advanced Technical Services
Christiansburg, VA
540-382-8861
Engineering Geology, Hydrology, and Geophysics
Computer Modeling and Visualization



Report Title:	Bedrock and Fracture study for Boothe Hill, Chatham County, NC
File Name:	Boothe Hill topo ls.ppt
Date:	7/2/04
Draftsman:	LJP

Figure 5. Resistivity section for Line 2 illustrating the interpreted soil-bedrock interface.

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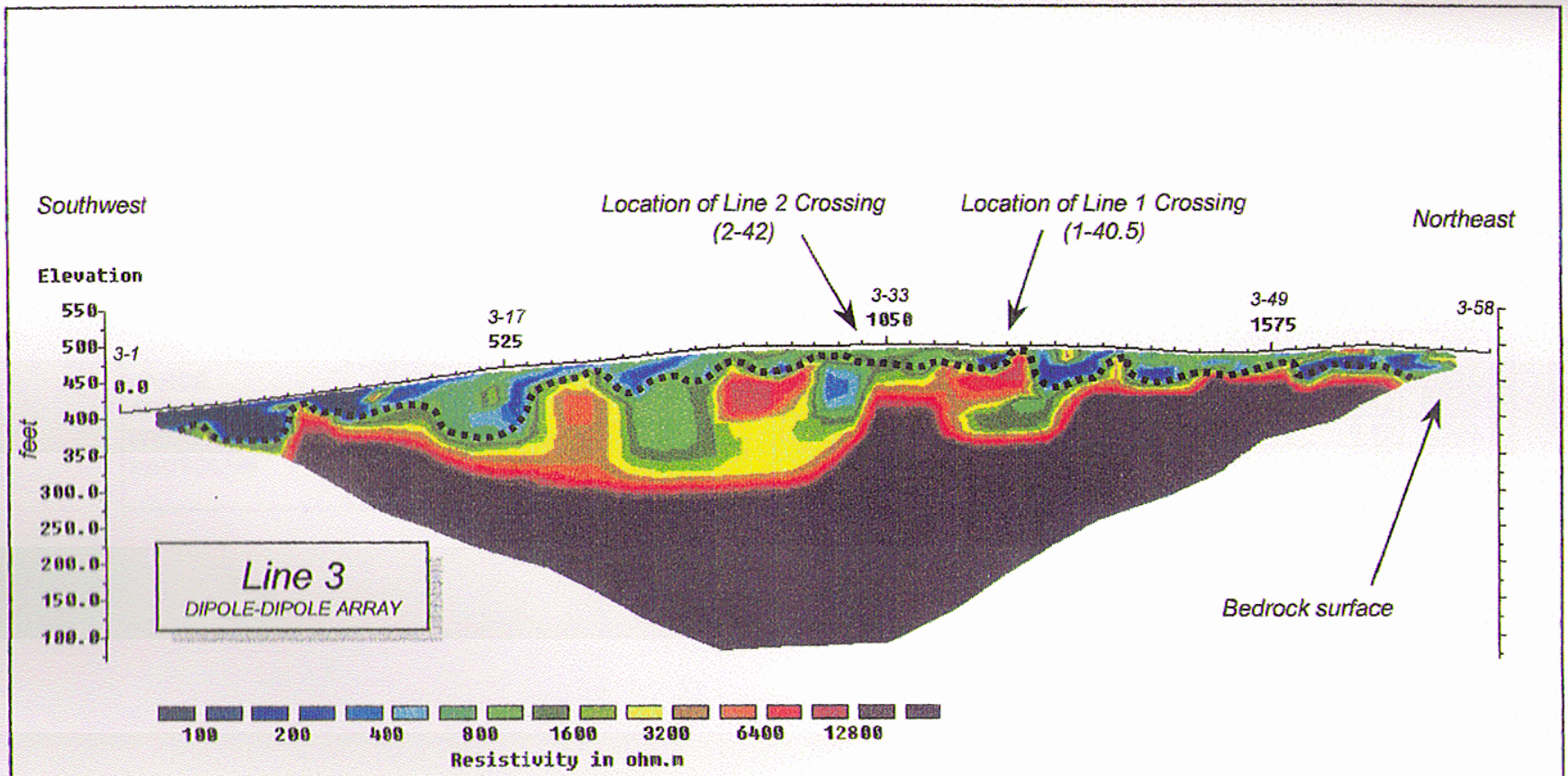
Computer Modeling and Visualization



Report Title:	*Bedrock and Fracture study for Boothe Hill, Chatham County, NC*
File Name:	*Boothe Hill topo ls.ppt*
Date:	*7/2/04*
Draftsman:	*LJP*

Figure 6. Resistivity section for Line 3 illustrating the interpreted soil-bedrock interface.

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Advanced Technical Services
Christiansburg, VA
540-382-8861
Engineering Geology, Hydrology, and Geophysics
Computer Modeling and Visualization

BOOTH MOUNTAIN

TABLE NUMBER 1, AREA SUMMARY

	BLOCK 1 AREA SQ.FT.	BLOCK 2 AREA SQ.FT.	BLOCK 3 AREA SQ.FT.	BLOCK 4 AREA SQ.FT.	BLOCK 5 AREA SQ.FT.	BLOCK 6 AREA SQ.FT.	TOTAL AREA SQ. FT.	TOTAL AREA ACRES	LOADING RATE IN/WK	LOADING G.P.D.
LOUISBURG	11,369	7,720	55,502	179,816			254,407	5.84	0.42	9,741.6
RION	10,218						10,218	0.23	0.42	391.3
VANCE	17,002	7,518	119,804	23,125	179,552		347,001	7.97	0.42	13,287.1
APPLING	17,871	145,455					163,326	3.75	0.42	6,254.0
WEDOWEE	12,746	83,890	136,856				233,492	5.36	0.42	8,940.7
PACTOLUS	11,971	8,979	4,862	10,418	150,946	549,246	736,422	16.91	0.42	28,198.6
							1,744,866	**40.06**		**66,813.2**

