CERTIFICATE OF AUTHENTICITY

THIS IS TO CERTIFY THAT THE FOLLOWING ELECTRONIC RECORDS ARE TRUE AND ACCURATE REPRODUCTIONS OF THE ORIGINAL RECORDS OF JAMES CITY COUNTY GENERAL SERVICES DEPARTMENT- STORMWATER DIVISION; WERE SCANNED IN THE REGULAR COURSE OF BUSINESS PURSUANT TO GUIDELINES ESTABLISHED BY THE LIBRARY OF VIRGINIA AND ARCHIVES; AND HAVE BEEN VERIFIED IN THE CUSTODY OF THE INDIVIDUAL LISTED BELOW.

BMP NUMBER: **99121**

DATE VERIFIED: **June 22, 2012**

QUALITY ASSURANCE TECHNICIAN: **Leah Hardenbergh**

Leah Hardenbergh

LOCATION: WILLIAMSBURG, VIRGINIA

Stormwater Division

MEMORANDUM

DATE: March 11, 2010

TO: Michael J. Gillis, Virginia Correctional Enterprises Document Management Services

FROM: Jo Anna Ripley, Stormwater

PO: 270712

RE: Files Approved for Scanning

General File ID or BMP ID: 99121

PIN:

Subdivision, Tract, Business or Owner Name (if known): Governors Land

Property Description: General Files

Site Address:

(For internal use only) **Box** 14 **Drawer:** 7

Agreements: (in file as of scan date) **N** **Book or Doc#:** **Page:**

Comments

Contents for Stormwater Management Facilities As-built Files

Each File is to contain:

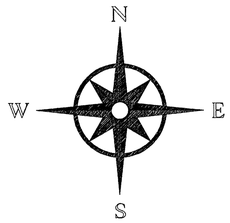
- ☐ 1. Maintenance Agreement
- ☐ 2. Construction certification
- ☐ 3. As-Built plan
- ☐ 4. Design Calculations
- ☐ 6. Correspondence
- ☐ 7. Inspection records
- ☐ 8. Miscellaneous

REVISIONS:	GOVERNORS LAND GOLF COURSE
DESIGNED BY: Fazio	
DRAWN BY: Jack D.	wadsworth GOLF CONSTRUCTION COMPANY — MIDWEST: 815-436-8400, 1901 Van Live Road • Plainfield, Illinois 60544; SOUTHEAST: 813-855-4685, 200 Forest Lakes Blvd • Oldsmar, Florida 33557; SOUTHWEST: 602-386-5757, 7004 N. 16th Avenue • Buckeye, Arizona 85326
INSTALLED BY: Jack D.	
SCALE: 1=100	Drainage Drawing of Record
DATE: 8-29-91	02 15 P.P. 14, 17 — SHEET: #1

Mce Mce Dec

15

99121_GOVERNORS_LAND_GENERAL_FILE - 003



WILLIAMSBURG VIRGINIA

GRAPHIC SCALE
600' 0' 600'
SCALE: 1" = 600'

BMP #11 (JR036)
TIMBER STRUCTURE
RECORD DRAWING PREPARED: 11/01

BMP #7 (JR034)
RIVER OAKS NORTH BMP
RECORD DRAWING PREPARED: 3/02

BMP #4 (JR040)
WYTHE HAMLET DRY POND
RECORD DRAWING PREPARED: 4/02

BMP #12 (JR018)
FOWLER'S LAKE
RECORD DRAWING PREPARED 3/02

BMP #5 (JR054)
TIMBER STRUCTURE
RECORD DRAWING PREPARED: 3/02

BMP #13 (JR022)
HORNE'S LAKE
RECORD DRAWING PREPARED: 4/02

BMP #27 (JR055)
TEE DISSAPATOR
NO RECORD DRAWING NEEDED

BMP #22 (JR027)
TIMBER STRUCTURE #4
RECORD DRAWING PREPARED: 4/02

BMP #16 (JR019)
WHITTAKER LAKE
RECORD DRAWING PREPARED: 3/02

BMP #8 (JR031)
TIMBER STRUCTURE
RECORD DRAWING PREPARED: 3/02

BMP #18 (JR017)
WINGFIELD LAKE
RECORD DRAWING PREPARED: 3/02

BMP #1 (JR021)
BENNETT'S POND
RECORD DRAWING PREPARED: 2/02

BMP #15 (JR035)
TIMBER STRUCTURE (GOLF CLUB)
RECORD DRAWING PREPARED: 3/02

BMP #6 (JR042)
BARRETT'S POINTE POND
RECORD DRAWING PREPARED: 3/02

BMP #24 (JR033)
MARSH AUGMENTED BMP
RECORD DRAWING PREPARED: 3/02

BMP #25 (JR032)
MARSH AUGMENTED BMP
RECORD DRAWING PREPARED: 3/02

BMP #10 (JR030)
TIMBER STRUCTURE
RECORD DRAWING PREPARED: 2/02

BMP #9 (JR041)
EXTENDED DETENTION
RECORD DRAWING PREPARED: 12/01

BMP #23 (JR029)
TIMBER STRUCTURE
RECORD DRAWING PREPARED: 4/02

BMP #20 (JR045)
TIMBER STRUCTURE #2 ✓
RECORD DRAWING PREPARED: 4/02

BMP #2 (JR025)
DRY DETENTION #2
RECORD DRAWING PREPARED: 10/01

BMP #19 (JR026)
TIMBER STRUCTURE #1 ✓
RECORD DRAWING PREPARED: 4/02

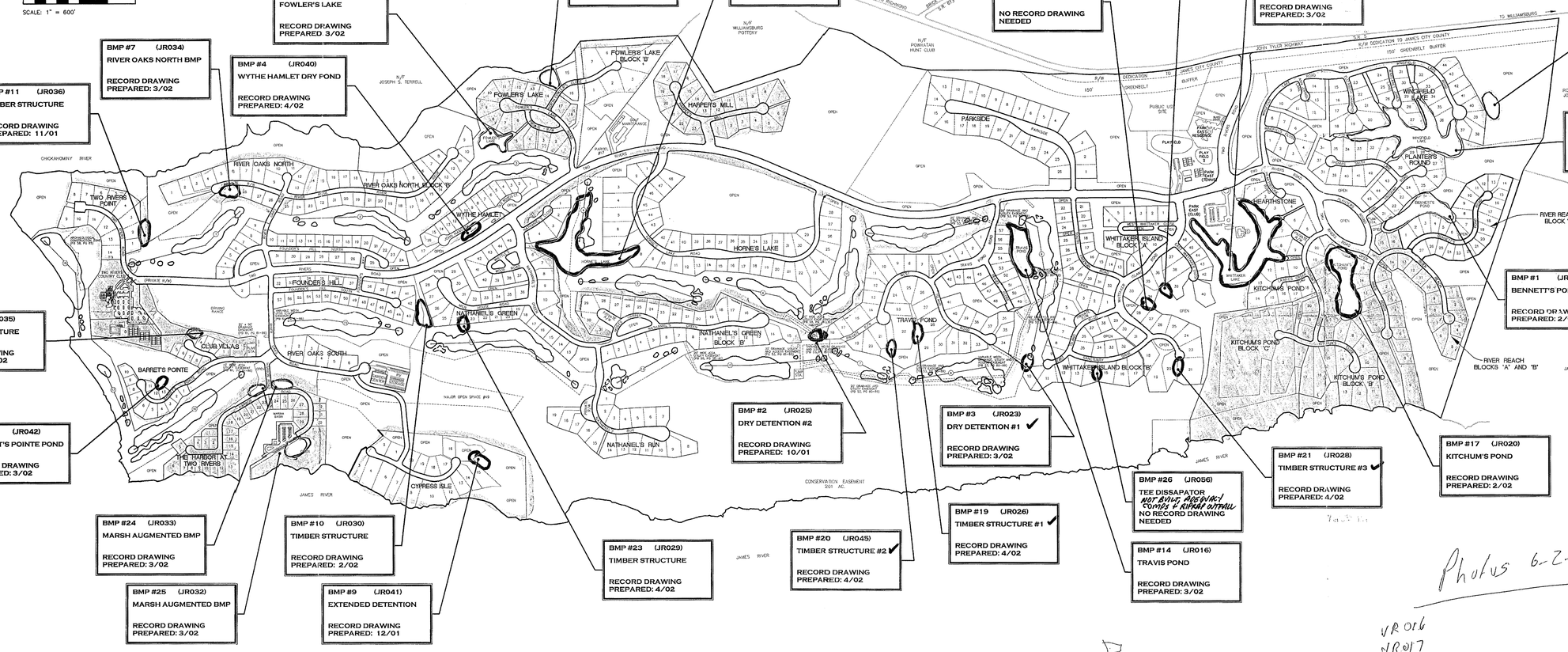
BMP #3 (JR023)
DRY DETENTION #1 ✓
RECORD DRAWING PREPARED: 3/02

BMP #26 (JR056)
TEE DISSAPATOR
NOT RIVER PRESERVE COMPS & RIPRAP OUTFALL
NO RECORD DRAWING NEEDED

BMP #14 (JR016)
TRAVIS POND
RECORD DRAWING PREPARED: 3/02

BMP #21 (JR028)
TIMBER STRUCTURE #3 ✓
RECORD DRAWING PREPARED: 4/02

BMP #17 (JR020)
KITCHUM'S POND
RECORD DRAWING PREPARED: 2/02



OVERALL PLAN OF BMP AS-BUILTS
SEPTEMBER 2002

THE GOVERNOR'S LAND
At Two Rivers

POWHATAN DISTRICT, JAMES CITY COUNTY, VIRGINIA

JR017 JR023
~~JR019~~ JR026
JR027 JR045
JR033 JR025
JR028
JR056

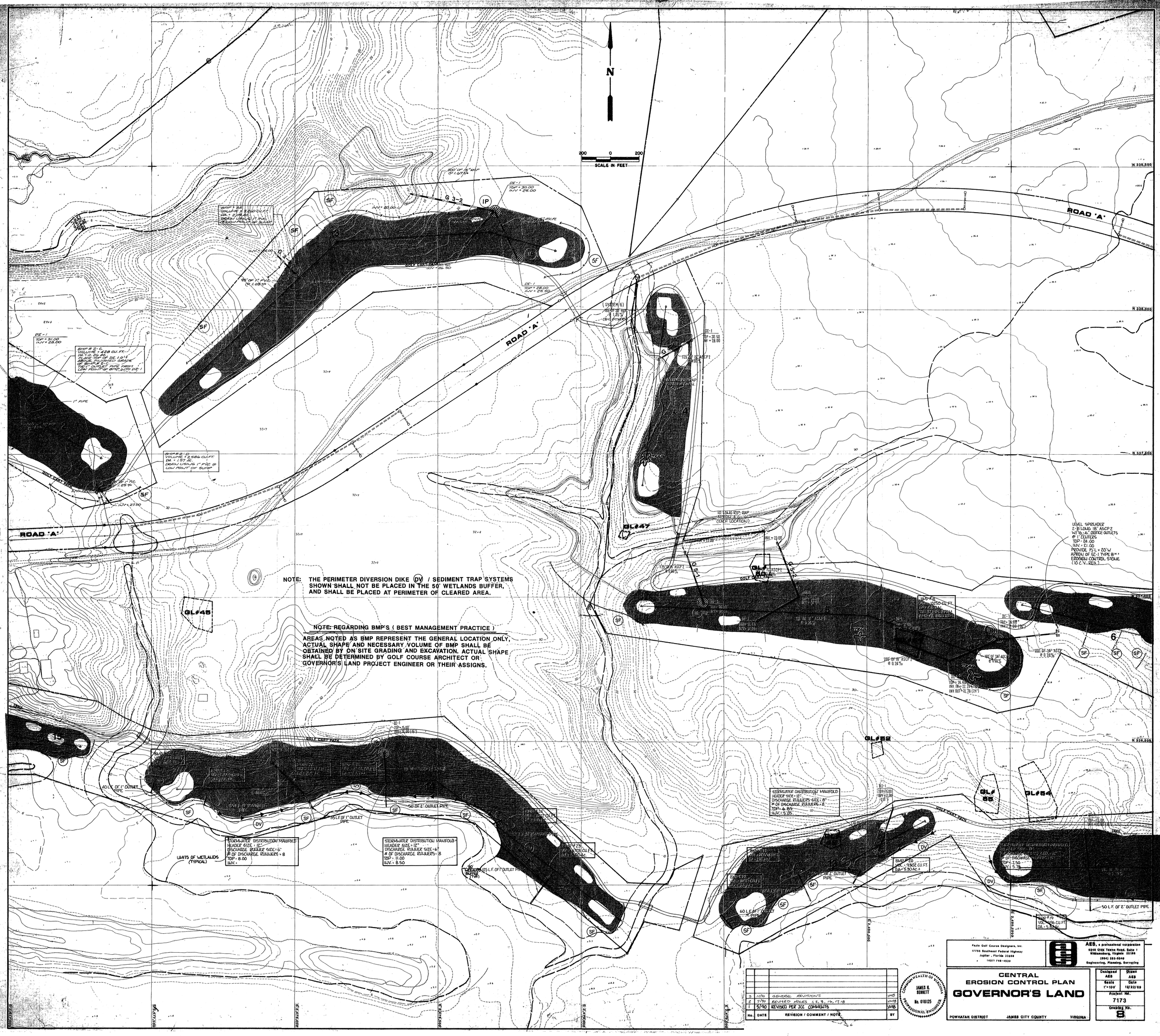
Photos 6-2-03

JR016
JR017
JR031
JR021
JR020
JR019
JR028 TCW (*) NEED RR @ OP
JR027 TCW (*) NEED RR @ FB
JR023 No photo, same as 1/02
JR026 TCW
JR045
JR054
JR018
JR024 (*) NATHANIEL'S RISER
JR022 HARPER
JR040

JR030 * Fenwick Hills Vert Pipe.
JR035
JR042
JR033
JR032
JR041
JR034

AWT 04.25.02-08:10 Overall-BMP.dwg

99121_GOVERNORS_LAND_GENERAL_FILE - 004



N
200 0 200
SCALE IN FEET
ROAD 'A'
ROAD 'A'
ROAD 'A'
GL#47
GL#45
GL#52
GL# 55
GL#54
GOLF CART PATH
SF
DV
IP
G 3-2
G 5-1
G 5-2
DI-1
TOP = 30.00
INV = 25.00
DI-1
TOP = 28.00
INV = 25.50
DI-1
TOP = 31.00
INV = 28.00
DI-1
TOP = 30.50
INV = 28.00
BMP = 3A
VOLUME = 3,260 CU.FT.
DA. = 2.09 AC.
DRAIN USING 1" PVC @ LOW POINT OF SUMP
95' OF 1" PVC @ 1.05%
BMP # 2-C
VOLUME = 428 CU. FT.
DA. = 0.26 AC.
PLACE TOP OF DI. 1.0'± ABOVE FINISHED GRADE OF BMP # 2-C
TIE 1" OUTLET PIPE FROM LOW POINT OF BMP INTO DI-1
BMP # 2-D
VOLUME = 2,586 CU.FT.
DA. = 1.57 AC.
DRAIN USING 1" PVC @ LOW POINT OF SUMP
1" PIPE
(SYSTEM 6)
185' OF 30" RCP @ 1.35% (BY OTHERS)
125' OF 15" ASCP 2 @ 4.00%
10 LONG RIP-RAP APRON 4 CU. Yd. (TYP.)
LEVEL SPREADER
2-8' LONG 18" ASCP 2
W/ 16-6" ORIFICE OUTLETS
@ 1' CENTERS
TOP = 24.00
INV. = 21.00
PROVIDE 15'L × 20'W
APRON OF EC-1 TYPE B
EROSION CONTROL STONE
(10 C.Y. REQ.)
BMP # 8
VOL. = 10250 CU. FT.
DI-1
TOP = 24.00
INV = 21.00 (24")
DI-1
TOP = 24.40
INV. IN = 22.28 (18")
INV. OUT = 21.78 (24")
200' OF 18" ASCP 2 @ 0.24%
180' OF 24" ASCP 2 @ 0.20%
200' OF 24" ASCP @ 0.20%
STORMWATER DISTRIBUTION MANIFOLD
HEADER SIZE = 12"
DISCHARGE RUNNER SIZE = 6"
# OF DISCHARGE RUNNERS = 8
TOP = 8.00
INV. =
LIMITS OF WETLANDS (TYPICAL)
STORMWATER DISTRIBUTION MANIFOLD
HEADER SIZE = 12"
DISCHARGE RUNNER SIZE = 6"
# OF DISCHARGE RUNNERS = 8
TOP = 11.00
INV. = 8.50
35 L.F. OF 1" OUTLET PIPE
50' OF 2" OUTLET PIPE
40 L.F. OF 1" OUTLET PIPE
50' WETLANDS BUFFER (TYP.)
125 L.F. OF 1" OUTLET PIPE
BMP # 24
STORMWATER DISTRIBUTION MANIFOLD
HEADER SIZE = 12"
DISCHARGE RUNNERS SIZE = 8"
# OF DISCHARGE RUNNERS = 8
TOP = 6.85
INV. = 5.05
DI-1
TOP = 15.00
INV = 12.00 (15")
DI-1
TOP = 13.00
SWALE
BMP # 20
VOL. = 9302 CU.FT.
DA. = 5.30 AC. ±
BMP # 19
VOL. = 4196 CU.FT.
DA. = 5.87 AC.
BMP # 21
BMP # 22
60 L.F. OF 1" OUTLET PIPE
100 L.F. OF 1" OUTLET PIPE
60 L.F. OF 2" OUTLET PIPE
50 L.F. OF 2" OUTLET PIPE
TOP = 7.50
INV. = 5.75
1
2
4
6
13
14
18
N 336,000
N 336,500
N 337,000
N 338,000
N 338,500
E 2,477,000
E 2,477,500
E 2,478,000
E 2,478,500
E 2,479,000
E 2,479,500
E 2,480,000
E 2,480,500

NOTE: THE PERIMETER DIVERSION DIKE (DV) / SEDIMENT TRAP SYSTEMS SHOWN SHALL NOT BE PLACED IN THE 50' WETLANDS BUFFER, AND SHALL BE PLACED AT PERIMETER OF CLEARED AREA.

NOTE: REGARDING BMP'S (BEST MANAGEMENT PRACTICE)

AREAS NOTED AS BMP REPRESENT THE GENERAL LOCATION ONLY, ACTUAL SHAPE AND NECESSARY VOLUME OF BMP SHALL BE OBTAINED BY ON SITE GRADING AND EXCAVATION. ACTUAL SHAPE SHALL BE DETERMINED BY GOLF COURSE ARCHITECT OR GOVERNOR'S LAND PROJECT ENGINEER OR THEIR ASSIGNS.

No.	DATE	REVISION / COMMENT / NOTE	BY
3	11/90	GENERAL REVISIONS	VMB
2	7/90	REVISED HOLES 1, 2, 3, 16, 17, 18	VMB
1	5/90	REVISED PER JCC COMMENTS	VMB

JAMES H. BENNETT
No. 018125

Fazio Golf Course Designers, Inc.
17755 Southeast Federal Highway
Jupiter, Florida 33458
(407) 746-4539

AES, a professional corporation
5248 Olde Towne Road, Suite 1
Williamsburg, Virginia 23188
(804) 253-0040
Engineering, Planning, Surveying

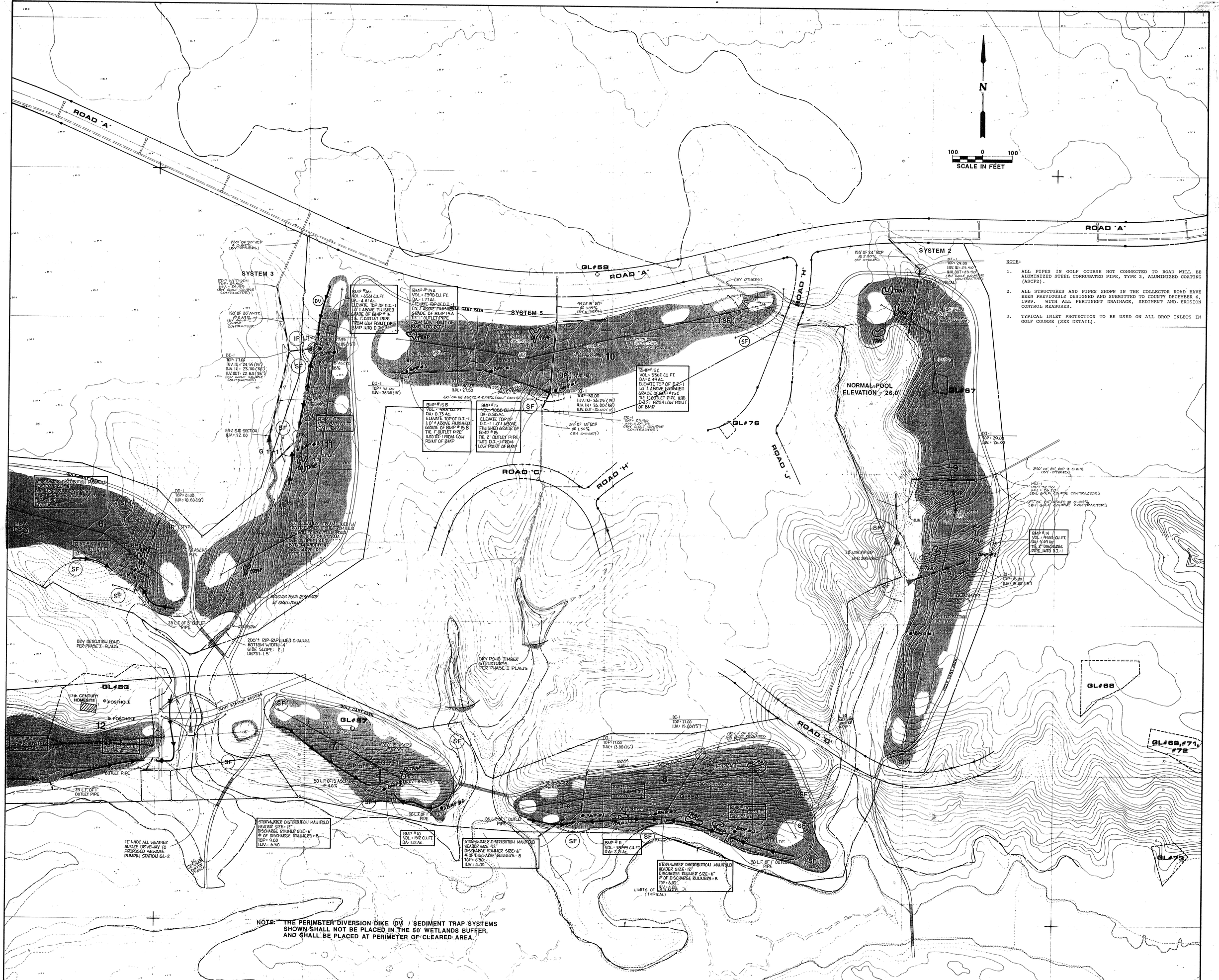
CENTRAL
EROSION CONTROL PLAN
GOVERNOR'S LAND

POWHATAN DISTRICT JAMES CITY COUNTY VIRGINIA

Designed AES	Drawn AES
Scale 1"=100'	Date 12/22/89

Project No.
7173

Drawing No.
8



No.	DATE	REVISION / COMMENT / NOTE	BY
5	11/90	GENERAL REVISIONS	VMB
4	7/90	REVISED HOLES 1, 2, 9, 16, 17, 18	VMB
3	6/90	GENERAL REVISIONS	VMB
2	6/90	REVISED PER CODES COMPLIANCE	VMB
1	5/90	REVISED PER JCC COMMENTS	VMB

COMMONWEALTH OF VIRGINIA
JAMES H. BENNETT
No. 018125
PROFESSIONAL ENGINEER

Fazio Golf Course Designers, Inc
17755 Southeast Federal Highway
Jupiter, Florida 33468
(407) 746-4539

AES, a professional corporation
3948 Olde Towne Road, Suite 1
Williamsburg, Virginia 23188
(804) 253-0040
Engineering, Planning, Surveying

EASTERN EROSION CONTROL PLAN
GOVERNOR'S LAND

POWHATAN DISTRICT JAMES CITY COUNTY VIRGINIA

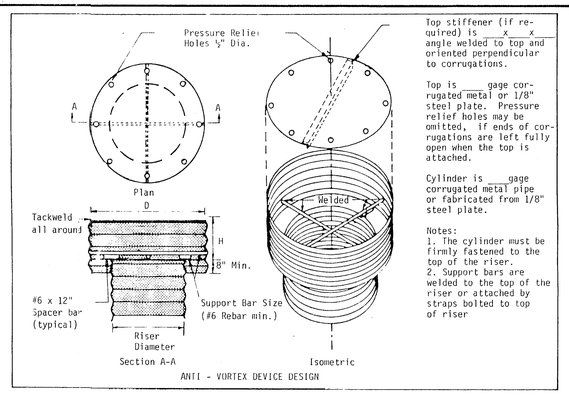
Designed	Drawn
AES	CMA
Scale	Date
1"=100'	12/22/89
Project No.	
7173	
Drawing No.	
9	

99121_GOVERNORS_LAND_GENERAL_FILE - 006

EROSION AND SEDIMENT CONTROL NOTES

The purpose of the erosion control measures shown on these plans shall be to preclude the transport of all waterborne sediments resulting from construction activities from entering onto adjacent properties or State waters. If field inspection reveals the inadequacy of the plan to confine sediment to the project site, appropriate modifications will be made to correct any plan deficiencies.

1. All erosion and sediment control measures shall be installed and maintained in accordance with the "Virginia Erosion and Sediment Control Handbook". The contractor shall be thoroughly familiar with all applicable measures contained therein which may be pertinent to this project.
2. All points of construction ingress and egress shall be protected by a temporary construction entrance to prevent tracking of mud onto public right-of-ways. An entrance permit from VDOT is required prior to any construction activities within State right-of-ways.
3. Sediment basins and traps, perimeter dikes, sediment barriers and other measures intended to trap sediment on-site must be constructed as a first step in grading and be made functional before upslope land disturbance takes place. Earthen structures such as dams, dikes, and diversions must be seeded and mulched with 15 days of installation. An on-site pre-construction meeting will be held between the Department of Public Works and the Contractor to identify those measures to be initially installed.
4. Maintenance of all erosion and sediment control measures shall be accomplished in accordance with the "Virginia Erosion and Sediment Control Handbook". Maintenance will include the repair of measures damaged by any subcontractor including those of the public utility companies. At the pre-construction meeting, the contractor will supply Public Works with the name of the individual who will be responsible for ensuring maintenance of installed measures on a daily basis.
5. Surface flows over cut and fill slopes shall be controlled by either redirecting flows from transversing the slopes or by installing mechanical devices to safely lower water downslope without causing erosion. A temporary fill diversion (Std. & Spec. 1.16) shall be installed prior to the end of each working day.
6. Sediment control measures may require minor field adjustments at time of construction to insure their intended purpose is accomplished. Department of Public Works approval will be required for other deviations from the approved plans.
7. The contractor shall strip and pile topsoil at the locations shown on this plan or as directed by the engineer. Silt fence shall be placed at the toe of the stockpile after stripping of topsoil is complete.
8. The contractor shall complete drainage facilities within 30 days following completion of rough grading at any point within the project. The installation of drainage facilities shall take precedence over all underground utilities. Outfall ditches from drainage structures shall be stabilized immediately after construction of same. This includes installation of erosion control stone where required. Any drainage outfalls required for a street must be completed before street grading begins.
9. Permanent or temporary soil stabilization must be applied to all denuded areas within 15 days after final grade is reached on any portion of the site. Soil stabilization must also be applied to denuded areas which may not be at final grade but will remain dormant (undisturbed) for longer than 30 days. Soil stabilization measures include vegetative establishment, mulching and the early application of gravel base material on areas to be paved.
10. No more than 300' of sanitary sewer, storm sewer, or waterlines are to be open at one time. Following installation of any portion of these items, all disturbed areas are to be immediately stabilized (i.e., the same day).
11. If disturbed area stabilization is to be accomplished during the months of December, January, or February, stabilization shall consist of mulching in accordance with Specification 1.75. Seeding will then take place as soon as the season permits.
12. The term Seeding, Final Vegetative Cover or Stabilization, on this site plan shall mean the successful germination and establishment of a stable grass cover from a properly prepared seedbed containing the specified amounts of seed, lime, and fertilizer in accordance with Specification 1.66, Permanent Seeding. Irrigation shall be required as necessary to ensure establishment of grass cover.
13. All slopes steeper than 3:1 shall require the use of erosion control blankets such as excelsior blankets to aid in the establishment of a vegetative cover. Installation shall be in accordance with Specification 1.75, Mulching and Manufacturer's Instructions.
14. Inlet protection in accordance with Specification 1.08 shall be provided for all storm drain inlets as soon as practical following construction of same.
15. Temporary liners, such as polyethylene sheets, shall be provided for all paved ditches until the permanent concrete liner is installed.
16. Paved ditches shall be required wherever erosion is evident. Particular attention shall be paid to those areas where grades exceed 3%.
17. Temporary erosion control measures are not to be removed until all disturbed areas are stabilized. After stabilization is complete, all measures shall be removed within 30 days. Trapped sediment shall be spread and seeded.
18. Off-site waste or borrow areas shall be approved by James City County prior to the import of any borrow or export of any waste to or from the project site.
19. All paved and/or piped outfalls will be constructed before road grading and utility installation begins.



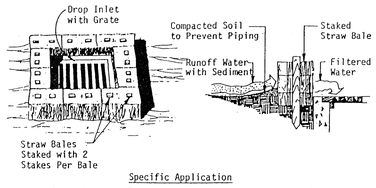
Top stiffener (if required) is ___x___x___ angle welded to top and oriented perpendicular to corrugations.

Top is ____ gage corrugated metal or 1/8" steel plate. Pressure relief holes may be omitted, if ends of corrugations are left fully open when the top is attached.

Cylinder is ____ gage corrugated metal pipe or fabricated from 1/8" steel plate.

Notes:
1. The cylinder must be firmly fastened to the top of the riser.
2. Support bars are welded to the top of the riser or attached by straps bolted to top of riser

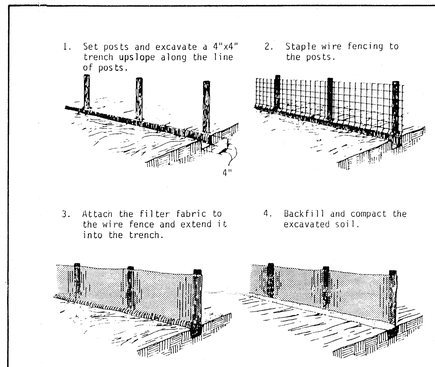
ANTI - VORTEX DEVICE DESIGN



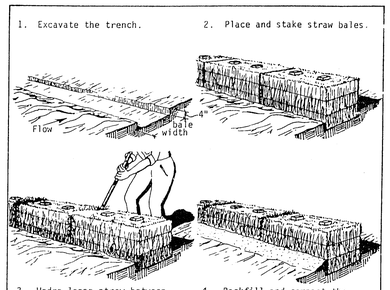
Specific Application

This method of inlet protection is applicable where the inlet drains a relatively flat area (slopes no greater than 5 percent) where sheet or overland flows (not exceeding 0.5 cfs) are typical. The method shall not apply to inlets receiving concentrated flows, such as in street or highway medians.

IP STRAW BALE DROP INLET SEDIMENT FILTER



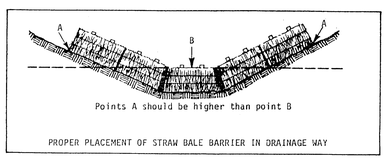
SF CONSTRUCTION OF A SILT FENCE



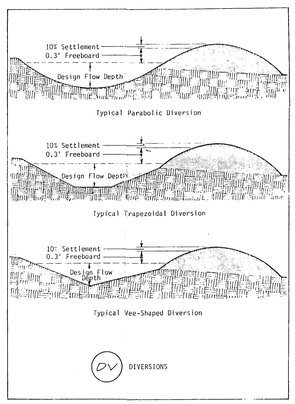
CONSTRUCTION OF A STRAW BALE BARRIER

Source: Adapted from Installation of Straw and Fabric Filter Barriers for Sediment Control, Sherwood and Wyant

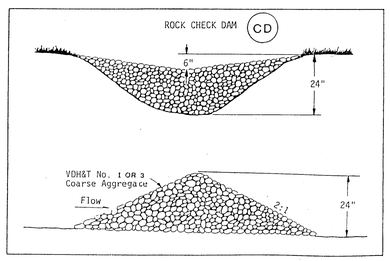
Plate 1.05c

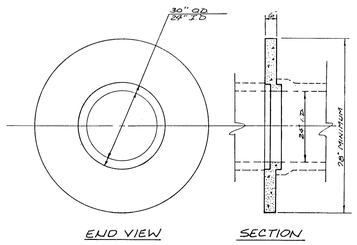


PROPER PLACEMENT OF STRAW BALE BARRIER IN DRAINAGE WAY

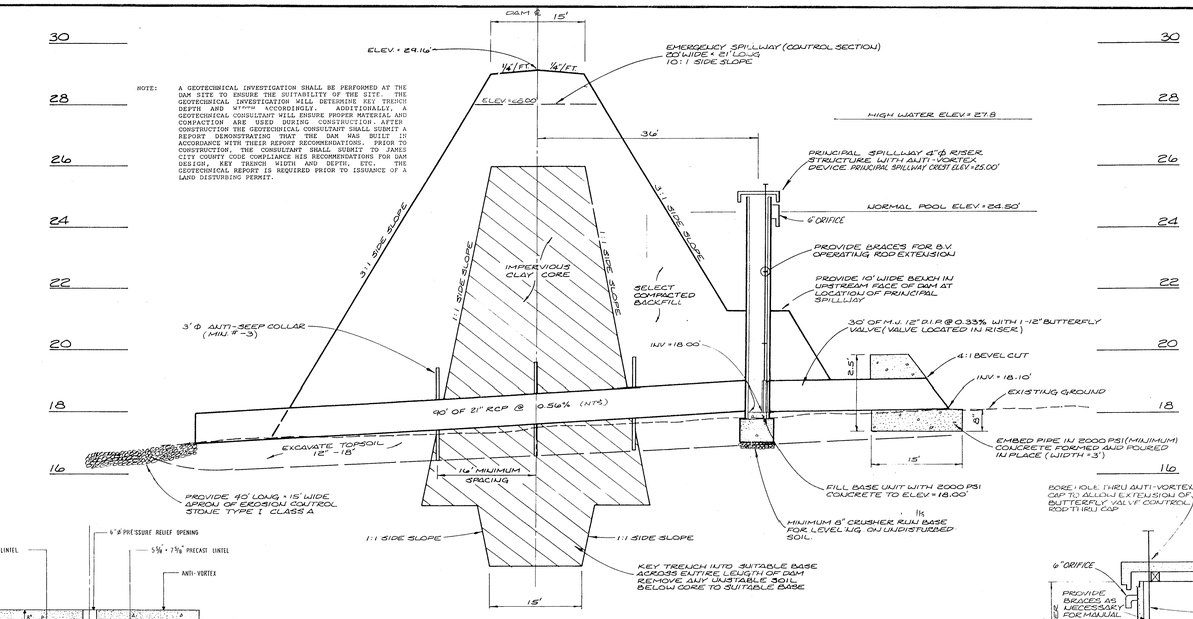


DV DIVERSIONS



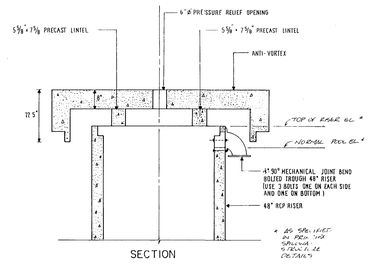


ANTI-SEEP COLLAR DETAIL
N.T.S.

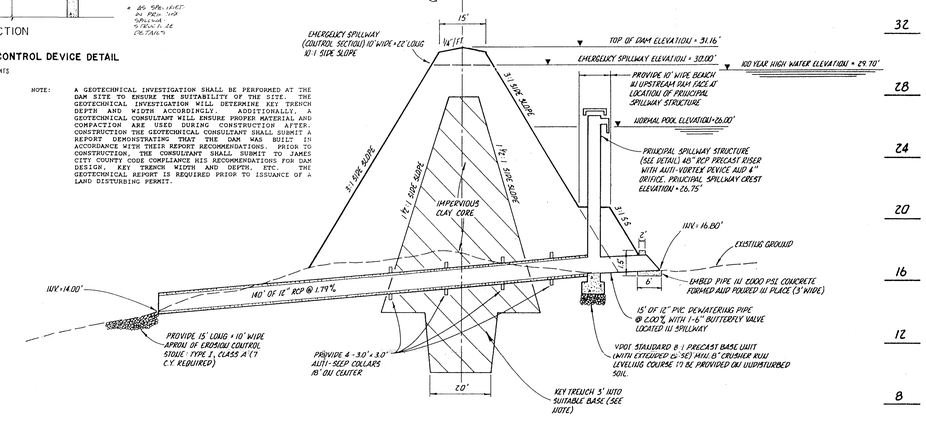


SECTION A-A
4TH FAIRWAY POND
1" = 10' HORIZ.
1" = 2' VERT.

NOTE: A GEOTECHNICAL INVESTIGATION SHALL BE PERFORMED AT THE DAM SITE TO ENSURE THE SUITABILITY OF THE SITE. THE GEOTECHNICAL INVESTIGATION WILL DETERMINE KEY TRENCH DEPTH AND WIDTH ACCORDINGLY. ADDITIONALLY, A GEOTECHNICAL CONSULTANT WILL ENSURE PROPER MATERIAL AND COMPACTION ARE USED DURING CONSTRUCTION. AFTER CONSTRUCTION THE GEOTECHNICAL CONSULTANT SHALL SUBMIT A REPORT DEMONSTRATING THAT THE DAM WAS BUILT IN ACCORDANCE WITH THEIR REPORT RECOMMENDATIONS. PRIOR TO CONSTRUCTION, THE CONSULTANT SHALL SUBMIT TO JAMES CITY COUNTY CODE COMPLIANCE HIS RECOMMENDATIONS FOR DAM DESIGN, KEY TRENCH WIDTH AND DEPTH, ETC. THE GEOTECHNICAL REPORT IS REQUIRED PRIOR TO ISSUANCE OF A LAND DISTURBING PERMIT.

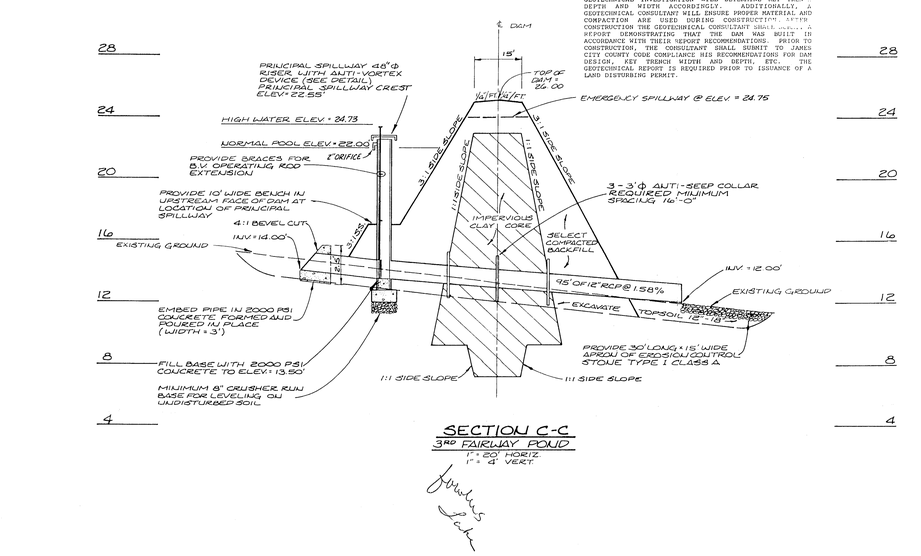


WATER QUALITY CONTROL DEVICE DETAIL
NTS

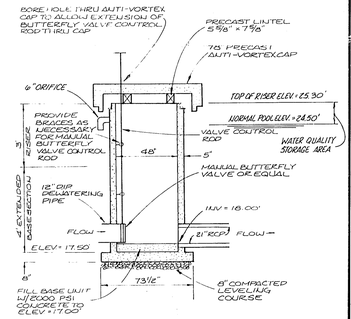


DAM CROSS SECTION B-B
9TH HOLE POND
1" = 10' HORIZ.
1" = 4' VERT.

NOTE: A GEOTECHNICAL INVESTIGATION SHALL BE PERFORMED AT THE DAM SITE TO ENSURE THE SUITABILITY OF THE SITE. THE GEOTECHNICAL INVESTIGATION WILL DETERMINE KEY TRENCH DEPTH AND WIDTH ACCORDINGLY. ADDITIONALLY, A GEOTECHNICAL CONSULTANT WILL ENSURE PROPER MATERIAL AND COMPACTION ARE USED DURING CONSTRUCTION. AFTER CONSTRUCTION THE GEOTECHNICAL CONSULTANT SHALL SUBMIT A REPORT DEMONSTRATING THAT THE DAM WAS BUILT IN ACCORDANCE WITH THEIR REPORT RECOMMENDATIONS. PRIOR TO CONSTRUCTION, THE CONSULTANT SHALL SUBMIT TO JAMES CITY COUNTY CODE COMPLIANCE HIS RECOMMENDATIONS FOR DAM DESIGN, KEY TRENCH WIDTH AND DEPTH, ETC. THE GEOTECHNICAL REPORT IS REQUIRED PRIOR TO ISSUANCE OF A LAND DISTURBING PERMIT.



SECTION C-C
3RD FAIRWAY POND
1" = 20' HORIZ.
1" = 4' VERT.



PRINCIPAL SPILLWAY STRUCTURE
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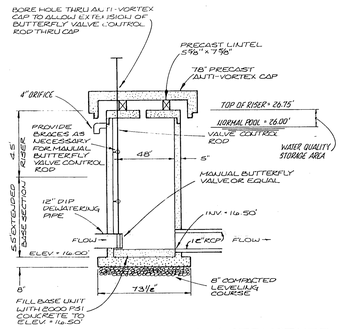

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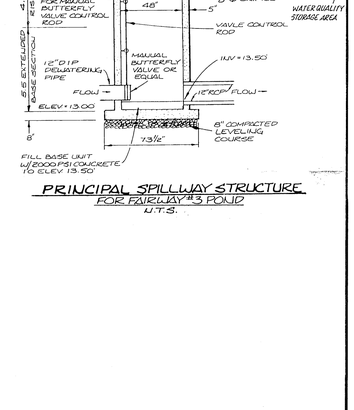

PRINCIPAL SPILLWAY STRUCTURE
FOR FAIRWAY #3 POND
N.T.S.

No.	DATE	REVISION / COMMENT / NOTE	BY

COMMONWEALTH OF VIRGINIA — JAMES H. BENNETT — No. 018125 — PROFESSIONAL ENGINEER

Fazio Golf Course Designers, Inc.
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(407) 746-4539

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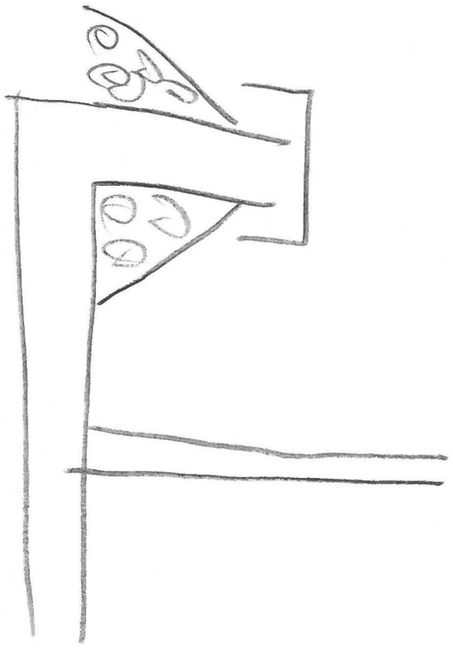
(804) 253-0040
Engineering, Planning, Surveying

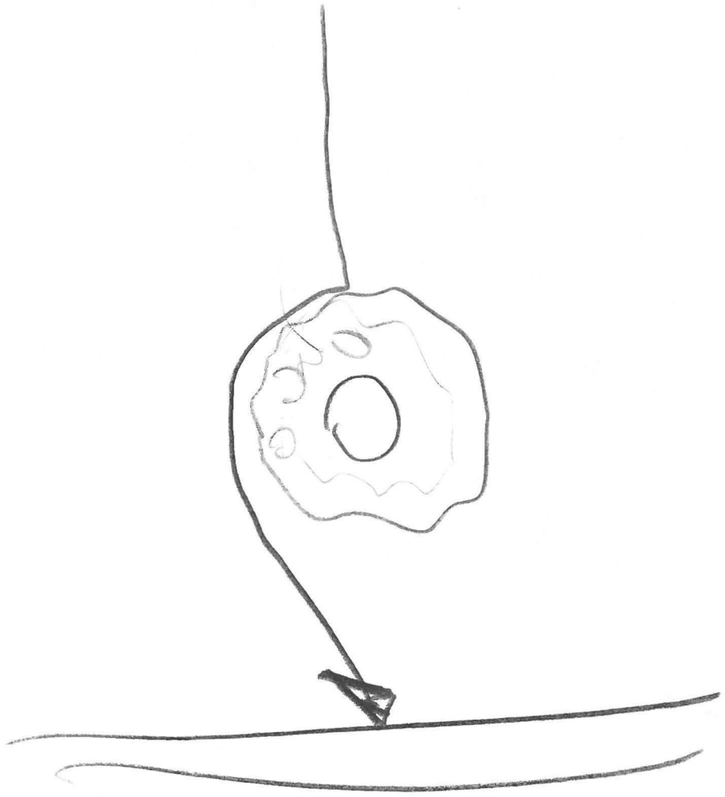
NOTES AND DETAILS

GOVERNOR'S LAND

POWHATAN DISTRICT — JAMES CITY COUNTY — VIRGINIA

Designed	Drawn
AES	C.A.N.
Scale	Date
1"=100'	12/22/89
Project No.	
7173	
Drawing No.	
10	





REVISIONS:	GOV
DESIGNED BY: Fazio	G
DRAWN BY: Jack D.	
INSTALLED BY: Jack D.	
SCALE: 1=100	Drai
DATE: 8-29-91	

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Review Of
The Stormwater Management/
Drainage System For The
Governor's Land Golf Course

prepared for:

Governor's Land Associates
P. O. Box 3125
Williamsburg, Virginia 23187

prepared by:

Williamsburg Environmental Group, Inc.
P. O. Box 3584
Williamsburg, Virginia 23187

November 1991

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1.0 INTRODUCTION

This report presents the results of a review by the Williamsburg Environmental Group, Inc. (WEG) of the stormwater management/drainage system on the Governor's land golf course. WEG was retained by Governor's Land Associates to evaluate the effectiveness of the implemented Best Management Practices (BMPs) on protecting water quality. A preliminary stormwater management plan was developed by Espey, Huston & Associates, Inc. (EH&A) (EH&A, 1990) at the request of James City County and was submitted as part of the golf course approval process. The goal of the EH&A study was to assess the water quality impact potential of the proposed course. The design plans for the golf course were submitted to James City County in December, 1989 and included the drainage, erosion/sediment control and clearing plans for the golf course corridor. BMP locations were preliminarily located on these plans, with final siting dependent upon the actual grading of the course. Construction of the golf course began in June, 1990.

WEG reviewed as-built drainage plans of the golf course, conducted field inspections of the drainage system, and verified the drainage areas for all BMPs. In addition, the BMPs were field surveyed to provide volumetric data of each facility for comparison with the required sizing. Some of the survey information was provided by Governor's Land Associates while the remainder of the information was collected by WEG in the field. With this information, WEG evaluated the final design and construction of the BMPs along with the nonpoint source pollutant removal efficiencies cited in the EH&A report. Modeling of the nonpoint source loadings from the golf course was conducted using the same computer modeling approach as in the EH&A analysis. In addition, the James City County 10-point, 3-step method for evaluating BMP plans was used to further verify that the Governor's Land Golf Course stormwater management system provides appropriate water quality protection (JCC, 1990). Based on the investigation by WEG of the entire Governor's Land Golf Course drainage system, specific maintenance recommendations were made which allow the stormwater management system to function properly, but with minimal impact to the playability of the golf course.

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2.0 PRELIMINARY STORMWATER MANAGEMENT PLAN

A conceptual stormwater management plan for the proposed Governor's Land Golf Course was developed by EH&A in March, 1990, and submitted to James City County as part of the approval process for the golf course. James City County had requested an assessment of the water quality impact potential associated with constructing a golf course within the 1,444-acre mixed-use Governor's Land project. The study addressed approximately 300-acres of the site including the golf course corridor and any natural drainage which flowed into the corridor. A nonpoint source loading model was used which incorporates loading rates developed by the Northern Virginia Planning District Commission (NVPDC) during the Occoquan/Four Mile Run Nonpoint Source Correlation Study (NVPDC, 1978) and are widely used in Virginia . Another advantage to this database is the wide distribution of land-use categories and soil types corresponding to loading rates (NVPDC, 1979).

Pre-development land uses were determined using various sources including; topographic maps from the U. S. Geological Survey and James City County, design/land plans from AES, Engineers and Surveyors, aerial photographs of the site, and an environmental assessment of the property previously completed by EH&A. The Governor's Land tract was composed of woodlands and agricultural fields, and the golf course study area reflected the same land use composition with 85% woodlands, and 15% agricultural fields. Soils information was obtained from the Soil Survey for James City County (USDA, 1985). The land use and soils information were input into the computer model to generate the pre-development nonpoint source pollutant loads for the site. Loads were computed for six constituents including; phosphorus, nitrogen, biochemical oxygen demand (BOD), suspended solids, lead and zinc. Table 2-1 shows the total loads for each of these constituents as determined in the EH&A study. This established the baseline to compare potential post-development impacts.

Post-development land use information was gathered from the most current land plan available to EH&A at the time of the study and the most current golf course routing plan available from Fazio Golf Course Designers, Inc. Information on nonpoint source loading rates for golf courses is limited and no published rates have been established by the NVPDC. Thus, loading rates for golf course turfgrass areas were based on other water quality studies.

The post-development loadings for the Governor's Land Golf Course were computed by EH&A and the results as compared to pre-existing loadings are shown in Table 2-1. Because all six constituents showed an increase over the pre-development values, EH&A developed a preliminary stormwater management plan which aimed at reducing nonpoint source loadings through the use of structural BMPs. The BMPs were planned to be constructed within the golf corridor to maximize the operation and

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TABLE 2-1

COMPARISON OF PRE- AND POST-DEVELOPMENT NONPOINT SOURCE LOADINGS ON THE GOVERNOR'S LAND GOLF COURSE

	Existing	Proposed Without BMPs	Proposed With BMPs
Constituents	Total (lb/yr)	Total (lb/yr)	Total (lb/yr)
Total Phosphorus	84	104	67
Total Nitrogen	1,049	1,212	885
Sediment	71,243	28,712	11,425
BOD	2,607	2,819	1,991
Lead	5	18	7
Zinc	10	17	11

maintenance efficiencies of the structures while optimizing the playability of the course. Forty-six dry pond and three wet pond BMPs were included in the plan, as shown in Figure 2-0, and located to maximize the dual benefits of the ponds; stormwater management and golf course amenity or hazard. The wet ponds corresponded to the large ponds planned for the development while the dry ponds were planned as either grass or sand bunkers located along the fairway edges or in the rough. The volume of each BMP was determined using the NVPDC's Occoquan BMP Handbook (NVPDC, 1987). The BMPs were sited based on drainage/topographic features and environmental limitations. Two other objectives were met by the initial siting of the BMPs; the adjacent undisturbed areas, including the wetlands primarily located along the southern edge of the course, were not impacted by the BMPs, and the playability of the course was affected. Based on the incorporation of the BMPs, the resulting nonpoint source loads were calculated using the computer model. The results are also shown in Table 2-1 and demonstrate that the proposed stormwater management plan could reduce the nutrient and sediment loadings from the study area to below pre-development levels.

The preliminary planning of the numerous BMPs allowed for the final type and location of each facility to be altered if the selection conditions changed during the construction of the course. This flexibility of revising the BMPs in the final plans and during construction was intended to ensure their incorporation within the course, thereby, attaining the required water quality protection. The combination of proper siting, sizing and maintenance of the basins, is necessary to attain the full nonpoint source pollutant removal efficiencies and to protect water quality. To accomplish this, appropriate changes to the preliminarily planned BMPs were expected.

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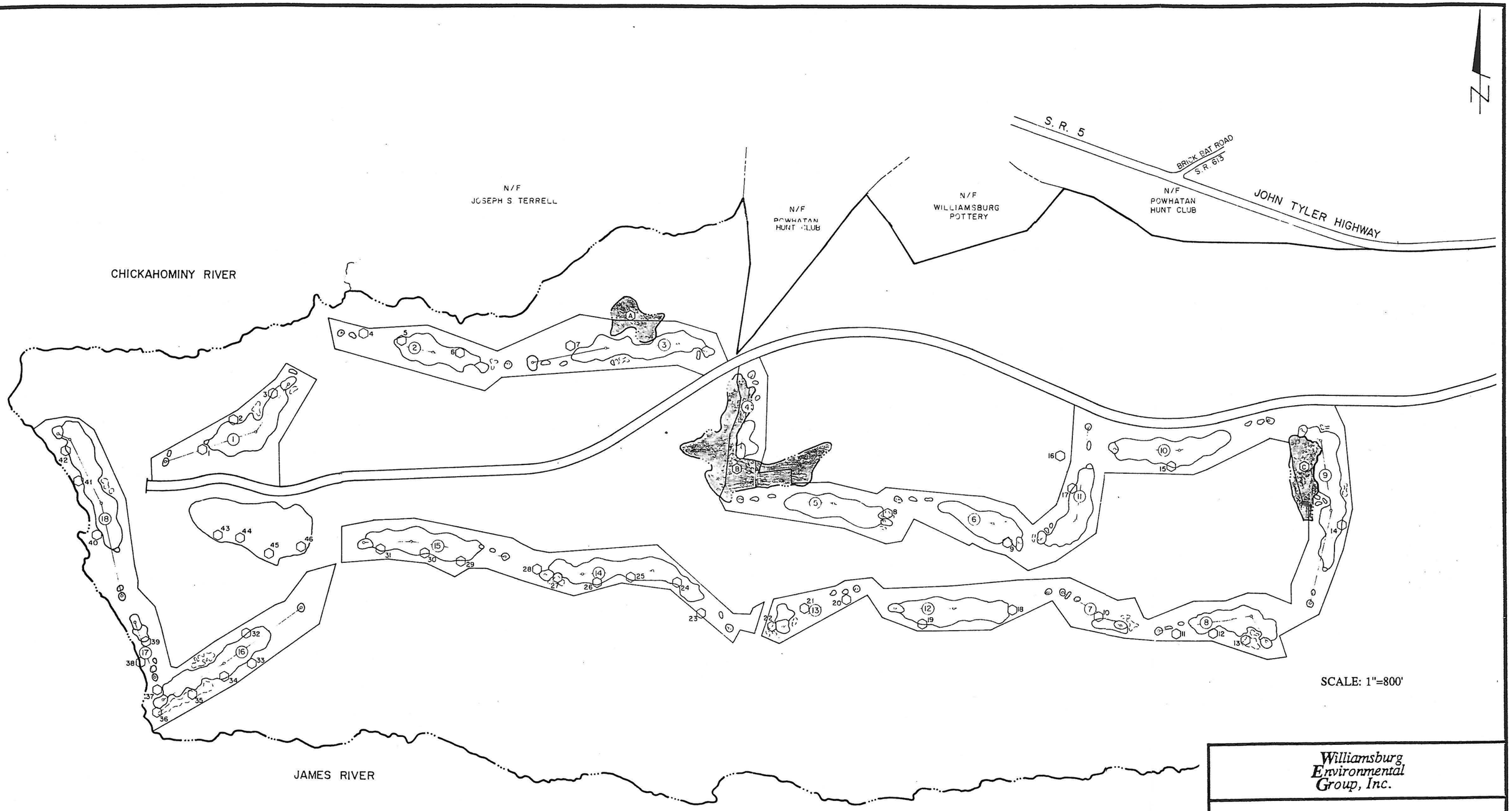

LEGEND

- BMP LOCATION
- GOLF HOLE
- GOLF COURSE CORRIDOR
- PROPOSED POND
- PROPERTY LINE
- PROPOSED ROAD

Sources: Fazio Golf Course Designers, Inc.
AES, A Professional Corp.
Espey, Huston and Associates, Inc.
-Stormwater Management Plan. March, 1990

Williamsburg Environmental Group, Inc.

Figure 2-0
Preliminary Stormwater Management Plan
for the
Governor's Land Golf Course

JAMES CITY COUNTY, VA.

NOVEMBER, 1991

3.0 GOVERNOR'S LAND GOLF COURSE STORMWATER MANAGEMENT SYSTEM

The preliminary stormwater management plan was prepared by EH&A for the Williamsburg Group, Inc., the initial developers for the site, with the results provided to AES for incorporation in the final golf course plans. AES conducted the engineering design of the proposed BMPs as part of the golf course plans. The construction company for the golf course, Wadsworth Golf Construction Company, revised the BMPs during construction based on input from the golf course architect, and through coordination with Governor's Land Associates. The final drainage areas and land uses treated within the golf course corridor led to alterations in the final type, location, and volumes of the BMPs (Figure 3-0). As-built plans for the drainage system and BMPs were generated by Wadsworth upon the completion of the first 17-holes of the golf course in September, 1991.

WEG's primary goal in reviewing the Governor's Land Golf Course stormwater management system was to evaluate the BMPs and determine if they provide the same measure of water quality protection as the preliminary EH&A study. This process included reviewing the as-built drainage plans, AES engineering plans, and volume data for BMPs on holes 4 through 11 which were surveyed by Wadsworth. WEG conducted field inspections of all BMPs and made field volume measurements of the remaining BMPs not surveyed by Wadsworth. Fifty-three BMPs are incorporated into the golf course using two principal types of facilities; five wet ponds and 48 infiltration basins. Infiltration basins account for 90% of the total BMPs and include 10 sand bunkers and 38 grass bunkers.

3.1 BEST MANAGEMENT PRACTICES

The preliminary stormwater management plan developed by EH&A used the Occoquan method for sizing the BMPs. This design technique was also used by WEG, for consistency purposes, to evaluate the adequacy of the as-built structures (NVPDC, 1987). The three wet ponds on the site proposed by EH&A have been built as amenity ponds for the golf course and the surrounding residential development. The storage volume of each pond exceeds the minimum that is required for wet pond BMPs. Two additional wet ponds were constructed under the direction of the architect and developer where topographic and environmental conditions allowed. The calculated volume for a wet pond, as for dry ponds, is dependent upon the drainage area and land use within the watershed. The sand traps that were designed as drainage structures have been evaluated as infiltration basins since sand infiltration is a viable BMP option. The sizing of infiltration basins is based on the runoff volume produced from the one inch storm over the contributing watershed (NVPDC, 1987).

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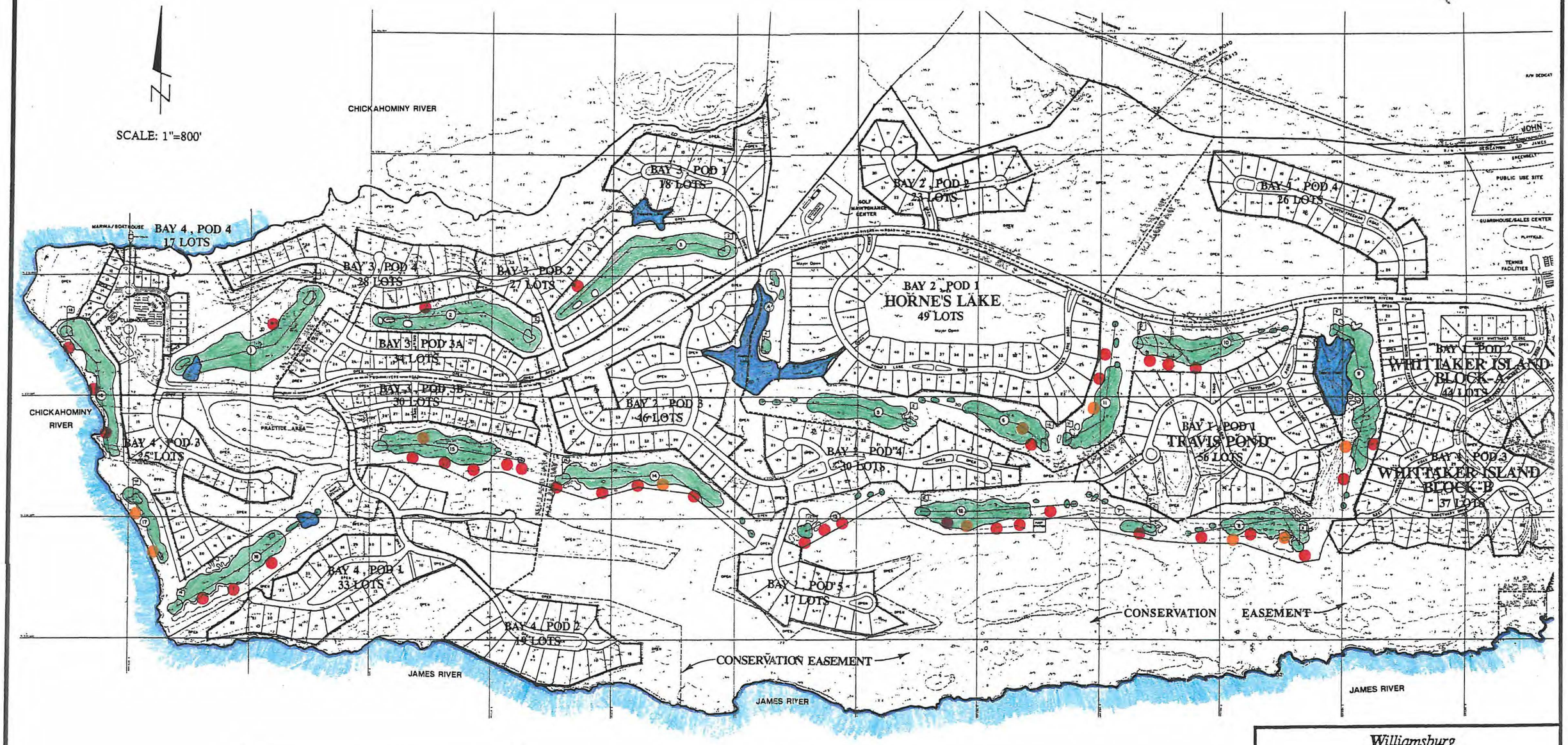

LEGEND

- Wet Pond
- Sand Trap
- Infiltration Basin/Dry Pond

Source: AES, A Professional Corp.
Governor's Land Overall Land Plan.

Williamsburg Environmental Group, Inc.

Figure 3-0
Best Management Practice
(BMP) Locations
for the
Governor's Land Golf Course

JAMES CITY COUNTY, VA.

NOVEMBER, 1991

Most of the BMPs were planned as dry ponds, but through the design of the golf course drainage system they actually function as infiltration basins. A high priority of the golf course drainage plan was to rapidly drain the playable areas and to treat the runoff in BMPs located in the rough areas. The system which was designed to accomplish this included collecting the drainage in drop inlets and piping the runoff to "blind sumps" in the BMPs where it was allowed to overflow through a grated manhole. Several BMPs have distribution pipes with vertical manifolds leading from the sumps to the BMPs. The runoff exfiltrates through the floor of the basins and is collected by a french drain system which outlets below the BMP. Most of these outlets were designed with an orifice cap and a one inch drain hole. This outlet design is based on the EH&A stormwater management plan which sized the outlets for dry ponds depending upon the desired detention time.

Infiltration basins are a separate BMP type and may be incorporated in a BMP plan where the watershed conditions are appropriate. Various sizing methods exist for infiltration basins and have corresponding pollutant removal rates (Metropolitan Washington Council of Governments (MWCOG), 1987). The removal efficiencies for infiltration basins are higher than for dry ponds since the filtration of the runoff through the soil media is more efficient than the settling process in removing both the soluble and fine particulate pollutants. Infiltration basins can service watersheds up to 50 acres where soils are permeable and coarse-grained pollutants are not abundant. The outlet structures for infiltration basins usually include only an emergency spillway to handle excess flows, and the water is released at a rate dependent upon the surface area and permeability of the basin floor. The exfiltration process through the basin floor provides the outlet control, and the french drain system on the Governor's Land golf course avoids soggy ground and ensures playability during dry periods. Because the french drain system is used and no direct outlet exists in many of the BMPs they can be classified as infiltration basins.

3.2 GOLF COURSE WATER QUALITY

To evaluate the effectiveness of the golf course BMPs on protecting water quality, WEG used the same modeling approach as in the EH&A study. The NVPDC method and loading rates were applied to the current drainage areas and BMPs. A decrease of approximately 40 acres from the EH&A study to the present study occurred since the final golf course layout and the surrounding land plan were altered. When the preliminary study was conducted, six nonpoint source pollutants were evaluated, but with the implementation of the Chesapeake Bay Preservation Act, it has become acceptable to analyze only phosphorus in water quality assessments. This study, therefore, uses only phosphorus loadings to compare with the preliminary study as recommended by the Chesapeake Bay Local Assistance Department (CBLAD, 1989) and the current James City County requirements (JCC, 1990). The

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phosphorus removal efficiency used for wet pond BMPs is the same as incorporated in the EH&A study (65%), and for infiltration basins, a 65% rate was used based on NVPDC recommendations (NVPDC, 1987). The post-development phosphorus loading rate computed with the nonpoint source model was found to be 0.23 lb/ac/yr. This rate includes the full compliment of BMPs located on the course, and reflects a slight improvement over the baseline phosphorus loading rate of 0.28 lb/ac/yr (adjusted for differences in drainage area in the EH&A study).

To further demonstrate the effectiveness of the BMPs on the Governor's Land golf course, WEG checked for conformity of the implemented stormwater management plan with the James City County 10-point, 3-step method for water quality planning. The necessary data for this approach was taken from the same sources used in the other portions of this study including, the current land plan and the BMP information included in the as-built plans. The total percentage of natural open space in the golf course corridor is 35% and the total percentage of the site which is treated by various BMPs is approximately 65%. WEG calculated the total points for the golf course site using Design 7 wet ponds (9 points) and Design 9 infiltration basins (10 points). The golf course corridor was able to meet the 10 point requirement promulgated by the County.

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4.0 SUMMARY AND RECOMMENDATIONS

The stormwater management and drainage system on the Governor's Land golf course includes a total of 53 BMPs which is four more than proposed in the EH&A study. The types of BMPs built on the course vary from those recommended in the EH&A study with the implementation of infiltration basins instead of dry ponds. Two additional wet ponds were built which were not originally planned. The location of the BMPs changed from the preliminary plan to better fit the final golf course layout and some facilities were combined while others were separated into two or three smaller basins. The total average removal efficiency of the implemented BMPs is greater than planned in the EH&A study since infiltration basins have a higher removal efficiency than dry ponds. The resulting phosphorus loading rate of 0.23 lbs/ac/yr as compared to the pre-development conditions loadings of 0.28 lbs/ac/yr shows a reduction in phosphorus for the study area. This loading rate includes the treatment of over 50 acres of planned residential area located adjacent to the golf course corridor which drains onto the course and is treated by the BMPs.

The golf course BMPs should be considered when evaluating the stormwater management requirements for future phases of residential development. Where the BMPs have been oversized, additional treatment of future development can be incorporated if drainage patterns permit and the high efficiency of these BMPs can be used to the maximum extent possible. By using the existing BMPs for future development, the need for additional BMPs in each phase of development may be reduced.

Maintenance of the numerous BMPs should not become a problem since it will be conducted as part of the scheduled golf course operations. A common problem of infiltration basins is caused by coarse sediments clogging the soil media and inhibiting the exfiltration process. However, with the dense turfgrass of the surrounding golf course fairway, which contributes less suspended solids than urban land uses, the basins on the Governor's Land site should require minimal maintenance to function properly. The normal long term turf maintenance practices such as aerating and topdressing with sandy soil should also prevent clogging and compaction problems by continuing to mix any abundance of fine solids which accumulate in the basins with other soil types. This filter media combined with the thatch layer of the grass provides excellent pollutant removal capacity. If problems do occur, the basins could easily be cleaned and resodded, since they are part of the overall golf course maintenance responsibility. Since infiltration basins do not require outlet structures with restricted orifices, the caps which were designed to provide appropriate detention times for the planned dry ponds can be removed from the BMP pipes. No additional pollutant removal capacity is created by detaining the water in the basins since the pollutant removal occurs when the water exfiltrates. In fact, problems caused by standing water such as mosquito

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breeding, soggy ground and dying grass are signs of an improperly functioning infiltration basin and should be remedied if possible.

