GOVERNMENT INTERACTION DOCUMENT CHECKLIST
GEORGIA-PACIFIC BUILDING PRODUCTS

Facility: GP Clarendon LP

1

Document Name: Stormwater Construction NOI - Additional Areas

Review Level: M Due Date: 4-Jan-11

Preparation Reason: R72-300 - SC Stormwater and Sediment Control Act

Signer/Approver: Jim Heinemann

Signer Authorized?: ☑ Yes ☐ No

Reason Signer Authorized: Responsible Corporate Officer (President, Vice President, Certain Managers). Delegation letter from Carmine Perri.

2

Principal Preparer: *Greg Mitchell, RMT*

Reviewed By:

VP Env Compli	☐ Yes	☐ No	Name:
Bus Env Mgr (H)	☑ Yes	☐ No	Name: Jim James/ Jim E. James / 3 Jan 2011
Reg Env Mgr (H, M)	☑ Yes	☐ No	Name: Jimmy Summers, 1-3-11 Jimmy Summers
Facil. Env Coordin.	☐ Yes	☐ No	Name:
G-P Corp.	☐ Yes	☐ No	Name:
Legal (H)	☐ Yes	☐ No	Name:
Third Party	☐ Yes	☐ No	Name:
Other (L)	☐ Yes	☐ No	Name:

3

Any non-compliance/anomaly?: ☐ Yes ☑ No

Describe:

If "Yes", Agency Notified:

Compliance Plan Attached?: ☐ Yes ☑ No

Schedule:

Owner:

Document, checklist and supporting information (*e.g.,* SOB) filed to:

Facility files:	☑ Yes	☐ No
FileNet:	☑ Yes	☐ No
Atlanta:	☐ Yes	☑ No

4

Remarks: NOI and SWPPP to be filed to obtain coverage under construction general permit for storm water discharges. This submittal will add 4 areas to the existing coverage under the general permit.

Proof of Delivery

Close Window

Dear Customer,

This notice serves as proof of delivery for the shipment listed below.

Tracking Number:	1Z78V8A80192002834
Service:	UPS Next Day Air®
Weight:	3.00 lbs
Shipped/Billed On:	01/04/2011
Delivered On:	01/05/2011 9:48 A.M.
Delivered To:	COLUMBIA, SC, US
Signed By:	HIOTT
Left At:	Mail Room

Thank you for giving us this opportunity to serve you.

Sincerely,

UPS

Tracking results provided by UPS: 01/06/2011 11:00 A.M. ET

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• ENVIRONMENT • ENERGY • ENGINEERING

January 4, 2011

Ms. Cynthia Ashford
Storm Water Permitting Section
Bureau of Water
South Carolina Department of Health and Environmental Control
2600 Bull Street
Columbia, SC 29201

Subject: GP Clarendon LP - Oriented Strand Board (OSB) Mill, Clarendon County, South Carolina
Notice of Intent (NOI) Addendum for Storm Water Discharges from Large Construction Activities – General Permit Coverage Number SCR10N260
Revised Storm Water Pollution Prevention Plan (SWPPP) Submittal

Dear Ms. Ashford:

RMT, Inc. (RMT), on the behalf of GP Clarendon LP, is submitting the following attachments for land-disturbing activities associated with construction planned for 2011 and 2012 as part of a Larger Common Plan for Development identified as GP Clarendon LP OSB Mill:

1. NOI Addendum and Associated Fees in the amount of $2,125 (Attachment 1)
2. Storm Water Management and Sediment and Erosion Control Plan Review Checklist for Design Professionals (Attachment 2)
3. Revised SWPPP (contained in Attachment 2)

The project site currently operates under Industrial General Permit (IGP) #SCR000000. This NOI submittal is to continue construction at the GP Clarendon LP OSB Mill that was permitted by the South Carolina Department of Health and Environmental Control on August 24, 2010 (Coverage Number SCR10N260). The land-disturbing activities addressed in this NOI Addendum and Revised SWPPP include maintenance operations at the Borrow Area (Area #1 and #2), maintenance operations at the Log Storage Area (Area #3), and relocating a ditch (Area #4). The proposed grading activities will disturb approximately 20.93 acres.

P:\PROJECT PALMETTO\POST-CLOSING\CLARENDON\WPGVL\L0579068001-003.DOCX

With this submittal, GP Clarendon LP requests coverage of the additional areas under the existing permit coverage number, SCR10N260. If you have any questions concerning this submittal, please contact me at 864.234.9135.

Sincerely,

RMT, Inc.

Greg S. Mitchell, P.E.
Project Engineer

Attachments

cc: James P. Summers, GP
Dan Curry, RMT
Central Files

Attachment 1
Notice of Intent for Storm Water Associated with Construction Activity

D H E C

PROMOTE PROTECT PROSPER

Notice of Intent (NOI) for Stormwater Discharges from Large and Small Construction Activities, NPDES General Permit SCR100000

For official use only

File number: __-__-__-__

Permit number: SCR10 __ __ __ __

Submittal package complete: _____

Public Notice Start Date (OCRM only): _____

For official use only

Submission of an NOI constitutes notice that the entity identified in Section I intends to be authorized under SCR100000. Instructions on page 5.

Date: 01/04/2011

Project/ Site Name: GP CLARENDON LP 2011 SITE IMPROVEMENTS **County:** Clarendon

Do you want this project to be considered for the Expedited Review Program (ERP)? ☐Yes ☐No (See instructions.)

If yes, is the design of this project above regulatory requirements or Low Impact Development? ☐Yes ☐No

I. Project Information

Project Owner/ Operator (Company or person): GP CLARENDON LP

Company EIN: 39-2061308 Phone: 803-505-4488 Fax: 803-505-4460

Mailing Address: 8250 SUMTER HIGHWAY City: ALCOLU State: SC Zip: 29001

Permit Contact (if owner is company): TIMOTHY COBEY Phone: 803-505-4488

Mailing Address: 8250 SUMTER HIGHWAY City: ALCOLU State: SC Zip: 29001

Email address (optional): TIMOTHY.COBEY@GAPAC.COM

II. Property Information

A. Site Location (street address, nearest intersection, etc.): 8250 SUMTER HIGHWAY

City/ Town (if in limits): ALCOLU Latitude: 33 ° 48' 18" N Longitude: -80 ° 14' 22" W

Tax map # (list all): 133-00-02-003(pt of),175-00-01-002,175-00-01-003(pt of),175-00-01-004(pt.),175-00-01-021

B. Property Owner: GP CLARENDON LP Phone: 803-505-4488

Mailing Address: 8250 SUMTER HIGHWAY City: ALCOLU State: SC Zip: 29001

III. Site Information

A. Disturbed area (to the nearest tenth of an acre): 20.93 acres Total area: 949.0 acres

B. Is this project part of a Larger Common Plan for Development or Sale (LCP)? ☒Yes ☐No

LCP/ Overall Development Name: GP CLARENDON LP OSB MILL Check here if this is the first phase. ☐

Previous state permit/ file number: 14-10-08-01 Previous NPDES coverage number: SCR10 N260

C. Start Date (MM/DD/YYYY): 8/29/2010 Completion Date: 2/29/2012

D. Is this site located on Indian Lands? ☐Yes ☒No If yes, name of reservation. _____

E. Type of Activity (check one):

☐ Commercial ☒ Industrial

☐ Institutional ☐ Residential: Single-family ☐ Multi-use (Commercial & Residential) ☐ Other:

☐ Linear ☐ Residential: Multi-family ☐ Site Preparation (No new impervious) _____

F. Are there any flooding problems downstream of or adjacent to this site? ☐Yes ☒No

G. Has S.C. DHEC issued a Notice to Comply or Notice of Violation for this site or LCP? ☐Yes ☒No

H. Is any part of the property located inside an MS4 or urbanized area? ☐Yes ☒No

If yes, list the MS4 operator or urbanized area name. _____

I. List all state and federal environmental permits or approvals applied for or obtained for this site (e.g., RCRA).

STORMWATER IGP (SCR000000), AIR PSD CONSTRUCTION PERMIT #0680-0046-CB, USACOE PERMIT 2005-4W-325

IV. Waterbody Information

A. Nearest receiving waterbody(s) [RWB]: TRIBUTARY TO POCOTALIGO Distance to nearest RWB (feet): _____

Classification of nearest RWB: FW Next/Nearest named RWB: POCOTALIGO (>5000 feet)

B. 1. Waters of the U.S./ State	On the site?	Delineated/ Identified?	Impacts?	Amount of impacts
a. Jurisdictional wetlands	☒Yes ☐No	☒Yes ☐No	☐Yes ☒No	____Ac
b. Non-jurisdictional wetlands	☐Yes ☒No	☒Yes ☐No	☐Yes ☒No	____Ac
c. Other Water(s) List: _____	☐Yes ☒No	☐Yes ☐No	☐Yes ☐No	____Ac ____Feet

2. If yes for impacts in B.1, describe each impact and activity, and list all permits (e.g., USACOE Nationwide permit, DHEC General Permit) and certifications that have been applied for or obtained for each impact.

WETLAND IMPACTS PERMITTED BY USACOE PERMIT 2005-4W-325 AND MITIGATED

C. **Impaired Waterbodies** (See instructions.)
List the nearest DHEC water quality monitoring station(s) [WQMS(s)] to which construction stormwater (SW) discharges will drain and the corresponding waterbody(s). PD-115 Waterbody(s): POCOTALIGO

1. Is this WQMS(s) listed on the most current 303(d) List for Impaired Waters? ☒Yes ☐No
   a. If yes for 1, list the impairment(s). DISSOLVED OXYGEN
   b. If yes for 1, will the site's construction SW discharges contain any pollutant(s) causing the impairment(s)? ☐Yes ☒No
   c. If yes for b, list the impairment(s) affected by the pollutant(s) referenced in b. _____
   d. If yes for b, will use of the proposed BMPs ensure that the site's discharges will not contribute to or cause further water quality standard violations for the impairment(s) listed in c? ☐Yes ☐No
2. Has a TMDL(s) been developed for this WQMS(s)? ☐Yes ☒No
   a. If yes for 2, list the impairment(s). _____
   b. If yes for 2, has the standard been attained for all impairment(s)? ☐Yes ☐No
   c. If no for b, will the site's construction SW discharges contain any pollutant(s) causing the impairment(s)? ☐Yes ☐No
   d. If yes for c, are your discharges consistent with the assumptions and requirements of the TMDL(s)? ☐Yes ☐No

D. 1. Are S.C. Navigable Waters (SCNW) on the site? ☐Yes ☒No
   a. If yes for 1, list the name of the SCNW: _____
   b. If yes for 1, will any construction activities cross over or occur in, under, or through the SCNW? ☐Yes ☐No
   c. If yes for b, then describe activities. _____
   d. If yes for b, are the activities in SCNW covered under a DHEC General Permit or other DHEC permit? ☐Yes ☐No
   e. If no for d, has an SCNW permit been applied for or issued for the site? ☐ Yes, for all activities ☐Yes, for some activities ☐No
   f. If yes for d or e, list permit number(s) and corresponding activities.

V. Operator Information

A. SWPPP Preparer: GREG MITCHELL S.C. Registration #: 2 4 7 4 0
Company/ Firm: RMT, INC. S.C. COA #: 0 0 2 2 0
Mailing Address: 30 PATEWOOD DRIVE SUITE 100 City: GREENVILLE State: SC Zip: 29615
Phone: (Day) 864-234-9135 (Mobile) 864-884-4906 (Fax) 864-281-0288
Email address (optional): GREG.MITCHELL@RMTINC.COM

B. Operator of Day-to-Day Site Activities [ODSA] (Company or person): TIMOTHY COBEY
Mailing Address: 8250 SUMTER HIGHWAY City: ALCOLU State: SC Zip: 29001
Phone: 803-505-4488 Fax: 803-505-4460
Site Contact (if ODSA is company): _____ Phone: _____

VI. Signatures and Certifications: DO NOT SIGN IN BLACK INK!

A. One copy of the SWPPP, all specifications and supporting calculations, forms, and reports are herewith submitted and made a part of this application. I have placed my signature and seal on the design documents submitted signifying that I accept responsibility for the design of the system. Further, I certify to the best of my knowledge and belief that the design is consistent with the requirements of Title 48, Chapter 14 of the Code of Laws of SC, 1976 as amended, pursuant to Regulation 72-300 et seq., and in accordance with the terms and conditions of SCR100000. (This should be person identified in Section V.A.)
Check one. ☒Engineer ☐Tier B Surveyor ☐Landscape Architect

GREG MITCHELL		24740
Printed name of SWPPP Preparer	**Signature of SWPPP Preparer**	**S.C. Registration #**

B. I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

I hereby certify that all land-disturbing construction and associated activity pertaining to this site shall be accomplished pursuant to and in keeping with the terms and conditions of the approved plans and SCR100000. I also certify that a responsible person will be assigned to the project for day-to-day control. I hereby grant authorization to the to S. C. Department of Health and Environmental Control (DHEC) and/or the local implementing agency the right of access to the site at all times for the purpose of on site inspections during the course of construction and to perform maintenance inspections following the completion of the land-disturbing activity. (See Section 122.22 of S.C. Reg. 61-9 for signatory authority information.)

JIM HEINEMANN		1/3/11
Printed name of Project Owner/Operator	**Signature of Project Owner/ Operator**	**Date**

NPDES CGP Fee Schedule A

(All Counties EXCEPT Beaufort, Berkeley, Charleston, Colleton, Dorchester, Georgetown, Horry, and Jasper)

This schedule should not be used for projects reviewed by a delegated entity or MS4 operator.

If you are completing the fillable version of this form and if the **County** and **Disturbed Area** fields are correctly filled out on page 1 of this form, the fees in the right-hand column will be automatically entered based on your answers to the questions below. The schedule should be attached to DHEC Form 2617. Do not send payment in window envelope. DO NOT MAIL CASH. DHEC will notify the Project Owner/ Operator if the submitted check or credit card payment cannot be processed. The review clock will start when acceptable payment is received.

1. **Will this project or LCP (item III.B) ultimately disturb 1 acre or more?** ☒ Yes ☐ No — $ 125 . 00
   If yes, enter $125 in right-hand column and proceed to item 2. If no, coverage under SCR100000 is not required; see BOW-SPWS for "Small Project Requirements in Non-Coastal Counties".
2. a. **Will this project or LCP ultimately disturb more than 2 acres?** ☒ Yes ☐ No
   If no, review fees are not initially required*; proceed to item 3.
   b. **If yes for 2a, is this project exempt from S.C. Reg. 72-300 et seq.?** ☐ Yes ☒ No
   If yes for 2b, review fees are not initially required*; proceed to item 3.
   If yes for 2a and no for 2b, enter review fees of $100/ **disturbed** acre (from item III.A on page 1) in right-hand column. The review fees cannot exceed $2000. Proceed to item 3. — $ 2000 . 00

3. **Total Required Fees**
   Add the values in the right-hand column. Maximum required fees are **$2125**. DHEC will not review this project until all required fees are received. **Total Required Fees:** $ 2125 . 00

* If DHEC will review the project, then DHEC will notify the Project Owner/ Operator in writing within 20 business days of receipt of the complete NOI and request review fees.

Payment by Check:
Make sure check is signed and has a current date on it. If check is more than 30 days old, it may be returned. The check must be for the entire amount of required fees.

STAPLE CHECK HERE

Make check payable to S.C. DHEC.

Payment by Credit Card:
Fill out the information below. Make sure that the authorized signature is complete.
Name as it appears on Card: _____ Phone: _____
Mailing Address: _____ City: _____ State: _____ Zip: _____
Type of Card: ☐ Visa ☐ MasterCard ☐ Discover Credit Card Number: _____
Expiration Date (MM/YYYY): _____ Credit Validation Value (3-digit # on back of card): ____
Authorized Signature: _____

For official use only: **Invoice Number QB** _ _ _ _ _ - _

CREDIT CARD TELEPHONE PAYMENT

MERCHANT COPY

SC DHEC/BUREAU OF FINA
PO BOX 100103
COLUMBIA, SC 292020000

01/04/2011 15:17:43
Merchant ID: 000000001003751
Terminal ID: 01454252
415164971996

CREDIT CARD
VISA SALE

CARD # XXXXXXXXXXXX8398
INVOICE 0009
Batch #: 000431
Approval Code: 022307
Entry Method: Manual
Approved: Online
Tax Amount: $0.00
Cust Code:
Card Code: M

SALE AMOUNT $1000.00

CUSTOMER COPY

Today's Date

Box)

:RCARD VISA

Call

COST CENTER/FUN

309020 53

309030 53

700 109810 53

OTHER:

INVOICE	AMOUNT	INVOICE

MERCHANT COPY

SC DHEC/BUREAU OF FINA
PO BOX 100103
COLUMBIA, SC 292020000

01/04/2011 15:18:35
Merchant ID: 000000001003751
Terminal ID: 01454252
415164971996

CREDIT CARD
VISA SALE

CARD # XXXXXXXXXXXX8391
INVOICE 001
Batch #: 00043
Approval Code: 04981
Entry Method: Manu
Approved: Onlir
Tax Amount: $0.
Cust Code:
Card Code: M

SALE AMOUNT $1125.

CUSTOMER COPY

Attachment 2
Storm Water Management and Sediment and Erosion Control Plan Review Checklist for Design Professionals

Stormwater Management and Sediment and Erosion Control Plan Review Checklist For Design Professionals

Please indicate the location and page number(s) where each item below can be found in your SWPPP or supporting calculations. If an item is not applicable, put N/A. The Department reserves the right to modify this checklist at any time. The Coastal Zone consists of the following counties: Beaufort, Berkeley, Charleston, Colleton, Dorchester, Georgetown, Horry, and Jasper.

Checklist Completed by:
Printed name: Gregory S. Mitchell Signature: _____ Date: 01/04/2011

1. **CURRENT COMPLETED APPLICATION FORM – *See Section 1, current Completed Application Form***
   - Original signatures
   - Signatory authority
   - All items completed and answered
   - Fee Schedule
   - *Note: State and local government projects are not exempt from the plan review fee of $100 per disturbed acre.*
2. **COPIES OF PLANS AND CALCULATIONS – *See Drawings; Sections 4 and 9.***
   - Plans stapled together!
   - For projects that disturb more than 2 acres, less than or equal to 2 acres but are part of a larger common plan of development or sale (LCP), or more than 0.5 acre and within ½ mile of a receiving waterbody (RWB) in the Coastal Zone, ONE set of plans and supporting documentation (report, calculations, maps, etc.) – ***Included***
   - For projects that disturb less than or equal to 2 acres (not part of LCP and not within ½ mile of RWB in the Coastal Zone), THREE sets of plans and one set of supporting documentation [*Note: You may submit up to 2 additional sets of plans to be stamped for approval.*] – ***N/A***
   - Supporting documentation tabbed (e.g., Maps, Pre-Development calculations) and pages numbered [no loose pages] – ***Included***
3. **LOCATION MAP – *See Section 5, Topographic Map and Engineering Drawings***
   - North arrow and scale
   - Outlined project location
   - Labeled road names
4. **PROJECT NARRATIVE – *See Section 4, Project Narrative***
   - Scope of project outlined, including a brief description of pre- and post-development conditions
   - Summary table of pre- and post-development flows (at least 2- and 10-year, 24-hour storm events)
   - Existing flooding problems in the surrounding area described
   - Disturbed area calculations included for subdivision projects or LCP disturbing 1 or more acres
     - For subdivisions if the site is not to be mass-graded, the following formula should be used to determine the amount of disturbance:

       Amount of Disturbance = 2[Max Restricted Building Size][Number of Lots] + Right of Way (ROW) areas {ROW areas include clearing for roads, utilities, easements etc.}

     - If this equation is used, include a note on the **plans** stating: "The site is not to be mass-graded. Only 2 times the footprint is to be cleared as the lots are developed. The assumed disturbance on each lot is ____ sq. ft."
5. **USGS TOPOGRAPHIC MAP – *See Section 5, Topographic Map***
   - Project boundary outlined
   - Route of runoff from site to nearest waterbody shown
   - Road names adjacent to site labeled
6. **SOILS INFORMATION – *See Section 6, Soils Information***
   - Project boundary outlined
   - Predominate soil types found at the site identified on the plans or on a separate map
   - *Note: Soils information is available from the Natural Resource Conservation Service through their website: http://websoilsurvey.nrcs.usda.gov/app/*
7. **FLOODWAY MAPS/FEMA FLOOD INSURANCE MAP – *See Section 7, FEMA Map***
   - Project boundary outlined, if in close proximity to floodplain/ floodway
   - *Note: The Department does not regulate the placement of fill in floodplains. Please see your local city or county official.*

8. **WATERS OF THE STATE, INCLUDING WETLANDS – *See Section 8, USACE Permit and Engineering Drawings.***
   - Delineation of all waters of the State (WoS), including wetlands, shown and labeled on plans (delineation not required if a 100-ft undisturbed buffer can be maintained between the WoS and all land-disturbing activities)
   - Additional, separate plan sheet that shows all WoS on the site and the impacted areas with a description of the activity(s), whether it is permanent or temporary, and any other relevant information.
   - If impacts to WoS, outlined areas of impacts and labeled that no work can begin in this area until all necessary USACOE permits and SCDHEC 401 certifications have been obtained.
   - Double row of silt fence provided in all areas where a 50' undisturbed buffer cannot be maintained between the disturbed area and the WoS
   - Minimum 10' maintenance buffer provided between last row of silt fence and WoS; or, if buffer not provided, then statement from P.E. on plans indicating how silt fence will be installed and maintained without impacts to WoS
   - *Note: If there are proposed impacts to WoS, then it is advised that you contact USACOE (866-329-8187) and/ or S.C. DHEC Water Quality Certification, Standards & Wetlands Programs Section (803-898-4300) to determine additional requirements before submitting the Notice of Intent (NOI).*
   - *Note: If WoS are to be impacted, work cannot be performed in these designated areas until all necessary permits have been acquired*
   - *Note: If a USACOE permit is required for construction of or access to a temporary or permanent stormwater management structure, NPDES permit coverage cannot be granted until the USACOE permits and S.C. DHEC 401 Section certifications are obtained.*
   - *Note: The Department recommends a minimum 20-foot buffer between a sediment trap/basin and WoS.*

9. **HYDROLOGIC ANALYIS**
   - Pre- and post-developed hydrologic analysis calculations for the 2- and 10-year, 24-hour storm events at each outfall point ***– See Section 9, Copies of Plans and Applications***
   - Drainage area maps that clearly correspond to the calculations (pre- and post-development) – ***See Drawings***
   - Analysis points for comparing runoff rates and the total drainage area analyzed do not change from pre- to post-development, although the immediate drainage areas contributing to each analysis point might shift. – ***See Drawings***
   - Post-development discharges less than pre-development discharges for each outfall point (if not, then see "Detention Waiver" section below) – ***See Sections 4 and 9***
   - Analysis performed using SCS 24-hour storm (Rational method is not acceptable) – ***TR-55 used***
   - Rainfall data from South Carolina DHEC Storm Water Management BMP Handbook (BMP Handbook) used in all calculations ***– Calculations in Section 9 Prepared Using BMP Handbook Data***
   - *Note: The curve number for open water, marshes, etc. should be 98 to 100.*

10. **DETENTION ANALYSIS/DESIGN – *See Section 10, No Detention Required for Project***
    - **Analysis**
      - Pond routing using a volume-based hydrograph for the 2- and 10-year, SCS 24-hour storm event (Drain:Edge, ICPR, HEC-1, SedCAD, HYDRAFLOW, etc. perform full pond routings; TR55 does not perform a full pond routing; rational method cannot be used)
      - Hydrologic and hydraulic calculations necessary to determine the impact of hydrograph timing modifications of the proposed land-disturbing activity, with and without the detention structure (results of analysis will determine the need to modify the detention design or eliminate the detention requirement—see note 2 below)
      - Inputs and outputs from analysis program
      - Summary table of the peak inflows, peak outflows, discharge velocities, and maximum water surface elevations (WSE) for the 2- and 10-year, 24-hour storm events for each detention structure
      - Stage-storage-discharge relationship for the outlet structure of each detention structure
      - If a rating curve for the outlet structure must be generated externally from the analysis program (Drain:Edge, HEC-1, etc.), data and equations used to rate the outlet structure
      - As-built of existing detention pond if the site drains to an existing detention pond (see below)
      - *Note: SedCAD users please refer to the memo regarding the input of outlet structures.*
      - *Note: The Department recommends using the 10% rule in performing analysis. The hydrologic analysis should be conducted for the larger drainage area, where the site in question encompasses 10% of the total drainage area. For example, if your site is 10 acres, then the hydrologic analysis should be performed at the point downstream where the contributing drainage area, including your 10-acre site, is approximately 100 acres.*
    - **Design**
      - Detail of outlet structure and cross-section of the dam/ berm or pond bank, including elevations and dimensions that correspond to the calculations
      - Orifice constructability considered (do not specify orifice diameters with increments of less than ¼")

- Maximum WSE for the 10-year storm event below the emergency spillway with 0.5-ft of freeboard between maximum WSE for the 10-year storm and the emergency spillway
- Maximum WSE for the 100-year storm event below the embankment with 0.5-ft of freeboard between maximum WSE for the 100-year storm and the embankment
- Dewatering time calculations for the 10-year storm event (dry ponds must drain completely within 72 hours)
- Bottom of all detention and retention ponds graded to have a slope of not less than 0.5%
- If the pond is to be used for sediment control during construction, temporary horseshoe-shaped riprap berm in front of any low level outlets provided during construction and shown on the pond detail
- Permanent maintenance access to all permanent detention structures (easements may be needed for structures surrounded by lots)
- Infiltration systems designed in accordance with S.C. Reg. 72-307.C(11) [specify how items a-j have been addressed]
- *Note: Emergency spillways should not be built on fill slopes.*
- *Note: The Department recommends installation of a trash rack or other debris-screening device on all pond risers.*
- *Note: The Department recommends a maximum slope of 3:1 on pond embankments to allow for ease of maintenance.*
- *Note: The Department recommends installation of sediment forebays at each outfall into the detention/ sediment basin.*

11. AS-BUILTS – *See Section 11, Not Required for this Project*

- Provided for all previously approved detention ponds that will receive flows from new drainage areas
- Prepared by a South Carolina Licensed Land Surveyor
- Grades/ contours/ depths for pond
- Elevations and dimensions of all outlet structures, including:
  - Pipe and orifice inverts and diameters
  - Weir elevations and dimensions
  - Riser dimensions and elevations
  - Emergency spillway dimensions and elevations
  - Locations and inverts for all pipes discharging into the pond
- If the elevations or dimensions of the structures listed above do not match those used in the approved plans, certification statement signed by the project's Registered Engineer indicating that the pond, as built, will function within all applicable standards provided [new analysis of the pond (routing) may be necessary]
- For projects located in the eight coastal counties: For any construction project permitted after September 1, 2006, as-built/record drawings will be required by DHEC-OCRM prior to stormwater permit closeout. Prior to the contractor requesting a final site inspection, one as-built drawing hard copy and 1 digital (scanned plan sheets as .tif or .pdf document) copy must be provided to OCRM staff.
- *Note: As-built survey and /or analysis must be submitted and accepted by the Department before Notice of Termination (NOT) is submitted.*

12. PERMANENT STORMWATER MANAGEMENT STRUCTURE MAINTENANCE – *See Section 12, Not Required for this Project*

- Signed agreement from the responsible party accepting ownership and maintenance of the structure
- Description of maintenance plan to be used
- Schedule of maintenance procedures (e.g., every 6 months)
- Detailed or manufacturer-specific maintenance items for proprietary control devices (oil-water separators, etc.), underground detention structures, exfiltration systems and non-traditional stormwater controls (constructed wetlands, bioretention, etc.)
- Typical maintenance items to be addressed
  - Grass to be mowed
  - Trees to be removed from within the pond and on the embankment
  - Trash and sediment to be removed from inside of and around the pond outlet structure
  - Orifices to be cleaned and unclogged
  - Outlet pipe to be cleaned, inspected, and repaired
  - Sediment accumulation to be removed from pond
  - Pond bottom to be regraded to provide proper drainage towards the outlet discharge point
  - Energy dissipator to be cleaned and repaired
  - Emergency spillway, if applicable, to be inspected and repaired
  - Erosion on side slopes, if present, to be addressed
  - The Department must be notified in writing of any changes in maintenance responsibility for the stormwater devices at the site (include this statement in agreement).

- *Note: The Department recommends that the county, city, or other governing utility, which has the authority to accept the ownership and maintenance of a storm drainage system also accept the permanent stormwater management structure.*
- *Note: If the entity or person with maintenance responsibility changes, then a new maintenance agreement, signed by the new person responsible for maintenance, must be provided to the Department. If a new, signed maintenance agreement is not provided to the Department, then the entity/ person who signed the most recent maintenance agreement on file with the Department will be considered the responsible entity.*

13. DISCHARGE POINTS – *See Section 13, Discharge Points and Drawings*

- Storm drainage or pond outfalls carried to an existing drainage outfall such as a pipe, ditch, etc.
- No new point discharges onto adjacent property where there was not a point discharge previously, unless written permission from the adjacent property owner is provided
- Level spreaders, plunge pools, etc. provided when the proposed outlet is near the property line and not directed to an existing outfall, such as a creek or ditch
- Twenty (20)-foot minimum buffer is provided between the property line and the discharge point
- Outlets shall not discharge on fill slopes

14. DETENTION WAIVER – *See Section 14, Not Applicable to this Project*

- *Note: If the 2- and 10-year, 24-hour post-developed flow rates exceed the pre-developed rates, waivers from detention may be granted in accordance with regulation 72-302(B) on a case-by-case basis*
- Justification and a written request, including the following statement: "*the increased flows will not have a significant adverse impact on the downstream/adjacent properties"*
- A project may be eligible for a waiver or variance of stormwater management for water quantity control if the applicant can demonstrate that:
  - The proposed project will have no significant adverse impact on the receiving natural waterway or downstream properties; or
  - The imposition of peak control requirements for rates of stormwater runoff would aggravate downstream flooding
- Waiver signed by the project's Professional Engineer
- *Note: See note in checklist item 10 regarding the 10% rule.*

15. PERMANENT WATER QUALITY REQUIREMENTS – *See Section 15, Not Applicable to this Project*

- Permanent water quality addressed (all projects or LCP that disturb 5 or more acres)
  - Wet ponds designed to catch the first ½" of runoff from the entire area draining to the pond and release it over at least a 24-hour period
  - Dry ponds designed to catch the first 1" of runoff from the entire area draining to the pond and release it over at least a 24-hour period
  - For areas not draining to a pond, show how permanent water quality requirements were addressed
- Projects disturbing less than five (5) acres but within one-half (1/2) mile of a receiving water body in the Coastal Zone must meet Section III.C.3.XIII.A of the Coastal Zone Management Program Refinements. Designs must show that the first ½ inch of runoff from the entire site or the first one (1) inch of runoff from the built upon area, whichever is greater, can be stored onsite.
- Waters of the U.S./State are not used for permanent water quality control (alternative means of treatment must be used if an existing pond is to be used for water quantity control).
- *Note: Other non-traditional stormwater controls such as Bioretention areas, constructed wetlands, etc. may be used. Consult the BMP Handbook for information on the design of these devices.*
- *Note: Pre-fabricated or proprietary treatment devices are approved on a case-by-case basis if adequate removal efficiency can be demonstrated. Provide pollutant removal efficiency data, preferably from a third-party testing company. Type of system selected should be based on the ability to remove the pollutants of concern in that area/situation (bacteria, hydrocarbons, etc.).*

16. SEDIMENTOLOGY– *See Section 16, Not Applicable to this Project*

- Trapping efficiency calculations showing that all sediment basins/ traps are capable of achieving a sediment trapping efficiency of at least 80% for the 10-year, 24-hour storm event, if more than 10 disturbed acres drain to a common point (stream, lake, etc.)
- Sediment basins provide storage for the 10-year, 24-hour storm event for disturbed conditions or 3600 ft^3/ acre draining to the basin, if more than 10 disturbed acres drain to a common point (stream, lake, property line, etc.)
- Sediment traps only used for drainage areas of less than 5 acres
- Sediment trap storage calculations, showing that 1800 ft^3/ total acre draining to each trap is provided below the spillway
- If trapping efficiency calculations are required for sediment traps, then provide peak outflow, q_{po}, calculations; the 10-year, 24-hour storm event for construction conditions cannot overtop the trap's spillway
- Sediment basins and traps designed for total area draining to them

- Drainage area map outlining the area draining to each basin/ trap
- Copies of figures used to determine V_{15} (SV-1) and trapping efficiency (ST-1, SB-1, SB-2), if Design Aids from BMP manual are used to determine trapping efficiencies
- Silt fence only used in areas with drainage areas of less than ¼ acre per 100 LF of fence and not used in areas with concentrated flows
- Clean-out stake, marked at ½ the designed sediment storage depth, provided in all sediment basins/ sediment traps
- *Note: Consult the BMP Handbook for information on the design of these and other devices.*
- *Note: The Design Aids in the BMP Handbook cannot be used to determine trapping efficiencies for structures in series. If the flow for the10-year, 24-hour storm for construction conditions overtops the structure or the structure's spillway, then the Design Aids cannot be used. If multiple soil types are in the area draining to the structure, then the soil type with the smallest D_{15} for the appropriate depth should be used to determine the settling velocity, V_{15}; an average D_{15} should not be used.*
- *Note: SedCAD users please refer to the memo regarding the input of outlet structures.*

17. STABLE CHANNEL CALCULATIONS – *See Section 17.*

- All channels and diversion ditches able to handle the 10-year storm event with non-erosive velocities of less than 5 feet per second during construction (use appropriate CN for disturbed areas) and post-construction (if velocity exceeds 5 ft/s, then permanent measures to reduce the velocity to a non-erosive rate must be provided)
- Rock check dams provided in temporary diversions
- Installation detail for erosion control blanket (ECB) or turf reinforcement matting (TRM) if ECBs or TRMs to be used

18. INLET PROTECTION– *See Section 18 and Drawings*

- Provided at all inlets
- Hay bales not used
- Steel posts and buried fabric shown for filter fabric inlet protection
- Inlet protection details provided for pre-paving and after roadways have been paved
- *Note: The Department recommends that an inlet not have more than one (1) acre draining to it.*

19. ENERGY DISSIPATORS/ OUTLET PROTECTION – *See Section 19*

- All outlets stabilized
- Riprap aprons sized appropriately
- Riprap detail shows apron dimensions and stone sizes for each pad or each pipe diameter
- Filter fabric installed beneath all riprap

20. FILL SLOPES AND/ OR EMBANKMENTS – *See Section 20*

- All slopes stabilized
- Slope drains designed in accordance with the BMP Handbook
- Slope drains provided where concentrated flows discharge onto a fill slope
- For all slopes steeper than 1.5:1, identification of stabilization practice (e.g., ECB, TRM)
- *Note: Measures, in addition to grassing or hydroseeding, include synthetic or vegetative matting, diversion berms, temporary slope drains, etc.*
- *Note: If retaining walls or fill slopes are to be constructed at the downstream property line, the Department recommends a 10' buffer to allow for construction and maintenance. If a 10' buffer is not provided, then provide permission from the adjacent property owner for possible land-disturbing activities on his property.*

21. UTILITY LINES – *See Section 21, Not Applicable to this Project*

- Limits of disturbance include areas disturbed for water and sewer line installation
- Inlet protection provided at all existing inlets that receive flows from the disturbed areas; also add this as a note on the plans
- For all utility lines crossing WoS, narrative and detail showing sediment and erosion control measures provided on plans
- Note for construction entrances to be provided at all locations where construction traffic accesses a paved roadway

22. TMDL/ 303d IMPAIRED WATERBODIES – *See Section 22*

- List the nearest S.C.DHEC Water Quality Monitoring Station (WQMS) that the site's stormwater discharges drain to and the waterbody on which it is located: PD-115 Pocotaligo River
- Qualitative and quantitative assessment (described in Section 3.4C of SCR100000), if nearest WQMS listed on the 2004 303(d) List of Impaired Waters **and** if site's stormwater construction discharges contain the pollutant of impairment **and** if site disturbs 25 or more acres

- Evaluation of selected BMPs if nearest WQMS listed on the 2004 303(d) List of Impaired Waters **and** if site's stormwater construction discharges contain the pollutant of impairment **and** if site disturbs less than 25 acres
- If Approved TMDL developed for nearest WQMS **and** if site's stormwater construction discharges contain the pollutant of impairment, showed that measures and controls on SWPPP met assumptions and requirements of TMDL (may need to contact Watershed Manager for assistance)
- *Note: Contact Department staff for guidance on selection of BMPs based on pollutant of impairment.*

23. NAVIGABLE WATERS – *See Section 23, Not Applicable to this Project*

- Extra plan sheet showing impacts to navigable water and description of activity included if S.C. Navigable Waters (SCNW) crossing and separate SCNW permit has not been obtained for all activities
- *Note: For NOIs initially submitted to delegated entities, if project has SCNW crossing and if separate SCNW permit has not been obtained for this crossing, then this item will be reviewed by S.C. DHEC before NPDES coverage will be granted.*

24. OCRM REQUIREMENTS – *See Section 24, Not Applicable to this Project*

- *Note: The following items only apply to those projects in the eight coastal counties.*
- If a project is within a half-mile of a receiving water body (RWB) or is one (1) or more acre in size, a digital project boundary must be submitted and approved by the OCRM GIS department. If OCRM's review of the project location indicates potential impacts to Coastal Resources on projects disturbing less than or equal to 0.5 acre but within ½ mile of a RWB, then OCRM staff will notify the applicant to submit an NOI. For projects which will disturb more than 0.5 acre and are located within ½ mile of a RWB, the NOI and other pertinent information must be submitted with the digital boundary. Please include the completed digital submittal form along with the electronic boundary. Go to http://www.scdhec.gov/environment/ocrm/permit/stormwater.htm for instructions.
- Any freshwater wetlands on the site must be identified and verified by the US Army Corps of Engineers (USACOE). A Corps wetland verification letter and corresponding signed, sealed and dated wetland plat must accompany the application package. The dates on the plat and verification letter must correspond. The Corp verification letter must reference the plat as an "accurate depiction" and not preliminary or approximation. The plat needs to identify whether or not the wetlands are jurisdictional or non-jurisdictional. Include USACOE permit number on the permit application if applicable.

  If non-jurisdictional wetlands are being impacted, a wetland impact statement as shown below must be completed along with an 8.5 x 11 inch map indicating the wetland acreages, amount and type of impacts. A USGS topographic map should also be submitted indicating the location of the project.

  "This project is proposed to impact ___ acres of Federally non-jurisdictional freshwater wetlands. These proposed impacts require approval under the SCCZM program. This plan will (fill, excavate, otherwise impact) (give individual wetland size by acres) for a total impact of (total acreage). Mitigation will be provided for these proposed impacts by (describe mitigation, giving acreages of preserved wetlands and/or buffers/credits)." If no mitigation is proposed, the notice needs to state as such.
- If saltwater/critical areas are located on the site, an OCRM approved delineation and plat must be included with the submittal package.
- If the proposed project is adjacent to saltwater/critical areas then a dock master plan will need to be submitted (if applicable) with the permit application package.
- Water and Sewer Certification requests if applicable.
- See item #15, 4th bullet of this checklist for additional water quality requirements in the Coastal Zone.

25. SITE PLANS CHECKLIST: - *See Drawings*

- *Note: The Department may require phased sediment and erosion control plans for large or complicated projects.*
- Location map with site outlined on first plan sheet (map should have enough detail to identify Surface Waters of the State within 1 mile of the site) ***– See Sheet 1 of Drawings***
- North arrow and scale – ***See Bottom Right Corner of Drawings***
- Property lines and adjacent landowners' names – ***See Cover Letter***
- Legend – ***See Sheet 1 of Drawings***
- Registered engineer's signed and dated seal – ***See Lower Right Corner of Drawings***

- Engineering Firm's Certificate of Authorization seal – ***See Lower Right Corner of Drawings***
- Existing and proposed contours for entire disturbed area – ***See Drawings***
- Limits of disturbed area – ***See Drawings***
- Locations of off-site material, waste, borrow, or construction equipment storage areas, excluding roll-off containers (*Note: Some off-site disturbed areas may require a separate application for NPDES coverage*) – ***See Cover Letter***
- Location and identification of any stormwater discharges associated with industrial activity (not construction) – ***See Section 4 and Cover Letter.***
- Delineation of WoS, including wetlands (see checklist item 8) – ***See Section 8***
- Easements – ***No Known Easement***
- Road profiles with existing and proposed ground elevations (if no contours are shown on the plans) – ***See Drawings***
- Grassing and stabilization specifications (temporary and permanent) – ***See Drawings***
- Construction sequence (implementation of all stormwater and sediment controls in the first phase of construction; ensure that basins, traps, ponds, etc. can be installed before the area draining to them is cleared and grubbed) – ***See Drawings***
- Standard notes (see following page) – ***See Drawings***
- Temporary and permanent control measures (provide details of all sediment and erosion control measures used; make sure the label or legend on the plans matches the name on the detail) – ***See Drawings***
  Note: Maintenance requirements for each BMP should be listed on the detail.
  Note: If details from the BMP Handbook are used, then the inspection frequency must be changed to be in accordance with the new CGP (see Standard note 3).

Standard Notes

1. If necessary, slopes, which exceed eight (8) vertical feet should be stabilized with synthetic or vegetative mats, in addition to hydroseeding. It may be necessary to install temporary slope drains during construction. Temporary berms may be needed until the slope is brought to grade.

2. Stabilization measures shall be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, but in no case more than fourteen (14) days after work has ceased, except as stated below.
   - **Where stabilization by the 14th day is precluded by snow cover** or frozen ground conditions stabilization measures must be initiated as soon as practicable.
   - Where construction activity on a portion of the Site is temporarily ceased, and earth-disturbing activities will be resumed within 14 days, temporary stabilization measures do not have to be initiated on that portion of the Site.

3. All sediment and erosion control devices shall be inspected every seven (7) days. If site inspections identify BMPs that are damaged or are not operating effectively, maintenance must be performed as soon as practical or as reasonably possible and before the next storm event whenever practicable.

   OR

   All sediment and erosion control devices shall be inspected at least once every fourteen (14) calendar days and within 24 hours of the end of a storm event of 0.5 inches or greater. If site inspections identify BMPs that are damaged or are not operating effectively, maintenance must be performed as soon as practical or as reasonably possible and before the next storm event whenever practicable.

4. Provide silt fence and/or other control devices, as may be required, to control soil erosion during utility construction. All disturbed areas shall be cleaned, graded, and stabilized with grassing immediately after the utility installation. Fill, cover, and temporary seeding at the end of each day are recommended. If water is encountered while trenching, the water should be filtered to remove any sediments before being pumped back into any waters of the State.

5. All erosion control devices shall be properly maintained during all phases of construction until the completion of all construction activities and all disturbed areas have been stabilized. Additional control devices may be required during construction in order to control erosion and/or offsite sedimentation. All temporary control devices shall be removed once construction is complete and the site is stabilized.

6. The contractor must take necessary action to minimize the tracking of mud onto paved roadway(s) from construction areas and the generation of dust. The contractor shall daily remove mud/soil from pavement, as may be required.

7. Residential subdivisions require erosion control features for infrastructure as well as for individual lot construction. Individual property owners shall follow these plans during construction or obtain approval of an individual plan in accordance with S.C Reg. 72-300 et seq. and SCR100000.

8. Temporary diversion berms and/or ditches will be provided as needed during construction to protect work areas from upslope runoff and/or to divert sediment-laden water to appropriate traps or stable outlets.

9. All waters of the State (WoS), including wetlands, are to be flagged or otherwise clearly marked in the field. A double row of silt fence is to be installed in all areas where a 50-foot buffer can't be maintained between the disturbed area and all WoS. A 10-foot buffer should be maintained between the last row of silt fence and all WoS.

10. Litter, construction debris, oils, fuels, and building products with significant potential for impact (such as stockpiles of freshly treated lumber) and construction chemicals that could be exposed to storm water must be prevented from becoming a pollutant source in storm water discharges.