BOOTH MOUNTAIN

TABLE NO. 3: CHATHAM COUNTY RAINFALL DATA ANALYSIS

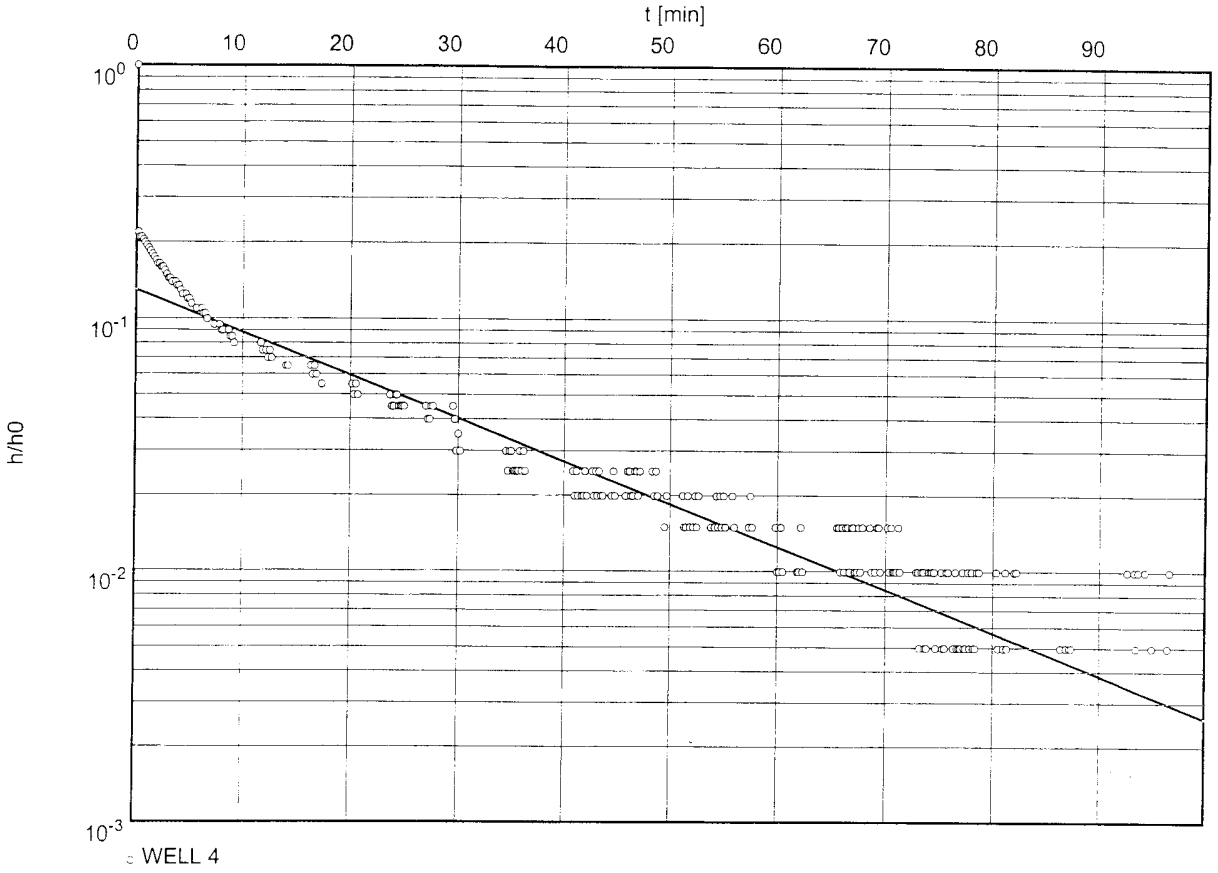
	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	ANNUAL
1973	4.22	4.92	5.33	5.82	3.56	9.16	2.38	3.21	1.84	1.04	0.66	5.78	47.92
1974	3.83	3.52	3.14	2.48	6.78	2.40	2.42	2.09	7.32	1.73	2.14	4.84	42.69
1975	7.57	3.07	7.36	1.55	8.77	1.96	12.73	2.60	8.44	1.59	2.23	3.24	**61.11**
1976	3.43	1.35	3.07	0.01	6.12	5.81	3.65	3.53	2.78	5.35	2.64	4.41	42.15
1977	3.35	1.69	6.85	1.83	2.49	1.21	2.76	5.17	7.63	5.07	1.76	3.36	43.17
1978	9.95	1.50	3.93	4.14	5.71	3.43	4.21	2.53	0.89	1.35	3.53	2.91	44.08
1979	6.64	5.82	3.61	5.49	2.72	6.01	4.27	4.01	6.91	2.16	4.67	1.18	*53.49*
1980	4.65	1.69	5.57	1.94	4.64	4.46	3.72	3.31	2.46	4.16	2.45	1.80	40.85
1981	1.00	3.95	2.17	0.93	1.94	3.02	5.48	1.67	7.16	4.28	0.00	0.00	31.60
1982	0.00	0.00	0.86	5.63	9.14	10.73	4.26	2.78	1.12	4.96	2.21	4.25	45.94
1983	1.86	5.56	8.03	4.66	4.71	5.61	1.31	2.47	2.53	4.61	4.67	6.62	52.64
1984	5.16	6.84	8.65	4.81	6.57	2.52	11.86	1.96	0.60	2.72	1.61	2.62	55.92
1985	5.01	5.74	1.40	1.01	4.72	5.05	6.75	9.66	0.03	4.50	11.97	1.11	*56.95*
1986	1.43	1.38	3.00	1.35	3.16	1.44	3.12	6.13	1.25	2.69	4.84	4.28	34.07
1987	5.63	3.86	6.06	3.98	1.37	2.78	1.15	3.80	4.48	1.70	3.55	3.35	41.71
1988	3.83	2.28	2.25	3.02	2.34	3.14	2.93	6.35	4.00	4.30	4.26	0.65	39.35
1989	1.75	6.82	6.87	4.04	5.70	5.88	11.73	4.87	4.12	5.71	3.12	3.15	**63.76**
1990	4.07	4.52	4.54	2.20	9.76	0.54	2.87	1.48	1.98	11.20	2.13	3.47	48.76
1991	5.55	1.10	5.60	3.46	2.80	5.97	4.47	1.93	4.74	1.54	1.97	2.69	41.82
1992	2.83	0.00	3.11	3.66	2.97	6.04	6.03	4.14	0.43	4.73	5.59	2.69	42.22
1993	4.95	3.38	7.17	4.77	4.31	1.53	3.38	2.93	3.00	3.57	3.16	3.38	45.53
1994	3.65	3.29	6.03	2.08	2.92	3.89	8.23	4.45	2.91	1.60	2.78	1.18	43.01
1995	6.37	4.73	2.61	1.24	4.97	9.26	3.63	3.54	2.48	10.78	5.69	1.70	*57.00*
1996	5.27	2.46	4.11	3.79	4.77	0.92	2.52	8.55	11.92	3.27	3.01	3.27	53.86
1997	3.44	3.59	3.28	6.13	1.46	3.55	6.02	1.94	5.92	3.03	3.51	3.36	45.23
1998	9.15	6.49	8.50	4.68	5.27	1.80	2.92	1.89	4.66	1.65	2.41	4.04	53.46
1999	5.74	2.20	2.78	4.57	3.65	1.80	5.05	4.18	13.49	3.56	2.01	2.35	51.38
2000	5.25	2.14	1.99	4.40	2.92	1.65	3.50	2.63	7.00	0.02	2.10	1.52	35.12
2001	1.68	2.67	5.70	1.47	1.77	4.27	5.45	4.78	1.96	1.26	0.37	2.39	33.77
2002	6.94	1.14	3.72	1.16	1.94	1.70	3.91	2.91	6.57	7.80	4.16	4.65	46.60
2003	2.03	5.30	7.50	6.75	5.21	5.34	7.06	6.15	3.94	2.79	1.91	3.08	**57.06**
AVG. YR.	4.39	3.32	4.67	3.32	4.36	3.96	4.83	3.79	4.34	3.70	3.13	3.01	46.85
8TH IN 10 WETTEST YR.	4.93	3.73	5.24	3.73	4.89	4.45	5.42	4.26	4.87	4.15	3.52	3.38	52.57

AVG. RAINFALL **46.85** INCHES
AVERAGE OF 8TH IN 10 WETTEST YEARS **52.57**

Waterloo Hydrogeologic 180 Columbia St. W. Waterloo,Ontario,Canada ph.(519)746-1798	slug/bail test analysis BOUWER-RICE's method	Date: 18.08.2004	TABLE 4B, Page 1
		Project: BOOTH MOUNTAIN	
		Evaluated by: EEA	