The stormwater management system at the Governor's Land golf course is meeting the water quality goals established during the planning phases of the project. There should be no detrimental long term water quality impacts associated with the operation and maintenance of the golf course. An Integrated Pest Management Plan was developed for the course as part of the conditions to zoning to ensure the proper use and applications of fertilizers and other chemicals on the course. This plan is currently being implemented by the golf course superintendent and should assist in preventing water quality impacts from the golf course. The level of stormwater management undertaken at the Governor's Land Golf Course is unmatched on any other facility in Virginia and reflects the extensive environmental planning which has occurred during the project's planning and design.

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TABLE 1

The Governor's Land
Golf Course BMP Volume Information

GOLF HOLE	BMP	BMP TYPE^	DRAINAGE AREA (AC)	IMPERVIOUS ACREAGE	BMP VOLUME (CU FT) REQUIRED	BMP VOLUME (CU FT) AS-BUILT	REMOVAL EFFICIENCY
1	POND	3	3.44	-	1613	14,000	65
	1-2	2	5.85	0.6	2172	3,355	65
2	2-1	1	9.99 6.9?	1.69	5277	2,618	23
3	3-1	2	2.18	0.12	456	471	65
	3-2	2	2.34 1.7	0.24	849	2,831	65
	POND	3	8.45 9.3	-	6000	160,000	65
4	LAKE	3	4.02 ? 9.9	-	1884	1590000***	65
5	LAKE	3	12.05 ? 19.2	-	5648	1590000***	65
6	6-1	2	9.75	1.47	5331	6,947	65
7	7-1	2	1.74	0.09	316	7,257	65
	7-2	2	0.39	0.02	71	1,661	65
8	8-1	2	2.39	0.19	673	15,303	65
	8-2	2	1.07 2.4	0.09	310	567	65
	8-3	2	1.76 2.1	0.1	379	1,256	65
9	9-1	2	0.39	0.02	71	3,959	65
	9-2	2b	3.73 2.1	0.59	1074	1,140	50
	POND	3	8.03 10.4	-	3764	636000***	65
10	POND	3	2.25 ?	-	1055	636000***	65
	10-1	2	3.93	0.2	713	4,823	65
	10-2	2	2.23 3.2	0.11	405	876	65
	10-3	2	1.03	0.05	187	2,392	65
11	11-1	2	1.22	0.06	221	3,052	65
	11-2	2	2.66	0.14	508	3,920	65
12	12-1	2	1.03	0.05	187	2,055	65
	12-2	2b	1.77	0.13	248	462	50
	12-3	2	0.25	0.01	45	266	65
	12-4	2	7.41	1	3643	3,873	65
13	13-1	1	9.39	1.63	5072	336	2
	13-2	2	0.64	0.03	116	1,871	65
	13-3	2	0.73	0.04	132	687	65
14	14-1	1	5.81	0.82	2544	129	1
	14-2	1	2.27	0.25	786	427	19
	14-3	1	10.24	1.8	5627	586	4
	14-4	2	1.9	0.13	468	2,397	65
15	15-1	2	1.03	0.08	283	1,789	65
	15-2	2	1.65	0.27	996	1,633	65
	15-3	2	7.35	1.5	5455	8,052	65
	15-4	2	0.94 4.4 ?	0.05	171	3,430	65
	15-5	2	5.87	1.15	4202	6,150	65
16	POND	3	3.05	-	1664	104,000	65
	16-1	2	1.22	0.07	280	631	65
	16-2	2	1.4	0.12	427	472	65
	16-3	2	3.88	0.19	704	4,896	65
17	SAND	2	1.7	0.09	309	NA	65
18*	1,2,3,	-	-	-	11247*	-	65
DR	DR-1	2	5.67	1.04	3773	4,981	65
	DR-2	2	3.94	0.28	1038	4,563	65
	DR-3	2	0.18	0.01	33	621	65
	DR-4	2	0.41	0.02	74	479	65

^BMP Types- 1=dry pond, 2= Design 9 infiltration basin, 2b= Design 8 infiltration basin, 3= wet pond
NA- Not available
(-)- Not applicable
* Hole 18 is not completed
** Based on EH&A Plan
***Pond Volumes for multiple holes

3/12/14

TABLE 2

Governor's Land Golf Course
10-Point BMP Worksheet

Total Site Area	259.8
Total Open Space	89

BMP Number	BMP Type	BMP Points	Drainage Area	Fraction of Site	Weighted BMP Pts	
1.10	wp	9	3.4	0.01	0.12	
1.2.	ib	10	5.8	0.02	0.22	
2.1	dp	6	6.9	0.03	0.16	
3.1	ib	10	2.1	0.01	0.08	
3.2	ib	10	1.7	0.01	0.07	
3.p	wp	11	9.3	0.04	0.39	
4.p	wp	11	9.9	0.04	0.42	
5.p	wp	11	19.2	0.07	0.81	
6.1	ib	10	9.7	0.04	0.37	
6.s	sand	10	0.4	0.00	0.02	
7.1	ib	10	1.7	0.01	0.07	
7.2	ib	10	0.4	0.00	0.02	
8.1	ib	10	2.4	0.01	0.09	
8.2	ib	10	2.4	0.01	0.09	
8.3	dp	6	2.1	0.01	0.05	
8.s	sand	10	2	0.01	0.08	
9.1	ib	10	4	0.02	0.15	
9.2	ib	10	2.1	0.01	0.08	
9.s	sand	10	0.4	0.00	0.02	
9.p	wp	11	10.4	0.04	0.44	
10.1	ib	10	2.3	0.01	0.09	
10.2	ib	10	3.2	0.01	0.12	
10.3	ib	10	1	0.00	0.04	
11.1	ib	10	1.2	0.00	0.05	
11.2	ib	10	2.7	0.01	0.10	
11.s	sand	10	0.5	0.00	0.02	
12.1	ib	10	1	0.00	0.04	
12.2 12.3	ib	9	2.1	0.01	0.07	
12.4	ib	10	7.4	0.03	0.28	
12.s	sand	10	0.2	0.00	0.01	
13.1	ib	10	1.8 9.4	0.01	0.07	- .07
13.2	ib	10	0.6	0.00	0.02	
13.3	ib	10	0.7	0.00	0.03	
14.1	dp	6	2.3 $.8	0.01	0.05	- .05
14.2	dp	6	1.7 1.3	0.01	0.04	
14.3	dp	6	2.2	0.01	0.05	- .05
14.4	ib	10	1.9	0.01	0.07	
14.s	sand	10	0.4	0.00	0.02	
15.1	ib	10	1	0.00	0.04	
15.2	ib	10	1.7	0.01	0.07	
15.3	ib	10	7.3	0.03	0.28	
15.4	ib	10	0.9 4.4	0.00	0.03	+ .17
15.5	ib	10	5.9	0.02	0.23	
15.s	sand	10	0.2	0.00	0.01	
16.p	wp	9	3.1	0.01	0.11	
16.1	ib	10	1.2	0.00	0.05	
16.2	ib	10	1.7	0.01	0.07	
16.3	ib	10	3.9	0.02	0.15	
17.s	sand	10	1.7	0.01	0.07	
18	ib	10	8.3	0.03	0.32	
dr	ib	10	10.2	0.04	0.39	
			176.6	0.68	6.72	

wp-wet pond
dp-dry pond
ib- infiltration basin
sand- sand trap acting as infiltration basin

NATURAL OPEN SPACE CREDIT

Fraction of Site	Credit	Points
34.26	0.1	3.43

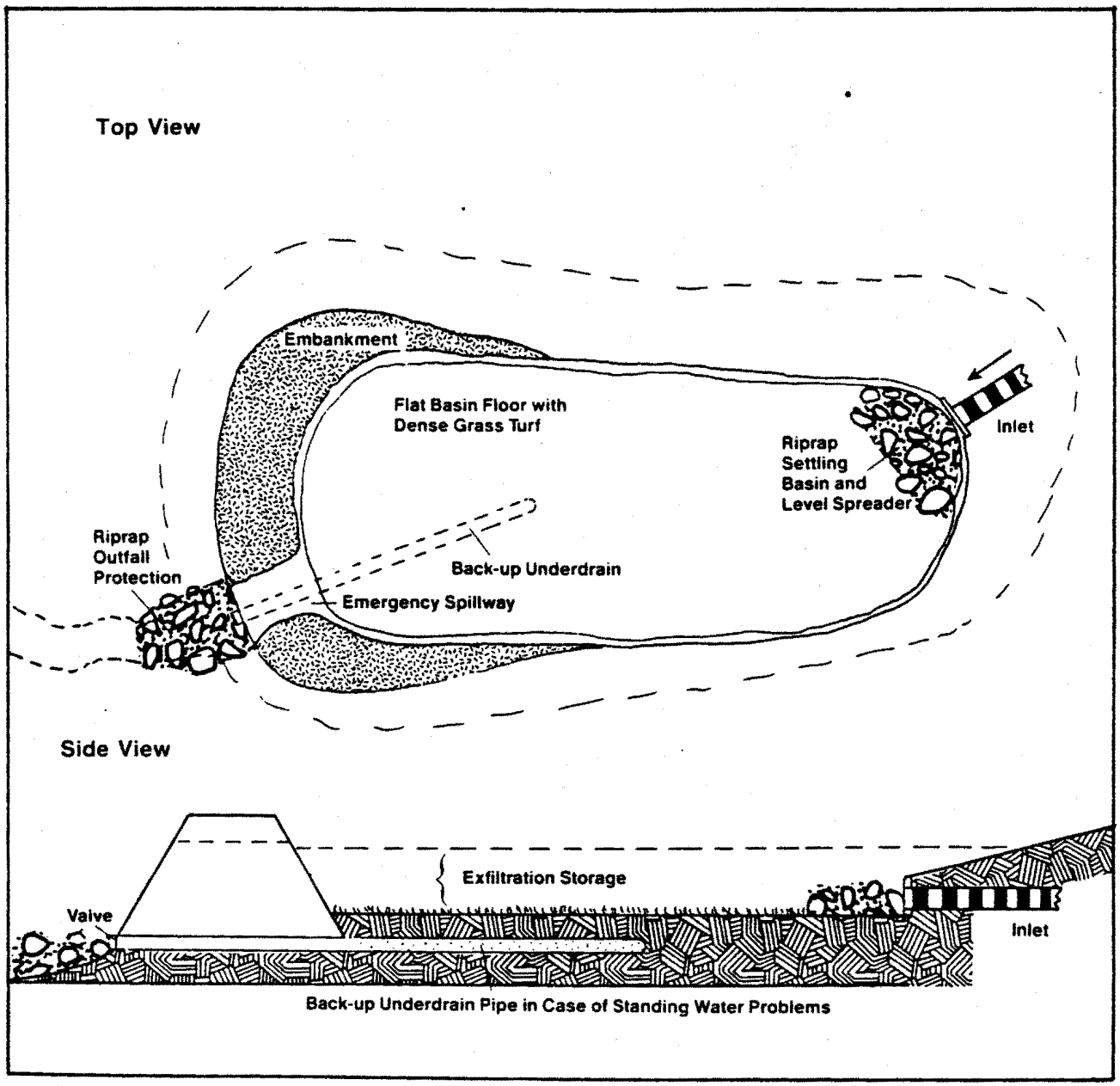
TOTAL WEIGHTED POINTS

Structural BMPs	Open Space	Total
6.72	3.43	10.14

CHAPTER 6: INFILTRATION BASINS

Infiltration basins are effective in removing both soluble and fine particulate pollutants borne in urban runoff. Coarse-grained pollutants should generally be removed before they enter a basin. Unlike other infiltration systems, basins can be easily adapted to provide full control of peak discharges for large design storms. Also, basins can serve relatively large drainage areas (up to 50 acres). Depending on the degree of storage/exfiltration achieved in the basin, significant groundwater recharge, low flow augmentation and localized streambank erosion control can be achieved.

Figure 6.1: Schematic of an Infiltration Basin

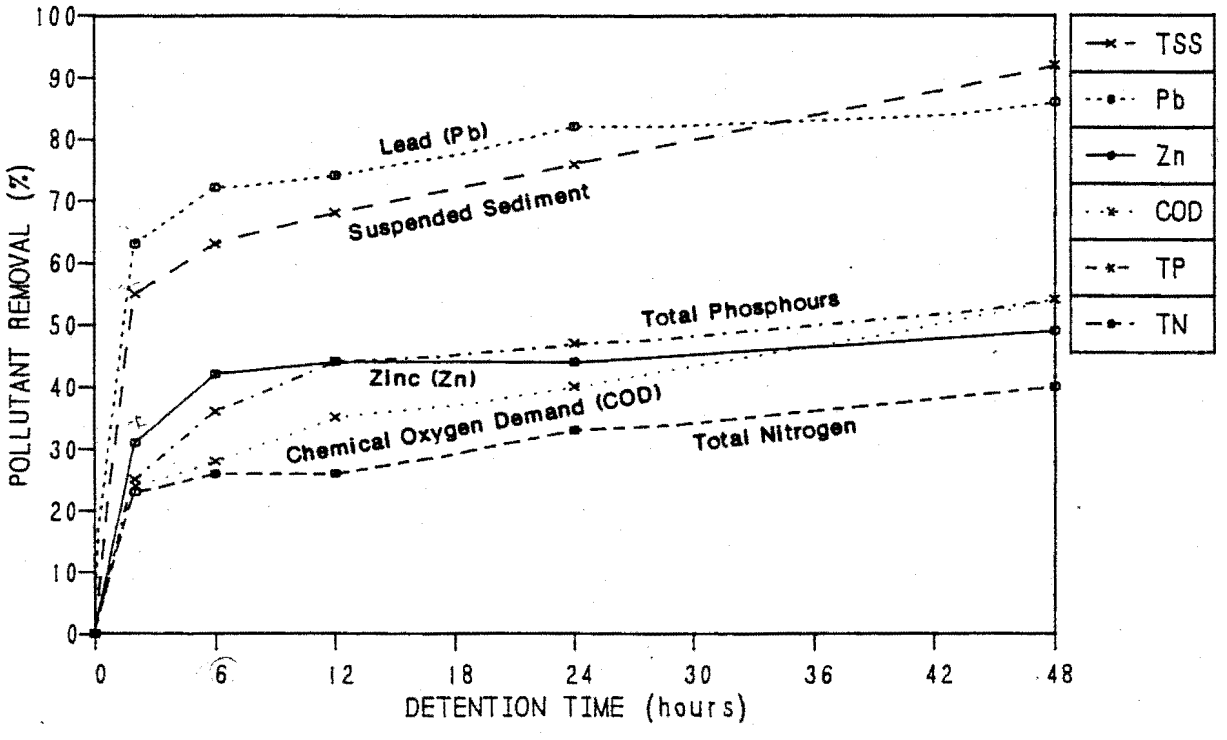


The field studies showed variable performance in removing phosphorus. Less than 15% of total phosphorus was removed at the Stedwick site over the long-term; whereas, initial results at the London Commons site indicated much higher average (70%) total phosphorus removal (OWML, 1986a). However, it is very likely that the long-term total phosphorus removal at the site is much lower, since very low (or even negative) removal rates were reported for larger storms. Resuspension of total phosphorus was cited as the likely cause.

NITROGEN

In the OWML (1983) settling column experiments, the upper limit on nitrogen removal achieved after 48 hours of detention was about 40%. Again, this is due to the predominance of soluble forms of nitrogen that comprise about 70-80% of the total nitrogen found in the Washington, D.C. area urban runoff (NVPDC, 1983). Field studies at the Stedwick extended detention pond suggested a long-term total nitrogen removal rate of about 25%, which compares well with the lab studies (Figure 3.7). Almost all of the particulate nitrogen settled out from the pond, but only limited settling of soluble nitrogen forms was reported. A higher average storm removal of total nitrogen was reported (52%) at the London Commons site (OWML, 1986a), although the long-term removal rates may not be as high.

Figure 3.6: Removal Rate vs. Detention Time For Selected Pollutants



NOTE: Based on OWML (1983) settling column data. Average values for seven tests. Removal equivalent to 4 feet of settling.

EH&A PROJECT NO. 11067
DOCUMENT NO. EF902134

STORMWATER MANAGEMENT PLAN FOR THE PROPOSED GOVERNOR'S LAND GOLF COURSE

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FEBRUARY 1990
REVISED MARCH 1990

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1.0 INTRODUCTION

This report presents a conceptual stormwater management and water quality protection plan for the proposed Governor's Land Golf Course in James City County, Virginia (Figure 1-1). The mixed-use Governor's Land project encompasses approximately 1444 acres located at the confluence of the James and Chickahominy Rivers (Figure 1-2). The Stormwater Management Plan (SWMP) includes only the golf course corridors and the surrounding drainage areas which affect each hole, totaling over 300 acres. The proposed SWMP consists of 3 wet and 47 dry pond Best Management Practices (BMPs) located throughout the proposed 18-hole golf course. The primary goal of the plan is to minimize water quality impacts associated with the development of the golf course while adding to the natural amenities of the site.

The performance of the proposed SWMP was analyzed using a nonpoint source microcomputer spreadsheet model, which computes annual nonpoint source pollutant loadings for a variety of land uses and soils. Two land use conditions were analyzed for the SWMP; existing project site conditions, and the developed Governor's Land Golf Course site. In view of the fact that the project is located at the confluence of the Chickahominy and James Rivers and is within the jurisdiction of the Chesapeake Bay Preservation Act (CBLAB, 1989), the Williamsburg Group has recognized the importance of integrating prudent water quality planning early in the development process. Thus, various BMPs, both structural and non-structural, have been incorporated into the proposed golf course plan to ensure the protection of water quality. These controls are consistent with other water quality management plans currently in place around the country and in Virginia.

The golf course design information used for the Stormwater Management Plan was obtained from Fazio Golf Course Designers, Inc.; the golf course architects for the Governor's Land development. Additional information concerning the actual clearing and grading of the course was obtained from AES, A Professional Corporation; the civil/site engineers for the Governor's Land site.

The existing land use and water quality conditions at the golf course site are discussed in Section 2.0 of this report. The proposed land uses associated with the golf course plan and the resulting water quality conditions are detailed in Section 3.0. The proposed SWMP for the golf course is outlined in Section 4.0 and a summary is presented in Section 5.0.

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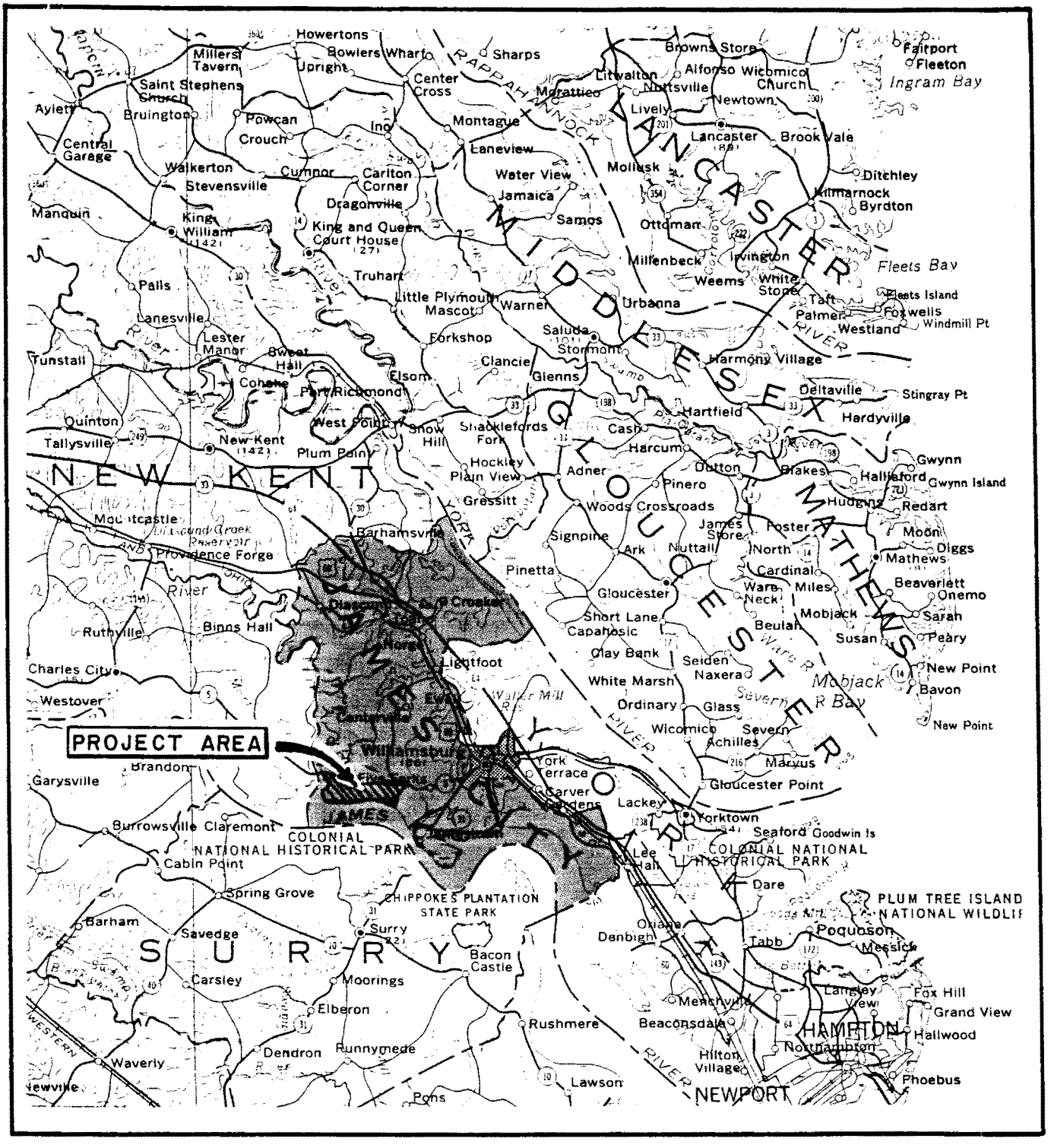


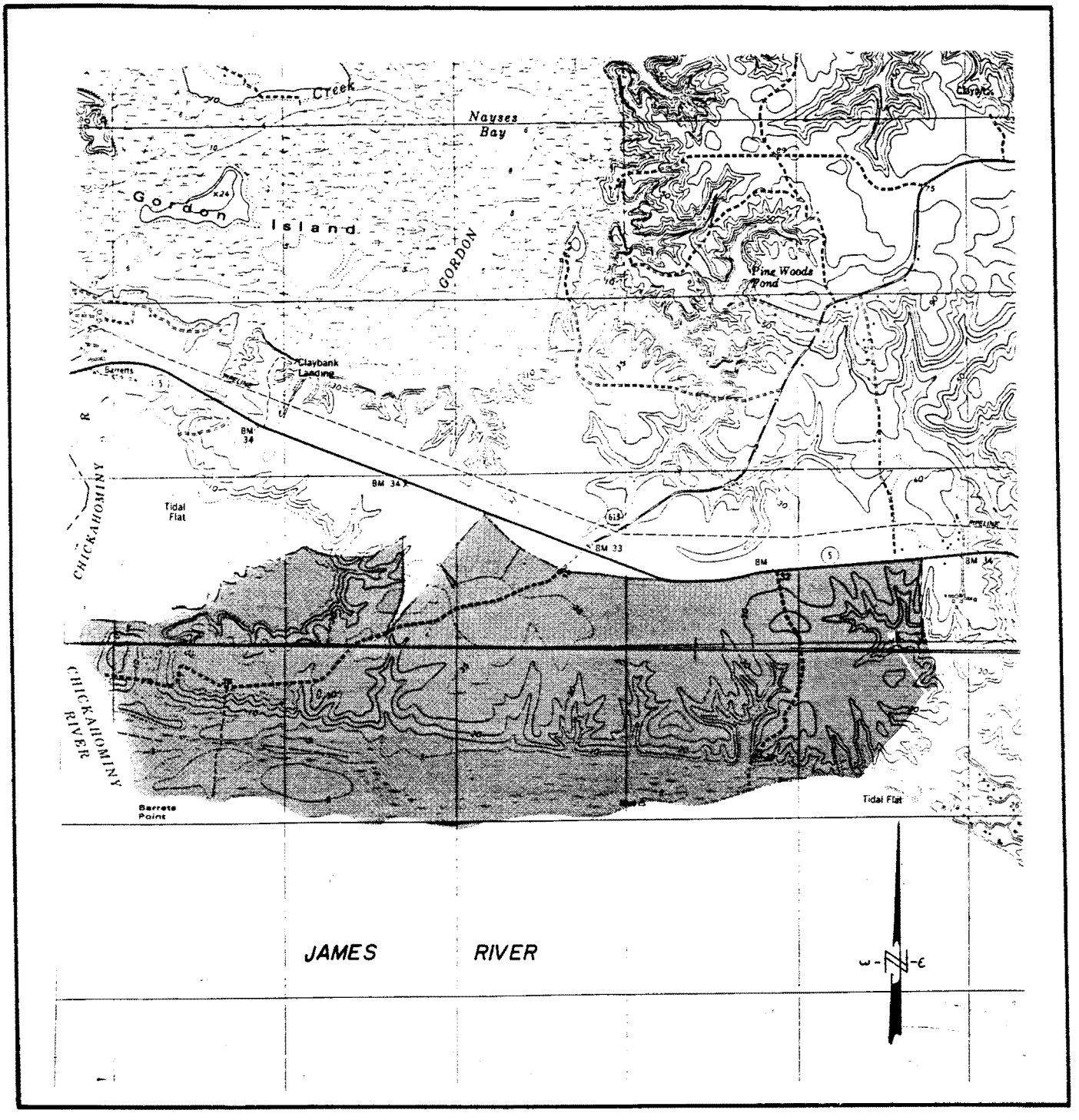
VICINITY MAP

FIGURE 1-1

SOURCE: U.S.G.S.-STATE OF VIRGINIA, 1973

ESPEY, HUSTON & ASSOCIATES, INC.
Engineering & Environmental Consultants

GOVERNOR'S LAND
James City County, Va.



LOCATION MAP

FIGURE: 1-2

SOURCE: U.S.G.S.- QUADRANGLE LOCATION MAPS ENTITLED

SURRY, V.A. 1983 & NORGE, V.A. 1984

ESPEY, HUSTON & ASSOCIATES, INC.
Engineering & Environmental Consultants

GOVERNOR'S LAND
James City County, Va.

2.0 EXISTING SITE CONDITIONS

The total acreage of the Governor's Land Golf Course site is approximately 304 acres, 210.85 ac. of golf course corridor area and 93.15 ac. of drainage area associated with the golf course site but containing other land uses. Since the site is located in the Coastal Plain physiographic province, the area is relatively flat with a total relief of approximately 40 ft. The lower areas which surround the peninsula include wetlands in many cases.

2.1 SOILS

The soils on the Governor's Land Golf Course site are primarily loam soils, with silt and fine sandy loams being the predominant soil type. The dominant soil associations at the site include the Peawick-Emporia-Leavy and the Leavy-Pamunkey-Dogue association. Both are deep soils which range from being very poorly drained to well-drained and both range from being predominantly clayey to loamy (USDA, 1985).

The most prevalent soil on the golf course site appears to be Peawick silt loam found on 0-3 percent slopes on stream terrace uplands of the coastal plain. Other soils that are present on the site include a Craven-Uchee complex, a fine sandy loam soil found on 6-10 percent slopes,and a Tetotum silt loam (EH&A, 1989).

2.2 LAND USE

The current land use of the Governor's Land site was determined with information provided by AES, A Professional Corporation, including the clearing and grading plan for the site. Also, U.S. Geological Survey (USGS) quadrangle maps and a previously completed environmental assessment of the property by Espey, Huston and Associates, Inc. were utilized (EH&A, 1989).

The property, which is bordered on the south by the James River and to the west by the Chickohominy River, contains several unique environmental features including, over 4 miles of shoreline along the rivers. The site also contains natural drainageways, both non-tidal and tidal wetlands, and mixed pine-hardwood forested areas and open farmland. The predominant land uses in the golf course corridor include the woodlands and the farmland with approximately 85% of the study

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area wooded and the remainder farmland, as summarized in Table 2-1. The farmland has recently been left idle in anticipation of site development and is becoming overgrown with various grasses.

2.3 WATER QUALITY

There are no site specific water quality data for the Governor's Land site. There are means, however, of assessing the impact of changes in land use based upon the knowledge of land use-pollutant export relationships. Nonpoint source loading rates developed by the Northern Virginia Planning District Commission (NVPDC, 1979) were used to evaluate the contributions of six constituents; total phosphorus, total nitrogen, biochemical oxygen demand (BOD), lead, zinc, and total sediment (TSS). An advantage to this data base is the wide distribution of land use categories and soil types corresponding to loading rates. The loading factors and land use categories used in the analysis of the Governor's Land Golf Course are summarized in Table 2-2 based on the prevalent silt loam type.

Information is limited for nonpoint source loading rates associated with golf courses and the NVPDC does not include a land use designation for golf courses in their published loading rates (NVPDC, 1979). Although, in an analysis of the proposed Robert Trent Jones resort development on Lake Manassas, the NVPDC assumed loading rates comparable to large lot single family lots when analyzing the proposed 300 ac golf complex (NVPDC, 1986). Thus, a phosphorus loading rate of 0.9 lb/ac/yr was used. Dr. Thomas Grizzard, Director of the Virginia Polytechnic Institute Occoquan Watershed Research Laboratory, used loading rates similar to those used for pasture lands as part of a sedimentation and water quality analysis of the Lake Pelham Watershed for the Town of Culpeper (Draper Aden Associates, 1987). A phosphorus loading rate of 0.5 lb/ac/yr was used. Conversations with Dr. Grizzard confirmed that accurate nonpoint source loading data are limited and the actual factors will vary depending on the level of chemical management at the golf course (Grizzard, 1989). Thus, a course with stringent fertilizer and pesticide management program should tend towards the low range of loading factors, while unmanaged courses may require loading rates in excess of 1 lb/ac/yr be utilized in water quality assessments. Studies have shown that turf grasses on a golf course with a healthy thatch layer can function as a viable buffer for the capture and filtration of suspended pollutants (Watschke, 1988)(GCSAA, 1988). With the available thatch layer and the preferred sandy soils associated with golf courses, runoff may be confined only to low frequency storm events. This can be further enhanced by the inclusion of BMPs to serve not only the golf course but also the contiguous development. In many instances, runoff is recirculated to the course as irrigation water.

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TABLE 2-1

EXISTING LAND USE
FOR THE GOVERNOR'S LAND GOLF COURSE AREA

Land Use	Area (ac)
Cropland	46
Forest	258
TOTAL	304

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TABLE 2-2

UNCONTROLLED NONPOINT SOURCE LOADING RATES
(LB/AC/YR)

Land Use	Density (units/ac)	Total Phosphorus	Total Nitrogen	BOD	Lead	Zinc	Sediment
Large Lot Family	1	.9	6.6	24	.18	.21	240
Single Family Residential	3	1.0	8.0	27	.29	.29	320
Single Family Residential	4	1.1	8.8	28	.42	.34	360
Open Area		.2	3.0	8	.02	.02	100
Golf Course		.5	6.1	8	.02	.02	100
Pastureland		.5	6.1	34	.03	.07	120
Woodlands		.1	2.5	7	.02	.02	120

Since a comprehensive Golf Course Environmental Management Plan (GCEMP) will be developed for the course to control the rate, amount, location and timing of the application of fertilizers and pesticides and the course will be maintained as a championship caliber facility, nonpoint source loading rates for nutrients and sediments approximating pastureland have been used in this analysis. For the remaining constituents, loading rates equivalent to idle land was used since unmanaged turf would be classified as such and it is the high maintenance of the golf course which raises the nutrient loadings.

Studies have shown that the most pronounced nonpoint pollutant in systems exhibiting mixes of undeveloped, and agricultural land uses are those related to the export of plant nutrients and trace metals (Overcash, 1981)(NVPDC, 1980)(EPA, 1983). Phosphorus and nitrogen are the principal nutrients critical to growth and algae growth. Since nutrients are generally transported with eroded sediments, the loadings of total sediment are crucial for assessing potential impacts. Decomposition of organic matter by micro-organisms can deplete dissolved oxygen (DO) levels in slower moving receiving waters. Thus, the BOD is evaluated in order to indicate the degree of potential DO depletion by expressing the amount of easily oxidized organic matter present in water. Trace metals, such as lead and zinc, are indicators of non-point source pollution from urban land uses, since neither constituent is generally present in undeveloped areas.The primary source of lead are motor fuel additives and automotive exhausts, while zinc is present in urban stormwaters from a number of sources, principally wear products from synthetic rubbers and the leaching of galvanized metals.

The water quality results for the existing land uses of the site are summarized in Table 2-3. These results set the baseline water quality standard for the site to which the proposed development's water quality is compared.

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TABLE 2-3

NONPOINT SOURCE LOADINGS ON
THE GOVERNOR'S LAND GOLF COURSE BASED ON
EXISTING CONDITIONS

Constituents	Loadings (lb/yr)
Total Phosphorus	84
Total Nitrogen	1,049
Sediment	71,243
BOD	2,607
Lead	5
Zinc	10

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3.0 PROPOSED CONDITIONS

3.1 LAND USE

In order to evaluate the proposed water quality impacts associated with the golf course, future land use designations were entered into the model. These new land uses were derived from the proposed golf course plans and the proposed land plan for the development. The primary difference is a change from forested land into golf course area. This area includes the proposed fairway, tees, and greens located within the golf corridor areas. Other area inside the corridor area, which would be selectively thinned, was left as woodlands. The proposed land uses for the area outside the golf course corridor which contribute drainage onto the golf course were modelled. These land uses include residential lots of .8 acres, .33 acres, .25 acres and open space. The resulting land use types therefore, include 35% golf, 32.8% forested land, with the remaining 32.2% divided among residential and open space. These areas are summarized in Table 3-1. Wetland areas have been avoided as much as possible in the designing of the course. Where the course does impact wetlands the proposed clearing plans call for minimal impact with preservation of as much of the natural vegetation as possible in order to maintain the natural setting in the final course layout.

3.2 WATER QUALITY

The modeling results for the proposed golf course as compared to the existing conditions are included in Table 3-2. These results of the nonpoint source loading computations indicate an increase in nutrients, with phosphorus increasing from 84 to 104 lb/yr and nitrogen increasing from 1049 to 1212 lb/yr while BOD increases from 2607 to 2819 lb/yr. The metals, lead and zinc increase from 5 and 10 lb/yr to 18 and 17 lb/yr, respectively. The total loadings for sediments decrease with the proposed land uses, from an existing load of over 70,000 lb/yr to less than 30,000 lb/yr. This reduction occurs primarily because a portion of the existing site is cropland which has a high sediment loading rate as compared to golf. Based on these results the change in land use, without considering possible mitigation, will increase the contribution of nonpoint pollutant loadings (except for sediments) from the site to neighboring waterways, including the James River and the Chickahominy River.

Based on these impacts, a conceptual SWMP was developed to minimize any water quality impacts from the site. The proposed SWMP includes structural BMPs strategically placed within the golf corridor to maximize the operation and maintenance efficiencies of the structures.

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TABLE 3-1

PROPOSED LAND USE
FOR THE GOVERNOR'S LAND GOLF COURSE AREA

Land Use	Area (ac)
Residential	83
Open Area	15
Golf Course	106
Forest	100
TOTAL	304

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TABLE 3-2

NONPOINT SOURCE LOADINGS ON
THE GOVERNOR'S LAND GOLF COURSE BASED ON
PROPOSED CONDITIONS

Constituents	Loadings (lb/yr) Existing	Proposed
Total Phosphorus	84	104
Total Nitrogen	1,049	1,212
Sediment	71,243	28,712
BOD	2,607	2,819
Lead	5	18
Zinc	10	17

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4.0 STORMWATER MANAGEMENT PLAN

The Proposed SWMP is aimed at maintaining the present water quality conditions of the runoff from the Governor's Land golf course. For modeling purposes, the golf course was divided into 19 sub-areas, one for each hole and one for the proposed driving range. Within these 19 subareas, 47 dry and 3 wet pond BMPs were incorporated within the golf course design to maximize the available locations for dual purpose ponds; golf course amenities and stormwater BMPs. Several of the proposed dry ponds may be constructed as sand bunkers, though, none were modeled as part of the SWMP. The sand bunkers can be strategically incorporated into the golf course design without impeding the playability of the course while maintaining the aesthetic appeal and providing additional water quality protection. Sand allows for greater filtration of stormwater through infiltration than grass, which depends primarily on sedimentation (City of Austin, 1984). These BMPs were located based on the proposed drainage structure design included in the grading plans as well as topographic, and environmental limitations. The figure, included in the map pocket, shows the approximate locations of the proposed ponds.

Field research has demonstrated that dry pond effectiveness is closely tied to proper sizing and can drop off with improper design or maintenance. Thus, in sizing the BMPs, special care was taken in determining each drainage area and land use type. The storage volume of each pond was derived based on the impervious cover at each contributing drainage area and was determined using criteria from the NVPDC's BMP Handbook for the Occoquan Watershed (NVPDC, 1987). With proper sizing of wet and dry pond BMPs, the following pollutant removal efficiencies (%) can be attained:

	Wet Pond	Dry Pond	Sand Filtration ?
Total Phosphorus	65	50	70
Total Nitrogen	48	40 ?	60
Sediment	92 ?	90 ?	90
~~BOD~~ COD	30	50	80
Lead	65	90	90
Zinc	50	50	90

for 5 VB/VR or 2 week retention or 1/2" /ac

if held 48 hrs

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The removal efficiencies are directly related to the detention time of each BMP. To ensure maximum efficiencies, the detention time should range frmo 24 to 48 hours for dry ponds (NVPDC, 1987). The storage volumes of the three wet ponds exceed NVPDC sizing criteria; thus, the maximum removal efficiencies can safely be utilized. The proposed dry ponds will effectively be shallow depressions (less than 2 feet deep) which are playable during dry weather. The size of the outlet pipes were computed to drain each pond between 24 and 48 hours. For dry ponds with less than 4,000 cubic ft of storage, a 1 in. pipe will be used. A 2 in. pipe will be installed for ponds with storage volumes ranging between 4,000 and 10,000 cubic ft, and all ponds with volumes in excess of 10,000 cubic ft will incorporate a 3 in. pipe. Since the proposed dry ponds will generally drain only the ~~folf~~ golf course site, runoff debris will be minimal and clogging should not be a problem. Routine leaf removal around the BMP the fall months will also minimize the potential for clogging.

Table 4-1 summarizes the necessary storage volumes calculated for each BMP. The locations of these ponds effectively treat over 189 acres or 62% of the golf course area. The remaining 115 acres, or 38% of the modelled areas will be treated by non-structural controls including naturally vegetated buffers. The buffers are part of the Chesapeake Bay Preservation Areas designated on the Governor's Land site (CBLAB, 1989). These buffers will provide water quality protection beyond that demonstrated in the modelling results since no buffering capacity was included. No BMP structure or outlet structure will extend into the 50 ft buffer adjacent to all wetlands, thus allowing for additional overland flow prior to any runoff being discharged into sensitive areas.

The total site contribution of all six constituents with the full compliment of BMPs are compared with the base line results for existing conditions in Table 4-2. This combination of proposed development and on-site BMPs result in lower loadings than existing conditions in four of the six constituents. A decrease in nutrients results, with reductions from 84 to 67 lb/yr and from 1049 to 885 lb/yr for phosphorus and nitrogen respectively. BOD is lowered from 2607 to 1991 lb/yr while sediments are decreased drastically from over 70,000 to less than 12,000 lb/yr. The two constituents that do not decrease are lead and zinc.

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TABLE 4-1

STORAGE VOLUMES OF PROPOSED DRY POND BMPS

BMP No.	Associated Hole	Storage Volume (cubic feet)
1	1	2,336
2	1	1,890
3	1	5,805
4	2	729
5	2	46,570*
6	2	8,748
7	3	4,230
8	5	10,249
9	6	13,166
10	7	1,512
11	8	3,083
12	8	3,187
13	8	1,674
14	9	9,553
15	10	7,817
16	11	5,819
17	11	2,538
18	12	2,295
19	12	8,893
20	13	9,302
21	13	2,595
22	13	11,419
23	14	6,728
24	14	1,485
25	14	3,105
26	14	16,459
27	14	2,511
28	14	432
29	15	2,214
30	15	14,534
31	15	1,808
32	16	203
33	16	1,080
34	16	297
35	16	594
36	16	230
37	16	5,967
38	17	797
39	17	1,175
40	18	5,144
41	18	3,767
42	18	2,336
43	DR	2,984
44	DR	2,552
45	DR	4,806
46	DR	594

DR = Driving Range
*It may be necessary to subdivide into multiple BMPs.

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TABLE 4-2

NONPOINT SOURCE LOADINGS ON
THE GOVERNOR'S LAND GOLF COURSE BASED ON
PROPOSED CONDITIONS WITH BMPS

Constituents	Loadings (lb/yr) Existing	Proposed w/BMPs
Total Phosphorus	84	67
Total Nitrogen	1,049	885
Sediment	71,243	11,425
BOD	2,607	1,991
Lead	5	7
Zinc	10	11

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These two trace metals increase slightly but the additional loadings, when incorporated into the overall scope of the receiving waters, is negligible. The quantity of lead increases from the existing conditions by 13 lb/yr prior to the inclusion of BMPs, while the addition of BMPs result in an increase of only 2 lbs/yr. Zinc increases 7 lbs/yr over the existing conditions, but with BMPs the increase is only 1 lb/yr. An increase in trace metals is expected as land is converted from an undeveloped area into a more urban-type land area in which these metals are more prevalent. Therefore, in this case an increase may be expected as a result of the development of the golf course but, at such low levels that no impacts to neighboring water bodies would be expected.

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5.0 SUMMARY

With the implementation of the SWMP outlined above, the impact to water quality resulting from the development of the Governor's Land Golf Course will be insignificant. This is substantiated through the modeling results which show improvements in four of the six constituents modeled. The SWMP lowers the additional loadings from the site for the proposed conditions through the use of on-site BMPs which results in an enhancement of the water quality found in existing conditions. These BMPs can be easily integrated into the golf course grading plan and provide refinement for both the golf course and surrounding waterways.

In addition to the BMPs included in the modelling results, other proposed conditions of the site may provide further water quality protection. The 50 ft vegetated buffers which are part of the requirements implemented by the newly passed Chesapeake Bay Preservation Act will be included on-site but were not considered as part of the water quality protection plan. The potential filtering of runoff by these buffer areas would provide additional water quality protection which in this case allows for a margin of safety. Also, recently published results by Thomas L. Watschke at the Environmental Resources Research Institute, Pennsylvania State University indicate that runoff volumes from turf is significantly lower than for land uses such as pastureland. The study, conducted for the USGS, includes the runoff results from 60 minute irrigation tests reflecting greater than 100-year rainfall intensities and demonstrates that the dense groundcover provided by turf, especially sod, can reduce runoff volumes and provide retention times of up to 50 minutes. It is therefore concluded in the study that dense, high quality turfgrass stands affect the overland flow process to the point where runoff is insignificant. And, the ability of turf in allowing water to infiltrate and promote metabolism of solutes may permit turfgrass areas to be used as a water quality treatment medium. All of this suggests that the minor impacts to water quality, with insignificant increases in metal loadings, would be further reduced and potentially resulting in water quality enhancement.

99121_GOVERNORS_LAND_GENERAL_FILE - 049

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GOVERNOR'S LAND
Management Company, Inc.

JUNE 26, 1991

ATTENTION: DARRYL COOK
JAMES CITY COUNTY CODES COMPLIANCE

SUBMITTED:
- 1 COPY OF "BMP AND TRAP" LOCATIONS FOR HOLES 4-11 OF GOLF COURSE
- 1 UPDATED CALCULATION SHEET LISTING THE INDIVIDUAL BMP SIZES PER HOLE COMPARED TO THAT ACTUALLY INSTALLED

PLEASE CALL IF YOU HAVE ANY QUESTIONS OR NEED ANY ADDITIONAL INFORMATION, THANKS.

JIM BENNETT
220-2158

JOHN HILTON -

Post Office Box 3125 23187 2700 Two Rivers Road 23185 Phone:(804)220-2158 Fax:(804)220-0831

WILLIAMSBURG, VIRGINIA

99121_GOVERNORS_LAND_GENERAL_FILE - 051

BMP & SAND TRAP DATA
GOVERNOR'S LAND

LOCATION	SAND TRAP CAPACITY	AVERAGE RADIUS	Holding DEPTH	BMP CAPACITY	TOTAL Holding CAPACITY	PLAN CAPACITY	BMP CAPACITY DIFFERENCE
#4 TRAP GR. R.	4,800	0	0	0	4,800	0	
#4 TOTALS	4,800	0	0	0	4,800		(+) ~~4,800~~
#5 TRAP FW. R	1,820	0	0	0	1,820	0	
#5 TRAP GR. R	5,600	0	0	0	5,600	0	
BMP#8						10,250 yd³	(-) 10,250
#5 TOTALS	7,420	0	0	0	7,420	0	(+) ~~7,420~~
#6 TRAP FW. R	2,010	0	0	0	2,010	0	
#6 BMP#1	0	39.3	3	7,275	7,275	0	
#6 TRAP GR. F	900	0	0	0	900	0	
PLAN BMP#9	0	0	0	0	0	14,711	
#6 TOTALS	2,910	—	—	7,275	10,185	14,711	(-) 4,526 (-) 7436
#7 BMP #1	0	43	2.5	7,257	7,257		
#7 TRAP GR. L	1,084	0	0	0	1,084		
PLAN BMP#10	0	0	0	0	0	1,512	
SUB-TOTAL	1,084	—	—	7,257	8,341	1,512	(+) ~~6,829~~ 5745
#7 BMP #2		23	2	1,661	1,661		(+) 1,661
#7 TOTALS	1,084	—	—	8,918	10,002	1,512	(+) ~~8,490~~ (+) 7406

+16,184

BMP & SAND TRAP DATA
GOVERNOR'S LAND

LOCATION	SAND TRAP CAPACITY	AVERAGE RADIUS	HOLDING DEPTH	BMP CAPACITY	TOTAL HOLDING CAPACITY	PLAN CAPACITY	BMP CAPACITY DIFFERENCE
#8 BMP #1	0	57	3	15,303	15,303		
#8 TRAP FW.R	3,950				3,950		
#8 PLAN BMP#11						5599	
SUB-TOTAL	3,950	—	—	15,303	19,253	5,599	(+) 13,654
#8 BMP #2		19	1	567	567		
#8 TRAP FW.R	1,728				1728		
PLAN BMP #12						3,182	
SUB-TOTAL	1,728	—	—	567	2,295	3,182	(-) 887
#8 BMP #3		20	2	1,256	1256		
#8 TRAP FW.R	1728				1728		
#8 TRAP FW.L	1331				1331		
PLAN BMP#13						3,402	
SUB-TOTAL	3,059	—	—	1,256	4,315	3,402	(+) 913
#8 TOTALS	8,737	—	—	17,126	25,863 17,126	12,183	(+) 13,680 + 4943
#9 BMP #1		41	1.5	3,959	3,959	0	
SUB-TOTAL		—	—				(+) 3,959 ?
#9 BMP #2		22	1	1,140	1,140		
#9 TRAP FW.R	2,160				2,160		
#9 TRAP FW.L	2,412				2,412		
PLAN BMP#14						9,553	
SUB-TOTAL	4,572	—	—	1,140	5,712	9,553	(-) 3,841
#9 TRAP GR.L	705				705		
#9 TRAP GR.F	1,100				1,100		
#9 TRAP GR.B	748				748		
SUB-TOTAL	2,553				2,553	0	(+) 2,553
#9 TOTALS	7,125			5,099	12,224	9,553	(+) 2,671 - 4434

BMP & SAND TRAP DATA
GOVERNOR'S LAND

6/27/91

LOCATION	SAND TRAP CAPACITY	AVERAGE RADIUS	HOLDING DEPTH	BMP CAPACITY	TOTAL HOLDING CAPACITY	PLAN CAPACITY	BMP CAPACITY DIFFERENCE
#10 BMP #1		32	3	4,823	4,823		
#10 TRAP FW.R	1,450				1,450		
PLAN BMP #15						7,080	
SUB-TOTAL	1,450	—	—	4,823	6,273	7,080	(-) 807
#10 BMP #2		16.7	2	876	876		
PLAN BMP #15-A						2,380	
SUB-TOTAL		—	—	876	876	2,380	(-) 504
#10 BMP #3		27.6	2	2,392	2,392		
#10 TRAP GR.R	972				972		
PLAN BMP #15-B						986	
SUB-TOTAL	972	—	—	2,392	3,364	986	(+) 2,378
PLAN BMP #15-C						3,362	
SUB-TOTAL					8091	3,362	(-) 3,362
#10 TOTALS	2,422	—	—	8,091	10,513	13,818	(-) 3,305 (-15717)
#11 BMP #1		36	1.5	3,052	3,052		
PLAN BMP #16						6,561	
SUB-TOTAL		—	—	3,052	3,052	6,561	(-) 3,509
#11 BMP #2		40.8	1.5	3,920	3,920		
#11 TRAP FW.R	4,950				4,950		
#11 TRAP GR.L	1,200				1,200		
PLAN BMP #17						3,470	
SUB-TOTAL	6,150			3,920	10,070 6972	3,470 10,031	(+) 6,600 - 3059
#11 TOTALS	6,150	—	—	6,972	13,122	10,031	(+) 3,091 -8297
TOTALS (4-11)	40,648	—	—	53,481	97,039	61,808	(+) 35,231

BASIN #10 GOVERNORS LAND

I BASIN DESIGN

TOTAL DRAINAGE AREA = 21.5 AC + 13.59 = 35.09 AC

∴ BASIN VOLUME REQUIRED = 67 yd³/AC 35.09 AC = 2351 yd³
= 63,471 FT³

WE WILL APPROXIMATE THE BASIN STORAGE VOLUME WITH THE SPILLWAY @ ELEV 21

2

VOL = BASIN AREA × 1/2 DAM HEIGHT 21
= (26,498) 1/2 (21 − 15.5) = 72,870 CF > 63471 F
WHICH IS OK

.4 × A × d =

58296

What FMP

CHECK LENGTH TO WIDTH RATIO

L = 260
We = 26491 / 260 = 101

$L/We = \frac{260}{101} = 2.55 > 2$ ∴ ITS OK

II PRINCIPAL SPILLWAY

THERE WILL BE NO EMERGENCY SPILLWAY FOR THIS POND. WE WILL DESIGN FOR THE 10 YEAR PEAK RUNOFF RATE

Q_{10} = SYSTEM 10 RUNOFF + CIA EXTRA

t_c = 32 MIN FROM L = 950 ΔH = 9' C = .35
USE Tc = 20 MIN TO BE CONSERVATIVE
I_{10} = 4.5 FROM FIG 1.5.1.5

∴ Q_{10} = 25.5 + .35 (4.5) 39.09 = 61.56

WE WILL DESIGN WITH A HEAD OF 1.5'

FROM PLATE 1.26h WE MUST USE A 48" RISER
Q_R = 74 cfs

THE DAM HIGH WATER MARK IS 22.5', ADD .5 FOR FREE BOARD AND TOP OF BERM = 23'

∴ THE LENGTH OF THE HORIZONTAL PIPE IS
L = 8 + 7 (3) + 8 (3) = 53' USE L = 56'

FROM TABLE 1.26 a USING H = 7.5
TRY A 36" PIPE Q = 78.9 C_F = 1.26 Q_F = 33.2
∴ USE A 36" PIPE H = 6' Q = 70.6 × 1.04

III NOW DESIGN THE ANTI-VORTEX TRASH RACK

FOR A 48" RISER DIA = 72" ✓ REFER TO TABLE 1.25d

H = 21" ✓

SUPPORT BAR IS 1-1/4" PIPE

TOP THICKNESS IS 10

CYLINDER THICKNESS = 12 ga

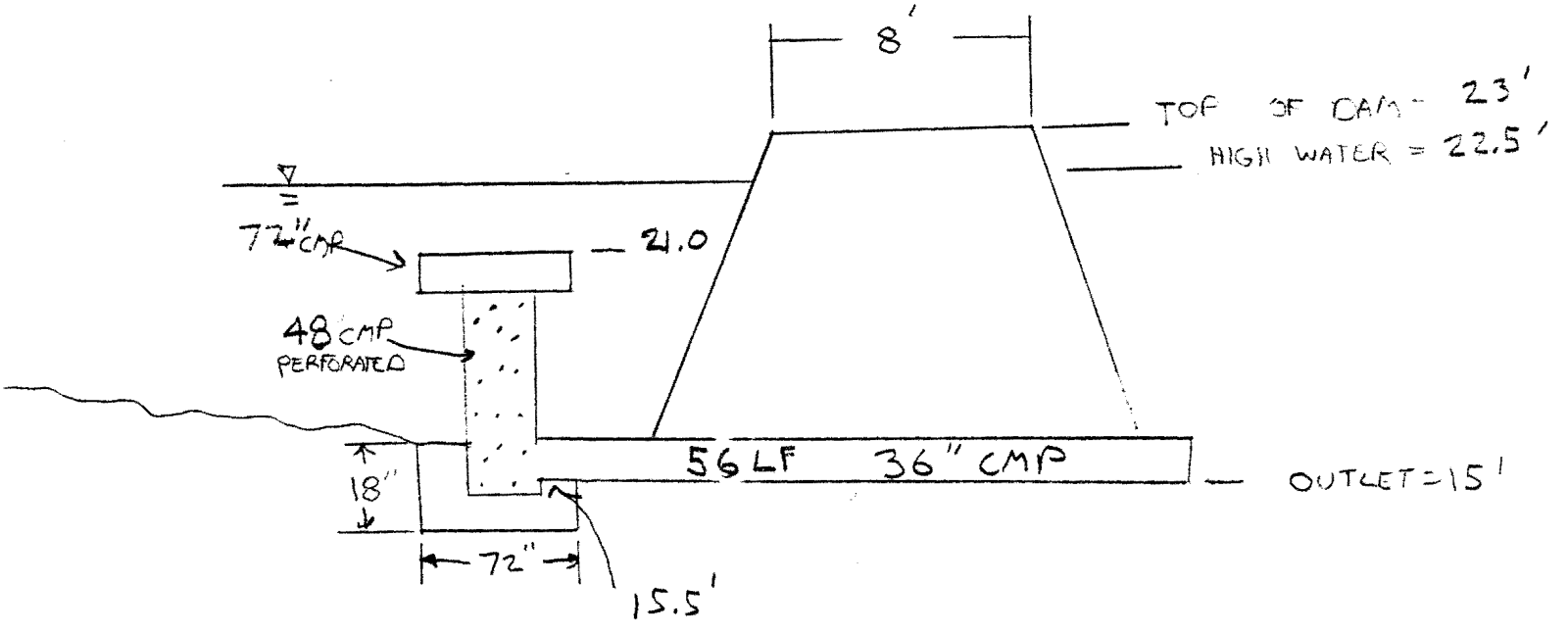
IV DESIGN ANTI SEEP COLLARS

$$L_s = K(Z+4)\left(1 + \frac{S}{0.25-S}\right)$$

$$L_s = 7(3+4)\left(1 + \frac{.009}{0.25-.009}\right)$$

$$L_s = 50.82$$

USE TWO 5.5' COLLARS (FROM PLATE 1.261)
18' ON CENTER



GOVERNOR'S LAND
JN. 7173
GAM 12/89

TEMPORARY SEDIMENT BASIN #1

- DRAINAGE AREA = 22.7 AC ?

STORAGE VOLUME REQD. = 22.7 AC × 67 CY/AC = 1521 CY.

STORAGE VOLUME PROVIDED = 1562 CY. ?

TOP OF SPILL WAY ELEV. = $\boxed{20.5}$

- BASIN SHAPE = $\frac{L}{W_e} \geq 2$ L = 400'

$W_e = \frac{14,000}{400} = 35$

$= \frac{L}{W_e} = \frac{400}{35} = 11.4$ OK

- BASIN WILL NOT HAVE EMERGENCY SPILLWAY THEREFORE PRINCIPAL SPILLWAY WILL BE DESIGNED TO CARRY 10 yr. STORM

Q_{10} = 32.6 cfs FROM SYSTEM #1 HYD. REPORT

- FROM PLATE 1.26h $\boxed{\text{USE 48" CMP RISER}}$ ✓

H = 1.0' Q = 39 cfs > 32.6 cfs => ok
ALLOW 1.5' OF FREE BOARD
TOP OF BERM ELEV = 20.5 + 1.5 = 22.00

- DISCHARGE BARREL DESIGN
TOP OF BERM IS 10' WIDE w/ 3:1 SIDE SLOPES

LENGTH = 74' of $\boxed{\text{24" CMP}}$

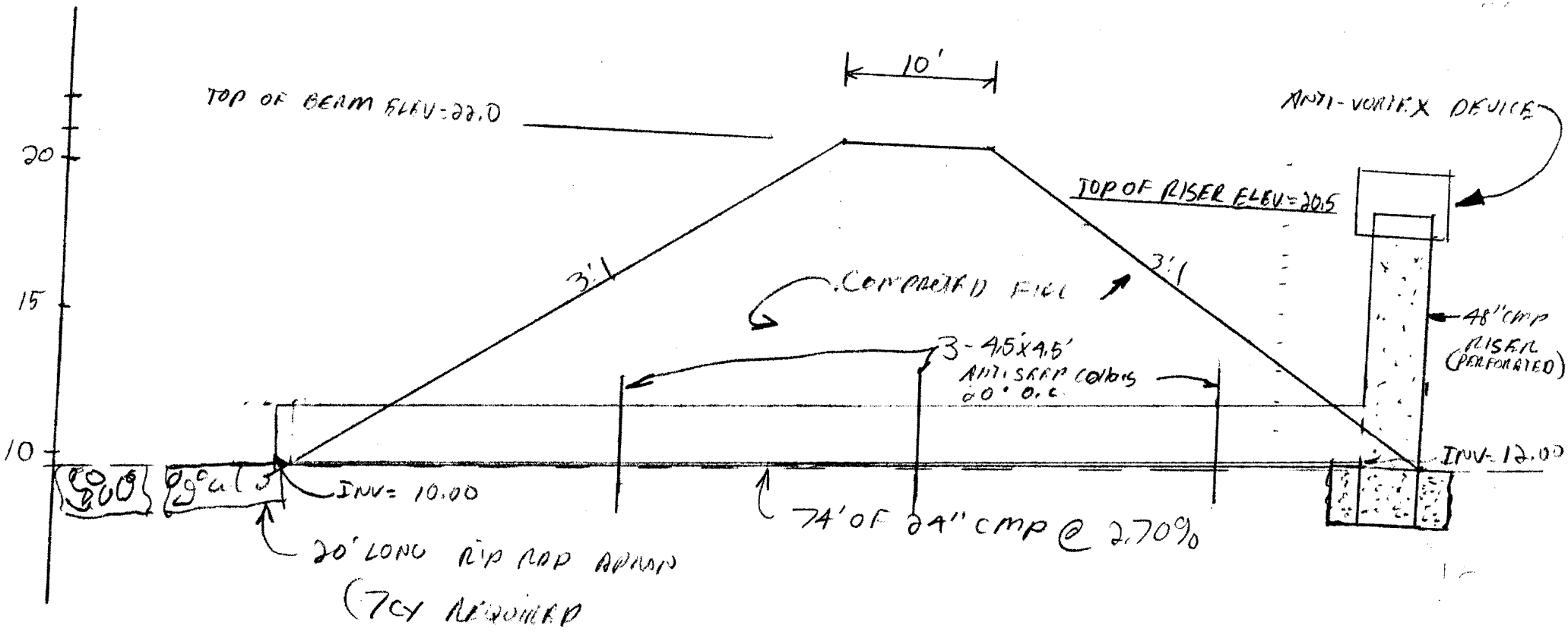
FROM TABLE 1.26b Q = 47.7 cfs > 32.6 cfs
H = 10.5' - 36 cfs ok

- ANTI-SEEP COLLARS

FROM PLATES 1.26K + 1.26L

USE 3 ANTI SEEP COLLARS 4.5' x 4.5' 20' APART

VDOT COPY



SCALE : 1"=10 HORIZ
1"=5' VERT

CROSS SECTION A-A
SEDIMENT BASIN #1

99121_GOVERNORS_LAND_GENERAL_FILE - 058

BASIN FOR SYSTEMS 4 & 2

I BASIN DESIGN

TOTAL DRAINAGE AREA = 17.36 + 2.9 = 20.26

∴ BASIN VOLUME REQD = $67 yd^3 (20.26) = 1357 yd^3 = 36{,}650 ft^3$

BASIN VOLUME IF WE PLACE RISER @ 22.5 CONTOUR
= LAKE AREA x 1/2 BASIN DEPTH @ THAT POINT
= 21,736.50 [1/2 (22.5 - 18.5)]
= $43{,}473 FT^3 > 36{,}650 FT^3$ ∴ ITS OK

∴ SPILLWAY TOP IS @ ELEV 22.5

CHECK LENGTH TO WIDTH RATIO
L = 350
We = 36,650/350 = 105
$\frac{L}{We} = \frac{350}{105} = 3.33 > 2$ ∴ ITS OK

II PRINCIPAL SPILLWAY DESIGN

THERE WILL BE NO EMERGENCY SPILLWAY FOR THIS BASIN. WE WILL DESIGN FOR A 10 YR PEAK RUNOFF RATE

Q_{10} = 3.8 + 18.7 = 22.50 cfs (OBTAINED FROM STORM SEWER CALCS FOR SYSTEM 4 & 2)

$Q_B = 25 cfs$ H = 5'

WE WILL DESIGN WITH A HEAD OF 1'

∴ FROM PLATE 1.26 H WE MUST USE A 30" RISER

$Q_B = 27 cfs$

THE DAM HIGH WATER MARK IS 22.5 + 1' HEAD = 23.5'

∴ THE LENGTH OF THE HORIZONTAL PIPE IS

L = DAM WIDTH + TWO 3:1 SIDE SLOPES
= 8' + [3(5) + 3(6)]
= 41'
USE 44' & PIPE OUTLET INVERT = 23.5 - 6 = 17.5

- HORIZONTAL PIPE
FROM TABLE 1.26 a USING H = 6.0'
TRY A 21" PIPE Q = 19.6 CF = 1.15 Q_m = 22.54 > 22.5
A 21" PIPE WORKS
WE WILL USE A 24" PIPE TO BE CONSERVATIVE

99121_GOVERNORS_LAND_GENERAL_FILE - 059

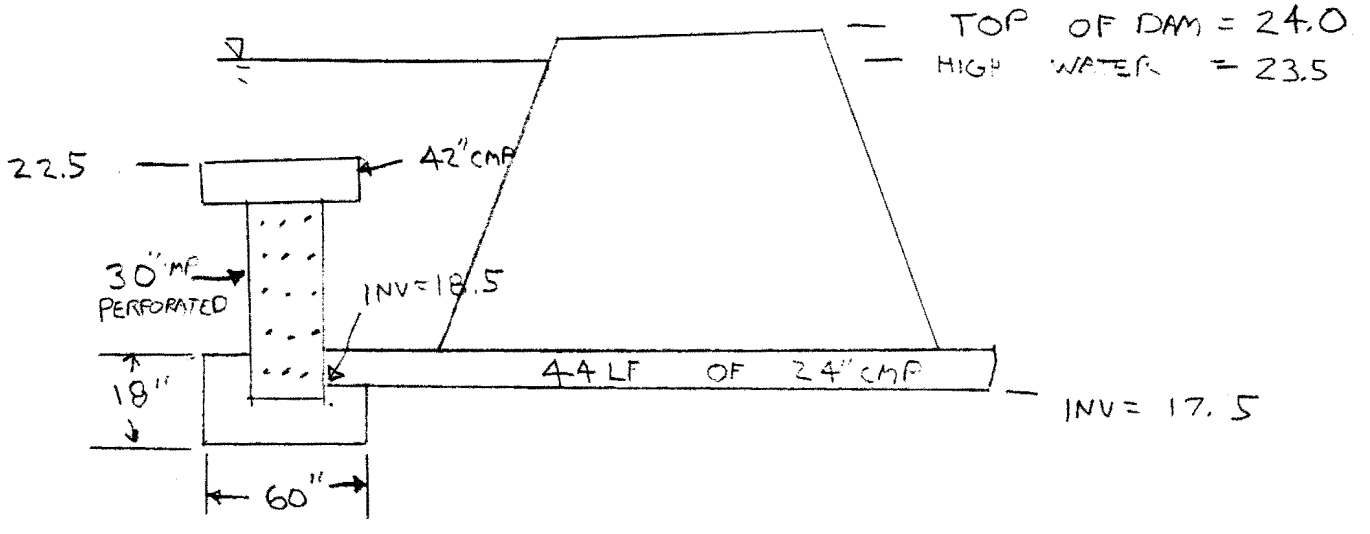
III NOW DESIGN THE ANTI-VORTEX TRASH RACK

FOR A 30" RISER CYLINDER DIA = 42"
CYLINDER THICKNESS = 16 gage
CYLINDER HEIGHT = 15"
SUPPORT BAR IS #6 REBAR
TOP THICKNESS = 14 ga

IV DESIGN ANTI SEEP COLLARS

$$L_s = 6\,(3+4)\left(1 + \frac{.025}{.25-.025}\right) = 38.9$$

∴ USE TWO 4' COLLARS (FROM PLATE 1.261)
15' ON CENTER



BASIN FOR SYSTEM #3

I: BASIN DESIGN

TOTAL DRAINAGE AREA = 19.89 + 18.73 = 38.62 AC

∴ BASIN VOLUME REQD = $67 yd^3 (38.62) = 2588 yd^3$
$= 69{,}864 FT^3$

BASIN VOLUME REQ. IF WE PLACE RISER @ 18.0 CONTOUR
= LAKE AREA X 1/2 BASIN DEPTH @ THAT POINT
= (4219.5) [1/2 (18 − 14)] = 84,390

∴ SPILLWAY TOP IS @ ELEV 18.0 67,512

CHECK LENGTH TO WIDTH RATIO
L = 1000
We = 69,864/1000

$\frac{L}{We} = \frac{1000}{69.87} = 14.3 > 2$ ∴ ITS OK

II PRINCIPAL SPILLWAY DESIGN

THERE WILL BE NO EMERGENCY SPILLWAY FOR THIS BASIN. WE WILL DESIGN FOR A 10 YR PEAK RUNOFF RATE

$Q_{10} = CIA + Q_{10}$ FOR SYSTEM 3
T_c = 31 MIN FROM DRAINAGE MANUAL L=1500
ΔH = 20.6

TO BE CONSERVATIVE, USE $T_c = 20$

∴ I = 4.7 FIG 1.5.1.5

WE WILL USE A C OF .35 WHICH IS CONSERVATIVE

∴ $Q_{10} = CIA + Q_{10_3} = .35 (4.7) 18 + 27.2$

$= 29.61 + 27.2 = 56.81$

WE WILL DESIGN WITH A HEAD OF 1.5

∴ FROM PLATE 1.26 H WE MUST USE A 48" RISER

THE DAM HIGH WATER MARK IS 18.0 + 1.5 = 19.5'
ADD A FREE BOARD OF .5' TO YEILD A DAM TOP OF 20.0'

HORIZONTAL PIPE
L = DAM WIDTH + TWO 3:1 SIDE SLOPES
= 8 + [3(5) + 3(5.5)]
= 8 + 31.5 = 39.5

∴ USE A 44' PIPE

∴ — HORIZONTAL PIPE
FROM TABLE 1.26a USING H = 4.5

TRY A 36" PIPE Q = 61.10 C_F = 1.06 Q_F = 64.77

∴ USE A 36" PIPE

III NOW DESIGN THE ANTI-VORTEX TRASH RACK

FOR A 48" RISER

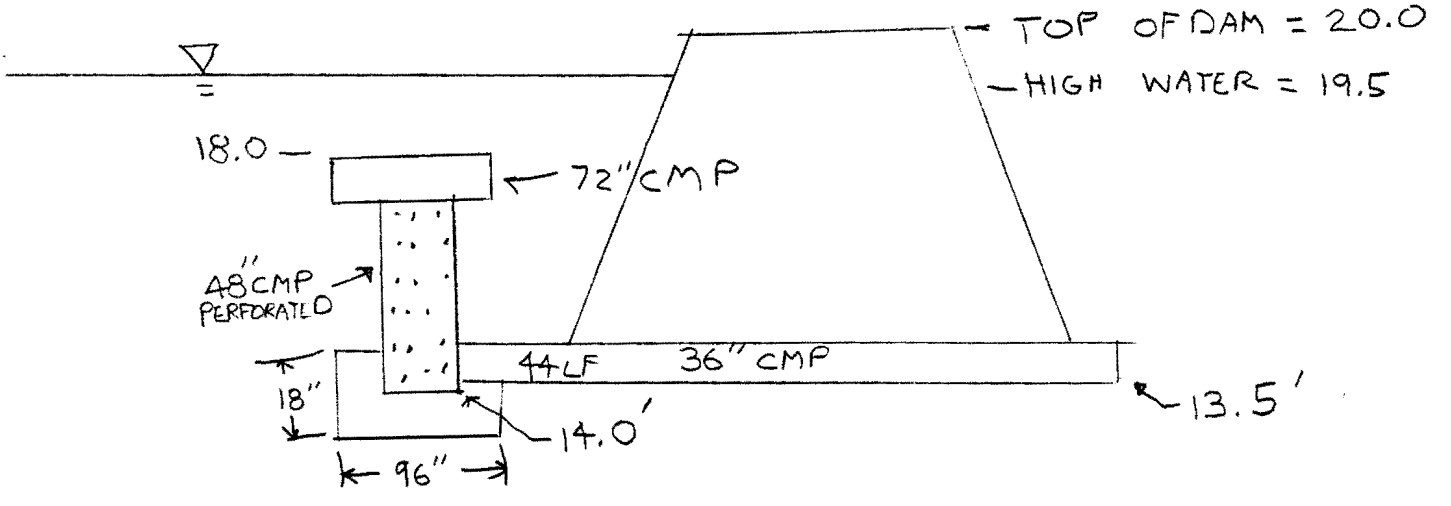
CYLINDER DIA = 72"
CYLINDER THICKNESS = 12 gage
CYLINDER HEIGHT = 21"
SUPPORT BAR IS = 1¼" PIPE
TOP THICKNESS = 10 ga

IV DESIGN ANTISEEP COLLARS

$$L_S = 4(3+4)\left(1 + \frac{.011}{0.25 - .011}\right)$$

L_S = 29.29

∴ USE TWO 4.5' ANTI-SEEP COLLARS
11' ON CENTER



BASIN # 6

I BASIN DESIGN

TOTAL DRAINAGE AREA = 27.86

∴ BASIN VOLUME REQ'D = 67 yd³ (27.86) = 1866 yd³ = 50,398 FT³

BASIN VOLUME IF WE PLACE RISER @ 21.5' CONTOUR
= LAKE AREA × ½ DEPTH @ THAT POINT
= 48285 [½ (21.5 − 18)]
= 84,498 FT³

∴ SPILLWAY TOP IS @ ELEV 21.5

CHECK LENGTH TO WIDTH RATIO
L = 450

We = 50,398/450 = 112

$\frac{L}{We} = \frac{450}{112} = 4.0$

II PRINCIPAL SPILLWAY DESIGN

THERE WILL BE NO EMERGENCY SPILLWAY FOR THIS BASIN, WE WILL DESIGN FOR A 10 YR PEAK RUNOFF RATE

Q_{10} = 33.5 (OBTAINED FROM STORM SEWER CALCS FOR BASIN 6)

WE WILL DESIGN WITH A HEAD OF 1'

∴ FROM PLATE 1.26 H WE MUST USE A 42" ~~36"~~ RISER

THE DAM HIGH WATER MARK IS 21.5+1 = 22.5
ADD .5' FOR FREE BOARD TOP DAM = 23.0
∴ THE LENGTH OF THE HORIZONTAL PIPE IS

L = DAM WIDTH + TWO 3:1 SIDE SLOPES
L = 8' + [3(5) 3(5.5)]

L = 39.5
USE 42 LF & PIPE OUTLET INVERT = 17.5'

- HORIZONTAL PIPE
FROM TABLE 1.26 a USING H = 5.0
TRY A 30" PIPE Q = 42.1 CF = 1.12 Q_F = 47.15 > 33.5

∴ WE WILL USE A 30" HORIZONTAL PIPE

III. NOW DESIGN THE ANTI-VORTEX RACK

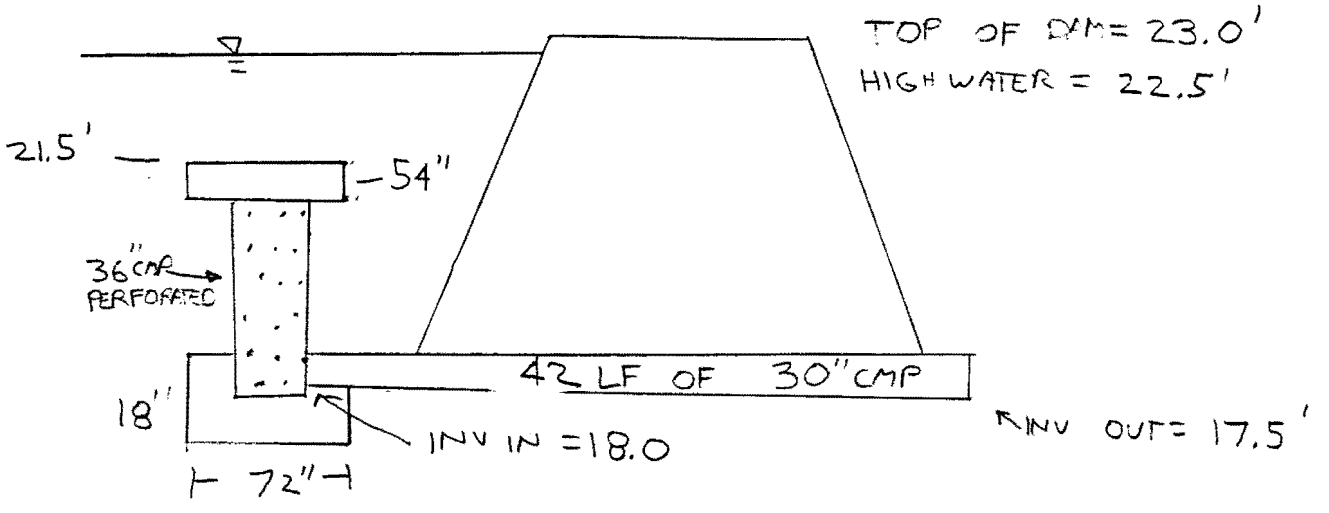
: FOR A 36" RISER CYLINDER DIA = 5.4"
CYLINDER THICKNESS = 14 ga
CYLINDER HEIGHT = 17"
SUPPORT BAR IS #8 REBAR
TOP THICKNESS = 12 ga

IV ANTISEEP COLLARS

$$L_s = 4.5\,(3+4)\left(1 + \frac{.0125}{(.25-.0125)}\right)$$

$$L_s = 33.16$$

USE TWO 4.0' COLLARS FROM PLATE 1.261
11' ON CENTER



DETENTION/SEDIMENT BASIN #7

(1)

JN 7173
GAM 12/89

- DESIGN BASIN TO DETAIN THE 2yr POST DEV. STORM AND RELEASE AT THE 2yr PRE-DEV. STORM RATE

PRE-DEVELOPMENT D.A. = 22.2 Ac

POST DEVELOPMENT D.A = 26.2 Ac

PRE-DEVELOPMENT

$C = 0.25$ $t_c = 35$ min

$I_2 = \frac{a_2}{b_r + t_c}$ $a_2 = 126.3$ $b_r = 17.3$

$I_2 = \frac{126.3}{17.3+35} = 2.41$ IN/HR

$Q_2 = 0.25(2.41)\,22.2 = \underline{13.4 \text{ cfs}} = q_o$ => ALLOWABLE DETENTION BASIN DISCHARGE

POST-DEVELOPMENT

$C_{comp} = 0.30$ $t_c = 31$ min

D.A. = 26.2 Ac

- CRITICAL STORM DURATION = T_c

$$T_c = \sqrt{\frac{2CA_a(b - t_c/4)}{q_o}} - b$$

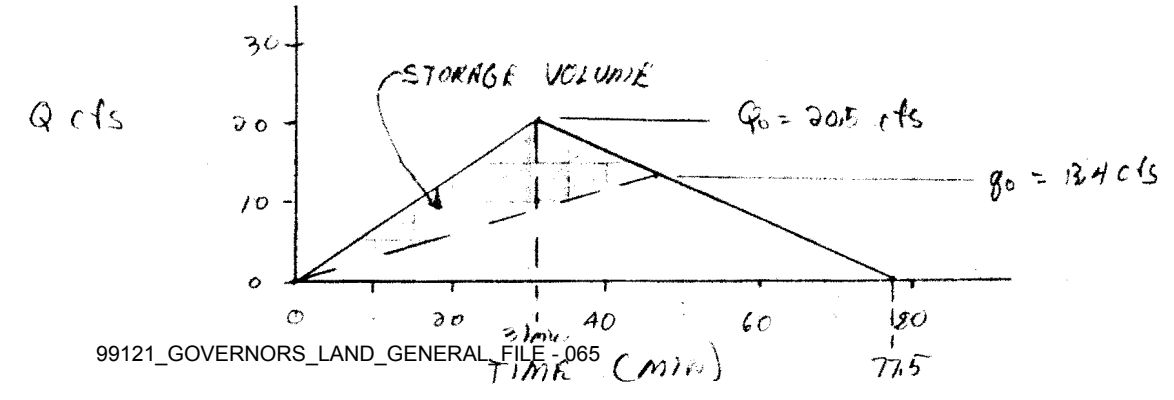
$$T_c = \sqrt{\frac{2(0.30)26.2(126.3)(17.3 - 7.75)}{13.4}} - 17.3 = 20.3 \text{ min}$$

SINCE $T_c < t_c$ SET $T_c = t_c = 31$ min

I_2 POST $= \frac{126.3}{17.3+31} = 2.61$ IN/HR

$Q_2 = 0.3(2.61)\,26.2 = \underline{20.5 \text{ cfs}} = Q_o$

CALCULATE STORAGE VOLUME



BASIN #7 CONT.