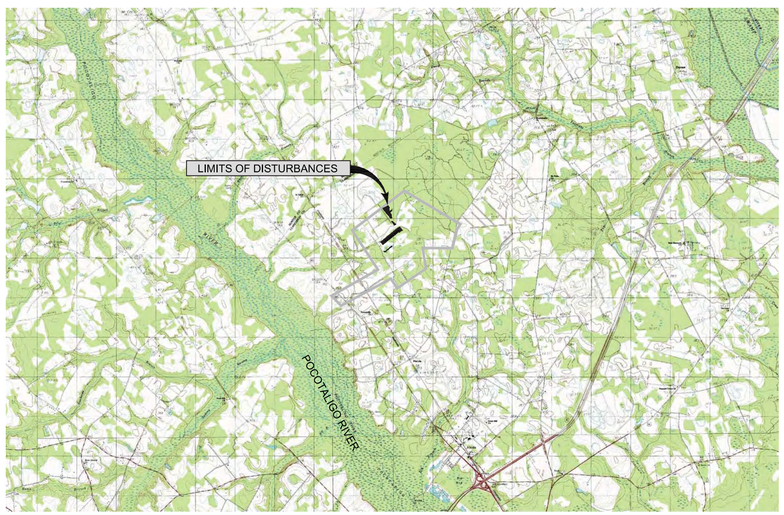
Section 1
Completed Notice of Intent Application Form DHEC 2617

See Attachment 1.

Section 2
Copies of Plans and Applications

See drawings.

NOI AND SWPPP MODIFICATIONS FOR PROPOSED 2011 SITE IMPROVEMENTS
GP CLARENDON LP
8250 SUMTER HIGHWAY, ALCOLU, SC 29001
JANUARY 2011



USGS TOPO MAP

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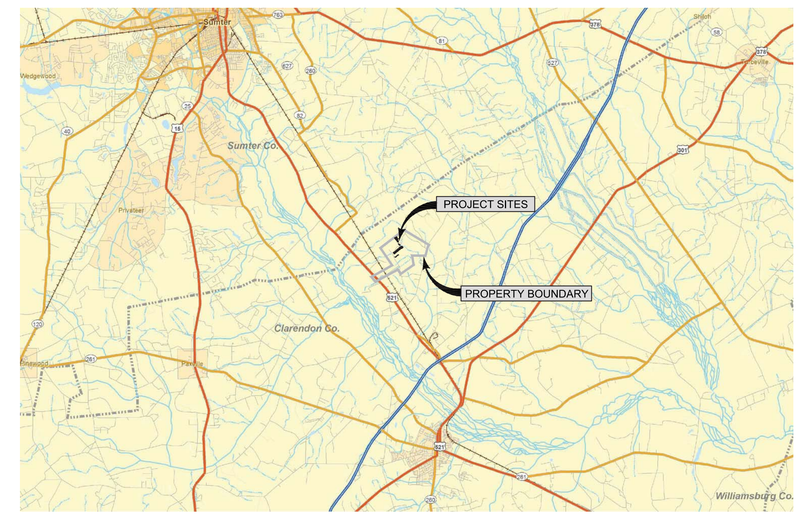


LOCATION MAP

0 1 2 4 6
SCALE IN MILES

GENERAL NOTES

1. SURVEY DATA TAKEN FROM A TOPOGRAPHICAL SURVEY PERFORMED BY GLENN ASSOCIATES SURVEYING, INC. AERIAL MAPPING SERVICES PROVIDED BY GEODATA CORPORATION–DIGITAL MAPPING SERVICES.
2. COORDINATES ARE LOCALIZED TO SOUTH CAROLINA GRID NAD'83, STATE PLANE, ZONE 3900.
3. THESE PLANS ARE ACCOMPANIED BY A NARRATIVE DOCUMENT ENTITLED "EROSION CONTROL AND SEDIMENT CONTROL PLAN" DATED DECEMBER 2010.
4. ALL EXISTING SURVEY CONTROL POINTS SHALL BE VERIFIED THROUGH GP CLARENDON LP ENGINEERING PRIOR TO BEGINNING NEW WORK.
5. THE PROJECT SITE IS LOCATED IN CLARENDON COUNTY, NORTHWEST OF THE TOWN OF ALCOLU, AS SHOWN ON THE LOCATION MAP.
6. SEE SHEET 9 OF 9 FOR EROSION AND SEDIMENT CONTROL NOTES.

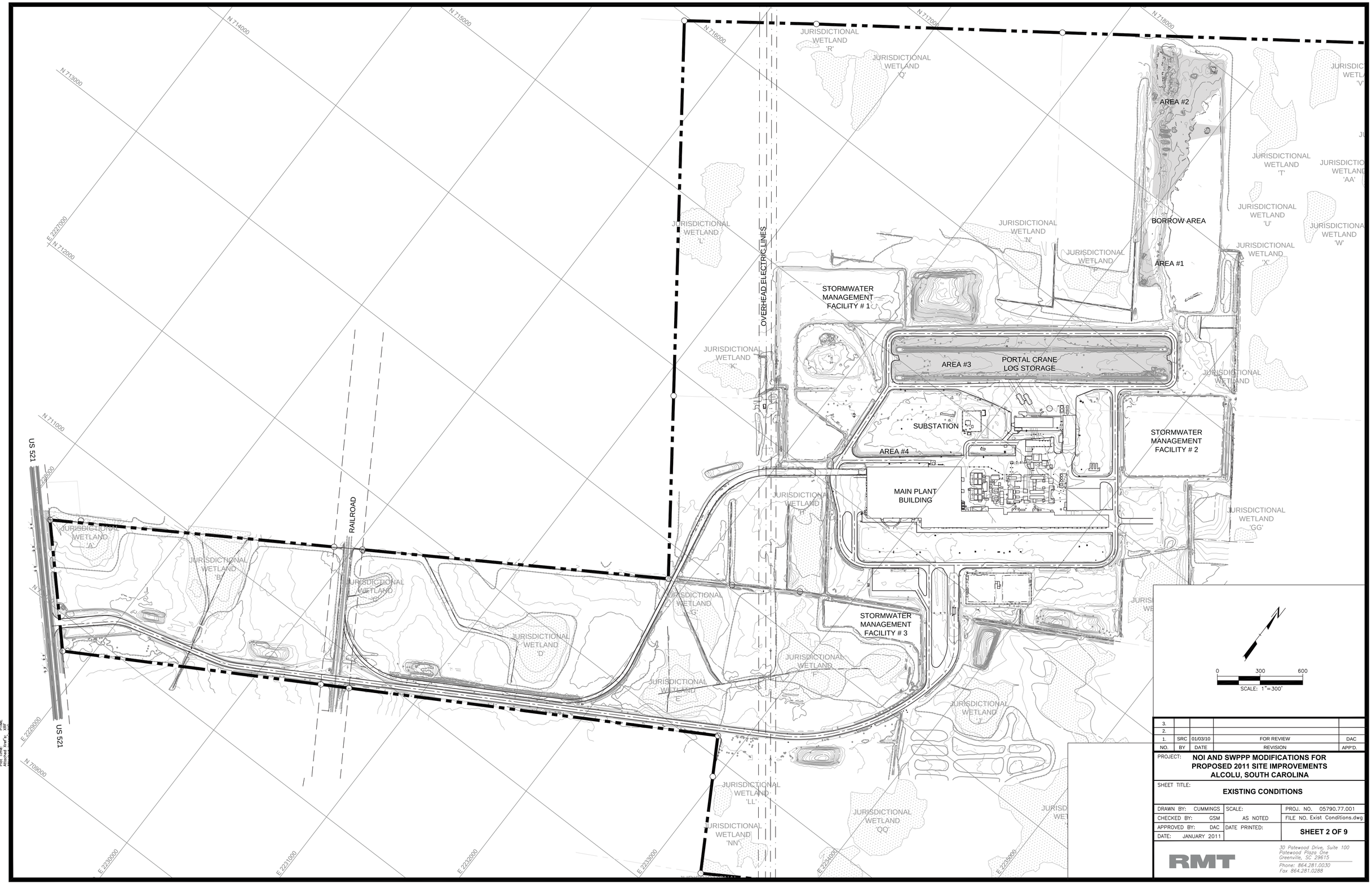
LEGEND

	EXISTING	NEW
CONTOUR	62	65
TREE LINE		
PROPERTY LINE		
SILT FENCE		
LIMITS OF DISTURBANCE		LOD
WETLANDS		
ROCK DITCH CHECK		

DRAWING INDEX

SHEET NO.	TITLE
1 OF 9	TITLE SHEET
2 OF 9	EXISTING CONDITIONS
3 OF 9	PREDEVELOPMENT/POSTDEVELOPMENT DRAINAGE AREAS
4 OF 9	AREA #1 BORROW AREA IMPROVEMENTS
5 OF 9	AREA #2 BORROW AREA IMPROVEMENTS
6 OF 9	AREA # 3 LOG STORAGE AREA IMPROVEMENTS
7 OF 9	AREA #4 RELOCATE DITCH NORTHWEST
8 OF 9	DETAILS
9 OF 9	DETAILS

RMT



NO.	BY	DATE	REVISION	APP'D.
3.				
2.				
1.	SRC	01/03/10	FOR REVIEW	DAC

PROJECT: **NOI AND SWPPP MODIFICATIONS FOR PROPOSED 2011 SITE IMPROVEMENTS ALCOLU, SOUTH CAROLINA**

SHEET TITLE: **EXISTING CONDITIONS**

DRAWN BY: CUMMINGS	SCALE:	PROJ. NO. 05790.77.001
CHECKED BY: GSM	AS NOTED	FILE NO. Exist Conditions.dwg
APPROVED BY: DAC	DATE PRINTED:	**SHEET 2 OF 9**
DATE: JANUARY 2011		

RMT
30 Patewood Drive, Suite 100
Patewood Plaza One
Greenville, SC 29615
Phone: 864.281.0030
Fax 864.281.0288

PLOT DATA
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Drawing Number: DWGN
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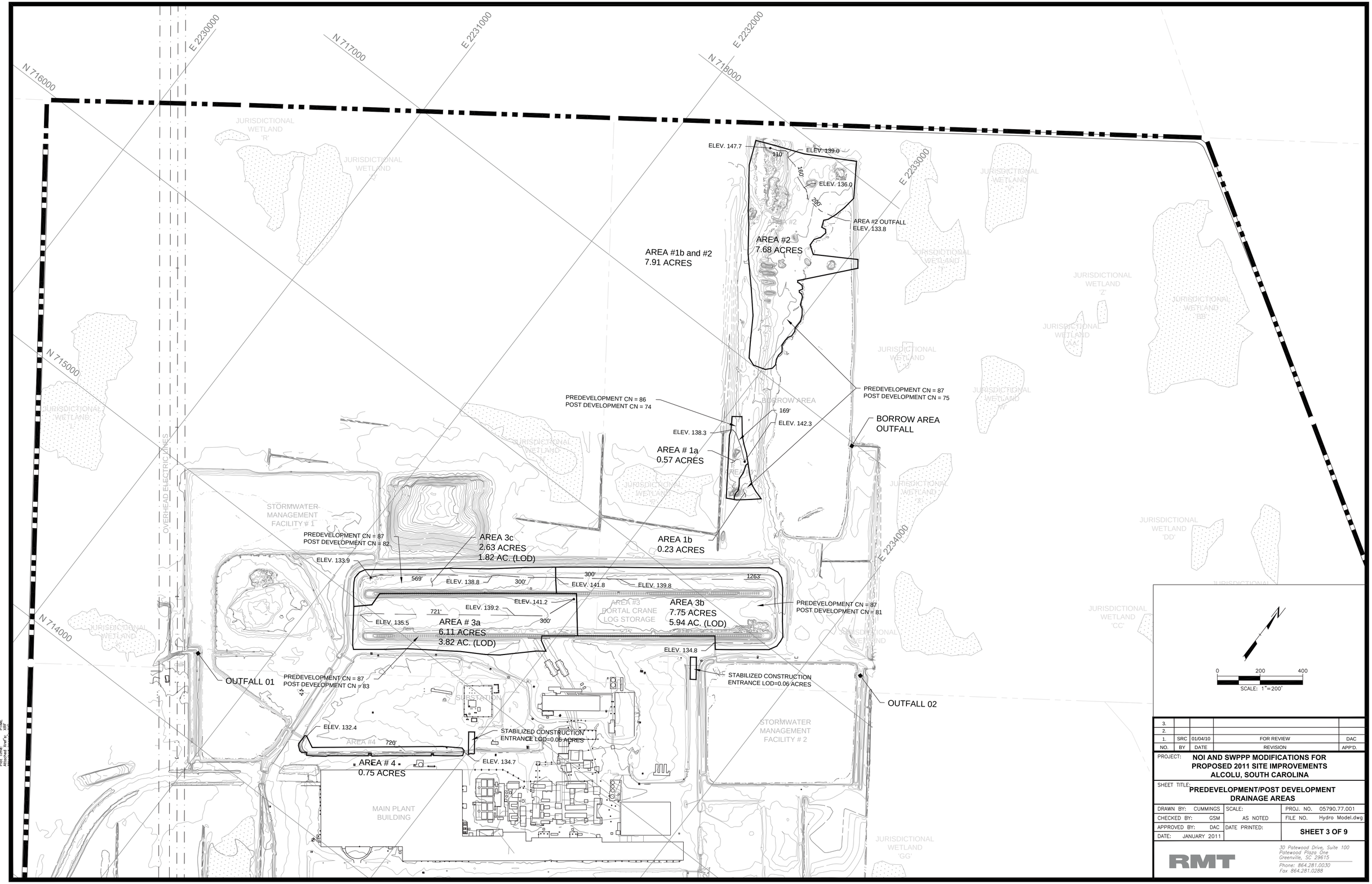

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NO.	BY	DATE	REVISION	APP'D.
3.				
2.				
1.	SRC	01/04/10	FOR REVIEW	DAC

PROJECT: **NOI AND SWPPP MODIFICATIONS FOR PROPOSED 2011 SITE IMPROVEMENTS ALCOLU, SOUTH CAROLINA**

SHEET TITLE: **PREDEVELOPMENT/POST DEVELOPMENT DRAINAGE AREAS**

DRAWN BY: CUMMINGS	SCALE:	PROJ. NO.	05790.77.001
CHECKED BY: GSM	AS NOTED	FILE NO.	Hydro Model.dwg
APPROVED BY: DAC	DATE PRINTED:	**SHEET 3 OF 9**	
DATE: JANUARY 2011			

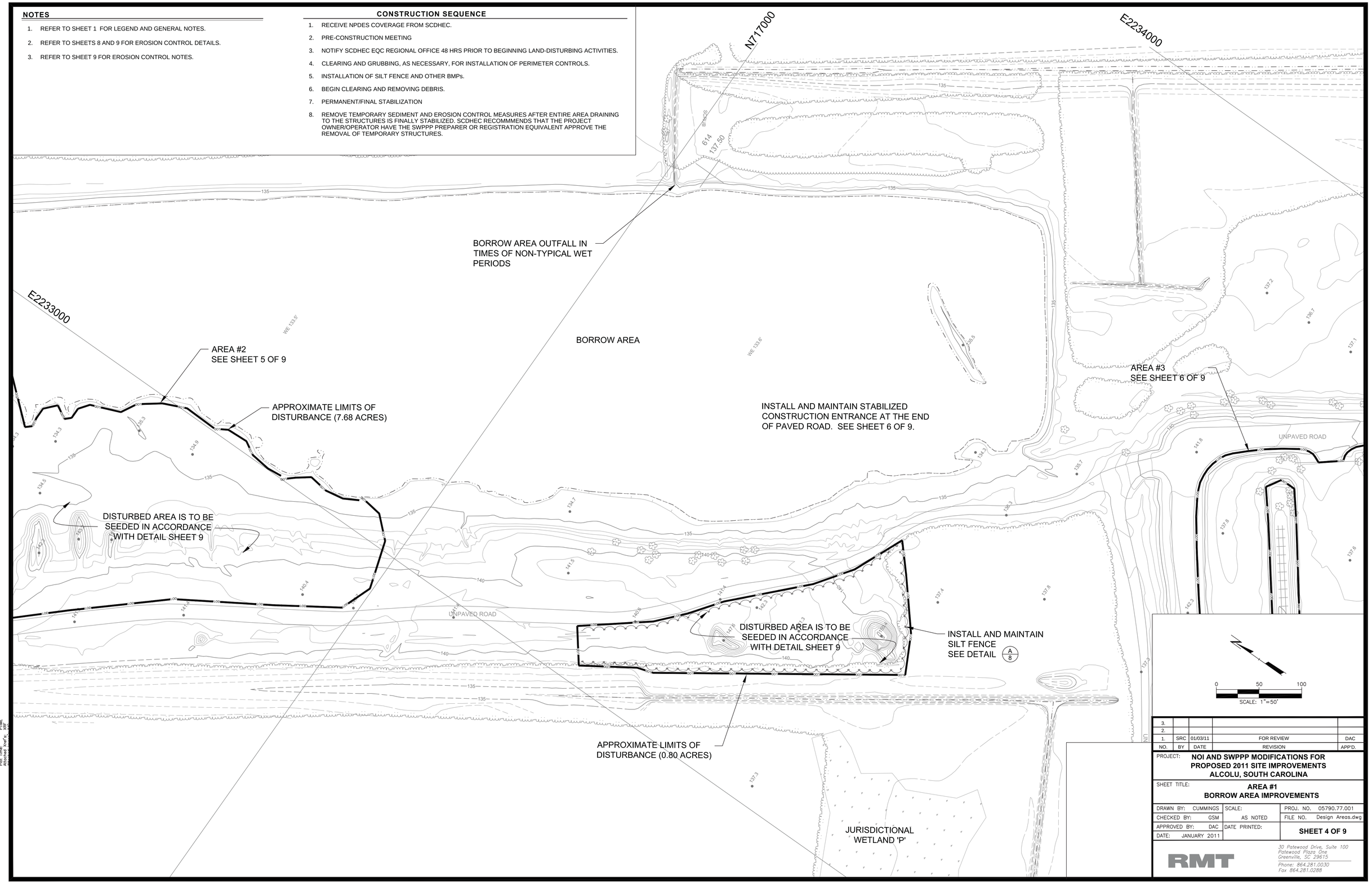
RMT
30 Patewood Drive, Suite 100
Patewood Plaza One
Greenville, SC 29615
Phone: 864.281.0030
Fax: 864.281.0288

NOTES

1. REFER TO SHEET 1 FOR LEGEND AND GENERAL NOTES.
2. REFER TO SHEETS 8 AND 9 FOR EROSION CONTROL DETAILS.
3. REFER TO SHEET 9 FOR EROSION CONTROL NOTES.

CONSTRUCTION SEQUENCE

1. RECEIVE NPDES COVERAGE FROM SCDHEC.
2. PRE-CONSTRUCTION MEETING
3. NOTIFY SCDHEC EQC REGIONAL OFFICE 48 HRS PRIOR TO BEGINNING LAND-DISTURBING ACTIVITIES.
4. CLEARING AND GRUBBING, AS NECESSARY, FOR INSTALLATION OF PERIMETER CONTROLS.
5. INSTALLATION OF SILT FENCE AND OTHER BMPs.
6. BEGIN CLEARING AND REMOVING DEBRIS.
7. PERMANENT/FINAL STABILIZATION
8. REMOVE TEMPORARY SEDIMENT AND EROSION CONTROL MEASURES AFTER ENTIRE AREA DRAINING TO THE STRUCTURES IS FINALLY STABILIZED. SCDHEC RECOMMMENDS THAT THE PROJECT OWNER/OPERATOR HAVE THE SWPPP PREPARER OR REGISTRATION EQUIVALENT APPROVE THE REMOVAL OF TEMPORARY STRUCTURES.



NO.	BY	DATE	REVISION	APP'D.
3.				
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1.	SRC	01/03/11	FOR REVIEW	DAC

PROJECT: **NOI AND SWPPP MODIFICATIONS FOR PROPOSED 2011 SITE IMPROVEMENTS ALCOLU, SOUTH CAROLINA**

SHEET TITLE: **AREA #1 BORROW AREA IMPROVEMENTS**

DRAWN BY: CUMMINGS	SCALE:	PROJ. NO. 05790.77.001
CHECKED BY: GSM	AS NOTED	FILE NO. Design Areas.dwg
APPROVED BY: DAC	DATE PRINTED:	**SHEET 4 OF 9**
DATE: JANUARY 2011		

RMT
30 Patewood Drive, Suite 100
Patewood Plaza One
Greenville, SC 29615
Phone: 864.281.0030
Fax 864.281.0288

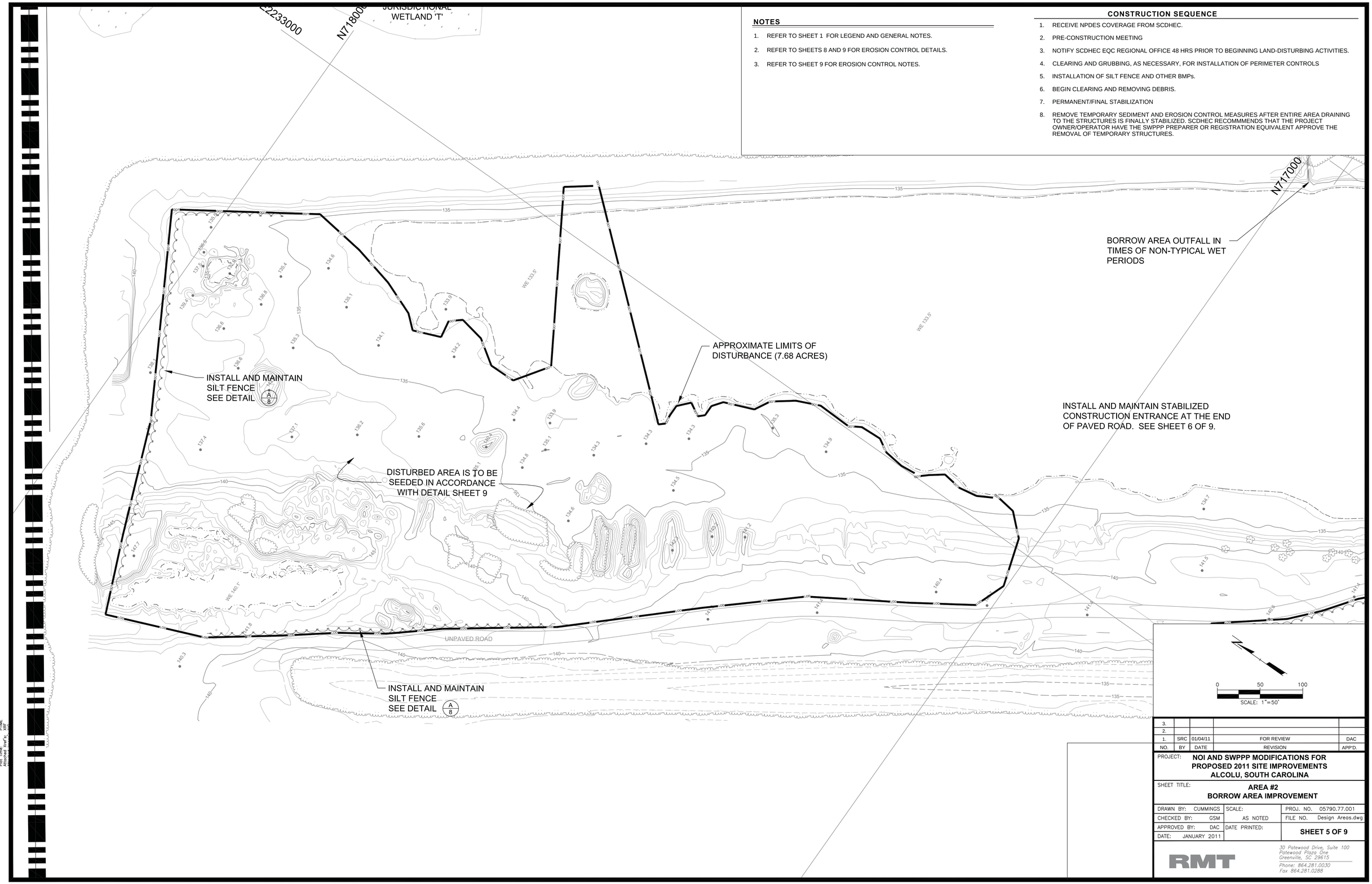
PLOT DATA
Drawing Name: DUNN
Drawing Number: 05790
Scale: SCL
Sheet Size: PLATE
Plot Date: PLOT
Plot Time: 10:00
Attached Xref's: XREF

NOTES

1. REFER TO SHEET 1 FOR LEGEND AND GENERAL NOTES.
2. REFER TO SHEETS 8 AND 9 FOR EROSION CONTROL DETAILS.
3. REFER TO SHEET 9 FOR EROSION CONTROL NOTES.

CONSTRUCTION SEQUENCE

1. RECEIVE NPDES COVERAGE FROM SCDHEC.
2. PRE-CONSTRUCTION MEETING
3. NOTIFY SCDHEC EQC REGIONAL OFFICE 48 HRS PRIOR TO BEGINNING LAND-DISTURBING ACTIVITIES.
4. CLEARING AND GRUBBING, AS NECESSARY, FOR INSTALLATION OF PERIMETER CONTROLS
5. INSTALLATION OF SILT FENCE AND OTHER BMPs.
6. BEGIN CLEARING AND REMOVING DEBRIS.
7. PERMANENT/FINAL STABILIZATION
8. REMOVE TEMPORARY SEDIMENT AND EROSION CONTROL MEASURES AFTER ENTIRE AREA DRAINING TO THE STRUCTURES IS FINALLY STABILIZED. SCDHEC RECOMMMENDS THAT THE PROJECT OWNER/OPERATOR HAVE THE SWPPP PREPARER OR REGISTRATION EQUIVALENT APPROVE THE REMOVAL OF TEMPORARY STRUCTURES.



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3.				
2.				
1.	SRC	01/04/11	FOR REVIEW	DAC

PROJECT: **NOI AND SWPPP MODIFICATIONS FOR PROPOSED 2011 SITE IMPROVEMENTS ALCOLU, SOUTH CAROLINA**

SHEET TITLE: **AREA #2 BORROW AREA IMPROVEMENT**

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CHECKED BY: GSM	AS NOTED	FILE NO. Design Areas.dwg
APPROVED BY: DAC	DATE PRINTED:	**SHEET 5 OF 9**
DATE: JANUARY 2011		

RMT
30 Patewood Drive, Suite 100
Patewood Plaza One
Greenville, SC 29615
Phone: 864.281.0030
Fax 864.281.0288

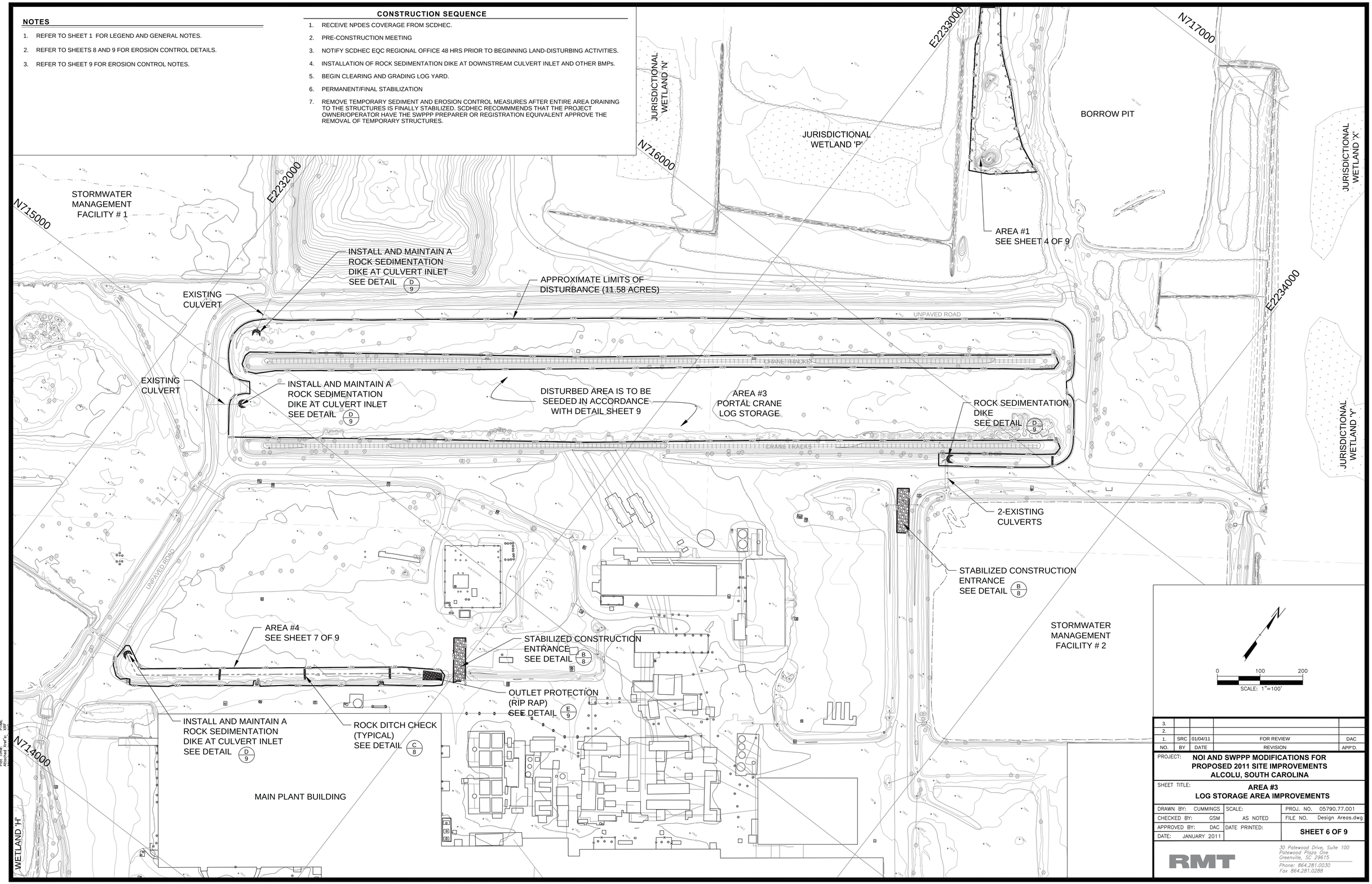
PLOT DATA
Drawing Name: INAK
Drawing Type: PDMR
Scale: SCL
Drawing Size: SIZE
Plot Date: PRMTE
Plot Time: PRMTT
Attached Xref's: XRF

NOTES

1. REFER TO SHEET 1 FOR LEGEND AND GENERAL NOTES.
2. REFER TO SHEETS 8 AND 9 FOR EROSION CONTROL DETAILS.
3. REFER TO SHEET 9 FOR EROSION CONTROL NOTES.

CONSTRUCTION SEQUENCE

1. RECEIVE NPDES COVERAGE FROM SCDHEC.
2. PRE-CONSTRUCTION MEETING
3. NOTIFY SCDHEC EQC REGIONAL OFFICE 48 HRS PRIOR TO BEGINNING LAND-DISTURBING ACTIVITIES.
4. INSTALLATION OF ROCK SEDIMENTATION DIKE AT DOWNSTREAM CULVERT INLET AND OTHER BMPs.
5. BEGIN CLEARING AND GRADING LOG YARD.
6. PERMANENT/FINAL STABILIZATION
7. REMOVE TEMPORARY SEDIMENT AND EROSION CONTROL MEASURES AFTER ENTIRE AREA DRAINING TO THE STRUCTURES IS FINALLY STABILIZED. SCDHEC RECOMMMENDS THAT THE PROJECT OWNER/OPERATOR HAVE THE SWPPP PREPARER OR REGISTRATION EQUIVALENT APPROVE THE REMOVAL OF TEMPORARY STRUCTURES.



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1.	SRC	01/04/11	FOR REVIEW	DAC

PROJECT: **NOI AND SWPPP MODIFICATIONS FOR PROPOSED 2011 SITE IMPROVEMENTS ALCOLU, SOUTH CAROLINA**

SHEET TITLE: **AREA #3 LOG STORAGE AREA IMPROVEMENTS**

DRAWN BY: CUMMINGS	SCALE:	PROJ. NO. 05790.77.001	
CHECKED BY: GSM	AS NOTED	FILE NO. Design Areas.dwg	
APPROVED BY: DAC	DATE PRINTED:	**SHEET 6 OF 9**	
DATE: JANUARY 2011			

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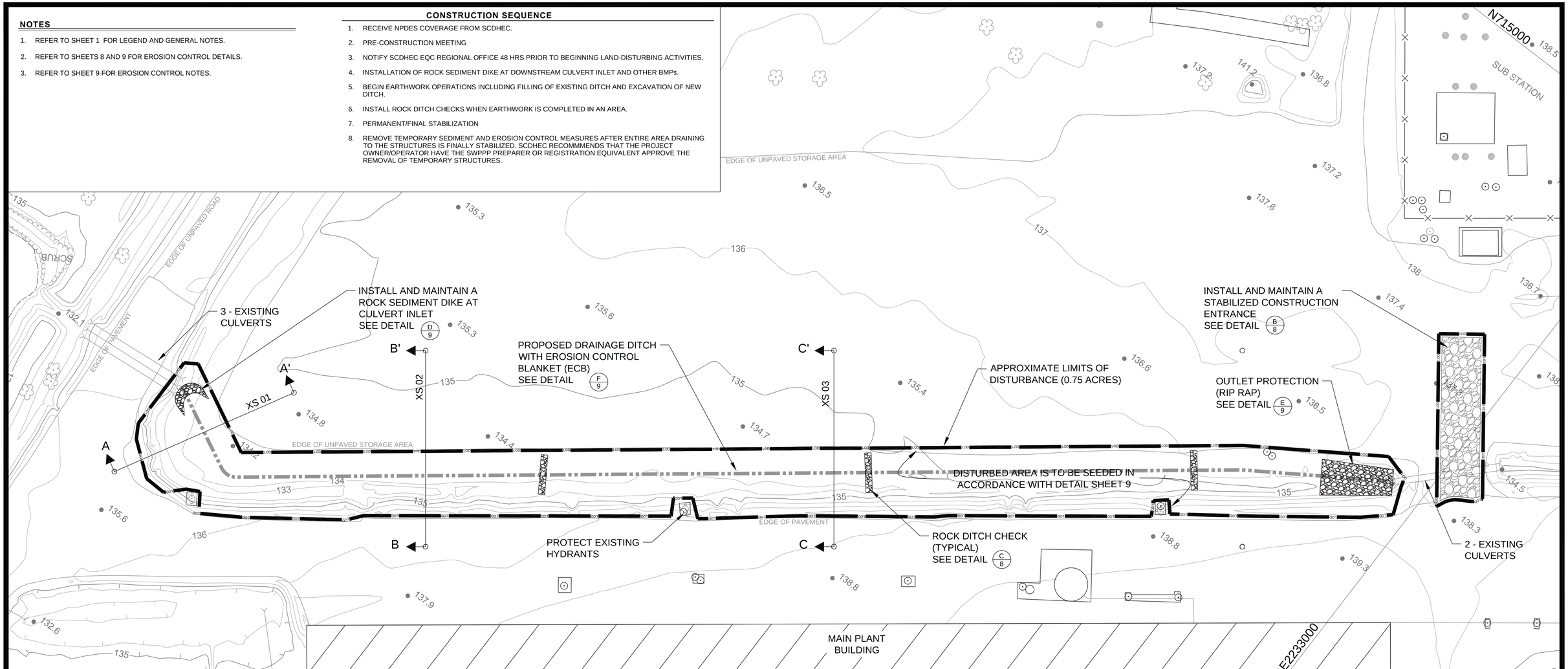
PLOT DATA
Drawing Name: NOAI PORT
Drawing Type: DGN
Scale: SQ1
Date Stamp: PLANE
Plot Date: PLANE
Plotted By: ABF
Attached Xref's: ABF

NOTES

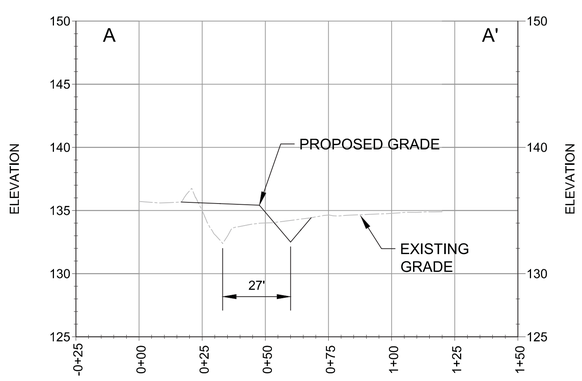
1. REFER TO SHEET 1 FOR LEGEND AND GENERAL NOTES.
2. REFER TO SHEETS 8 AND 9 FOR EROSION CONTROL DETAILS.
3. REFER TO SHEET 9 FOR EROSION CONTROL NOTES.

CONSTRUCTION SEQUENCE

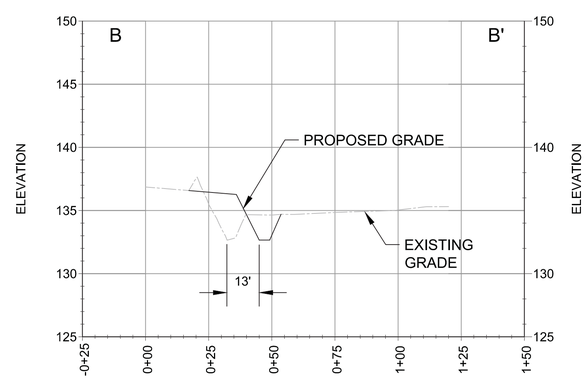
1. RECEIVE NPDES COVERAGE FROM SCDHEC.
2. PRE-CONSTRUCTION MEETING
3. NOTIFY SCDHEC EQC REGIONAL OFFICE 48 HRS PRIOR TO BEGINNING LAND-DISTURBING ACTIVITIES.
4. INSTALLATION OF ROCK SEDIMENT DIKE AT DOWNSTREAM CULVERT INLET AND OTHER BMPs.
5. BEGIN EARTHWORK OPERATIONS INCLUDING FILLING OF EXISTING DITCH AND EXCAVATION OF NEW DITCH.
6. INSTALL ROCK DITCH CHECKS WHEN EARTHWORK IS COMPLETED IN AN AREA.
7. PERMANENT/FINAL STABILIZATION
8. REMOVE TEMPORARY SEDIMENT AND EROSION CONTROL MEASURES AFTER ENTIRE AREA DRAINING TO THE STRUCTURES IS FINALLY STABILIZED. SCDHEC RECOMMMENDS THAT THE PROJECT OWNER/OPERATOR HAVE THE SWPPP PREPARER OR REGISTRATION EQUIVALENT APPROVE THE REMOVAL OF TEMPORARY STRUCTURES.



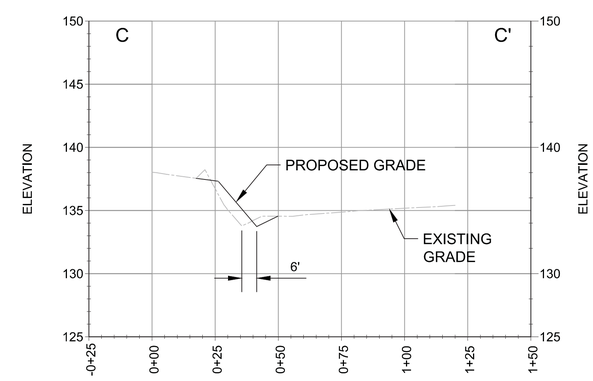
DITCH XS 01 SECTION

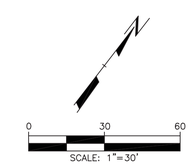


DITCH XS 02 SECTION



DITCH XS 03 SECTION





NO.	BY	DATE	REVISION	APP'D.
3.				
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1.	SRC	01/04/11	FOR REVIEW	DAC

PROJECT: **NOI AND SWPPP MODIFICATIONS FOR PROPOSED 2011 SITE IMPROVEMENTS ALCOLU, SOUTH CAROLINA**

SHEET TITLE: **AREA #4 RELOCATE DITCH NORTHWEST**

DRAWN BY: CUMMINGS	SCALE:	PROJ. NO. 05790.77.001	
CHECKED BY: GSM	AS NOTED	FILE NO. Design Areas.dwg	
APPROVED BY: DAC	DATE PRINTED:	**SHEET 7 OF 9**	
DATE: JANUARY 2011			

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PLOT DATA
Drawing Name: DUNK
Drawing Type: PDMR
Scale: SCL
Paper Size: PSIZE
Plot Date: PDATE
Plot Time: PTIME
Attached Xref's: XREF

SILT FENCE DETAIL

When and Where to Use It

Silt fence is applicable in areas:
Where the maximum sheet or overland flow path length to the fence is 100–feet.
Where the maximum slope steepness (normal [perpendicular] to fence line) is 2H:1V.
That do not receive concentrated flows greater than 0.5 cfs.
Do not place silt fence across channels or use it as a velocity control BMP.

Materials

Steel Posts
Use 48–inch long steel posts that meet the following minimum physical requirements:
Composed of high strength steel with minimum yield strength of 50,000 psi.
Have a standard "T" section with a nominal face width of 1.38–inches and nominal "T" length of 1.48–inches.
Weigh 1.25 pounds per foot (+–8%).
Have a soil stabilization plate with a minimum cross section area of 17–square inches attached to the steel posts.
Painted with a water based baked enamel paint.
Use steel posts with a minimum length of 4–feet, weighing 1.25 pounds per linear foot (+–8%) with projections to aid in fastening the fabric.
Except when heavy clay soils are present on site, steel posts will have a metal soil stabilization plate welded near the bottom such that when the post is driven to the proper depth, the plate will be below the ground level for added stability.
The soil plates should have the following characteristics:
Be composed of minimum 15 gauge steel,
Have a minimum cross section area of 17–square inches.

Geotextile Filter Fabric

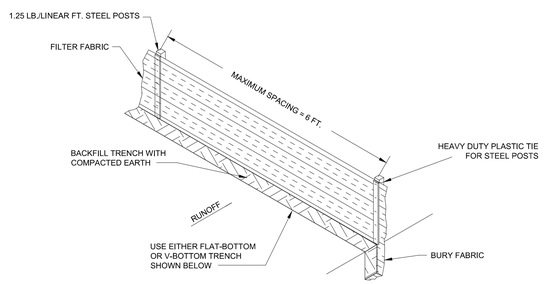
Filter fabric is:
Composed of fibers consisting of long chain synthetic polymers composed of at least 85% by weight of polyolefins, polyesters, or polyamides.
Formed into a network such that the filaments or yarns retain dimensional stability relative to each other.
Free of any treatment or coating which might adversely alter its physical properties after installation.
Free of defects or flaws that significantly affect its physical and/or filtering properties.
Cut to a minimum width of 36 inches.
Use only fabric appearing on SCDOT Approval Sheet #34 meeting the requirements of the most current edition of the SCDOT Standard Specifications for Highway Construction.

Installation

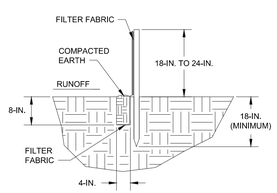
Excavate a trench approximately 6–inches wide and 6–inches deep when placing fabric by hand.
Place 12–inches of geotextile fabric into the 6–inch deep trench, extending the remaining 6–inches towards the upslope side of the trench.
Backfill the trench with soil or gravel and compact.Bury 12–inches of fabric into the ground when pneumatically installing silt fence with a slicing method.
Purchase fabric in continuous rolls and cut to the length of the barrier to avoid joints.
When joints are necessary, wrap the fabric together at a support post with both ends fastened to the post, with a 6–inch minimum overlap.
Install posts to a minimum depth of 24–inches. Install posts a minimum of 1– to 2– inches above the fabric, with no more than 3–feet of the post above the ground.
Space posts to maximum 6–feet centers. Attach fabric to wood posts using staples made of heavy–duty wire at least 1½–inch long, spaced a maximum of 6–inches apart.
Staple a 2–inch wide lathe over the filter fabric to securely fasten it to the upslope side of wooden posts.
Attach fabric to the steel posts using heavy–duty plastic ties that are evenly spaced and placed in a manner to prevent sagging or tearing of the fabric.
In all cases, ties should be affixed in no less than 4 places.
Install the fabric a minimum of 24–inches above the ground.
When necessary, the height of the fence above ground may be greater than 24–inches. In tidal areas, extra silt fence height may be required. The post height will be twice the exposed post height.
Post spacing will remain the same and extra height fabric will be 4–, 5–, or 6–feet tall. Locate silt fence checks every 100 feet maximum and at low points.
Install the fence perpendicular to the direction of flow and place the fence the proper distance from the toe of steep slopes to provide sediment storage and access for maintenance and cleanout.