Slug Test No. 2 — Test conducted on: 7/22/04

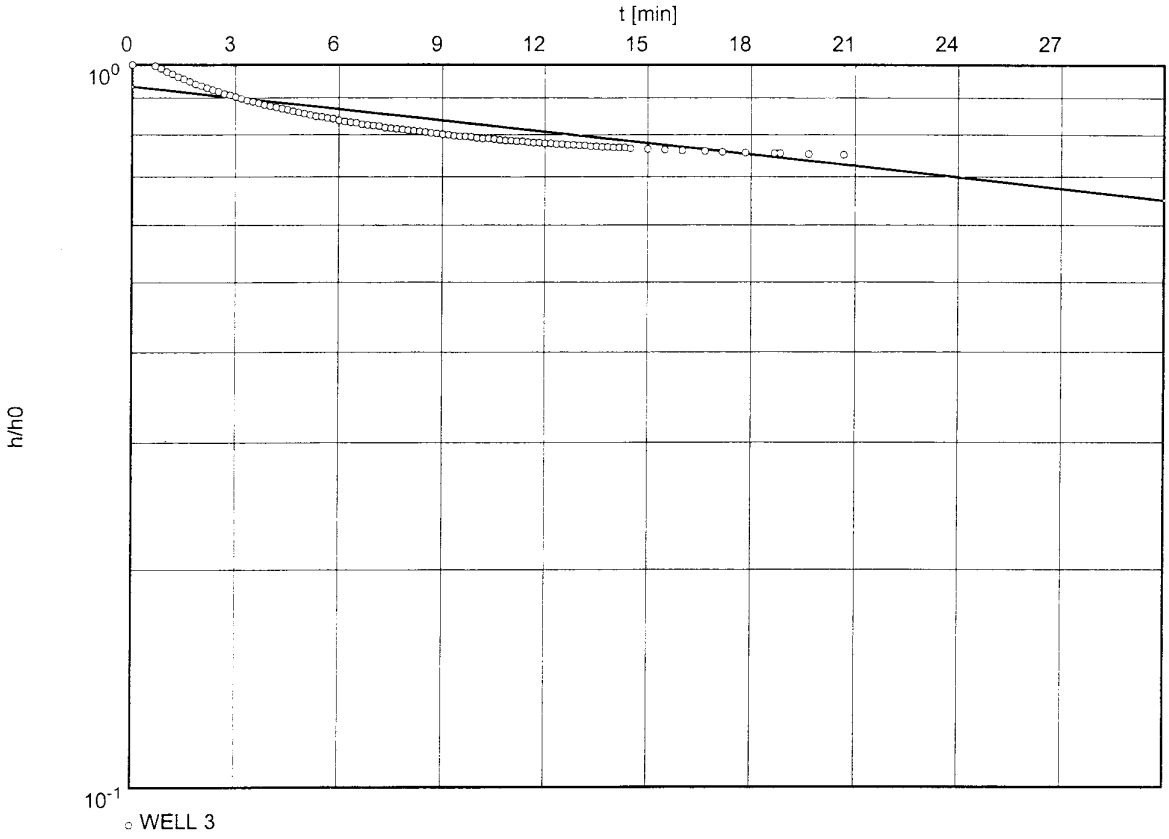
WELL 2



Hydraulic conductivity [ft/min]: 3.99×10^{-6}

Waterloo Hydrogeologic 180 Columbia St. W. Waterloo,Ontario,Canada ph.(519)746-1798	slug/bail test analysis BOUWER-RICE's method	Date: 18.08.2004	TABLE 4C, Page 1
		Project: BOOTH MOUNTAIN	
		Evaluated by: EEA	

Slug Test No. 3	Test conducted on: 7/23/04
WELL 3 - UNDEVELOPED	



Hydraulic conductivity [ft/min]: 1.26×10^{-6}

PO Box 30653
Raleigh, NC 27622

Soil Test Report

Farm:

7/27/04 **SERVING N.C. CITIZENS FOR OVER 50 YEARS** **Chatham County**

Agronomist Comments:

Field Information		Applied Lime			Recommendations										
Sample No.	*Last Crop*	*Mo*	*Yr*	*T/A*	*Crop or Year*	*Lime*	*N*	*P_2O_5*	*K_2O*	*Mg*	*Cu*	*Zn*	*B*	*Mn*	*See Note*
BOOW1					1st Crop: Hardwood,M	3T	80-120	60-80	20-40	0	0	$			11
					2nd Crop:										

Test Results

Soil Class	*HM%*	*W/V*	*CEC*	*BS%*	*Ac*	*pH*	*P-I*	*K-I*	*Ca%*	*Mg%*	*Mn-I*	*Mn-AI (1)*	*Mn-AI (2)*	*Zn-I*	*Zn-AI*	*Cu-I*	*S-I*	*SS-I*	*NO_3-N*	*NH_4-N*	*Na*
MIN	0.32	1.31	3.0	53.0	1.4	5.2	3	24	35.0	14.0	734			20	20	30	27				0.1

Field Information		Applied Lime			Recommendations										
Sample No.	*Last Crop*	*Mo*	*Yr*	*T/A*	*Crop or Year*	*Lime*	*N*	*P_2O_5*	*K_2O*	*Mg*	*Cu*	*Zn*	*B*	*Mn*	*See Note*
BOOW2					1st Crop: Hardwood,M	3T	80-120	70-90	20-40	$	$	$			11
					2nd Crop:										

Test Results

Soil Class	*HM%*	*W/V*	*CEC*	*BS%*	*Ac*	*pH*	*P-I*	*K-I*	*Ca%*	*Mg%*	*Mn-I*	*Mn-AI (1)*	*Mn-AI (2)*	*Zn-I*	*Zn-AI*	*Cu-I*	*S-I*	*SS-I*	*NO_3-N*	*NH_4-N*	*Na*
MIN	0.04	1.30	1.8	44.0	1.0	5.1	0	21	25.0	12.0	1781			0	0	8	128				0.1

Field Information		Applied Lime			Recommendations										
Sample No.	*Last Crop*	*Mo*	*Yr*	*T/A*	*Crop or Year*	*Lime*	*N*	*P_2O_5*	*K_2O*	*Mg*	*Cu*	*Zn*	*B*	*Mn*	*See Note*
BOOW4					1st Crop: Hardwood,M	0	80-120	70-90	0	0	0	0			11
					2nd Crop:										

Test Results

Soil Class	*HM%*	*W/V*	*CEC*	*BS%*	*Ac*	*pH*	*P-I*	*K-I*	*Ca%*	*Mg%*	*Mn-I*	*Mn-AI (1)*	*Mn-AI (2)*	*Zn-I*	*Zn-AI*	*Cu-I*	*S-I*	*SS-I*	*NO_3-N*	*NH_4-N*	*Na*
MIN	0.27	1.27	4.5	73.0	1.2	5.3	0	43	44.0	24.0	408			223	223	41	32				0.1