(2)

JN 7173
GAM

- STORAGE VOLUME = $\frac{20.5 \times 77.5 \times 60}{2} - \frac{13.4 \times 77.5 \times 60}{2}$

= 47,663 cf − 31,155 cf

= 16,508 cf = 611 CY = DETENTION STORAGE VOLUME.

- SEDIMENT STORAGE VOLUME REQD. = 67 CY/ac × 26.2 Ac

= 1755 CY.

VOLUME REQUIRED = 2100 CY.

TOP OF RISER ELEV. = 20.50
INV. OF POND AT DAM = 15.50

C = 0.30, I_{10} = 3.56 in/hr, A = 26.2 Ac.

Q_{10} = 0.30 (3.56) 26.2 = 27.98 cfs

- USE INADEQUATE CULVERT FOR DETENTION CONTROL STRUCTURE.

USE 1 JOINT 12" RCP CULVERT FOR CONTROL STRUCTURE FROM TABLE 1.26 b Q = 10.0 cfs

INV IN = 15.50
INV OUT = 15.40

H = 5'

- USE 24" CMP PERFORATED RISER FOR SEDIMENT BASIN PRINCIPAL SPILLWAY ON INADEQUATE CULVERT

TOP ELEV = 20.50

- LET TOP OF TIMBER DAM ACT AS EMERGENCY SPILLWAY WEIR. OVERFLOW WILL SPLASH ONTO RIP RAP APRON (SEE PLANS).

GOVERNOR'S L
7173
3-26-90
ELA

SEDIMENT TRAP FOR SYSTEM #9

VOLUME REQUIRED = 67 (13.64) = 914 cy = 27,674 FT^3

WE WILL ESTIMATE TRAP VOLUME BY USE OF C

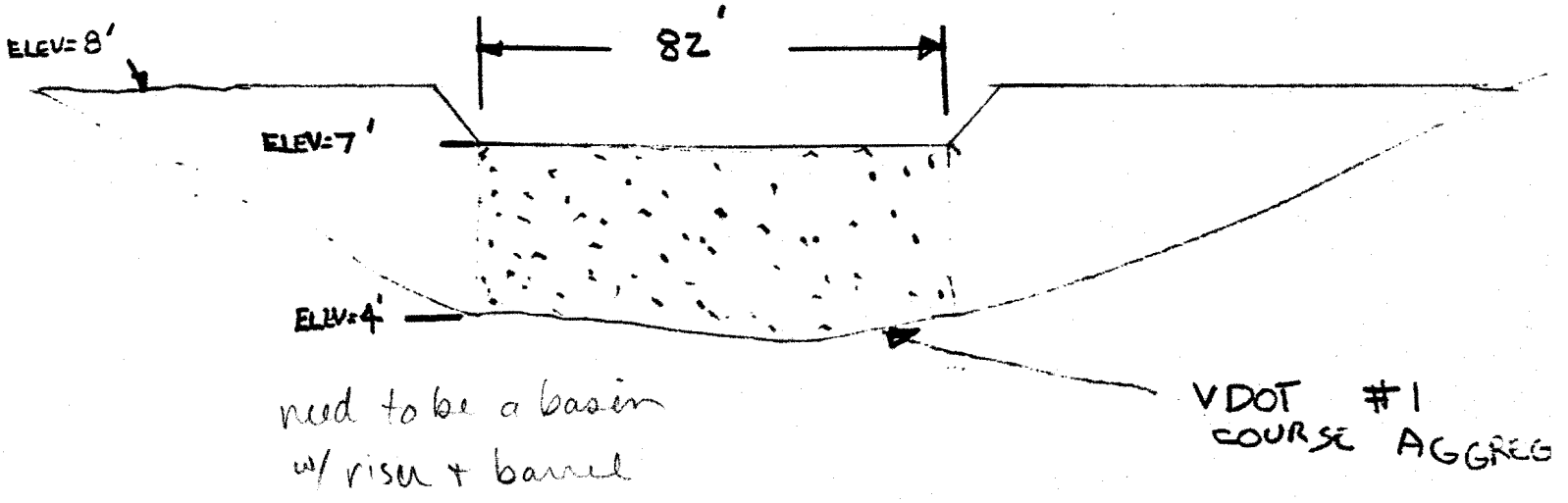
ELEV	AREA	ΔH	ΔV	ACCUM V
4.0	0			
5	7854	1	3927	3927
6	15278	1	11566	15493
6.5	16350	.5	7907	23400
7	20348	.5	9175	32575

∴ WE NEED THE STORAGE VOLUME AT THE 7' CONTOUR ∴ $H_o = 3'$

LENGTH OF OUTLET = 6 (DRAINAGE AREA)
= 6(13.64) = 81.84'

BECAUSE $H_o = 3'$ $H = 4'$ & WIDTH @ TOP = 3'

THE WIDTH @ DAM BOTTOM = 3 + 2(4)(2) = 19'



REPORT OF

SUBSURFACE EXPLORATION
AND GEOTECHNICAL ENGINEERING ANALYSIS

GOVERNOR'S LAND DAMS - EMBANKMENT EVALUATION
JAMES CITY COUNTY, VIRGINIA

ECS PROJECT NO. 6221

FOR

Mr. Jim Bennett, P.E.
Dominion Land Management Co.
P.O. Box 26532
Richmond, Virginia 23261

December 31, 2000

December 31, 2000

Mr. Jim Bennett, P.E.
Dominion Land Management Co.
P.O. Box 26532
Richmond, Virginia 23261

ECS Project No. 6221

RE: Governor's Land Dams - Embankment Evaluation
James City County, Virginia

Dear Mr. Bennett:

As requested, ECS, Ltd. conducted a subsurface soils exploration and engineering evaluation of eight (8) existing "earthen type" dams located within the Governor's Land Development in James City County, Virginia. The following dams were included in this evaluation:

- Fowler's Lake (JR018)
- Horne's Lake (JR022)
- #12 Tee Box Dry Detention Pond (JR025)
- Travis Pond (JR016)
- Whittaker's Lake (JR019)
- Bennett's Pond (JR021)
- Founder's Hill Pond (JR034, RIVER OAKS NORTH BMP #3)
- Wingfield Lake (JR017)

Included in Appendix I of this report are a boring location diagram (from site drawings provided by AES and/or WEG), the boring logs with a subsurface profile (by ECS), and the dam cross-section/schematic (from initial construction drawings provided by AES and/or WEG), for each dam referenced above.

The purpose of this subsurface exploration and engineering evaluation was to determine the composition of the existing dam and ascertain the nature of the subsurface soils underlying the dam. The data collected from the soil test borings was utilized to evaluate the general stability and condition of the existing dam. The findings and conclusions discussed herein are based on the results of our site reconnaissance, soil test borings, laboratory test results, and our understanding of the required dam construction.

It is our understanding that AES will perform an as-built survey with regard to slope gradient(s), elevation(s), and spillway structures.

SCOPE OF STUDY:

[Subsurface Exploration]:

The subsurface exploration was conducted by performing three (3) soil test borings along the approximate longitudinal centerline of each existing dam. The borings were typically extended to depths of 15 feet at each approximate shoulder and to a depth of 30 feet near the center of the dam, except as noted herein. Whittaker's Lake Dam had a 40-foot deep center boring and #12 Tee Box Dry Detention Pond had a 20-foot deep center boring. The Founder's Hill Detention Pond had borings extended to depths of 24-feet at the center and 16-feet at each approximate shoulder, below existing surface elevations.

The borings were performed with a truck mounted drill rig, which utilized mud-rotary procedures to advance the boreholes. Drilling fluid was used in this process. Soil sampling was continuous throughout the depth of the borings. At completion of the drilling operations, the boreholes were backfilled with the drilling fluid ("Bentonite Slurry").

Representative soil samples were obtained by means of the split-barrel sampling procedure in accordance with ASTM Specification D-1586. In this procedure, a 2-inch outside diameter (O.D.), split-barrel sampler is driven into the soil a distance of 24 inches by a 140-pound hammer falling 30 inches. The number of blows required to drive the sampler through a 12 inch interval is termed the Standard Penetration Test (SPT) value and is indicated for each sample on the boring logs. This value can be used as a qualitative indication of the in-place relative density of cohesionless soils and relatively consistency of cohesive soils. This indication is qualitative, since many factors can significantly affect the penetration resistance value and prevent a direct correlation between drill rigs, drilling procedures, and hammer rod sampler assemblies.

After recovery, representative portions of each sample were removed from the split-barrel sampler and sealed in glass jars. The samples were taken to our laboratory in Richmond, Virginia for visual classification and laboratory testing. Visual classifications were performed on the basis of texture and plasticity in accordance with the Unified Soil Classification System (USCS). A brief description of the USCS and Reference Notes for Boring Logs are included in Appendix III.

[Laboratory Analysis]:

Representative soil samples collected from the soil test borings were subjected to laboratory testing for the purposes of substantiating the visual classifications and to determine the soil's pertinent engineering properties. Laboratory testing included natural moisture content determination, Atterberg Limits tests, and grain size analysis (percent passing the #200 sieve). The results of the laboratory testing are included in Appendix II of this report.

EXISTING DAM CHARACTERISTICS:

In general, each dam evaluated as part of this study is classified as a Zoned Earthen Dam. A zoned dam is defined by an inner core (typically a relatively impervious clay material) and an outer shell (typically a more granular or sandy material). It is our understanding that topography information will be provided by the project Civil Engineer (AES, Inc.), as part of their "as-built" survey.

The surface description of each dam is based on observations by ECS personnel during the drilling activities (October/November 2000).

- **Fowler's Lake Dam**

It is our estimation that the existing dam at Fowler's Lake is approximately 200 feet long. The front (pond) side of the dam is vegetated with grass. The topography of the crest of the dam is undulating, presumably for aesthetic reasons. The back (downstream) side of the dam was heavily vegetated with thick underbrush and small diameter trees.

- **Horne's Lake Dam**

It is our estimation that the existing dam at Horne's Lake is approximately 700 feet long. The front (pond) side of the dam is vegetated with grass. The topography of the crest of the dam is relatively flat. The back (downstream) side of the dam was heavily vegetated with thick brush and small diameter trees.

- **#12 Tee Box Dry Detention Pond**

It is our estimation that the existing dam at the dry detention pond at the #12 Tee Box is approximately 175 feet long. The front (pond) side of the dam is vegetated with grass and a few small trees. The topography of the crest of the dam is relatively flat with an asphalt golf cart path traversing along the centerline of the dam. The back (downstream) side of the dam was grass covered.

- **Travis Pond Dam**

It is our estimation that the existing dam at Travis Pond is approximately 200 feet long. The front (pond) side of the dam was vegetated with manicured grass. The topography of the crest of the dam is relatively flat. The back (downstream) side of the dam was vegetated with manicured grass.

- **Whittaker's Lake Dam**

It is our estimation that the existing dam at Whittaker Lake is approximately 400 feet long. The front side of the dam was vegetated with grass. The topography of the crest of the dam is relatively flat. The backside of the dam was heavily vegetated with underbrush and small trees.

- **Bennett's Pond Dam**

It is our estimation that the existing dam at Bennett's Pond is approximately 330 feet long. The front side of the dam was lightly vegetated with tall grass. The topography of the crest of the dam is relatively flat. The backside of the dam is vegetated with manicured grass.

- **Founder's Hill Pond Dam**

It is our estimation that the existing dam at Founder's Hill detention pond is approximately 85 feet long. The front side of the dam was lightly vegetated with tall grass. The topography of the crest of the dam is relatively flat. The backside of the dam is vegetated with manicured grass. Organic debris was observed partially blocking the spillway pipe on the backside of the dam, with 2 to 3 inches of water in the pipe.

- **Wingfield Lake Dam**

Plan and topography information was not available for Wingfield Lake Dam; however, from the site reconnaissance it is estimated that the dam is approximately 300 feet long. The front side of the dam was vegetated with grass. The topography of the crest of the dam is relatively flat. The backside of the dam is heavily wooded with underbrush and small to medium trees.

RESULTS OF THE BORINGS AND LABORATORY TESTING:

The following discussions provide a general overview of the composition of each dam and the underlying subsurface conditions.

It should be noted that mud-rotary drilling procedures involve the use of a "bentonite slurry" that temporarily seals the borehole, and therefore, groundwater readings are difficult to obtain during drilling. In this regard, the presence of water below the surface is determined from visual inspection of each soil sample obtained from the split-spoon sampler. Actual soil moisture and/or the water conditions within each soil strata can be obtained from the boring logs. Be advised that the water level referenced at completion of the drilling (lower left corner of the boring logs) may not accurately represent the static water table level. Groundwater commentary (provided below) for each dam is based on the visual inspection of each soil sample. It is common for most subsurface soils to possess moist to wet properties. Soils classified as very wet to saturated typically indicate the presence of the static water table.

It should also be noted that a majority of the fill samples evaluated contained some organic debris. Typically, the organic debris was in the form of small root and wood material (in trace amounts), which is considered typical in most cases when fill for dam embankments is obtained from on-site or nearby borrow sources where shallow excavating and/or scraping operations are performed. The presence of this organic material, in small quantities or trace amounts, is considered acceptable.

- **Fowler's Lake Dam**

The results of our soil test borings and laboratory testing indicates that the existing dam, at the areas and depths sampled, is generally comprised of fill material to depths of about 8 to 19 feet below top of dam surface. The fill layers, which comprise the top shell and the inner core, are classified as Clayey SAND (SC), Silty SAND (SM), and Fat CLAY (CH). The sandy soils are loose in density and the clay soils are very soft to very stiff in consistency. The transitions from the fill material into the natural original soils were relatively clean. In this regard, it appears that proper steps were taken to remove heavy topsoil and/or thick vegetation prior to fill placement. The transition between the fill (clay core) and the original ground surface in boring B-2, which was performed near the center of the dam, was marked by the presence of a layer of orangish brown, Sandy Lean CLAY (CL). This stratum was observed between the approximate depths of 14 feet and 18 feet, and appears to represent the original ground surface.

The natural soils underlying the fill material generally consist of erratic deposits of medium dense to dense Silty and Clayey SANDS (SM, SC and SP) and soft to very stiff Sandy Lean CLAY (CL).

Significant moisture was not observed within the dam fill material. Groundwater, however, was encountered in boring B-3 at a depth of about 24 feet below top of the dam surface. The presence of water at this depth does not present a problem with regard to the stability of the dam.

- **Horne's Lake Dam**

The results of our soil test borings and laboratory testing indicates that the existing dam, at the areas and depths sampled, is generally comprised of fill material to depths of about 12 to 16 feet below top of dam surface. The fill layers, which comprise the top shell and the inner core, are classified as Sandy Lean CLAY (CL), Sandy Fat CLAY with organics (OH) and Fat CLAY (CH). The clayey soils are soft to very stiff in consistency. The transitions from the fill material (clay core) into the natural original soils were relatively clean. In this regard, it appears that proper steps were taken to remove heavy topsoil and/or thick vegetation prior to fill placement. The transition between the fill and the original ground surface in boring B-2, which was performed near the center of the dam, was marked by the presence of a layer of orangish brown and gray, Clayey SAND (SC). This stratum was observed between the approximate depths of 16 feet and 20 feet, and appears to represent the original ground surface.

The natural soils underlying the fill material generally consist of erratic deposits of loose to medium dense Silty and Clayey SANDS (SM and SC) and stiff Fat CLAY (CH).

Significant moisture was not observed within the dam fill material.

- **#12 Tee Box Dry Detention Pond**

The results of our soil test borings and laboratory testing indicates that the existing dam, at the areas and depths sampled, is generally comprised of fill material to depths of about 8 to 12 feet below top of dam surface. An asphalt golf cart path traversed the centerline of the dam consisting of 4 inches of asphalt and 2 inches of stone. The fill layers, which comprise the top shell and the inner core, are classified as Fat CLAY (CH). The clay soils are soft to stiff in consistency. The transitions from the fill material (clay core) into the natural original soils were relatively clean along the shoulders of the dam (borings B-1 and B-3), although some organic material was encountered in the natural soil in B-1. Overall, it appears that proper steps were taken to remove heavy topsoil and/or thick vegetation prior to fill placement. The transition between the fill and the original ground surface in boring B-2, which was performed near the center of the dam, was marked by the presence of a layer of orangish brown and gray, Sandy Lean CLAY (CL). This stratum was observed between the approximate depths of 10 feet and 14 feet, and appears to represent the original ground surface.

The natural soils underlying the fill material generally consist of erratic deposits of medium dense Clayey SANDS (SC), soft to very stiff Sandy Lean CLAY (CL) and stiff Fat CLAY (CH).

Significant moisture was not observed within the dam fill material.

- **Travis Pond Dam**

The results of our soil test borings and laboratory testing indicates that the existing dam, at the areas and depths sampled, is generally comprised of fill material to depths of about 15 to 18 feet below top of dam surface. The fill layers, which comprise the top shell and the inner core, are classified as Fat CLAY (CH) and clayey SAND (SC). The clay soils are soft to very stiff in consistency. The sand soils are loose in density. The transitions from the fill material (clay core) into the natural original soils were not determined along the shoulders of the dam (borings B-1 and B-3). With regard to the center boring (B-2), it appears that proper steps were taken to remove heavy topsoil and/or thick vegetation prior to fill placement. The transition between the fill and the original ground surface in boring B-2, which was performed near the center of the dam, was marked by the presence of a layer of orangish brown and gray, Clayey SAND (SC). This stratum was observed between the approximate depths of 13 feet and 28 feet, and appears to represent the original ground surface.

The natural soils underlying the fill material generally consist of erratic deposits of medium dense Clayey SANDS (SC) and Silty SAND with Gravel (SP-SM).

Significant moisture was not observed within the dam fill material. Groundwater was encountered in boring B-2 at a depth of about 23 feet below top of the dam surface. The presence of water at this depth does not present a problem with the stability of the dam.

- **Whittaker's Lake Dam**

The results of our soil test borings and laboratory testing indicates that the existing dam, at the areas and depths sampled, is generally comprised of fill material to depths of about 15 to 28 feet below top of dam surface. The fill layers, which comprise the top shell and the inner core, are classified as Fat CLAY (CH) and Sandy Lean CLAY (CL). The clay soils are soft to very stiff in consistency. The transitions from the fill material into the natural original soils were not determined along the shoulders of the dam (borings B-1 and B-3). With regard to the center boring (B-2), it appears that proper steps were taken to remove heavy topsoil and/or thick vegetation prior to fill placement. The transition between the fill (clay core) and the original ground surface in boring B-2, which was performed near the center of the dam, was marked by the presence of a layer of orangish brown and tan, Poorly-Graded SAND (SP). This stratum was observed between the

approximate depths of 28 feet and 33 feet, and appears to represent the original ground surface.

The natural soils underlying the fill material generally consist of erratic deposits of medium dense Poorly Graded SAND (SP), soft to medium stiff Sandy Elastic SILT (MH), and medium stiff Sandy Lean CLAY (CL).

Significant moisture was not observed within the dam fill material.

- **Bennett's Pond Dam**

The results of our soil test borings and laboratory testing indicates that the existing dam, at the areas and depths sampled, is generally comprised of fill material to depths of about 13.5 to 15 feet below top of dam surface. The fill layers, which comprise the top shell and the inner core, are classified as Fat CLAY (CH), sandy SILT (ML), and sandy Lean CLAY (CL). The clay and silt soils are soft to stiff in consistency. The transitions from the fill material into the natural original soils were not determined along the shoulders of the dam (borings B-1 and B-3). With regard to the center boring (B-2), it appears that proper steps were taken to remove heavy topsoil and/or thick vegetation prior to fill placement. The transition between the fill material (clay core) and the original ground surface in boring B-2, which was performed near the center of the dam, was marked by the presence of a layer of orangish brown, Silty SAND (SM). This stratum was observed between the approximate depths of 13.5 feet and 18 feet, and appears to represent the original ground surface.

The natural soils underlying the fill material generally consist of erratic deposits of very loose Clayey SANDS (SC), loose Silty SAND (SM), very soft to soft Fat CLAY (CH), and soft, organic, Elastic SILT (OH).

Significant moisture was not observed within the dam fill material. Groundwater was encountered in boring B-2 at a depth of about 16 feet below top of the dam surface. The presence of water at this does not present a problem with the stability of the dam.

- **Founder's Hill Dam**

The results of our soil test borings and laboratory testing indicates that the existing dam, at the areas and depths sampled, is generally comprised of fill material to depths of about 4.0 to 8.0 feet below top of dam surface. The fill layers, which comprise the top shell and the inner core, are classified as Fat CLAY (CH) and clayey SAND (SC). The clay soils are medium stiff to very stiff in consistency, and the sand soils are loose to medium dense. The transitions from the fill material into the natural original soils were relatively clean. In this regard, it appears that proper steps were taken to remove heavy topsoil

and/or thick vegetation prior to fill placement. The transition between the fill material (clay core) and the original ground surface in boring B-2, which was performed near the center of the dam, was marked by the presence of a layer of orangish brown and gray, Fat CLAY with fine sand (CH). This stratum was observed between the approximate depths of 8.0 feet and 12.0 feet, and appears to represent the original ground surface.

The natural soils underlying the fill material generally consist of deposits of loose to medium dense Silty SAND (SM), very soft to medium stiff Fat CLAY (CH), and soft to stiff sandy CLAY (CL).

Significant moisture was not observed within the dam fill material. Groundwater was encountered in borings B-2 and B-3 at depths of about 17 feet and 5 feet below top of the dam surface, respectively. The presence of water at this depth indicates that there is seepage below the dam. The normal pool elevation for this dam is relatively shallow; therefore, the water encountered at these depths does not present a problem with the stability of the dam.

- **Wingfield Lake Dam**

The results of our soil test borings and laboratory testing indicates that the existing dam, at the areas and depths sampled, is generally comprised of fill material to depths of about 15 to 30 feet below top of dam surface. The fill layers, which comprise the top shell and the inner core, are classified as Fat CLAY (CH). The clay soils are soft to medium stiff in consistency. The transitions from the fill material into the natural original soils were not determined along the shoulders of the dam (borings B-1 and B-3). With regard to the center boring (B-2), it appears that proper steps were taken to remove heavy topsoil and/or thick vegetation prior to fill placement. The transition between the fill material (clay core) and the original ground surface in boring B-2, which was performed near the center of the dam, was marked by the presence of a layer of bluish gray Fat CLAY with fine sand (CH). This stratum was observed between the approximate depths of 30.0 feet and 34.0 feet, and appears to represent the original ground surface.

The natural soils underlying the fill material generally consist of deposits of Fat CLAY (CH), clayey SAND (SC), fine to coarse SAND trace silt (SP), and sandy Lean CLAY (CL).

Significant moisture was not observed within the dam fill material.

ENGINEERING EVALUATION AND CONCLUSIONS:

Based on the results of our soil test borings and laboratory testing, it is our opinion that the existing dams ***satisfy*** the current state dam design criteria, and/or other commonly accepted dam design criteria, with regard to embankment composition (material type and density) and overall stability. In general, the dams are classified as Zoned Earthen Dam structures, comprised predominantly of an impervious clay core with clayey and sandy soils comprising the shell.

General maintenance, however, should be provided for each dam on a routine basis. This should include annual inspections for surface erosion or vertical and horizontal cracking in the embankment. In addition, the toe drain and stilling basin should be inspected for erosion and loss of rip-rap, seepage beyond the toe drain, or increased flow or movement of fines through the drains. All large bushes and trees should be removed from the embankment face (both front and back sides), and animal burrows or other holes/cavities along the embankment should be thoroughly inspected and filled as appropriate.

ECS, Ltd. has appreciated the opportunity to be of service to you on this project. Please contact this office should you have any questions or need further assistance.

Respectfully,

ENGINEERING CONSULTING SERVICES, LTD.

David J. Schlotterer
Staff Geologist/Project Manager

COMMONWEALTH OF VIRGINIA
DAVID E. STINNETTE
NO. 028419
PROFESSIONAL ENGINEER

David E. Stinnette, P.E.
Engineering Services Manager

Copies: (3) Jim Bennett (Dominion Land Management Co.)

GEOTECH/REPORTS/6221

Appendicies

I. **Boring Location Diagram, Boring Logs, Subsurface Profile, Dam Schematic:**

- Fowlers Lake
- Horne's Lake
- #12 Tee Box Dry Detention Pond
- Travis Pond
- Whittaker's Lake
- Bennett's Pond
- Founder's Hill Detention Pond
- Wingfield Lake

I. **Summary of Laboratory Test Data**

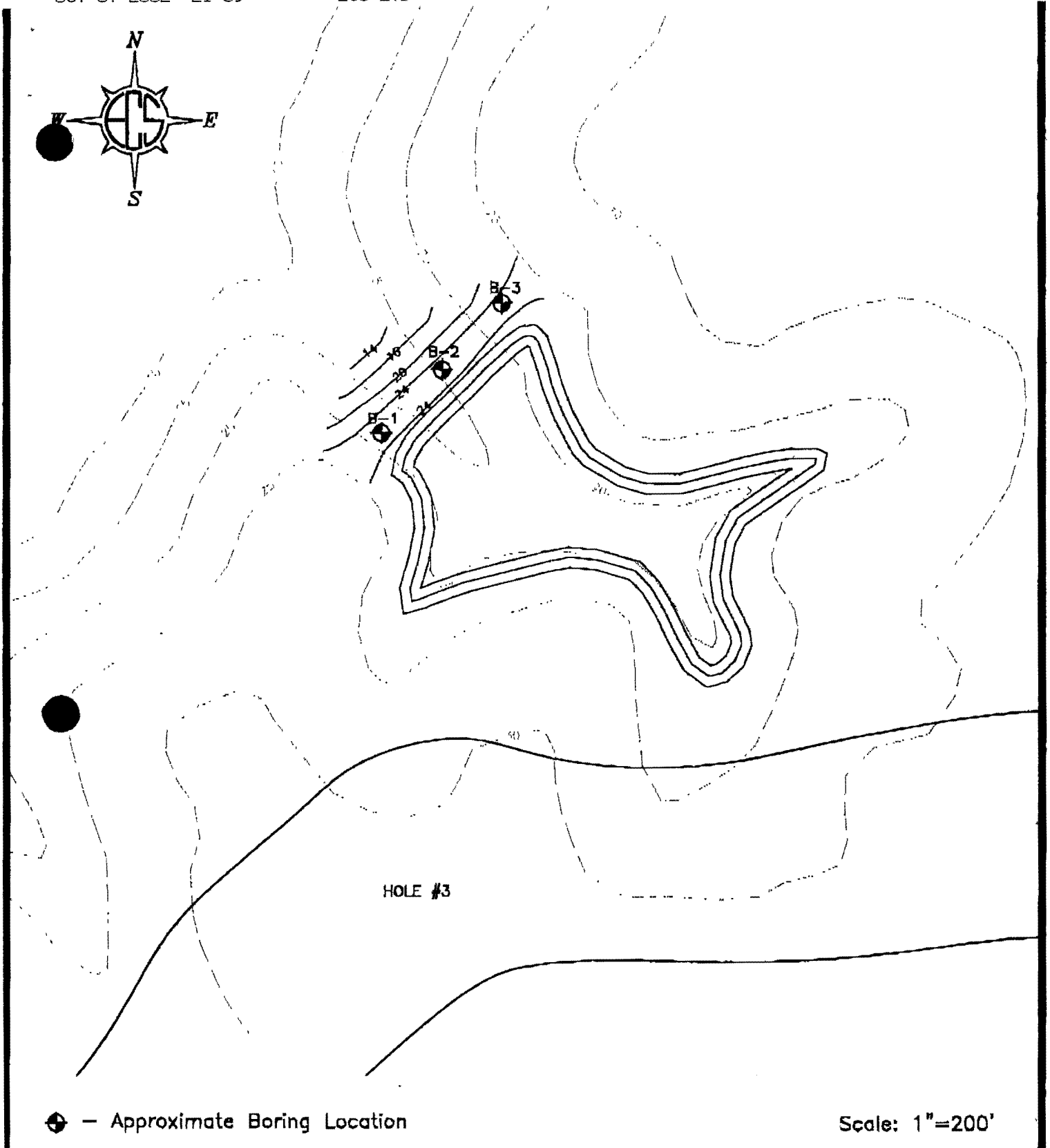
II. **Unified Soil Classification System and Reference Notes for Boring Logs**

Appendix I

Boring Location Diagram, Boring Logs, Subsurface Profile, Dam Schematic:

- Fowlers Lake
- Horne's Lake
- #12 Tee Box Dry Detention Pond
- Travis Pond
- Whittaker's Lake (Dam Schematic Not Available)
- Bennett's Pond
- Founder's Hill Detention Pond
- Wingfield Lake (Dam Schematic Not Available)

Fowler's Lake



PREPARED FOR:

DOMINION LAND MANAGEMENT

ECS LTD
ENGINEERING CONSULTING SERVICES, LTD

BORING LOCATION DIAGRAM

GOVERNOR'S LAND
FOWLERS LAKE
JAMES CITY COUNTY, VIRGINIA

ECS, LTD. PROJECT NO. 6221

CLIENT	JOB #	BORING #	SHEET
DOMINION LAND MANAGEMENT CO.	6221	B-1	1 OF 1

PROJECT NAME: GOVERNOR'S LAND DAMS (EMBANKMENT EVAL.)

ARCHITECT-ENGINEER: AES, INC.

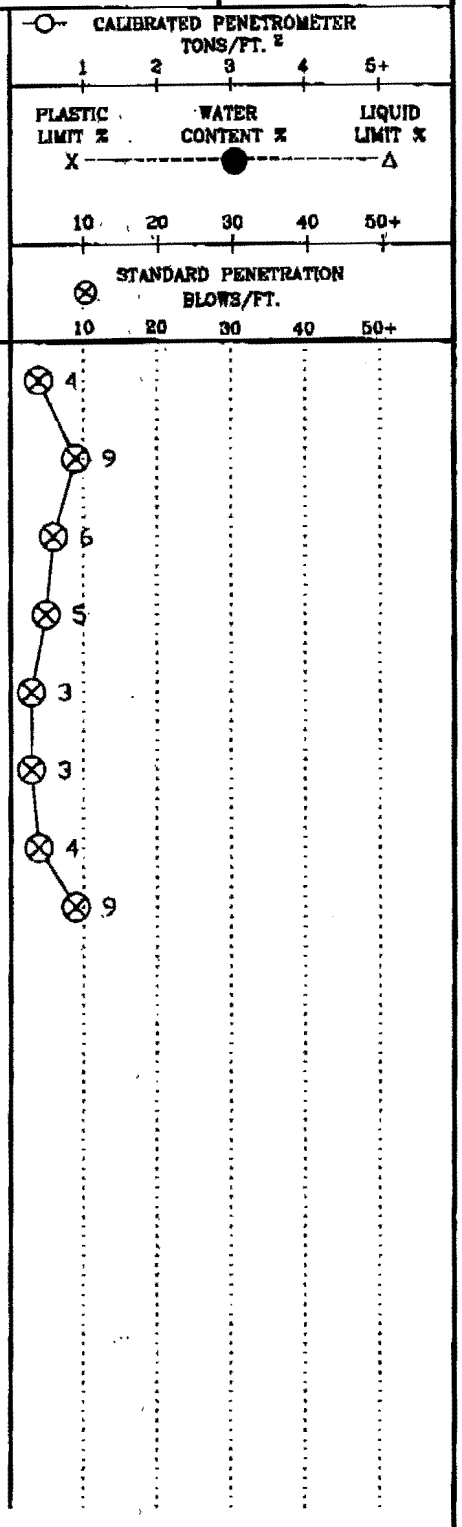
SITE LOCATION: FOWLER'S LAKE DAM, JAMES CITY COUNTY, VA

ENGLISH UNITS

SURFACE ELEVATION 25.10

SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL
1	SS	24	24	Topsoil-4", (FILL)
2	SS	24	24	Fat CLAY With Fine Sand, Grayish Brown and Orangish Brown, Moist, Soft, (CH-FILL)
3	SS	24	24	Silty Fine to Medium SAND, Bluish Gray, Wet, Loose, (SM-FILL)
4	SS	24	24	Sandy Fat CLAY, Bluish Gray, Wet, Soft, (CH-FILL)
5	SS	24	24	Fat CLAY With Fine Sand, Bluish Gray, Wet, Soft, (CH-FILL)
6	SS	24	24	Fine Sandy Fat CLAY, Orangish Brown and Bluish Gray, Moist, Very Soft, (CH-FILL)
7	SS	24	24	
8	SS	12	12	Fine Sandy Lean CLAY, Orangish Brown, Moist, Soft, (CL)

END OF BORING @ 15.0'



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU THE TRANSITION MAY BE GRADUAL

DRY WS OR TD	BORING STARTED 10-23-00	TOPSOIL DEPTH 4"
WL(AB) WL(AC)	BORING COMPLETED 10-23-00	CAVE IN DEPTH ●
WL	RIG FISHBURNE FOREMAN ED	DRILLING METHOD HOLLOW STEM AUGER

CLIENT	JOB #	BORING #	SHEET
DOMINION LAND MANAGEMENT CO.	6221	B-2	1 OF 1

PROJECT NAME: GOVERNOR'S LAND DAMS (EMBANKMENT EVAL.)

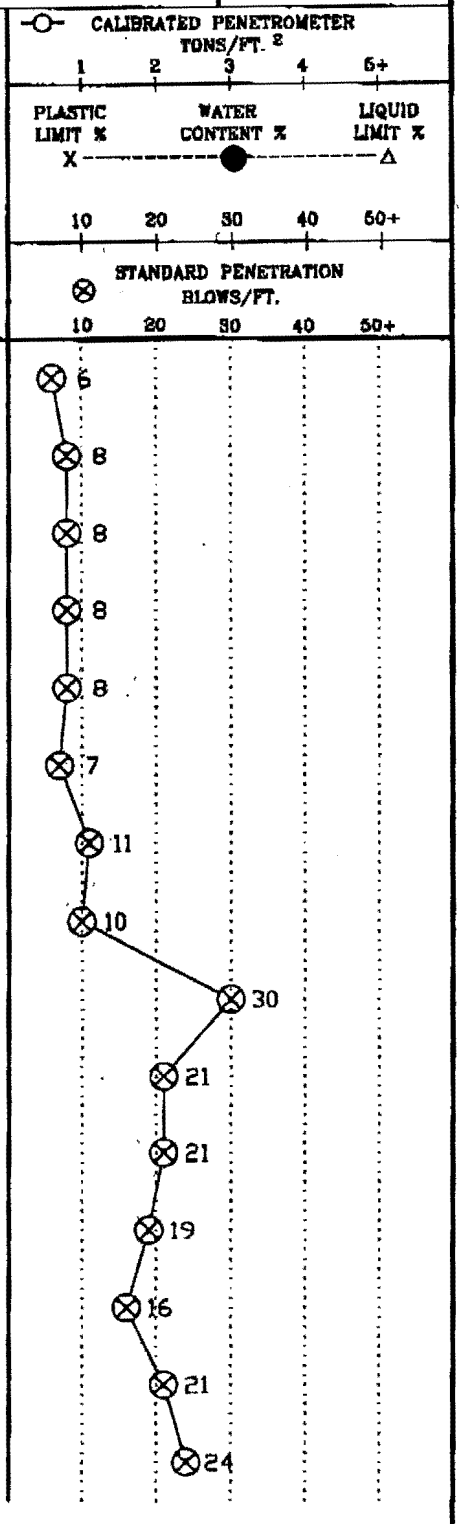
ARCHITECT-ENGINEER: AES, INC.

SITE LOCATION: FOWLER'S LAKE DAM, JAMES CITY COUNTY, VA

ENGLISH UNITS

SURFACE ELEVATION 25.10

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)
0	1	SS	24	24	Topsoil-3", (FILL)		
	2	SS	24	24	Clayey Fine SAND, Tan, Dry, Loose, (SC-FILL)		
5	3	SS	24	24	Fat CLAY With Fine Sand, Bluish Gray and Orangish Brown, Moist, Medium Stiff to Stiff, (CH-FILL)		20
	4	SS	24	24			
	5	SS	24	24			
10	6	SS	24	24			15
	7	SS	24	24			
15	8	SS	24	24			10
	9	SS	24	24	Fine Sandy Lean CLAY, Orangish Brown, Moist, Very Stiff, (CL)		
	10	SS	24	24	Clayey Fine to Medium SAND, Orangish Brown, Moist, Medium Dense, (SC)		
20	11	SS	24	24	Silty Fine to Medium SAND, Orangish Brown and Tan, Moist to Wet, Medium Dense, (SM)		5
	12	SS	24	24			
25	13	SS	24	24			0
	14	SS	24	24			
	15	SS	24	24	Silty Fine to Coarse SAND With Fine Gravel, Orangish Brown and Tan, Wet, Medium Dense, (SM)		
30							



END OF BORING @ 30.0'

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU THE TRANSITION MAY BE GRADUAL

WS OR WD	BORING STARTED 10-23-00	TOPSOIL DEPTH 3"
WL(AB) WL(AC)	BORING COMPLETED 10-23-00	CAVE IN DEPTH ●
WL	RIG FISHBURNE FOREMAN ED	DRILLING METHOD HOLLOW STEM AUGER

CLIENT	JOB #	BORING #	SHEET
DOMINION LAND MANAGEMENT CO.	6221	B-3	1 OF 1

PROJECT NAME: GOVERNOR'S LAND DAMS (EMBANKMENT EVAL.)

ARCHITECT-ENGINEER: AES, INC.

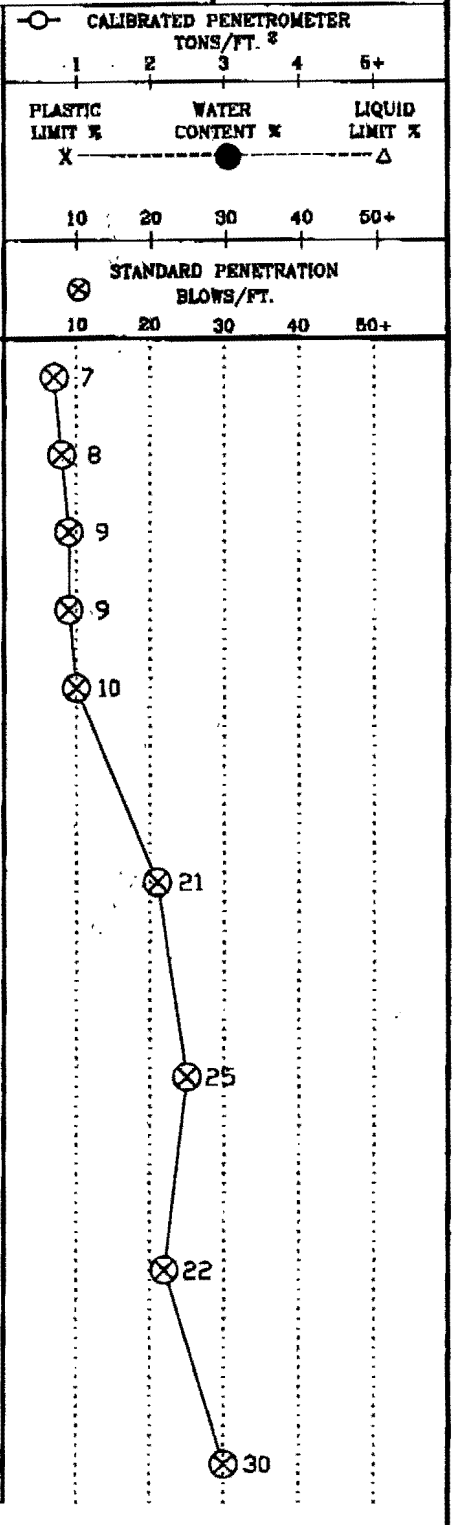
SITE LOCATION: FOWLER'S LAKE DAM, JAMES CITY COUNTY, VA

ENGLISH UNITS

SURFACE ELEVATION 25.10

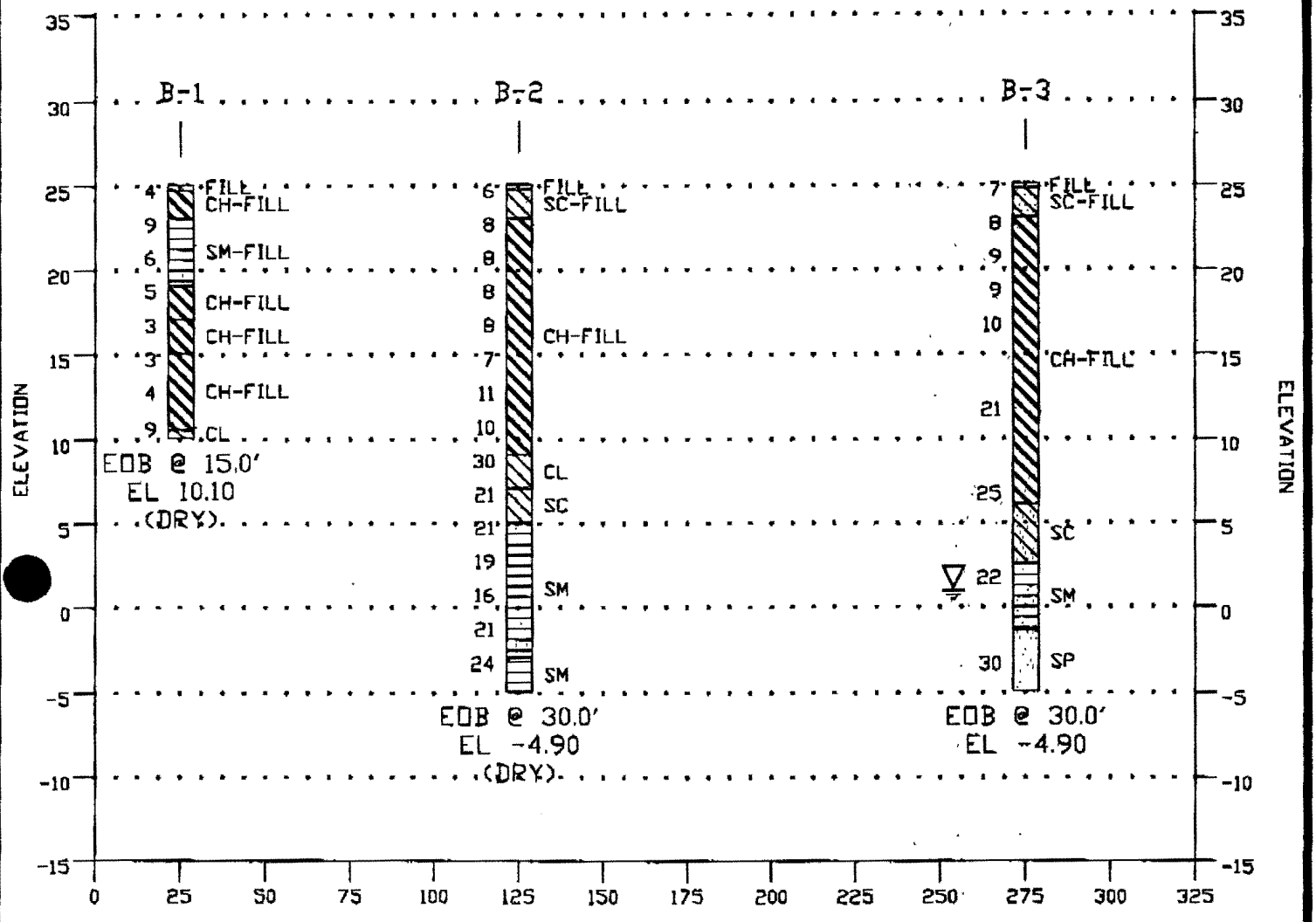
SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL
1	SS	24	24	Topsoil-3", (FILL)
2	SS	24	24	Clayey Fine SAND, Light Brown, Dry, Loose, (SC-FILL)
3	SS	24	24	Fat CLAY, Trace Fine Sand, Orangish Brown and Gray, Moist, Medium Stiff to Very Stiff, (CH-FILL)
4	SS	24	24	
5	SS	24	24	
6	SS	24	24	
7	SS	24	24	Clayey Fine to Medium SAND, Orangish Brown and Tan, Wet, Medium Dense, (SC)
8	SS	24	24	Silty Fine to Medium SAND, Orangish Brown and Tan, Saturated, Medium Dense, (SM)
9	SS	24	24	Fine to Coarse SAND With Fine to Coarse Gravel, Trace Silt Orangish Brown and Tan, Moist, Dense, (SP)

END OF BORING @ 30.0'



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU THE TRANSITION MAY BE GRADUAL

24.0' WS OR WD	BORING STARTED 10-23-00	TOPSOIL DEPTH 3"
WL(AB) WL(AC)	BORING COMPLETED 10-23-00	CAVE IN DEPTH ●
WL	RIG FISHBURNE FOREMAN ED	DRILLING METHOD HOLLOW STEM AUGER



SCALE
VERTICAL SCALE 1"=10'
HORIZONTAL SCALE 1"=50'

PREPARED FOR:

DOMINION LAND MGMNT. CO.

ECS LTD
ENGINEERING CONSULTING SERVICES, LTD

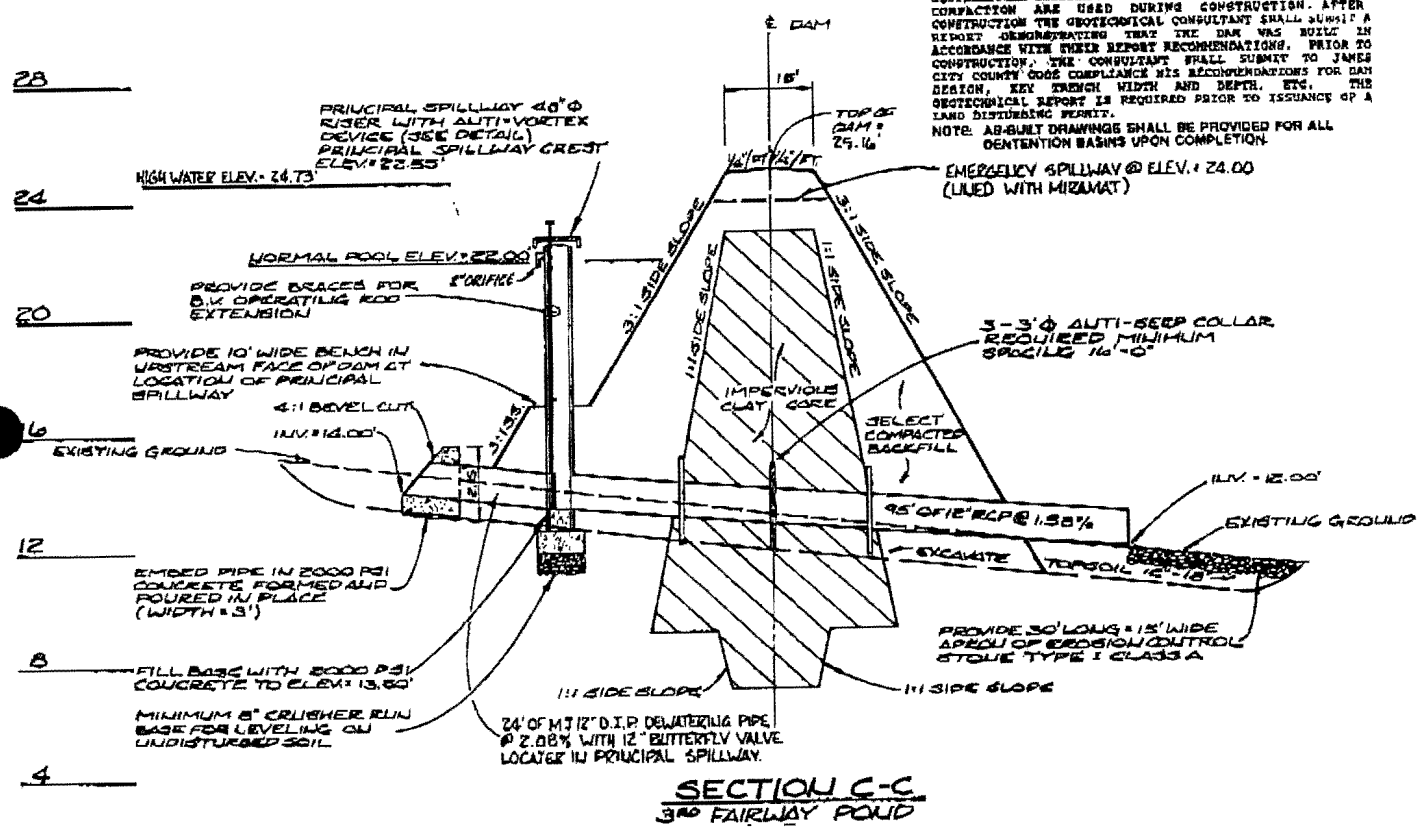
GENERALIZED CROSS SECTION

FOWLER'S LAKE
GOVERNOR'S LAND DAMS
JAMES CITY COUNTY, VIRGINIA

ECS, LTD. PROJECT NO. 6221

NOTE: A GEOTECHNICAL INVESTIGATION SHALL BE PERFORMED AT THE DAM SITE TO ENSURE THE SUITABILITY OF THE SITE. THE GEOTECHNICAL INVESTIGATION WILL DETERMINE KEY TRENCH DEPTH AND WIDTH ACCORDINGLY. ADDITIONALLY, A GEOTECHNICAL CONSULTANT WILL ENSURE PROPER MATERIAL AND COMPACTION ARE USED DURING CONSTRUCTION. AFTER CONSTRUCTION THE GEOTECHNICAL CONSULTANT SHALL SUBMIT A REPORT DEMONSTRATING THAT THE DAM WAS BUILT IN ACCORDANCE WITH THEIR REPORT RECOMMENDATIONS. PRIOR TO CONSTRUCTION, THE CONSULTANT SHALL SUBMIT TO JAMES CITY COUNTY CODE COMPLIANCE NIS RECOMMENDATIONS FOR DAM DESIGN, KEY TRENCH WIDTH AND DEPTH, ETC. THE GEOTECHNICAL REPORT IS REQUIRED PRIOR TO ISSUANCE OF A LAND DISTURBING PERMIT.

NOTE: AS-BUILT DRAWINGS SHALL BE PROVIDED FOR ALL DENTENTION BASINS UPON COMPLETION.



SECTION C-C
3RD FAIRWAY POND

PREPARED FOR:

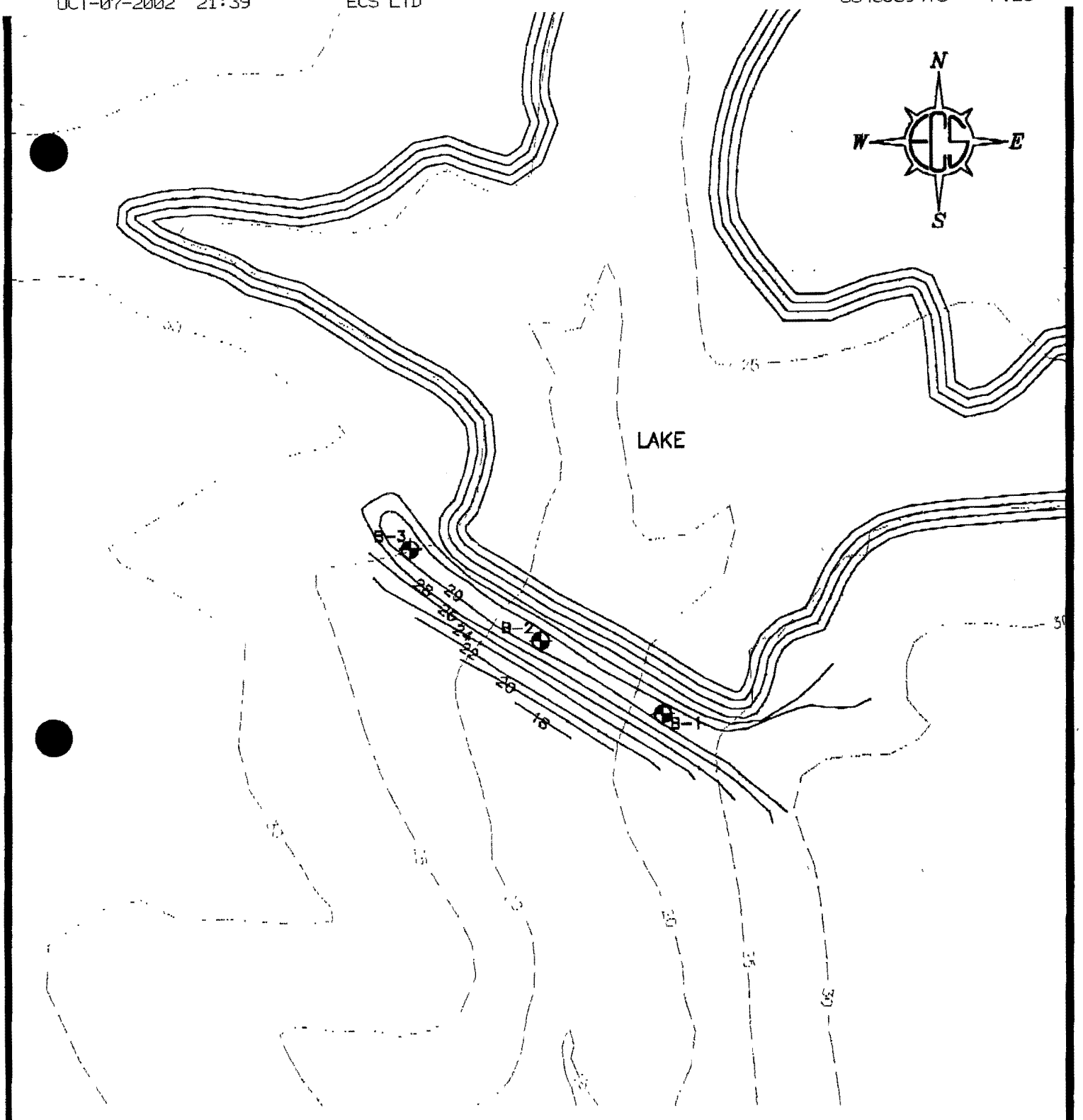
DOMINION LAND MANAGEMENT

ECS LTD
ENGINEERING CONSULTING SERVICES, LTD

DAM SCHEMATIC
GOVERNOR'S LAND
FOWLERS LAKE
JAMES CITY COUNTY, VIRGINIA

ECS, LTD. PROJECT NO. 6221

Horne's Lake



⊕ – Approximate Boring Location

Scale: 1"=200'

PREPARED FOR:

DOMINION LAND MANAGEMENT

ECS LTD
ENGINEERING CONSULTING SERVICES, LTD

BORING LOCATION DIAGRAM

GOVERNOR'S LAND
HORNE'S LAKE
JAMES CITY COUNTY, VIRGINIA

ECS, LTD. PROJECT NO. 6221

CLIENT	JOB #	BORING #	SHEET
DOMINION LAND MANAGEMENT CO.	6221	B-1	1 OF 1

PROJECT NAME	ARCHITECT-ENGINEER
GOVERNOR'S LAND DAMS (EMBANKMENT EVAL.)	AES, INC.

SITE LOCATION
HORNE'S LAKE DAM, JAMES CITY CO., VIRGINIA

ENGLISH UNITS

SURFACE ELEVATION 29.10

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL
0	1	SS	24	24	Topsoil-3", (FILL)
	2	SS	24	24	Fine Sandy Lean CLAY With Roots, Orangish Brown and Gray, Moist, Soft, (CL-FILL)
5	3	SS	24	24	Fine Sandy Fat CLAY With Wood Fragments and Roots, Orangish Brown and Gray, Moist, Medium Stiff, (OH-FILL)
	4	SS	24	24	
	5	SS	24	24	Fat CLAY, Trace Fine Sand, Orangish Brown and Gray, Moist, Stiff to Medium Stiff, (CH-FILL)
10	6	SS	24	24	
	7	SS	24	24	Fat CLAY With Fine Sand and Fine Sandy Layers, Orangish Brown and Gray, Moist, Stiff, (CH)
15	8	SS	12	12	
					Fat CLAY With Fine Sand and Clayey Fine to Medium Sand Pocket, Orangish Brown and Gray Moist, Stiff, (CH)
20					END OF BORING @ 15.0'
25					
30					

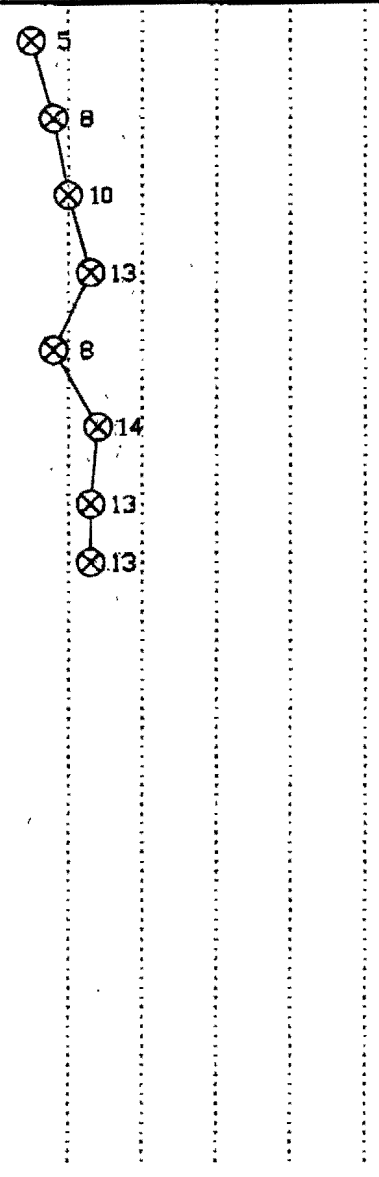
WATER LEVELS

ELEVATION (FT): 25, 20, 15, 10, 5, 0

CALIBRATED PENETROMETER TONS/FT.^{2}: 1, 2, 3, 4, 5+

PLASTIC LIMIT % X — WATER CONTENT % ● — LIQUID LIMIT % Δ: 10, 20, 30, 40, 50+

STANDARD PENETRATION BLOWS/FT.: 10, 20, 30, 40, 50+



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU THE TRANSITION MAY BE GRADUAL

DRY	WS OR WD	BORING STARTED 10-23-00	TOPSOIL DEPTH 3"
WL(AB)	WL(AC)	BORING COMPLETED 10-23-00	CAVE IN DEPTH ●
WL		RIG FISHBURNE FOREMAN ED	DRILLING METHOD HOLLOW STEM AUGER

CLIENT	JOB #	BORING #	SHEET
DOMINION LAND MANAGEMENT CO.	6221	B-2	1 OF 1

PROJECT NAME: GOVERNOR'S LAND DAMS (EMBANKMENT EVAL.)

ARCHITECT-ENGINEER: AES, INC.