Inspection and Maintenance

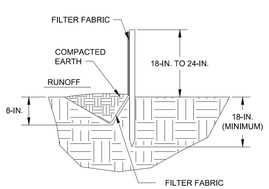
Inspect every seven calendar days. Check for sediment buildup and fence integrity. Check where runoff has eroded a channel beneath the fence, or where the fence has sagged or collapsed by fence overtopping.
If the fence fabric tears, begins to decompose, or in any way becomes ineffective, replace the section of fence immediately.
Remove sediment accumulated along the fence when it reaches 1/3 the height of the fence, especially if heavy rains are expected.
Remove trapped sediment from the site or stabilize it on site.
Remove silt fence within 30 days after final stabilization is achieved or after temporary best management practices (BMPs) are no longer needed.
Permanently stabilize disturbed areas resulting from fence removal.



SILT FENCE INSTALLATION



FLAT-BOTTOM TRENCH DETAIL



V-SHAPED TRENCH DETAIL

A / 8 — **TYPICAL SILT FENCE DETAIL**
NOT TO SCALE

STABILIZED CONSTRUCTION ENTRANCE

Inspection and Maintenance:

Inspect construction entrances every seven (7) calendar days. Check for mud and sediment buildup and pad integrity.
Make daily inspections during periods of wet weather. Maintenance is required more frequently in wet weather conditions.
Reshape the stone pad as needed for drainage and runoff control.
Wash or replace stones as needed and as directed by the inspector. The stone in the entrance should be washed or replaced whenever the entrance fails to reduce mud being carried off–site by vehicles.
Frequent washing will extend the useful life of stone.Immediately remove mud and sediment tracked or washed onto public roads by brushing or sweeping.
Flushing should only be used when the water can be discharged to a sediment trap or basin.
Repair any broken pavement immediately.

When and Where to Use It

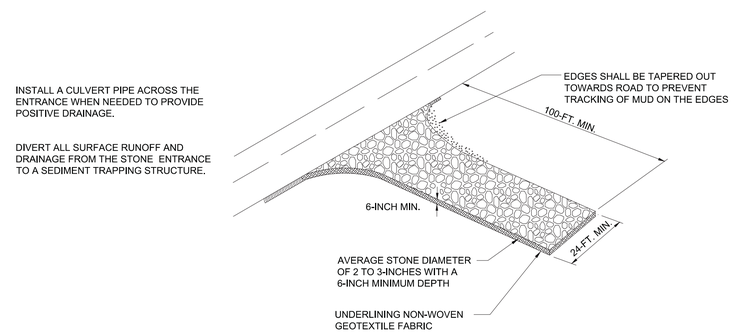
Stabilized construction entrances should be used at all points where traffic will be leaving a construction site and moving directly onto a public road.

Important Considerations

If washing is used, provisions must be made to intercept the wash water and trap the sediment before it is carried offsite. Washdown facilities shall be required as directed by SCDHEC as needed. Washdown areas in general must be established with crushed gravel and drain into a sediment trap or sediment basin. Construction entrances should be used in conjunction with the stabilization of construction roads to reduce the amount of mud picked up by vehicles.

Installation

Remove all vegetation and any objectionable material from the foundation area.
Divert all surface runoff and drainage from stones to a sediment trap or basin.
Install a non–woven geotextile fabric prior to placing any stone.
Install a culvert pipe across the entrance when needed to provide positive drainage.
The edges of the entrance shall be tapered out towards the road to prevent tracking of mud at the edge of the entrance. Entrance shall consist of 1–inch to 3–inch D50 stone placed at a minimum depth of 6–inches.
Minimum dimensions of the entrance shall be 24 feet wide by 100–feet long, and may be modified as necessary to accommodate site constraints.



B / 8 — **STABILIZED CONSTRUCTION ENTRANCE**
NOT TO SCALE

ROCK DITCH CHECK

When and Where to Use It

A rock ditch check should be installed in steeply sloped swales, or in swales where adequate vegetation cannot be established.
Rock ditch checks should be used only in small open channels. Rock ditch checks should not be placed in waters of the state or USGS blue–line streams (unless approved by SCDHEC or Federal authorities).

Installation:

A non–woven geotextile fabric shall be installed over the soil surface where the rock ditch check is to be placed.

The body of the rock ditch check shall be composed of 12–inch D50 Riprap.

The upstream face of the rock ditch check may be composed of 1–inch D50 washed stone.

Rock ditch checks should not exceed a height of 2–feet at the centerline of the channel.

Rock ditch checks should have a minimum top flow length of 2–feet.

Stone should be placed over the channel banks to prevent water from cutting around the ditch check.

The rock must be placed by hand or mechanical placement (no dumping of rock to form dam) to achieve complete coverage of the ditch or swale and to ensure that the center of the check is lower than the edges.

The maximum spacing between the dams should be such that the toe of the upstream check is at the same elevation as the top of the downstream check.

Inspection and Maintenance:

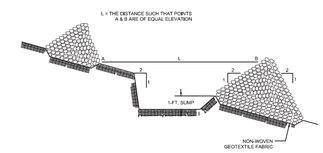
Inspect rock ditch checks every seven (7) calendar days. Inspect for sediment and debris accumulation. Inspect ditch check edges for erosion and repair promptly as required.

Sediment should be removed when it reaches 1/3 the original check height.

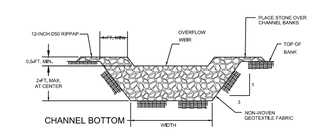
In the case of grass–lined ditches and swales, rock ditch checks should be removed when the grass has matured sufficiently to protect the ditch or swale unless the slope of the swale is greater than 4%.

After construction is complete, all stone should be removed by the grading contractor if vegetation will be used for permanent erosion control measures.

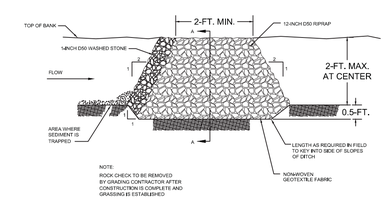
The area beneath the rock ditch checks should be seeded and mulched immediately after rock check dam removal.



SPACING BETWEEN DITCH CHECK



CROSS SECTION A-A THRU STONE DITCH CHECK



TYPICAL DITCH CHECK SECTION

C / 8 — **ROCK DITCH CHECK**
NOT TO SCALE

NO.	BY	DATE	REVISION	APP'D.
3.				
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1.	SRC	01/03/11	ISSUED FOR SCDHEC REVIEW	DAC

PROJECT: **NOI AND SWPPP MODIFICATIONS FOR PROPOSED 2011 SITE IMPROVEMENTS ALCOLU, SOUTH CAROLINA**

SHEET TITLE: **DETAILS**

DRAWN BY: REYZEKD	SCALE:	PROJ. NO.	05790.77.001
CHECKED BY: GSM	AS NOTED	FILE NO.	Detail-Erosion.dwg
APPROVED BY: DAC	DATE PRINTED:	**SHEET 8 OF 9**	
DATE: JANUARY 2011			

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ROCK SEDIMENT DIKE

When and Where to Use It:

Rock sediment dikes are most effective in areas where sediment control is needed with minimal disturbance. They can be used as sediment control structures for the outfalls of diversion swales, diversion dikes, in low areas or other areas where concentrated sediment laden flow is expected. Rock sediment dikes should not be placed in Waters of the State or any other streams that have a base flow.

Installation:

A non-woven geotextile fabric shall be installed over the soil surface where the rock sediment dike is to be placed.

The body of the rock sediment dike shall be composed of minimum 9-inch D50 Riprap.

The upstream face of the rock sediment dike shall be composed of a 1-foot thick layer of 3/4-inch to 1-inch D50 washed stone placed at a slope of 2H:1V.

Rock sediment dikes shall have a minimum top flow length of 3-feet (2-foot flow length through the riprap and 1-foot flow length through the washed stone).

The rock must be placed by hand or mechanical placement (no dumping of rock to form the sediment dike) to achieve the proper dimensions.

A sediment sump shall be located on the upstream side of the structure to provide sediment storage. The upstream side of the sediment sump shall have a slope of 5H:1V to inhibit erosion of the sediment storage area. The minimum depth of the sediment sump shall be 2-feet. Mark the sediment cleanout level of the sediment dike with a stake in the field.

Seed and mulch all disturbed areas.

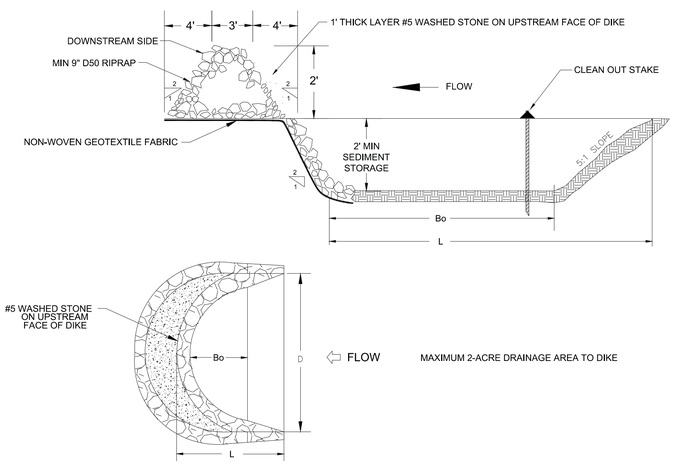
Inspection and Maintenance:

The key to a functional rock sediment dike is continual monitoring, regular maintenance and regular sediment removal.

Regular inspections should be done every seven (7) calendar days.

Remove sediment when it reaches 50% of the sediment storage volume or when reaches the top of cleanout stake.
Removed sediment from the sump should be removed from, or stabilized on site.

All rock sediment dikes should be removed within 30 days after final site stabilization is achieved or after they are no longer needed. Disturbed areas resulting from the removal of rock sediment dikes should be permanently stabilized.

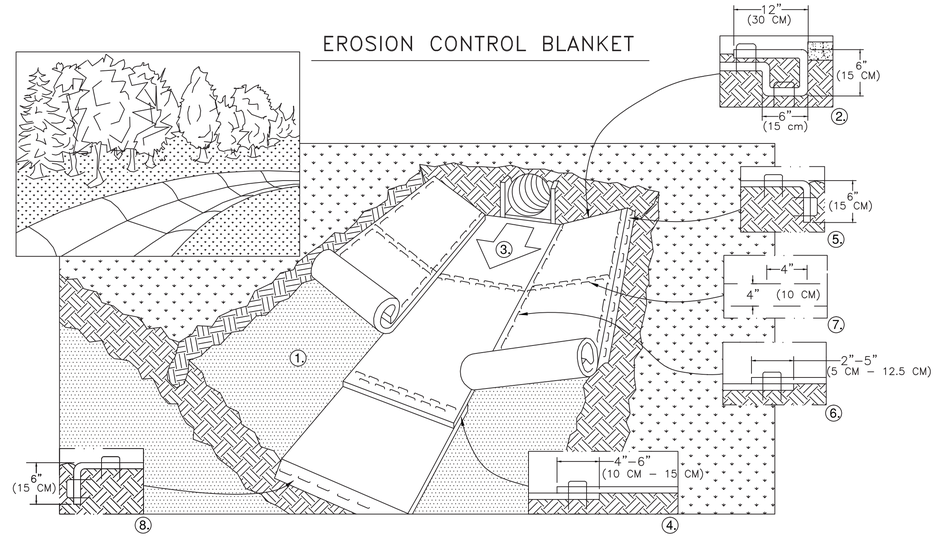


TYPICAL ROCK DIKE DIMENSIONS

D	L	Bo	PEAK FLOW (CFS)	TOTAL STORAGE VOL. (CU. FT.)	SEDIMENT STORAGE VOLUME (CU. FT.)
15'	17.5'	3.5'	24.1	838	250
20'	20.0'	6.0'	32.1	1263	406
25'	22.5'	8.5'	40.1	1766	601
30'	25.0'	11.0'	48.2	2348	836

D / 9 **ROCK SEDIMENT DIKE**
NOT TO SCALE

EROSION CONTROL BLANKET



1. PREPARE SOIL BEFORE INSTALLING ROLLED EROSION CONTROL PRODUCTS (RECP's), INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED. NOTE: WHEN USING CELL-O-SEED DO NOT SEED PREPARED AREA. CELL-O-SEED MUST BE INSTALLED WITH PAPER SIDE DOWN.
2. BEGIN AT THE TOP OF THE CHANNEL BY ANCHORING THE RECP's IN A 6" (15 CM) DEEP X 6" (15 CM) WIDE TRENCH WITH APPROXIMATELY 12" (30 CM) OF RECP's EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE RECP's WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" (30 CM) APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMAPCT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" (30 CM) PORTION OF RECP's BACK OVER SEED AND COMPACTED SOIL. SECURE RECP's OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" (30 CM) ACROSS THE WIDTH OF THE RECP's.
3. ROLL CENTER RECP's IN DIRECTION OF WATER FLOW IN BOTTOM OF CHANNEL. RECP's WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL RECP's MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING THE DOT SYSTEM™, STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
4. PLACE CONSECUTIVE RECP's END OVER END (SHINGLE STYLE) WITH A 4" - 6" (10 CM -15 CM) OVERLAP. USE A DOUBLE ROW OF STAPLES STAGGERED 4" (10 CM) APART AND 4" (10 CM) ON CENTER TO SECURE RECP's.
5. FULL LENGTH EDGE OF RECP's AT TOP OF SIDE SLOPES MUST BE ANCHORED WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" (30 CM) APART IN A 6" (15 CM) DEEP X 6" (15 CM) WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.
6. ADJACENT RECP's MUST BE OVERLAPPED APPROXIMATELY 2" - 5" (5 CM -12.5 CM) (DEPENDING ON RECP's TYPE) AND STAPLED.
7. IN HIGH FLOW CHANNEL APPLICATIONS, A STAPLE CHECK SLOT IS RECOMMENDED AT 30 TO 40 FOOT (9 M - 12 M) INTERVALS. USE A DOUBLE ROW OF STAPLES STAGGERED 4" (10 CM) APART AND 4" (10 CM) ON CENTER OVER ENTIRE WIDTH OF THE CHANNEL.
8. THE TERMINAL END OF THE RECP's MUST BE ANCHORED WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" (30 CM) APART IN A 6" (15 CM) DEEP X 6" (15 CM) WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.

NOTE:
* IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" (15 CM) MAY BE NECESSARY TO PROPERLY ANCHOR THE RECP's.

CRITICAL POINTS
A. OVERLAPS AND SEAMS
B. PROJECTED WATER LINE
C. CHANNEL BOTTOM/SIDE SLOPE VERTICES

NOTE:
* HORIZONTAL STAPLE SPACING SHOULD BE ALTERED IF NECESSARY TO ALLOW STAPLES TO SECURE THE CRITICAL POINTS ALONG THE CHANNEL SURFACE.

** IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" (15 cm) MAY BE NECESSARY TO PROPERLY ANCHOR THE RECP's.

F / 9 **EROSION CONTROL BLANKET**
NOT TO SCALE

OUTLET PROTECTION
When and Where to Use It:

Place an oulet protection at the downstream end of a culvert or discharge pipe.

Installation:
A non-woven geotextile fabric shall be installed over the soil surface where the outlet protection is to be placed.

The outlet protection shall be composed of minimum 20-inch D50 Riprap.

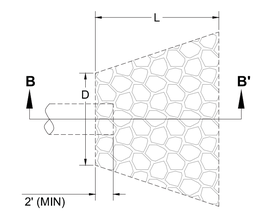
The rock must be placed by hand or mechanical placement (no dumping of rock to form the outlet protection) to achieve the proper dimensions.

Seed and mulch all disturbed areas.

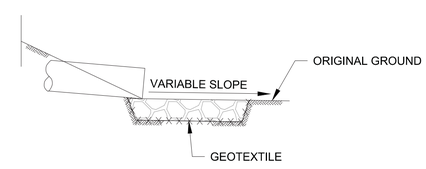
Inspection and Maintenance:
The key to a functional outlet protection is continual monitoring, regular maintenance and regular sediment removal.

Regular inspections should be done every seven (7) calendar days.

OUTLET PROTECTION SIZING TABLE			
CULVERT SIZE	AVERAGE ROCK DIAMETER	APRON WIDTH 'D' (MINIMUM)	APRON LENGTH 'L' (HIGH FLOW)
12"	5"	3-4 FT	8-12 FT
18"	8"	4-6 FT	12-18 FT
24"	10"	6-8 FT	18-22 FT
30"	12"	8-10 FT	22-28 FT
36"	14"	10-12 FT	28-32 FT
42"	16"	12-14 FT	32-38 FT
48"	20"	14-16 FT	38-44 FT



PLAN VIEW



SECTION B - B'

E / 9 **OUTLET PROTECTION**
NOT TO SCALE

EROSION AND SEDIMENT CONTROL NOTES

1. IF NECESSARY, SLOPES WHICH EXCEED EIGHT (8) VERTICAL FEET SHOULD BE STABILIZED WITH SYNTHETIC OR VEGETATIVE MATS, IN ADDITION TO HYDRO SEEDING. IT MAY BE NECESSARY TO INSTALL TEMPORARY SLOPE DRAINS DURING CONSTRUCTION. TEMPORARY BERMS MAY BE NEEDED UNTIL THE SLOPE IS BROUGHT TO GRADE.
2. STABILIZATION MEASURES SHALL BE INITIATED AS SOON AS PRACTICAL IN PORTIONS OF THE SITE WHERE CONSTRUCTION ACTIVITIES HAVE TEMPORARILY OR PERMANENTLY CEASED, BUT IN NO CASE MORE THAN FOURTEEN (14) DAYS AFTER WORK HAS CEASED, EXCEPT AS STATED BELOW.
WHERE STABILIZATION BY THE 14TH DAY IS PRECLUDED BY SNOW OR FROZEN GROUND CONDITIONS STABILIZATION MEASURES MUST BE INITIATED AS SOON AS PRACTICAL.
WHERE CONSTRUCTION ACTIVITY ON A PORTION OF THE SITE IS TEMPORARILY CEASED AND EARTH DISTURBING ACTIVITIES WILL BE RESUMED WITHIN FOURTEEN (14) DAYS, TEMPORARY STABILIZATION MEASURES DO NOT HAVE TO BE INITIATED ON THAT PORTION OF THE SITE.
3. ALL SEDIMENT CONTROL DEVICES SHALL BE INSPECTED EVERY SEVEN (7) DAYS. IF SITE INSPECTIONS IDENTIFY BMP's THAT ARE DAMAGED OR ARE NOT OPERATING EFFICIENTLY, MAINTENANCE MUST BE PERFORMED AS SOON AS PRACTICAL OR AS REASONABLY POSSIBLE AND BEFORE THE NEXT STORM EVENT WHENEVER PRACTICABLE.
4. ALL EROSION CONTROL DEVICES SHALL BE PROPERLY MAINTAINED DURING ALL PHASES OF CONSTRUCTION UNTIL THE COMPLETION OF ALL CONSTRUCTION ACTIVITIES AND ALL DISTURBED AREAS HAVE BEEN STABILIZED. ADDITIONAL CONTROL DEVICES MAY BE REQUIRED DURING CONSTRUCTION IN ORDER TO CONTROL EROSION AND OR OFF SITE SEDIMENTATION. ALL TEMPORARY CONTROL DEVICES SHALL BE REMOVED ONCE CONSTRUCTION IS COMPLETE AND THE SITE IS STABILIZED.
5. THE CONTRACTOR MUST TAKE NECESSARY ACTION TO MINIMIZE THE GENERATION OF DUST AND TRACKING OF MUD ONTO PAVED ROADWAYS FROM CONSTRUCTION AREAS. THE CONTRACTOR SHALL REMOVE DAILY MUD/SOIL FROM PAVEMENT.
6. TEMPORARY DIVERSION BERMS AND OR DITCHES SHALL BE PROVIDED AS NEEDED DURING CONSTRUCTION TO PROTECT WORK AREAS FROM UPSLOPE RUNOFF AND OR TO DIVERT SEDIMENT LADEN WATER TO APPROPRIATE TRAPS OR STABLE OUTLETS. ALL WATERS OF THE STATE (WoS), INCLUDING WETLANDS, ARE TO BE FLAGGED OR OTHERWISE CLEARLY MARKED IN THE FIELD. A DOUBLE ROW OF SILT FENCE SHALL BE INSTALLED IN ALL AREAS WHERE A FIFTY (50) FOOT BUFFER CANNOT BE MAINTAINED BETWEEN THE DISTURBED AREA AND WoS. A TEN (10) FOOT BUFFER SHALL BE MAINTAINED BETWEEN THE LAST ROW OF SILT FENCE AND ALL WoS.
7. LITTER, CONSTRUCTION DEBRIS, OILS, FUELS AND BUILDING PRODUCTS WITH SIGNIFICANT POTENTIAL FOR IMPACT, SUCH AS STOCKPILES OF TREATED LUMBER AND CONSTRUCTION CHEMICALS THAT COULD BE EXPOSED TO STORM WATER, MUST BE PREVENTED FROM BECOMING A POLLUTANT SOURCE IN STORM WATER DISCHARGES.
8. RIP RAP PROTECTION SHALL BE PROVIDED AT ALL STORM DRAIN OUTLETS.
9. BY FEMA FIRM MAPS 4500510080B THIS PROJECT IS LOCATED IN FLOOD ZONE X WHICH IS NOT A FLOOD HAZARD ZONE.
10. FILLING OF JURISDICTIONAL WATERS PERMITTED BY USACE PERMIT 2005-4W-325-W. NO FILLING OF WETLANDS IS PLANNED FOR THIS SCOPE OF WORK.
11. TOTAL AREA TO BE DISTURBED IS 20.93 ACRES. THIS INCLUDES 20.81 ACRES FOR AREAS #1 - #4 AND 0.12 ACRES FOR THE TWO STABILIZED CONSTRUCTION ENTRANCES.

SEEDING:

1. SEEDING SHALL BE PERFORMED IN ACCORDANCE WITH THE SCDOT STANDARD SPECIFICATION SECTION 810. REFER TO THE SEEDING SCHEDULE BELOW.

SEEDING FOR PERMANENT VEGETATION

SCHEDULE No.	COMMON NAME OF SEED	APPLICATION RATE LBS./ACRE	PLANTING DATES
3	COMMON BERMUDA (HULLED)	30	MARCH 1 TO AUGUST 14
	WEEPING LOVE GRASS	10	
	SERICEA LESPEDEZA (SCARIFIED)	50	
4	COMMON BERMUDA (UNHULLED)	40	AUGUST 15 TO FEBRUARY 28
	WEEPING LOVE GRASS	10	
	SERICEA LESPEDEZA (UNHULLED, UNSCARIFIED)	80	
	RESEEDING CRIMSON CLOVER	20	
	RYE GRAIN	20	

SEEDING FOR TEMPORARY VEGETATION

SCHEDULE No.	COMMON NAME OF SEED	APPLICATION RATE LBS./ACRE	PLANTING DATES
1	ANNUAL SUDAN GRASS (SWEET OR TIFF)	40	APRIL 1 TO AUGUST 15
2	BROWN TOP MILLET	50	APRIL 1 TO AUGUST 15
3	RYE GRAIN	50	AUGUST 16 TO MARCH 31

NO.	BY	DATE	REVISION	APP'D.
3.				
2.				
1.	SRC	01/03/11	ISSUED FOR SCDHEC REVIEW	DAC

PROJECT: **EROSION AND SEDIMENT CONTROL PLAN COMPLETION OF RAIL SPUR ALCOLU, SOUTH CAROLINA**

SHEET TITLE: **DETAILS**

DRAWN BY: REYZEKD	SCALE:	PROJ. NO.	05790.77.001
CHECKED BY: GSM	AS NOTED	FILE NO.	Detail-Erosion.dwg
APPROVED BY: DAC	DATE PRINTED:	**SHEET 9 OF 9**	
DATE: JANUARY 2011			

RMT
30 Patewood Drive, Suite 100
Patewood Plaza One
Greenville, SC 29615
Phone: 864.281.0030
Fax: 864.281.0288

Section 3
Location Map

See Drawing Sheet 1.

Section 4
Project Narrative

GP Clarendon LP OSB Mill, Alcolu, South Carolina

Background

The GP Clarendon LP OSB Mill is covered under the NPDES General Permit for Storm Water Discharges from Large and Small Construction Activities, Coverage Number SCR10N260, which was issued on August 24, 2010. GP acquired the facility from Grant Clarendon on May 26, 2010. GP is completing construction at the site that was initiated by Grant Clarendon in 2006 under a previous coverage number.

There are several areas planned for improvement in 2011 and 2012. As of December 2010, there are five areas within the property which will undergo construction in 2011 and 2012. These activities include the currently permitted rail spur area (SC10N260), as well as two areas within the Borrow Area (Areas #1 and #2), the Log Storage Area (Area #3), realignment of an existing ditch (Area #4), and paving an existing road. This NOI submittal addresses storm water discharges associated with the completion of the aforementioned additional construction activities.

The two locations (Area #1 and #2) within the Borrow Area are similar in scope. Both areas have debris piles, and the ground cover is poor vegetation to bare soil. Some of Area #1 and all of Area #2 drain into the Borrow Area, which infiltrates or evaporates in normal weather conditions. The improvements planned for Area #1 and #2 include removing and disposing of debris in accordance with local, state, and federal regulations and final stabilization of disturbed areas.

The Log Storage Area (Area #3) is in need of maintenance. The soil vegetative cover is sparse, with weeds being the dominant vegetation. The improvement planned for Area #3 includes the clearing of the weeds, regrading areas as needed, and final stabilization of disturbed areas. Area #3 runoff empties into Storm Water Management Facility #1 and #2. The area is split fairly evenly, with the western half discharging to Storm Water Management Facility #1 and the eastern half to #2.

A ditch currently parallels a paved area, northwest of the main plant building. The Owner desires to move the ditch farther from the paved area. The relocated ditch (Area #4) will match the sectional geometry of the existing ditch. Area #4 disturbed areas shall be stabilized upon completion of earthwork. The ditch discharges into Storm Water Management Facility #1.

The paving of the existing road includes filling of ruts, leveling and preparing existing aggregate for pavement. Minimal impact to pervious areas is anticipated because the road is not to be widened beyond the current aggregate footprint. Therefore, this construction project will not require coverage under the NOI.

The mill has coverage under the current NPDES General Permit # SCR000000 for Storm Water Discharges Associated with Industrial Activity (IGP) and three designated storm water management facilities #1, #2, and #3.

Storm Water Management Facility #1 discharges to the southwest into an unnamed tributary to the Pocotaligo River, via Outfall 01. The eastern portion of the site, including the outfall from Storm Water Management Facility #2, flows to the east discharging to Big Branch, a tributary to the Pocotaligo River. Storm water flow from Areas #3 and #4 will be directed to these facilities after best management practices, as further described in this SWPPP, are implemented to minimize potential sedimentary impacts. Therefore, it is not anticipated that the construction will have a significant adverse impact on the operation of the Storm Water Management Facility or to the Jurisdictional wetlands or ditches to which storm water from this construction activity may discharge.

Post construction storm water runoff will be discharged to the Storm Water Management Facilities #1, #2 and the Borrow Area. Following the proposed construction activities, peak runoff rates discharged from outfalls for Storm Water Facilities #1 and #2, and the Borrow Area will not increase.

Description of Disturbed Areas

The following details the pre-development and post-development condition of the area that will be disturbed.

Area #1a

The majority of Area #1 empties into an unnamed drainage ditch (1a). Some of Area #1 empties into the Borrow Area (1b). For the purposes of performing the hydrologic calculations, Area 1b was combined with Area #2. The removal of the debris and improving vegetative cover will reduce the peak rate of runoff. Table 4-1 provides the peak pre-development and post-development flow rates for the area to be disturbed.

Table 4-1
Borrow Area #1a Storm Water Runnoff

AREA	2-YEAR, 24-HOUR STORM		10-YEAR, 24-HOUR STORM	
	PRE 2 YEAR SORM EVENT (CFS)	POST 2 YEAR STORM EVENT (CFS)	PRE 10 YEAR STORM EVENT (CFS)	POST 10 YEAR STORM EVENT (CFS)
1a	1.77	1.06	3.07	2.23

Area #1b and #2

All of Area #1b and #2 empties into the Borrow Area. The removal of the debris and improved vegetative cover will reduce the peak rate of runoff. Table 4-2 provides the peak pre-development and post-development flow rates for the area to be disturbed.

Table 4-2
Borrow Area #2 Storm Water Runnoff

AREA	2-YEAR, 24-HOUR STORM		10-YEAR, 24-HOUR STORM	
	PRE 2 YEAR SORM EVENT (CFS)	POST 2 YEAR STORM EVENT (CFS)	PRE 10 YEAR STORM EVENT (CFS)	POST 10 YEAR STORM EVENT (CFS)
1b & 2	19.93	11.12	34.29	23.33

Area #3

The Log Storage Area runoff is divided between Storm Water Management Facility #1 and #2. There are three locations which discharge the Log Storage Area storm water. Two discharge into Storm Water Management Facility #1 and the other into #2. The removal of the weeds and improved vegetative cover will reduce the amount of runoff, but the improved grading will allow positive drainage of the area. The removal of the debris and improved vegetative cover will reduce the peak rate of runoff. Table 4-3 provides the peak pre-development and post-development flow rates for the area to be disturbed.

Table 4-3
Log Storage Area Storm Water Runnoff

AREA	2-YEAR, 24-HOUR STORM		10-YEAR, 24-HOUR STORM	
	PRE 2 YEAR SORM EVENT (CFS)	POST 2 YEAR STORM EVENT (CFS)	PRE 10 YEAR STORM EVENT (CFS)	POST 10 YEAR STORM EVENT (CFS)
3a	9.58	6.76	16.61	12.46
3b	10.46	6.11	18.15	11.62
3c	4.82	3.42	8.34	6.39

Erosion and Sediment Control Measures

Silt fencing will be placed on the downgradient perimeter of the disturbed areas to control sediment migration.

Construction traffic will travel on private, plant-owned paved and/or gravel roads prior to reaching public roads. Stabilized construction entrances shall be constructed as shown in the engineering drawings. Contractors will be responsible for minimizing the tracking of mud onto roadways and will cleanup mud tracked onto mill-owned roads.

Wire backed silt fences will be constructed with at least 4 inches of filter material buried in an embedment trench. The trench will be backfilled and the soil compacted over the filter fabric. Stakes will be no further than 10 feet apart and driven no less than 24 inches below the ground surface. A construction detail for the silt fence is included on the engineering drawings. Silt fences and any sediment remaining in place will be removed after the upslope area has been permanently stabilized.

Riprap and Geotextile filter fabric, outlet protection, will be provided at the inlets and outlets of new culverts, as necessary. Riprap protection is sized to prevent the channel from eroding due to the high

velocities experienced during the 10-year, 24-hour storm event. The rip rap will be part of final stabilization.

Rock check dams will be constructed. A construction detail for the rock check dams is included in the engineering drawings.

Rock sediment dikes will be constructed. A construction detail for the rock sediment dike is included in the engineering drawings.

Erosion Control Blankets (ECB) will be used. ECB will be installed in the relocated ditch in accordance with manufacturer's requirements.

Scope and Sequence of Work

1. Receive NPDES coverage from SC DHEC
2. Pre-Construction meeting
3. Notify SC DHEC EQC Regional Office 48 hrs prior to beginning land disturbing activities.
4. Installation of construction entrance(s).
5. Clearing and grubbing only as necessary for installation of perimeter controls.
6. Installation of silt fence.
7. Clearing and grubbing only as necessary for construction of rock ditch checks.
8. All site work including debris removal and earthwork
9. Permanent/final stabilization
10. Remove temporary sediment and erosion control measures after entire area draining to the structures is finally stabilized. SC DHEC recommends that the project owner/operator have the SWPPP preparer or registration equivalent approve the removal of temporary structures.

Storm Water and Sediment Management Structure Control Plan

Inspections

All erosion and sediment control measures will be inspected at least once every 7 days.

Damaged or ineffective devices will be replaced or repaired as necessary. Sediment deposits will be removed when they reach one-third the height of the silt fence. Mud will be removed from roadways as necessary. Table 4-2 is a maintenance and inspection checklist that will be completed when inspecting erosion and sediment control measures. Completed checklists will be maintained on the site.

Table 4-4
Maintenance and inspection Checklist

DATE	ITEM INSPECTED	CONDITION	INSPECTED BY	CORRECTIVE ACTION TAKEN (if necessary)
	Silt Fencing ▪ Inspect once every 7 days ▪ Repair decomposing fabric, holes/tears, and any other damage promptly ▪ Remove sediment deposits when they reach one-third the height of the fence			
	Outlet Protection ▪ Inspect periodically for scouring beneath the riprap or dislodged stones from high flows			
	Stabilized Construction Entrance ▪ Inspect once every 7 days ▪ Check for mud and sediment buildup and pad integrity. ▪ Wash or replace stones as needed and as directed by the inspector. The stone entrance should be washed or replaced whenever the entrance fails to reduce mud being carried off-site by vehicles.			
	Erosion Control Blanket (ECB) ▪ Inspect once every 7 days ▪ Repair decomposing material, holes/tears, and any other damage promptly			

Table 4-4
Maintenance and inspection Checklist

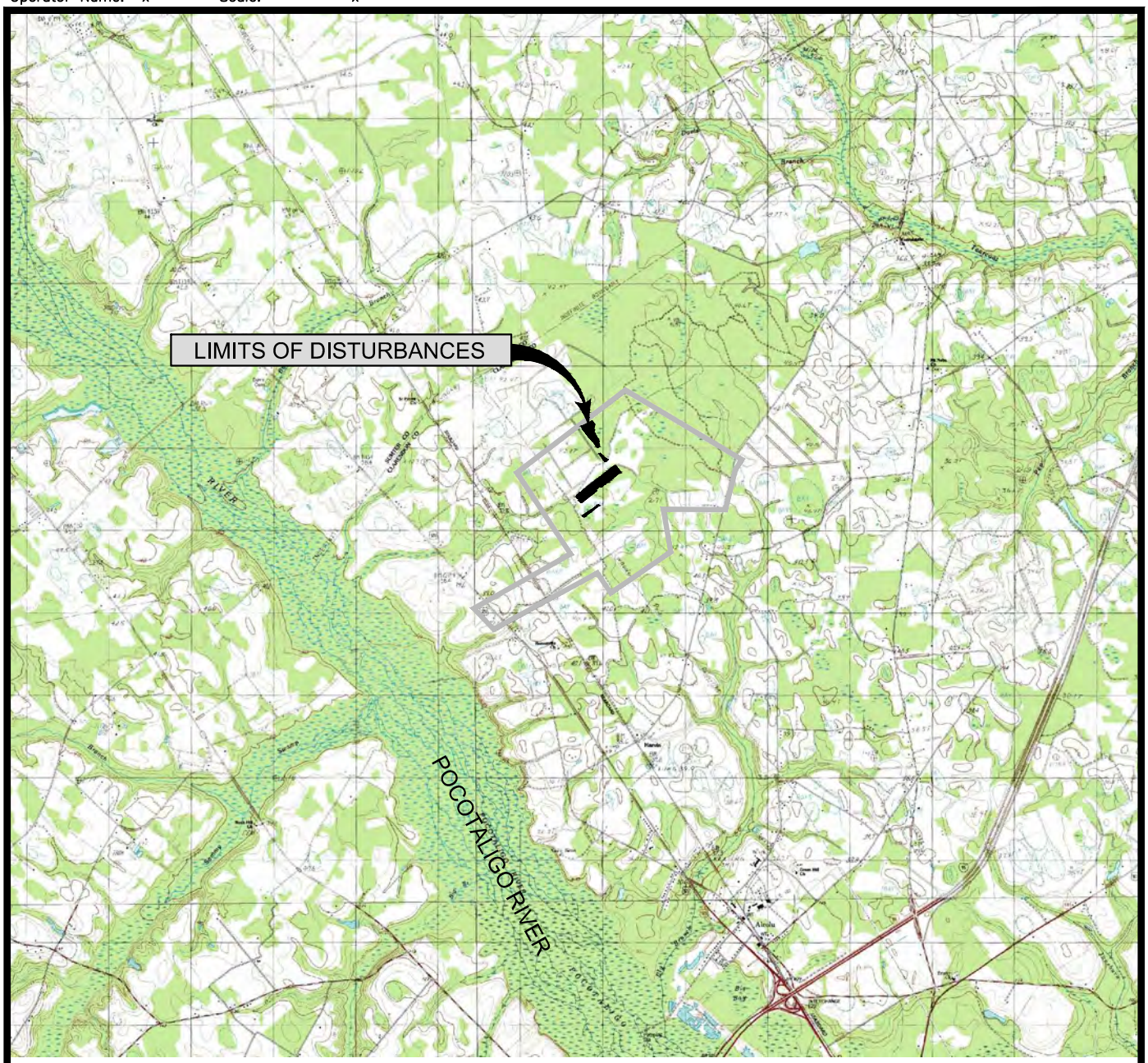
DATE	ITEM INSPECTED	CONDITION	INSPECTED BY	CORRECTIVE ACTION TAKEN (if necessary)
	Rock Sediment Dike ▪ Inspect once every 7 days. ▪ Inspect for sediment accumulation and debris accumulation**.** ▪ Inspect ditch edges for erosion and repair promptly as required ▪ Sediment should be removed when it reaches 1/3 the original check height ▪ In the case of grass-lined ditches and swales, rock sediment dike should be removed when the grass has matured sufficiently to protect the ditch or swale unless the slope of the swale is greater than 4%. ▪ After construction is complete, all stone should be removed by the grading contractor if vegetation will be used for permanent erosion control. ▪ The area beneath the rock sediment dike should be seeded and mulched immediately after rock sediment dike removal.			

Table 4-4
Maintenance and inspection Checklist

DATE	ITEM INSPECTED	CONDITION	INSPECTED BY	CORRECTIVE ACTION TAKEN (if necessary)
	Rock Ditch Check ▪ Inspect once every 7 days. ▪ Inspect for sediment accumulation and debris accumulation. ▪ Inspect ditch edges for erosion and repair promptly as required ▪ Sediment should be removed when it reaches 1/3 the original check height ▪ In the case of grass-lined ditches and swales, rock ditch checks should be removed when the grass has matured sufficiently to protect the ditch or swale unless the slope of the swale is greater than 4%. ▪ After construction is complete, all stone should be removed by the grading contractor if vegetation will be used for permanent erosion control. ▪ The area beneath the rock ditch check should be seeded and mulched immediately after rock ditch check removal.			

Section 5
Topographic Map (Outline Disturbed Areas)

PLOT DATA
Drawing Name: x
Operator Name: x Scale: x



0 1000 2000 3000

SCALE IN FEET

N

RMT

EROSION AND SEDIMENT CONTROL PLAN
2011 SITE IMPROVEMENTS
ALCOLU, SOUTH CAROLINA

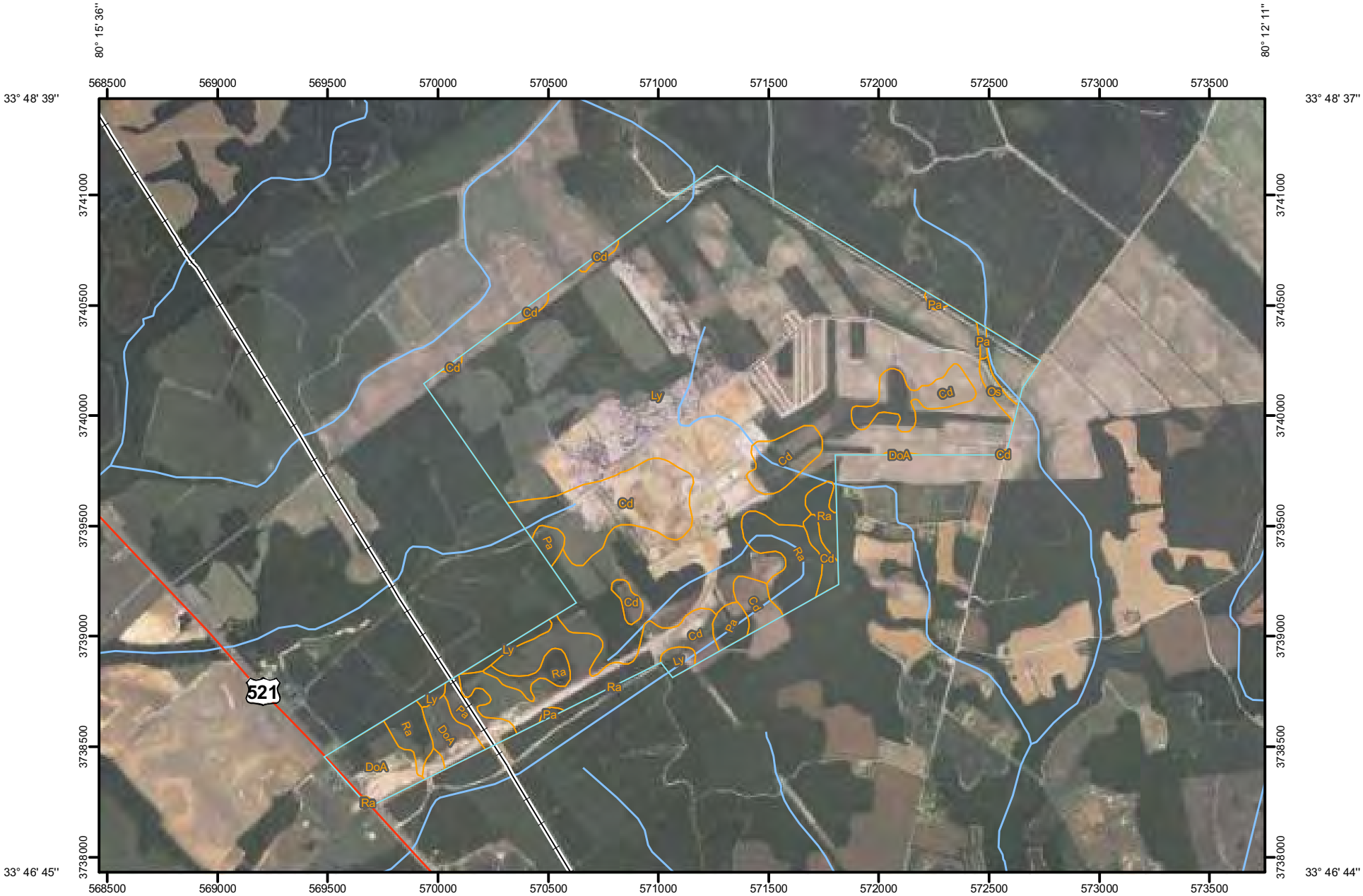
SITE LOCATION MAP

DRAWN BY:	SRC
APPROVED BY:	
PROJECT NO.	05790.77.001
FILE NO.	Site Location.dwg
DATE:	DECEMBER 2010

J:\05790\77\Site Location.dwg, 12/22/2010 10:36:42 AM, DWG To PDF.pc3

Section 6
Soils Information

Soil Map—Clarendon County, South Carolina
(GL Clarendon LP)



Map Scale: 1:25,100 if printed on A size (8.5" x 11") sheet.