Water Balance for: BOOTH MOUNTAIN

BOOTHWB — WELL DRAINED SOIL

Input ==>

Outp

Thornthwaite Potential Evapotranspiration Method — Enter Site Latitude: 36.60 degrees Latitude

	Average Monthly Temp. (degrees F)	Daylight Hours divided by 12	Heat Index (I)	Calculated PET (degrees F)	Manually entered PET data: Potential ET (in/mo)
January	45.9	0.87	1.93	0.46	0.93
February	48.3	0.85	2.46	0.60	1.40
March	54.4	1.03	3.98	1.33	2.17
April	62.7	1.09	6.41	2.54	3.30
May	70.3	1.21	8.96	4.27	4.34
June	76.9	1.22	11.40	5.76	4.80
July	80.7	1.23	12.89	6.80	4.65
August	79.5	1.16	12.41	6.12	4.03
September	74.6	1.03	10.52	4.42	3.30
October	64.8	0.97	7.08	2.55	1.86
November	55.8	0.86	4.36	1.24	1.20
December	48.3	0.85	2.46	0.60	0.62
TOTAL =			84.86	36.68	32.60

PAN Evaporation Data (used

Location of PAN Data: CHA

Enter PAN Multiplication Factor:

Janu
Febru
Marc
April
May
June
July
Augu
Septe
Octol
Nove
Dece
TO

Spray Irrigation Area =	40	acres
Lagoon Area =	1.5	acres

☐ << == Check Box to use Thornthaite Method

☑ <<== Check Box to use Manually entered PET data.

☑ <<

WWTP Design Flow = 66,000 GPD

Limiting Soil Ksat = 0.0500 inch/day

Drainage Coefficient = 0.1

Kv = Ksat * (Drainage Coeff.) = 0.12 inch/day

	# of Days in Month (days)	RAINFALL Monthly Rain (in/mo)	Rainfall Runoff 0.20 (in/mo)	RainFall Infiltrating Soil (in/mo)	Potential ET (in/mo)	Constant Vertical Drainage (in/mo)	Maximum Allowable Irrigation (in/mo)	Ratio of Monthly Influent to WWTP Design Flow (ratio)	Actual WWTP Monthly Influent Flow (GPD)	Ac Accu (GP
January	31	4.93	0.99	3.94	0.93	3.72	0.71	1.00	66,000.0	5,
February	28	3.73	0.75	2.98	1.40	3.36	1.78	1.00	66,000.0	4,
March	31	5.24	1.05	4.19	2.17	3.72	1.70	1.00	66,000.0	3,
April	30	3.73	0.75	2.98	3.30	3.60	3.92	1.00	66,000.0	3
May	31	4.89	0.98	3.91	4.34	3.72	4.15	1.00	66,000.0	1,
June	30	4.45	0.89	3.56	4.80	3.60	4.84	1.00	66,000.0	-2
July	31	5.42	1.08	4.34	4.65	3.72	4.03	1.00	66,000.0	3
August	31	4.26	0.85	3.41	4.03	3.72	4.34	1.00	66,000.0	-3
September	30	4.87	0.97	3.90	3.30	3.60	3.00	1.00	66,000.0	1,
October	31	4.15	0.83	3.32	1.86	3.72	2.26	1.00	66,000.0	2,
November	30	3.52	0.70	2.82	1.20	3.60	1.98	1.00	66,000.0	2,
December	31	3.38	0.68	2.70	0.62	3.72	1.64	1.00	66,000.0	3,
TOTAL =	365	52.57	10.51	42.06	32.60	43.80	34.34	12.00		

Results:

Total Storage Required of 7.04 inches = 115.9 days of Storage

Notes:

Spray Irrigation Monthly Application Factor = a forcing factor by which the "normally" Actual Spray Irrigation Rate is multiplied by, with the Storage Required being re-calculated to account for this factor.

Formulas:

(Max. Allowable Irrigation) = (ET) + (Drainage) - (Rain)

(Monthly Excess) = (Max. Allowable Irrigation) - (Monthly Influent Waste Volume)

where: (- Monthly Excess) = water that must be stored in Storage Pond

where: (+ Monthly Excess) = extra water that can be spray irrigated out of Storage Pond

Output =>

Data: (used for RainFall IN and Evaporation Out of Lagoon)

CHAPEL HILL

Evaporation Factor: 0.70 <<== 0.70 recommended

	PAN Evaporation Data (in/mo)	PAN Evap. Data X Mult. Factor (in/mo)
January	1.09	0.76
February	0.82	0.57
March	3.73	2.61
April	5.29	3.70
May	5.78	4.05
June	6.64	4.65
July	7.37	5.16
August	6.50	4.55
September	5.17	3.62
October	3.57	2.50
November	2.30	1.61
December	1.52	1.06
TOTAL =	49.77	34.84

☑ <<== Check Box to account for Rain - Evap. In/out of Lagoon

Actual "RainFall - ET" Accumulated into/out of Lagoon itself		Monthly WWTP Accumulated Volume to be disposed of	
In (GPD ave.)	In (Gallons)	In (Gallons)	In (in/mo)
5,484.6	170,023.9	2,216,023.9	2.04
4,591.3	128,556.6	1,976,556.6	1.82
3,454.5	107,069.8	2,153,089.8	1.98
36.7	1,099.8	1,981,099.8	1.82
1,109.0	34,379.5	2,080,379.5	1.92
-268.8	-8,065.3	1,971,934.7	1.82
343.0	10,631.6	2,056,631.6	1.89
-381.1	-11,812.9	2,034,187.1	1.87
1,698.6	50,958.3	2,030,958.3	1.87
2,169.4	67,251.9	2,113,251.9	1.95
2,593.4	77,802.0	2,057,802.0	1.89
3,043.2	94,340.0	2,140,340.0	1.97
	722,255.4	24,812,255.4	22.84

Max. Allowable Irrigation Application Factor	Unfactored Monthly Spray (in/mo)	Actual Monthly Spray Irrigation Rate: Factored Monthly Spray (in/mo)	Actual Monthly Spray Irrigation Rate: Max. Irrig. Rate (Y or N)	Actual Monthly Spray Irrigation Rate: Monthly Monthly Accumul. Gallons	Total Storage Required (inch)	Total Storage Required (gallons)
0.80	0.70600	0.14120	N	153,377	4.44452	4,827,819
0.20	1.77600	0.35520	N	385,833	5.90885	6,418,543
0.50	1.69800	0.84900	N	922,219	7.04210	7,849,414
1.00	3.82008	3.91600	Y	4,253,721	4.94991	5,376,793
1.00	1.91521	4.14800	Y	4,505,728	2.71712	2,951,444
2.60	1.81537	4.53249	N	4,923,379	0.00000	0
1.00	1.89335	1.89335	N	2,056,632	0.00000	0
1.00	1.87268	1.87268	N	2,034,187	0.00000	0
1.00	1.86971	1.86971	N	2,030,958	0.00000	0
1.00	1.94547	1.94547	N	2,113,252	0.00000	0
0.50	1.89442	0.99200	N	1,077,551	0.90242	980,251
0.20	1.63600	0.32720	N	355,418	2.54563	2,765,173
	22.84	22.84		24,812,255		

☑ <<== Check "Spray Factors Box" if any Factors OTHER than 1.00 used.