SITE LOCATION: HORNE'S LAKE DAM, JAMES CITY CO., VIRGINIA

ENGLISH UNITS

SURFACE ELEVATION 29.10

CALIBRATED PENETROMETER TONS/FT.^{2} (1, 2, 3, 4, 5+)

PLASTIC LIMIT % X — WATER CONTENT % ● — LIQUID LIMIT % Δ (10, 20, 30, 40, 50+)

STANDARD PENETRATION BLOWS/FT. ⊗ (10, 20, 30, 40, 50+)

SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	STANDARD PENETRATION BLOWS/FT.
1	SS	24	24	Topsoil-3", (FILL)	8
2	SS	24	24	Fine Sandy Lean CLAY With Roots, Orangish Brown and Medium Gray, Moist, Medium Stiff, (CL-FILL)	8
3	SS	24	24	Fat CLAY With Decomposed Roots, Trace Fine Sand, Orangish Brown and Gray, Moist to Wet Medium Stiff to Stiff, (CL-CH-FILL) [Decomposed roots encountered at approximately 4.0 feet]	11
4	SS	24	24		13
5	SS	24	24		12
6	SS	24	24		14
7	SS	24	24		15
8	SS	24	24		5
9	SS	24	24	Clayey Fine to Medium SAND, Orangish Brown and Gray Mottled, Moist, Medium Dense, (SC)	15
10	SS	24	24		20
11	SS	24	24	Clayey Fine to Medium SAND, Orangish Brown and Gray, Wet, Medium Dense to Loose, (SC)	23
12	SS	24	24		8
13	SS	24	24	Silty Fine SAND, Reddish Brown, Wet, Medium Dense, (SM)	28
14	SS	24	24		20
15	SS	24	24	Silty Fine to Coarse SAND With Fine Gravel, Yellowish Brown, Saturated, Medium Dense, (SM)	25

END OF BORING @ 30.0'

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU THE TRANSITION MAY BE GRADUAL

WL DRY WS OR WD	BORING STARTED 10-23-00	TOPSOIL DEPTH 3"
WL(AB) WL(AC)	BORING COMPLETED 10-23-00	CAVE IN DEPTH ●
WL	RIG FISHBURNE FOREMAN ED	DRILLING METHOD HOLLOW STEM AUGER

CLIENT	JOB #	BORING #	SHEET
DOMINION LAND MANAGEMENT CO.	6221	B-3	1 OF 1

PROJECT NAME	ARCHITECT-ENGINEER
GOVERNOR'S LAND DAMS (EMBANKMENT EVAL.)	AES, INC.

SITE LOCATION
HORNE'S LAKE DAM, JAMES CITY CO., VIRGINIA

ENGLISH UNITS

SURFACE ELEVATION 29.10

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL
0	1	SS	24	24	Topsoil-3", (FILL)
	2	SS	24	24	Fine Sandy Fat CLAY, Orangish Brown and Gray, Moist, Medium Stiff, (CH-FILL)
5	3	SS	24	24	Fat CLAY With Fine Sand and Trace Small Roots, Orangish Brown and Gray, Moist, Medium Stiff to Very Stiff, (CH-FILL)
	4	SS	24	24	
	5	SS	24	24	
10	6	SS	24	24	
	7	SS	24	24	Clayey Fine to Medium SAND With Marine Shell Fragments, Reddish Brown and Gray, Wet, Loose, (SM)
15	8	SS	12	12	
20					
25					
30					

END OF BORING @ 15.0'

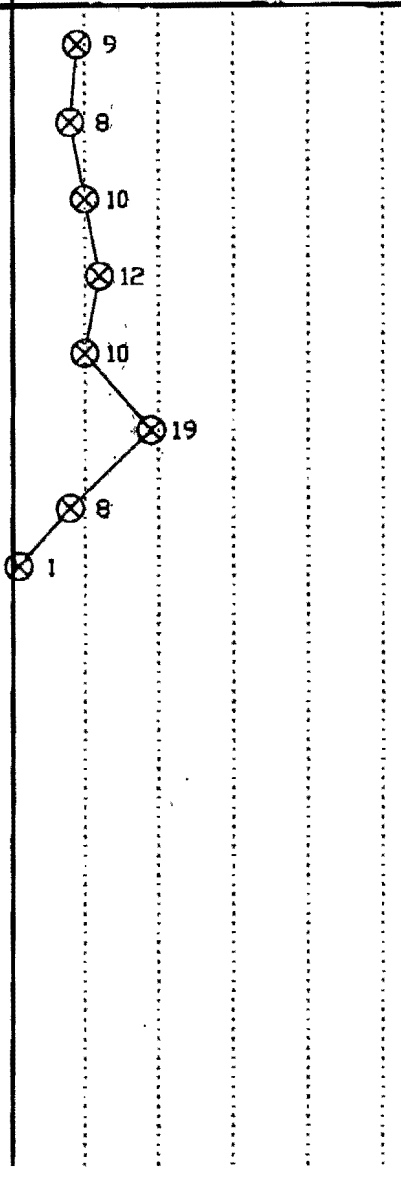
WATER LEVELS

ELEVATION (FT): 25, 20, 15, 10, 5, 0

CALIBRATED PENETROMETER TONS/FT.^{2}: 1, 2, 3, 4, 5+

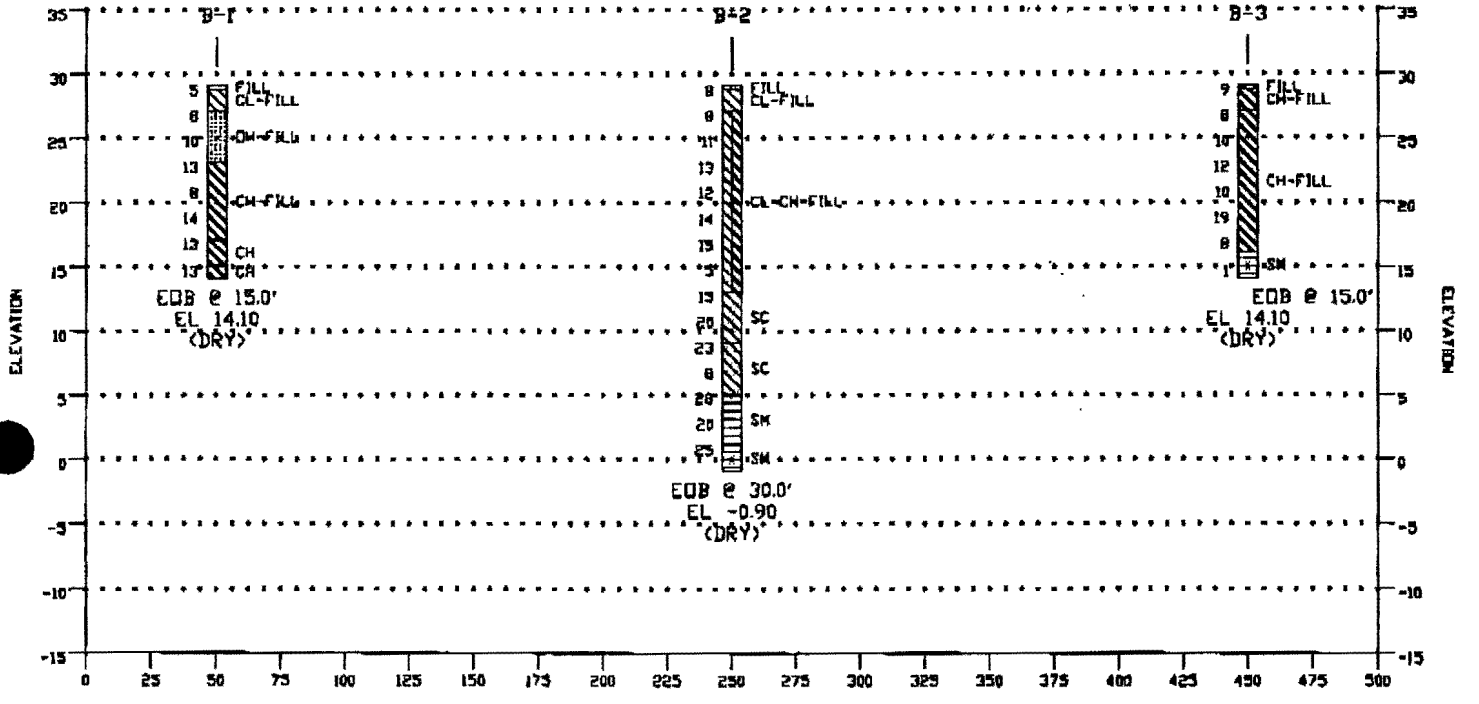
PLASTIC LIMIT % X — WATER CONTENT % ● — LIQUID LIMIT % Δ: 10, 20, 30, 40, 50+

STANDARD PENETRATION BLOWS/FT. ⊗: 10, 20, 30, 40, 50+



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU THE TRANSITION MAY BE GRADUAL

DRY	WS OR ⓦ	BORING STARTED 10-23-00	TOPSOIL DEPTH 3"
WL(AB)	WL(AC)	BORING COMPLETED 10-23-00	CAVE IN DEPTH ●
WL		RIG FISHBURNE FOREMAN ED	DRILLING METHOD HOLLOW STEM AUGER



PREPARED FOR:

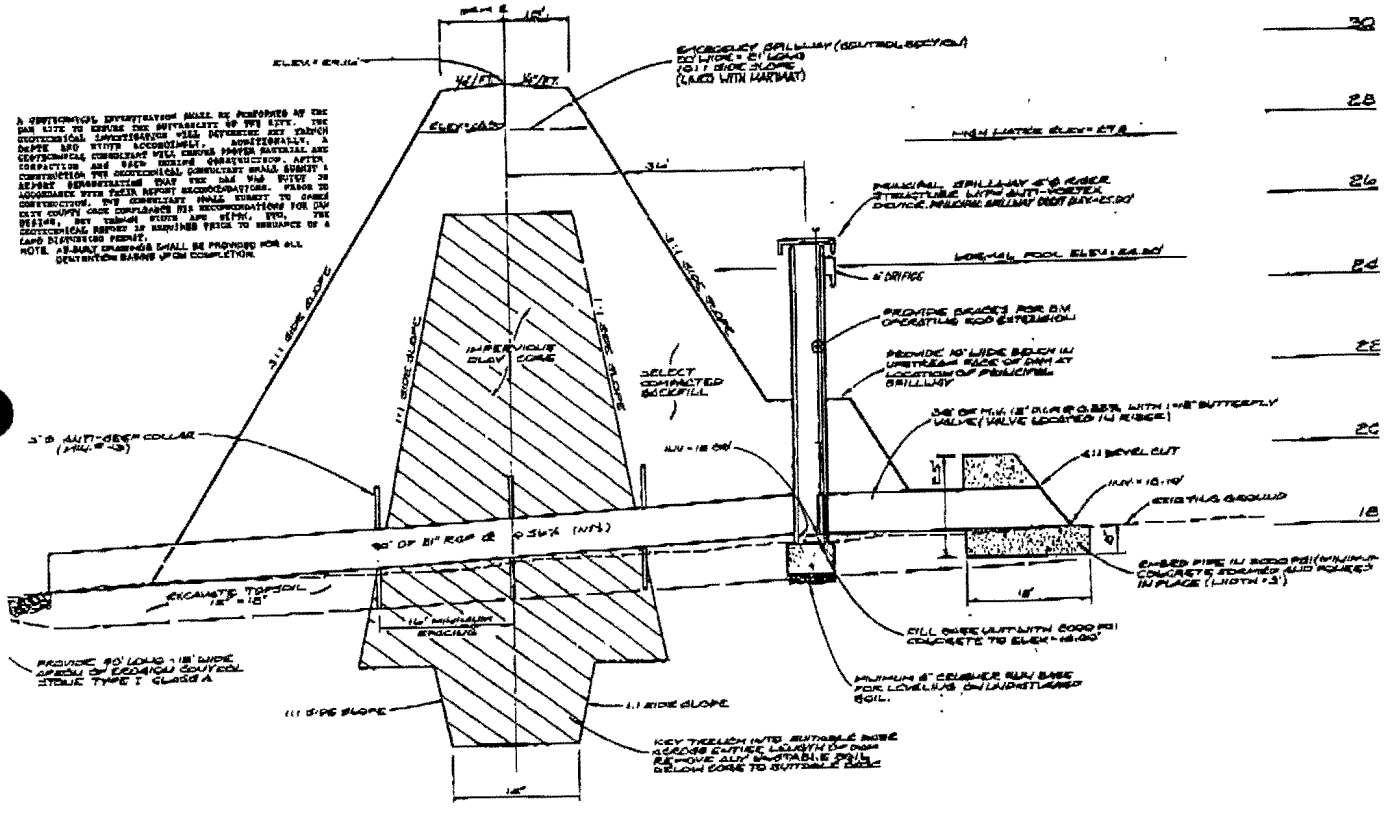
DOMINION LAND MGMNT. CO.

ECS LTD
ENGINEERING CONSULTING SERVICES, LTD

GENERALIZED CROSS SECTION

HORNE'S LAKE
GOVERNOR'S LAND DAMS
JAMES CITY COUNTY, VIRGINIA

ECS, LTD. PROJECT NO. 6221



SECTION A-A
4TH FAIRWAY POND

PREPARED FOR:

DOMINION LAND MANAGEMENT

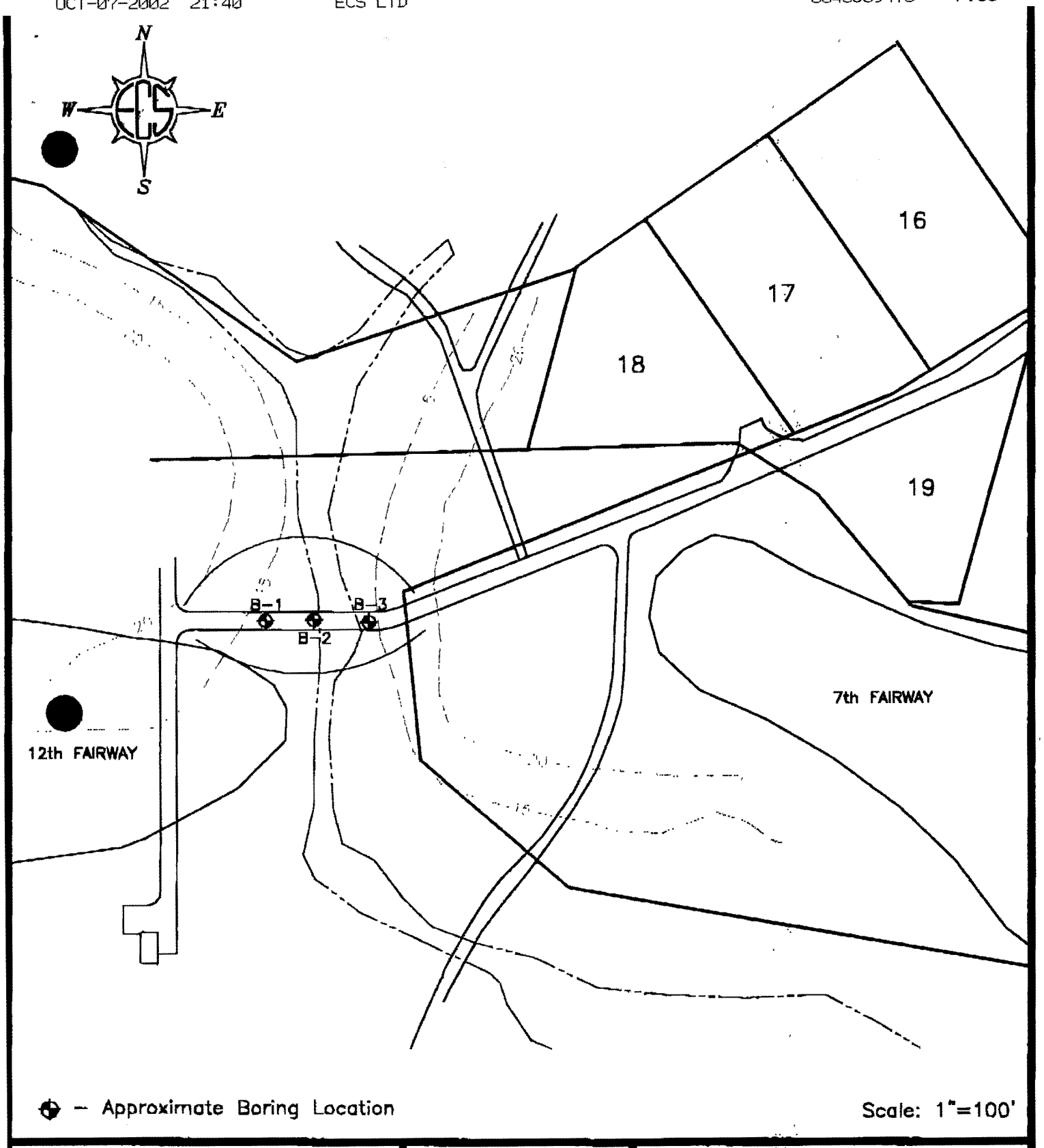
ECS LTD
ENGINEERING CONSULTING SERVICES, LTD

DAM SCHEMATIC

GOVERNOR'S LAND
HORNE'S LAKE DAM
JAMES CITY COUNTY, VIRGINIA

ECS, LTD. PROJECT NO. 6221

#12 Tee Box Dry Detention Pond



PREPARED FOR:

DOMINION LAND MANAGEMENT

ECS LTD
ENGINEERING CONSULTING SERVICES, LTD

BORING LOCATION DIAGRAM

GOVERNOR'S LAND
#12 TEE BOX
JAMES CITY COUNTY, VIRGINIA

ECS, LTD. PROJECT NO. 6221

CLIENT	JOB #	BORING #	SHEET
DOMINION LAND MANAGEMENT CO.	6221	B-1	1 OF 1

PROJECT NAME: GOVERNOR'S LAND DAMS (EMBANKMENT EVAL.)

ARCHITECT-ENGINEER: AES, INC.

SITE LOCATION: #12 TEE BOX, JAMES CITY COUNTY, VIRGINIA

ENGLISH UNITS

SURFACE ELEVATION 19.50

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	ELEVATION (FT)	STANDARD PENETRATION BLOWS/FT.
0	1	SS	24	24	Asphalt-4"/ Gravel-2" (FILL)		6
	2	SS	24	24	Fat CLAY With Fine Sand, Light Brown and Gray, Moist, Medium Stiff, (CH-FILL)		6
5	3	SS	24	24		15	9
	4	SS	24	24	Fat CLAY With Fine Sand, Bluish Gray, Moist, Medium Stiff, (CH-FILL)		9
	5	SS	24	24	Fat CLAY, Trace Fine Sand, Grayish Brown, Wet, Soft, (CH-FILL)	10	4
10	6	SS	24	24			4
	7	SS	24	24	Fine Sandy Fat CLAY, Trace Roots, Light Brown and Gray, Wet, Soft, (CH-FILL)		9
15	8	SS	12	12	Fine Sandy Lean CLAY With Organics, Orangish Brown and Gray, Moist, Medium Stiff, (CL)	5	10
20					Fine to Medium Sandy Lean CLAY With Marine Shell Fragments, Reddish Brown to Gray, Medium Stiff, (CL)	0	
					END OF BORING @ 15.0'		
25						-5	
30						-10	

CALIBRATED PENETROMETER TONS/FT.² — 1, 2, 3, 4, 5+

PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT %

10, 20, 30, 40, 50+

STANDARD PENETRATION BLOWS/FT. — 10, 20, 30, 40, 50+

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU THE TRANSITION MAY BE GRADUAL

DRY WS OR FD	BORING STARTED 10-23-00	ASPHALT DEPTH 4" / GRAVEL DEPTH 2"
WL(AB) WL(AC)	BORING COMPLETED 10-23-00	CAVE IN DEPTH ●
WL	RIG FISHBURNE FOREMAN SONNY	DRILLING METHOD HOLLOW STEM AUGER

CLIENT	JOB #	BORING #	SHEET
DOMINION LAND MANAGEMENT CO.	6221	B-2	1 OF 1

PROJECT NAME: GOVERNOR'S LAND DAMS (EMBANKMENT EVAL.)

ARCHITECT-ENGINEER: AES, INC.

SITE LOCATION: #12 TEE BOX, JAMES CITY COUNTY, VIRGINIA

ENGLISH UNITS

SURFACE ELEVATION 19.50

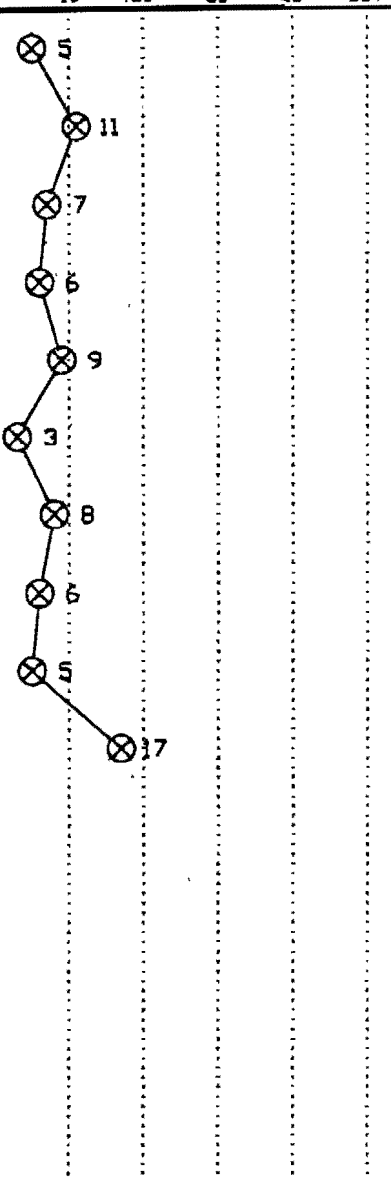
DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL
0	1	SS	24	24	Asphalt-3"/ Gravel-3" (FILL)
	2	SS	24	24	Fat CLAY With Fine Sand and Organics, Orangish Brown, Moist, Soft, (CH-FILL)
5	3	SS	24	24	Fat CLAY With Trace Small Roots and Fine Sand, Grayish Brown, Moist, Stiff, (CH-FILL)
	4	SS	24	24	
	5	SS	24	24	
10	6	SS	24	24	Fine to Medium Sandy CLAY, Orangish Brown and Gray, Wet, Soft, (CL)
	7	SS	24	24	Fat CLAY With Fine to Medium Sand, Orangish Brown and Gray, Moist, Soft to Very Stiff, (CH)
15	8	SS	24	24	
	9	SS	24	24	
	10	SS	24	24	
20					END OF BORING @ 20.0'
25					
30					

WATER LEVELS — ELEVATION (FT): 15, 10, 5, 0, -5, -10

CALIBRATED PENETROMETER TONS/FT.^{2}: 1, 2, 3, 4, 5+

PLASTIC LIMIT % X — WATER CONTENT % ● — LIQUID LIMIT % Δ: 10, 20, 30, 40, 50+

STANDARD PENETRATION BLOWS/FT.: 10, 20, 30, 40, 50+



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU THE TRANSITION MAY BE GRADUAL

WL DRY WS OR WD	BORING STARTED 10-23-00	ASPHALT DEPTH 3" / GRAVEL DEPTH 3"
WL(AB) WL(AC)	BORING COMPLETED 10-23-00	CAVE IN DEPTH ●
WL	RIG FISHBURNE FOREMAN SONNY	DRILLING METHOD HOLLOW STEM AUGER

CLIENT	JOB #	BORING #	SHEET
DOMINION LAND MANAGEMENT CO.	6221	B-3	1 OF 1

PROJECT NAME: GOVERNOR'S LAND DAMS (EMBANKMENT EVAL.)

ARCHITECT-ENGINEER: AES, INC.

SITE LOCATION: #12 TEE BOX, JAMES CITY COUNTY, VIRGINIA

ENGLISH UNITS

SURFACE ELEVATION 19.50

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL
0	1	SS	24	24	Asphalt-3" (FILL)
	2	SS	24	24	Fine Sandy Lean CLAY, Orangish Brown and Gray, Moist, Medium Stiff, (CL-FILL)
5	3	SS	24	24	Fat CLAY, Trace Fine Sand, Brown and Gray, Moist, Very Stiff, (CH-FILL)
	4	SS	24	24	Fat CLAY With Fine Sand and Shell Fragments, Grayish Brown, Moist, Medium Stiff, (CH-FILL)
	5	SS	24	24	Fat CLAY, Trace Fine Sand, Orangish Brown and Gray, Moist, Medium Stiff, (CH-FILL)
10	6	SS	24	24	Clayey Fine to Medium SAND, Brown and Gray Moist, Medium Dense, (SC)
	7	SS	24	24	Clayey Fine to Medium SAND, Orangish Brown and Gray, Moist, Medium Dense, (SC)
15	8	SS	12	12	Fine to Medium Sandy Lean CLAY, Grayish Brown, Moist, Very Stiff, (CL)
20					END OF BORING @ 15.0'
25					
30					

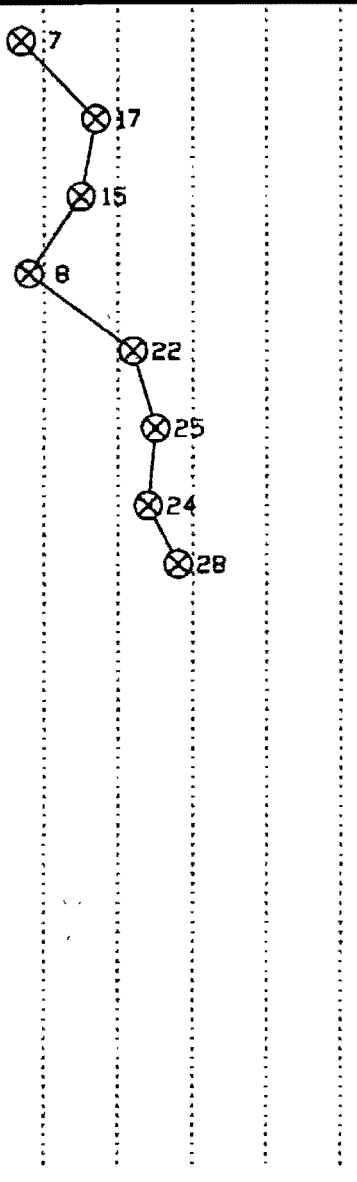
WATER LEVELS

ELEVATION (FT): 15, 10, 5, 0, -5, -10

CALIBRATED PENETROMETER TONS/FT.^{2}: 1, 2, 3, 4, 5+

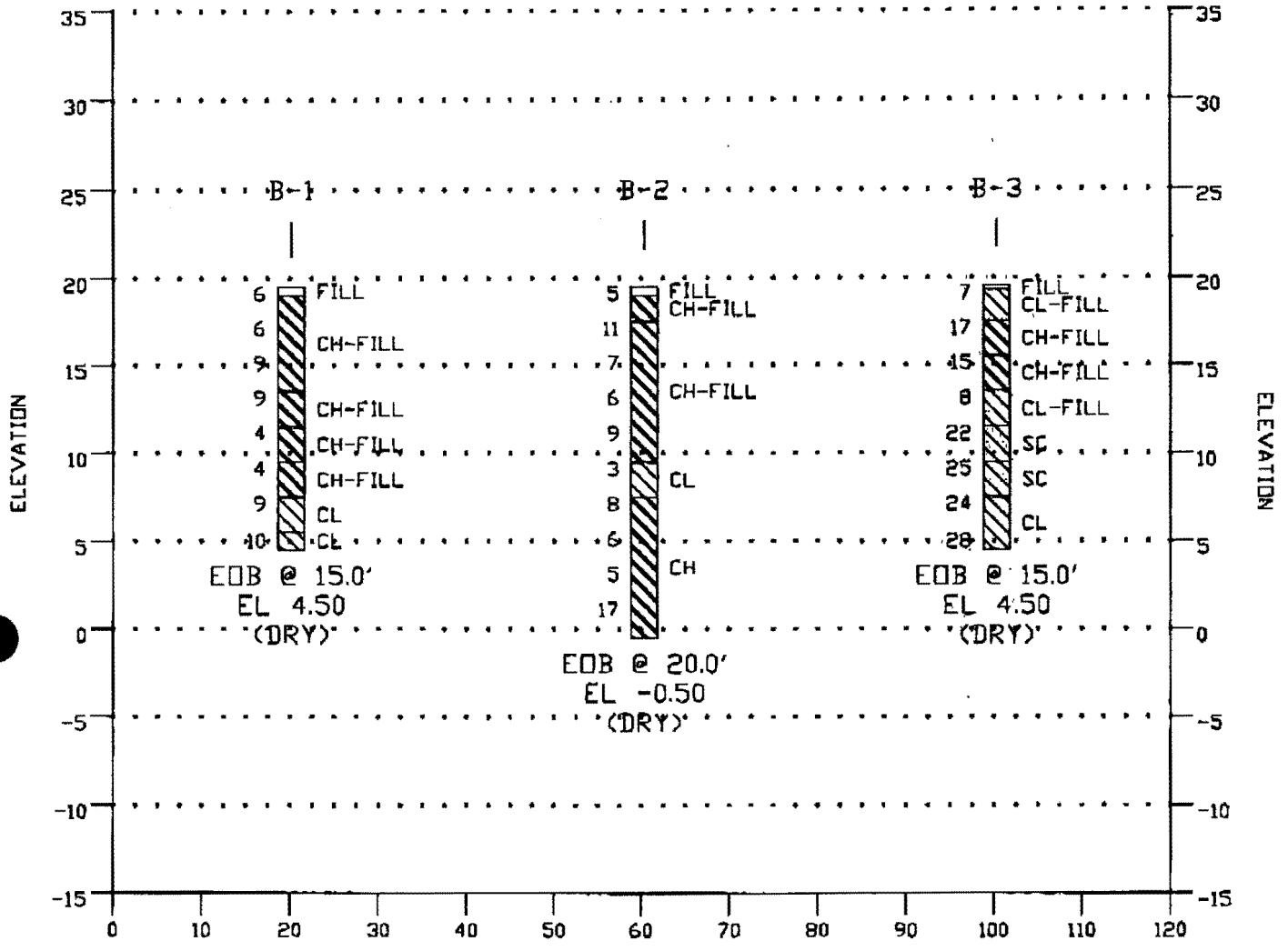
PLASTIC LIMIT % X — WATER CONTENT % ● — LIQUID LIMIT % △: 10, 20, 30, 40, 50+

STANDARD PENETRATION BLOWS/FT. ⊗: 10, 20, 30, 40, 50+



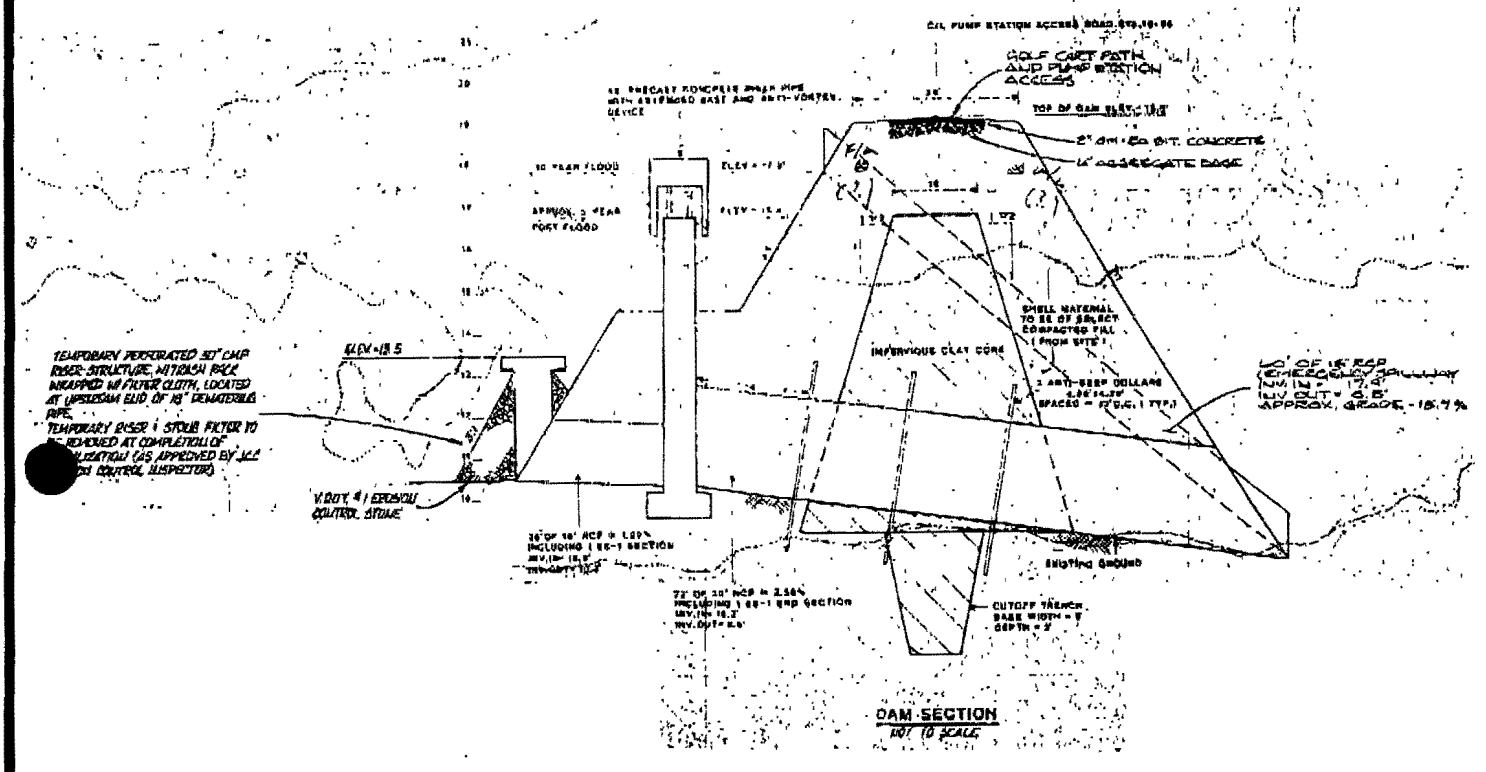
THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU THE TRANSITION MAY BE GRADUAL

WL DRY	WS OR ⓦ	BORING STARTED 10-23-00	ASPHALT DEPTH 3"
▼WL(AB)	▼WL(AC)	BORING COMPLETED 10-23-00	CAVE IN DEPTH ●
▼WL		RIG FISHBURNE FOREMAN SONNY	DRILLING METHOD HOLLOW STEM AUGER



SCALE
VERTICAL SCALE 1"=10'
HORIZONTAL SCALE 1"=20'

PREPARED FOR:		GENERALIZE CROSS SECTION
DOMINION LAND MGMNT. CO.	ECS LTD ENGINEERING CONSULTING SERVICES, LTD	#12 TEE BOX GOVERNOR'S LAND DAMS JAMES CITY COUNTY, VIRGINIA ECS, LTD. PROJECT NO. 6221



PREPARED FOR:

DOMINION LAND MANAGEMENT

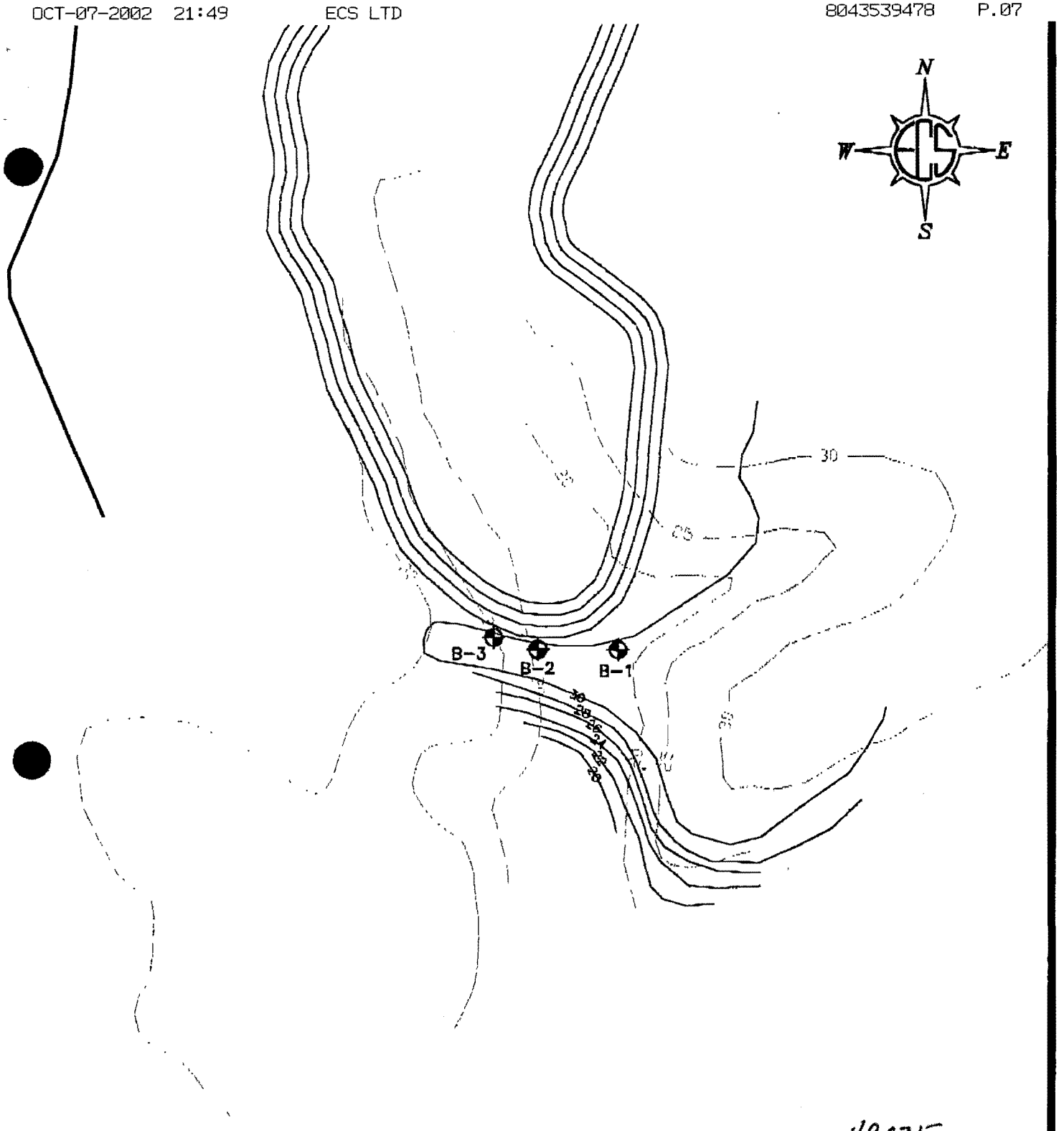
ECS LTD
ENGINEERING CONSULTING SERVICES, LTD

DAM SCHEMATIC

GOVERNOR'S LAND
#12 TEE BOX
JAMES CITY COUNTY, VIRGINIA

ECS, LTD. PROJECT NO. 6221

Travis Pond Dam



JR025

◆ – Approximate Boring Location

Scale: 1"=100'

PREPARED FOR:

DOMINION LAND MANAGEMENT

ECS LTD
ENGINEERING CONSULTING SERVICES, LTD

BORING LOCATION DIAGRAM

GOVERNOR'S LAND
TRAVIS POND
JAMES CITY COUNTY, VIRGINIA

ECS, LTD. PROJECT NO. 6221

CLIENT	JOB #	BORING #	SHEET
DOMINION LAND MANAGEMENT CO.	6221	B-1	1 OF 1

PROJECT NAME: GOVERNOR'S LAND DAMS (EMBANKMENT EVAL.)

ARCHITECT-ENGINEER: AES, INC.

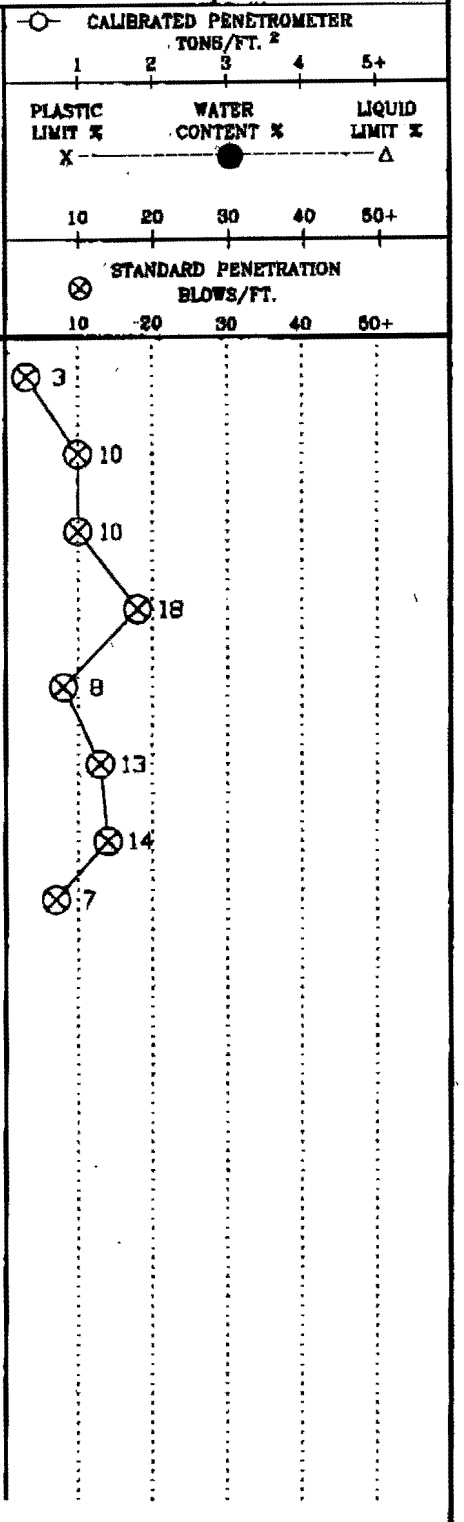
SITE LOCATION: TRAVIS POND, JAMES CITY COUNTY, VIRGINIA

ENGLISH UNITS

SURFACE ELEVATION 31.10

SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL
1	SS	24	24	Topsoil-6", (FILL)
2	SS	24	24	Fat CLAY With Fine Sand and Roots, Brown and Light Gray, Moist, Soft, (CH-FILL)
3	SS	24	24	Fat CLAY With Roots and Wood Fragments, Trace Fine Sand, Oranglsh Brown and Gray, Moist, Medium Stiff to Very Stiff, (CH-FILL) [Wood fragments found in samples 2 and 6]
4	SS	24	24	
5	SS	24	24	
6	SS	24	24	
7	SS	24	24	
8	SS	12	12	

END OF BORING @ 15.0'



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU THE TRANSITION MAY BE GRADUAL

DRY WS OR TD	BORING STARTED 10-24-00	TOPSOIL DEPTH 6"
WL(AB) WL(AC)	BORING COMPLETED 10-24-00	CAVE IN DEPTH
WL	RIG FISHBURNE FOREMAN ED	DRILLING METHOD HOLLOW STEM AGUER

CLIENT	JOB #	BORING #	SHEET
DOMINION LAND MANAGEMENT CO.	6221	B-2	1 OF 1

PROJECT NAME	ARCHITECT-ENGINEER
GOVERNOR'S LAND DAMS (EMBANKMENT EVAL.)	AES, INC.

SITE LOCATION
TRAVIS POND, JAMES CITY COUNTY, VIRGINIA

ENGLISH UNITS

SURFACE ELEVATION 31.10

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL
0	1	SS	24	24	Topsoil-6", (FILL)
	2	SS	24	24	Fat CLAY With Roots and Organics, Orangish Brown and Gray, Moist, Medium Stiff to Stiff, (CH-FILL) [Organics found to a depth of 4 feet]
5	3	SS	24	24	
	4	SS	24	24	
	5	SS	24	24	
10	6	SS	24	24	
	7	SS	24	24	
15	8	SS	24	24	
	9	SS	24	24	
	10	SS	24	24	Clayey Fine to Medium SAND, Orangish Brown and Gray, Wet to Saturated, Medium Dense, (SC)
20	11	SS	24	24	
	12	SS	24	24	
25	13	SS	24	24	
	14	SS	24	24	
30	15	SS	24	24	Silty Fine to Coarse SAND With Fine to Medium Gravel, Dark Brown and Tan, Saturated, Medium Dense, (SP-SM)

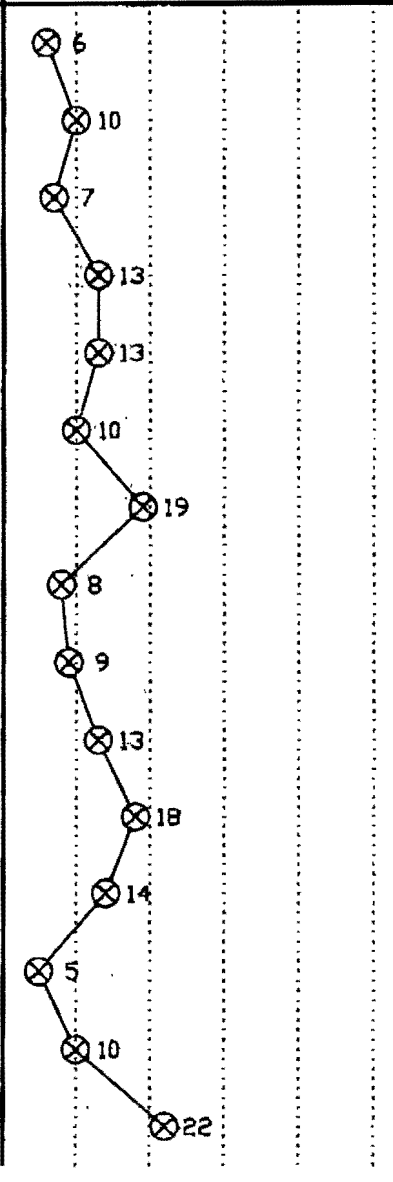
WATER LEVELS

ELEVATION (FT): 30, 25, 20, 15, 10, 5

CALIBRATED PENETROMETER TONS/FT.^{2}: 1, 2, 3, 4, 6+

PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT %: 10, 20, 30, 40, 50+

STANDARD PENETRATION BLOWS/FT.: 10, 20, 30, 40, 50+



END OF BORING @ 30.0'

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU THE TRANSITION MAY BE GRADUAL

23.0' WS OR ⊗D	BORING STARTED 10-24-00	TOPSOIL DEPTH 6"
WL(AB) WL(AC)	BORING COMPLETED 10-24-00	CAVE IN DEPTH ●
WL	RIG FISHBURNE FOREMAN ED	DRILLING METHOD HOLLOW STEM AGUER

CLIENT	JOB #	BORING #	SHEET
DOMINION LAND MANAGEMENT CO.	6221	B-3	1 OF 1

PROJECT NAME: GOVERNOR'S LAND DAMS (EMBANKMENT EVAL.)

ARCHITECT-ENGINEER: AES, INC.

SITE LOCATION: TRAVIS POND, JAMES CITY COUNTY, VIRGINIA

ENGLISH UNITS

SURFACE ELEVATION 31.10

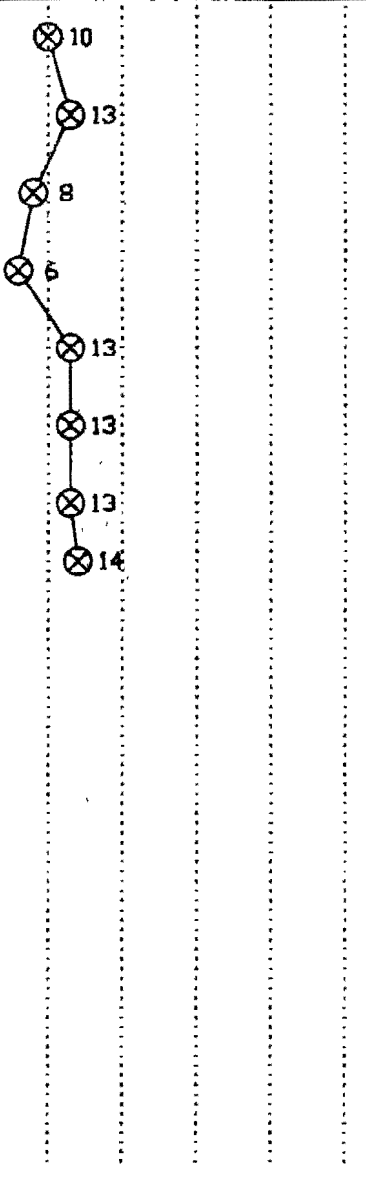
DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL
0	1	SS	24	24	Topsoil-6", (FILL)
	2	SS	24	24	Clayey Fine SAND, Orangish Brown and Gray, Moist, Loose, (SC-FILL)
5	3	SS	24	24	Fat CLAY, Trace Fine Sand and Organics, Orangish Brown and Gray, Moist, Stiff, (CH-FILL)
	4	SS	24	24	
	5	SS	24	24	
10	6	SS	24	24	
	7	SS	24	24	
15	8	SS	12	12	
20					END OF BORING @ 15.0'
25					
30					

WATER LEVELS ELEVATION (FT): 30, 25, 20, 15, 10, 5

CALIBRATED PENETROMETER TONS/FT.^{2}: 1, 2, 3, 4, 6+

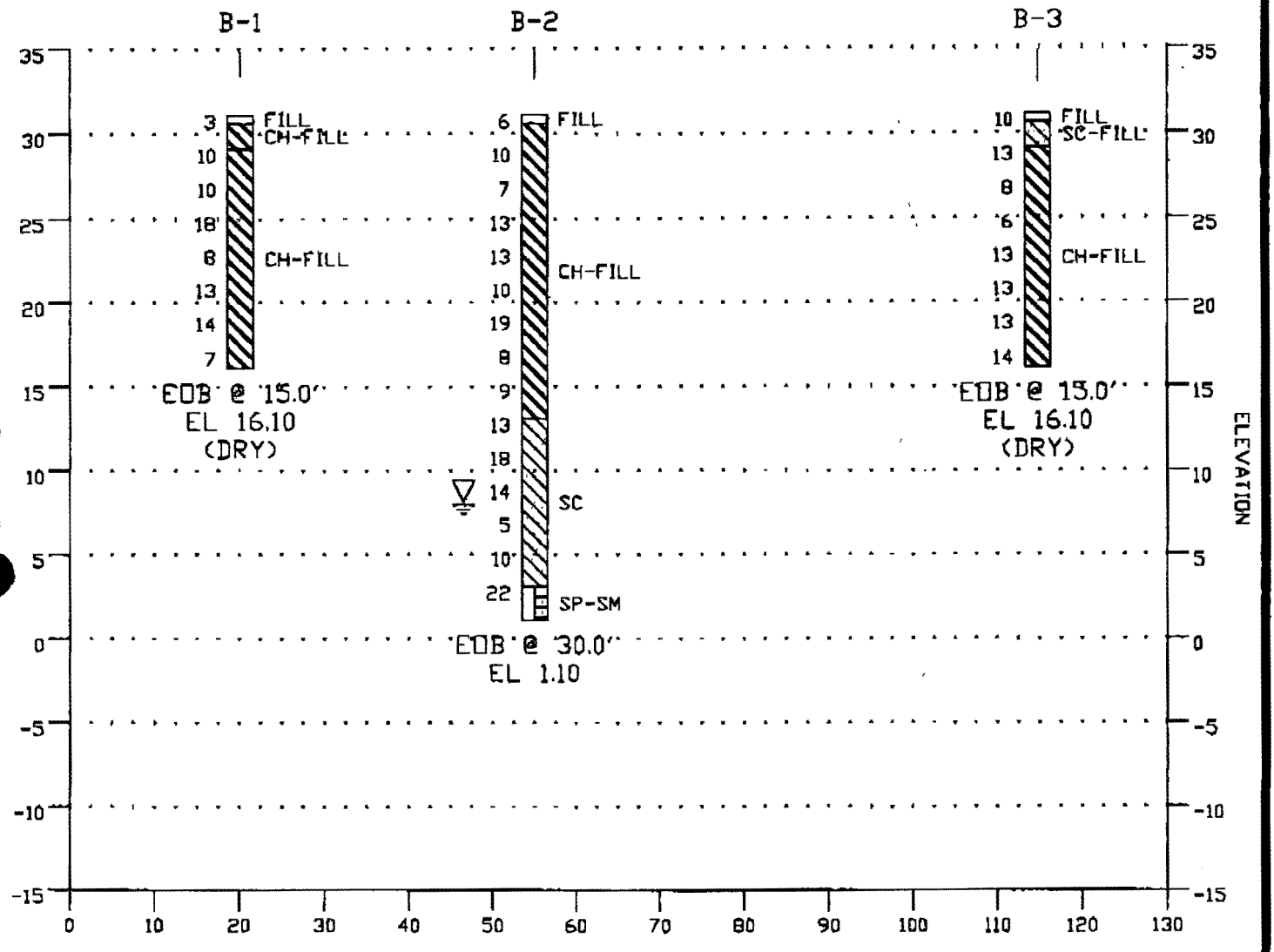
PLASTIC LIMIT % X — WATER CONTENT % ● — LIQUID LIMIT % Δ: 10, 20, 30, 40, 50+

STANDARD PENETRATION BLOWS/FT. ⊗: 10, 20, 30, 40, 50+



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU THE TRANSITION MAY BE GRADUAL

⊥ DRY WS OR WD	BORING STARTED 10-24-00	TOPSOIL DEPTH 6"
▼WL(AB) ▼WL(AC)	BORING COMPLETED 10-24-00	CAVE IN DEPTH ●
▼WL	RIG FISHBURNE FOREMAN ED	DRILLING METHOD HOLLOW STEM AGUER



SCALE
VERTICAL SCALE 1"=10'
HORIZONTAL SCALE 1"=20'

PREPARED FOR:

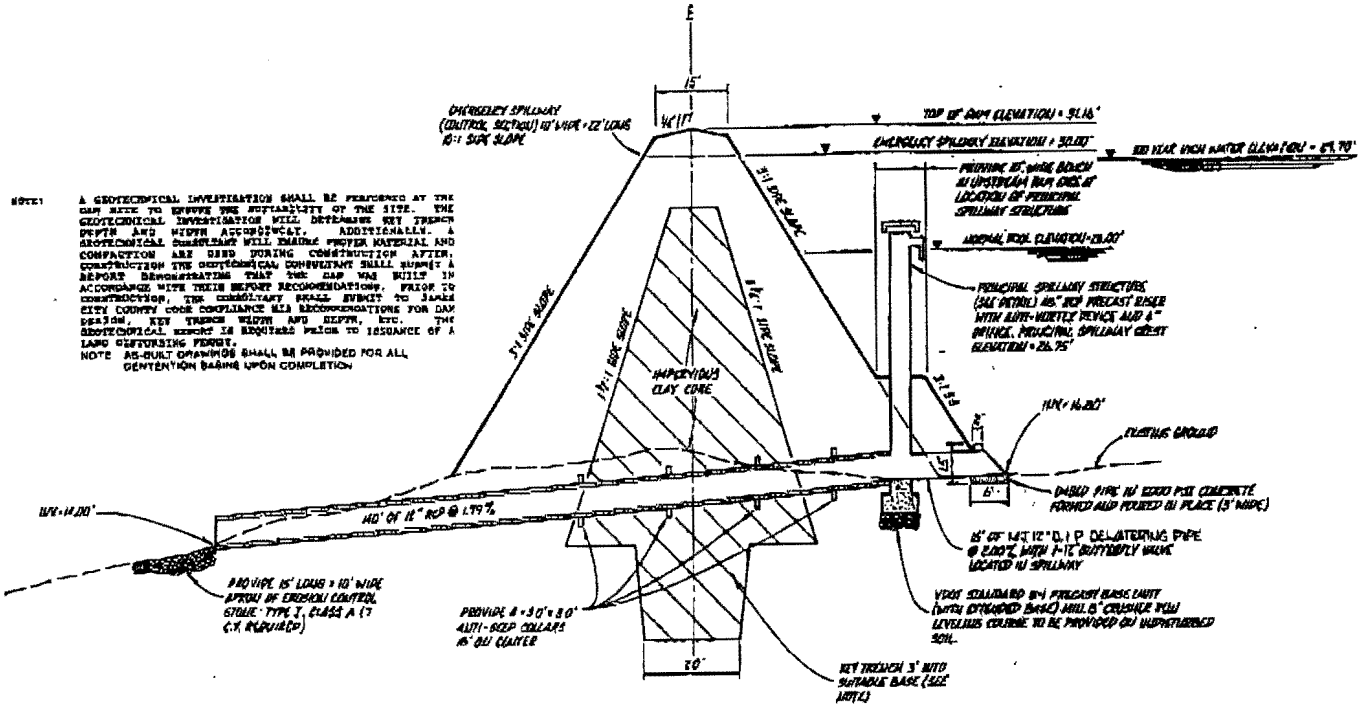
DOMINION LAND MGMNT. CO.

ECS LTD
ENGINEERING CONSULTING SERVICES, LTD

GENERALIZE CROSS SECTION

TRAVIS POND
GOVERNOR'S LAND DAMS
JAMES CITY COUNTY, VIRGINIA

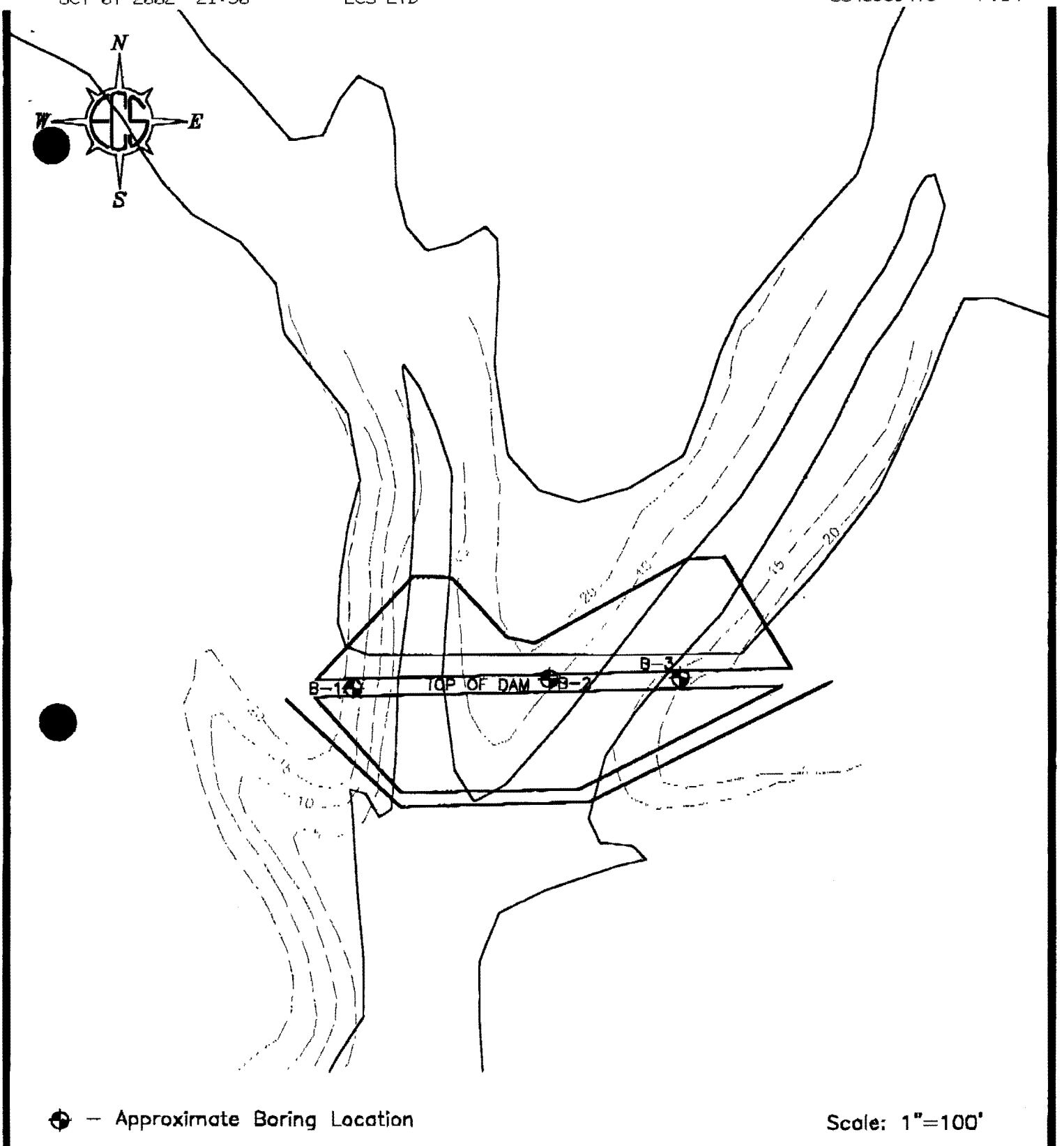
ECS, LTD. PROJECT NO. 6221



DAM CROSS SECTION B-B
9TH HOLE POND

PREPARED FOR:		DAM SCHEMATIC
DOMINION LAND MANAGEMENT	ECS LTD ENGINEERING CONSULTING SERVICES, LTD	GOVERNOR'S LAND TRAVIS POND JAMES CITY COUNTY, VIRGINIA ECS, LTD. PROJECT NO. 6221

Whittaker's Lake



⊕ – Approximate Boring Location

Scale: 1"=100'

PREPARED FOR:

DOMINION LAND MANAGEMENT

ECS LTD
ENGINEERING CONSULTING SERVICES, LTD

BORING LOCATION DIAGRAM

GOVERNOR'S LAND
WHITTAKER'S LAKE
JAMES CITY COUNTY, VIRGINIA

ECS, LTD. PROJECT NO. 6221

CLIENT	JOB #	BORING #	SHEET
DOMINION LAND MANAGEMENT CO.	6221	B-1	1 OF 1

PROJECT NAME: GOVERNOR'S LAND DAMS (EMBANKMENT EVAL.)

ARCHITECT-ENGINEER: AES, INC.

SITE LOCATION: WHITTAKER'S LAKE DAM, JAMES CITY CO., VA

CALIBRATED PENETROMETER TONS/FT.^{2} (1, 2, 3, 4, 5+)

PLASTIC LIMIT % X — WATER CONTENT % ● — LIQUID LIMIT % Δ (10, 20, 30, 40, 50+)

STANDARD PENETRATION BLOWS/FT. ⊗ (10, 20, 30, 40, 50+)

ENGLISH UNITS

SURFACE ELEVATION 25.00

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	STANDARD PENETRATION BLOWS/FT.
0	1	SS	24	24	Topsoil-5", (FILL)	14
	2	SS	24	24	Fat CLAY With Trace Tiny Roots and Wood Fragments, Trace Fine Sand, Grayish Brown, Moist to Saturated, Stiff to Medium Stiff, (CH-FILL)	10
5	3	SS	24	24		8
	4	SS	24	24		8
	5	SS	24	24		7
10	6	SS	24	24		6
	7	SS	24	24		4
15	8	SS	12	12		8
					END OF BORING @ 15.0'	

WATER LEVELS — ELEVATION (FT): 20, 15, 10, 5, 0

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU THE TRANSITION MAY BE GRADUAL

DRY WS OR WD	BORING STARTED 10-23-00	TOPSOIL DEPTH 5"
WL(AB) WL(AC)	BORING COMPLETED 10-23-00	CAVE IN DEPTH ●
WL	RIG FISHBURNE FOREMAN R.R.	DRILLING METHOD HOLLOW STEM AUGER

CLIENT	JOB #	BORING #	SHEET
DOMINION LAND MANAGEMENT CO.	6221	B-2	1 OF 2

PROJECT NAME: GOVERNOR'S LAND DAMS (EMBANKMENT EVAL.)

ARCHITECT-ENGINEER: AES, INC.

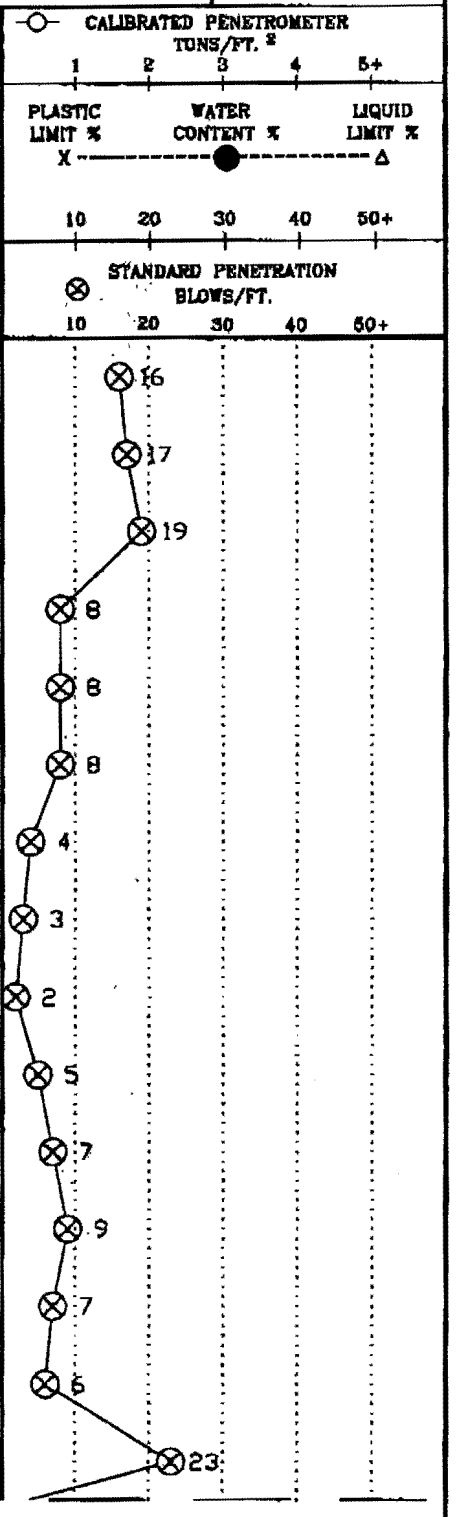
SITE LOCATION: WHITTAKER'S LAKE DAM, JAMES CITY CO., VA

ENGLISH UNITS

SURFACE ELEVATION 25.00

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL
0	1	SS	24	24	Topsoil-5", (FILL)
	2	SS	24	24	Fine Sandy Lean CLAY With Roots and Wood Fragments, Brown, Moist, Very Stiff, (CL-FILL)
5	3	SS	24	24	Fat CLAY, Trace Wood Fragments, Trace Fine Sand, Orangish Brown and Bluish Gray, Moist, Very Stiff to Medium Stiff, (CH-FILL)
	4	SS	24	24	
	5	SS	24	24	Fat CLAY With Trace Tiny Roots and Wood Fragments, Orangish and Grayish Brown, Moist to Wet, Medium Stiff to Soft, (CH-FILL)
10	6	SS	24	24	
	7	SS	24	24	
15	8	SS	24	24	Fat CLAY With Trace Organics, Trace Fine Sand, Orangish Brown and Gray, Wet, Soft, (CH-FILL)
	9	SS	24	24	
	10	SS	24	24	
20	11	SS	24	24	
	12	SS	24	24	
25	13	SS	24	24	
	14	SS	24	24	
	15	SS	24	24	Silty Fine to Coarse SAND With Fine to Coarse Gravel, Orangish Brown and Tan, Saturated, Medium Dense, (SP)
30					

WATER LEVELS ELEVATION (FT): 20, 15, 10, 5, 0



CONTINUED ON NEXT PAGE.

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU THE TRANSITION MAY BE GRADUAL

DRY WS OR TD	BORING STARTED 10-23-00	TOPSOIL DEPTH 5"
WL(AB) WL(AC)	BORING COMPLETED 10-23-00	CAVE IN DEPTH ●
WL	RIG FISHBURNE FOREMAN R.R.	DRILLING METHOD HOLLOW STEM AUGER

CLIENT	JOB #	BORING #	SHEET
DOMINION LAND MANAGEMENT CO.	6221	B-2	2 OF 2

PROJECT NAME: GOVERNOR'S LAND DAMS (EMBANKMENT EVAL.)

ARCHITECT-ENGINEER: AES, INC.