N

0 300 600 1,200 1,800 Meters

0 1,000 2,000 4,000 6,000 Feet

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Map Units

Special Point Features

Blowout

Borrow Pit

Clay Spot

Closed Depression

Gravel Pit

Gravelly Spot

Landfill

Lava Flow

Marsh or swamp

Mine or Quarry

Miscellaneous Water

Perennial Water

Rock Outcrop

Saline Spot

Sandy Spot

Severely Eroded Spot

Sinkhole

Slide or Slip

Sodic Spot

Spoil Area

Stony Spot

Very Stony Spot

Wet Spot

Other

Special Line Features

Gully

Short Steep Slope

Other

Political Features

Cities

Water Features

Oceans

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

MAP INFORMATION

Map Scale: 1:25,100 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:20,000.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 17N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Clarendon County, South Carolina
Survey Area Data: Version 8, Feb 3, 2010

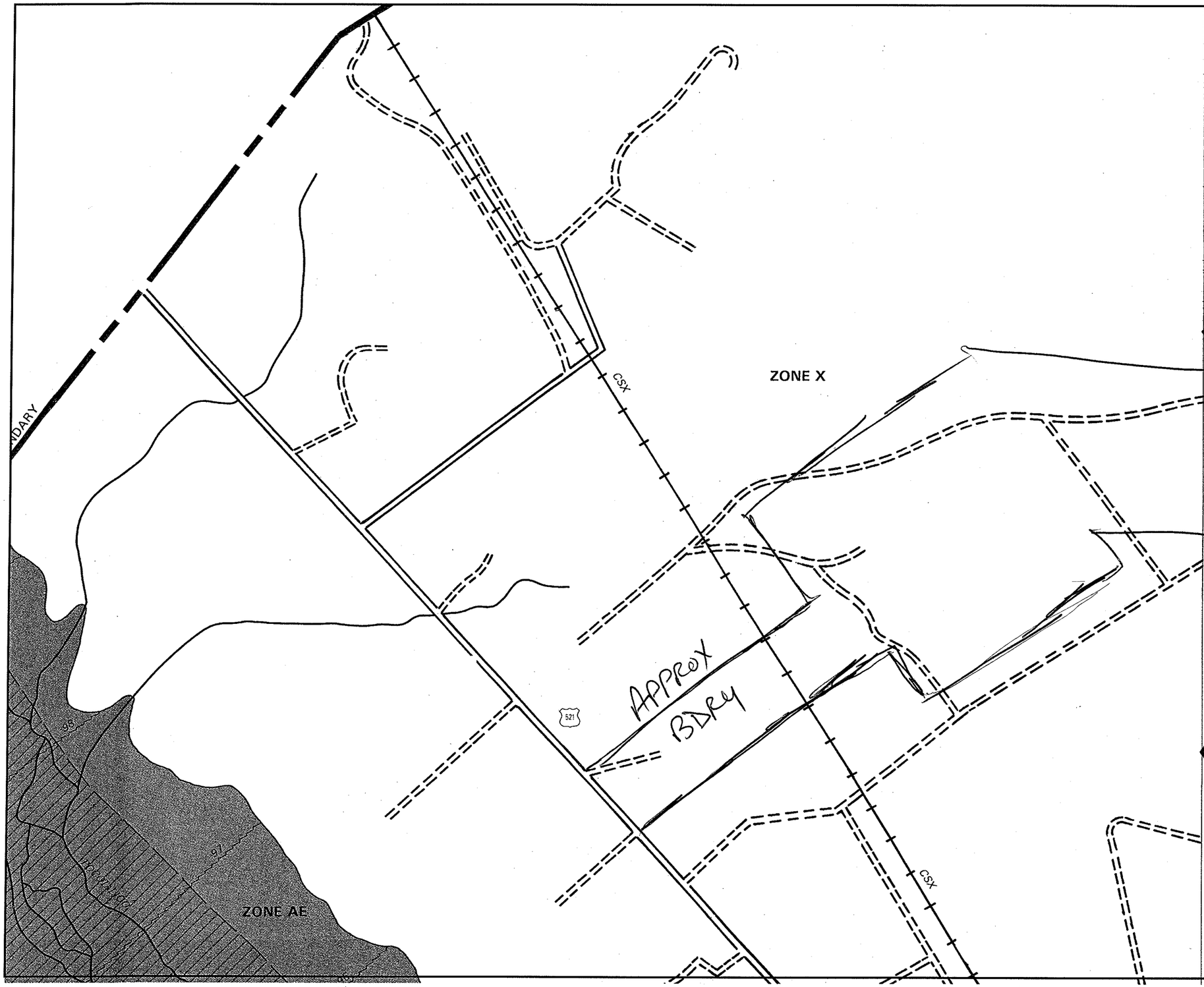
Date(s) aerial images were photographed: 6/7/2006

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Clarendon County, South Carolina (SC027)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
Cd	Clarendon loamy sand	165.6	17.2%
DoA	Dothan loamy fine sand, 0 to 2 percent slopes	34.4	3.6%
Ly	Lynchburg loamy sand	688.4	71.4%
Os	Osier loamy fine sand	4.0	0.4%
Pa	Paxville loam	24.8	2.6%
Ra	Rains sandy loam	47.0	4.9%
Totals for Area of Interest		**964.3**	**100.0%**

Section 7
FEMA Map



APPROXIMATE SCALE IN FEET

1000 0 1000

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

CLARENDON COUNTY, SOUTH CAROLINA
(UNINCORPORATED AREAS)

PANEL 80 OF 250

COMMUNITY–PANEL NUMBER:
450051 0080 B

EFFECTIVE DATE:
JUNE 3, 1991

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

Section 8
Jurisdictional Wetland Information

DEPARTMENT OF THE ARMY
CHARLESTON DISTRICT, CORPS OF ENGINEERS
69-A Hagood Avenue
CHARLESTON, SOUTH CAROLINA 29403-5107

REPLY TO
ATTENTION OF

April 3, 2006

Regulatory Division

Grant Clarendon Inc.
c/o Allen W. Conger
MACTEC Engineering and Consulting, Inc.
720 Gracern Road, Suite 132
Columbia, SC 20210

Dear Mr. Conger:

This is in response to your application requesting a Department of the Army permit.

Enclosed is your Department of the Army Permit #2005-4W-325. It authorizes you to perform the work specified on the attached drawings. This permit is issued under the provisions of the Federal laws for the protection and preservation of the navigable waters of the United States.

Please notify this office promptly, in writing, when you start and complete the work. The enclosed cards may be used for that purpose. You should also be aware that a special condition has been included in this permit which requires that a copy of the permit and drawings must be available at the work site during the entire time of construction.

Respectfully,

for Tina B. Hadden
Chief, Regulatory Division

Enclosures

DEPARTMENT OF THE ARMY PERMIT

Permittee: GRANT CLARENDON INC

1321 TECHNOLOGY DRIVE
BARNWELL, SC 29812

Permit No: 2005-4W-325

Issuing Office: CHARLESTON DISTRICT

NOTE: The term "you" and its derivatives, as used in this permit, means the permittee or any future transferee. The term "this office" refers to the appropriate district or division office of the Corps of Engineers having jurisdiction over the permitted activity or the appropriate official of that office acting under the authority of the commanding officer.

You are authorized to perform work in accordance with the terms and conditions specified below.

Project Description:
The work consists of placing fill material in waters of the U.S. to accommodate an Oriented Strand Board manufacturing facility and its associated access roads and rail spur in accordance with attached drawings entitled: Activity: Future OSB Manufacturing Plant Site; Project: Clarendon GFP Site; Location: East side of Hwy 521, approximately 5 miles north of Alcolu, SC in Clarendon. Sheets 1 and 4 of 20 dated September 16, 2005; Sheets 2 and 3 of 20 dated September 20, 2005, Grant Clarendon, Inc.; OSB Plant – Clarendon County; Agent: MACTEC, Inc., 720 Gracern Rd., Suite 132, Columbia, SC 29210. Sheets 5 thru 15, 17 thru 19 of 20 dated September 16, 2005 and Sheet 16 of 20 dated September 15, 2005; Grant Clarendon, Inc., 1321 Technology Drive, Barnwell, SC 29812, MACTEC, 720 Gracern Road, Suite 132, Columbia, SC 29210, Proposed Mitigation for Jurisdictional Impacts, Proposed Grant Clarendon Manufacturing Facility, Clarendon County, South Carolina. Sheet 20 of 20 dated November 22, 2005.

Project Location:
The project site is located in jurisdictional ditches and wetlands adjacent to the Pocotaligo River in Clarendon County, South Carolina.

Permit Conditions:

General Conditions:

1. The time limit for completing the work authorized ends on **31 March 2011.** If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least one month before the above date is reached.

2. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition 4 below. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.

3. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and state coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

4. If you sell the property associated with this permit, you must obtain the signature of the new owner in the space provided and forward a copy of the permit to this office to validate the transfer of this authorization.

5. If a conditioned water quality certification has been issued for your project, you must comply with the conditions specified in the certification as special conditions to this permit. For your convenience, a copy of the certification is attached if it contains such conditions.

6. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of your permit.

Special Conditions:

SEE PAGE 4.

Further Information:

1. Congressional Authorities: You have been authorized to undertake the activity described above pursuant to:

☐ Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403).

☒ Section 404 of the Clean Water Act (33 U.S.C. 1344).

☐ Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (33 U.S.C. 1413).

2. Limits of this authorization.

a. This permit does not obviate the need to obtain other Federal, state, or local authorizations required by law.

b. This permit does not grant any property rights or exclusive privileges.

c. This permit does not authorize any injury to the property or rights of others.

d. This permit does not authorize interference with any existing or proposed Federal project.

3. Limits of Federal Liability. In issuing this permit, the Federal Government does not assume any liability for the following:

a. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.

b. Damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the United States in the public interest.

c. Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit.

d. Design or construction deficiencies associated with the permitted work.

e. Damage claims associated with any future modification, suspension, or revocation of this permit.

4. Reliance on Applicant's Data: The determination of this office that issuance of this permit is not contrary to the public interest was made in reliance on the information you provided.

5. Reevaluation of Permit Decision. This office may reevaluate its decision on this permit at any time the circumstances warrant. Circumstances that could require a reevaluation include, but are not limited to, the following:

a. You fail to comply with the terms and conditions of this permit.

b. The information provided by you in support of your permit application proves to have been false, incomplete, or inaccurate (See 4 above).

c. Significant new information surfaces which this office did not consider in reaching the original public interest decision.

Such a reevaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 325.7 or enforcement procedures such as those contained in 33 CFR 326.4 and 326.5. The referenced enforcement procedures provide for the issuance of an administrative order requiring you to comply with the terms and conditions of your permit and for the initiation of legal action where appropriate. You will be required to pay for any corrective measures ordered by this office, and if you fail to comply with such directive, this office may in certain situations (such as those specified in 33 CFR 209.170) accomplish the corrective measures by contract or otherwise and bill you for the cost.

6. Extensions. General condition 1 establishes a time limit for the completion of the activity authorized by this permit. Unless there are circumstances requiring either a prompt completion of the authorized activity or a reevaluation of the public interest decision, the Corps will normally give favorable consideration to a request for an extension of this time limit.

Your signature below, as permittee, indicates that you accept and agree to comply with the terms and conditions of this permit.

April 3/06

(PERMITTEE) **(DATE)**

GRANT CLARENDON INC

This permit becomes effective when the Federal official, designated to act for the Secretary of the Army, has signed below.

3 April 2006

(DISTRICT ENGINEER) **(DATE)**

EDWARD R. FLEMING

or his Designee

for **Tina B. Hadden**

Chief, Regulatory Division

When the structures or work authorized by this permit are still in existence at the time the property is transferred, the terms and conditions of this permit will continue to be binding on the new owner(s) of the property. To validate the transfer of this permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.

(TRANSFEREE) **(DATE)**

A. SPECIAL CONDITIONS FOR PERMIT #: 2005-4W-325

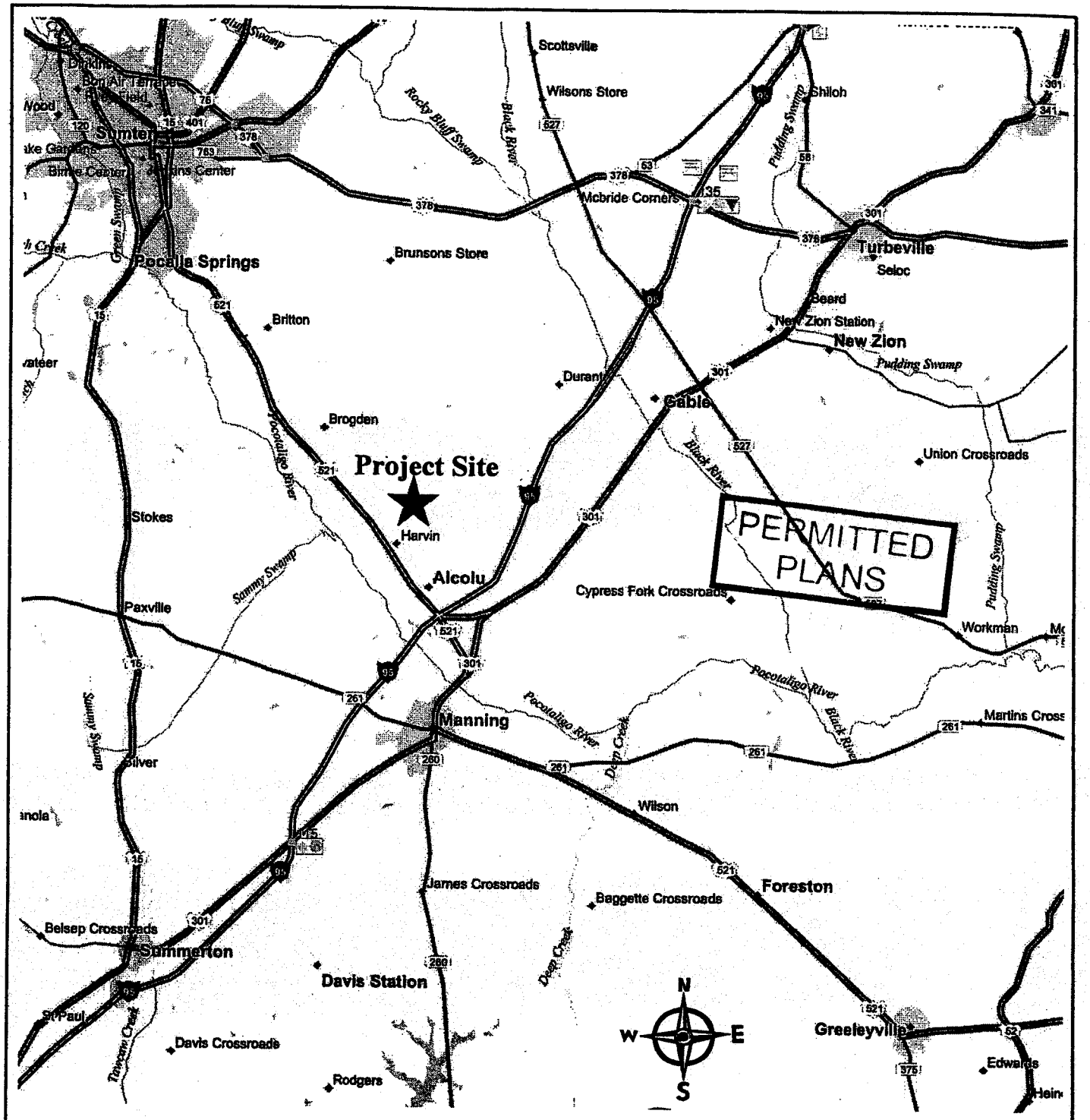
a. That the permittee agrees to provide all contractors associated with construction of the authorized activity a copy of the permit and drawings. A copy of the permit will be available at the construction site at all times.

b. That the permittee shall submit a signed compliance certification to the Corps within 60 days following completion of the authorized work and any required mitigation. The certification will include:
   1. A copy of this permit;
   2. A statement that the authorized work was done in accordance with the Corps authorization, including any general or specific conditions;
   3. A statement that any required mitigation was completed in accordance with the permit conditions;
   4. The signature of the permittee certifying the completion of the work and mitigation.

c. That the permittee recognizes that its commitment to perform and implement the following conditions was a deciding factor towards the favorable and timely decision on this permit and that the permittee recognizes that a failure on its part to both actively pursue and implement these conditions may be grounds for modification, suspension or revocation of this Department of the Army authorization.

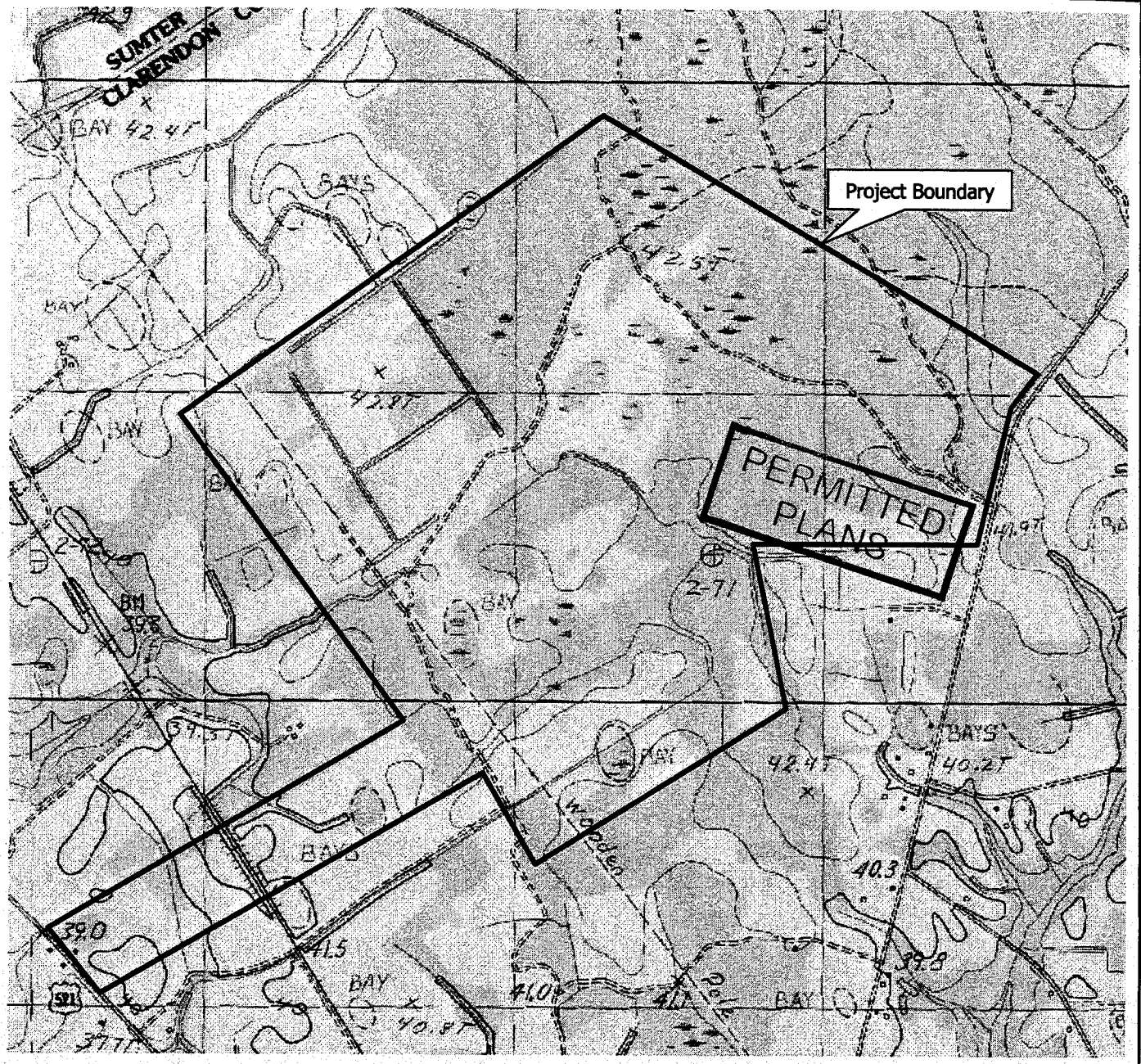
   1. That as compensatory mitigation for the impacts to aquatic resources, the permittee agrees to preserve 4.16 acres of unaltered wetlands, and preserve 7.75 acres of upland buffers. Preservation shall be my means of either deed restrictive covenants or conservation easement. The covenants or easement documents and surveyed plat of the mitigation area must be submitted to the District Engineer or his designee for review and approval prior to execution. Sample language for restrictive covenants and easement documents are enclosed for your consideration.

   2. That the permittee must submit evidence of execution and recording of the preservation easements or covenants and surveyed plat of the mitigation area to both the Corps of Engineers and DHEC not later than 60 days from the effective date of this authorization, or prior to commencement of the authorized work, whichever is later.



Source: DeLORME Street Atlas 5.0

Activity: Future OSB Manufacturing Plant Site **Project:** Clarendon GFP Site **Location:** East side of Hwy 521, approximately 5 miles north of Alcolu, SC in Clarendon	**Applicant:** Grant Clarendon Inc. 1441 Main Street Columbia, SC 29201 **Consultant:** MACTEC, Inc. 720 Gracern Road, Suite 132 Columbia, SC 29210	**Location Map** **949-Acre Project Site** Clarendon County, South Carolina September 16, 2005 Lat: N 33°47.85' Long: W -80°13.82'
	Application No. 2005-4w-325	Sheet 1 of 20

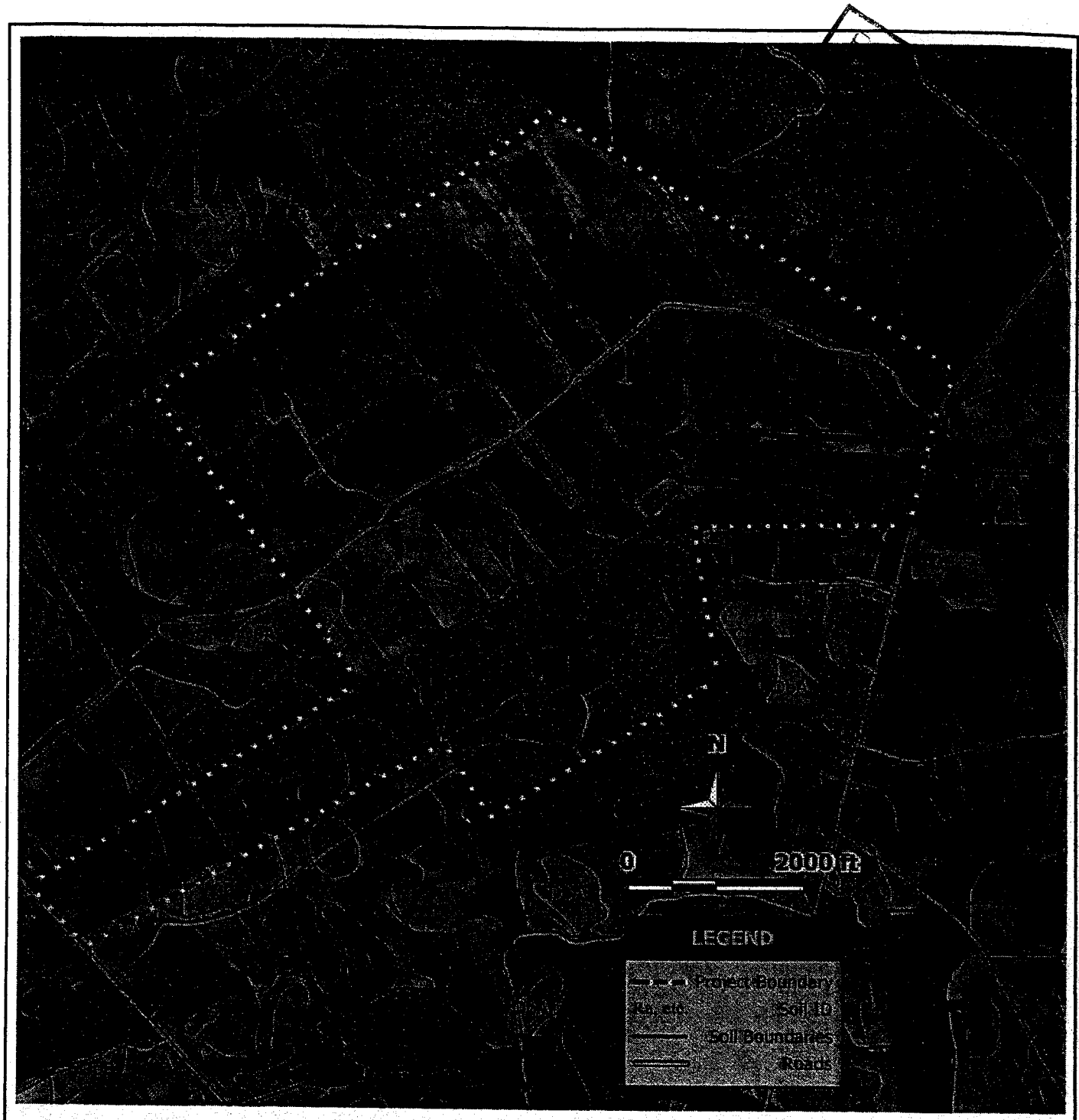


SCALE (IN FEET)
0 1,000

N W E S

Source: USGS 1983 Tearcoat Branch Quadrangle

Activity: Future OSB Manufacturing Plant Site **Project:** Clarendon GFP Site **Location:** East side of Hwy 521, approximately 5 miles north of Alcolu, SC in Clarendon	**Applicant:** Grant Clarendon Inc. 1441 Main Street Columbia, SC 29201 **Consultant:** MACTEC, Inc. 720 Gracern Road, Suite 132 Columbia, SC 29210	**Vicinity Map-Topography** **949-Acre Project Site** Clarendon County, South Carolina September 20, 2005 Lat: N 33°47.85' Long: W -80°13.82'
	Application No. 2005-4W-325	Sheet 2 of 20

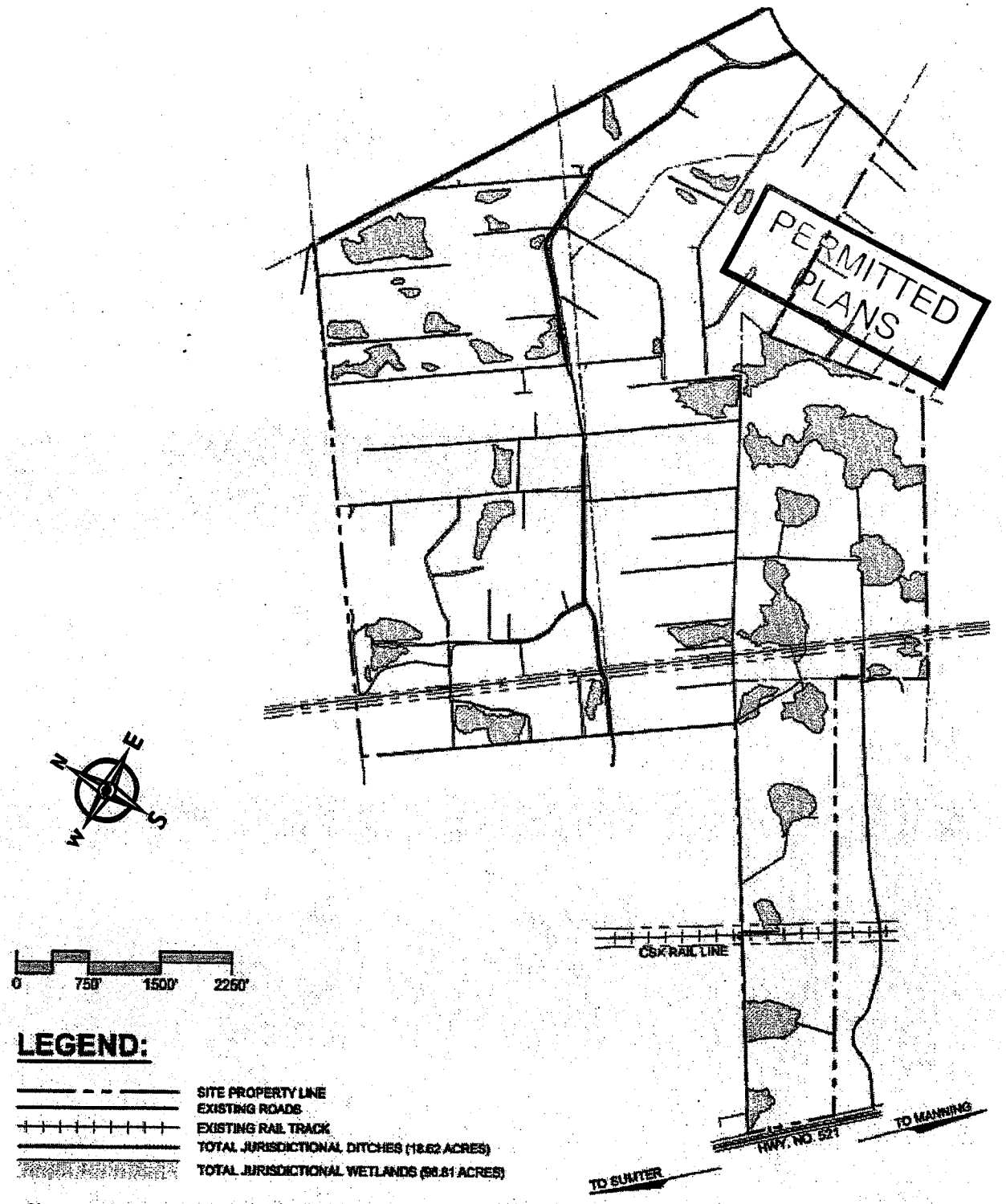


Source: Background 1999 NAPP Infrared Aerial Photograph, with SCDNR Soils Overlay-1972 Tearcoat Branch Quadrangle

Ly – Lynchburg loamy sand
Pa – Paxville loam
Ra – Rains sandy loam

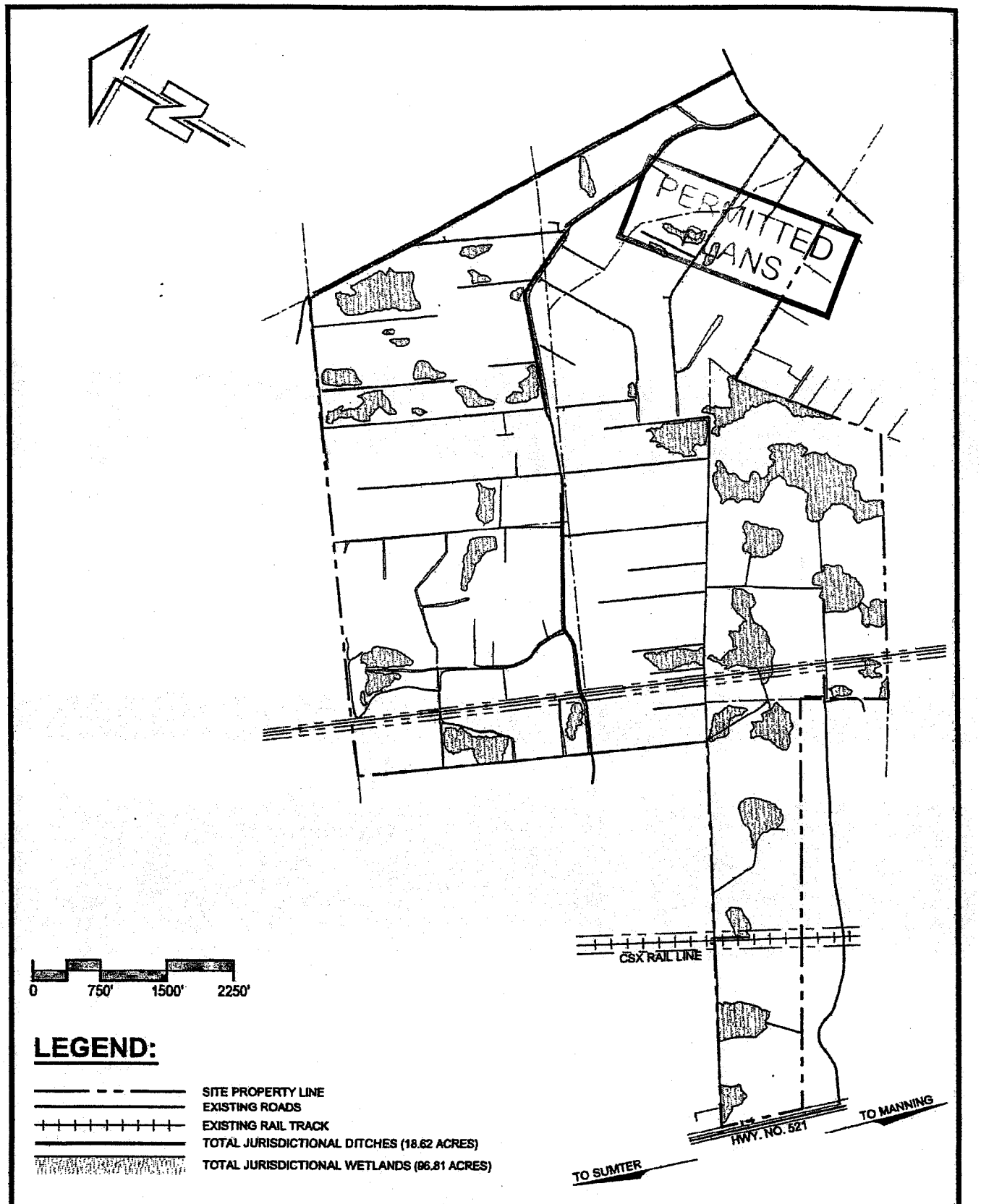
Cd – Clarendon loamy sand
DoA – Dothan loamy fine sand

Activity: Future OSB Manufacturing Plant Site **Project:** Clarendon GFP Site **Location:** East side of Hwy 521, approximately 5 miles north of Alcolu, SC in Clarendon	**Applicant:** Grant Clarendon Inc. 1441 Main Street Columbia, SC 29201 **Consultant:** MACTEC, Inc. 720 Gracern Road, Suite 132 Columbia, SC 29210	**Soils Map** **949-Acre Project Site** Clarendon County, South Carolina September 20, 2005 Lat: N 33°47.85′ Long: W -80°13.82′
	Application No. 2005-4W-325	Sheet 3 of 20



Source: Glenn Associates Surveying, Inc. Plat of USACE Verified Waters

Activity: Future OSB Manufacturing Plant Site **Project:** Clarendon GFP Site **Location:** East side of Hwy 521, approximately 5 miles north of Alcolu, SC in Clarendon	**Applicant:** Grant Clarendon Inc. 1441 Main Street Columbia, SC 29201 **Consultant:** MACTEC, Inc. 720 Gracern Road, Suite 132 Columbia, SC 29210	**Jurisdictional Wetlands and Ditches** **949-Acre Project Site** Clarendon County, South Carolina September 16, 2005 Lat: N 33°47.85′ Long: W -80°13.82′
	Application No. 2005-4W-325	Sheet 4 of 20



LEGEND:

- SITE PROPERTY LINE
- EXISTING ROADS
- EXISTING RAIL TRACK
- TOTAL JURISDICTIONAL DITCHES (18.62 ACRES)
- TOTAL JURISDICTIONAL WETLANDS (96.81 ACRES)

AGENT:
MACTEC Inc.
720 GRACERN Rd SUITE 132
COLUMBIA, SC 29210

APPLICANT:
GRANT CLARENDON INC.
1441 MAIN STREET
COLUMBIA, SC 29210

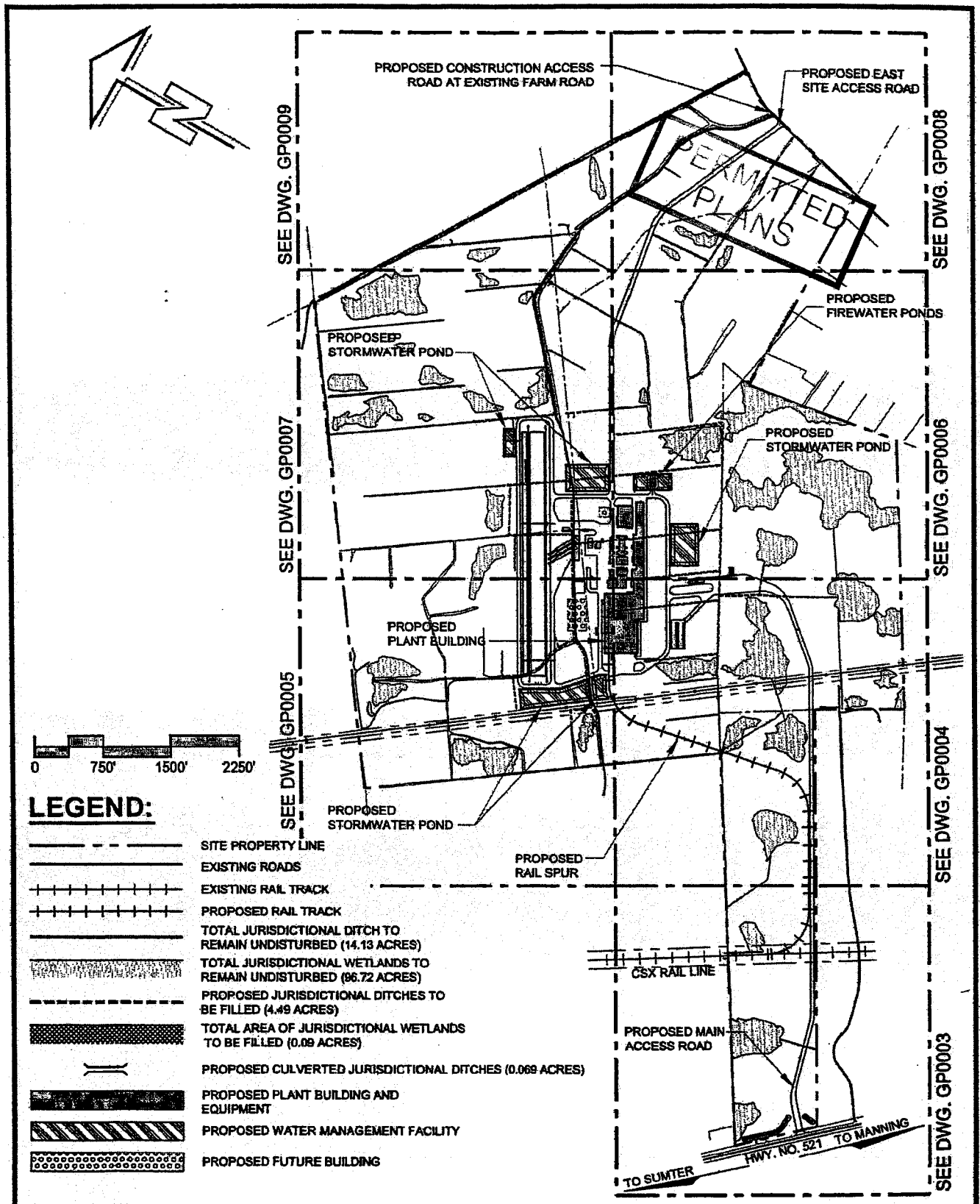
Grant Clarendon Inc.
OSB Plant - Clarendon County, S.C.
Lat: N 33° 47.71' Long: W 80° 13.85'
Permit No.: 2005-4W-325
Site - Existing Conditions Plan

DATE: 9/16/05 ~~05/09/16~~

DRAWING NUMBER: 00-GP-0001

SHEET NUMBER: 5 of 20

ISSUE/REVISION: A



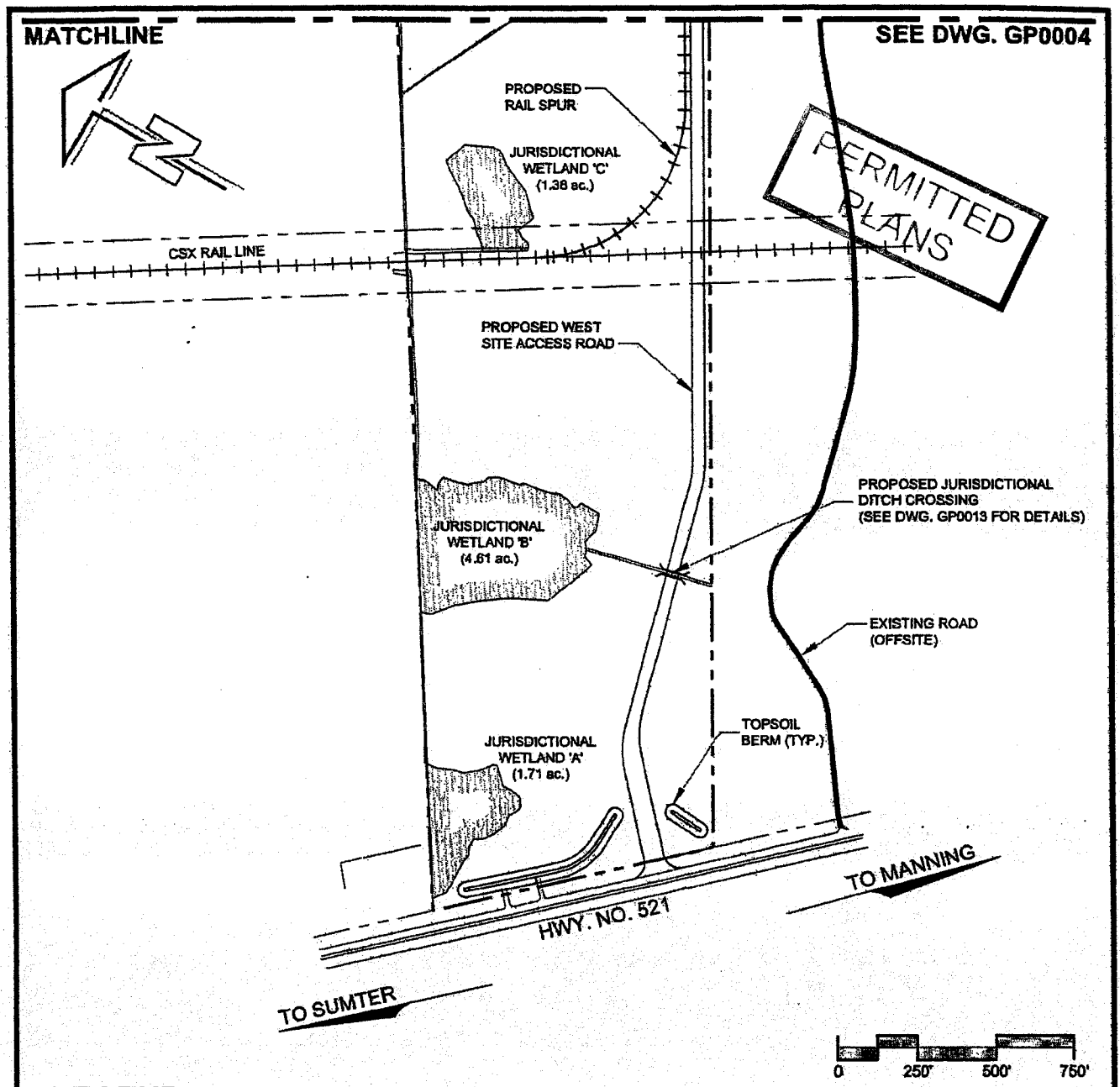
AGENT:
MACTEC Inc.
720 GRACERN Rd SUITE 132
COLUMBIA, SC 29210

APPLICANT:
GRANT CLARENDON INC.
1441 MAIN STREET
COLUMBIA, SC 29210

Grant Clarendon Inc.
OSB Plant - Clarendon County, S.C.
Lat: N 33° 47.71' Long: W 80° 13.85'
Permit No.: 2005-4W-325
Site - Key Plan

9/16/05

DRAWING NUMBER	SHEET NUMBER	DATE	ISSUE/REVISION
00-GP-0002	6 of 20	~~05/09/16~~	A



LEGEND:

- SITE PROPERTY LINE
- EXISTING RAIL TRACK
- PROPOSED RAIL TRACK
- TOTAL JURISDICTIONAL DITCH TO REMAIN UNDISTURBED (14.13 ACRES)
- TOTAL JURISDICTIONAL WETLANDS TO REMAIN UNDISTURBED (96.72 ACRES)
- PROPOSED JURISDICTIONAL DITCHES TO BE FILLED (4.49 ACRES)
- TOTAL AREA OF JURISDICTIONAL WETLANDS TO BE FILLED (0.09 ACRES)
- PROPOSED NEW DITCH TO BE DITCHES (0.069 ACRES)
- PROPOSED PLANT BUILDING AND EQUIPMENT
- PROPOSED WATER MANAGEMENT FACILITY
- PROPOSED FUTURE BUILDING

AGENT:
MACTEC Inc.
720 GRACERN Rd SUITE 132
COLUMBIA, SC 29210

APPLICANT:
GRANT CLARENDON INC.
1441 MAIN STREET
COLUMBIA, SC 29210

Grant Clarendon Inc.
OSB Plant - Clarendon County, S.C.
Lat: N 33° 47.71' Long: W 80° 13.85'
Permit No.: 2005-4W-325
Site - Index Plan 1 of 7

