MAPS Removed

PENDING PETITION MEMO

Date: 9/24/2007

TO : OE&E
OGC
G&W

FROM: CENTRAL OPERATIONS

UTILITY: CHESAPEAKE APPALACHIA, LLC

SUBJECT: 07-T-1130

Application of Chesapeake Appalachia, LLC For a Certificate of Environmental Compatibility and Public Need to Construct Approximately 51,433 of 8" Steel Coated Pipeleine in the Towns of Barrington and Starkley, Yates County; and the Towns of Reading and Tyrone, Schuyler County.

07-T-1130

Chesapeake
ENERGY

2007 SEP 24 AM 11: 29

Tim Smith
Office: (304) 353-5065
Cell: (304) 382-8783
tsmith@chkenergy.com

September 20, 2007

Ms. Jaclyn Brilling, Secretary
State of New York Public Service Commission
Building 3
Empire State Plaza
Albany, NY 12223

Dear Ms. Brilling:

Please find enclosed an original and four copies of Chesapeake Appalachia, L.L.C.'s Notice of Intent to Construct a Natural Gas Pipeline. The notice includes an overview map (Attachment "A") upon a portion of the Dundee, Keuka Park, Reading Center and Wayne 7.5' USGS quads reflecting the proposed location of approximately 51,433 feet ± of 8-inch steel pipeline. This pipeline will be constructed within the Towns of Barrington and Starkey, Yates County, and the Towns of Reading and Tyrone, Schuyler County, New York. Construction is expected to begin on or around November 26, 2007.

This notice is being filed pursuant to Article VII, Section 121-a(3) of the New York Public Service Law and requests a Certificate of Environmental Compatibility and Public Need under Section 85-1.3 of 16 NYCRR Chapter 1, Subchapter G.

Should you have any questions or desire additional information, please feel free to contact me at the address below or by phone as indicated above.

Sincerely,

Tim Smith

Tim Smith

Enclosures

Chesapeake Energy Corporation - Eastern Division
P.O. Box 6070 • Charleston, WV 25362-0070 • 900 Pennsylvania Avenue • Charleston, WV 25302
304.353.5000 • fax 304.353.5231

Chesapeake
ENERGY

Michael A. John
Vice President - Operations

September 20, 2007

Ms. Jaclyn Brilling, Secretary
State of New York Public Service Commission
Building 3
Empire State Plaza
Albany, NY 12223-1350

Re: Environmental Management and Construction Standards and Practices

Dear Ms. Brilling:

I hereby certify that in constructing pipeline within the State of New York, Chesapeake Appalachia, L.L.C., will utilize *Environmental Management and Construction Standards and Practices for Underground Transmission and Distribution Facilities*, revised February 28, 2006, as approved by the Public Service Commission.

Sincerely,

Michael John

Chesapeake Energy Corporation - Eastern Division
P.O. Box 6070 • Charleston, WV 25362-0070 • 900 Pennsylvania Avenue • Charleston, WV 25302
304.353.5121 • mjohn@chkenergy.com

Chesapeake
ENERGY

Michael A. John
Vice President - Operations

September 20, 2007

Ms. Jaclyn Brilling, Secretary
State of New York Public Service Commission
Building 3
Empire State Plaza
Albany, NY 12223-1350

Re: Environmental Management and Construction Standards and Practices

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Sincerely,

Michael John

Chesapeake Energy Corporation - Eastern Division
P.O. Box 6070 • Charleston, WV 25362-0070 • 900 Pennsylvania Avenue • Charleston, WV 25302
304.353.5121 • mjohn@chkenergy.com

NOTICE OF INTENT TO CONSTRUCT
A NATURAL GAS GATHERING PIPELINE
IN THE
TOWN OF BARRINGTON, COUNTY OF YATES,
TOWN OF STARKEY, COUNTY OF YATES,
TOWN OF TYRONE, COUNTY OF SCHUYLER,
TOWN OF READING, COUNTY OF SCHUYLER,
STATE OF NEW YORK

September 20, 2007

INDEX

PART I
PROJECT DESCRIPTION

Pursuant to Article VII, Section 121 (a).3 of the New York State Public Service Law and 16NYCRR Subpart 85-1.2, Chesapeake Appalachia, L.L.C. ("CHK") hereby requests the issuance of a Certificate of Environmental Compatibility and Public Need ("Certificate") from the New York State Public Service Commission ("PSC") by serving this Notice of Intent ("NOI") to construct a natural gas gathering pipeline in the Towns of Barrington and Starkey, Yates County, and the Towns of Reading and Tyrone, Schuyler County, New York. No compression facilities are planned at this time.

The pipeline will serve to produce additional gas from the existing Silk #1 gas well (API # 31-123-22776) and for future wells and will consist of approximately 51,443 feet of 8-inch coated steel pipe (the "Pipeline"). There are no alternate high-pressure lines to produce the gas from the above referenced well. The pipeline route is solely within and upon privately held lands with the exception of crossing public roads as further described herein. The proposed pipeline route represents the minimum adverse environmental impact, considering that only Big Stream Creek, a NYDEC regulated water source, is proposed to be crossed by horizontal directional drill bore method.

CHK requests New York State Department of Environmental Conservation ("DEC") Water Quality Certifications under Article 15, Title 5, Section 401 for the crossing of Big Stream Creek, Gravel Run Creek, and Rock Stream Creek, twenty seven (27) unnamed intermittent creeks/streams and 32 wetland crossings be incorporated into the requested Certificate.

Pursuant to 16 NYCRR Subpart 85-1.3(b) CHK has contacted all applicable Municipal, County and State entities that would have jurisdiction over any portion of the Pipeline project, should it not be pursued under Article VII, and find there are no known applicable rules, ordinances or laws which CHK finds unreasonably restrictive.

The DEC's law for the Use and Protection of Waters (Part 608), which will apply to the stream and creek crossings, is not considered to be unreasonably restrictive by CHK.

The anticipated commencement date for the construction of the Pipeline is on or about November 26, 2007, or within 10 days of receipt of a Certificate, whichever is earlier. The Pipeline should be completed within approximately 120 days of commencement.

The description for the proposed pipeline to is as follows:

> Commencing at Chesapeake's Silk #1 gas well (API: 31-123-2276) located on Tax Map 104.03-1-7, 52.3 acres in the Town of Barrington, Yates County, New York, and proceeding in a southeast direction ±550' to an underground telephone line and Gray Road, thence continuing ±150' across Gray Road in a southeast direction to an overhead electric line, thence ±1,200' southeast and southwest to an intermittent stream labeled "IS23", thence ±400' southeast to an intermittent stream labeled "IS22", thence ±1,700' southeast to a wetland labeled "Z", thence ±50'southeast through the wetland, thence ±100' southeast to an intermittent stream labeled "IS21", thence ±775' southeast direction to Bellis Hill Road, a wetland labeled "Y" and an underground fiber optic line, thence ±950' along Bellis Hill Road in an easterly direction, thence ±100' crossing Bellis Hill Road in a southeast direction to a ditch line which is labeled "IS20", thence ±100' southeast direction to a ditch line and intermittent stream which is labeled "IS20A" which is a continuation of the previous ditch, thence ±450' in a southeast direction to an intermittent stream labeled "IS19", thence ±1,000' through Old Bath Road in a southeast direction to a wetland which is labeled "X", and an overhead electric line, thence ±300' south along the eastern edge of Old Bath Road to an intermittent stream which is labeled

"IS18", thence ±400' south to a wetland which is labeled "W" , thence ±80' south through this wetland along the eastern edge of Old Bath Road, thence ±100' south along the eastern edge of Old Bath Road to a wetland which is labeled "V", thence ±100' southwest along the eastern edge of Old Bath Road through wetland "V", thence ±850' in a southwest and southeast direction to an intermittent stream labeled "IS17", thence ±700' feet in a southeast direction to a wetland labeled "U", continuing on through this wetland ±100' in a southeast direction, thence ±300' south until reaching a buried telephone cable and edge of Ellis Road, thence ±100' south crossing Ellis Road and an overhead electric line, thence ±100' south until reaching a wetland labeled "FF", thence ±50' south until reaching a wetland labeled "EE", thence ±300' south until reaching a wetland labeled "DD", thence ±200' south until reaching a wetland labeled "CC", thence ±180' south until reaching a wetland labeled "BB", thence ±75' south through wetland "BB", thence ±1,900'south to angle point station 387+66, thence east ±650' until reaching wetland "T", thence through wetland "T" ±200' southeast to an angle point and station 382+01, thence ±90' southeast in to wetland "S"; thence ±90' through wetland "S" southeast; thence ±140' in a southeast direction and to the edge of wetland "T" again, thence ±140' southeast through wetland "T", thence ±900' southwest until reaching the edge of wetland "R", thence ±600' south through wetland "R", thence ±600' south until reaching an intermittent stream labeled "IS16" and the edge of wetland "Q" and "P", thence ±100' southeast through wetland "P", thence ±100' southeast until reaching wetland "Q", thence ± 200' southeast through wetland "Q" to the edge of wetland "O", thence passing through wetland "O" and ±1100' southeast to the edge of wetland "N", thence ±50' southeast through wetland "N", thence ±50' southeast to the edge of Bill Bailey Road and an intermittent stream labeled "IS15", thence ±190' southeast through Bill Bailey Road to the edge of a primary stream labeled"PS5", thence ±210' southeast to the edge of an intermittent stream labeled "IS14", thence through "IS14" and ±2,300' southeast to the edge of NYS Route 230, the edge of a primary stream labeled "PS4", and an intermittent stream labeled "IS13", thence through NYS Route 230 ±750' southeast to the edge of wetland "M" also known as *Big Stream*, thence ±1800' southeast through wetland

"M, thence ±175' southeast to wetland "IS99", thence ±200' southeast through three intermittent streams "IS99", "IS98", "IS97", to the edge of wetland "LL", thence ±900' southeast to an intermittent stream labeled "IS12", thence ±850' southeast to an intermittent stream labeled "IS11", thence ±100' southeast through wetland "L", thence ±1200' southeast to angle point station number 256+27, thence ±100' southeast to the edge of Gravel Run Road and a buried telephone cable, thence ±100' southeast through Gravel Run Road, an overhead electric line, and to the edge of Haley Hill Road, thence ±800' southeast through Haley Hill Road and an overhead electric line to a livestock fence, thence ±1100' southeast through this fence to an intermittent stream labeled "IS10", thence ±450' southeast to wetland "K", thence ±100' southeast through wetland "K", thence ±120' southeast to an intermittent stream labeled "IS9", thence ±350' southeast to an intermittent stream labeled "IS8", thence ±500' southeast to an intermittent stream labeled "IS7", thence ±500' southeast to angle point station 214+95, thence ±100' east to wetland and Gravel Run Creek labeled "PS3", thence ±450' east to wetland "J", thence ±50' east through wetland "J", thence ±250' east to wetland "I", thence ±100' east through wetland "I', thence ±150' southeast to angle point station 203+59, thence ±450' southeast to the edge of Six Corners Road, thence ±75' southeast through Six Corners Road to the edge of wetland "H", thence ±390' southeast through wetland "H" to the edge of wetland "G", thence ±300' southeast through wetland "G" to the edge of Bossard Road and an overhead electric line, thence ±750' southeast through Bossard Road and an underground telephone cable to wetland "F", thence ±50' southeast through wetland "F", thence ±340' southeast to the edge of Glen Road and the Town of Barrington, Yates County and Town of Tyrone, Schuyler County border, thence ±140' southeast through Glen Road and a buried telephone cable and overhead electric line to wetland "E", thence ±100' south through wetland "E", thence ±575' south to an intermittent stream labeled "IS6", thence ±1100' southeast to angle point station 163+70, thence ±1250' east to angle point station 151+51, thence ±200' southeast to the edge of Bigelow Hill Road and an overhead electric line, thence ±2000' southeast through Bigelow Hill Road to an intermittent stream labeled "IS5", thence ±800' southeast to wetland "D", thence ±150' southeast through wetland "D" to an intermittent stream labeled "IS4", thence ±1040' southeast to an intermittent stream/unnamed creek labeled "IS3", thence ±1250' southeast through "IS3" to wetland "C", thence ±50' southeast through wetland "C"; thence ±600' southeast to the edge of Clark Price Road and an overhead electric line, thence ±425' southeast through Clark Price Road and an overhead electric line to the edge of Pre-Emption Road and an overhead electric line, thence ±1575' southeast through Pre-Emption Road to an existing livestock fence, through this existing livestock fence ±3250' southeast to the edge of wetland "B", thence ±125' southeast through wetland "B", thence ±150' southeast to the edge of State Route 226, thence ±250' through State Route 226 and an overhead electric line to the edge of a braided intermittent unnamed creek, labeled "IS2", thence ±1900' southeast through the intermittent unnamed creek "IS2" to another intermittent stream labeled "IS1", thence ±1300' southwest through "IS1" to wetland and stream labeled "PS1", thence ±300' southeast through "PS1" to the proposed meter site/compressor location, tie-in point to Columbia Gas Transmission Line R-16".

This represents an approximate proposed total length of 51,443'-feet or 9.74 miles of 8" pipeline.

The Pipeline will be installed per the right-of-way agreements. CHK's right-of-ways are generally 50' in width during any construction, except where noted on Exhibit "D". The width to be cleared along the rights of way will be 40' leaving 10' in addition if needed by the contractor, except as noted on the attached Exhibit "D". The Pipeline right of way will be cleared to a width of 50' for a distance of approximately 100' on both sides of the streams, creeks and roads if necessary. In addition, the approximate locations of optional 20' by 60' stacking areas are indicated on the map attached hereto as Exhibit "D" which areas CHK may utilize under the terms of the space provided in the right-of-way agreements CHK holds on the subject premises. Where indicated, different dimensional stacking areas are also noted on the attached Exhibit "D". Timber, stumps, tops and brush may be stacked along the outer edge in the right of way or in the stacking areas for use by the landowners on whose property it was cut; tops and brush, however, may be chipped and/or buried within the right of way.

There are lands cultivated for commercial farm purposes crossed by the Pipeline and these areas will have a minimum of 48" of cover. In all other areas the Pipeline will be buried with a minimum of

36" of cover unless solid rock is encountered, in which case special precautions will be taken, according to PSC requirements. Maximum operating pressure of the Pipeline is 900 psig. Maximum test pressure of the Pipeline is 1,350 psig with allowances for topography.

The roads to be crossed by the Pipeline are Gray Road, Bellis Hill Road, Bath Road, Ellis Road, Bill Bailey Road, Gravel Run Road, Haley Hill Road, Six Corners Road, Bossard Road, Glen Road, Bigelow Hill Road, Clarke Price Road, Pre-Emption Road, and NYS Routes 226 and 230. Road crossings will either be open cut, bored using the conventional method, or horizontally directionally drilled. Town, County and State highway permits, if required, will be secured and copies sent to the PSC.

There are three (3) named creeks/streams, three (3) unnamed creeks/streams, twenty-seven (27) unnamed intermittent creeks/streams, and thirty-two (32) wetlands to be crossed by the Pipeline. The stream crossings may be constructed using the open cut dry crossing method or CHK may elect to horizontal directional drill or conventionally bore these creeks, streams and wetlands. There are no creek/stream crossings that have a classification of C(t) or higher. CHK will use filter fabric fences and/or hay bales on the bank of the streams and will use filter fabric and/or hay bales in the streams below the point at which they are being crossed. The creek/stream crossings will be completed within 24 hours.

There are lands cultivated for commercial farm purposes crossed by the Pipeline. Officials from Schuyler County indicate that the properties of James Howell (tax # 30.00-3-3.11), Cleason Newswanger (tax # 30.00-3-23.12), Earl Ray Nolt (tax # 20.00-1-9.1), Robert A. Timberman III (tax # 130.03-1-5), Noah S. Zimmerman (tax # 130.03-1-7) and Christian Zimmerman (tax # 20.00-1-24.2) are located in designated Agricultural Districts. Officials from Yates County indicate that the properties of Gary W. Brown (tax # 126.02-1-12) and Cleon Martin (tax # 111.04-1-18) and (tax # 118.02-1-7) are located in designated Agricultural Districts.

The New York State Historic Preservation Office issued a letter dated January 9, 2007 of "No Impact" which is enclosed herein.

There are no existing and/or officially approved planned residential, commercial, industrial, institutional and recreation land uses within or immediately adjacent to the planned Pipeline.

Of all the items listed in 16NYCRR Subpart 85-1.2(2)(99) [Ecosystem Resources], except erodible soils that was addressed in the DEC approved Stormwater Management Plan issued August 16, 2007 identified as permit NYR 10N351, (permit attached) and wetlands, creeks and streams, which the DEC will address, none were found to exist in the area of the Pipeline. **One (1) State Wetland "KP-1" was found to exist and its location is identified on the project map as Wetland "M" (Big Stream). CHK is waiting for comments back from the New York State DEC concerning the state wetland crossing and the associated buffer area. Also some Army Corps of Engineers wetlands are being crossed and their locations are outlined in the project map.** The lateral extent of the wetland boundaries and their respective "buffer zones" will be reestablished by field delineation prior to the start of the Pipeline construction. **CHK will minimize disturbance in wetlands and all wetland crossings will be open cut or bored using the conventional or horizontal directional drill method.** The method used will be determined before the preconstruction meeting to be held prior to commencement of operations.

Lands crossed by the Pipeline are privately owned. Landowners were not aware of any Officially Designated Cultural Resources located on their property.

No Officially Designated Visual Resources were identified with this project including scenic areas, roads, vistas and overlooks.

To CHK's knowledge there are no known habitats of endangered plant or animal species associated with the Pipeline. The NYDEC Division of Fish, Wildlife & Marine Resources issued a letter dated December 21, 2006, and indicated there was "no record of known occurrences." (Letter is enclosed herein.)

CHK will construct, operate and maintain the Pipeline in accordance with the PSC's Environmental Management and Construction Standards and Practices Plan, revised 2/28/06, as adopted under PSC Case #02-T-1162 (EM&CS&P). CHK's letter certifying same is enclosed with this NOI. The EM&CS&P check-off list of the specific standards and practices to be used in relation to the Pipeline is also enclosed with this NOI. Due to the anticipated construction date, a Winter Construction Restoration and Remediation Plan will be implemented.

CHK is a member of Dig Safely New York (16NYCRR Part 753 [Code Rule 53]). The contractor, prior to construction of the Pipeline, will make all requisite calls. CHK conducted its own inspection for verification purposes and found two underground gas transmission lines owned by Columbia Gas Transmission crossing the proposed Pipeline on the Austin and Eldridge properties and one underground gas well gathering line also owned by Columbia Gas Transmission crossing the proposed Pipeline on the N. Zimmerman property. There are underground communication lines on the Wicker, Thompson, Wheeler, Bloom, Jones, Ballard, Randall, Morse and Silk properties. All crossings are located at the various road crossings. CHK found overhead utility lines on the south side of State Route 226, the north side of Clark Price Road, the west side of Bigelow Hill Road, the north side of Bossard Road, east of Six Corners Road, on the south side of Haley Hill Road, on the east side of Gravel Run Road, on the north side of State Route 230, on the south side of Ellis Road, along the east side of Old Bath Road, on the South side of Bellis Hill Road and the south side of Gray Road.

The Pipeline route has been reviewed by John Strub of the PSC and Mike Saviola of the NY Department Agricultural and Markets.

All rights of way or leases across private property have been secured for the Pipeline. The Pipeline route, as described in this NOI and on the topographic map attached as Exhibit "A", incorporates discussions with and input from all landowners affected by the Pipeline.

The following have been attached as exhibits to this NOI:

Exhibit "A":	Topographic map at 1" = 2000' scale indicating the route of the Pipeline and well relevant to the Pipeline.
Exhibit "B":	Field Summary indicating well tie-in points, approximate Pipeline footage, road and/or stream crossings, and a brief description of the land under which the Pipeline will be installed.
Exhibit "C":	Service List and Certificate of Service indicating to whom copies of this NOI are being sent.
Exhibit "D":	Project map at 1" = 400' scale indicating the route of the Pipeline, Pipeline markers, and wells relevant to the Pipeline. The location of the Pipeline markers may deviate slightly from the locations indicated on the map in that they will be placed in such a manner so as to minimize interference with landowners' use of the properties. In any event, they will be placed so that each immediate adjacent marker will be visible from the other. Furthermore, Pipeline markers will be placed at all road and stream crossings.

EXHIBIT "B"
FIELD SUMMARY
Chesapeake Appalachia, L.L.C., N.O.I. Dated 9/20/07
for Pipeline in the Towns of Barrington and Starkey, Yates County,
and Towns of Reading and Tyrone, Schuyler County, New York

General Description	Nominal Line Diameter	Length	Roads or Streams to be Crossed or Bored	Underground Utilities to be Crossed or Paralleled	Land Description
Commencing at Chesapeake Appalachia Silk well API 31-123-22776 to tie into the existing Columbia Gas Transmission line R-16 pipeline.	8 inch	51,443 ±	Roads - Gray, Bellis Hill, Old Bath, Ellis, Bill Bailey, Gravel Run, Haley Hill, Six Corners, Bossard, Glen, Bigelow Hill, Clark Price, Pre-Emption, and NYS Routes 226 & 230 Streams - Big Stream, Gravel Run Creek and Rock Stream Creek; 3 Unnamed streams; 27 Unnamed intermittent streams	Crossing two underground Columbia Gas Transmission pipelines Crossing one Columbia Gas Transmission well gathering line Crossing nine underground communications lines	Wooded - 18,067' ± Agricultural Field - 23,648' ± Abandonded Field - 2,142' ± Pasture - 1,296' ± Residential Yard - 1,241' ± Wetlands - 3,898' ± Road Crossings - 1,151' ±

CERTIFICATE OF SERVICE

I, the undersigned, Tim Smith, do hereby certify that on September 21, 2007, I have served on each of the parties or persons designated herein a copy of Chesapeake Appalachia, L.L.C., Notice of Intent to Construct a Natural Gas Gathering Pipeline by mailing a true and exact copy thereof via the United States Postal Service, certified and postage prepaid, to the addresses specified below.

1. Ms. Jaclyn Brilling, Secretary (original and 4 copies)
State of New York Public Service Commission
Building 3
Empire State Plaza
Albany, NY 12223

2. State of New York Public Service Commission
Gas Safety Division
Attn: Mr. Gavin Nicoletta
Building 3
Empire State Plaza
Albany, NY 12223

3. New York State Department of Environmental Conservation
Region 8
Attn: Mr. Peter A. Lent, Regional Permit Administrator
6274 East Avon-Lima Road
Avon, NY 14414-9519

4. New York State Department of Transportation
Region 6
Attn: Mr. Peter E. White, P.E., Regional Director
107 Broadway
Hornell, NY 14843

5. Mr. Nathan Rudgers, Commissioner
New York State Department of Agriculture and Markets
1 Winners Circle
Albany, NY 12235

6. New York State Office of Parks, Recreation and Historic Preservation
Historic Preservation Field Services Bureau
Attn: Nancy Herter
Peebles Island Resource Center
P.O. Box 189
Waterford, NY 12188-0189

CERTIFICATE OF SERVICE (Continued)

7. New York State Department of Environmental Conservation
Division of Fish, Wildlife & Marine Resources
Wildlife Resources Center-New York Natural Heritage Program
Attn: Ms. Jean Petrusiak
700 Troy-Schenectady Road
Latham, NY 12210-2400

8. United States Department of Interior
Fish and Wildlife Service
Attn: Mr. David Stilwell
3817 Luker Road
Cortland, NY 13405

9. Department of Army
Buffalo District, Corps of Engineers
Attn: Diane Kozlowski
1776 Niagra Street
Buffalo, NY 14207-3199

10. Mr. Mike Saviola
New York Department of Agriculture and Markets
158 Main Street
Mt. Morris, NY 14510

11. Mr. Timothy O'Hearn
Schuyler County Administrator
105 Ninth Street
Watkins Glen, NY 14891

12. Mr. Greg Mathews
Superintendent of Highways
Schuyler County Highway Department
910 South Decatur Street
Watkins Glen, NY 14891

13. Mr. Marvin Switzer
Town of Reading
P.O. Box 5
Reading Center, NY 14876

14. Town of Reading Highway Department
P.O. Box 5
Reading Center, NY 14876

CERTIFICATE OF SERVICE (Continued)

15. Town of Tyrone
569 Route 23
Dundee, NY 14837

16. Town of Tyrone Barn
596 Route 23
Tyrone, NY 14887

17. Ms. Sarah Purdy
Yates County Administrator
417 Liberty Street
Penn Yan, NY 14527

18. Ms. Marilyn Scharf
Town of Barrington Planner
Barrington Town Hall
5133 Old Bath Road
Dundee, NY 14837

19. Mr. Steve Wheeler
Town of Barrington Highway Dept.
5133 Old Bath Road
Dundee, NY 14837

20. Mr. James Ritter
Town of Starkey Planner
Starkey Town Hall
656 Dundee Glenora Road
Dundee, NY 14837

21. Louis Seeley
Town of Starkey Highway Dept.
656 Dundee Glenora Road
Dundee, NY 14837

Tim Smith
Tim Smith

Subscribed and sworn before me this 21st day of September, 2007.

Betty J. Paolini
Notary Public

My commission expires 11-18-2008.

OFFICIAL SEAL
NOTARY PUBLIC
STATE OF WEST VIRGINIA
Betty J. Paolini
1900 Pine Manor Road
Charleston, WV 25301
My Commission Expires Nov. 18, 2008

PART II

1. Appendix 7-D Form A – Report of Specifications of Proposed Construction of Gas Pipeline to be Subjected to Pressure of 125 psig or More (255.302) – **(Form enclosed in Triplicate)**.

2. Appendix 7-G – Notice of Construction for Gas Gathering Lines to be Subjected to Pressure of 125 psig or More or for Gas Gathering Lines to be Located in an Area Used for Commercial Farm Purposes – **(properly executed)**.

3. Appendix 7-G(a) – Forms executed by the following Farmland operators are enclosed :
   Cleon Martin (two parcels)
   Gary W. Brown
   Christian Zimmerman
   Noah S. Zimmerman
   Robert Timberman III
   Earl Ray Nolt
   Cleason Newswanger
   James Howell

4. New York Department of Environmental Conservation Division of Fish, Wildlife & Marine Resources – **December 21, 2006 letter indicating "no known occurrences" is enclosed.**

5. New York Department of Environmental Conservation Division of Water – **August 16, 2006 letter indicating coverage Under SPDES General Permit for Storm Water Discharges is enclosed, including five copies of the Erosion and Sediment Control Plan for PSC use.**

6. New York State Office of Parks, Recreation and Historic Preservation – **January 9, 2007 letter indicating "No Impact" is enclosed.**

As indicated elsewhere within this NOI the following permits have been applied for or are in the preparation process.

1. Joint Application with the New York Department of Environmental Conservation and U.S. Army Corps of Engineers has been applied for – **September 12, 2007 letter and permit application is enclosed for PSC use.**

2. Road crossing permits with the following County, Town and State agencies are in the preparation process.
   A. County of Schuyler
   B. Town of Barrington
   C. Town of Tyrone
   D. Town of Starkey
   E. Town of Reading
   F. New York State DOT

All permits will be forwarded to the PSC prior to the beginning of construction.

APPENDIX 7-D
FORM A

STATE OF NEW YORK
PUBLIC SERVICE COMMISSION

REPORT OF SPECIFICATIONS OF PROPOSED CONSTRUCTION OF GAS PIPELINE TO BE SUBJECTED TO PRESSURE OF 125 PSIG OR MORE

255.302

(Submitted in Triplicate)

Gas Corporation: Chesapeake Appalachia, L.L.C. Date: 9/20/07

Route From: Silk Well To: Col. Gas Transmission P/L R-16"

New Construction: 51,443 - Feet Reconstruction:

Counties traversed: Schuyler and Yates

Towns traversed: (Schuyler) Reading & Tyrone, (Yates) Barrington & Starkey

Cities traversed: N/A

Incorporated villages traversed: N/A

Estimated date: Start of construction: November 26, 2007

Completion of construction: March 26, 2008

Identity of line (gas corporation name or numbers): W-23638

Required filing: The following maps, sketches, and drawings shall be filed with, and as part of, this report:

a) Three sets of current U.S. Geological Survey maps (7½ or 15-minute) sufficient to show the entire route of the proposed construction or reconstruction and an area of one mile on either side of the route. The route of the construction or reconstruction shall be clearly indicated thereon, and

b) Three sets of strip maps and design drawings showing details of the proposed construction or reconstruction.

Note: Where more than one construction design factor is used, the specifications relative to each shall be separately listed. Where necessary, supply the requested information on attached sheets identified by the Roman numeral, number, and letter designation of the item on this form.

1. General

   1. Length 51,443 - Feet
   2. Nominal outside diameter, "D", inches 8.625
   3. Nominal wall thickness, "T", inches 0.219
   4. Type and/or grade of pipe API 5 L X-42
   5. Manufacturer of steel USX
   6. Manufacturer of pipe USX
   7. Type of longitudinal joint Electric resistance weld
   8. Specified minimum yield strength, psi 42,000
   9. Nominal ultimate strength, psi 16,185
   10. Is pipe new or used? New
   11. If used pipe is employed, describe the inspection and reconditioning N/A
   12. Mill test pressure, psi 1,600
   13. Maximum certified operating pressure, psi 1,066
   14. Calculated pipe stress (hoop stress) 20,991

       Where $\frac{PD}{2t}$ = stress, psi $\frac{1066 \times 8.625}{2 \times 0.219}$
   15. Ratio of pipe stress to yield strength, percent 50%
   16. Check of pipe specifications:
       a) Are the physical and chemical specifications of pipe to be verified by outside laboratories? No
       b) By whom?
       c) By class locations, what percentage of the welds are to be radiographed? 100%
       d) By whom? Jan-X
       e) How will gas corporation certify the radiograph technician? NYDOT

II. Fabrication

What inspection procedures will be followed for detection of gouges, grooves, and dents for:

a) Factory coated pipe Holiday Detector

b) Field coated pipe Visual Inspection

III. Railroad, Road, and Water Crossings

1. Railroad crossings
   - a) List, giving location N/A
   - b) Indicate whether cased or not; if not cased, provide reason
2. Street or road crossings
   - a) List, giving location Gray, Bellis Hill, Old Bath, Ellis, Bill Bailey, Gravel Run, Haley Hill, Six Corners, Bossard, Glen, Bigelow Hill, Clark Price, Pre-emption, and NYS Routes 226 & 230
   - b) Indicate whether cased or not Not cased
   - c) Indicate if heavier wall carrier pipe used Yes
3. Lake, river, stream, or creek crossings
   - a) List, giving location Big Stream, Gravel Run and Rock Stream Creek
   - b) Describe any special construction precautions to be followed SWPPP
4. Pipeline encroachments
   - a) List any encroachments to railroads; identify by location N/A
   - b) List any encroachments to roads in which special construction precautions will be employed; identify by location N/A

IV. Valves

1. Manual valves
   - a) Number of sectionalizing valves 4
   - b) Spacing of sectionalizing valves 3 miles
2. Type, make, and location of any automatic valves to be used N/A
3. Blowdown procedure
   - a) Describe method N/A
   - b) Number, size, and location of blowdown valves N/A
   - c) Estimated blowdown time for each section of pipeline

V. Minimum Cover

If minimum prescribed cover cannot be maintained, indicate location, nature of problem, and special precautions to be observed.

36" cover to be maintained, deeper if possible

VI. Exposed piping and self-supported spans other than on gas corporation property

1. Number of instances N/A
2. Location of each
3. Reasons for exposed piping
4. Total length in each instance
5. Length of each self-supported span
6. Precautions taken (signs, fences, etc.)
7. What special precautions taken

VII. Corrosion Control

1. Type of field coating:
   a) For pipe (if not factory coated) Factory coated
   b) For girth welds and fittings Wrap sleeve
2. Type of test of coating before backfill Holiday Detector
3. Type of test of coating after backfill Test Stands
4. Proposed cathodic protection Magnesium Anodes

VIII. Pressure and leakage tests

1. Test pressure 1600 (1.5 greater than MAOP)
2. Test medium Water
3. Duration of test 12 Hrs.
4. Length of test sections Entire length of pipeline
5. What is the source of water supply used? Location stream
6. How and where is water disposed of after test? Land application

IX. Purging of pipelines and mains

Description of purging procedure by class location Wellhead gas

X. Route of Pipeline

1. Has gas corporation obtained necessary R/W from each party having interest in R/W? If not, what is status? Yes
2. Has gas corporation obtained formal approval and all necessary permits from governmental agencies? If not, what is status?
   No – Joint DEC/ACOE Nationwide Permit 12 & 14 and wetland permit filed 9/12/07; road crossing permits being prepared.

XI. Class Locations

Supply full information for entire length of pipeline to indicate basis of determination of class location of each segment thereof in accordance with 16 NYCRR 255.5 See NOI

XII. Odorizing Provisions

1. Type of equipment to be installed N/A
2. Type of odorant to be added
3. Threshold perception to be achieved (percent of L.E.L.)

APPENDIX 7-D
FORM A

STATE OF NEW YORK
PUBLIC SERVICE COMMISSION

REPORT OF SPECIFICATIONS OF PROPOSED CONSTRUCTION OF GAS PIPELINE TO BE SUBJECTED TO PRESSURE OF 125 PSIG OR MORE
255.302
(Submitted in Triplicate)

Gas Corporation: Chesapeake Appalachia, L.L.C. Date: 9/20/07

Route From: Silk Well To: Col. Gas Transmission P/L R-16"

New Construction: 51,443 - Feet Reconstruction: ___________

Counties traversed: Schuyler and Yates

Towns traversed: (Schuyler) Reading & Tyrone, (Yates) Barrington & Starkey

Cities traversed: N/A

Incorporated villages traversed: N/A

Estimated date: Start of construction: November 26, 2007

Completion of construction: March 26, 2008

Identity of line (gas corporation name or numbers): W-23638

Required filing: The following maps, sketches, and drawings shall be filed with, and as part of, this report:

a) Three sets of current U.S. Geological Survey maps (7½ or 15-minute) sufficient to show the entire route of the proposed construction or reconstruction and an area of one mile on either side of the route. The route of the construction or reconstruction shall be clearly indicated thereon, and

b) Three sets of strip maps and design drawings showing details of the proposed construction or reconstruction.

Note: Where more than one construction design factor is used, the specifications relative to each shall be separately listed. Where necessary, supply the requested information on attached sheets identified by the Roman numeral, number, and letter designation of the item on this form.

1. General

1. Length 51,443 - Feet
2. Nominal outside diameter, "D", inches 8.625
3. Nominal wall thickness, "T", inches 0.219
4. Type and/or grade of pipe API 5 L X-42
5. Manufacturer of steel USX
6. Manufacturer of pipe USX
7. Type of longitudinal joint Electric resistance weld
8. Specified minimum yield strength, psi 42,000
9. Nominal ultimate strength, psi 16,185
10. Is pipe new or used? New
11. If used pipe is employed, describe the inspection and reconditioning N/A
12. Mill test pressure, psi 1,600
13. Maximum certified operating pressure, psi 1,066
14. Calculated pipe stress (hoop stress) 20,991

    Where $\frac{PD}{2t}$ = stress, psi $\frac{1066 \times 8.625}{2 \times 0.219}$
15. Ratio of pipe stress to yield strength, percent 50%
16. Check of pipe specifications:
    - a) Are the physical and chemical specifications of pipe to be verified by outside laboratories? No
    - b) By whom?
    - c) By class locations, what percentage of the welds are to be radiographed? 100%
    - d) By whom? Jan-X
    - e) How will gas corporation certify the radiograph technician? NYDOT

II. Fabrication

What inspection procedures will be followed for detection of gouges, grooves, and dents for:

- a) Factory coated pipe Holiday Detector
- b) Field coated pipe Visual Inspection

III. Railroad, Road, and Water Crossings

1. Railroad crossings
   a) List, giving location N/A
   b) Indicate whether cased or not; if not cased, provide reason

2. Street or road crossings
   a) List, giving location Gray, Bellis Hill, Old Bath, Ellis, Bill Bailey, Gravel Run, Haley Hill, Six Corners, Bossard, Glen, Bigelow Hill, Clark Price, Pre-emption, and NYS Routes 226 & 230
   b) Indicate whether cased or not Not cased
   c) Indicate if heavier wall carrier pipe used Yes
3. Lake, river, stream, or creek crossings
   a) List, giving location Big Stream, Gravel Run and Rock Stream Creek
   b) Describe any special construction precautions to be followed SWPPP
4. Pipeline encroachments
   a) List any encroachments to railroads; identify by location N/A
   b) List any encroachments to roads in which special construction precautions will be employed; identify by location N/A

IV. Valves

1. Manual valves
   a) Number of sectionalizing valves 4
   b) Spacing of sectionalizing valves 3 miles
2. Type, make, and location of any automatic valves to be used N/A
3. Blowdown procedure
   a) Describe method N/A
   b) Number, size, and location of blowdown valves N/A
   c) Estimated blowdown time for each section of pipeline

V. Minimum Cover

If minimum prescribed cover cannot be maintained, indicate location, nature of problem, and special precautions to be observed.

36" cover to be maintained, deeper if possible

VI. Exposed piping and self-supported spans other than on gas corporation property

1. Number of instances N/A
2. Location of each
3. Reasons for exposed piping
4. Total length in each instance
5. Length of each self-supported span
6. Precautions taken (signs, fences, etc.)
7. What special precautions taken

VII. Corrosion Control

1. Type of field coating:
   a) For pipe (if not factory coated) Factory coated
   b) For girth welds and fittings Wrap sleeve
2. Type of test of coating before backfill Holiday Detector
3. Type of test of coating after backfill Test Stands
4. Proposed cathodic protection Magnesium Anodes

VIII. Pressure and leakage tests

1. Test pressure 1600 (1.5 greater than MAOP)
2. Test medium Water
3. Duration of test 12 Hrs.
4. Length of test sections Entire length of pipeline
5. What is the source of water supply used? Location stream
6. How and where is water disposed of after test? Land application

IX. Purging of pipelines and mains

Description of purging procedure by class location Wellhead gas

X. Route of Pipeline

1. Has gas corporation obtained necessary R/W from each party having interest in R/W? If not, what is status? Yes
2. Has gas corporation obtained formal approval and all necessary permits from governmental agencies? If not, what is status?
   No – Joint DEC/ACOE Nationwide Permit 12 & 14 and wetland permit filed 9/12/07; road crossing permits being prepared.

XI. Class Locations

Supply full information for entire length of pipeline to indicate basis of determination of class location of each segment thereof in accordance with 16 NYCRR 255.5 See NOI

XII. Odorizing Provisions

1. Type of equipment to be installed N/A
2. Type of odorant to be added
3. Threshold perception to be achieved (percent of L.E.L.)

APPENDIX 7-D
FORM A

STATE OF NEW YORK
PUBLIC SERVICE COMMISSION

REPORT OF SPECIFICATIONS OF PROPOSED CONSTRUCTION OF GAS PIPELINE TO BE SUBJECTED TO PRESSURE OF 125 PSIG OR MORE
255.302
(Submitted in Triplicate)

Gas Corporation: Chesapeake Appalachia, L.L.C. Date: 9/20/07

Route From: Silk Well To: Col. Gas Transmission P/L R-16"

New Construction: 51,443 - Feet Reconstruction: ______

Counties traversed: Schuyler and Yates

Towns traversed: (Schuyler) Reading & Tyrone, (Yates) Barrington & Starkey

Cities traversed: N/A

Incorporated villages traversed: N/A

Estimated date: Start of construction: November 26, 2007

Completion of construction: March 26, 2008

Identity of line (gas corporation name or numbers): W-23638

Required filing: The following maps, sketches, and drawings shall be filed with, and as part of, this report:

a) Three sets of current U.S. Geological Survey maps (7½ or 15-minute) sufficient to show the entire route of the proposed construction or reconstruction and an area of one mile on either side of the route. The route of the construction or reconstruction shall be clearly indicated thereon, and

b) Three sets of strip maps and design drawings showing details of the proposed construction or reconstruction.

Note: Where more than one construction design factor is used, the specifications relative to each shall be separately listed. Where necessary, supply the requested information on attached sheets identified by the Roman numeral, number, and letter designation of the item on this form.

1. General

1. Length 51,443 - Feet
2. Nominal outside diameter, "D", inches 8.625
3. Nominal wall thickness, "T", inches 0.219
4. Type and/or grade of pipe API 5 L X-42
5. Manufacturer of steel USX
6. Manufacturer of pipe USX
7. Type of longitudinal joint Electric resistance weld
8. Specified minimum yield strength, psi 42,000
9. Nominal ultimate strength, psi 16,185
10. Is pipe new or used? New
11. If used pipe is employed, describe the inspection and reconditioning
    N/A
12. Mill test pressure, psi 1,600
13. Maximum certified operating pressure, psi 1,066
14. Calculated pipe stress (hoop stress) 20,991

    Where $\frac{PD}{2t}$ = stress, psi $\frac{1066 \times 8.625}{2 \times 0.219}$
15. Ratio of pipe stress to yield strength, percent 50%
16. Check of pipe specifications:
    - a) Are the physical and chemical specifications of pipe to be verified by outside laboratories? No
    - b) By whom?
    - c) By class locations, what percentage of the welds are to be radiographed? 100%
    - d) By whom? Jan-X
    - e) How will gas corporation certify the radiograph technician?
      NYDOT

II. Fabrication

What inspection procedures will be followed for detection of gouges, grooves, and dents for:

- a) Factory coated pipe Holiday Detector
- b) Field coated pipe Visual Inspection

III. Railroad, Road, and Water Crossings

1. Railroad crossings
   a) List, giving location N/A
   b) Indicate whether cased or not; if not cased, provide reason

2. Street or road crossings
   a) List, giving location Gray, Bellis Hill, Old Bath, Ellis, Bill Bailey, Gravel Run, Haley Hill, Six Corners, Bossard, Glen, Bigelow Hill, Clark Price, Pre-emption, and NYS Routes 226 & 230
   b) Indicate whether cased or not Not cased
   c) Indicate if heavier wall carrier pipe used Yes
3. Lake, river, stream, or creek crossings
   a) List, giving location Big Stream, Gravel Run and Rock Stream Creek
   b) Describe any special construction precautions to be followed SWPPP
4. Pipeline encroachments
   a) List any encroachments to railroads; identify by location N/A
   b) List any encroachments to roads in which special construction precautions will be employed; identify by location N/A

IV. Valves

1. Manual valves
   a) Number of sectionalizing valves 4
   b) Spacing of sectionalizing valves 3 miles
2. Type, make, and location of any automatic valves to be used N/A
3. Blowdown procedure
   a) Describe method N/A
   b) Number, size, and location of blowdown valves N/A
   c) Estimated blowdown time for each section of pipeline

V. Minimum Cover

If minimum prescribed cover cannot be maintained, indicate location, nature of problem, and special precautions to be observed.

36" cover to be maintained, deeper if possible

VI. Exposed piping and self-supported spans other than on gas corporation property

1. Number of instances N/A
2. Location of each
3. Reasons for exposed piping
4. Total length in each instance
5. Length of each self-supported span
6. Precautions taken (signs, fences, etc.)
7. What special precautions taken

VII. Corrosion Control

1. Type of field coating:
   a) For pipe (if not factory coated) Factory coated
   b) For girth welds and fittings Wrap sleeve
2. Type of test of coating before backfill Holiday Detector
3. Type of test of coating after backfill Test Stands
4. Proposed cathodic protection Magnesium Anodes

VIII. Pressure and leakage tests

1. Test pressure 1600 (1.5 greater than MAOP)
2. Test medium Water
3. Duration of test 12 Hrs.
4. Length of test sections Entire length of pipeline
5. What is the source of water supply used? Location stream
6. How and where is water disposed of after test? Land application

IX. Purging of pipelines and mains

Description of purging procedure by class location Wellhead gas

X. Route of Pipeline

1. Has gas corporation obtained necessary R/W from each party having interest in R/W? If not, what is status? Yes
2. Has gas corporation obtained formal approval and all necessary permits from governmental agencies? If not, what is status?
   No – Joint DEC/ACOE Nationwide Permit 12 & 14 and wetland permit filed 9/12/07; road crossing permits being prepared.

XI. Class Locations

Supply full information for entire length of pipeline to indicate basis of determination of class location of each segment thereof in accordance with 16 NYCRR 255.5 See NOI

XII. Odorizing Provisions

1. Type of equipment to be installed N/A
2. Type of odorant to be added
3. Threshold perception to be achieved (percent of L.E.L.)

APPENDIX 7-G
(cf. Part 255)

NOTIFICATION OF CONSTRUCTION
FOR
GAS GATHERING LINES TO BE SUBJECTED TO PRESSURE OF 125 PSIG OR MORE
OR
FOR GAS GATHERING LINES TO BE LOCATED IN AN AREA USED FOR COMMERCIAL FARM PURPOSES

Company: Chesapeake Appalachia, L.L.C. **Date**: September 20, 2007

Description of Project: Construct 51,443 feet of 8" coated steel well pipeline (W-23638)

Location of Project: Towns of Reading and Tyrone, Schuyler County, Towns of Barrington and Starkey, Yates County, New York.

Estimated Starting Date: November 26, 2007

Estimated Completion Date: March 26, 2008

The following persons have stop work authority and are responsible for environmental protection and construction of this project. Mike Fealy will be responsible for daily oversight of the project and has 36 years of experience overseeing the construction and environmental monitoring of such projects.

Construction		Environmental
Mike Fealy	Mark Deal	James E. Grey
Pipeline Specialist	Northern Region Manager	Director-Regulatory Compliance
Route 1, Box 107-10	900 Pennsylvania Ave.	900 Pennsylvania Ave.
Buckhannon, WV 26201	Charleston, WV 25302	Charleston, WV 25302
304-472-4103	304-353-5000	304-353-5120
304-641-5520 (cell)	405-650-2577 (cell)	304-541-5120 (cell)

Address: Chesapeake Appalachia, L.L.C., 900 Pennsylvania Ave., Charleston, WV 25302

Telephone No: 304-353-5000

Maximum Allowable Operating Pressure: 900 psig

Location Class*: One (1) by population/Class three (3) by design

* The line will be constructed to transmission line standards. The Albany Office of the Gas Division will be contacted prior to construction: (518) 474-5453.

APPENDIX 7-G (continued)

Pipe and Coating Description

a. **Nominal Diameter**: 8-inch (OD 8.625 inches)

b. **Nominal Wall Thickness**: 0.219 inch

c. **Pipe Specification**: API 5L

d. **Grade**: X-42

e. **Coating Type**: Fusion Bonded Epoxy

f. **Method of Application**: Mill applied

g. **Longitudinal Joint Type**: ERW

Test Data

a. **Test Medium**: water

b. **Duration**: minimum of 12 hours

c. **Test Pressure**: Minimum 1,600 psig

Name and mailing address of affected farmland operators:

Name	Mailing Address
Cleon Martin	4888 Bailey Road, Dundee, NY 14837
Gary W. Brown	5588 Six Corners Road, Dundee, NY 14837
Christian Zimmerman	5009 Bigelow Hill Road, Dundee, NY 14837
Noah Zimmerman	1047 Mud Lane Road, Rock Stream, NY 14878
Robert A. Timberman	6188 NYS Route 14A, Rock Stream, NY 14878
James Howell	4671 NYS Route 226, Rock Stream, NY 14878
Cleason Newswanger	4531 County Road 27, Rock Stream, NY 14878
Earl Ray Nolt	645 Pre-emption Road, Dundee, NY 14837

Minimum Cover

For each area used for commercial farm purposes complete Appendix 7-G(a), including the statement of farmland operator and a copy of a map showing each farmland border, nearest public road and the proposed route of the gathering line. Indicate the proposed depth of cover for all segments of the line and respective length of each segment.

If minimum prescribed cover cannot be maintained, indicate location, nature of problem, and special precautions to be observed.

APPENDIX 7-G (continued)

I hereby certify that this gathering line will be constructed to the requirements of subdivision 9(h) of 16 NYCRR Part 255.

(Signed) ______________________
Officer of Corporation

APPENDIX 7-G (a)

MAP OF AN AREA USED FOR COMMERCIAL FARM PURPOSES AND REVIEW OF THE PROPOSED DEPTH-OF-COVER BY THE FARMLAND OPERATOR

(To be completed for each affected farmland area, as denoted under "Minimum Cover" in Appendix 7-G)

Name of Farmland Operator for the Affected Area: Cleon Martin
Landowner

Location of Affected Farmland Area: Tax Map

Town of: Barrington , Yates County NY

Nearest public road,

Review Information

In areas cultivated for commercial farm purposes, as identified by the farmland operator, all pipes shall be installed with a minimum of 48 inches of cover. The farmland operator may allow less that 48 inches of cover if less conforms with normal agricultural practices and planned agricultural engineering projects. The farmland operator may require depth-of-cover greater than 48 inches where necessary to safely accommodate such practices and projects.

Farmland operator: I am aware that the local Soil and Conservation Agent* is available to discuss with me, prior to executing this document, depth-of-pipeline cover compatible with safe practices and standard of the U.S. Department of Agriculture, Soil Conservation Service, contained in the national Handbook of Conservation Practices and its National Engineering Manual. I have reviewed a copy of the proposed map (attached hereto) of the line crossing my farm.

5-21-07
Date

Cleon Martin
(Signed) Farmland Operator

*USDA, Soil Conservation Service employee or County Soil and Water Conservation District Employee.

APPENDIX 7-G (a)

MAP OF AN AREA USED FOR COMMERCIAL FARM PURPOSES AND REVIEW OF THE PROPOSED DEPTH-OF-COVER BY THE FARMLAND OPERATOR

(To be completed for each affected farmland area, as denoted under "Minimum Cover" in Appendix 7-G)

Name of Farmland Operator for the Affected Area: Cleon Martin
Landowner

Location of Affected Farmland Area: Tax Map

Town of: Barrington, Yates County NY

Nearest public road,

Review Information

In areas cultivated for commercial farm purposes, as identified by the farmland operator, all pipes shall be installed with a minimum of 48 inches of cover. The farmland operator may allow less that 48 inches of cover if less conforms with normal agricultural practices and planned agricultural engineering projects. The farmland operator may require depth-of-cover greater than 48 inches where necessary to safely accommodate such practices and projects.

Farmland operator: I am aware that the local Soil and Conservation Agent* is available to discuss with me, prior to executing this document, depth-of-pipeline cover compatible with safe practices and standard of the U.S. Department of Agriculture, Soil Conservation Service, contained in the national Handbook of Conservation Practices and its National Engineering Manual. I have reviewed a copy of the proposed map (attached hereto) of the line crossing my farm.

5-21-07
Date

Cleon Martin
(Signed) Farmland Operator

*USDA, Soil Conservation Service employee or County Soil and Water Conservation District Employee.

APPENDIX 7-G (a)

MAP OF AN AREA USED FOR COMMERCIAL FARM PURPOSES AND REVIEW OF THE PROPOSED DEPTH-OF-COVER BY THE FARMLAND OPERATOR

(To be completed for each affected farmland area, as denoted under "Minimum Cover" in Appendix 7-G)

Name of Farmland Operator for the Affected Area: Gary W. Brown
Landowner

Location of Affected Farmland Area: Tax Map

Town of: Barrington , Yates County NY

Nearest public road,

Review Information

In areas cultivated for commercial farm purposes, as identified by the farmland operator, all pipes shall be installed with a minimum of 48 inches of cover. The farmland operator may allow less that 48 inches of cover if less conforms with normal agricultural practices and planned agricultural engineering projects. The farmland operator may require depth-of-cover greater than 48 inches where necessary to safely accommodate such practices and projects.

Farmland operator: I am aware that the local Soil and Conservation Agent* is available to discuss with me, prior to executing this document, depth-of-pipeline cover compatible with safe practices and standard of the U.S. Department of Agriculture, Soil Conservation Service, contained in the national Handbook of Conservation Practices and its National Engineering Manual. I have reviewed a copy of the proposed map (attached hereto) of the line crossing my farm.

May 22 · 07
Date

Gary W. Brown
(Signed) Farmland Operator

*USDA, Soil Conservation Service employee or County Soil and Water Conservation District Employee.

APPENDIX 7-G (a)

MAP OF AN AREA USED FOR COMMERCIAL FARM PURPOSES
AND
REVIEW OF THE PROPOSED DEPTH-OF-COVER BY THE FARMLAND OPERATOR

(To be completed for each affected farmland area, as denoted under "Minimum Cover" in Appendix 7-G)

Name of Farmland Operator for the Affected Area: Christian Zimmerman
Landowner

Location of Affected Farmland Area: Tax Map

Town of: Tyrone , Schuyler County NY

Nearest public road,

Review Information

In areas cultivated for commercial farm purposes, as identified by the farmland operator, all pipes shall be installed with a minimum of 48 inches of cover. The farmland operator may allow less that 48 inches of cover if less conforms with normal agricultural practices and planned agricultural engineering projects. The farmland operator may require depth-of-cover greater than 48 inches where necessary to safely accommodate such practices and projects.

Farmland operator: I am aware that the local Soil and Conservation Agent* is available to discuss with me, prior to executing this document, depth-of-pipeline cover compatible with safe practices and standard of the U.S. Department of Agriculture, Soil Conservation Service, contained in the national Handbook of Conservation Practices and its National Engineering Manual. I have reviewed a copy of the proposed map (attached hereto) of the line crossing my farm.

5-24-07
Date

Christian Zimmerman
(Signed) Farmland Operator

*USDA, Soil Conservation Service employee or County Soil and Water Conservation District Employee.

APPENDIX 7-G (a)

MAP OF AN AREA USED FOR COMMERCIAL FARM PURPOSES
AND
REVIEW OF THE PROPOSED DEPTH-OF-COVER BY THE FARMLAND OPERATOR

(To be completed for each affected farmland area, as denoted under "Minimum Cover" in Appendix 7-G)

Name of Farmland Operator for the Affected Area: Noah S. Zimmerman
Landowner

Location of Affected Farmland Area: Tax Map

Town of: Starkey , Schuyler County NY

Nearest public road,

Review Information

In areas cultivated for commercial farm purposes, as identified by the farmland operator, all pipes shall be installed with a minimum of 48 inches of cover. The farmland operator may allow less that 48 inches of cover if less conforms with normal agricultural practices and planned agricultural engineering projects. The farmland operator may require depth-of-cover greater than 48 inches where necessary to safely accommodate such practices and projects.

Farmland operator: I am aware that the local Soil and Conservation Agent* is available to discuss with me, prior to executing this document, depth-of-pipeline cover compatible with safe practices and standard of the U.S. Department of Agriculture, Soil Conservation Service, contained in the national Handbook of Conservation Practices and its National Engineering Manual. I have reviewed a copy of the proposed map (attached hereto) of the line crossing my farm.

5-23-07
Date

Noah S. Zimmerman
(Signed) Farmland Operator

*USDA, Soil Conservation Service employee or County Soil and Water Conservation District Employee.

APPENDIX 7-G (a)

MAP OF AN AREA USED FOR COMMERCIAL FARM PURPOSES AND REVIEW OF THE PROPOSED DEPTH-OF-COVER BY THE FARMLAND OPERATOR

(To be completed for each affected farmland area, as denoted under "Minimum Cover" in Appendix 7-G)

Name of Farmland Operator for the Affected Area: Robert A. Timberman III
Landowner

Location of Affected Farmland Area: Tax Map

Town of: Starkey , Schuyler County NY

Nearest public road,

Review Information

In areas cultivated for commercial farm purposes, as identified by the farmland operator, all pipes shall be installed with a minimum of 48 inches of cover. The farmland operator may allow less that 48 inches of cover if less conforms with normal agricultural practices and planned agricultural engineering projects. The farmland operator may require depth-of-cover greater than 48 inches where necessary to safely accommodate such practices and projects.

Farmland operator: I am aware that the local Soil and Conservation Agent* is available to discuss with me, prior to executing this document, depth-of-pipeline cover compatible with safe practices and standard of the U.S. Department of Agriculture, Soil Conservation Service, contained in the national Handbook of Conservation Practices and its National Engineering Manual. I have reviewed a copy of the proposed map (attached hereto) of the line crossing my farm.

5-25-07
Date

(Signed) Farmland Operator

*USDA, Soil Conservation Service employee or County Soil and Water Conservation District Employee.

APPENDIX 7-G (a)

MAP OF AN AREA USED FOR COMMERCIAL FARM PURPOSES AND REVIEW OF THE PROPOSED DEPTH-OF-COVER BY THE FARMLAND OPERATOR

(To be completed for each affected farmland area, as denoted under "Minimum Cover" in Appendix 7-G)

Name of Farmland Operator for the Affected Area: James Howell
Landowner

Location of Affected Farmland Area: Tax Map

Town of: Reading , Schuyler County NY

Nearest public road,

Review Information

In areas cultivated for commercial farm purposes, as identified by the farmland operator, all pipes shall be installed with a minimum of 48 inches of cover. The farmland operator may allow less that 48 inches of cover if less conforms with normal agricultural practices and planned agricultural engineering projects. The farmland operator may require depth-of-cover greater than 48 inches where necessary to safely accommodate such practices and projects.

Farmland operator: I am aware that the local Soil and Conservation Agent* is available to discuss with me, prior to executing this document, depth-of-pipeline cover compatible with safe practices and standard of the U.S. Department of Agriculture, Soil Conservation Service, contained in the national Handbook of Conservation Practices and its National Engineering Manual. I have reviewed a copy of the proposed map (attached hereto) of the line crossing my farm.

May 23, 2007
Date

James L Howell
(Signed) Farmland Operator

*USDA, Soil Conservation Service employee or County Soil and Water Conservation District Employee.

APPENDIX 7-G (a)

MAP OF AN AREA USED FOR COMMERCIAL FARM PURPOSES AND REVIEW OF THE PROPOSED DEPTH-OF-COVER BY THE FARMLAND OPERATOR

(To be completed for each affected farmland area, as denoted under "Minimum Cover" in Appendix 7-G)

Name of Farmland Operator for the Affected Area: Cleason L. Newswanger
Landowner

Location of Affected Farmland Area: Tax Map

Town of: Reading , Schuyler County NY

Nearest public road,

Review Information

In areas cultivated for commercial farm purposes, as identified by the farmland operator, all pipes shall be installed with a minimum of 48 inches of cover. The farmland operator may allow less that 48 inches of cover if less conforms with normal agricultural practices and planned agricultural engineering projects. The farmland operator may require depth-of-cover greater than 48 inches where necessary to safely accommodate such practices and projects.

Farmland operator: I am aware that the local Soil and Conservation Agent* is available to discuss with me, prior to executing this document, depth-of-pipeline cover compatible with safe practices and standard of the U.S. Department of Agriculture, Soil Conservation Service, contained in the national Handbook of Conservation Practices and its National Engineering Manual. I have reviewed a copy of the proposed map (attached hereto) of the line crossing my farm.

5-23-07
Date

Cleason L. Newswanger
(Signed) Farmland Operator

*USDA, Soil Conservation Service employee or County Soil and Water Conservation District Employee.

APPENDIX 7-G (a)

MAP OF AN AREA USED FOR COMMERCIAL FARM PURPOSES AND REVIEW OF THE PROPOSED DEPTH-OF-COVER BY THE FARMLAND OPERATOR

(To be completed for each affected farmland area, as denoted under "Minimum Cover" in Appendix 7-G)

Name of Farmland Operator for the Affected Area: Earl Ray Nolt
Landowner

Location of Affected Farmland Area: Tax Map

Town of: Tyrone , Schuyler County NY

Nearest public road,

Review Information

In areas cultivated for commercial farm purposes, as identified by the farmland operator, all pipes shall be installed with a minimum of 48 inches of cover. The farmland operator may allow less that 48 inches of cover if less conforms with normal agricultural practices and planned agricultural engineering projects. The farmland operator may require depth-of-cover greater than 48 inches where necessary to safely accommodate such practices and projects.

Farmland operator: I am aware that the local Soil and Conservation Agent* is available to discuss with me, prior to executing this document, depth-of-pipeline cover compatible with safe practices and standard of the U.S. Department of Agriculture, Soil Conservation Service, contained in the national Handbook of Conservation Practices and its National Engineering Manual. I have reviewed a copy of the proposed map (attached hereto) of the line crossing my farm.

6-1-07
Date

Earl Ray Nolt
(Signed) Farmland Operator

*USDA, Soil Conservation Service employee or County Soil and Water Conservation District Employee.

New York State Department of Environmental Conservation
Division of Fish, Wildlife & Marine Resources
New York Natural Heritage Program
625 Broadway, 5th floor, Albany, New York 12233-4757
Phone: (518) 402-8935 • **FAX:** (518) 402-8925

Denise M. Sheehan
Commissioner

Rec. 12/28/06
Tim

December 21, 2006

Tim Smith
Chesapeake Energy Corp
900 Pennsylvania Ave
Charleston, WV 25302

Dear Mr. Smith:

In response to your recent request, we have reviewed the New York Natural Heritage Program databases with respect to an Environmental Assessment for the proposed New Construction - Silk Pipeline #23638, area as indicated on the map you provided, located in the Town of Barrington, Yates County; and the Towns of Tyrone and Reading, Schuyler Cunty.

> We have no records of <u>known</u> occurrences of rare or state-listed animals or plants, significant natural communities, or other significant habitats, on or in the immediate vicinity of your site.

The absence of data does not necessarily mean that rare or state-listed species, natural communities or other significant habitats do not exist on or adjacent to the proposed site. Rather, our files currently do not contain any information which indicates their presence. For most sites, comprehensive field surveys have not been conducted. For these reasons, we cannot provide a definitive statement on the presence or absence of rare or state-listed species, or of significant natural communities. This information should not be substituted for on-site surveys that may be required for environmental assessment.

Our databases are continually growing as records are added and updated. If this proposed project is still under development one year from now, we recommend that you contact us again so that we may update this response with the most current information.

This response applies only to known occurrences of rare or state-listed animals and plants, significant natural communities and other significant habitats maintained in the Natural Heritage Data bases. Your project may require additional review or permits; for information regarding other permits that may be required under state law for regulated areas or activities (e.g., regulated wetlands), please contact the appropriate NYS DEC Regional Office, Division of Environmental Permits, at the enclosed address.

Sincerely,
Tara Seoane
Tara Seoane, Information Services
New York Natural Heritage Program

ECEIVED
DEC 27 2006

Enc.
cc: Reg. 8, Wildlife Mgr.
Reg. 8, Fisheries Mgr.