SITE LOCATION: WHITTAKER'S LAKE DAM, JAMES CITY CO., VA

ENGLISH UNITS

SURFACE ELEVATION 25.00

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL
30	16	SS	24	24	Silty Fine to Coarse SAND With Fine to Coarse Gravel, Brownish Brown and Tan, Saturated, Medium Dense, (SP)
	17	SS	24	24	
35	18	SS	24	24	Fine Sandy SILT, Bluish Green, Moist, Soft to Medium Stiff, (MH)
	19	SS	24	24	
40	20	SS	24	24	Fine Sandy Lean CLAY With Fine to Medium Gravel, Bluish Gray, Wet, Medium Stiff, (CL)
45					END OF BORING @ 40.0'
50					
55					
60					

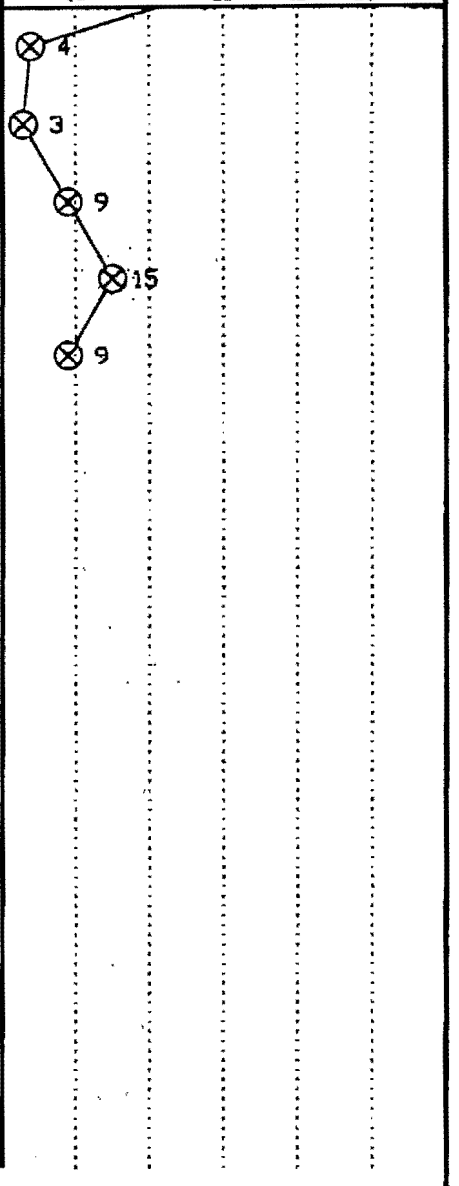
WATER LEVELS

ELEVATION (FT): 10, 15, 20, 25, 30

CALIBRATED PENETROMETER TONS/FT.^{2}: 1, 2, 3, 4, 5+

PLASTIC LIMIT % X — WATER CONTENT % ● — LIQUID LIMIT % △: 10, 20, 30, 40, 50+

STANDARD PENETRATION BLOWS/FT.: 10, 20, 30, 40, 50+



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU THE TRANSITION MAY BE GRADUAL

DRY WS OR WD	BORING STARTED 10-23-00	TOPSOIL DEPTH 5"
WL(AB) WL(AC)	BORING COMPLETED 10-23-00	CAVE IN DEPTH ●
WL	RIG FISHBURNE FOREMAN R.R.	DRILLING METHOD HOLLOW STEM AUGER

CLIENT	JOB #	BORING #	SHEET
DOMINION LAND MANAGEMENT CO.	6221	B-3	1 OF 1

PROJECT NAME: GOVERNOR'S LAND DAMS (EMBANKMENT EVAL.)

ARCHITECT-ENGINEER: AES, INC.

SITE LOCATION: WHITTAKER'S LAKE DAM, JAMES CITY CO., VA

ENGLISH UNITS

SURFACE ELEVATION 25.00

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	ELEVATION (FT)	STANDARD PENETRATION BLOWS/FT.
0	1	SS	24	24	Topsoil-3", (FILL)		15
	2	SS	24	24	Fat CLAY With Fine Sand, Trace Roots and Organics, Orangish Brown and Gray, Moist, Stiff, (CH-FILL)		10
5	3	SS	24	24	Fat CLAY, Trace Fine Sand and Coarse Gravel, Orangish Brown and Gray, Moist to Saturated, Soft to Medium Stiff, (CH-FILL) [Trace coarse gravel in sample 3]	20	10
	4	SS	24	24			7
	5	SS	24	24			9
10	6	SS	24	24		15	5
	7	SS	24	24			6
	8	SS	12	12			7
15					END OF BORING @ 15.0'	10	
20						5	
25						0	
30							

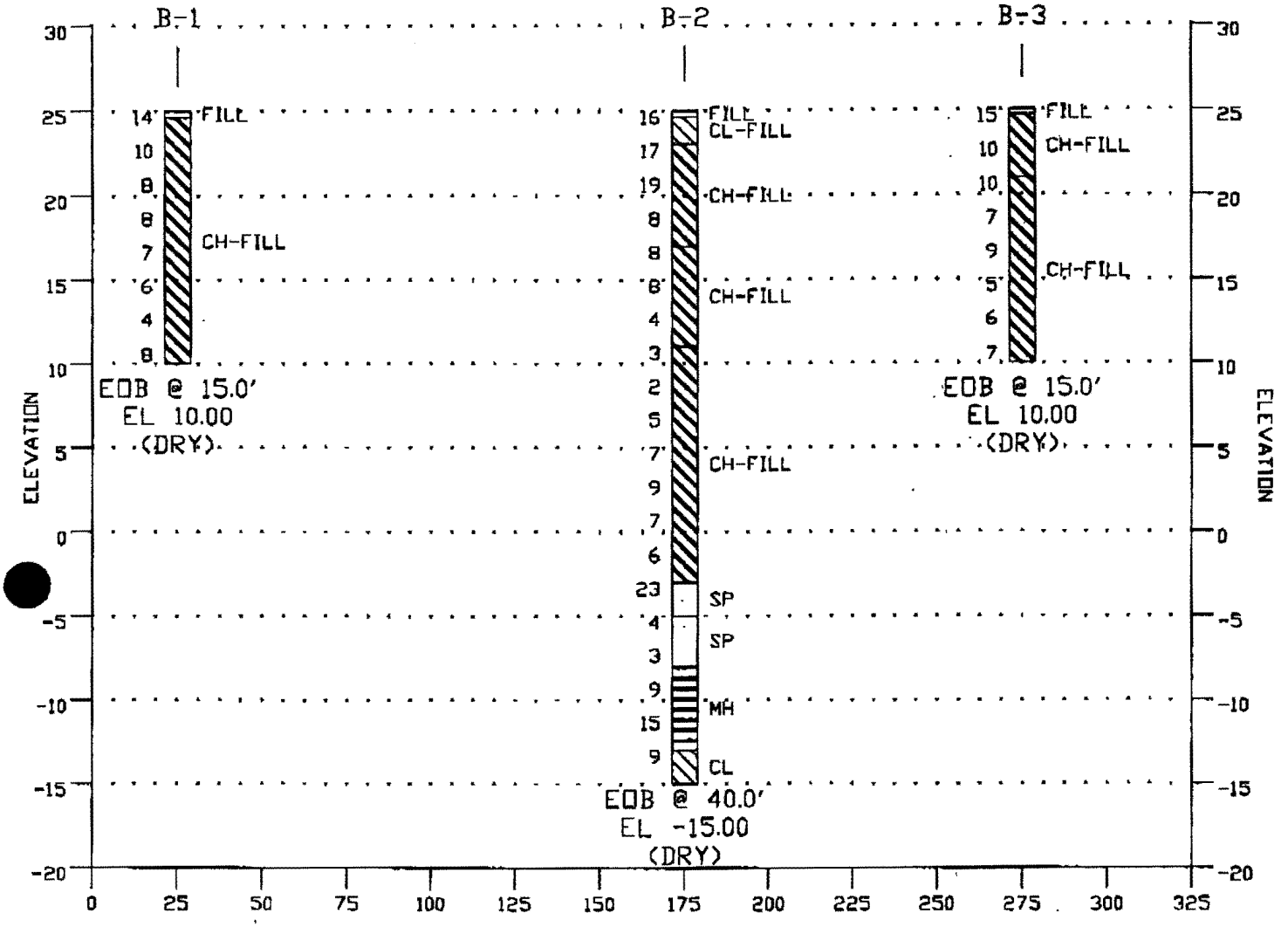
CALIBRATED PENETROMETER TONS/FT.^{2}: 1 2 3 4 5+

PLASTIC LIMIT % X — WATER CONTENT % ● — LIQUID LIMIT % Δ: 10 20 30 40 50+

STANDARD PENETRATION BLOWS/FT.: 10 20 30 40 50+

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU THE TRANSITION MAY BE GRADUAL

DRY WS OR WD	BORING STARTED 10-23-00	TOPSOIL DEPTH 3"
WL(AB) WL(AC)	BORING COMPLETED 10-23-00	CAVE IN DEPTH
WL	RIG FISHBURNE FOREMAN R.R.	DRILLING METHOD HOLLOW STEM AUGER



PREPARED FOR:

DOMINION LAND MGMNT. CO.

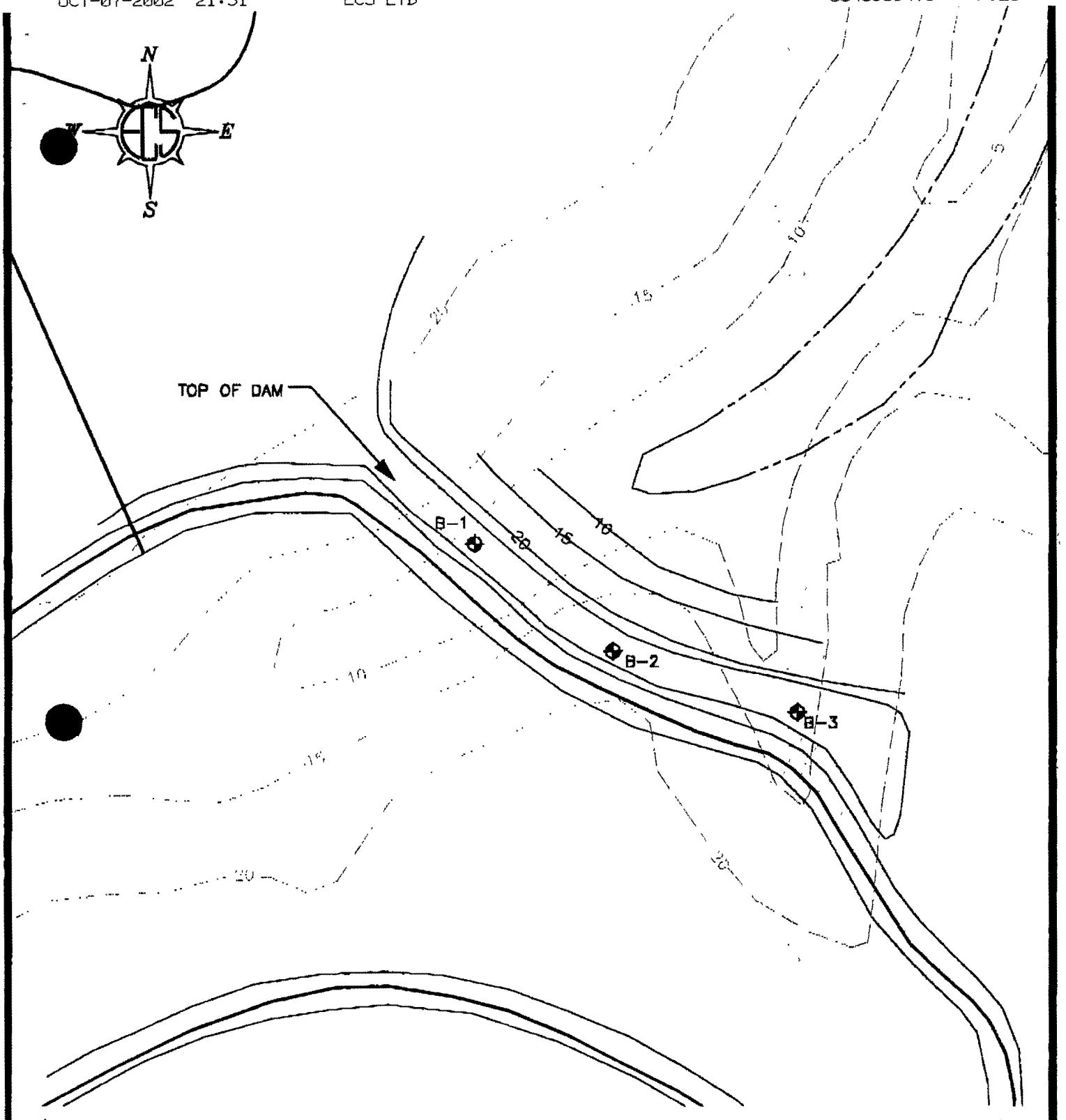
ECS LTD
ENGINEERING CONSULTING SERVICES, LTD

GENERALIZED CROSS SECTION

WHITTAKER'S LAKE
GOVERNOR'S LAND DAMS
JAMES CITY COUNTY, VIRGINIA

ECS, LTD. PROJECT NO. 6221

Bennett's Pond Dam



⊕ – Approximate Boring Location

Scale: 1"=60'

PREPARED FOR:

DOMINON LAND MANAGEMENT

ECS LTD
ENGINEERING CONSULTING SERVICES, LTD

BORING LOCATION DIAGRAM

GOVERNOR'S LAND
BENNETT'S POND
JAMES CITY COUNTY, VIRGINIA

ECS, LTD. PROJECT NO. 6221

CLIENT	JOB #	BORING #	SHEET
DOMINION LAND MANAGEMENT CO.	6221	B-1	1 OF 1

PROJECT NAME: GOVERNOR'S LAND DAMS (EMBANKMENT EVAL.)

ARCHITECT-ENGINEER: AES, INC.

SITE LOCATION: BENNETT'S POND, JAMES CITY COUNTY, VIRGINIA

ENGLISH UNITS

SURFACE ELEVATION 22.00

SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	STANDARD PENETRATION BLOWS/FT.
1	SS	24	24	Topsoil-2", (FILL)	11
2	SS	24	24	Fine Sandy SILT With Organics, Tan, Dry, Stiff, (ML-FILL)	13
3	SS	24	24	Fat CLAY, Trace Fine Sand, Orangish Brown and Gray, Moist, Stiff, (CH-FILL)	12
4	SS	24	24		13
5	SS	24	24		12
6	SS	24	24		13
7	SS	24	24		13
8	SS	12	12		13

END OF BORING @ 15.0'

CALIBRATED PENETROMETER TONS/FT.^{2}: 1 2 3 4 5+

PLASTIC LIMIT % X — WATER CONTENT % ● — LIQUID LIMIT % Δ: 10 20 30 40 50+

STANDARD PENETRATION BLOWS/FT.: 10 20 30 40 50+

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU THE TRANSITION MAY BE GRADUAL

WL DRY WS OR WD	BORING STARTED 10-25-00	TOPSOIL DEPTH 2"
WL(AB) WL(AC)	BORING COMPLETED 10-25-00	CAVE IN DEPTH ●
WL	RIG FISHBURNE FOREMAN SONNY	DRILLING METHOD HOLLOW STEM AUGER

CLIENT	JOB #	BORING #	SHEET
DOMINION LAND MANAGEMENT CO.	6221	B-2	1 OF 1

PROJECT NAME: GOVERNOR'S LAND DAMS (EMBANKMENT EVAL.)

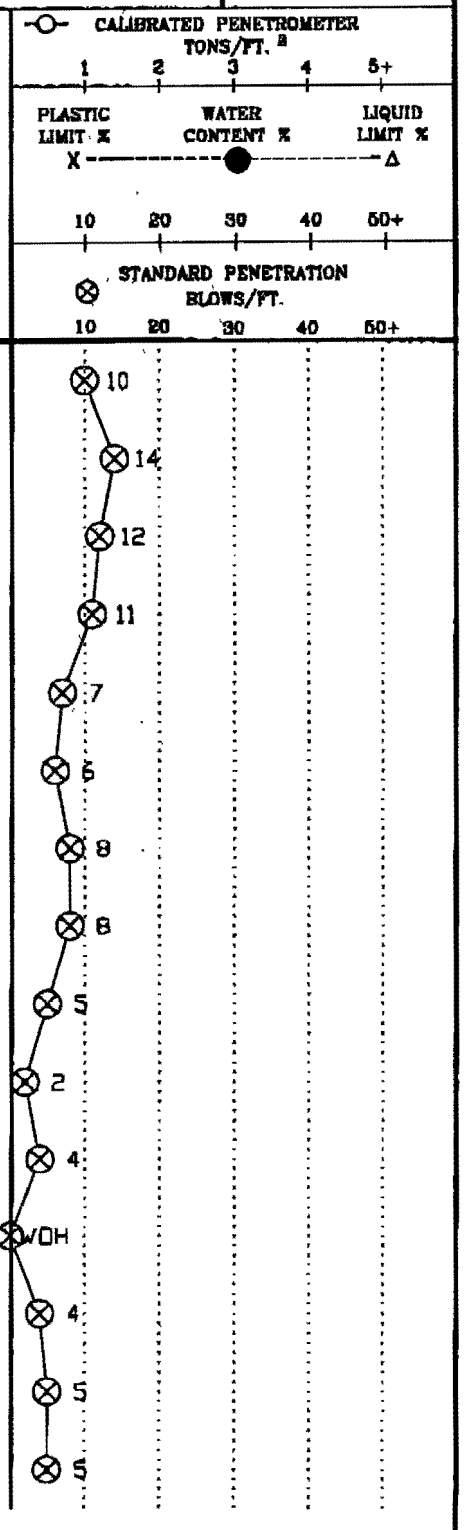
ARCHITECT-ENGINEER: AES, INC.

SITE LOCATION: BENNETT'S POND, JAMES CITY COUNTY, VIRGINIA

ENGLISH UNITS

SURFACE ELEVATION 22.00

SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL
1	SS	24	24	Topsoil-2", (FILL)
2	SS	24	24	Fine Sandy Lean CLAY, Tan, Moist, Medium Stiff, (CL-FILL)
3	SS	24	24	Fat CLAY With Trace Organics and Fine Sand, Orangish Brown and Gray, Moist, Stiff to Medium Stiff, (CH-FILL)
4	SS	24	24	
5	SS	24	24	
6	SS	24	24	
7	SS	24	24	
8	SS	24	24	Silty Fine to Medium SAND, Orangish Brown, Wet, Loose, (SM)
9	SS	24	24	
10	SS	24	24	Clayey Fine to Medium SAND, Medium Gray, Wet, Very Loose, (SC)
11	SS	24	24	
12	SS	24	24	Fat CLAY, Trace Fine Sand, Bluish Gray, Saturated, Very Soft to Soft, (CH)
13	SS	24	24	
14	SS	24	24	Organic Elastic SILT, Trace Fine Sand, Dark Gray and Black, Wet, Soft, (OH)
15	SS	24	24	



END OF BORING @ 30.0'

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU THE TRANSITION MAY BE GRADUAL

16.0' WS OR WD	BORING STARTED 10-25-00	TOPSOIL DEPTH 2"
WL(AB) WL(AC)	BORING COMPLETED 10-25-00	CAVE IN DEPTH ●
WL	RIG FISHBURNE FOREMAN SONNY	DRILLING METHOD HOLLOW STEM AUGER

CLIENT	JOB #	BORING #	SHEET
DOMINION LAND MANAGEMENT CO.	6221	B-3	1 OF 1

PROJECT NAME: GOVERNOR'S LAND DAMS (EMBANKMENT EVAL.)

ARCHITECT-ENGINEER: AES, INC.

SITE LOCATION: BENNETT'S POND, JAMES CITY COUNTY, VIRGINIA

ENGLISH UNITS

SURFACE ELEVATION 22.00

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL
0	1	SS	24	24	Topsoil-2", (FILL)
	2	SS	24	24	Fine Sandy Lean CLAY With Organics, Grayish Brown, Moist, Medium Stiff, (CL-FILL)
5	3	SS	24	24	Fat CLAY, Trace Fine Sand and Tiny Roots, Orangish Brown and Gray, Moist, Soft to Stiff, (CH-FILL)
	4	SS	24	24	
	5	SS	24	24	
10	6	SS	24	24	
	7	SS	24	24	
	8	SS	12	12	
15					END OF BORING @ 15.0'
20					
25					
30					

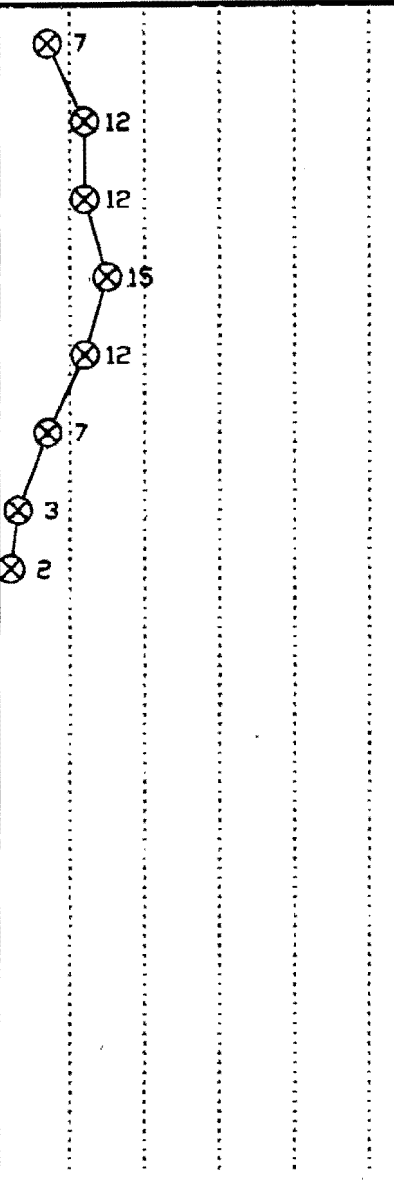
WATER LEVELS

ELEVATION (FT): 20, 15, 10, 5, 0, -5

CALIBRATED PENETROMETER TONS/FT.^{2}: 1, 2, 3, 4, 5+

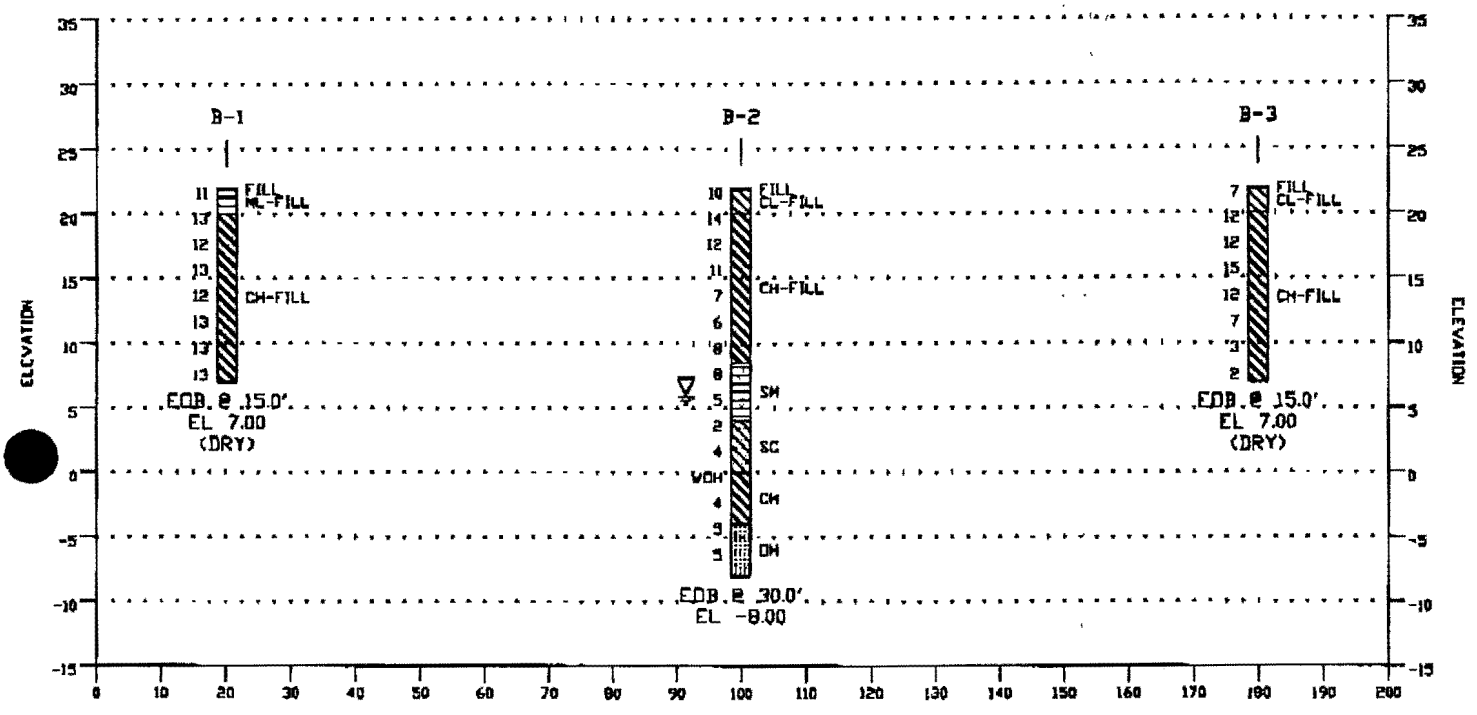
PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT %: 10, 20, 30, 40, 50+

STANDARD PENETRATION BLOWS/FT.: 10, 20, 30, 40, 50+



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU THE TRANSITION MAY BE GRADUAL

WL DRY WS OR WD	BORING STARTED 10-25-00	TOPSOIL DEPTH 2"
WL(AB) WL(AC)	BORING COMPLETED 10-25-00	CAVE IN DEPTH ●
WL	RIG FISHBURNE FOREMAN SONNY	DRILLING METHOD HOLLOW STEM AUGER



PREPARED FOR:

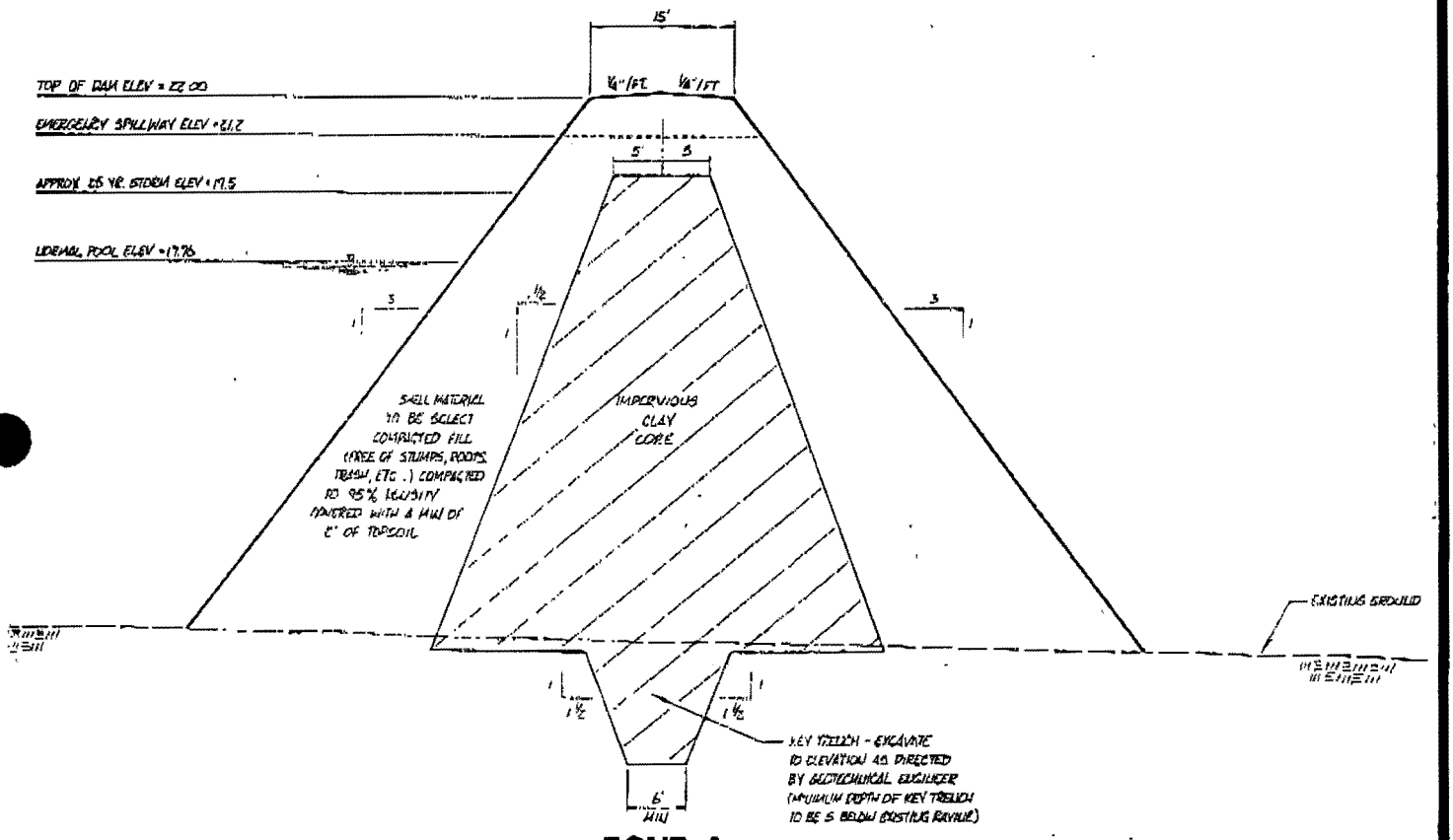
DOMINION LAND MGMNT. CO.

ECS LTD
ENGINEERING CONSULTING SERVICES, LTD

GENERALIZED CROSS SECTION

BENNETT'S POND
GOVERNOR'S LAND DAMS
JAMES CITY COUNTY, VIRGINIA

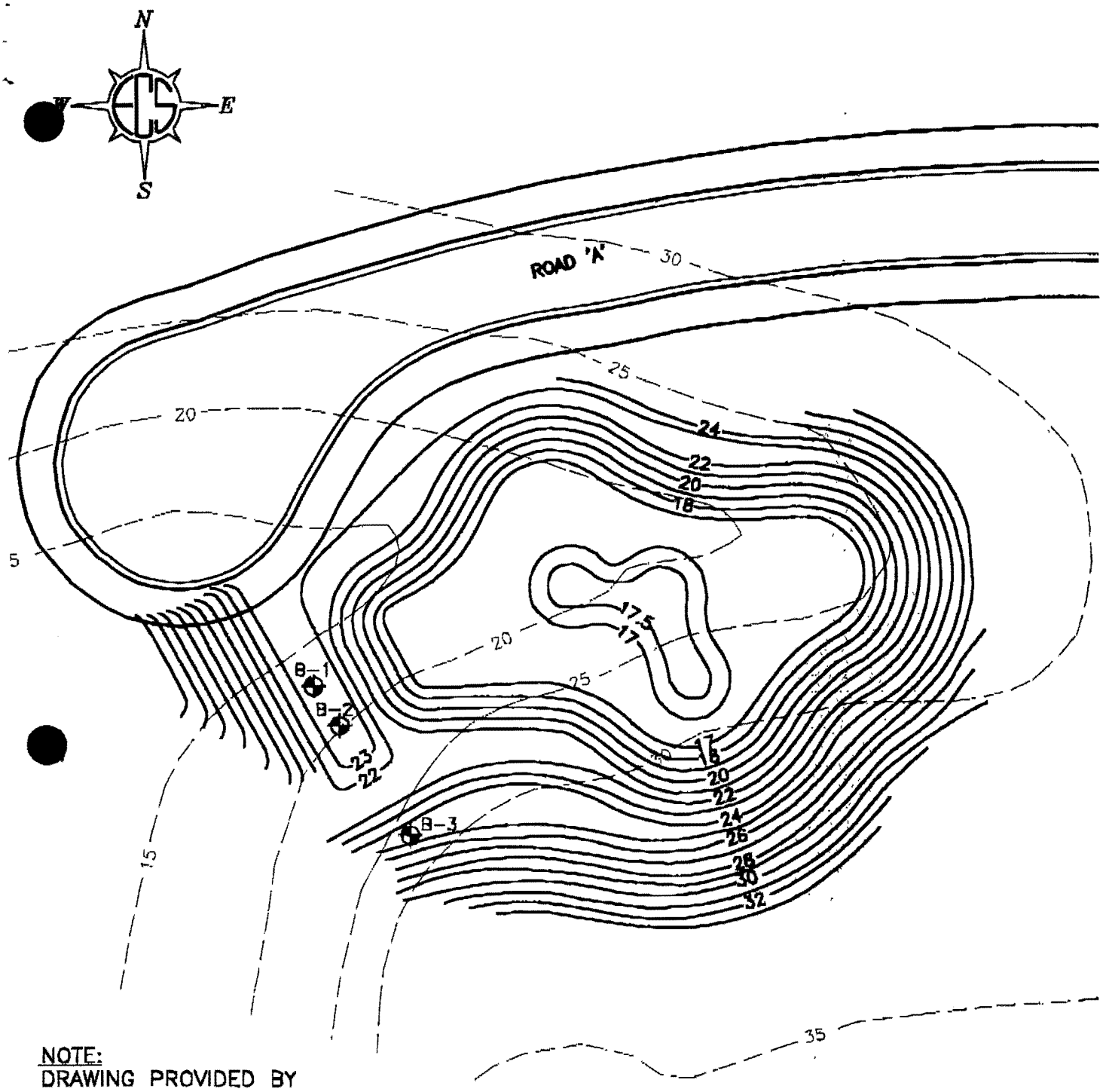
ECS, LTD. PROJECT NO. 6221



POND A
DAM CROSS-SECTION

PREPARED FOR:		DAM SCHEMATIC
DOMINION LAND MANAGEMENT	ECS LTD ENGINEERING CONSULTING SERVICES, LTD	GOVERNOR'S LAND BENNETT'S POND JAMES CITY COUNTY, VIRGINIA ECS, LTD. PROJECT NO. 6221

Founder's Hill Detention Pond



NOTE:
DRAWING PROVIDED BY
WILLIAMSBURG ENVIRONMENTAL
GROUP, DATE: 5/14/96

⊕ – Approximate Boring Location

Scale: 1"=40'

PREPARED FOR:		BORING LOCATION DIAGRAM
DOMINION LAND MANAGEMENT	ECS LTD ENGINEERING CONSULTING SERVICES, LTD	FOUNDER'S HILL GOVERNOR'S LAND JAMES CITY CO., VIRGINIA ECS, LTD. PROJECT NO. 6221

CLIENT	JOB #	BORING #	SHEET
DOMINION LAND MANAGEMENT CO.	6221	B-1	1 OF 1

PROJECT NAME	ARCHITECT-ENGINEER
GOVERNOR'S LAND DAMS EVAL.	AES, INC.

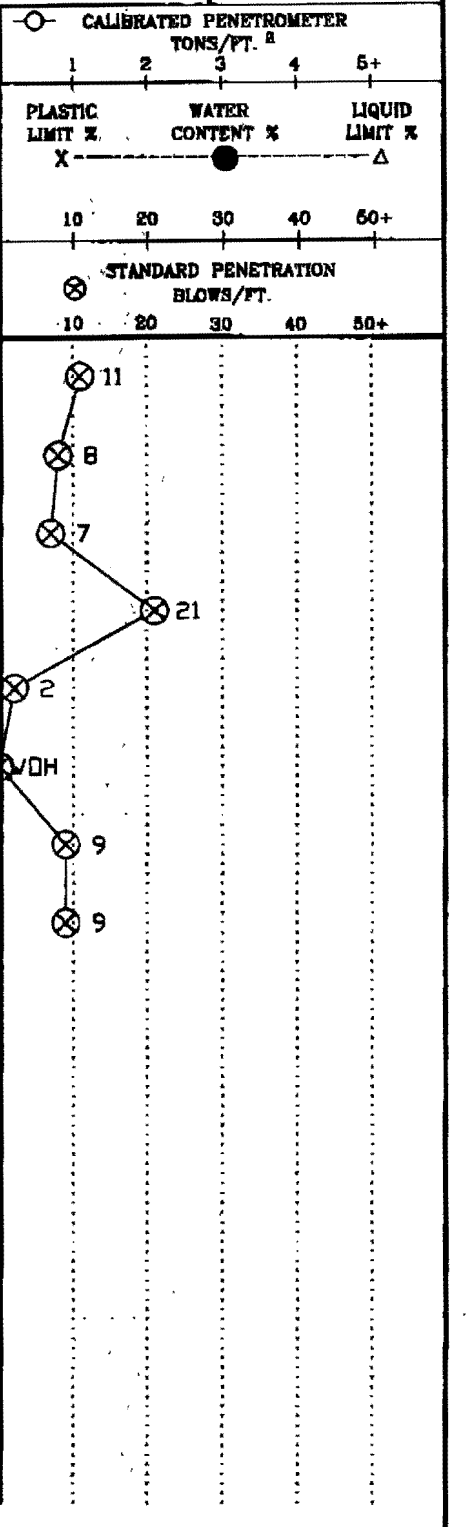
SITE LOCATION
FOUNDERS HILL, JAMES CITY COUNTY, VA

ENGLISH UNITS

SURFACE ELEVATION 23.00

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL
0	1	SS	24	24	Topsoil
	2	SS	24	24	Fat CLAY With Fine Sand, Trace Roots, Orangish Brown and Gray, Moist, Stiff to Medium Stiff, (CH-FILL)
5	3	SS	24	24	Fat CLAY With Fine Sand, Grayish Brown and Bluish Gray, Moist, Medium Stiff, (CH-FILL)
	4	SS	24	24	Fat CLAY With Fine Sand, Trace Wood, Orangish Brown and Bluish Light Gray, Moist, Very Stiff, (CH-FILL)
10	5	SS	24	24	Fat CLAY With Fine Sandy Lenses, Orangish Brown and Gray, Wet, Very Soft (CH)
	6	SS	24	24	Silty CLAY With Roots, Trace Fine Sand, Orangish Brown, Gray and Tan, Moist, Medium Stiff, (CL-CH)
	7	SS	24	24	Silty Fine to Medium SAND, Tan, Moist, Loose, (SM)
15	8	SS	24	24	
20					END OF BORING @ 16.0'
25					
30					

WATER LEVELS ELEVATION (FT): 20, 15, 10, 5, 0, -5



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU THE TRANSITION MAY BE GRADUAL

DRY	WS OR WD	BORING STARTED 12-5-00	TOPSOIL DEPTH 2"
WL(AB)	WL(AC)	BORING COMPLETED 12-5-00	CAVE IN DEPTH @ 13.2'
WL		RIG FISHBURNE FOREMAN SONNY	DRILLING METHOD HOLLOW STEM AUGER

CLIENT	JOB #	BORING #	SHEET
DOMINION LAND MANAGEMENT CO.	6221	B-2	1 OF 1

PROJECT NAME	ARCHITECT-ENGINEER
GOVERNOR'S LAND DAMS EVAL.	AES, INC.

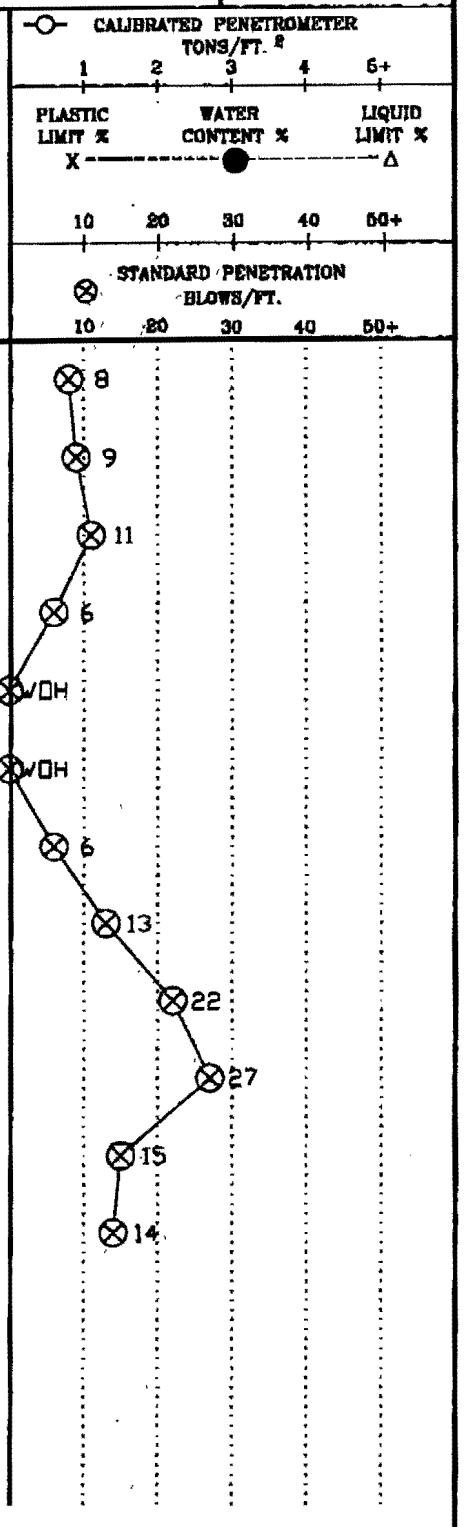
SITE LOCATION
FOUNDERS HILL, JAMES CITY COUNTY, VA

ENGLISH UNITS

SURFACE ELEVATION 23.00

SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL
1	SS	24	24	Topsoil
2	SS	24	24	Clayey Fine to Medium SAND, Orangish Brown, Moist, Loose, (SC-FILL)
3	SS	24	24	Fat CLAY With Fine Sand, Trace Wood Fragments, Orangish Brown and Gray, Moist, Medium Stiff to Stiff, (CH-FILL) [Wood fragments in sample #3 only]
4	SS	24	24	
5	SS	24	24	Fat CLAY With Fine Sandy Lenses, Orangish Brown and Gray Moist, Very Soft, (CH)
6	SS	24	24	
7	SS	24	24	Fat CLAY With Fine Sand, Bluish Gray, Moist, Medium Stiff, (CH)
8	SS	24	24	Silty Fine to Medium SAND, Tan to Reddish Brown, Moist to Wet, Medium Dense, (SM)
9	SS	24	24	
10	SS	24	24	
11	SS	24	24	Silty Fine to Coarse SAND, Reddish Brown, Saturated, Medium Dense, (SM)
12	SS	24	24	

END OF BORING @ 24.0'



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU THE TRANSITION MAY BE GRADUAL

17.0' WS OR WD	BORING STARTED 12-5-00	TOPSOIL DEPTH 2"
WL(AB) WL(AC)	BORING COMPLETED 12-5-00	CAVE IN DEPTH @ 18.3'
WL	RIG FISHBURNE FOREMAN SONNY	DRILLING METHOD HOLLOW STEM AUGER

CLIENT	JOB #	BORING #	SHEET
DOMINION LAND MANAGEMENT CO.	6221	B-3	1 OF 1

PROJECT NAME	ARCHITECT-ENGINEER
GOVERNOR'S LAND DAMS EVAL.	AES, INC.

SITE LOCATION
FOUNDERS HILL, JAMES CITY COUNTY, VA

DESCRIPTION OF MATERIAL

ENGLISH UNITS

SURFACE ELEVATION 24.50

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL
0	1	SS	24	24	Topsoil
	2	SS	24	24	Clayey Fine to Medium SAND, Orangish Brown and Gray, Moist, Medium Dense to Loose, (SC-FILL)
5	3	SS	24	24	Fine to Medium Sandy CLAY, Medium Gray, Wet, Soft, (CL)
	4	SS	24	24	Fat CLAY With Fine Clay, Bluish Gray, Moist to Wet, Very Soft, (CH)
	5	SS	24	24	
10	6	SS	24	24	
	7	SS	24	24	
15	8	SS	24	24	Fine Sandy CLAY, Reddish Brown, Moist to Dry, Stiff, (CL)

END OF BORING @ 16.0'

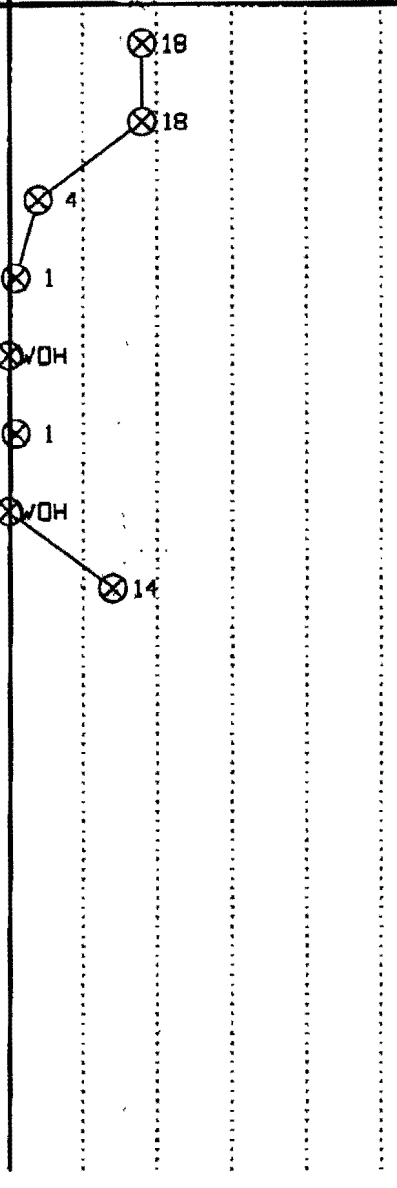
WATER LEVELS

ELEVATION (FT): 20, 15, 10, 5, 0, -5

CALIBRATED PENETROMETER TONS/FT.² (1, 2, 3, 4, 5+)

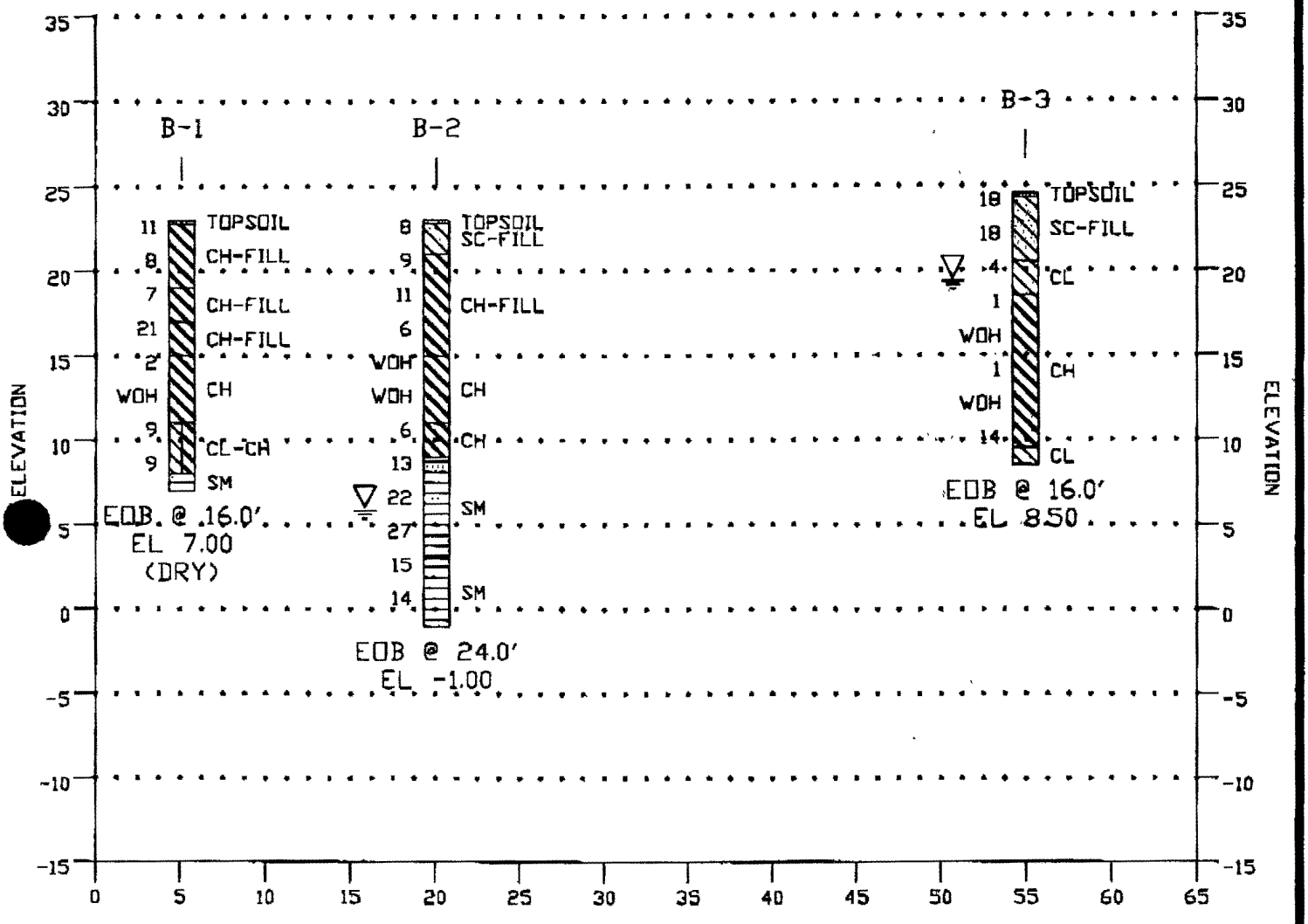
PLASTIC LIMIT % X — WATER CONTENT % ● — LIQUID LIMIT % Δ (10, 20, 30, 40, 50+)

STANDARD PENETRATION BLOWS/FT. (10, 20, 30, 40, 50+)



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU THE TRANSITION MAY BE GRADUAL

5.0' WS OR WD	BORING STARTED 11-20-00	TOPSOIL DEPTH 2"
WL(AB) WL(AC)	BORING COMPLETED 11-20-00	CAVE IN DEPTH ●
WL	RIG FISHBURNE FOREMAN MIKE	DRILLING METHOD HOLLOW STEM AUGER



SCALE
VERTICAL SCALE 1"=10'
HORIZONTAL SCALE 1"=10'

PREPARED FOR:

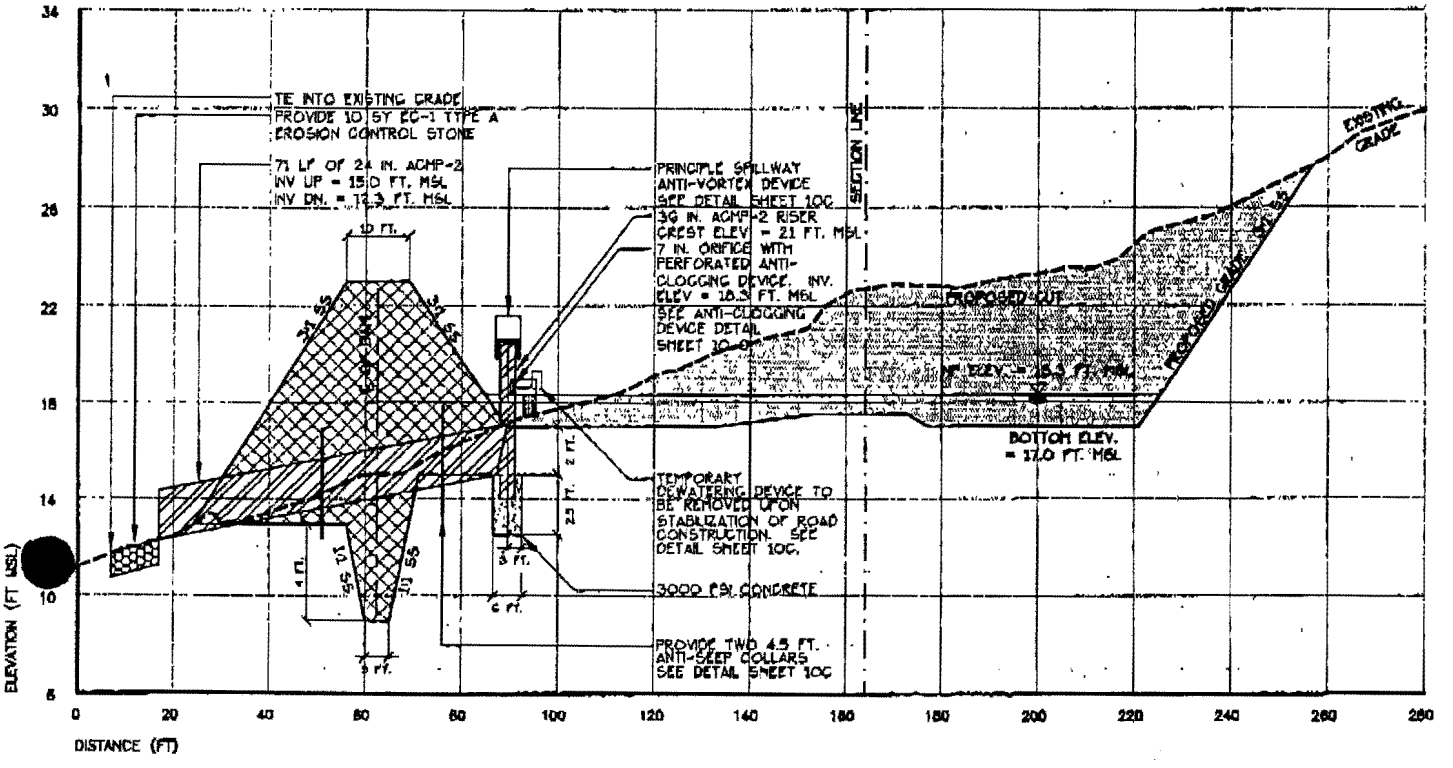
DOMINION LAND MGMNT. CO.

ECS LTD
ENGINEERING CONSULTING SERVICES, LTD

GENERALIZED CROSS SECTION

FOUNDER'S HILL
GOVERNOR'S LAND DAMS
JAMES CITY COUNTY, VIRGINIA

ECS, LTD. PROJECT NO. 6221



PROFILE

SCALE: HORIZONTAL 1 IN.= 20 FT., VERTICAL 1 IN.= 4 FT.

NOTE:
DRAWING PROVIDED BY
WILLIAMSBURG ENVIRONMENTAL
GROUP, DATE: 5/14/96

PREPARED FOR:

DOMINION LAND MANAGEMENT

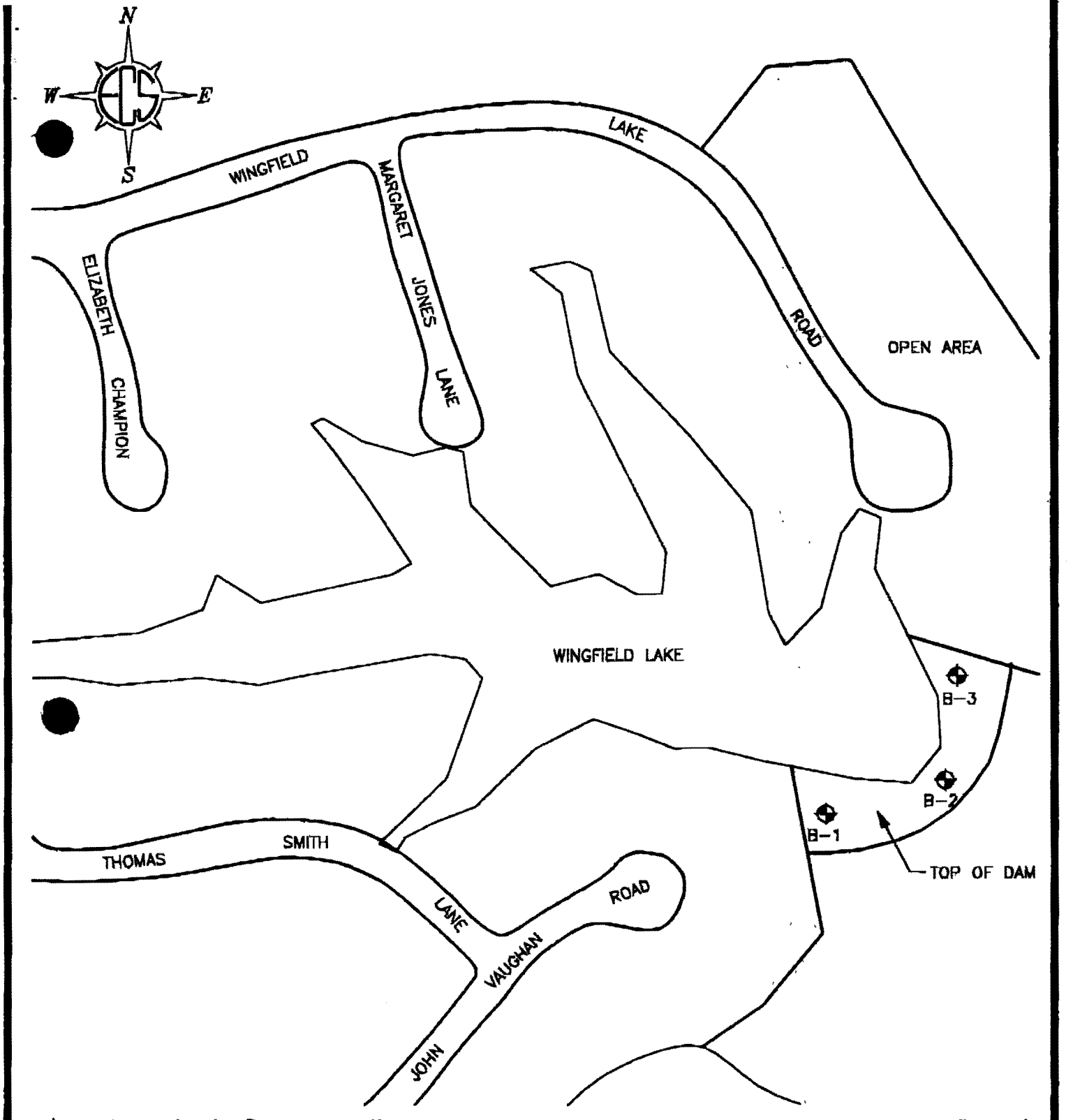
ECS LTD
ENGINEERING
CONSULTING
SERVICES, LTD

DAM SCHEMATIC

FOUNDER'S HILL
GOVERNOR'S LAND
JAMES CITY CO., VIRGINIA

ECS, LTD. PROJECT NO. 6221

Wingfield Lake



⊕ – Approximate Boring Location

Scale: 1"=200'

PREPARED FOR:

DOMINION LAND MANAGEMENT

ECS LTD
ENGINEERING CONSULTING SERVICES, LTD

BORING LOCATION DIAGRAM

GOVERNOR'S LAND
WINGFIELD LAKE
JAMES CITY COUNTY, VIRGINIA

ECS, LTD. PROJECT NO. 6221

CLIENT	JOB #	BORING #	SHEET
DOMINION LAND MANAGEMENT CO.	6221	B-1	1 OF 1

PROJECT NAME: GOVERNOR'S LAND DAMS (EMBANKMENT EVAL.)

ARCHITECT-ENGINEER: AES, INC.

SITE LOCATION: WINGFIELD LAKE DAM, JAMES CITY CO., VA

ENGLISH UNITS

SURFACE ELEVATION

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	STANDARD PENETRATION BLOWS/FT.
0	1	SS	24	24	Topsoil-1", (FILL)	5
	2	SS	24	24	Fat CLAY, Trace Fine Sand and Roots, Orangish Brown and Gray, Moist to Wet, Soft to Medium Stiff, (CH-FILL)	5
5	3	SS	24	24		8
	4	SS	24	24	Fat CLAY With Fine Sand and Sand Pockets, Orangish Brown and Gray, Moist, Medium Stiff, (CH-FILL) [Sand pockets larger in sample 8]	9
	5	SS	24	24		9
10	6	SS	24	24		8
	7	SS	24	24		9
	8	SS	12	12		9
15					END OF BORING @ 15.0'	
20						
25						
30						

WATER LEVELS — ELEVATION (FT)

CALIBRATED PENETROMETER TONS/FT. 1 2 3 4 5+

PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT % 10 20 30 40 50+

STANDARD PENETRATION BLOWS/FT. 10 20 30 40 50+

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU THE TRANSITION MAY BE GRADUAL

WS OR TD	BORING STARTED 10-23-00	
WL(AB) WL(AC)	BORING COMPLETED 10-23-00	CAVE IN DEPTH
WL	RIG FISHBURNE FOREMAN ED	DRILLING METHOD HOLLOW STEM AUGER

CLIENT	JOB #	BORING #	SHEET
DOMINION LAND MANAGEMENT CO.	6221	B-2	1 OF 2

PROJECT NAME: GOVERNOR'S LAND DAMS (EMBANKMENT EVAL.)

ARCHITECT-ENGINEER: AES, INC.

SITE LOCATION: WINGFIELD LAKE DAM, JAMES CITY CO., VA

CALIBRATED PENETROMETER TONS/FT.^{2} (1, 2, 3, 4, 5+)

PLASTIC LIMIT % X — WATER CONTENT % ● — LIQUID LIMIT % Δ (10, 20, 30, 40, 50+)

STANDARD PENETRATION BLOWS/FT. ⊗ (10, 20, 30, 40, 50+)

ENGLISH UNITS

SURFACE ELEVATION

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	STANDARD PENETRATION BLOWS/FT.
0	1	SS	24	24	Topsoil-1", (FILL)	5
	2	SS	24	24	Fine Sandy SILT With Roots, Tan, Dry, Soft, (ML-FILL)	5
5	3	SS	24	24	Fat CLAY, Trace Fine Sand, Trace Tiny Roots and Organics, Orangish Brown and Gray, Moist, Soft to Medium Stiff, (CH-FILL)	8
	4	SS	24	24		9
	5	SS	24	24		6
10	6	SS	24	24		7
	7	SS	24	24		6
15	8	SS	24	24		4
	9	SS	24	24		6
	10	SS	24	24		8
20	11	SS	24	24		10
	12	SS	24	24		8
25	13	SS	24	24		6
	14	SS	24	24		7
	15	SS	24	24		7
30						

WATER LEVELS ELEVATION (FT)

CONTINUED ON NEXT PAGE.

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU THE TRANSITION MAY BE GRADUAL

DRY WS OR WD	BORING STARTED 10-23-00	TOPSOIL DEPTH 1"
WL(AB) WL(AC)	BORING COMPLETED 11-20-00	CAVE IN DEPTH @ 37.3'.
WL	RIG FISHBURNE FOREMAN ED	DRILLING METHOD HOLLOW STEM AUGER

CLIENT	JOB #	BORING #	SHEET
DOMINION LAND MANAGEMENT CO.	6221	B-2	2 OF 2

PROJECT NAME: GOVERNOR'S LAND DAMS (EMBANKMENT EVAL.)

ARCHITECT-ENGINEER: AES, INC.

SITE LOCATION: WINGFIELD LAKE DAM, JAMES CITY CO., VA

CALIBRATED PENETROMETER TONS/FT.² (1, 2, 3, 4, 5+)

PLASTIC LIMIT % X — WATER CONTENT % ● — LIQUID LIMIT % Δ (10, 20, 30, 40, 50+)

STANDARD PENETRATION BLOWS/FT. ⊗ (10, 20, 30, 40, 50+)

ENGLISH UNITS

SURFACE ELEVATION

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	STANDARD PENETRATION BLOWS/FT.
30	16	SS	24	24	Fat CLAY With Fine Sand, Bluish Gray, Moist, Medium Stiff to Soft, (CH)	8
	17	SS	24	24		5
35	18	SS	24	24	Clayey Fine to Medium SAND, Bluish Gray, Moist, Loose, (SC)	8
	19	SS	24	24	Fine to Coarse SAND, Trace Silt, Medium Gray, Saturated, Medium Dense, (SP)	12
	20	SS	24	24	Fine to Medium Sandy Lean CLAY, Bluish Gray, Saturated, Stiff, (CL)	12
40					END OF BORING @ 40.0'	
45						
50						
55						
60						

WATER LEVELS — ELEVATION (FT)

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU THE TRANSITION MAY BE GRADUAL

DRY WS OR WD	BORING STARTED 10-23-00	TOPSOIL DEPTH 1"
WL(AB) WL(AC)	BORING COMPLETED 11-20-00	CAVE IN DEPTH @ 37.3'
WL	RIG FISHBURNE FOREMAN ED	DRILLING METHOD HOLLOW STEM AUGER

CLIENT	JOB #	BORING #	SHEET
DOMINION LAND MANAGEMENT CO.	6221	B-3	1 OF 1

PROJECT NAME: GOVERNOR'S LAND DAMS (EMBANKMENT EVAL.)

ARCHITECT-ENGINEER: AES, INC.

SITE LOCATION: WINGFIELD LAKE DAM, JAMES CITY CO., VA

ECS LTD

CALIBRATED PENETROMETER TONS/FT.^{2} (1, 2, 3, 4, 5+)

PLASTIC LIMIT % X — WATER CONTENT % ● — LIQUID LIMIT % Δ (10, 20, 30, 40, 50+)

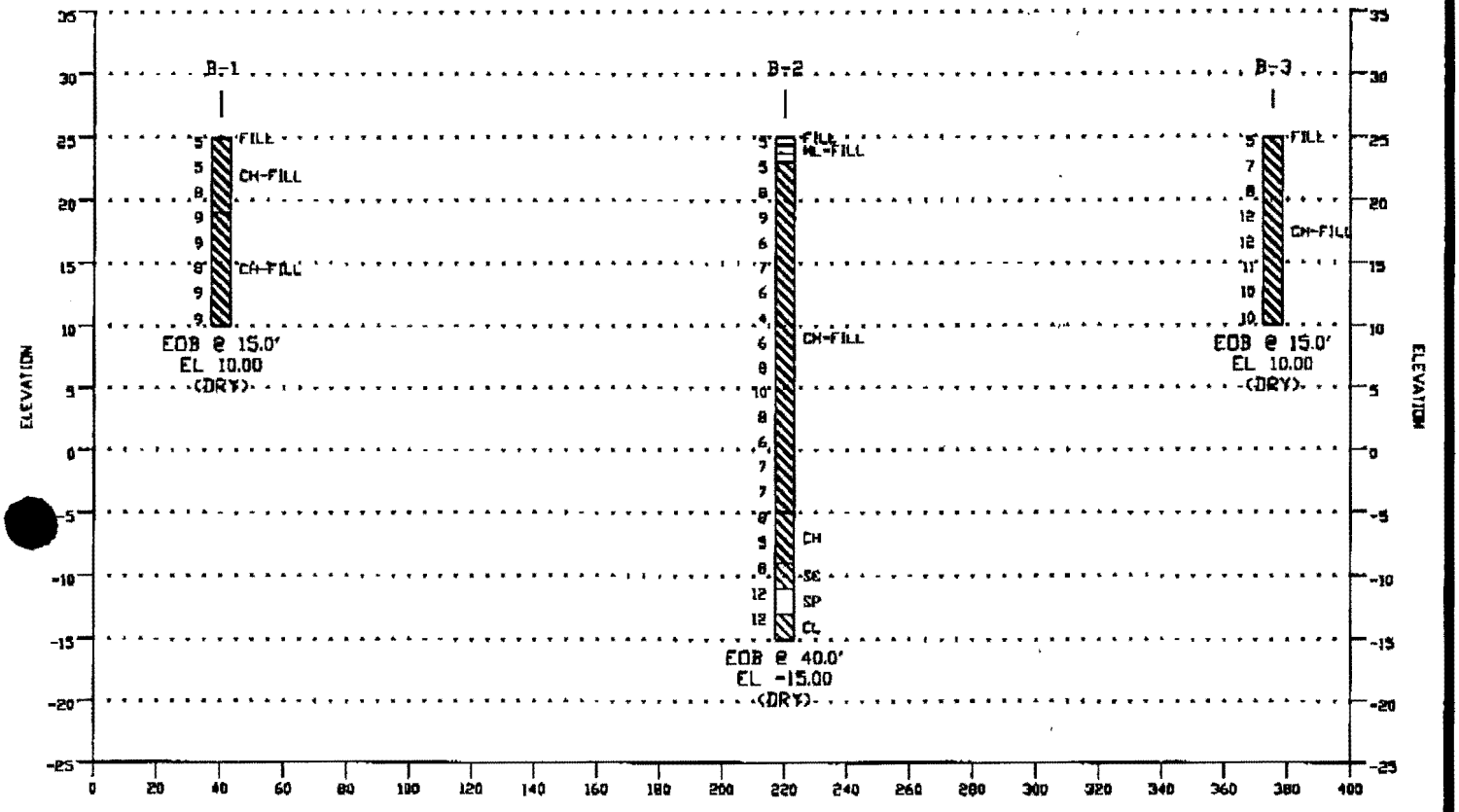
STANDARD PENETRATION BLOWS/FT. ⊗ (10, 20, 30, 40, 50+)

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL (ENGLISH UNITS)	STANDARD PENETRATION BLOWS/FT.
0	1	SS	24	24	Topsoil-1", (FILL)	5
	2	SS	24	24	Fat CLAY, Trace Fine Sand, Roots and Organics, Orangish Brown and Gray, Moist, Soft to Medium Stiff, (CH-FILL)	7
5	3	SS	24	24		8
	4	SS	24	24		12
	5	SS	24	24		12
10	6	SS	24	24		11
	7	SS	24	24		10
	8	SS	12	12		10
15					END OF BORING @ 15.0'	
20						
25						
30						

WATER LEVELS ELEVATION (FT)

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN-SITU THE TRANSITION MAY BE GRADUAL

WS OR WD	BORING STARTED 10-23-00	
WL(AB) WL(AC)	BORING COMPLETED 10-23-00	CAVE IN DEPTH ●
WL	RIG FISHBURNE FOREMAN ED	DRILLING METHOD HOLLOW STEM AUGER



SCALE
VERTICAL SCALE 1"=15'
HORIZONTAL SCALE 1"=60'

PREPARED FOR:

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GENERALIZED CROSS SECTION

WINGFIELD LAKE
GOVERNOR'S LAND DAMS
JAMES CITY COUNTY, VIRGINIA

ECS, LTD. PROJECT NO. 6221

Appendix II

Summary of Laboratory Test Data

Engineering Consulting Services, Ltd.