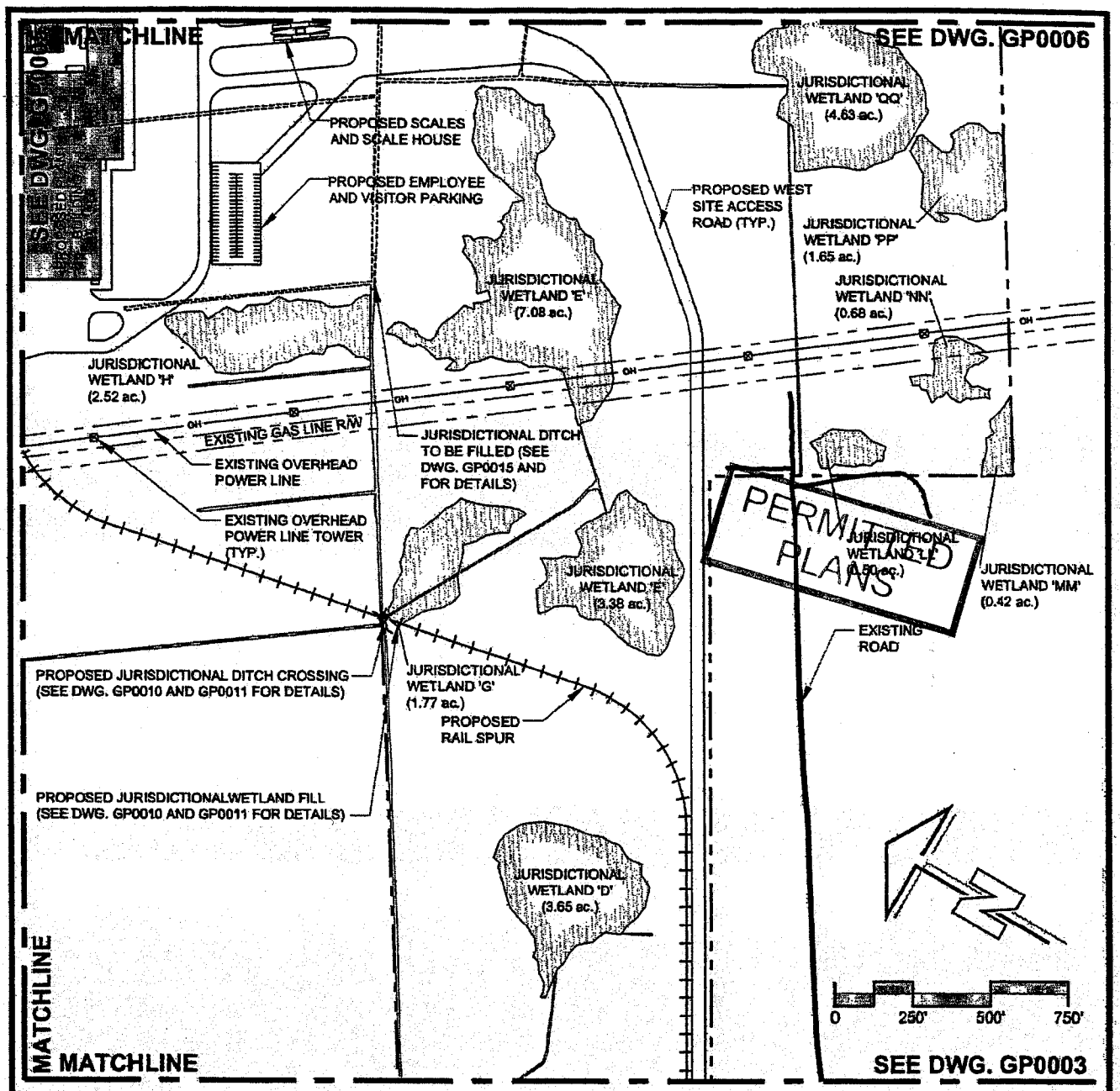
9/16/05

DATE ~~05/09/16~~

DRAWING NUMBER 00-GP-0003

SHEET NUMBER 7 of 20

ISSUE/REVISION A



LEGEND:

- SITE PROPERTY LINE
- EXISTING RAIL TRACK
- PROPOSED RAIL TRACK
- TOTAL JURISDICTIONAL DITCH TO REMAIN UNDISTURBED (14.13 ACRES)
- TOTAL JURISDICTIONAL WETLANDS TO REMAIN UNDISTURBED (96.72 ACRES)
- PROPOSED JURISDICTIONAL DITCHES TO BE FILLED (4.49 ACRES)
- TOTAL AREA OF JURISDICTIONAL WETLANDS TO BE FILLED (0.09 ACRES)
- PROPOSED CULVERTED JURISDICTIONAL DITCHES (0.069 ACRES)
- PROPOSED PLANT BUILDING AND EQUIPMENT
- PROPOSED WATER MANAGEMENT FACILITY
- PROPOSED FUTURE BUILDING

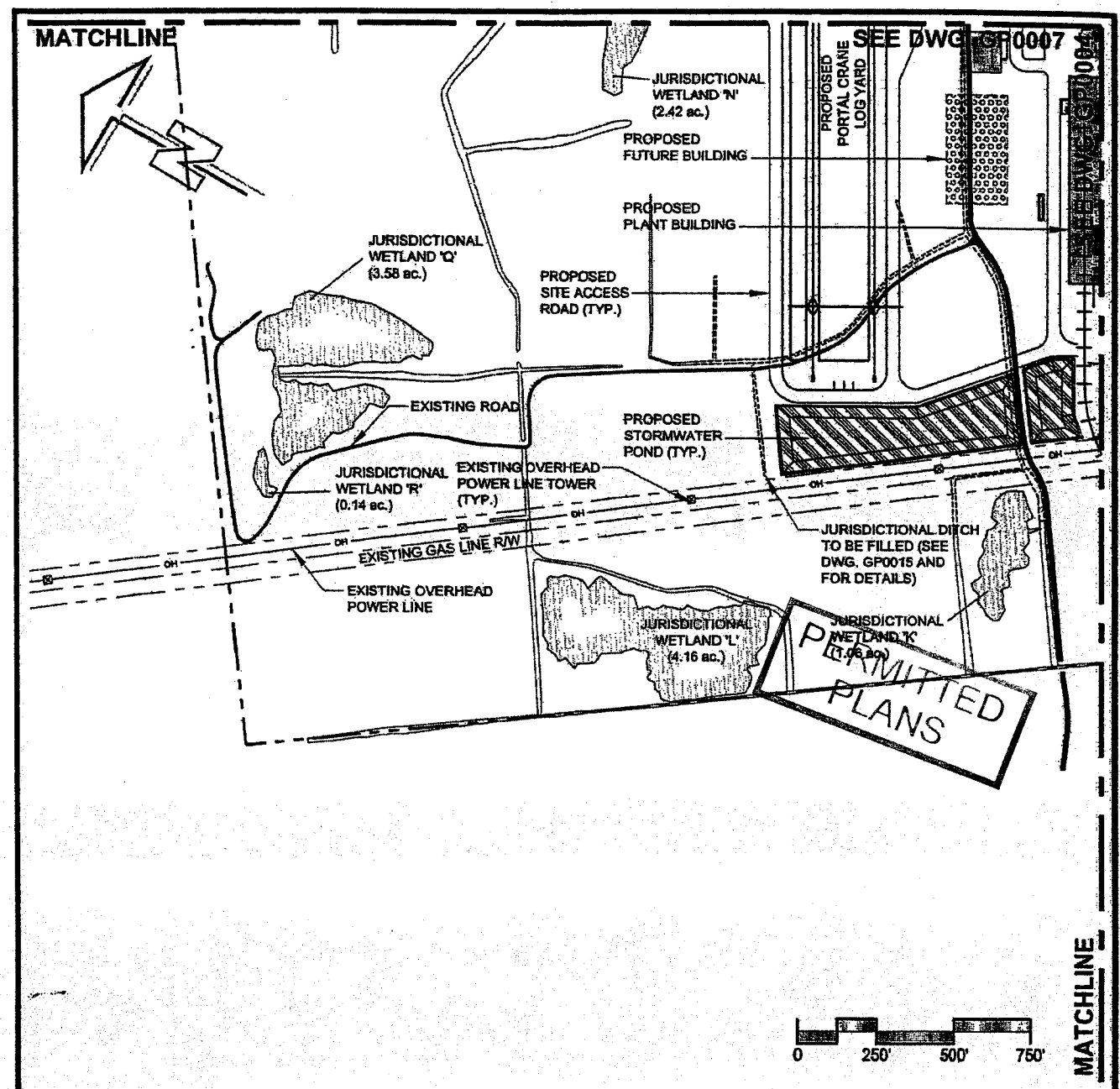
AGENT:
MACTEC Inc.
720 GRACERN Rd SUITE 132
COLUMBIA, SC 29210

APPLICANT:
GRANT CLARENDON INC.
1441 MAIN STREET
COLUMBIA, SC 29210

Grant Clarendon Inc.
OSB Plant - Clarendon County, S.C.
Lat: N 33° 47.71' Long: W 80° 13.85'
Permit No. : 2005-40-325
Site - Index Plan 2 of 7

DATE: 9/16/05 ~~05/09/10~~

DRAWING NUMBER: 00-GP-0004
SHEET NUMBER: 8 of 20
ISSUE/REVISION: A



LEGEND:

- SITE PROPERTY LINE
- EXISTING RAIL TRACK
- PROPOSED RAIL TRACK
- TOTAL JURISDICTIONAL DITCH TO REMAIN UNDISTURBED (14.13 ACRES)
- TOTAL JURISDICTIONAL WETLANDS TO REMAIN UNDISTURBED (96.72 ACRES)
- PROPOSED JURISDICTIONAL DITCHES TO BE FILLED (4.49 ACRES)
- TOTAL AREA OF JURISDICTIONAL WETLANDS TO BE FILLED (0.09 ACRES)
- PROPOSED CULVERTED JURISDICTIONAL DITCHES (0.069 ACRES)
- PROPOSED PLANT BUILDING AND EQUIPMENT
- PROPOSED WATER MANAGEMENT FACILITY
- PROPOSED FUTURE BUILDING

AGENT:
MACTEC Inc.
720 GRACERN Rd SUITE 132
COLUMBIA, SC 29210

APPLICANT:
GRANT CLARENDON INC.
1441 MAIN STREET
COLUMBIA, SC 29210

Grant Clarendon Inc.
OSB Plant - Clarendon County, S.C.
Lat: N 33° 47.71' Long: W 80° 13.85'
Permit No.: 2005-4W-325
Site - Index Plan 3 of 7

9/16/05
DATE
~~05/09/16~~

DRAWING NUMBER
00-GP-0005

SHEET NUMBER
9 of 20

ISSUE/REVISION
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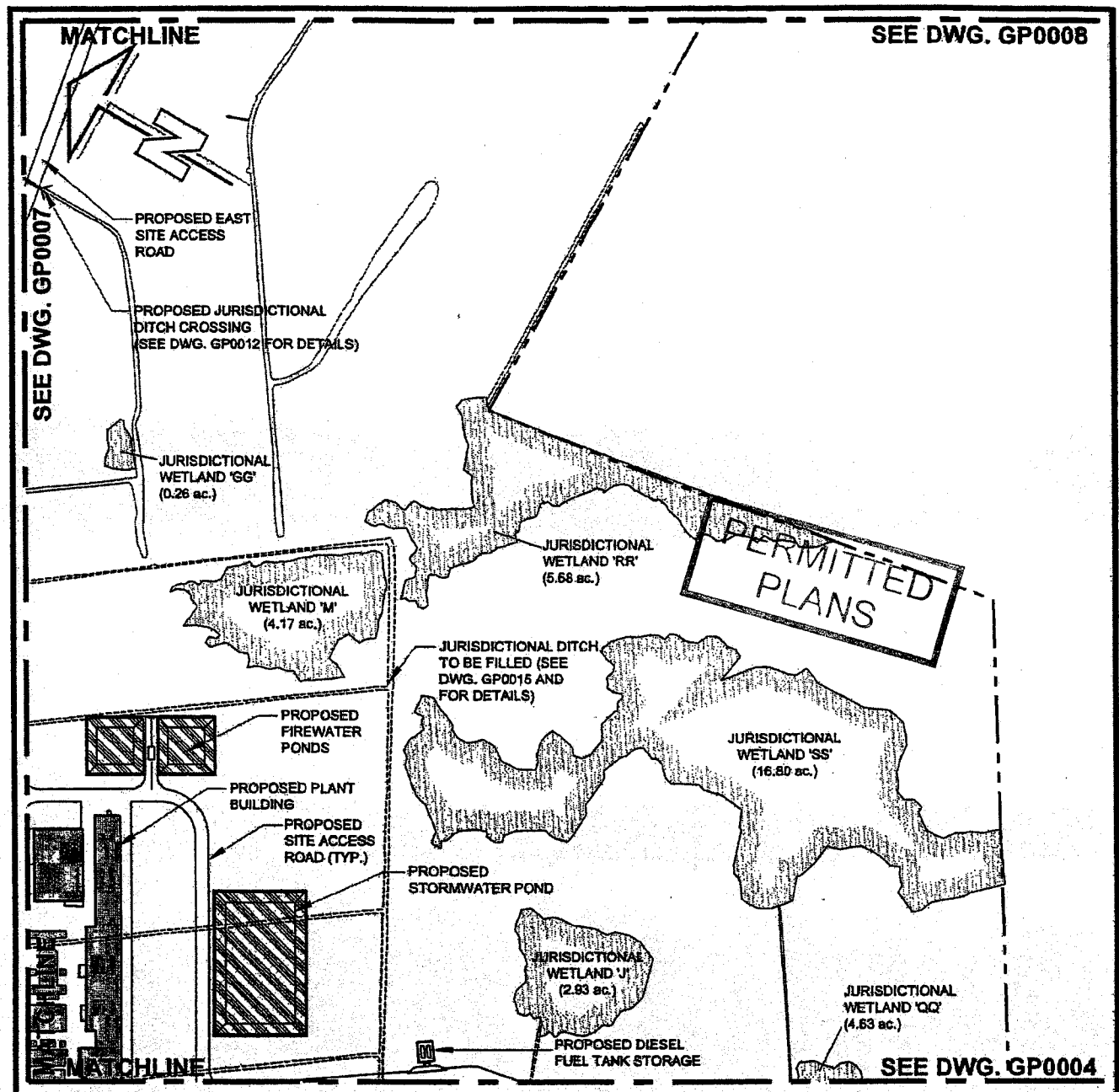

LEGEND:

- SITE PROPERTY LINE
- EXISTING RAIL TRACK
- PROPOSED RAIL TRACK
- TOTAL JURISDICTIONAL DITCH TO REMAIN UNDISTURBED (14.13 ACRES)
- TOTAL JURISDICTIONAL WETLANDS TO REMAIN UNDISTURBED (96.72 ACRES)
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- TOTAL AREA OF JURISDICTIONAL WETLANDS TO BE FILLED (0.09 ACRES)
- PROPOSED CULVERTED JURISDICTIONAL DITCHES (0.069 ACRES)
- PROPOSED PLANT BUILDING AND EQUIPMENT
- PROPOSED WATER MANAGEMENT FACILITY
- PROPOSED FUTURE BUILDING

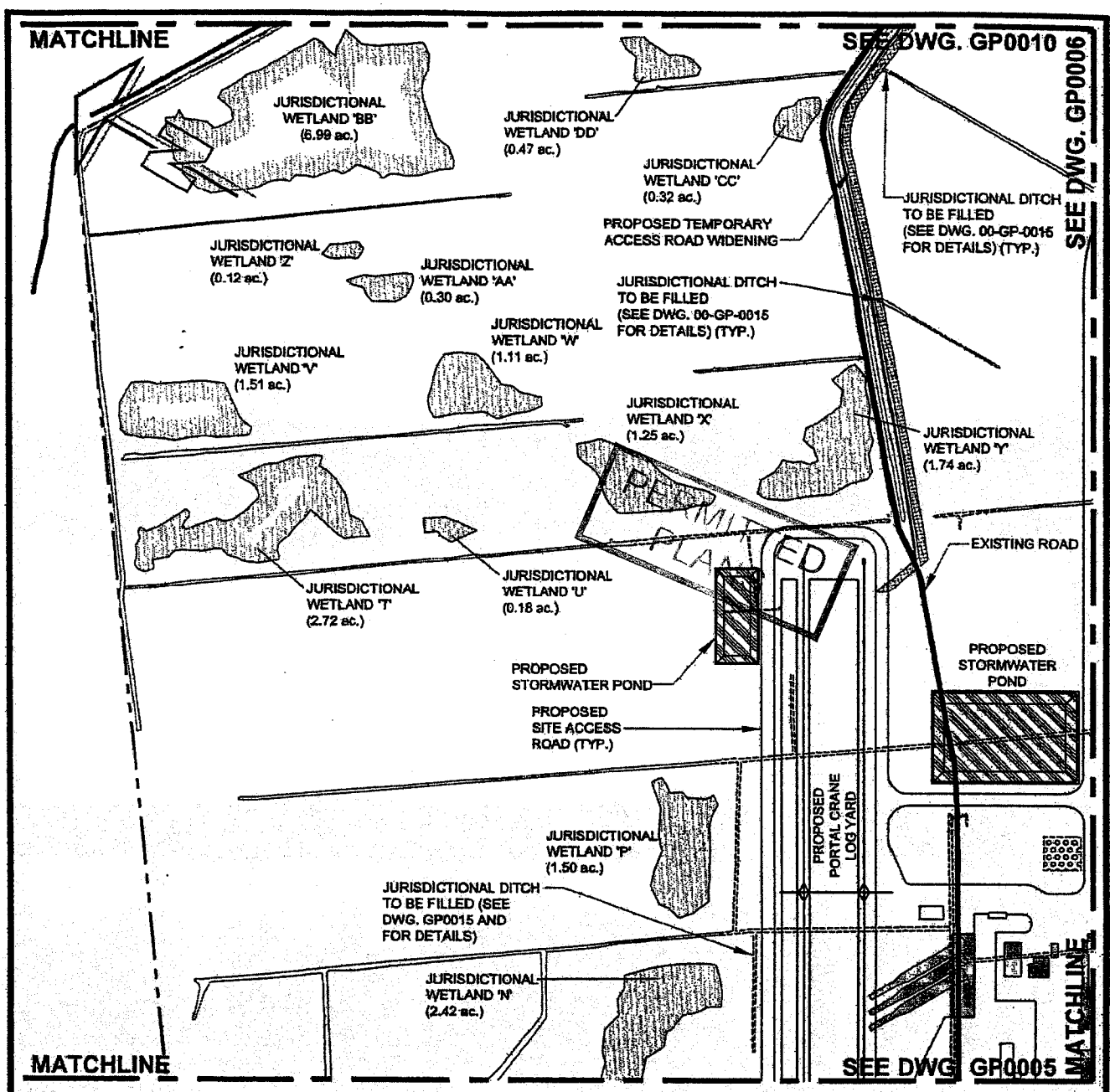
AGENT:
MACTEC Inc.
720 GRACERN Rd SUITE 132
COLUMBIA, SC 29210

APPLICANT:
GRANT CLARENDON INC.
1441 MAIN STREET
COLUMBIA, SC 29210

Grant Clarendon Inc.
OSB Plant - Clarendon County, S.C.
Lat: N 33° 47.71' Long: W 80° 13.85'
Permit No. : 2005-4w-325
Site - Index Plan 4 of 7

9/16/05

DATE	DRAWING NUMBER	SHEET NUMBER	ISSUE/REVISION
~~05/09/16~~	00-GP-0006	10 of 20	A



LEGEND:

- SITE PROPERTY LINE
- EXISTING RAIL TRACK
- PROPOSED RAIL TRACK
- TOTAL JURISDICTIONAL DITCH TO REMAIN UNDISTURBED (14.13 ACRES)
- TOTAL JURISDICTIONAL WETLANDS TO REMAIN UNDISTURBED (96.72 ACRES)
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- PROPOSED CULVERTED JURISDICTIONAL DITCHES (0.069 ACRES)
- PROPOSED PLANT BUILDING AND EQUIPMENT
- PROPOSED WATER MANAGEMENT FACILITY
- PROPOSED FUTURE BUILDING

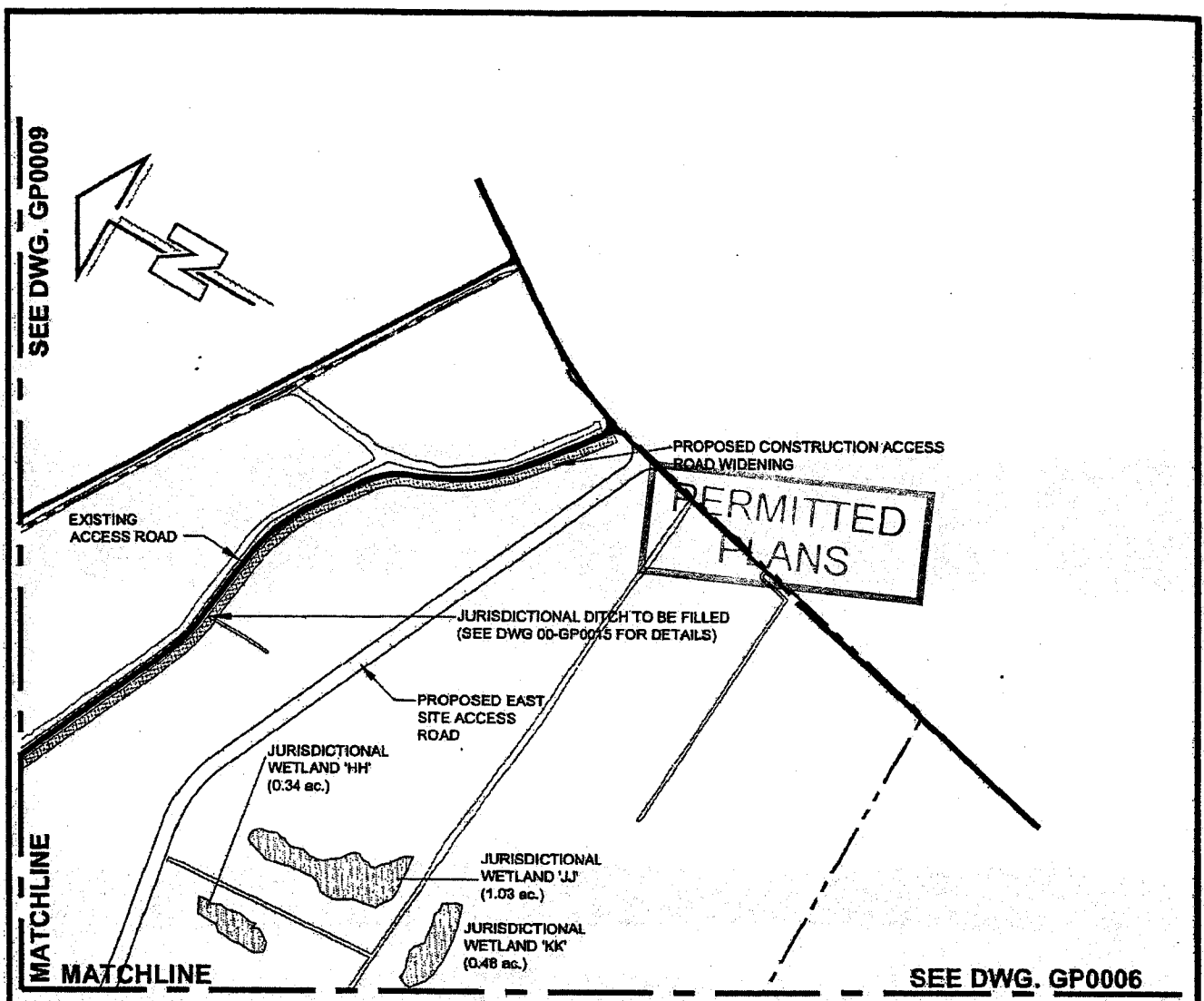
AGENT:
MACTEC Inc.
720 GRACERN Rd SUITE 132
COLUMBIA, SC 29210

APPLICANT:
GRANT CLARENDON INC.
1441 MAIN STREET
COLUMBIA, SC 29210

Grant Clarendon Inc.
OSB Plant - Clarendon County, S.C.
Lat: N 33° 47.71' Long: W 80° 13.85'
Permit No.: 2005-4W-325
Site - Index Plan 5 of 7

9/16/05

DATE	DRAWING NUMBER	SHEET NUMBER	ISSUE/REVISION
~~05/09/16~~	00-GP-0007	11 of 20	A



0 250' 500' 750'

LEGEND:

- SITE PROPERTY LINE
- EXISTING RAIL TRACK
- PROPOSED RAIL TRACK
- TOTAL JURISDICTIONAL DITCH TO REMAIN UNDISTURBED (14.13 ACRES)
- TOTAL JURISDICTIONAL WETLANDS TO REMAIN UNDISTURBED (96.72 ACRES)
- PROPOSED JURISDICTIONAL DITCHES TO BE FILLED (4.49 ACRES)
- TOTAL AREA OF JURISDICTIONAL WETLANDS TO BE FILLED (0.09 ACRES)
- PROPOSED CULVERTED JURISDICTIONAL DITCHES (0.069 ACRES)
- PROPOSED PLANT BUILDING AND EQUIPMENT
- PROPOSED WATER MANAGEMENT FACILITY
- PROPOSED FUTURE BUILDING

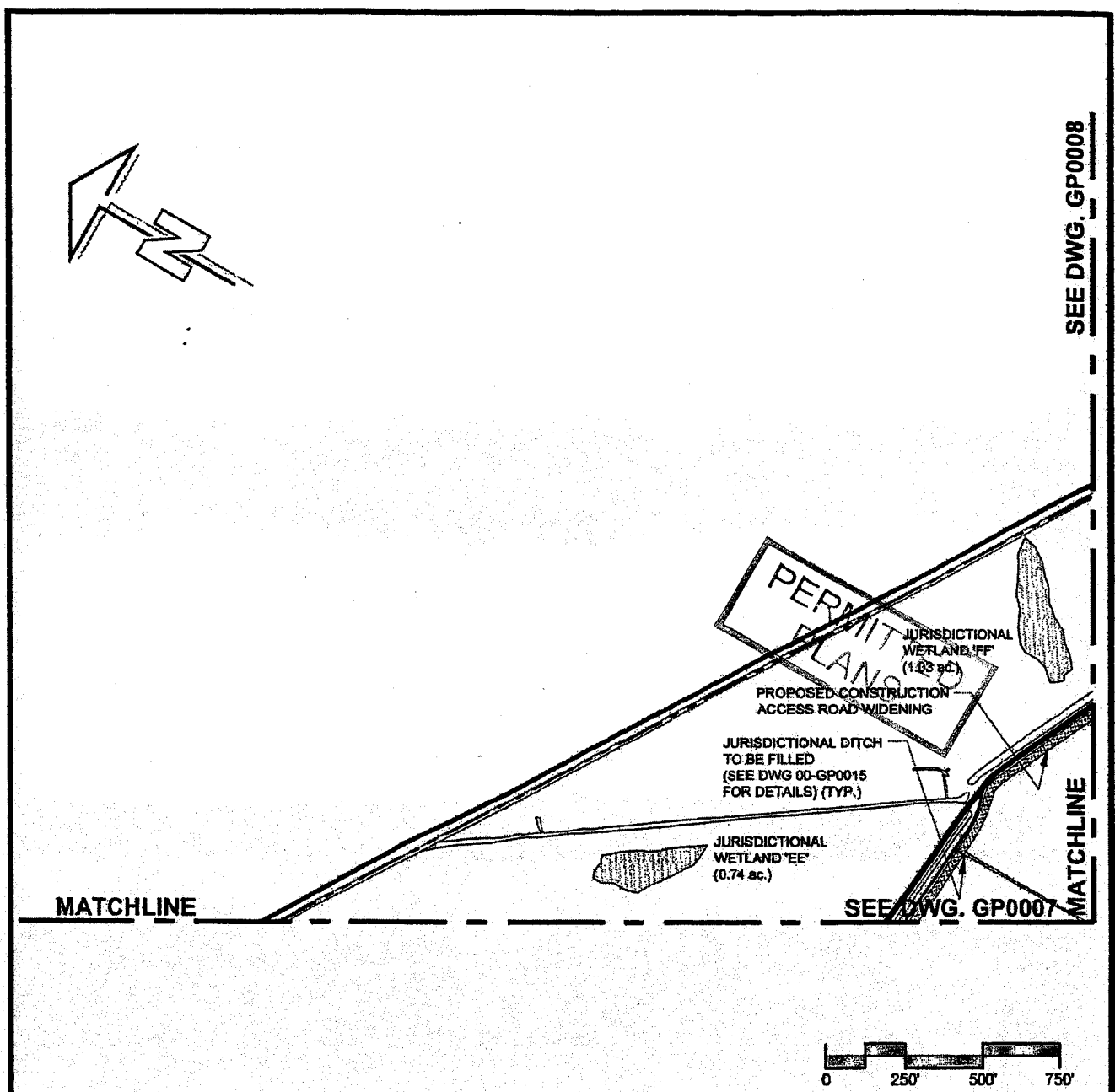
AGENT:
MACTEC Inc.
720 GRACERN Rd SUITE 132
COLUMBIA, SC 29210

APPLICANT:
GRANT CLARENDON INC.
1441 MAIN STREET
COLUMBIA, SC 29210

Grant Clarendon Inc.
OSB Plant - Clarendon County, S.C.
Lat: N 33° 47.71' Long: W 80° 13.85'
Permit No.: 2005-4W-325
Site - Index Plan 6 of 7

9/16/05

DRAWING NUMBER	SHEET NUMBER
00-GP-0008	12 of 20
DATE: ~~05/09/16~~	ISSUE/REVISION: A



LEGEND:

- SITE PROPERTY LINE
- EXISTING RAIL TRACK
- PROPOSED RAIL TRACK
- TOTAL JURISDICTIONAL DITCH TO REMAIN UNDISTURBED (14.13 ACRES)
- TOTAL JURISDICTIONAL WETLANDS TO REMAIN UNDISTURBED (86.72 ACRES)
- PROPOSED JURISDICTIONAL DITCHES TO BE FILLED (4.49 ACRES)
- TOTAL AREA OF JURISDICTIONAL WETLANDS TO BE FILLED (0.09 ACRES)
- PROPOSED CULVERTED JURISDICTIONAL DITCHES (0.069 ACRES)
- PROPOSED PLANT BUILDING AND EQUIPMENT
- PROPOSED WATER MANAGEMENT FACILITY
- PROPOSED FUTURE BUILDING

AGENT:
MACTEC Inc.
720 GRACERN Rd SUITE 132
COLUMBIA, SC 29210

APPLICANT:
GRANT CLARENDON INC.
1441 MAIN STREET
COLUMBIA, SC 29210

Grant Clarendon Inc.
OSB Plant - Clarendon County, S.C.
Lat: N 33° 47.71' Long: W 80° 13.85'
Permit No. : 2005-4W-328
Site - Index Plan 7 of 7

DATE: 9/16/05 ~~05/09/16~~

DRAWING NUMBER: 00-GP-0009

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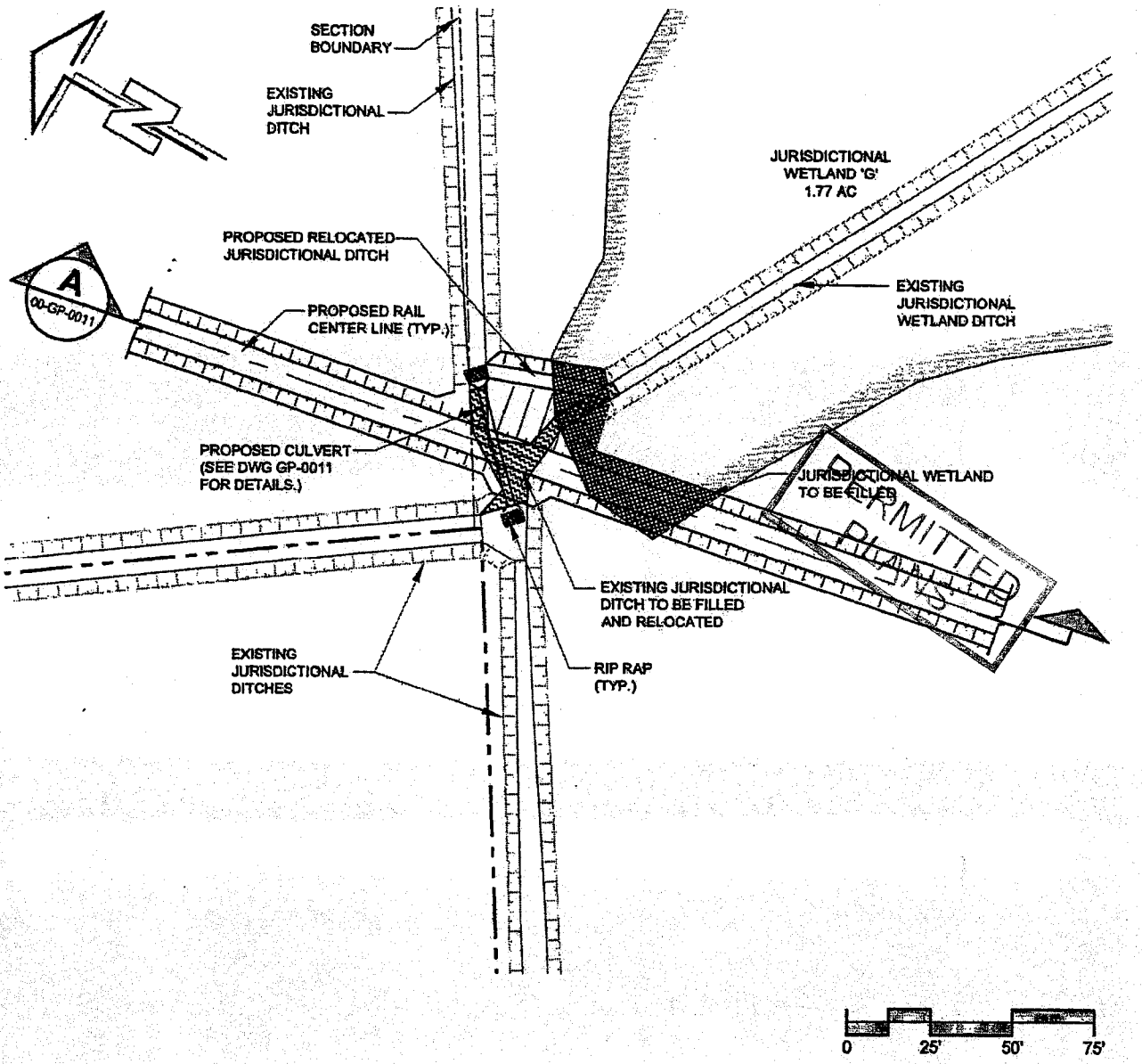
ISSUE/REVISION: A



LEGEND:

- SITE PROPERTY LINE
- RAIL TRACK CENTER LINE
- TOTAL JURISDICTIONAL DITCH TO REMAIN UNDISTURBED
- TOTAL JURISDICTIONAL WETLANDS TO REMAIN UNDISTURBED
- PROPOSED JURISDICTIONAL DITCHES TO BE FILLED
- TOTAL AREA OF JURISDICTIONAL WETLANDS TO BE FILLED (0.09 ACRES)
- PROPOSED NEW DITCH TO BE CONSTRUCTED (0.01 ACRES)
- PROPOSED CULVERTED JURISDICTIONAL DITCHES (0.069 ACRES)

AGENT:
MACTEC Inc.
720 GRACERN Rd SUITE 132
COLUMBIA, SC 29210

APPLICANT:
GRANT CLARENDON INC.
1441 MAIN STREET
COLUMBIA, SC 29210

Grant Clarendon Inc.
OSB Plant - Clarendon County, S.C.
Lat: N 33° 47.71' Long: W 80° 13.85'
Permit No.: 2005-4w-329
Rail Crossing - Plan View

9/16/05
DATE
~~05/09/16~~

DRAWING NUMBER
00-GP-0010

SHEET NUMBER
14 of 20

ISSUE/REVISION
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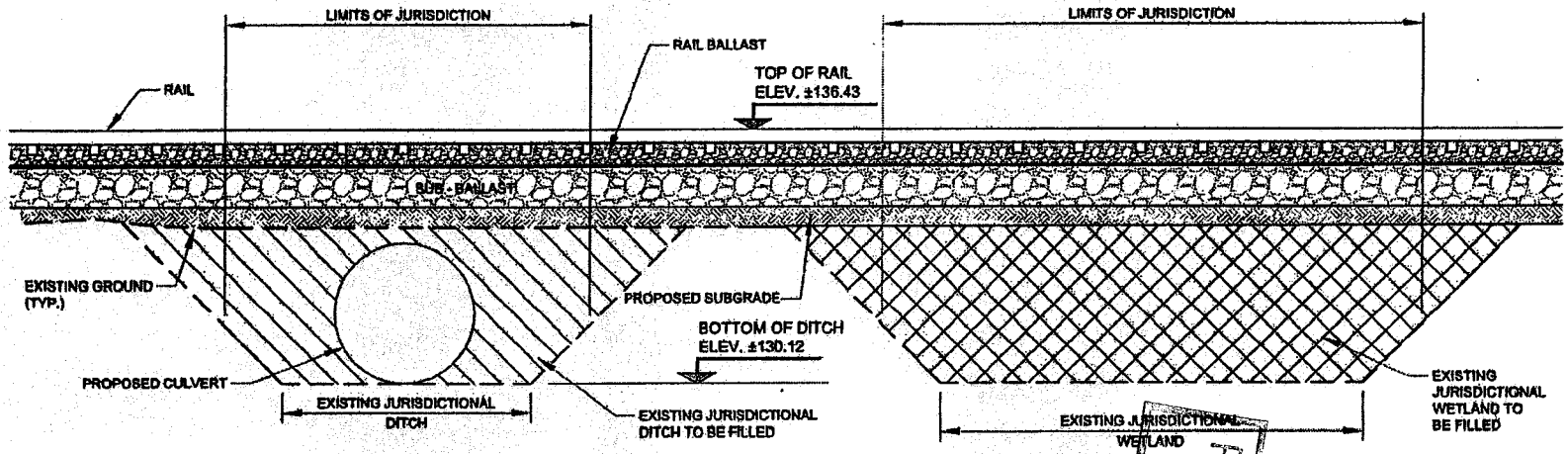


PERMITTED PLANS

SECTION A

SCALE: N.T.S.

00-GP-0010

GENERAL NOTES:

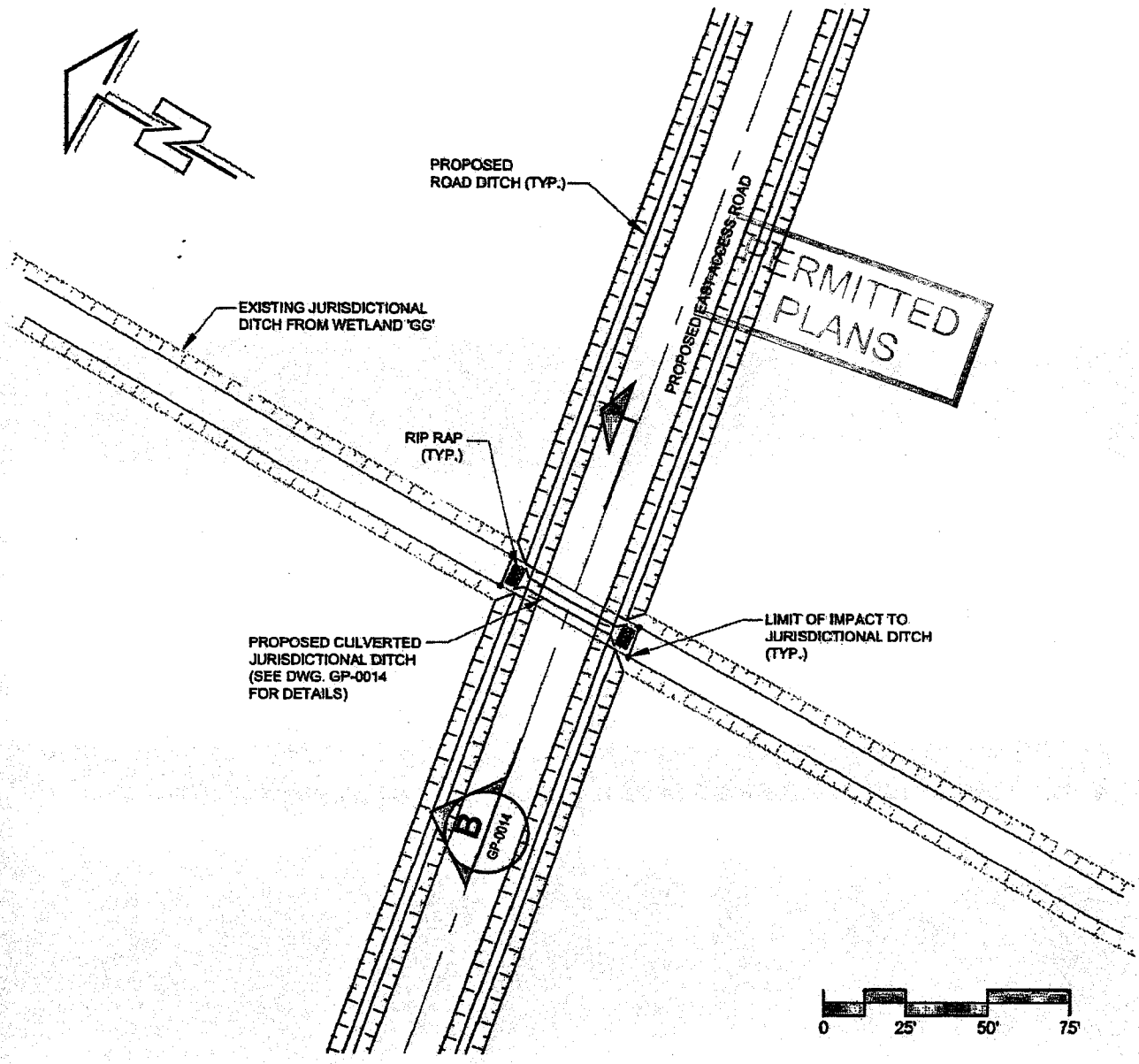
1. ADDITIONAL MINOR UNDERCUTTING OF THE LOOSE SOILS AND BACKFILL WITH SUITABLE MATERIALS WILL OCCUR AS SITE CONDITIONS DICTATE.