New York State Department of Environmental Conservation
Division of Water
Bureau of Water Permits, 4th Floor
625 Broadway, Albany, New York 12233-3505
Phone: (518) 402-8111 • **Fax:** (518) 402-9029
Website: www.dec.state.ny.us

Alexander B. Grannis
Commissioner

8/16/2007

CHESAPEAKE APPALACHIA, LLC
JAMES GREY
900 PENNSYLVANIA AVE, PO BOX 6070
CHARLESTON WV 25362-

Re: ACKNOWLEDGMENT of NOTICE of INTENT for Coverage Under SPDES General Permit for Storm Water Discharges from CONSTRUCTION ACTIVITY General Permit No. GP-02-01

Dear Prospective Permittee:

This is to acknowledge that the New York State Department of Environmental Conservation (Department) has received a complete Notice of Intent (NOI) for coverage under General Permit No. GP-02-01 for the construction activities located at:

SILK PIPELINE
GRAY ROAD
BARRINGTON NY 14527- **County: YATES**

Pursuant to Environmental Conservation Law (ECL) Article 17, Titles 7 and 8, ECL Article 70, discharges in accordance with GP-02-01 from the above construction site will be authorized **5** business days from **8/9/2007** which is the date we received your final NOI, unless notified differently by the Department.

The permit identification number for this site is: NYR **10N351** . Be sure to include this permit identification number on any forms or correspondence you send us. When coverage under the permit is no longer needed, you must submit a Notice of Termination to the Department.

This authorization is conditioned upon the following:

1. The information submitted in the NOI received by the Department on **8/9/2007** is accurate and complete.

2. You have developed a Storm Water Pollution Prevention Plan (SWPPP) that complies with GP-02-01 which must be implemented as the first element of construction at the above-noted construction site.

3. Activities related to the above construction site comply with all other requirements of GP-02-01.

4. Payment of the annual $50 regulatory fee, which is billed separately by the Department in the early fall. The regulatory fee covers a period of one calendar year. In addition, as of September 1, 2004, construction stormwater permittees will also be assessed an initial authorization fee of $50 per acre of land disturbed and $300 per acre of future impervious area. The initial authorization fee covers the duration of the authorized disturbance.

5. You have obtained all necessary Uniform Procedures Act (UPA) permits. You should check with your Regional Permit Administrator for further information. (Note: Construction activities cannot commence until all UPA permits have been issued.)

Please be advised that the Department may request a copy of your SWPPP for review.

Should you have any questions regarding any aspect of the requirements specified in GP-02-01, please contact Dave Gasper at (518) 402-8114 or the undersigned at (518) 402-8109.

Sincerely,

Toni Cioffi

Toni Cioffi
Environmental Program Specialist 1

cc: RWE - 8
SWPPP Preparer

KEYSTONE ASSOCIATES LLC
LAUVE, PE THEODORE
229-231 STATE STREET, FOURTH FLOOR
BINGHAMTON NY 13901-

New York State Office of Parks, Recreation and Historic Preservation
Historic Preservation Field Services Bureau
Peebles Island, PO Box 189, Waterford, New York 12188-0189 518-237-8643

January 09, 2007

Timothy Smith
Chesapeake Natural Gas
900 Pennsylvania Avenue
Charleston, West Virginia 25302

Re: FERC
Silk Pipeline #23638
BARRINGTON, Yates
READING, TYRONE, Schuyler County
07PR00093

Dear Mr. Smith:

Thank you for requesting the comments of the Office of Parks, Recreation and Historic Preservation (OPRHP). We have reviewed the project in accordance with the New York State Parks, Recreation and Historic Preservation Law, Section 14.09.

Based upon this review, it is the OPRHP's opinion that your project will have No Impact upon cultural resources in or eligible for inclusion in the State and National Registers of Historic Places.

If further correspondence is required regarding this project, please be sure to refer to the OPRHP Project Review (PR) number noted above.

Sincerely,

Ruth L. Pierpont

Ruth L. Pierpont
Director

RECEIVED
JAN 16 2007

ENVIRONMENTAL MANAGEMENT AND CONSTRUCTION

STANDARDS AND PRACTICES

CHECK-OFF LIST: PART III

SILK TO COLUMBIA GAS TRANSMISSION R-16 PIPELINE

III. General Planning Objectives and Procedures	3	X
1. Planning Objectives	3	X
1.1 Supervision and Inspection	5	X
1.1.1 Environmental Inspection	5	X
1.1.2 Responsibilities of Environmental Inspector	5	X
2. Procedures for the Identification and Protection of Sensitive Resources	6	X
2.1 Rare and Endangered Species & Their Habitats	7	
2.2 Cultural Resources	8	
2.3 Streams, Wetlands & Other Water Resources	9	X
2.4 Active Agricultural Lands	9	X
2.5 Alternative/Conflicting Land Uses	9	
2.6 Steep Slopes, Highly Erodible Soils & Flood Plains	10	X
2.7 Timber Resources, Commercial Sugarbushes & Unique/Old Growth Forests	10	
2.8 Officially Designated Visual Resources	10	
3. Land Requirements	11	X
3.1 Objectives	11	X
3.2 Pipeline Routing	11	X
3.3 Right-Of-Way Width	12	X
3.3.1 Permanent ROW	12	X
3.3.2 Temporary ROW	12	X
3.3.3 Extra Work Space	13	X
3.3.4 Associated/Appurtenant Facilities: Meter Site	13	X
3.3.5 Compressor Stations	14	
3.3.6 Storage, Fabrication and other Construction Related Sites	14	X
3.3.7 Permanent Disposal Sites	15	
4. Site Preparation	16	X
4.1 Objectives	16	X
4.2 Staking and ROW Delineation	16	X
5. Clearing in Upland Areas	16	X
5.1 Objectives	16	X
5.2 Definitions	17	X
5.3 Equipment	17	X
5.4 Clearing Methods & Procedures in Upland Areas	18	X
5.5 Log Disposal	19	X
5.5.1 Construction Use	19	X
5.5.2 Log Piles	19	X
5.5.3 Sale	20	
5.5.4 Chipping	20	X

Erosion and Sediment Control Plan

Silk Natural Gas Pipeline
Town of Barrington/Town of Reading
Yates/Schuyler County, New York

Prepared For:
Chesapeake Appalachia, LLC
900 Pennsylvania Ave
P.O. Box 6070
Charleston, West Virginia 25362

KEYSTONE
ASSOCIATES
ARCHITECTS • ENGINEERS • SURVEYORS LLC

229-231 State Street, Fourth Floor • Binghamton, NY 13901 • Phone: 607.722.1100 • Fax: 607.722.2515 • keystone@pronetisp.net

Project No. 1137.06507

June 30, 2007

EROSION AND SEDIMENT CONTROL PLAN
SILK NATURAL GAS PIPELINE
TOWN OF BARRINGTON/TOWN OF READING
YATES/SCHUYLER COUNTY, NEW YORK

TABLE OF CONTENTS

EROSION AND SEDIMENT CONTROL PLAN
SILK NATURAL GAS PIPELINE
TOWN OF BARRINGTON/TOWN OF READING
YATES/SCHUYLER COUNTY, NEW YORK

I. BACKGROUND INFORMATION

A. Project Background

Keystone Associates, Architects, Engineers, and Surveyors, LLC was retained by Chesapeake Appalachia, LLC of Charleston, West Virginia to complete a Stormwater Pollution Prevention Plan to address sediment and erosion control activities associated with construction of a natural gas pipeline known as Silk Pipeline, Yates/Schuyler County, New York **(see Figure 1 - Location Map and Figure 2 – USGS Map).**

B. Purpose of Stormwater Plan Report

The purpose of this Erosion and Sediment Control Plan is to delineate the stormwater erosion and sediment control practices required to prevent, minimize, or mitigate potential water quality and flooding impacts associated with stormwater discharges for the proposed project.

In addition, this report identifies the submittals and signatures required to meet the regulatory requirements for a New York State Department of Environmental Conservation (NYSDEC) State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges for Construction Activities **(see Appendix A - Stormwater Discharge Permit Information).** Appendix A contains a Notice of Intent Form (NOI) and permit signatory requirements. The NOI form is to be submitted by the facility operator in accordance with the instructions on the form. The NOI form should be finalized, executed, and submitted to NYSDEC as required. The Notice of Intent and permit notifications, the Construction Site

Logbook, and the stormwater inspection reports shall be kept on site at all times during construction.

C. Regulatory Requirements

The Federal Water Pollution Control Act of 1972 (with amendments), also referred to as the Clean Water Act (CWA), provides that stormwater discharges associated with industrial activity from a point source (including discharges through a municipal separate storm sewer system) to waters of the United States are unlawful, unless authorized by a National Pollutant Discharge Elimination System (NPDES) permit. In New York, which is a NPDES-delegated state, this is accomplished through the administration of the SPDES program administered by the NYSDEC.

A discharge that is subject to the NPDES regulations may be eligible to obtain coverage under a general permit by submitting an NOI to the administrator of the program, the NYSDEC. The NOI's are to be submitted to their Albany, New York office. Except when in compliance with the General Permit, or with a duly authorized permit from NYSDEC, discharge of stormwater associated with industrial activity by any person shall be unlawful.

The General Permit (Permit No. GP-02-01, effective January 8, 2003) may authorize all discharges of stormwater associated with construction activity (those sites or common plans of development or sale that will result in the disturbance of one or more acres total land area) occurring on or after March 10, 2003, and where stormwater discharges from a point source to waters of the United States including wetlands.

D. Project and Site Description

This project involves the construction and installation of approximately 9.73 miles of 6-inch steel pipeline (well line) within a 50-foot wide right-of-way. The pipeline is to tie one existing well into an existing pipeline running along State Route 14A. The natural gas pipeline and appurtenances will be installed in trenches that will generally be backfilled in the same day. The approximate width of the disturbance will be the 50-foot right-of-way. Trees within the right-of-way will be cleared and stockpiled on the downhill side of the right of way. All county and town road crossings and certain wetlands (see **Figure 2 – USGS Vicinity Map**) will be underground bores. All areas disturbed by installation of the natural gas pipeline and appurtenances will be restored to substantially original conditions (pavement, grass, etc.).

Drainage and Stormwater Disposal. The site is within the Chemung River Basin and Oswego-Seneca-Oneida Rivers (Finger Lakes) Basin. The natural gas pipeline installation is located within the Towns of Barrington and Reading. A majority of the site eventually drains to Keuka Lake to Seneca Lake, unnamed tributary to Keuka Lake, and overland to Seneca Lake and ultimately to Lake Ontario via Oswego River. A small portion of the site eventually drains to Tobehanna Creek to Lamoka Lake and ultimately the Chemung River (see **Figure 3 – Drainage Area Map**).

Soils. According to the Yates County Soil Survey and Schuyler County Soil Survey, there are several soil types occurring within in the project area (see **Figures 4, 5, & 6 – Soils Map**). The soil information is summarized in **Table 1-1 Soil Types.** These soils are sloping to steep sloping, deep to moderately deep, well drained to moderately well drained, medium textured soils formed in glacial outwash or glacial till. The soils are in Soil Groups A, B, C, and D.

Table 1-1 Soil Types

					Depth To:		
Symbol	Name	Area of Disturb.	% of Site	% Slopes	GW	BR	Perm
SOIL GROUP A/B		0.68	1.15				
Ct	Chenango & Tioga gravelly silt loam			2 to 5	>2.0	>32	Moderate
SOIL GROUP A		0.74	1.25				
Cw	Chenango soils			15 to 20	NA	>32	Very rapid
SOIL GROUP B		3.90	6.61				
Mm	Middlebury silt loam			0 to 2	>1.5	>30	Very rapid
Wf	Chadakoin gravelly loam			5 to 15	NA	>30	Moderate
Wh	Chadakoin gravelly loam			15 to 25	NA	>30	Moderate
Wk	Chadakoin gravelly loam, eroded			15 to 25	NA	>30	Moderate
SOIL GROUP B/C		0.32	0.54				
We	Chadakoin/Bath/Valois			25 to 45	>2.0	>25	Moderate
SOIL GROUP C		50.36	85.37				
BuB	Burdett silt loam			3 to 8	>0.5	>60	0.6-2.0
BuC	Burdett silt loam			8 to 15	>0.5	>60	0.6-2.0
ErA	Erie silt loam			0 to 3	>0.5	>60	0.6-2.0
LoB	Lordstown channery silt loam			3 to 8	>6.0	>20	0.6-2.0
Lv	Lordstown & Manlius soils			25 to 45	NA	>32	Moderate
MrB/Me	Mardin channery silt loam			3 to 8	>1.5	>60	0.6-2.0
Mf	Mardin channery silt loam			8 to 15	>1.5	>60	Slow
Mg	Mardin channery silt loam,eroded			8 to 15	>1.5	>60	Slow
VoA/Ve	Volusia channery silt loam			0 to 3	>0.5	>60	0.6-2.0
VoB/Vf	Volusia channery silt loam			3 to 8	>0.5	>60	0.6-2.0
Vg	Volusia channery silt loam			8 to 15	>0.5	>60	Slow
Vk	Volusia channery silt loam			15 to 25	>0.5	>60	Slow
SOIL GROUP C/D		1.79ac	3.03				
Ha	Holly silt loam			0 to 1	0.0-0.5	>24	Slow
SOIL GROUP D		1.21ac	2.05				
Ae	Alfis silt loam			3 to 8	0.0-0.5	>42	Slow
Cp/Cy	Chippewa silt loam			0 to 1	0.0-0.5	>60	0.6-2.0
	Totals:	59.00ac	100.00				

Legend/Definitions

SG = Soil Group
GW = Groundwater (feet)
BR = Bedrock (inches)
Perm. = Permeability in inches per hour (based on upper soil horizons)
NA = Not available in Soil Survey for Ontario and Yates Counties, New York
Area of Disturb.= Area of Land Disturbance

E. Existing (Pre-Development) Conditions

The route designed for the natural gas pipeline construction run will be within a 50-foot wide right-of-way through forested and agricultural areas (see **Figures 4 – Aerial Photograph**).

F. Proposed Future (Post-Development) Conditions

All disturbed areas will be restored to substantially original conditions. Therefore there will be no increase or decrease in impervious area.

II. EROSION AND SEDIMENT CONTROL

A. Temporary Erosion and Sediment Control Facilities

1. Temporary erosion and sediment controls during construction are to be in accordance with the New York Standards and Specifications for Erosion and Sediment Control, Section 9 (NYSDEC, 2005). These standards are detailed in **Appendix C – Erosion and Sediment Control Details**. In general, natural gas pipeline construction will require stabilized construction entrances for off-road installations, silt fence/haybales to be installed downgradient of disturbed soil or soil stockpile areas where drainage could impact existing ditches, swales, creeks, etc.

III. IMPLEMENTATION SCHEDULE AND MAINTENANCE

A. Implementation Schedule

1. Refer to **Figure 5 – Erosion Control Plan**, the following schedule for erosion and sediment control facilities shall be implemented:
    a. Sign and Submit Notice of Intent (NOI) for Stormwater Discharges Associated with Construction Activity Under the SPDES General Permit (by Operator).
    b. Hold Pre-construction Conference.
    c. Install temporary gravel construction entrance/exits as required.
    d. Install fabric silt fence/haybales where required.
    e. Clear proposed alignment of natural gas pipelines.
    f. Install stream crossings where necessary to cross streams with construction equipment.
    g. Construct natural gas pipeline and appurtenances.
    h. Restore disturbed areas to original conditions (pavement, seed and mulch, etc.).
    i. Inspect all erosion and sediment controls weekly and after rainfall events; repair as required.
    j. Water vegetation as required.
    k. After the sites are stabilized and vegetation has become established, remove all temporary erosion control measures.
    l. Submit Notice of Termination (NOT) form for Stormwater Discharges Associated with Construction Activity Under the SPDES General Permit (by Operator).

2. The contractor shall be responsible for development and implementation of appropriate temporary erosion and sediment control features for the project in compliance with all applicable rules, regulations, permits, project plans and specifications, and the Erosion and Sediment Control Plan.

B. Construction and Inspection

1. A Construction Site Logbook with report forms is included in **Appendix D –Construction Site Stormwater Logbook.**

2. A copy of the Erosion and Sediment Control Plan, the Notice of Intent, permit notifications, the Construction Site Logbook, and the erosion and sediment control p lan inspection reports shall be kept on site at all times during construction.

C. Short Term Maintenance

Short term maintenance should occur during construction, and for a post-construction period of one (1) year. Short term maintenance is the responsibility of the contractor during construction and in accordance with any guarantee period as outlined in the contract documents.

1. Vegetated areas and drainage channels are to be maintained as follows:
    - Maintain a grass height of 4" to 6",
    - Maintain sideslopes, and
    - Repair erosion as necessary.

D. Long-Term Maintenance

1. The Towns of Barrington and Reading are responsible for maintaining those facilities located within their highway and property boundaries and easements if any.

2. The State of New York is responsible for maintaining those facilities located within its highway and property boundaries and easements if any.

3. Chesapeake Appalachia, LLC is responsible for maintaining those facilities located within its right-of-ways for vegetation; including mowing, fertilizing, watering, pruning, fire controls in dry weather, reseeding, and repairs as necessary to maintain a vigorous, dense vegetative cover.

4. Maintenance activities for vegetated areas and drainage channels are to be maintained as follows:
   - Maintain a grass height of 4" to 6",
   - Maintain slopes, and
   - Repair erosion as necessary.

E. Maintenance Schedule

Table 2-1 Maintenance Schedule

STRUCTURE OR FEATURE	MAINTENANCE OR MONITORING TASK	SCHEDULE
Grass	Mow	As required to maintain grass at required height and free of woody plant growth
Grassed Swales/ Channels	Monitor water level	Monthly and during and after each substantial rainfall
	Clean	When 25 percent of the original volume has been exceeded.

REFERENCES

Empire State Chapter, Soil and Water Conservation Society. March 2003. New York Standards for Urban Erosion and Sediment Control. Empire State Chapter, Soil and Water Conservation Society, Syracuse, New York.

Hallett Surveying & Mapping, PC. 2007. Stationing Map – Proposed Silk Pipeline, Town of Barrington & Town of Reading, Yates/Steuben County, New York. Hallett Surveying & Mapping, PC, Addison, New York.

New York State Department of Environmental Conservation. August 2005. New York Standards and Specifications for Erosion and Sediment Control. Empire State Chapter, Soil and Water Conservation Society, Syracuse, New York.

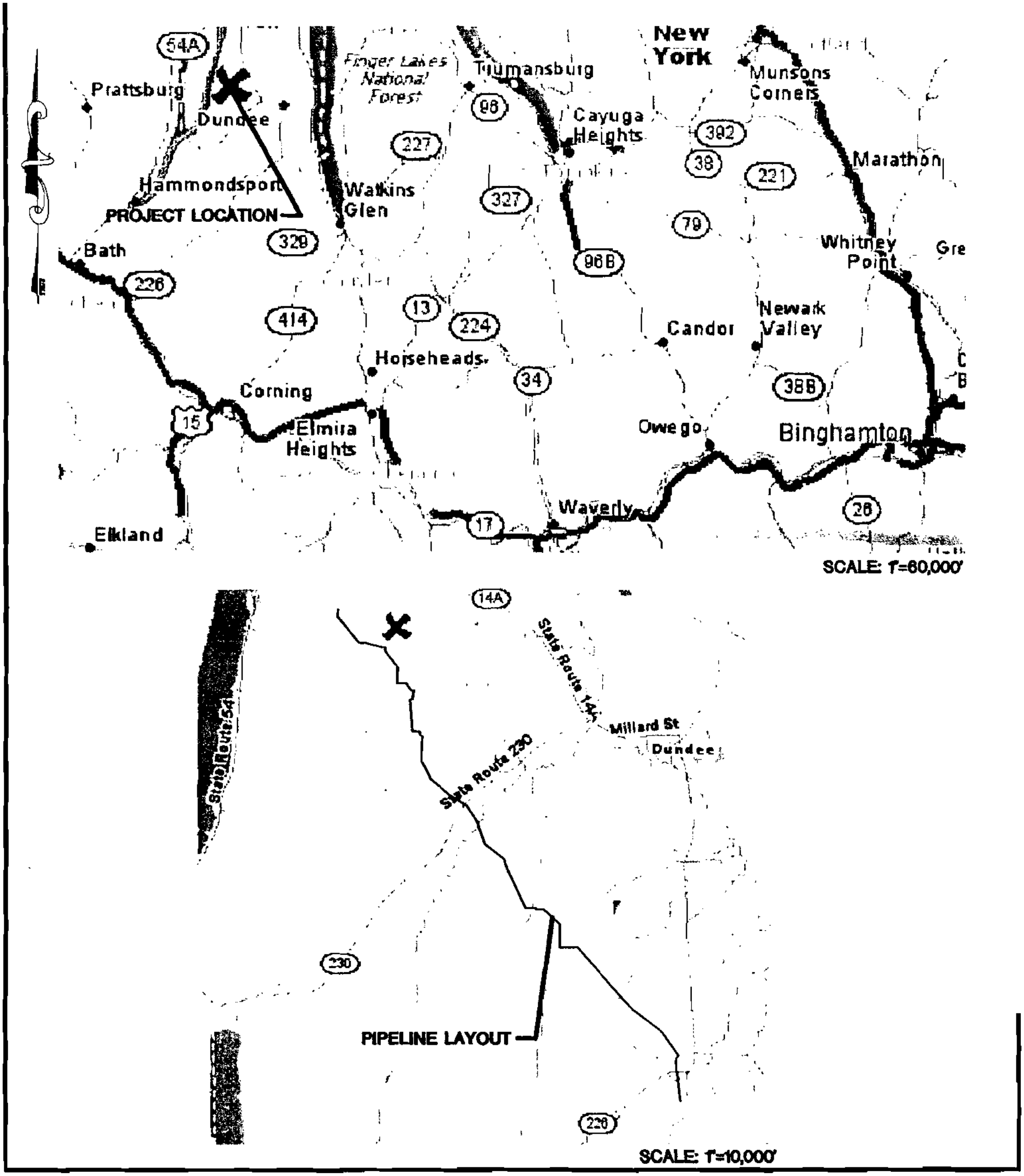
New York State Department of Environmental Conservation. August 2003. New York State Stormwater Management Design Manual. Empire State Chapter, Soil and Water Conservation Society c/o Cayuga County SWCS, Auburn, New York.

New York State Department of Environmental Conservation. January 8, 2003. New York State Department of Environmental Conservation SPDES General Permit for Stormwater Discharges from Construction Activitty, Permit No. GP-02-01 (effective date January 8, 2003; expiration date January 8, 2008).

Soil Survey of Schuyler County New York. 1979. USDA/Cornell University. Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Soil Survey of Ontario and Yates County New York. 1958. USDA/Cornell University. Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

FIGURES



KEYSTONE ASSOCIATES
ARCHITECTS, ENGINEERS AND SURVEYORS, LLC

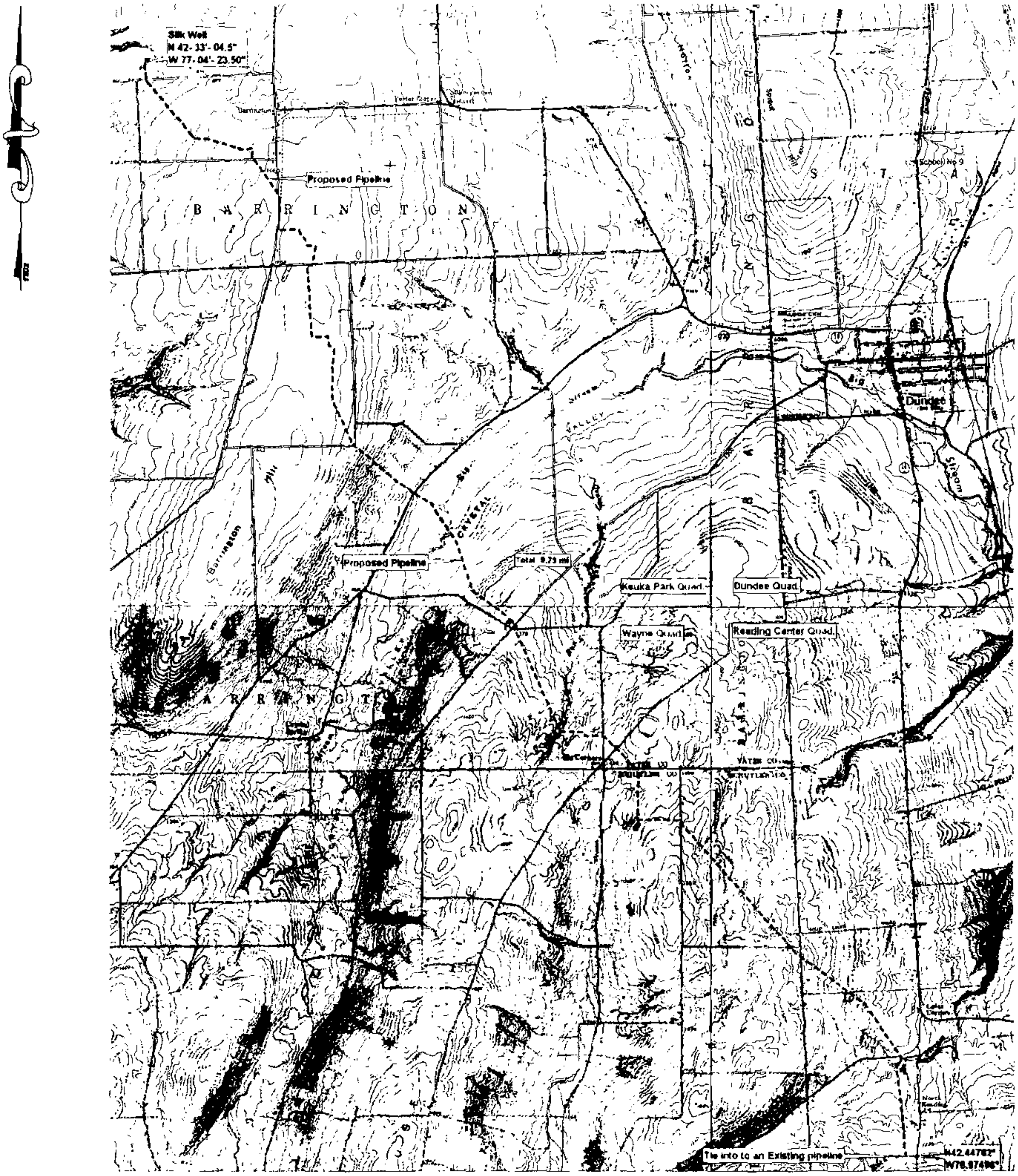
SILK NATURAL GAS PIPELINE

TOWN OF BARRINGTON/TOWN OF READING

YATES & SCHUYLER COUNTY NEW YORK

FIGURE 1

LOCATION MAP



SCALE: 1"=5,000'

KEYSTONE
ASSOCIATES
ARCHITECTS, ENGINEERS AND SURVEYORS, LLC

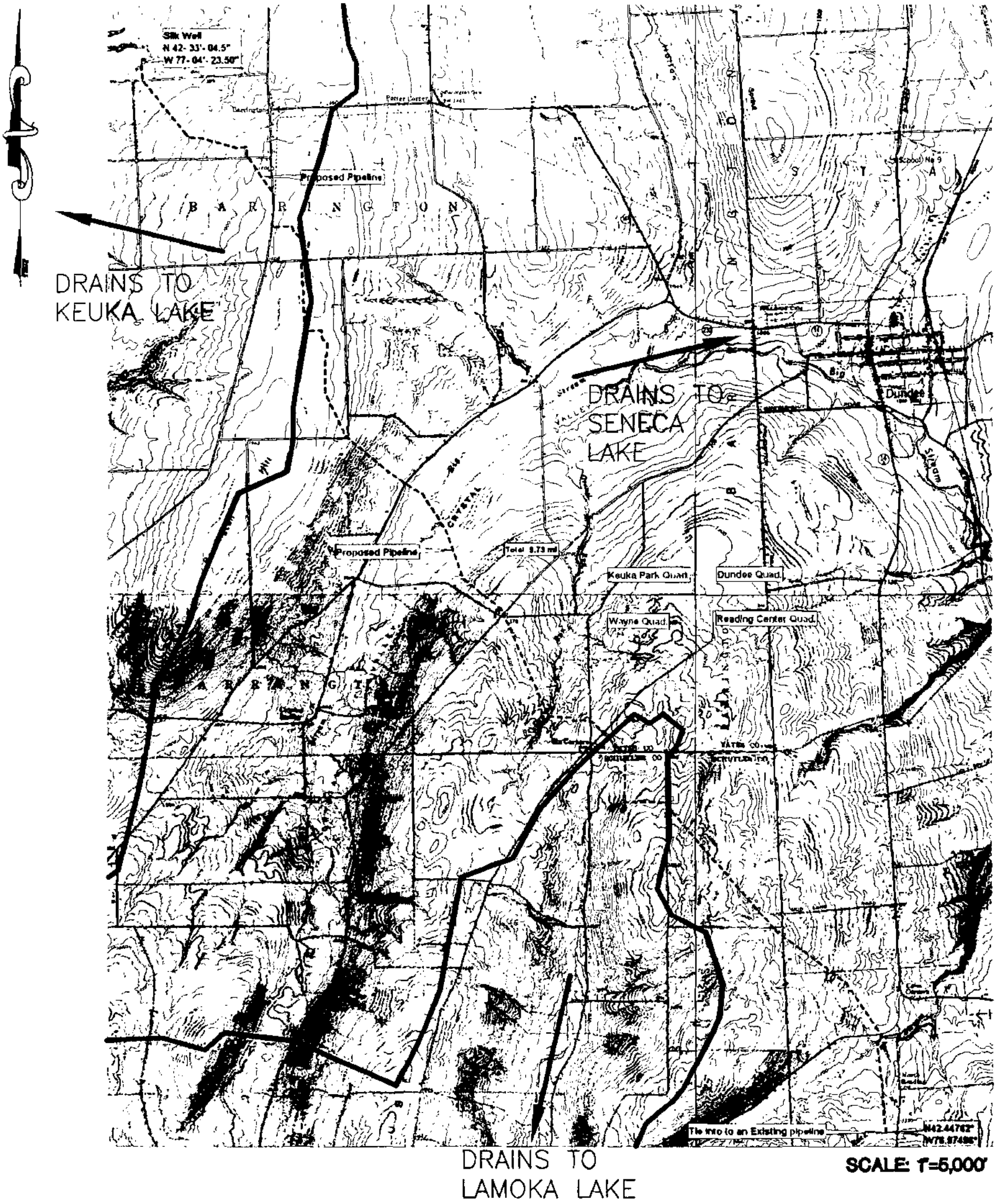
SILK NATURAL GAS PIPELINE

TOWN OF BARRINGTON/TOWN OF READING

YATES & SCHUYLER COUNTY NEW YORK

FIGURE 2

USGS MAP



KEYSTONE ASSOCIATES
ARCHITECTS, ENGINEERS AND SURVEYORS, LLC

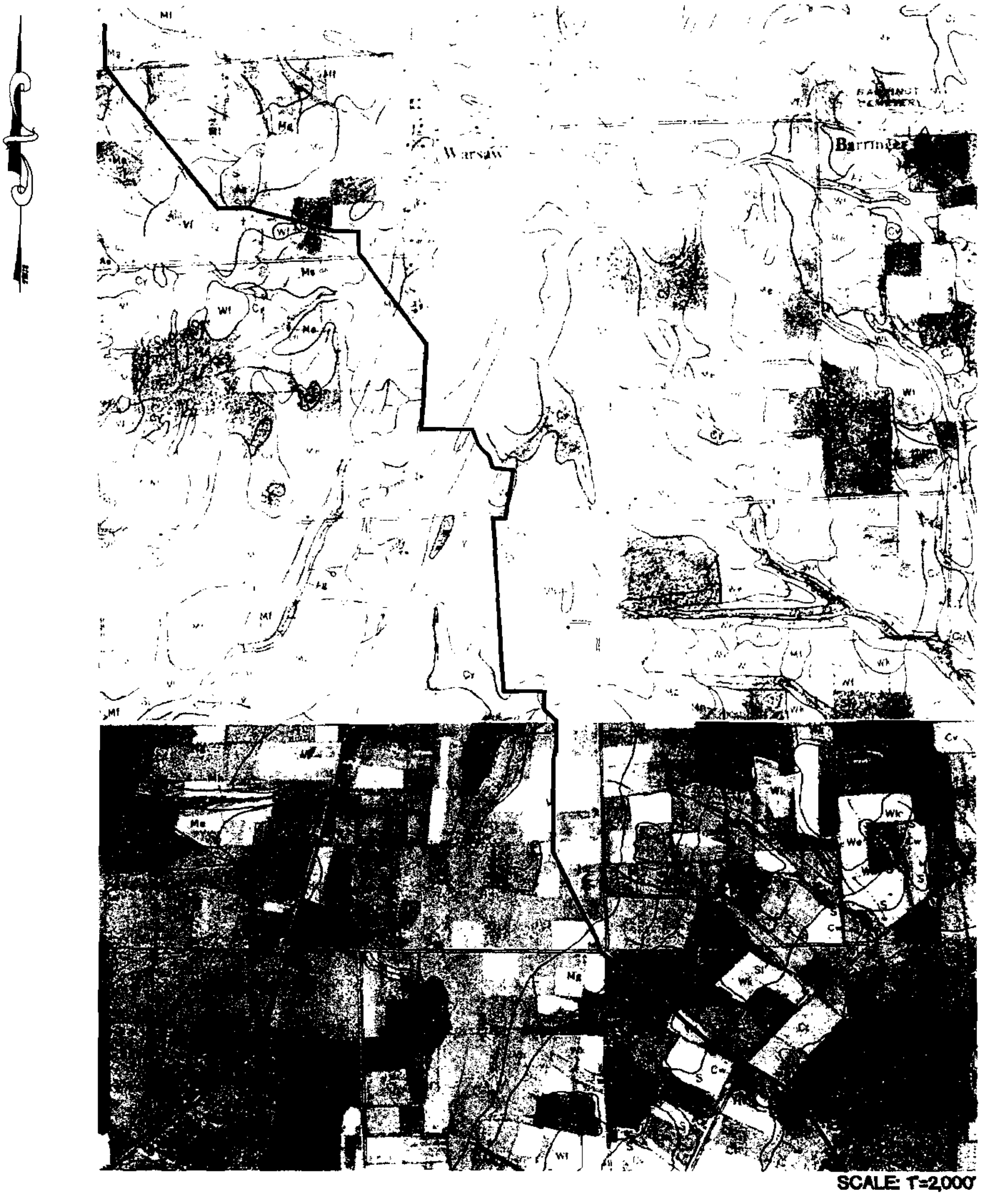
SILK NATURAL GAS PIPELINE

TOWN OF BARRINGTON/TOWN OF READING

YATES & SCHUYLER COUNTY NEW YORK

FIGURE 3

DRAINAGE AREA MAP



SCALE: T=2,000'

KEYSTONE ASSOCIATES
ARCHITECTS, ENGINEERS AND SURVEYORS, LLC

SILK NATURAL GAS PIPELINE

TOWN OF BARRINGTON/TOWN OF READING

YATES & SCHUYLER COUNTY NEW YORK

FIGURE 4

YATES COUNTY SOILS MAP

SCALE: 1"=2,000'

KEYSTONE ASSOCIATES
ARCHITECTS, ENGINEERS AND SURVEYORS, LLC

SILK NATURAL GAS PIPELINE

TOWN OF BARRINGTON/TOWN OF READING

YATES & SCHUYLER COUNTY NEW YORK

FIGURE 5

YATES COUNTY SOILS MAP

SCALE: 1"=2,000'

KEYSTONE
ASSOCIATES
ARCHITECTS, ENGINEERS AND SURVEYORS, LLC

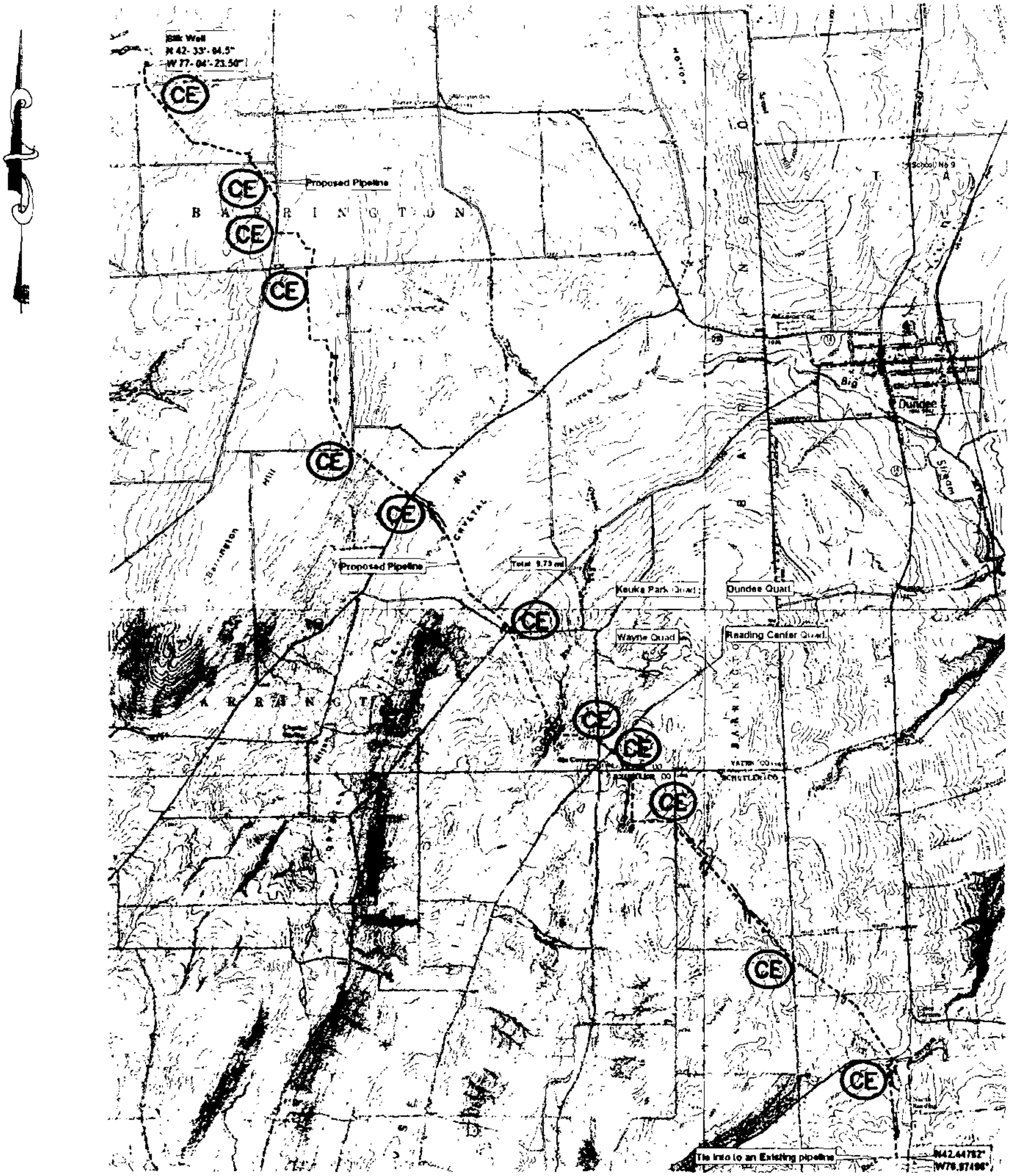
SILK NATURAL GAS PIPELINE

TOWN OF BARRINGTON/TOWN OF READING

YATES & SCHUYLER COUNTY NEW YORK

FIGURE 6

SCHUYLER COUNTY
SOILS MAP



CE CONSTRUCTION ENTRANCE
EACH SIDE OF PAVED ROAD

SCALE: 1"=5,000'

→ SILT FENCE

KEYSTONE
ASSOCIATES
ARCHITECTS, ENGINEERS AND SURVEYORS, LLC

SILK NATURAL GAS PIPELINE

TOWN OF BARRINGTON/TOWN OF READING

YATES & SCHUYLER COUNTY NEW YORK

FIGURE 7

EROSION CONTROL PLAN

APPENDIX A
STORMWATER DISCHARGE PERMIT INFORMATION

New York State Department of Environmental Conservation
Division of Water
Bureau of Water Permits, 4th Floor
625 Broadway, Albany, New York 12233-3505
Phone: (518) 402-8111 • **Fax:** (518) 402-9029
Website: www.dec.state.ny.us

Alexander B. Grannis
Commissioner

8/16/2007

CHESAPEAKE APPALACHIA, LLC
JAMES GREY
900 PENNSYLVANIA AVE, PO BOX 6070
CHARLESTON WV 25362-

Re: ACKNOWLEDGMENT of NOTICE of INTENT for Coverage Under SPDES General Permit for Storm Water Discharges from CONSTRUCTION ACTIVITY General Permit No. GP-02-01

Dear Prospective Permittee:

This is to acknowledge that the New York State Department of Environmental Conservation (Department) has received a complete Notice of Intent (NOI) for coverage under General Permit No. GP-02-01 for the construction activities located at:

SILK PIPELINE
GRAY ROAD
BARRINGTON NY 14527- **County: YATES**

Pursuant to Environmental Conservation Law (ECL) Article 17, Titles 7 and 8, ECL Article 70, discharges in accordance with GP-02-01 from the above construction site will be authorized 5 business days from 8/9/2007 which is the date we received your final NOI, unless notified differently by the Department.

The permit identification number for this site is: NYR **10N351** . Be sure to include this permit identification number on any forms or correspondence you send us. When coverage under the permit is no longer needed, you must submit a Notice of Termination to the Department.

This authorization is conditioned upon the following:

1. The information submitted in the NOI received by the Department on **8/9/2007** is accurate and complete.

2. You have developed a Storm Water Pollution Prevention Plan (SWPPP) that complies with GP-02-01 which must be implemented as the first element of construction at the above-noted construction site.

3. Activities related to the above construction site comply with all other requirements of GP-02-01.

1752059166

NOTICE OF INTENT

New York State Department of Environmental Conservation
Division of Water
625 Broadway, 4th Floor
Albany, New York 12233-3505

NYR ☐☐☐☐☐☐
(for DEC use only)

Stormwater Discharges Associated with Construction Activity Under State Pollutant Discharge Elimination System (SPDES) General Permit # GP-02-01

All sections must be completed unless otherwise noted. Failure to complete all items may result in this form being returned to you, thereby delaying your coverage under this General Permit. Applicants must read and understand the conditions of the permit and prepare a Stormwater Pollution Prevention Plan prior to submitting this NOI. Applicants are responsible for identifying and obtaining other DEC permits that may be required. To properly complete this form, please refer to the Instruction Manual which can be accessed at www.dec.state.ny.us/website/dow/toolbox/instr_man.pdf

-IMPORTANT-

THIS FORM FOR MACHINE PRINT ONLY
RETURN THIS FORM TO THE ADDRESS ABOVE

OWNER/OPERATOR MUST SIGN FORM

Owner/Operator Information

Owner/Operator (Company Name/Private Owner Name/Municipality Name)
CHESAPEAKE APPALACHIA, LLC

Owner/Operator Contact Person Last Name (NOT CONSULTANT)
GREY

Owner/Operator Contact Person First Name
JAMES

Owner/Operator Mailing Address
900 PENNSYLVANIA AVE, PO BOX 6070

City
CHARLESTON

State
WV

Zip
25362 -

Phone (Owner/Operator)
304 - 353 - 5065

Fax (Owner/Operator)
304 - 353 - 5231

Email (Owner/Operator)
egrey@chkenergy.com

7599059161

Location Information

Project Site Information

Project/Site Name: SILK PIPELINE

Street Address (NOT P.O. BOX): GRAY ROAD

City/Town/Village (THAT ISSUES BUILDING PERMIT): TOWN OF BARRINGTON

State: NY

Zip: 14527 -

County: YATES

DEC Region (if known): 8

Name of Nearest Cross Street: BALLARD ROAD

Distance to Nearest Cross Street (Feet): 340

Direction to Nearest Cross Street: ○ North ○ South ○ East ● West

1. Provide the Geographic Coordinates for the project site in NYTM Units. To do this you **must** go to the NYSDEC Stormwater Interactive Map on the DEC website at:

www.dec.state.ny.us/website/imsmaps/stormwater/viewer.htm

Zoom into your Project Location such that you can accurately click on the centroid of your site. Once you have located your project site go to the dropdown menu on the left and choose "Get Coordinates". Click on the center of your site and a small window *containing the X, Y coordinates in UTM will pop up. Transcribe these coordinates into the* boxes below. For problems with the interactive map use the help function.

X Coordinates (Easting)	Y Coordinates (Northing)
329824	4713067

2. What is the nature of this construction project?

● New Construction

○ Redevelopment with increase in imperviousness

○ Redevelopment with no increase in imperviousness

Project Site Information

3. Select the predominant land use for both pre and post development conditions.
SELECT ONLY ONE CHOICE FOR EACH

Pre-Development Existing Land Use

- ○ FOREST
- ○ PASTURE/OPEN LAND
- ○ CULTIVATED LAND
- ○ SINGLE FAMILY HOME
- ○ SINGLE FAMILY SUBDIVISION
- ○ TOWN HOME RESIDENTIAL
- ○ MULTIFAMILY RESIDENTIAL
- ○ INSTITUTIONAL/SCHOOL
- ○ INDUSTRIAL
- ○ COMMERCIAL
- ○ ROAD/HIGHWAY
- ○ RECREATIONAL/SPORTS FIELD
- ○ BIKE PATH/TRAIL
- ○ SUBSURFACE UTILITY
- ○ PARKING LOT
- ● OTHER

OTHER FOREST/OPEN LAND

Post-Development Future Land Use

- ○ SINGLE FAMILY HOME
- ○ SINGLE FAMILY SUBDIVISION
- ○ TOWN HOME RESIDENTIAL
- ○ MULTIFAMILY RESIDENTIAL
- ○ INSTITUTIONAL/SCHOOL
- ○ INDUSTRIAL
- ○ COMMERCIAL
- ○ ROAD/HIGHWAY
- ○ RECREATIONAL/SPORTS FIELD
- ○ BIKE PATH/TRAIL
- ● LINEAR UTILITY (water, sewer, gas, etc.)
- ○ PARKING LOT
- ○ OTHER

Number of Lots

OTHER

4. Will future use of this site be an agricultural property as defined by the NYS Agriculture and Markets Law ? ○ Yes ● No

5. Is this a project which does not require coverage under the General Permit (e.g. Project done under an Individual SPDES Permit, or department approved remediation)? ○ Yes ● No

6. Is this property owned by a state authority, state agency or local government? ○ Yes ● No

7. In accordance with the larger common plan of development or sale; enter the total project site acreage, the acreage to be disturbed and the future impervious area (acreage) within the disturbed area. Round to the nearest tenth of an acre.

Total Site Acreage	Acreage To Be Disturbed	Existing Impervious Area Within Disturbed	Future Impervious Area Within Disturbed
59.0	59.0	0.6	0.6

8. Will there be more than 5 acres disturbed at any given time? ○ Yes ● No

9. Indicate the percentage of each Hydrologic Soil Group(HSG) at the site.

A	B	C	D
2 %	8 %	85 %	5 %

10. Is this a phased project? (**if yes, The SWPPP must address all planned phases**) ● Yes ○ No

11. Enter the planned start and end dates of the disturbance activities

Start Date: 08/01/2007 - End Date: 01/31/2008

Receiving System(s)

12. Provide the name of the nearest, <u>natural</u>, classified surface waterbody(ies) into which construction site runoff has the potential to discharge.

SURFACE FLOW TO UNNAMED TRIBUTARY TO

KEUKA LAKE, & BIG STREAM TO SENECA LAKE,

TOBEHANNA CREEK TO LAMOKA LAKE

For Questions 13 and 14 refer to the Instruction Manual for a subset of 303(d) segments and TMDL watersheds subject to Condition A of the permit. These waterbodies and watersheds have been identified for regulation within the stormwater program due to some level of impairment by nutrients, silt or sediment. The Instruction Manual can be accessed at www.dec.state.ny.us/website/dow/toolbox/swpp_man.pdf

13. Has the surface waterbody(ies) in question 12 been identified as a 303(d) segment? ○ Yes ● No

14. Is this project located in a TMDL Watershed? ○ Yes ● No

<u>NOTE:</u> If you answered Yes to either question 13 or 14, Pursuant to Part I.D.1.(b) of the permit, you <u>must</u> have your SWPPP prepared and certified by a licensed/certified professional and the SWPPP is subject to a 60-business day review.

15. Does the site runoff enter a separate storm sewer system- including roadside drains, swales, ditches, culverts, etc? ● Yes ○ No ○ Unknown
(if no, skip question 16)

16. What is the name of the municipality/entity that owns the separate storm sewer system?

TOWN OF BARRINGTON & TOWN OF READING

17. Does any runoff from the site enter a sewer classified as a Combined Sewer? ○ Yes ● No ○ Unknown

Stormwater Pollution Prevention Plan (SWPPP)

18. Has the required Erosion and Sediment Control component of the SWPPP been developed in conformance with the current NYS Standards and Specifications for Erosion and Sediment Control (aka Blue Book) ? ● Yes ○ No

19. Does this construction activity require the development of a SWPPP that includes Water Quality and Quantity Control components (Post-Construction Stormwater Management Practices) **If no, Skip question 20** ○ Yes ● No

20. Have the Water Quality and Quantity Control components of the SWPPP been developed in comformance with the current NYS Stormwater Management Design Manual ? ○ Yes ○ No

NOTE: If you answered no to question 18 or 20, Pursuant to Part I.D.3.(b) of the permit, you must have your SWPPP prepared and certified by a licensed/certified professional and the SWPPP is subject to a 60-business day review. Please provide further details in the details/comment section on the last page of this form.

21. The Stormwater Pollution Prevention Plan (SWPPP) was prepared by:

- ● Professional Engineer (P.E.)
- ○ Soil and Water Conservation District (SWCD)
- ○ Registered Landscape Architect (R.L.A)
- ○ Certified Professional in Erosion and Sediment Control (CPESC)
- ○ Owner/Operator
- ○ Other

SWPPP Preparer Information
(if different from Owner/Operator info)

SWPPP Preparer: KEYSTONE ASSOCIATES, LLC

Contact Name (Last, Space, First): LAUVE, PE THEODORE

Mailing Address: 229-231 STATE STREET, FOURTH FLOOR

City: BINGHAMTON

State: NY

Zip: 13901-

Phone: 607-722-1100

Fax: 607-722-2515

Email: lauve t@keystoneassociatesllc.com

Stormwater Pollution Prevention Plan (SWPPP)

Erosion and Sediment Control Practices

22. Has a construction sequence schedule for the planned management practices been prepared? ● Yes ○ No

23. Select all of the erosion and sediment control practices that will be employed on the project site.

Temporary Structural

- ○ Check Dams
- ○ Construction Road Stabilization
- ● Dust Control
- ○ Earth Dike
- ○ Level Spreader
- ○ Perimeter Dike/Swale
- ○ Pipe Slope Drain
- ○ Portable Sediment Tank
- ○ Rock Dam
- ○ Sediment Basin
- ○ Sediment Traps
- ● Silt Fence
- ● Stabilized Construction Entrance
- ○ Storm Drain Inlet Protection
- ○ Straw/Hay Bale Dike
- ● Temporary Access Waterway Crossing
- ○ Temporary Stormdrain Diversion
- ○ Temporary Swale
- ○ Turbidity Curtain
- ○ Water bars

Biotechnical

- ○ Brush Matting
- ○ Wattling

Vegetative Measures

- ○ Brush Matting
- ○ Dune Stabilization
- ○ Grassed Waterway
- ● Mulching
- ○ Protecting Vegetation
- ○ Recreation Area Improvement
- ● Seeding
- ○ Sodding
- ● Straw/Hay Bale Dike
- ○ Streambank Protection
- ○ Temporary Swale
- ○ Topsoiling
- ○ Vegetating Waterways

Permanent Structural

- ○ Debris Basin
- ○ Diversion
- ○ Grade Stabilization Structure
- ○ Land Grading
- ○ Lined Waterway (Rock)
- ○ Paved Channel (Concrete)
- ○ Paved Flume
- ○ Retaining Wall
- ○ Riprap Slope Protection
- ○ Rock Outlet Protection
- ○ Streambank Protection

Other

Stormwater Pollution Prevention Plan (SWPPP)

Water Quality and Quantity Control

Important: Completion of Questions 24-30 is not required if the project:

Disturbs less than 5 acres and is planned for single-family residential homes(including subdivisions) or construction on agricultural property and does not have a discharge to a 303(d) water or is not located within a TMDL watershed.

Additionally, sites where there will be no future impervious area within the disturbed area and that do not have a change(pre to post development)in hydrology do not need to complete questions 24-30.

24. Indicate all the permanent Stormwater Management Practice(s) that will be installed on this site

Post Construction Stormwater Management Practices

Ponds

○ Micropool Extended Detention (P-1)
○ Wet Pond (P-2)
○ Wet Extended Detention (P-3)
○ Multiple Pond System (P-4)
○ Pocket Pond (P-5)

Filtering

○ Surface Sand Filter (F-1)
○ Underground Sand Filter (F-2)
○ Perimeter Sand Filter (F-3)
○ Organic Filter (F-4)
○ Bioretention (F-5)

○ Other

Wetlands

○ Shallow Wetland (W-1)
○ Extended Detention Wetland (W-2)
○ Pond/Wetland System (W-3)
○ Pocket Wetland (W-4)

Infiltration

○ Infiltration Trench (I-1)
○ Infiltration Basin (I-2)
○ Dry Well (I-3)

Open Channels

○ Dry Swale (O-1)
○ Wet Swale (O-2)

Describe other stormwater management practices not listed above or explain any deviations from the technical standards. If the SWPPP does not conform to the technical standards, the SWPPP must be prepared and certified by a licensed/certified professional and is subject to a 60 business day review.

Has a long term Operation and Maintenance plan for the post construction management practices been developed? ○ Yes ○ No

If Yes, Identify the entity responsible for the long term Operation and Maintenance

Stormwater Pollution Prevention Plan (SWPPP) - Water Quality and Quantity Control

25. Provide the total water quality volume required and the total provided for the site.

Total Water Quality Volume (WQv)

WQv Required ☐☐☐.☐☐☐ **acre-feet**

WQv Provided ☐☐☐.☐☐☐ **acre-feet**

26. Provide the following Unified Stormwater Sizing Criteria for the site.

Total Channel Protection Storage Volume (CPv) - Extended detention of post-developed 1 year, 24 hour storm event

CPv Required ☐☐☐.☐☐☐ **acre-feet**

CPv Provided ☐☐☐.☐☐☐ **acre-feet**

The need to provide for channel protection has been waived because
○ Site discharges directly to fourth order stream or larger

Total Overbank Flood Control Criteria (Qp) - Peak discharge rate for the 10 year storm

Pre-Development ☐☐☐.☐☐☐ **CFS**

Post-development ☐☐☐.☐☐☐ **CFS**

Total Extreme Flood Control Criteria (Qf) - Peak discharge rate for the 100 year storm

Pre-Development ☐☐☐.☐☐☐ **CFS**

Post-development ☐☐☐.☐☐☐ **CFS**

The need to provide for flood control has been waived because
○ Site discharges directly to fourth order stream or larger
○ Downstream analysis reveals that flood control is not required

IMPORTANT: For questions 27 and 28 impervious area should be calculated considering the project site and all offsite areas that drain to the post-construction stormwater management practice(s) (Total Drainage Area = Project Site + Offsite areas)

27. Pre-Construction Impervious Area - As a percent of the Total Drainage Area enter the percentage of the existing impervious areas before construction begins. ☐☐☐ %

28. Post-Construction Impervious Area - As a percent of the Total Drainage Area enter the percentage of the future impervious areas that will be created/remain on the site after completion of construction. ☐☐☐ %

29. Indicate the total number of permanent stormwater management practices to be installed ☐☐

30. Provide the total number of stormwater discharge points from the site (include discharges to either surface waters or to seperate storm sewer systems) ☐☐

[illegible]

31. Select any other DEC permits that are required for this project or ○ None

DEC Permits

○ Air Pollution Control
○ Coastal Erosion
○ Hazardous Waste
○ Long Island Wells
○ Mined Land Reclamation
○ Other SPDES
○ Solid Waste
● Stream Protection/Article 15
● Water Quality Certificate
○ Dam Safety
○ Water Supply
● Freshwater Wetlands
○ Tidal Wetlands
○ Wild, Scenic and Recreational Rivers

Other

32. If this NOI is being submitted for the purpose of continuing coverage under a general permit for stormwater runoff from construction activities, please indicate the former SPDES number assigned.

NYR

[illegible]

Erosion & Sediment control will be provided during construction. Water quality & quantity controls is not required since there will be no increase in impervious area for the project. Post development water quantity is less than pre-development due to minimal change in ground cover (from woods/grass to grass where applicable). Boring will occur in some locations therefore not changing the existing land cover.

[illegible]

I have read or been advised of the permit conditions and believe that I understand them. I also understand that, under the terms of the permit, there may be reporting requirements. I also certify under penalty of law that this document and the corresponding documents 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(s) 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 further understand that coverage under the general permit will be identified in the acknowledgment that I will receive as a result of submitting this NOI and can be as long as sixty (60) days as provided for in the general permit. I also understand that, by submitting this NOI, I am acknowledging that the SWPPP has been developed and will be implemented as the first element of construction. and agreeing to comply with all the terms and conditions of the general permit for which this NOI is being submitted.