Richmond, Virginia

Laboratory Testing Summary

Date: 11/8/00

Project Number: 6221 **Project Name:** Governor's Land Dams (Embankment Evaluation)

Project Engineer: D.J.S. **Principal Engineer:** D.E.S. **Summary By:** K.H

Boring Number	Sample Number	Depth (feet)	Moisture Content (%)	USC	Liquid Limit	Plastic Limit	Plasticity Index	Percent Passing No. 200 Sieve	Compaction Maximum Density (pcf)	Compaction Optimum Moisture (%)	CBR Value	Other
B2/F.L	S-4	6.0'-8.0'	29.7	CH	57	21	36	*	*	*	*	*
B2/F.L	S-5	8.0'-10.0'	*	CH	*	*	*	99.1	*	*	*	*
B2/F.L	S-9	16.0'-18.0'	29.8	CL	*	*	*	*	*	*	*	*
B2/H.L	S-5	8.0'-10.0'	26.6	CL	46	20	26	*	*	*	*	*
B2/H.L	S-6	10.0'-12.0'	*	CH	*	*	*	93.1	*	*	*	*
B2/H.L	S-9	16.0'-18.0'	16.1	SC	*	*	*	*	*	*	*	*
B2/#12	S-3	4.0'-6.0'	*	CL	*	*	*	88.4	*	*	*	*
B2/#12	S-4	6.0'-8.0'	24.4	CL	42	17	25	*	*	*	*	*
B2/#12	S-6	10.0'-12.0'	22.2	CL	*	*	*	*	*	*	*	*
B2/T.P	S-7	12.0'-14.0'	34.6	CH	76	27	49	*	*	*	*	*
B2/T.P	S-8	14.0'-16.0'	*	CH	*	*	*	97.1	*	*	*	*
B2/T.P	S-10	18.0'-20.0'	22.1	SC	*	*	*	*	*	*	*	*
B2/W.L	S-11	20.0'-22.0'	29.5	CH	54	23	31	*	*	*	*	*
B2/W.L	S-12	22.0'-24.0'	*	CH	*	*	*	96.6	*	*	*	*
B2/W.L	S-15	28.0'-30.0'	10.7	SP	*	*	*	*	*	*	*	*
B2/B.P	S-5	8.0'-10.0'	35.4	CH	66	23	43	*	*	*	*	*
B2/B.P	S-6	10.0'-12.0'	*	CH	*	*	*	96.9	*	*	*	*
B2/B.P	S-8	14.0'-16.0'	23.8	SM	*	*	*	*	*	*	*	*
B2/Wing	S-6	10.0'-12.0'	36.2	CH	61	24	37	*	*	*	*	*
B2/Wing	S-7	12.0'-14.0'	*	CH	*	*	*	95.8	*	*	*	*
B2/Wing	S-15	28.0'-30.0'	33.0	CH	*	*	*	*	*	*	*	*

Summary Key:

V = Virginia Test Method
S = Standard Proctor
M = Modified Proctor
Hyd = Hydrometer
Con = Consolidation
DS = Direct Shear
GS = Specific Gravity
UCS = Unconfined Compression Soil
UCR = Unconfined Compression Rock
LS = Lime Stabilization
CS = Cement Staibilization
OC = Organic Content
SA = See Attached
NP = Non Plastic
* = Test Not Conducted

OCT-07-2002 21:55 ECS LTD 8043539478 P.22

Engineering Consulting Services, Ltd.

Richmond, Virginia

Laboratory Testing Summary

Date: 11/8/00

Project Number: 6221 **Project Name:** Governor's Land Dams (Embankment Evaluation)

Project Engineer: D.J.S. **Principal Engineer:** D.E.S. **Summary By:** K.H

Boring Number	Sample Number	Depth (feet)	Moisture Content (%)	USC	Liquid Limit	Plastic Limit	Plasticity Index	Percent Passing No. 200 Sieve	Compaction Maximum Density (pcf)	Compaction Optimum Moisture (%)	CBR Value	Other
B2/F.H.	S-3	4.0' - 6.0'	34.3	CH	83	29	54	*	*	*	*	
B2/F.H.	S-5	8.0' - 10.0	40.1	CH	*	*	*	90.2	*	*	*	

Summary Key:

SA = See Attached
S = Standard Proctor
M = Modified Proctor
V = Virginia Test Method
OC = Organic Content

Hyd = Hydrometer
Con = Consolidation
DS = Direct Shear
GS = Specific Gravity

UCS = Unconfined Compression Soil
UCR = Unconfined Compression Rock
LS = Lime Stabilization
CS = Cement Stabilization

OCT-07-2002 21:55 ECS LTD 8043539478 P.23

Appendix III

Unified Soil Classification System and Reference Notes for Boring Logs

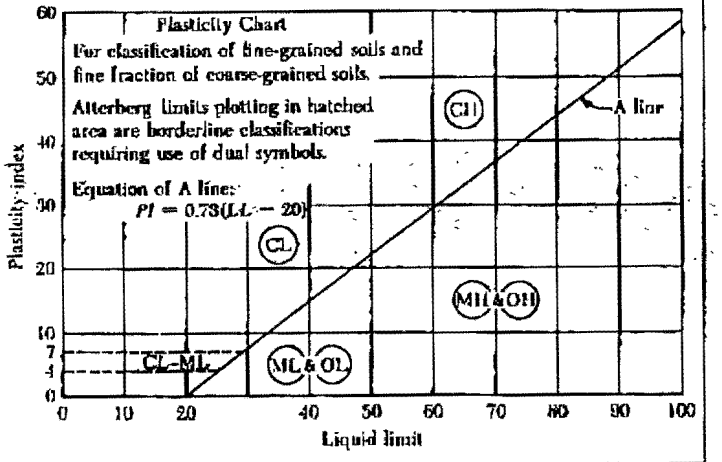
UNIFIED SOIL CLASSIFICATION SYSTEM (USCS)

Table Unified System of Classification

Major divisions			Group symbols	Typical names
Coarse-Grained Soils More than 50% retained on No. 200 sieve	Gravels 50% or more of coarse fraction retained on No. 4 sieve	Clean Gravels	GW	Well-graded gravels and gravel-sand mixtures, little or no fines
			GP	Poorly graded gravels and gravel-sand mixtures, little or no fines
		Gravels with Fines	GM	Silty gravels, gravel-sand-silt mixtures
			GC	Clayey gravels, gravel-sand-clay mixtures
	Sands More than 50% of coarse fraction passes No. 4 sieve	Clean Sands	SW	Well-graded sands and gravelly sands, little or no fines
			SP	Poorly graded sands and gravelly sands, little or no fines
		Sands with Fines	SM	Silty sands, sand-silt mixtures
			SC	Clayey sands, sand-clay mixtures
Fine-Grained Soils 50% or more passes No. 200 sieve	Silts and Clays Liquid limit 50% or less		ML	Inorganic silts, very fine sands, rock flour, silty or clayey fine sands
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
			OL	Organic silts and organic silty clays of low plasticity
	Silts and Clays Liquid limit greater than 50%		MH	Inorganic silts, micaceous or diatomaceous fine sands or silts, elastic silts
			CH	Inorganic clays of high plasticity, fat clays
			OH	Organic clays of medium to high plasticity
Highly Organic Soils			PT	Peat, muck, and other highly organic soils

Table (Continued)

Classification criteria		
Classification on basis of percentage of fines: Less than 5% pass No. 200 sieve — GW, GP, SW, SP; More than 12% pass No. 200 sieve — GM, GC, SM, SC; 5% to 12% pass No. 200 sieve — Borderline classification requiring use of dual symbols	$C_u = D_{60}/D_{10}$ Greater than 4; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ Between 1 and 3	
	Not meeting both criteria for GW	
	Atterberg limits plot below "A" line or plasticity index less than 4	Atterberg limits plotting in hatched area are borderline classifications requiring use of dual symbols
	Atterberg limits plot above "A" line and plasticity index greater than 7	
	$C_u = D_{60}/D_{10}$ Greater than 6; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ Between 1 and 3	
	Not meeting both criteria for SW	
	Atterberg limits plot below "A" line or plasticity index less than 4	Atterberg limits plotting in hatched area are borderline classifications requiring use of dual symbols
	Atterberg limits plot above "A" line and plasticity index greater than 7	



Visual-manual identification, see ASTM Designation D2488.

Reprinted from the Annual Book of ASTM Standards

Engineering Consulting Services, Ltd.

REFERENCE NOTES FOR BORING LOGS

I. Drilling and Sampling Symbols:

SS - Split Spoon Sampler
ST - Shelby Tube Sampler
RC - Rock Core; NX, BX, AX
DC - Dutch Cone Penetrometer
PA - Power Auger (no sample)
HSA - Hollow Stem Auger
PM - Pressuremeter
WS - Wash Sample
BS - Bulk Sample of Cuttings
RB - Rock Bit Drilling

Standard Penetration Test (SPT) refers to the blows per foot of a 140 lb hammer free falling 30 inches on a 2 in. O.D. split-spoon sampler, as specified in ASTM D-1586. The SPT blow count is commonly referred to as the N-value. Typically the split-spoon sampler is driven to depths of 18 to 24 inches. The SPT result, N-value, is commonly determined by summing the second and third 6-inch increments.

II. Correlation of Penetration Resistances to Soil Properties:

COHESIVE SOILS
(CLAY, SILT and COMBINATIONS)

CONSISTENCY	SPT, N (Blows/Foot)	UNDRAINED SHEAR STRENGTH C_u (PSF)
VERY SOFT	< 2	<250
SOFT	3 - 5	250 - 500
MEDIUM STIFF	6 - 10	500 - 1000
STIFF	11 - 15	1000 - 2000
VERY STIFF	16- 30	2000 - 4000
HARD	> 31	> 4000

NON-COHESIVE SOILS
(SAND, GRAVEL, SILT and COMBINATIONS)

DENSITY	SPT, N (Blows/Foot)	RELATIVE DENSITY (%)
VERY LOOSE	< 5	0 – 15
LOOSE	6 – 10	16 – 35
MEDIUM DENSE	11 – 30	36 – 65
DENSE	31 – 50	66 – 85
VERY DENSE	51 – 80	86 – 98
EXTREMELY DENSE	> 81	99 - 100

[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: 2.00 mm to 1/4 inch (diameter of pencil lead)
  - Medium: .42 mm to 2.00 mm (diameter of broom straw)
  - Fine: .074 mm to .42 mm (diameter of human hair)

III. Water Level Measurement Symbols:

WL - Water Level
WCI - Wet Cave In
WS - While Sampling
DCI - Dry Cave In
WD - While Drilling
BCR - Before Casing Removal
ACR - After Casing Removal

The water levels are those water levels actually measured in the borehole at the times indicated by the symbol. The measurements are relatively reliable when augering, without adding drilling fluids in a granular soil. In clays and plastic silts, the accurate determination of water levels may require several days for the water level to stabilize. In such cases additional methods of measurement are generally applied.

Scott Thomas

From: Scott Thomas
Sent: Thursday, July 10, 2003 4:25 PM
To: Darryl Cook; Joe Buchite; Pat Menichino
Cc: John Horne
Subject: Governor's Land - BMP Update

Governor's Land
Certification Reviews

This is a brief update on the status of the Governor's Land BMPs - as I am sure by now you have been starting to get the Surety Release forms that I have been completing. This has been an overwhelming task. Early in the process the owner complained to County administration. We've been diligently working on this for about 8 months ever since Rick performed initial final BMP inspections from last November through March. There are 27 BMPs in Governor's Land under various different bonds (17 bonds approximate). There were several meetings with Jim Bennett November through January on this issue. AES got heavily involved in the process from about January to present. Glen Oder is currently the contact for Dominion on the project.

The general process has been as follows (November through July):

1. Owner request bond release (Governor's Land & Stonehouse)
2. Initial Final Inspection of BMPs (Rick)
3. Record Drawing Review (Rick/Scott)
4. Construction Certification Review
5. County generated letter with record drawing, construction certification and construction (field) related deficiencies for each of the 27 BMPs.
6. AES resubmission with revised record drawings and memo addressing County comments for each BMP.
7. Construction certification issues addressed by ECS and ECE, Inc.
8. Owner addresses construction (field) related items
9. County reinspection of BMPs
10. County review of revised record drawings
11. County review of construction certification submittals
12. County review of AES memos and supporting material
13. Administrative tracking (GIS, Access Database, files, etc.)
14. Surety Request forms completed.

As of right now, all the BMPs in Governor's Land are acceptable for release except for two BMPs. One is JR 056 which was a Tee dissipater that was supposed to be in Whittaker Island Block B, but was never constructed. It is my understanding that this was agreed upon by the County and the owner due to concerns by the lot owner along Sanctuary Drive. Although the downstream channel appears somewhat stable, I have requested channel adequacy computations to support not providing this BMP per the approved plan. The second BMP is JR 019, Whittaker Lake, which I am still sorting through some top of dam/emergency spillway issues on. AES has provided an asbuilt routing for this basin.

At this point I have forwarded on Surety Request forms that I can pending AES addressing the two remaining BMP items. Although only two BMPs remain, these two BMPs are in the bond being held for Governors Land Phase 1, Sections 1-2-3 of which we are holding $ 73,000 for. In this bond are about 10 BMPs and the two I still have issues on are in that block. Therefore, this bond cannot be released yet.

I realize there may be site issues that remain and/or other subdivision or road issues that may prohibit release of bond in an orderly fashion. However, from a BMP sense, I do suggest that if we can now is the time to release bond on the BMPs as overall the BMPs have been fully reviewed, maintenance performed and are in the best shape they have been in about 10 years. It will not take long for trees, trash, debris, etc. process to start to generate again on the BMP structures that have been reviewed.

Let me know if you have any questions on the status of this project.

Scott J. Thomas, P.E.
James City County
Environmental Division

Scott Thomas

From: Scott Thomas
Sent: Thursday, July 10, 2003 3:28 PM
To: 'Victoria Bains'; 'Marc Bennett'
Subject: Governor's Land - Asbuilts

RE: Certification Review
Project: Governors Land – Whittaker Lake; JR 019

I am very near the end of all BMP reviews for the Governor's Land project. Based on my review of the memorandum by AES dated June 26th 2003 and revised record drawings for Whittaker Lake, County BMP ID Code JR 019, I feel some additional information is warranted. Although an asbuilt routing was provided which shows 0.43 ft. of freeboard for the 100-year storm event, not all of my issues per comment # 3 (JCC Env Div letter dated March 10th 2003) were addressed.

Of main concern is the adequacy of the emergency spillway. It was stated that some erosion was evident in the emergency spillway following Hurricane Floyd. Although this was a 500-year frequency storm and erosion could be expected, it is not known whether the 100-year event (which should be designed for) could cause the same condition.

Based on the approved design, the emergency spillway was to be a token spillway, set above the 100-year design WSEL for the pond. Based on asbuilt information, the emergency spillway elevation is at El. 24.39 (0.71 feet below design) and the 100-year design high water elevation based on the asbuilt routing is now at El. 25.16 as compared to El. 25.10 per the approved design. Therefore, depth of flow in the emergency spillway is approximately 0.77 ft. for the 100-year event.

Again per my comment, the emergency spillway is now a flow controlling device as opposed to a token spillway; therefore, an analyses is required to show that the emergency spillway (in place) has adequate erosion resistance for passing the 100-year event. Provide emergency spillway computations that show that grass-lining is acceptable for expected velocities in the spillway during a 100-year storm event.

Scott J. Thomas, P.E.
James City County
Environmental Division

Scott Thomas

From: Scott Thomas
Sent: Friday, June 27, 2003 11:51 AM
To: 'Oder, G. Glenn'
Subject: RE: Governor's Land BMP Releases

Glenn

Sorry I haven't gotten back to you sooner. This email will help you for both Stonehouse and Governors Land.

Stonehouse - I would like to reset a day with you to reinspect the BMPs that still needed work. How is your Monday/Tuesday July 7 and 8th. Maybe 9 am in the morning before it gets to hot out.

Governors Land- I have been working diligently on the BMP/bond releases for Governors Land and corresponding back and forth with AES. As you are aware, to date, we have performed a first review of record drawings (asbuilts), construction certifications and performed a final inspection of every BMP in Governor's Land. This is a quick update of where we are currently. Following our joint June 2nd reinspection meeting, I have received multiple submissions from AES with record drawing updates, corrections and technical memos to address our concerns. Some of the transmittals had construction certifications as required for several BMPs from ECE, Inc. (Bob Moss). The way it works here is once I am ok with the BMP end of things, I forward a Surety Request Form on to our enforcement/inspection people, who then proceed with closing out the project. If there are site-related issues, they made still need addressed. Due to the age of some of these sections, I would anticipate little or no site issues on any of the projects; however, I cannot speak for our inspection staff. The contact is Pat Menichino (Inspectors Supervisor 253-6675) and Joe Buchite (Inspector 253-6643). Both the inspector's group and myself must sign off on projects before it goes to our Division director for release of the bond. They handle the site end of things and I handle the BMP end of things. The two come together then for final release. Administratively, we (Joan Etchberger 253-6670) then handles contacting the bonding or lending agency or bank to authorize release of bond. We typically do not copy the authorization letter to the owner, it just works it's way through the system and the bond/surety is released. Therefore, in this case, there would be no special notification of when letters go to the lending agency.

I have forwarded the following on for processing release of bond on these projects in Governors Land. There may be one or several BMPs in these bonded projects.

Barretts Pointe $ 21,500
Fowlers Lake Block B $ 88,800
Wythe Hamlet $ 17,250
Land Bay 5, Pod 1, Wingfield Lake $ 76,000
Land Bay 5, Pod 2 Hearthstone, Kitchums & Planters Round $ 76,000 Cypress Isle $ 30,000
River Oaks North $ 65,000 Club Villas $ 15,700 Bay 4, Pod 4 Two Rivers Point $ 32,000
Marina & Marina Village (Harbor at Two Rivers) $ 150,000 Land Bay 3 Pod 3 Founders Hill
$ 5,000 Land Bay 2 Pod 3 Nathaniels Green $ 73,000 Land Bay 2 Pod 1 Hornes Lake $ 73,000
Land Bay 3 Pod 1 Fowlers Lake $ 73,000

I believe two of these were previously released, Land Bay 2 Pod 1 Fowlers Lake and Marina & Marina Village; however, there were some BMP certification issues remaining for these which are now finished. Without those two sureties, this corresponds to approximately $ 573,250 of surety being held in Governors Land that is close to release.

The last remaining working block of BMPs/Surety is Governors Land Phase 1 Section 1, 2 and 3 of which the surety amount is $73,000 and of which there are several BMPs within this project. I am currently reviewing the resubmittals from AES on this bonded section. This particular project may be the last to be reduced/released as it also contains the "missing BMP" JR 056. I believe this bond contains the following BMPs: JR019, JR016, JR025, JR 026, JR045, JR028, JR027, JR022, JR023, JR056 and JR055.

This should be a sufficient update for you. If you have any questions, call me at 757-

253-6639.

Scott J. Thomas, P.E.
James City County
Environmental Division

Visit: http://www.james-city.va.us/resources/devmgmt/div_devmgmt_environ.html
and
www.protectedwithpride.org

-----Original Message-----
From: Oder, G. Glenn [mailto:ggoder@kaufcanconsulting.com]
Sent: Monday, June 23, 2003 5:12 PM
To: Scott Thomas
Cc: (Tory) Bains Victoria (E-mail); Bennett Jim (E-mail 2); Moore Jerry (E-mail); Bennett Marc (E-mail)
Subject: Governor's Land BMP Releases

Scott,
I understand we have now completed all of the field work on the 25 BMP's in the Governor's Land subdivision. I also understand that 24 BMP's have passed the field inspection and you have one final field inspection to complete (Nathaniel's Green: seal pipe). Thanks again for your extra effort to inspect these projects during this unusually wet spring and summer we have had in our area.

As we wrap this project up I understand that the drawings for 22 of the 25 BMP's have been submitted for review in your office. I realize some of these arrived recently and I am certain they will have to wait for review, however I understand that you have been reviewing the documents and corresponding with Tory. Thank you for your efforts to get these drawings reviewed and completed.

As these drawings are accepted and you request the release of the surety, please know that I would appreciate an email or a cc of your correspondence to the surety holder. This would assist us in our reports to Dominion and I would be very appreciative of the information.

Please know that your assistance has been very helpful in this process and we look forward to wrapping this paperwork up. If any of us can provide any additional information or assistance, please do not hesitate to call. I look forward to your reply.
Glenn

The information contained in this electronic message is confidential and is intended only for the use of the individual or entity named above. If you are not the intended recipient of this message, you are hereby notified that any use, distribution, copying or disclosure of this communication is strictly prohibited. If you have received this communication in error, please notify Kaufman & Canoles Consulting at (757) 591-6500 or by return e-mail to helpdesk@kaufcanconsulting.com, and purge the communication immediately without making any copy or distribution.

Scott Thomas

Modified: Wed 6/18/2003 12:29 PM

Governor's Land BMP Questions
June 17, 2003

Dave

Attached is information to address your questions about Cypress Isle (JR 041), River Oaks North A BMP # 3 (JR 034) and Whittaker Lake (JR 019).

For the Cypress-River Oaks issue, I searched through design information in the files and information on the design plans and record drawings. Design information is a little vague and common information is hard to be found. However, I can deduct the following:

1. Although I don't have actual areas for both based on stage-storage curves, based on comparison of drawing information both BMPs are very similar in shape, size and depth.

2. Normal pool for Cypress Isle is about 1 ft. and normal pool for River Oaks is about 1.6 ft. I do not have enough information to give exact area of the normal pool for Cypress Isle. For River Oaks, based on stage-storage information, normal pool size is about 10,454 cubic feet (about 78,000 gallon). It is safe to say that Cypress is similar in size.

3. Using top of dam, I can give exact information for volume. At top of dam for Cypress Isle, volume is about 41,713 cubic feet (about 312,000 gallon). At top of dam for River Oaks, top of dam volume is about 53,753 cubic feet (about 402,000 gallon).

For the Whittaker Lake issue, there is no substantial evidence based on asbuilt information, recent field observations and historical photographs that we have on file to conclude that there is a substantial leak in the riser structure for this BMP. Based on asbuilt information for the controlling orifice on the riser and top of the concrete anti-vortex device (cap) compared to the asbuilt survey normal pool elevation, normal pool is not below expected elevation. If there was a substantial leak, I would expect the normal pool elevation to be maintained substantially below the controlling orifice elevation (at least 3 to 6 inches). Also, as the riser is difficult to visually inspect due to it's offset location from the dam embankment and due to the heavy concrete cap which covers most of the riser crest. The only true way to verify if there is a leak is to pull the riser cap and visually inspect the vertical standpipe. Currently, there is no substantial evidence to warrant such an action on my part.

Scott J. Thomas, P.E.
Civil Engineer
Environmental Division

Scott Thomas

From: Scott Thomas
Sent: Monday, May 19, 2003 11:30 AM
To: 'Victoria Bains'; 'Marc Bennett'
Subject: RE: Governor's Land BMPs

SP14589.jr022.wpd (18 KB) SP14589.jr016.wpd (18 KB) SP14589.jr018.wpd (15 KB)

Victoria,

Starting Friday 5/9, I have been working on finishing the Governors Land BMP letters. I anticipate that I will finish either today (Monday) or tomorrow, depending on interuptions. I will formally issue them under cover as one block of letter; however, in an effort to keep things moving per your request below, I am advance emailing you the following 3:

JR 022 Horne's Lake
JR 016 Travis Pond
JR 018 Fowler's Lake

Correspondence above in in Wordperfect v 9.0 format.

Scott J. Thomas, P.E.
James City County
Environmental Division

Visit: http://www.james-city.va.us/resources/devmgmt/div_devmgmt_environ.html
and
www.protectedwithpride.org

-----Original Message-----
From: Victoria Bains [mailto:vbains@aesva.com]
Sent: Friday, May 16, 2003 4:06 PM
To: Scott Thomas
Cc: Glenn Oder (E-mail)
Subject: Governor's Land

Scott,

Here is the latest version of the status spreadsheet for the BMP's. The contractor is going to finish up this coming week, so if you could get the last six comment letters to me by Monday I would greatly appreciate it. This way if you found something that I might of overlooked the contractor is out at Governor's Land and I can make arrangements to have additional task completed. Thank you for your cooperation.

Tory

Victoria A. (Tory) Bains
Project Engineer
AES Consulting Engineers
5248 Olde Towne Road, Suite 1
Williamsburg, Virginia 23188
(757) 253-0040
Fax: (757) 220-8994

Scott Thomas

From: Victoria Bains [vbains@aesva.com]
Sent: Friday, May 16, 2003 4:06 PM
To: Scott Thomas
Cc: Glenn Oder (E-mail)
Subject: Governor's Land

Governor's Land2.xls (51 KB)

Scott,

Here is the latest version of the status spreadsheet for the BMP's. The contractor is going to finish up this coming week, so if you could get the last six comment letters to me by Monday I would greatly appreciate it. This way if you found something that I might of overlooked the contractor is out at Governor's Land and I can make arrangements to have additional task completed. Thank you for your cooperation.

Tory

Victoria A. (Tory) Bains
Project Engineer
AES Consulting Engineers
5248 Olde Towne Road, Suite 1
Williamsburg, Virginia 23188
(757) 253-0040
Fax: (757) 220-8994

Scott Thomas

From: Scott Thomas
Sent: Tuesday, February 18, 2003 3:13 PM
To: 'mbennett@aesva.com'; 'Victoria Bains'
Cc: Rick Hall
Subject: Gov Land BMPs

This is a reminder based on my conversation last week with Marc Bennett. Please correct the "Timber Dry Detention Structures Dimension" table on Sheet 2 (labeled as Sheet 34) of the record drawing as submitted for the following four BMPs:

JR 026 AES # 19 West Island Road Timber Crib Wall # 1
JR 027 AES # 22 West Island Road Timber Crib Wall # 4
JR 028 AES # 21 Sanctuary Road Timber Crib Wall # 3
JR 045 AES # 20 West Island Road Timber Crib Wall # 2

The record drawing by AES dated 4/19/02 has information for all four of these BMPs on one record drawing set. However, the table on the second drawing appears to have mixed up information for top of wall and other data. I will need this information in order to finish review on these BMPs. Please correct this information and send me 4 copies.

Also, I have been using the first version of the excel spreadsheet as forwarded and it has been helpful. I have one correction at this point, AES BMP # 10 (JR 030) would require construction certification per Note # 18 Sheet 9 of the approved plan.

Scott J. Thomas, P.E.
James City County
Environmental Division

Scott Thomas

Modified: Fri 11/15/2002 12:03 PM

Pat/Joe
RE: Governors Land Bonds/Project Close Outs

As you know, we met with Jim Bennett and AES some time ago to make a priority list of projects for closing out and AES submitted about 27 asbuilt drawings over the past year for review. Rick Hall is now involved with me to try and help with the BMP side of project release. This involves administrative processing through our BMP database system, review of record drawings, review of construction certifications, final field inspection and issuing a letter if there are any deficiencies on the asbuilt, construction cert, or if any field-related items need performed (ie. cleaning of sediment, trash, stabilization, etc.)

Joe, if you remember, we had a list of the Governors Land projects and bond amounts and listed them in order for closeout. We are proceeding in that order. As we finish our end, I will give you information to proceed with closeout and try to give you an idea of where we are going next, so you can perform your end of things.

OK for Release

1. Governors Land, River Reach, Land Bay 5, Pod 4, Blocks A& B (County Plan S-28-96). There are no onsite BMP issues for this section, so are done. Drainage from this project goes to Kitchums Pond and Bennetts Pond which are on other bonds. Therefore, you can close out if you are ok from a site perspective.

BMP Issues - Forwarding Letter

2. I will be issuing a letter for Governors Land Barretts Pointe (County Plan S-42-98). There are deficiencies on the record drawing, construction certification is needed and there are construction-related (field) items needed to be performed for the BMP.

Next

3. Governors Land, Fowlers Lake, Block B (County Plan S-110-98, BMP ID Code JR 054, Timber Wall)
4. Governors Land, Land Bay 5, Pod 1, Wingfield Lake

10,15,14

add outlet pipe to Stn 16 to help drain sand SP-17

Williamsburg Environmental Group, Inc.

Post Office Box 3584
Williamsburg, Virginia 23187
(804) 220-6869
Fax (804) 229-4507

RECEIVED 1-21-92

January 20, 1992

Mr. Darryl Cook
Code Compliance
James City County
P.O. Box JC
Williamsburg, Virginia 23187

Dear ~~Mr. Cook~~ Darryl;

This letter follows up our meeting on Tuesday, January 14, 1992 where we discussed your comments regarding the **Review of the Stormwater Management/Drainage System for the Governor's Land Golf Course** conducted by the Williamsburg Environmental Group Inc. (WEG) last November. As you requested we are providing specific information pertaining to the BMP volumes built at the Governor's Land Golf Course, including an explanation of the sizing technique used in our review document. Also included is a copy of the as-built drawings provided by the golf course construction company which WEG used to evaluate drainage areas for specific BMPs.

Table 1 presents a summary of the BMPs incorporated into the Governor's Land Golf Course drainage system along with pertinent design parameters. Several of the BMPs function as infiltration basins based on their final construction. They were originally planned as dry pond BMPs using the design methods outlined in the BMP Handbook for the Occoquan Watershed (NVPDC, 1987), however, during the construction phase of the project the outlet design for the BMPs was revised to include an underdrain system (i.e., french drain) which aids in the complete drainage of the structures. This design, which is also covered in the Occoquan and Metropolitan Washington Council of Governments (MWCOG) manuals, was apparently chosen during construction to minimize potential soggy ground within the BMPs. Section 3.1 of our review document includes a more detailed review of how the drainage system of the golf course functions. Figure 6.1 from the MWCOG Manual (attached) further shows the applicability of an underdrain system in an infiltration basin.

There are many advantages to infiltration basins over other urban BMPs (specifically extended dry detention ponds) including a high pollutant removal efficiency of both soluble and fine particulate pollutants attained through the exfiltration process. The basic design for infiltration basins is similar to dry ponds except the impounded water exfiltrates through the basin floor rather than through an outlet structure. The basic design includes a nearly level floor, to maximize surface area of the basin, and the establishment of a dense stand of turfgrass which promotes infiltration and binds up the sediments. The Governor's Land BMPs follow these basic design features.

In addition, several design considerations that should be incorporated in the planning of infiltration basins to ensure that the basins function properly were used in constructing the BMPs on the Governor's Land Golf Course. They include; trapping the excess sediments, especially coarse grained sediment, prior to entering the basin to avoid clogging of the surface soil pores on the basin floor. This is accomplished throughout the golf course corridor on Governor's Land with the dense turfgrass surrounding the BMPs. Also, proper design to avoid scouring or eroding of the basin floor is imperative and distributing the runoff volume evenly over the basin floor to maximize exfiltration rates is necessary. The drainage system of the Governor's Land Golf Course accomplishes this through the "manifold" system used in the BMPs. Finally, providing a back-up drainage system should be included, which is not a direct outlet structure, that allows the runoff volume to infiltrate fully should problems occur related to a high

groundwater table or slow permeability rates of the soils. The french drain system used in the Governor's Land BMPs accomplishes this task without interrupting the exfiltration process of the BMPs.

The 65% pollutant removal efficiency used in evaluating the overall nonpoint source loadings for the golf course corresponds to the average phosphorus removal attained by infiltration basins sized according to James City County's Design 9 method. This sizing technique requires that the basin volume equal one inch per impervious acre of drainage area. Table 1 compares the required BMP volumes with the as-built volumes for each BMP. Upon review of the as-built BMPs, all of the basins which met the required volume were assigned a 65% removal efficiency, or 10 points in the James City County 10-point method. For two of the basins which were undersized using the Design 9 method, Design 8 (0.5 inches per impervious acre) was used to determine the required BMP volume. These BMPs were assigned the corresponding efficiency for Design 8 infiltration basins of 50% (i.e., 9 points in the James City County 10-point method). For five BMPs which were substantially undersized, the assumption was made that their efficiency equals the percentage of volume required for an extended dry detention pond, and 6 points in the James City County method. The attached Figure 3.6 (Removal Rates vs. Detention Time for Selected Pollutants) copied from the MWCOG Manual formed the basis for the removal efficiencies used in the model. The removal efficiencies used for each BMP in the modeling of the golf course phosphorus loadings are shown in Table 1. A summary of the 10-point BMP method is presented in Table 2.

If you require additional information pertaining to this letter or the attached information or the original review document, please do not hesitate to call me.

Sincerely,

Ronald J. Boyd, P.E.
President

Attachments

cc: Mr. Jim Bennett, Governor's Land Associates

Governors Land Stormwater Management Facilities - JCC Environmental Division Inventory
County BMP Inventory & Inspection Program

No.	BMP ID Code	Record Dwg.	Plan Number	Stormwater Management Facility Name	Location	Type	General Information:	* Preliminary Inspection Comments:
1	JR 016	Yes	SP-145-89	Travis Pond	Near 2013 Travis Close Road	Wet Pond	Large lake	Check if emergency spillway on design plan.
2	JR 017	Yes	S-144-89	Wingfield Lake	Near 3028 John Vaughan Rd.	Wet Pond	Large lake	Access difficulties.
3	JR 018	Yes	S-145-89	Fowlers Lake	Near 3229 Fowlers Lake Road	Wet Pond	Large lake	D/S trees, barrel seepage failure, no valve extension.
4	JR 019	Yes	S-7-90	Whittaker Lake	Near 2816 Lawnes Creek Road	Wet Pond	Large lake; shoreline plantings	Trees in emergency which is off property.
5	JR 020	Yes	S-14-93	Kitchums Pond	Near 3005 Kitchums Close	Wet Pond	Cut pond; long run 6 inch PVC outlet	Location primary outlet barrel.
6	JR 021	Yes	S-14-93	Bennetts Pond	Near 3024 John Vaughn Lane	Wet Pond	Larger Lake	Access difficulty.
7	JR 022	Yes	SP-145-89	Hornes Lake	Near 3021 Nathaniels Green	Wet Pond	Larger lake; irrigation source	No valve extension; shoreline collapse at golf green.
8	JR 023	Yes	S-7-90	Golf Course Pond (End Fairway # 9)	West of 2936 East Island Road	Dry Pond	Golf course cartway crosses embankment	D/S tree removal and routine cleaning.
9	JR 025	Yes	S-7-90	Halfway House BMP (Fairways # 6 & # 11)	West of 2344 West Island Road	Dry Pond	Along golf cart/pump station access path.	Riser subsidence. Routine cleaning & tree removal required.
10	JR 026	Yes	S-7-90	West Island Road BMP # 1	East of 2327 West Island Road	Timber Crib Wall	Between Lot 22 & 28 Travis Pond	Tree down at wall. Undercutting.
11	JR 027	Yes	S-7-90	Whitaker Island BMP # 4	Near 3029 Whittaker Island Road	Timber Crib Wall	South Lots 36 & 38	Not inspected.
12	JR 028	Yes	S-7-90	Sanctuary Road BMP # 3	East of 2489 Sanctuary Drive	Timber Crib Wall	At end of cul-de-sac	Trees along wall. Check BMP orifice design vs installation.
13	JR 029	Yes	S-6-92	Miln House Road BMP	West of 1917 Miln House Road	Timber Crib Wall	Fairway # 14 to south; adjacent homes	Anti-vortex/trash rack device missing. Clean outlet storm system.
14	JR 030	Yes	S-29-95	Founders Hill BMP	East of 1756 Founders Hill South	Timber Crib Wall	Fairway # 14 & # 15 to south	Left wall undercut failure & d/s erosion. Perf PVC installed incorrect.
15	JR 031	Yes	S-21-93	Wingfield Lake East Timber Structure	East of 3251 Wingfield Lake Road	Timber Crib Wall	In natural wooded area	Access problem. Fallen tree has caused wall failure.
16	JR 032	Yes	S-127-93	Marina Village BMP # 2	End Harbor Road	Wet Pond (Marsh)	Near parking lot and boat ramp area	Storm drain inflow pipes to BMP need cleaned of sediment.
17	JR 033	Yes	S-127-93	Harbor Road BMP # 1 (Marina Village)	North side Harbor Road	Shallow Marsh	Interconnected BMPs at road intersection.	Routine clean basin bottom for positive drainage.
18	JR 034	Yes	S-12-96	River Oaks North A BMP # 3	West of 1588 River Ridge Road	Wet Pond	End cul-de-sac.	Routine barrel cleaning at outfall.
19	JR 035	Yes	S-96-98	Clubhouse Pond (Near County Club Villas)	North of 1400 Two Rivers Road	Timber Crib Wall	CMP Riser; near lot retaining wall	Routine cleaning of stone around riser and storm drain pipe inflows.
20	JR 036	Yes	S-52-95	Two Rivers Point	East of 1210 Two Rivers Point	Timber Crib Wall	Located in channel.	Perforated PVC low flow orifice installed improperly.
21	JR 037			Golf Maintenance Area BMP	North Two Rivers Road		West of Harpers Mill	
22	JR 040	Yes	S-32-98	Wythe Hamlet BMP	South of 1820 John Hancock Rd	Dry Pond	Outfalls to Two Rivers Road.	Minor cleaning at riser and basin bottom for positive drainage.
23	JR 041	Yes	S-79-98	Cypress Isle BMP	North of 1832 Cypress Isle	Dry Pond	Outfalls to wetland area.	Extend riprap up sidewalls of outlet protection stilling basin.
24	JR 042	Yes	S-42-98	Barretts Pointe BMP	East of 2908 Barrets Pointe	Wet Pond	RCP outlet pipe structure.	Sediment load due to adjacent construction.
25	JR 045	Yes	S-7-90	West Island Road BMP # 2	East of 2333 West Island Road	Timber Crib Wall	End of West Island Road cul-de-sac	Wall base undercut; timber supports exposed.
26	JR 054	Yes	S-110-98	Fowlers Lake Block B (# 10)	North of 3220 Fowlers Lake Road	Timber Crib Wall	Near Intx Fowlers Lake Rd & N Fowlers	Not inspected.
27	JR 055	Yes	S-7-90	Whitaker Island Tee Dissipator	Near 3029 Whittaker Island Road	Energy Dissipator	Inlet box with pipe tee spreader	Severe inlet, D/S erosion. Fixed summer 2001.

* Preliminary inspection notes based on cursory engineering inspection performed on January 19th 2001 and by results of inspection performed under the County BMP Inspection program in April 2001, October 2001 and April 2002.

Record Drawing Transmittals from AES

October 17 2001	Halfway House
November 6 2001	Two Rivers Point Timber Crib Wall
December 28 2001	Cypress Isle
February 11 2002	Whittaker Lake, Two Rivers CC, Travis Pond, Fowlers Lake
February 14 2002	Bennetts Pond, Kitchums Pond
February 22 2002	Founders Hill
February 29 2002	Golf Course Fairway # 9, Wingfield Timber Crib
March 18 2002	Barretts Pointe, River Oaks North
May 2 2002	Geotech Fowlers and Wingfield; Phase 1 Timber Walls # 1, # 2, # 3 and # 4, Wingfield Lake, Hornes Lake, Marina BMP, Harbor BMP, Wythe Hamlet, Nathaniels Green

County BMP Inspection Program (3/27/01 - 4/12/01, and 10/17/01 - 11/8/01)
Hit -List / Schedule of Phase I Inspections

JR - James River Watershed

West Sector -Chickahominy/Governors Land

1. JR 016 Governors Land - Travis Pond
1. JR 017 Governors Land - Wingfield Lake
2. JR 018 Governors Land - Fowlers Lake
3. JR 019 Governors Land - Whittaker Lake
4. JR 020 Governors Land - Kitchums Pond
5. JR 021 Governors Land - Bennetts Pond
6. JR 022 Governors Land - Hornes Lake
7. JR 023 Governors Land - Golf Course Pond (End Fairway # 9)
8. JR 025 Governors Land - Halfway House (Fairways # 6 & # 11)
9. JR 026 Governors Land - West Island Road BMP # 1(East Side)
10. JR 027 Governors Land - Whittaker Island BMP # 4 Timber Wall
11. JR 028 Governors Land - Sanctuary Road BMP # 3 Timber Wall
12. JR 029 Governors Land - Miln House Road BMP (1917 Miln House)
13. JR 030 Governors Land - Founders Hill BMP
14. JR 031 Governors Land - Wingfield Lake East Timber Crib Wall (Woods)
15. JR 032 Governors Land - Marina Village BMP
16. JR 033 Governors Land - Harbor Road BMP (Marina Village)
17. JR 034 Governors Land - River Oaks North A BMP (West End)
18. JR 035 Governors Land - Clubhouse Pond (Near Country Club Villas)
19. JR 036 Governors Land - Two Rivers Point
20. JR 037 Governors Land - Golf Maintenance Area BMP
21. JR 040 Governors Land - Wythe Hamlet BMP
22. JR 041 Governors Land - Cypress Isle BMP
23. JR 042 Governors Land - Barretts Pointe BMP
24. JR 045 Governors Land - West Island Road BMP # 2 (East side at end cul-de-sac)
25. JR 055 Governors Land - Whittaker Island Tee Dissipator

West Sector - Other

24. JR 051 Greensprings Lake-National Golf Course
25. JR 006 Patriots Colony Basin # 1 (North of Villa Court # 1)
26. JR 015 Patriots Colony Basin # 2 (South of Villa Court # 6)
27. JR 001 First Colony Lake Pasbehegh (Private Dam)
28. JR 007 Berkeleys Green Phase 6 (End Moss Creek Drive)
29. JR 005 Fernbrook Subdivision (End of Captain Wynne Drive)

Central Sector (Kingsmill-Busch Gardens)

30. JR 004 Rhine River Lake - Busch Gardens (Large Lake)
31. JR 008 Kingsmill - Warehams Pond (Large Lake)
32. JR 009 Kingsmill - Jeffersons Hundred Phase II (?)
33. JR 010 Kingsmill - Brownings Grant (?)
34. JR 011 Kingsmill - Golf Course No. 3
35. JR 012 Kingsmill - Kingsmill Conference Center

East Sector (Grove)

36. JR 013 Little Zion Baptist Church
37. JR 002 James River Elementary School-Community Center
38. JR 038 James River Commerce Center

County BMP Inspection Program (-)
Hit -List / Schedule of Phase II Inspections

JR - James River Watershed

West Sector (Chickahominy/Governors Land)

1. JR 048 Greensprings West Phase I (near entrance at Centerville Road)
2. JR 053 Greensprings-Wmbg Nat Golf Course Maintenance Facility (3215 Monticello Alt 5 at FH 5)
3. JR 024 Patriots Colony Phase 2 (Timber Crib)
4. JR 043 Avalon Route 5
5. JR 054 Governors Land - Fowlers Lake Block B (Timber Crib near intx Fowlers Lake & N Fowlers Close)
6. JR 040 Governors Land - Wythe Hamlet (dry pond)
7. JR 042 Governors Land - Barretts Pointe
8. JR 041 Governors Land - Cypress Isle (North of 1832 Cypress Isle lot 15)

Central Sector (Kingsmill)

2. JR 039 Kingsmill Marina
3. JR 050 Kingsmill East Community Center (Timber Crib)
4. JR 049 Kingsmill East - Wareham's Pond Rd. Ext. (wet pond # 3)
5. JR 046 Kingsmill East - Sandy's Fort (North of 115 Andrew Lindsey, wet pond # 2)
6. JR 047 Kingsmill East - Sandy's Fort (South of 132 George Sandys, wet pond # 5)

East Sector (Grove)

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GOVERNOR'S LAND at TWO RIVERS

Stormwater Management Facilities / Best Management Practices Inspection / Acceptance Log
June 30, 2003

AES Project Number 7173-09

BMP #	JCC BMP ID	Record Dwg.Date	Structure Type	General Location	Design Date	Plan Approval Date	Certification Required	Record Drawing Status	James City County Inspection Date	AES Inspection Date Initial-Final	Corrective Required Actions	Status	Date of Completed Actions
14	JR016	Mar-02	Pond	Travis Pond	Dec-89	Feb-91	**No - Geotech. Report Provided**	**Sent Record Dwgs to JCC 6/27/03**	March 13, 2003	2/6/03 - 6/2/03	**Maintenance Complete.** Evaluate sediment accumulation/Evaluated and fine. Dam needs to be sodden in one area on downstream side. Outflow needs to be cleared of all vegetation and outflow protection needs to be improved.	**Sent Record Dwgs to JCC 6/26/03 JCC Final Inspection 6/02/03**	**6/27/2003**
18	JR017	Mar-02	Lake	Wingfield Lake	Dec-89	Jun-93	No	**Sent Record Dwgs to JCC 4/23/03**	December 19, 2002	1/31/03 - 3/11/03	**Maintenance Complete.** Evaluate sediment accumulation/Evaluated and fine. Record drawing clarifications; mow grass; remove trees and woody vegetation; establish grass; remove sediment and debris at rip-rap outlet	**Sent Record Dwgs to JCC 4/23/03 JCC Final Inspection 6/02/03**	**4/23/2003**
12	JR018	Mar-02	Lake	Fowler's Lake	Nov-89	Nov-92	**No - Geotech. Report Provided**	**Sent Record Dwgs to JCC 6/16/03**	March 25, 2003	2/6/03 - 2/26/03	**Maintenance Complete.** Evaluate sediment accumulation/Evaluated and fine. Clear and remove pine trees and woody vegetation along shoreline at the dam. Stabilize bare spots, may need to add topsoil to get grass to take. Install outlet protection to outfall pipe.	**Sent Record Dwgs to JCC 6/16/03 JCC Final Inspection 6/02/03**	**6/16/2003**
16	JR019	Mar-02	Lake	Whittaker Lake	Feb-90	Feb-91	**No - Geotech. Report Provided**	**Sent Record Dwgs to JCC 6/27/03**	February 6, 2003	2/5/03 - 3/11/03	**Maintenance Complete.** Evaluate sediment accumulation/Evaluated and fine. Need to clear and remove woody vegetation along shoreline and stabilize any bare spots. Need to improve outlet protection at outfall pipe. **Verifying Survey Elevations.**	**Need to run hydraulic evaluation using as-built information**	**6/27/2003**
17	JR020	Feb-02	Pond	Kitchum's Pond		Jun-93	No	**Sent Record Dwgs to JCC 5/13/03**	January 10, 2003	1/31/03 - 2/24/03	**Maintenance Complete.** Evaluate sediment accumulation/Evaluated and fine. Remove small pines along downstream face of dam and at outlet	**Sent Record Dwgs to JCC 5/13/03 JCC Final Inspection 6/02/03**	**5/13/2003**
1	JR021	Feb-02	Pond	Bennett's Pond	Apr-93	Jul-93	No	**Sent Record Dwgs to JCC 5/16/03**	January 10, 2003	1/31/03 - 5/14/03	**Maintenance Complete.** Check balance pipe, need to field verify pipe invert; Evaluate sediment accumulation; Stabilize emergency spillway; Repair hole in embankment (center of dam)	**Sent Record Dwgs to JCC 5/16/03 JCC Final Inspection 6/02/03**	**5/16/2003**
13	JR022	Apr-02	Lake	Horne's Lake	Oct-89	Oct-91	**No - Geotech. Report Provided**	**Sent Record Dwgs to JCC 6/16/03**	March 25, 2003	2/5/03 - 2/26/03	**Maintenance Complete.** Evaluate sediment accumulation. Clear and remove woody vegetation along shoreline of dam. Stabilize bare spots on dam. Remove silt fence near outfall and clean debris from around outfall area. Place filter fabric around outfall and add riprap for outlet protection.	**Sent Record Dwgs to JCC 6/16/03 JCC Final Inspection 6/02/03**	**6/16/2003**
3	JR023	Mar-02	Dry Pond #1	Travis Pond	Dec-89	Feb-91	No	**Sent Record Dwgs to JCC 6/16/03**	March 31, 2003	2/6/03 - 5/20/03	**Maintenance Complete.** Dry detention pond is in good condition. However, up towards West Island Road the Pipe that runs along side of the bike trail and flows to a riprap lined ditch that flows to the dry detention pond is clogged up with debris. The pipe needs to be cleaned out and ditch needs to be replaced from invert to approximately 15' out and lined with filter fabric and riprap.	**Sent Record Dwgs to JCC 6/16/03 JCC Final Inspection 6/02/03**	**6/16/2003**
2	JR025	Oct-01	Dry Pond #2	Travis Pond	Dec-89	Feb-91	No	**Sent Record Dwgs to JCC 4/23/03**	February 25, 2003	2/6/03-3/11/03	**Maintenance Complete.** 18" RCP inflow pipe is in urgent need of repair or replacement. The pipe looks as if it has become disconnected w/ riser and/ or has broken apart. Due to this the ground is eroding around the riser and has created a hole in the ground between entrance of pipe and riser. The outfall protection needs to be improved. existing rip-rap needs to removed and filter fabric needs to placed and existing rip-rap placed on fabric. 15" RCP acting as the Emergency spillway needs to be cleaned of sediment and debris.	**JCC Has Given Final Inspection and Approved. Sent Record Dwgs to JCC 4/23/03**	**4/23/2003**
19	JR026	Apr-02	Timber #1	Travis Pond	Dec-89	Feb-91	No	**Sent Record Dwgs to JCC 6/17/03**	February 21, 2003	2/6/03 - 5/20/03	**Maintenance Complete.** Tree has fallen on wall and has been cut into three sections. Top section is laying on outflow pipe and caused the RCP to break off at the joint flush with the wall. The middle section is laying on the pipe section between the riser and the wall. The wall has been undermined due to the riser not functioning properly and ground elevations changed due to the fallen tree causing water to divert around riser. Tree needs to be cleared and removed from structure and organic material needs to be removed from structure area. Wall needs to be stabilized with concrete in the area that has been undermined. Outflow pipe needs to be reattached and riser needs to be straightened and stone replaced around riser. upstream side needs to be slightly graded to assure flow to riser. Outlet protection for outflow pipe needs to be reestablished	**Sent Record Dwgs to JCC 6/17/03 JCC Final Inspection 6/02/03**	**6/17/2003**
22	JR027	Apr-02	Timber #4	Whittaker Island Block "A"	Dec-89	Feb-91	No	**Sent Record Dwgs to JCC 6/17/03**	February 20, 2003	2/5/03 - 6/2/03	**Maintenance Complete.** One section of inflow channel needs to stabilized. Inflow pipe needs to be exposed and inlet protection needs to be established. Fallen tree needs to be cleared and removed from timber structure and in the area of the fallen tree holes along wall need to filled with flowable fill. Outflow needs to be cleared and cleaned out. outlet protection needs to be reestablished and downstream side of wall needs stone removed and filter fabric installed and stone replaced up to 5' off wall.	**Sent Record Dwgs to JCC 6/17/03 JCC Final Inspection 6/02/03**	**6/17/2003**
21	JR028	Apr-02	Timber #3	Whittaker Island Block "B"	Dec-89	Feb-91	No	**Sent Record Dwgs to JCC 6/17/03**	February 20, 2003	2/5/03 - 6/2/03	**Maintenance Complete.** On downstream side of wall need to go down to solid ground and install filter fabric and grouted in place stone for 5' off wall. Outlet protection needs to be improved. Riser is gone but functioning well.	**Sent Record Dwgs to JCC 6/17/03 JCC Final Inspection 6/02/03**	**6/17/2003**
23	JR029	Apr-02	Timber	Nathaniel's Green	Jan-92	Jul-92	No	**Sent Record Dwgs to JCC 6/23/03**	March 12, 2003	2/6/03 - 5/20/03	**Maintenance Complete.** Found evidence of some flow has gone around riser. Stone needs to cleaned or replaced around riser. Downstream side of timber wall needs stone removed and filter fabric installed and stone replaced up to 5' off wall. Outflow pipe needs outfall exposed and outlet protection needs to be reestablished.	**Sent Record Dwgs to JCC 6/23/03 JCC Final Inspection 6/26/03**	**6/23/2003**
10	JR030	Feb-02	Timber	Founder's Hill	Mar-95	Jul-95	**Yes**	**Sent Record Dwgs to JCC 5/15/03**	February 5, 2003	1/31/03 - 4/22/03	**Maintenance Complete.** Pull stone down to solid ground then place filter fabric and cover w/ stone; Stone needs to be grouted in; Clean debris from downstream and upstream to 5' off wall and 30' of channel	**Sent Record Dwgs to JCC 5/15/03 JCC Final Inspection 6/02/03**	**5/15/2003**
8	JR031	Mar-02	Timber	Wingfield Lake	Jun-92	Jun-93	No	**Sent Record Dwgs to JCC 4/23/03**	January 24, 2003	2/5/03-2/26/03	**Maintenance Complete.** Clear and remove debris. Needs to be taken down to solid ground for the length of the wall on down stream side and place filter fabric with stone for 5' out. Riprap at outfall needs to be added w/ filter fabric.	**Sent Record Dwgs to JCC 4/23/03 JCC Final Inspection 6/02/03**	**4/23/2003**
25	JR032	Mar-02	Marsh Augmented BMP	The Harbor at Two Rivers	Jan-94	Oct-94	No	**Sent Record Dwgs to JCC 6/16/03**	March 12, 2003	2/6/03 - 5/14/03	**Maintenance Complete.** Need to remove accumulated sediment in inflow pipes. Remove vegetation, debris and sediment within 10' of the ends of all storm drain pipes. Remove trash, litter and large debris from pond.	**Sent Record Dwgs to JCC 6/16/03 JCC Final Inspection 6/02/03**	**6/16/2003**
24	JR033	Mar-02	Marsh Augmented BMP	The Harbor at Two Rivers	Jan-94	Oct-94	No	**Sent Record Dwgs to JCC 5/15/03**	February 18, 2003	2/6/03 - 5/14/03	**Maintenance Complete.** Need to remove accumulated sediment in Culvert pipe. Remove vegetation, debris and sediment within 10' of the ends of all storm drain pipes.	**Sent Record Dwgs to JCC 5/15/03 JCC Final Inspection 6/02/03**	**5/15/2003**
7	JR034	Mar-02	Marsh Augmented BMP	River Oaks North	Apr-96	Nov-96	Waived	**Sent Record Dwgs to JCC 5/15/03**	January 15, 2003	1/31/03 - 5/14/03	**Maintenance Complete.** Check record drawings for signature; Evaluate sediment accumulation; Provide information of incoming storm sewers; Remove small tree and woody vegetation on dam; Clean sediment and debris from outfall; Remove dewatering device.	**Sent Record Dwgs to JCC 5/15/03 JCC Final Inspection 6/02/03**	**5/15/2003**
15	JR035	Mar-02	Timber	Two River Country Club	Sep-93		No	**Sent Record Dwgs to JCC 6/17/03**	January 14, 2003	1/31/03 - 6/2/03	**Maintenance Complete.** Provide crest elevation on record drawings; Re-check elevation of riser crest; Clear debris / organic matter / vegetation from rock at riser; (Possibly remove and replace stone at riser); Check / replace wood top cap	**Sent Record Dwgs to JCC 6/17/03 JCC Final Inspection 6/02/03**	**6/17/2003**
11	JR036	Nov-01	Timber	Two Rivers Point		Nov-96	**Yes**	**Sent Record Dwgs to JCC 4/23/03**	January 14, 2003	1/31/03-3/3/03	**Maintenance Complete.** Construction Certification needed; Forward record drawings; Clean / remove debris and organic material just ahead of primary wall; Convert BMP to permanent facility	**Sent Record Dwgs to JCC 4/23/03 JCC Final Inspection 6/02/03**	**4/23/2003**
4	JR040	Apr-01	Dry Pond	Wythe Hamlet	Apr-98	Sep-98	Waived	**Sent Record Dwgs to JCC 4/23/03**	November 22, 2002	1/31/03 - 3/26/03	**Maintenance Complete.** Forward record drawings; Clean and remove sediment / debris / vegetation at end of 18-inch and 24-inch pipes, and at principal flow control; Remove vegetation within 10-feet of principal flow control; Compact and re-fill settlement above 10-inch outfall barrel.	**Sent Record Dwgs to JCC 4/23/03 JCC Final Inspection 6/02/03**	**4/23/2003**
9	JR041	Dec-01	Ex. *Detention*	Cypress Isle	Aug-98	Jan-99	**Yes**	**Sent Record Dwgs to JCC 4/23/03**	February 5, 2003	2/6/03 - 4/22/03	**Maintenance Complete.** Evaluate sediment accumulation/Evaluated and fine. Remove sediment from inflow pipe. Stabilize bare spots, may need to add topsoil to get grass to take.	**Sent Record Dwgs to JCC 4/23/03 JCC Final Inspection 6/02/03**	**4/23/2003**
6	JR042	Mar-02	Pond	Barrett's Point Pond	May-98	Sep-98	**Yes**	**Sent Record Dwgs to JCC 4/23/03**	November 14, 2002	2/6/03 - 3/26/03	**Maintenance Complete.** Construction Certification needed from earthwork. Evaluate sediment accumulation/Evaluated and fine. Check invert on 12"HDPE drain and crest elev. of emergency spillway and class of rip-rap. Forward record drawings. Topsoil and seed bare areas. Fill depressions in pipe alignment and topsoil and seed	**Sent Record Dwgs to JCC 4/23/03 JCC Final Inspection 6/02/03**	**4/23/2003**
20	JR045	Apr-02	Timber #2	Travis Pond	Dec-89	Feb-91	No	**Sent Record Dwgs to JCC 6/17/03**	February 21, 2003	1/31/03 - 5/20/03	**Maintenance Complete.** Left side undermining of timber wall; Pull stone down to solid ground then place filter fabric and cover w/ stone; Stone needs to be grouted in place; Clean debris from downstream and upstream to 5' off wall and 30' of channel.	**Sent Record Dwgs to JCC 6/17/03 JCC Final Inspection 6/02/03**	**6/17/2003**
5	JR054	Mar-02	Timber	Fowler's Lake Block "B"	Oct-92	Sep-99	**Yes**	**Sent Record Dwgs to JCC 5/15/03**	November 22, 2002	1/31/03 - 4/22/03	**Maintenance Complete.** Construction Certification needed from earthwork. Forward record drawings; Clear debris from perforated pipes and stone at orifice. Clear and remove fallen tree and debris.	**Sent Record Dwgs to JCC 5/15/03 JCC Final Inspection 6/02/03**	**5/15/2003**
27	JR055	Not Req.	T-Dissapator	Whittaker Island Block "A"	Dec-89	Feb-91	No	N/A	N/A	N/A	N/A	N/A	**6/23/2003**
26	JR056	Not Req.	T-Dissapator	Whittaker Island Block "B"	Dec-89	Feb-91	No	N/A	N/A	N/A	**County has requested channel adequacy computations.** Need field verification of channel size and then need to run hydraulic calcs. to show channel will not erode from two-year storm and channel has capacity for the ten-year storm.	**Field work to be completed by 7/11/03**	

AES #1

GOVERNOR'S LAND at TWO RIVERS

Stormwater Management Facilities / Best Management Practices Inspection / Acceptance Log
February 7, 2003

AES Project Number 7173-09

BMP #	JCC BMP ID	Record Dwg.Date	Structure Type	General Location	Design Date	Plan Approval Date	Certification Required	Construction Date	AES Inspection Date	Required Actions	Status	Date of Completed Actions	Rel'sd
14	JR016	Mar-02	Pond	Travis Pond	Dec-89	Feb-91	No - Geotech. Report Provided (Yes sheet 6 & sheet 10 (cc))		2/6/2003	* AES MISSED CONC. RUBBLED BARREL. WE HAVE 4 INSPECTS TO 2000 THAT SHOW BARREL. AES 2/03. Evaluate sediment accumulation. Shoreline and dam in great shape. Outflow is functioning and there is no apparent erosion.	AES Coordinating Corrective Work		6-2-03 OK
18	JR017	Mar-02	Lake	Wingfield Lake	Dec-89	Jun-93	No (Yes Note 18 Sheet 7)		1/31/2003	Sedimentation evaluation; record drawing clarifications; mow grass; remove trees and woody vegetation; establish grass; remove sediment and debris at rip-rap outlet	AES Coordinating Corrective Work		6-2-03 OK
12	JR018	Mar-02	Lake	Fowler's Lake	Nov-89	Nov-92	No - Geotech. Report Provided (Yes sheet 15 note and sheet 10.)		2/6/2003	Clear and remove pine trees and woody vegetation along shoreline at the dam. Stabilize bare spots, may need to add topsoil to get grass to take.	AES Coordinating Corrective Work		6-2-03 OK
16	JR019	Mar-02	Lake	Whittaker Lake	Feb-90	Feb-91	(No) Geotech. Report Provided (Yes Sheet 32)		2/5/2003	Evaluate sediment accumulation. Need to clear and remove woody vegetation along shoreline and stabilize any bare spots	AES Coordinating Corrective Work		6-2-03 OK
17	JR020	Feb-02	Pond	Kitchum's Pond		Jun-93	No		1/31/2003	Evaluate depth of water for sedimentation; Remove small pines along downstream face of dam and at outlet	AES Coordinating Corrective Work		6-2-03 OK
1	JR021	Feb-02	Pond	Bennett's Pond	Apr-93	Jul-93	No		1/31/2003	Check balance pipe; Evaluate sediment accumulation; Stabilize emergency spillway; Repair hole in embankment (center of dam)	AES Coordinating Corrective Work		6-2-03 OK
13	JR022	Apr-02	Lake	Horne's Lake	Oct-89	Oct-91	~~No - Geotech. Report Provided~~ (YES SHEET 10)		2/5/2003	Evaluate sediment accumulation. Clear and remove woody vegetation along shoreline of dam. Stabilize bare spots on dam. Remove silt fence near outfall and clean out sediment from outfall. May need to place filter fabric around outfall and spruce up riprap.	AES Coordinating Corrective Work		6-23-02 OK
3	JR023	Mar-02	Dry Pond #1	Travis Pond	Dec-89	Feb-91	No		2/6/2003	Dry detention pond is in good condition. However, up towards West Island Road the Pipe that runs along side of the bike trail and flows to a riprap lined ditch that flows to the dry detention pond is clogged up with debris. The pipe needs to be cleaned out and ditch needs to be replaced from invert to approximately 15' out and lined with filter fabric and riprap.	AES Coordinating Corrective Work		6-23-03 OK
2	JR025	Oct-01	Dry Pond #2	Travis Pond	Dec-89	Feb-91	No		2/6/2003	18" RCP inflow pipe has become disconnected to the riser and ground on the inflow side and around riser is being eroded away. The 30" RCP running from the riser to the downstream side of the road appears to be coming apart at the joints. Also the 15" RCP acting as the Emergency spillway needs to be cleaned of sediment and debris.	AES Coordinating Corrective Work		REV APP'D
19	JR026	Apr-02	Timber #1	Travis Pond	Dec-89	Feb-91	No ✓		2/6/2003	Tree has fallen on wall and has been cut up some. Outflow pipe RCP is broken off at the joint at the wall. Wall is slightly leaning and runoff is going around riser and is undermining wall. Eight post are exposed down to the concrete supports and sitting in water. One section of the tree is sitting on the section of pipe between riser and wall and riser looks as if it is leaning to one side. Will need to drain hole that the wall is sitting in and fill will flowable fill then place filter fabric and grouted stone up to 5' off wall on both sides. Add 3 pressure treated stringers 2"x8" starting right under cap for 20' in length and then evenly placed to right above pipe . Each stringer will be bolted twice through each post with 3/4" galvinized bolts.	AES Coordinating Corrective Work		OK 10-23-03
22	JR027	Apr-02	Timber #4	Whittaker Island Block "A"	Dec-89	Feb-91	No		2/5/2003	Upland inflow pipe needs to be repaired by lifting up and placing filter fabric and stone underneath Need to go down to solid ground the length of the wall and place filter fabric and grout in stone for 5' off. Riser is gone but functioning well. ?	AES Coordinating Corrective Work		* 6-2-03
21	JR028	Apr-02	Timber #3	Whittaker Island Block "B"	Dec-89	Feb-91	No		2/5/2003	Need to go down to solid ground the length of the wall and place filter fabric and grout in stone for 5' off. Riser is gone but functioning well. ?	AES Coordinating Corrective Work		* 6-2-03
23	JR029	Apr-02	Timber	Nathaniel's Green	Jan-92	Jul-92	No ✓		2/6/2003	Riser still in place but Anti-Vortex has been remover. Riser has standing water and vegetation below invert of outflow. Some flow is going around riser and undermining wall. On downstream side of wall 3 places where ground has been washed away. Top of pipe exposed right where it comes out of wall, could not find outfall. Need to go to solid ground the length of the wall and place filter fabric with grout in stone for 5' off wall.	AES Coordinating Corrective Work		* 6-2-03
10	JR030	Feb-02	Timber	Founder's Hill	Mar-95	Jul-95	~~No~~ YES Note 18, Sht 9		1/31/2003	Pull stone down to solid ground then place filter fabric and cover w/ stone; Stone needs to be grouted in; Clean debris from downstream and upstream to 5' off wall and 30' of channel	AES Coordinating Corrective Work		OK 6-2-03
8	JR031	Mar-02	Timber	Wingfield Lake	Jun-92	Jun-93	No		2/5/2003	Clear and remove debris. Needs to be taken down to solid ground for the length of the wall on both sides and place filter fabric with grouted in stone for 5' out. Riprap at outfall needs to be addeded w/ filter fabric.	AES Coordinating Corrective Work		6-2-03 OK
25	JR032	Mar-02	Marsh Augmented BMP	The Harbor at Two Rivers	Jan-94	Oct-94	No		2/6/2003	Remove sediment from inlet towards boat ramp. Remove trash and large debris from pond.	AES Coordinating Corrective Work		OK 6-2-03
24	JR033	Mar-02	Marsh Augmented BMP	The Harbor at Two Rivers	Jan-94	Oct-94	No		2/6/2003	Culvert pipe needs sediment removed.	AES Coordinating Corrective Work		OK 6-2-03
7	JR034	Mar-02	Marsh Augmented BMP	River Oaks North	Apr-96	Nov-96	Waived		1/31/2003	Check record drawings for signature; Check spot elevations on bottom of pond for design and sedimentation; Provide information of incoming storm sewers; Remove small tree and woody vegetation on dam; Clean sediment and debris from outfall; Remove dewatering device.	AES Coordinating Corrective Work		OK 6-2-03
15	JR035	Mar-02	Timber	Two River Country Club	Sep-93		No		1/31/2003	Provide crest elevation on record drawings; Re-check elevation of riser crest; Clear debris / organic matter / vegetation from rock at riser; (Possibly remove and replace stone at riser); Check / replace wood top cap	AES Coordinating Corrective Work		OK 6-2-03
11	JR036	Nov-01	Timber	Two Rivers Point		Nov-96	**Yes**		1/31/2003	Construction Certification needed; Forward record drawings; Clean / remove debris and organic material just ahead of primary wall; Convert BMP to permanent facility	AES Coordinating Corrective Work		
4	JR040	Apr-01	Dry Pond	Wythe Hamlet	Apr-98	Sep-98	Waived		1/31/2003	Forward record drawings; Clean and remove sediment / debris / vegetation at end of 18-inch and 24-inch pipes, and at principal flow control; Remove vegetation within 10-feet of principal flow control; Compact and re-fill settlement above 10-inch outfall barrel.	AES Coordinating Corrective Work		OK 6-2-03
9	JR041	Dec-01	Ex. Detention	Cypress Isle	Aug-98	Jan-99	**Yes** ✓		2/6/2003	Remove sediment from inflow pipe. Stabilize bare spots, may need to add topsoil to get grass to take. Some erosion has occurred on embankment opposite from road due to area runoff.	AES Coordinating Corrective Work		OK 6-2-03
6	JR042	Mar-02	Pond	Barrett's Point Pond	May-98	Sep-98	**Yes**		2/6/2003	Construction Certification needed from earthwork;Check spot elevations on bottom of pond for design and sedimentation;Check invert on 12"HDPE drain and crest elev.of emergency spillway and class of rip-rap;Forward record drawings;Topsoil and seed bare areas. Fill depressions in pipe alignment and topsoil and seed	AES Coordinating Corrective Work		OK 6-2-03
20	JR045	Apr-02	Timber #2	Travis Pond	Dec-89	Feb-91	No		1/31/2003	Left side undermining of timber wall; Pull stone down to solid ground then place filter fabric and cover w/ stone; Stone needs to be grouted in; Clean debris from downstream and upstream to 5' off wall and 30' of channel.	AES Coordinating Corrective Work		OK 6-23-03
5	JR054	Mar-02	Timber	Fowler's Lake Block "B"	Oct-92	Sep-99	**Yes**		1/31/2003	Construction Certification needed from earthwork;Forward record drawings; Clear debris from perforated pipes and stone at orifice. Clear and remove fallen tree and debris.	AES Coordinating Corrective Work		OK 6-2-03
27	JR055	Not Req.	T-Dissapator	Whittaker Island Block "A"	Dec-89	Feb-91	No		N/A	N/A	N/A	N/A	OK 6-2-03
26	JR056	Not Req.	T-Dissapator	Whittaker Island Block "B"	Dec-89	Feb-91	No		N/A	ADEQUACY COMPS PROVIDED & RIPRAP OUTFALL Sept 9 '03 N/A	N/A	N/A	OK 10-24-03