AGENT:
MACTEC Inc.
720 GRACERN Rd SUITE 132
COLUMBIA, SC 29210

APPLICANT:
GRANT CLARENDON INC.
1441 MAIN STREET
COLUMBIA, SC 29210

Grant Clarendon Inc.
OSB Plant - Clarendon County, S.C.
Lat: N 33° 47.71' Long: W 80° 13.85'
Permit No.: 2005-40-348
Rail Crossing - Typical Section

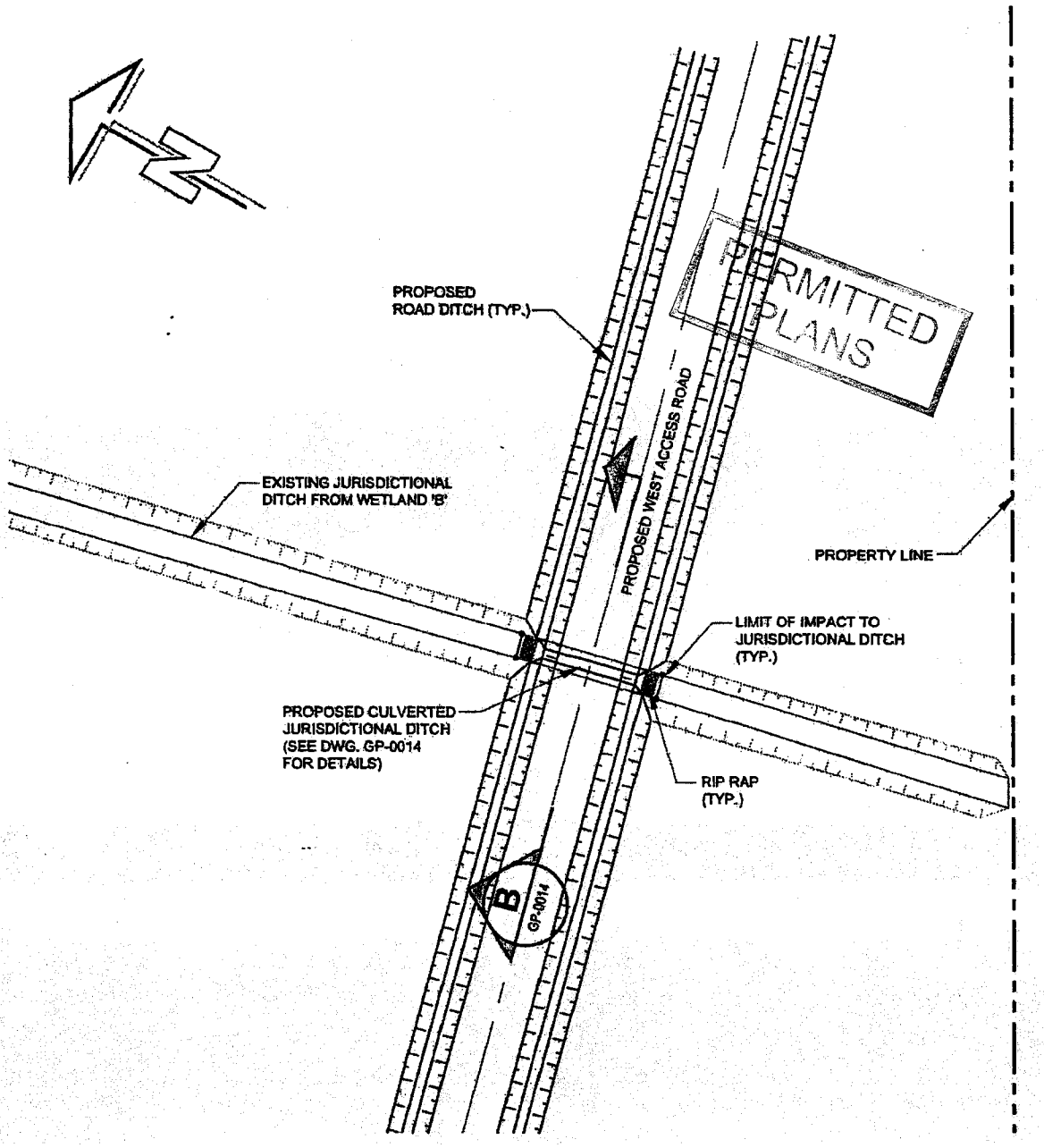
DATE	DRAWING NUMBER
~~05/09/10~~ 9/16/05	00-GP-0011
SHEET NUMBER	ISSUE/REVISION
15 of 20	A



LEGEND:

- SITE PROPERTY LINE
- PROPOSED ROAD CENTER LINE
- TOTAL JURISDICTIONAL DITCH TO REMAIN UNDISTURBED
- PROPOSED CULVERTED JURISDICTIONAL DITCHES

AGENT: MACTEC Inc. 720 GRACERN Rd SUITE 132 COLUMBIA, SC 29210 APPLICANT: GRANT CLARENDON INC. 1441 MAIN STREET COLUMBIA, SC 29210	**Grant Clarendon Inc.** **OSB Plant - Clarendon County, S.C.** **Lat: N 33° 47.71' Long: W 80° 13.85'** **Permit No.: 2005-4W-328** **Road Crossing Plan - North Location**	DRAWING NUMBER **00-GP-0012** SHEET NUMBER 16 of 20 DATE 9/15/05 ~~05/09/15~~ ISSUE/REVISION **A**



LEGEND:

- SITE PROPERTY LINE
- PROPOSED ROAD CENTER LINE
- TOTAL JURISDICTIONAL DITCH TO REMAIN UNDISTURBED
- PROPOSED CULVERTED JURISDICTIONAL DITCHES

0 25' 50' 75'

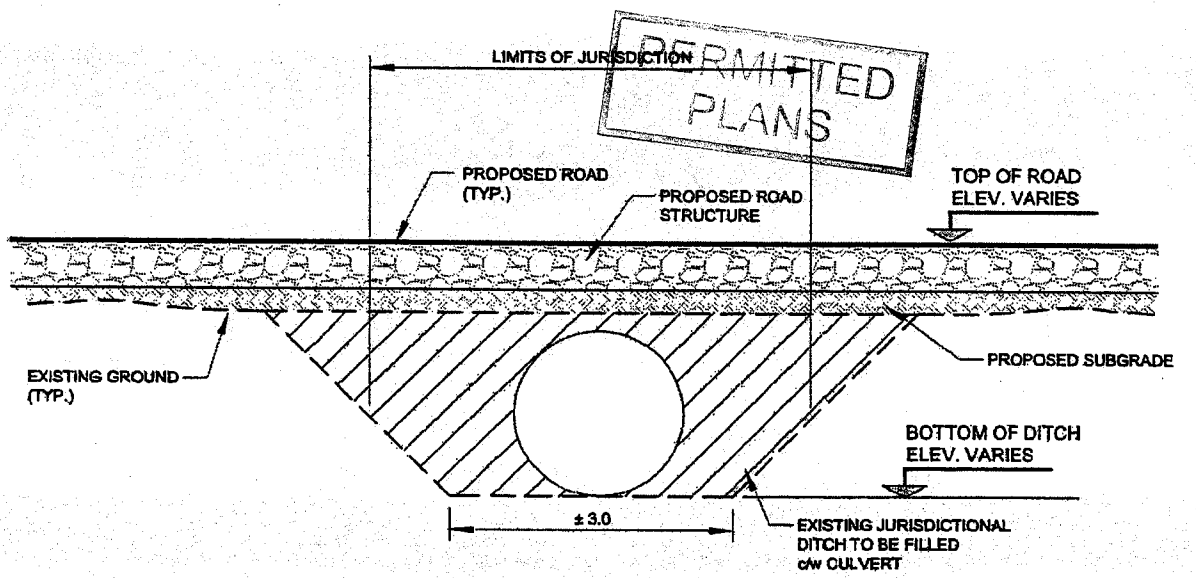
AGENT:
MACTEC Inc.
720 GRACERN Rd SUITE 132
COLUMBIA, SC 29210

APPLICANT:
GRANT CLARENDON INC.
1441 MAIN STREET
COLUMBIA, SC 29210

Grant Clarendon Inc.
OSB Plant - Clarendon County, S.C.
Lat: N 33° 47.71' Long: W 80° 13.85'
Permit No.: 2005-40-325
Road Crossing Plan - South Location

DATE: 9/16/05 ~~05/09/16~~

DRAWING NUMBER: 00-GP-0013
SHEET NUMBER: 17 of 20
ISSUE/REVISION: A



SECTION

SCALE: N.T.S.

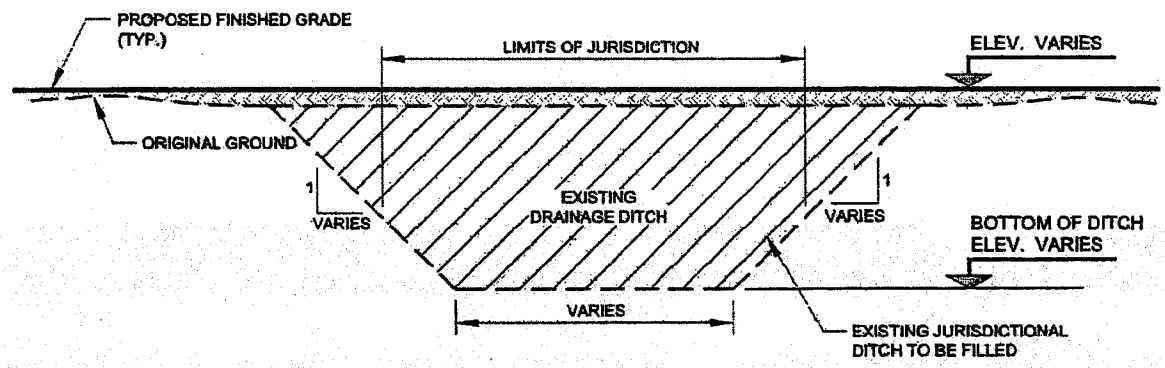
B
0012, 0013

GENERAL NOTES:

1. ADDITIONAL MINOR UNDERCUTTING OF THE LOOSE SOILS AND BACKFILL WITH SUITABLE MATERIALS WILL OCCUR AS SITE CONDITIONS DICTATE.

AGENT: MACTEC Inc. 720 GRACERN Rd SUITE 132 COLUMBIA, SC 29210 APPLICANT: GRANT CLARENDON INC. 1441 MAIN STREET COLUMBIA, SC 29210	**Grant Clarendon Inc.** **OSB Plant - Clarendon County, S.C.** **Lat: N 33° 47.71' Long: W 80° 13.85'** **Permit No.: 2005-40-325** **Road Crossing - Typical Section**	DRAWING NUMBER **00-GP-0014** SHEET NUMBER 18 of 20
	DATE ~~05/09/16~~ 9/16/05	ISSUE/REVISION **A**

PERMITTED PLANS



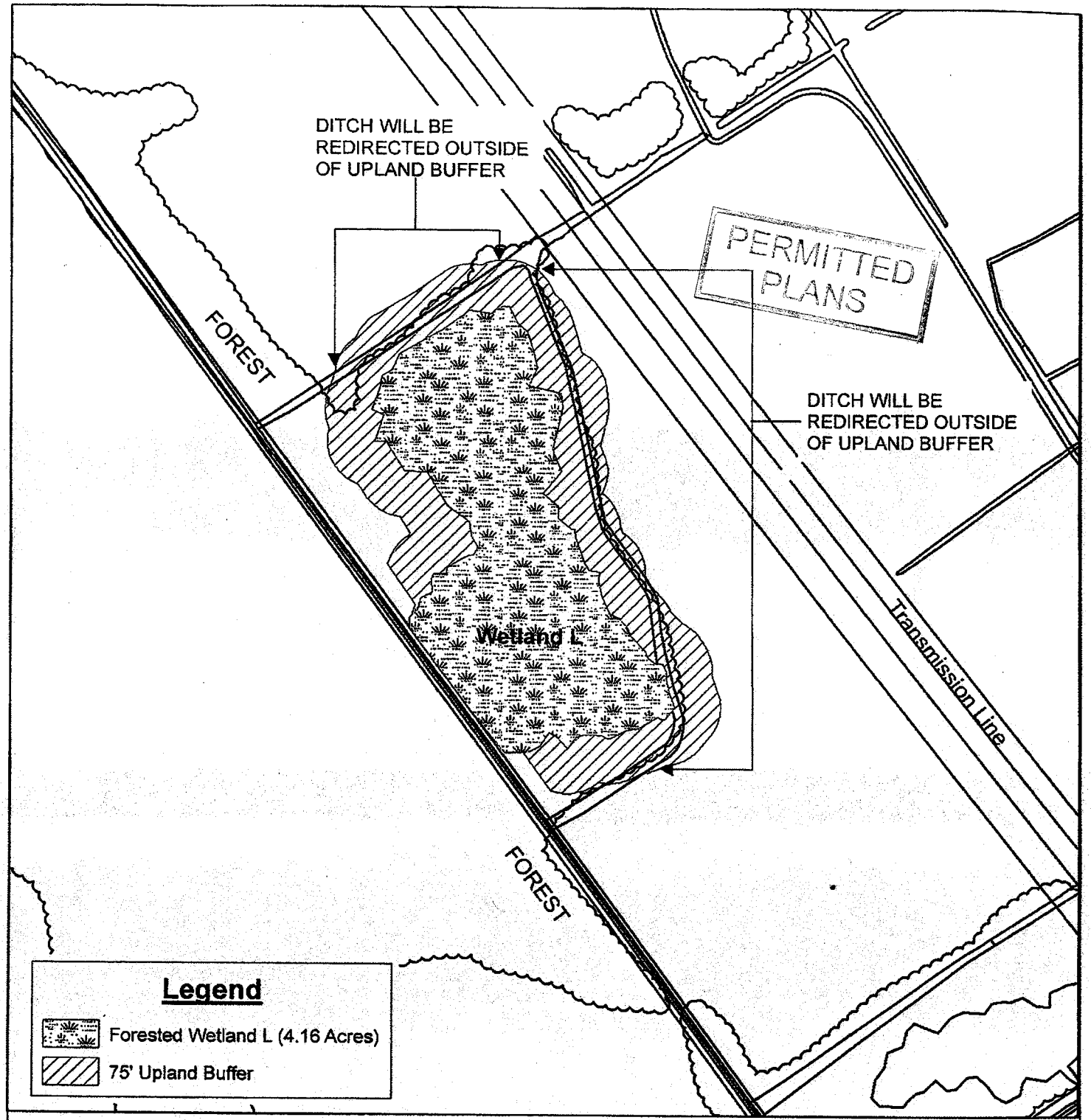
TYPICAL DITCH FILL SECTION

SCALE: N.T.S

GENERAL NOTES:

1. ADDITIONAL MINOR UNDERCUTTING OF THE LOOSE SOILS AND BACKFILL WITH SUITABLE MATERIALS WILL OCCUR AS SITE CONDITIONS DICTATE.

AGENT: MACTEC Inc. 720 GRACERN Rd SUITE 132 COLUMBIA, SC 29210 APPLICANT: GRANT CLARENDON INC. 1441 MAIN STREET COLUMBIA, SC 29210	**Grant Clarendon Inc.** **OSB Plant - Clarendon County, S.C.** **Lat: N 33° 47.71' Long: W 80° 13.85'** **Permit No.: 2005-4W-328** **Jurisdictional Ditch - Fill Section**	DRAWING NUMBER **00-GP-0015** SHEET NUMBER 19 of 20 DATE 9/16/05 ~~05/09/16~~ ISSUE/REVISION **A**



Base Map: Glenn Associates Surveying, Inc.

0 62.5 125 250 375 500 Feet

Grant Clarendon Inc.
1321 Technology Drive
Barnwell, SC 29812

MACTEC
720 Gracern Road, Suite 132
Columbia, SC 29210

Proposed Mitigation for Jurisdictional Impacts
Proposed Grant Clarendon Manufacturing Facility
Clarendon County, South Carolina
November 22, 2005

Prepared By: RC 11/22/05 Checked By: AMC 11-22-05 MACTEC Project No. 6671-05-0394

Sheet 20 of 20

BOARD:
Elizabeth M. Hagood
Chairman

Mark B. Kent
Vice Chairman

L. Michael Blackmon
Secretary

D H E C

PROMOTE PROTECT PROSPER

C. Earl Hunter, Commissioner

Promoting and protecting the health of the public and the environment.

BOARD:
Edwin H. Cooper, III

Carl L. Brazell

Steven G. Kisner

Coleman F. Buckhouse, MD

FEB 16 2006

February 13, 2006

Grant Clarendon Inc
MACTEC Engineering & Consulting
720 Gracern Rd Ste 132
Columbia SC 29210

Re: Certification in Accordance with Section 401 of the Clean Water Act, as amended.

Grant Clarendon Inc
Placement of fill in waters of the US
Pocotaligo River
Clarendon County
P/N 2005-4W-325-W

Randy

Dear Sir,

We have reviewed plans for this project and determined there is a reasonable assurance that the proposed project will be conducted in a manner consistent with the Certification requirements of Section 401 of the Federal Clean Water Act, as amended. In accordance with the provisions of Section 401, we certify that this project, subject to the indicated conditions, is consistent with applicable provisions of Section 303 of the Federal Clean Water Act, as amended. We also hereby certify that there are no applicable effluent limitations under Sections 301(b) and 302, and that there are no applicable standards under Sections 306 and 307.

This certification is subject to the following conditions:

1. Once the project is initiated, it must be carried to completion in an expeditious manner in order to minimize the period of disturbance to the environment.

2. Construction activities must avoid to the greatest extent practicable, encroachment into any wetland/creek bank areas not designated as impact areas. Wetlands that are unintentionally impacted must be appropriately mitigated.

3. All necessary measures must be taken to prevent oil, tar, trash, debris and other pollutants from entering the adjacent waters or wetlands.

4. Only clean earthen material free of all potential sources of pollution must be used as fill.

5. The applicant must implement best management practices that will minimize erosion and migration of sediments off site. These practices may include the use of mulches, hay bales, silt fences, or other devices capable of preventing erosion and migration of sediments. All disturbed land surfaces must be stabilized upon project completion.

6. A State sediment and erosion control permit must be obtained prior to any land disturbing activity.

7. The project must be developed in accordance with the site development plan published in a joint public notice by the Army Corps of Engineers on October 28, 2005.

8. The applicant must provide compensatory mitigation for wetlands impacts associated with the proposed work by preserving 4.16 acres of an on-site forested wetland (Wetland L) and placing a 75-foot wide upland buffer along the northern and eastern edges of the wetland. The buffer areas are currently open field and will be replanted with native species and allowed to regenerate naturally. Flow to two jurisdictional ditches adjacent to the wetland on the north and east sides will be redirected outside of the upland buffer. No monitoring will be implemented for the wetland or the buffer. The preserved areas must be protected in perpetuity through the placement of a U. S. Army Corps of Engineers approved restrictive covenants. A declaration of restrictive covenants or conservation easement must be reviewed and approved by the Department prior to recording. A stamped, recorded copy of the declaration of restrictive covenants must be submitted to the Department within 60 days of 404-permit issuance.

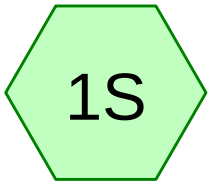
The SC Department of Health and Environmental Control reserves the right to impose additional conditions on the Certification to respond to unforeseen, specific problems that might arise and to take any enforcement action to ensure compliance with State water quality standards.

Sincerely,

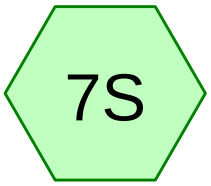
M. Rheta Geddings, Director
Division of Water Quality
Bureau of Water

cc: US Army Corps of Engineers
Charleston District Office
Sumter EQC Office District Office

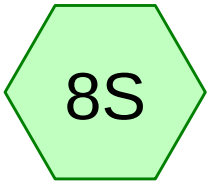
Section 9
Hydrologic Analysis



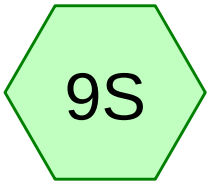
Borrow Area #1b - Existing



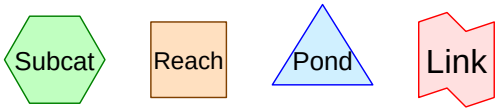
Borrow Area #1b - Improved



Borrow Area #1a - Existing



Borrow Area #1a - Improved



Drainage Diagram for NOI_SWPPP 2010_Area #1
Prepared by RMT, INC. 12/21/2010
HydroCAD® 8.00 s/n 004531 © 2006 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcats)
0.796	74	>75% Grass cover, Good, HSG C (7S,9S)
0.796	86	<50% Grass cover, Poor, HSG C (1S,8S)
1.592		

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Borrow Area #1b - Existing Runoff Area=0.227 ac Runoff Depth>2.11"
Flow Length=169' Slope=0.0266 '/' Tc=12.4 min CN=86 Runoff=0.72 cfs 0.040 af

Subcatchment 7S: Borrow Area #1b - Improved Runoff Area=0.227 ac Runoff Depth>1.25"
Flow Length=169' Slope=0.0266 '/' Tc=12.4 min CN=74 Runoff=0.43 cfs 0.024 af

Subcatchment 8S: Borrow Area #1a - Existing Runoff Area=0.569 ac Runoff Depth>2.11"
Flow Length=169' Slope=0.0237 '/' Tc=13.0 min CN=86 Runoff=1.77 cfs 0.100 af

Subcatchment 9S: Borrow Area #1a - Improved Runoff Area=0.569 ac Runoff Depth>1.25"
Flow Length=169' Slope=0.0237 '/' Tc=13.0 min CN=74 Runoff=1.06 cfs 0.059 af

Total Runoff Area = 1.592 ac Runoff Volume = 0.223 af Average Runoff Depth = 1.68"
100.00% Pervious Area = 1.592 ac 0.00% Impervious Area = 0.000 ac

Subcatchment 1S: Borrow Area #1b - Existing

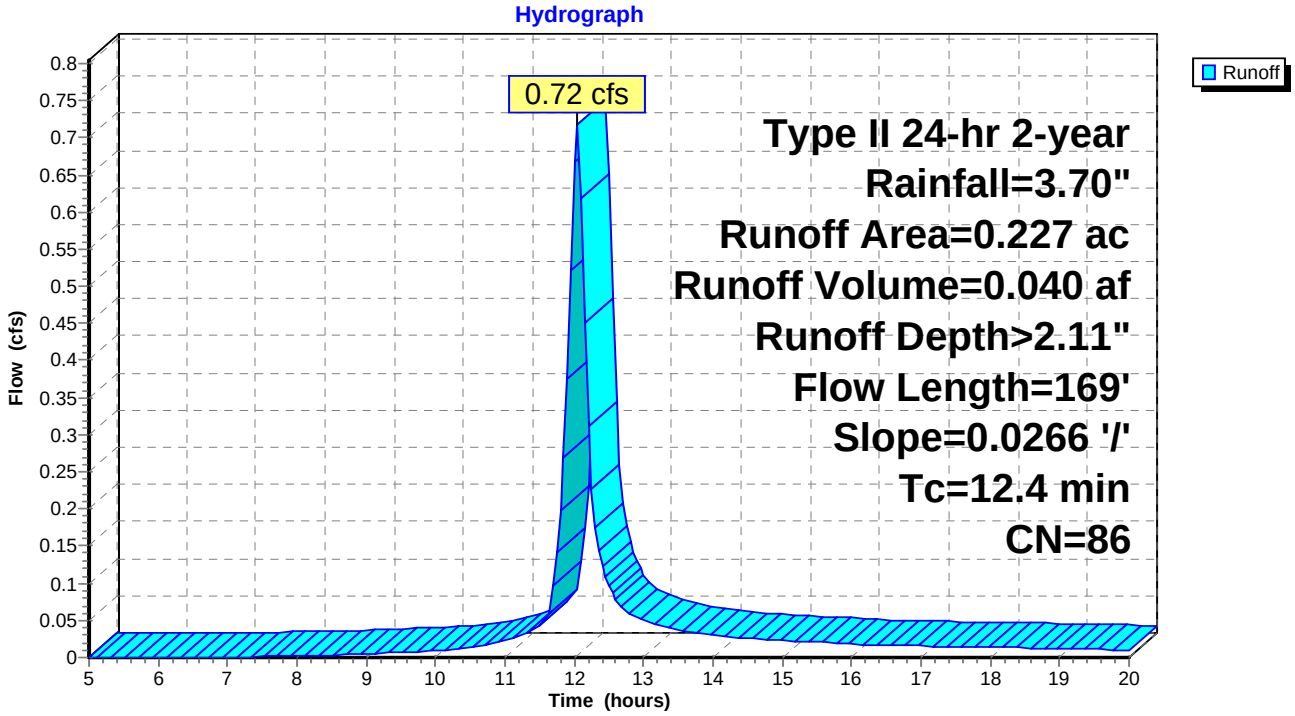
Runoff = 0.72 cfs @ 12.04 hrs, Volume= 0.040 af, Depth> 2.11"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-year Rainfall=3.70"

Area (ac)	CN	Description
0.227	86	<50% Grass cover, Poor, HSG C
0.227		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.4	169	0.0266	0.23		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"

Subcatchment 1S: Borrow Area #1b - Existing



Subcatchment 7S: Borrow Area #1b - Improved

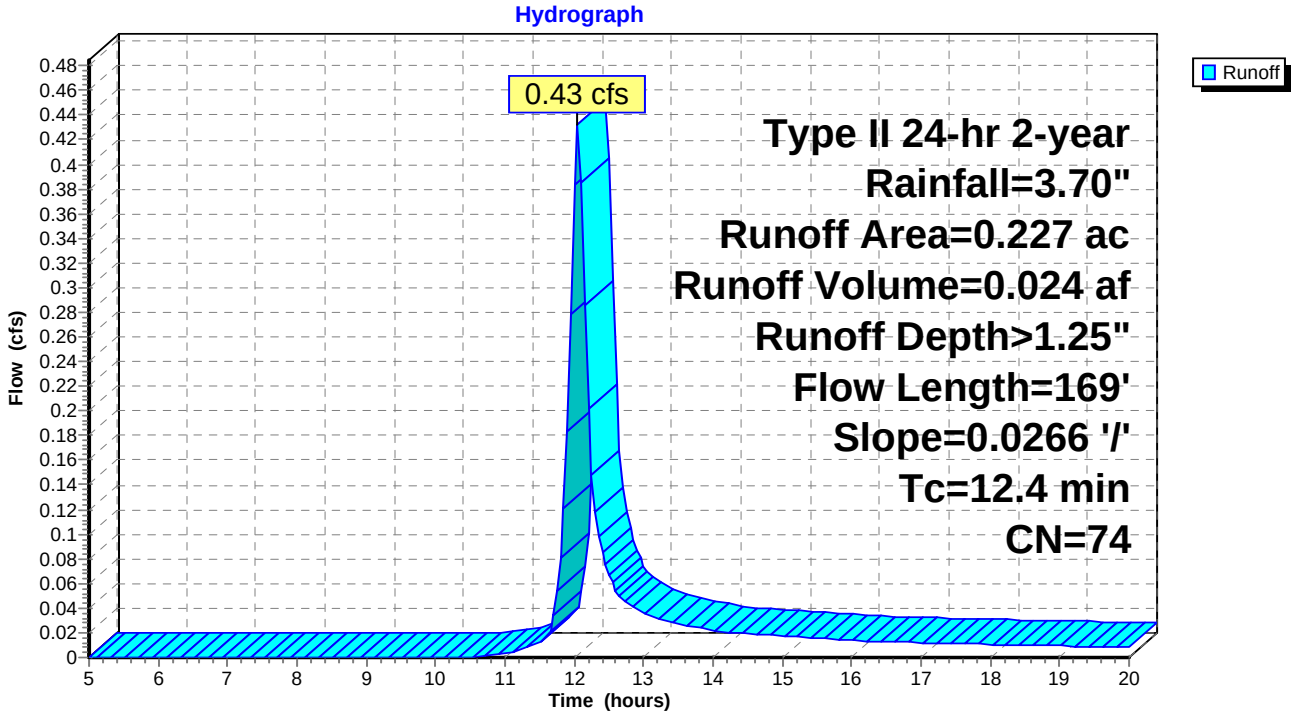
Runoff = 0.43 cfs @ 12.05 hrs, Volume= 0.024 af, Depth> 1.25"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-year Rainfall=3.70"

Area (ac)	CN	Description
0.227	74	>75% Grass cover, Good, HSG C
0.227		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.4	169	0.0266	0.23		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"

Subcatchment 7S: Borrow Area #1b - Improved



Subcatchment 8S: Borrow Area #1a - Existing

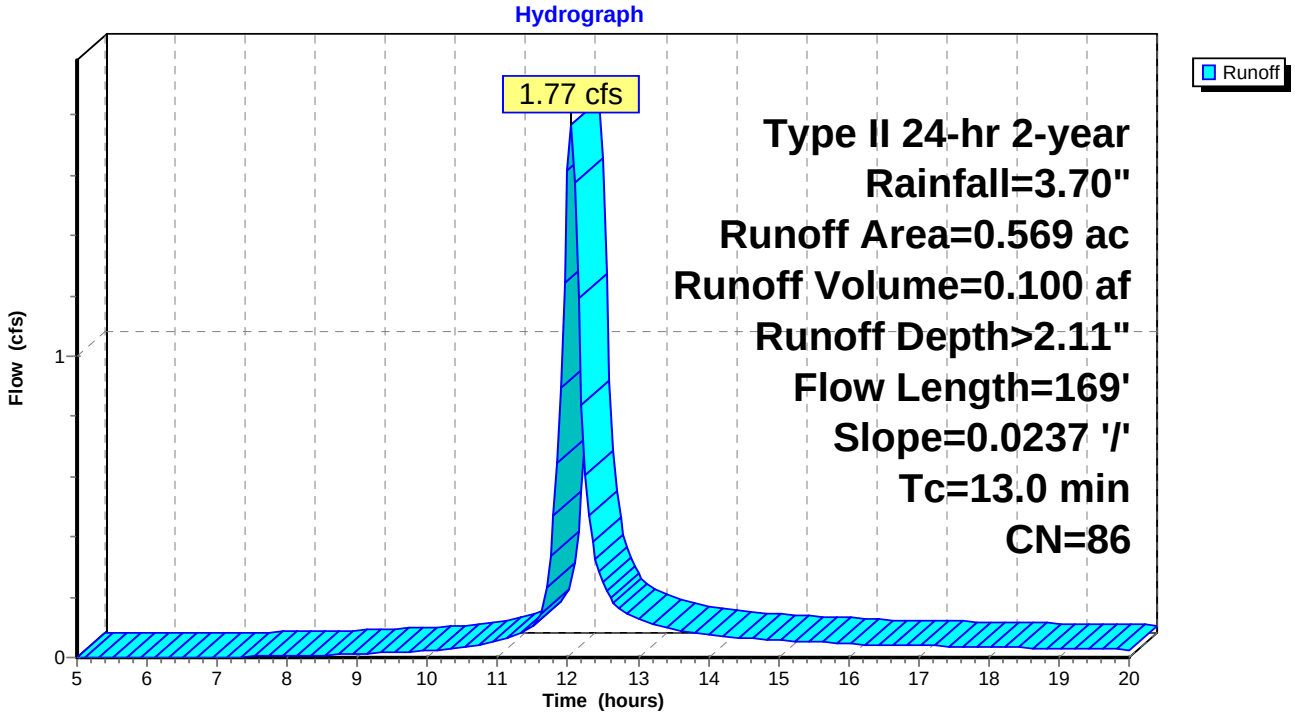
Runoff = 1.77 cfs @ 12.05 hrs, Volume= 0.100 af, Depth> 2.11"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-year Rainfall=3.70"

Area (ac)	CN	Description
0.569	86	<50% Grass cover, Poor, HSG C
0.569		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.0	169	0.0237	0.22		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"

Subcatchment 8S: Borrow Area #1a - Existing



Subcatchment 9S: Borrow Area #1a - Improved

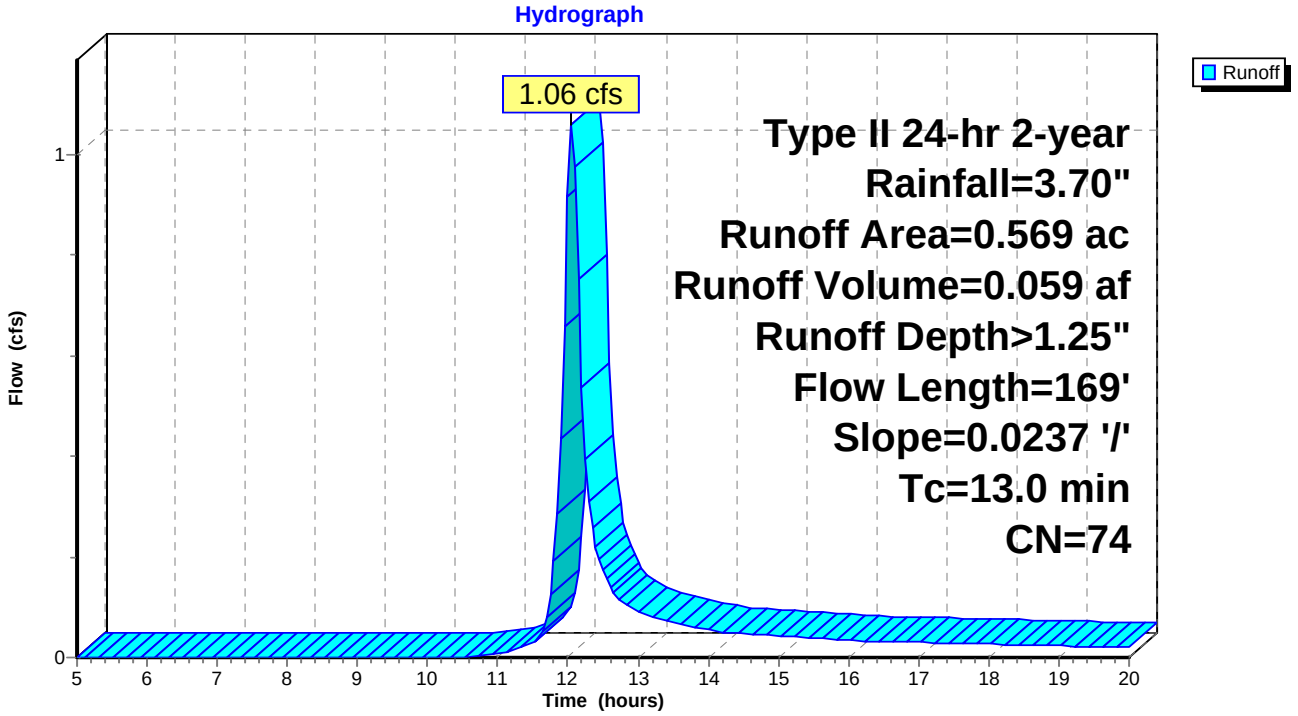
Runoff = 1.06 cfs @ 12.06 hrs, Volume= 0.059 af, Depth> 1.25"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-year Rainfall=3.70"

Area (ac)	CN	Description
0.569	74	>75% Grass cover, Good, HSG C
0.569		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.0	169	0.0237	0.22		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"

Subcatchment 9S: Borrow Area #1a - Improved



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Borrow Area #1b - Existing Runoff Area=0.227 ac Runoff Depth>3.77"
Flow Length=169' Slope=0.0266 '/' Tc=12.4 min CN=86 Runoff=1.24 cfs 0.071 af

Subcatchment 7S: Borrow Area #1b - Improved Runoff Area=0.227 ac Runoff Depth>2.62"
Flow Length=169' Slope=0.0266 '/' Tc=12.4 min CN=74 Runoff=0.91 cfs 0.050 af

Subcatchment 8S: Borrow Area #1a - Existing Runoff Area=0.569 ac Runoff Depth>3.76"
Flow Length=169' Slope=0.0237 '/' Tc=13.0 min CN=86 Runoff=3.06 cfs 0.179 af

Subcatchment 9S: Borrow Area #1a - Improved Runoff Area=0.569 ac Runoff Depth>2.62"
Flow Length=169' Slope=0.0237 '/' Tc=13.0 min CN=74 Runoff=2.23 cfs 0.124 af

Total Runoff Area = 1.592 ac Runoff Volume = 0.424 af Average Runoff Depth = 3.19"
100.00% Pervious Area = 1.592 ac 0.00% Impervious Area = 0.000 ac

Subcatchment 1S: Borrow Area #1b - Existing

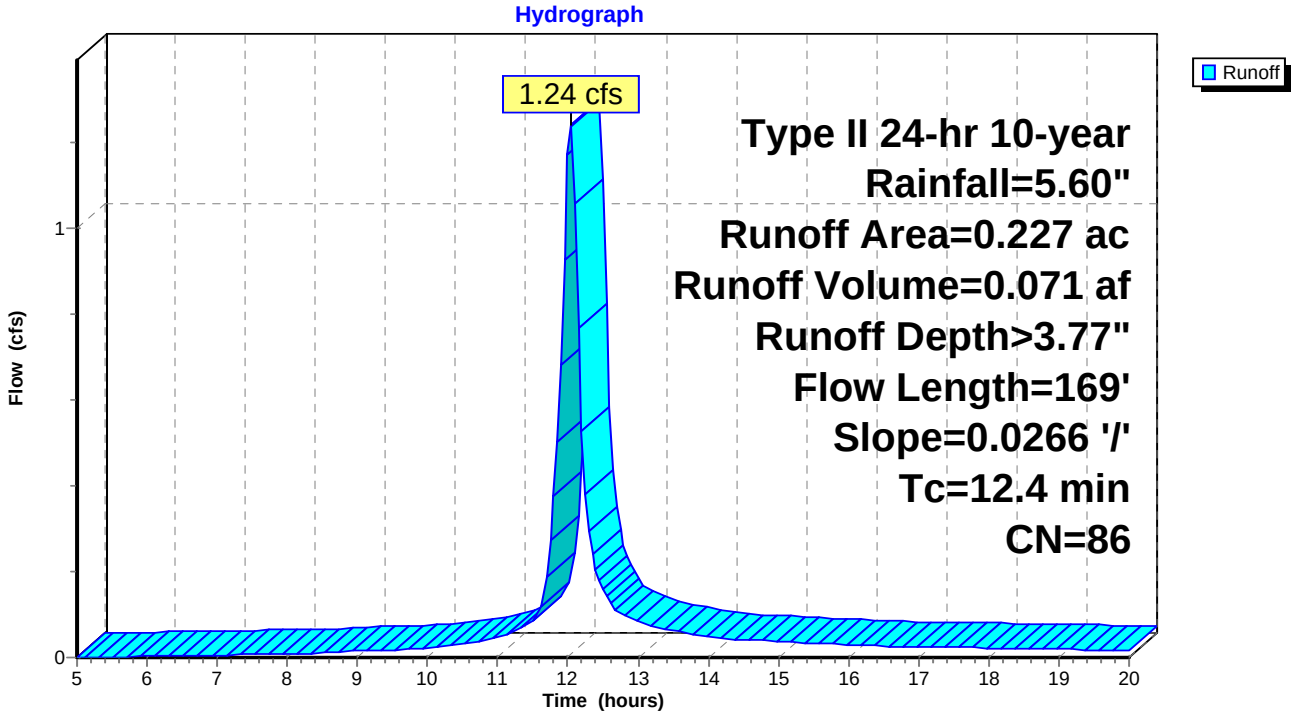
Runoff = 1.24 cfs @ 12.04 hrs, Volume= 0.071 af, Depth> 3.77"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-year Rainfall=5.60"

Area (ac)	CN	Description
0.227	86	<50% Grass cover, Poor, HSG C
0.227		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.4	169	0.0266	0.23		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"

Subcatchment 1S: Borrow Area #1b - Existing



Subcatchment 7S: Borrow Area #1b - Improved

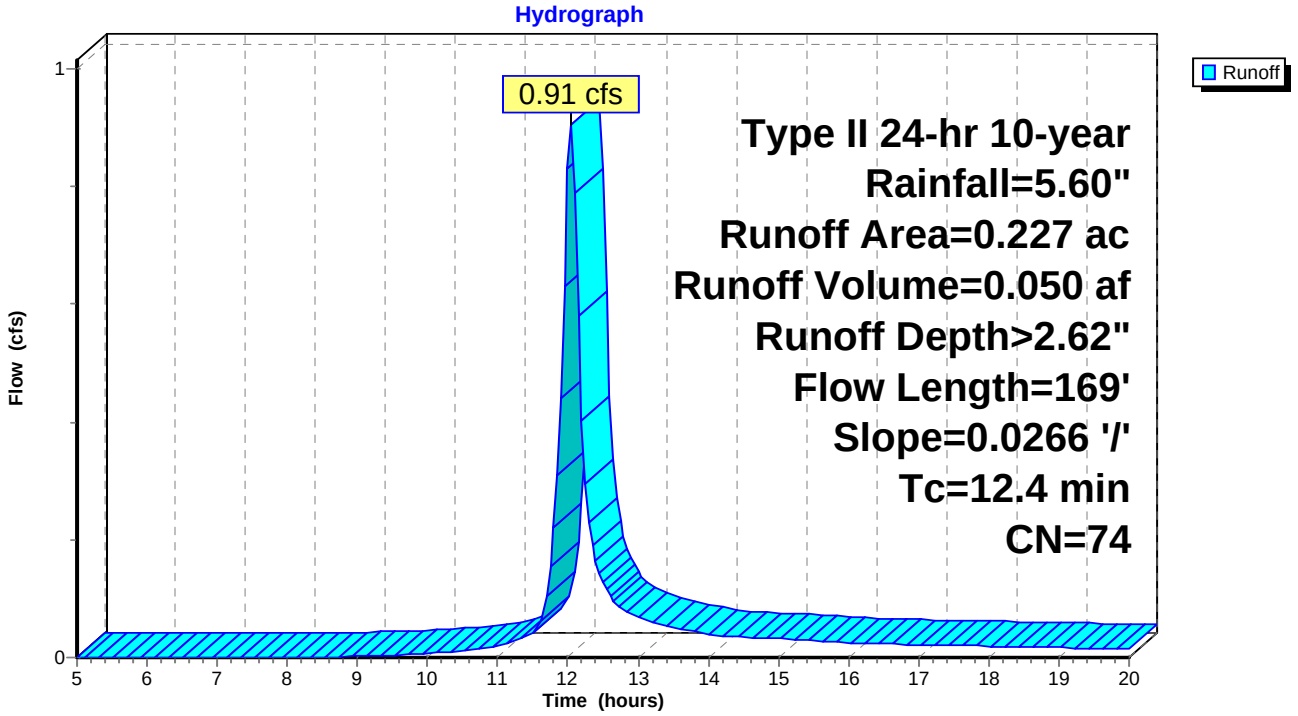
Runoff = 0.91 cfs @ 12.04 hrs, Volume= 0.050 af, Depth> 2.62"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-year Rainfall=5.60"

Area (ac)	CN	Description
0.227	74	>75% Grass cover, Good, HSG C
0.227		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.4	169	0.0266	0.23		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"

Subcatchment 7S: Borrow Area #1b - Improved



Subcatchment 8S: Borrow Area #1a - Existing

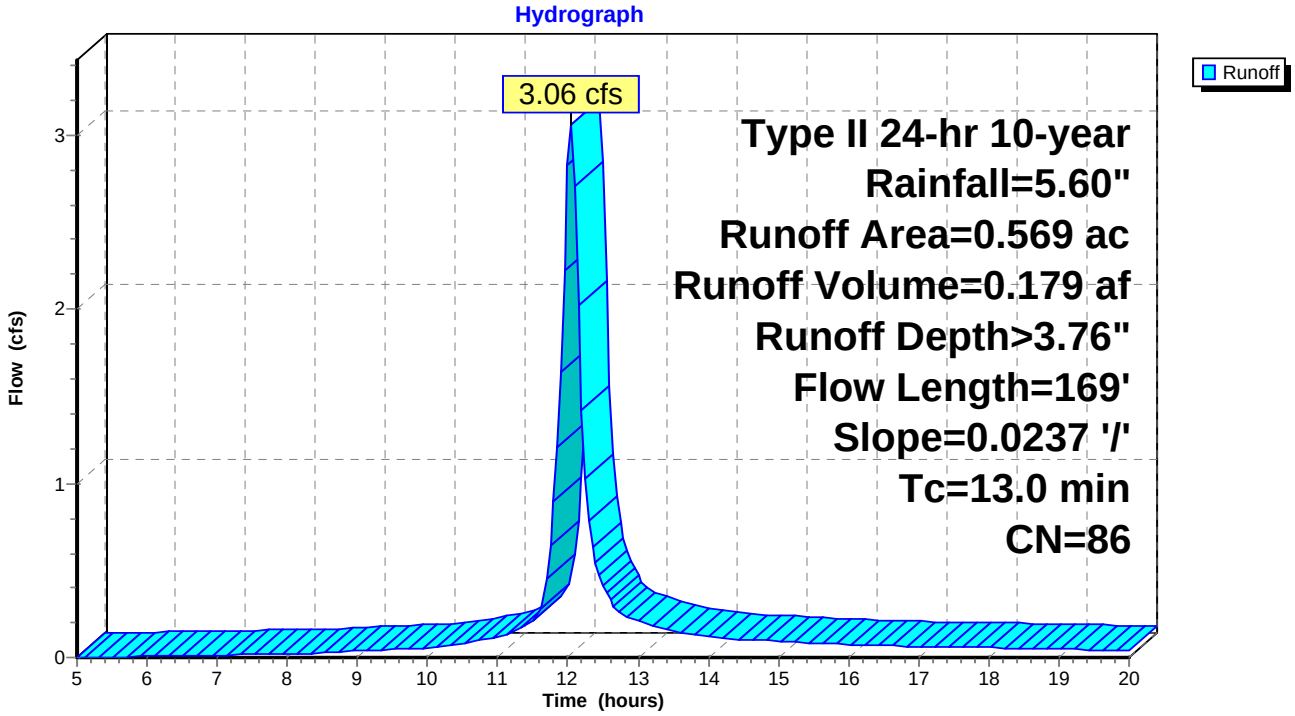
Runoff = 3.06 cfs @ 12.04 hrs, Volume= 0.179 af, Depth> 3.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-year Rainfall=5.60"

Area (ac)	CN	Description
0.569	86	<50% Grass cover, Poor, HSG C
0.569		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.0	169	0.0237	0.22		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"