Print First Name James

MI E

Print Last Name Grey

Owner/Operator Signature James E. Grey

Date 06/30/2007

KEYSTONE
ASSOCIATES
ARCHITECTS, ENGINEERS AND SURVEYORS, LLC

TRANSMITTAL

To: New York State Department of
Environmental Conservation
Division of Water
625 Broadway, 4th Floor
Albany, New York 12233-3505

Attn: Toni Cioffi

Project: Silk Pipeline
Towns of Barrington & Reading
Yates County, New York

Project #: 1137.06507

Date: August 6, 2007

Quantity	Date	Description
1	06/30/07	Notice of Intent (NOI)

This is transmitted as checked below:

x For approval
___ For your use
___ For review & comment
___ As requested

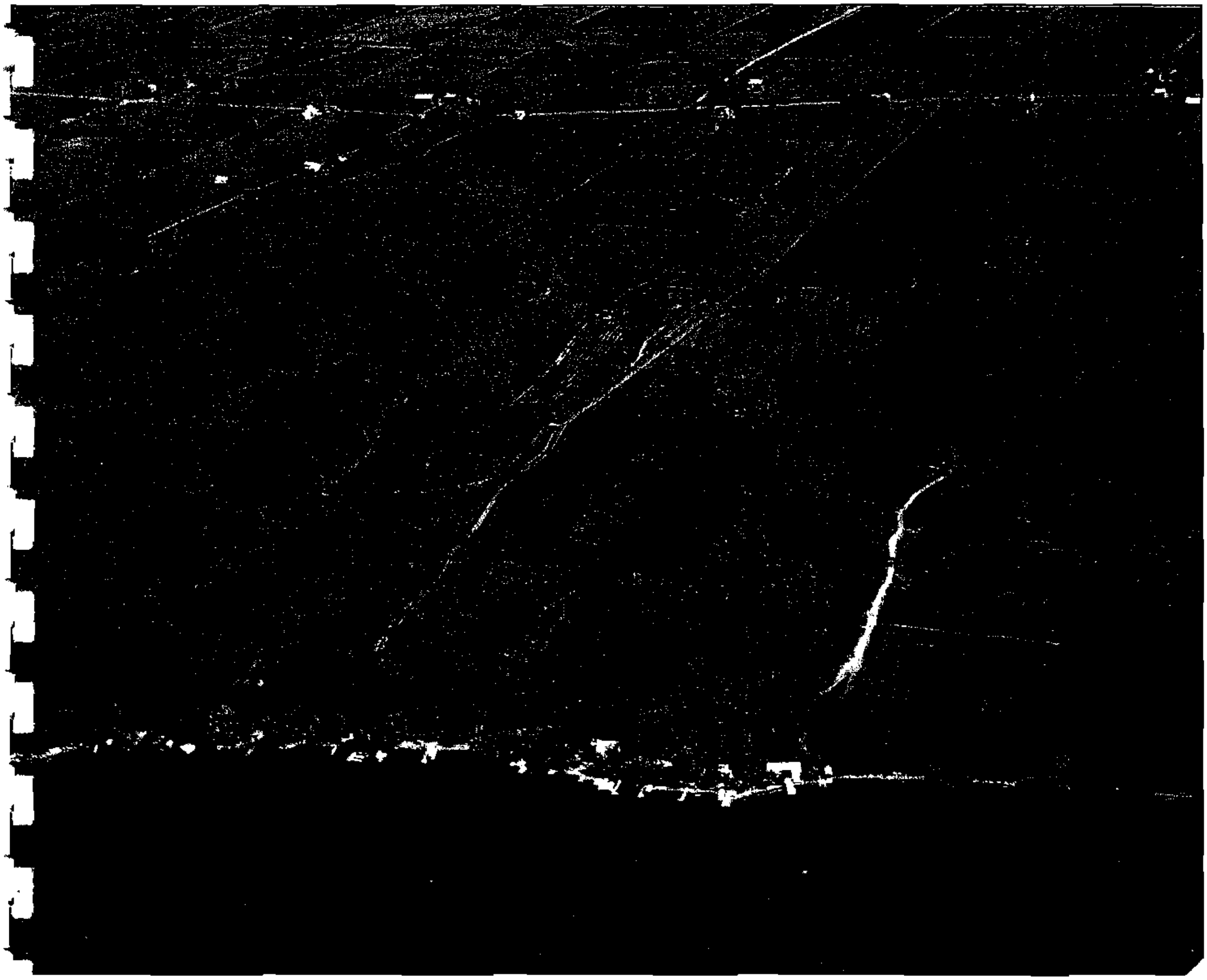
___ No Exception Taken
___ Furnish as Corrected
___ Revise and Resubmit
___ For immediate action

___ Reviewed
___ Rejected
___ Submit Specified Item
___ Prints returned after loan to us

Copy To: File

Signed: Rebecca Feher, EIT

APPENDIX B
SOILS INFORMATION



SOIL SURVEY OF

SCHUYLER COUNTY NEW YORK

United States Department of Agriculture
Soil Conservation Service
in cooperation with the
Cornell University Agricultural Experiment Station

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS

[The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Absence of an entry indicates that data were not available or were not estimated]

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors	
						K	T
	In	In/hr	In/in	pH			
Ad	0-8	0.6-2.0	0.16-0.22	6.1-7.3	Low	---	---
Alden	8-30	0.2-0.6	0.14-0.20	6.1-7.3	Low	---	
	30-50	0.2-0.6	0.08-0.15	6.6-8.4	Low	---	
AnA, AnB, AnC	0-8	0.6-2.0	0.17-0.22	6.1-7.3	Low	0.37	3-2
Angola	8-27	0.06-0.2	0.11-0.19	5.6-7.8	Low	0.28	
	27	---	---	---	---	---	
ApA, ApB	0-8	0.6-2.0	0.12-0.20	5.6-7.3	Low	0.32	3
Appleton	8-34	0.06-0.6	0.07-0.18	5.6-7.8	Low	0.37	
	34-60	0.06-0.6	0.07-0.18	7.4-8.4	Low	0.37	
AQ*. Aquepts and Saprists							
ArB, ArC	0-5	0.6-2.0	0.10-0.15	3.6-6.0	Low	0.24	2-1
Arnot	5-19	0.6-2.0	0.08-0.12	3.6-6.0	Low	0.17	
	19	---	---	---	---	---	
At	0-4	0.6-2.0	0.14-0.22	4.5-5.5	Low	---	---
Atkins	4-27	0.06-2.0	0.14-0.18	4.5-5.5	Low	---	
	27-60	2.0-20.0	0.08-0.12	4.5-6.0	Low	---	
AuB, AuC, AuD	0-6	0.6-2.0	0.16-0.21	5.6-7.3	Low	0.37	3
Aurora	6-23	0.06-0.2	0.13-0.20	5.6-7.3	Low	0.28	
	23	---	---	---	---	---	
BaB, BaC, BaD, BHE*	0-2	0.6-2.0	0.10-0.20	4.5-6.0	Low	0.24	3
Bath	2-27	0.6-2.0	0.08-0.18	4.5-6.0	Low	0.28	
	27-52	<0.2	0.01-0.06	4.5-6.5	Low	0.28	
	52-60	<0.2	0.01-0.06	5.1-7.3	Low	0.28	
BuB, BuC, BuD	0-8	0.6-2.0	0.15-0.20	5.1-7.3	Low	0.37	3-2
Burdett	8-19	0.6-2.0	0.13-0.18	5.1-7.3	Low	0.37	
	19-32	0.06-0.2	0.08-0.14	6.1-7.3	Low	0.28	
	32-64	0.06-0.2	0.08-0.14	6.1-8.4	Low	0.28	
Ca	0-9	0.6-2.0	0.20-0.35	6.1-7.3	Low	---	3
Canandaigua	9-38	0.2-0.6	0.19-0.20	6.1-7.3	Low	---	
	38-50	0.2-0.6	0.19-0.20	6.6-8.4	Low	0.49	
Cc	0-99	0.6-6.0	0.35-0.45	5.6-7.3	---	---	---
Carlisle							
Ce	0-11	0.6-2.0	0.09-0.16	4.5-6.0	Low	0.24	3
Castile	11-42	2.0-6.0	0.05-0.13	4.5-6.0	Low	0.20	
	42-50	>6.0	0.01-0.02	5.1-7.3	Low	0.17	
ChA	0-9	0.6-6.0	0.11-0.19	4.5-5.5	Low	0.37	3
Chenango	9-37	0.6-6.0	0.05-0.14	4.5-6.0	Low	0.20	
	37-50	6.0-20	0.01-0.03	5.1-6.5	Low	0.17	
CnA, CnB, CoB	0-9	0.6-6.0	0.08-0.15	4.5-5.5	Low	0.24	3
Chenango	9-37	0.6-6.0	0.05-0.14	4.5-6.0	Low	0.20	
	37-50	6.0-20	0.01-0.03	5.1-6.5	Low	0.17	
Cp	0-9	0.6-2.0	0.14-0.21	4.5-6.5	Low	0.32	3
Chippewa	9-15	0.6-2.0	0.10-0.17	4.5-6.5	Low	0.43	
	15-42	<0.2	0.01-0.02	5.1-7.3	Low	0.28	
	42-60	<0.2	0.01-0.02	5.6-8.4	Low	0.28	

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors	
						K	T
	In	In/hr	In/in	pH			
CrA, CrB----------	0-10	0.6-2.0	0.14-0.21	5.1-7.3	Low-------------	0.49	3
Collamer	10-16	0.6-2.0	0.14-0.20	5.6-7.3	Low-------------	0.43	
	16-38	0.2-0.6	0.16-0.20	5.6-7.8	Low-------------	0.43	
	38-50	0.2-0.6	0.12-0.20	6.1-8.4	Low-------------	0.64	
CsA, CsB, CsC----	0-7	0.6-2.0	0.15-0.20	5.1-7.3	Low-------------	0.32	3
Conesus	7-56	0.6-2.0	0.09-0.19	5.1-7.3	Low-------------	0.37	
	56-77	0.06-0.2	0.08-0.16	7.4-8.4	Low-------------	0.28	
DkB, DkC----------	0-9	0.6-2.0	0.16-0.21	5.1-7.3	Low-------------	0.49	3
Dunkirk	9-14	0.6-2.0	0.16-0.20	5.1-7.3	Low-------------	0.43	
	14-44	0.2-0.6	0.16-0.20	5.6-7.8	Low-------------	0.43	
	44-64	0.2-0.6	0.12-0.20	6.1-8.4	Low-------------	0.64	
DUE3*:							
Dunkirk----------	0-9	0.6-2.0	0.16-0.21	5.1-7.3	Low-------------	0.49	3
	9-14	0.6-2.0	0.16-0.20	5.1-7.3	Low-------------	0.43	
	14-44	0.2-0.6	0.16-0.20	5.6-7.8	Low-------------	0.43	
	44-64	0.2-0.6	0.12-0.20	6.1-8.4	Low-------------	0.64	
Hudson-----------	0-18	0.2-2.0	0.16-0.21	5.6-7.3	Moderate--------	0.49	3
	18-40	0.06-0.2	0.13-0.17	5.6-7.3	Moderate--------	0.28	
	40-60	0.06-0.2	0.12-0.20	6.6-8.4	Moderate--------	0.28	
ErA, ErB, ErC----	0-9	0.6-2.0	0.12-0.19	5.1-6.0	Low-------------	0.37	3
Erie	9-15	0.6-2.0	0.09-0.16	5.1-7.3	Low-------------	0.28	
	15-45	0.06-0.2	0.01-0.03	5.1-7.3	Low-------------	0.28	
	45-55	0.06-0.2	0.01-0.03	5.6-8.4	Low-------------	0.28	
FF*. Fluvaquents- Udifluvents							
FrA, FrB, FrC----	0-5	0.6-2.0	0.17-0.21	4.5-6.0	Low-------------	0.37	3
Fremont	5-31	0.2-2.0	0.12-0.19	4.5-6.0	Low-------------	0.37	
	31-60	<0.2	0.11-0.16	5.6-7.3	Low-------------	0.28	
Ha---------------	0-10	0.6-2.0	0.14-0.24	5.6-7.3	Low-------------	0.24	5
Halsey	10-25	0.6-2.0	0.12-0.18	5.6-7.3	Low-------------	0.32	
	25-51	6.0-20	0.02-0.07	6.6-7.8	Low-------------	---	
HnB, HnC, HnD----	0-6	0.6-2.0	0.16-0.21	4.5-6.0	Low-------------	0.43	3
Hornell	6-28	0.2-0.6	0.11-0.13	4.5-6.0	Moderate--------	0.28	
	28-39	<0.06	0.07-0.13	4.5-6.0	Moderate--------	0.28	
	39	---	---	---	----------------	---	
HrA, HrB, HrC, HrCK, HSD*, HSE*------------	0-8	0.6-6.0	0.07-0.15	5.6-7.3	Low-------------	0.24	3
Howard	8-28	0.6-6.0	0.06-0.12	5.6-7.3	Low-------------	0.20	
	28-36	0.6-6.0	0.05-0.08	5.6-7.3	Low-------------	0.20	
	36-54	>20.	0.01-0.02	7.4-8.4	Low-------------	0.17	
HuB, HuC----------	0-18	0.2-2.0	0.16-0.21	5.6-7.3	Moderate--------	0.49	3
Hudson	18-40	0.06-0.2	0.13-0.17	5.6-7.3	Moderate--------	0.28	
	40-60	0.06-0.2	0.12-0.20	6.6-8.4	Moderate--------	0.28	
LnB, LnC, LnD----	0-7	0.6-2.0	0.10-0.16	5.1-6.5	Low-------------	0.28	3
Lansing	7-38	0.6-2.0	0.09-0.19	5.1-7.3	Low-------------	0.37	
	38-50	0.06-0.2	0.08-0.16	7.4-8.4	Low-------------	0.28	
LoB, LoC, LoD----	0-4	0.6-2.0	0.11-0.17	4.5-6.0	Low-------------	0.24	3
Lordstown	4-24	0.6-2.0	0.10-0.16	4.5-6.0	Low-------------	0.28	
	24-30	0.6-2.0	0.05-0.14	4.5-6.0	Low-------------	0.28	
	30	---	---	---	----------------	---	

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors	
						K	T
	In	In/hr	In/in	pH			
LTE*, LTF*:							
Lordstown	0-4	0.6-2.0	0.11-0.17	4.5-6.0	Low	0.20	3
	4-24	0.6-2.0	0.10-0.16	4.5-6.0	Low	0.28	
	24-30	0.6-2.0	0.05-0.14	4.5-6.0	Low	0.28	
	30	---	---	---	---	---	
Arnot	0-5	0.6-2.0	0.10-0.15	4.5-6.0	Low	0.24	2-1
	5-19	0.6-2.0	0.08-0.12	4.5-6.0	Low	0.17	
	19	---	---	---	---	---	
Ma	0-8	0.2-0.6	0.16-0.21	5.6-7.3	Moderate	---	---
Madalin	8-28	0.06-0.2	0.12-0.13	5.6-7.8	Moderate	---	
	28-50	<0.2	0.12-0.13	7.4-8.4	Moderate	---	
MrB, MrC, MrD	0-8	0.6-2.0	0.11-0.17	3.6-6.5	Low	0.24	3
Mardin	8-21	0.6-2.0	0.09-0.16	3.6-6.5	Low	0.28	
	21-51	<0.2	0.01-0.03	5.1-7.3	Low	0.28	
	51-69	<0.2	0.01-0.03	5.1-8.4	Low	0.28	
OdA, OdB	0-12	0.2-0.6	0.17-0.21	5.6-7.3	Moderate	0.49	3
Odessa	12-28	<0.2	0.12-0.17	5.6-7.8	Moderate	0.28	
	28-50	<0.06	0.12-0.14	7.4-8.4	Moderate	0.28	
OCF*. Ochrepts- Orthents							
Pa	0-21	0.6-6.0	0.35-0.45	5.1-7.3	---	---	---
Palms	21-50	0.2-2.0	0.14-0.22	6.1-8.4	Low	---	
Ph	0-24	0.2-2.0	0.12-0.20	4.5-6.0	Low	---	---
Philo	24-50	2.0-20.0	0.06-0.10	4.5-6.0	Low	---	
Pt*. Pits, gravel							
Rh	0-9	0.6-2.0	0.09-0.12	5.1-6.5	Low	0.20	3
Red Hook	9-28	0.6-2.0	0.04-0.17	5.1-6.5	Low	0.43	
	28-50	0.6-6.0	0.04-0.11	5.6-7.3	Low	0.43	
RnA, RnB	0-6	0.2-0.6	0.16-0.21	5.6-7.3	Moderate	0.37	3
Rhinebeck	6-14	0.06-0.2	0.12-0.14	5.6-7.8	Moderate	0.28	
	14-42	0.06-0.2	0.12-0.14	6.1-8.4	Moderate	0.28	
	42-54	0.06-0.2	0.12-0.15	7.4-8.4	Low	0.28	
ROF*: Rock outcrop.							
Arnot	0-5	0.6-2.0	0.10-0.15	4.5-6.0	Low	0.24	2-1
	5-19	0.6-2.0	0.08-0.12	4.5-6.0	Low	0.17	
	19	---	---	---	---	---	
ScB3, ScC3, ScD3	0-4	0.2-0.6	0.17-0.21	5.6-7.3	Moderate	0.49	3
Schoharie	4-33	<0.2	0.12-0.17	5.6-7.8	Moderate	0.28	
	33-60	<0.2	0.12-0.14	7.4-8.4	Moderate	0.28	
ShC3, ShD3	0-6	0.2-0.6	0.17-0.21	5.6-7.3	Moderate	0.49	3
Schoharie	6-24	<0.2	0.12-0.17	5.6-7.3	Moderate	0.28	
Variant	24	---	---	---	---	---	
SyC, SyD, SyE	0-9	0.6-2.0	0.12-0.19	3.6-6.0	Low	0.37	3
Schuyler	9-38	0.2-2.0	0.11-0.18	3.6-6.0	Low	0.37	
	38-50	0.06-0.2	0.09-0.18	3.6-6.0	Low	0.28	
Te	0-10	0.6-2.0	0.18-0.21	5.6-7.3	Low	---	---
Teel	10-44	0.6-2.0	0.17-0.19	5.6-7.3	Low	---	
	44-50	0.6-2.0	0.12-0.19	6.6-7.8	Low	---	

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors	
						K	T
	In	In/hr	In/in	pH			
TuB, TuC--------- Tuller	0-7 7-18 18	0.6-2.0 0.06-0.6 ---	0.09-0.15 0.06-0.10 ---	4.5-5.5 4.5-6.0 ---	Low------------ Low------------ ---------------	0.24 0.17 ---	2-1
UD*. Udorthents							
VaB, VaC, VaD, VEE*------------ Valois	0-6 6-45 45-60	0.6-2.0 0.6-2.0 0.6-6.0	0.08-0.16 0.07-0.14 0.03-0.09	4.5-5.5 4.5-6.0 5.1-7.3	Low------------ Low------------ Low------------	0.24 0.28 0.20	3
VHF*:							
Valois-----------	0-6 6-45 45-60	0.6-2.0 0.6-2.0 0.6-6.0	0.08-0.16 0.07-0.14 0.03-0.09	4.5-5.5 4.5-6.0 5.1-7.3	Low------------ Low------------ Low------------	0.24 0.28 0.20	3
Howard-----------	0-8 8-28 28-36 36-54	0.6-6.0 0.6-6.0 0.6-6.0 >20.	0.07-0.15 0.06-0.12 0.05-0.08 0.01-0.02	5.6-7.3 5.6-7.3 5.6-7.3 7.4-8.4	Low------------ Low------------ Low------------ Low------------	0.24 0.20 0.20 0.17	3
VoA, VoB, VoC, VoD------------- Volusia	0-6 6-13 13-60	0.6-2.0 ← 0.6-2.0 <0.2	0.11-0.17 0.09-0.16 0.01-0.02	4.5-6.5 4.5-6.5 5.1-7.8	Low------------ Low------------ Low------------	0.24 0.28 0.28	3
Wk--------------- Wallkill	0-5 5-18 18-38	0.6-2.0 0.6-2.0 2.0-20	0.16-0.21 0.15-0.20 0.19-0.22	6.1-7.3 6.1-7.3 5.6-7.8	Low------------ Low------------ Low------------	--- --- ---	---
Wy--------------- Wayland	0-6 6-50	0.2-2.0 0.06-0.2	0.17-0.22 0.16-0.20	5.6-7.8 5.6-7.8	Low------------ Low------------	--- ---	---

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 17.--SOIL AND WATER FEATURES

[The definitions of "flooding" and "water table" in the Glossary explain terms such as "rare," "brief," "apparent," and "perched." The symbol < means less than; > means more than. Absence of an entry indicates that the feature is not a concern]

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
Ad Alden	D	None	---	---	0-0.5	Perched	Nov-Jun	>60	---	High	High	Low.
AnA, AnB, AnC Angola	C	None	---	---	0.5-1.5	Perched	Dec-May	20-40	Rippable	High	High	Low.
ApA, ApB Appleton	C	None	---	---	0.5-1.5	Perched	Dec-May	>60	---	High	High	Low.
AQ*. Aquepts and Saprists												
ArB, ArC Arnot	C/D	None	---	---	1.0-1.5	Perched	Mar-May	10-20	Hard	Moderate	Low	High.
At Atkins	D	Common	Very brief	Sep-Jul	0-1.0	Apparent	Nov-Jun	>60		High	High	Moderate.
AuB, AuC, AuD Aurora	C	None	---	---	1.5-2.0	Perched	Mar-May	20-40	Rippable	Moderate	Moderate	Low.
BaB, BaC, BaD, BHE* Bath	C	None	---	---	2.0-4.0	Perched	Jan-Mar	>60	---	Moderate	Moderate	Moderate.
BuB, BuC, BuD Burdett	C	None	---	---	0.5-1.5	Perched	Dec-May	>60	---	High	High	Low.
Ca Canandaigua	D	None	---	---	0-1.0	Apparent	Nov-May	>60	---	High	High	Low.
Cc Carlisle	A/D	Frequent	Long	Nov-May	0-1.0	Apparent	Sep-Jun	>60	---	High	High	Low.
Ce Castile	B	None	---	---	1.5-2.0	Apparent	Mar-May	>60	---	Moderate	Moderate	Moderate.
ChA, CnA, CnB Chenango	A	None	---	---	>6.0	---	---	>60	---	Moderate	Low	Moderate.
CoB Chenango	A	Rare	---	---	3.0-6.0	Apparent	Mar-Apr	>60	---	Moderate	Low	Moderate.
Cp Chippewa	D	None	---	---	0.0-0.5	Perched	Nov-May	>60	---	Moderate	High	Moderate.
CrA, CrB Collamer	C	None	---	---	1.5-2.0	Perched	Mar-May	>60	---	High	Moderate	Low.

See footnote at end of table.

Soil name and map symbol	Hydro-logic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
CsA, CsB, CsC------ Conesus	B	None---------	---	---	1.5-2.0	Perched	Mar-May	>60	---	Moderate	Moderate	Low.
DkB, DkC----------- Dunkirk	B	None---------	---	---	>6.0	---	---	>60	---	Moderate	Low-------	Low.
DUE3*: Dunkirk-----------	B	None---------	---	---	>6.0	---	---	>60	---	Moderate	Low-------	Low.
Hudson------------	C	None---------	---	---	1.5-2.0	Perched	Mar-May	>60	---	Moderate	High------	Low.
ErA, ErB, ErC------ Erie	C	None---------	---	---	0.5-1.5	Perched	Dec-May	>60	---	High------	High------	Moderate.
FF*. Fluviquents- Udifluvents												
FrA, FrB, FrC------ Fremont	C	None---------	---	---	0.5-1.5	Perched	Dec-May	>40	Rippable	High------	High------	High.
Ha----------------- Halsey	D	None to frequent.	Brief-----	Sep-Apr	0-0.5	Apparent	Sep-Jun	>60	---	High------	High------	Low.
HnB, HnC, HnD------ Hornell	D	None---------	---	---	0.5-1.5	Perched	Dec-May	20-40	Rippable	Moderate	High------	High.
HrA, HrB, HrC, HrCK, HSD*, HSE*- Howard	A	None---------	---	---	>6.0	---	---	>60	---	Moderate	Low-------	Low.
HuB, HuC----------- Hudson	C	None---------	---	---	1.5-2.0	Perched	Mar-May	>60	---	Moderate	High------	Low.
LnB, LnC, LnD------ Lansing	B	None---------	---	---	3.0-6.0	Perched	Mar-May	>60	---	Moderate	Low-------	Moderate.
LoB, LoC, LoD------ Lordstown	C	None---------	---	---	>6.0	---	---	20-40	Hard	Moderate	Low-------	High.
LTE*, LTF*: Lordstown---------	C	None---------	---	---	>6.0	---	---	20-40	Hard	Moderate	Low-------	High.
Arnot-------------	C/D	None---------	---	---	1.0-1.5	Perched	Mar-May	10-20	Hard	Moderate	Low-------	High.
Ma----------------- Madalin	D	None---------	---	---	0-0.5	Apparent	Nov-Jun	>60	---	Moderate	High------	Low.
MrB, MrC, MrD------ Mardin	C	None---------	---	---	1.5-2.0	Perched	Mar-May	>60	---	Moderate	Moderate	Moderate.
OdA, OdB----------- Odessa	D	None---------	---	---	0.5-1.5	Perched	Dec-May	>60	---	Moderate	High------	Low.
OCF*. Ochrepts-Orthents												
Pa----------------- Palms	A/D	Frequent----	Long-------	Nov-May	0-1.0	Apparent	Nov-May	>60	---	High------	High------	Moderate.

See footnote at e

TABLE 17.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
Ph Philo	B	Common	Brief	Jan-May	1.5-3.0	Apparent	Jan-Apr	>60	---------	Moderate	Low	High.
Pt*. Pits, gravel												
Rh Red Hook	C	None to rare	---	---	0.5-1.5	Apparent	Dec-May	>60	---	High	High	Moderate.
RnA, RnB Rhinebeck	D	None	---	---	0.5-1.5	Perched	Dec-May	>60	---	Moderate	High	Low.
ROF*: Rock outcrop.												
Arnot	C/D	None	---	---	1.0-1.5	Perched	Apr-May	10-20	Hard	Moderate	Low	High.
ScB3, ScC3, ScD3 Schoharie	C	None	---	---	1.5-3.0	Perched	Mar-May	>60	---	Moderate	High	Low.
ShC3, ShD3 Schoharie Variant	C	None	---	---	1.5-3.0	Perched	Mar-May	20-40	Hard	Moderate	High	Low.
SyC, SyD, SyE Schuyler	C	None	---	---	1.5-2.0	Perched	Mar-May	>60	---	High	Moderate	Moderate.
Te Teel	B	Common	Brief	Nov-May	0.5-2.0	Apparent	Jan-May	>60	---	High	Moderate	Low.
TuB, TuC Tuller	D	None	---	---	0.5-1.0	Perched	Dec-Jun	10-20	Hard	High	High	High.
UD*. Udorthents												
VaB, VaC, VaD, VEE* Valois	B	None	---	---	3.0-6.0	---	---	>60	---	Moderate	Low	High.
VHF*: Valois	B	None	---	---	3.0-6.0	---	---	>60	---	Moderate	Low	High.
Howard	A	None	---	---	>6.0	---	---	>60	---	Moderate	Low	Low.
VoA, VoB, VoC, VoD Volusia	C	None	---	---	0.5-1.5	Perched	Dec-May	>60	---	High	High	Moderate.
Wk Wallkill	D	Frequent	Long	Nov-Jun	0-0.5	Apparent	Nov-Jun	>60	---	High	Moderate	Moderate.
Wy Wayland	D	Frequent	Brief to long.	Nov-Jun	0-0.5	Apparent	Nov-Jun	>60	---	High	High	Low.

* See description of the map unit for composition and behavior characteristics of the map unit.

pan. Permeability above the fragipan is moderate, and it is slow in the fragipan and substratum. Rooting depth is confined to the zone above the fragipan. Available water capacity is moderate. Runoff is rapid. Organic matter content is low. In unlimed areas the surface layer and upper part of the subsoil are very strongly acid to medium acid.

These soils have poor potential for farming. Most areas are idle, pastured, or in woodland.

These soils are not suited to cultivation. Steep slopes and the hazard of erosion are the main limitations. The slope is too steep for safe use of farm machinery. Droughtiness is a concern in some years because of the rapid rate of runoff. These soils are better suited to permanent plant cover, such as sod crops for pasture.

The soils are suited to pasture, but cover vegetation needs to be maintained and grazing controlled to protect the soil from erosion. Lime and fertilizer are needed to maintain stands and assure growth, but application is difficult because of the steep slope. Droughtiness is a concern in some years. Protection from overgrazing and maintenance of plant cover are the main pasture management needs.

These soils are suited to woodland. On exposed areas, such as logging roads and skid trails, the erosion hazard is severe. Machine planting of seedlings is generally not feasible because of slope.

These soils are limited for most nonfarm uses mainly by slope and, to a lesser extent, slow permeability in the fragipan and substratum and sandstone fragments in the surface layer. Most areas are better suited to reforestation, woodland, wildlife habitat, or natural open areas. Capability subclass VIe.

BuB—Burdett silt loam, 3 to 8 percent slopes. This deep, somewhat poorly drained, gently sloping soil is on lower slopes that receive runoff from higher adjacent soils.

Typically, the surface layer of this soil is dark grayish brown silt loam 8 inches thick. The upper part of the subsoil is mottled, friable, light olive brown silt loam 6 inches thick; the middle part is mottled, friable, grayish brown heavy silt loam 5 inches thick; and the lower part is mottled, firm, dark grayish brown heavy silt loam 13 inches thick. The substratum is firm, grayish brown shaly heavy silt loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of wetter soils in slight depressions and along drainageways. Also included are areas of better drained soils on rises and a few areas of Angola soils where bedrock is within a depth of 40 inches.

In the spring and other excessively wet periods, a seasonal high water table is perched above the lower part of the subsoil. Permeability is moderate in the surface layer and upper part of the subsoil and slow in the lower part of the subsoil and in the substratum. Early in spring, the rooting depth is confined to the upper part of the subsoil, but as the water table recedes some roots extend into the lower part of the subsoil. Available water capacity is moderate to high. Runoff is slow to moderate. Organic matter content is medium to high. In unlimed areas reaction ranges from strongly acid to neutral in the surface layer and upper part of the subsoil.

This soil has fair potential for farming. Cultivated areas are used for row crops in support of dairy operations. Areas near Seneca Lake are used for vineyards.

This soil is moderately well suited to many field crops commonly grown in the area. If this soil is used for cultivated crops, the choice of crops is limited unless adequate drainage is provided. Drainage allows early spring planting. In some areas excess surface water can be removed by diverting runoff from adjacent soils. The soil is suited to tile drainage and open-ditch drainage. Practices that control erosion include stripcropping, contour tillage, and use of cover crops. If the soil is drained, row crops can be grown frequently, but crop residue should be returned to the soil. Keeping tillage to a minimum, tillage at the proper moisture levels, and using a cropping system that includes sod crops help to maintain soil structure and organic matter content.

This soil is moderately well suited to pasture and hay. Prevention of overgrazing and restriction of grazing when the soil is wet are the major concerns of pasture management. This soil compacts easily when wet. Overgrazing and compaction cause loss of pasture plants and usually result in increased runoff. Proper stocking rates to maintain key plant species, rotation of pasture, yearly mowing to help control weeds and brush, and restricted grazing during wet periods are the chief management needs.

This soil is suited to woodland. Equipment use is restricted during excessively wet periods. The surface layer compacts when wet, forming deep ruts.

The perched seasonal high water table and slow permeability in the lower part of the subsoil and in the substratum limit this soil for many nonfarm uses. Capability subclass IIIw.

BuC—Burdett silt loam, 8 to 15 percent slopes. This deep, somewhat poorly drained, sloping soil is on side slopes of valley walls that receive some runoff from higher adjacent soils. Most areas are dissected by intermittent drainageways.

Typically, the surface layer of this soil is dark grayish brown silt loam 6 inches thick. The upper part of the subsoil is mottled, friable, light olive brown heavy silt loam 8 inches thick; the middle part is mottled grayish brown heavy silt loam 5 inches thick; and the lower part is mottled, firm, dark grayish brown silty clay loam 16 inches thick. The substratum is firm, grayish brown shaly heavy silt loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of wetter soils in slight depressions and along drainageways. Also included are small areas of better drained soils and areas of Fremont and Volusia soils near the Glen Creek area.

This soil has a perched seasonal high water table in the upper part of the subsoil during early spring. The water table is perched above the lower part of the subsoil. Permeability is moderate in the surface layer and upper part of the subsoil and slow in the lower part of the subsoil. Early in spring, roots are restricted by the high water table to the upper part of the subsoil, but as the water table recedes they extend into the firm, lower part of the subsoil. Available water capacity is moderate to high. Runoff is moderate to rapid. Organic matter content is medium to high. In unlimed areas reaction ranges from strongly acid to neutral in the surface layer and upper part of the subsoil.

This soil has fair potential for farming. Cultivated areas are used for row crops in support of dairy operations. Areas near Seneca Lake are used for vineyards.

This soil can be used for some field crops commonly grown in the area. If this soil is used for cultivated crops, it needs to be adequately drained and protected from erosion. Wetness delays spring planting and limits use of the soil to short-term crops. In some areas interceptor drains can divert runoff from higher adjacent soils, or tile drainage and sod waterways can be used to remove excess water. Practices that control erosion include stripcropping, contour tillage, and use of cover crops. This soil tends to be cloddy if plowed when wet. Minimum tillage, incorporating crop residue into the soil, and tillage at the proper moisture levels improve soil tilth and increase organic matter content.

This soil is moderately well suited to pasture and hay. It is not suited to early spring grazing and will compact very easily if grazed when the surface is wet. Overgrazing and compaction can cause loss of pasture and result in increased runoff. Proper stocking rates to maintain desired plant species, pasture rotation, yearly mowing to help control weeds and brush, and restricted grazing during wet periods are the chief management needs.

This soil is suited to woodland. Placing logging roads and skid trails on the contour helps control erosion on exposed areas. Equipment use is restricted during excessively wet periods; the surface layer of the soil compacts, forming deep ruts.

Slope, the perched seasonal high water table, and slow permeability in the lower part of the subsoil and in the substratum limit this soil for many nonfarm uses. Capability subclass IIIw.

BuD—Burdett silt loam, 15 to 25 percent slopes. This deep, somewhat poorly drained, moderately steep soil is on side slopes of valley walls that receive runoff from adjacent higher soils. The areas are dissected by intermittent drainageways.

Typically, the surface layer of this soil is dark grayish brown heavy silt loam 5 inches thick. The upper part of the subsoil is mottled, friable, light olive brown heavy silt loam 7 inches thick; the middle part is mottled, friable, grayish brown heavy silt loam 4 inches thick; and the lower part is mottled, firm, dark grayish brown silty clay loam 14 inches thick. The substratum is firm, grayish brown channery heavy silt loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of better drained soils on slightly higher areas. Also included are silty Fremont soils and coarser textured Volusia soils in the Glen Creek area and a few severely eroded areas.

A seasonal high water table is perched above the lower part of the subsoil in early spring. Permeability is moderate in the surface layer and in the upper part of the subsoil and slow in the lower part of the subsoil and in the substratum. Early in the spring, plant roots are confined to the zone above the water table, but as the water table recedes some roots extend into the lower part of the subsoil. Available water capacity is moderate to high. Runoff is rapid. Organic matter content is medium. In unlimed areas reaction ranges from strongly acid to neutral in the surface layer and upper part of the subsoil.

This soil has poor potential for cultivated crops. Most cleared areas are used for pasture or hay. Many areas are wooded.

This soil is poorly suited to cultivated crops because of the hazard of erosion. The use of machinery is difficult and hazardous because of moderately steep slopes. This soil tends to be cloddy if plowed when wet. If the soil is cultivated, incorporating crop residue into the soil, cover crops, crop rotations, and tillage at the proper moisture levels help to maintain tilth and increase organic matter content. The content of organic matter has been depleted as a result of past erosion. In some areas excess water can be removed by diverting runoff from adjacent soils. Sod waterways, contour tillage, and minimum tillage remove excess water and control erosion.

This soil is suited to permanent pasture. Open areas that have satisfactory seedings should be topdressed with lime and fertilizer, but application is difficult because of slope. Grazed areas need a permanent plant cover to prevent further erosion. Proper stocking rates, pasture rotation, yearly mowing to control weeds and brush, and restricted grazing during wet periods are the chief management needs.

This soil is suited to woodland. Placing logging roads and skid trails on the contour where possible helps control erosion. Equipment use is restricted during excessively wet periods.

Moderately steep slopes, the perched seasonal high water table, and the slow permeability in the lower part of the subsoil and in the substratum limit this soil for most nonfarm uses. Capability subclass IVe.

Ca—Canandaigua silt loam. This deep, nearly level or depressional, poorly drained and very poorly drained ed and commonly is more than 30 inches for deep-rooted crops. Available water capacity is moderate to low. Runoff is slow. Organic matter content is low. In unlimed areas the surface layer is very strongly acid to strongly acid.

This soil has good potential for farming. Cultivated areas are used for dry beans, potatoes, or row crops in support of dairy operations. The smaller fan areas are used for hay or pasture. Wooded areas are scattered, quite small, and generally adjacent to streams.

This soil is easy to work and can be cultivated early in spring. It is suited to most crops commonly grown in this region. Deep-rooted perennial crops are especially well suited to the soil. The high content of small stone fragments interferes somewhat with tillage operations and harvesting equipment. This soil tends to be droughty, and the longer sloping areas are subject to erosion if they are intensively cultivated and not protected. The soil is suited to irrigation and generally is easy to keep in good tilth. Incorporating crop residue into the soil, use of cover crops, and minimum tillage improve tilth and maintain organic matter content. Contour tillage and stripcropping help to control erosion and conserve moisture.

This soil is suited to pasture, mainly for early spring grazing. Deep-rooted legumes in the pasture are especially well suited to the soil. The fans that are too small to make cultivation feasible are commonly used for early grazing. This soil tends to be droughty. Plant growth is sparse by midsummer, and care must be taken to prevent overgrazing during dry summer months. Proper stocking rates, pasture rotation, weed control, and adequate applications of lime and fertilizer are the chief management needs.

This soil is suited to woodland. The stone fragments in the surface layer are a limitation for some tree planting equipment.

Possible flooding from tributary streams and the small stone fragments in the surface layer are the main limitations for nonfarm uses. Capability subclass IIs.

Cp—Chippewa silt loam. This deep, poorly drained and very poorly drained, nearly level soil is in depressions, drainageways, and seeps on upland areas that receive runoff from adjacent higher soils. Slope ranges from 0 to 3 percent.

Typically, the surface layer is 15 inches thick. It is very dark grayish brown silt loam in the upper 9 inches and mottled, firm, light brownish gray channery silt loam in the lower 6 inches. The subsoil is a very firm fragipan of mottled, grayish brown channery silt loam 27 inches thick. The substratum is firm, dark gray gravelly loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of somewhat better drained Volusia and Erie soils on slightly higher knolls. Also included are small areas of soils that have a mucky surface layer; thin, silty soils near some drainageways and in depressions; wet pockets of soils that have a less firm and less dense fragipan than this Chippewa soil; and a few large areas of gently sloping Chippewa soils.

This soil has a water table at or near the surface in the spring and during wet periods. The water table is perched above the fragipan, which is slowly permeable or very slowly permeable. Permeability is moderate above the fragipan. The rooting depth is severely restricted by the prolonged high water table and the dense fragipan. Available water capacity is moderate to low. Runoff is intermittently ponded to very slow. Organic matter content is medium to high in the surface layer. In unlimed areas the surface layer and upper part of the subsoil are very strongly acid to slightly acid.

Most of the cleared areas of this soil are pastured. Other areas support water-tolerant shrubs and trees. A few drained areas are used for row crops and hay, and some areas are used for wetland wildlife habitat. This soil has poor potential for cultivated crops and most urban uses.

This soil is suited to selected crops if it is properly managed, drained, and protected from ponding. Undrained areas are too wet for cultivated crops. Where outlets are available, the soil is suited to tile drainage. Open ditches, surface drainage, land shaping, or some combination of these practices with tile drainage is needed to remove water in low pockets. Diversions can be used to intercept runoff from adjacent soils. Cultivating within the proper range of moisture content reduces soil compaction and clodding. Growing cover crops, returning crop residue to the soil, and minimum tillage help to maintain the organic matter content and a friable surface layer. The more sloping areas are subject to erosion if cultivated and not protected. Most areas of this soil are better suited to pasture than to cultivated crops.

The use of undrained open areas is generally limited to pasture. Prevention of overgrazing and restriction of grazing when the soil is wet are the major concerns of pasture management. The surface layer compacts easily and water is ponded on the surface if the soil is grazed when wet. Water-tolerant plant species are needed, and preparation of seedbed and seeding need to be done during the drier summer months, when soil is less likely to be wet. Proper stocking rates, pasture rotation, and yearly mowing to control weeds and brush are the chief pasture management needs.

This soil is suited to water-tolerant trees such as red maple. The soil is generally too wet for machine planting of tree seedlings. Hand planting of seedlings is feasible. The use of heavy machinery during wet periods severely compacts the surface layer.

This soil is limited for many nonfarm uses by prolonged wetness, ponding, and slow or very slow permeability in the fragipan. Capability subclass IVw.

A seasonal high water table in the Hudson soils is perched in the lower part of the subsoil for brief periods in the spring. In the Dunkirk soils the water table is mainly at a depth of more than 6 feet. Permeability in the Dunkirk soils is moderately slow in the lower part of the subsoil and in the substratum. In the Hudson soils it is slow in the subsoil and substratum. Plant roots are not restricted in Dunkirk soils, but in Hudson soils the rooting depth is mostly confined to 2 feet. Available water capacity is high in Dunkirk soils and moderate to high in Hudson soils. Runoff is rapid or very rapid on both soils, and organic matter content is low in both soils. In unlimed areas the surface layer and upper part of the subsoil are strongly acid to neutral in the Dunkirk soils and medium acid to neutral in the Hudson soils.

These soils have very poor potential for farming. They can be used for permanent pasture, and some areas are used for pasture. Many areas are better suited to woodland.

These soils are suitable for long-term pasture. They are not suited to hay or cultivated crops. The soils are very susceptible to further erosion if cultivated. Slopes are generally too steep for safe use of farm machinery. Open areas are suitable for pasture, but renovation, reseeding, and applying fertilizer are difficult. Overgrazing increases the hazards of erosion and gullying. These soils can be grazed early in spring, but droughtiness in midsummer is a limitation. Management practices that maintain stands of protective cover are needed.

These soils are suited to woodland. Hand planting of seedlings is generally needed.

These soils are limited for most nonfarm uses by steep slopes and extreme susceptibility to further erosion and gullying. Excavation of toe slopes can result in mass slumps or slides. Capability subclass VIIe.

ErA—Erie silt loam, 0 to 3 percent slopes. This deep, somewhat poorly drained, nearly level soil is mainly on broad hilltops that receive little or no runoff from adjacent areas.

Typically, the surface layer is very dark grayish brown silt loam 8 inches thick. The subsoil is 37 inches thick. The upper 7 inches of the subsoil is friable, yellowish brown silt loam and mottled, light brownish gray channery silt loam; the lower 30 inches is a firm fragipan of mottled, dark grayish brown channery heavy loam and mottled, dark grayish brown and olive brown channery light silty clay loam. The substratum is olive brown channery silt loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of wetter Chippewa soils in slight depressions and near drainageways. Also included are small convex areas of moderately well drained Mardin soils and areas of soils with a surface layer of channery silt loam.

In the spring and during other excessively wet periods, a seasonal high water table is perched above the fragipan in this soil. Water moves laterally across the top of the fragipan and can be observed in exposures such as road cuts. Depth to the fragipan ranges from 10 to 16 inches. Permeability above the fragipan is moderate, and it is slow in the fragipan and substratum. The rooting zone is confined mainly to the depth to the fragipan. Available water capacity is moderate to low. Runoff is slow. Organic matter content is medium to high. In unlimed areas the surface layer is strongly acid to medium acid and the subsoil is strongly acid to neutral.

This soil has fair potential for farming. Cultivated areas are used for small grains, corn, hay, and pasture. A large acreage of this soil is wooded or idle and is in the Hector land use area.

This soil is suited to most field crops commonly grown in the county. Seasonal wetness is the major limitation. A combination of surface drainage and tile drainage is generally needed, and tile drains are suitable for random drainage of wet spots to allow more uniform use of fields. Keeping tillage to a minimum, tillage at the proper moisture content, incorporating crop residue into the soil, using cropping systems that include sod crops, and using a winter cover crop help to maintain tilth and increase organic matter content.

This soil is suited to pasture, mainly a mixture of grasses and water-tolerant legumes. Prevention of overgrazing and restriction of grazing when the soil is wet are the major concerns of pasture management. Overgrazing causes loss of pasture; grazing when the soil is wet compacts the surface layer. The main pasture management needs include applications of lime and fertilizer, proper stocking rates, pasture rotation, and yearly mowing to help control weeds.

This soil is suited to woodland. Machine planting of tree seedlings is practical on large areas of this soil. Heavy equipment used during wet periods severely compacts the surface layer.

The main limitations for nonfarm uses of this soil are the perched seasonal high water table and the slowly permeable fragipan. Capability subclass IIIw.

ErB—Erie silt loam, 3 to 8 percent slopes. This deep, somewhat poorly drained, gently sloping soil is on upland areas that receive runoff from higher adjacent soils.

Typically, the surface layer is dark brown silt loam 3 inches thick. The subsoil is 42 inches thick. The upper 12 inches of the subsoil is friable, yellowish brown silt loam and mottled, light brownish gray channery silt loam; the lower 30 inches is a firm fragipan of mottled, dark grayish brown channery heavy loam and mottled, dark grayish brown and olive brown channery light silty clay loam. The substratum is olive brown channery silt loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of wetter Chippewa soils in slight depressions and near drainageways. Also included are better drained Mardin soils on slight rises or knolls, finer textured Appleton the major concern of pasture management. Topdressing the soil with lime and fertilizer, maintaining a permanent plant cover to prevent erosion, use of proper stocking rates, rotation of pastures, and yearly mowing to help control brush and weeds are the chief management needs.

This soil is suited to woodland. Logging roads and skid trails placed on the contour where possible help to reduce the erosion hazard.

The main limitations of this soil for nonfarm uses are slope and the slow permeability of the substratum. The seasonal high water table in early spring is a limitation for some uses. Capability subclass IIIe.

LnD—Lansing gravelly silt loam 15 to 25 percent slopes. This deep, well drained, moderately steep soil is on valley sides and hillsides on uplands. The areas receive runoff from higher adjacent soils.

Typically, the surface layer is dark grayish brown gravelly silt loam 5 inches thick. The subsurface layer is very friable, brown silt loam 2 inches thick. The next layer is 6 inches thick. It is a mixture of the subsurface layer and the subsoil and consists of friable, pale brown gravelly silt loam. The subsoil is friable and firm, brown gravelly silt loam 21 inches thick. The substratum is firm, dark grayish brown gravelly loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of wetter Conesus soils on toe slopes. Also included are small areas of soils with a nongravelly surface layer, small areas of eroded soils, small areas of soils with slopes of more than 25 percent, and a few areas of soils that have bedrock within 40 inches of the surface.

A seasonal high water table is at a depth of 3 to 6 feet in this soil for brief periods in early spring. Permeability is moderate in the surface layer and subsoil and slow in the substratum. Root growth is restricted by the substratum. Available water capacity is moderate to high. Runoff is rapid. Organic matter content is low. In unlimed areas the surface layer is strongly acid to slightly acid.

This soil has poor potential for farming. Many areas are used for small grains, hay, or pasture. Areas near Seneca Lake are primarily used for grapes and other small fruits.

This soil is poorly suited to cultivated crops. The operation of farm equipment is difficult and hazardous because of slope, and the hazard of erosion is severe. If this soil is cultivated, a protective plant cover needs to be maintained for as long as possible and management practices such as minimum tillage, use of cover crops, and return of crop residue to the soil are needed to improve tilth and control runoff. If slope permits, contour tillage and stripcropping can be used to control erosion.

This soil is suited to pasture, especially for early-season grazing. It is well suited to deep-rooted legumes as part of the seeding mixture. Plowing across the slope and leaving strips of sod help to control runoff and erosion. Periodic renovation to reestablish seeding, additions of lime and fertilizer, prevention of overgrazing, use of proper stocking rates, rotation of pastures, and yearly mowing to help control weeds and brush are the major pasture management needs.

This soil is suited to woodland. Logging roads and skid trails placed on the contour where possible help to reduce runoff and erosion.

The main limitations of this soil for nonfarm uses are the slow permeability of the substratum and slope. The seasonal high water table in early spring is a limitation for some uses. Capability subclass IVe.

LoB—Lordstown channery silt loam, 3 to 8 percent slopes. This gently sloping, well drained soil is on hilltops and ridges at the highest elevations in the county.

Typically, the surface layer is dark grayish brown channery silt loam 6 inches thick. The subsoil is friable, channery silt loam 18 inches thick. It is yellowish brown in the upper 6 inches and brownish yellow in the lower 12 inches. The substratum is pale brown very channery silt loam 6 inches thick. Fine-grained sandstone bedrock is at a depth of 30 inches.

Included with this soil in mapping are small areas of somewhat poorly drained Tuller soils in slight depressions and along drainageways. Also included are a few spots of Arnot soils that have bedrock at a depth of less than 20 inches and small areas of deeper Bath soils.

The depth to bedrock in this soil is 20 to 40 inches. Permeability is moderate in the subsoil and substratum. The rooting depth is determined by the depth to bedrock. Available water capacity is moderate to low. Runoff is moderate. Organic matter content is low. In unlimed areas the surface layer and subsoil are commonly very strongly acid to medium acid.

This soil has good to fair potential for farming. Many areas are idle or in woodland.

This soil is suited to cultivated crops that tolerate a short growing season. Tillage and cultivation are limited in places by small stone fragments in the surface layer. The soil tends to be droughty, and crops that mature early in the year are more dependable. Frequent applications of lime and fertilizer, minimum tillage, use of cover crops, incorporating crop residue into the soil, contour tillage, and mulching are needed to improve tilth, conserve moisture, and control the erosion hazard.

This soil is suited to pasture, particularly for early-spring grazing. Plant growth is very slow by midsummer, and care must be taken to prevent overgrazing in that period. Proper stocking rates, pasture rotation, weed and brush control, and adequate applications of lime and fertilizer are the chief pasture management needs.

This soil is suited to woodland. Machine planting of tree seedlings is practical on large areas of this soil.

This soil is limited for many nonfarm uses by the moderate depth to bedrock. Capability subclass IIe.

gray silty clay to a depth of 45 inches and brown and gray silty clay loam at a depth of more than 45 inches.

Included with this soil in mapping are small areas of slightly better drained Rhinebeck soils on rises and benches. Also included are small areas of Canandaigua soils, areas of soils where the subsoil is underlain by loamy glacial till, and small areas of soils that have a mucky surface layer.

This soil has a high water table at or near the soil surface for prolonged periods. Water is often ponded on the surface early in spring and in other excessively wet periods. Permeability is slow in the subsoil and slow or very slow in the substratum. The rooting depth is mainly confined to the upper part of the subsoil and is restricted by the prolonged high water table and the firm, clayey subsoil. Available water capacity is high. Runoff is intermittently ponded to very slow. Organic matter content is high in the surface layer. In unlimed areas the surface layer is medium acid to neutral.

Most areas of this soil are idle or support water-tolerant shrubs and trees. The cleared areas are used for low-grade pasture and grasses. This soil has poor to fair potential for farming and urban uses; it has better potential for wildlife habitat, ponds, and natural open areas.

This soil is suited to cultivated crops if it is drained and protected from ponding; undrained areas are too wet for crops. A combination of surface and tile drainage is needed on this soil. Because of the slow permeability, drains need to be close to each other. The main limitation for drainage is a lack of adequate outlets. If the soil is cultivated when wet, hard clods or crusts form at the surface; if the soil is cultivated when dry, seed germination and crop growth are poor. Minimum tillage, using cover crops, and incorporating crop residue into the soil help to maintain the organic matter content and tilth.

This soil is suited to pasture. Undrained areas cannot be grazed in spring because of the likely damage to the surface layer. Overgrazing and compaction of the surface layer cause a loss of desired plant species and ponding on the surface layer. Partial drainage, proper stocking rates, pasture rotation, yearly mowing to help control brush and weeds, and restricted grazing when the soil is wet are the major pasture management needs.

This soil is suited to water-tolerant trees such as red maple and eastern hemlock. The use of logging equipment is restricted during excessively wet periods. Planting of tree seedlings should be delayed until the water table recedes.

The main limitations for most nonfarm uses of this soil are the high water table and the slowly permeable subsoil. Some areas are suitable for wetland wildlife habitat. Capability subclass IVw.

MrB—Mardin channery silt loam, 3 to 8 percent slopes. This deep, moderately well drained, gently sloping soil is in convex areas on uplands. The areas receive runoff from adjacent soils.

Typically, the surface layer is dark grayish brown channery silt loam 8 inches thick. The subsoil is 43 inches thick. The upper 10 inches of the subsoil is yellowish brown, friable channery silt loam and light olive brown channery loam; the middle 3 inches is mottled, light brownish gray channery silt loam; the lower 30 inches is a very firm fragipan of olive brown gravelly loam. The substratum is very firm, olive brown very gravelly loam to a depth of more than 60 inches.

Included with this soil in mapping are small areas of somewhat poorly drained Volusia soils in slight depressions and along drainageways. Also included are small areas of better drained Bath soils on slight rises and knolls, areas of Schuyler soils, and a few areas of soils that have bedrock within 40 inches of the surface.

In spring and other excessively wet periods, a seasonal high water table is perched above the fragipan in this soil. Depth to the fragipan ranges from 14 to 26 inches. Permeability is moderate above the fragipan and slow and very slow in the fragipan and substratum. Roots are mostly confined to the zone above the fragipan. Available water capacity is moderate to low. Runoff is moderate. Organic matter content is low to medium. In unlimed areas the surface layer and upper part of the subsoil are extremely acid to slightly acid.

This soil has good potential for farming. Cultivated areas are used for small grains, corn, and hay. Most of the acreage of the soil is cultivated or in small woodlots.

This soil is suited to cultivated crops commonly grown in the area. The surface layer contains many flat stone fragments that hinder tillage and harvesting operations but that do not prevent cultivation. Large applications of lime are needed to establish and grow legumes. This soil is not suited to continuous cultivation. Contour tillage, stripcropping, use of cover crops, and using diversions to break long slopes help to control runoff and erosion. Drainage of wetter included soils by random tile drains allows early planting and more uniform field management. Minimum tillage, cover crops, incorporating crop residue into the soil, and mulching are needed to increase water infiltration during the growing season and to maintain tilth.

This soil is suited to pasture. Prevention of overgrazing and restriction of grazing when the soil is wet are the main pasture management concerns. The soil compacts if grazed when wet. Overgrazing and compaction of the surface layer restrict plant growth and increase runoff. Measures are needed to increase infiltration, mainly during the growing season. Adequate applications of lime and fertilizer, proper stocking rates, pasture rotation, and yearly mowing to help control brush and weeds are the main management needs.

This soil is suited to woodland. Machine planting of tree seedings is feasible in open areas.

The main limitations for nonfarm uses of this soil are the temporary seasonal high water table and the slow or very slow permeability of the fragipan and substratum. Capability subclass IIw.

MrC—Mardin channery silt loam, 8 to 15 percent slopes. This deep, moderately well drained, sloping soil is in convex or long, smooth areas that receive runoff from higher adjacent soils.

Typically, the surface layer is dark grayish brown channery silt loam 5 inches thick. The subsoil is 44 inches thick. The upper 10 inches of the subsoil is yellowish brown, friable channery silt loam and light olive brown channery loam; the middle 3 inches is mottled, light brownish gray channery silt loam; the lower 31 inches is a very firm fragipan of olive brown gravelly loam. The substratum is very firm, olive brown very gravelly loam to a depth of more than 60 inches.

Included with this soil in mapping are small areas of somewhat poorly drained Volusia soils along drainageways. Also included are areas of Schuyler soils in the southwestern part of the county, better drained Bath soils, and soils that have bedrock at a depth of less than 40 inches.

A seasonal high water table is perched above the fragipan of this soil in the spring and other excessively wet periods. Depth to the fragipan ranges from 14 to 26 inches. Permeability is moderate above the fragipan and slow or very slow in the fragipan and substratum. The rooting depth is mostly confined to the zone above the fragipan. Available water capacity is moderate to low. Organic matter content is low to medium. Runoff is moderate to rapid. In unlimed areas the surface layer and upper part of the subsoil are extremely acid to slightly acid.

This soil has fair potential for farming. Most of the acreage is in pasture, hay, or woodland. Cultivated areas are used for small grains or corn.

This soil is suited to general row crops if erosion and runoff are controlled. The surface layer contains many flat stone fragments that hinder tillage and harvesting equipment, and the moisture content is inadequate for plants during dry periods. Contour tillage, stripcropping, use of cover crops, and keeping tillage to a minimum reduce erosion, conserve moisture, and maintain tilth. Diversions are needed to help break up long slopes and divert runoff from other areas. Areas where conservation practices cannot be applied are better suited to deep-rooted legumes. Large applications of lime and fertilizer are needed to maintain legume stands and increase plant growth.

This soil is suited to pasture. Overgrazing reduces plant growth, and grazing when the soil is wet compacts the surface layer. Both result in increased runoff and erosion. Applications of lime and fertilizer are required to assure good growth of legumes and other grass mixtures. Measures that increase infiltration, particularly during the dry summer months, are needed. Proper stocking rates, pasture rotation, yearly mowing to control weeds and brush, and restricted grazing when the soil is wet are the chief management needs.

This soil is suited to woodland. Placing logging roads on the contour where possible helps to control runoff and erosion.

The main limitations for most nonfarm uses of this soil are the seasonal high water table, the slow or very slow permeability of the fragipan, and slope. Capability subclass IIIe.

MrD—Mardin channery silt loam, 15 to 25 percent slopes. This deep, moderately well drained, moderately steep soil is in narrow, oblong areas on side slopes of a dissected plateau. The areas receive runoff from higher adjacent soils.

Typically, the surface layer is dark grayish brown channery silt loam 4 inches thick. The subsoil is 42 inches thick. The upper 10 inches of the subsoil is yellowish brown, friable channery silt loam and light olive brown channery loam; the middle 3 inches is mottled, light brownish gray channery silt loam; the lower 29 inches is a very firm fragipan of olive brown channery silt loam. The substratum is very firm, olive brown very gravelly loam to a depth of more than 60 inches.

Included with this soil in mapping are small areas of somewhat poorly drained Volusia soils along drainageways and at the base of slopes where seepage water comes to the surface. Also included are areas of finer textured Schuyler soils in the southwestern part of the county and small areas of severely eroded soils.

In spring a seasonal high water table is perched above the fragipan of this soil. The fragipan is at a depth of 14 to 26 inches. Permeability is moderate above the fragipan and slow or very slow in the fragipan and substratum. The rooting depth is restricted to the zone above the fragipan. Runoff is rapid. Available water capacity is moderate to low. Organic matter content is low to medium. In unlimed areas the surface layer and upper part of the subsoil are extremely acid to slightly acid.

This soil has fair to poor potential for farming. It is used for hay, pasture, and woodland.

This soil is limited for cultivated crops by slope, rapid runoff, and the hazard of erosion. The use of farm machinery is difficult and hazardous. The soil is not suited to frequent cultivation. Minimum tillage, use of cover crops, and diversions that break up long slopes and divert excess runoff are needed to control erosion and increase water infiltration during the growing season. If slopes permit, contour tillage and stripcropping are suitable for this soil. Difficulty in tilling this soil and the hazard of erosion make long-term sod crops more practical than other crops. Large amounts of lime and fertilizer are needed to maintain good plant growth.

This soil is suited to pasture. The natural fertility is low; therefore, lime and fertilizer are necessary to maintain productivity. Plowing across the slope and leaving strips of sod help to control erosion and increase infiltration during the reseeding process. Prevention of overgrazing, proper stocking rates, pasture rotation, restricted grazing when the soil is wet, and yearly mowing to help control weeds and brush are the major pasture management requirements.

This soil is suited to woodland. Placing logging roads and skid trails on the contour where possible helps to reduce the erosion hazard.

This soil is limited for most nonfarm uses by the slow or very slow permeability of the fragipan and substratum, the moderately steep slopes, and seasonal wetness. Capability subclass IVe.

OCF—Ochrepts-Orthents complex, very steep. This complex consists of deep, somewhat excessively drained, unconsolidated soil material in areas dissected by deep, steep-sided streams. In many areas this material is very thick, as much as 8 to 10 feet, but it is as thin as 4 feet where the streams have cut into bedrock. Slopes are commonly near 100 percent but range from 35 to 100 percent. The soil has a tendency to slip or slump downslope, especially where the stream undercuts the soil deposit. The Ochrepts and Orthents make up about equal parts of this unit and are so intermingled that it was not practical to map them separately. A few small areas in this unit have rock outcrop ledges and spots where the soil material is less than 4 feet thick.

These soils have undergone very little development and vary from place to place in the texture and types of layers in the soil. The soils in this complex have little or no potential for farming or other uses. Capability subclass VIIIs.

OdA—Odessa silt loam, 0 to 3 percent slopes. This deep, somewhat poorly drained, nearly level soil is in areas of former glacial lakes. The areas receive runoff from higher adjacent soils.

Typically, the surface layer is very dark grayish brown silt loam 9 inches thick. The subsurface layer is mottled, friable, brown silt loam 3 inches thick. The upper 4 inches of the subsoil is mottled, firm, reddish brown silty clay loam. The lower 12 inches of the subsoil is mottled, firm, dark reddish gray silty clay. The substratum is firm, dark reddish gray and dark grayish brown silty clay loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of wetter Madalin soils along drainageways. Also included are spots of better drained Schoharie soils on slight rises and knolls and small areas of Collamer soils.

A seasonal high water table is perched in the upper part of the subsoil of this soil in the spring and other excessively wet periods. Permeability is slow or very slow in the subsoil and very slow in the substratum. The rooting depth is restricted by the seasonal high water table and the firm, clayey subsoil. Most roots are confined to a depth of 20 inches. Available water capacity is moderate to high. Runoff is slow. Organic matter content is medium to high. In unlimed areas the surface layer is medium acid to neutral and the subsoil is medium acid to mildly alkaline.

This soil has fair potential for farming. In some areas cultivated crops such as small grains, corn, and hay are grown in support of dairy farming.

This soil is suited to cultivated crops. Unless the soil is drained, planting is delayed in the spring and the choice of crops is restricted. Removing excess water, maintaining tilth, and diverting runoff from surrounding soils are the main management concerns. Because this soil has very slow internal drainage, a system of closely spaced tile drains or a combination of surface and tile drainage is needed. This soil is somewhat sticky when wet and hard when dry. Good tilth is difficult to maintain. If the soil is worked when wet, the surface becomes cloddy and crusty. Plowing at the proper moisture content, using cover crops, incorporating crop residue into the soil, and minimum tillage help to maintain tilth.

This soil is suited to late spring pasture or summer pasture when the soil is not wet. Prevention of overgrazing and restriction of grazing when the soil is wet are the major pasture management concerns. This soil compacts if grazed during excessivly wet periods. Undrained areas are better suited to forage crops, such as birdsfoot trefoil, which tolerate wetness. Proper stocking rates, pasture rotation, and yearly mowing to help control weeds and brush are the chief management needs.

This soil is suited to woodland. The use of heavy equipment during excessively wet periods causes compaction.

This soil is limited for many nonfarm uses by the seasonal high water table, the slow or very slow permeability of the subsoil, and the clayey subsoil. Capability subclass IIIw.

OdB—Odessa silt loam, 3 to 8 percent slopes. This deep, somewhat poorly drained, gently sloping soil is in slightly convex areas in former glacial lake plains. The areas receive runoff from higher adjacent soils.

Typically, the surface layer is very dark grayish brown silt loam 8 inches thick. The subsurface layer is friable, brown silt loam 4 inches thick. The subsoil is 16 inches thick. The upper 4 inches of the subsoil is mottled, firm, reddish brown silty clay loam; the lower 12 inches is mottled, firm, dark reddish gray silty clay. The substratum is firm, dark reddish gray and dark grayish brown silty clay loam to a depth of 60 inches or more.

Included with this soil in mapping are spots of wetter soils in slight depressions and along drainageways. Also included are areas of better drained Schoharie soils on slight rises and knolls, small areas of better drained Collamer soils, and areas of eroded soils.

In spring and other excessively wet periods, the water table in this soil is perched in the upper part of the subsoil. Permeability is slow or very slow in the subsoil and very slow in the substratum. The rooting depth is upper part of the subsoil is friable, brown very gravelly loam 12 inches thick; the lower part is firm, dark brown very gravelly silt loam 9 inches thick. The substratum is dark yellowish brown, stratified sand and gravel to a depth of 60 inches or more.

Included with these soils in mapping are small areas of soils that are more sandy than these Valois or Howard soils. Also included are Bath soils which have a dense fragipan and small areas of soils underlain by silty or clayey deposits.

The seasonal high water table in this unit is generally at a depth of more than 3 feet. Permeability is moderate in the subsoil of the Valois soils and moderate or moderately rapid in the subsoil of the Howard soils. Plant roots are not restricted, but the rooting depth is mainly 3 feet. Available water capacity is moderate in the Valois soils and moderate to low in the Howard soils. Runoff is rapid to very rapid. Organic matter content is low. In unlimed areas the surface layer is very strongly acid to strongly acid in the Valois soils and medium acid to neutral in the Howard soils.

These soils have very poor potential for farming. Most areas are wooded.

This unit is too steep for most uses other than woodland and recreation. Farm equipment cannot be operated safely, and the hazard of erosion is very severe. A protective vegetative cover is needed at all times to control erosion. Pasture improvement is very difficult.

These soils are suited to woodland. They are too steep to allow feasible planting of tree seedlings by machine.

In urban areas this unit is suited to use as natural open areas. Capability subclass VIIe.

VoA—Volusia channery silt loam, 0 to 3 percent slopes. This deep, somewhat poorly drained, nearly level soil commonly is on hilltops. Some lower areas of this soil receive runoff from higher adjacent soils.

Typically, the surface layer is dark grayish brown channery silt loam 9 inches thick. The subsoil is mottled, friable, pale brown channery silt loam 3 inches thick. The next layer is light grayish brown channery silt loam 2 inches thick. This is underlain by a very firm fragipan of mottled, dark grayish brown channery silt loam 34 inches thick. The substratum is firm, dark grayish brown channery silt loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of wetter Chippewa soils in slight depressions and along drainageways. Also included are areas of Fremont soils, Erie soils, and soils where bedrock is within 40 inches of the surface.

This soil has a seasonal high water table perched above the fragipan in the spring and other excessively wet periods. The water moves laterally across the top of the fragipan and can be observed seeping from exposures such as roadcuts. Depth to the fragipan ranges from 10 to 16 inches. Permeability above the fragipan is moderate and in the fragipan is slow or very slow. The rooting depth is confined mainly to the zone above the fragipan. Available water capacity is low to moderate. Runoff is slow. Organic matter content is medium to high in the surface layer. In unlimed areas the surface layer and upper part of the subsoil are very strongly acid to slightly acid.