BMP 1
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GOVERNOR'S LAND at TWO RIVERS

Stormwater Management Facilities / Best Management Practices Inspection / Acceptance Log
February 7, 2003

AES Project Number 7173-09

AES #2

BMP #	JCC BMP ID	Record Dwg.Date	Structure Type	General Location	Design Date	Plan Approval Date	Certification Required	Construction Date	James City County Inspection Date	AES Inspection Date Initial-Final	Required Actions	Status	Date of Completed Actions
14	JR016	Mar-02	Pond	Travis Pond	Dec-89	Feb-91	**No - Geotech. Report Provided**			2/6/2003	Evaluate sediment accumulation. Shoreline and dam in great shape. Outflow is functioning and there is no apparent erosion.	AES Coordinating Corrective Work	
18	JR017	Mar-02	Lake	Wingfield Lake	Dec-89	Jun-93	No		December 19, 2002	1/31/2003	Evaluate sediment accumulation. Record drawing clarifications; mow grass; remove trees and woody vegetation; establish grass; remove sediment and debris at rip-rap outlet	AES Coordinating Corrective Work	
12	JR018	Mar-02	Lake	Fowler's Lake	Nov-89	Nov-92	**No - Geotech. Report Provided**			2/6/2003	Evaluate sediment accumulation. Clear and remove pine trees and woody vegetation along shoreline at the dam. Stabilize bare spots, may need to add topsoil to get grass to take.	AES Coordinating Corrective Work	
16	JR019	Mar-02	Lake	Whittaker Lake	Feb-90	Feb-91	**No - Geotech. Report Provided**			2/5/2003	Evaluate sediment accumulation. Need to clear and remove woody vegetation along shoreline and stabilize any bare spots	AES Coordinating Corrective Work	
17	JR020	Feb-02	Pond	Kitchum's Pond		Jun-93	No		January 10, 2003	1/31/03 - 2/24/03	Evaluate sediment accumulation. Remove small pines along downstream face of dam and at outlet	Work Completed	2/24/2003
1	JR021	Feb-02	Pond	Bennett's Pond	Apr-93	Jul-93	No		January 10, 2003	1/31/2003	Check balance pipe; Evaluate sediment accumulation; Stabilize emergency spillway; Repair hole in embankment (center of dam)	Contractor scheduled to complete 2/25/03	
13	JR022	Apr-02	Lake	Horne's Lake	Oct-89	Oct-91	**No - Geotech. Report Provided**			2/5/2003	Evaluate sediment accumulation. Clear and remove woody vegetation along shoreline of dam. Stabilize bare spots on dam. Remove silt fence near outfall and clean out sediment from outfall. May need to place filter fabric around outfall and spruce up riprap.	AES Coordinating Corrective Work	
3	JR023	Mar-02	Dry Pond #1	Travis Pond	Dec-89	Feb-91	No			2/6/2003	Dry detention pond is in good condition. However, up towards West Island Road the Pipe that runs along side of the bike trail and flows to a riprap lined ditch that flows to the dry detention pond is clogged up with debris. The pipe needs to be cleaned out and ditch needs to be replaced from invert to approximately 15' out and lined with filter fabric and riprap.	AES Coordinating Corrective Work	
2	JR025	Oct-01	Dry Pond #2	Travis Pond	Dec-89	Feb-91	No			2/6/2003	18" RCP inflow pipe has become disconnected to the riser and ground on the inflow side and around riser is being eroded away. The 30" RCP running from the riser to the downstream side of the road appears to be coming apart at the joints. Also the 15" RCP acting as the Emergency spillway needs to be cleaned of sediment and debris.	Contractor Scheduled to start 3/3/03	Eagles Nest
19	JR026	Apr-02	Timber #1	Travis Pond	Dec-89	Feb-91	No			2/6/2003	Tree has fallen on wall and has been cut up some. Outflow pipe RCP is broken off at the joint at the wall. Wall is slightly leaning and runoff is going around riser and is undermining wall. Eight post are exposed down to the concrete supports and sitting in water. One section of the tree is sitting on the section of pipe between riser and wall and riser looks as if it is leaning to one side. Will need to drain hole that the wall is sitting in and fill will flowable fill then place filter fabric and grouted stone up to 5' off wall on both sides.	AES Coordinating Corrective Work	
22	JR027	Apr-02	Timber #4	Whittaker Island Block "A"	Dec-89	Feb-91	No			2/5/2003	Upland inflow pipe needs to be repaired by lifting up and placing filter fabric and stone underneath Need to go down to solid ground the length of the wall and place filter fabric and grout in stone for 5' off. Riser is gone but functioning well.	AES Coordinating Corrective Work	
21	JR028	Apr-02	Timber #3	Whittaker Island Block "B"	Dec-89	Feb-91	No			2/5/2003	Need to go down to solid ground the length of the wall and place filter fabric and grout in stone for 5' off. Riser is gone but functioning well.	AES Coordinating Corrective Work	
23	JR029	Apr-02	Timber	Nathaniel's Green	Jan-92	Jul-92	No			2/6/2003	Riser still in place but Anti-Vortex has been remover. Riser has standing water and vegetation below invert of outflow. Some flow is going around riser and undermining wall. On downstream side of wall 3 places where ground has been washed away. Top of pipe exposed right where it comes out of wall, could not find outfall. Need to go to solid ground the length of the wall and place filter fabric with grout in stone for 5' off wall.	AES Coordinating Corrective Work	
10	JR030	Feb-02	Timber	Founder's Hill	Mar-95	Jul-95	No		February 5, 2003	1/31/2003	Pull stone down to solid ground then place filter fabric and cover w/ stone; Stone needs to be grouted in; Clean debris from downstream and upstream to 5' off wall and 30' of channel	AES Coordinating Corrective Work	
8	JR031	Mar-02	Timber	Wingfield Lake	Jun-92	Jun-93	No		January 24, 2003	2/5/2003	Clear and remove debris. Needs to be taken down to solid ground for the length of the wall on both sides and place filter fabric with grouted in stone for 5' out. Riprap at outfall needs to be addeded w/ filter fabric.	Contractor scheduled to start 2/25/03	
25	JR032	Mar-02	Marsh Augmented BMP	The Harbor at Two Rivers	Jan-94	Oct-94	No			2/6/2003	Remove sediment from inlet towards boat ramp. Remove trash and large debris from pond.	AES Coordinating Corrective Work	
24	JR033	Mar-02	Marsh Augmented BMP	The Harbor at Two Rivers	Jan-94	Oct-94	No		February 18, 2003	2/6/2003	Culvert pipe needs sediment removed.	AES Coordinating Corrective Work	
7	JR034	Mar-02	Marsh Augmented BMP	River Oaks North	Apr-96	Nov-96	Waived		January 15, 2003	1/31/2003	Check record drawings for signature; Check spot elevations on bottom of pond for design and sedimentation; Provide information of incoming storm sewers; Remove small tree and woody vegetation on dam; Clean sediment and debris from outfall; Remove dewatering device.	AES Coordinating Corrective Work	
15	JR035	Mar-02	Timber	Two River Country Club	Sep-93		No		January 14, 2003	1/31/2003	Provide crest elevation on record drawings; Re-check elevation of riser crest; Clear debris / organic matter / vegetation from rock at riser; (Possibly remove and replace stone at riser); Check / replace wood top cap	AES Coordinating Corrective Work	
11	JR036	Nov-01	Timber	Two Rivers Point		Nov-96	**Yes**		January 14, 2003	1/31/2003	Construction Certification needed; Forward record drawings; Clean / remove debris and organic material just ahead of primary wall; Convert BMP to permanent facility	AES Coordinating Corrective Work	
4	JR040	Apr-01	Dry Pond	Wythe Hamlet	Apr-98	Sep-98	Waived		November 22, 2002	1/31/2003	Forward record drawings; Clean and remove sediment / debris / vegetation at end of 18-inch and 24-inch pipes, and at principal flow control; Remove vegetation within 10-feet of principal flow control; Compact and re-fill settlement above 10-inch outfall barrel.	AES Coordinating Corrective Work	
9	JR041	Dec-01	Ex. Detention	Cypress Isle	Aug-98	Jan-99	**Yes**		February 5, 2003	2/6/2003	Evaluate sediment accumulation. Remove sediment from inflow pipe. Stabilize bare spots, may need to add topsoil to get grass to take.	AES Coordinating Corrective Work	
6	JR042	Mar-02	Pond	Barrett's Point Pond	May-98	Sep-98	**Yes**		November 14, 2002	2/6/2003	Construction Certification needed from earthwork;Evaluate sediment accumulation. Check invert on 12"HDPE drain and crest elev.of emergency spillway and class of rip-rap;Forward record drawings;Topsoil and seed bare areas. Fill depressions in pipe alignment and topsoil and seed	AES Coordinating Corrective Work	
20	JR045	Apr-02	Timber #2	Travis Pond	Dec-89	Feb-91	No			1/31/2003	Left side undermining of timber wall; Pull stone down to solid ground then place filter fabric and cover w/ stone; Stone needs to be grouted in; Clean debris from downstream and upstream to 5' off wall and 30' of channel.	AES Coordinating Corrective Work	
5	JR054	Mar-02	Timber	Fowler's Lake Block "B"	Oct-92	Sep-99	**Yes**		November 22, 2002	1/31/2003	Construction Certification needed from earthwork;Forward record drawings; Clear debris from perforated pipes and stone at orifice. Clear and remove fallen tree and debris.	AES Coordinating Corrective Work	
27	JR055	Not Req.	T-Dissapator	Whittaker Island Block "A"	Dec-89	Feb-91	No		N/A	N/A	N/A	N/A	N/A
26	JR056	Not Req.	T-Dissapator	Whittaker Island Block "B"	Dec-89	Feb-91	No		N/A	N/A	N/A	N/A	N/A

AES #3

GOVERNOR'S LAND at TWO RIVERS

Stormwater Management Facilities / Best Management Practices Inspection / Acceptance Log
May 1, 2003

AES Project Number 7173-09

BMP #	JCC BMP ID	Record Dwg.Date	Structure Type	General Location	Design Date	Plan Approval Date	Certification Required	Record Drawing Status	James City County Inspection Date	AES Inspection Date Initial-Final	Required Actions	Status	Date of Completed Actions
14	JR016	Mar-02	Pond	Travis Pond	Dec-89	Feb-91	**No - Geotech. Report Provided**	Completed needs VMB signature		2/6/2003	Evaluate sediment accumulation/Evaluated and fine. Dam needs to be sodded in one area on downstream side. Outflow needs to be cleared of all vegetation and outflow protection needs to be improved.	AES Coordinating Corrective Work	
18	JR017	Mar-02	Lake	Wingfield Lake	Dec-89	Jun-93	No	**Sent Record Dwgs to JCC 4/23/03**	December 19, 2002	1/31/03 - 3/11/03	**Maintenance Complete**. Evaluate sediment accumulation/Evaluated and fine. Record drawing clarifications; mow grass; remove trees and woody vegetation; establish grass; remove sediment and debris at rip-rap outlet	**Sent Record Dwgs to JCC 4/23/03 Need JCC Final Inspection**	**4/23/2003**
12	JR018	Mar-02	Lake	Fowler's Lake	Nov-89	Nov-92	**No - Geotech. Report Provided**	Completed 03/12/03 Needs VMB review		2/6/03 - 2/26/03	**Maintenance Complete.** Evaluate sediment accumulation/Evaluated and fine. Clear and remove pine trees and woody vegetation along shoreline at the dam. Stabilize bare spots, may need to add topsoil to get grass to take. Install outlet protection to outfall pipe.	**Preparing Record Dwgs then Need JCC Final Inspection**	
16	JR019	Mar-02	Lake	Whittaker Lake	Feb-90	Feb-91	**No - Geotech. Report Provided**	Completed field survey. Adding new info. to dwgs	February 6, 2003	2/5/03 - 3/11/03	**Maintenance Complete.** Evaluate sediment accumulation, need more info. on pond to verify accumulation. Need to clear and remove woody vegetation along shoreline and stabilize any bare spots. Need to improve outlet protection at outfall pipe.	**May need to run hydraulic evaluation using as-built information**	
17	JR020	Feb-02	Pond	Kitchum's Pond		Jun-93	No	Completed needs VMB signature	January 10, 2003	1/31/03 - 2/24/03	**Maintenance Complete**. Evaluate sediment accumulation/Evaluated and fine. Remove small pines along downstream face of dam and at outlet	**Preparing Record Dwgs then Need JCC Final Inspection**	
1	JR021	Feb-02	Pond	Bennett's Pond	Apr-93	Jul-93	No	Completed field survey. Adding new info. to dwgs	January 10, 2003	1/31/2003	Check balance pipe, need to field verify pipe invert; Evaluate sediment accumulation; Stabilize emergency spillway; Repair hole in embankment (center of dam)	**Contractor needs to go back and topsoil & seed**	
13	JR022	Apr-02	Lake	Horne's Lake	Oct-89	Oct-91	**No - Geotech. Report Provided**	Completed 03/12/03 Needs VMB review		2/5/03 - 2/26/03	**Maintenance Complete.** Evaluate sediment accumulation. Clear and remove woody vegetation along shoreline of dam. Stabilize bare spots on dam. Remove silt fence near outfall and clean debris from around outfall area. Place filter fabric around outfall and add riprap for outlet protection.	**Preparing Record Dwgs then Need JCC Final Inspection**	
3	JR023	Mar-02	Dry Pond #1	Travis Pond	Dec-89	Feb-91	No			2/6/2003	Dry detention pond is in good condition. However, up towards West Island Road the Pipe that runs along side of the bike trail and flows to a riprap lined ditch that flows to the dry detention pond is clogged up with debris. The pipe needs to be cleaned out and ditch needs to be replaced from invert to approximately 15' out and lined with filter fabric and riprap.	**Contractor started work**	
2	JR025	Oct-01	Dry Pond #2	Travis Pond	Dec-89	Feb-91	No	**Sent Record Dwgs to JCC 4/23/03**	February 25, 2003	2/6/03-3/11/03	**Maintenance Complete**. 18" RCP inflow pipe is in urgent need of repair or replacement. The pipe looks as if it has become disconnected w/ riser and/ or has broken apart. Due to this the ground is eroding around the riser and has created a hole in the ground between entrance of pipe and riser. The outfall protection needs to be improved. existing rip-rap needs to removed and filter fabric needs to placed and existing rip-rap placed on fabric. 15" RCP acting as the Emergency spillway needs to be cleaned of sediment and debris.	**JCC Has Given Final Inspection and Approved. Sent Record Dwgs to JCC 4/23/03**	**4/23/2003**
19	JR026	Apr-02	Timber #1	Travis Pond	Dec-89	Feb-91	No	**Need more survey information after repair work is complete**	February 21, 2003	2/6/2003	Tree has fallen on wall and has been cut into three sections. Top section is laying on outflow pipe and caused the RCP to break off at the joint flush with the wall. The middle section is laying on the pipe section between the riser and the wall. The wall has been undermined due to the riser not functioning properly and ground elevations changed due to the fallen tree causing water to divert around riser. Tree needs to be cleared and removed from structure and organic material needs to be removed from structure area. Wall needs to be stabilized with concrete in the area that has been undermined. Outflow pipe needs to be reattached and riser needs to be straightened and stone replaced around riser. upstream side needs to be slightly graded to assure flow to riser. Outlet protection for outflow pipe needs to be reestablished.	AES Coordinating Corrective Work	
22	JR027	Apr-02	Timber #4	Whittaker Island Block "A"	Dec-89	Feb-91	No	**Need more survey information after repair work is complete**	February 20, 2003	2/5/2003	One section of inflow channel needs to stabilized. Inflow pipe needs to be exposed and inlet protection needs to be established. Fallen tree needs to be cleared and removed from timber structure and in the area of the fallen tree holes along wall need to filled with flowable fill. Outflow needs to be cleared and cleaned out. outlet protection needs to be reestablished and downstream side of wall needs stone removed and filter fabric installed and stone replaced up to 5' off wall.	AES Coordinating Corrective Work	
21	JR028	Apr-02	Timber #3	Whittaker Island Block "B"	Dec-89	Feb-91	No	**Need more survey information after repair work is complete**	February 20, 2003	2/5/2003	On downstream side of wall need to go down to solid ground and install filter fabric and grouted in place stone for 5' off wall. Outlet protection needs to be improved. Riser is gone but functioning well.	AES Coordinating Corrective Work	
23	JR029	Apr-02	Timber	Nathaniel's Green	Jan-92	Jul-92	No			2/6/2003	Found evidence of some flow has gone around riser. Stone needs to cleaned or replaced around riser. Downstream side of timber wall needs stone removed and filter fabric installed and stone replaced up to 5' off wall. Outflow pipe needs outfall exposed and outlet protection needs to be reestablished.	AES Coordinating Corrective Work	
10	JR030	Feb-02	Timber	Founder's Hill	Mar-95	Jul-95	**Yes**	Completed needs VMB signature	February 5, 2003	1/31/2003	Pull stone down to solid ground then place filter fabric and cover w/ stone; Stone needs to be grouted in; Clean debris from downstream and upstream to 5' off wall and 30' of channel	AES Coordinating Corrective Work	
8	JR031	Mar-02	Timber	Wingfield Lake	Jun-92	Jun-93	No	**Sent Record Dwgs to JCC 4/23/03**	January 24, 2003	2/5/03-2/26/03	**Maintenance Complete.** Clear and remove debris. Needs to be taken down to solid ground for the length of the wall on down stream side and place filter fabric with stone for 5' out. Riprap at outfall needs to be added w/ filter fabric.	**Sent Record Dwgs to JCC 4/23/03 Need JCC Final Inspection**	**4/23/2003**
25	JR032	Mar-02	Marsh Augmented BMP	The Harbor at Two Rivers	Jan-94	Oct-94	No			2/6/2003	Need to remove accumulated sediment in inflow pipes. Remove vegetation, debris and sediment within 10' of the ends of all storm drain pipes. Remove trash, litter and large debris from pond.	AES Coordinating Corrective Work	
24	JR033	Mar-02	Marsh Augmented BMP	The Harbor at Two Rivers	Jan-94	Oct-94	No	Completed needs VMB signature	February 18, 2003	2/6/2003	Need to remove accumulated sediment in Culvert pipe. Remove vegetation, debris and sediment within 10' of the ends of all storm drain pipes.	AES Coordinating Corrective Work	
7	JR034	Mar-02	Marsh Augmented BMP	River Oaks North	Apr-96	Nov-96	Waived	Completed needs VMB signature	January 15, 2003	1/31/2003	Check record drawings for signature; Evaluate sediment accumulation; Provide information of incoming storm sewers; Remove small tree and woody vegetation on dam; Clean sediment and debris from outfall; Remove dewatering device.	AES Coordinating Corrective Work	
15	JR035	Mar-02	Timber	Two River Country Club	Sep-93		No	Adding new information to drawing	January 14, 2003	1/31/2003	Provide crest elevation on record drawings; Re-check elevation of riser crest; Clear debris / organic matter / vegetation from rock at riser; (Possibly remove and replace stone at riser); Check / replace wood top cap	AES Coordinating Corrective Work	
11	JR036	Nov-01	Timber	Two Rivers Point		Nov-96	**Yes**	**Sent Record Dwgs to JCC 4/23/03**	January 14, 2003	1/31/03-3/3/03	**Maintenance Complete.** Construction Certification needed; Forward record drawings; Clean / remove debris and organic material just ahead of primary wall; Convert BMP to permanent facility	**Sent Record Dwgs to JCC 4/23/03 Need JCC Final Inspection**	**4/23/2003**
4	JR040	Apr-01	Dry Pond	Wythe Hamlet	Apr-98	Sep-98	Waived	**Sent Record Dwgs to JCC 4/23/03**	November 22, 2002	1/31/03 - 3/26/03	**Maintenance Complete.** Forward record drawings; Clean and remove sediment / debris / vegetation at end of 18-inch and 24-inch pipes, and at principal flow control; Remove vegetation within 10-feet of principal flow control; Compact and re-fill settlement above 10-inch outfall barrel.	**Sent Record Dwgs to JCC 4/23/03 Need JCC Final Inspection**	**4/23/2003**
9	JR041	Dec-01	Ex. Detention	Cypress Isle	Aug-98	Jan-99	**Yes**	**Sent Record Dwgs to JCC 4/23/03**	February 5, 2003	2/6/2003	**Maintenance Complete.** Evaluate sediment accumulation/Evaluated and fine. Remove sediment from inflow pipe. Stabilize bare spots, may need to add topsoil to get grass to take.	**Sent Record Dwgs to JCC 4/23/03 Need JCC Final Inspection**	**4/23/2003**
6	JR042	Mar-02	Pond	Barrett's Point Pond	May-98	Sep-98	**Yes**	**Sent Record Dwgs to JCC 4/23/03**	November 14, 2002	2/6/03 - 3/26/03	**Maintenance Complete.** Construction Certification needed from earthwork. Evaluate sediment accumulation/Evaluated and fine. Check invert on 12"HDPE drain and crest elev. of emergency spillway and class of rip-rap. Forward record drawings. Topsoil and seed bare areas. Fill depressions in pipe alignment and topsoil and seed	**Sent Record Dwgs to JCC 4/23/03 Need JCC Final Inspection**	**4/23/2003**
20	JR045	Apr-02	Timber #2	Travis Pond	Dec-89	Feb-91	No	**Need more survey information after repair work is complete**	February 21, 2003	1/31/2003	Left side undermining of timber wall; Pull stone down to solid ground then place filter fabric and cover w/ stone; Stone needs to be grouted in place; Clean debris from downstream and upstream to 5' off wall and 30' of channel.	AES Coordinating Corrective Work	
5	JR054	Mar-02	Timber	Fowler's Lake Block "B"	Oct-92	Sep-99	**Yes**	Completed needs VMB signature	November 22, 2002	1/31/2003	Construction Certification needed from earthwork. Forward record drawings; Clear debris from perforated pipes and stone at orifice. Clear and remove fallen tree and debris.	**Contractor Started 4/1/03**	
27	JR055	Not Req.	T-Dissapator	Whittaker Island Block "A"	Dec-89	Feb-91	No	N/A	N/A	N/A	N/A	N/A	N/A
26	JR056	Not Req.	T-Dissapator	Whittaker Island Block "B"	Dec-89	Feb-91	No	N/A	N/A	N/A	N/A	N/A	N/A

GOVERNOR'S LAND at TWO RIVERS

Stormwater Management Facilities / Best Management Practices Inspection / Acceptance Log
May 16, 2003

AES Project Number 7173-09

BMP #	JCC BMP ID	Record Dwg.Date	Structure Type	General Location	Design Date	Plan Approval Date	Certification Required	Record Drawing Status	James City County Inspection Date	AES Inspection Date Initial-Final	Required Actions	Status	Date of Completed Actions
14	JR016	Mar-02	Pond	Travis Pond	Dec-89	Feb-91	**No - Geotech. Report Provided**	**Completed waiting on comment letter from County**		2/6/2003	Evaluate sediment accumulation/Evaluated and fine. Dam needs to be sodden in one area on downstream side. Outflow needs to be cleared of all vegetation and outflow protection needs to be improved.	**Contractor needs to go back and stabilize**	
18	JR017	Mar-02	Lake	Wingfield Lake	Dec-89	Jun-93	No	**Sent Record Dwgs to JCC 4/23/03**	December 19, 2002	1/31/03 - 3/11/03	**Maintenance Complete.** Evaluate sediment accumulation/Evaluated and fine. Record drawing clarifications; mow grass; remove trees and woody vegetation; establish grass; remove sediment and debris at rip-rap outlet	**Sent Record Dwgs to JCC 4/23/03 Need JCC Final Inspection**	**4/23/2003**
12	JR018	Mar-02	Lake	Fowler's Lake	Nov-89	Nov-92	**No - Geotech. Report Provided**	**Completed waiting on comment letter from County**		2/6/03 - 2/26/03	**Maintenance Complete.** Evaluate sediment accumulation/Evaluated and fine. Clear and remove pine trees and woody vegetation along shoreline at the dam. Stabilize bare spots, may need to add topsoil to get grass to take. Install outlet protection to outfall pipe.	**Preparing Record Dwgs then Need JCC Final Inspection**	
16	JR019	Mar-02	Lake	Whittaker Lake	Feb-90	Feb-91	**No - Geotech. Report Provided**	Adding new information to drawing	February 6, 2003	2/5/03 - 3/11/03	**Maintenance Complete.** Evaluate sediment accumulation, need more info. on pond to verify accumulation. Need to clear and remove woody vegetation along shoreline and stabilize any bare spots. Need to improve outlet protection at outfall pipe.	**May need to run hydraulic evaluation using as-built information**	
17	JR020	Feb-02	Pond	Kitchum's Pond		Jun-93	No	**Sent Record Dwgs to JCC 5/13/03**	January 10, 2003	1/31/03 - 2/24/03	**Maintenance Complete.** Evaluate sediment accumulation/Evaluated and fine. Remove small pines along downstream face of dam and at outlet	**Sent Record Dwgs to JCC 5/13/03 Need JCC Final Inspection**	**5/13/2003**
1	JR021	Feb-02	Pond	Bennett's Pond	Apr-93	Jul-93	No	**Sent Record Dwgs to JCC 5/16/03**	January 10, 2003	1/31/03 - 5/14/03	**Maintenance Complete.** Check balance pipe, need to field verify pipe invert; Evaluate sediment accumulation; Stabilize emergency spillway; Repair hole in embankment (center of dam)	**Preparing Record Dwgs then Need JCC Final Inspection**	**5/16/2003**
13	JR022	Apr-02	Lake	Horne's Lake	Oct-89	Oct-91	**No - Geotech. Report Provided**	**Completed waiting on comment letter from County**		2/5/03 - 2/26/03	**Maintenance Complete.** Evaluate sediment accumulation. Clear and remove woody vegetation along shoreline of dam. Stabilize bare spots on dam. Remove silt fence near outfall and clean debris from around outfall area. Place filter fabric around outfall and add riprap for outlet protection.	**Preparing Record Dwgs then Need JCC Final Inspection**	
3	JR023	Mar-02	Dry Pond #1	Travis Pond	Dec-89	Feb-91	No	**Completed waiting on comment letter from County**		2/6/2003	**Maintenance Complete.** Dry detention pond is in good condition. However, up towards West Island Road the Pipe that runs along side of the bike trail and flows to a riprap lined ditch that flows to the dry detention pond is clogged up with debris. The pipe needs to be cleaned out and ditch needs to be replaced from invert to approximately 15' out and lined with filter fabric and riprap.	**Preparing Record Dwgs then Need JCC Final Inspection**	
2	JR025	Oct-01	Dry Pond #2	Travis Pond	Dec-89	Feb-91	No	**Sent Record Dwgs to JCC 4/23/03**	February 25, 2003	2/6/03-3/11/03	**Maintenance Complete.** 18" RCP inflow pipe is in urgent need of repair or replacement. The pipe looks as if it has become disconnected w/ riser and/ or has broken apart. Due to this the ground is eroding around the riser and has created a hole in the ground between entrance of pipe and riser. The outfall protection needs to be improved. existing rip-rap needs to removed and filter fabric needs to placed and existing rip-rap placed on fabric. 15" RCP acting as the Emergency spillway needs to be cleaned of sediment and debris.	**JCC Has Given Final Inspection and Approved. Sent Record Dwgs to JCC 4/23/03**	**4/23/2003**
19	JR026	Apr-02	Timber #1	Travis Pond	Dec-89	Feb-91	No	**Need more survey information after repair work is complete**	February 21, 2003	2/6/2003	Tree has fallen on wall and has been cut into three sections. Top section is laying on outflow pipe and caused the RCP to break off at the joint flush with the wall. The middle section is laying on the pipe section between the riser and the wall. The wall has been undermined due to the riser not functioning properly and ground elevations changed due to the fallen tree causing water to divert around riser. Tree needs to be cleared and removed from structure and organic material needs to be removed from structure area. Wall needs to be stabilized with concrete in the area that has been undermined. Outflow pipe needs to be reattached and riser needs to be straightened and stone replaced around riser. upstream side needs to be slightly graded to assure flow to riser. Outlet protection for outflow pipe needs to be reestablished.	AES Coordinating Corrective Work	
22	JR027	Apr-02	Timber #4	Whittaker Island Block "A"	Dec-89	Feb-91	No	**Need more survey information after repair work is complete**	February 20, 2003	2/5/2003	One section of inflow channel needs to stabilized. Inflow pipe needs to be exposed and inlet protection needs to be established. Fallen tree needs to be cleared and removed from timber structure and in the area of the fallen tree holes along wall need to filled with flowable fill. Outflow needs to be cleared and cleaned out. outlet protection needs to be reestablished and downstream side of wall needs stone removed and filter fabric installed and stone replaced up to 5' off wall.	AES Coordinating Corrective Work	
21	JR028	Apr-02	Timber #3	Whittaker Island Block "B"	Dec-89	Feb-91	No	**Need more survey information after repair work is complete**	February 20, 2003	2/5/2003	On downstream side of wall need to go down to solid ground and install filter fabric and grouted in place stone for 5' off wall. Outlet protection needs to be improved. Riser is gone but functioning well.	AES Coordinating Corrective Work	
23	JR029	Apr-02	Timber	Nathaniel's Green	Jan-92	Jul-92	No	**Completed waiting on comment letter from County**		2/6/2003	**Maintenance Complete.** Found evidence of some flow has gone around riser. Stone needs to cleaned or replaced around riser. Downstream side of timber wall needs stone removed and filter fabric installed and stone replaced up to 5' off wall. Outflow pipe needs outfall exposed and outlet protection needs to be reestablished.	**Preparing Record Dwgs then Need JCC Final Inspection**	
10	JR030	Feb-02	Timber	Founder's Hill	Mar-95	Jul-95	**Yes**	**Sent Record Dwgs to JCC 5/15/03**	February 5, 2003	1/31/03 - 4/22/03	**Maintenance Complete.** Pull stone down to solid ground then place filter fabric and cover w/ stone; Stone needs to be grouted in; Clean debris from downstream and upstream to 5' off wall and 30' of channel	**Preparing Record Dwgs then Need JCC Final Inspection**	**5/15/2003**
8	JR031	Mar-02	Timber	Wingfield Lake	Jun-92	Jun-93	No	**Sent Record Dwgs to JCC 4/23/03**	January 24, 2003	2/5/03-2/26/03	**Maintenance Complete.** Clear and remove debris. Needs to be taken down to solid ground for the length of the wall on down stream side and place filter fabric with stone for 5' out. Riprap at outfall needs to be added w/ filter fabric.	**Sent Record Dwgs to JCC 4/23/03 Need JCC Final Inspection**	**4/23/2003**
25	JR032	Mar-02	Marsh Augmented BMP	The Harbor at Two Rivers	Jan-94	Oct-94	No	**Completed waiting on comment letter from County**		2/6/03 - 5/14/03	**Maintenance Complete.** Need to remove accumulated sediment in inflow pipes. Remove vegetation, debris and sediment within 10' of the ends of all storm drain pipes. Remove trash, litter and large debris from pond.	**Preparing Record Dwgs then Need JCC Final Inspection**	
24	JR033	Mar-02	Marsh Augmented BMP	The Harbor at Two Rivers	Jan-94	Oct-94	No	**Sent Record Dwgs to JCC 5/15/03**	February 18, 2003	2/6/03 - 5/14/03	**Maintenance Complete.** Need to remove accumulated sediment in Culvert pipe. Remove vegetation, debris and sediment within 10' of the ends of all storm drain pipes.	**Preparing Record Dwgs then Need JCC Final Inspection**	**5/15/2003**
7	JR034	Mar-02	Marsh Augmented BMP	River Oaks North	Apr-96	Nov-96	Waived	**Sent Record Dwgs to JCC 5/15/03**	January 15, 2003	1/31/03 - 5/14/03	**Maintenance Complete.** Check record drawings for signature; Evaluate sediment accumulation; Provide information of incoming storm sewers; Remove small tree and woody vegetation on dam; Clean sediment and debris from outfall; Remove dewatering device.	**Preparing Record Dwgs then Need JCC Final Inspection**	**5/15/2003**
15	JR035	Mar-02	Timber	Two River Country Club	Sep-93		No	Adding new information to drawing	January 14, 2003	1/31/2003	**Maintenance Complete.** Provide crest elevation on record drawings; Re-check elevation of riser crest; Clear debris / organic matter / vegetation from rock at riser; (Possibly remove and replace stone at riser); Check / replace wood top cap	**Preparing Record Dwgs then Need JCC Final Inspection**	
11	JR036	Nov-01	Timber	Two Rivers Point		Nov-96	**Yes**	**Sent Record Dwgs to JCC 4/23/03**	January 14, 2003	1/31/03-3/3/03	**Maintenance Complete.** Construction Certification needed; Forward record drawings; Clean / remove debris and organic material just ahead of primary wall; Convert BMP to permanent facility	**Sent Record Dwgs to JCC 4/23/03 Need JCC Final Inspection**	**4/23/2003**
4	JR040	Apr-01	Dry Pond	Wythe Hamlet	Apr-98	Sep-98	Waived	**Sent Record Dwgs to JCC 4/23/03**	November 22, 2002	1/31/03 - 3/26/03	**Maintenance Complete.** Forward record drawings; Clean and remove sediment / debris / vegetation at end of 18-inch and 24-inch pipes, and at principal flow control; Remove vegetation within 10-feet of principal flow control; Compact and re-fill settlement above 10-inch outfall barrel.	**Sent Record Dwgs to JCC 4/23/03 Need JCC Final Inspection**	**4/23/2003**
9	JR041	Dec-01	Ex. Detention	Cypress Isle	Aug-98	Jan-99	**Yes**	**Sent Record Dwgs to JCC 4/23/03**	February 5, 2003	2/6/03 - 4/22/03	**Maintenance Complete.** Evaluate sediment accumulation/Evaluated and fine. Remove sediment from inflow pipe. Stabilize bare spots, may need to add topsoil to get grass to take.	**Sent Record Dwgs to JCC 4/23/03 Need JCC Final Inspection**	**4/23/2003**
6	JR042	Mar-02	Pond	Barrett's Point Pond	May-98	Sep-98	**Yes**	**Sent Record Dwgs to JCC 4/23/03**	November 14, 2002	2/6/03 - 3/26/03	**Maintenance Complete.** Construction Certification needed from earthwork. Evaluate sediment accumulation/Evaluated and fine. Check invert on 12"HDPE drain and crest elev. of emergency spillway and class of rip-rap. Forward record drawings. Topsoil and seed bare areas. Fill depressions in pipe alignment and topsoil and seed	**Sent Record Dwgs to JCC 4/23/03 Need JCC Final Inspection**	**4/23/2003**
20	JR045	Apr-02	Timber #2	Travis Pond	Dec-89	Feb-91	No	**Need more survey information after repair work is complete**	February 21, 2003	1/31/2003	Left side undermining of timber wall; Pull stone down to solid ground then place filter fabric and cover w/ stone; Stone needs to be grouted in place; Clean debris from downstream and upstream to 5' off wall and 30' of channel.	AES Coordinating Corrective Work	
5	JR054	Mar-02	Timber	Fowler's Lake Block "B"	Oct-92	Sep-99	**Yes**	**Sent Record Dwgs to JCC 5/15/03**	November 22, 2002	1/31/03 - 4/22/03	**Maintenance Complete.** Construction Certification needed from earthwork. Forward record drawings; Clear debris from perforated pipes and stone at orifice. Clear and remove fallen tree and debris.	**Sent Record Dwgs to JCC 5/15/03 Need JCC Final Inspection**	**5/15/2003**
27	JR055	Not Req.	T-Dissapator	Whittaker Island Block "A"	Dec-89	Feb-91	No	N/A	N/A	N/A	N/A	N/A	N/A
26	JR056	Not Req.	T-Dissapator	Whittaker Island Block "B"	Dec-89	Feb-91	No	N/A	N/A	N/A	N/A	N/A	N/A

DEVELOPMENT MANAGEMENT

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May 20, 2003

Mr. James H. Bennett
Governors Land Associates
9701 Mill Pond Run
Toano, Va. 23168

Re: Governor's Land
BMP Certification Reviews

Dear Mr. Bennett:

Attached is correspondence relative to the review of certification material for the following BMPs in Governor's Land. Items as outlined in each of the letters must be addressed prior to considering release of the developer's surety instrument and closing out the project.

- JR 022, Hornes Lake, SP-145-89
- JR 016, Travis Pond, SP-145-89
- JR 018, Fowlers Lake, SP-145-89
- JR 023, Golf Course Pond at Fairway 9, S-7-90
- JR 029, Nathaniels Green Miln House Road, S-6-92
- JR 032, Marina Village (Shallow Marsh), S-127-93
- JR 055, Whittaker Island Block A (Level Spreader), S-7-90
- JR 056, Sanctuary Drive (Level Spreader), S-7-90

This is in addition to letters already previously forwarded for the following BMPs and projects:

- JR 025, Halfway House BMP, S-7-90
- JR 019, Whittaker Lake, S-7-90
- JR 026, West Island Road BMP # 1 (timber crib wall), S-7-90
- JR 045, West Island Road BMP # 2 (timber crib wall), S-7-90
- JR 028, Sanctuary Road BMP # 3 (timber crib wall), S-7-90
- JR 027, Whittaker Island BMP # 4 (timber crib wall), S-7-90
- JR 030, Founders Hill, S-29-95
- JR 031, Wingfield Lake Timber Crib Wall, S-21-93
- JR 033, The Harbor at Two Rivers, Dual Forebays, S-127-93
- JR 041, Cypress Isle, S-79-98
- JR 017, Wingfield Lake, S-144-89
- JR 021, Bennetts Pond, S-14-93
- JR 020, Kitchums Pond, S-14-93
- JR 034, River Oaks North BMP # 3, S-12-96

- JR 035, Two River Country Club, Club Villas Timber Crib Wall, SP-49-93
- JR 036, Two Rivers Point, Timber Crib Wall, S-52-95
- JR 040, Wythe Hamlet, S-32-98
- JR 054, Fowlers Lake Block B, S-110-98
- JR 042, Barretts Pointe, S-42-98

According to our records and supplemental correspondence being forwarded to us by AES Consulting Engineers, this completes the review of certification materials (record drawings and construction certifications, as applicable) and initial final inspection of all identified BMP facilities within Governor's Land.

Once this work is satisfactorily completed, contact our office appropriately for reinspection. To avoid confusion, we request that notices for reinspection be performed via either telephone or email correspondence. Please contact me at 757-253-6639 or the assigned Environmental Division inspector, Joe Buchite at 757-253-6643 if you have any comments or questions.

Sincerely,

Scott J. Thomas, P.E.
Civil Engineer
Environmental Division

cc: Marc Bennett and Victoria Bains, AES - via fax
Rick Hall, Environmental Division
Joe Buchite, Environmental Division

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(757) 253-2620

March 10, 2003

Mr. James H. Bennett
Governors Land Associates
9701 Mill Pond Run
Toano, Va. 23168

Re: Governor's Land
BMP Certification Reviews

Dear Mr. Bennett:

Attached is correspondence relative to the review of certification material for the following BMPs in Governor's Land. Items as outlined in each of the letters must be addressed prior to considering release of the developer's surety instrument and closing out the project.

- JR 025, Halfway House BMP, S-7-90
- JR 019, Whittaker Lake, S-7-90
- JR 026, West Island Road BMP # 1 (timber crib wall), S-7-90
- JR 045, West Island Road BMP # 2 (timber crib wall), S-7-90
- JR 028, Sanctuary Road BMP # 3 (timber crib wall), S-7-90
- JR 027, Whittaker Island BMP # 4 (timber crib wall), S-7-90

This is in addition to letters already previously forwarded for the following BMPs and projects:

- JR 030, Founders Hill, S-29-95
- JR 031, Wingfield Lake Timber Crib Wall, S-21-93
- JR 033, The Harbor at Two Rivers, Dual Forebays, S-127-93
- JR 041, Cypress Isle, S-79-98
- JR 017, Wingfield Lake, S-144-89
- JR 021, Bennetts Pond, S-14-93
- JR 020, Kitchums Pond, S-14-93
- JR 034, River Oaks North BMP # 3, S-12-96
- JR 035, Two River Country Club, Club Villas Timber Crib Wall, SP-49-93
- JR 036, Two Rivers Point, Timber Crib Wall, S-52-95
- JR 040, Wythe Hamlet, S-32-98
- JR 054, Fowlers Lake Block B, S-110-98
- JR 042, Barretts Pointe, S-42-98

Once this work is satisfactorily completed, contact our office appropriately for reinspection. We will continue with the review of certification material as submitted for remaining BMPs including those in Travis Pond, Nathaniel's Green and Whittaker Island. Please contact me at 757-253-6639 if you have any comments or questions.

Sincerely,

Scott J. Thomas, P.E.
Civil Engineer
Environmental Division

cc: Marc Bennett and Victoria Bains, AES - via fax
Rick Hall, Environmental Division
Joe Buchite, Environmental Division

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February 18, 2003

Mr. James H. Bennett
Governors Land Associates
9701 Mill Pond Run
Toano, Va. 23168

Re: Governor's Land
BMP Certification Reviews

Dear Mr. Bennett:

Attached is correspondence relative to the review of certification material for the following BMPs in Governor's Land. Items as outlined in each of the letters must be addressed prior to considering release of the developer's surety instrument and closing out the project.

- JR 030, Founders Hill, S-29-95
- JR 031, Wingfield Lake Timber Crib Wall, S-21-93
- JR 033, The Harbor at Two Rivers, Dual Forebays, S-127-93
- JR 041, Cypress Isle, S-79-98

This is in addition to letters already previously forwarded for the following BMPs and projects:

- JR 017, Wingfield Lake, S-144-89
- JR 021, Bennetts Pond, S-14-93
- JR 020, Kitchums Pond, S-14-93
- JR 034, River Oaks North BMP # 3, S-12-96
- JR 035, Two River Country Club, Club Villas Timber Crib Wall, SP-49-93
- JR 036, Two Rivers Point, Timber Crib Wall, S-52-95
- JR 040, Wythe Hamlet, S-32-98
- JR 054, Fowlers Lake Block B, S-110-98
- JR 042, Barretts Pointe, S-42-98

Once this work is satisfactorily completed, contact our office appropriately for reinspection. We will continue with the review of certification material as submitted for all remaining BMPs. We are still in the process of working with Whittaker Lake, Travis Pond, Hornes Lake and facilities in Nathaniels Green. Please contact me at 757-253-6639 or the assigned Environmental Division inspector, Joe Buchite at 757-253-6643 if you have any further comments or questions.

Sincerely,

Scott J. Thomas, P.E.
Civil Engineer
Environmental Division

cc: Marc Bennett, AES - via fax
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January 24, 2003

Mr. James H. Bennett
Governors Land Associates
9701 Mill Pond Run
Toano, Va. 23168

Re: Governor's Land
BMP Certification Reviews

Dear Mr. Bennett:

Attached is correspondence relative to the review of certification material for the following BMPs in Governor's Land. Items as outlined in each of the letters must be addressed prior to considering release of the developer's surety instrument and closing out the project.

- JR 017, Wingfield Lake, S-144-89
- JR 021, Bennetts Pond, S-14-93
- JR 020, Kitchums Pond, S-14-93
- JR 034, River Oaks North BMP # 3, S-12-96
- JR 035, Two River Country Club, Club Villas Timber Crib Wall, SP-49-93
- JR 036, Two Rivers Point, Timber Crib Wall, S-52-95

This is in addition to letters already previously forwarded for the following BMPs and projects:

- JR 040, Wythe Hamlet, S-32-98
- JR 054, Fowlers Lake Block B, S-110-98
- JR 042, Barretts Pointe, S-42-98

Once this work is satisfactorily completed, contact our office appropriately for reinspection. We will continue with the review of certification material as submitted for all remaining BMPs. Our goal is to proceed next with Travis Pond, Hornes Lake and Nathaniels Green.

Please contact me at 757-253-6639 or the assigned Environmental Division inspector, Joe Buchite at 757-253-6643 if you have any further comments or questions.

Sincerely,

Scott J. Thomas, P.E.
Civil Engineer
Environmental Division

cc: Marc Bennett, AES - via fax

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Governors Land Stormwater Management Facilities
James City County Environmental Division - BMP Inventory & Inspection Program

No.	BMP ID Code	Record Dwg.	Plan Number	Stormwater Management Facility Name	Location	Type	Description:
1	JR 016	Yes	SP-145-89	Travis Pond	Near 2013 Travis Close Road	Wet Pond	Large lake
2	JR 017	Yes	S-144-89	Wingfield Lake	Near 3028 John Vaughan Rd.	Wet Pond	Large lake
3	JR 018	Yes	S-145-89	Fowlers Lake	Near 3229 Fowlers Lake Road	Wet Pond	Large lake
4	JR 019	Yes	S-7-90	Whittaker Lake	Near 2816 Lawnes Creek Road	Wet Pond	Large lake; shoreline plantings
5	JR 020	Yes	S-14-93	Kitchums Pond	Near 3005 Kitchums Close	Wet Pond	Cut pond; long run 6 inch PVC outlet
6	JR 021	Yes	S-14-93	Bennetts Pond	Near 3024 John Vaughn Lane	Wet Pond	Larger Lake
7	JR 022	Yes	SP-145-89	Hornes Lake	Near 3021 Nathaniels Green	Wet Pond	Larger lake; irrigation source
8	JR 023	Yes	S-7-90	Golf Course Pond (Fairway # 9)	West of 2936 East Island Road	Dry Pond	Golf course cartway crosses embankment
9	JR 025	Yes	S-7-90	Halfway House BMP (Fairways # 6 & # 11)	West of 2344 West Island Road	Dry Pond	Along golf cart/pump station access path.
10	JR 026	Yes	S-7-90	West Island Road BMP # 1	East of 2327 West Island Road	Timber Crib Wall	Between Lot 22 & 28 Travis Pond
11	JR 027	Yes	S-7-90	Whitaker Island Road BMP # 4	Southeast of 3017 Whittaker Island	Timber Crib Wall	Southeast of Lot 35
12	JR 028	Yes	S-7-90	Sanctuary Road BMP # 3	East of 2489 Sanctuary Drive	Timber Crib Wall	At end of cul-de-sac
13	JR 029	Yes	S-6-92	Nathaniels Green - Miln House Road	West of 1917 Miln House Road	Timber Crib Wall	Fairway # 14 to south; adjacent homes
14	JR 030	Yes	S-29-95	Founders Hill	East of 1756 Founders Hill South	Timber Crib Wall	Fairway # 14 & # 15 to south
15	JR 031	Yes	S-21-93	Wingfield Lake - East Timber Structure	East of 3251 Wingfield Lake Road	Timber Crib Wall	In natural wooded area
16	JR 032	Yes	S-127-93	Marina Village BMP # 2	End Harbor Road	Wet Pond (Marsh)	Near parking lot and boat ramp area
17	JR 033	Yes	S-127-93	Harbor Road BMP # 1 (Marina Village)	North side Harbor Road	Shallow Marsh	Interconnected BMPs at road intersection.
18	JR 034	Yes	S-12-96	River Oaks North A BMP # 3	West of 1588 River Ridge Road	Wet Pond	End cul-de-sac.
19	JR 035	Yes	SP-49-93	Clubhouse Pond (Near County Club Villas)	North of 1400 Two Rivers Road	Timber Crib Wall	CMP Riser; near lot retaining wall
20	JR 036	Yes	S-52-95	Two Rivers Point	East of 1210 Two Rivers Point	Timber Crib Wall	Located in channel.
21	JR 037			Golf Maintenance Area BMP	North Two Rivers Road		West of Harpers Mill
22	JR 040	Yes	S-32-98	Wythe Hamlet	South of 1820 John Hancock Rd	Dry Pond	Outfalls to Two Rivers Road.
23	JR 041	Yes	S-79-98	Cypress Isle	North of 1832 Cypress Isle	Dry Pond	Outfalls to wetland area.
24	JR 042	Yes	S-42-98	Barretts Pointe	East of 2908 Barrets Pointe	Wet Pond	RCP outlet pipe structure.
25	JR 045	Yes	S-7-90	West Island Road BMP # 2	East of 2333 West Island Road	Timber Crib Wall	End of West Island Road cul-de-sac
26	JR 054	Yes	S-110-98	Fowlers Lake Block B (# 10)	North of 3220 Fowlers Lake Road	Timber Crib Wall	Near Intx Fowlers Lake Rd & N Fowlers
27	JR 055	Yes	S-7-90	Whitaker Island Tee Dissipator	Near 3029 Whittaker Island Road	Energy Dissipator	Inlet box with pipe tee spreader
28	JR 056	No	S-7-90	Sanctuary Drive Tee Dissipator	2517 Sanctuary Drive	Level Spreader	End of storm pipe system Sanctuary Drive

County BMP Inspection Program (3/27/01 - 4/12/01, and 10/17/01 - 11/8/01)
Hit -List / Schedule of Phase I Inspections

JR - James River Watershed

West Sector -Chickahominy/Governors Land

1. JR 016 Governors Land - Travis Pond
1. JR 017 Governors Land - Wingfield Lake
2. JR 018 Governors Land - Fowlers Lake
3. JR 019 Governors Land - Whittaker Lake
4. JR 020 Governors Land - Kitchums Pond
5. JR 021 Governors Land - Bennetts Pond
6. JR 022 Governors Land - Hornes Lake
7. JR 023 Governors Land - Golf Course Pond (at golf cart path Fairway # 9)
8. JR 025 Governors Land - Halfway House (Near Pump Sta. GL-2/west of West Island Road cul-de-sac)
9. JR 026 Governors Land - West Island Road BMP # 1(East of 2327 West Island Road and cul-de-sac)
10. JR 027 Governors Land - Whittaker Island BMP # 4 Timber Wall (near 3017 Whittaker Island)
11. JR 028 Governors Land - Sanctuary Road BMP # 3 Timber Wall (end of Sanctuary Drive)
12. JR 029 Governors Land - Miln House Road BMP (1917 Miln House)
13. JR 030 Governors Land - Founders Hill BMP (timber crib wall)
14. JR 031 Governors Land - Wingfield Lake East Timber Crib Wall (Woods)
15. JR 032 Governors Land - Marina Village BMP # 2 (shallow marsh at parking lot)
16. JR 033 Governors Land - Harbor Road BMP (Marina Village - Dual forebays)
17. JR 034 Governors Land - River Oaks North A BMP (West End)
18. JR 035 Governors Land - Clubhouse Pond (Near Country Club Villas)
19. JR 036 Governors Land - Two Rivers Point
20. JR 037 Governors Land - Golf Maintenance Area BMP
21. JR 041 Governors Land - Cypress Isle BMP
22. JR 045 Governors Land - West Island Road BMP # 2 (southeast of cul-de-sac at end West Island Road)
23. JR 055 Governors Land - Whittaker Island Tee Dissipator (level spreader)
24. JR 056 Governors Land - Sanctuary Drive Tee Dissipator (level spreader Lot 14)

West Sector - Other

24. JR 051 Greensprings Lake-National Golf Course
25. JR 006 Patriots Colony Basin # 1 (North of Villa Court # 1)
26. JR 015 Patriots Colony Basin # 2 (South of Villa Court # 6)
27. JR 001 First Colony Lake Pasbehegh (Private Dam)
28. JR 007 Berkeleys Green Phase 6 (End Moss Creek Drive)
29. JR 005 Fernbrook Subdivision (End of Captain Wynne Drive)

Central Sector (Kingsmill-Busch Gardens)

30. JR 004 Rhine River Lake - Busch Gardens (Large Lake)
31. JR 008 Kingsmill - Warehams Pond (Large Lake)
32. JR 009 Kingsmill - Jeffersons Hundred Phase II (?)
33. JR 010 Kingsmill - Brownings Grant (?)
34. JR 011 Kingsmill - Golf Course No. 3
35. JR 012 Kingsmill - Kingsmill Conference Center

East Sector (Grove)

36. JR 013 Little Zion Baptist Church
37. JR 002 James River Elementary School-Community Center
38. JR 038 James River Commerce Center

G:\SWMProg\BMP\CoInspProg\PH1Sched\JRSched

County BMP Inspection Program (-)
Hit -List / Schedule of Phase II Inspections

JR - James River Watershed

West Sector (Chickahominy/Governors Land)

1. JR 048 Greensprings West Phase I (near entrance at Centerville Road)
2. JR 053 Greensprings-Wmbg Nat Golf Course Maintenance Facility (3215 Monticello Alt 5 at FH 5)
3. JR 024 Patriots Colony Phase 2 (Timber Crib)
4. JR 043 Avalon Route 5 (Shallow Marsh)
5. JR 054 Governors Land - Fowlers Lake Block B (Timber Crib near intx Fowlers Lake & N Fowlers Close)
6. JR 040 Governors Land - Wythe Hamlet (Dry Pond)
7. JR 042 Governors Land - Barretts Pointe (Wet Pond)
8. JR 041 Governors Land - Cypress Isle (North of 1832 Cypress Isle Lot 15)

Central Sector (Kingsmill)

2. JR 039 Kingsmill Marina
3. JR 050 Kingsmill East Community Center (Timber Crib)
4. JR 049 Kingsmill East - Wareham's Pond Rd. Ext. (wet pond # 3)
5. JR 046 Kingsmill East - Sandy's Fort (North of 115 Andrew Lindsey, wet pond # 2)
6. JR 047 Kingsmill East - Sandy's Fort (South of 132 George Sandys, wet pond # 5)

East Sector (Grove)

G:\SWMProg\BMP\CoInspProg\PH2Sched\JRSched

Governors Land Stormwater Management Facilities - JCC Environmental Division Inventory
County BMP Inventory & Inspection Program

No.	BMP ID Code	Record Dwg.	Plan Number	Stormwater Management Facility Name	Location	Type	General Information:	* Preliminary Inspection Comments:
1	JR 016	Yes	SP-145-89	Travis Pond	Near 2013 Travis Close Road	Wet Pond	Large lake	Check if emergency spillway on design plan.
2	JR 017	Yes	S-144-89	Wingfield Lake	Near 3028 John Vaughan Rd.	Wet Pond	Large lake	Access difficulties.
3	JR 018	Yes	S-145-89	Fowlers Lake	Near 3229 Fowlers Lake Road	Wet Pond	Large lake	D/S trees, barrel seepage failure, no valve extension.
4	JR 019	Yes	S-7-90	Whittaker Lake	Near 2816 Lawnes Creek Road	Wet Pond	Large lake; shoreline plantings	Trees in emergency which is off property.
5	JR 020	Yes	S-14-93	Kitchums Pond	Near 3005 Kitchums Close	Wet Pond	Cut pond; long run 6 inch PVC outlet	Location primary outlet barrel.
6	JR 021	Yes	S-14-93	Bennetts Pond	Near 3024 John Vaughn Lane	Wet Pond	Larger Lake	Access difficulty.
7	JR 022	Yes	SP-145-89	Hornes Lake	Near 3021 Nathaniels Green	Wet Pond	Larger lake; irrigation source	No valve extension; shoreline collapse at golf green.
8	JR 023	Yes	S-7-90	Golf Course Pond (End Fairway # 9)	West of 2936 East Island Road	Dry Pond	Golf course cartway crosses embankment	D/S tree removal and routine cleaning.
9	JR 025	Yes	S-7-90	Halfway House BMP (Fairways # 6 & # 11)	West of 2344 West Island Road	Dry Pond	Along golf cart/pump station access path.	Riser subsidence. Routine cleaning & tree removal required.
10	JR 026	Yes	S-7-90	West Island Road BMP # 1	East of 2327 West Island Road	Timber Crib Wall	Between Lot 22 & 28 Travis Pond	Tree down at wall. Undercutting.
11	JR 027	Yes	S-7-90	Whitaker Island BMP # 4	Southeast of 3017 Whittaker Island	Timber Crib Wall	Southeast of Lot 35	Not inspected.
12	JR 028	Yes	S-7-90	Sanctuary Road BMP # 3	East of 2489 Sanctuary Drive	Timber Crib Wall	At end of cul-de-sac	Trees along wall. Check BMP orifice design vs installation.
13	JR 029	Yes	S-6-92	Miln House Road BMP	West of 1917 Miln House Road	Timber Crib Wall	Fairway # 14 to south; adjacent homes	Anti-vortex/trash rack device missing. Clean outlet storm system.
14	JR 030	Yes	S-29-95	Founders Hill BMP	East of 1756 Founders Hill South	Timber Crib Wall	Fairway # 14 & # 15 to south	Left wall undercut failure & d/s erosion. Perf PVC installed incorrect.
15	JR 031	Yes	S-21-93	Wingfield Lake East Timber Structure	East of 3251 Wingfield Lake Road	Timber Crib Wall	In natural wooded area	Access problem. Fallen tree has caused wall failure.
16	JR 032	Yes	S-127-93	Marina Village BMP # 2	End Harbor Road	Wet Pond (Marsh)	Near parking lot and boat ramp area	Storm drain inflow pipes to BMP need cleaned of sediment.
17	JR 033	Yes	S-127-93	Harbor Road BMP # 1 (Marina Village)	North side Harbor Road	Shallow Marsh	Interconnected BMPs at road intersection.	Routine clean basin bottom for positive drainage.
18	JR 034	Yes	S-12-96	River Oaks North A BMP # 3	West of 1588 River Ridge Road	Wet Pond	End cul-de-sac.	Routine barrel cleaning at outfall.
19	JR 035	Yes	SP-49-93	Clubhouse Pond (Near County Club Villas)	North of 1400 Two Rivers Road	Timber Crib Wall	CMP Riser; near lot retaining wall	Routine cleaning of stone around riser and storm drain pipe inflows.
20	JR 036	Yes	S-52-95	Two Rivers Point	East of 1210 Two Rivers Point	Timber Crib Wall	Located in channel.	Perforated PVC low flow orifice installed improperly.
21	JR 037			Golf Maintenance Area BMP	North Two Rivers Road		West of Harpers Mill	
22	JR 040	Yes	S-32-98	Wythe Hamlet BMP	South of 1820 John Hancock Rd	Dry Pond	Outfalls to Two Rivers Road.	Minor cleaning at riser and basin bottom for positive drainage.
23	JR 041	Yes	S-79-98	Cypress Isle BMP	North of 1832 Cypress Isle	Dry Pond	Outfalls to wetland area.	Extend riprap up sidewalls of outlet protection stilling basin.
24	JR 042	Yes	S-42-98	Barretts Pointe BMP	East of 2908 Barrets Pointe	Wet Pond	RCP outlet pipe structure.	Sediment load due to adjacent construction.
25	JR 045	Yes	S-7-90	West Island Road BMP # 2	East of 2333 West Island Road	Timber Crib Wall	End of West Island Road cul-de-sac	Wall base undercut; timber supports exposed.
26	JR 054	Yes	S-110-98	Fowlers Lake Block B (# 10)	North of 3220 Fowlers Lake Road	Timber Crib Wall	Near Intx Fowlers Lake Rd & N Fowlers	Not inspected.
27	JR 055	Yes	S-7-90	Whitaker Island Tee Dissipator	Near 3029 Whittaker Island Road	Energy Dissipator	Inlet box with pipe tee spreader	Severe inlet, D/S erosion. Fixed summer 2001.
28	JR 056	No	S-7-90	Sanctuary Drive Tee Dissipator	2517 Sanctuary Drive	Level Spreader	along Lot 14 Whittaker Island Blk B	Possible this device was not constructed.

* Preliminary inspection notes based on cursory engineering inspection performed on January 19th 2001 and by results of inspection performed under the County BMP Inspection program in April 2001, October 2001 and April 2002.

Record Drawing and other Certification Transmittals from AES

October 17 2001	Halfway House
November 6 2001	Two Rivers Point Timber Crib Wall
December 28 2001	Cypress Isle
February 11 2002	Whittaker Lake, Two Rivers CC, Travis Pond, Fowlers Lake
February 14 2002	Bennetts Pond, Kitchums Pond
February 22 2002	Founders Hill
February 29 2002	Golf Course Fairway # 9, Wingfield Timber Crib
March 18 2002	Barretts Pointe, River Oaks North
May 2 2002	Geotech Fowlers and Wingfield; Phase 1 Timber Walls # 1, # 2, # 3 and # 4, Wingfield Lake, Hornes Lake, Marina BMP, Harbor BMP, Wythe Hamlet, Nathaniels Green
September 17 2002	Full copy of postconstruction geotech report (ECS, #6221, 12/31/00) for Fowlers, Hornes, T-box Travis, Whittaker, Bennetts, Founders Hill and Wingfield.
February 25 2003	AES Inspection reports for JR016, JR018, JR019, JR025, JR032, JR027, JR028, JR026, JR023, JR022, JR045, JR029, JR020

JR056
5-7-90

AES CONSULTING ENGINEERS
Engineering, Surveying and Planning
5248 Olde Towne Road, Suite 1
Williamsburg, Virginia 23188
Phone: (757) 253-0040
Fax: (757) 220-8994

LETTER OF TRANSMITTAL

DATE: 9-Sep-03	JOB NO. 7173-09
ATTENTION: Scott Thomas	
RE: Governor's Land	

TO : James City County
Environmental Division
101 Mounts Bay Road
Williamsburg, VA 23187

RECEIVED SEP 2003 ENVIRONMENTAL DIVISION

WE ARE SENDING YOU: [X] Attached [ ] Under separate cover via _____ the following items:

[ ] Shop drawings [ ] Prints [ ] Plans [ ] Samples [ ] Specifications

[X] Copy of letter [ ] Change order [x] Other Calculations

COPIES	DATE	NO.	DESCRIPTION
1	8-9-03		Memo responding to e-mail from County – Sanctuary Drive Lot 14
1	8-9-03		Calculations

THESE ARE TRANSMITTED as checked below:

[X] For Approval [ ] Approved as submitted [ ] Resubmit _____ copies for approval

[ ] For your use [ ] Approved as noted [ ] Submit _____ copies for distribution

[ ] As requested [ ] Returned for corrections [ ] Return _____ Corrected prints

[ ] For review and comment [ ] For Signature

[ ] FOR BIDS DUE _____ [ ] PRINTS RETURNED AFTER LOAN TO US

REMARKS:
If you have any questions please contact me. Thank you.

COPIES TO: file SIGNED: Victoria Bains
Victoria Bains

AES CONSULTING ENGINEERS
Engineering, Surveying and Planning
5248 Olde Towne Road, Suite 1
WILLIAMSBURG, VIRGINIA 23188

(757) 253-0040
FAX (757) 220-8994

LETTER OF TRANSMITTAL

TO James City County Environmental

DATE	JOB NO.
September 17, 2000	7173

ATTENTION Scott Thomas

RE: Governor's Land BMP

WE ARE SENDING YOU ☑ Attached ☐ Under separate cover via _____ the following items:

☐ Shop drawings ☐ Prints ☐ Plans ☐ Samples ☐ Specifications

☐ Copy of letter ☐ Change order ☐ _____

COPIES	DATE	NO.	DESCRIPTION
2			Overall Plans of BMP As-Builts
1			Geo-Technical Report.
			Post Construction Geotech Report various facilities

THESE ARE TRANSMITTED as checked below:

☐ For approval ☐ Approved as submitted ☐ Resubmit _____ copies for approval

☑ For your use ☐ Approved as noted ☐ Submit _____ copies for distribution

☑ As requested ☐ Returned for corrections ☐ Return _____ corrected prints

☐ For review and comment ☐ _____

☐ FOR BIDS DUE _____ ☐ PRINTS RETURNED AFTER LOAN TO US

REMARKS I know it has been some time ... but never let it be said that we don't follow through.

COPY TO _____ SIGNED: V. Marc Bass

If enclosures are not as noted, kindly notify us at once.

GEOTECH REPORT ECS PRECEDES THIS DATE

Scott Thomas

From: Scott Thomas
Sent: Wednesday, November 08, 2000 2:13 PM
To: Mike Woolson
Subject: Governors Land BMP's

Mike

Here are my comments for the 3 BMP facilities we looked at in Governors Land on October 25th.

JR 017 Governors Land - Wingfield Lake
Description: Large lake (wet pond) at end of John Vaughan and Wingfield Lake Roads.

1. Certification of the constructed pond fill embankment is requested.
2. Clean and remove trees and woody vegetation on the downslope embankment. Saturated roots mats combined with high wind can cause trees to overtop and accelerate soil erosion and embankment failure.
3. Clean and remove trees and vegetation within 15 feet of the pond riser and clean all weirs and orifices.
4. Clean and remove vegetation and establish riprap outlet protection at the downstream pond barrel outfall.
5. Remove large, dead woody debris from the emergency spillway.
6. Remove previously installed downstream toe silt fence which is deteriorated.

JR 031 Governors Land - Wingfield Drive
Description: Timber crib detention structure in back of 3251 Wingfield Lake Road, Lot 40.

1. An 8 inch diameter tree located between the timber crib wall and riser structure has fallen and caused serious structural damage to the pretreated wood structure. The wall is 45 degree offset from vertical. Inspection by a qualified professional is required to assess the structural and stormwater integrity of the timber crib wall and outlet barrel pipe and overall impact to function of the basin. A report with recommendations for action/repair is required.
2. Clean and remove all debris from along the upstream base of wall and within 15 feet of the riser.
3. Outlet protection is required at the downstream pond barrel outfall.
4. The EC-1 Type A stone (toe protection) required along the downstream edge of wall was not visible and needs installed.

JR 016 Governors Land - Travis Pond
Description: Large wet pond at end of Travis Close Road near Golf Course Hole 9.

1. Certification of the constructed pond fill embankment is requested.
2. Fill and stabilize erosion gullies which have formed on the downstream embankment.
3. Clean and remove construction debris from the downstream embankment toe and at the pond barrel outfall. A considerable amount of 1 to 3 foot size concrete rubble was present and is severely restricting outflow from the pond barrel and may have damaged the pipe.
4. The valve control mechanism was not visible on the concrete riser. The design plans requires a 12 inch PVC dewatering pipe with a 6 inch butterfly valve. It is unclear if the drain and valve were installed since an access hatch or inspection port was not present on the riser cap.

James City County Environmental Division
County Stormwater Management / BMP Inventory & Inspection Program

Internal Rating System

The internal rating system for the *County Stormwater Management/BMP Inventory and Inspection Program* was developed by the Environmental Division. The assigned rating is based on a detailed field observation and assessment of the overall structural, stormwater runoff control and aesthetic condition of the facility as it relates to its designated function in accordance with the approved design plan and specifications.

In general, the rating system is based on a 1 (bad) to 5 (good) scale as follows:

Environmental Division Condition Codes		
Rating	Description	Definition
1	***Serious Condition***	Immediate need for repair or alteration. Routine, Non-Routine or Emergency maintenance activities required. Requires Immediate action.
2	***Degraded Condition***	Needs Improvement. Routine maintenance activities required and Non-Routine maintenance activities imminent.
3	***Adequate Condition***	Adequately maintained facility. Acceptable structural and stormwater management control function. Routine maintenance activities imminent.
4	***Good Condition***	Well-Maintained Facility. No Routine Maintenance activities required. Routine Maintenance activities appear performed on a regular basis.
5	***Excellent Condition***	Newly Constructed or Very-Well Maintained Facility. No type of Routine Maintenance activities are currently required.

Routine Maintenance is generally defined as landscaping, cosmetic and aesthetic maintenance such as tree and shrub care; wetland plant care; seeding and mulching; slope stabilization; grass mowing; pruning; filling and repair of slope gully erosion; animal control due to nuisance rodents; removal of invasive vegetation; minor sediment cleaning and general care taking in accordance with any approved maintenance and operation plans for the facility. Also includes removal of debris and other matter to the best of the Owner's ability where such debris or matter has slightly impeded or threatens to impede proper functioning or free flow of base or storm flow.

Non-Routine or Emergency Activities are generally defined as the repair or replacement of necessary components that have partially or completely failed *and* directly impair the SWM/BMP facility from performing its proper control or treatment function; impose an immediate or potential safety hazard; impede base or storm flows; create flooding or erosion dangers to surrounding or downstream properties; or threaten the public's health, safety or welfare. Generally applies to essential (vital) interior structural and stormwater management components including embankments; risers and outlet barrels; trash racks and anti-vortex devices; emergency spillways; pretreatment forebays; seepage controls; drains; water quality or quantity control devices including orifices and weirs; outlet protection or energy dissipators; bank or shoreline stabilization; major sediment removal (dredging); and any other special operational structures. Applicable components are usually interior to the physical functional boundary and essential to the proper control or treatment function of the SWM/BMP facility.