Subcatchment 8S: Borrow Area #1a - Existing



Subcatchment 9S: Borrow Area #1a - Improved

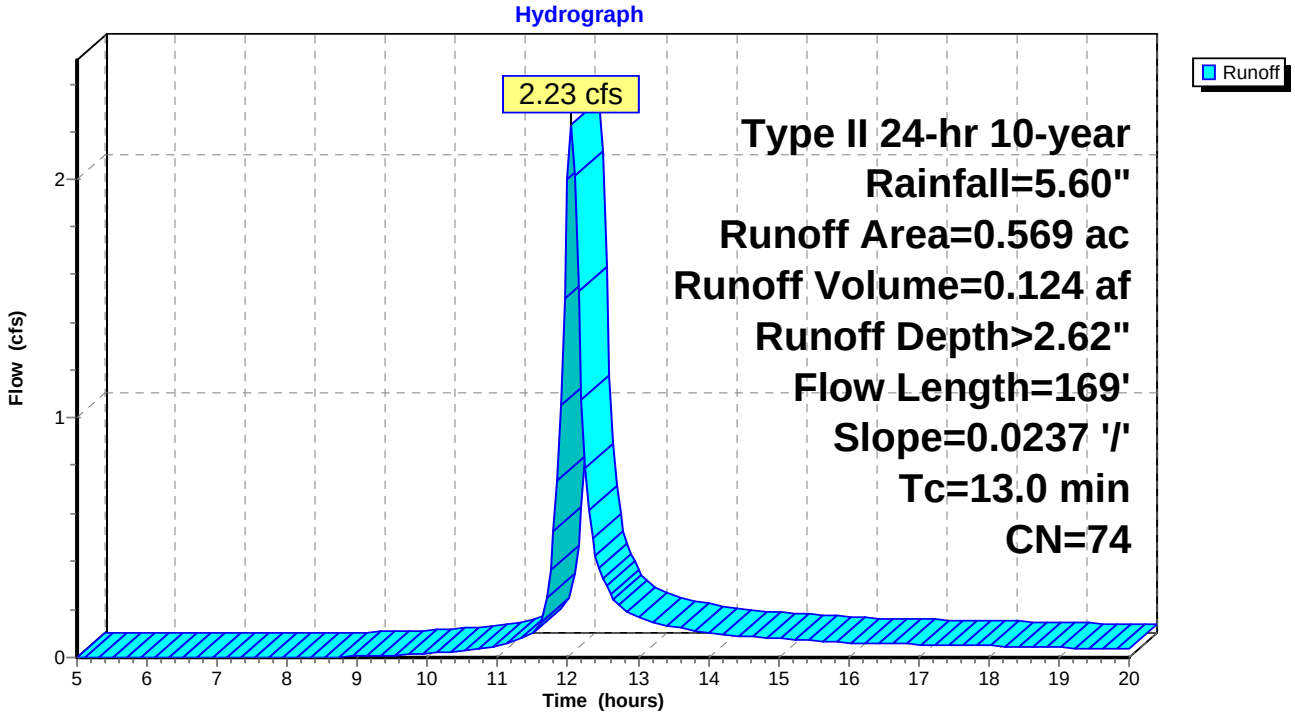
Runoff = 2.23 cfs @ 12.05 hrs, Volume= 0.124 af, Depth> 2.62"

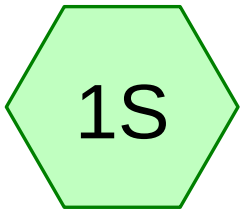
Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-year Rainfall=5.60"

Area (ac)	CN	Description
0.569	74	>75% Grass cover, Good, HSG C
0.569		Pervious Area

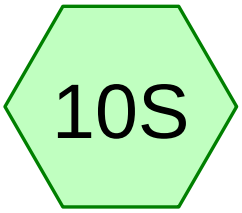
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.0	169	0.0237	0.22		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"

Subcatchment 9S: Borrow Area #1a - Improved

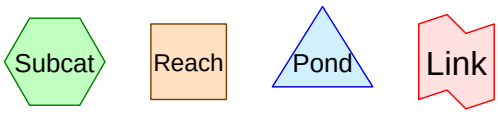




Borrow Area #2 - Existing



Borrow Area #2 - Improved



Drainage Diagram for NOI_SWPPP 2010_Area #2
Prepared by RMT, INC. 12/21/2010
HydroCAD® 8.00 s/n 004531 © 2006 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcats)
7.220	74	>75% Grass cover, Good, HSG C (10S)
7.220	86	<50% Grass cover, Poor, HSG C (1S)
14.440		

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Borrow Area #2 - Existing Runoff Area=7.220 ac Runoff Depth>2.10"
Flow Length=470' Tc=21.2 min CN=86 Runoff=17.56 cfs 1.266 af

Subcatchment 10S: Borrow Area #2 - Improved Runoff Area=7.220 ac Runoff Depth>1.24"
Flow Length=470' Tc=23.7 min CN=74 Runoff=9.63 cfs 0.748 af

Total Runoff Area = 14.440 ac Runoff Volume = 2.015 af Average Runoff Depth = 1.67"
100.00% Pervious Area = 14.440 ac 0.00% Impervious Area = 0.000 ac

Subcatchment 1S: Borrow Area #2 - Existing

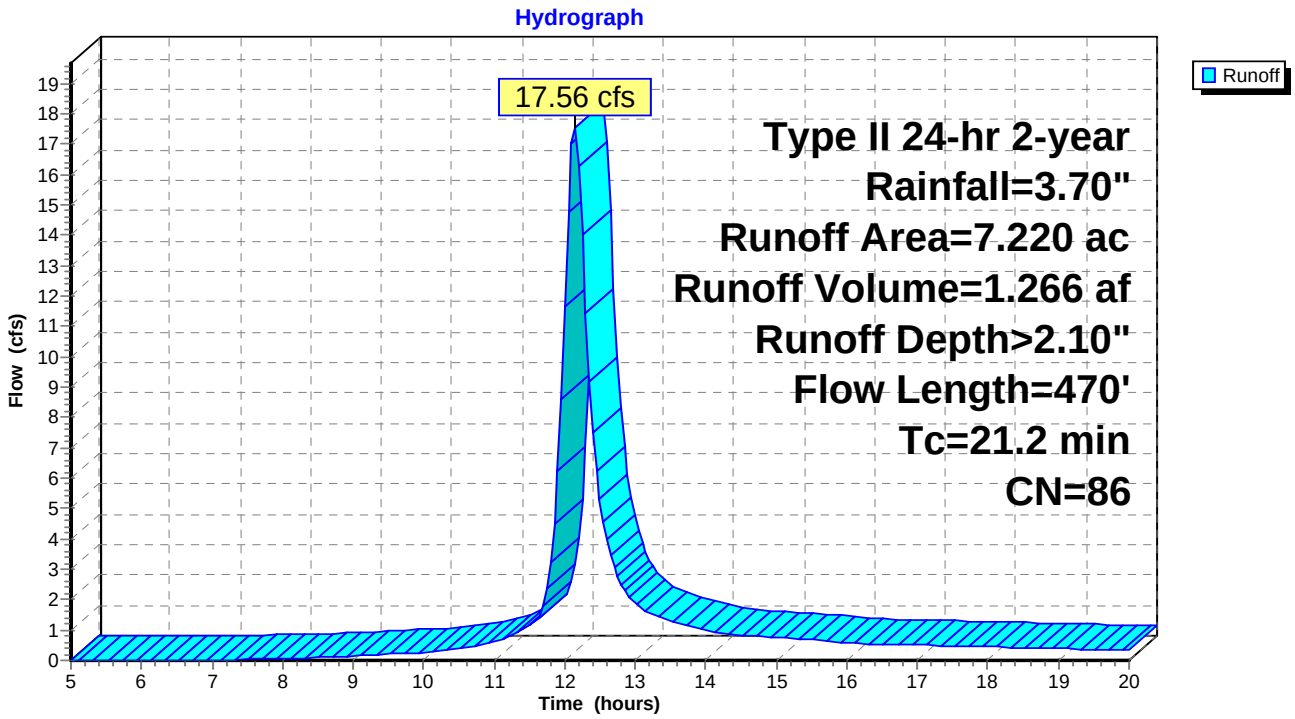
Runoff = 17.56 cfs @ 12.14 hrs, Volume= 1.266 af, Depth> 2.10"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-year Rainfall=3.70"

Area (ac)	CN	Description
7.220	86	<50% Grass cover, Poor, HSG C
7.220		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	110	0.0790	0.32		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
13.5	160	0.0190	0.20		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
2.0	200	0.0110	1.69		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
21.2	470	Total			

Subcatchment 1S: Borrow Area #2 - Existing



Subcatchment 10S: Borrow Area #2 - Improved

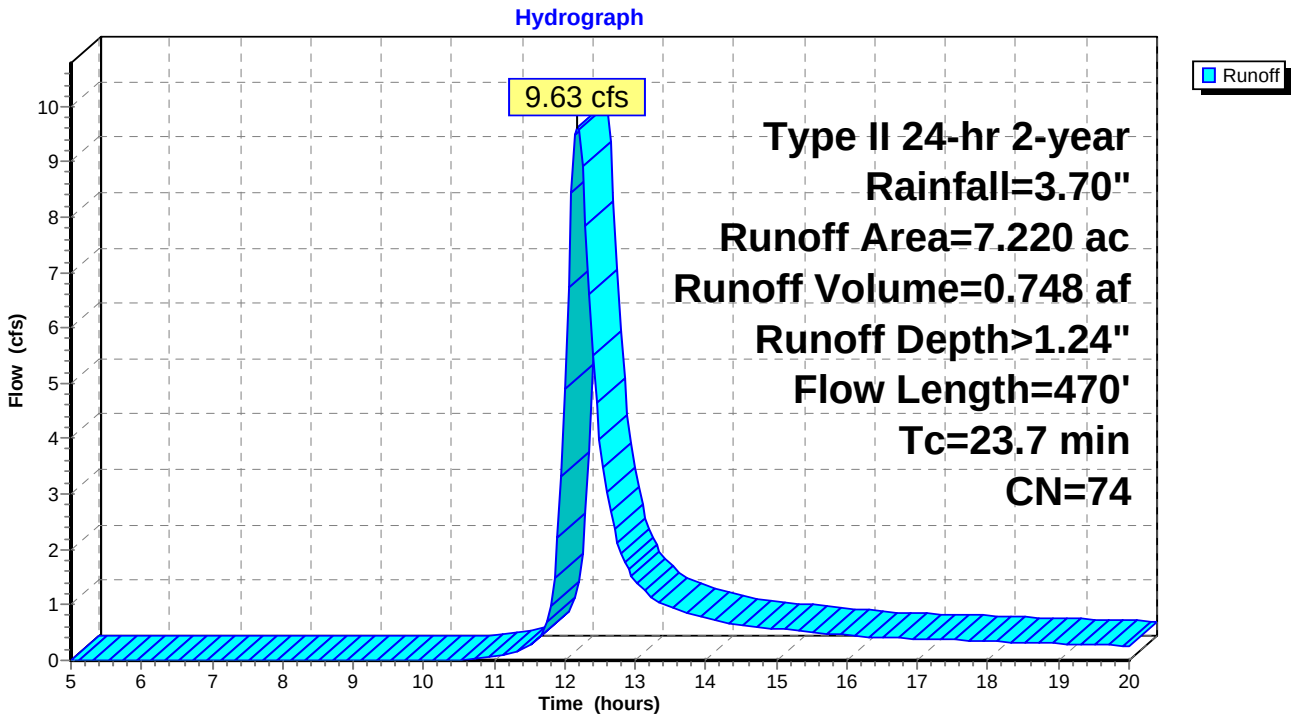
Runoff = 9.63 cfs @ 12.18 hrs, Volume= 0.748 af, Depth> 1.24"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-year Rainfall=3.70"

Area (ac)	CN	Description
7.220	74	>75% Grass cover, Good, HSG C
7.220		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	110	0.0790	0.32		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
13.5	160	0.0190	0.20		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
4.5	200	0.0110	0.73		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
23.7	470	Total			

Subcatchment 10S: Borrow Area #2 - Improved



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Borrow Area #2 - Existing Runoff Area=7.220 ac Runoff Depth>3.76"
Flow Length=470' Tc=21.2 min CN=86 Runoff=30.64 cfs 2.260 af

Subcatchment 10S: Borrow Area #2 - Improved Runoff Area=7.220 ac Runoff Depth>2.61"
Flow Length=470' Tc=23.7 min CN=74 Runoff=20.59 cfs 1.570 af

Total Runoff Area = 14.440 ac Runoff Volume = 3.830 af Average Runoff Depth = 3.18"
100.00% Pervious Area = 14.440 ac 0.00% Impervious Area = 0.000 ac

Subcatchment 1S: Borrow Area #2 - Existing

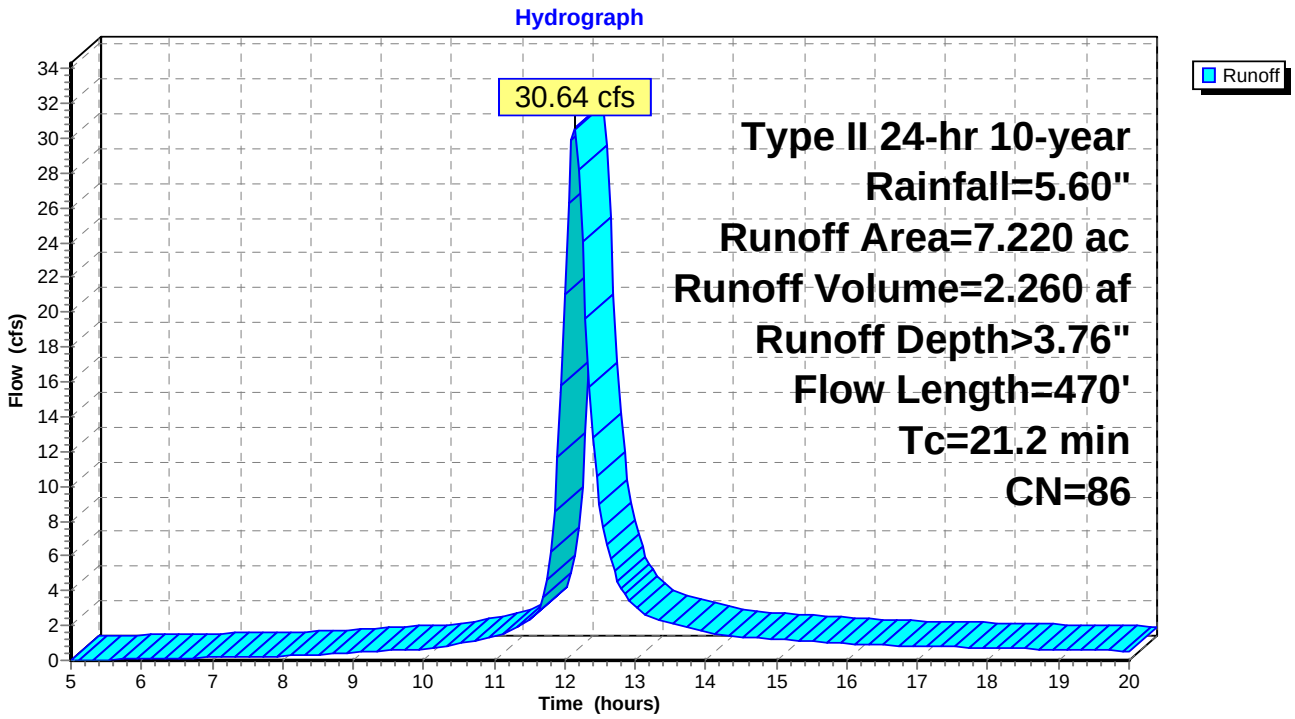
Runoff = 30.64 cfs @ 12.13 hrs, Volume= 2.260 af, Depth> 3.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-year Rainfall=5.60"

Area (ac)	CN	Description
7.220	86	<50% Grass cover, Poor, HSG C
7.220		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	110	0.0790	0.32		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
13.5	160	0.0190	0.20		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
2.0	200	0.0110	1.69		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
21.2	470	Total			

Subcatchment 1S: Borrow Area #2 - Existing



Subcatchment 10S: Borrow Area #2 - Improved

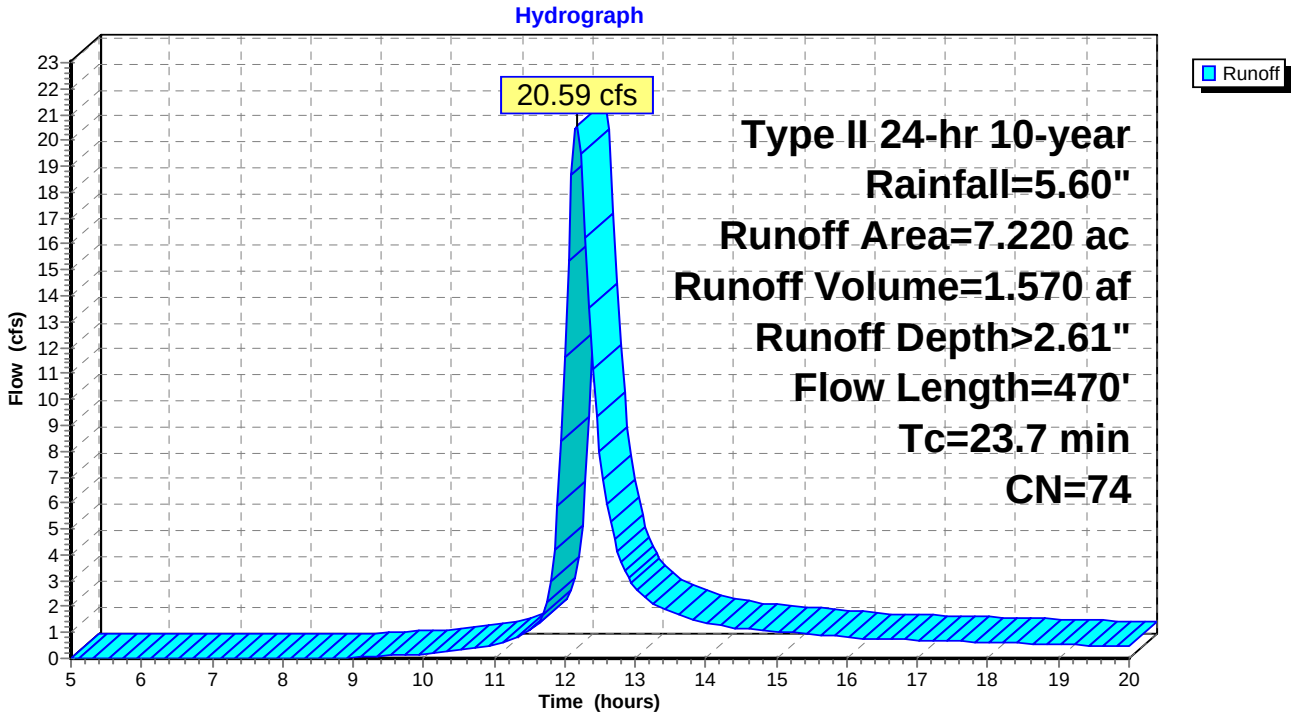
Runoff = 20.59 cfs @ 12.17 hrs, Volume= 1.570 af, Depth> 2.61"

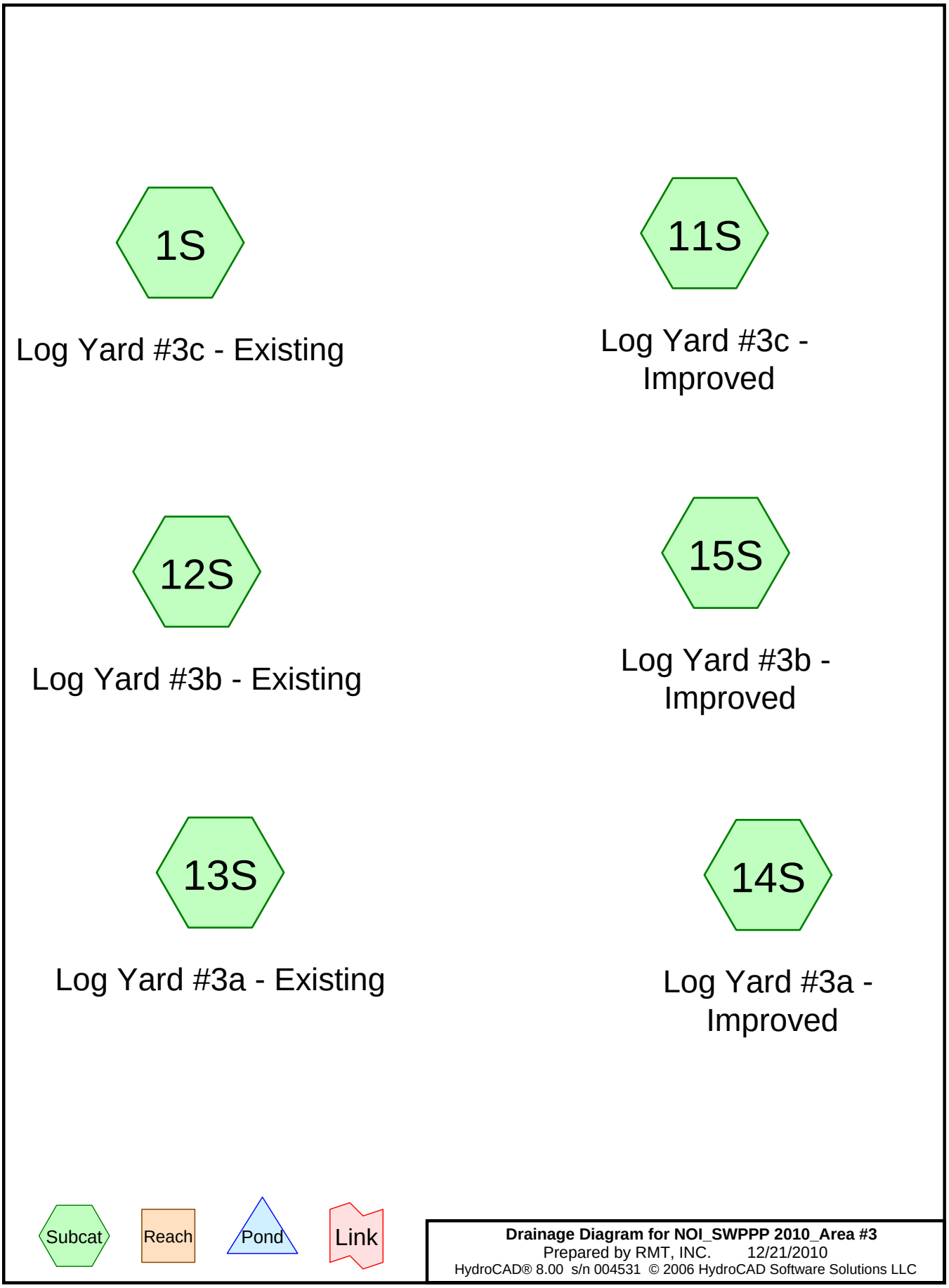
Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-year Rainfall=5.60"

Area (ac)	CN	Description
7.220	74	>75% Grass cover, Good, HSG C
7.220		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	110	0.0790	0.32		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
13.5	160	0.0190	0.20		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
4.5	200	0.0110	0.73		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
23.7	470	Total			

Subcatchment 10S: Borrow Area #2 - Improved





Drainage Diagram for NOI_SWPPP 2010_Area #3
Prepared by RMT, INC. 12/21/2010
HydroCAD® 8.00 s/n 004531 © 2006 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcats)
17.680	79	50-75% Grass cover, Fair, HSG C (11S,14S,15S)
17.680	86	<50% Grass cover, Poor, HSG C (1S,12S,13S)
35.360		

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Log Yard #3c - Existing Runoff Area=2.630 ac Runoff Depth>2.09"
Flow Length=869' Tc=35.4 min CN=86 Runoff=4.65 cfs 0.459 af

Subcatchment 11S: Log Yard #3c - Improved Runoff Area=2.630 ac Runoff Depth>1.56"
Flow Length=869' Tc=43.6 min CN=79 Runoff=2.99 cfs 0.341 af

Subcatchment 12S: Log Yard #3b - Existing Runoff Area=8.940 ac Runoff Depth>2.08"
Flow Length=1,563' Tc=54.7 min CN=86 Runoff=11.63 cfs 1.549 af

Subcatchment 13S: Log Yard #3a - Existing Runoff Area=6.110 ac Runoff Depth>2.09"
Flow Length=1,021' Tc=44.5 min CN=86 Runoff=9.23 cfs 1.063 af

Subcatchment 14S: Log Yard #3a - Improved Runoff Area=6.110 ac Runoff Depth>1.55"
Flow Length=1,021' Tc=58.0 min CN=79 Runoff=5.66 cfs 0.788 af

Subcatchment 15S: Log Yard #3b - Improved Runoff Area=8.940 ac Runoff Depth>1.53"
Flow Length=1,563' Tc=81.5 min CN=79 Runoff=6.43 cfs 1.140 af

Total Runoff Area = 35.360 ac Runoff Volume = 5.341 af Average Runoff Depth = 1.81"
100.00% Pervious Area = 35.360 ac 0.00% Impervious Area = 0.000 ac

Subcatchment 1S: Log Yard #3c - Existing

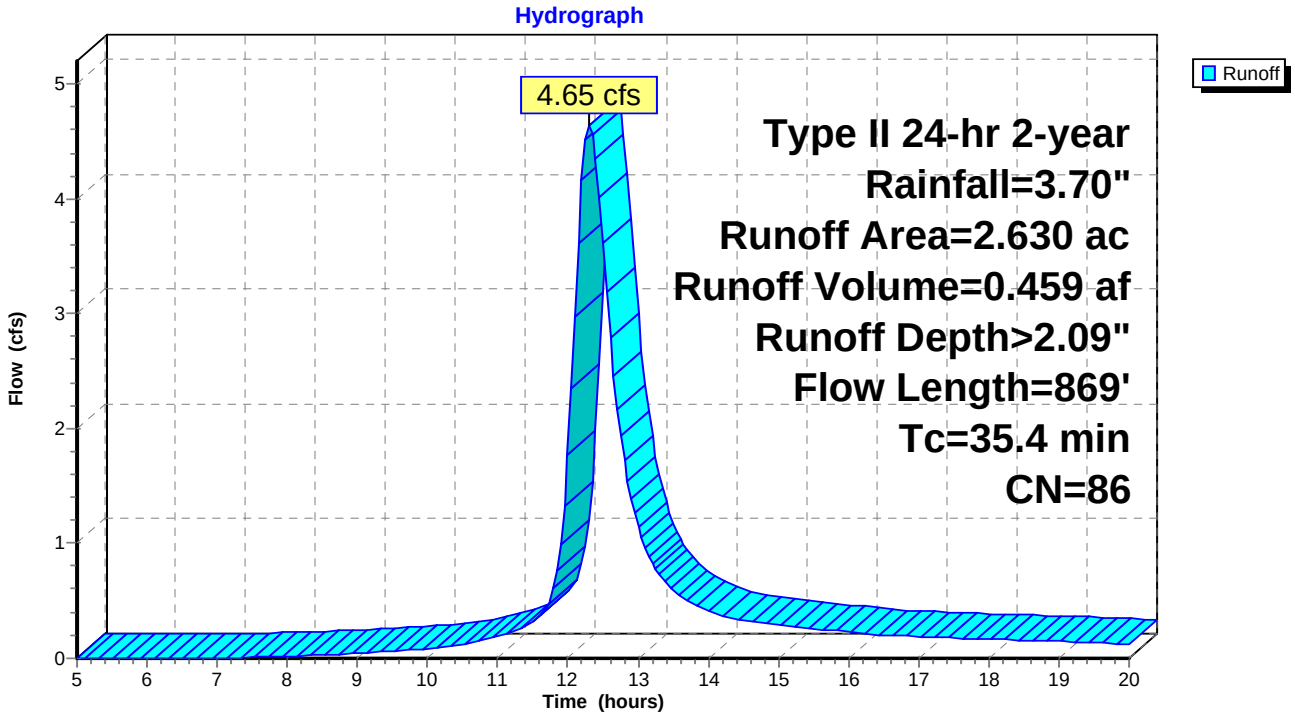
Runoff = 4.65 cfs @ 12.31 hrs, Volume= 0.459 af, Depth> 2.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-year Rainfall=3.70"

Area (ac)	CN	Description
2.630	86	<50% Grass cover, Poor, HSG C
2.630		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
29.0	300	0.0100	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
6.4	569	0.0086	1.49		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
35.4	869	Total			

Subcatchment 1S: Log Yard #3c - Existing



Subcatchment 11S: Log Yard #3c - Improved

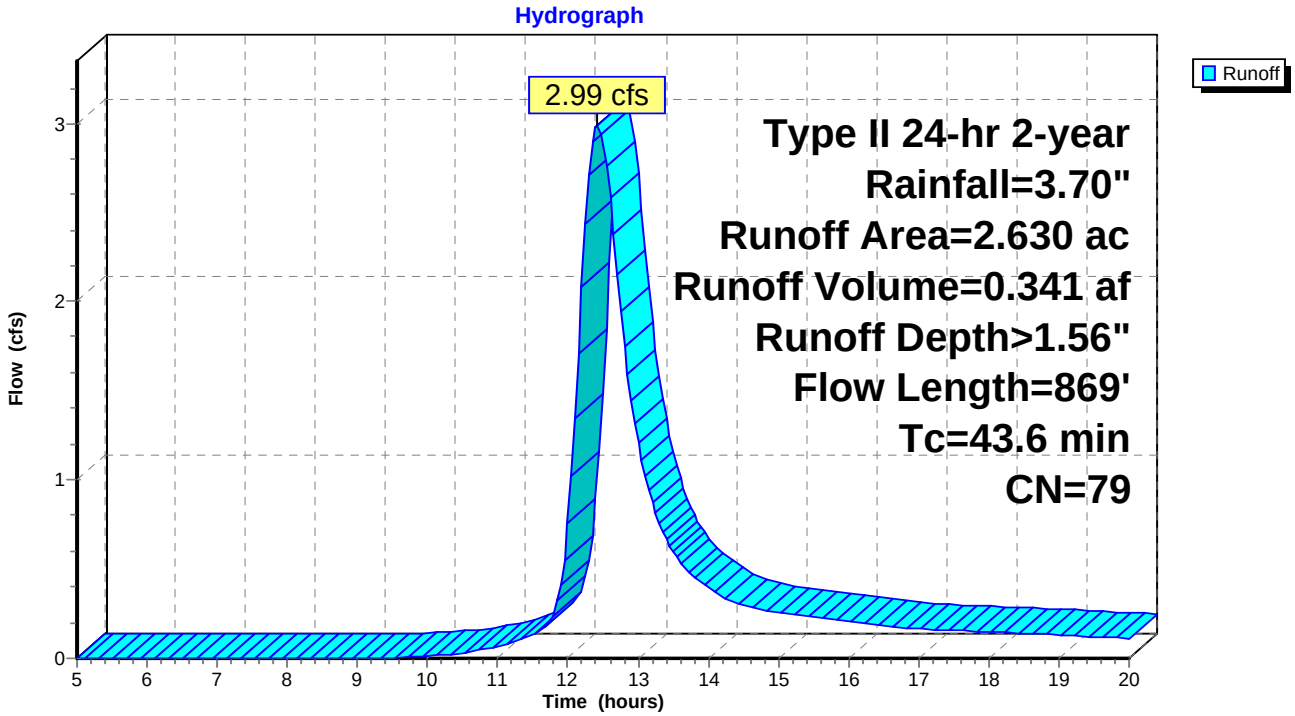
Runoff = 2.99 cfs @ 12.43 hrs, Volume= 0.341 af, Depth> 1.56"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-year Rainfall=3.70"

Area (ac)	CN	Description
2.630	79	50-75% Grass cover, Fair, HSG C
2.630		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
29.0	300	0.0100	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
14.6	569	0.0086	0.65		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
43.6	869	Total			

Subcatchment 11S: Log Yard #3c - Improved



Subcatchment 12S: Log Yard #3b - Existing

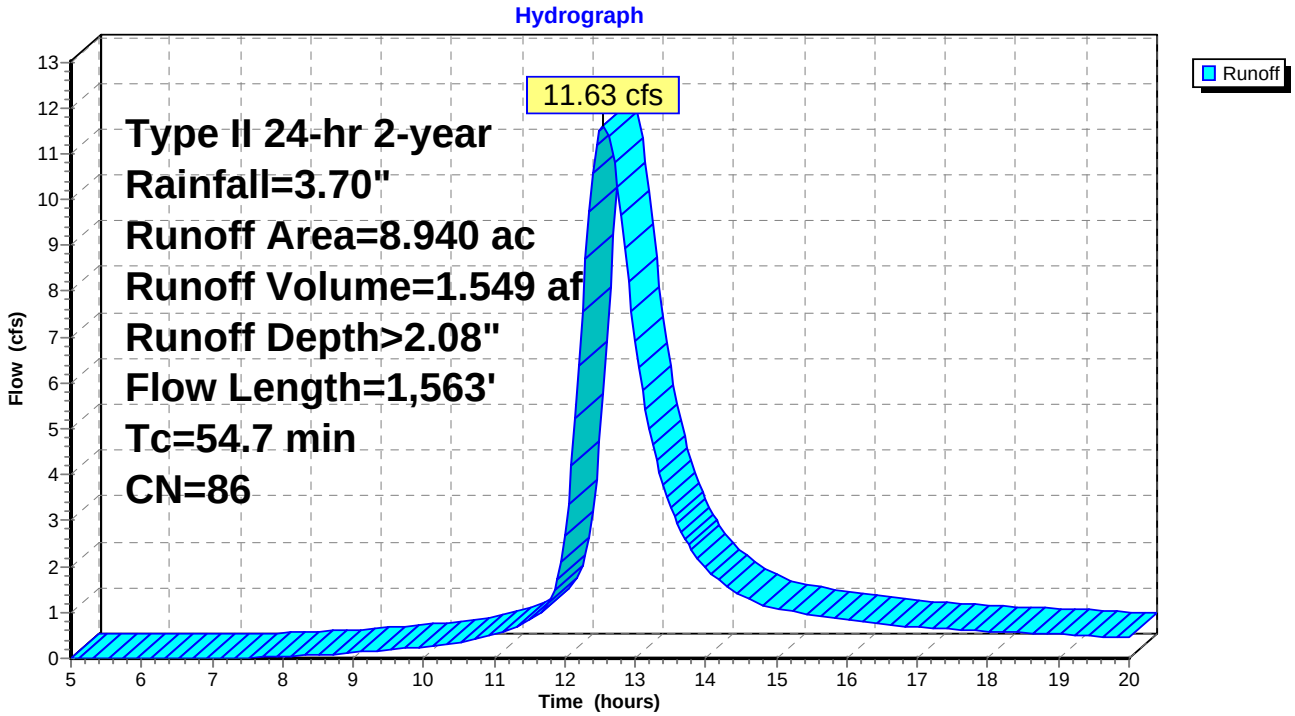
Runoff = 11.63 cfs @ 12.55 hrs, Volume= 1.549 af, Depth> 2.08"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-year Rainfall=3.70"

Area (ac)	CN	Description
8.940	86	<50% Grass cover, Poor, HSG C
8.940		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
34.0	300	0.0067	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
20.7	1,263	0.0040	1.02		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
54.7	1,563	Total			

Subcatchment 12S: Log Yard #3b - Existing



Subcatchment 13S: Log Yard #3a - Existing

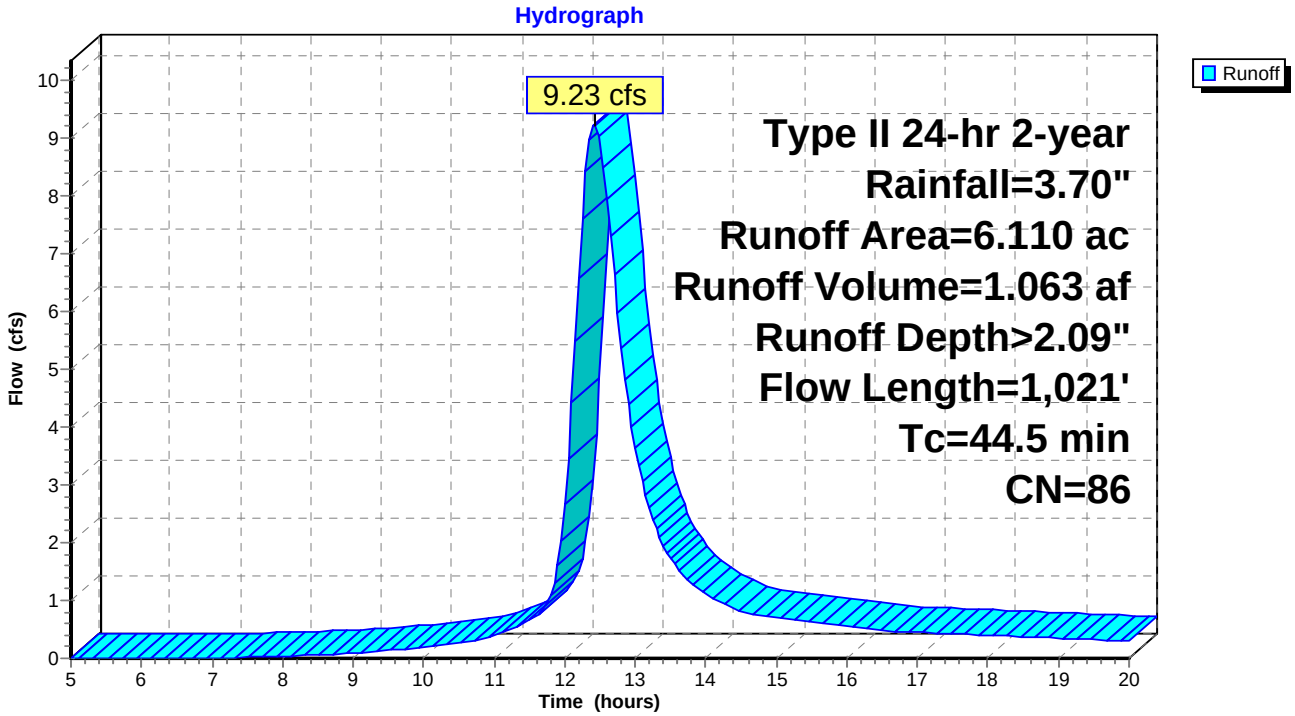
Runoff = 9.23 cfs @ 12.42 hrs, Volume= 1.063 af, Depth> 2.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-year Rainfall=3.70"

Area (ac)	CN	Description
6.110	86	<50% Grass cover, Poor, HSG C
6.110		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
34.0	300	0.0067	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
10.5	721	0.0051	1.15		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
44.5	1,021	Total			

Subcatchment 13S: Log Yard #3a - Existing



Subcatchment 14S: Log Yard #3a - Improved

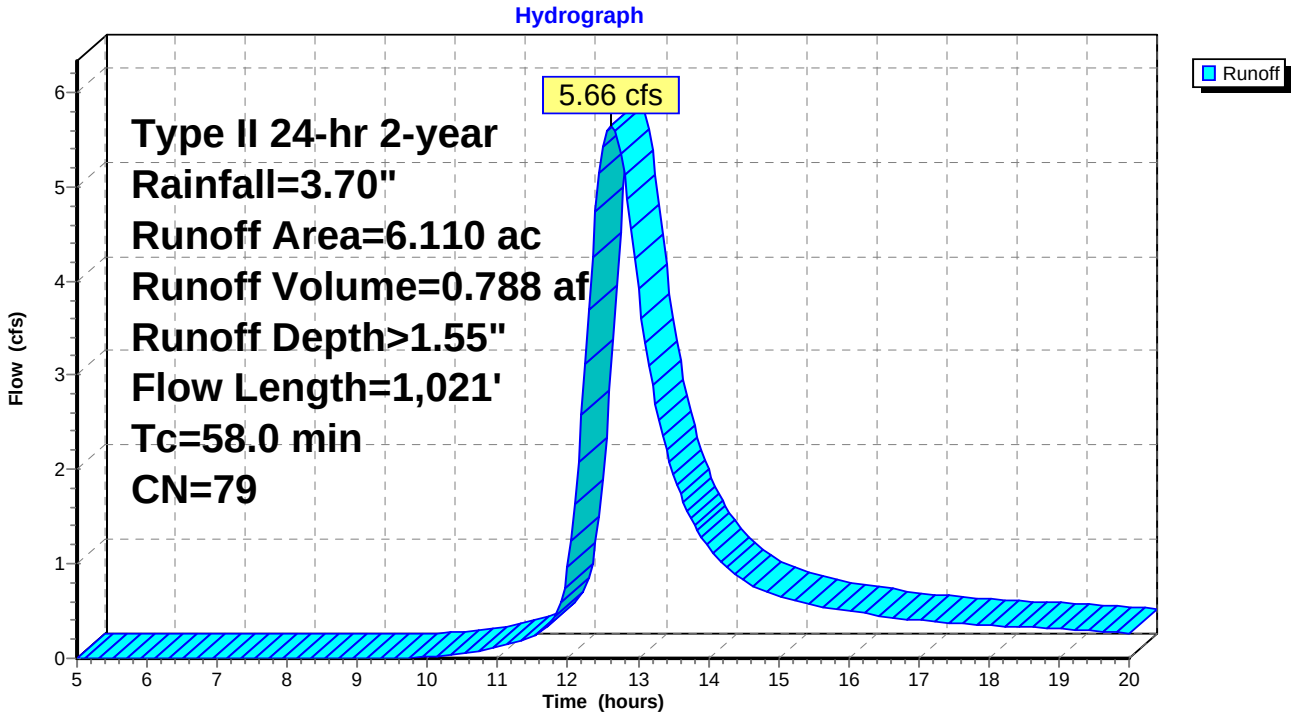
Runoff = 5.66 cfs @ 12.61 hrs, Volume= 0.788 af, Depth> 1.55"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-year Rainfall=3.70"

Area (ac)	CN	Description
6.110	79	50-75% Grass cover, Fair, HSG C
6.110		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
34.0	300	0.0067	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
24.0	721	0.0051	0.50		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
58.0	1,021	Total			

Subcatchment 14S: Log Yard #3a - Improved



Subcatchment 15S: Log Yard #3b - Improved

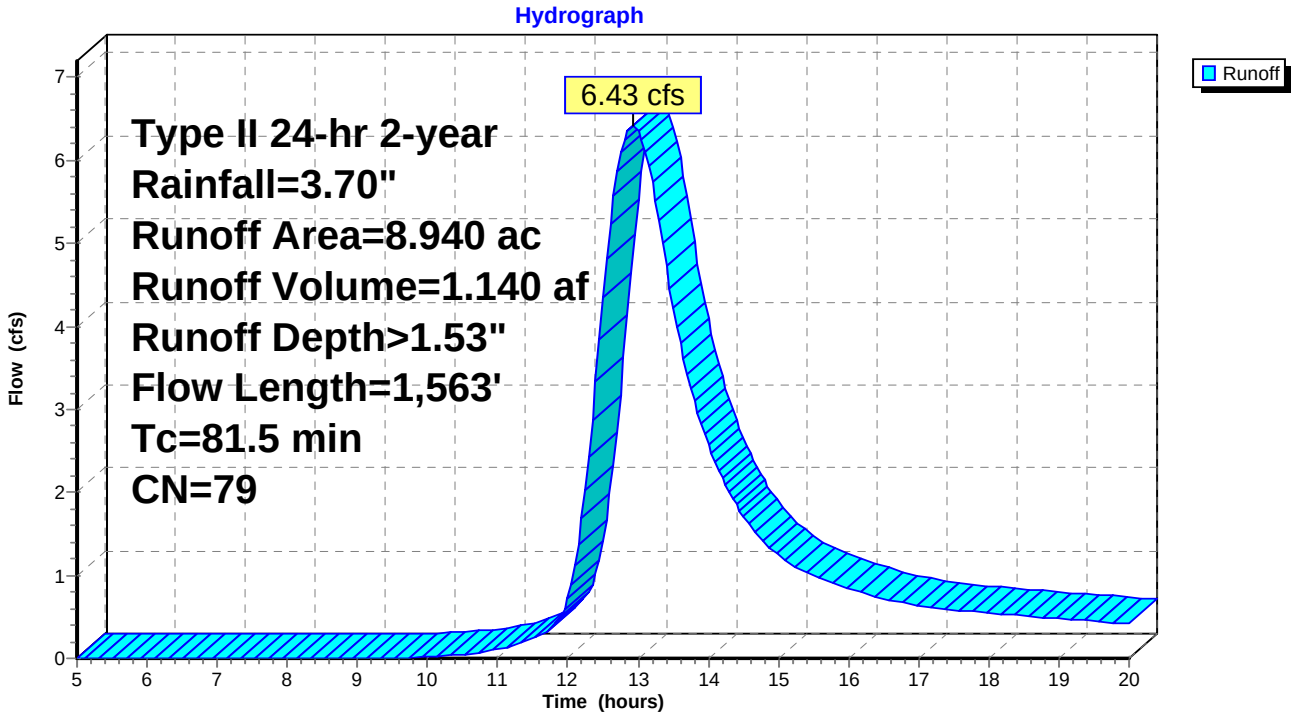
Runoff = 6.43 cfs @ 12.93 hrs, Volume= 1.140 af, Depth> 1.53"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-year Rainfall=3.70"