This soil has fair potential for farming. Cultivated areas are used for small grains, corn for silage, or hay. Many areas are in pasture. The remaining areas are idle or in woodland, and a large portion of the idle land is being planted to conifer plantations.

Undrained areas of this soil are limited to short-season crops or crops that can withstand seasonal wetness. With drainage, this soil is suited to many crops grown in the area. Some areas can be improved by diverting runoff from adjacent higher soils. In other areas a more complete drainage system, including some combination of open-ditch and tile drainage, is required. A patterned drainage system is generally not feasible because the slow internal drainage requires very close spacing of drains to be effective. Some fields can be partially improved by tile drainage of included wet spots. Tillage at the proper moisture content, fall plowing, using cover crops and minimum tillage, and incorporating crop residue into the soil are practices that help to maintain tilth and increase organic matter content. Liberal applications of lime and fertilizer are needed on this soil. Small stone fragments in the surface layer limit some tillage and harvesting operations.

This soil is suited to summer pasture. Prevention of overgrazing and restriction of grazing when the soil is wet are the major pasture management concerns. This soil compacts if grazed during excessively wet periods. Proper stocking rates, pasture rotation, yearly mowing to help control brush and weeds, and topdressing with lime and fertilizer are needed for pasture management.

This soil is suited to woodland. The use of heavy equipment during excessively wet periods severely compacts the surface layer.

This soil is limited for most nonfarm uses by the seasonal high water table and the very slow or slow permeability of the fragipan and substratum. Small stone fragments in the surface layer limit some uses. Many areas are excellent sites for dugout ponds. Capability subclass IIIw.

VoB—Volusia channery silt loam, 3 to 8 percent slopes. This deep, somewhat poorly drained, gently sloping soil is on concave uplands that receive little runoff and on lower toe slopes that receive large amounts of runoff from adjacent soils.

Typically, the surface layer is dark grayish brown channery silt loam 6 inches thick. The subsoil is mottled, friable, pale brown channery silt loam 4 inches thick. The next layer is mottled, firm, light grayish brown channery silt loam 3 inches thick. This is underlain by a very firm fragipan of mottled, dark grayish brown channery silt loam 35 inches thick. The substratum is firm, dark grayish brown channery silt loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of wetter Chippewa soils in slight depressions and along drainageways. Also included are small areas of better drained Mardin soils on slight rises and convex knolls, areas of finer textured Fremont soils, and a few small areas of soils that have bedrock within 40 inches of the surface.

In the spring and other excessively wet periods, a seasonal high water table is perched above the fragipan. The water moves laterally on top of the fragipan and can be observed seeping from exposures such as roadcuts. Depth to the fragipan ranges from 10 to 16 inches. Permeability is moderate above the fragipan and slow or very slow in the fragipan. The rooting depth is restricted to the zone above the fragipan. Available water capacity is low to moderate. Runoff is moderate. Organic matter content is medium to high in the surface layer. In unlimed areas the surface layer and upper part of the subsoil are very strongly acid to slightly acid.

This soil has fair potential for farming. Cultivated areas are used for small grains, corn for silage, or hay. Some areas are in pasture, and some are idle or in woodland. Most of the idle land is reverting to woodland or is being planted to conifer plantations (fig. 8).

If this soil is used for cultivated crops, it needs to be heavily limed and fertilized, effectively drained, and protected from erosion. With drainage, it is suited to many crops commonly grown in the area, but plant growth is limited during long dry periods. Response to tile drainage is limited. Drains generally need to be closely spaced. Many areas can be improved by interceptor drains that divert excess runoff from adjacent higher soils. Random drains for the included wetter soils allow more uniform management of some fields. Measures that help to control erosion are contour tillage, using diversions, stripcropping, minimum tillage, and using cover crops. These practices plus plowing at the proper moisture content, returning crop residue to the soil, and using sod crops in the cropping system help to maintain tilth, increase organic matter content, and conserve moisture. Small stone fragments in the surface layer limit some tillage operations.

This soil is suited to summer pasture. Prevention of overgrazing and restriction of grazing when the soil is wet are the major pasture management concerns. This soil compacts if grazed during excessively wet periods. Overgrazing and compaction of the surface layer restrict plant growth and increase runoff. Proper stocking rates, pasture rotation, yearly mowing to help control weeds, and applications of lime and fertilizer are major management needs.

This soil is suited to woodland. Machine planting of tree seedlings is practical in open areas of this soil. The use of heavy logging equipment is restricted during excessively wet periods.

This soil is limited for many nonfarm uses by the seasonal high water table and the very slow or slow permeability of the fragipan and substratum. Small stone fragments in the surface layer limit some uses. Some areas are good sites for diked ponds. Capability subclass IIIw.

VoC—Volusia channery silt loam, 8 to 15 percent slopes. This deep, somewhat poorly drained, sloping soil is on lower hillsides and toe slopes that receive runoff from higher adjacent soils.

Typically, the surface layer is grayish brown channery silt loam 4 inches thick. The subsoil is mottled, friable, pale brown channery silt loam 5 inches thick. The next layer is mottled, firm, light grayish brown channery silt loam 3 inches thick. This is underlain by a very firm fragipan of mottled, dark grayish brown channery silt loam 36 inches thick. The substratum is dark grayish brown channery silt loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Chippewa soils where seepage water comes to the surface. Also included are small areas of moderately well drained soils on ridges, small areas of Fremont soils on toe slopes, and spots of soils that have bedrock within 40 inches of the surface.

In the spring and other excessively wet periods, a seasonal high water table is perched above the fragipan of this soil. The water commonly moves downslope across the top of the fragipan. Depth to the fragipan ranges from 10 to 16 inches. Permeability is moderate above the fragipan and very slow or slow in the fragipan. The rooting depth is confined to the zone above the fragipan. Available water capacity is low to moderate. Runoff is rapid. Organic matter content is medium to high in the surface layer. In unlimed areas the surface layer and upper part of the subsoil are very strongly acid to slightly acid.

This soil has fair to poor potential for farming. Most areas are idle or are farmed at a low level of intensity. Some large areas are wooded.

This soil is limited for cultivated crops by runoff and erosion. Plant growth is limited by a lack of moisture during long dry periods in midsummer. Many areas of this soil are better suited to hay than to row crops. Wetness delays spring planting, and undrained areas need short-term crops or water-tolerant crops. Measures that help to control erosion are contour tillage, using diversions to break up long slopes, stripcropping, using sod crops in the cropping system, minimum tillage, establishing sod waterways, and using cover crops. Wetness can be controlled by diverting runoff from adjacent soils and by using tile drains for random drainage of wet pockets and as interceptor drains to divert subsurface seepage. Minimum tillage, tillage at proper moisture rel, using cover crops, and incorporating crop residue o the soil help to maintain tilth, conserve moisture, and increase organic matter content. Crops need liberal mounts of lime and fertilizer. Small stone fragments in e surface layer limit some tillage operations.

This soil is suited to summer pasture. Prevention of overgrazing and restriction of grazing when the soil is et are the major pasture management concerns. Grazg when the soil is wet compacts the surface layer, and overgrazing reduces plant growth. Both cause increased runoff and erosion. Growth of plants in some areas is nited during dry periods. Topdressing with lime and rtilizer, proper stocking rates, pasture rotation, and yearly mowing to help control weeds are the main management needs.

This soil is suited to northern hardwoods. Placing logging roads and skid trails on the contour reduces gullying.

This soil is limited for most nonfarm uses by the seaonal high water table, very slowly or slowly permeable fragipan and substratum, and slope. Small stone fragments in the surface layer limit some uses. Capability ubclass IIIe.

VoD—Volusia channery silt loam, 15 to 25 percent slopes. This deep, somewhat poorly drained, moderately teep soil is on concave lower valley walls and hillsides hat receive runoff from higher adjacent soils.

Typically, the surface layer is grayish brown channery silt loam 3 inches thick. The subsoil is mottled, friable, ale brown channery silt loam 5 inches thick. The next layer is mottled, firm, light grayish brown channery silt loam 3 inches thick. This is underlain by a very firm ragipan of mottled, dark grayish brown channery silt oam 35 inches thick. The substratum is dark grayish brown channery silt loam to a depth of 60 inches or more.

Included with this soil in mapping are small wet pockets of Chippewa soils where seepage water comes to the surface. These areas are indicated on the map by a spot symbol. Also included are small areas of finer textured Fremont soils and better drained Mardin soils.

In the spring and other excessively wet periods, this soil has a seasonal high water table perched above the fragipan. The water moves laterally across the top of the fragipan. Depth to the fragipan ranges from 10 to 16 inches. Permeability is moderate above the fragipan and very slow or slow in the fragipan. The rooting depth is confined to the zone above the fragipan. Available water capacity is low to moderate. Runoff is rapid. Organic matter content is medium in the surface layer. In unlimed areas the surface layer is strongly acid to slightly acid.

This soil has poor potential for farming. Most cleared areas are used for hay or pasture or are idle. Many areas are forested.

This soil is poorly suited to cultivated crops. The hazard of erosion and seasonal wetness are the main limitations. The soil is not suited to frequent cultivation; it requires practices such as diverting runoff, contour tillage, minimum tillage, use of cover crops, incorporating crop residue into the soil, and tillage at the proper moisture content to maintain tilth, increase organic matter content, and control runoff and erosion. The operation of farm machinery is limited by slope and small stone fragments in the surface layer. Large amounts of lime and fertilizer are needed on this soil to maintain plant growth.

This soil is suited to pasture, but it must be adequately limed and fertilized, and periodic tillage to reestablish the forage seeding and to incorporate lime and fertilizer is necessary. Plowing across the slope and leaving strips of sod help to control erosion. Controlled grazing, proper stocking rates, pasture rotation, restricted grazing during wet periods, and yearly mowing to help control brush and weeds are major pasture management requirements.

This soil is suited to woodland. Placing logging roads and skid trails on the contour help control erosion. The use of equipment is restricted during excessively wet periods.

This soil is limited for many nonfarm uses by the seasonal high water table, very slow or slow permeability of the fragipan, and slope. Capability subclass IVe.

Wk—Wallkill silt loam. This deep, very poorly drained, nearly level soil is in areas on flood plains. Slope ranges from 0 to 3 percent but is mostly less than 2 percent.

Typically, the surface layer of this soil is very dark grayish brown silt loam 5 inches thick. The subsoil is mottled, dark gray silt loam 11 inches thick. The next layer is mottled, black silt loam 2 inches thick. This is underlain by black, well decomposed organic material 20 inches thick. The substratum is very dark gray silt loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Wayland soils that are not underlain with organic material.

The water table in this soil is at or near the surface much of the year. The level of the water table is controlled by the adjacent streams and nearby Seneca Lake. This soil is subject to periodic flooding. Permeability is moderate in the subsoil and moderately rapid to rapid in the organic material. The rooting depth is determined by the depth to the water table but is mainly restricted to the upper part of the subsoil. Available water capacity is high. Runoff is slow to occasionally ponded. Organic matter content is high. In unlimed areas the surface layer and subsoil are slightly acid to neutral.

This soil has poor potential for farming. It has better potential for wetland wildlife habitat and natural open areas. Most areas of the soil support water-tolerant grasses and shrubs.

Undrained areas of this soil are too wet for cultivated crops or hay. If wetness is controlled, the soil is well suited to intensive cropping, but suitable outlets general-

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SOIL SURVEY

Ontario and Yates Counties
New York

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UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service
In cooperation with
CORNELL UNIVERSITY AGRICULTURAL EXPERIMENT STATION

24 to 40 inches thick above silt or clay. It occupies low-lying areas in the sandy region north of Geneva and is associated with the well-drained Ottawa soils, the moderately well drained Berrien soil, and the poorly drained Morocco soil. It resembles the poorly drained Morocco soil but is not so deep above the clay.

Typical profile of Allendale fine sandy loam under forest:

A_0 Organic mat of black decomposed leaves and twigs bound together by fine roots; 1 to 3 inches thick.

A_1 0 to 4 inches, black (10YR 2/1) fine sandy loam; strong medium crumb structure; friable when moist, nonplastic when wet; high in organic matter and matted with fine roots; medium acid; 3 to 6 inches thick.

G_1 4 to 12 inches, light brownish-gray (10YR 6/2) fine sand with low-contrast mottlings of yellowish brown (10YR 5/4); structureless; moderately dense in place; breaks into large angular blocks when moist, very friable when dry; contains small- and medium-sized roots; medium acid, 6 to 12 inches thick.

G_2 12 to 30 inches, yellowish-brown (10YR 5/6) fine sand with low-contrast mottlings of brown (7.5YR 5/4); structureless; firm when moist, nonplastic when wet; contains a few medium-sized roots; low water-holding capacity but wet until late in the season; medium acid; 14 to 28 inches thick.

CG 30 to 36 inches, pinkish-gray fine and medium sand with brown and yellowish-brown stains; medium acid to neutral; 0 to 16 inches thick.

D 36 inches +, pinkish-gray (7.5YR 6/2) silt or clay with moderate-contrast mottlings of yellowish brown (10YR 5/4); dense in place and breaks out in large irregular blocks; firm when moist, slightly plastic when wet; contains very few roots; lies below the permanent water table; neutral to slightly calcareous.

The profile of this soil is not so acid as those of soils on deeper sands in the same area. Normally it is only medium acid. In some places the entire soil from the surface downward may be nearly neutral.

Allendale fine sandy loam, 0 to 2 percent slopes (Ab).—This sandy soil is too wet for most crops unless it has been drained artificially. Drainage can be improved by open ditches, or by tile if the clay is not too near the surface.

Most of the undrained areas are in second-growth forest or brush. Where drainage has been improved enough, the soil can be used for pasture, hay, corn, and some vegetable crops or small fruits. If the soil has been adequately drained by tiling, the rotations and supporting practices of rotation group 1, table 10, are suited to it. The soil requires medium amounts of lime and phosphorus and high amounts of potassium to maintain these rotations.

Allis Series

These soils are the poorly drained members of the catena that includes the well-drained Manlius soils, the imperfectly drained Hornell soils, and the very poorly drained Chippewa soils. The parent material is clayey glacial till, mostly from clay shales of the underlying bedrock.

The soils are fine textured and strongly acid. They vary from shallow to moderately deep. The growth of roots is restricted by the shallow depth of the soils and by their wetness in spring. During the summer, these soils become very dry.

Typical profile of Allis silt loam under forest:

A_1 0 to 4 inches, dark-gray (10YR 4/1) silt loam; strong coarse granular structure; sticky when moist, plastic when wet; high in organic matter and matted with fine roots; medium acid; 3 to 5 inches thick.

BG_1 4 to 12 inches, highly mottled 60 percent yellowish-brown (10YR 5/6) and 40 percent gray (10YR 6/1) silty clay loam; coarse blocky structure; aggregates coated with gray; firm when moist, plastic when wet; contains roots; strongly acid; 6 to 12 inches thick.

BG_2 12 to 26 inches, silty clay with high-contrast mottling of 50 percent olive gray (5Y 5/2) and 50 percent brown (10YR 5/3); coarse blocky structure; very firm when moist, sticky and plastic when wet; contains only a few large roots; strongly acid; layer may be absent in shallow phases of this soil but normally is 10 to 20 inches thick.

CG 26 to 36 inches, very dark grayish-brown (2.5Y 3/2) clay-shale till mottled with olive brown (2.5Y 4/4); thick platy structure; aggregates very firm when moist, "soapy" when wet; strongly acid; 0 to 10 inches thick.

D 36 to 42 inches, olive-brown (2.5Y 4/4) thin-bedded soft acid clay shale at depths ranging from 1 to 10 feet.

Allis channery silt loam, 12 to 20 inches deep, eroded, 15 to 25 percent slopes (Ac).—This shallow poorly drained soil on moderately steep slopes is very poor for crops. It has lost most of its original surface layer. The highly mottled fine-textured subsoil is now exposed at the surface. Shallow gullies that have cut to bedrock are common. The soil is extremely wet in the spring, but it becomes very dry in midsummer.

This soil responds so poorly to fertilizers and other management practices that the increased yields usually do not pay for the time and materials used. Legumes are not well suited to this soil. Birdsfoot trefoil is probably the best, but even this will fail in many places. Without a legume, nitrogen fertilizer is essential to get even moderate yields from the grass meadows. The soil requires high amounts of lime and medium amounts of phosphorus and potassium.

If possible, this soil should be reforested or allowed to reforest naturally. If the soil must be used for crops, the management practices suggested in rotation group 11, table 10, are suitable.

Allis silt loam, 36 inches or more deep, 3 to 8 percent slopes (Ad).—This is a deep but poorly drained soil on moderate slopes. Seepage water contributes to the poor drainage. The subsoil is clayey.

The soil is low in fertility and responds poorly to management when used for most crops. It is difficult to keep the plow layer in good tilth. Control of erosion is a moderate problem, even though the slopes are gentle.

This soil is best suited to hay or pasture. It is not well suited to legumes, but Ladino clover and birdsfoot trefoil sown in mixtures with grasses may persist if limed and fertilized. If legumes fail, nitrogen must be added to get good yields of hay or pasture. The rotations and supporting practices under rotation group 5 of table 10 are suitable. The soil will need high amounts of lime and medium amounts of phosphorus and potassium.

Allis silt loam, 12 to 20 inches deep, 3 to 8 percent slopes (Ae).—This poorly drained shallow soil on gentle slopes is one of the poorest soils in this area for cropping. Its shallow depth and poor drainage greatly restrict its use. The soil is too wet in the spring and too dry in midsummer. The clayey texture and poor tilth are difficult to manage.

Diversion terraces are not practical on this soil, so rotations which control runoff should be used. If intertilled crops must be grown, three or more years of sod crops should be used for each year of intertilled crops. The soil is poorly suited to legumes. Ladino clover and birdsfoot trefoil may succeed if sown in mixtures with grasses. If legumes fail, nitrogen must be added to the remaining grasses.

The management practices and rotations of rotation group 10, table 10, are suited to this soil. High amounts of lime and medium amounts of phosphorus and potassium are needed to maintain fertility.

Allis silt loam, 12 to 20 inches deep, eroded, 8 to 15 percent slopes (Af).—This shallow poorly drained clayey soil is strongly acid and moderate to low in fertility. It can be used for crops, but yields are low and response to management is poor.

This eroded shallow soil should be reforested or used for pasture. Birdsfoot trefoil is probably the best suited legume, but it may not persist. When no legume i grown, nitrogen fertilizer is necessary to get even fair yields of hay. The soil can be used for early spring grazing, but it becomes very dry and produces little forage in the middle of summer.

The rotations and management suggested in rotation group 10, table 10, are best for this soil. High amounts of lime and medium amounts of phosphorus and potassium are needed to maintain fertility.

Alluvial Soils, Undifferentiated, 0 to 2 Percent Slopes (Ag)

This map unit consists of several different kinds of soils on recently deposited alluvium along small streams. In the northern part of the county where lime is abundant, it may include soils of the Genesee, Eel, Wayland, or Sloan series. In the southern part of the county, where the alluvial materials are acid, this unit may include Tioga, Middlebury, Holly, and Sloan soils. Most areas are chiefly poorly drained soils surrounding very small areas of moderately well drained or well drained soils. Commonly the area next to the stream is made up of gravel and stream wash.

Most of these areas are cut up by the stream channel, or consist of wet and dry soils in such intricate patterns that they are not suitable for cropping. They may be fair or even good for permanent pasture. They commonly produce especially well in the drier parts of the summer when other pastures are making little growth. Phosphorus should be supplied to obtain good pastures. Areas of acid soils will benefit from lime.

Angola Series

This is a poorly drained moderately deep soil series. In these counties it is represented by Angola silt loam, 0 to 3 percent slopes. The parent material is a fine-textured glacial till that contains small amounts of lime. The glacial till was derived almost entirely from weakly calcareous clayey gray shales like those of the underlying bedrock.

The Angola soil is the poorly drained member of the catena that includes the imperfectly drained Aurora soils and the very poorly drained Fonda soils. Fonda soils, however, were included in the Alden soils as mapped in these two counties. The poor natural drainage of the Angola soil causes the surface layer to be gray in color and the subsoil to be highly mottled. The subsoil is saturated until late in spring. The soil becomes very dry in midsummer.

Typical profile of Angola silt loam under forest:

A$_1$ 0 to 4 inches, very dark gray (10YR 3/1) heavy silt loam; moderate coarse granular structure; friable when dry, moderately sticky and plastic when wet; high in organic matter and matted with fine roots; medium acid; 3 to 6 inches thick.

BG$_1$ 4 to 13 inches, olive-brown (2.5Y 4/4) silty clay loam strongly mottled with yellowish brown (10YR 5/8); strong medium blocky structure; aggregates firm when moist, sticky and plastic when wet; contains many fine roots; medium acid; 6 to 12 inches thick.

BG$_2$ 13 to 24 inches, olive (5Y 4/4) silty clay loam; moderate coarse blocky structure; aggregates firm when dry, sticky and plastic when wet; contains fewer roots than layer above; neutral to slightly acid; 8 to 16 inches thick.

C 24 to 31 inches, olive-brown (2.5Y 4/4) silty clay loam; weak coarse blocky structure; hard when dry, plastic when moist, sticky and plastic when wet; contains very few roots; slightly alkaline to slightly calcareous (pH 7.5 to 8); 8 to 22 inches thick.

D 31 inches +, gray or olive clay shales, alkaline to calcareous.

Angola silt loam, 0 to 3 percent slopes (Ah).—This moderately deep poorly drained soil commonly occurs in small level or depressed areas or on gentle slopes that receive seepage from higher ground. It is suited to only a few crops and responds poorly to management.

This soil is difficult to drain. Drainage-type diversion terraces may improve the drainage of deeper areas on seepage slopes. Open ditches or tile are needed to drain the depressed or level areas. In some places the shallow depth prevents the use of open ditches or tile. Even if drains are established, the water moves very slowly through the soil because it is fine textured.

In most places this soil is best used for continuous sod or for sod crops that are plowed only occasionally to renew the stands. The rotations in rotation group 3, table 10, are suitable. The soil needs medium amounts of lime, phosphorus, and potassium.

Arkport Series

These are well-drained sandy soils derived from lake-laid fine and very fine sands. They are the well-drained members of a catena that includes the moderately well drained Galen soil, the imperfectly to poorly drained Junius soil, and the very poorly drained Granby soil. The surface soil and subsoil are medium acid, but the substratum is calcareous.

The fine sandy loam soils of this series have fair to good water-holding capacity and are highly responsive to management. The loamy fine sand of this series is droughty.

The profiles of these soils are well aerated. Roots penetrate deeply and are able to draw on a large volume of soil for plant nutrients and water. The organic-matter content is moderate in uncultivated soils, but it is lost rapidly under cultivation. The maintenance organic matter in these soils is one of the major management problems.

Chagrin silt loam, alluvial fan, 2 to 8 percent slopes r).—This soil is on small alluvial fans where small ributary streams enter the larger valleys. These alluvial an areas have distinct slopes, in contrast to the nearly el slopes of the Chagrin soils on the first bottoms. e soil lies above the level of most floods that go through the main valleys, but sheet flooding from nearby uplands accompanies heavy rains. The soil profile is darker gray an the profile of Chagrin silt loam on first bottoms. It ntains small fragments of shale. The shale and stones are not on the surface, but the deep substratum may consist almost entirely of shale fragments.

In some places it will be necessary to deepen or raighten stream channels that cut through these alluvial fans. Straightening the channel will prevent erosion of the banks. This soil is suited to the rotations of rotation oup 1, table 10, but where slopes are more than 600 feet length, some method of diverting water is needed for rotations that grow row crops for 2 or more years in succession. Intertilled crops can be grown on this soil very intensive rotations if they are heavily manured. he soil has medium lime and phosphorus requirements and low potassium requirements.

Chagrin shaly silt loam, alluvial fan, 2 to 8 percent lopes (Cs).—This soil has a large quantity of shale fragents on the surface and throughout the profile. It has fair to good water-holding capacity but is generally more roughty than the silt loam.

This is a good soil, suited to most crops grown in the ounty. On many farms it is the best cropland available, and intertilled crops should be concentrated on it. Rotation group 1, table 10, suggests rotations and other ractices for this soil. Management requirements for aintenance are similar to those described for Chagrin silt loam, alluvial fan, 2 to 8 percent slopes.

Chenango Series

These are strongly acid well-drained soils on glacial utwash terraces in southern Ontario and Yates Counties. They occur well above the overflow level of streams. A few areas of these soils are on kames in the same general ocality. The parent material comes almost entirely from cid sandstone and shale. The Chenango series is the well-drained member of the catena that includes the moderately well drained Braceville soil, the poorly drained Red Hook soil, and the very poorly drained Atherton soil.

The Chenango soils are strongly acid. They are low in natural fertility, but they have good physical properties, and they respond very well to good management. Plant roots are able to penetrate deeply and to obtain water and plant nutrients from a large volume of soil. The substratum has low water-holding capacity.

Typical profile of Chenango gravelly loam under forest:

A_0 Thin layer of litter overlying a 1-inch to 2-inch mat of finely divided black (10YR 2/1) organic matter; contains many fine roots; strongly acid.

A_1 0 to 2 inches, very dark grayish-brown (10YR 3 2) loam; moderate fine crumb structure; very friable, nonsticky and nonplastic; contains many small and medium-sized roots; high in organic matter; specks of white sand suggest that organic matter masks a thin A_2 horizon; layer is 1 to 3 inches thick.

B_{21} 2 to 11 inches, yellowish-brown (10YR 5 6) gravelly loam; weak fine crumb structure; very friable, nonplastic; full of small and medium-sized roots, good water-holding capacity; strongly acid (pH 5.0 to 5.5); 6 to 12 inches thick.

B_{22} 11 to 21 inches, brown (10YR 5 3) to yellowish-brown (10YR 5 4) gravelly loam; weak medium crumb structure, easily penetrated by roots, has fair water-holding capacity and will release most of the water to plant roots; strongly acid; 8 to 16 inches thick.

B_3 21 to 32 inches, light yellowish-brown (10YR 6/4) gravelly sandy loam; very weak fine crumb structure; very friable; contains roots; low water-holding capacity; medium acid; 10 to 20 inches thick.

C 32 inches —, grayish-brown (10YR 5/2) stratified beds of sand and gravel derived principally from shale and sandstone; low water-holding capacity; medium acid.

Chenango gravelly loam, 0 to 5 percent slopes (Cu).—This deep well-drained soil is well suited to intensive cultivation for most crops grown in the county. On many farms it is the best cropland available, and intertilled crops may be concentrated on it. The principal management problem is maintaining fertility.

Suitable rotations are suggested in rotation group 1, table 10. For these rotations, the soil has high lime and potassium requirements and medium phosphorus requirements. More intensive fertilization brings a good response from many of the high-value crops.

Chenango gravelly loam, 5 to 15 percent slopes (Cv).—This well-drained strongly acid soil is somewhat droughty. It usually occurs on small knolls that have irregular moderate slopes, but sometimes it is on the single short slopes of the terrace faces. The greater slope increases runoff, so that the soil is more droughty than Chenango gravelly loam on the nearly level terraces. In most places the topography is too complex for the use of contour tillage, but cultivation should be across the slope if possible.

This soil can be used for most crops grown in the county. Rotations and supporting practices suitable for maintaining organic matter and controlling runoff are given in rotation group 3, table 10. For the rotations listed, the soil has high lime and potassium requirements and medium phosphorus requirements. This soil responds less to management than the nearly level Chenango soils.

→ **Chenango soils, 15 to 25 percent slopes** (Cw).—These are well to excessively drained, droughty, gravelly soils on rounded hills. Much water runs off these slopes. The upper 24 to 30 inches has fair water-holding capacity, but the underlying strata hold little water. Fertility is low. The moderately steep and complex slopes make use of machinery difficult, and contour tillage is almost impossible.

Rotations used on this soil must control runoff and maintain organic matter. Suitable rotations are listed in rotation group 6, table 10. Not more than 1 year of intertilled crop should be used in each rotation. The soil has high lime and potassium requirements and medium requirements for phosphorus.

On most farms the soil is best suited to long stands of sod crops for hay or pasture. Birdsfoot trefoil and alfalfa are the best suited legumes.

Chenango soils, 25 to 45 percent slopes (Cx).—Steep, complex slopes and droughtiness make this mapping unit poor for any use except pasture or forestry. Much of it has been severely eroded. In uneroded areas the soil material is thinner over the gravel than is normal for the

Chenango soils on gentle slopes, but the kind, the order, and the distinctness of the separate layers are similar.

Most of this unit is now used for pastures that contain poor stands of unpalatable grasses. The management described in rotation group 12, table 10, is appropriate. If continuous sod is used, high rates of liming, medium rates of phosphorus fertilization, and high rates of potassium fertilization are needed. These materials are very difficult to apply on such steep slopes. Because of droughtiness, yields of pasture are low even when fertility is improved. The unit is probably better used for forestry.

Chenango and Tioga gravelly silt loams, alluvial fan, 2 to 5 percent slopes (Ct).—This complex of soils occurs on gently sloping alluvial fans where small tributary streams enter the larger valleys in the southern part of the area. On the older, higher lying fans the soil profile is like that of the Chenango series. On the younger, lower lying fans, which are flooded occasionally, the soils consist of alluvial sediments and there has been little soil development other than accumulation of organic matter in the surface layers. The gravel in both of these kinds of soil is mainly flat, angular sandstone fragments from the adjoining uplands.

This complex is good cropland, sometimes the best on the farm. It can be used intensively for intertilled crops if heavily manured. Suitable rotations are given in rotation group 1, table 10. For these rotations the soils have high lime requirements and medium requirements for phosphorus and potassium. Response of intensively grown cash crops to additional fertilizer is normally high. Runoff must be controlled, and organic matter must be maintained. Streambank erosion needs to be controlled along the small streams that flow across these areas from the uplands.

Chippewa Series

These are very poorly drained strongly acid soils. They have developed on firm glacial till derived from acid sandstone and shale. They are the very poorly drained soils of the catena that includes the well-drained Bath soils, the moderately well drained Mardin soils, the imperfectly drained Fremont soils, and the poorly drained Volusia soils.

The Chippewa soils are permanently wet in their natural state. The dull gray color and strong mottling of the subsoil indicate prolonged waterlogging. Some of the areas are wet, because they receive seepage from higher lying land. Others occupy definite depressions.

A typical profile of Chippewa silt loam under forest follows:

A_0 2 or 3 inches of black (10YR 2/1) well-decomposed organic matter; granular structure; very strongly acid.

A_{1g} 0 to 5 inches, very dark gray (10YR 3/1) silt loam; weak medium granular structure; firm, plastic; strongly acid; 4 to 8 inches thick.

G 5 to 20 inches, gray (2.5Y 6/0) heavy silt loam strongly mottled with yellowish brown (10YR 5/4); breaks out into coarse blocky aggregates; firm, plastic; contains only a few roots in upper part of layer; medium acid; 12 to 36 inches thick.

CG 20 inches +, light olive-gray (5Y 6/2) heavy silt loam to silty clay loam mottled with brown; weak coarse blocky structure; very firm when moist, plastic when wet; contains very few roots; medium to slightly acid; permanent water table usually lies above this layer.

Chippewa silt loam, 0 to 1 percent slopes (Cy).—This very poorly drained soil is unsuited to crops unless it is drained. Pastures furnish very little grazing. The use made of the small areas of this soil is usually determined by the use of the surrounding better drained soils.

If the soil can be at least partly drained, it will support fair pastures if limed and fertilized with phosphorus and potassium. It is difficult and expensive to drain the soil properly, because both seepage and surface drainage contribute to the wetness. The soil is sometimes drained to allow efficient use of the rest of the field.

This soil could be used for any of the rotations described in rotation group 1, table 10, but only the last two are convenient or economical. The soil has high lime requirements and medium requirements for phosphorus and potassium.

Chippewa silt loam, 3 to 8 percent slopes (Cz).—This soil is on slopes that receive seepage water. This water commonly comes from deep-seated permeable strata in the till that cannot be tapped easily by surface ditches. Locating the water-bearing layer and tapping it with tile before it reaches the seepage spot has been successful in some places.

Most areas of this soil are small. In pastures these spots are ignored. In cultivated areas of better soils, they interfere with tillage unless drained. Where the drainage can be improved to the equivalent of that of a poorly drained soil, the soil can be used in all but the first two rotations of rotation group 4, table 10. The requirements of this soil for lime are high and for phosphorus and potassium fertilizers are medium. The soil responds little to management.

Collamer Series

These imperfectly drained soils have developed in silts, very fine sands, and clays laid down in glacial lakes. They are free of gravel and stones. They are associated with the well-drained Dunkirk soils, the poorly drained Canandaigua soil, and the very poorly drained Colwood soil.

The mottling and rust-brown staining in the subsoil indicate that it is saturated for moderate periods during the year. The soil has not been strongly leached. It is moderately high in organic matter. Roots penetrate the upper part of the profile easily. In the lower subsoil and substratum they appear to grow mainly along the cracks between the structural aggregates.

Profile of Collamer silt loam under forest:

A_1 0 to 4 inches, dark grayish-brown (10YR 4/2) silt loam; fine crumb structure; friable; high in organic matter and full of fine roots; medium acid; 3 to 5 inches thick.

A_{21} 4 to 8 inches, light olive-brown (2.5Y 5/4) silt loam; fine crumb structure; friable; slightly plastic; contains considerable organic matter and many small and medium-sized roots; medium acid; 2 to 6 inches thick.

A_{22} 8 to 11 inches, light-gray (2.5Y 7/2) silt loam mottled with strong brown (7.5YR 5/8); weak thin platy structure; friable when moist, slightly plastic when wet allows fair root penetration; medium acid; 3 to inches thick.

B_{21} 11 to 16 inches thick, brown to dark-brown (7.5YR 4 heavy silt loam with medium-contrast mottling of stron brown (7.5YR 5/6); moderate fine blocky structur firm, moderately plastic; has good capacity to hol moisture and supply it to plants; restricts roots slightl slightly acid; 4 to 8 inches thick.

All of the rotations of group 1, table 10, would be good on this soil. It is suited to most of the crops grown in the county and is especially suitable for intensively grown vegetables. It is probably least suited to small grains, which tend to make a heavy growth and to lodge. Under the rotations listed, the soil has a low lime requirement, a medium phosphorus requirement, and a low potassium requirement. Intensively grown cash crops generally respond to larger amounts of fertilizer, including nitrogen.

Genesee silt loam, high bottom, 0 to 2 percent slopes (Gd).—This soil probably has the highest natural productivity in Ontario or Yates Counties. It lies on high bottom lands or low terraces that are rarely flooded. It has the good properties of the Genesee silt loam on the first bottom lands, but it has none of its limitations. It has good water-holding capacity. It responds well to fertilizer and other management practices.

Under any of the rotations listed in group 1, table 10, this soil is suited to all of the crops grown in the region. For good yields under these rotations, it has low lime requirements, medium phosphorus requirements, and low potassium requirements.

Granby Series

This very poorly drained sandy soil developed in calcareous lake-laid sands. The water table stands at or near the surface almost continuously. The soil occupies flat or depressed areas. It is the very poorly drained member of the catena that includes the well-drained Arkport soils, the moderately well-drained Galen soil, and the poorly drained Junius soil. It is associated with these soils and with Carlisle or Edwards muck.

Typical profile of Granby fine sandy loam under forest:

A_1 0 to 8 inches, black (10YR 2/1) fine sandy loam; moderate fine to medium granular structure; friable, nonplastic, somewhat greasy feeling; high in organic matter: contains many fine and medium-sized roots; neutral; 6 to 10 inches thick.

G_1 8 to 13 inches, white (10YR 8/2) or light-gray (10YR 7/2) fine sand, almost free of mottling: firm in place, nonplastic: contains few roots: an intensely reduced horizon; slightly acid to neutral; 4 to 8 inches thick.

G_2 13 to 29 inches, strongly mottled dark-brown (7.5YR 4/4) and light brownish-gray (10YR 6/2) very fine sandy loam: firm in place, friable when moist, nonplastic when wet: contains very few roots; neutral to slightly acid; 12 to 24 inches thick.

CG 29 inches +, light brownish-gray (2.5Y 6/2) medium to fine sand: upper part may be mottled with yellowish brown; single-grain structure; dense to compact in place, nonplastic when wet: contains no roots: layer is permanently wet except when drained: calcareous.

Granby fine sandy loam, 0 to 1 percent slopes (Ge).—Where undrained this soil is unsuited to agricultural use. Areas partly drained by open ditches can be used for pasture. These pastures are especially productive during the drier parts of the year. They consist of good stands of desirable grasses.

When this soil is completely drained by tile, it is suited to most of the crops grown in the county. All of the rotations of group 1, table 10, can be used. The soil is not well suited to alfalfa, but it is excellent for Ladino clover and red clover. The rotations suggested require low rates for lime application, medium rates for phosphorus and high rates for potassium. Intensively grown vegetables respond to higher rates of fertilization than the general rates suggested.

Holly Series

This is a poorly drained medium acid series on the first bottoms. The moderately well drained Middlebury soil is in the same catena. The very poorly drained soils from the same materials would be in the Sloan series, but their area in Ontario and Yates Counties was so small that they were included with the Holly silt loam mapping unit.

Typical profile of Holly silt loam in forest:

A_1 0 to 5 inches, very dark grayish-brown (2.5Y 3/2) silt loam; moderate medium crumb structure: friable, slightly plastic; high in organic matter; many roots; medium acid; 4 to 6 inches thick.

CG_1 5 to 11 inches, dark grayish-brown (2.5Y 4/2) silt loam mottled with rust brown; moderate coarse crumb structure; slightly firm when moist, slightly plastic when wet; moderate in organic matter; many roots concentrated in this layer; medium acid; 4 to 8 inches thick.

CG_2 11 to 24 inches, dark-gray (5Y 4/1) silty clay loam strongly mottled with brown (10YR 3/3); massive to coarse blocky structure; firm when moist, plastic when wet; contains only a few small roots; water table is within this layer for long periods; medium acid; 10 to 20 inches thick.

CG_3 24 inches+, gray (5Y 5/1) silty clay loam mottled with yellowish brown; mottling decreases with depth; massive, firm when moist, plastic when wet; this horizon is below the water table most of the year; medium to slightly acid.

Holly silt loam, 0 to 1 percent slopes (Ha).—The gray surface soil and the high degree of mottling below 8 to 10 inches indicates the poor drainage. The soil is saturated for long periods. In most places it is too wet to be used for anything but grass hay or pasture. Native pastures are mostly coarse unpalatable grasses. Fair to good pastures or meadows can be obtained by seeding to reed canarygrass or redtop.

In most areas drainage cannot be improved without deepening existing stream channels. Usually this is not practical. Where the soil can be drained, it is suited to the rotations of group 1, table 10. Where it can be even slightly drained, good pastures of Ladino clover and grass can be established. This soil has a high lime requirement, a medium phosphorus requirement, and a medium potassium requirement.

Homer Series

This series includes poorly drained high-lime soils from glacial outwash. The parent material was mostly layered sand and gravel, high in limestone, and a few layers of silt or silty clay. The Homer series is the poorly drained member of the catena that includes the well drained Palmyra and Howard soils, the moderately well drained Phelps soil, and the very poorly drained Westland soil.

In many places the poor drainage of these soils is caused by clogging of the small soil pores with silt. Compact layers of sandy clay or silty clay cause poor internal drainage in other places. In some areas all layers of this soil can be penetrated by water, but it is poorly drained because it occupies depressions that have a high water table.

ypical profile of Lobdell silt loam under forest:

- A_1 0 to 6 inches, grayish-brown (10YR 5/2) silt loam: moderate medium granular structure; friable when moist, slightly plastic when wet; contains many fine and medium-sized roots; slightly acid (pH 6.1 to 6.5); 5 to 8 inches thick.
- C_1 6 to 18 inches, light yellowish-brown or pale-brown (10YR 6/4 to 6/3) silt loam: weak medium crumb structure; friable; slightly to medium acid: 10 to 20 inches thick.
- C_2 18 inches +, pale-brown (10YR 6/3) silt loam or fine sandy loam mottled with gray (10YR 5/1, and yellowish brown (10YR 5/4); layers may range from sandy loam to silty clay loam and contain layers of gravel in some places; weak medium blocky to crumb structure: firm in place but friable if broken out when moist; neutral.

Lobdell silt loam, 0 to 2 percent slopes (Lu).—Most of s soil in Ontario and Yates Counties occurs as long narrow strips between streams and the nearby uplands. is moderately well drained, but it is flooded periodically. e soil is free of gravel and stones.

This is a good soil for corn, most of the intensively grown cash crops, hay, and pasture. It is less well suited spring grains because planting is delayed in spring. It not well suited to alfalfa, but alfalfa may be used in xtures with other legumes. It is an excellent soil for Ladino clover.

This soil is suited to intensive use for the rotations of oup 1, table 10, and if so used, needs few or no support- g practices for the control of water. Its requirements for lime and phosphorus are medium, and for potassium its requirement is low. Many crops, especially intensively own vegetables, respond well to higher rates of fertiliza- n, including use of nitrogen.

ordstown Series

These are shallow to moderately deep strongly acid soils that developed in loose glacial till deposited over ndstone and shale bedrock. Their profiles are typical the strongly acid well-drained soils of these counties. n outstanding feature is the bright yellowish-brown color of their subsoils. These soils usually are strongly oping and stony or channery. They resemble the well- ained Bath soils, except that the Bath soils are underlain y a deep firm glacial till.

Typical profile of Lordstown channery silt loam under rest:

- A_0 Almost black humus, unmixed with mineral soil, held in a mat of fine roots: very strongly to extremely acid: 2 to 4 inches thick.
- A_2 0 to 2 inches, pinkish-gray (7.5YR 6/2) channery silt: color may be masked by mixing in of organic matter; structureless or very weak fine crumb structure: friable; very strongly acid (pH 4.5 to 5.0); ½ to 3 inches thick.
- B_{21} 2 to 8 inches, brownish-yellow (10YR 6/6) to strong-brown (7.5YR 5/6) channery silt loam; weak very fine crumb structure; very friable: a well-aerated layer depleted of bases and rich in iron oxide; contains many roots; strongly to very strongly acid: 5 to 8 inches thick.
- B_{22} 8 to 18 inches, yellowish-brown (10YR 5/6) channery silt loam similar to horizon above but less yellowish: weak fine crumb structure: friable; contains large and medium-sized roots: strongly acid; 8 to 12 inches thick.
- B_3 18 to 28 inches, light yellowish-brown (10YR 6/4) channery or flaggy silt loam: weak fine crumb structure: friable to slightly firm: permeable to roots and water; transitional to the parent material: strongly acid; 8 to 14 inches thick.
- C 28 to 32 inches, grayish-brown (10YR 5/2) to light brownish-gray (10YR 6/2) very flaggy loam or silt loam: loose to slightly firm glacial till consisting mainly of material from the underlying thin-bedded, acid, fine-grained sandstone and shale: very weak structure: strongly acid; layer ranges up to 8 inches thick but may be absent in places.
- D 32 inches +, interbedded acid Devonian sandstone and shale bedrock, in the upper part commonly somewhat broken and displaced by glacial action; occurs at depths ranging from 12 to more than 40 inches.

Where soil is shallow, all of B_3 and C and part of B_{22} horizons are lacking.

Lordstown channery silt loam, 5 to 15 percent slopes (Lw).—This soil is fair for cultivated crops, but not much of it is used, because most of it is located at high elevations that are not easily accessible. Machinery can be used on these slopes, but bedrock outcrops may interfere with tillage in some places. Most of the soil is deep enough to have a fair moisture supply and to allow normal tillage. Runoff is moderately rapid, and water control is a problem.

The soil is suited to corn for grain or silage, small grains, hay, pasture, and potatoes. Other crops can be grown, but choice of crops is limited by stoniness, low fertility, strong acidity, low moisture supply in the soil, or poor location for marketing. The rotations and supporting practices of group 3, table 10, are suitable. For maintaining fertility under these rotations, the soil has a high lime requirement and medium phosphorus and potassium requirements. Potatoes respond moderately well to heavier rates of fertilization, including use of nitrogen. Either alfalfa or birdsfoot trefoil can be grown successfully if enough lime and fertilizer are used.

Lordstown channery silt loam, 15 to 25 percent slopes (Lx).—This soil is restricted in use and in response to management by shallow depth, low water-holding capacity, moderately steep slopes, and a moderate erosion hazard. It most commonly lies on long continuous slopes flanked on the lower edge by less well-drained Mardin or Volusia soils and on the upper side by Fremont soils or sloping phases of Lordstown soils. This phase is shallower than the less sloping Lordstown soils. The depth to bedrock is between 15 and 25 inches in most places, but some areas are deeper. The soil is uneroded or only slightly eroded. The rapid runoff may result in moderate erosion. Steep slopes make the use of agricultural machinery difficult.

Rotation group 6, table 10, suggests some rotations and practices suitable for this soil. The rotations that have 2 or more years of sod crops are the best. The soil can be used for potatoes, but limited moisture supply and difficulty of cultivation make it less suitable than many other soils. Under the rotations of group 6, the soil has a high lime requirement and medium phosphorus and potassium requirements.

Most crops give little response to larger amounts of fertilizer, but potatoes require large applications for best yields. Where potatoes are grown, lime should be applied only in small amounts at the time of seeding the legume in the rotation.

Permanent native pastures can be improved by lime and fertilizer. More productive pastures are obtained by plowing and reseeding to mixtures of legumes and grasses. Ladino clover is an excellent legume, but birdsfoot trefoil may yield more over a long period of time.

Lordstown channery silt loam, eroded, 15 to 25 percent slopes (Ly).—This soil has lost most or all of its original plow layer by erosion. Organic matter is low, and the soil is 6 to 10 inches thinner over bedrock than the uneroded Lordstown channery silt loam, 15 to 25 percent slopes. Yields are lower, and crop suitability is more limited.

The soil is best suited to long-time stands of legume-grass mixtures for hay or pasture, but it can be used for the rotations of group 10, table 10. To maintain soil fertility, high rates of liming and medium rates of fertilization with phosphorus and potassium are needed. Response is small to larger amounts of phosphorus and potassium, but nitrogen is badly needed on this eroded soil.

This soil is suited to permanent pasture. Higher pasture yields and better soil conservation generally can be obtained by plowing at long intervals, or when the legume fails, and by reseeding with productive legumes and grasses.

Lordstown soils, 45 to 70 percent slopes (Lz).—Bedrock outcrops in many places on these very steep soils. Depth ranges from almost nothing to about 3 feet. The depth varies extremely within short distances.

These are nonagricultural soils. About 96 percent is covered with second-growth and third-growth forests. Open areas considered to be idle account for 3 percent of the total acreage, and 1 percent is within areas used for pasture or crops.

→ **Lordstown and Manlius soils, 25 to 45 percent slopes** (Lv).—This unit includes steep areas of the Lordstown soils just described and the Manlius soils described on this page. Both are very strongly acid well-drained soils, low in fertility and shallow to moderately deep over bedrock. The soils are unsuited to cropping because the slopes are too steep for the use of machinery.

These soils are in rotation group 12, table 10. They can be used for permanent pasture, but in most places they are better suited to forestry. Without lime and fertilizer, pasture produces very little. The steep slopes are so difficult to lime and fertilize that few pastures are improved. For maintenance of improved permanent pasture, the soil has a high lime requirement and medium phosphorus and potassium requirements. Such pasture produces well in spring and early in summer when moisture is usually plentiful, but produces little in other seasons.

Lyons Series

This very poorly drained series developed in highly calcareous medium-textured glacial till. It occupies level areas and depressions that have poor drainage outlets. It is associated with the well-drained Honeoye soils, the moderately well drained Lima soils, and the poorly drained Kendaia soils. This series is also associated with the Lansing soils and the Ontario soils. The black highly organic surface soil and the strongly mottled subsoil indicate the very poor drainage.

Typical profile of Lyons silt loam under forest:

A_1 0 to 6 inches, very dark gray (10YR 3/1) to black (10YR 2/1) silt loam; moderate medium crumb structure; friable when moist, slightly sticky when wet; high in organic matter and matted with small roots; neutral; 5 to 8 inches thick.

G_1 6 to 12 inches, gray (10YR 5/1) silt loam; rust-brown streaks occur along old root channels but there is little other mottling; weak medium blocky structure; firm when moist, slightly plastic when wet; an intensely reduced horizon; slightly alkaline; 4 to 8 inches thick.

G_2 12 to 24 inches, brown to dark-brown (10YR 4/3), gray (10YR 5/1), and strong-brown (7.5YR 5/8) mottled silt loam; moderately compact in place but breaks out as coarse blocky aggregates; firm when moist, slightly sticky when wet; only a few medium-sized roots penetrate along cracks; saturated with water most of the time; slightly alkaline; 8 to 16 inches thick.

CG 24 inches +, strongly mottled light brownish-gray (10YR 6/2) and dark yellowish-brown (10YR 4/4, gritty silt loam; compact and hard in place; firm when moist; calcareous; gradual transition to bluish-gray compact high-lime glacial till; permanent water table normally above the 36-inch depth.

Lyons silt loam, 0 to 1 percent slopes (LA).—When not drained, this soil is too wet for agricultural use. Few areas have been well drained artificially. Where the soil is partly drained by open ditches, the excess surface water is removed and the water table is lowered slightly. These areas are suitable for pasture, which produces well during dry weather.

Where good artificial drainage has been established, this is one of the most productive soils in the area and is well suited to the rotations of group 1, table 10. Intensively grown vegetable crops, corn, hay, and pasture are all good crops for the soil. These rotations have low requirements for lime and potassium and a medium requirement for phosphorus on this soil. The soil responds well to higher rates of fertilization if it is used for intensively grown vegetable crops.

→Manlius Series

These very strongly acid well-drained soils developed in glacial till from acid thin-bedded shale. The depth to shale bedrock is generally shallow but may be 5 or more feet in some places. These soils resemble the Lordstown soils except that the parent material of the Manlius series is extremely shaly. These soils are very low in native fertility, but crops respond well to fertilizers. Where the shale bedrock is near the surface, the low supplies of moisture limit plant growth. The Manlius series is the well-drained member of the catena that includes the imperfectly drained Hornell soils and the poorly drained Allis soils. Manlius soils are not so clayey as the associated soils.

Typical profile of Manlius shaly silt loam under forest:

A_0 Raw humus mat; very strongly acid; 2 to 4 inches thick.

A_2 0 to 1 inch, very pale brown (10YR 7/3) silt loam; very weak very fine crumb structure; loose; contains many small and medium-sized roots; a leached horizon partly masked by organic matter; very strongly acid; ¼ to 1½ inches thick.

B_2 1 to 20 inches, yellowish-brown (10YR 5/6 to 5/4) shaly silt loam that becomes duller in color with depth; weak fine crumb structure; friable, slightly plastic when wet; roots penetrate easily; good water-holding capacity; very strongly acid; 12 to 24 inches thick.

C 20 to 36 inches, olive-gray (5Y 5/2) very shaly silt loam; friable when moist, slightly plastic when wet; readily penetrated by roots; medium water-holding capacity; contains large chunks of shale; strongly acid; 0 to 18 inches thick.

D 36 inches +, gray (10YR 6/1) thin-bedded flaky shale; strongly acid (pH 5.0 to 5.5).

Vhere bedrock is at shallow depth, C horizon and lower rt of B_2 horizon are lacking.

Ianlius shaly silt loam, 36 inches or more deep, 5 to percent slopes (Ma).—This soil is extremely acid and in fertility, but it responds well to fertilizer and lime d to other good management practices. It is moderately lible. This restricts the rotations to which it is ed. Special attention should be paid to maintaining ganic matter and controlling water. The soil has fair good water-holding capacity.

This soil is suited to the rotations and supporting prac- s of group 7, table 10. It is fair to good for crops d pasture, but most of the soil is now poorly managed d produces low yields. It can be used for corn for grain silage, small grains, potatoes and alfalfa, birdsfoot foil, and other sod crops. It could be used for cash ps other than potatoes, but it is not practical to grow ch crops at this distance from markets.

The requirement of this soil for lime is high, and for osphorus and potassium it is medium. These amounts ould maintain fertility, but potatoes and other cash rops respond well to larger amounts of fertilizer. Hay d pasture show very small response to extra fertilizer.

Manlius shaly silt loam, 36 inches or more deep, eroded, to 15 percent slopes (Mb).—This soil has lost most, or , of the original surface layer through erosion, so that ginal subsoil material is now the plow layer. As a ult the soil contains less organic matter, is less per- neable to moisture, loses more of the water needed by lants, and erodes more easily than uneroded Manlius ly silt loam, 36 inches or more deep, on 5 to 15 percent pes. These problems make this phase more difficult o manage and less suited to most crops. Like the other anlius soils, this phase is very acid and very low in tility.

This soil is best suited to corn, small grains, and sod rops, but it can be used for potatoes or other cash crops very intensive management is applied. The rotations d supporting practices of rotation group 9, table 10, needed. Special attention should be paid to building p organic matter by the use of manure and long-lived tands of sod crops. Wherever possible, the sod should nain as long as the legume persists in the stand. Birds- ot trefoil is one of the best legumes for this purpose. Alfalfa can be grown when limed and fertilized, but it normally persists only 2 or 3 years.

This soil has high requirements for lime and medium quirements for phosphorus and potassium. It generally needs liberal applications of nitrogen to replenish its supplies after erosion. Nitrogen is especially important iere legumes are lacking in the sod crops.

Manlius shaly silt loam, 12 to 20 inches deep, eroded, 15 to 25 percent slopes (Mc).—Moderately steep slopes d low water-holding capacity make this a poor soil for riculture. The strong slopes are difficult to till, and the ck of water allows little response to management. Over most of the area, the depth to bedrock and the ater-holding capacity have been further reduced by vere erosion. The soil is very strongly acid and very w in fertility.

Wherever possible, this soil should be reforested or hould be kept in sod as long as the legumes last. Where pes are no longer than 300 feet, 1 year of intertilled op can be rotated with 2 or more years of sod crops. In most places this soil needs the rotations of group 11, table 10. Shallow depth prevents construction of the diversion terraces needed to divert runoff and control erosion if more intensive rotations are used. Under the rotations that are suitable, the soil has a high lime requirement and medium requirements for phosphorus and potassium. It also needs nitrogen very much, and most crops respond well to use of manure or commercial nitrogen.

Manlius shaly silt loam, 36 inches or more deep, eroded, 15 to 25 percent slopes (Md).—Because of its greater depth to bedrock and consequently higher water-holding capacity, this is a much better soil than Manlius shaly silt loam, 12 to 20 inches deep, eroded, on 15 to 25 percent slopes. About 90 percent of the area has lost 5 to 10 inches of soil and is low in organic matter. Most of the uneroded 10 percent is in woods. This steeply sloping soil is hard to work.

This soil does not respond to management well enough to be used successfully for intensively grown cash crops. Hay and pasture are the best suited crops. The rotations of group 9, table 10, are suitable if the supporting practices shown in the table are followed. Restoring organic matter to the surface layer is one of the most important management needs. Under the rotations suggested, the soil has a high lime requirement and medium requirements for potassium and phosphorus. It also needs nitrogen, either as commercial fertilizer or in manure.

Improving native pastures with fertilizer and lime is difficult. Better results are generally obtained by using a rotation in which a grass-legume mixture is seeded in small grain and is allowed to remain as long as the legume persists.

Mardin Series

These moderately well drained very strongly acid soils have developed in glacial till consisting mainly of sandstone and shale. They have a very dense layer at about 20 inches. There is a gradual transition to hard, slowly permeable glacial till. The topmost 15 inches of the Mardin profile resembles that of the Bath soils. The mottled color below that depth shows that internal drainage is restricted.

The Mardin series is the moderately well drained member of the catena that includes the well-drained Bath soils, the poorly drained Volusia soils, and the very poorly drained Chippewa soils. Mardin soils are fair to good for hay, pasture, and potatoes, but not so good as the Bath soils.

Typical profile of Mardin channery silt loam in a virgin area:

A_0	Very dark gray to black humus, unmixed with mineral soil, held firmly in a mat of fine roots; extremely to very strongly acid; 1 to 3 inches thick.
A_2	0 to 1 inch, very thin light brownish-gray (10YR 6/2) silt, slightly stained by organic matter; structureless; very friable; an intensively leached layer; very strongly acid; ½ to 3 inches thick.
B_2	1 to 15 inches, yellowish-brown to brownish-yellow (10YR 5/8 to 6/8) channery silt loam; colors become more grayish with depth; very weak very fine crumb structure; very friable; a well-aerated layer strongly leached of bases and rich in iron oxide; contains medium-sized roots; strongly to very strongly acid; 8 to 15 inches thick.

A'_{2g}[7] 15 to 20 inches, light yellowish-brown (10YR 6/4) channery silt loam, strongly mottled with yellowish brown and light brownish gray; weak medium crumb structure; friable; contains medium-sized roots; layer is periodically waterlogged; strongly acid; 3 to 7 inches thick.

B'_{2gm} 20 to 30 inches, pale-brown (10YR 6/3), gray (10YR 5/1), and yellowish-brown (10YR 5/4) mottled channery silt loam, high in silts and low in clay; very weak coarse blocky structure; a hardpan layer, very firm to hard, dense; very slowly permeable to water; penetrated by very few roots; strongly acid; 10 to 18 inches thick.

B'_{3m} 30 to 60 inches, channery silt loam similar to layer above but less mottled and not quite so hard; strongly acid in the upper part but may be only medium to slightly acid in the lower part; 20 to 40 inches thick.

C 60 inches +, grayish-brown (10YR 5/2) channery silt loam or loam glacial till; weak platy structure; firm; channers are flat, fine-grained sandstone fragments 2 to 6 inches across; till consists mainly of acid sandstone and shale materials; medium to strongly acid, may be neutral at depths of 7 to 10 feet.

Mardin channery silt loam, 3 to 8 percent slopes (Me).—Restricted internal drainage somewhat limits the response of this soil to management, but it is a good soil for many crops. It is suited to corn for grain or silage, small grains, sod crops for hay or pasture, and small fruits, potatoes, and other cash crops. It cannot be used continuously for row crops without field terraces, and the hardpan at about 15 inches generally prevents the construction of such terraces. The soil can be used for most of the rotations and supporting practices of group 2, table 10. Alfalfa should not be used as the only legume in a sod crop, but it generally yields enough to justify its inclusion in the seeding mixture. The soil is very poorly suited to tree fruits.

Under the rotations suggested, this soil has a high lime requirement and medium requirements for potassium and phosphorus. Hay and pasture respond little to more fertilizer. Potatoes respond well if they receive more fertilizer and nitrogen.

Table 7 gives data on yields obtained from experimental plots on this soil that were treated for a period of 11 years with different combinations of lime, fertilizer, and manure. The plots are near Ithaca, New York.

TABLE 7.—*Average acre yield of crops in a rotation of corn—oats—2 years of hay—wheat—1 year of hay on Mardin channery silt loam, 3 to 8 percent slopes, at Ithaca, N. Y.*

Amendments applied during rotation [1]	Crop and years of record				
	Corn for silage	Oats	Mixed hay after oats [3]	Winter wheat	Mixed hay after wheat [4]
	11	[2] 5	11	11	5
	Tons	*Bu.*	*Tons*	*Bu.*	*Tons*
a. 27 tons of manure per acre	7. 9	30	1. 2	15	------
b. 1,000 lbs. limestone, 60 lbs. phosphate (P_2O_5), and 18 tons manure per acre	9. 7	39	1. 7	18	2. 0
c. 1,000 lbs. limestone, 120 lbs. phosphate (P_2O_5), and 27 tons manure per acre	10. 0	48	1. 9	24	2. 5
d. 3,000 lbs. limestone, 60 lbs. phosphate (P_2O_5), and 18 tons manure per acre	10. 4	44	2. 0	25	2. 3
e. 3,000 lbs. limestone, 120 lbs. phosphate (P_2O_5), and 27 tons manure per acre	11. 5	48	2. 1	27	2. 7
f. 5,000 lbs. limestone, 120 lbs. phosphate (P_2O_5), and 27 tons manure per acre	12. 2	44	2. 2	30	2. 8

[1] Lime: 500 pounds is applied with each hay seeding in experiments b and c; another 2,000 pounds before plowing for corn in experiments d and e; and another 2,000 pounds after plowing for corn in f.

Phosphate: 30 pounds is applied with each hay seeding in experiments b and d; and another 30 pounds with oats, and 30 pounds with wheat in experiments c, e, and f.

Manure: Equal amounts are applied to corn, to 2nd-year hay after oats, and to wheat in the spring.

[2] Yields included for only the last 5 years because of introduction of Mohawk variety.

[3] Seeding mixture is timothy, Ladino clover, red clover, and alfalfa. The yields are an average of the 1st and 2nd hay years over an 11-year period.

[4] Seeding mixture is timothy and red clover.

Mardin channery silt loam, 8 to 15 percent slopes (Mf).—This sloping soil has a more serious water control problem than Mardin channery silt loam, 3 to 8 percent slopes. About the same crops are suited to this more strongly sloping soil, but they should be grown in longer rotations, and practices for control of runoff should be more intensive. Maintaining the fertility of this soil under the rotations and supporting practices of group 5, table 10, requires a high rate of liming and a medium rate of fertilization with phosphorus and potassium. Where legumes are not an important part of the rotations, and manure is not used liberally, application of commercial nitrogen is necessary. Sod crops respond little to larger amounts of fertilizer, but potatoes respond well to heavy fertilization.

Mardin channery silt loam, eroded, 8 to 15 percent slopes (Mg).—This soil has lost most of its original surface layer through erosion. Its depth to the very compact substratum is 5 to 10 inches less than that of Mardin channery silt loam, 8 to 15 percent slopes. The organic-matter content is low. This soil has lower water-holding capacity and less response to good management than the uneroded phase having the same slopes. The organic matter can be increased by growing sod crops most of the time or by applying manure liberally. This will lessen runoff and increase absorption of water.

Corn for silage, small grains, hay, and pasture are good crops for this soil. It can also be used for potatoes, but the returns are small for the large amounts of fertilizer required. The rotations and supporting practices of rotation group 7, table 10, are suited to this soil. Under these rotations, the soil has a high lime requirement and medium phosphorus and potassium requirements. In addition, it needs nitrogen, which can be obtained from legumes, manure, or commercial fertilizer.