PROTECTED WITH PRIDE IN JAMES CITY COUNTY

99121_GOVERNORS_LAND_GENERAL_FILE - 176

Surety by Site Name

SUBDIVISION					SILTATION				
SURETY		RELEASED?		EXPIRATION	SURETY		RELEASED?		EXPIRATION	NAME
	$0		☐			$0		☐		GOVERNOR'S LAND - AMENITIES
L/C	$21,500	RA	☐		L/C	$21,500	RA	☐		GOVERNOR'S LAND - BARRETT'S POINTE
	$0		☐		L/C	$11,400	RAR	☑		GOVERNOR'S LAND - BARRETT'S POINTE - FILL SITE
L/C	$15,700	RA	☐		L/C	$15,700	RA	☐		GOVERNOR'S LAND - CLUB VILLAS
	$0		☐		L/C	$5,000	RA*R	☑		GOVERNOR'S LAND - COUNTRY CLUB
L/C	$30,000	RA	☐		L/C	$30,000	RA	☐		GOVERNOR'S LAND - CYPRESS ISLE
	$0		☐		Check	$7,000		☑		GOVERNOR'S LAND - DREDGE HARBOR CHANNEL ENTRACE - STOCKPILE AT GARDEN CENTER
	$0		☐			$0		☐		GOVERNOR'S LAND - EASTERN CONSTRUCTION ROAD
	$0		☐			$0		☐		GOVERNOR'S LAND - ENTRANCE AND CONNECTOR ROADS
L/C	$88,800	RA	☐		L/C	$88,800	RA	☐		GOVERNOR'S LAND - FOWLER'S LAKE - BLOCK B
	$0		☐			$0		☐		GOVERNOR'S LAND - FOWLER'S LAKE DAM MODIFICATIONS
	$0		☐		L/C	$150,000	RA*R	☑		GOVERNOR'S LAND - GARDEN CENTER & RV STORAGE
	$0		☐		L/C	$150,000	RA*R	☑		GOVERNOR'S LAND - GARDEN CENTER AMENDMENT #1
	$0		☐		L/C	$5,000	RAR	☑		GOVERNOR'S LAND - GOLF COURSE
L/C	$5,000		☑		L/C	$5,000		☑		GOVERNOR'S LAND - KITCHUM'S POND - BLOCK C
L/C	$180,000	RA*R	☑		L/C	$73,000	RA*R	☑		GOVERNOR'S LAND - LAND BAY 2 - POD 1 - HORNE'S LAKE
L/C	$180,000	RA*R	☑		L/C	$26,000	RAR	☑		GOVERNOR'S LAND - LAND BAY 2 - POD 2 - HARPER'S MILL
L/C	$180,000	RA*	☐		L/C	$73,000	RA*	☐		GOVERNOR'S LAND - LAND BAY 2 - POD 3 - NATHANIEL'S GREEN (1)*
L/C	$180,000	**RA*	☐			$0		☐		GOVERNOR'S LAND - LAND BAY 2 - POD 3 - NATHANIEL'S GREEN (2)*
L/C	$180,000	RA*	☐		L/C	$73,000	RA*	☐		GOVERNOR'S LAND - LAND BAY 2 - POD 4 - NATHANIEL'S GREEN-BLOCK B
L/C	$180,000	RA*	☐		L/C	$73,000	RA**	☐		GOVERNOR'S LAND - LAND BAY 2 - POD 5 - NATHANIEL'S RUN
L/C	$180,000	RA*R	☑		L/C	$73,000	RA*R	☑		GOVERNOR'S LAND - LAND BAY 3 - POD 1 - FOWLER'S LAKE
L/C	$75,000	RA	☐		L/C	$5,000	RA	☐		GOVERNOR'S LAND - LAND BAY 3 - POD 3 - FOUNDER'S HILL
	$0		☐		L/C	$15,000	RAR	☑		GOVERNOR'S LAND - LAND BAY 4 - POD 3 - FILLING OPERATION
	$0		☐		L/C	$5,000	RA*R	☑		GOVERNOR'S LAND - LAND BAY 4 - POD 4 - FILLING OPERATION
L/C	$76,000	*RA	☐		L/C	$76,000	*RA	☐		GOVERNOR'S LAND - LAND BAY 5 - POD 1 - WINGFIELD LAKE

Surety by Site Name

SUBDIVISION SURETY		RELEASED?	EXPIRATION	SILTATION SURETY		RELEASED?	EXPIRATION	NAME
L/C	$76,000	*RA	☐	L/C	$76,000	*RA	☐	GOVERNOR'S LAND - LAND BAY 5 - POD 2 - HEARTHSTONE,KITCHUM'S & PLANTER'S ROUND
L/C	$18,000	*RA	☑	L/C	$18,000	*RA	☑	GOVERNOR'S LAND - LAND BAY 5 - POD 2 - KITCHUM'S POND, BLOCK B
L/C	$150,000	*RAR	☑	L/C	$150,000	RA*R	☑	GOVERNOR'S LAND - MARINA & MARINA VILLAGE (HARBOR AT TWO RIVERS)
L/C	$1,300,000	RA	☑		$0		☐	GOVERNOR'S LAND - MASTER PLAN
L/C	$1,300,000	RA	☑		$0		☐	GOVERNOR'S LAND - MASTER PLAN (2)
L/C	$1,300,000	RA	☑		$0		☐	GOVERNOR'S LAND - MASTER PLAN (3)
	$0		☐		$0		☐	GOVERNOR'S LAND - NATURE TRAIL & BIKE PATH
	$0		☐		$0		☐	GOVERNOR'S LAND - NATURE TRAIL AND PEDESTRIAN BRIDGE
L/C	$180,000	RA*	☐	L/C	$73,000	RA**	☐	GOVERNOR'S LAND - PHASE 1 - SECTION 1-2-3*
L/C	$122,500	RA*R	☑		$0		☐	GOVERNOR'S LAND - PHASE 1 - SECTION 4 - PARKSIDE*
	$0		☐	L/C	$9,000	R/AR	☑	GOVERNOR'S LAND - RECREATION VEHICLE PARKING LOT
L/C	$65,000	RA*	☐	L/C	$65,000	RA*	☐	GOVERNOR'S LAND - RIVER OAKS NORTH
L/C	$16,000	RA	☐	L/C	$16,000	RA	☐	GOVERNOR'S LAND - RIVER OAKS NORTH - BLOCK B
	$0		☐	L/C	$12,000	RA	☐	GOVERNOR'S LAND - RIVER OAKS ROAD EXTENSION
L/C	$140,000	RA*	☐		$0		☐	GOVERNOR'S LAND - RIVER OAKS SOUTH
L/C	$140,000	RA*	☐	L/C	$140,000	RA*	☐	GOVERNOR'S LAND - RIVER REACH - LAND BAY 5 - POD 4 - BLOCK A & B
L/C	$5,000	RA*	☐	L/C	$5,000	RA*	☐	GOVERNOR'S LAND - RIVER'S REACH - BLOCK C
	$0		☐		$0		☐	GOVERNOR'S LAND - ROADSIDE LANDSCAPE PLAN
L/C	$32,000	RA*	☐	L/C	$32,000	RA*	☐	GOVERNOR'S LAND - TWO RIVERS POINT - BAY 4 - POD 4
	$0		☐		$0		☐	GOVERNOR'S LAND - TWO RIVERS POINT - NATURE TRAIL
	$0		☐		$0		☐	GOVERNOR'S LAND - WATER AND FORCE MAIN EXTENSION
L/C	$5,000	**RA	☐	L/C	$1,300,000		☑	GOVERNOR'S LAND - WESTERN RECREATIONAL FACILITIES (PROFFER AGREE*
L/C	$17,250	RA	☐	L/C	$17,250	RA	☐	GOVERNOR'S LAND - WYTHE HAMLET

Number Listed: 49

SURETY REQUEST FORM

Project Name: Governors Land (Whitaker Travis) Phase I Sections 1-2-3

Requested By: Jim Bennett from before Governors Land Assoc.

Phone Number: 234-5000

Date Requested: 1/31/03

Date Completed & Requester Notified: _____

Action Requested

☐ Subdivision Surety — Calculate ☐ Reduce ☐ Release ☐

Checklist

☐ JCSA $ _____
☐ Streetlights / Street Signs _____
☐ Street Dedication / VDOT _____

Surety Amount Needed $ _____

Comments _____

☒ Erosion Control Surety — Calculate ☐ Reduce ☐ Release ☒

Checklist $73,000 included 10 BMPs: JR019, JR016, JR025, JR026, JR045, JR028, JR027, JR023, JR065, + JR056

☐ BMP Certification / Record Drawings Last bond release, was waiting to resolve issues with BMP JR056. Has been resolved. Therefore, can release 100% BMP cost in this bond. All BMPs in Gov Land now completed.

Surety Amount Needed $ _____

Comments _____

INDICATE YOUR APPROVAL BY INITIALING THE APPROPRIATE BLANK:

INSP. _____ DEC _____ ST SM 1-24-03 PTM _____

SURETY REQUEST FORM

LAND BAY 3 POD 1
FOWLERS LAKE
73-rev

Project Name: Governors LAND – ~~Fowlers LAKE Block B~~

Requested By: Jim Bennett – Governors LAND Assoc.

Phone Number: 234-5000

Date Requested: 1/31/03

Date Completed & Requester Notified: _____

Action Requested

☐ Subdivision Surety — Calculate ☐ Reduce ☐ Release ☐

Checklist

☐ JCSA $_____
☐ Streetlights / Street Signs _____
☐ Street Dedication / VDOT _____

Surety Amount Needed $ _____

Comments _____

☒ Erosion Control Surety — Calculate ☐ Reduce ☐ Release ☒

Checklist One BMP JR018 (S-110-98)

$88,800 ☐ BMP Certification / Record Drawings All record drawings, const cert + field-related BMP items have been addressed. OK to release!

Surety Amount Needed $ _____

Comments I believe this bond has already been released, but this officially closes out this section

INDICATE YOUR APPROVAL BY INITIALING THE APPROPRIATE BLANK:

INSP. _____ DEC _____ ST SAT 6-27-03 PTM _____

SURETY REQUEST FORM

Project Name: Governors Land – Land Bay 2 Pod 1 Hornes Lake

Requested By: Jim Bennett – Governors Land Associates

Phone Number: 234-5000

Date Requested: 1/31/03

Date Completed & Requester Notified: _____

Action Requested

☐ Subdivision Surety — Calculate ☐ Reduce ☐ Release ☐

Checklist

☐ JCSA $ _____
☐ Streetlights / Street Signs _____
☐ Street Dedication / VDOT _____

Surety Amount Needed $ _____

Comments _____

☒ Erosion Control Surety — Calculate ☐ Reduce ☐ Release ☒

Checklist One Lake JR022 Hornes Lake (SP-145-89)

$73,000

☐ BMP Certification / Record Drawings All record drawing, construction certification + field-related BMP items have been addressed. OK to release 100% of BMP cost

Surety Amount Needed $ _____

Comments _____

INDICATE YOUR APPROVAL BY INITIALING THE APPROPRIATE BLANK:

INSP. _____ DEC _____ ST [illegible] 6-26-03 PTM _____

SURETY REQUEST FORM

Project Name: Governors Land – Land Bay 2 Pod 3 Nathaniels Green

Requested By: Jim Bennett – Governors Land Assoc.

Phone Number: 234-5000

Date Requested: 1/31/03

Date Completed & Requester Notified: _____

Action Requested

☐ Subdivision Surety — Calculate ☐ Reduce ☐ Release ☐

Checklist

☐ JCSA $ _____
☐ Streetlights / Street Signs _____
☐ Street Dedication / VDOT _____

Surety Amount Needed $ _____

Comments _____

☑ Erosion Control Surety — Calculate ☐ Reduce ☐ Release ☑

Checklist ONE BMP Milnhouse Road Timber Wall JR029 (5-6-92)

$13,000

☐ BMP Certification / Record Drawings All record drawing, construction certification & field-related items for BMP have been addressed. OK to release 100% of BMP bond amount.

Surety Amount Needed $ _____

Comments _____

INDICATE YOUR APPROVAL BY INITIALING THE APPROPRIATE BLANK:

INSP. _____ DEC _____ ST SAT 6-26-03 PTM

SURETY REQUEST FORM

Project Name: GovernorsLand - LAND BAY 3 POD 3 FOUNDER'S HILL

Requested By: Jim Bennett - Governors Land Associates

Phone Number: 234-5000

Date Requested: 1/31/03

Date Completed & Requester Notified: _____

Action Requested

☐ Subdivision Surety — Calculate ☐ Reduce ☐ Release ☐

Checklist

☐ JCSA $ _____
☐ Streetlights / Street Signs _____
☐ Street Dedication / VDOT _____

Surety Amount Needed $ _____

Comments _____

☒ Erosion Control Surety — Calculate ☐ Reduce ☐ Release ☐

Checklist One Timber Crib Wall BMP JR030 (5-29-95)

☐ BMP Certification / Record Drawings All record drawing, construction certification and field-related items for BMP are addressed. OK to release 100% of BMP Cost.

Surety Amount Needed $ _____

Comments _____

INDICATE YOUR APPROVAL BY INITIALING THE APPROPRIATE BLANK:

INSP. _____ DEC _____ ST SH 6-26-03 PTM _____

SURETY REQUEST FORM

Project Name: GovernorsLAND – (HARBOR AT TWO RIVERS) MARINA + MARINA VILLAGE

Requested By: Jim Bennett – Governors Land Assoc.

Phone Number: 234-5000

Date Requested: 1/31/03

Date Completed & Requester Notified: _____

Action Requested

☐ Subdivision Surety — Calculate ☐ Reduce ☐ Release ☐

Checklist

☐ JCSA $ _____
☐ Streetlights / Street Signs _____
☐ Street Dedication / VDOT _____

Surety Amount Needed $ _____

Comments _____

☑ Erosion Control Surety — Calculate ☐ Reduce ☐ Release ☑

Checklist Two BMPS JR032 & JR033 (S-127-93)

☑ BMP Certification / Record Drawings All record drawing, const cert + field-related BMP items addressed. OK to release 100% BMP cost. (See Below)

Surety Amount Needed $ _____

Comments THIS BOND MAY HAVE BEEN Released Already BUT STILL PROCEEDED WITH BMP CERTIFICATIONS.

INDICATE YOUR APPROVAL BY INITIALING THE APPROPRIATE BLANK:

INSP DEC ST SAT 6-26-03 PTM

SURETY REQUEST FORM

BAY 4 POD 4

Project Name: Governors LAND- Two Rivers Point

Requested By: Jim Bennett - Governors Land Assoc.

Phone Number: 234-5000

Date Requested: 1/31/03

Date Completed & Requester Notified: _____

Action Requested

☐ Subdivision Surety — Calculate ☐ Reduce ☐ Release ☐

Checklist

☐ JCSA $ _____
☐ Streetlights / Street Signs _____
☐ Street Dedication / VDOT _____

Surety Amount Needed $ _____

Comments _____

☒ Erosion Control Surety — Calculate ☐ Reduce ☐ Release ☒

$32,000 **Checklist** One onsite BMP JR036 (5-52-95) Timber Wall.

☐ BMP Certification / Record Drawings All record drawing construction certification and field-related items have been addressed. OK to release 100% of BMP Cost.

Surety Amount Needed $ _____

Comments _____

INDICATE YOUR APPROVAL BY INITIALING THE APPROPRIATE BLANK:

INSP _____ DEC _____ ST SJT 6-26-03 PTM _____

SURETY REQUEST FORM

Project Name: Governors LAND - Club Villas

Requested By: Jim Bennett - Governor LAND Assoc.

Phone Number: 234-5000

Date Requested: 1/31/03

Date Completed & Requester Notified: _____

Action Requested

☐ Subdivision Surety — Calculate ☐ Reduce ☐ Release ☐

Checklist

☐ JCSA $ _____
☐ Streetlights / Street Signs _____
☐ Street Dedication / VDOT _____

Surety Amount Needed $ _____

Comments _____

☒ Erosion Control Surety — Calculate ☐ Reduce ☐ Release ☒

$15,700 **Checklist** JR035 (5-96-98) Timber Crib Wall

☒ BMP Certification / Record Drawings This project had no onsite BMP; however, was waiting for resolution to Record Drawing + field related issues for the timber crib wall for the Country Club portion of the project. This bond was released. Therefore, OK to release bond for this section as all issues have been addressed.

Surety Amount Needed $ _____

Comments _____

INDICATE YOUR APPROVAL BY INITIALING THE APPROPRIATE BLANK:

INSP ____ DEC ____ ST SJT 0-26-03 PTM ____

SURETY REQUEST FORM

Project Name: Governors Land - River Oaks North

Requested By: Jim Bennett - Governors Land Assoc.

Phone Number: 234-5000

Date Requested: ~~[illegible]~~ 1/31/03

Date Completed & Requester Notified: _____

Action Requested

☐ Subdivision Surety — Calculate ☐ Reduce ☐ Release ☐

Checklist

☐ JCSA $ _____
☐ Streetlights / Street Signs _____
☐ Street Dedication / VDOT _____

Surety Amount Needed $ _____

Comments _____

☒ Erosion Control Surety — Calculate ☐ Reduce ☐ Release ☒

Checklist One Onsite BMP JR 034 (5-12-96)

☐ BMP Certification / Record Drawings All record drawing, construction certification, and field-related items for the BMP have been addressed. OK to release 100% of BMP Cost.

Surety Amount Needed $ _____

Comments _____

INDICATE YOUR APPROVAL BY INITIALING THE APPROPRIATE BLANK:

INSP. _____ DEC _____ ST SAT 6-26-03 PTM _____

SURETY REQUEST FORM

Project Name: Governors Land – Cypress Isle

Requested By: James Bennett – Governors Land Associates

Phone Number: 234-5000

Date Requested: 1/31/03

Date Completed & Requester Notified: _____

Action Requested

☐ Subdivision Surety — Calculate ☐ Reduce ☐ Release ☐

Checklist

☐ JCSA $ _____
☐ Streetlights / Street Signs _____
☐ Street Dedication / VDOT _____

Surety Amount Needed $ _____

Comments _____

☑ Erosion Control Surety — Calculate ☐ Reduce ☐ Release ☑

Checklist Onsite BMP JR041 (S-79-98)

☐ BMP Certification / Record Drawings All record drawing, construction certification + field related items have been addressed for the BMP. OK to release 100% of BMP Cost.

Surety Amount Needed $ _____

Comments _____

INDICATE YOUR APPROVAL BY INITIALING THE APPROPRIATE BLANK:

ANSP ISLE - 188 DEC ____ ST SJ 6-26-03 PTM ____

SURETY REQUEST FORM

Project Name: Governors Land - Land Bay 5 Pod 2 Hearthstone, Kitchum's + Planters Round

Requested By: Jim Bennett - Governors Land Assoc.

Phone Number: 234-5000

Date Requested: 1/31/03

Date Completed & Requester Notified: _____

Action Requested

☐ Subdivision Surety — Calculate ☐ Reduce ☐ Release ☐

Checklist

☐ JCSA $ _____
☐ Streetlights / Street Signs _____
☐ Street Dedication / VDOT _____

Surety Amount Needed $ _____

Comments _____

☒ Erosion Control Surety — Calculate ☐ Reduce ☐ Release ☒

$16,000

Checklist Two BMPs this section JR020 Kitchums Pond + JR021 Bennetts Pond (S-14-93)

☐ BMP Certification / Record Drawings All record drawing, construction certification & field-related items for the BMPs have been addressed. OK to release 100% of BMP Costs.

Surety Amount Needed $ _____

Comments _____

INDICATE YOUR APPROVAL BY INITIALING THE APPROPRIATE BLANK:

99121_GOVERNORS_LAND_GENERAL_SAMPLE - 189 ENSP ____ DEC ____ ST SJ 6-26-03 PTM ____

SURETY REQUEST FORM

Project Name: Governors Land – Land Bay 5, Pod 1 Wingfield Lake

Requested By: Jim Bennett Governors Land Assoc.

Phone Number: 234-5000

Date Requested: 1/31/03

Date Completed & Requester Notified: _____

Action Requested

☐ Subdivision Surety — Calculate ☐ Reduce ☐ Release ☐

Checklist

☐ JCSA $ _____
☐ Streetlights / Street Signs _____
☐ Street Dedication / VDOT _____

Surety Amount Needed $ _____

Comments _____

☒ Erosion Control Surety — Calculate ☐ Reduce ☐ Release ☒

Checklist Two BMPs this section. JR017 (S-144-89); JR031 (S-21-93)

☐ BMP Certification / Record Drawings All record drawing, construction cert and field related items for BMPs in this section are addressed. OK to release 100% of BMP costs

Surety Amount Needed $ _____

Comments _____

INDICATE YOUR APPROVAL BY INITIALING THE APPROPRIATE BLANK:

INSP. ____ DEC ____ ST SJT 6-26-03 PTM ____

SURETY REQUEST FORM

Project Name: Governor's Land - Wythe Hamlet

Requested By: Jim Bennett - Governors Land Associates

Phone Number: 234-5000

Date Requested: 1/31/03

Date Completed & Requester Notified: _____

Action Requested

☐ Subdivision Surety — Calculate ☐ Reduce ☐ Release ☐

Checklist

☐ JCSA $ _____
☐ Streetlights / Street Signs _____
☐ Street Dedication / VDOT _____

Surety Amount Needed $ _____

Comments _____

☒ Erosion Control Surety — Calculate ☐ Reduce ☐ Release ☒

Checklist

☐ BMP Certification / Record Drawings All record drawing, const cert, and field related items for the BMP have been addressed. OK to release 100% of BMP Cost. BMP is OK.

Surety Amount Needed $ _____

Comments _____

INDICATE YOUR APPROVAL BY INITIALING THE APPROPRIATE BLANK:

INSP. _____ DEC ST 6-18-03 PTM

SURETY REQUEST FORM

Project Name: Governors Land - Fowler's Lake Block B

Requested By: Jim Bennett - Governors Land Foundation

Phone Number: 234-5000

Date Requested: 1/31/03

Date Completed & Requester Notified: _____

Action Requested

☐ Subdivision Surety — Calculate ☐ Reduce ☐ Release ☐

Checklist

☐ JCSA $ _____
☐ Streetlights / Street Signs _____
☐ Street Dedication / VDOT _____

Surety Amount Needed $ _____

Comments _____

☒ Erosion Control Surety — Calculate ☐ Reduce ☐ Release ☒

Checklist S-110-98; JR054

☐ BMP Certification / Record Drawings All Record drawing, Const Cert. + Field Related items for BMP are addressed. Release 100% BMP Cost. BMP is ok.

Surety Amount Needed $ _____

Comments _____

INDICATE YOUR APPROVAL BY INITIALING THE APPROPRIATE BLANK:

INSP. _____ DEC _____ ST SJT 6-18-03 PTM _____

SURETY REQUEST FORM

Project Name: Governors Land - Barrett's Pointe

Requested By: Jim Bennett - Governors Land Associates

Phone Number: 234-5000

Date Requested: 1/31/03

Date Completed & Requester Notified: _____

Action Requested

☐ Subdivision Surety — Calculate ☐ Reduce ☐ Release ☐

Checklist

☐ JCSA $ _____
☐ Streetlights / Street Signs _____
☐ Street Dedication / VDOT _____

Surety Amount Needed $ _____

Comments _____

☒ Erosion Control Surety — Calculate ☐ Reduce ☐ Release ☒

Checklist S-42-98; JR042

☐ BMP Certification / Record Drawings Record drawing, Const Cert + field-related BMP items addressed. Release 100% of BMP Cost. BMP is OK.

Surety Amount Needed $ _____

Comments _____

INDICATE YOUR APPROVAL BY INITIALING THE APPROPRIATE BLANK:

INSP. _____ DEC _____ ST ✓ 6-18-03 PTM _____

Surety by Site Name

SUBDIVISION SURETY		RELEASED?	EXPIRATION	SILTATION SURETY		RELEASED?	EXPIRATION	NAME
	$0	☐			$0	☐		GOVERNOR'S LAND - AMENITIES
L/C	$21,500	RA ☐	Letter Issued (7)	L/C	$21,500	RA ☐	JR042 ✓	GOVERNOR'S LAND - BARRETT'S POINTE S-42-98
	$0	☐		L/C	$11,400	RAR ☑		GOVERNOR'S LAND - BARRETT'S POINTE - FILL SITE
L/C	$15,700	RA ☐	Letter Issued ✓ (7)	L/C	$15,700	RA ☐	JR035 ✓	GOVERNOR'S LAND - CLUB VILLAS S-96-98 BMP SP-49-93
							BMP # IS NOT IN THIS SECTION; HOLD BOND TILL BMP SOK.	
	$0	☐		L/C	$5,000	RA*R ☑	JR035	GOVERNOR'S LAND - COUNTRY CLUB
L/C	$30,000	RA ☐	Letter Issued ✓ (8)	L/C	$30,000	RA ☐	JR041 ✓	GOVERNOR'S LAND - CYPRESS ISLE
	$0	☐		Check	$7,000	☑		GOVERNOR'S LAND - DREDGE HARBOR CHANNEL ENTRACE - STOCKPILE AT GARDEN CENTER
	$0	☐			$0	☐		GOVERNOR'S LAND - EASTERN CONSTRUCTION ROAD
	$0	☐			$0	☐		GOVERNOR'S LAND - ENTRANCE AND CONNECTOR ROADS
L/C	$88,800	RA ☐	Letter Issued ✓ (2)	L/C	$88,800	RA ☐	JR054 ✓ S-110-98	GOVERNOR'S LAND - FOWLER'S LAKE - BLOCK B
	$0	☐			$0	☐		GOVERNOR'S LAND - FOWLER'S LAKE DAM MODIFICATIONS
	$0	☐		L/C	$150,000	RA*R ☑		GOVERNOR'S LAND - GARDEN CENTER & RV STORAGE
	$0	☐		L/C	$150,000	RA*R ☑		GOVERNOR'S LAND - GARDEN CENTER AMENDMENT #1
	$0	☐		L/C	$5,000	RAR ☑		GOVERNOR'S LAND - GOLF COURSE
L/C	$5,000	☑		L/C	$5,000	☑		GOVERNOR'S LAND - KITCHUM'S POND - BLOCK C
L/C	$180,000	RA*R ☑	(5)	L/C	$73,000	RA*R ☑	JR022 ✓	GOVERNOR'S LAND - LAND BAY 2 - POD 1 - HORNE'S LAKE
L/C	$180,000	RA*R ☑		L/C	$26,000	RAR ☑		GOVERNOR'S LAND - LAND BAY 2 - POD 2 - HARPER'S MILL
L/C	$180,000	RA* ☐	(5)	L/C	$73,000	RA* ☐	JR029 ✓	GOVERNOR'S LAND - LAND BAY 2 - POD 3 - NATHANIEL'S GREEN (1)*
L/C	$180,000	**RA* ☐			$0	☐		GOVERNOR'S LAND - LAND BAY 2 - POD 3 - NATHANIEL'S GREEN (2)*
L/C	$180,000	RA* ☐	(5)	L/C	$73,000	RA* ☐		GOVERNOR'S LAND - LAND BAY 2 - POD 4 - NATHANIEL'S GREEN-BLOCK B
L/C	$180,000	RA* ☐	(5)	L/C	$73,000	RA** ☐		GOVERNOR'S LAND - LAND BAY 2 - POD 5 - NATHANIEL'S RUN
L/C	$180,000	RA*R ☑	Letter Issued (5)	L/C	$73,000	RA*R ☑	RECEIVED ✓ JR018	GOVERNOR'S LAND - LAND BAY 3 - POD 1 - FOWLER'S LAKE
L/C	$75,000	RA ☐		L/C	$5,000	RA ☐	JR030	GOVERNOR'S LAND - LAND BAY 3 - POD 3 - FOUNDER'S HILL
	$0	☐		L/C	$15,000	RAR ☑		GOVERNOR'S LAND - LAND BAY 4 - POD 3 - FILLING OPERATION
	$0	☐		L/C	$5,000	RA*R ☑		GOVERNOR'S LAND - LAND BAY 4 - POD 4 - FILLING OPERATION
L/C	$76,000	*RA ☐	Letter Issued ✓ (3)	L/C	$76,000	*RA ☐	JR017, JR031 ✓	GOVERNOR'S LAND - LAND BAY 5 - POD 1 - WINGFIELD LAKE S-144-89 + S-21-93

Surety by Site Name

SUBDIVISION SURETY		RELEASED?	EXPIRATION	SILTATION SURETY		RELEASED?	EXPIRATION	NAME
L/C	$76,000	*RA	☐ Letters issued (4)	L/C	$76,000	*RA	☐ JR020, JR021	GOVERNOR'S LAND - LAND BAY 5 - POD 2 - HEARTHSTONE,KITCHUM'S & PLANTER'S ROUND
L/C	$18,000	*RA	☑	L/C	$18,000	*RA	☑	GOVERNOR'S LAND - LAND BAY 5 - POD 2 - KITCHUM'S POND, BLOCK B
L/C	$150,000	*RAR	☑ Letters issued	L/C	$150,000	RA*R	☑ JR033, JR032	GOVERNOR'S LAND - MARINA & MARINA VILLAGE (HARBOR AT TWO RIVERS) S-127-93
L/C	$1,300,000	RA	☑		$0		☐	GOVERNOR'S LAND - MASTER PLAN
L/C	$1,300,000	RA	☑		$0		☐	GOVERNOR'S LAND - MASTER PLAN (2)
L/C	$1,300,000	RA	☑		$0		☐	GOVERNOR'S LAND - MASTER PLAN (3)
	$0		☐		$0		☐	GOVERNOR'S LAND - NATURE TRAIL & BIKE PATH
	$0		☐		$0		☐	GOVERNOR'S LAND - NATURE TRAIL AND PEDESTRIAN BRIDGE
L/C	$180,000	RA*	☐ Letters issued (5)	L/C	$73,000	RA**	☐ JR019, JR016, JR025, JR026	GOVERNOR'S LAND - PHASE 1 - SECTION 1-2-3* * WHITAKER AB, TRAVIS
L/C	$122,500	RA*R	☑		$0		☐ JR045, JR028, JR027	GOVERNOR'S LAND - PHASE 1 - SECTION 4 - PARKSIDE* & MISSING BMP
	$0		☐	L/C	$9,000	R/AR	☑ JR023, JR056, JR055	GOVERNOR'S LAND - RECREATION VEHICLE PARKING LOT
L/C	$65,000	RA*	☐ Letter forwarded (6)	L/C	$65,000	RA*	☐ JR034	GOVERNOR'S LAND - RIVER OAKS NORTH
L/C	$16,000	RA	☐	L/C	$16,000	RA	☐	GOVERNOR'S LAND - RIVER OAKS NORTH - BLOCK B
	$0		☐	L/C	$12,000	RA	☐	GOVERNOR'S LAND - RIVER OAKS ROAD EXTENSION
L/C	$140,000	RA*	☐		$0		☐	GOVERNOR'S LAND - RIVER OAKS SOUTH
L/C	$140,000	RA*	☐ NO ONSITE BMP. OK TO RELEASE (1)	L/C	$140,000	RA*	☐ S-28-96	GOVERNOR'S LAND - RIVER REACH - LAND BAY 5 - POD 4 - BLOCK A & B S-28-96
L/C	$5,000	RA*	☐	L/C	$5,000	RA*	☐	GOVERNOR'S LAND - RIVER'S REACH - BLOCK C
	$0		☐		$0		☐	GOVERNOR'S LAND - ROADSIDE LANDSCAPE PLAN
L/C	$32,000	RA*	☐ Letter issued (10)	L/C	$32,000	RA*	☐ JR036	GOVERNOR'S LAND - TWO RIVERS POINT - BAY 4 - POD 4
	$0		☐		$0		☐	GOVERNOR'S LAND - TWO RIVERS POINT - NATURE TRAIL
	$0		☐		$0		☐	GOVERNOR'S LAND - WATER AND FORCE MAIN EXTENSION
L/C	$5,000	**RA	☐	L/C	$1,300,000		☑	GOVERNOR'S LAND - WESTERN RECREATIONAL FACILITIES (PROFFER AGREE*
L/C	$17,250	RA	☐ Letter issued (11)	L/C	$17,250	RA	☐ JR040	GOVERNOR'S LAND - WYTHE HAMLET S-32-98

2ND REV.

Number Listed: 49

* JR037, JR036, JR027, JR028, JR045, JR025, JR016, JR019, ~~JR022~~, JR055

MISSING BMP JR056

AES CONSULTING ENGINEERS
Engineering, Surveying and Planning
5248 Olde Towne Road, Suite 1
Williamsburg, Virginia 23188
Phone: (757) 253-0040
Fax: (757) 220-8994

LETTER OF TRANSMITTAL

DATE: 11-Jul-03	JOB NO. 7173-09
ATTENTION: Scott Thomas	
RE: Governor's Land	

TO : James City County
Environmental Division
101 Mounts Bay Road
Williamsburg, VA 23187

RECEIVED JUL 2003 ENVIRONMENTAL DIVISION

WE ARE SENDING YOU: [X] Attached [ ] Under separate cover via _____ the following items:

[ ] Shop drawings [ ] Prints [ ] Plans [ ] Samples [ ] Specifications

[X] Copy of letter [ ] Change order [ ] Other _____

COPIES	DATE	NO.	DESCRIPTION
1	7-11-03		Memo responding to e-mail from County – Whittaker Lake JR019
1	7-11-03		Calculations JR019

THESE ARE TRANSMITTED as checked below:

[X] For Approval [ ] Approved as submitted [ ] Resubmit _____ copies for approval

[ ] For your use [ ] Approved as noted [ ] Submit _____ copies for distribution

[ ] As requested [ ] Returned for corrections [ ] Return _____ Corrected prints

[ ] For review and comment [ ] For Signature

[ ] FOR BIDS DUE _____ [ ] PRINTS RETURNED AFTER LOAN TO US

REMARKS:
If you have any questions please contact me. Thank you.

COPIES TO: file SIGNED: Victoria Bains
Victoria Bains

AES CONSULTING ENGINEERS
Engineering, Surveying and Planning
5248 Olde Towne Road, Suite 1
Williamsburg, Virginia 23188
Phone: (757) 253-0040
Fax: (757) 220-8994

LETTER OF TRANSMITTAL

DATE: 26-Jun-03	JOB NO. 7173-09
ATTENTION: Scott Thomas	
RE: Governor's Land	

TO : James City County
Environmental Division
101 Mounts Bay Road
Williamsburg, VA 23187

WE ARE SENDING YOU: [X] Attached [ ] Under separate cover via _____ the following items:

[ ] Shop drawings [X] Prints [X] Plans [ ] Samples [ ] Specifications

[X] Copy of letter [ ] Change order [X] Other Construction Certification

COPIES	DATE	NO.	DESCRIPTION
1	6-26-03		As-Built drawing (Mylar) – Whittaker Lake
1	6-26-03		As-Built drawing (Black line) – Whittaker Lake
1	6-26-03		Memo responding to letter from County – Whittaker Lake
1	6-26-03		As-Built drawing (Mylar) – Travis Pond JR 0/b
1	6-26-03		As-Built drawing (Black line) – Travis Pond JR 0/b
1	6-26-03		Memo responding to letter from County – Travis Pond JR 0/b

THESE ARE TRANSMITTED as checked below:

[X] For Approval [ ] Approved as submitted [ ] Resubmit _____ copies for approval

[ ] For your use [ ] Approved as noted [ ] Submit _____ copies for distribution

[ ] As requested [ ] Returned for corrections [ ] Return _____ Corrected prints

[ ] For review and comment [ ] For Signature

[ ] FOR BIDS DUE _____ [ ] PRINTS RETURNED AFTER LOAN TO US

REMARKS:
If you have any questions please contact me. Thank you.

COPIES TO: file

SIGNED: Victoria Bains
Victoria Bains

S:\JOBS\7173\09\Wordproc\Document\JCC Transmittal8.doc

Rev. 6/26/03

AES CONSULTING ENGINEERS
Engineering, Surveying and Planning
5248 Olde Towne Road, Suite 1
Williamsburg, Virginia 23188
Phone: (757) 253-0040
Fax: (757) 220-8994

LETTER OF TRANSMITTAL

DATE: 26-Jun-03	JOB NO. 7173-09
ATTENTION: Scott Thomas	
RE: Governor's Land	

TO : James City County
Environmental Division
101 Mounts Bay Road
Williamsburg, VA 23187

WE ARE SENDING YOU: [X] Attached [ ] Under separate cover via _____ the following items:

[ ] Shop drawings [X] Prints [X] Plans [ ] Samples [ ] Specifications

[X] Copy of letter [ ] Change order [X] Other Construction Certification

COPIES	DATE	NO.	DESCRIPTION
1	6-26-03		As-Built drawing (Mylar) – Whittaker Lake
1	6-26-03		As-Built drawing (Black line) – Whittaker Lake
1	6-26-03		Memo responding to letter from County – Whittaker Lake
1	6-26-03		As-Built drawing (Mylar) – Travis Pond JR 016
1	6-26-03		As-Built drawing (Black line) – Travis Pond JR 016
1	6-26-03		Memo responding to letter from County – Travis Pond JR 016

THESE ARE TRANSMITTED as checked below:

[X] For Approval [ ] Approved as submitted [ ] Resubmit _____ copies for approval

[ ] For your use [ ] Approved as noted [ ] Submit _____ copies for distribution

[ ] As requested [ ] Returned for corrections [ ] Return _____ Corrected prints

[ ] For review and comment [ ] For Signature

[ ] FOR BIDS DUE _____ [ ] PRINTS RETURNED AFTER LOAN TO US

REMARKS:
If you have any questions please contact me. Thank you.

COPIES TO: file

SIGNED: Victoria Bains
Victoria Bains

AES CONSULTING ENGINEERS
Engineering, Surveying and Planning
5248 Olde Towne Road, Suite 1
Williamsburg, Virginia 23188
Phone: (757) 253-0040
Fax: (757) 220-8994

LETTER OF TRANSMITTAL

DATE: 23-Jun-03	JOB NO. 7173-09
ATTENTION: Scott Thomas	
RE: Governor's Land	

TO : James City County
Environmental Division
101 Mounts Bay Road
Williamsburg, VA 23187

JUN 2003
RECEIVED
ENVIRONMENTAL DIVISION

WE ARE SENDING YOU: [X] Attached [ ] Under separate cover via _____ the following items:

[ ] Shop drawings [X] Prints [X] Plans [ ] Samples [ ] Specifications

[X] Copy of letter [ ] Change order [X] Other Construction Certification

COPIES	DATE	NO.	DESCRIPTION
1	6-23-03		As-Built drawing (Mylar) – Nathaniel's Green JR029
1	6-23-03		As-Built drawing (Black line) – Nathaniel's Green JR029
1	6-23-03		Memo responding to letter from County – Nathaniel's Green JR029
1	6-23-03		Memo responding to letter from County – Whittaker Island Block A JR055
1	6-23-03		Memo responding to letter from County – Sanctuary Drive Lot 14 JR056

THESE ARE TRANSMITTED as checked below:

[X] For Approval [ ] Approved as submitted [ ] Resubmit _____ copies for approval

[ ] For your use [ ] Approved as noted [ ] Submit _____ copies for distribution

[ ] As requested [ ] Returned for corrections [ ] Return _____ Corrected prints

[ ] For review and comment [ ] For Signature

[ ] FOR BIDS DUE _____ [ ] PRINTS RETURNED AFTER LOAN TO US

REMARKS:
If you have any questions please contact me. Thank you.

COPIES TO: file

SIGNED: Victoria Bains
Victoria Bains

AES CONSULTING ENGINEERS
Engineering, Surveying and Planning
5248 Olde Towne Road, Suite 1
Williamsburg, Virginia 23188
Phone: (757) 253-0040
Fax: (757) 220-8994

LETTER OF TRANSMITTAL

DATE: 18-Jun-03	JOB NO. 7173-09
ATTENTION: Scott Thomas	
RE: Governor's Land	

JUN 2003
RECEIVED
ENVIRONMENTAL DIVISION

TO : James City County
Environmental Division
101 Mounts Bay Road
Williamsburg, VA 23187

WE ARE SENDING YOU: [X] Attached [ ] Under separate cover via _____ the following items:

[ ] Shop drawings [X] Prints [X] Plans [ ] Samples [ ] Specifications

[X] Copy of letter [ ] Change order [X] Other Construction Certification

COPIES	DATE	NO.	DESCRIPTION
1	6-17-03		As-Built drawing (Mylar) – Fowler's Lake Block "B"
1	6-17-03		As-Built drawing (Black line) – Fowler's Lake Block "B"
1	2-6-03		Inspection Report
1	6-17-03		As-Built drawing (Mylar) – Wythe Hamlet
1	6-17-03		As-Built drawing (Black line) – Wythe Hamlet

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[ ] For review and comment [ ] For Signature

[ ] FOR BIDS DUE _____ [ ] PRINTS RETURNED AFTER LOAN TO US

REMARKS:
If you have any questions please contact me. Thank you.

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Victoria Bains

AES CONSULTING ENGINEERS
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COPIES	DATE	NO.	DESCRIPTION
1	6-17-03		As-Built drawing (Mylar) – Fowler's Lake Block "B"
1	6-17-03		As-Built drawing (Black line) – Fowler's Lake Block "B"
1	2-6-03		Inspection Report

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LETTER OF TRANSMITTAL

DATE: 17-Jun-03	JOB NO. 7173-09
ATTENTION: Scott Thomas	
RE: Governor's Land	

TO : James City County
Environmental Division
101 Mounts Bay Road
Williamsburg, VA 23187

RECEIVED JUN 2003 ENVIRONMENTAL DIVISION

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[X] Copy of letter [ ] Change order [X] Other Construction Certification

COPIES	DATE	NO.	DESCRIPTION
1	6-17-03		As-Built drawing (Mylar) – Two Rivers Country Club JR035
1	6-17-03		As-Built drawing (Black line) – Two Rivers Country Club JR035
1	6-17-03		Memo responding to letter from County – Two Rivers Country Club JR035
1	6-17-03		As-Built drawing (Mylar) – West Island Road BMP #1 JR026
1	6-17-03		As-Built drawing (Black line) – West Island Road BMP #1 JR026
1	6-17-03		Memo responding to letter from County – – West Island Road BMP #1 JR026
1	6-17-03		As-Built drawing (Mylar) – West Island Road BMP #2 JR045
1	6-17-03		As-Built drawing (Black line) – West Island Road BMP #2 JR045
1	6-17-03		Memo responding to letter from County – West Island Road BMP #2 JR045
1	6-17-03		As-Built drawing (Mylar) – Sanctuary Road BMP #3 JR028
1	6-17-03		As-Built drawing (Black line) – Sanctuary Road BMP #3 JR028
1	6-17-03		Memo responding to letter from County – Sanctuary Road BMP #3 JR028
1	6-17-03		As-Built drawing (Mylar) – Whittaker Island BMP #4 JR027
1	6-17-03		As-Built drawing (Black line) – Whittaker Island BMP #4 JR027
1	6-17-03		Memo responding to letter from County – Whittaker Island BMP #4 JR027

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Fax: (757) 220-8994

LETTER OF TRANSMITTAL

DATE: 16-May-03	JOB NO. 7173-09
ATTENTION: Scott Thomas	
RE: Governor's Land	

MAY 2003

TO : James City County
Environmental Division
101 Mounts Bay Road
Williamsburg, VA 23187

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[ ] Shop drawings [X] Prints [X] Plans [ ] Samples [ ] Specifications

[X] Copy of letter [ ] Change order [X] Other Construction Certification

COPIES	DATE	NO.	DESCRIPTION
1	5-15-03		As-Built drawing (Mylar) – Founder's Hill Timber Wall JR030
1	5-15-03		As-Built drawing (Black line) – Founder's Hill Timber Wall JR030
1	5-15-03		Memo responding to letter from County – Founder's Hill Timber Wall JR030
1	5-15-03		As-Built drawing (Mylar) – Fowler's Lake Block "B" Timber Wall JR054
1	5-15-03		As-Built drawing (Black line) – – Fowler's Lake Block "B" Timber Wall JR054
1	5-15-03		Memo responding to letter from County – – Fowler's Lake Block "B" Timber Wall JR054
1	5-15-03		As-Built drawing (Mylar) – The Harbor @ Two Rivers JR033
1	5-15-03		As-Built drawing (Black line) – The Harbor @ Two Rivers JR033
1	5-15-03		Memo responding to letter from County – The Harbor @ Two Rivers JR033
1	5-15-03		As-Built drawing (Mylar) – River Oaks North BMP JR034
1	5-15-03		As-Built drawing (Black line) – River Oaks North BMP JR034
1	5-15-03		Memo responding to letter from County – River Oaks North BMP JR034
1	5-16-03		As-Built drawing (Mylar) – Bennett's Pond JR021
1	5-16-03		As-Built drawing (Black line) – Bennett's Pond JR021
1	5-16-03		Memo responding to letter from County – Bennett's Pond JR021

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5248 Olde Towne Road, Suite 1
Williamsburg, Virginia 23188
Phone: (757) 253-0040
Fax: (757) 220-8994

LETTER OF TRANSMITTAL

DATE: 13-May-03	JOB NO. 7173-09
ATTENTION: Scott Thomas	
RE: Governor's Land	

TO : James City County
Environmental Division
101 Mounts Bay Road
Williamsburg, VA 23187

MAY 2003

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[ ] Shop drawings [X] Prints [X] Plans [ ] Samples [ ] Specifications

[X] Copy of letter [ ] Change order [X] Other Construction Certification

COPIES	DATE	NO.	DESCRIPTION
1	5-13-03		As-Built drawing (Mylar) – Kitchum's Pond JR020
1	5-13-03		As-Built drawing (Black line) - Kitchum's Pond JR020
1	5-13-03		Memo responding to letter from County - Kitchum's Pond JR020

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5248 Olde Towne Road, Suite 1
Williamsburg, Virginia 23188
Phone: (757) 253-0040
Fax: (757) 220-8994

LETTER OF TRANSMITTAL

DATE: 23-Apr-03	JOB NO. 7173-09
ATTENTION: Scott Thomas	
RE : Governor's Land	

TO : James City County
Environmental Division
101 Mounts Bay Road
Williamsburg, VA 23187

RECEIVED APR 2003 ENVIRONMENTAL DIVISION

WE ARE SENDING YOU: [X] Attached [ ] Under separate cover via _____ the following items:

[ ] Shop drawings [X] Prints [X] Plans [ ] Samples [ ] Specifications

[X] Copy of letter [ ] Change order [X] Other Construction Certification

COPIES	DATE	NO.	DESCRIPTION
1	4-23-03		As-Built drawing (Mylar) - Wingfield Lake JR017
1	4-23-03		As-Built drawing (Black line) - Wingfield Lake JR017
1	4-23-03		Memo responding to letter from County - Wingfield Lake JR017
1	4-23-03		As-Built drawing (Mylar) – Cypress Isle JR041
1	4-23-03		As-Built drawing (Black line) - Cypress Isle JR041
1	4-23-03		Memo responding to letter from County - Cypress Isle JR041
1	4-23-03		Routing computations using As-Built information JR041
1	4-23-03		As-Built drawing (Mylar) – Barrett's Point Pond JR042
1	4-23-03		As-Built drawing (Black line) - Barrett's Point Pond JR042
1	4-23-03		Memo responding to letter from County - Barrett's Point Pond JR042
1	4-23-03		As-Built drawing (Mylar) – Wythe-Hamlet Dry Pond JR040
1	4-23-03		As-Built drawing (Black line) - Wythe-Hamlet Dry Pond JR040
1	4-23-03		Memo responding to letter from County - Wythe-Hamlet Dry Pond JR040
1	4-23-03		As-Built drawing (Mylar) – Travis Pond Dry Pond #2 JR025
1	4-23-03		As-Built drawing (Black line) - Travis Pond Dry Pond #2 JR025
1	4-23-03		Memo responding to letter from County - Travis Pond Dry Pond #2
1	4-23-03		As-Built drawing (Mylar) – Two Rivers Point Timber Structure JR036
1	4-23-03		As-Built drawing (Black line) - Two Rivers Point Timber Structure JR036
1	4-23-03		Memo responding to letter from County - Two Rivers Point Timber JR036
1	4-23-03		As-Built drawing (Mylar) - Wingfield Lake Timber Structure JR031
1	4-23-03		As-Built drawing (Black line) - Wingfield Lake Timber Structure JR031
1	4-23-03		Memo responding to letter from County - Wingfield Lake Timber JR031

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5248 Olde Towne Road, Suite 1
Williamsburg, Virginia 23188
Phone: (757) 253-0040
Fax: (757) 220-8994

LETTER OF TRANSMITTAL

DATE: 25-Feb-03	JOB NO. 7173-09
ATTENTION: Scott Thomas	
RE : Governor's Land	

TO : James City County
Environmental Division
101 Mounts Bay Road
Williamsburg, VA 23187

FEB 2003
RECEIVED
ENVIRONMENTAL DIVISION

WE ARE SENDING YOU: [X] Attached [ ] Under separate cover via _____ the following items:

[ ] Shop drawings [ ] Prints [ ] Plans [ ] Samples [ ] Specifications

[ ] Copy of letter [ ] Change order [ ] Other _____

COPIES	DATE	NO.	DESCRIPTION
13	2-25-03		Inspection Reports for BMP's
			JR016, JR018, JR019, JR025, JR032, JR027, JR028,
			~~JR[illegible]~~, JR026, JR023, JR022, JR045, JR029
			JR020

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Engineering, Surveying and Planning
5248 Olde Towne Road, Suite 1
WILLIAMSBURG, VIRGINIA 23188

(757) 253-0040
FAX (757) 220-8994

LETTER OF TRANSMITTAL

DATE	JOB NO.
5/02/02	7173-00

ATTENTION

RE: Governor's Land BMP As-Builts

TO James City Environmental Division

RECEIVED MAY 2002 ENVIRONMENTAL DIVISION

WE ARE SENDING YOU ☒ Attached ☐ Under separate cover via _____ the following items:

☐ Shop drawings ☐ Prints ☐ Plans ☐ Samples ☐ Specifications

☐ Copy of letter ☐ Change order ☐ _____

COPIES	DATE	NO.	DESCRIPTION
1			Excerpt from Geo-Technical Report for Fowler's Lake
1			Excerpt from Geo-Technical Report for Winfield Lake
2			Record Drawings for Timber Structures #1, #2, #3, #4 in Phase 1
2			Record Drawings for Winfield Lake
2			Record Drawings for Hornes Lake
2			Record Drawings for Marina BMP
2			Record Drawings for The Harbor BMP
2			Record Drawings for Wythe Hamlet BMP
2			Record Drawings for Nathaniel's Creek Timber Structure BMP

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☐ As requested ☐ Returned for corrections ☐ Return _____ corrected prints

☐ For review and comment ☐ _____

☐ FOR BIDS DUE _____ ☐ PRINTS RETURNED AFTER LOAN TO US

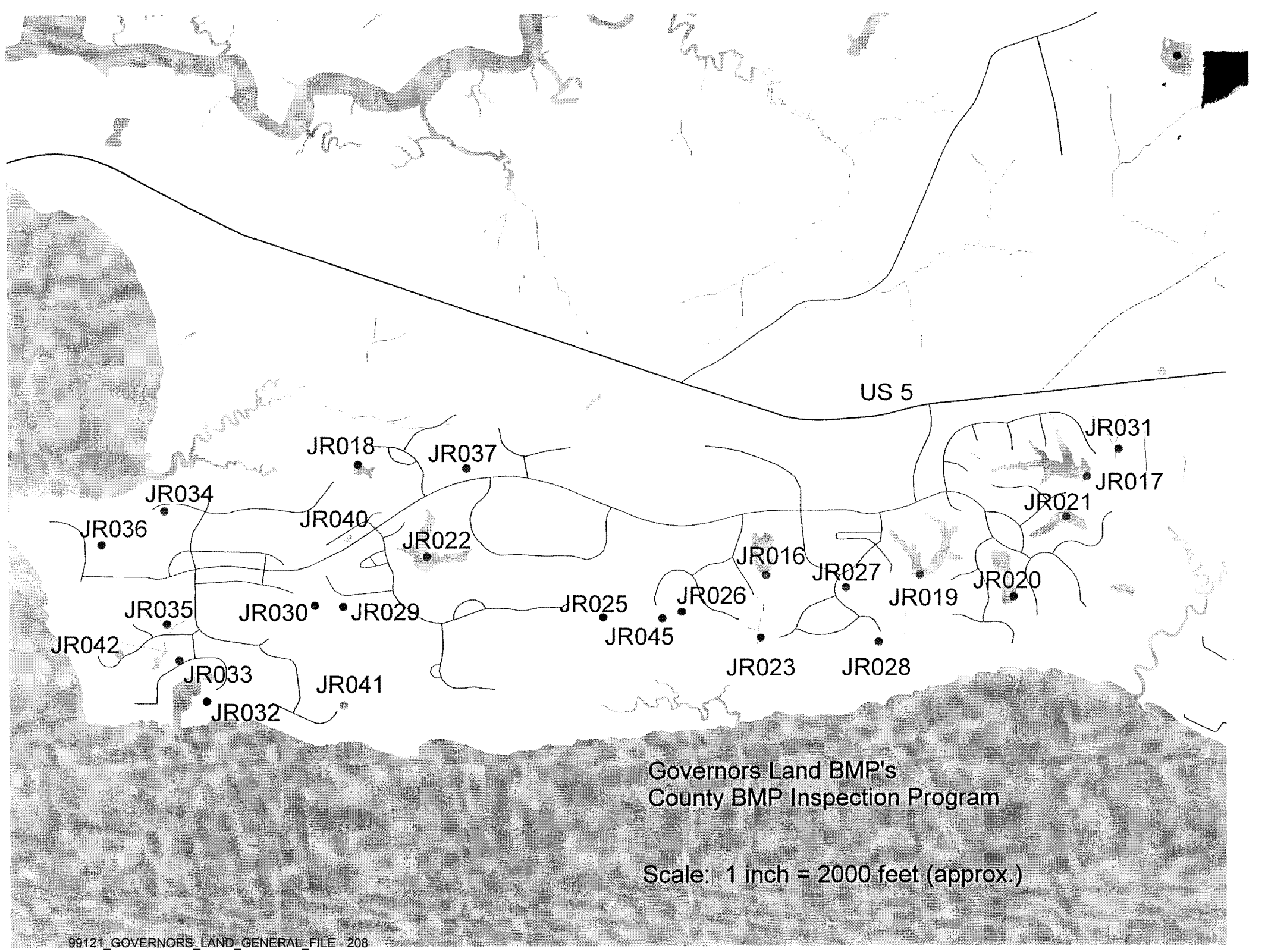
REMARKS

This should be the finish of the BMP Record Drawings in Governor's Land

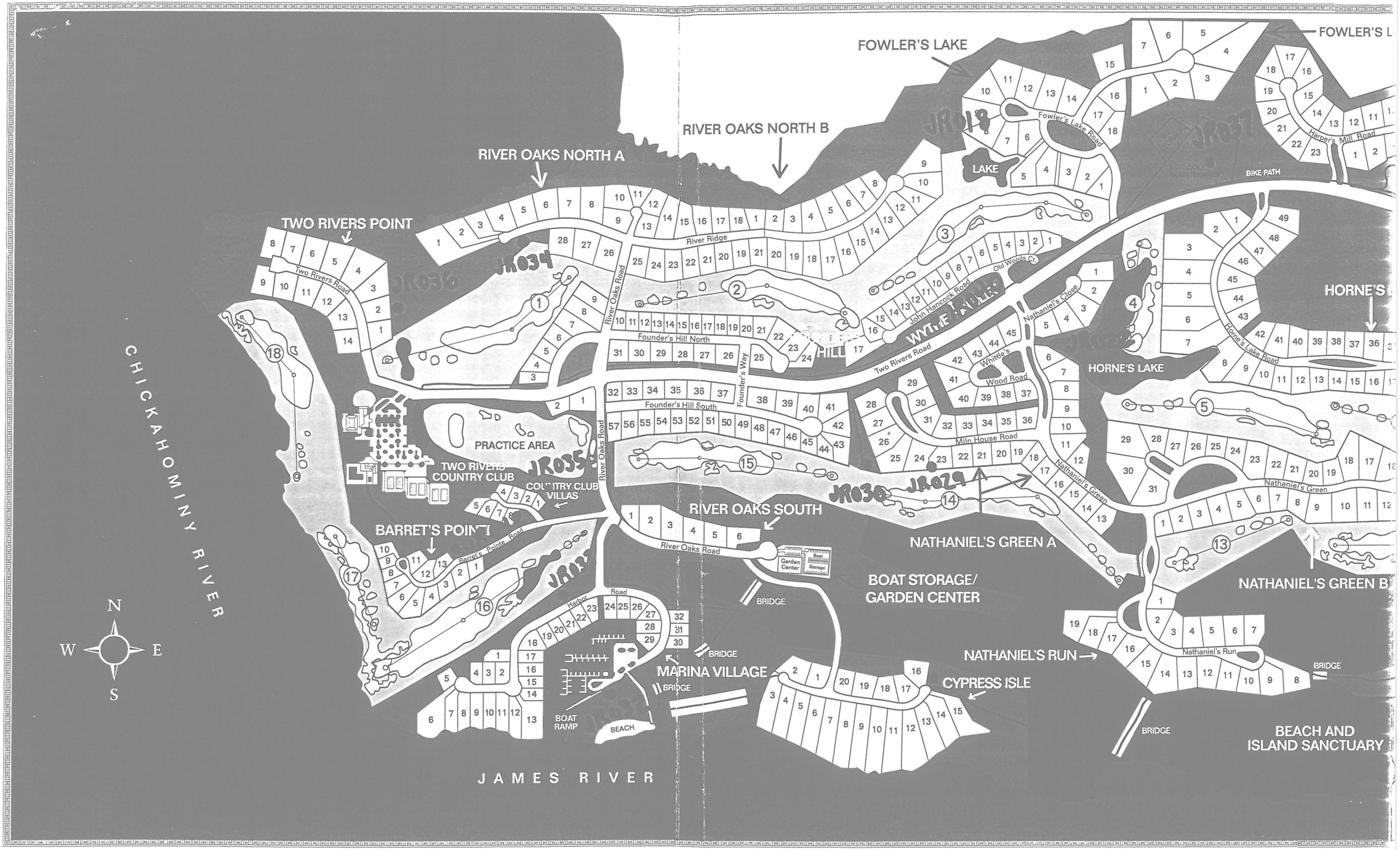
Logged

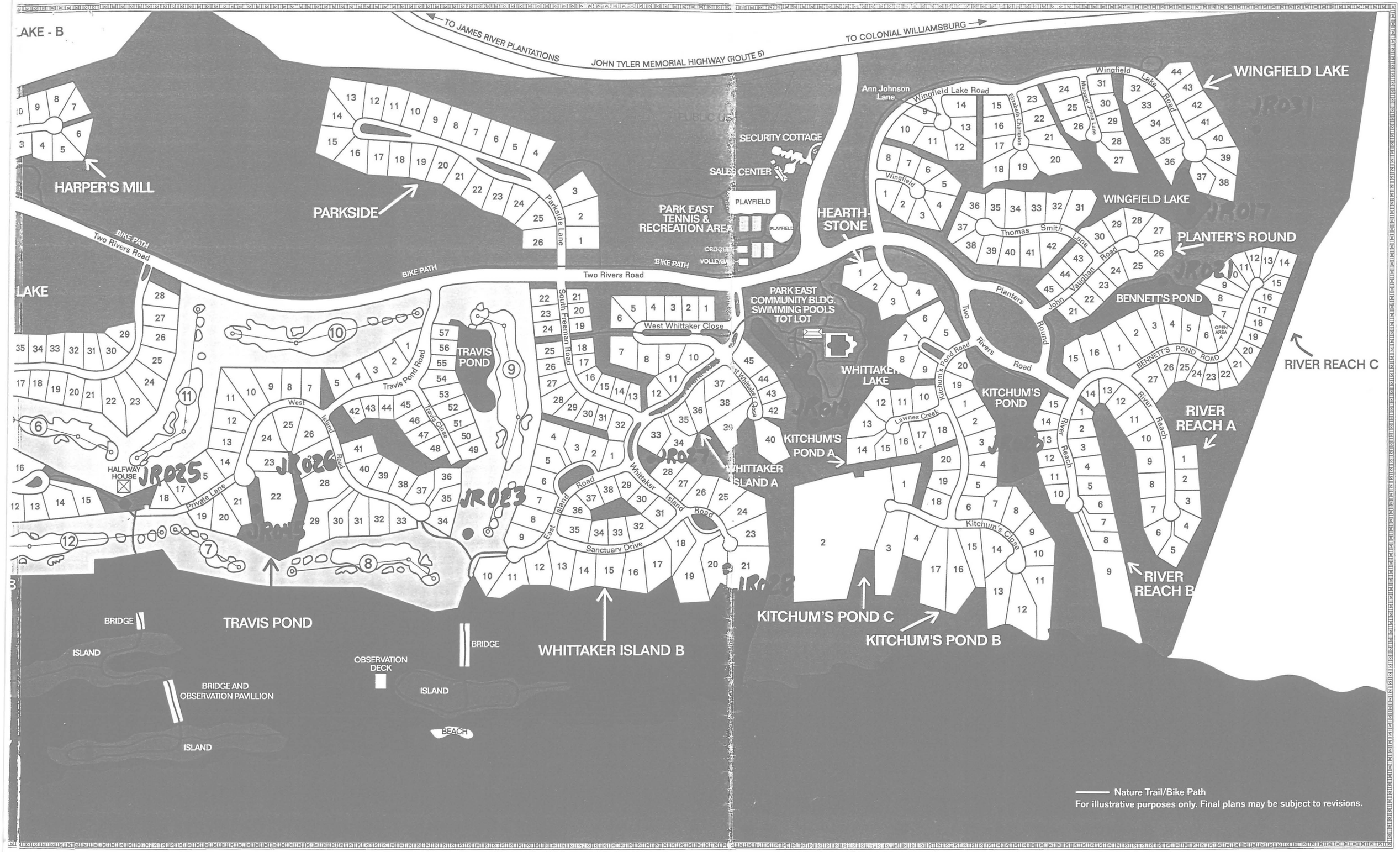
COPY TO _____ SIGNED: _____

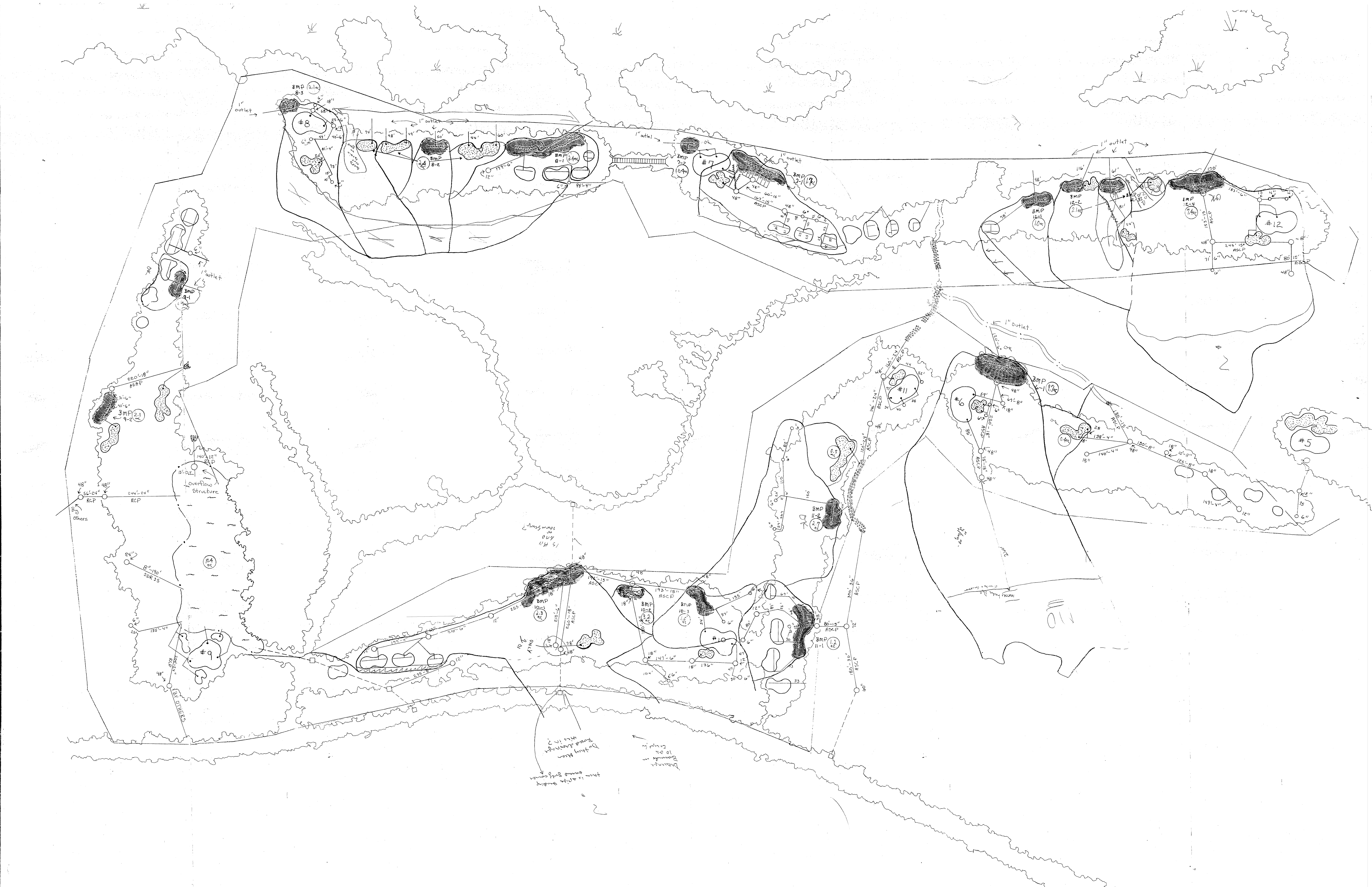
If enclosures are not as noted, kindly notify us at once.



99121_GOVERNORS_LAND_GENERAL_FILE - 208


FOWLER'S LAKE
FOWLER'S L
RIVER OAKS NORTH B
RIVER OAKS NORTH A
TWO RIVERS POINT
Two Rivers Road
River Ridge
River Oaks Road
Founder's Hill North
Founder's Hill South
Founder's Way
Fowler's Lake Road
LAKE
Harper's Mill Road
BIKE PATH
John Hancock Road
Old Woods Ct.
Nathaniel's Close
Two Rivers Road
Whittle's
Wood Road
Mill House Road
Nathaniel's Green
HORNE'S
Horne's Lake Road
HORNE'S LAKE
PRACTICE AREA
TWO RIVERS COUNTRY CLUB
COUNTRY CLUB VILLAS
BARRET'S POINT
Barret's Pointe Road
RIVER OAKS SOUTH
River Oaks Road
Garden Center
Boat Storage
BOAT STORAGE/ GARDEN CENTER
NATHANIEL'S GREEN A
NATHANIEL'S GREEN B
Harbor Road
BRIDGE
MARINA VILLAGE
BOAT RAMP
BEACH
NATHANIEL'S RUN
Nathaniel's Run
CYPRESS ISLE
BEACH AND ISLAND SANCTUARY
CHICKAHOMINY RIVER
JAMES RIVER
N
W
E
S


LAKE - B
TO JAMES RIVER PLANTATIONS
JOHN TYLER MEMORIAL HIGHWAY (ROUTE 5)
TO COLONIAL WILLIAMSBURG
HARPER'S MILL
PARKSIDE
Parkside Lane
SECURITY COTTAGE
SALES CENTER
PLAYFIELD
PARK EAST TENNIS & RECREATION AREA
CROQUET
VOLLEYBALL
HEARTH-STONE
WINGFIELD LAKE
Ann Johnson Lane
Wingfield Lake Road
Wingfield Lake Road
Elizabeth Champion
Margaret Jones Lane
Thomas Smith Lane
John Vaughan Road
PLANTER'S ROUND
BENNETT'S POND
BENNETT'S POND ROAD
OPEN AREA A
RIVER REACH C
RIVER REACH A
RIVER REACH B
River Reach
BIKE PATH
Two Rivers Road
LAKE
Two Rivers Road
Planters Round
PARK EAST COMMUNITY BLDG. SWIMMING POOLS TOT LOT
West Whittaker Close
South Freeman Road
TRAVIS POND
Travis Pond Road
West Island Road
Travis Close
Private Lane
HALFWAY HOUSE
WHITTAKER LAKE
Kitchum's Pond Road
KITCHUM'S POND
Lawnes Creek
KITCHUM'S POND A
WHITTAKER ISLAND A
Whittaker Island Road
East Island Road
Sanctuary Drive
Kitchum's Close
KITCHUM'S POND C
KITCHUM'S POND B
WHITTAKER ISLAND B
BRIDGE
ISLAND
TRAVIS POND
BRIDGE AND OBSERVATION PAVILLION
OBSERVATION DECK
BRIDGE
ISLAND
BEACH
ISLAND
Nature Trail/Bike Path
For illustrative purposes only. Final plans may be subject to revisions.



REVISIONS:	GOVER
DESIGNED BY: Fazio	GOLF
DRAWN BY: Jack D.	wadsw GOLF CONSTRUCTI
INSTALLED BY: Jack D.	
SCALE: 1=100	Drainage
DATE: 8-29-91	6 7 8 9 10 11, 12

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