Area (ac)	CN	Description
8.940	79	50-75% Grass cover, Fair, HSG C
8.940		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
34.0	300	0.0067	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
47.5	1,263	0.0040	0.44		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
81.5	1,563	Total			

Subcatchment 15S: Log Yard #3b - Improved



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Log Yard #3c - Existing Runoff Area=2.630 ac Runoff Depth>3.74"
Flow Length=869' Tc=35.4 min CN=86 Runoff=8.16 cfs 0.820 af

Subcatchment 11S: Log Yard #3c - Improved Runoff Area=2.630 ac Runoff Depth>3.04"
Flow Length=869' Tc=43.6 min CN=79 Runoff=5.87 cfs 0.667 af

Subcatchment 12S: Log Yard #3b - Existing Runoff Area=8.940 ac Runoff Depth>3.72"
Flow Length=1,563' Tc=54.7 min CN=86 Runoff=20.46 cfs 2.768 af

Subcatchment 13S: Log Yard #3a - Existing Runoff Area=6.110 ac Runoff Depth>3.73"
Flow Length=1,021' Tc=44.5 min CN=86 Runoff=16.24 cfs 1.898 af

Subcatchment 14S: Log Yard #3a - Improved Runoff Area=6.110 ac Runoff Depth>3.03"
Flow Length=1,021' Tc=58.0 min CN=79 Runoff=11.13 cfs 1.542 af

Subcatchment 15S: Log Yard #3b - Improved Runoff Area=8.940 ac Runoff Depth>3.00"
Flow Length=1,563' Tc=81.5 min CN=79 Runoff=12.64 cfs 2.234 af

Total Runoff Area = 35.360 ac Runoff Volume = 9.929 af Average Runoff Depth = 3.37"
100.00% Pervious Area = 35.360 ac 0.00% Impervious Area = 0.000 ac

Subcatchment 1S: Log Yard #3c - Existing

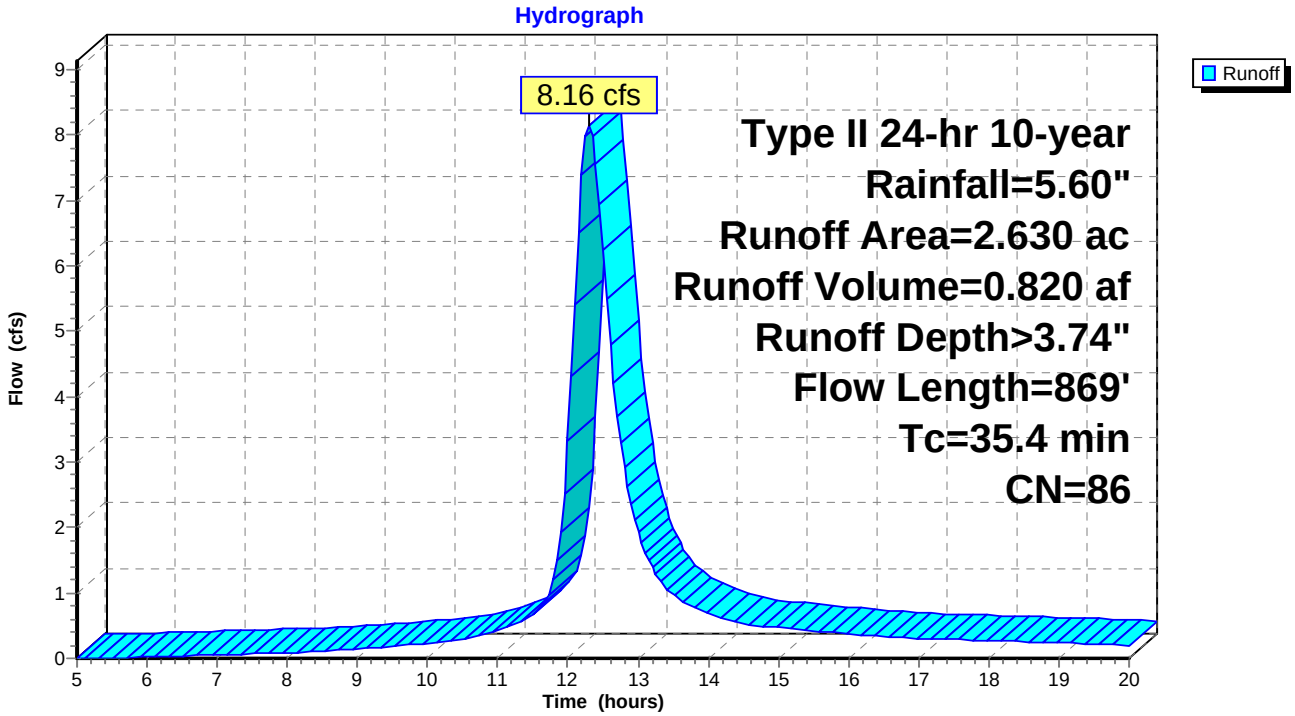
Runoff = 8.16 cfs @ 12.30 hrs, Volume= 0.820 af, Depth> 3.74"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-year Rainfall=5.60"

Area (ac)	CN	Description
2.630	86	<50% Grass cover, Poor, HSG C
2.630		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
29.0	300	0.0100	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
6.4	569	0.0086	1.49		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
35.4	869	Total			

Subcatchment 1S: Log Yard #3c - Existing



Subcatchment 11S: Log Yard #3c - Improved

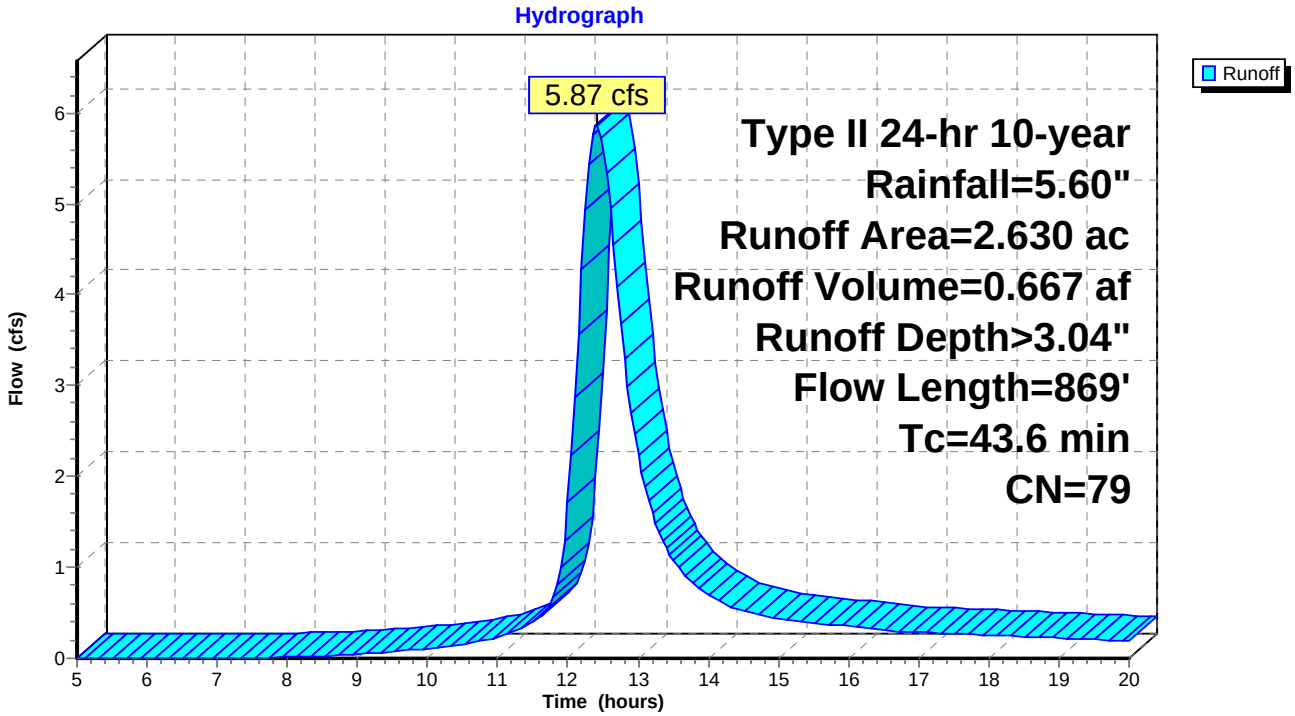
Runoff = 5.87 cfs @ 12.41 hrs, Volume= 0.667 af, Depth> 3.04"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-year Rainfall=5.60"

Area (ac)	CN	Description
2.630	79	50-75% Grass cover, Fair, HSG C
2.630		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
29.0	300	0.0100	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
14.6	569	0.0086	0.65		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
43.6	869	Total			

Subcatchment 11S: Log Yard #3c - Improved



Subcatchment 12S: Log Yard #3b - Existing

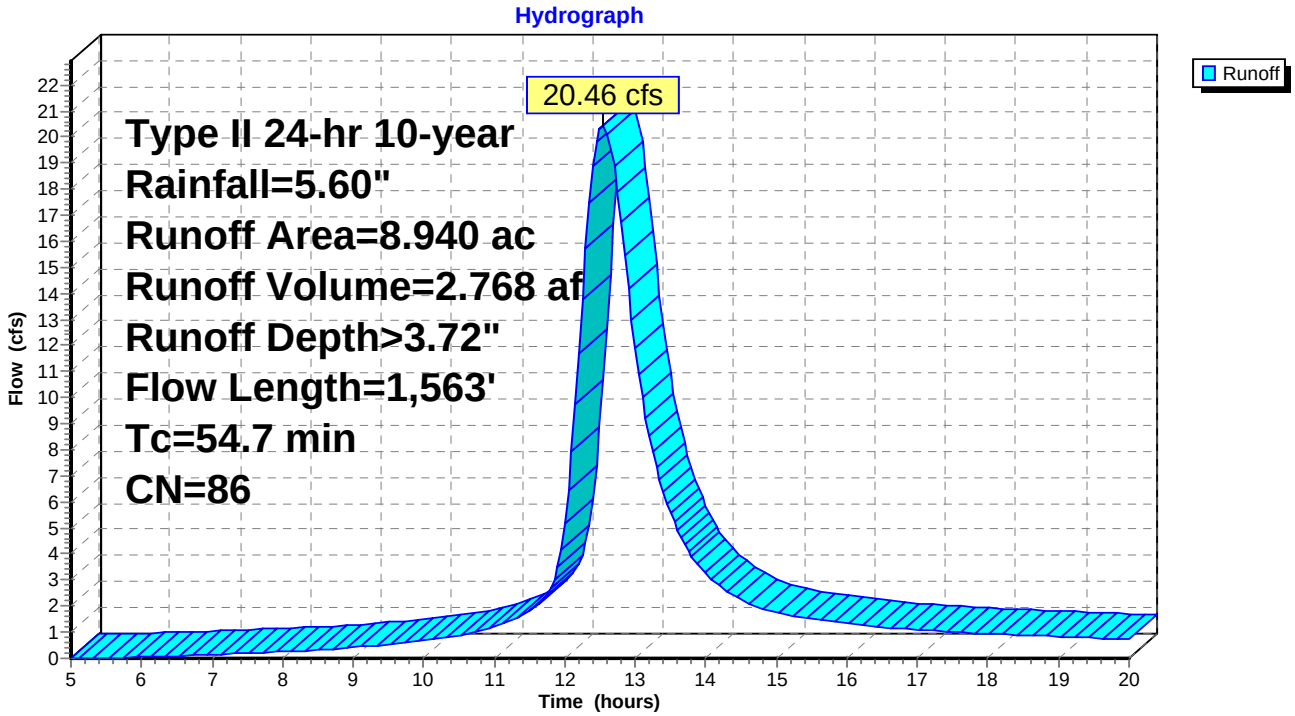
Runoff = 20.46 cfs @ 12.54 hrs, Volume= 2.768 af, Depth> 3.72"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-year Rainfall=5.60"

Area (ac)	CN	Description
8.940	86	<50% Grass cover, Poor, HSG C
8.940		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
34.0	300	0.0067	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
20.7	1,263	0.0040	1.02		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
54.7	1,563	Total			

Subcatchment 12S: Log Yard #3b - Existing



Subcatchment 13S: Log Yard #3a - Existing

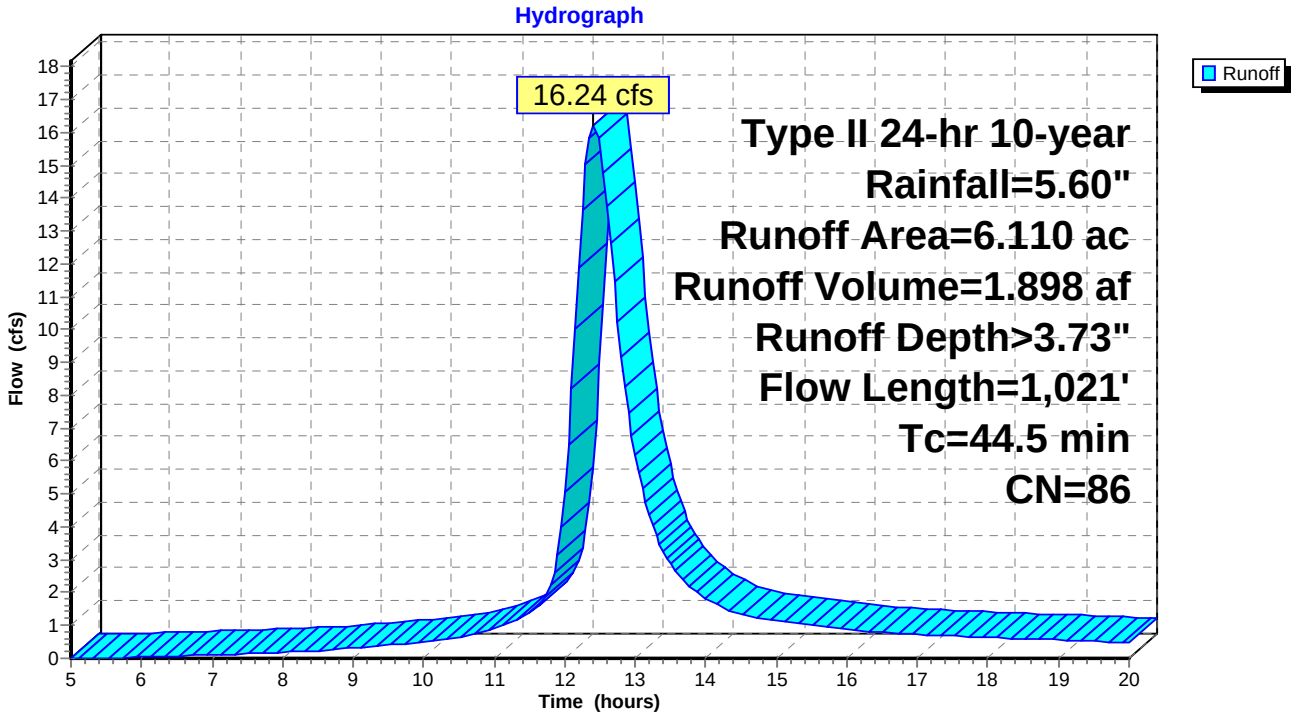
Runoff = 16.24 cfs @ 12.41 hrs, Volume= 1.898 af, Depth> 3.73"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-year Rainfall=5.60"

Area (ac)	CN	Description
6.110	86	<50% Grass cover, Poor, HSG C
6.110		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
34.0	300	0.0067	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
10.5	721	0.0051	1.15		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
44.5	1,021	Total			

Subcatchment 13S: Log Yard #3a - Existing



Subcatchment 14S: Log Yard #3a - Improved

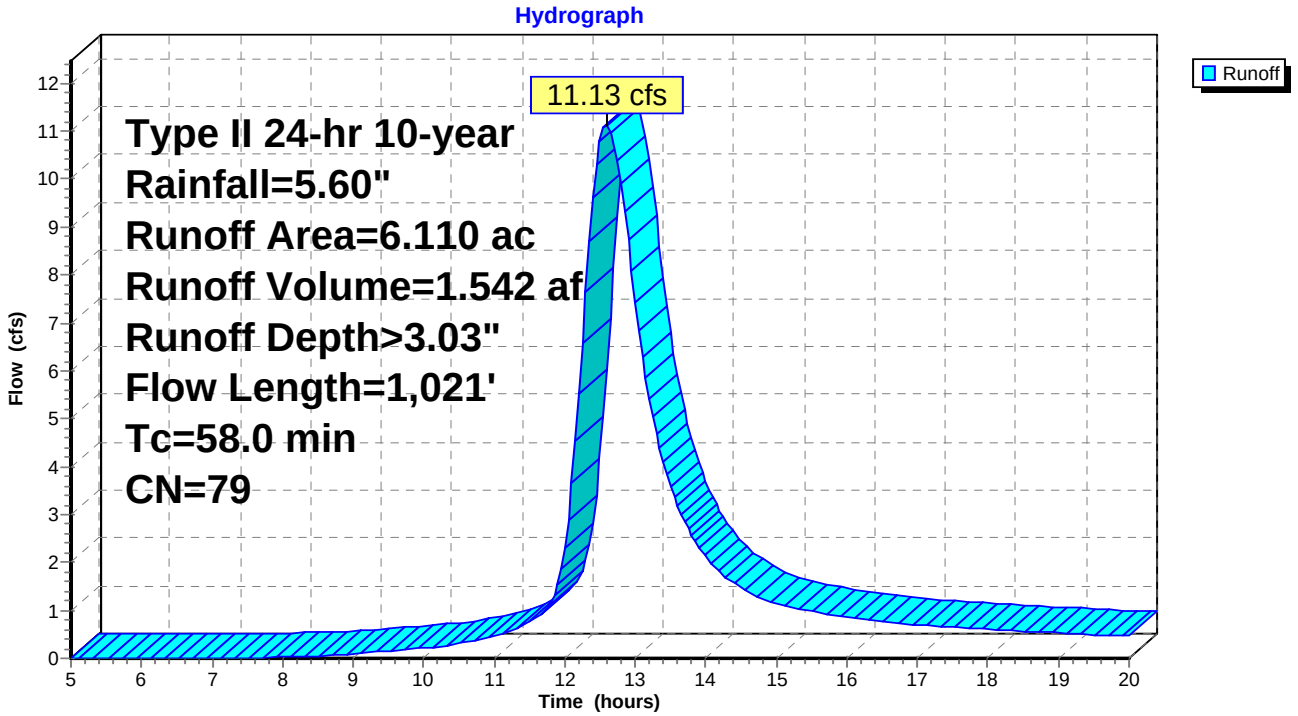
Runoff = 11.13 cfs @ 12.59 hrs, Volume= 1.542 af, Depth> 3.03"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-year Rainfall=5.60"

Area (ac)	CN	Description
6.110	79	50-75% Grass cover, Fair, HSG C
6.110		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
34.0	300	0.0067	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
24.0	721	0.0051	0.50		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
58.0	1,021	Total			

Subcatchment 14S: Log Yard #3a - Improved



Subcatchment 15S: Log Yard #3b - Improved

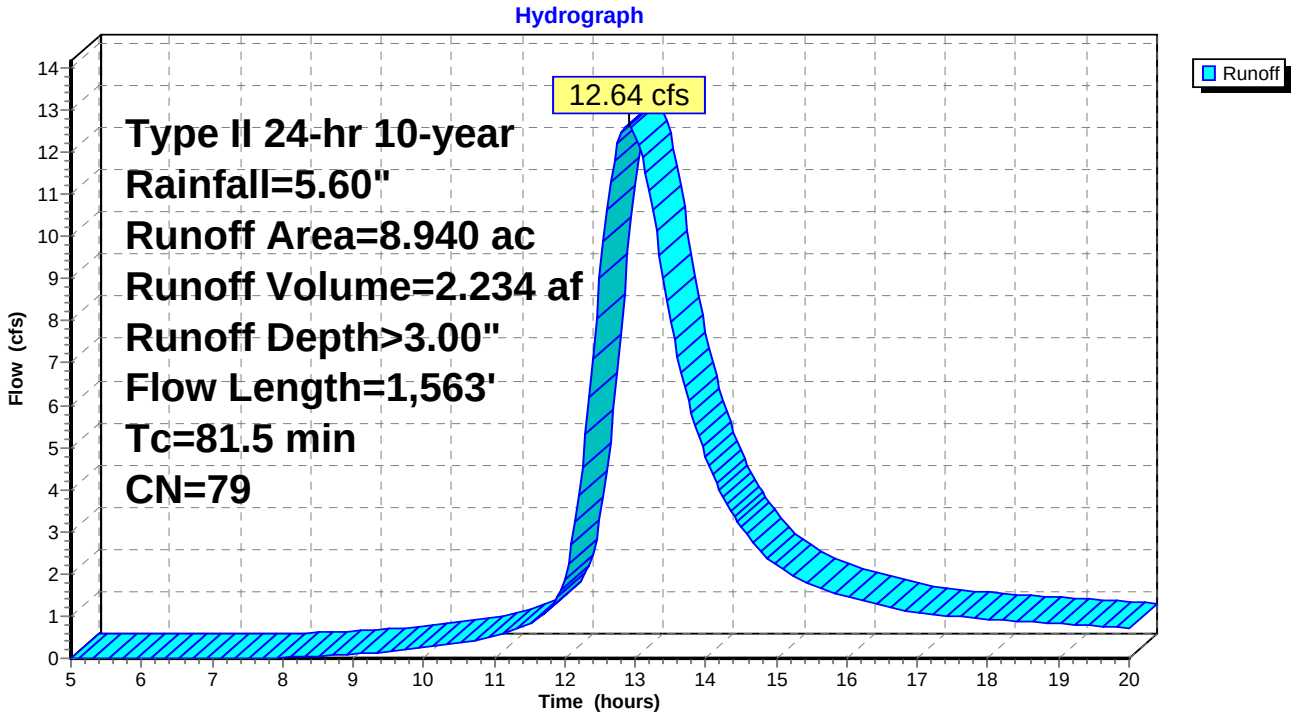
Runoff = 12.64 cfs @ 12.91 hrs, Volume= 2.234 af, Depth> 3.00"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-year Rainfall=5.60"

Area (ac)	CN	Description
8.940	79	50-75% Grass cover, Fair, HSG C
8.940		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
34.0	300	0.0067	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
47.5	1,263	0.0040	0.44		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
81.5	1,563	Total			

Subcatchment 15S: Log Yard #3b - Improved



Section 10
Detention Analysis/Design

See Section 9. No detention features are required for this project as post-development peak runoff rates do not exceed pre-development peak runoff rates for the 2- and 10-year, 24-hour storm events

Section 11
As-Builts

Existing detention features will not be used to control sediment as part of this project.

Runoff from Area #1 discharges to either an unnamed ditch or to the borrow area where water typically evaporates or infiltrates.

Runoff from Area #2 discharges to the borrow area where water typically evaporates or infiltrates.

Runoff from the Log Storage Area (Area #3) discharges to Storm Water Management Facility #1 and Storm Water Management Facility #2.

Runoff carried by the ditch (Area #4) discharges into Storm Water Management Facility #1.

The Storm Water Management Facilities #1 and #2 were designed to accommodate the aforementioned runoff.

Section 12
Permanent Storm Water Management Structure Maintenance

Existing storm water management facilities were permitted under SCR10C348 by the prior owner. Therefore, a permanent storm water management structure maintenance agreement is not required for this project.

Section 13
Discharge Points

Portions of the disturbed areas will be captured in the mill's storm water facility management #1 and Storm Water Management Facility #2 collection system and discharged under NPDES Permit No. SCR000000. The remaining disturbed areas will discharge to the Borrow Area. See drawings for details.

Section 14
Detention Waiver

A detention waiver is not required for this project as post development peak runoff rates do not exceed predevelopment peak runoff rates for the 2- year and 10-year, 24-hour storm events. See Section 9.

Section 15
Permanent Water Quality Requirements

Post-development peak runoff rates do not exceed predevelopment peak runoff rates for the 2-year and 10-year, 24-hour storm events. Therefore, permanent water quality requirements are not applicable to this project. See Section 9 for copies of hydrologic calculations.

Section 16
Sedimentology

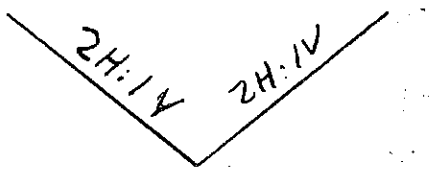
Ten acres or more of disturbed land will not drain to a common point. Therefore, trapping efficiency calculations are not required for this project.

Section 17
Stable Channel Calculations

Portions of the disturbed areas will be captured in the plant's storm water management facilities #1 and #2 discharged through Outfalls 01 and 02, as authorized by NPDES Permit No. SCR000000. The proposed construction will not increase the peak rates of discharge to the unnamed tributary of Pocotaligo River during the 2-year and 10-year, 24-hour storm events. Therefore, this construction project will not increase the flow rate in Pocotaligo River, and will not increase the potential for erosion and flooding. Existing culverts and outlet protection were permitted under SCR10C348 by the previous owner. The proposed land disturbing activities will not result in an increase in peak rates of runoff from the 2- and 10-year, 24-hour storm events. Therefore, previously permitted culverts and associated outlet protection will be sufficient.

PROJECT/PROPOSAL NAME/LOCATION: GP Clarendon, South Carolina		PROJECT/PROPOSAL NO. 05790.77.001
SUBJECT: Final Stabilization of Ditch		
PREPARED BY: S. Cummings	DATE: 12/22/10	FINAL ☐
CHECKED BY:	DATE:	REVISION ☐

- Relocating ditch further away from pavement.



Typical Ditch Section

$\tau = \gamma \times d_n \times S$

τ = max. shear stress (lbs/ft^2)

$\gamma = 62.4\ lbs/ft^3$

d_n = flow depth = 2.98 ft per North American Green

$S = 0.0032\ ft/ft$

$\tau = 62.4\ lbs/ft^3 \times 2.98\ ft \times 0.0032\ ft/ft$

$\tau = 0.60\ lbs/ft^3$

∴ Erosion Control Blankets (ECBs), Class B should be installed in ditch.

- Outlet Protection

2 - 30" culverts per HGBD report

Design per South Carolina DHEC - 30" Culvert / 48"

Ave Rock Dia. = 12" / 20"

Width on narrow end = 8' - 10' / 14' (16')

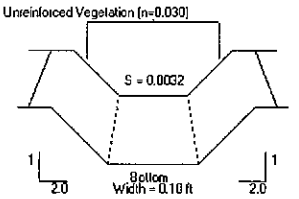
Length for high flow = 22' - 28' / 38' (44')

w/2-30" culverts used 48" culvert dimensions

North American Green - ECMDS Version 4.3		12/22/2010 11:54 AM	COMPUTED BY: S. Cummings
PROJECT NAME: GP Clarendon		PROJECT NO.: 05790.77.001	
FROM STATION/REACH:	TO STATION/REACH:	DRAINAGE AREA: Culvert #10	DESIGN FREQUENCY:

HYDRAULIC RESULTS

Discharge (cfs)	Peak Flow Period (hrs)	Velocity (fps)	Area (sq.ft)	Hydraulic Radius(ft)	Normal Depth (ft)
61.6	2.0	3.41	18.05	1.34	2.98



Not to Scale

LINER RESULTS

Reach	Matting Type / Staple Pattern	Stability Analysis	Vegetation Characteristics: Phase	Class	Type	Density	Permissible Shear Stress (psf)	Calculated Shear Stress (psf)	Safety Factor	Remarks
Straight	Unreinforced	Vegetation		C	Bunch	75-95%	4.20	0.59	7.06	STABLE
		Soil	Sandy Loam				0.035	0.080	0.44	UNSTABLE

Back to Input Screen

Stormwater Calculations

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HGBD No: 305102102

December 2005

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APPENDIX 4

Construction Flow Calculations

Sedimentation (SEDIMOT II Computer Model)

Ditch Velocity Calculations

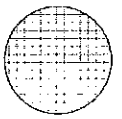
Ditch and Culvert Velocity Calculations

Culvert #	Total Area (acre)	Added Area (acre)	Q (cfs)	Culvert Dia. (in)	Flow Velocity (ft/s)
1	2.801	-	11.95	1x24	2.2
2	0.535	-	4.49	1x24	0.9
3	7.725	-	30.00	2x30	1.5
4	8.418	0.693	28.06	2x30	1.4
5	11.099	2.681	36.68	2x30	2.6
6	0.134	-	0.64	1x24	0.8
7	2.784	2.650	17.34	1x30	2.3
8	5.190	-	27.17	2x24	2.3
9	10.005	4.815	44.99	2x30	2.4
10	18.503	8.498	61.56	2x36	2.7
11	6.453	-	19.34	1x30	1.0
12	4.134	-	12.29	1x24	1.1
13	13.629	9.495	40.13	2x30	3.0
14	3.756	-	11.46	1x24	1.1
15	12.153	8.397	32.33	2x30	2.3
16	1.165	-	7.71	1x24	1.9
17	7.845	6.680	33.21	2x30	2.3
18	7.942	-	22.40	1x30	1.0
19	29.237	-	43.95	2x30	2.5
20	32.325	3.088	50.03	2x30	2.6
21	6.827	-	19.79	1x30	2.0
22	26.34	-	58.55	2x36	2.6
23	113.767	58.190	128.32	3x42	4.3
24	1.960	-	10.16	1x24	2.0
25	15.594	13.634	36.09	1x36	2.6
26	15.594	13.634	36.09	1x36	2.6
27	19.796	-	54.34	1x42	3.3
28	1.444	-	4.62	1x12	1.1
29	3.230	-	10.34	1x18	1.2

Note: Flow velocities are calculated in ditches immediately upstream of the corresponding culverts.

Erosion Control Blankets (ECBs)

Plan Symbol



Description

Temporary erosion control blankets (ECBs) are products composed primarily of biologically, photochemically or otherwise degradable constituents such as wheat straw, coconut fiber, or aged curled excelsior wood product with longevity of approximately 1- to 3-years.

When and Where to Use It

Use ECBs for temporary stabilization of soil immediately following seeding until the vegetative cover has grown and becomes established. ECBs provide temporary protection by degrading over time as the vegetation becomes established. Some products are effective for a few months while others degrade slowly and are effective for up to 3-years.

ECB Categories

- Class A (Slope Applications Only)
- Class B (Channel Applications Only).

Class A ECBs are for **slope applications only**.

- Applicable for slopes **2H:1V or flatter** only. Slopes greater than 2H:1V require Turf Reinforcement Matting (TRM).

Class B ECBs are for **channel applications**.

- Use for channels and concentrated flow areas with a maximum calculated shear stress **less than 1.75 lb/ft^2**. Design shear stresses greater than 1.75 lb/ft^2 require TRM applications.

0.60 lbs/ft^2

All acceptable Class A and Class B temporary erosion control blankets consisting of straw, coconut, or straw-coconut blends meet the following requirements:

- Use non-organic, photodegradable or biodegradable polypropylene netting.
- Consist of **double netted matting**, defined as matting with netting on both sides of the blanket. The top netting is degradable polypropylene with a maximum mesh opening of 0.75 inches by 0.75 inches. The bottom is degradable polypropylene with a maximum mesh opening of 0.5 inches by 0.5 inches.
- Be sewn on center a maximum of 2.0 inches

All acceptable Class A and Class B temporary erosion control blankets consisting of curled excelsior fibers meet the following requirements:

- Use non-organic, photodegradable or biodegradable polypropylene netting
- Consist of double netted matting. Double netted matting is matting with netting on both sides of the blanket. The degradable polypropylene top netting requires a maximum mesh opening of 1.0-inches by 1.0-inches. The degradable polypropylene bottom netting requires a maximum mesh opening of 1.0-inches by 1.0-inches
- Consist of curled excelsior interlocking fibers with 80% of the fibers a minimum of 6-inches long
- Sewn on center a maximum of 4.0-inches.

Use Class A and Class B temporary erosion control blankets having the following Minimum Average Roll Values (MARV) for physical properties, as derived from quality control testing performed by a Geosynthetic Accreditation Institute – Laboratory Accreditation Program (GAI-LAP) accredited laboratory:

- Minimum mass per unit area (ASTM D6475) of 6 oz/yd^2 (203 g/m^2)
- Minimum thickness (ASTM D6525) of 0.25-inches (6 mm)
- Minimum initial grab tensile strength (ASTM D6818) of 75x75 lb/ft. (1x1 kN/m)
- Minimum roll width of 48-inches (1.22 m)

- For Class B channel applications, a minimum unvegetated shear stress of 1.0 lb/ft^2 (48 N/m^2) based on short-term peak flow duration of 0.5 hour is required.

Installation

Grade and compact ECB protected areas as indicated on the plans.

Remove large rocks, soil clods, vegetation, and other sharp objects that could keep the ECB from intimate contact with subgrade.

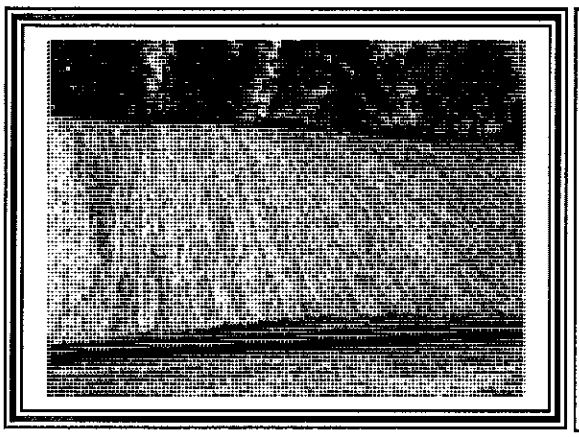
Prepare seedbed by loosening 2 to 3 inches of soil above final grade.

Proper ECB installation is different for each product, therefore follow the recommended installation procedure from the specific manufacturer.

When requested, a Manufacturer's Representative may be required to be on-site to oversee and approve the initial installation of the ECB. When requested, a letter from the Manufacturer approving the contractor installation may be required.

Inspection and Maintenance

- Inspect areas protected by ECBs for dislocation or failure every 7 calendar days and within 24-hours after each storm that produces ½-inch or more of rain.
- Conduct regular inspections until grasses are firmly established.
- Adhere to the pinning or stapling pattern as shown on the Manufacturer's installation sheet.
- If there is evidence that the ECB is not securely fastened to the soil, require extra pins or staples to inhibit the ECB from becoming dislodged.
- If washout or breakage occurs, repair all damaged areas immediately by restoring the soil on slopes or channels to its finished grade, re-apply fertilizer and seed, and replacing the appropriate ECB material as needed.



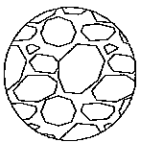
ECB Slope Applications

Preventive Measures and Troubleshooting Guide

Field Condition	Common Solutions
Undercutting occurs along the top of the slope.	Dig a 6-x 6-inch trench along the top of the slope and anchor blanket into trench by back filling and tamping the soil.
Blankets separate along the seams.	Overlap adjacent blanket 2- to 3-inch and staple every 3-feet.
Blankets separate where the rolls are attached end to end.	Shingle the blanket so the top blanket covers the bottom blanket by 6-inches and staple through the overlapped areas every 12-inches.
Blanket does not make complete contact with the soil surface.	Prepare the soil surface by removing rocks, clods, sticks and vegetation, fill in rill and uneven areas.
Excessive water flows across stabilized surface.	Use other BMPs to limit flow on stabilized area. Use other BMPs to reduce slope lengths. Do not use to stabilize areas with swift moving concentrated flows.

Riprap

Plan Symbol



Description

Riprap is a permanent, erosion-resistant channel lining aggregate consisting of large, loose, angular stone with a filter fabric or granular underlining. The purpose of riprap is to:

- Protect the soil from the erosive force of concentrated runoff
- Slow runoff velocities while enhancing the potential for infiltration

The filter fabric or granular underlining prevents undermining of the riprap layer by the migration of soil particles under seepage forces through the riprap.

When and Where to Use It

The preferred method of slope and channel protection is the use of vegetation. If vegetation can not withstand the design flows, ECBs and TRMs are the preferred and suggested method of protection. When conditions are too severe for vegetation and TRMs, riprap may be used for erosion control and protection. Riprap is used, as appropriate, at storm drain outlets, on channel banks and/or bottoms, drop structures, at the toe of slopes, and in transitions from concrete channels to vegetated channels. Riprap sizes are designed by the diameter or by the weight of the stones. It is often misleading to think of riprap in terms of diameter, since the stones should be angular instead of spherical.

Installation

Place a lining of geotextile filter fabric or granular filter material between the riprap and the underlying soil surface to prevent soil movement into or through the riprap.

Inspection and Maintenance

- Once a riprap installation has been completed, it should require very little maintenance.
- It should, however, be inspected periodically to determine if high flows have caused scour beneath the riprap and filter fabric or dislodged any of the stone.
- Care must be taken to properly control sediment-laden construction runoff that may drain to the point of the new installation. If repairs are needed, they should be performed immediately.

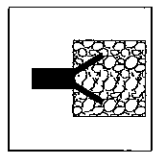
Riprap Lined Channel

Preventive Measures and Troubleshooting Guide

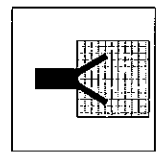
Field Condition	Common Solutions
High flows causing scour beneath riprap or filter fabric dislodging the stone.	Replace filter fabric and rearrange stone appropriately.
Riprap blocks channel, causing erosion along edges.	Make sure excavation is deep enough, rearrange riprap appropriately.
Piping or slumping occurs.	Make sure filter fabric was installed and make sure it isn't damaged.
Stones have moved and erosion of foundation has occurred.	Make sure riprap is properly graded.
Undercut riprap slope and slumping occurring.	Check to be sure that foundation toe is properly reinforced.
Stone displacement occurring.	Make sure fill slopes have been properly compacted, remove debris and make needed repairs.

Outlet Protection

Plan Symbol



RipRap



ECB or TRM

Description

Outlet protection dissipates the energy of concentrated storm water flows reducing erosion or scouring at storm water outlets. In addition, outlet protection lowers the potential for downstream erosion. Outlet protection is achieved through a variety of techniques, including turf reinforcement mats (TRMs), riprap, concrete aprons, paved sections and other structural measures.

The techniques outlined in this section are not the only techniques that may be used for outlet protection design. This section shows one method for outlet protection design as an example of the variables that need to be considered in the design. Other methods utilized that are not discussed in this Handbook should include all graphs, charts, and calculations verifying that the protection will handle the peak flow velocity, flow depths, and shear stress.

Installation

- Do not protect pipe or channel outlets at the top of cut slopes or on slopes steeper than 10% with only outlet protection. This causes re-concentration of the flow resulting in increased velocities when the flow leaves the protection area.
- Follow specific standards for installation of the selected materials used for outlet protection.
- Follow all Manufacturer's installation procedures for TRMs and other manufactured products.

- A Manufacturer's Representative may be required to oversee all installation procedures and officially approve the installation of manufactured products used for outlet protection.

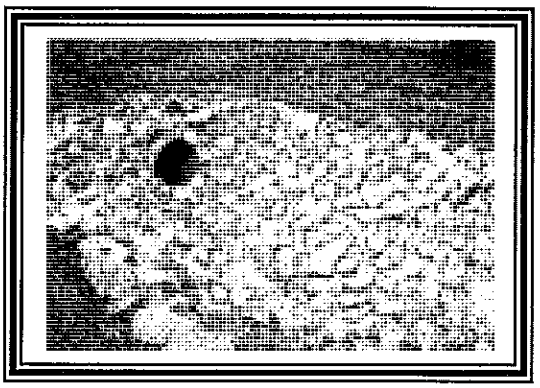
Inspection and Maintenance

- Periodically check all outlet protection, aprons, plunge pools, and structural outlets for damage. Immediately make all needed repairs to prevent further damage.
- If any evidence of erosion or scouring is apparent, modify the design as needed to provide long term protection (keeping in mind fish passage requirements if applicable).
- Inspect outlet structures after heavy rains to see if any erosion has taken place around or below the structure.

The table below provides general information for sizing rock and outlet aprons for various sized pipes.

Culvert Size (inches)	Average Rock Diameter (inches)	Apron Width at the narrow end (feet)	Apron Length for slow flow (feet)	Apron Length for high flow (feet)
8"	3"	2-3 ft	3-5 ft	5-7 ft
12"	5"	3-4 ft	4-6 ft	8-12 ft
18"	8"	4-6 ft	6-8 ft	12-18 ft
24"	10"	6-8 ft	8-12 ft	18-22 ft
30"	12"	8-10 ft	12-14 ft	22-28 ft
36"	14"	10-12 ft	14-16 ft	28-32 ft
42"	16"	12-14 ft	16-18 ft	32-38 ft
48"	20"	14-16 ft	18-25 ft	38-44 ft

2 - 30" Culverts



Riprap Outlet Protection

Preventive Measures and Troubleshooting Guide

Field Condition	Common Solutions
Riprap washes away.	Replace riprap with a larger diameter based on the pipe diameter and discharge velocity.
Apron is displaced.	Align apron with receiving water and keep it straight throughout its length. Repair damaged fabric and replace riprap that has washed away.
Scour occurs around apron or riprap.	Remove damaged TRM or riprap, fill in scoured areas, and repair damage to slopes channels or underlying filter fabric. Reinstall outlet protection.
Outlet erodes.	Stabilize TRM outlets with vegetation, replace eroded riprap; grout riprap.

ISSUED FOR
PERMIT
Date: 2005/12/19

EXHIBIT 8

HUSSEY, GAY, BELL & DEYOUNG, INC.
CONSULTING ENGINEERS

SAVANNAH, GA | COLUMBIA, SC | MOUNT PLEASANT, SC | GAINESVILLE, GA

A Bell Company

REVISIONS

DRAWN: JDB | DESIGNED: VSR | CHECKED: CGM
DATE: DEC. 19, 2005
HGBD JOB # : 305102100
SCALE: 1"=600'

OSB PLANT
PREPARED FOR
GRANT CLARENDON PRODUCTS INC.

DITCH AND CULVERT LOCATION PLAN

DRAWING NUMBER
8
8 OF 7 SHEETS

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Section 18
Inlet Protection

Existing inlet protection for culverts was permitted under SCR10C348 by the previous owner. Post development peak rates of runoff will not exceed predevelopment peak rates of runoff for the 2- and 10-year, 24-hour storm events. Therefore, the existing inlet protection will suffice for this project. No catch basins and/or storm sewers are planned for this project.

Section 19
Energy Dissipaters/Outlet Protection

Existing outlet protection design information was provided in the permit application for SCR10C348 by the previous owner. Outlet protection will be installed in Area #4 as a part of the relocation of this ditch. All other existing outlet protection will suffice for this project as post-development peak rates of runoff will not exceed predevelopment peak rates of runoff.

Section 20
Fill Slopes/Embankments

Not applicable to this project.

Embankments will be constructed and grassed as further specified on engineering drawings.

Section 21
Utility Lines

Not applicable to this project.

Section 22
TMDL/303d Impaired Waterbodies

SC DHEC water quality monitoring station number PD-115 is included on SC DHEC's Clean Water Act Section 303(d) list of impaired waters due to failing to meet the State's dissolved oxygen criterion for freshwater. This monitoring station is located upstream from the discharge locations of streams that drain the site. A total maximum daily load (TMDL) has not been approved for this section of Pocotaligo River.

Section 23
Navigable Waters

The GP Clarendon LP site is not located on a South Carolina navigable water. Three non-navigable tributaries to the Pocotaligo River drain the site. Criteria for facilities adjacent to navigable waters are not applicable to this project.

Section 24
OCRM Requirements

The GP Clarendon LP facility is located in Clarendon County, which is outside of the State designated Coastal Zone. Criteria for sites located within the Coastal Zone are not applicable to this project.

Section 25
Site Plans Checklist

See drawings.