Mardin channery silt loam, eroded, 15 to 25 percent slopes (Mh).—Low fertility and rapid runoff are the main problems on this soil. Its use is restricted by the strong

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[7] See footnote 1, page 31.

pe and the slow internal drainage. These slopes are ifficult to work. Wherever possible, this soil should be d for long-term stands of hay or pasture. If necessary, intertilled crop can be used 1 year in the rotation if e is taken to control runoff. Birdsfoot trefoil is robably the best legume for long stands of sod crops. alfa is likely to be winterkilled, and the soil is too ughty for good yields of Ladino clover.

Rotation group 9, table 10, has suitable rotations and ractices for this soil. Under these rotations, the soil has high lime requirement and medium requirements for osphorus and potassium. It also needs nitrogen, which be obtained from the legumes used in the rotation, eavy manuring, or nitrogen fertilizer. Little response received from heavier applications of fertilizer.

Mardin silt loam, 12 to 20 inches deep, 3 to 15 percent lopes (Mk).—The upper part of the profile of this soil like that described for the series, but solid bedrock is ly 12 to 20 inches from the surface. A layer 6 to 10 hes thick, just above the bedrock, is mottled. A few cres have slopes steeper than 15 percent.

The shallow depth makes the root zone 6 to 10 inches inner than that of the deeper Mardin soils. Crops are s responsive to management because moisture is lacking dry seasons. Diversion terraces cannot be constructed because the soil is shallow, and sod crops must be grown a larger part of the rotation to control the runoff.

The soil can be used for the rotations of group 10, table , if simple practices for water control are followed. Under such rotations, the soil has a high lime requirement d medium phosphorus and potassium requirements. itrogen is usually needed, especially where legumes are t important in the rotations. Crops respond little to good management or to higher rates of fertilization.

Mardin and Langford soils, 25 to 45 percent slopes Ml).—Steepness of slope limits agricultural use of both of these soils, so they have been shown by the same map symbol, even though they are in different parts of the unties. Both are moderately well drained. The Mardin il is acid throughout, and the Langford soil is neutral n the substratum.

About 40 percent of this mapping unit has been used r crops or pasture, and most of the acreage used is at ast moderately eroded. The soils are too steep for the use of machinery and are unsuited to cropping. These soils are in rotation group 12, table 10. They can be sed for permanent pasture if necessary, but wherever ossible they should be used for forestry.

Pastures produce little during the summer. The rapid runoff leaves little moisture for plants, and it is difficult o lime and fertilize the soils. For even fair production f pasture, the soils have a high lime requirement and medium requirements for phosphorus and potassium. Without lime, fertilizer, and enough moisture, the native lants produce a very poor cover, and that only during spring and early in summer. If cattle graze such poor pasture, erosion results.

Middlebury Series

These moderately well drained medium-acid soils developed on the first bottoms. The parent material is alluvium that washed from acid soils in the southern part of the surveyed area. New material is added to the surface when the streams overflow in the spring. These are young soils, and the principal evidence of profile development is the organic matter accumulated in the topmost 5 to 8 inches.

The Middlebury series is the moderately well drained member of the catena that includes the well-drained Tioga soil, the poorly drained Holly soil, and the very poorly drained Sloan soil.

Typical profile of Middlebury silt loam under forest:

A_1 0 to 6 inches, dark grayish-brown (10YR 4/2) mellow silt loam; moderate medium crumb structure; friable when moist, slightly plastic when wet; contains many fine roots; medium acid; 5 to 8 inches thick.

C_1 6 to 18 inches, light yellowish-brown (10YR 6/4) silt loam; weak medium crumb structure; friable when moist, slightly plastic when wet; readily penetrated by roots; medium acid; 8 to 15 inches thick.

C_g 18 to 30 inches, grayish-brown (2.5Y 5/2) silt loam mottled with yellowish brown (10YR 5/8); closely resembles layer above except for the intense mottling; weak coarse crumb structure; firm when moist, slightly plastic when wet; medium acid; 8 to 16 inches thick.

C_2 30 inches +, reddish-brown (2.5YR 5/4) heavy silt loam, weakly mottled with gray and rust brown in the upper part; varies from sandy loam to silty clay loam; moderately dense in place; plastic when wet; medium acid.

Middlebury silt loam, 0 to 2 percent slopes (Mm).—This productive soil is well suited to grasses, shallow-rooted legumes, corn for grain or silage, and some intensively grown cash crops. It is only fair for alfalfa, but alfalfa can be included with other legumes in the seeding mixtures. Spring grains can be grown, but they are likely to lodge and may have to be planted late because the soil is wet. The principal management problem is maintenance of fertility. Control of streambank erosion is necessary in some areas.

The soil is suited to the rotations of group 1, table 10, and needs few supporting practices to control water. Its requirement for lime is high and its requirements for phosphorus and potassium are medium. Intensively grown cash crops respond well to heavier rates of fertilization and the addition of nitrogen. This is a very good soil for pasture, especially for Ladino clover. Pasture on this soil produces well in midsummer when pastures on the uplands are producing little.

Morocco Series

These poorly drained sandy soils have developed in strongly acid deep sands on flats and depressions. The parent materials are lake-laid sands. The soil is poorly drained because it is in flats and depressions that have poor drainage outlets and because the material at depths of 5 feet or more is slowly permeable to water. This underlying material may be very dense glacial till or it may be layers of silt and clay.

This series is associated with the Allendale and Berrien series. The upper part of a typical profile is similar to that of the Allendale series, but sandy material extends to depths of several feet. The Allendale soil, in contrast, is underlain by clay at depths of 2 to 3 feet.

Typical profile of Morocco fine sandy loam under forest:

A_0 Forest litter overlying a thin mat of raw humus; very strongly acid (pH 4.5 to 5.0); ½ to 2 inches thick.

when moist; readily penetrated by roots; good water-holding capacity; medium acid.

B'$_2$ 28 to 50 inches, light olive-brown (2.5Y 5/4), gravelly loam; weak medium to fine subangular blocky structure within very coarse prisms; thin coatings of dark yellowish-brown (10YR 4/4) slightly sticky clay on some of the blocks; vertical streaks of light yellowish-brown coarse silt surround the large prisms; firm to very firm; strongly acid in the upper part but only slightly acid or neutral in the lower part; 15 to 30 inches thick.

C$_2$ 50 inches +, grayish-brown (2.5Y 5/2), gravelly loam; moderate thick platy structure; firm; neutral in the upper part, generally calcareous below 72 inches.

Valois gravelly silt loam, 5 to 15 percent slopes (Va).—This is a well-drained, medium-textured soil with good water-holding capacity. It can be planted early in spring. It responds well to good management. It absorbs water rapidly and, except during heavy rains, does not erode seriously. Its moderate slopes somewhat restrict the intensity with which this soil should be cropped.

All of the crops grown in Ontario and Yates Counties are suited to this soil, provided they are grown in the rotations of group 5, table 10, and with the supporting practices listed. Under this management, the soil has a high lime requirement and medium phosphorus and potassium requirements. Potatoes and most vegetable crops respond to larger amounts of phosphorus and potassium fertilizers and to nitrogen.

Valois gravelly silt loam, eroded, 5 to 15 percent slopes (Vb).—This soil has lost most, or all, of the original surface layer. The present plow layer consists mainly of subsoil material. It is lower in organic-matter content and has poorer tilth than the Valois gravelly silt loam, 5 to 15 percent slopes. The surface soil absorbs water more slowly and runoff is greater, so that danger of erosion is greater.

Most of the crops grown in the two counties are suited to this soil, but only 1 year of row crops should be in a rotation. The soil is suited to the rotations of group 7, table 10, and the supporting practices suggested. Under these rotations, the soil has a high lime requirement and medium phosphorus and potassium requirements. The response to higher rates of fertilization is less than on the uneroded soil, except where organic matter has been restored to the plow layer. Native pastures consist of undesirable plants. They produce little forage after the first of July. Good pastures can be obtained by fertilizing, liming, and seeding to grass-legume mixtures.

Valois gravelly silt loam, 15 to 25 percent slopes (Vc).—This moderately steep Valois soil has rapid runoff. Erosion is difficult to control. Use of machinery is difficult on these steep slopes. The soil does not respond so well to good management as the more gently sloping soils of the Valois series, because more of the water needed by crops is lost in runoff. The soil can be used for the rotations suggested for group 8, table 10, if the practices to control runoff are used. It would be best to use this soil for rotations that contain only close-growing crops and sod crops, unless there is no better soil available for intertilled crops. Alfalfa is a well-suited crop for this soil; birdsfoot trefoil and red clover are also well suited. Under the rotations of group 8, this soil has a high lime requirement and medium phosphorus and potassium requirements.

Valois gravelly silt loam, eroded, 15 to 25 percent slopes (Vd).—About 80 percent of the Valois soils on moderately steep slopes are severely eroded and are included in this unit. The present plow layer is composed mainly of subsoil material. It is low in organic-matter content. It is more slowly permeable than the plow layer of the uneroded soil. This allows greater runoff and more serious erosion.

The soil is suited to the rotations of group 10, table 10, except that the rotation with a row crop should not be used. The soil needs the management practices suggested and has a high lime requirement and medium phosphorus and potassium requirements.

Native pastures yield poorly. Better pastures and better erosion control can be obtained by plowing and seeding to grass-legume mixtures. Birdsfoot trefoil is a good legume to use. Lime, phosphorus, and potassium are needed to establish and maintain pastures on this soil.

Volusia Series

The Volusia series is well known throughout southern New York as a problem soil. Drainage is poor. The soils have developed on moderate nearly uniform or slightly concave slopes where seepage water from nearby higher areas keeps the soil wet for long periods in the spring or after heavy rains. The surface soil is gray, the subsoil is highly mottled but friable, and a dense almost impermeable hardpan lies at 15 to 19 inches. Water seeps into the soil above this pan. Tile drainage is not practical over most of these soils because of the pan, but it can be used to drain depressions in which seepage concentrates. The soils are low in fertility and their response to management is small. The Volusia series is the poorly drained member of the catena that includes the well-drained Bath soils, the moderately well drained Mardin soils, and the very poorly drained Chippewa soils. In large areas where these soils are associated, Volusia soils account for most of the acreage.

Typical profile of Volusia channery silt loam under forest:

A$_0$ Nearly black raw humus is present on slight knolls, but commonly absent in slight depressions; very strongly to strongly acid; up to 1½ inches thick.

A$_1$ 0 to 4 inches, dark grayish-brown (10YR 4/2) channery silt loam; moderate medium and coarse crumb structure; friable; very strongly to strongly acid; 3 to 6 inches thick.

B$_{2g}$ 4 to 6 inches, yellowish-brown (10YR 5/4 to 5/6) channery silt loam with few distinct mottles; weak fine and medium crumb structure; friable; a discontinuous layer, present on slight knolls, absent in slight depressions; layer is mixed into the plow layer in cultivated areas; very strongly to strongly acid; up to 4 inches thick.

A'$_{2g}$[9] 6 to 12 inches, light olive-brown to light yellowish-brown (2.5Y 5/4 to 6/4) coarse silt loam to loam with many medium and large distinct yellowish-brown mottles; weak or very weak medium platy to massive; friable; roots are common; strongly acid; 4 to 7 inches thick.

B'$_{2xm}$ 12 to 25 inches, olive-brown (2.5Y 4/4) channery silt loam with many faint gray and brown mottles and few to many very dark brown stains; vertical streaks, mainly less than ¾ inches across, divide the horizon into prisms 10 to 30 inches across; these streaks consist of light brownish-gray (2.5Y 6/2) silt or silty clay and have natural breakage planes down the middles and have yellowish-brown borders; interiors of prisms have weak to very weak coarse blocky structure; blocks break to very weak medium blocks;

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[9] See footnote 4, page 31.

faces of blocks are coated with thin films of gray silt; very firm, extremely hard; fine roots in cracks, but none in prisms; strongly acid; 10 to 20 inches thick.

B'_{3m} 25 to 48 inches, olive-brown to light olive-brown (2.5Y 4/4 to 5/3) very channery silt loam or loam; extensions of gray streaks from horizon above divide this horizon into gray-coated prisms 2 to 4 feet across; weak to very weak medium blocky structure; very firm, very hard; contains very few roots; strongly acid in the upper part but may be only medium acid below a depth of 3½ feet; 20 to 40 inches thick.

C_1 48 inches +, pale-olive to olive (5Y 6/4 to 5/3) very channery loam or silt loam; weak medium blocky or thick platy structure; aggregates have very thin gray coatings; layer firm but less brittle than layer above; strongly to slightly acid in the upper part, and acidity generally decreases with depth; may be calcareous below 4½ or 5 feet.

→ **Volusia channery silt loam, 0 to 3 percent slopes (Ve).**—This soil is in small areas where seepage water collects. It is one of the poorest of the Volusia soils. Runoff is relatively slow. Improving the drainage is very difficult. Diversion terraces may intercept some of the seepage water and improve the drainage slightly. Tile lines properly located may tap the sources of seepage water.

This soil is poorly suited to crops that require much labor or special management for good yields. It is best suited to sod crops. Shallow-rooted legumes are best for mixing with grasses, but birdsfoot trefoil grows fairly well. The soil can be used for corn for silage and for small grains. Winter wheat produces well, but yields of oats are commonly low because of late planting in the spring.

The rotations of group 3, table 10, with very simple management practices to control erosion, are suitable for this soil. Under these rotations, the soil has a high requirement for lime and medium requirements for phosphorus and potassium. Response to higher rates of fertilization is very small, except that crops other than inoculated legumes respond to nitrogen.

→ **Volusia channery silt loam, 3 to 8 percent slopes (Vf).**—This is the best of the Volusia soils. The moderate slopes allow excess water to drain off but they do not cause serious erosion. Response to management is small, and crops that require much intensive management are poorly suited. Small grains, hay, pasture, and corn for silage can be grown with reasonable success under good management. Alfalfa is very poorly suited; Ladino clover, red clover, and birdsfoot trefoil can be used. Winter wheat produces fairly well, but oats give low yields because they cannot be planted until late in spring.

The soil can be used for the rotations of group 4, table 10, with the supporting practices listed. Under these rotations, the soil has a high lime requirement and medium requirements for phosphorus and potassium. Response to larger amounts of phosphorus or potassium is small, but most crops except legumes respond to nitrogen. Yields resulting from different levels of management of this soil during an experiment are given in table 9.

→ **Volusia channery silt loam, 8 to 15 percent slopes (Vg).**—The rapid runoff and slow infiltration of water on this soil creates a moderate erosion problem. In addition, this soil has the other limitations of Volusia soils. Like other Volusia soils, it is best suited to sod crops but can be used with fair success for corn for silage and for small grains. Ladino clover, red clover, and birdsfoot trefoil are suitable legumes. Wheat is productive, but oats have low yields because they cannot be planted until late. When used for the rotations of group 7, table 10, with the supporting practices listed, this soil has a high lime requirement and medium requirements for phosphorus and potassium.

TABLE 9.—*Average acre yield on Volusia channery silt loam, 3 to 8 percent slopes, under 5 rates of fertilization*

[For all rates of fertilization the rotation consists of 1 year of corn, 1 year of oats, 2 years of hay, 1 year of wheat, and 1 year of hay. Tests made at Ithaca, N. Y.]

Amendments applied during rotation[1]	Crop and years of record				
	Corn for silage 11	Oats [2] 5	Mixed hay after oats[3] 11	Winter wheat 11	Mixed hay after wheat[4] 5
	Tons	*Bu.*	*Tons*	*Bu.*	*Tons*
a. 1,000 lbs. limestone, 60 lbs. phosphate (P_2O_5), and 18 tons manure per acre	7.6	38	1.7	14	1.8
b. 1,000 lbs. limestone, 120 lbs. phosphate (P_2O_5), and 27 tons manure per acre	9.0	45	1.8	17	2.3
c. 3,000 lbs. limestone, 60 lbs. phosphate (P_2O_5), and 18 tons manure per acre	9.8	42	1.9	18	2.2
d. 3,000 lbs. limestone, 120 lbs. phosphate (P_2O_5), and 27 tons manure per acre	10.0	45	2.0	22	2.4
e. 5,000 lbs. limestone, 120 lbs. phosphate (P_2O_5), and 27 tons manure per acre	11.5	50	2.1	23	2.3

[1] Amendments applied as follows:
Lime:
Rates a and b: 500 lbs. drilled in row at each hay seeding.
Rates c and d: 500 lbs. drilled in row at each hay seeding and 2,000 lbs. before plowing sod for corn.
Rate e: 500 lbs. drilled in row at each hay seeding, 2,000 lbs. before plowing sod for corn, and 2,000 lbs. when corn is planted.
Phosphate:
Rates a and c: 30 lbs. applied at each hay seeding.
Rates b, d, and e: 30 lbs. applied at each hay seeding, 30 lbs. on oats, and 30 lbs. on wheat.
Manure:
Rates a, b, c, d, and e: Total tons of manure for the rotation to be divided equally among the corn crop, the 2nd year of hay after the oat crop, and the wheat crop.

[2] Record for only the last 5 years of the 11-year experiment because an improved variety of oats, the Mohawk, was introduced.

[3] Seeding mixture is timothy, Ladino clover, red clover, and alfalfa. Yields are averages for the 1st- and 2nd-year hay crops through the 11-year period.

[4] Seeding mixture is timothy and medium red clover.

Volusia channery silt loam, eroded, 8 to 15 percent slopes (Vh).—Most or all of the original plow layer of this soil has been lost through erosion. The present plow layer consists mainly of subsoil material. The depth to the hardpan is 6 to 9 inches less than on the same soil before it was eroded. The soil is highly erodible. The organic-matter content is low, and water filters into the soil slowly. This soil has a low moisture supply during the dry season. Response to management is less than on the uneroded Volusia channery silt loam on 5 to 15 percent slopes.

Hay and pasture are the crops best suited to this soil. Alfalfa is poorly suited, but Ladino clover, red clover, and birdsfoot trefoil are good legumes for this soil. Corn for silage and small grains can also be grown. Wheat is more productive than oats. The soil can be used for the rotations of group 8, table 10, with the supporting practices listed for control of runoff. Under this management, the soil has high requirements for lime and medium requirements for potassium and phosphorus.

Volusia channery silt loam, eroded, 15 to 25 percent slopes (Vk).—This poorly drained soil is of small extent. About 80 to 90 percent of it has been seriously eroded. The hardpan is 10 inches or less below the surface. The organic-matter content is low in the plow layer. Response to management is low.

The soil should not be used for intertilled crops. It is suited to the rotations of group 11, table 10. In these rotations, wheat is a more productive small grain than oats, and birdsfoot trefoil is probably the best legume. The soil has a high lime requirement and medium requirements for potassium and phosphorus. Where the sod crops do not include legumes, nitrogen fertilizer gives very large increases in yield. Native pastures can be improved by lime and fertilizer, but better soil conservation and better production are obtained by growing pasture crops in a rotation with small grains. A legume-grass pasture mixture is seeded in a small grain and left as long as the legume persists in the stand.

Warners series

This very poorly drained black soil series is developing on flats and depressions from alluvium that lies over shell marl. Water usually stands on the surface for long periods. The soil is closely associated with Edwards muck, 0 to 1 percent slopes. The Warners soil is forming in shallow depressions or basins where alluvium has been deposited over the marl that underlies the Edwards series. Most of the Warners soil in this area is loam, but some areas of silt loam and very fine sandy loam are included in the single unit of the Warners series mapped in these counties.

Typical profile of Warners loam under cultivation:

A_1 0 to 7 inches, black (10YR 2/1) loam; strong fine to medium granular structure; loose and mellow when moist, slightly sticky when wet; mildy alkaline: 6 to 9 inches thick.

C 7 to 24 inches, very dark gray (10YR 3/1) loam; granular structure: loose and mellow when moist, slightly plastic when wet; contains small white shells in places; commonly slightly calcareous; 10 to 20 inches thick.

D 24 inches +, chalk-white to light-gray (10YR 7/1) shell marl: 10 inches to several feet thick; layer is underlain by compact light-gray calcareous sand.

Warners loam, 0 to 1 percent slopes (Wa).—Without artificial drainage, this soil cannot be used for agriculture. Cleared undrained areas are commonly included in pastures, but the vegetation is mainly sedges and cattails. Where the soil is partly drained by open ditches, timothy and redtop hay are produced, and Ladino clover could be grown.

Where the soil is completely drained, it is suited to cabbage, celery, onions, hay, and pasture. The drained soil is suited to the rotations of group 1, table 10. For maintenance of fertility under these rotations, the soil has a low lime requirement and medium phosphorus and potassium requirements. Larger amounts of potassium and phosphorus and some nitrogen bring a generally good response from the soil if it has been well drained.

Wayland Series

These poorly drained soils are developing in neutral recent alluvium on the first bottom lands. The parent material is derived almost entirely from the high-lime soils of the nearby uplands. Material is added to the surface every year during floods. The Wayland series is the poorly drained member of the catena that includes the well-drained Genesee soils, the moderately well drained Eel soils, and the very poorly drained Sloan soil. It is also mapped as the poorly drained associate of the Chagrin series.

Typical profile of Wayland silt loam under forest:

A_1 0 to 8 inches, very dark grayish-brown (10YR 3/2) silt loam, with rust-colored mottling along root channels and worm holes; coarse granular structure; friable; contains many fine roots; neutral; 6 to 10 inches thick.

CG_1 8 to 24 inches, dark grayish-brown (10YR 4/2) to gray (10YR 5/1) silt loam, mottled with rust brown, especially along root channels; weak coarse blocky structure; slightly plastic when wet; neutral; 10 to 20 inches thick.

CG_2 24 inches +, dark-gray (10YR 4/1) silt loam with rust-brown mottling; massive to coarse blocky structure; firm when moist, plastic when wet; mildly alkaline; this material grades into bluish-gray clay; permanent water table is 18 inches or less from the surface.

Wayland silt loam, 0 to 1 percent slopes (Wb).—This poorly drained soil is too wet for most crops except hay and pasture. Unimproved and undrained native pastures support low-quality forage, but they produce well late in summer and early in autumn when the upland pastures provide the least feed. This soil occupies some of the lowest parts of the first bottom lands, where outlets for artificial drainage are few.

Generally, drainage cannot be improved enough for success with crops that require intensive management. Where drainage can be improved, the soil is suited to corn, hay, or pasture. Ladino clover is the best suited legume. It makes excellent pasture even when the soil is only partly drained. The soil can be used for the rotations of group 1, table 10, but in most places continuous sod is a better use. The soil has low requirements for lime and potassium and a medium requirement for phosphorus.

Wayland silty clay loam, 0 to 1 percent slopes (Wc).—This soil is similar to Wayland silt loam on 0 to 1 percent slopes, but it is finer in texture throughout the profile. Like the silt loam, this soil is too wet for most crops except hay or pasture. Even where outlets are available for artificial drainage, the soil drains so slowly that sod crops are generally the only ones that will do well. Ladino clover is the best suited legume. In some places the soil can be drained enough to be used for corn in drier seasons. The soil has low requirements for lime and potassium and a medium requirement for phosphorus.

Westland Series

This very poorly drained series has developed in calcareous glacial outwash material. It occupies low-lying positions where much more fine material was deposited than in the higher lying sites where the well-drained soils later developed. The very poor drainage shows in the very dark colored surface soil and the highly mottled gray and yellowish-brown subsoil. The Westland series is the very poorly drained member of the catena that includes the well-drained Palmyra soils, the moderately well drained Phelps soil, and the poorly drained Homer soils. It is also mapped as the very poorly drained associate of the Howard series.

Typical profile of Westland silt loam under forest:

A_1 0 to 6 inches, very dark gray (10YR 3/1) to black (10YR 2/1) silt loam; moderate coarse granular structure; friable; very high in organic matter; filled with fine roots; neutral; 5 to 8 inches thick.

G_1 6 to 12 inches, gray (10YR 5/1) silt loam or gravelly silt loam, weakly mottled with yellowish brown (10YR 5/6) and light brownish gray (10YR 6/2); firm in place, nonplastic when wet; neutral; 4 to 8 inches thick.

G_2 12 to 24 inches, light brownish-gray (10YR 6/2) heavy silt loam or silty clay loam; weak medium blocky structure; firm, slightly plastic; neutral; 8 to 16 inches thick.

CG 24 inches +, gray to light brownish-gray (10YR 6/1 to 6/2) layers of silt, gravel, and sand; glacial outwash composed of shale, sandstone, and limestone; calcareous; saturated with water during most of the year.

Westland silt loam, 0 to 1 percent slopes (Wd).—If this soil is not drained, it is too wet for crops and is very poor for pasture. Native plants are coarse grasses, sedges, and rushes. In most places it is possible to drain the soil artificially. Where it is well drained by tile or open ditches, this soil is suited to corn, small grains, hay, pasture, and most of the intensively grown cash crops. For the rotations of group 1, table 10, it requires few or no supporting practices except drainage. Its requirement for lime is low, and its requirements for phosphorus and potassium are medium. On the drained soil, larger amounts of phosphorus and potassium bring a good response from intensively grown crops. Nitrogen also brings a good response.

⇒ Woostern Series

These well-drained strongly acid soils have developed on loose to slightly firm glacial till derived from acid sandstone and shale. They are weak podzols similar to the Bath soils but are underlain by more rapidly permeable material. Rolling or irregular topography is typical of the Woostern soils. They commonly occur on the lower slopes of valleys just above the terraces where the Chenango soils lie. Woostern soils are also associated with the moderately well drained Mardin soils and the poorly drained Volusia soils.

Typical profile of Woostern gravelly loam under forest:

A_0 Almost black humus, unmixed with mineral material; held in a mat of fine roots; very strongly acid; 1 to 3 inches thick.

A_2 0 to 2 inches, pinkish-gray (7.5YR 6/2) loam; color commonly masked by organic matter in cutover areas; very weak very fine crumb structure; very friable; very strongly or extremely acid; 1 to 3 inches thick.

B_{21} 2 to 7 inches, yellowish-brown (10YR 5/6 to 5/8) gravelly loam; very weak very fine crumb structure; very friable; well aerated, strongly leached of bases, and rich in iron oxide; contains medium-sized and fine roots; very strongly acid; 5 to 8 inches thick.

B_{22} 7 to 20 inches, yellowish-brown (10YR 5/4) gravelly loam, lighter in color than layer above; weak fine crumb structure; friable, well aerated, and leached of bases; moderately rich in iron oxide; strongly acid (pH 5.1 to 5.5); 10 to 16 inches thick.

B_1 20 to 30 inches, light yellowish-brown (10YR 6/4) gravelly loam, lighter in color than horizon above; weak medium crumb structure; friable; contains large roots; strongly acid; 6 to 16 inches thick.

C 30 inches +, grayish-brown to light brownish-gray (2.5Y 5/2 to 6/2) very gravelly loam; loose to slightly firm glacial till consisting mainly of acid sandstone and shale and a smaller amount of crystalline rocks; permeable to water; upper part is penetrated by plant roots; material may be weakly water sorted in some places.

Woostern gravelly loam, 5 to 15 percent slopes (Wf).—This sloping Woostern gravelly loam generally has irregular relief so that different parts of the same field slope in different directions. Contour tillage is generally not possible on these complex slopes. The soil has good structure and good water-holding capacity. It responds well to good management.

This soil is suited to most crops grown in the area if properly managed. It can be used for the rotations of group 3, table 10, which require only simple practices to control runoff. To maintain fertility under these rotations, large amounts of lime and medium amounts of phosphorus and potassium are needed. Larger amounts of phosphorus and potassium and also nitrogen generally give good response on potatoes and other crops that need intensive management.

Woostern gravelly loam, eroded, 5 to 15 percent slopes (Wg).—This soil is like Woostern gravelly loam, 5 to 15 percent slopes, except that most of the original surface layer has been lost. The present plow layer is within part of the original subsoil. The organic-matter content of the soil is low.

Most crops grown in the two counties are at least moderately well suited to this soil. The soil is moderately productive when well managed. It is suited to the rotations of group 6, table 10. It needs only simple practices to control runoff, but it requires special practices, such as heavy manuring, to restore the organic-matter content. Wherever possible, the rotation should contain only 1 year of a close-growing crop and at least 2 years of a sod crop until the organic-matter content has been restored to the soil. Under the rotations suggested, the soil has a high requirement for lime and medium requirements for phosphorus and potassium. Response to heavier rates of phosphorus and potassium fertilization is moderately good on intensively grown cash crops. Response to the addition of nitrogen is generally high for all crops except legumes.

Woostern gravelly loam, 15 to 25 percent slopes (Wh).—The slopes are usually complex on this soil. Runoff is rapid, and it is important to control erosion and conserve moisture for crops. The soil tends to be droughty. The moderately steep slopes interfere with the use of machinery.

This soil is poorly suited to crops that require intensive management. Sod crops are best, and this soil should be used as seldom as possible for intertilled crops. The rotations of group 6, table 10, are good if simple supporting practices for controlling runoff are used. Under this management, the soil has a high lime requirement and medium requirements for phosphorus and potassium.

Native pastures can be improved by fertilization and liming, but better soil conservation and better production can be obtained by plowing periodically and seeding to grass-legume mixtures. Birdsfoot trefoil is one of the best legumes for this soil.

Woostern gravelly loam, eroded, 15 to 25 percent slopes (Wk).—This soil is like Woostern gravelly loam, 15 to 25 percent slopes, except that most of the original surface layer has been lost through erosion. The organic-matter content is low. This increases runoff so that erosion control is difficult. Contour tillage is not practical because the slopes are moderately steep and also complex in most places.

The rotations of group 10, table 10, require only simple supporting practices for control of runoff on this soil. Under these rotations, the soil has a high lime requirement and medium requirements for phosphorus and potassium. Response is small when larger amounts of phosphorus and potassium are applied. Good response is commonly obtained from the use of nitrogen for crops other than legumes. Alfalfa and birdsfoot trefoil are both well suited as the sod crop in these rotations. The yield and quality of the forage on native pastures can be increased by liming and fertilization. Better production and better soil conservation can be obtained, however, by using birdsfoot trefoil. The trefoil is seeded with a companion crop and reseeded in the same way whenever it fails to produce a stand.

Woostern, Bath, and Valois soils, 25 to 45 percent slopes (We).—These are steep well-drained acid soils from glacial till. Soils of the Woostern, Bath, and Valois series are not shown separately on the map because the slope is the controlling factor in use and management. The soils are too steep to be used for crops.

In most places, native pastures are so poor that the soil would be better used for forestry. If necessary, fair pastures can be grown on the less steep parts of these soils by seeding birdsfoot trefoil. Such pastures have a high lime requirement and medium requirements for phosphorus and potassium. Lime and fertilizer can also improve native pastures, but applying these materials is so difficult and expensive and the response is so small that their use generally does not pay. Native pastures that are not improved produce little and erode seriously. Most of the soil used for pasture at the time of this survey was already seriously eroded. Production of either improved or unimproved pastures is fair in the spring and early summer but is low during midsummer when moisture is scarce.

Soil Management Systems

This section is designed to help the farmer choose a combination of practices suitable for the soils on his farm and appropriate for conditions prevailing at the time he makes his choice. The section is based on three tables. Table 10 gives for each soil mapped: (1) suitable crop rotations or uses; (2) practices to be used with these rotations for maintaining organic matter and controlling erosion; and (3) need for lime, nitrogen, phosphorus, and potassium at three levels of management (A, B, C). Table 11 converts the word ratings (low, medium, and high) of table 10 into pounds per acre of nitrogen (N), phosphate (P_2O_5), and potash (K_2O) to be applied yearly. Finally, table 12 shows yields to be expected from each soil at one or more of the three levels of fertilization.

Study of these tables will show that the increased yields at B and C levels are achieved by increasing the amounts of fertilizer and lime, not by changing the crop rotations or supporting practices. The rotations, with the supporting management for control of erosion and maintenance of organic matter, are basic to sound management. Generally, level B of fertilizer and lime is the minimum for effective soil maintenance under the rotation. Level A is not recommended. To obtain the estimated yields at the various levels, artificial drainage should be applied where needed, and choice of crop varieties, timeliness of work, control of weeds and insects, and other practices that make for good husbandry are necessary. In the following pages the various practices necessary for good management are discussed in more detail.

Crop Rotations and Supporting Practices To Maintain Organic Matter and Control Runoff

A good crop rotation, with proper supporting management, will maintain the soil and provide good yields. In planning a rotation, you must take into account the effect of each crop on the supply of organic matter. Row crops (intertilled crops) take from the soil, each year, about 2 percent of its total reserve of organic matter. Small grains or similar close-growing crops remove, each year, about half as much as a row crop. In contrast, grass-legume mixtures for hay or pasture add about 2 percent to the total supply of organic matter the first year they are grown on land used for a crop rotation. Consequently, a legume-grass sod, in the first year, will just about offset the depleting effect of a row crop. In the second year, a legume-grass sod is about one-fourth as effective as it was the first year. Grass crops, if they receive nitrogen, add about as much organic matter as a sod made up of legumes and grasses. Grass sods not fertilized with nitrogen do not make sufficient growth and therefore supply much less organic matter.

To maintain organic matter, you should try to get the most favorable balance between soil-depleting and soil-conserving crops. But a combination of crops ideal for maintaining organic matter may not provide the crops you need. Usually, the crops most needed on the farm cannot maintain organic matter by themselves. If, for example, you need to grow more corn to make your farming pay, you will have to supply at least part of the organic matter by other means than growing sod crops.

Water Features

Yates County, New York

Map symbol and soil name	Hydrologic group	Surface runoff	Month	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
Ae:										
Tuller	D	---	January	0.0-1.0	1.0-1.7	---	---	None	---	None
			February	0.0-1.0	1.0-1.7	---	---	None	---	None
			March	0.0-1.0	1.0-1.7	---	---	None	---	None
			April	0.0-1.0	1.0-1.7	---	---	None	---	None
			May	0.0-1.0	1.0-1.7	---	---	None	---	None
			June	0.0-1.0	1.0-1.7	---	---	None	---	None
			November	0.0-1.0	1.0-1.7	---	---	None	---	None
			December	0.0-1.0	1.0-1.7	---	---	None	---	None
Ct:										
Chenango	A	---	March	3.0->6.0	>6.0	---	---	None	---	None
			April	3.0->6.0	>6.0	---	---	None	---	None
Tioga	B	---	January	---	---	---	---	None	Very brief	Occasional
			February	2.0->6.0	>6.0	---	---	None	Very brief	Occasional
			March	2.0->6.0	>6.0	---	---	None	Brief	Occasional
			April	2.0->6.0	>6.0	---	---	None	Brief	Occasional
			May	---	---	---	---	None	Very brief	Occasional
			November	---	---	---	---	None	Brief	Occasional
			December	---	---	---	---	None	Very brief	Occasional
Cw:										
Chenango	A	---	Jan-Dec			---	---	None	---	None

Tabular Data Version: 4
Tabular Data Version Date: 12/14/2006

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Water Features

Yates County, New York

Map symbol and soil name	Hydrologic group	Surface runoff	Month	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface depth	Duration	Frequency	Duration	Frequency
				Ft	*Ft*	*Ft*				
Cy:										
Chippewa	D	---	January	0.0-1.0	0.7-1.7	0.0-0.5	Very long	Occasional	---	None
			February	0.0-1.0	0.7-1.7	0.0-0.5	Very long	Occasional	---	None
			March	0.0-1.0	0.7-1.7	0.0-0.5	Very long	Occasional	---	None
			April	0.0-1.0	0.7-1.7	0.0-0.5	Very long	Occasional	---	None
			May	0.0-1.0	0.7-1.7	0.0-0.5	Very long	Occasional	---	None
			June	0.0-1.0	0.7-1.7	---	---	None	---	None
			November	0.0-1.0	0.7-1.7	0.0-0.5	Very long	Occasional	---	None
			December	0.0-1.0	0.7-1.7	0.0-0.5	Very long	Occasional	---	None
Ha:										
Wayland	C/D	---	January	0.0-1.0	>6.0	0.0-0.5	Very long	Occasional	Long	Frequent
			February	0.0-1.0	>6.0	0.0-0.5	Very long	Occasional	Long	Frequent
			March	0.0-1.0	>6.0	0.0-0.5	Very long	Occasional	Long	Frequent
			April	0.0-1.0	>6.0	0.0-0.5	Very long	Occasional	Long	Frequent
			May	0.0-1.0	>6.0	0.0-0.5	Very long	Occasional	Long	Frequent
			June	0.0-1.0	>6.0	0.0-0.5	---	None	Long	Frequent
			November	0.0-1.0	>6.0	0.0-0.5	Very long	Occasional	Long	Frequent
			December	0.0-1.0	>6.0	0.0-0.5	Very long	Occasional	Long	Frequent
Lv:										
Lordstown	C	---	Jan-Dec			---	---	None	---	None
Manlius	C	---	Jan-Dec			---	---	None	---	None

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Water Features

Yates County, New York

Map symbol and soil name	Hydrologic group	Surface runoff	Month	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface depth	Duration	Frequency	Duration	Frequency
				Ft	*Ft*	*Ft*				
Me:										
Mardin	C	---	January	1.4-2.0	1.5-2.2	---	---	None	---	None
			February	1.4-2.0	1.5-2.2	---	---	None	---	None
			March	1.4-2.0	1.5-2.2	---	---	None	---	None
			April	1.4-2.0	1.5-2.2	---	---	None	---	None
			December	1.4-2.0	1.5-2.2	---	---	None	---	None
Mf:										
Mardin	C	---	January	1.4-2.0	1.5-2.2	---	---	None	---	None
			February	1.4-2.0	1.5-2.2	---	---	None	---	None
			March	1.4-2.0	1.5-2.2	---	---	None	---	None
			April	1.4-2.0	1.5-2.2	---	---	None	---	None
			December	1.4-2.0	1.5-2.2	---	---	None	---	None
Mg:										
Mardin, eroded	C	---	January	1.4-2.0	1.5-2.2	---	---	None	---	None
			February	1.4-2.0	1.5-2.2	---	---	None	---	None
			March	1.4-2.0	1.5-2.2	---	---	None	---	None
			April	1.4-2.0	1.5-2.2	---	---	None	---	None
			December	1.4-2.0	1.5-2.2	---	---	None	---	None
Mm:										
Middlebury	B	---	January	---	---	---	---	None	Very brief	Occasional
			February	1.5-2.0	>6.0	---	---	None	Very brief	Occasional
			March	1.5-2.0	>6.0	---	---	None	Brief	Occasional
			April	1.5-2.0	>6.0	---	---	None	Brief	Occasional
			May	---	---	---	---	None	Brief	Occasional
			November	---	---	---	---	None	Brief	Occasional
			December	---	---	---	---	None	Very brief	Occasional

Tabular Data Version: 4
Tabular Data Version Date: 12/14/2006

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Water Features

Yates County, New York

Map symbol and soil name	Hydrologic group	Surface runoff	Month	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface depth	Duration	Frequency	Duration	Frequency
				Ft	*Ft*	*Ft*				
Ve:										
Volusia	C	---	January	0.5-1.5	0.8-1.8	---	---	None	---	None
			February	0.5-1.5	0.8-1.8	---	---	None	---	None
			March	0.5-1.5	0.8-1.8	---	---	None	---	None
			April	0.5-1.5	0.8-1.8	---	---	None	---	None
			May	0.5-1.5	0.8-1.8	---	---	None	---	None
			November	0.5-1.5	0.8-1.8	---	---	None	---	None
			December	0.5-1.5	0.8-1.8	---	---	None	---	None
Vf:										
Volusia	C	---	January	0.5-1.5	0.8-1.8	---	---	None	---	None
			February	0.5-1.5	0.8-1.8	---	---	None	---	None
			March	0.5-1.5	0.8-1.8	---	---	None	---	None
			April	0.5-1.5	0.8-1.8	---	---	None	---	None
			May	0.5-1.5	0.8-1.8	---	---	None	---	None
			November	0.5-1.5	0.8-1.8	---	---	None	---	None
			December	0.5-1.5	0.8-1.8	---	---	None	---	None
Vg:										
Volusia	C	---	January	0.5-1.5	0.8-1.8	---	---	None	---	None
			February	0.5-1.5	0.8-1.8	---	---	None	---	None
			March	0.5-1.5	0.8-1.8	---	---	None	---	None
			April	0.5-1.5	0.8-1.8	---	---	None	---	None
			May	0.5-1.5	0.8-1.8	---	---	None	---	None
			November	0.5-1.5	0.8-1.8	---	---	None	---	None
			December	0.5-1.5	0.8-1.8	---	---	None	---	None

Water Features

Yates County, New York

Map symbol and soil name	Hydrologic group	Surface runoff	Month	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface depth	Duration	Frequency	Duration	Frequency
				Ft	*Ft*	*Ft*				
Vk:										
Volusia, eroded	C	---	January	0.5-1.5	0.8-1.8	---	---	None	---	None
			February	0.5-1.5	0.8-1.8	---	---	None	---	None
			March	0.5-1.5	0.8-1.8	---	---	None	---	None
			April	0.5-1.5	0.8-1.8	---	---	None	---	None
			May	0.5-1.5	0.8-1.8	---	---	None	---	None
			November	0.5-1.5	0.8-1.8	---	---	None	---	None
			December	0.5-1.5	0.8-1.8	---	---	None	---	None
We:										
Bath	C	---	February	2.0-3.1	2.1-3.2	---	---	None	---	None
			March	2.0-3.1	2.1-3.2	---	---	None	---	None
Chadakoin	B	---	Jan-Dec			---	---	None	---	None
Valois	B	---	Jan-Dec			---	---	None	---	None
Wf:										
Chadakoin	B	---	Jan-Dec			---	---	None	---	None
Wh:										
Chadakoin	B	---	Jan-Dec			---	---	None	---	None
Wk:										
Chadakoin, eroded	B	---	Jan-Dec			---	---	None	---	None

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Tabular Data Version: 4
Tabular Data Version Date: 12/14/2006

Important characteristics of the soils

[The kind of profile of each soil is shown in figures 4, 5, and 6, on pages 31, 45, and 54. The kind of profile varies according to the parent material and the drainage of the soil. A4=well-drained Alluvial soil; A3=moderately well drained Alluvial soil; A2=imperfectly drained Alluvial soil; G4=well-drained Gray-Brown Podzolic soil; G3=moderately well drained Gray-Brown Podzolic soil; G2=imperfectly drained Gray-Brown Podzolic soil; H=very poorly drained Humic Gley soil; L=poorly drained Low-Humic Gley soil; P4=well-drained Podzolic soil; P3=moderately well drained Podzolic soil; and P2=imperfectly drained Podzolic soil]

Map symbol	Soil and dominant slope range	Kind of profile	Texture of profile	Parent material	Lime content	Topography [1]	Permeability [2]	Erodibility	Capability
Aa	Alden silty clay loam, 0 to 1 percent slopes.	H	Medium	Shale and sandstone till.	Low	Simple	Slow	Low	VIw
Ab	Allendale fine sandy loam, 0 to 2 percent slopes.	L	Coarse	Lacustrine sands	Very low	Simple	Slow	Low	IIIw
Ac	Allis channery silt loam, 12 to 20 inches deep, eroded, 15 to 25 percent slopes.	L	Moderately fine.	Shaly till and residuum.	Very low	Simple	Slow	Very high	VIIe
Ad	Allis silt loam, 36 inches or more deep, 3 to 8 percent slopes.	L	Moderately fine.	Shaly till	Very low	Simple	Slow	Medium	IIIe
Ae	Allis silt loam, 12 to 20 inches deep, 3 to 8 percent slopes.	L	Moderately fine.	Shaly till and residuum	Very low	Simple	Slow	Medium	IVe
Af	Allis silt loam, 12 to 20 inches deep, eroded, 8 to 15 percent slopes.	L	Moderately fine.	Shaly till and residuum.	Very low	Simple	Slow	High	VIe
Ag	Alluvial soils, undifferentiated, 0 to 2 percent slopes.	A4, A3, A2, L	Medium	Alluvial sediments	Low to high.	Complex	Moderate	Low	VIw
Ah	Angola silt loam, 0 to 3 percent slopes	L	Moderately fine.	Shaly till and residuum.	Low	Simple	Slow	Low	IVw
Ak	Arkport-Dunkirk fine sandy loams, 6 to 12 percent slopes.	G4	Coarse to medium.	Lacustrine silts and sands.	Medium	Complex	Moderate	High	IVe
Al	Arkport-Dunkirk fine sandy loams, eroded, 12 to 20 percent slopes.	G4	Coarse to medium.	Lacustrine silts and sands.	Medium	Complex	Moderate	Very high	VIe
Am	Arkport fine sandy loam, 0 to 5 percent slopes.	G4	Coarse	Lacustrine fine sands	Medium	Complex	Rapid	Medium	IIe
An	Arkport fine sandy loam, 6 to 12 percent slopes.	G4	Coarse	Lacustrine fine sands	Medium	Complex	Moderate	Medium	IIIe
Ao	Arkport fine sandy loam, eroded, 12 to 20 percent slopes.	G4	Coarse	Lacustrine fine sands	Medium	Complex	Moderate	Very high	VIIe
Ap	Arkport loamy fine sand, 0 to 5 percent slopes.	G4	Coarse	Lacustrine fine sands	Medium	Complex	Rapid	Medium	IIs
Ar	Arkport soils, 20 to 45 percent slopes	G4	Coarse	Lacustrine fine sands	Medium	Complex	Moderate	Very high	VIIe
As	Atherton silt loam, 0 to 1 percent slopes	H	Moderately coarse.	Glacial outwash	Very low	Simple	Slow	Low	IIIw
At	Aurora silt loam, 3 to 8 percent slopes	P2	Moderately fine.	Shaly till and residuum.	Low	Simple	Slow	Medium	IIIe
Au	Aurora silt loam, eroded, 3 to 8 percent slopes.	P2	Moderately fine.	Shaly till and residuum.	Low	Simple	Slow	Medium	IIIe

See footnotes at end of table.

Cn	Cazenovia silt loam, 3 to 10 percent slopes.	G4	Moderately fine.	Reworked high-lime till.	High	Simple	Moderate	Medium	IIe
Co	Cazenovia silt loam, 10 to 20 percent slopes.	G4	Moderately fine.	Reworked high-lime till.	High	Simple	Moderate	High	IIIe
Cp	Chagrin silt loam, 0 to 2 percent slopes	A4	Medium	Alluvial sediments	Low	Simple	Moderate	Low	IIw
Cr	Chagrin silt loam, alluvial fan, 2 to 8 percent slopes.	A4	Medium	Alluvial sediments	Low	Simple	Moderate	Low	IIe
Cs	Chagrin shaly silt loam, alluvial fan, 2 to 8 percent slopes.	A4	Medium	Alluvial sediments	Low	Simple	Moderate	Low	IIe
Ct	Chenango and Tioga gravelly silt loams, alluvial fan, 2 to 5 percent slopes.	P4	Moderately coarse.	Local outwash	Very low	Simple	Moderate	Low	IIe
Cu	Chenango gravelly loam, 0 to 5 percent slopes.	P4	Moderately coarse.	Glacial outwash	Very low	Simple	Rapid	Low	I
Cv	Chenango gravelly loam, 5 to 15 percent slopes.	P4	Moderately coarse.	Glacial outwash	Very low	Complex	Rapid	Low	IIe
Cw	Chenango soils, 15 to 25 percent slopes	P4	Moderately coarse.	Glacial outwash	Very low	Complex	Very rapid	High	IIIe
Cx	Chenango soils, 25 to 45 percent slopes	P4	Moderarely coarse.	Glacial outwash	Very low	Complex	Very rapid	Very high	VIe
Cy	Chippewa silt loam, 0 to 1 percent slopes	H	Medium	Shale and sandstone till.	Very low	Simple	Slow	Low	VIw
Cz	Chippewa silt loam, 3 to 8 percent slopes.	H	Medium	Shale and sandstone till.	Very low	Simple	Slow	Low	VIw
CA	Collamer silt loam, 0 to 6 percent slopes	G2	Medium	Lacustrine silts and sands.	Medium	Simple	Slow	Medium	IIe
CB	Collamer silt loam, 6 to 12 percent slopes.	G2	Medium	Lacustrine silts and sands.	Medium	Simple	Slow	High	IIIe
CC	Colwood silt loam, 0 to 1 percent slopes	H	Medium	Lacustrine silts and sands.	High	Simple	Slow	Low	IIIw
Da	Darien silt loam, 0 to 3 percent slopes	G2	Moderately fine.	Shaly till	Medium	Simple	Slow	Low	IIw
Db	Darien silt loam, 3 to 8 percent slopes	G2	Moderately fine.	Shaly till	Medium	Simple	Slow	Medium	IIe
Dc	Darien silt loam, 8 to 15 percent slopes	G2	Moderately fine.	Shaly till	Medium	Simple	Slow	High	IIIe
Dd	Darien silt loam, eroded, 8 to 15 percent slopes.	G2	Moderately fine.	Shaly till	Medium	Simple	Slow	High	IVe
De	Dunkirk fine sandy loam, 0 to 6 percent slopes.	G4	Medium	Lacustrine silts and sands.	Medium	Simple	Moderate	Medium	IIe
Df	Dunkirk fine sandy loam, 6 to 12 percent slopes.	G4	Medium	Lacustrine silts and sands.	Medium	Complex	Moderate	High	IIIe
Dg	Dunkirk silt loam, 0 to 6 percent slopes	G4	Medium	Lacustrine silts and sands.	Medium	Simple	Moderate	Medium	IIe

See footnotes at end of table.

Ha	Holly silt loam, 0 to 1 percent slopes	L	Medium	Alluvial sediments	Very low	Simple	Slow	Low	IV
Hb	Homer sandy loam, 0 to 3 percent slopes	L	Moderately coarse.	Glacial outwash	High	Simple	Slow	Low	IIIw
Hc	Homer silt loam, 0 to 3 percent slopes	L	Moderately coarse.	Glacial outwash	High	Simple	Slow	Low	IIIw
Hd	Honeoye fine sandy loam, 0 to 3 percent slopes.	G4	Medium	High-lime till	High	Simple	Moderate	Low	I
He	Honeoye fine sandy loam, 3 to 10 percent slopes.	G4	Medium	High-lime till	High	Simple	Moderate	Medium	IIe
Hf	Honeoye fine sandy loam, 10 to 20 percent slopes.	G4	Medium	High-lime till	High	Simple	Moderate	High	IIIe
Hg	Honeoye fine sandy loam, eroded, 10 to 20 percent slopes.	G4	Medium	High-lime till	High	Simple	Slow	High	IIIe
Hh	Honeoye silt loam, 0 to 3 percent slopes	G4	Medium	High-lime till	High	Simple	Moderate	Medium	I
Hk	Honeoye silt loam, 3 to 10 percent slopes.	G4	Medium	High-lime till	High	Simple	Moderate	Low	IIe
Hl	Honeoye silt loam, 10 to 20 percent slopes.	G4	Medium	High-lime till	High	Simple	Moderate	High	IIIe
Hm	Honeoye silt loam, eroded, 10 to 20 percent slopes.	G4	Medium	High-lime till	High	Simple	Slow	High	IIIe
Hn	Honeoye soils, eroded, 20 to 30 percent slopes.	G4	Medium	High-lime till	High	Simple	Slow	Very high	VIe
Ho	Hornell silt loam, 36 inches or more deep, 3 to 8 percent slopes.	P2	Moderately fine.	Shaly till	Very low	Simple	Slow	Medium	IIe
Hp	Hornell silt loam, 12 to 20 inches deep, 3 to 8 percent slopes.	P2	Moderately fine.	Shaly till and residuum	Very low	Simple	Slow	Medium	IIIw
Hr	Hornell silt loam, 36 inches or more deep, 8 to 15 percent slopes.	P2	Moderately fine.	Shaly till	Very low	Simple	Slow	High	IIIe
Hs	Hornell silt loam, 12 to 20 inches deep, eroded, 8 to 15 percent slopes.	P2	Moderately fine.	Shaly till and residuum	Very low	Simple	Slow	High	IVe
Ht	Hornell silt loam, 36 inches or more deep, eroded, 8 to 15 percent slopes.	P2	Moderately fine.	Shaly till	Very low	Simple	Slow	High	IVe
Hu	Howard gravelly loam, 0 to 5 percent slopes.	G4	Moderately coarse.	Glacial outwash	Medium	Simple	Rapid	Low	I
Hv	Howard gravelly loam, 5 to 15 percent slopes.	G4	Moderately coarse.	Glacial outwash	Medium	Complex	Rapid	Medium	IIe
Hw	Howard soils, 15 to 25 percent slopes	G4	Moderately coarse.	Glacial outwash	Medium	Complex	Very rapid	High	VIe
Ja	Junius fine sandy loam, 0 to 2 percent slopes.	L	Coarse	Lacustrine fine sands	Medium	Simple	Slow	Low	IIIw
Ka	Kendaia loam, 0 to 3 percent slopes	L	Medium	High-lime till	High	Simple	Slow	Low	IIIw
Kb	Kendaia silt loam, 0 to 3 percent slopes	L	Medium	High-lime till	High	Simple	Slow	Low	IIIw
Kc	Kendaia silt loam, 3 to 8 percent slopes	L	Medium	High-lime till	High	Simple	Slow	Low	IIIe

See footnotes at end of table.

Important characteristics of the soils—Continued

Map symbol	Soil and dominant slope range	Kind of profile	Texture of profile	Parent material	Lime content	Topography [1]	Permeability [2]	Erodibility	Capability
La	Lakemont silty clay loam, 0 to 2 percent slopes.	L	Fine	Lacustrine silts and clays.	High	Simple	Slow	Low	IVw
Lb	Langford gravelly silt loam, 3 to 8 percent slopes.	P3	Medium	Shale and sandstone till.	Low	Simple	Moderate	Medium	IIe
Lc	Langford gravelly silt loam, 8 to 15 percent slopes.	P3	Medium	Shale and sandstone till.	Low	Simple	Moderate	High	IIIe
Ld	Lansing and Danley silt loams, 12 to 20 inches deep, 3 to 8 percent slopes.	G4	Medium	Thin till and residuum.	Medium	Simple	Moderate	Medium	IVs
Le	Lansing and Danley silt loams, 12 to 20 inches deep, eroded, 8 to 15 percent slopes.	G4	Medium	Thin till and residuum.	Medium	Simple	Slow	High	VIs
Lf	Lansing and Danley silt loams, 12 to 20 inches deep, eroded, 15 to 25 percent slopes.	G4	Medium	Thin till and residuum.	Medium	Simple	Slow	Very high	VIIs
Lg	Lansing silt loam, 3 to 10 percent slopes.	G4	Medium	Mixed till	Medium	Simple	Moderate	Medium	IIe
Lh	Lansing silt loam, 10 to 20 percent slopes.	G4	Medium	Mixed till	Medium	Simple	Moderate	High	IIIe
Lk	Lansing silt loam, eroded, 10 to 20 percent slopes.	G4	Medium	Mixed till	Medium	Simple	Slow	High	IIIe
Ll	Lansing silt loam, 20 to 30 percent slopes.	G4	Medium	Mixed till	Medium	Simple	Moderate	Very high	IVe
Lm	Lansing silt loam, eroded, 20 to 30 percent slopes.	G4	Medium	Mixed till	Medium	Simple	Slow	Very high	VIe
Ln	Lima fine sandy loam, 0 to 3 percent slopes.	G3	Medium	High-lime till	High	Simple	Moderate	Low	IIw
Lo	Lima fine sandy loam, 3 to 10 percent slopes.	G3	Medium	High-lime till	High	Simple	Moderate	Medium	IIe
Lp	Lima silt loam, 12 to 20 inches deep, 0 to 3 percent slopes.	G3	Medium	Thin high-lime till	High	Simple	Moderate	Low	IIw
Lr	Lima silt loam, 0 to 3 percent slopes	G3	Medium	High-lime till	High	Simple	Moderate	Low	IIw
Ls	Lima silt loam, 3 to 10 percent slopes	G3	Medium	High-lime till	High	Simple	Moderate	Medium	IIe
Lt	Lima silt loam, 10 to 20 percent slopes	G3	Medium	High-lime till	High	Simple	Moderate	High	IIIe
Lu	Lobdell silt loam, 0 to 2 percent slopes	A3	Medium	Alluvial sediments	Low	Simple	Moderate	Low	IIw
Lv	Lordstown and Manlius soils, 25 to 45 percent slopes.	P4	Medium	Shale and sandstone till.	Very low	Simple	Moderate	Very high	VIIe
Lw	Lordstown channery silt loam, 5 to 15 percent slopes.	P4	Medium	Shale and sandstone till.	Very low	Simple	Moderate	Medium	IIe
Lx	Lordstown channery silt loam, 15 to 25 percent slopes.	P4	Medium	Shale and sandstone till.	Very low	Simple	Moderate	High	IVe

Ly	Lordstown channery silt loam, eroded, 15 to 25 percent slopes.	P4	Medium	Shale and sandstone till.	Very low	Simple	Moderate	High	VIe
Lz	Lordstown soils, 45 to 70 percent slopes	P4	Medium	Shale and sandstone till.	Very low	Simple	Moderate	Very high	VIIe
LA	Lyons silt loam, 0 to 1 percent slopes	H	Medium	High-lime till	High	Simple	Slow	Low	IIIw
Ma	Manlius shaly silt loam, 36 inches or more deep, 5 to 15 percent slopes.	P4	Moderately fine.	Shaly till	Very low	Simple	Moderate	High	IIe
Mb	Manlius shaly silt loam, 36 inches or more deep, eroded, 5 to 15 percent slopes.	P4	Moderately fine.	Shaly till	Very low	Simple	Moderate	High	IIIe
Mc	Manlius shaly silt loam, 12 to 20 inches deep, eroded, 15 to 25 percent slopes.	P4	Moderately fine.	Shaly till and residuum	Very low	Simple	Slow	Very high	VIIs
Md	Manlius shaly silt loam, 36 inches or more deep, eroded, 15 to 25 percent slopes.	P4	Moderately fine.	Shaly till	Very low	Simple	Slow	Very high	VIe
Me	Mardin channery silt loam, 3 to 8 percent slopes.	P3	Medium	Shale and sandstone till	Very low	Simple	Moderate	Medium	IIe
Mf	Mardin channery silt loam, 8 to 15 percent slopes.	P3	Medium	Shale and sandstone till	Very low	Simple	Moderate	High	IIIe
Mg	Mardin channery silt loam, eroded, 8 to 15 percent slopes.	P3	Medium	Shale and sandstone till	Very low	Simple	Slow	High	IVe
Mh	Mardin channery silt loam, eroded, 15 to 25 percent slopes.	P3	Medium	Shale and sandstone till	Very low	Simple	Slow	Very high	VIe
Mk	Mardin silt loam, 12 to 20 inches deep, 3 to 15 percent slopes.	P3	Medium	Shale and sandstone till	Very low	Simple	Moderate	Medium	IIIe
Ml	Mardin and Langford soils, 25 to 45 percent slopes.	P3	Medium	Shale and sandstone till	Very low	Simple	Moderate	Very high	VIe
Mm	Middlebury silt loam, 0 to 2 percent slopes.	A3	Medium	Alluvial sediments	Very low	Simple	Moderate	Low	IIw
Mn	Morocco fine sandy loam, 0 to 2 percent slopes.	L	Coarse	Lacustrine sands	Very low	Simple	Slow	Low	IIIw
Mo	Muck, acid (unclassified), 0 to 1 percent slopes.			Organic material	Very low	Simple	Slow	Low	IIIw
Na	Newton fine sandy loam, 0 to 1 percent slopes.	H	Coarse	Lacustrine sands	Very low	Simple	Slow	Low	IIIw
Nb	Nunda silt loam, 0 to 6 percent slopes	G4	Moderately fine.	Reworked glacial till	Medium	Complex	Moderate	Medium	IIe
Nc	Nunda silt loam, 6 to 12 percent slopes	G4	Moderately fine.	Reworked glacial till	Medium	Complex	Moderate	High	IVe
Nd	Nunda silt loam, eroded, 6 to 12 percent slopes.	G4	Moderately fine.	Reworked glacial till	Medium	Complex	Slow	High	VIe
Ne	Nunda silt loam, eroded, 12 to 20 percent slopes.	G4	Moderately fine.	Reworked glacial till	Medium	Complex	Slow	Very high	VIe
Nf	Nunda silt loam, eroded, 20 to 45 percent slopes.	G4	Moderately fine.	Reworked glacial till	Medium	Complex	Slow	Very high	VIe

See footnotes at end of table.

Important characteristics of the soils—Continued

Map symbol	Soil and dominant slope range	Kind of profile	Texture of profile	Parent material	Lime content	Topography [1]	Permeability [2]	Erodibility	Capability
Va	Valois gravelly silt loam, 5 to 15 percent slopes.	P4	Medium	Shale and sandstone till.	Low	Complex	Moderate	Medium	IIe
Vb	Valois gravelly silt loam, eroded, 5 to 15 percent slopes.	P4	Medium	Shale and sandstone till.	Low	Complex	Moderate	Medium	IIIe
Vc	Valois gravelly silt loam, 15 to 25 percent slopes.	P4	Medium	Shale and sandstone till.	Low	Complex	Moderate	High	IIIe
Vd	Valois gravelly silt loam, eroded, 15 to 25 percent slopes.	P4	Medium	Shale and sandstone till.	Low	Complex	Moderate	High	VIe
Ve	Volusia channery silt loam, 0 to 3 percent slopes.	L	Medium	Shale and sandstone till.	Very low	Simple	Slow	Low	IIIw
Vf	Volusia channery silt loam, 3 to 8 percent slopes.	L	Medium	Shale and sandstone till.	Very low	Simple	Slow	Medium	IIIe
Vg	Volusia channery silt loam, 8 to 15 percent slopes.	L	Medium	Shale and sandstone till.	Very low	Simple	Slow	High	IIIe
Vh	Volusia channery silt loam, eroded, 8 to 15 percent slopes.	L	Medium	Shale and sandstone till.	Very low	Simple	Slow	High	IVe
Vk	Volusia channery silt loam, eroded, 15 to 25 percent slopes.	L	Medium	Shale and sandstone till.	Very low	Simple	Slow	Very high	VIe
Wa	Warners loam, 0 to 1 percent slopes	L	Medium	Alluvium over marl	High	Simple	Slow	Low	IIIw
Wb	Wayland silt loam, 0 to 1 percent slopes.	L	Medium	Alluvial sediments	Medium	Simple	Slow	Low	IVw
Wc	Wayland silty clay loam, 0 to 1 percent slopes.	L	Moderately fine.	Alluvial sediments	Medium	Simple	Slow	Low	IVw
Wd	Westland silt loam, 0 to 1 percent slopes.	H	Medium	Glacial outwash	High	Simple	Slow	Low	IIIw
We	Woostern, Bath, and Valois soils, 25 to 45 percent slopes.	P4	Medium	Shale and sandstone till.	Very low	Complex	Moderate	Very high	VIIe
Wf	Woostern gravelly loam, 5 to 15 percent slopes.	P4	Medium	Shale and sandstone till.	Very low	Complex	Moderate	Medium	IIe
Wg	Woostern gravelly loam, eroded, 5 to 15 percent slopes.	P4	Medium	Shale and sandstone till.	Very low	Complex	Moderate	Medium	IIIe
Wh	Woostern gravelly loam, 15 to 25 percent slopes.	P4	Medium	Shale and sandstone till.	Very low	Complex	Moderate	High	VIe
Wk	Woostern gravelly loam, eroded, 15 to 25 percent slopes.	P4	Medium	Shale and sandstone till.	Very low	Complex	Low	High	VIe

[1] Simple topography: single slopes upon which contour cultivation and stripcropping can be used. Complex topography: compound or irregular slopes that are difficult to cultivate and plant on the contour.