☐ <<== Check "Factors Reset Box" to reset all Factors back to 1.00

TABLE 7, MODERATELY WELL DRAINED SOILS
LOADING ANALYSES - HARDWOODS
BOOTH MOUNTAIN

MINIMUM INFILTRATION RATE = 0.05 IN/HR

COEFFICIENT OF LOADING 0.04 TO 0.1

A) E.P.A. FORMULA: BETWEEN 1.44 in/mo 3.6 in/mo

INFILTRATION RATE * 24 HR. * 30 DAYS * COEFFICIENT OF LOADING (0.1)

Vertical Drainage is less than 3.6 MONTHLY DRAINAGE (IN/MO)

RECOMMENDED LOADING LESS THAN 0.5 IN/WK

B) NITROGEN LOADING:

ESTIMATED NITROGEN CONCENTRATION= 15 PPM

DISCHARGE VOLUME= 66,000.0 GALLONS PER DAY

LOADING = 3,013.66 LBS NITROGEN PER YEAR

LAND REQUIREMENT: 40.18 ACRES 40 acres available

UPTAKE= 75 POUNDS PER ACRE PAN UNMANAGED HARDWOODS

C) PHOSPHOROUS LOADING:

ESTIMATED PHOSPHOROUS CONCENTRATION= 2 MG/L

DISCHARGE VOLUME= 66,000 GALLONS PER DAY

UPTAKE= 13.45 POUNDS PER ACRE *LESS THAN 27 POUNDS PER ACRE UPTAKE

**"Land Treatment Systems for Municipal and Industrial Wastes" Ronald W. Crites, Sherwood C. Reed & Rober C Bastian, McGraw-Hill, 2000

LOADING = 401.82 POUNDS OF PHOSPHOROUS PER YEAR

LAND REQUIREMENT= 29.88 ACRES 46 acres available

TABLE 7 (CONT.), MODERATELY WELL DRAINED SOILS

LOADING ANALYSIS - HARDWOODS

BOOTH MOUNTAIN

D) ORGANIC LOADING CALCULATIONS:

TOD=	COD+NOD		35 PPM	
COD=		25	PPM	
NOD=		10	PPM	AMMONIA AND ORGANIC N
BOD=		5	PPM	
CAPACITY=		66,000	GALLONS PER DAY	

TOD LOADING= 7,032 POUNDS PER YEAR

LAND REQUIREMENT= *3.85* ACRES 40 ACRES AVAILABLE

ASSUMING 5 POUNDS/ACRE/DAY HARDWOODS

E) HEAVY METAL LOADINGS:

AVG. CEC = 3.1 meq/100 g

E.P.A. FORMULA

TONS OF WASTE WATER= 134,333 TONS OF WASTE WATER/ACRE/20 YEARS

LOADING= 2,009,106.0 TONS OF WASTE WATER

LAND REQUIREMENTS= *15* ACRES 40 ACRES AVAILABLE

THE HEAVY METAL LOADING DOES NOT REFLECT TERTIARY TREATMENT

WELL CONSTRUCTION RECORD

North Carolina - Department of Environment and Natural Resources - Division of Water Quality - Groundwater Section

WELL CONTRACTOR (INDIVIDUAL) NAME (print) Tim Bowles CERTIFICATION # 3277

WELL CONTRACTOR COMPANY NAME Graham : Currie Well Drilling PHONE # (910 6732921

STATE WELL CONSTRUCTION PERMIT# _____ (if applicable) ASSOCIATED WQ PERMIT# _____ (if applicable)

1. WELL USE (Check Applicable Box): Residential ☐ Municipal/Public ☐ Industrial ☐ Agricultural ☐ Monitoring ☐ Recovery ☐ Heat Pump Water Injection ☐ Other ☒ If Other, List Use Temporary

2. WELL LOCATION:
Nearest Town: Fearrington County Chatham
SSR 1721 27228
(Street Name, Numbers, Community, Subdivision, Lot No., Zip Code)

Engineer:
3. ~~OWNER~~: Edwin Andrews : Associates
Address PO Box 30653
(Street or Route No.)
Raleigh NC 27622-0653
City or Town State Zip Code
(919)- 783 8395
Area code- Phone number

4. DATE DRILLED 7-6-04
5. TOTAL DEPTH: 26
6. DOES WELL REPLACE EXISTING WELL? YES ☐ NO ☒
7. STATIC WATER LEVEL Below Top of Casing: N/A FT. (Use "+" if Above Top of Casing)
8. TOP OF CASING IS +1.5 FT. Above Land Surface*
*Top of casing terminated at/or below land surface requires a variance in accordance with 15A NCAC 2C .0118.
9. YIELD (gpm): N/A METHOD OF TEST _____
10. WATER ZONES (depth): N/A

11. DISINFECTION: Type N/A Amount _____
12. CASING:

	Depth		Diameter	Wall Thickness or Weight/Ft.	Material
From	0	To 21 Ft.	2"	SDR-21	PVC
From		To Ft.			
From		To Ft.			

13. GROUT:

	Depth		Material	Method
From		To Ft.		
From		To Ft.		

14. SCREEN:

	Depth		Diameter	Slot Size	Material
From	21	To 26 Ft.	2 in.	.010 in.	PVC
From		To Ft.	in.	in.	

15. SAND/GRAVEL PACK:

	Depth		Size	Material
From	19	To 25 Ft.	#2	filter sand
From	0	To 19 Ft.	3/8"	Bentonite

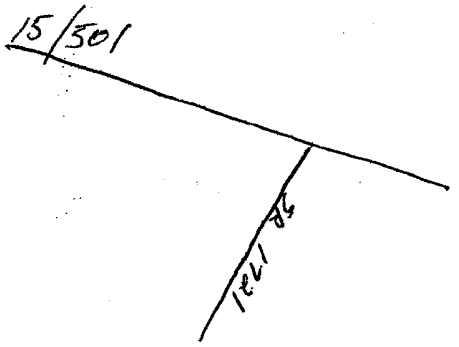
16. REMARKS: _____

Topographic/Land setting
☐Ridge ☐Slope ☐Valley ☐Flat
(check appropriate box)
Latitude/longitude of well location
_____
(degrees/minutes/seconds)
Latitude/longitude source: ☐GPS ☐Topographic map
(check box)

DRILLING LOG

DEPTH From	To	Formation Description
0 -	5	Clay
5 -	10	Clay
10 -	15	Clay
15 -	20	Clay / Blue Rock
20 -	24	Clay Blue Rock
24 -	26	Blue Rock

LOCATION SKETCH
Show direction and distance in miles from at least two State Roads or County Roads. Include the road numbers and common road names.



I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER

Jim Bowles 7-20-04
SIGNATURE OF PERSON CONSTRUCTING THE WELL DATE

Submit the original to the Division of Water Quality, Groundwater Section, 1636 Mail Service Center - Raleigh, NC 27699-1636 Phone No. (919) 733-3221, within 30 days.