[2] The relative ease with which the soil transmits water and air.

U. S. VERNM T PRINTING OFFICE 195

Soil Features

Yates County, New York

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
Ae:									
Tuller	Lithic bedrock	12-20	---	---	---	---	High	High	High
Ct:									
Chenango	---	---	---	---	---	---	Moderate	Low	Moderate
Tioga	---	---	---	---	---	---	Moderate	Low	Moderate
Cw:									
Chenango	---	---	---	---	---	---	Moderate	Low	Moderate
Cy:									
Chippewa	Fragipan	8-20	---	Noncemented	---	---	High	High	Moderate
Ha:									
Wayland	---	---	---	---	---	---	High	High	Low
Lv:									
Lordstown	Lithic bedrock	12-40	---	---	---	---	Moderate	Low	High
Manlius	Lithic bedrock	12-40	---	---	---	---	Moderate	Low	Moderate
Me:									
Mardin	Fragipan	18-26	---	Noncemented	---	---	Moderate	Moderate	Low
Mf:									
Mardin	Fragipan	18-26	---	Noncemented	---	---	Moderate	Moderate	Low
Mg:									
Mardin, eroded	Fragipan	18-26	---	Noncemented	---	---	Moderate	Moderate	Low

This report shows only the major soils in each map unit. Others may exist.

Soil Features

Yates County, New York

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	*In*		*In*	*In*			
Mm:									
Middlebury	---	---	---	---	---	---	High	Moderate	Low
Ve:									
Volusia	Fragipan	10-22	---	Noncemented	---	---	High	High	Moderate
Vf:									
Volusia	Fragipan	10-22	---	Noncemented	---	---	High	High	Moderate
Vg:									
Volusia	Fragipan	10-22	---	Noncemented	---	---	High	High	Moderate
Vk:									
Volusia, eroded	Fragipan	10-22	---	Noncemented	---	---	High	High	Moderate
We:									
Bath	Fragipan	25-38	---	Noncemented	---	---	Moderate	Moderate	Moderate
Chadakoin	---	---	---	---	---	---	Moderate	Low	High
Valois	---	---	---	---	---	---	Moderate	Low	High
Wf:									
Chadakoin	---	---	---	---	---	---	Moderate	Low	High
Wh:									
Chadakoin	---	---	---	---	---	---	Moderate	Low	High
Wk:									
Chadakoin, eroded	---	---	---	---	---	---	Moderate	Low	High

This report shows only the major soils in each map unit. Others may exist.

APPENDIX C
EROSION AND SEDIMENT CONTROL DETAILS

STANDARD AND SPECIFICATIONS FOR MULCHING

Definition

Applying coarse plant residue or chips, or other suitable materials, to cover the soil surface.

Purpose

The primary purpose is to provide initial erosion control while a seeding or shrub planting is establishing. Mulch will conserve moisture and modify the surface soil temperature and reduce fluctuation of both. Mulch will prevent soil surface crusting and aid in weed control. Mulch is also used alone for temporary stabilization in non-growing months.

Conditions Where Practice Applies

On soils subject to erosion and on new seedings and shrub plantings. Mulch is useful on soils with low infiltration rates by retarding runoff.

Criteria

Site preparation prior to mulching requires the installation of necessary erosion control or water management practices and drainage systems.

Slope, grade and smooth the site to fit needs of selected mulch products.

Remove all undesirable stones and other debris to meet the needs of the anticipated land use and maintenance required.

Apply mulch after soil amendments and planting is accomplished or simultaneously if hydroseeding is used.

Select appropriate mulch material and application rate or material needs. Determine local availability.

Select appropriate mulch anchoring material.

NOTE: The best combination for grass/legume establishment is straw (cereal grain) mulch applied at 2 ton/acre (90 lbs./1000sq.ft.) and anchored with wood fiber mulch (hydromulch) at 500 – 750 lbs./acre (11 – 17 lbs./1000 sq. ft.). The wood fiber mulch must be applied through a hydroseeder immediately after mulching.

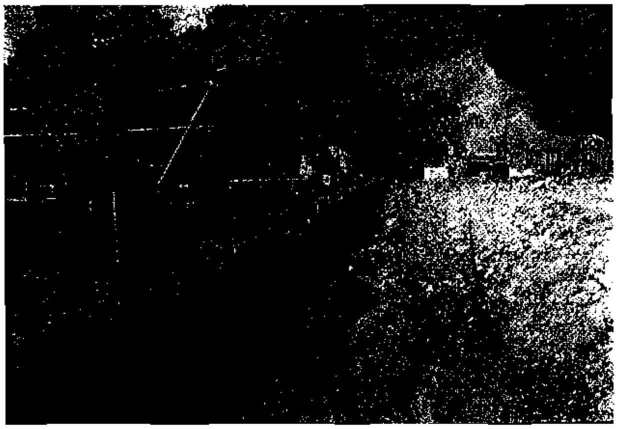
Table 3.7
Guide to Mulch Materials, Rates, and Uses

Mulch Material	Quality Standards	per 1000 Sq. Ft.	per Acre	Depth of Application	Remarks
Wood chips or shavings	Air-dried. Free of objectionable coarse material	500-900 lbs.	10-20 tons	2-7”	Used primarily around shrub and tree plantings and recreation trails to inhibit weed competition. Resistant to wind blowing. Decomposes slowly.
Wood fiber cellulose (partly digested wood fibers)	Made from natural wood usually with green dye and dispersing agent	50 lbs.	2,000 lbs.	—	Apply with hydromulcher. No tie down required. Less erosion control provided than 2 tons of hay or straw.
Gravel, Crushed Stone or Slag	Washed; Size 2B or 3A—1 1/2”	9 cu. yds.	405 cu. yds.	3”	Excellent mulch for short slopes and around plants and ornamentals. Use 2B where subject to traffic. (Approximately 2,000 lbs./cu. yd.). Frequently used over filter fabric for better weed control.
Hay or Straw	Air-dried; free of undesirable seeds & coarse materials	90-100 lbs. 2-3 bales	2 tons (100-120 bales)	cover about 90% surface	Use small grain straw where mulch is maintained for more than three months. Subject to wind blowing unless anchored. Most commonly used mulching material. Provides the best micro-environment for germinating seeds.
Jute twisted yarn	Undyed, unbleached plain weave. Warp 78 ends/yd., Weft 41 ends/ yd. 60-90 lbs./roll	48” x 50 yds. or 48” x 75 yds.	—	—	Use without additional mulch. Tie down as per manufacturers specifications. Good for center line of concentrated water flow.
Excelsior wood fiber mats	Interlocking web of excelsior fibers with photodegradable plastic netting	8” x 100” 2-sided plastic, 48” x 180” 1-sided plastic	—	—	Use without additional mulch. Excellent for seeding establishment. Tie down as per manufacturers specifications. Approximately 72 lbs./roll for excelsior with plastic on both sides. Use two sided plastic for centerline of waterways.
Compost	Up to 3” pieces, moderately to highly stable	3-9 cu. yds.	134-402 cu. yds.	1-3”	Coarser textured mulches may be more effective in reducing weed growth and wind erosion.
Straw or coconut fiber, or combination	Photodegradable plastic net on one or two sides	Most are 6.5 ft. x 3.5 ft.	81 rolls	—	Designed to tolerate higher velocity water flow, centerlines of waterways, 60 sq. yds. per roll.

Table 3.8
Mulch Anchoring Guide

Anchoring Method or Material	Kind of Mulch to be Anchored	How to Apply
1. Peg and Twine	Hay or straw	After mulching, divide areas into blocks approximately 1 sq. yd. in size. Drive 4-6 pegs per block to within 2" to 3" of soil surface. Secure mulch to surface by stretching twine between pegs in criss-cross pattern on each block. Secure twine around each peg with 2 or more tight turns. Drive pegs flush with soil. Driving stakes into ground tightens the twine.
2. Mulch netting	Hay or straw	Staple the light-weight paper, jute, wood fiber, or plastic nettings to soil surface according to manufacturer's recommendations. Should be biodegradable. Most products are not suitable for foot traffic.
3. Wood cellulose fiber	Hay or straw	Apply with hydroseeder immediately after mulching. Use 500 lbs. wood fiber per acre. Some products contain an adhesive material ("tackifier"), possibly advantageous.
4. Mulch anchoring tool	Hay or straw	Apply mulch and pull a mulch anchoring tool (blunt, straight discs) over mulch as near to the contour as possible. Mulch material should be "tucked" into soil surface about 3".
5. Tackifier	Hay or straw	Mix and apply polymeric and gum tackifiers according to manufacturer's instructions. Avoid application during rain. A 24-hour curing period and a soil temperature higher than 45^0 Fahrenheit are required.

STANDARD AND SPECIFICATIONS
FOR
SILT FENCE



Definition

A temporary barrier of geotextile fabric installed on the contours across a slope used to intercept sediment laden runoff from small drainage areas of disturbed soil.

Purpose

The purpose of a silt fence is to reduce runoff velocity and effect deposition of transported sediment load. Limits imposed by ultraviolet stability of the fabric will dictate the maximum period the silt fence may be used (approximately one year).

Conditions Where Practice Applies

A silt fence may be used subject to the following conditions:

1. Maximum allowable slope lengths contributing runoff to a silt fence placed on a slope are:

Slope Steepness	Maximum Length (ft.)
2:1	25
3:1	50
4:1	75
5:1 or flatter	100

2. Maximum drainage area for overland flow to a silt fence shall not exceed ¼ acre per 100 feet of fence, with maximum ponding depth of 1.5 feet behind the fence; and

3. Erosion would occur in the form of sheet erosion; and

4. There is no concentration of water flowing to the barrier.

Design Criteria

Design computations are not required for installations of 1 month or less. Longer installation periods should be designed for expected runoff. All silt fences shall be placed as close to the areas as possible, but at least 10 feet from the toe of a slope to allow for maintenance and roll down. The area beyond the fence must be undisturbed or stabilized.

Sensitive areas to be protected by silt fence may need to be reinforced by using heavy wire fencing for added support to prevent collapse.

Where ends of filter cloth come together, they shall be overlapped, folded and stapled to prevent sediment bypass. A detail of the silt fence shall be shown on the plan. See Figure 5A.8 on page 5A.21 for details.

Criteria for Silt Fence Materials

1. Silt Fence Fabric: The fabric shall meet the following specifications unless otherwise approved by the appropriate erosion and sediment control plan approval authority. Such approval shall not constitute statewide acceptance.

Fabric Properties	Minimum Acceptable Value	Test Method
Grab Tensile Strength (lbs)	90	ASTM D1682
Elongation at Failure (%)	50	ASTM D1682

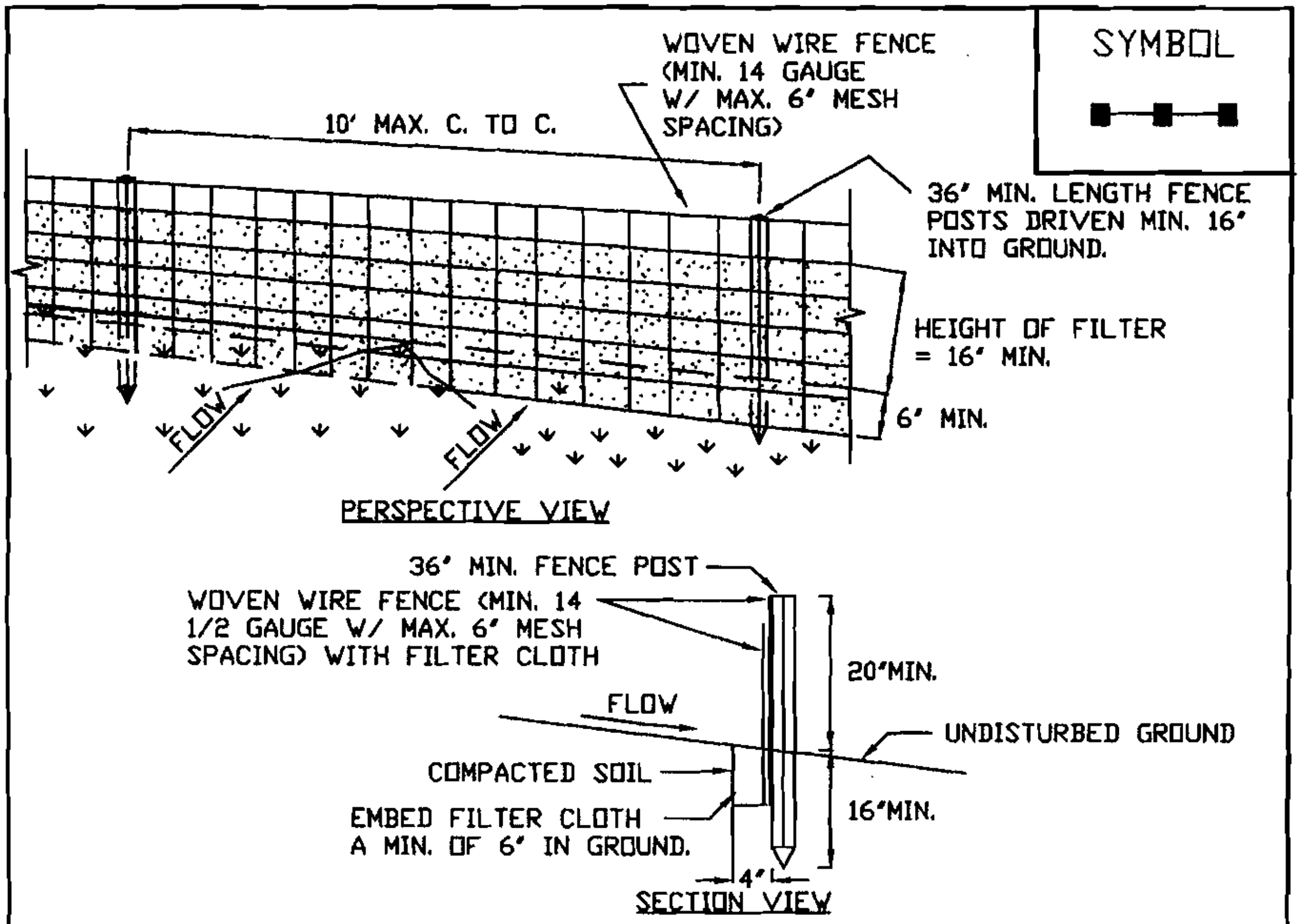
Mullen Burst Strength (PSI)	190	ASTM D3786
Puncture Strength (lbs)	40	ASTM D751 (modified)
Slurry Flow Rate (gal/min/sf)	0.3	
Equivalent Opening Size	40-80	US Std Sieve CW-02215
Ultraviolet Radiation Stability (%)	90	ASTM G-26

2. Fence Posts (for fabricated units): The length shall be a minimum of 36 inches long. Wood posts will be of sound quality hardwood with a minimum cross sectional area of 3.0 square inches. Steel posts will be standard T and U section weighing not less than 1.00 pound per linear foot.

3. Wire Fence (for fabricated units): Wire fencing shall be a minimum 14 gage with a maximum 6 in. mesh opening, or as approved.

4. Prefabricated Units: Envirofence, Geofab, or approved equal, may be used in lieu of the above method providing the unit is installed per details shown in Figure 5A.8.

Figure 5A.8
Silt Fence



CONSTRUCTION SPECIFICATIONS

1. WOVEN WIRE FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES. POSTS SHALL BE STEEL EITHER 'T' OR 'U' TYPE OR HARDWOOD.
2. FILTER CLOTH TO BE TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24' AT TOP AND MID SECTION. FENCE SHALL BE WOVEN WIRE, 6' MAXIMUM MESH OPENING.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVER-LAPPED BY SIX INCHES AND FOLDED. FILTER CLOTH SHALL BE EITHER FILTER X, MIRAFI 100X, STABILINKA T140N, OR APPROVED EQUIVALENT.
4. PREFABRICATED UNITS SHALL BE GEOFAB, ENVIROFENCE, OR APPROVED EQUIVALENT.
5. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN 'BULGES' DEVELOP IN THE SILT FENCE.

ADAPTED FROM DETAILS PROVIDED BY: USDA - NRCS, NEW YORK STATE DEPARTMENT OF TRANSPORTATION, NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION, NEW YORK STATE SOIL & WATER CONSERVATION COMMITTEE	SILT FENCE

STANDARD AND SPECIFICATIONS
FOR
STABILIZED CONSTRUCTION ENTRANCE

Definition

A stabilized pad of aggregate underlain with geotextile located at any point where traffic will be entering or leaving a construction site to or from a public right-of-way, street, alley, sidewalk, or parking area.

Purpose

The purpose of stabilized construction entrance is to reduce or eliminate the tracking of sediment onto public rights-of-way or streets.

Conditions Where Practice Applies

A stabilized construction entrance shall be used at all points of construction ingress and egress.

Design Criteria

See Figure 5A.35 on page 5A.76 for details.

Aggregate Size: Use a matrix of 1-4 inch stone, or reclaimed or recycled concrete equivalent.

Thickness: Not less than six (6) inches.

Width: 12-foot minimum but not less than the full width of points where ingress or egress occurs. 24-foot minimum if there is only one access to the site.

Length: As required, but not less than 50 feet (except on a single residence lot where a 30 foot minimum would apply).

Geotextile: To be placed over the entire area to be covered with aggregate. Filter cloth will not be required on a single-family residence lot. Piping of surface water under entrance shall be provided as required. If piping is impossible, a mountable berm with 5:1 slopes will be permitted.

Criteria for Geotextile

The geotextile shall be woven or nonwoven fabric consisting only of continuous chain polymeric filaments or yarns of polyester. The fabric shall be inert to commonly encountered chemicals, hydro-carbons, mildew, rot resistant, and conform to the fabric properties as shown:

Fabric Properties[3]	Light Duty[1] Roads Grade Subgrade	Heavy Duty[2] Haul Roads Rough Graded	Test Method
Grab Tensile Strength (lbs)	200	220	ASTM D1682
Elongation at Failure (%)	50	60	ASTM D1682
Mullen Brust Strength (lbs)	190	430	ASTM D3786
Puncture Strength (lbs)	40	125	ASTM D751 modified
Equivalent Opening Size	40-80	40-80	US Std Sieve CW-02215
Aggregate Depth	6	10	--

[1] Light Duty Road: Area sites that have been graded to subgrade and where most travel would be single axle vehicles and an occasional multi-axle truck. Acceptable materials are Trevira Spunbond 1115, Mirafi 100X, Typar 3401, or equivalent.

[2] Heavy Duty Road: Area sites with only rough grading, and where most travel would be multi-axle vehicles. Acceptable materials are Trevira Spunbond 1135, Mirafi 600X, or equivalent.

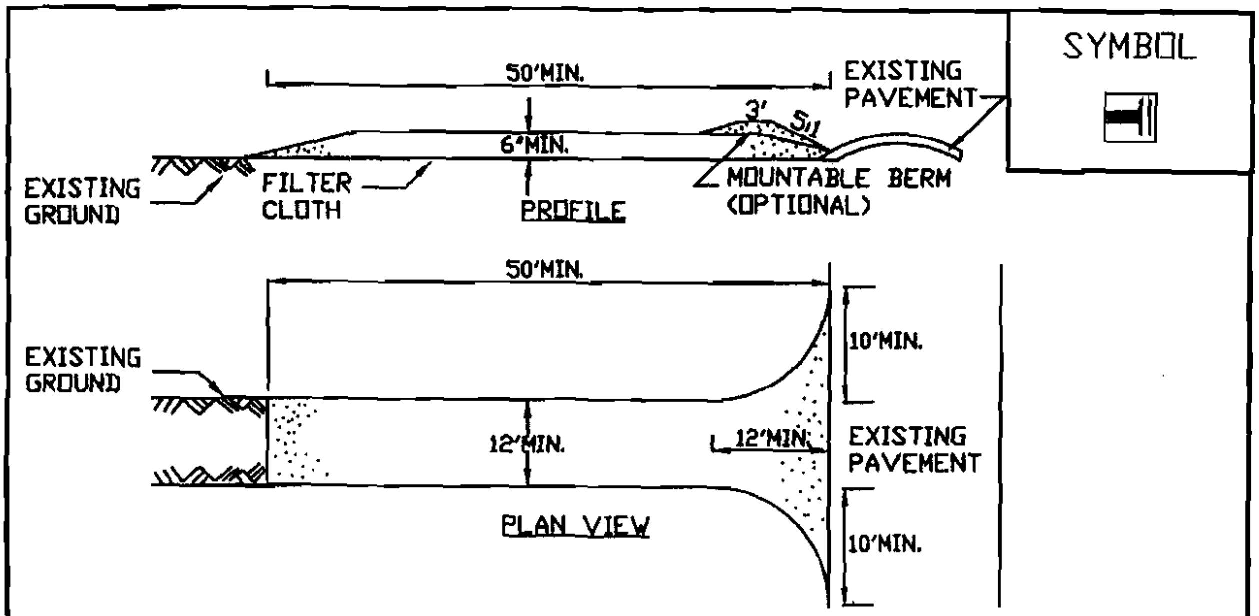
[3] Fabrics not meeting these specifications may be used only when design procedure and supporting documentation are supplied to determine aggregate depth and fabric strength.

Maintenance

The entrance shall be maintained in a condition which will prevent tracking of sediment onto public rights-of-way or streets. This may require periodic top dressing with additional aggregate. All sediment spilled, dropped, or washed onto public rights-of-way must be removed immediately.

When necessary, wheels must be cleaned to remove sediment prior to entrance onto public rights-of-way. When washing is required, it shall be done on an area stabilized with aggregate, which drains into an approved sediment-trapping device. All sediment shall be prevented from entering storm drains, ditches, or watercourses.

Figure 5A.35
Stabilized Construction Entrance



CONSTRUCTION SPECIFICATIONS

1. STONE SIZE - USE 1-4 INCH STONE, OR RECLAIMED OR RECYCLED CONCRETE EQUIVALENT.
2. LENGTH - NOT LESS THAN 50 FEET (EXCEPT ON A SINGLE RESIDENCE LOT WHERE A 30 FOOT MINIMUM LENGTH WOULD APPLY).
3. THICKNESS - NOT LESS THAN SIX (6) INCHES.
4. WIDTH - TWELVE (12) FOOT MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS. TWENTY-FOUR (24) FOOT IF SINGLE ENTRANCE TO SITE.
5. GEOTEXTILE - WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE.
6. SURFACE WATER - ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED BENEATH THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.
7. MAINTENANCE - THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACTED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
8. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON A AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
9. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN.

ADAPTED FROM DETAILS PROVIDED BY: USDA - NRCS, NEW YORK STATE DEPARTMENT OF TRANSPORTATION, NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION, NEW YORK STATE SOIL & WATER CONSERVATION COMMITTEE	STABILIZED CONSTRUCTION ENTRANCE

STANDARD AND SPECIFICATIONS FOR TEMPORARY ACCESS WATERWAY CROSSING

Definition

A temporary access waterway crossing is a structure placed across a waterway to provide access for construction purposes for a period of less than one year. Temporary access crossings shall not be utilized to maintain traffic for the general public.

Purpose

The purpose of the temporary access waterway crossing is to provide safe, environmentally sound access across a waterway for construction equipment by establishing minimum standards and specifications for the design, construction, maintenance, and removal of the structure. Temporary access waterway crossing are necessary to prevent construction equipment from damaging the waterway, blocking fish migration, and tracking sediment and other pollutants into the waterway. This standard and specification may represent a channel constriction, thus, the temporary nature of waterway access crossing must be stressed. They should be planned to be in service for the shortest practical period of time and removed as soon as their function is completed.

Conditions Where Practice Applies

The following standard and specification for temporary access waterway crossings are applicable in non-tidal waterways. These standard and specifications provide designs based on waterway geometry rather than the drainage area contributing to the point of crossing.

The principal consideration for development of the standard and specifications is concern for erosion and sediment control. Structural utility and safety must also be considered when designing temporary access waterway crossings to withstand expected loads.

The tree types of standard temporary access waterway crossings are bridges, culverts, and fords.

General Requirements

1. In-Stream Excavation: In-Stream excavation shall be limited to only that necessary to allow installation of the standard methods as presented in Subsection "Temporary Access Waterway Crossing Methods."

2. Elimination of Fish Migration Barriers: Of the three basic methods presented in Subsection "Temporary Access Waterway Crossing Methods," bridges pose the least potential for creating barriers to aquatic migration. The construction of any specific crossing method as presented in Subsection "Temporary Access Waterway Crossing Methods," shall not cause a significant water level difference between the upstream and downstream water surface elevations. Fish spawning or migration within waterways is from October 1 to April 30 for water classified for trout and from March 15 to June 15 for other streams. Restrictions imposed by the NYS Department of Environmental Conservation during these time periods may apply and must be checked.

3. Crossing Alignment: The temporary waterway crossing shall be at right angles to the stream. Where approach conditions dictate, the crossing may vary 15 degrees from a line drawn perpendicular to the centerline of the stream at the intended crossing location.

4. Road Approaches: The centerline of both roadway approaches shall coincide with the crossing alignment centerline for a minimum distance of 50 feet from each bank of the waterway being crossed. If physical or right-of-way restraints preclude the 50 feet minimum, a shorter distance may be provided. All fill materials associated with the roadway approach shall be limited to a maximum height of 2 feet above the existing flood plain elevation.

5. Surface Water Diverting Structure: A water diverting structure such as a swale shall be constructed (across the roadway on both roadway approaches) 50 feet (maximum) on either side of the waterway

crossing. This will prevent roadway surface runoff from directly entering the waterway. The 50 feet is measured from the top of the waterway bank. Design criteria for this diverting structure shall be in accordance with the "Standard and Specification" for the individual design standard of choice. If the roadway approach is constructed with a reverse grade away from the waterway, a separate diverting structure is not required.

6. Road Width: All crossings shall have one traffic lane. The minimum width shall be 12 feet with a maximum width of 20 feet.

7. Time of Operation: All temporary crossing shall be removed within 14 calendar days after the structure is no longer needed. Unless prior written approval is obtained, all structures shall be removed within one year from the date of the installation.

8. Materials

    A. Aggregate: There shall be no earth or soil materials used for construction within the waterway channel. NYS DOT specifications for coarse aggregate designation No. 4 (3/4" to 4"), also referenced as AASHTO designation No. 1, shall be the minimum acceptable aggregate size for temporary crossings. Larger aggregates will be allowed.

    B. Filter Cloth: Filter cloth is a fabric consisting of either woven or nonwoven plastic, polypropylene, or nylon used to distribute the load, retain fines, allow increased drainage of the aggregate and reduce mixing of the aggregate with the subgrade soil. Filter cloths such as Mirafi, Typar, Adva Filter, Polyfilter X, or approved equivalent shall be used, as required by the specific method.

Temporary Access Waterway Crossing Methods

The following criteria for erosion and sediment control shall be considered when selecting a specific temporary access waterway crossing standard method:

1. Site aesthetics: Select a standard design method that will least disrupt the existing terrain of the stream reach. Consider the effort that will be required to restore the area after the temporary crossing is removed.

2. Site location: Locate the temporary crossing where there will be the least disturbance to the soils of the existing waterway banks. When possible, locate the crossing at a point receiving minimal surface runoff.

3. Physical site constraints: The physical constraints of a site may preclude the selection of one or more of the standard methods.

4. Time of year: The time of year may preclude the selection of one or more of the standard methods due to fish spawning or migration restrictions.

5. Vehicular loads and traffic patterns: Vehicular loads, traffic patterns, and frequency of crossing should be considered in choosing a specific method.

6. Maintenance of crossing: The standard methods will require various amounts of maintenance. The bridge method should require the least maintenance, whereas the ford method will probably require more intensive maintenance.

7. Removal of the Structure: Ease of removal and subsequent damage to the waterway should be primary factors in considering the choice of a standard method.

Temporary Access Bridge (Figure 5A.36 on page 5A.84)

A temporary access bridge is a structure made of wood, metal, or other materials, which provides access across a stream or waterway.

Considerations

1. This is the preferred method for temporary access waterway crossings. Normally, bridge construction causes the least disturbance to the waterway bed and banks when compared to the other access waterway crossings.

2. Most bridges can be quickly removed and reused.

3. Temporary access bridges pose the least chance for interference with fish migration when compared to the other temporary access waterway crossings.

4. Restrictions and Permits: A permit from the New York State Department of Environmental Conservation, Division of Regulatory Affairs, Regional Permit Administrator, will be needed to install and remove temporary access culverts in streams with a classification of C(T) and higher. Installation and removal may not be permitted during the period of time from the start of trout spawning until the eggs have hatched. In some instances, restrictions may also be applied to bass spawning waters.

Construction Specifications

1. Restriction: Construction, use, or removal of a temporary access bridge will not normally have any time of year restrictions if construction, use, or removal does not disturb the stream or its banks.

2. Bridge Placement: A temporary bridge structure shall be constructed at or above bank elevation to prevent the entrapment of floating materials and debris.

3. Abutments: Abutments shall be placed parallel to and on stable banks.

4. Bridge Span: Bridges shall be constructed to span the entire channel. If a footing, pier, or bridge support is constructed within the waterway, a stream-disturbance permit may be required.

5. Stringers: Stringers shall either be logs, saw timber, pre-stressed concrete beams, metal beams, or other approved materials.

6. Deck Material: Decking shall be of sufficient strength to support the anticipated load. All decking members shall be placed perpendicular to the stringers, butted tightly, and securely fastened to the stringers. Decking materials must be butted tightly to prevent any soil material tracked onto the bridge from falling into the waterway below.

7. Run Planks (optional): Run planking shall be securely fastened to the length of the span. One run plank shall be provided for each track of the equipment wheels. Although run planks are optional, they may be necessary to properly distribute loads.

8. Curbs or Fenders: Curbs or fenders may be installed along the outer sides of the deck. Curbs or fenders are an option, which will provide additional safety.

9. Bridge Anchors: Bridges shall be securely anchored at only one end using steel cable or chain. Anchoring at only one end will prevent channel obstruction in the event that floodwaters float the bridge. Acceptable anchors are large trees, large boulders, or driven steel anchors. Anchoring shall be sufficient to prevent the bridge from floating downstream and possibly causing an obstruction to the flow.

10. Stabilization: All areas disturbed during installation shall be stabilized within 14 calendar days of that disturbance in accordance with the Standard and Specification for Temporary Critical Area Plantings on page 3.3.

Bridge Maintenance Requirements

1. Inspection: Periodic inspection shall be performed by the user to ensure that the bridge, streambed, and streambanks are maintained and not damaged.

2. Maintenance: Maintenance shall be performed, as needed to ensure that the structure complies with the standard and specifications. This shall include removal and disposal of any trapped sediment or debris. Sediment shall be disposed of outside of the floodplain and stabilized.

Bridge Removal and Clean-Up Requirements

1. Removal: When the temporary bridge is no longer needed, all structures including abutments and other bridging materials shall be removed within 14 calendar days. In all cases, the bridge materials shall be removed within one year of installation.

2. Final Clean-Up: Final clean-up shall consist of removal of the temporary bridge from the waterway, protection of banks from erosion, and removal of all construction materials. All removed materials shall be stored outside the waterway floodplain.

3. Method: Removal of the bridge and clean-up of the area shall be accomplished without construction equipment working in the waterway channel.

4. Final Stabilization: All areas disturbed during removal shall be stabilized within 14 calendar days of that disturbance in accordance with the Standard and Specifications for Permanent Critical Area Plantings on page 5.5.

Temporary Access Culvert (Figure 5A.37 on page 5A.85)

A temporary access culvert is a structure consisting of a section(s) of circular pipe, pipe arches, or oval pipes of reinforcing concrete, corrugated metal, or structural plate, which is used to convey flowing water through the crossing.

Considerations

1. Temporary culverts are used where a) the channel is too wide for normal bridge construction, b) anticipated loading may prove unsafe for single span bridges, or c) access is not needed from bank to bank.

2. This temporary waterway crossing method is normally preferred over a ford type of crossing, since disturbance to the waterway is only during construction and removal of the culvert.

3. Temporary culverts can be salvaged and reused.

Construction Specifications

1. Restrictions and Permits: A permit from the New York State Department of Environmental Conservation, Division of Regulatory Affairs, Regional Permit Administrator, will be needed to install and remove temporary access culverts in streams with a classification of C(T) and higher. Installation and removal may not be permitted during the period of time from the start of trout spawning until the eggs have hatched. In some instances, restrictions may also be applied to bass spawning waters.

2. Culvert Strength: All culverts shall be strong enough to support their cross sectional area under maximum expected loads.

3. Culvert Size: The size of the culvert pipe shall be the largest pipe diameter that will fit into the existing channel without major excavation of the waterway channel or without major approach fills. If a channel width exceeds 3 feet, additional pipes may be used until the cross sectional area of the pipes is greater than 60 percent of the cross sectional area of the existing channel. The minimum size culvert that may be used is 12-inch diameter pipe.

4. Culvert Length: The culvert(s) shall extend a minimum of one foot beyond the upstream and downstream toe of the aggregate placed around the culvert. In no case shall the culvert exceed 40 feet in length.

5. Filter Cloth: Filter cloth shall be placed on the streambed and streambanks prior to placement of the pipe culvert(s) and aggregate. The filter cloth shall cover the streambed and extend a minimum six inches and a maximum one foot beyond the end of the culvert and bedding material. Filter cloth reduces settlement and improves crossing stability.

6. Culvert Placement: The invert elevation of the culvert shall be installed on the natural streambed grade to minimize interference with fish migration (free passage of fish).

7. Culvert Protection: The culvert(s) shall be covered with a minimum of one foot of aggregate. If multiple culverts are used, they shall be separated by at least 12 in. of compacted aggregate fill. At the minimum, the bedding and fill material used in the construction of them temporary access culvert crossings shall conform with the aggregate requirements cited in the General Requirements subsection.

8. Stabilization: All areas disturbed during culvert installation shall be stabilized within 14 calendar days of the disturbance in accordance with the Standard for Permanent Critical Area Plantings.

Culvert Maintenance Requirements

1. Inspection: Periodic inspection shall be performed to ensure that the culverts, streambed, and streambanks are not damaged, and that sediment is not entering the stream or blocking fish passage or migration.

2. Maintenance: Maintenance shall be performed, as needed in a timely manner to ensure that structures are in compliance with this standard and specification. This shall include removal and disposal of any trapped sediment or debris. Sediment shall be disposed of and stabilized outside the waterway flood plain.

Culvert Removal and Clean-Up Requirements

1. Removal: When the crossing has served its purpose, all structures, including culverts, bedding, and filter cloth materials shall be removed within 14 calendar days. In all cases, the culvert materials shall be removed within one year of installation. No structure shall be removed during the spawning season (March 15 through June 15).

2. Final Clean-Up: Final clean-up shall consist of removal of the temporary structure from the waterway, removal of all construction materials, restoration of original stream channel cross section, and protection of the streambanks from erosion. Removed material shall be stored outside of the waterway floodplain.

3. Method: Removal of the structure and clean-up of the area shall be accomplished without construction equipment working in the waterway channel.

4. Final Stabilization: All areas disturbed during culvert removal shall be stabilized within 14 calendar days of the disturbance in accordance with the Standard for Permanent Critical Area Plantings.

Temporary Access Ford (Figure 5A.38 on page 5A.86)

A temporary access ford is a shallow structure placed in the bottom of a waterway over which the water flows while still allowing traffic to cross the waterway.

Considerations

Temporary fords may be used when the streambanks are less than four (4) feet above the invert of the stream, and the streambed is armored with naturally occurring bedrock, or can be protected with an aggregate layer in conformance with these specifications.

Construction Specifications

1. Restrictions and Permits: A permit from New York State Department of Environmental Conservation, Division of Regulatory Affairs, Regional Permit Administrator, will be needed to install, use, and remove temporary fords in streams with a classification of C(T) or higher. Installation and removal may not be permitted during the period of time from the start of trout spawning until the eggs have hatched. In some instances, restrictions may also be applied to bass spawning waters.

2. The approaches to the structure shall consist of stone pads constructed to comply with the aggregate requirements of the General Requirements subsection.

The entire ford approach (where banks were cut) shall be covered with filter cloth and protected with aggregate to a depth of four (4) inches.

3. Fords shall be prohibited when the streambanks are four (4) feet or more in height above the invert of the stream.

4. The approach roads at the cut banks shall be no steeper than 5:1. Spoil material from the banks shall be stored out of the floodplain and stabilized.

5. One layer of filter cloth shall be placed on the streambed, streambanks, and road approaches prior to placing the bedding material on the stream channel or approaches. The filter cloth will be a minimum of six (6) inches and a maximum one foot beyond bedding material.

6. The bedding material shall be course aggregate or gabion mattresses filled with coarse aggregate.

7. Aggregate used in ford construction shall meet the minimum requirements of the General Requirements subsection.

8. All fords shall be constructed to minimize the blockage of stream flow and shall allow free flow over the ford. The placing of any material in the waterway bed will cause some upstream ponding. The depth of this ponding will be equivalent to the depth of the material placed within the stream and therefore should be kept to a minimum height. However, in no case will the bedding material be placed deeper than 12 inches or one-half (1/2) the height of the existing banks whichever is smaller.

9. Stabilization: All areas disturbed during ford installation shall be stabilized within 14 calendar days of that disturbance in accordance with the Standard and Specifications for Temporary Critical Area Planting on page 3.3.

10. Ford removal and Clean-Up Requirements

   A. Removal: When the temporary structure has served its purpose, excess material used for this structure need not be removed. Care should be taken so that any aggregate left does not create an impoundment or restrict fish passage.

   B. Final Clean-Up: Final clean-up shall consist of removal of excess temporary ford materials from the waterway. All materials shall be stored outside the waterway floodplain.

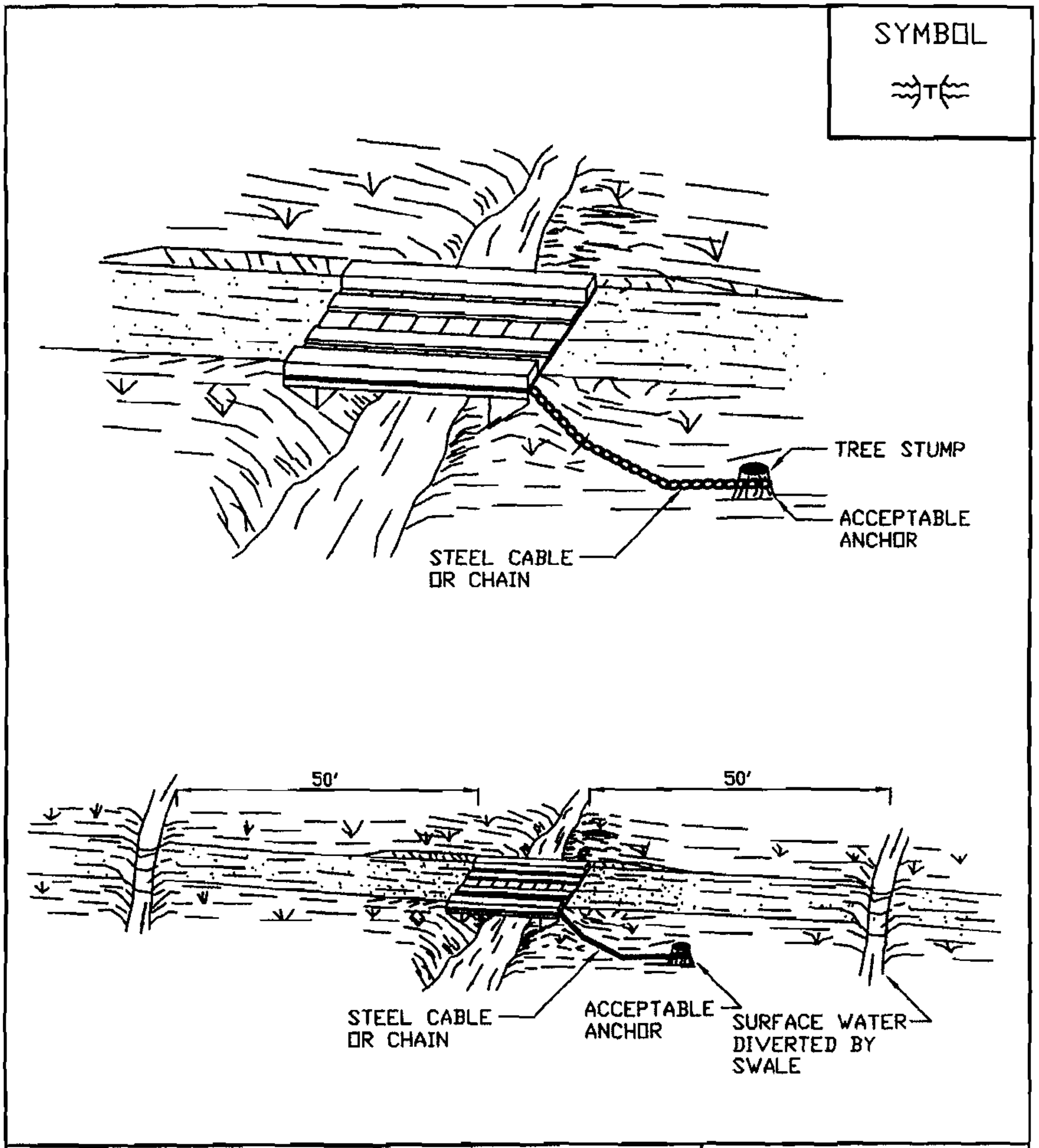
   C. Method: Clean up shall be accomplished without construction equipment working in the stream channel.

   D. Approach Disposition: The approach slopes of the cut banks shall not be backfilled.

   E. Final Stabilization: All areas disturbed during ford removal shall be stabilized within 14 calendar days of that disturbance in accordance with the Standard and Specifications for Permanent Critical Area Planting on page 3.3.

NOTE: Any temporary access crossing shall conform to the technical requirements of this Standard and Specifications as well as any specific requirement imposed by the New York State Department of Environmental Conservation. Permits may be required for streambank disturbance.

Figure 5A.36
Temporary Access Bridge



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TEMPORARY ACCESS BRIDGE

Figure 5A.37
Temporary Access Culvert

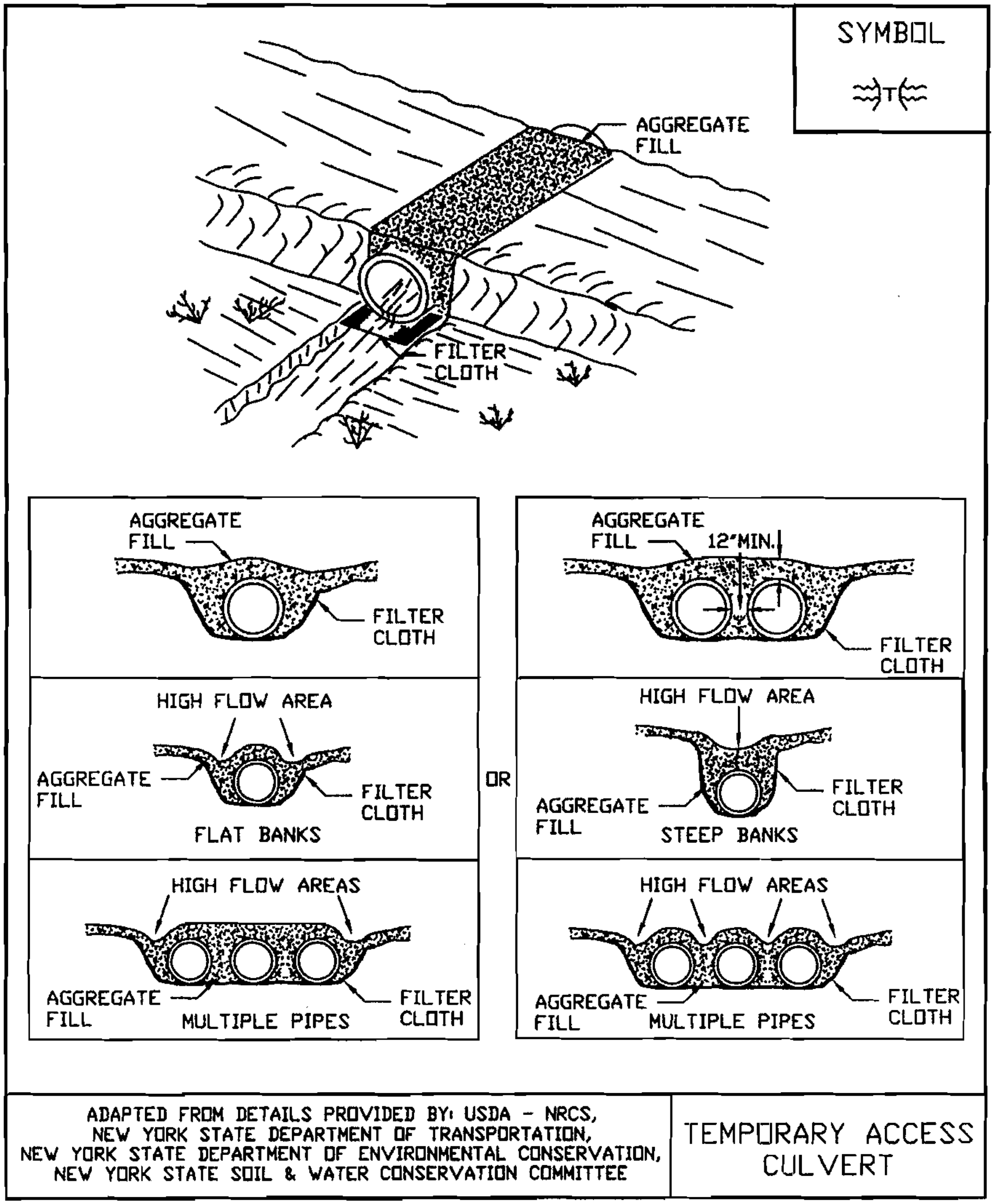
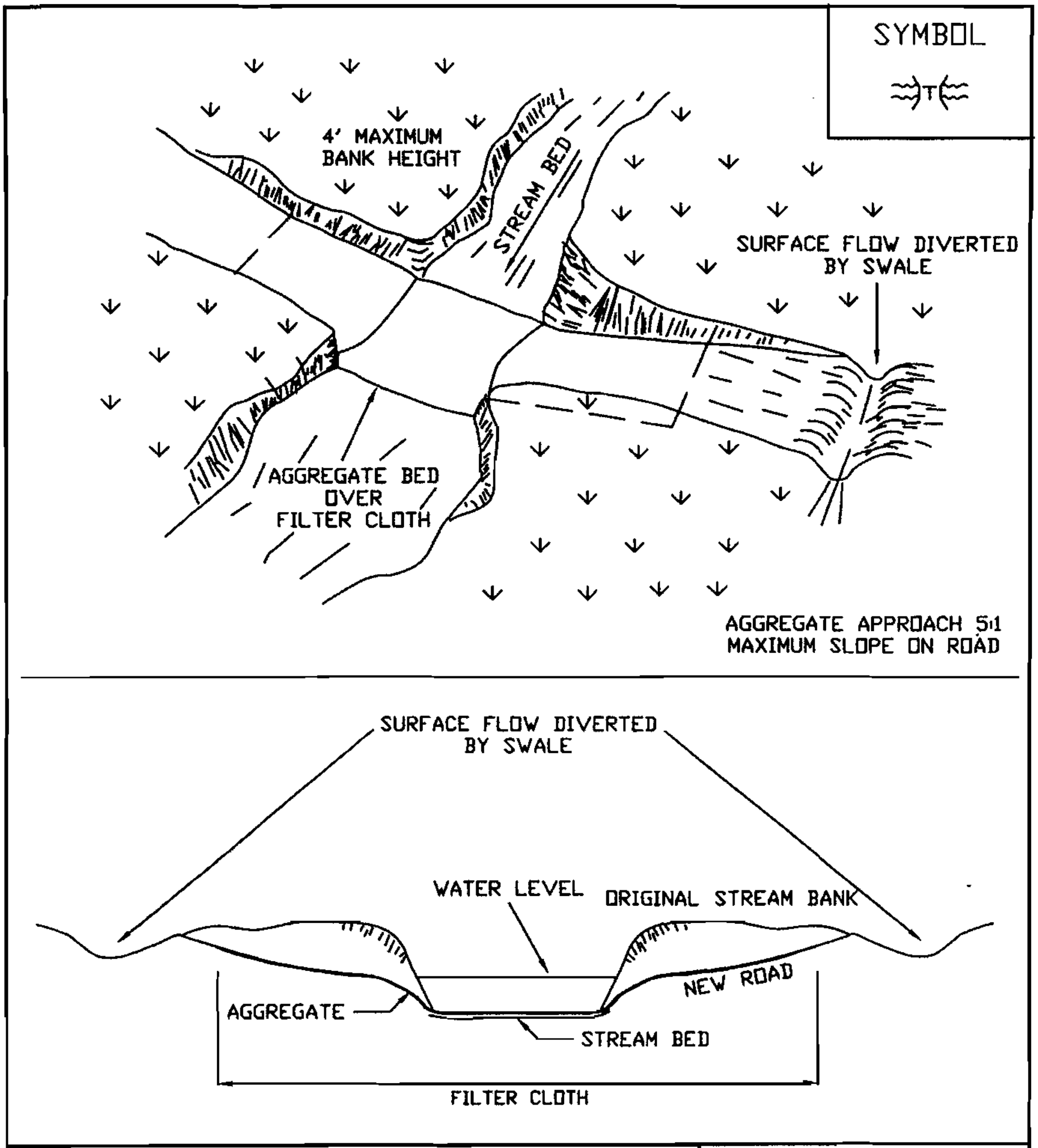


Figure 5A.38
Temporary Access Ford



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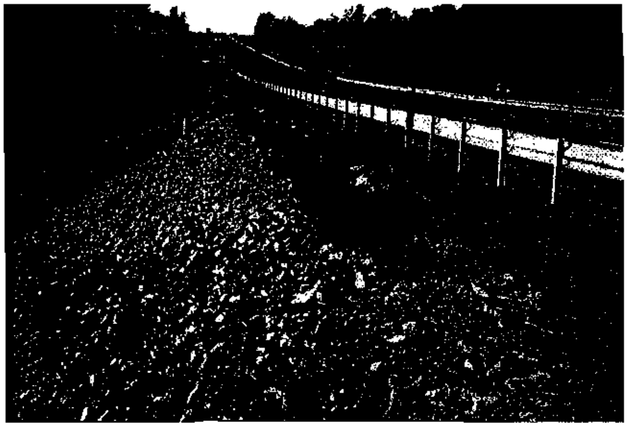
TEMPORARY ACCESS FORD

STANDARD AND SPECIFICATIONS
FOR
RIPRAP SLOPE PROTECTION



Definition

A layer of stone designed to protect and stabilize areas subject to erosion.

Purpose

To protect the soil surface from erosive forces and/or improve the stability of soil slopes that are subject to seepage or have poor soil structure.

Conditions Where Practice Applies

Riprap is used for cut and fill slopes subject to seepage, erosion, or weathering, particularly where conditions prohibit the establishment of vegetation. Riprap is also used for channel side slopes and bottoms, streambanks, grade sills, on shorelines subject to erosion, and at inlets and outlets to culverts, bridges, slope drains, grade stabilization structures, and storm drains.

Design Criteria

Gradation – Riprap should be a well-graded mixture with 50% by weight larger than the specified design size. The diameter of the largest stone size in such a mixture should be 1.5 times the d_{50} size with smaller sizes grading down to 1 inch. The designer should select the size or sizes that equal or exceed that minimum size based on riprap gradations commercially available in the area.

Thickness – The minimum layer thickness should be 1.5 times the maximum stone diameter, but in no case less than 6 inches.

Quality – Stone for riprap should be hard, durable field or quarry materials. They should be angular and not subject to breaking down when exposed to water or weathering. The specific gravity should be at least 2.5.

Size – The sizes of stones used for riprap protection are determined by purpose and specific site conditions:

1. Slope Stabilization – Riprap stone for slope stabilization not subject to flowing water or wave action should be sized for the proposed grade. The gradient of the slope to be stabilized should be less than the natural angle of repose of the stone selected. Angles of repose of riprap stones may be estimated from Figure 5B.26.

   Riprap used for surface stabilization of slopes does not add significant resistance to sliding or slope failure and should not be considered a retaining wall. Slopes approaching 1.5:1 may require special stability analysis. The inherent stability of the soil must be satisfactory before riprap is used for surface stabilization.

2. Outlet Protection – Design criteria for sizing stone and determining dimensions of riprap aprons are presented in Standards and Specifications for Rock Outlet Protection.

3. Streambank Protection – Design criteria for sizing stone for stability of channel bank are presented in Standard and Specifications for Structural Streambank Protection.

Filter Blanket – A filter blanket is a layer of material placed between the riprap and the underlying soil to prevent soil movement into or through the riprap. A suitable filter may consist of a well-graded gravel or sand-gravel layer or a synthetic filter fabric manufactured for this purpose. The design of a gravel filter blanket is based on the ratio of particle size in the overlying filter material to that of the base material in accordance with the criteria below. Multiple layers may be designed to affect a proper filter if necessary.

A gravel filter blanket should have the following relationship for a stable design:

$$\frac{d_{15}\text{ filter}}{d_{85}\text{ base}} \leq 5$$

$$5 < \frac{d_{15}\text{ filter}}{d_{50}\text{ base}} \leq 40$$

and

$$\frac{d_{50}\text{ filter}}{d_{50}\text{ base}} \leq 40$$

Filter refers to the overlying material while base refers to the underlying material. These relationships must hold between the base and filter and the filter and riprap to prevent migration of material. In some cases, more than one filter may be needed. Each filter layer should be a minimum of 6 inches thick, unless an acceptable filter fabric is used.

A synthetic filter fabric may be used with or in place of gravel filters. The following particle size relationships should exist:

1. Filter fabric covering a base containing 50% or less by weight of fine particles (#200 sieve size):
   a. $\frac{\text{d85 base (mm)}}{\text{EOS*filter fabric (mm)}} > 1$
   b. total open area of filter fabric should not exceed 36%
2. Filter fabric covering other soils:
   a. EOS is no larger than 0.21 mm (#70 sieve size)
   b. total open area of filter fabric should not exceed 10%

*EOS – Equivalent opening size compared to a U.S. standard sieve size.

No filter fabric should have less than 4% open area or an EOS less than U.S. Standard Sieve #100 (0.15 mm). The permeability of the fabric must be greater than that of the soil. The fabric may be made of woven or nonwoven monofilament yarns and should meet the following minimum requirements:

Thickness 20-60 mils

grab strength 90-120 lbs.

conform to ASTM D-1682 or ASTM D-177

Filter blankets should always be provided where seepage is significant or where flow velocity and duration of flow or turbulence may cause underlying soil particles to move though the riprap.

Construction Specifications

Subgrade Preparation – Prepare the subgrade for riprap and filter to the required lines and grades shown on the plans. Compact any fill required in the subgrade to a density approximating that of the undisturbed material or overfill depressions with riprap. Remove brush, trees, stumps, and other objectionable material. Cut the subgrade sufficiently deep so that the finished grade of the riprap will be at the elevation of the surrounding area. Channels should be excavated sufficiently to allow placement of the riprap in a manner such that the finished inside dimensions and grade of the riprap meet design specifications.

Sand and gravel filter blanket – Place the filter blanket immediately after the ground foundation is prepared. For gravel, spread filter stone in a uniform layer to the specified depth. Where more than one layer of filter material is used, spread the layers with minimal mixing.

Synthetic filter fabric – Place the cloth directly on the prepared foundation. Overlap the edges by at least 2 feet, and space the anchor pins every 3 feet along the overlap. Bury the upper and lower ends of the cloth a minimum of 12 inches below ground. Take precautions not to damage the cloth by dropping the riprap. If damage occurs, remove the riprap and repair the sheet by adding another layer of filter fabric with a minimum overlap of 12 inches around the damaged area. Where large stones are to be placed, a 4-inch layer of fine sand or gravel is recommended to protect the filter cloth. Filter fabric is not recommended as a filter on slopes steeper than 2 horizontal to 1 vertical.

Stone placement – Placement of the riprap should follow immediately after placement of the filter. Place riprap so that it forms dense, well-graded mass of stone with a minimum of voids. The desired distribution of stones throughout the mass may be obtained by selective loading at the quarry and controlled dumping during final placement. Place riprap to its full thickness in one operation. Do not place riprap by dumping through chutes or other methods that cause segregation of stone sizes. Be careful not to dislodge the underlying base or filter when placing the stones.

The toe of the riprap should be keyed into a stable foundation at its base as shown in Figure 5B.27—Typical Riprap Slope Protection Detail. The toe should be excavated to a depth of 2.0 feet. The design thickness of the riprap should extend a minimum of 3 feet horizontally from the slope. The finished slope should be free of pockets of small stone or clusters of large stones. Hand placing may be necessary to achieve proper distribution of stone sizes to produce a relatively smooth, uniform surface. The finished grade of the riprap should blend with the surrounding area.

Maintenance

Riprap should be inspected periodically for scour or dislodged stones. Control weed and brush growth as needed.

Figure 5B.26
Angles of Repose of Riprap Stones (FHWA)

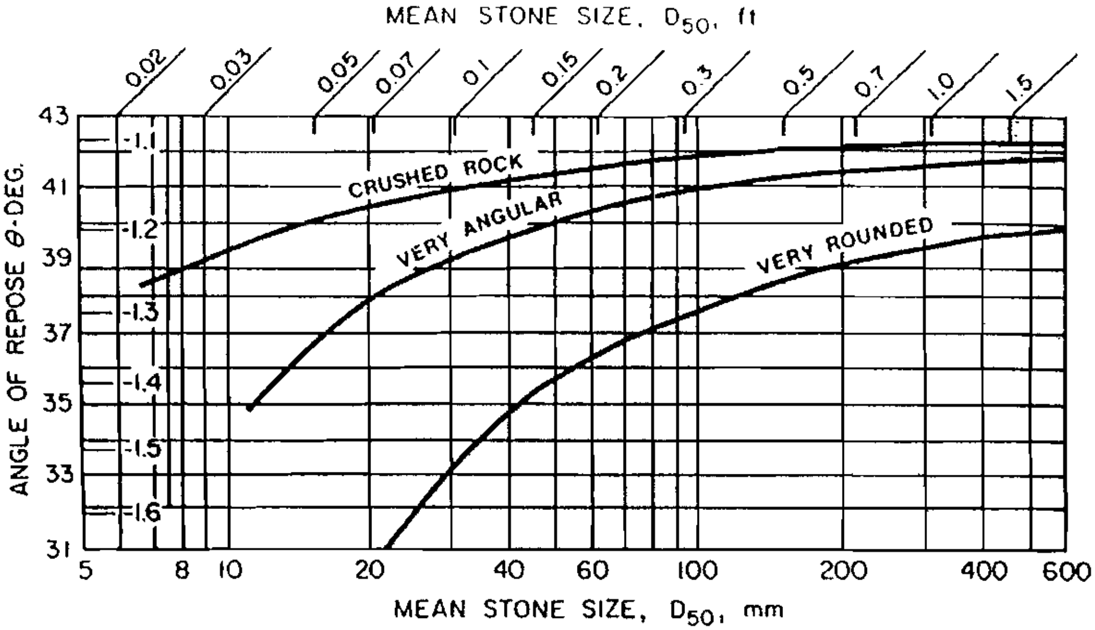
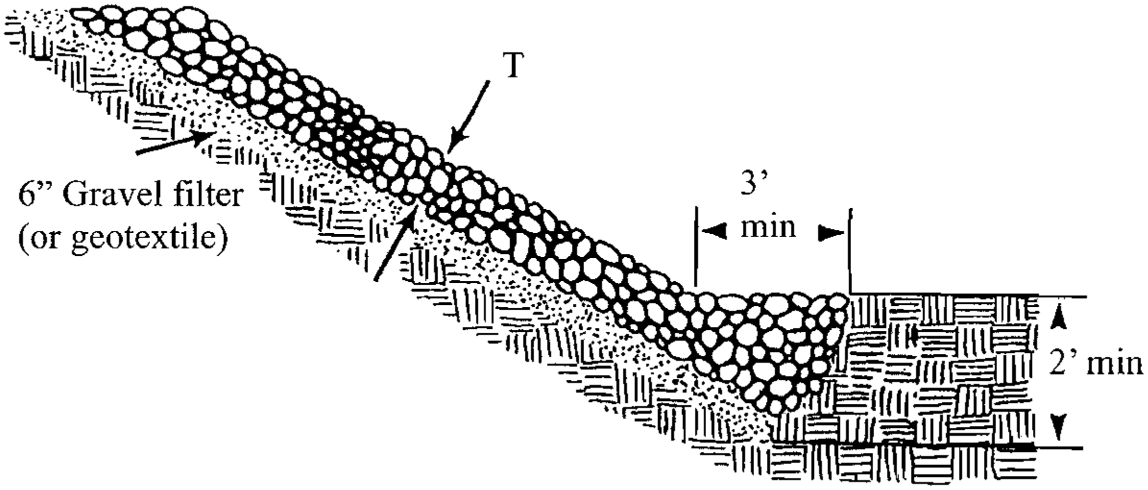


Figure 5B.27
Typical Riprap Slope Protection Detail



APPENDIX D
CONSTRUCTION SITE STORMWATER LOGBOOK

Construction Site Stormwater Logbook

Silk Natural Gas Pipeline
Town of Barrington/Town of Reading
Yates/Schuyler County, New York

Prepared For:
Chesapeake Appalachia, LLC
900 Pennsylvania Ave
P.O. Box 6070
Charleston, West Virginia 25362

KEYSTONE
ASSOCIATES
ARCHITECTS • ENGINEERS • SURVEYORS LLC

229-231 State Street, Fourth Floor • Binghamton, NY 13901 • Phone: 607.722.1100 • Fax: 607.722.2515 •www.keystoneassociatesllc.com

Project No. 1137.06507

June30, 2007

APPENDIX H

STATE POLLUTANT DISCHARGE ELIMINATION SYSTEM FOR CONSTRUCTION ACTIVITIES

CONSTRUCTION SITE LOG BOOK

Table of Contents

Properly completing forms such as those contained in Appendix H meet the inspection requirement of NYS-DEC SPDES GP for Construction Activities. Completed forms shall be kept on site at all times and made available to authorities upon request.

I. PRE-CONSTRUCTION MEETING DOCUMENTS

Project Name ____
Permit No. ______________________ **Date of Authorization** ____________
Name of Operator ____
Prime Contractor ____

a. Preamble to Site Assessment and Inspections

The Following Information To Be Read By All Person's Involved in The Construction of Stormwater Related Activities:

The Operator agrees to have a qualified professional[1] conduct an assessment of the site prior to the commencement of construction[2] and certify in this inspection report that the appropriate erosion and sediment controls described in the SWPPP have been adequately installed or implemented to ensure overall preparedness of the site for the commencement of construction.

Prior to the commencement of construction, the Operator shall certify in this site logbook that the SWPPP has been prepared in accordance with the State's standards and meets all Federal, State and local erosion and sediment control requirements.

N/A

When construction starts, site inspections shall be conducted by the qualified professional at least every 7 calendar days and within 24 hours of the end of a storm event of 0.5 inches or greater (Construction Duration Inspections). The Operator shall maintain a record of all inspection reports in this site logbook. The site logbook shall be maintained on site and be made available to the permitting authorities upon request. The Operator shall post at the site, in a publicly accessible location, a summary of the site inspection activities on a monthly basis (Monthly Summary Report).

The operator shall also prepare a written summary of compliance with this general permit at a minimum frequency of every three months (Operator's Compliance Response Form), while coverage exists. The summary should address the status of achieving each component of the SWPPP.

Prior to filing the Notice of Termination or the end of permit term, the Operator shall have a qualified professional perform a final site inspection. The qualified professional shall certify that the site has undergone final stabilization[3] using either vegetative or structural stabilization methods and that all temporary erosion and sediment controls (such as silt fencing) not needed for long-term erosion control have been removed. In addition, the Operator must identify and certify that all permanent structures described in the SWPPP have been constructed and provide the owner(s) with an operation and maintenance plan that ensures the structure(s) continuously functions as designed.

---

[1] "Qualified Professional means a person knowledgeable in the principles and practice of erosion and sediment controls, such as a Certified Professional in Erosion and Sediment Control (CPESC), soil scientist, licensed engineer or someone working under the direction and supervision of a licensed engineer (person must have experience in the principles and practices of erosion and sediment control).

[2] "Commencement of construction" means the initial removal of vegetation and disturbance of soils associated with clearing, grading or excavating activities or other construction activities.

[3] "Final stabilization" means that all soil-disturbing activities at the site have been completed and a uniform, perennial vegetative cover with a density of eighty (80) percent has been established or equivalent stabilization measures (such as the use of mulches or geotextiles) have been employed on all unpaved areas and areas not covered by permanent structures.

b. Operators Certification

"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 gathered and evaluated 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. Further, I hereby certify that the SWPPP meets all Federal, State, and local erosion and sediment control requirements. I am aware that false statements made herein are punishable as a class A misdemeanor pursuant to Section 210.45 of the Penal Law.

Name (please print): ____________________

Title ____________________ **Date:** ____________

Address: ____________________

Phone: ____________ **Email:** ____________________

Signature: ____________________

N/A

c. Qualified Professional's Credentials & Certification

"I hereby certify that I meet the criteria set forth in the General Permit to conduct site inspections for this project and that the appropriate erosion and sediment controls described in the SWPPP and as described in the following Pre-construction Site Assessment Checklist have been adequately installed or implemented, ensuring the overall preparedness of this site for the commencement of construction."

Name (please print): ____________________

Title ____________________ **Date:** ____________

Address: ____________________

Phone: ____________ **Email:** ____________________

Signature: ____________________

II. CONSTRUCTION DURATION INSPECTIONS

a. Directions:

Inspection Forms will be filled out during the entire construction phase of the project.
Required Elements:

(1) On a site map, indicate the extent of all disturbed site areas and drainage pathways. Indicate site areas that are expected to undergo initial disturbance or significant site work within the next 14-day period;

(2) Indicate on a site map all areas of the site that have undergone temporary or permanent stabilization;

(3) Indicate all disturbed site areas that have not undergone active site work during the previous 14-day period;

(4) Inspect all sediment control practices and record the approximate degree of sediment accumulation as a percentage of sediment storage volume (for example, 10 percent, 20 percent, 50 percent);

(5) Inspect all erosion and sediment control practices and record all maintenance requirements such as verifying the integrity of barrier or diversion systems (earthen berms or silt fencing) and containment systems (sediment basins and sediment traps). Identify any evidence of rill or gully erosion occurring on slopes and any loss of stabilizing vegetation or seeding/mulching. Document any excessive deposition of sediment or ponding water along barrier or diversion systems. Record the depth of sediment within containment structures, any erosion near outlet and overflow structures, and verify the ability of rock filters around perforated riser pipes to pass water; and

(6) Immediately report to the Operator any deficiencies that are identified with the implementation of the SWPPP.

CONSTRUCTION DURATION INSPECTIONS Page 1 of ______

SITE PLAN/SKETCH

Inspector (print name)	**Date of Inspection**
Qualified Professional (print name)	**Qualified Professional Signature**

The above signed acknowledges that, to the best of his/her knowledge, all information provided on the forms is accurate and complete.

Maintaining Water Quality

Yes No NA
[ ] [ ] [ ] Is there an increase in turbidity causing a substantial visible contrast to natural conditions?
[ ] [ ] [ ] Is there residue from oil and floating substances, visible oil film, or globules or grease?
[ ] [ ] [ ] All disturbance is within the limits of the approved plans.
[ ] [ ] [ ] Have receiving lake/bay, stream, and/or wetland been impacted by silt from project?

Housekeeping

1. General Site Conditions
Yes No NA
[ ] [ ] [ ] Is construction site litter and debris appropriately managed?
[ ] [ ] [ ] Are facilities and equipment necessary for implementation of erosion and sediment control in working order and/or properly maintained?
[ ] [ ] [ ] Is construction impacting the adjacent property?
[ ] [ ] [ ] Is dust adequately controlled?

2. Temporary Stream Crossing
Yes No NA
[ ] [ ] [ ] Maximum diameter pipes necessary to span creek without dredging are installed.
[ ] [ ] [ ] Installed non-woven geotextile fabric beneath approaches.
[ ] [ ] [ ] Is fill composed of aggregate (no earth or soil)?
[ ] [ ] [ ] Rock on approaches is clean enough to remove mud from vehicles & prevent sediment from entering stream during high flow.

Runoff Control Practices

1. Excavation Dewatering
Yes No NA
[ ] [ ] [ ] Upstream and downstream berms (sandbags, inflatable dams, etc.) are installed per plan.
[ ] [ ] [ ] Clean water from upstream pool is being pumped to the downstream pool.
[ ] [ ] [ ] Sediment laden water from work area is being discharged to a silt-trapping device.
[ ] [ ] [ ] Constructed upstream berm with one-foot minimum freeboard.

2. Level Spreader
Yes No NA
[ ] [ ] [ ] Installed per plan.
[ ] [ ] [ ] Constructed on undisturbed soil, not on fill, receiving only clear, non-sediment laden flow.
[ ] [ ] [ ] Flow sheets out of level spreader without erosion on downstream edge.

3. Interceptor Dikes and Swales
Yes No NA
[ ] [ ] [ ] Installed per plan with minimum side slopes 2H:1V or flatter.
[ ] [ ] [ ] Stabilized by geotextile fabric, seed, or mulch with no erosion occurring.
[ ] [ ] [ ] Sediment-laden runoff directed to sediment trapping structure

CONSTRUCTION DURATION INSPECTIONS

Page 3 of ______

Runoff Control Practices (continued)

4. Stone Check Dam
Yes No NA
☐ ☐ ☐ Is channel stable? (flow is not eroding soil underneath or around the structure).
☐ ☐ ☐ Check is in good condition (rocks in place and no permanent pools behind the structure).
☐ ☐ ☐ Has accumulated sediment been removed?.

5. Rock Outlet Protection
Yes No NA
☐ ☐ ☐ Installed per plan.
☐ ☐ ☐ Installed concurrently with pipe installation.

Soil Stabilization

1. Topsoil and Spoil Stockpiles
Yes No NA
☐ ☐ ☐ Stockpiles are stabilized with vegetation and/or mulch.
☐ ☐ ☐ Sediment control is installed at the toe of the slope.

2. Revegetation
Yes No NA
☐ ☐ ☐ Temporary seedings and mulch have been applied to idle areas.
☐ ☐ ☐ 4 inches minimum of topsoil has been applied under permanent seedings

Sediment Control Practices

1. Stabilized Construction Entrance
Yes No NA
☐ ☐ ☐ Stone is clean enough to effectively remove mud from vehicles.
☐ ☐ ☐ Installed per standards and specifications?
☐ ☐ ☐ Does all traffic use the stabilized entrance to enter and leave site?
☐ ☐ ☐ Is adequate drainage provided to prevent ponding at entrance?

2. Silt Fence
Yes No NA
☐ ☐ ☐ Installed on Contour, 10 feet from toe of slope (not across conveyance channels).
☐ ☐ ☐ Joints constructed by wrapping the two ends together for continuous support.
☐ ☐ ☐ Fabric buried 6 inches minimum.
☐ ☐ ☐ Posts are stable, fabric is tight and without rips or frayed areas.
Sediment accumulation is ___% of design capacity.

Sediment Control Practices (continued)

3. Storm Drain Inlet Protection (Use for Stone & Block; Filter Fabric; Curb; or, Excavated practices)
Yes No NA
[ ] [ ] [ ] Installed concrete blocks lengthwise so open ends face outward, not upward.
[ ] [ ] [ ] Placed wire screen between No. 3 crushed stone and concrete blocks.
[ ] [ ] [ ] Drainage area is 1acre or less.
[ ] [ ] [ ] Excavated area is 900 cubic feet.
[ ] [ ] [ ] Excavated side slopes should be 2:1.
[ ] [ ] [ ] 2" x 4" frame is constructed and structurally sound.
[ ] [ ] [ ] Posts 3-foot maximum spacing between posts.
[ ] [ ] [ ] Fabric is embedded 1 to 1.5 feet below ground and secured to frame/posts with staples at max 8-inch spacing.
[ ] [ ] [ ] Posts are stable, fabric is tight and without rips or frayed areas.
Sediment accumulation ___% of design capacity.

4. Temporary Sediment Trap
Yes No NA
[ ] [ ] [ ] Outlet structure is constructed per the approved plan or drawing.
[ ] [ ] [ ] Geotextile fabric has been placed beneath rock fill.
Sediment accumulation is ___% of design capacity.

5. Temporary Sediment Basin
Yes No NA
[ ] [ ] [ ] Basin and outlet structure constructed per the approved plan.
[ ] [ ] [ ] Basin side slopes are stabilized with seed/mulch.
[ ] [ ] [ ] Drainage structure flushed and basin surface restored upon removal of sediment basin facility.
Sediment accumulation is ___% of design capacity.

Note: Not all erosion and sediment control practices are included in this listing. Add additional pages to this list as required by site specific design.
Construction inspection checklists for post-development stormwater management practices can be found in Appendix F of the New York Stormwater Management Design Manual.

CONSTRUCTION DURATION INSPECTIONS

b. Modifications to the SWPPP (To be completed as described below)

The Operator shall amend the SWPPP whenever:
1. There is a significant change in design, construction, operation, or maintenance which may have a significant effect on the potential for the discharge of pollutants to the waters of the United States and which has not otherwise been addressed in the SWPPP; or
2. The SWPPP proves to be ineffective in:
    a. Eliminating or significantly minimizing pollutants from sources identified in the SWPPP and as required by this permit; or
    b. Achieving the general objectives of controlling pollutants in stormwater discharges from permitted construction activity; and
3. Additionally, the SWPPP shall be amended to identify any new contractor or subcontractor that will implement any measure of the SWPPP.

Modification & Reason:

III. Monthly Summary of Site Inspection Activities

Name of Permitted Facility:	**Today's Date:**	**Reporting Month:**
Location:	**Permit Identification #:**	
Name and Telephone Number of Site Inspector:		

Date of Inspection	Regular / Rainfall based Inspection	Name of Inspector	Items of Concern

Owner/Operator Certification:

"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 gathered and evaluated 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 false statements made herein are punishable as a class A misdemeanor pursuant to Section 210.45 of the Penal Law."

Signature of Permittee or Duly Authorized Representative

Name of Permittee or Duly Authorized Representative

Date

Duly authorized representatives must have written authorization, submitted to DEC, to sign any permit documents.

Chesapeake
Natural Gas.
Natural Advantages.

Mitra Pratt
Office: (607) 569-2999
Cell: (607) 242-2012
Fax: (607) 569-2897
mpratt@chkenergy.com

September 12, 2007

HAND DELIVERED

Mr. Peter Lent
New York State Region 8 DEC,
6274 E Avon-Lima Road
Avon, NY 14414-9519

Re: Proposed Pipeline Construction: Silk Pipeline W23638
Towns of Reading, Tyrone, Starkey, & Barrington
Schuyler and Yates Counties, New York
Permit Applied for: NW12 & NW14

Dear Mr. Peter Lent:

Chesapeake Appalachia, L.L.C. (CHK) is in the planning stages to construct an 8" steel natural gas gathering line. The total pipeline length of the Silk Pipeline shown in blue on the maps provided in the Wetland Delineation Report in Figure 1 is 9.75 miles. This pipeline will be high pressure (greater than 125 psig) and will be certificated under Article VII of the Public Service Commission (PSC). These maps encompass portions of Reading Center, Wayne, and Keuka Park 7.5' USGS quadrangle maps and identify the proposed pipeline route.

In addition to the enclosed four copies of the Joint Application for Permit, please note the following:

- A NYS Natural Heritage Review was received on December 21, 2006 and indicated that our project did not impact any threatened or endangered species. This letter has been provided for your reference.
- On January 16, 2007, the NYS Office of Parks, Recreation, and Historic Preservation issued a "no impact" letter regarding our proposed project. This letter has been provided for your reference.
- This pipeline will be constructed using NY PSC approved Environmental Management and Construction Standards and Practices for Underground Utilities and Distribution Facilities - revised Feb. 28, 2006.
- The only state regulated water that will be crossed by this proposed pipeline project is *Big Stream*, identified on NYDEC Wetland maps as "KP-1" and further identified in the attached wetland delineation report as wetland "M" and will be directionally bored with no disturbance to the stream or wetland.

- I have enclosed a copy of the NOI for coverage under SPDES General Permit, identified as permit NYR10N351. In general, the temporary erosion and sediment control facilities to be used during construction of this pipeline include stabilized construction entrances for access to the site and silt fences and/or hay bales down gradient of disturbed soils where drainage could impact existing ditches, swales, creeks, etc. In addition, all disturbed areas at the stream crossings will be seeded and mulched within twenty four hours upon crossing.
- In regard to a 401 Water Quality Certification, upon filing our Article VII NOI with the PSC, we will request that the PSC issue this certification. However I would also like to bring to your attention, Table 1 in the Wetland Report; no intermittent stream, primary stream, or wetland will encounter greater than 0.10 acres of disturbance.
- The NW14 is requested for the existing private access crossing of Rock Stream, which lies east of the proposed pipeline centerline station 10+80.

At your earliest convenience, please review and contact me at the above number with any questions or comments.

Sincerely,

Mitra Pratt

Mitra Pratt
Civil Engineering

Cc: Army Corp.
Enclosures

95-19-3 (8/00) pfp

JOINT APPLICATION FOR PERMIT

New York State
United States Army Corps of Engineers

Applicable to agencies and permit categories listed in item 1. Please read all instructions on back. Attach additional information as needed. Please print legibly or type.

1. Check permits applied for:

NYS Dept. of Environmental Conservation
- ☐ Stream Disturbance (Bed and Banks)
- ☐ Navigable Waters (Excavation and Fill)
- ☐ Docks, Moorings or Platforms (Construct or Place)
- ☐ Dams and Impoundment Structures (Construct, Reconstruct or Repair)
- ☐ Freshwater Wetlands
- ☐ Tidal Wetlands
- ☐ Coastal Erosion Control
- ☐ Wild, Scenic and Recreational Rivers
- ☐ 401 Water Quality Certification
- ☐ Potable Water Supply
- ☐ Long Island Wells
- ☐ Aquatic Vegetation Control
- ☐ Aquatic Insect Control
- ☐ Fish Control

NYS Office of General Services (State Owned Lands Under Water)
- ☐ Lease, License, Easement or other Real Property Interest
- ☐ Utility Easement (pipelines, conduits, cables, etc.)
- ☐ Docks, Moorings or Platforms (Construct or Place)

Adirondack Park Agency
- ☐ Freshwater Wetlands Permit
- ☐ Wild, Scenic and Recreational Rivers

Lake George Park Commission
- ☐ Docks (Construct or Place)
- ☐ Moorings (Establish)

US Army Corps of Engineers
- ☒ Section 404 (Waters of the United States)
- ☐ Section 10 (Rivers and Harbors Act)
- ☒ Nationwide Permit (s) Identify Number(s) 12&14

For Agency Use Only:
DEC APPLICATION NUMBER

US ARMY CORPS OF ENGINEERS

2. Name of Applicant (Use full name)
Chesapeake Appalachia LLC.

Telephone Number (daytime)
607-569-2999 ext.203

Mailing Address
Mitra Pratt

Post Office P.O. Box 190, Hammondsport
State NY
Zip Code 14840

3. Taxpayer ID (If applicant is not an individual)
521383102

4. Applicant is a/an: (check as many as apply)
☒ Owner ☒ Operator ☐ Lessee ☐ Municipality / Governmental Agency

5. If applicant is not the owner, identify owner here - otherwise, you may provide Agent/Contact Person information.
Owner or Agent/Contact Person ☐ Owner ☐ Agent /Contact Person
Telephone Number (daytime)

Mailing Address

Post Office
State
Zip Code

6. Project / Facility Location (mark location on map, see instruction 1a.)
County: Yates and Schuyler
Town/City/Village: Reading, Tyrone, Starkey, and Barrington
Tax Map Section/ Block /Lot Number:

Location (Including Street or Road)
please see attached map

Telephone Number (daytime)
607-569-2999 (203)

Post Office
State NY
Zip Code

7. Name of Stream or Waterbody (on or near project site)

8. Name of USGS Quad Map:
Keuka Park, Reading Center and Wayne

Location Coordinates:
please see attached map
NYTM-E NYTM-N 4

9. Project Description and Purpose: (Category of Activity e.g. new construction/installation, maintenance or replacement; Type of Structure or Activity e.g. bulkhead, dredging, filling, dam, dock, taking of water; Type of Materials and Quantities; Structure and Work Area Dimensions; Need or Purpose Served)

Construct new 8-inch steel natural gas pipeline by open cut dry/crossing or directional bore or conventional

bore method w/in 50-ft to 75-ft ROW. (Appendix C) Area of disturbance is calculated at 4' foot width by

length of crossing (Table 1). No crossing (project) to exceed 0.10 acre of total disturbance. Wetlands PS2, IS2,

and M to be constructed by bore method. Install E&S measures, seed and mulch crossings within 24 hrs.

See attached Silk Pipeline Wetland Delineation Report with diagrams.

10. Proposed Use:
☒ Private ☐ Public ☐ Commercial

11. Will Project Occupy State Land?
☐ Yes ☒ No

12. Proposed Start Date:
11.15.07

13. Estimated Completion Date:
05.01.08

14. Has Work Begun on Project? (If yes, attach explanation of why work was started without permit.)
☐ Yes ☒ No

15. List Previous Permit / Application Numbers and Dates: (If Any)

16. Will this Project Require Additional Federal, State, or Local Permits?
☒ Yes ☐ No
If Yes, Please List: NYPSC Article VII Certification

17. If applicant is not the owner, both must sign the application
I hereby affirm that information provided on this form and all attachments submitted herewith is true to the best of my knowledge and belief. False statements made herein are punishable as a Class A misdemeanor pursuant to Section 210.45 of the Penal Law. Further, the applicant accepts full responsibility for all damage, direct or indirect, of whatever nature, and by whomever suffered, arising out of the project described herein and agrees to indemnify and save harmless the State from suits, actions, damages and costs of every name and description resulting from said project. In addition, Federal Law, 18 U.S.C., Section 1001 provides for a fine of not more than $10,000 or imprisonment for not more than 5 years, or both where an applicant knowingly and willingly falsifies, conceals, or covers up a material fact; or knowingly makes or uses a false, fictitious or fraudulent statement.

Date 09/12/07 Signature of Applicant Mitra Pratt Title Project Engineering Technician

Date ________ Signature of Owner ________ Title ________

WETLAND DELINEATION REPORT

PROPOSED SILK PIPELINE #W-23638

TOWNS OF READING, TYRONE, STARKEY &
BARRINGTON

SCHUYLER & YATES COUNTIES
NEW YORK

WETLAND DELINEATION REPORT

PROPOSED SILK PIPELINE # W-23638

TOWNS OF READING, TYRONE, STARKEY &
BARRINGTON

SCHUYLER & YATES COUNTIES
NEW YORK

PREPARED BY:
HALLETT SURVEYING & MAPPING, P.C.
13 COMMUNITY DRIVE, SUITE 102
ADDISON, NY 14801

FIELD INVESTIGATOR:
RICHARD A. DAUGHERTY

STARTED OCT. 2006
COMPLETED MAY 2007

TABLE OF CONTENTS

1.0 INTRODUCTION

The services of Hallett Surveying & Mapping, P.C. (Hallett) were retained by Chesapeake Appalachia, L.L.C. (Chesapeake) to perform a wetland investigation in the Towns of Barrington & Starkey and Reading and Tyrone respectively in the Counties of Yates & Schuyler, New York State. The project area is the corridor of a proposed natural gas pipeline right of way (ROW) that is approximately 9.75 miles in length as well as the proposed access roads to be used during the construction of the proposed pipeline. The main ROW varies in width from 50 to 75 feet. The project is known as the Silk Pipeline #W-23638

The Hallett wetland investigation consisted of a review of available background information covering the subject area and then a subsequent field review for wetlands and any other regulated waters through which the proposed pipeline route crosses. This report describes the results of the background information and field reviews along with supporting figures, field data sheets, and photographs.

2.0 BACKGROUND AND RESOURCE INFORMATION

Prior to performing the field investigation phase of the project Hallett acquired and reviewed available background information covering the project area. The information found and reviewed consisted of the following (shown following Section 6.0 as Figures 1 through 5):

- USGS 7.5 minute "Keuka Park", "Reading Center" & "Wayne" Topo Quadrangles (Figure 1)
- New York State Department of Environmental Conservation New York State Freshwater Wetlands Map (Figure 2)
- U.S. Fish & Wildlife Service National Wetlands Inventory Map (Figure 3)
- U.S. Soil Conservation Service (USSCS) Soil Survey Map (Figure 4)
- Aerial photography obtained from NYSGIS Clearinghouse (Figure 5)

****All figures follow page 10 of this report****

3.0 METHODS

The resource information described in Section 2.0 was used during the field review phase of the project. A walk-through of the entire length of the proposed route was completed during the field review with special attention given to those areas of the project for which the background information yielded potential or known wetland situations.

Flagging of the wetlands and data collection along the delineated wetland boundaries was performed by Hallett during and/or between the dates of Oct. 13, to Nov. 30, 2006 at which point we received the first substantial snowfall in the area and ceased the review till spring and then March 30, 2007 through May 29, 2007. The wetlands were determined using the federal criteria for vegetation, soils and hydrology based on the US Army Corps of Engineers (CORPS) Wetlands Delineations Manual (Environmental Laboratory 1987).

Survey flagging was placed along the wetland boundaries based on the observation of vegetation, hydrology and soil conditions. The observations were made along transects perpendicular to the wetland boundaries at intervals along the wetland boundary sufficient to properly capture that portion of the wetland falling within the proposed pipeline right of way. In the case of creek or substantial flowing body of water that appeared to be sustained for the majority of the year and contained minimal or no adjacent wetlands outside the main channel of the water body an identifier of "PS" followed by a consecutive number was assigned as a designation for a "Primary Stream/Creek" (i.e. "PS1", "PS2", etc.). In the case of small stream that appears to only contain flowing water during periods of rain or spring runoff and contained minimal or no adjacent wetlands outside the main channel of the water body an identifier of "IS" was assigned as a designation for a "Intermittent Stream" (i.e. "IS1", "IS2", etc.). All other wetlands delineated during this study were assigned a letter identifier (i.e. "A", "B", etc.). Each wetland flag was labeled with a unique wetland identifier and a consecutive number to maintain correlation between wetland flags (i.e. "PS1-1", "PS1-2", "IS1-1", "IS1-2", "A-1", "A-2", etc.).

To further support the wetlands boundaries, data on vegetation, hydrological indicators and soil properties were gathered at sample plots within and on the upland side of a given wetland and recorded on wetland sample data sheets in the format provided or given in the CORPS Wetlands Delineations Manual.

Vegetation data was collected in all wetland situations with the exception of stream or creek channels that contained no adjacent wetlands and no vegetation was found to be growing within the stream or creek channel itself. The plots varied in size depending on which vegetation layer was being sampled with the tree layer plot being 30 feet in diameter, the sapling/shrub layer plot being 10 feet in diameter and the herbaceous layer being 5 feet in diameter. Ocular estimates of the percent coverage of a plant species were recorded on the data sheets. Wetland vegetation was determined to be present when more than 50 percent of the dominant species in a sample plot were found to have an indicator status of obligate (OBL), facultative-wet (FACW), or facultative (FAC+ and FAC), excluding those with a FAC- indicator. The dominant species for each vegetation layer in a sample plot were determined by ranking the species in decreasing order of percent coverage. Those species found to cumulatively comprise more than 50 percent of a given layer were automatically considered dominant in that layer. In addition any species found to cumulatively comprise 20 percent or more were considered dominant.

Scientific nomenclature for plant species was obtained from *A Checklist of New York State Plants* (Mitchell and Tucker 1997) along with the PLANTS Database accessed through the United States Department of Agriculture website (http://plants.usda.gov/). The indicator status for each dominant plant species was determined using the *National List of Plants that Occur in Wetlands: Northeast (Region 1)* Reed 1988) and the *1995 Supplement To the List of Plants that Occur in Wetlands: Northeast (Region 1)* (Tiner etal. 1995). For any species not included in the list, the indicator status was designated using the *Manual of Vascular Plants of Northeastern United Status and Adjacent Canada* (Gleason 1952) and *Gray's Manual of Botany* (Fernald 1950).

Soil and hydrology data were collected in soil pits or soil borer holes to a minimum depth of 16 inches within the sample plots, with the exception of stream or creek channels, or other areas permanently inundated with surface water such as a pond. Soils characteristics were noted along the soil profile at the depth specified by the CORPS wetland delineations manual along with procedures outlined for identifying hydric soils found in the *Field Indicators of Hydric Soils in the United States* (USDA NRCS 1995). Soil colors were determined using the Munsell Color Charts and noted on the data sheets. Primary and secondary indicators of hydrology were also observed and recorded on the data sheets at each sample plot. The wetland boundaries were refined down from a general location as established by the sample plot to a division line between upland and wetland conditions based on intermediate soil samplings and/or extents of wetland hydrologic indicators and/or the presence of wetland vegetation along each transect.

4.0 RESULTS

This section of the report shall provide a general description of the project and overview of wetland occurrences along the proposed pipeline corridor route and/or proposed access roads.

4.1 General Site Description

The included portions of the USGS 7.5 minute "Keuka Park", "Reading Center" & "Wayne" Topo Quadrangles show that the proposed pipeline route proceeds in a general southeast direction crossing a number of roads and tributaries, portions of four towns and two counties as previously described. The proposed ROW regularly changes elevation, generally not dramatically, as it traverses hills and valleys throughout its length. The proposed route begins approximately 550' north of Gray Road approximately 0.8 miles west of Old Bath Road in the Town of Barrington, Yates County at an existing natural gas well and proceeds generally southeasterly to a point approximately 400 feet west of County Route 27 and approximately 0.15 miles north of Eaton Road in the Town of Reading, Schuyler County at a proposed existing pipeline tie in.

The New York State Department of Environmental Conservation, New York State Freshwater Wetlands Map depicts one state regulated wetland identified as "KP-1" in the Town of Barrington, Yates County southeasterly of State Route 230 in an area known as "Crystal Valley". A named stream/creek known as "Big Stream" runs through wetland "KP-1".

The United States Fish & Wildlife Services National Wetlands Inventory Map shows that proposed route passes through or in close proximity to 6 mapped wetlands. The first occurrence is mapped with a description of PFO1A (Temporarily flooded, broad-leaved deciduous, palustrine forested) and is located approximately 575 feet west of Schuyler County Route 27 and 175 feet west of the end of the proposed pipeline route. The wetland appears to include the channel of a named stream/creek known as Rock Stream and its adjacent lowland areas. The proposed right of way appears not to cross the mapped portion of the wetland but was found to be in close proximity. The area of the stream/creek channel falling within the proposed route was delineated as Wetland "PS1".

The next occurrence is also mapped with a description of PFO1A and is located 250 south of N.Y.S. Route 226 along the proposed pipeline route. The wetland appears to include the main channel and overflow channels of an un-named stream/creek and its adjacent lowland areas. The area of the stream/creek channels falling within the proposed right of way were delineated as Wetlands "PS2" and "IS2". The areas adjacent to the channels were not found to have wetland characteristics based on the observed conditions noted on the corresponding data sheets included in Figure 5.

The next occurrence is mapped with a description of PSS1E (Seasonally flooded/saturated, broad-leaved, palustrine scrub-shrub) and is located approximately 1405 feet north of Clark Price Road along the proposed pipeline route. The wetland appears to include the channel of a small un-named stream and its adjacent lowland areas. The area of the channel falling within the proposed pipeline route was delineated as Wetland "IS3".

The next occurrence is mapped with a description of PFO1/SS1E (Broad-leaved deciduous palustrine forested/seasonally flooded or saturated, broad-leaved, scrub-shrub) and is located approximately 1000 feet southeast of N.Y.S. Route 230 in Crystal Valley along the proposed pipeline route. The wetland also encompasses the wetland recognized by the New York State Department of Environmental Conservation, New York State Freshwater identified as "KP-1". The wetland appears to encompass the named stream/creek known as Big Stream as well as its overflow channels and adjacent lowland areas. The area of the proposed pipeline route falling within the channels of the small drainage tributary streams, the main channel and overflow channels of Big Stream and the adjacent lowland areas were delineated as Wetlands "LL", "IS97", "IS98", "IS99" & Wetland "M". Wetlands "LL", "IS97", "IS98" & "IS99" consist of small tributary channels and adjacent wetlands that feed into the main wetland/channel system delineated as Wetland "M".

The next occurrence is mapped with a description of PFO1E and PUBHh (Seasonally flooded or saturated, broad-leaved deciduous palustrine forested and diked/impounded, permanently flooded, palustrine unconsolidated bottom) and is located approximately 840' west of Bill Bailey Road and 2640' south of Ellis Road along the proposed pipeline route. The wetland appears to encompass a pond and an adjacent lowland area. It appears that the proposed pipeline route does not contain any of the mapped portion of the two wetlands but was found to be in close proximity. The wetland areas in the vicinity of the mapped wetlands were delineated as Wetlands "S" and "T".

The final occurrence does not involve the right of way of the proposed pipeline route but rather a proposed access road leading east from Schuyler County Route 27 to the proposed pipeline right of way. The wetland is mapped with a description of PFO1A (Temporarily flooded, broad-leaved deciduous, palustrine forested) and is located approximately 340 feet west of Schuyler County Route 27, 260 feet east of the proposed pipeline route approximately 1000 feet north of the southerly terminus of the proposed pipeline route. The wetland appears to include the channel of a named stream/creek known as Rock Stream and its adjacent lowland areas. The proposed right of way appears not to cross the mapped portion of the wetland but was found to be in very close proximity. The area of the stream/creek channel and its overflow channel falling within the proposed route was delineated as Wetland "PS6".

The U.S. Soil Conservation Service (USSCS) Soil Survey Mapping (Figure 4) shows several soil types that occur within the length of the proposed pipeline right of way. These soil types include:

- Burdett Silt Loam (3-15% slopes)
- Volusia Channery Silt Loam (0-25% slopes)
- Mardin Channery Silt Loam (3-15% slopes)
- Woostern Gravely Loam (5-25% slopes)
- Alluvial Soils (0-2% slopes)
- Chippewa Silt Loam (0-8% slopes)
- Holly Silt Loam (0-1% slopes)
- Chenanngo & Tioga Gravely Silt Loams (2-5% slopes)

The Alluvial Soils, Chippewa Silt Loam and Holly Silt Loam are listed on the National Hydric Soils List as obtained from the U.S. Dept. of Agriculture's Natural Resource Conservation Service website (http://soils.usda.gov/use/hydric/).

A consultation with a representative from the New York State Department of Conservation revealed that the proposed pipeline route passes through several streams/creeks with a classification of C and D. No streams or creeks falling within the proposed pipeline route were found to have a classification of C(t) or higher.

The aerial photography obtained from the NYSGIS Clearinghouse website shows that proposed pipeline route passes through a mixture of forest, brush land, active farm and rural residential areas. Older aerial photography as shown in the Local Soil Survey mapping depicts a large portion of the route that is not presently active farm land as being former farm land that has since reverted to brushy/wooded areas.

4.2 Site Ecology

The proposed Silk Pipeline and access right of ways includes several plant communities that include agricultural crop and pasture fields, mixed forest and brushy areas, lowland swamp areas and deciduous upland cover types. The majority of these types were found throughout the length of the proposed pipeline right of way, with the exception of the lowland swampy area which had one occurrence being the area delineated as Wetland "M", which consists of Big Stream and its adjacent lowland areas in Crystal Valley southeast of N.Y.S. Route 230. The general species of vegetation found in each delineated wetland varied throughout the length of the proposed route and species occurrences for both upland and wetland sample plots can be seen on the individual data sheets found in Appendix B to follow.

4.3 Wetlands And Streams

This section of the report provides specific details regarding the wetlands and stream crossings identified within the limits of the proposed Silk pipeline right of way. During the field investigation performed by Hallett Surveying & Mapping, P.C. (HSM) a total of 32 wetlands, 27 intermittent streams and 6 primary streams were identified and delineated as New York State Freshwater Wetlands, National Wetlands Inventory mapped or recognized wetlands and/or potential waters of the U.S.

Aerial photography shown in Figure 5 depicts the delineated wetland/stream locations in relationship to the overall extents of the proposed pipeline right of way route. Photographs of each wetland/stream crossing incident can be seen in Appendix A. Appendix B contains individual data collection sheets containing soil, hydrology, and vegetation species characteristics for wetland sample plots and upland sample plot when applicable. (Table 1 provides an overview of each wetland/stream delineation).

The delineated wetlands were marked in the field as "B" through "FF" and "LL". The wetland originally identified as "A" is not included herein due to a re-alignment of the proposed pipeline route which removed the proposed route from the vicinity of the location of wetland A. The intermittent streams were delineated and marked in the field as "IS1" through "IS23" and "IS97" through "IS99". The Primary streams were delineated and marked in the field as "PS1" through "PS6". Wetland "PS6" falls outside the proposed right of way of the Silk pipeline but is within the limits of a proposed access right of way to the proposed pipeline route. Wetland "AA" falls outside the limits of the proposed pipeline route right of way but is in close proximity and was therefore delineated and marked for reference during the construction phase of the proposed project. The coded wetland delineation ribbons were then surveyed and mapped by Hallett Surveying & Mapping, P.C. (APPENDIX C).

A large majority of the wetlands concern streams or creeks that are or feed into other major tributaries in the area of the proposed project. A description of what body of water these streams or creeks are or flow into can be found in Table 1. Any further informational notes pertinent to each wetland or stream/creek crossing can be found on the individual data sheets associated with that crossing found in APPENDIX B.

The total area of delineated wetlands and other waters of the U.S. within the proposed pipeline right of way and its proposed access roads is 5.266+/- acres (Table 1). The total length of streams (primary and intermittent) within the proposed pipeline right of way is 2734+/- linear feet (Table 1). The total proposed area of delineated wetlands and other waters of the U.S. within the proposed pipeline right of way to be disturbed is 0.240+/- acres with no individual delineated wetland or stream crossing disturbance being at or in access of 0.10 acres (Table 1). One delineated wetland, Wetland M, contains in access of 0.10 acres which would have been disturbed, however that particular crossing will be a proposed horizontal bore to avert any disturbance within the delineated wetland.

TABLE 1

Proposed Silk Pipeline Route, Schuyler Yates Counties, NY

Wetland/Stream Designation (In order of occurance along proposed route)	Area within proposed ROW (acres)	Linear feet of stream within ROW	Proposed area of disturbance	Primary Community Type	Common plant species	Mapped soil type	Hydrologic characteristics	Comments
A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Omited due to proposed route re-alignement
PS1	0.050	105 (cumulative total of both channels)	0.004 acres	Stream Channel	N/A	Burdett Silt Loam	Drainage Patterns/Inundated	Named Primary Stream known as "Rock Stream"
IS1	0.007	75	16 Sq. Ft.	Stream/Field Diversion Ditch	Juncus Effusus, Typha Latifolia, Carex, sp.	Volusia Channery Silt Loam	Drainage Patterns/Inundated	Man made surface run-off diversion ditch/stream channel -- tributaryof Rock Stream
PS2	0.019	60	**0 Sq. Ft. -- proposed bore**	Stream Channel	N/A	Burdett Silt Loam	Drainage Patterns/Inundated	Un-named primary stream -- tributary of Rock Stream
IS2	0.016	136	**0 Sq. Ft. -- proposed bore**	Stream Channel	Carex, sp., Impatiens Capensis, Aster, sp., Fraxinus Pennsylvanica	Burdett Silt Loam	Drainage Patterns	Overflow Channel to un-named primary stream "PS2" -- tributary of Rock Stream
B	0.212	N/A	0.011 acres	Wet area (depression) within active ag. Field	Juncus Effusus, Phragmites Australis, Carex, sp.	Volusia and/or Mardin Channery Silt Loam	Saturated in upper 12 inches	
C	0.060	N/A	0.006 acres	Wet area (depression) within active ag. Field	Juncus Effusus, Carex, sp.	Mardin Channery Silt Loam	Saturated in upper 12 inches/Drainage patterns	
IS3	0.009	8	32 Sq. Ft.	Stream Channel	Juncus Effusus, Aster, sp.	Volusia Channery Silt Loam	Drainage Patterns/Inundated	Un-named stream -- tributary of Big Stream
IS4	0.010	50	36 Sq. Ft.	Stream Channel	Juncus Effusus, Carex, sp.	Volusia Channery Silt Loam	Drainage Patterns/Inundated	Previousl re-constructed un-named stream/diversion ditch channel -- tributary of Big Stream
D	0.060	N/A	0.005 acres	Deciduous Forest Wetland	Juncus Effusus, Faxinus Pennsylvanica, Acer Rubrum	Volusia Channery Silt Loam	Saturated in upper 12 inches	
IS5	0.010	72	36 Sq. Ft.	Stream Channel	Impatiens Capensis	Volusia Channery Silt Loam	Drainage Patterns/Inundated	Un-named, possibly man made stream/diversion ditch -- tributary of Big Stream
IS6	0.106	66	0.008 acres	Stream Channel & adjacent lowlands	Salix, sp., Juncus Effusus, Osmunda Cinnamomea	Volusia Channery Silt Loam	Saturated in upper 12 inches/Drainage patterns	Un-named stream -- tributary of Tobahanna Creek
E	0.157	N/A	0.008 acres	Wet Seepage Area	Juncus Effusus, Aster, sp., Euthamia Graminifolia	Volusia Channery Silt Loam	Saturated in upper 12 inches/Drainage patterns	

TABLE 1

Proposed Silk Pipeline Route, Schuyler Yates Counties, NY

F	0.070	50	0.006 acres	Wet Seepage Area/Stream	Euthamia Graminifolia, Phragmites Australis, Vitus, sp.	Volusia Channery Silt Loam	Saturated in upper 12 inches/Drainage patterns	
G	0.083	N/A	0.008 acres	Wet Seepage Area	Cornus Amomum, Salix, sp., Osmunda Cinnamomea	Mardin Channery Silt Loam	Saturated in upper 12 inches/Drainage patterns	
H	0.027	63	0.002 acres	Wet Seepage Area/Stream	Fraxinus Pennsylvanica, Cqarex, sp., Euthamia Graminifolia	Mardin Channery Silt Loam and/or Woostem Gravely Loam	Inundated/Drainage Patterns	
I	0.107	105 (cumulative total of both channels)	0.01 acres	Stream Channel (s) and adjacent wet areas	Cornus Sericea, Carex, sp., Osmunda Cinnamomea, Juncus Effusus	Volusia Channery Silt Loam	Saturated in upper 12 inches/Drainage patterns	Un-named stream channels -- tributary of Gravel Run Creek and eventually Big Stream
J	0.085	101	0.005 acres	Stream Channel and adjacent wet areas	Cornus Sericea, Salix, sp., Osmunda Cinnamomea, Fraxinus Pennsylvanica	Volusia Channery Silt Loam	Saturated in upper 12 inches/Drainage patterns	Un-named stream channel -- tributar of Gravel Run Creek and eventually Big Stream
PS3	0.024	60	0.002 acres	Stream/Creek Channel	N/A	Alluvial Soils ***(recognized as hydric)***	Inundated/Drainage Patterns	Gravel Run Creek -- tributary of Big Stream
IS7	0.004	65	12 Sq. Ft.	Stream Channel	N/A	Volusia Channery Silt Loam	Inundated/Drainage Patterns	Un-named Stream -- tributary of Gravel Run Creek and eventually Big Stream
IS8	0.024	53	0.002 acres	Stream Channel and adjacent wet areas	Juncus Effusus, Fraxinus Pennsylvanica	Volusia Channery Silt Loam	Inundated/Drainage Patterns	Un-named Stream -- tributary of Gravel Run Creek and eventually Big Stream
IS9	0.005	54	8 Sq. Ft.	Stream Channel/Drainage Ditch	Carex, sp., Salix, sp.	Volusia Channery Silt Loam	Inundated/Drainage Patterns	Man made drainage ditch -- tributary of Gravel Run Creek and eventually Big Stream
K	0.085	N/A	0.007 acres	Wet Seepage Area	Osmunda Cinnamomea, Ulmus Americana, Salix, sp., Fraxinus Pennsylvanica	Volusia Channery Silt Loam	Saturated in upper 12 inches/Drainage patterns	
IS10	0.005	79	12 Sq. Ft.	Stream Channel/Drainage Ditch	Salix, sp.	Volusia Channery Silt Loam	Inundated/Drainage Patterns	Man made (or altered) drainage ditch/stream -- tributary of Gravel Ru Creek and eventually Big Stream
L	0.048	N/A	0.004 acres	Wet Seepage Area	Symplocarpus Foetidus, Osmunda Cinnamomea, Fraxinus Pennsylvanica	Chippewa Silt Loam ***(reognized as hydric)***	Inundated/Drainage Patterns	
IS11	0.004	54	12 Sq. Ft.	Stream Channel	N/A	Chippewa Silt Loam ***(reognized as hydric)***	Inundated/Drainage Patterns	Un-named Stream -- tributary of Big Stream
IS12	0.004	75	10 Sq. Ft.	Stream Channel/Drainage Ditch	Carex, sp., Salix, sp.	Woostem Gravely Loam, eroded	Inundated/Drainage Patterns	Man made diversion ditch

TABLE 1

Proposed Silk Pipeline Route, Schuyler Yates Counties, NY

LL	0.007	32	8 Sq. Ft.	Stream Channel and adjacent wet areas	Symplocarpus Foetidus, Impatiens Capensis, Fraxinus Pennsylvanica	Volusia Channery Silt Loam	Saturated in upper 12 inches/Drainage patterns	Drainage Ditch/Stream -- tributary of Big Stream
IS97	0.002	59	7 Sq. Ft.	Stream Channel/Drainage Ditch	Symplocarpus Foetidus, Carex, sp., Onoclea Sensibilis	Volusia Channery Silt Loam	Saturated in upper 12 inches/Drainage patterns	Drainage Ditch/Stream -- tributary of Big Stream
IS98	0.002	60	7 Sq. Ft.	Stream Channel/Drainage Ditch	Symplocarpus Foetidus, Carex, sp., Onoclea Sensibilis	Volusia Channery Silt Loam	Saturated in upper 12 inches/Drainage patterns	Drainage Ditch/Stream -- tributary of Big Stream
IS99	0.002	63	7 Sq. Ft.	Stream Channel/Drainage Ditch	Symplocarpus Foetidus, Carex, sp., Onoclea Sensibilis	Volusia Channery Silt Loam	Saturated in upper 12 inches/Drainage patterns	Drainage Ditch/Stream -- tributary of Big Stream
M	1.849	383 (approx. cumulative total of all channels)	**0 Sq. Ft. -- proposed bore**	Swamp /Stream Channel and adjacent wetlands	Cornus Amomum, Carex, sp., Symplocarpus Foetidus & Quercus Bicolor, willd	Holly ***(reognized as hydric)*** & Middlebury Silt Loams	Saturated in upper 12 inches/Drainage patterns	Big Stream main channel and side channels and adjacent lowland swamp area
IS13	0.003	39	12 Sq. Ft.	Stream Channel/Road Side Ditch	Euphamia Graminifolia & Unknown Grass species	Chenango & Tioga Gravely Silt Loams	Saturated in upper 12 inches/Drainage patterns	Road Side Ditch/Stream -- tributary of Big Stream
PS4	0.003	25	0 Sq. Ft.	Stream Channel	N/A	Chenango & Tioga Gravely Silt Loams	Inundated/Drainage Patterns	Un-named Stream – tributary of Big Stream
IS14	0.005	60	16 Sq. Ft.	Stream Channel	N/A	Woostern Gravely Loam and Mardin Channery Silt Loam	Inundated/Drainage Patterns	Un-named Stream – tributary of Big Stream
PS5	0.019	59	0.002 acres	Stream Channel	N/A	Mardin Channery Silt Loam	Inundated/Drainage Patterns	Un-named Stream – tributary of Big Stream
IS15	0.009	103	0.001 acres	Stream Channel/Road Side Ditch	Typha Angustifolia, Carex, sp., Salix, sp.	Mardin Channery Silt Loam	Inundated/Drainage Patterns	Drainage Ditch/Stream -- tributary of Big Stream
N	0.119	N/A	0.003 acres	Wet Scrub-Shrub Seepage Area	Osmunda Cinnamomea, Carex, sp., Salix, sp., Fraxinus Pennsylvanica	Mardin Channery Silt Loam	Saturated in upper 12 inches/Drainage patterns	
O	0.054	57	0.003 acres	Wet Scrub-Shrub Seepage Area/Drainage Ditch Stream	Salix, sp., Phragmites Australis, Cornus Amomum, Carex, sp.	Volusia Channery Silt Loam	Inundated/Drainage Patterns	Drainage Ditch/Stream and adjacent lowland wet area – tributary of Big Stream
P	0.093	N/A	0.007 acres	Wet Scrub-Shrub Seepage Area	Carex, sp., Salix, sp., Fraxinus Pennsylvanica	Volusia Channery Silt Loam	Inundated/Drainage Patterns	
Q	0.006	N/A	0 Sq. Ft.	Wet Meadow	Phragmites Australis, Carex, sp. Cornus Sericea	Volusia Channery Silt Loam	Inundated/Drainage Patterns	

TABLE 1

Proposed Silk Pipeline Route, Schuyler Yates Counties, NY

IS16	0.001	26	8 Sq. Ft.	Stream Channel/Drainage Ditch	N/A	Volusia Channery Silt Loam	Inundated/Drainage Patterns	Man made drainage ditch flowing into wetland Q
R	0.674	N/A	0.044 acres	Wet Meadow/Wet seepage Area	Cornus Amomum, Carex, sp., Phragmites Australis	Volusia Channery Silt Loam	Inundated/Drainage Patterns	
S	0.233	55	0.021 acres	Scrub-Shrub Wetland & Corresponding Drainage Ditch/ Overflow Stream	Phragmites Australis, Alnus Incana, ssp. Rugosa, Acer Rubrum, Fraxinus Pennsylvanica	Volusia Channery Silt Loam	Saturated in upper 12 inches/Drainage patterns	
T	0.256	N/A	0.017 acres	Scrub-Shrub/Active Agric. Field Wet Seepage Area	Carex, sp., Panicum Virgatum, Juncus Effusus	Chippewa Silt Loam ***(reognized as hydric)***	Saturated in upper 12 inches/Drainage patterns	
BB	0.022	N/A	0 Sq. Ft.	Deciduous Forest Wetland	Carex, sp., Juncus Effusus, Acer Rubrum	Volusia Channery Silt Loam	Inundated/Drainage Patterns	
CC	0.006	N/A	23 Sq. Ft.	Ponded Area	Juncus Effusus	Volusia Channery Silt Loam	Ponded/Inundated	
DD	0.006	N/A	0.001 acres	Ponded Area	Juncus Effusus, Carex, sp.	Volusia Channery Silt Loam	Ponded/Inundated	
EE	0.010	N/A	0.002 acres	Ponded Area	Typha Angustifolia, Salix, sp.	Volusia Channery Silt Loam	Ponded/Inundated	
FF	0.004	N/A	0.001 acres	Ponded Area	Carex, sp, Salix, sp.	Volusia Channery Silt Loam	Ponded/Inundated	
U	0.270	91	0.008 acres	Wet Seepage Area and Stream Channel/Drainage Ditch	Phragmites Australis, Carex, sp.	Volusia Channery Silt Loam	Saturated in upper 12 inches/Drainage patterns	Stream/Ditch empties into a National Wetlands Inventory identified wetland to the north of the proposed pipeline route
IS17	0.005	76	12 Sq. Ft.	Stream Channel/Drainage Ditch	Juncus Effusus, Carex, sp., Panicum Virgatum	Mardin Channery Silt Loam	Inundated/Drainage Patterns	Stream/Ditch empties into a National Wetlands Inventory identified wetland to the north of the proposed pipeline route
V	0.036	N/A	0 Sq. Ft.	Wet Seepage Area	Phragmites Australis, Euthamia Graminifolia	Volusia Channery Silt Loam	Saturated in upper 12 inches/Drainage patterns	
W	0.083	N/A	0.007 acres	Wet Seepage Area	Salix, sp., Panicum Virgatum	Volusia Channery Silt Loam	Saturated in upper 12 inches/Drainage patterns	
IS18	0.002	51	6 Sq. Ft.	Stream Channel/Drainage Ditch	Salix, sp., Phragmites Australis,	Volusia Channery Silt Loam	Inundated/Drainage Patterns	Stream/Dtich flows through a culvert to the west side of Old Bath Road and into an un-named creek

TABLE 1

Proposed Silk Pipeline Route, Schuyler Yates Counties, NY

X	0.032	88	0.001 acres	Stream Channel and/or Road Side Ditch and Adjacent Wet Areas	Salix, sp., Phragmites Australis, Osmunda Cinnamomea	Volusia Channery Silt Loam	Saturated in upper 12 inches/Drainage patterns	Stream/Dtich flows through a culvert to the west side of Old Bath Road and into an un-named creek
IS19	0.020	100	0.001 acres	Field Drainage Ditch/Wet Meadow	Phragmites Australis	Volusia Channery Silt Loam	Inundated/Drainage Patterns	
IS20	0.010	74	36 Sq. Ft.	Stream Channel/Road Side Ditch	Phragmites australis, Panicum Virgatum	Volusia Channery Silt Loam	Inundated/Drainage Patterns	Stream/Ditch flows westerly to an un-named creek which is a tributary of Keuka Lake
IS20A	0.007	98	16 Sq. Ft.	Field Drainage Ditch/Wet Meadow	Phragmites australis, Panicum Virgatum	Volusia Channery Silt Loam	Inundated/Drainage Patterns	Drainage ditch flows north into wetland IS20
Y	0.055	N/A	0.005 acres	Deciduous Forest/Scrub-Shrub Wetland	Phragmites Australis, Osmunda Cinnamomea, Carex, sp., Vitus, sp.	Mardin Channery Silt Loam	Saturated in upper 12 inches/Drainage patterns	
IS21	0.005	50	16 Sq. Ft.	Stream Channel/Drainage Ditch/Wet Meadow	Cornus Sericea, Juncus Effusus, Carex, sp.	Volusia Channery Silt Loam	Inundated/Drainage Patterns	Stream/Ditch flows north into a wet swampy area north of the proposed pipeline route
Z	0.040	N/A	0.003 acres	Deciduous Forest/Scrub-Shrub Seepage Area	Vitus, sp., Euphamia Graminifolia	Volusia Channery Silt Loam	Saturated in upper 12 inches/Drainage patterns	
IS22	0.002	59	7 Sq. Ft.	Stream Channel/Drainage Ditch	Fraxinus Pennsylvanica	Mardin Channery Silt Loam	Inundated/Drainage Patterns	Stream/Ditch appears to be man made or at least altered which flows into an un-named stream which is a tributary to Keuka Lake
IS23	0.008	55	27 Sq. Ft.	Stream Channel/Drainage Ditch	N/A	Mardin Channery Silt Loam	Inundated/Drainage Patterns	Stream/Ditch appears to be man made or at least altered which flows into an un-named stream which is a tributary to Keuka Lake
AA	0.000	n/A	0 Sq. Ft.	Pond and adjacent wet area	Panicum Virgatum, Fraxinus Pennsylvanica	Mardin Channery Silt Loam	Inundated/Drainage Patterns	Off Right of Way
PS6	0.015	23	0.015 acres	Stream Channel	Impatiens Capensis, Arisaema Triphyllum, Phragmites Australis, Salix, sp.	Burdett Silt Loam	Inundated/Drainage Patterns	Named Primary Stream known as "Rock Stream" -- access right of way crossing -- not within proposed pipeline route
TOTALS	5.266	2,538 (does not include Wetlands PS2, IS2 & M due to proposed bore)	0.239 acres					

5.0 SUMMARY

Hallett Surveying & Mapping, P.C. was contacted by Chesapeake Appalachia, L.L.C. to perform a wetland investigation along their proposed Silk natural gas pipeline (#W-23638) right of way and its corresponding proposed access roads. The proposed pipeline is approximately 9.75 miles in length and is located in the Towns of Reading & Tyrone, Schuyler County and Barrington, Yates County, New York.

Hallett Surveying & Mapping, P.C. collected various available background and resource information regarding the subject area prior to commencement of any field activities. The various New York State Freshwater and National Wetland Inventory mapped wetlands were noted for specific attention during the field portion of the investigation.

A field investigation of the proposed pipeline route and access roads was performed during the dates of Oct. 13 to Nov. 30, 2006 and March 30 through May 29, 2007. The wetlands were delineated using the federal criteria for vegetation, soils and hydrology based on the US Army Corps of Engineers (CORPS) Wetlands Delineations Manual. A total of 32 wetlands, 27 intermittent streams and 6 primary streams were identified, delineated and surveyed along the proposed pipeline right of way and access roads.

A total of 5.266 acres of wetlands and other waters of the U.S. area located within the limits of the proposed pipeline right of way and its proposed access roads. Approximately 2,734 linear feet of primary or intermittent streams are located within the proposed right of way and access roads. The total proposed area of wetland disturbance within the proposed pipeline right of way and the proposed access roads is 0.240+/- acres.

6.0 REFERENCES

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FIGURE 1

PROJECT LOCATION

FIGURE 2

N.Y.S. FRESHWATER WETLANDS MAPPING

FIGURE 3

NATIONAL WETLANDS INVENTORY MAPPING

FIGURE 4

SOIL SURVEY MAPPING

FIGURE 4

SHEET 4 OF 5

Schuyler County Soil Legend

MUSYM	SOIL	MUSYM	SOIL
Ad	Alden silt loam	HrCK	Howard gravelly loam, rolling
AnA	Angola silt loam	HSD	Howard, moderately steep
AnB	Angola silt loam	HSE	Howard soils, steep
AnC		HuB	Hudson gravelly silt loam
ApA	Appleton silt loam	HuC	Hudson gravelly silt loam
ApB	Appleton silt loam	LnB	Lansing gravelly silt loam
AQ	Aquepts and Saprists, ponded	LnC	Lansing gravelly silt loam
ArB	Arnot channery silt loam	LnD	Lansing gravelly silt loam
ArC	Arnot channery silt loam	LoB	Lordstown channery silt loam
At	Atkins silt loam	LoC	Lordstown channery silt loam
AuB	Aurora channery silt loam	LoD	Lordstown channery silt loam
AuC	Aurora channery silt loam	LTE	Lordstown-Arnot, steep
AuD	Aurora channery silt loam	LTF	Lordstown-Arnot, very steep
BaB	Bath channery silt loam	Ma	Madalin silt loam
BaC	Bath channery silt loam	MrB	Mardin channery silt loam
BaD	Bath channery silt loam	MrC	Mardin channery silt loam
BHE	Bath soils, steep	MrD	Mardin channery silt loam
BuB	Burdett silt loam	OCF	Ochrepts-Orthents, very steep
BuC	Burdett silt loam	OdA	Odessa silt loam
BuD	Burdett silt loam	OdB	Odessa silt loam
Ca	Canandaigua silt loam	Pa	Palms muck
Cc	Carlisle muck	Ph	Philo silt loam
Ce	Castile gravelly silt loam	Pt	Pits, gravel
ChA	Chenango silt loam	Rh	Red Hook gravelly silt loam
CnA	Chenango gravelly silt loam	RnA	Rhinebeck gravelly silt loam
CnB	Chenango gravelly silt loam	RnB	Rhinebeck gravelly silt loam
CoB	Chenango channery silt loam	ROF	Rock outcrop-Arnot complex
Cp	Chippewa silt loam	ScB3	Schoharie silty clay loam
CrA	Collamer silt loam	ScC3	Schoharie silty clay loam
CrB	Collamer silt loam	ScD3	Schoharie silty clay loam
CsA	Conesus silt loam	ShC3	Schoharie Varient silty clay loam
CsB	Conesus silt loam	ShD3	Schoharie Varient silty clay loam
CsC	Conesus silt loam	SyC	Schuyler silt loam
DkB	Dunkirk silt loam	SyD	Schuyler silt loam
DkC	Dunkirk silt loam	SyE	Schuyler silt loam
DUE3	Dunkirk & Hudson, steep, eroded	Te	Teel silt loam
ErA	Erie silt loam	TuB	Tuller channery silt loam
ErB	Erie silt loam	TuC	Tuller channery silt loam
ErC	Erie silt loam	UD	Udorthents, smoothed
FF	Fluvaquents-Udifluvents complex	VaB	Valois gravelly silt loam
FrA	Fremont silt loam	VaC	Valois gravelly silt loam
FrB	Fremont silt loam	VaD	Valois gravelly silt loam
FrC	Fremont silt loam	VEE	Valois soils, steep
Ha	Halsey mucky silt loam	VHF	Valois & Howard, very steep
HnB	Hornell channery silt loam	VoA	Volusia channery silt loam
HnC	Hornell channery silt loam	VoB	Volusia channery silt loam
HnD	Hornell channery silt loam	VoC	Volusia channery silt loam
HrA	Howard gravelly loam	VoD	Volusia channery silt loam
HrB	Howard gravelly loam	W	Water
HrC	Howard gravelly loam	Wk	Wallkill silt loam
		Wy	Wayland silt loam

FIGURE 4

SHEET 5 OF 5

Yates County Soil Legend

MUSYM	SOIL	MUSYM	SOIL
Ac	ALLIS (TULLER)	Lb	LANGFORD
Ad	ALLIS	Lc	LANGFORD
Ae	ALLIS (TULLER)	Ld	LANSING (FARMINGTON)
Af	ALLIS (TULLER)	Le	LANSING (FARMINGTON)
Ag	FLUVAQUENTS	Lf	LANSING (FARMINGTON)
Ah	ANGOLA	Lg	LANSING
Am	ARKPORT	Lh	LANSING
An	ARKPORT	Lk	LANSING
Ao	ARKPORT	Ll	LANSING
Ar	ARKPORT	Lm	LANSING
As	ATHERTON	Ln	LIMA
At	AURORA	Lo	LIMA
Au	AURORA	Lr	LIMA
Av	AURORA	Ls	LIMA
Aw	AURORA	Lt	LIMA
Ax	AURORA	Lu	LOBDELL (TEEL)
Ba	BATH	Lv	LORDSTOWN
Bb	BATH	Lw	LORDSTOWN
Bc	BERRIEN (GALEN)	Lx	LORDSTOWN
Be	BRACEVILLE (CASTILE)	Ly	LORDSTOWN
Cb	CAMILUS	Lz	LORDSTOWN
Cc	CANEADEA	Ma	MANLIUS
Cd	CANEADEA (RHINEBECK)	Mb	MANLIUS
Ce	CARLISLE	Mc	MANLIUS (NASSAU)
Cf	CARLISLE	Md	MANLIUS
Cg	CAYUGA	Me	MARDIN
Ch	CAYUGA	Mf	MARDIN
Ck	CAYUGA	Mg	MARDIN
Cl	CAYUGA	Mh	MARDIN
Cm	CAYUGA	Ml	MARDIN
Cr	CHAGRIN (HERKIMER)	Mm	MIDDLEBURY
Cs	CHAGRIN (HERKIMER)	Mn	MOROCCO
Ct	CHENANGO	Mo	SAPRISTS
Cu	CHENANGO	Ms	
Cv	CHENANGO	Oa	ODESSA
Cw	CHENANGO	Ob	ODESSA
Cx	CHENANGO	Of	ONTARIO
Cy	CHIPPEWA	Og	ONTARIO
Cz	CHIPPEWA (VOLUSIA)	Oh	ONTARIO
De	DUNKIRK	Ok	ONTARIO
Df	DUNKIRK	Ol	ONTARIO
Dg	DUNKIRK	Om	ONTARIO
Dh	DUNKIRK	On	ONTARIO
Dk	DUNKIRK	Or	OVID
Dl	DUNKIRK	Os	OVID
Ea	EDWARDS	Ot	OVID
Eb	EEL (TEEL)	Ou	OVID
Ed	ERIE	Pa	PALMYRA
Ee	ERIE	Pd	PALMYRA
Ef	ERIE	Pe	PALMYRA
Fc	FREMONT (VOLUSIA)	Pf	PALMYRA
Fd	FREMONT (VOLUSIA)	Pk	PHELPS
Fe	FREMONT (VOLUSIA)	Pl	POYGAN (FONDA)
Ff	SAPRISTS	Ra	RED HOOK
Fg	FULTON (RHINEBECK)	Sa	SCHOHARIE
Ga	GALEN	Sb	SCHOHARIE
Gc	GENESEE (HAMLIN)	Sc	SCHOHARIE
Gd	GENESEE (HAMLIN)	Sd	SCHOHARIE
Ha	HOLLY (WAYLAND)	Se	SCHOHARIE
Hc	HOMER	Sf	SCHOHARIE
Hd	HONEOYE	Sg	SCHOHARIE
He	HONEOYE	Sh	SCHOHARIE
Hf	HONEOYE	Sk	SLOAN (WAYLAND)
Hg	HONEOYE	Sl	UDORTHENTS
Hh	HONEOYE	Ta	TOLEDO (FONDA)
Hk	HONEOYE	Va	VALOIS
Hl	HONEOYE	Vb	VALOIS
Hm	HONEOYE	Vc	VALOIS
Hn	HONEOYE	Vd	VALOIS
Ho	HORNELL	Ve	VOLUSIA
Hp	HORNELL (TULLER)	Vf	VOLUSIA
Hr	HORNELL	Vg	VOLUSIA
Ht	HORNELL	Vh	VOLUSIA
Hu	HOWARD	Vk	VOLUSIA
Hv	HOWARD	Wb	WAYLAND
Hw	HOWARD	Wd	WESTLAND
Ja	JUNIUS	We	WOOSTERN (BATH)
Ka	KENDAIA	Wf	WOOSTERN (BATH)
Kb	KENDAIA	Wg	WOOSTERN (BATH)
Kc	KENDAIA	Wh	WOOSTERN (BATH)
La	LAKEMONT	Wk	WOOSTERN (BATH)
LA	LYONS		

FIGURE 5

WETLAND LOCATIONS OVERLAID ON RECENT AERIAL PHOTOGRAPHY

APPENDIX A

SITE PHOTOGRAPHY

APPENDIX B

FIELD DATA SHEETS

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 11/28/06
County: SCHUYLER
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID:
Transect ID:
Plot ID: PS1 (UPLAND)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. PRUNUS VIRGINIANA	T/SS	FACU	9.		
2. OSTRYA VIRGINIANA	T	FACU-	10.		
3. CARPINUS CAROLINIANA	T	FAC	11.		
4. RUBUS IDAEUS	H	FAC-	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 25%

Remarks:

HYDROLOGY

___ Recorded Data (Described in Remarks)
  ___ Stream, Lake, or Tide Gauge
  ___ Aerial Photographs
  ___ Other
___ No Recorded Data Available

Field Observations:

Depthof Surface Water: N/A (in.)