GW-1 REV. 07/2001

WELL CONSTRUCTION RECORD

North Carolina - Department of Environment and Natural Resources - Division of Water Quality - Groundwater Section

WELL CONTRACTOR (INDIVIDUAL) NAME (print) Tim Bowles CERTIFICATION # 3277

WELL CONTRACTOR COMPANY NAME Graham : Currie Well Drilling PHONE # (910) 673 2921

STATE WELL CONSTRUCTION PERMIT# _____ (if applicable) ASSOCIATED WQ PERMIT# _____ (if applicable)

1. WELL USE (Check Applicable Box): Residential ☐ Municipal/Public ☐ Industrial ☐ Agricultural ☐ Monitoring ☐ Recovery ☐ Heat Pump Water Injection ☐ Other ☒ If Other, List Use Temporary

2. WELL LOCATION:
Nearest Town: Fearrington County Chatham
SSR 1721 27228
(Street Name, Numbers, Community, Subdivision, Lot No., Zip Code)

3. ~~OWNER:~~ Engineer: Edwin Andrews : Associates
Address PO Box 30653
(Street or Route No.)
Raleigh NC 27622-0653
City or Town State Zip Code
(919) 783 8395
Area code- Phone number

4. DATE DRILLED 7-6-04

5. TOTAL DEPTH: 35

6. DOES WELL REPLACE EXISTING WELL? YES ☐ NO ☒

7. STATIC WATER LEVEL Below Top of Casing: N/A FT.
(Use "+" if Above Top of Casing)

8. TOP OF CASING IS +1.5 FT. Above Land Surface*
*Top of casing terminated at/or below land surface requires a variance in accordance with 15A NCAC 2C .0118.

9. YIELD (gpm): N/A METHOD OF TEST _____

10. WATER ZONES (depth): N/A

11. DISINFECTION: Type N/A Amount _____

12. CASING:

	Depth		Diameter	Wall Thickness or Weight/Ft.	Material
From 0	To 30	Ft.	2	SDR-21	PVC
From _____	To _____	Ft.	_____	_____	_____
From _____	To _____	Ft.	_____	_____	_____

13. GROUT:

	Depth		Material	Method
From _____	To _____	Ft.	_____	_____
From _____	To _____	Ft.	_____	_____

14. SCREEN:

	Depth		Diameter		Slot Size		Material
From 30	To 35	Ft.	2	in.	.010	in.	PVC
From _____	To _____	Ft.	_____	in.	_____	in.	_____

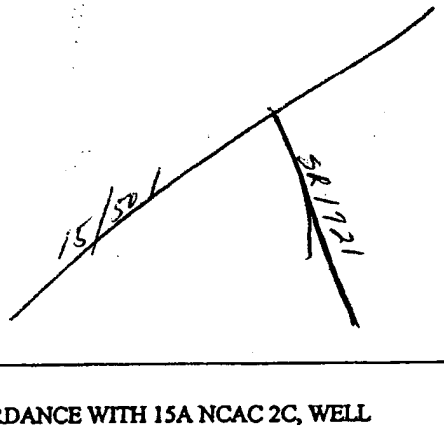
15. SAND/GRAVEL PACK:

	Depth		Size	Material
From 28	To 35	Ft.	#2	Filter sand
From 0	To 28	Ft.	3/8"	Bentonite

Topographic/Land setting
☐Ridge ☐Slope ☐Valley ☐Flat
(check appropriate box)
Latitude/longitude of well location
_____
(degrees/minutes/seconds)
Latitude/longitude source: ☐GPS ☐Topographic map
(check box)

DEPTH From	To	DRILLING LOG Formation Description
0	5	Clay
5	10	Sand / Marl
10	20	Weathered Rock
20	35	Weathered Rock
35	40	Weathered Rock

LOCATION SKETCH
Show direction and distance in miles from at least two State Roads or County Roads. Include the road numbers and common road names.



16. REMARKS: _____

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER

Tim Bowles 7-20-04
SIGNATURE OF PERSON CONSTRUCTING THE WELL DATE

Submit the original to the Division of Water Quality, Groundwater Section, 1636 Mail Service Center - Raleigh, NC 27699-1636 Phone No. (919) 733-3221, within 30 days.

GW-1 REV. 07/2001

WELL CONSTRUCTION RECORD

North Carolina - Department of Environment and Natural Resources - Division of Water Quality - Groundwater Section

WELL CONTRACTOR (INDIVIDUAL) NAME (print) Tim Bowles CERTIFICATION # 3277

WELL CONTRACTOR COMPANY NAME Graham ; Currie Well Drilling PHONE # (919) 673 2921

STATE WELL CONSTRUCTION PERMIT# (if applicable) _____ ASSOCIATED WQ PERMIT# (if applicable) _____

1. WELL USE (Check Applicable Box): Residential ☐ Municipal/Public ☐ Industrial ☐ Agricultural ☐
Monitoring ☐ Recovery ☐ Heat Pump Water Injection ☐ Other ☒ If Other, List Use Temporary

2. WELL LOCATION:
Nearest Town: Fearrington County Chatham
SSR 1721 27228
(Street Name, Numbers, Community, Subdivision, Lot No., Zip Code)

Engineer:
3. ~~OWNER:~~ Edwin Andrews ; Associates
Address PO Box 30653
(Street or Route No.)
Raleigh NC 27622-0653
City or Town State Zip Code
(919)- 783 8395
Area code- Phone number

4. DATE DRILLED 7-6-04
5. TOTAL DEPTH: 40
6. DOES WELL REPLACE EXISTING WELL? YES ☐ NO ☒
7. STATIC WATER LEVEL Below Top of Casing: NA FT. (Use "+" if Above Top of Casing)
8. TOP OF CASING IS +1.5 FT. Above Land Surface*
*Top of casing terminated at/or below land surface requires a variance in accordance with 15A NCAC 2C .0118.
9. YIELD (gpm): N/A METHOD OF TEST _____
10. WATER ZONES (depth): N/A
11. DISINFECTION: Type N/A Amount _____
12. CASING:

	Depth		Diameter	Wall Thickness or Weight/Ft.	Material
From 0	To 38	Ft. 2	SDR 21		PVC
From _____	To _____	Ft. _____	_____		_____
From _____	To _____	Ft. _____	_____		_____

13. GROUT:

	Depth		Material	Method
From _____	To _____	Ft. _____		_____
From _____	To _____	Ft. _____		_____

14. SCREEN:

	Depth		Diameter	Slot Size	Material
From 38	To 40	Ft. 2	in. .10	in.	PVC
From _____	To _____	Ft. _____	in. _____	in.	_____

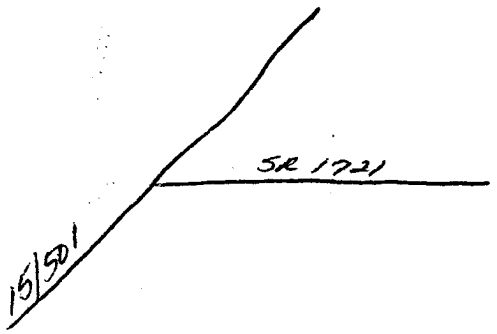
15. SAND/GRAVEL PACK:

	Depth		Size	Material
From 33	To 40	Ft. #2		Filter Sand
From 0	To 33	Ft. 5/8"		Bentonite

Topographic/Land setting
☐Ridge ☐Slope ☐Valley ☐Flat
(check appropriate box)
Latitude/longitude of well location
_____
(degrees/minutes/seconds)
Latitude/longitude source: ☐GPS ☐Topographic map
(check box)

DEPTH From	To	DRILLING LOG Formation Description
0 -	5	clay
5 -	12	Sand / wet
12 -	20	Sand / wet
20 -	25	weather Rock
25 -	35	weather Rock
35 -	40	weather Rock

LOCATION SKETCH
Show direction and distance in miles from at least two State Roads or County Roads. Include the road numbers and common road names.



16. REMARKS: _____

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Jim Bowles 7-20-04
SIGNATURE OF PERSON CONSTRUCTING THE WELL DATE

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GW-1 REV. 07/2001

7 W

WELL CONSTRUCTION RECORD

North Carolina - Department of Environment and Natural Resources - Division of Water Quality - Groundwater Section

WELL CONTRACTOR (INDIVIDUAL) NAME (print) Tim Bowles CERTIFICATION # 3277

WELL CONTRACTOR COMPANY NAME Graham ; Currie Well Drilling PHONE # (910) 673 2921

STATE WELL CONSTRUCTION PERMIT# (if applicable) _____ ASSOCIATED WQ PERMIT# (if applicable) _____

1. WELL USE (Check Applicable Box): Residential ☐ Municipal/Public ☐ Industrial ☐ Agricultural ☐
Monitoring ☐ Recovery ☐ Heat Pump Water Injection ☐ Other ☒ If Other, List Use Temporary

2. WELL LOCATION:
Nearest Town: Fearrington County Chatham
SSR 1721 27228
(Street Name, Numbers, Community, Subdivision, Lot No., Zip Code)

3. ~~OWNER~~ Engineer: Edwin Andrews ; Associates
Address PO Box 30653
(Street or Route No.)
Raleigh NC 27622-0653
City or Town State Zip Code
(919) 783 8395
Area code- Phone number

4. DATE DRILLED 7-6-04
5. TOTAL DEPTH: 80
6. DOES WELL REPLACE EXISTING WELL? YES ☐ NO ☒
7. STATIC WATER LEVEL Below Top of Casing: N/A FT.
(Use "+" if Above Top of Casing)
8. TOP OF CASING IS +1.5 FT. Above Land Surface*
*Top of casing terminated at/or below land surface requires a variance in accordance with 15A NCAC 2C .0118.
9. YIELD (gpm): N/A METHOD OF TEST _____
10. WATER ZONES (depth): N/A

11. DISINFECTION: Type N/A Amount _____
12. CASING:

	Depth		Diameter	Wall Thickness or Weight/Ft.	Material
From 0	To 75	Ft.	2	SDR 21	PVC
From _____	To _____	Ft.	_____	_____	_____
From _____	To _____	Ft.	_____	_____	_____

13. GROUT:

	Depth		Material	Method
From _____	To _____	Ft.	_____	_____
From _____	To _____	Ft.	_____	_____

14. SCREEN:

	Depth		Diameter	Slot Size	Material
From 75	To 80	Ft.	2 in.	.010 in.	PVC
From _____	To _____	Ft.	_____ in.	_____ in.	_____

15. SAND/GRAVEL PACK:

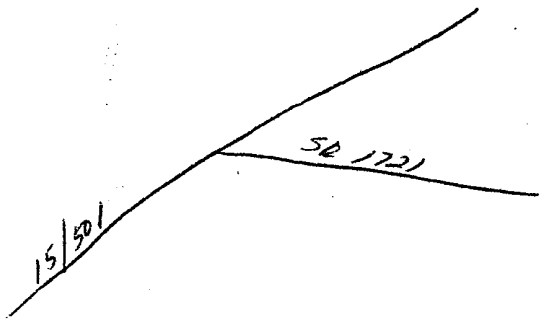
	Depth		Size	Material
From 70	To 80	Ft.	10-30	Silica Sand
From 0	To 70	Ft.	3/8"	Bentonite

16. REMARKS: _____

Topographic/Land setting
☐Ridge ☐Slope ☐Valley ☐Flat
(check appropriate box)
Latitude/longitude of well location
_____
(degrees/minutes/seconds)
Latitude/longitude source: ☐GPS ☐Topographic map
(check box)

DEPTH From	To	DRILLING LOG Formation Description
0 -	10	clay
10 -	20	clay
20 -	30	clay
30 -	40	clay
40 -	50	clay
50 -	60	weathered Blue Rock
60 -	80	Blue Rock

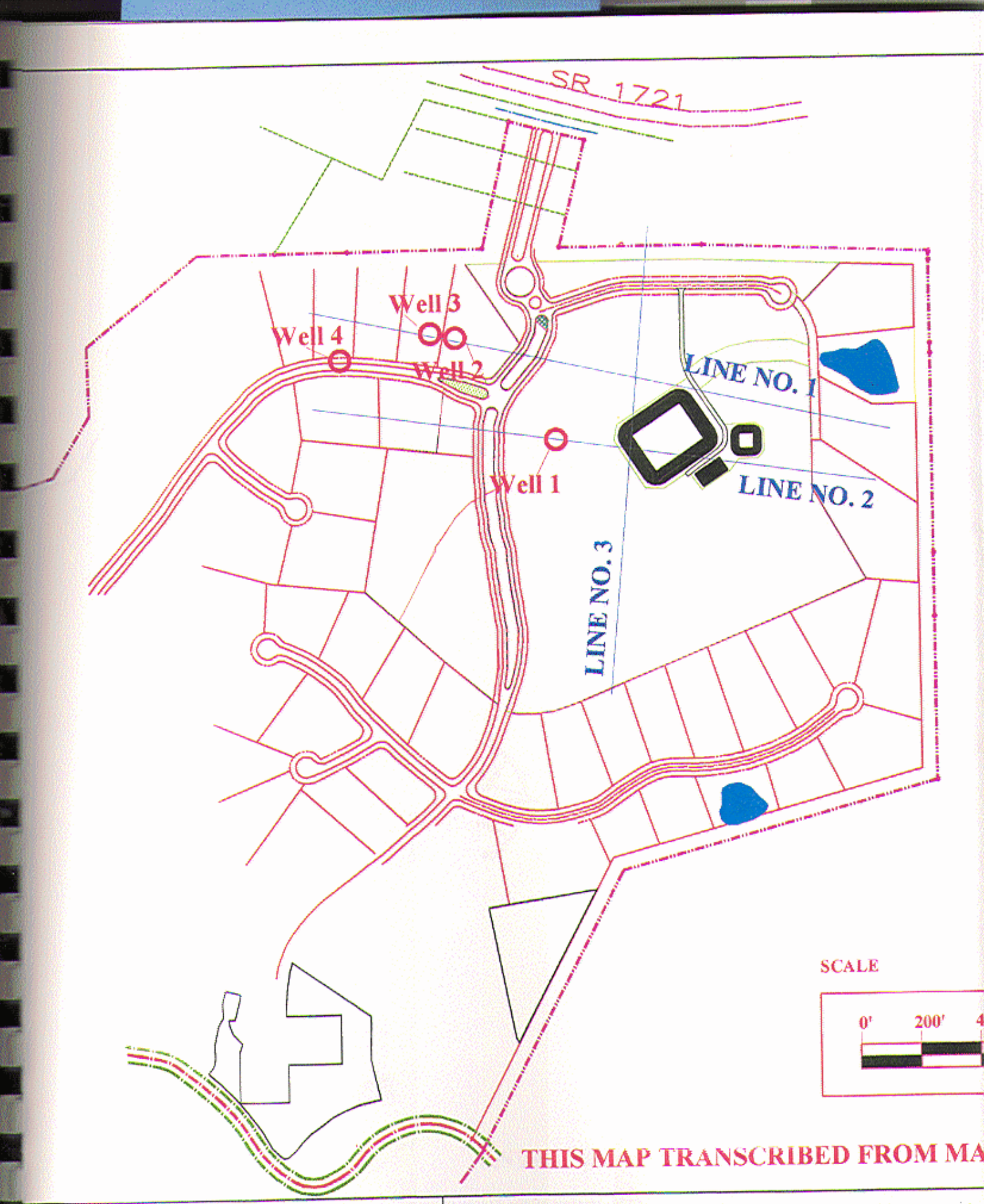
LOCATION SKETCH
Show direction and distance in miles from at least two State Roads or County Roads. Include the road numbers and common road names.



I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER

Tim Bowles 7-20-04
SIGNATURE OF PERSON CONSTRUCTING THE WELL DATE

Submit the original to the Division of Water Quality, Groundwater Section, 1636 Mail Service Center - Raleigh, NC 27699-1636 Phone No. (919) 733-3221, within 30 days. GW-1 REV. 07/2001



THIS MAP TRANSCRIBED FROM MA

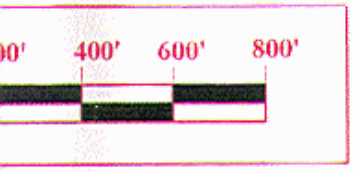
BOOTH MOUNTAIN
SITE MAP

EDWIN ANDREWS & A
CONSULTING HYDROGEOLOGI

LEGEND

SAPROLITE TEST WELL

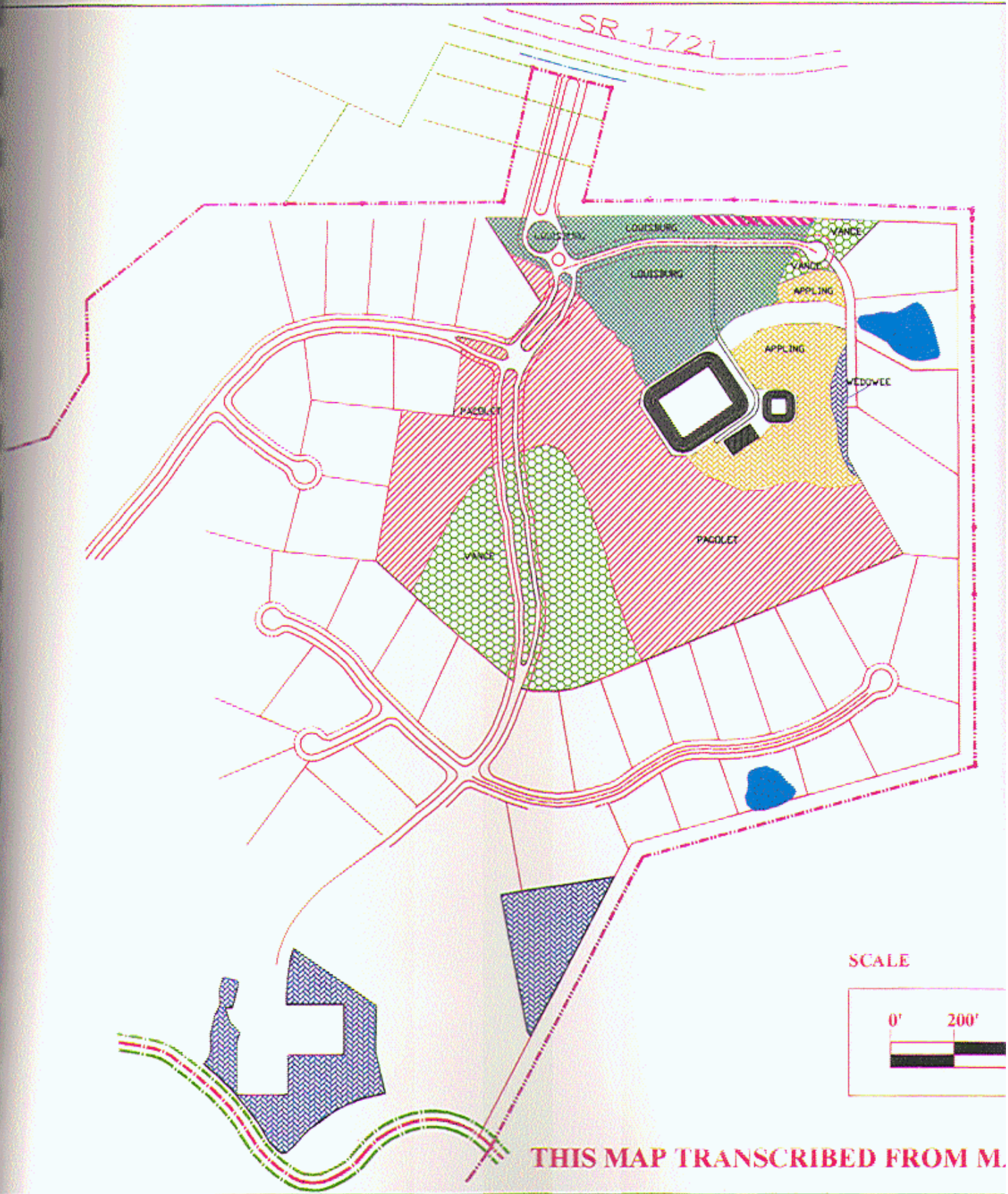
ATS INTERNATIONAL INC.
GEOPHYSICAL SURVEY LINE



I MAP PREPARED BY SOIL AND ENVIRONMENTAL CONSULTANTS, INC.

& ASSOCIATES, P.C.
OGISTS AND SOIL SCIENTISTS

FIGURE NO. 1
SCALE: 1 = 400
EAA PROJECT NO. RW174



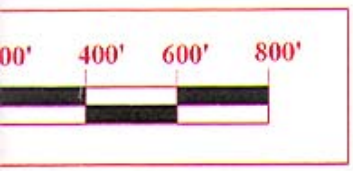
THIS MAP TRANSCRIBED FROM M

BOOTH MOUNTAIN
SOIL MAP

EDWIN ANDREWS &
CONSULTING HYDROGEOLOG

LEGEND

- APPLING WELL DRAINED MODERATELY PERMEABLE SOIL
- LOUISBURG WELL DRAINED RAPIDLY PERMEABLE SOIL
- RION WELL DRAINED, MODERATELY PERMEABLE SOIL
- PACOLET WELL DRAINED, MODERATELY PERMEABLE SOIL
- VANCE WELL DRAINED SLOWLY PERMEABLE SOIL
- WEDOWEE WELL DRAINED MODERATELY PERMEABLE SOIL



M MAP PREPARED BY SOIL AND ENVIRONMENTAL CONSULTANTS, INC.

& ASSOCIATES, P.C.
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FIGURE NO. 2
SCALE: 1 = 400
EAA PROJECT NO. RW174