Depth to Free Water in Pit: N/A (in.)

Depth to Saturated Soils: N/A (in.)

Wetland Hydrology Indicators:
 Primary Indicators:
  ___ Inundated
  ___ Saturated in Upper 12 Inches
  ___ Water Marks
  _x_ Drift Lines
  ___ Sediment Deposits
  ___ Drainage Patterns in Wetlands
 Secondary Indicators (2 or more required):
  ___ Oxidized Root Channels in Upper 12 Inches
  ___ Water Stained Leaves
  ___ Local Soil Survey Data
  ___ FAC-Neutral Test
  ___ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series & Phase): BuB – BURDETT SILT LOAM (3–8%)

Drainage Class: Somewhat Poorly Drained

Field Observations
Confirmed Map Type? [✓ Yes] No

Taxonomy (Subgroup): Aeric Ochraqualfs

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0–16+	A	10YR/4/2	n/a	n/a	Silty Loam

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes [✓ No] (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? Yes [✓ No]

(Circle)
Is This Sampling Point Within a Wetland? Yes [✓ No]

Remarks:
No sample plot was taken within the Rock Stream Creek channel or overflow channel.

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 10/13/06
County: SCHUYLER
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: ____
Transect ID: ____
Plot ID: IS1 (WET)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Juncus Effusus	H	FACW+	9.		
2. Typha Latifolia	H	OBL	10.		
3. Carex sp.	H	FACW	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC–). 100%

Remarks:
Dominant plant species listed are those that were found to be growing within the stream/ditch channel and did not include those species found growing on the adjacent banks.

HYDROLOGY

__Recorded Data (Described in Remarks)
- ___Stream, Lake, or Tide Gauge
- ___Aerial Photographs
- ___Other

__No Recorded Data Available

Field Observations:

Depthof Surface Water: 3 (in.)

Depth to Free Water in Pit: 0 (in.)

Depth to Saturated Soils: 0 (in.)

Wetland Hydrology Indicators:
- Primary Indicators:
  - _x_ Inundated
  - ___ Saturated in Upper 12 Inches
  - ___ Water Marks
  - _x_ Drift Lines
  - ___ Sediment Deposits
  - _x_ Drainage Patterns in Wetlands
- Secondary Indicators (2 or more required):
  - ___ Oxidized Root Channels in Upper 12 Inches
  - ___ Water Stained Leaves
  - ___ Local Soil Survey Data
  - ___ FAC–Neutral Test
  - ___ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series & Phase): VoB – VOLUSIA CHANNERY SILT LOAM (3–8%)

Drainage Class: Somewhat Poorly Drained

Field Observations
Confirmed Map Type? Yes No

Taxonomy (Subgroup): Aeric Fragiaquepts

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

No soil profile pit was dug within the stream/ditch channel.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? [✓ Yes] No

(Circle)
Is This Sampling Point Within a Wetland? [✓ Yes] No

Remarks:

Wetland IS1 consists of a man–made drainage ditch/stream that empties into Rock Stream.

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 10/13/06
County: SCHUYLER
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID:
Transect ID:
Plot ID: PS2 (upland)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Rosa Multiflora	H	FACU	9.		
2. Euthamia Graminifolia	H	FAC	10.		
3. Acer Negundo	H	FAC–	11.		
4. Prunus Virginiana	T/SS	FACU	12.		
5. Rubus Idaeus	T	FAC+	13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC–). 40%

Remarks:

HYDROLOGY

☐ Recorded Data (Described in Remarks)
  ☐ Stream, Lake, or Tide Gauge
  ☐ Aerial Photographs
  ☐ Other
☐ No Recorded Data Available

Field Observations:

Depthof Surface Water: n/a (in.)

Depth to Free Water in Pit: n/a (in.)

Depth to Saturated Soils: n/a (in.)

Wetland Hydrology Indicators:
Primary Indicators:
  ☐ Inundated
  ☐ Saturated in Upper 12 Inches
  ☐ Water Marks
  ☒ Drift Lines
  ☐ Sediment Deposits
  ☐ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
  ☐ Oxidized Root Channels in Upper 12 Inches
  ☐ Water Stained Leaves
  ☐ Local Soil Survey Data
  ☐ FAC–Neutral Test
  ☐ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series & Phase): BuB – BURDETT SILT LOAM (3–8%)

Drainage Class: Somewhat Poorly Drained

Field Observations
Confirmed Map Type? [✓ Yes] No

Taxonomy (Subgroup): Aeric Ochraqualfs

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0–9	A	10YR/3/2	n/a	n/a	Silty Loam
9–16+	B	7.5YR/3/2	n/a	n/a	Silty Loam

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes [✓ No] (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? Yes [✓ No]

(Circle)
Is This Sampling Point Within a Wetland? Yes [✓ No]

Remarks:

No wetland sample plot was taken within the stream channel.

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 10/13/06
County: SCHUYLER
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: ___
Transect ID: ___
Plot ID: IS2 (wet)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Aster sp.	H	FAC	9.		
2. Carex sp.	H	FACW	10.		
3. Impatiens Capensis	H	FACW	11.		
4. Fraxinus Pennsylvanica	T	FACW	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC–). 100%

Remarks:
Vegetation samples limited to those growin within the limits of the apparent stream channel within the limits of the proposed pipeline right of way. The bottom of the stream channel appears to not support an abundance of vegetation due to its rocky and gravelish makeup.

HYDROLOGY

___Recorded Data (Described in Remarks)
  ___Stream, Lake, or Tide Gauge
  ___Aerial Photographs
  ___Other
___No Recorded Data Available

Field Observations:

Depthof Surface Water: n/a (in.)

Depth to Free Water in Pit: n/a (in.)

Depth to Saturated Soils: n/a (in.)

Wetland Hydrology Indicators:
Primary Indicators:
  ___Inundated
  ___Saturated in Upper 12 Inches
  ___Water Marks
  _x_ Drift Lines
  ___Sediment Deposits
  _x_ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
  ___Oxidized Root Channels in Upper 12 Inches
  ___Water Stained Leaves
  ___Local Soil Survey Data
  _x_ FAC–Neutral Test
  ___Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name (Series & Phase): BuB – BURDETT SILT LOAM (3–8%)

Taxonomy (Subgroup): Aeric Ochraqualfs

Drainage Class: Somewhat Poorly Drained

Field Observations

Confirmed Map Type? [✓ Yes] No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0–7	A	10YR/3/2	7.5YR/5/8	<5%/faint	Silty Loam

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks:

The soil test pit was dug to 7 inches at which point refusal was met due to a dense rock and gravel sublayer.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)

Wetland Hydrology Present? [✓ Yes] No

Hydric Soils Present? [✓ Yes] No

(Circle)

Is This Sampling Point Within a Wetland? [✓ Yes] No

Remarks:

This site consits of a natural drainge channel that appears to regularly carry water as an overflow channel during rain events and seasonal runoff to the main unnamed creek/stream to the south which empties into Rock Stream.

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 10/13/06
County: SCHUYLER
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: ____
Transect ID: ____
Plot ID: IS2 (upland)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Euthamia Graminifolia	H	FAC	9.		
2. Rubus Idaeus	H	FAC–	10.		
3. Fraxinus Pennsylvanica	T	FACW	11.		
4. Juglans Nigra	T	FACU	12.		
5. Solanum Dulcamara	H	FAC–	13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC–). 40%

Remarks:
Vegetation sampling area excludes that portion of the apprent stream channel.

HYDROLOGY

___Recorded Data (Described in Remarks)
  ___Stream, Lake, or Tide Gauge
  ___Aerial Photographs
  ___Other
___No Recorded Data Available

Field Observations:

Depthof Surface Water: n/a (in.)

Depth to Free Water in Pit: n/a (in.)

Depth to Saturated Soils: n/a (in.)

Wetland Hydrology Indicators:
Primary Indicators:
  ___Inundated
  ___Saturated in Upper 12 Inches
  ___Water Marks
  ___Drift Lines
  ___Sediment Deposits
  ___Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
  ___Oxidized Root Channels in Upper 12 Inches
  ___Water Stained Leaves
  ___Local Soil Survey Data
  ___FAC–Neutral Test
  ___Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name (Series & Phase): BuB – BURDETT SILT LOAM (3–8%)

Taxonomy (Subgroup): Aeric Ochraqualfs

Drainage Class: Somewhat Poorly Drained

Field Observations

Confirmed Map Type? [✓ Yes] No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0–9	A	10YR/4/2	none	none	Silty Loam
9+	B	10YR/4/2	7.5YR/5/6	10% faint	Silty Loam

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- _x_ Gleyed or Low Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes [✓ No] (Circle)

Wetland Hydrology Present? Yes [✓ No]

Hydric Soils Present? [✓ Yes] No

(Circle)

Is This Sampling Point Within a Wetland? Yes [✓ No]

Remarks:

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 10/16/06
County: SCHUYLER
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID:
Transect ID:
Plot ID: B (wet)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Juncus Effusus	H	FACW+	9.		
2. Carex sp.	H	FACW	10.		
3. Phragmites Australis	H	FACW	11.		
4. Dactylis Glomerata	H	FACU	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 75%

Remarks:

HYDROLOGY

___ Recorded Data (Described in Remarks)
  ___ Stream, Lake, or Tide Gauge
  ___ Aerial Photographs
  ___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: 1 (in.)

Depth to Free Water in Pit: 0 (in.)

Depth to Saturated Soils: 0 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
  x Inundated
  x Saturated in Upper 12 Inches
  ___ Water Marks
  ___ Drift Lines
  ___ Sediment Deposits
  ___ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
  ___ Oxidized Root Channels in Upper 12 Inches
  ___ Water Stained Leaves
  ___ Local Soil Survey Data
  x FAC-Neutral Test
  ___ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name (Series & Phase): VoB – VOLUSIA CHANNERY SILT LOAM (3–8%)
MrB – MARDIN CHANNERY SILT LOAM (3–8%)

Drainage Class: Somewhat Poorly Drained
Moderatly Well Drained

Taxonomy (Subgroup): Aeric Fragiochrepts
Typic Fragiochrepts

Field Observations
Confirmed Map Type? [✓ Yes] No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0–12	A	10YR/3/1	7.5YR/3/4	10%	Silty Clay Loam
12+	B	10YR/6/2	7.5YR/5/6	10%	Silty Clay Loam

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
x Gleyed or Low Chroma Colors

x Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

The soil sample closely matches both soil types listed above and considering that the site is located at the mapped convergance of the two soil types it was found to agree with the mapped types. Also some degree of difference to the mapped type can be attributed to the mixing of horizons due to the fact that the site falls within an agricultural field affected by plowing in the past.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? [✓ Yes] No

(Circle)
Is This Sampling Point Within a Wetland? [✓ Yes] No

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 10/16/06
County: SCHUYLER
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID:
Transect ID:
Plot ID: B (upland)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Dactylis Glomerata	H	FACU	9.		
2. Daucus Carota	H	FACU	10.		
3. Phragmites Australis	H	FACW	11.		
4. Trifolium Pratense	H	FACU–	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC–). 25%

Remarks:

HYDROLOGY

___ Recorded Data (Described in Remarks)
  ___ Stream, Lake, or Tide Gauge
  ___ Aerial Photographs
  ___ Other
___ No Recorded Data Available

Field Observations:

Depthof Surface Water: n/a (in.)

Depth to Free Water in Pit: n/a (in.)

Depth to Saturated Soils: n/a (in.)

Wetland Hydrology Indicators:
Primary Indicators:
  ___ Inundated
  ___ Saturated in Upper 12 Inches
  ___ Water Marks
  ___ Drift Lines
  ___ Sediment Deposits
  ___ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
  ___ Oxidized Root Channels in Upper 12 Inches
  ___ Water Stained Leaves
  ___ Local Soil Survey Data
  ___ FAC–Neutral Test
  ___ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name (Series & Phase): VoB – VOLUSIA CHANNERY SILT LOAM (3–8%)
MrB – MARDIN CHANNERY SILT LOAM (3–8%)

Taxonomy (Subgroup): Aeric Fragiochrepts
Typic Fragiochrepts

Drainage Class: Somewhat Poorly Drained
Moderatly Well Drained

Field Observations
Confirmed Map Type? [✓ Yes] No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0–10	A	10YR/4/2	none	none	Silty Loam
10+	B	10YR/6/2	7.5YR/5/6	10%	Silty Clay Loam

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- _x_ Gleyed or Low Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

The soil sample closely matches both soil types listed above and considering that the site is located at the mapped convergance of the two soil types it was found to agree with the mapped types.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes [✓ No] (Circle)
Wetland Hydrology Present? Yes [✓ No]
Hydric Soils Present? [✓ Yes] No

(Circle)
Is This Sampling Point Within a Wetland? Yes [✓ No]

Remarks:

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 10/16/06
County: SCHUYLER
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID:
Transect ID:
Plot ID: C (wet)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Juncus Effusus	H	FACW+	9.		
2. Trifolium Pratense	H	FACU	10.		
3. Carex, sp.	H	FACW	11.		
4. Phleum Pratense	H	FACU	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC–). 50%

Remarks:

HYDROLOGY

___Recorded Data (Described in Remarks)
  ___Stream, Lake, or Tide Gauge
  ___Aerial Photographs
  ___Other
___No Recorded Data Available

Field Observations:

Depth of Surface Water: n/a (in.)

Depth to Free Water in Pit: 9" (in.)

Depth to Saturated Soils: 4" (in.)

Wetland Hydrology Indicators:
Primary Indicators:
  ___Inundated
  _x_Saturated in Upper 12 Inches
  ___Water Marks
  ___Drift Lines
  ___Sediment Deposits
  _x_Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
  ___Oxidized Root Channels in Upper 12 Inches
  ___Water Stained Leaves
  ___Local Soil Survey Data
  _x_FAC–Neutral Test
  ___Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name (Series & Phase): MrB – MARDIN CHANNERY SILT LOAM (3–8%)

Taxonomy (Subgroup): Typic Fragiochrepts

Drainage Class: Moderatly Well Drained

Field Observations

Confirmed Map Type? [✓ Yes] No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0–8	A	10YR/4/1	none	none	Silty Loam
8+	B	10YR/5/1	7.5YR/5/6	10%	Silty Clay Loam

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
_x_ Gleyed or Low Chroma Colors

_x_ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

The site falls in close proximity to the mapped division between the Mardin Channery Silt Loam and the Volusia Channery Silt Loam, however the characteristics of the sample closely match those of the Mardin series and not the Volusia series, therefore it was determined that the location of wetland "B" falls within the mapped Mardin series soil type.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? [✓ Yes] No

(Circle)
Is This Sampling Point Within a Wetland? [✓ Yes] No

Remarks:

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE

Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.

Investigator: RICHARD DAUGHERTY

Date: 10/16/06

County: SCHUYLER

State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No

Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]

Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: ___

Transect ID: ___

Plot ID: C (upland)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Phleum Pratense	H	FACU	9.		
2. Trifolium Pratense	H	FACU	10.		
3. Euthamia Graminifolia	H	FAC	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC–). 33%

Remarks:

HYDROLOGY

___Recorded Data (Described in Remarks)
- ___Stream, Lake, or Tide Gauge
- ___Aerial Photographs
- ___Other

___No Recorded Data Available

Field Observations:

Depth of Surface Water: n/a (in.)

Depth to Free Water in Pit: n/a (in.)

Depth to Saturated Soils: n/a (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ___Inundated
- ___Saturated in Upper 12 Inches
- ___Water Marks
- ___Drift Lines
- ___Sediment Deposits
- ___Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___Oxidized Root Channels in Upper 12 Inches
- ___Water Stained Leaves
- ___Local Soil Survey Data
- ___FAC-Neutral Test
- ___Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series & Phase): MrB – MARDIN CHANNERY SILT LOAM (3–8%)

Taxonomy (Subgroup): Typic Fragiochrepts

Drainage Class: Moderatly Well Drained
Field Observations
Confirmed Map Type? [✓ Yes] No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0–10	A	10YR/3/2	none	none	Silty Loam
10+	B	10YR/4/2	none	none	Silty Clay Loam

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

The site falls in close proximity to the mapped division between the Mardin Channery Silt Loam and the Volusia Channery Silt Loam, however the characteristics of the sample closely match those of the Mardin series and not the Volusia series, therefore it was determined that the location of wetland "B" falls within the mapped Mardin series soil type.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes [✓ No] (Circle)
Wetland Hydrology Present? Yes [✓ No]
Hydric Soils Present? Yes [✓ No]

(Circle)
Is This Sampling Point Within a Wetland? Yes [✓ No]

Remarks:

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 10/16/06
County: SCHUYLER
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID:
Transect ID:
Plot ID: IS3 (wetland)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Juncus Effusus	H	FACW+	9.		
2. Rosa Multiflora	H	FACU	10.		
3. Aster, sp.	H	FAC	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC–). 67%

Remarks:
Vegetation samples limited to the flat areas adjacent to the flowing stream channel and within the channel itself.

HYDROLOGY

___ Recorded Data (Described in Remarks)
  ___ Stream, Lake, or Tide Gauge
  ___ Aerial Photographs
  ___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: 4 (in.)

Depth to Free Water in Pit: 0 (in.)

Depth to Saturated Soils: 0 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
- x Inundated
- x Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- x Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water Stained Leaves
- ___ Local Soil Survey Data
- x FAC–Neutral Test
- ___ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series & Phase): VoA & VoB – VOLUSIA CHANNERY SILT LOAM (3–8%)

Taxonomy (Subgroup): Aeric Fragiochrepts

Drainage Class: Somewhat Poorly Drained

Field Observations
Confirmed Map Type? [✓ Yes] No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0–6	A	10YR/4/2	7.5YR/5/8	few/faint	Silty Loam

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- _x_ Gleyed or Low Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

The channel of the stream itself flows on bedrock. The soil sample was taken to a depth of 6" where it met resistance due to the underlying bedrock layer.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? [✓ Yes] No

(Circle)
Is This Sampling Point Within a Wetland? [✓ Yes] No

Remarks:

No adjacent upland sample plot studied due to the fact that the flat part of the channel abruptly transforms to a steep bank on either side of the channel leading to the elevation of the adjacent farm fields. The channel at some time in the past appears to have been man made or at least altered to reflect its current recessed depth or elevation differance with the adjacent fields.

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 10/16/06
County: SCHUYLER
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? [✓ Yes] No
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: ______
Transect ID: ______
Plot ID: IS4 (wetland)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Juncus Effusus	H	FACW+	9.		
2. Carex sp.	H	FACW	10.		
3. Euthamia Graminifolia	H	FAC	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC–). 100%

Remarks:

Vegetation samples limited to the areas along the bottom of the ditch/stream slope adjacent to the flowing stream channel and within the channel itself.

HYDROLOGY

___ Recorded Data (Described in Remarks)
  ___ Stream, Lake, or Tide Gauge
  ___ Aerial Photographs
  ___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: 3 (in.)

Depth to Free Water in Pit: 0 (in.)

Depth to Saturated Soils: 0 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
  x Inundated
  x Saturated in Upper 12 Inches
  ___ Water Marks
  ___ Drift Lines
  ___ Sediment Deposits
  x Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
  ___ Oxidized Root Channels in Upper 12 Inches
  ___ Water Stained Leaves
  ___ Local Soil Survey Data
  x FAC–Neutral Test
  ___ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series & Phase): VoA – VOLUSIA CHANNERY SILT LOAM (0–3%)

Drainage Class: Somewhat Poorly Drained

Field Observations

Taxonomy (Subgroup): Aeric Fragiochrepts

Confirmed Map Type? [✓ Yes] No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0–16+	A	Gley1/4/N	7.5YR/4/6	35%	Silty Clay

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- _x_ Gleyed or Low Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

The stream channel and adjacent banks were recently altered or constructed with the upper portions of the original soil profile having been removed.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? [✓ Yes] No

(Circle)
Is This Sampling Point Within a Wetland? [✓ Yes] No

Remarks:

The site was listed as being siginificantly disturbed due to the recent construction and alterations to the channels previous and original state. No upland sample was taken at the site due to the abrupt visual and physical changes of the vegetation between the channel/ditch bottom and the adjacent side slopes along with the fact that the original soil profile had been removed or significantly altered. The areas adjacent to the ditch channel and side slopes are an active agricultural field to the southeast and a wooded area to the northwest with neither area showing any wetland indications or characteristics and are approximately 3 feet higher in elevation than the bottom of the stream/ditch channel.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 10/19/06
County: SCHUYLER
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID:
Transect ID:
Plot ID: D (wet)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Populus Tremuloides	T/SS	FACU	9.		
2. Juncus Effusus	H	FACW+	10.		
3. Fraxinus Pennsylvanica	T	FACW	11.		
4. Acer Rubrum	T/SS	FAC	12.		
5. Prunus Virginiana	T/SS	FACU	13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC–). 60%

Remarks:

HYDROLOGY

___ Recorded Data (Described in Remarks)
  ___ Stream, Lake, or Tide Gauge
  ___ Aerial Photographs
  ___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: n/a (in.)

Depth to Free Water in Pit: 6 (in.)

Depth to Saturated Soils: 3 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
  ___ Inundated
  _x_ Saturated in Upper 12 Inches
  ___ Water Marks
  ___ Drift Lines
  ___ Sediment Deposits
  ___ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
  ___ Oxidized Root Channels in Upper 12 Inches
  ___ Water Stained Leaves
  ___ Local Soil Survey Data
  _x_ FAC-Neutral Test
  ___ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series & Phase): VoA – VOLUSIA CHANNERY SILT LOAM (0–3%)

Taxonomy (Subgroup): Aeric Fragiochrepts

Drainage Class: Somewhat Poorly Drained
Field Observations
Confirmed Map Type? [✓ Yes] No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0–8	A	10YR/4/2	7.5YR/4/6	10%	Silty Loam
8+	B	2.5Y/6/1	7.5YR/4/6	15%	Silty Loam

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
_x_ Gleyed or Low Chroma Colors

___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? [✓ Yes] No

(Circle)
Is This Sampling Point Within a Wetland? [✓ Yes] No

Remarks:

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 10/19/06
County: SCHUYLER
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID:
Transect ID:
Plot ID: D (upland)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Populus Tremuloides	T/SS	FACU	9.		
2. Quercus Alba	T	FACU-	10.		
3. Acer Rubrum	T/SS	FAC	11.		
4. Rubus Idaeus	H	FAC-	12.		
5. Prunus Virginiana	SS	FACU	13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 20%

Remarks:

HYDROLOGY

___Recorded Data (Described in Remarks)
  ___Stream, Lake, or Tide Gauge
  ___Aerial Photographs
  ___Other
___No Recorded Data Available

Field Observations:

Depth of Surface Water: n/a (in.)

Depth to Free Water in Pit: n/a (in.)

Depth to Saturated Soils: n/a (in.)

Wetland Hydrology Indicators:
  Primary Indicators:
    ___Inundated
    ___Saturated in Upper 12 Inches
    ___Water Marks
    ___Drift Lines
    ___Sediment Deposits
    ___Drainage Patterns in Wetlands
  Secondary Indicators (2 or more required):
    ___Oxidized Root Channels in Upper 12 Inches
    ___Water Stained Leaves
    ___Local Soil Survey Data
    ___FAC-Neutral Test
    ___Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series & Phase): VoA – VOLUSIA CHANNERY SILT LOAM (0-3%)

Taxonomy (Subgroup): Aeric Fragiochrepts

Drainage Class: Somewhat Poorly Drained
Field Observations
Confirmed Map Type? [✓ Yes] No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0-6	A	10YR/4/3	none	none	Silty Loam
8+	B	10YR/5/6	7.5YR/5/6	15%	Silty Loam

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low Chroma Colors
x Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes [✓ No] (Circle)
Wetland Hydrology Present? Yes [✓ No]
Hydric Soils Present? Yes [✓ No]

(Circle)
Is This Sampling Point Within a Wetland? Yes [✓ No]

Remarks:

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 10/19/06
County: SCHUYLER
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID:
Transect ID:
Plot ID: IS5 (wetland)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Impatiens Capensis	H	FACW	9.		
2. Juncus Effusus	H	FACW+	10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC–). 100%

Remarks:

Vegetation samples limited to the areas adjacent to the flowing stream channel and within the channel itself.

HYDROLOGY

__ Recorded Data (Described in Remarks)
__ Stream, Lake, or Tide Gauge
__ Aerial Photographs
__ Other
__ No Recorded Data Available

Field Observations:

Depth of Surface Water: 4 (in.)

Depth to Free Water in Pit: 0 (in.)

Depth to Saturated Soils: 0 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
x Inundated
x Saturated in Upper 12 Inches
__ Water Marks
__ Drift Lines
__ Sediment Deposits
x Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
__ Oxidized Root Channels in Upper 12 Inches
__ Water Stained Leaves
__ Local Soil Survey Data
x FAC–Neutral Test
__ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series & Phase): VoA – VOLUSIA CHANNERY SILT LOAM (0–3%)

Drainage Class: Somewhat Poorly Drained

Taxonomy (Subgroup): Aeric Fragiochrepts

Field Observations
Confirmed Map Type? [✓ Yes] No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low Chroma Colors

___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

No soil sample taken within the stream/ditch channel.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes [✓ No] (Circle)
Wetland Hydrology Present? Yes [✓ No]
Hydric Soils Present? Yes [✓ No]

(Circle)
Is This Sampling Point Within a Wetland? Yes [✓ No]

Remarks:

The stream/ditch channel appears to be man made or at least reconstructed from any possible original location or condtion. The channel is approximately 6 feet in total width with the majority of the vegetation growing in the flat bottom portion of the channel. The bottom of the stream/ditch is recessed below the surrounding original grade by approximately 2.5 feet with near vertical side slopes. The areas adjacent to the channel are wooded with no indications of wetland conditions or characteristics.

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 10/19/06
County: SCHUYLER
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID:
Transect ID:
Plot ID: IS6 (wet)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Salix sp.	T/SS	FACW	9.		
2. Juncus Effusus	H	FACW+	10.		
3. Prunus Virginiana	T/SS	FACU	11.		
4. Euthamia Graminifolia	H	FAC	12.		
5. Phleum Pratense	H	FACU	13.		
6. Osmunda Cinnamomea	H	FACW	14.		
7. Cornus Foemina ssp. Racemosa	SS	FAC–	15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC–). 67%

Remarks:

HYDROLOGY

___ Recorded Data (Described in Remarks)
- ___ Stream, Lake, or Tide Gauge
- ___ Aerial Photographs
- ___ Other

___ No Recorded Data Available

Field Observations:

Depth of Surface Water: n/a (in.)

Depth to Free Water in Pit: 6 (in.)

Depth to Saturated Soils: 4 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
- ___ Inundated
- x Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- X Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water Stained Leaves
- ___ Local Soil Survey Data
- x FAC–Neutral Test
- ___ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series & Phase): VoA – VOLUSIA CHANNERY SILT LOAM (0–3%)

Taxonomy (Subgroup): Aeric Fragiochrepts

Drainage Class: Somewhat Poorly Drained
Field Observations
Confirmed Map Type? [✓ Yes] No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0–10	A	10YR/4/1	none	none	Silty Loam
10+	B	10YR/6/1	7.5YR/5/6	few/faint	Silty Loam

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? [✓ Yes] No

(Circle)
Is This Sampling Point Within a Wetland? [✓ Yes] No

Remarks:

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 10/19/06
County: SCHUYLER
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID:
Transect ID:
Plot ID: IS6 (upland)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Aster, sp.	H	FAC	9.		
2. Euthamia Graminifolia	H	FAC	10.		
3. Phleum Pratense	H	FACU	11.		
4. Soldiago Canadensis	H	FACU	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 50%

Remarks:

HYDROLOGY

___ Recorded Data (Described in Remarks)
  ___ Stream, Lake, or Tide Gauge
  ___ Aerial Photographs
  ___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: n/a (in.)

Depth to Free Water in Pit: n/a (in.)

Depth to Saturated Soils: n/a (in.)

Wetland Hydrology Indicators:
Primary Indicators:
  ___ Inundated
  ___ Saturated in Upper 12 Inches
  ___ Water Marks
  ___ Drift Lines
  ___ Sediment Deposits
  ___ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
  ___ Oxidized Root Channels in Upper 12 Inches
  ___ Water Stained Leaves
  ___ Local Soil Survey Data
  x FAC-Neutral Test
  ___ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series & Phase): VoA – VOLUSIA CHANNERY SILT LOAM (0–3%)

Drainage Class: Somewhat Poorly Drained

Field Observations
Confirmed Map Type? [✓ Yes] No

Taxonomy (Subgroup): Aeric Fragiochrepts

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0–12	A	10YR/4/2	none	none	Silty Loam
12+	B	10YR/6/1	7.5YR/5/6	few/faint	Silty Loam

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- x Gleyed or Low Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? Yes [✓ No]
Hydric Soils Present? [✓ Yes] No

(Circle)
Is This Sampling Point Within a Wetland? Yes [✓ No]

Remarks:

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 10/19/06
County: SCHUYLER
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: ___
Transect ID: ___
Plot ID: E (wet)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Juncus Effusus	H	FACW+	9.		
2. Euthamia Graminifolia	H	FAC	10.		
3. Phleum Pratense	H	FACU	11.		
4. Aster, sp.	H	FAC	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC–). 75%

Remarks:

HYDROLOGY

___ Recorded Data (Described in Remarks)
- ___ Stream, Lake, or Tide Gauge
- ___ Aerial Photographs
- ___ Other

___ No Recorded Data Available

Field Observations:

Depth of Surface Water: n/a (in.)

Depth to Free Water in Pit: 7 (in.)

Depth to Saturated Soils: 6 (in.)

Wetland Hydrology Indicators:
- Primary Indicators:
  - ___ Inundated
  - _x_ Saturated in Upper 12 Inches
  - ___ Water Marks
  - ___ Drift Lines
  - ___ Sediment Deposits
  - _x_ Drainage Patterns in Wetlands
- Secondary Indicators (2 or more required):
  - ___ Oxidized Root Channels in Upper 12 Inches
  - ___ Water Stained Leaves
  - ___ Local Soil Survey Data
  - _x_ FAC-Neutral Test
  - ___ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series & Phase): VoB - VOLUSIA CHANNERY SILT LOAM (3-8%)

Drainage Class: Somewhat Poorly Drained

Field Observations

Confirmed Map Type? [✓ Yes] No

Taxonomy (Subgroup): Aeric Fragiochrepts

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0-12	A	10YR/4/2	7.5YR/6/8	15%	Silty Loam
12+	B	10YR/6/2	7.5YR/6/8	15%	Silty Loam

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
_x_ Gleyed or Low Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? [✓ Yes] No

(Circle)
Is This Sampling Point Within a Wetland? [✓ Yes] No

Remarks:

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 10/19/06
County: SCHUYLER
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID:
Transect ID:
Plot ID: E (upland)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Solidago Canadensis	H	FACU	9.		
2. Euthamia Graminifolia	H	FAC	10.		
3. Phleum Pratense	H	FACU	11.		
4. Trifoleum Pratense	H	FACU	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC−). 25%

Remarks:

HYDROLOGY

___Recorded Data (Described in Remarks)
  ___Stream, Lake, or Tide Gauge
  ___Aerial Photographs
  ___Other
___No Recorded Data Available

Field Observations:

Depth of Surface Water: n/a (in.)

Depth to Free Water in Pit: n/a (in.)

Depth to Saturated Soils: n/a (in.)

Wetland Hydrology Indicators:
Primary Indicators:
  ___Inundated
  ___Saturated in Upper 12 Inches
  ___Water Marks
  ___Drift Lines
  ___Sediment Deposits
  ___Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
  ___Oxidized Root Channels in Upper 12 Inches
  ___Water Stained Leaves
  ___Local Soil Survey Data
  ___FAC-Neutral Test
  ___Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series & Phase): VoB – VOLUSIA CHANNERY SILT LOAM (3–8%)

Taxonomy (Subgroup): Aeric Fragiochrepts

Drainage Class: Somewhat Poorly Drained
Field Observations
Confirmed Map Type? [✓ Yes] No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0–8	A	10YR/4/2	none	none	Silty Loam
8+	B	10YR/6/3	10YR/5/6	few/faint	Silty Loam

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? Yes [✓ No]
Hydric Soils Present? Yes [✓ No]

(Circle)
Is This Sampling Point Within a Wetland? Yes [✓ No]

Remarks:

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 10/23/06
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: ___
Transect ID: ___
Plot ID: F (wet)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Cornus Foemina ssp. Racemosa	SS	FAC–	9.		
2. Euthamia Graminifolia	H	FAC	10.		
3. Vitus sp.	V	FAC	11.		
4. Phragmites Australis	H	FACW	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC–). 75%

Remarks:

HYDROLOGY

___ Recorded Data (Described in Remarks)
- ___ Stream, Lake, or Tide Gauge
- ___ Aerial Photographs
- ___ Other

___ No Recorded Data Available

Field Observations:

Depth of Surface Water: n/a (in.)

Depth to Free Water in Pit: 7 (in.)

Depth to Saturated Soils: 0 (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ___ Inundated
- _x_ Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- _x_ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water Stained Leaves
- ___ Local Soil Survey Data
- _x_ FAC–Neutral Test
- ___ Other (Explain in Remarks)

Remarks:
The wetland sample plot was taken in the wetland area adjacent to the stream channel running through the wetland to establish the fact that the wetland extends beyond the area immediately adjacent to the stream channel.

SOILS

Map Unit Name
(Series & Phase): Vf – VOLUSIA CHANNERY SILT LOAM (3–8%)

Taxonomy (Subgroup): Aeric Fragiochrepts

Drainage Class: Somewhat Poorly Drained

Field Observations

Confirmed Map Type? [✓ Yes] No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0–9	A	10YR/4/2	7.5YR/5/6	3%	Silty Loam
9+	B	2.5Y/6/2	7.5YR/5/8	15%	Silty Loam

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
_x_ Gleyed or Low Chroma Colors

___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? [✓ Yes] No

(Circle)
Is This Sampling Point Within a Wetland? [✓ Yes] No

Remarks:

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 10/23/06
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: ___
Transect ID: ___
Plot ID: F (upland)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Pinus Strobus	T	FACU	9.		
2. Cornus Foemina ssp. Racemosa	SS	FAC-	10.		
3. Robinia Pseudoacacia	T	FACU-	11.		
4. Prunus Serotina	T	FACU	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 0%

Remarks:

HYDROLOGY

___ Recorded Data (Described in Remarks)
  ___ Stream, Lake, or Tide Gauge
  ___ Aerial Photographs
  ___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: n/a (in.)

Depth to Free Water in Pit: n/a (in.)

Depth to Saturated Soils: n/a (in.)

Wetland Hydrology Indicators:
Primary Indicators:
  ___ Inundated
  ___ Saturated in Upper 12 Inches
  ___ Water Marks
  ___ Drift Lines
  ___ Sediment Deposits
  ___ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
  ___ Oxidized Root Channels in Upper 12 Inches
  ___ Water Stained Leaves
  ___ Local Soil Survey Data
  ___ FAC-Neutral Test
  ___ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series & Phase): Vf – VOLUSIA CHANNERY SILT LOAM (3–8%)

Taxonomy (Subgroup): Aeric Fragiochrepts

Drainage Class: Somewhat Poorly Drained
Field Observations
Confirmed Map Type? [✓ Yes] No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0–10	A	10YR/4/3	none	none	Silty Loam
10+	B	2.5Y/6/3	none	none	Silty Loam

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes [✓ No] (Circle)
Wetland Hydrology Present? Yes [✓ No]
Hydric Soils Present? Yes [✓ No]

(Circle)
Is This Sampling Point Within a Wetland? Yes [✓ No]

Remarks:

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 11/30/06
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID:
Transect ID:
Plot ID: G (wet)

VEGETATION

Dominant Plant Species	Stratum	Indicator
1. Euthamia Graminifolia	H	FAC
2. Cornus Foemina ssp. Racemosa	SS	FAC-
3. Cornus Amomum	SS	FACW
4. Populus Tremuloides	T	FACU
5. Salix, sp.	T	FACW
6. Rosa Multiflora	H	FACU
7. Osmunda Cinnamomea	H	FACW
8.		
9.		
10.		
11.		
12.		
13.		
14.		
15.		
16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 57%

Remarks:

HYDROLOGY

___ Recorded Data (Described in Remarks)
- ___ Stream, Lake, or Tide Gauge
- ___ Aerial Photographs
- ___ Other

___ No Recorded Data Available

Field Observations:

Depth of Surface Water: n/a (in.)

Depth to Free Water in Pit: 3 (in.)

Depth to Saturated Soils: 0 (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ___ Inundated
- x Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- x Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water Stained Leaves
- ___ Local Soil Survey Data
- x FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series & Phase): Me – MARDIN CHANNERY SILT LOAM (3-8%)

Drainage Class: Moderately Well Drained

Field Observations
Confirmed Map Type? Yes [✓ No]

Taxonomy (Subgroup): Typic Fragiochrepts

Profile Description:

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0-9	A	2.5Y/4/2	5YR/5/8	10%	Silty Loam
10+	B	5Y/4/2	10YR/6/8	20%	Silty Loam

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- _x_ Gleyed or Low Chroma Colors
- _x_ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? [✓ Yes] No

(Circle)
Is This Sampling Point Within a Wetland? [✓ Yes] No

Remarks:

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 11/30/06
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: ___
Transect ID: ___
Plot ID: G (upland)

VEGETATION

Dominant Plant Species	Stratum	Indicator
1. Acer Rubrum	T	FAC
2. Cornus Foemina ssp. Racemosa	SS	FAC–
3. Pinus Resinosa	T	FACU
4. Euthama Graminifolia	H	FAC
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		
13.		
14.		
15.		
16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC–). 50%

Remarks:

HYDROLOGY

___Recorded Data (Described in Remarks)
- ___Stream, Lake, or Tide Gauge
- ___Aerial Photographs
- ___Other

___No Recorded Data Available

Field Observations:

Depth of Surface Water: n/a (in.)

Depth to Free Water in Pit: n/a (in.)

Depth to Saturated Soils: n/a (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ___Inundated
- ___Saturated in Upper 12 Inches
- ___Water Marks
- ___Drift Lines
- ___Sediment Deposits
- ___Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___Oxidized Root Channels in Upper 12 Inches
- ___Water Stained Leaves
- ___Local Soil Survey Data
- _x_ FAC–Neutral Test
- ___Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series & Phase): Me – MARDIN CHANNERY SILT LOAM (3–8%)

Taxonomy (Subgroup): Typic Fragiochrepts

Drainage Class: Moderately Well Drained
Field Observations
Confirmed Map Type? Yes [✓ No]

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0–13	A	2.5Y/4/3	none	none	Silty Loam
13+	B	5Y/4/2	10YR/6/8	few/faint	Silty Loam

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? Yes [✓ No]
Hydric Soils Present? Yes [✓ No]

(Circle)
Is This Sampling Point Within a Wetland? Yes [✓ No]

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 11/27/06
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: ___
Transect ID: ___
Plot ID: H (wet)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Fraxinus Pennsylvanica	T	FAC	9.		
2. Prunus Virginiana	T/SS	FACU	10.		
3. Cornus Foemina ssp. Racemosa	SS	FAC-	11.		
4. Carex, sp.	H	FACW	12.		
5. Euthamia Graminifolia	H	FAC	13.		
6. Echinochloa Crusgalli	H	FACU	14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 50%

Remarks:

HYDROLOGY

___ Recorded Data (Described in Remarks)
  ___ Stream, Lake, or Tide Gauge
  ___ Aerial Photographs
  ___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: 1 (in.)

Depth to Free Water in Pit: 0 (in.)

Depth to Saturated Soils: 0 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
- x Inundated
- x Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- x Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water Stained Leaves
- ___ Local Soil Survey Data
- x FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks:
FLOWING 1' WIDE STREAM CHANNEL.

SOILS

Map Unit Name (Series & Phase): Wf – WOOSTERN GRAVELY LOAM (5–15%)
Me – MARDIN CHANNERY SILT LOAM (3–8%)

Taxonomy (Subgroup): Not provided in local survey desc. (WOOSTERN SERIES)
Typic Fragiochrepts (MARDIN SERIES)

Drainage Class: Well Drained
Moderately Well Drained

Field Observations
Confirmed Map Type? Yes [✓ No]

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0–6	A	10YR/3/2	none	none	Silty Loam
6+	B	2.5Y/4/2	7.5YR/5/8	10%	Silty Loam

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
_x_ Gleyed or Low Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:
The local soil survey depicts the site being in or nearly in a Woostern Series soil type, no description of the Woostern series was found on the NRCS website, the website did however list teh Wooster series but it is unclear if the are intended to be the same series. The Wooster series is listed as being an Oxyaquic Fragiudalf. The soil color characteristics somewhat matched the NRCS descritpion of the Wooster series but did not resemble the description the local survey gives of the Woostern series.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? [✓ Yes] No

(Circle)
Is This Sampling Point Within a Wetland? [✓ Yes] No

Remarks:

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 11/27/06
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID:
Transect ID:
Plot ID: H (upland)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Fraxinus Pennsylvanica	T	FAC	9.		
2. Prunus Virginiana	T/SS	FACU	10.		
3. Cornus Foemina ssp. Racemosa	SS	FAC–	11.		
4. Pinus Resinosa	T	FACU	12.		
5. Euthamia Graminifolia	H	FAC	13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC–). 40%

Remarks:

HYDROLOGY

___Recorded Data (Described in Remarks)
- ___Stream, Lake, or Tide Gauge
- ___Aerial Photographs
- ___Other

___No Recorded Data Available

Field Observations:

Depth of Surface Water: n/a (in.)

Depth to Free Water in Pit: n/a (in.)

Depth to Saturated Soils: n/a (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ___Inundated
- ___Saturated in Upper 12 Inches
- ___Water Marks
- ___Drift Lines
- ___Sediment Deposits
- ___Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___Oxidized Root Channels in Upper 12 Inches
- ___Water Stained Leaves
- ___Local Soil Survey Data
- ___FAC–Neutral Test
- ___Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name (Series & Phase): Wf – WOOSTERN GRAVELY LOAM (5–15%) / Me – MARDIN CHANNERY SILT LOAM (3–8%)

Drainage Class: Well Drained / Moderately Well Drained

Taxonomy (Subgroup): Not provided in local survey desc. (WOOSTERN SERIES) / Typic Fragiochrepts (MARDIN SERIES)

Field Observations Confirmed Map Type? Yes [✓ No]

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0–12	A	10YR/4/2	none	none	Silty Loam
12+	B	10YR/5/2	none	none	Silty Loam

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:
The local soil survey depicts the site being in or nearly in a Woostern Series soil type, no description of the Woostern series was found on the NRCS website, the website did however list teh Wooster series but it is unclear if the are intended to be the same series. The Wooster series is listed as being an Oxyaquic Fragiudalf. The soil color characteristics somewhat matched the NRCS descritpion of the Wooster series but did not resemble the description the local survey gives of the Woostern series.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes [✓ No] (Circle)

Wetland Hydrology Present? Yes [✓ No]

Hydric Soils Present? Yes [✓ No]

(Circle)

Is This Sampling Point Within a Wetland? Yes [✓ No]

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 11/27/06
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID:
Transect ID:
Plot ID: 1 (wet)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Osmunda Cinnamomea	H	FACW	9.		
2. Prunus Virginiana	T/SS	FACU	10.		
3. Cornus Sericea	SS	FACW+	11.		
4. Rosa Multiflora	H	FACU	12.		
5. Juncus Effusus	H	FACW+	13.		
6. Carex. sp.	H	FACW	14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC–). 67%

Remarks:

HYDROLOGY

___ Recorded Data (Described in Remarks)
- ___ Stream, Lake, or Tide Gauge
- ___ Aerial Photographs
- ___ Other

___ No Recorded Data Available

Field Observations:

Depth of Surface Water: n/a (in.)

Depth to Free Water in Pit: 3 (in.)

Depth to Saturated Soils: 0 (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ___ Inundated
- x Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- x Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water Stained Leaves
- ___ Local Soil Survey Data
- x FAC–Neutral Test
- ___ Other (Explain in Remarks)

Remarks:
THE MAIN PORTION OF THE WETLAND IS A FLOWING STREAM CHANNEL. THE WETLAND SAMPLE PLOT WAS TAKEN IN THE WET AREA ADJACENT TO THE STREAM CHANNEL PORTION OF THE WETLAND TO PROVE THE WETLAND EXTENDS BEYOND THE MAIN STREAM CHANNEL.

SOILS

Map Unit Name
(Series & Phase): Vf – VOLUSIA CHANNERY SILT LOAM (3-8%)

Drainage Class: Somewhat Poorly Drained

Field Observations
Confirmed Map Type? [✓ Yes] No

Taxonomy (Subgroup): Aeric Fragiochrepts

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0-6	A	10YR/4/2	none	none	Silty Loam
6+	B	2.5Y/4/2	7.5YR/5/8	15%	Silty Loam

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- _x_ Gleyed or Low Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? [✓ Yes] No

(Circle)
Is This Sampling Point Within a Wetland? [✓ Yes] No

Remarks:

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE

Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.

Investigator: RICHARD DAUGHERTY

Date: 11/27/06

County: YATES

State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No

Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]

Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: ___

Transect ID: ___

Plot ID: 1 (upland)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Trifolium Pratense	H	FACU	9.		
2. Phleum Pratense	H	FACU	10.		
3. Carex. sp.	H	FACW	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC–). 33%

Remarks:

HYDROLOGY

___Recorded Data (Described in Remarks)
  ___Stream, Lake, or Tide Gauge
  ___Aerial Photographs
  ___Other
___No Recorded Data Available

Field Observations:

Depth of Surface Water: n/a (in.)

Depth to Free Water in Pit: n/a (in.)

Depth to Saturated Soils: n/a (in.)

Wetland Hydrology Indicators:
Primary Indicators:
  ___Inundated
  ___Saturated in Upper 12 Inches
  ___Water Marks
  ___Drift Lines
  ___Sediment Deposits
  ___Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
  ___Oxidized Root Channels in Upper 12 Inches
  ___Water Stained Leaves
  ___Local Soil Survey Data
  ___FAC–Neutral Test
  ___Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series & Phase): Vf – VOLUSIA CHANNERY SILT LOAM (3–8%)

Drainage Class: Somewhat Poorly Drained

Field Observations
Confirmed Map Type? [✓ Yes] No

Taxonomy (Subgroup): Aeric Fragiochrepts

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0–9	A	10YR/4/2	none	none	Silty Loam
9+	B	2.5Y/4/2	7.5YR/5/8	10%	Silty Loam

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
_x_ Gleyed or Low Chroma Colors

___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes [✓ No] (Circle)
Wetland Hydrology Present? Yes [✓ No]
Hydric Soils Present? [✓ Yes] No

(Circle)
Is This Sampling Point Within a Wetland? Yes [✓ No]

Remarks:

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 11/27/06
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: ___
Transect ID: ___
Plot ID: J (wet)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Osmunda Cinnamomea	H	FACW	9.		
2. Rosa Multiflora	H	FACU	10.		
3. Prunus Virginiana	SS/T	FACU	11.		
4. Cornus Sericea	SS	FACW+	12.		
5. Fraxinus Pennsylvanica	T	FACW	13.		
6. Euthamia Graminifolia	H	FAC	14.		
7. Salix, sp.	SS	FACW	15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC–). 71%

Remarks:

HYDROLOGY

___ Recorded Data (Described in Remarks)
  ___ Stream, Lake, or Tide Gauge
  ___ Aerial Photographs
  ___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: n/a (in.)
Depth to Free Water in Pit: 2 (in.)
Depth to Saturated Soils: 0 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
  ___ Inundated
  x Saturated in Upper 12 Inches
  ___ Water Marks
  ___ Drift Lines
  ___ Sediment Deposits
  x Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
  ___ Oxidized Root Channels in Upper 12 Inches
  ___ Water Stained Leaves
  ___ Local Soil Survey Data
  x FAC-Neutral Test
  ___ Other (Explain in Remarks)

Remarks:
THE MAIN PORTION OF THE WETLAND IS A FLOWING STREAM CHANNEL. THE WETLAND SAMPLE PLOT WAS TAKEN IN THE WET AREA ADJACENT TO THE STREAM CHANNEL PORTION OF THE WETLAND TO PROVE THE WETLAND EXTENDS BEYOND THE MAIN STREAM CHANNEL.

SOILS

Map Unit Name
(Series & Phase): Vf – VOLUSIA CHANNERY SILT LOAM (3–8%)

Taxonomy (Subgroup): Aeric Fragiochrepts

Drainage Class: Somewhat Poorly Drained
Field Observations
Confirmed Map Type? [✓ Yes] No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0–10	A	10YR/3/1	5YR/4/6	few/faint	Silty Loam
10+	B	2.5Y/4/1	7.5YR/5/8	15%	Silty Loam

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
x Gleyed or Low Chroma Colors

___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? [✓ Yes] No

(Circle)
Is This Sampling Point Within a Wetland? [✓ Yes] No

Remarks:

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 11/27/06
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID:
Transect ID:
Plot ID: J (upland)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Trifolium Pratense	H	FACU	9.		
2. Phleum Pratense	H	FACU	10.		
3. Euthamia Graminifolia	H	FAC	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 33%

Remarks:

HYDROLOGY

___ Recorded Data (Described in Remarks)
  ___ Stream, Lake, or Tide Gauge
  ___ Aerial Photographs
  ___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: n/a (in.)

Depth to Free Water in Pit: n/a (in.)

Depth to Saturated Soils: n/a (in.)

Wetland Hydrology Indicators:
Primary Indicators:
  ___ Inundated
  ___ Saturated in Upper 12 Inches
  ___ Water Marks
  ___ Drift Lines
  ___ Sediment Deposits
  ___ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
  ___ Oxidized Root Channels in Upper 12 Inches
  ___ Water Stained Leaves
  ___ Local Soil Survey Data
  ___ FAC-Neutral Test
  ___ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series & Phase): Vf – VOLUSIA CHANNERY SILT LOAM (3–8%)

Drainage Class: Somewhat Poorly Drained
Field Observations
Confirmed Map Type? [✓ Yes] No

Taxonomy (Subgroup): Aeric Fragiochrepts

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0–10	A	10YR/3/2	none	none	Silty Loam
10+	B	2.5Y/4/2	7.5YR/5/8	10%	Silty Loam

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
_x_ Gleyed or Low Chroma Colors

___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes [✓ No] (Circle)
Wetland Hydrology Present? Yes [✓ No]
Hydric Soils Present? [✓ Yes] No

(Circle)
Is This Sampling Point Within a Wetland? Yes [✓ No]

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 11/30/06
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: ___
Transect ID: ___
Plot ID: PS3

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1.			9.		
2.			10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC–). ___

Remarks:
NO VEGETATION FOUND TO BE GROWING WITHIN THE STREAM/CREEK CHANNEL

HYDROLOGY

___Recorded Data (Described in Remarks)
- ___Stream, Lake, or Tide Gauge
- ___Aerial Photographs
- ___Other

___No Recorded Data Available

Field Observations:

Depth of Surface Water: 5–10 (in.)

Depth to Free Water in Pit: 0 (in.)

Depth to Saturated Soils: 0 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
- x Inundated
- x Saturated in Upper 12 Inches
- x Water Marks
- x Drift Lines
- ___Sediment Deposits
- x Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___Oxidized Root Channels in Upper 12 Inches
- ___Water Stained Leaves
- ___Local Soil Survey Data
- ___FAC–Neutral Test
- ___Other (Explain in Remarks)

Remarks:
THE WETLAND CONSISTS OF A FLWOING CHANNEL APPROXIAMTELY 10 FEET IN WIDTH.

SOILS

Map Unit Name
(Series & Phase): Ag- ALLUVIAL SOILS (0-2%)

Drainage Class: Gererally poorly drained

Field Observations
Confirmed Map Type? Yes No

Taxonomy (Subgroup): None provided in local survey

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- _x_ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:
No soil sample taken in channel.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes No (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? [✓ Yes] No

(Circle)
Is This Sampling Point Within a Wetland? [✓ Yes] No

Remarks:

The stream/creek channel appears to be consistently inundated throughout the year. The channel is recessed below regular grade approximately 2 feet and there was no indication that in periods of rain or seasonal runoff that water flows outside the defined channel.

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 11/30/06
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: ___
Transect ID: ___
Plot ID: IS7

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1.			9.		
2.			10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC–). ___

Remarks:
No vegetation found to be growing within stream channel.

HYDROLOGY

___ Recorded Data (Described in Remarks)
  ___ Stream, Lake, or Tide Gauge
  ___ Aerial Photographs
  ___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: 4 (in.)

Depth to Free Water in Pit: 0 (in.)

Depth to Saturated Soils: 0 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
- x Inundated
- x Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- x Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water Stained Leaves
- ___ Local Soil Survey Data
- x FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks:
THE WETLAND CONSISTS OF A FLOWING CHANNEL APPROXIAMTELY 3 FEET IN WIDTH.

SOILS

Map Unit Name
(Series & Phase): Vf – VOLUSIA CHANNERY SILT LOAM (3-8%)

Drainage Class: Somewhat poorly drained

Field Observations
Confirmed Map Type? [✓ Yes] No

Taxonomy (Subgroup): Aeric Fragiochrepts

Profile Description:

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low Chroma Colors

___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:
No soil sample taken in channel or area adjacent to channel as there is no indications of wetland conditions outside the channel.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? [✓ Yes] No

(Circle)
Is This Sampling Point Within a Wetland? [✓ Yes] No

Remarks:
The stream channel appears to generally carry water throughout the year.

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 11/30/06
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: ___
Transect ID: ___
Plot ID: IS8 (wet)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Euthamia Graminifolia	H	FAC	9.		
2. Solidago Canadensis	H	FACU	10.		
3. Juncus Effusus	H	FACW+	11.		
4. Prunus Virginiana	SS	FACU	12.		
5. Fraxinus Pennsylvanica	T	FACW	13.		
6. Crataegus, sp.	T/SS	FACU	14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 50%

Remarks:
There is an unidentifiable species of grass growing within the stream portion of the wetland which extends out of the channel into the adjacent areas. It is believed to be Argostis Stolonifera (FACW) but could not be verified.

HYDROLOGY

___ Recorded Data (Described in Remarks)
  ___ Stream, Lake, or Tide Gauge
  ___ Aerial Photographs
  ___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: 3 (in.)

Depth to Free Water in Pit: 0 (in.)

Depth to Saturated Soils: 0 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
  x Inundated
  x Saturated in Upper 12 Inches
  ___ Water Marks
  ___ Drift Lines
  ___ Sediment Deposits
  x Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
  ___ Oxidized Root Channels in Upper 12 Inches
  ___ Water Stained Leaves
  ___ Local Soil Survey Data
  x FAC-Neutral Test
  ___ Other (Explain in Remarks)

Remarks:
The wetland consists of a flowing stream channel approximately 3 feet in width along with some adjacent wet areas outside the main channel.

SOILS

Map Unit Name
(Series & Phase): Vf – VOLUSIA CHANNERY SILT LOAM (3–8%)

Drainage Class: Somewhat poorly drained

Field Observations
Confirmed Map Type? [✓ Yes] No

Taxonomy (Subgroup): Aeric Fraglochrepts

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0–10	A	10YR/3/1	none	none	Silty Loam
10+	B	2.5Y/3/2	7.5YR/6/8	15%	Silty Loam

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
_x_ Gleyed or Low Chroma Colors

___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? [✓ Yes] No

(Circle)
Is This Sampling Point Within a Wetland? [✓ Yes] No

Remarks:

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE

Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.

Investigator: RICHARD DAUGHERTY

Date: 11/30/06

County: YATES

State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No

Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]

Is the area a potential problem area? Yes [✓ No]

(If needed, explain on reverse.)

Community ID: ___

Transect ID: ___

Plot ID: IS8 (upland)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Euthamia Graminifolia	H	FAC	9.		
2. Solidago Canadensis	H	FACU	10.		
3. Prunus Virginiana	SS	FACU	11.		
4. Fraxinus Pennsylvanica	T	FACW	12.		
5. Crataegus, sp.	T/SS	FACU	13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC−). 40%

Remarks:
There is an unidentifiable species of grass growing within the stream portion of the wetland which extends out of the channel into the adjacent areas. It is believed to be Argostis Stolonifera (FACW) but could not be verified. The extents of the wetland were flagged to the outer edge of this species of grass.

HYDROLOGY

___ Recorded Data (Described in Remarks)
  ___ Stream, Lake, or Tide Gauge
  ___ Aerial Photographs
  ___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: n/a (in.)

Depth to Free Water in Pit: n/a (in.)

Depth to Saturated Soils: n/a (in.)

Wetland Hydrology Indicators:
Primary Indicators:
  ___ Inundated
  ___ Saturated in Upper 12 Inches
  ___ Water Marks
  ___ Drift Lines
  ___ Sediment Deposits
  ___ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
  ___ Oxidized Root Channels in Upper 12 Inches
  ___ Water Stained Leaves
  ___ Local Soil Survey Data
  ___ FAC-Neutral Test
  ___ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series & Phase): Vf - VOLUSIA CHANNERY SILT LOAM (3-8%)

Taxonomy (Subgroup): Aeric Fragiochrepts

Drainage Class: Somewhat poorly drained
Field Observations
Confirmed Map Type? [✓ Yes] No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0-10	A	10YR/3/2	none	none	Silty Loam
10+	B	2.5Y/3/2	7.5YR/6/8	15%	Silty Loam

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
_x_ Gleyed or Low Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes [✓ No] (Circle)
Wetland Hydrology Present? Yes [✓ No]
Hydric Soils Present? [✓ Yes] No

(Circle)
Is This Sampling Point Within a Wetland? Yes [✓ No]

Remarks:

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 3/30/07
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: ___
Transect ID: ___
Plot ID: IS9

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Carex sp.	H	FACW	9.		
2. Solidago Canadensis	H	FACU	10.		
3. Salix, sp.	SS	FACW	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC–). 67%

Remarks:
Only the species of vegetation growing within the drainage channel were noted.

HYDROLOGY

___ Recorded Data (Described in Remarks)
  ___ Stream, Lake, or Tide Gauge
  ___ Aerial Photographs
  ___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: 3 (in.)

Depth to Free Water in Pit: 0 (in.)

Depth to Saturated Soils: 0 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
- _x_ Inundated
- _x_ Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- _x_ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water Stained Leaves
- ___ Local Soil Survey Data
- _x_ FAC–Neutral Test
- ___ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series & Phase): Vf – VOLUSIA CHANNERY SILT LOAM (3–8%)

Taxonomy (Subgroup): Aeric Fragiochrepts

Drainage Class: Somewhat poorly drained

Field Observations
Confirmed Map Type? [✓ Yes] No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:
No soil data was taken within the channel.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? [✓ Yes] No

(Circle)
Is This Sampling Point Within a Wetland? [✓ Yes] No

Remarks:

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 3/30/07
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID:
Transect ID:
Plot ID: K (wet)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Prunus Virginiana	T	FACU	9.		
2. Osmunda Cinnamomea	H	FACW	10.		
3. Ulmus Americana	T	FACW-	11.		
4. Solidago Canadensis	H	FACU	12.		
5. Salix. sp.	SS	FACW	13.		
6. Cornus Foemina. ssp. Racemosa	SS	FAC-	14.		
7. Fraxinus Pennsylvanica	T	FACW	15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 57%

Remarks:

HYDROLOGY

___ Recorded Data (Described in Remarks)
  ___ Stream, Lake, or Tide Gauge
  ___ Aerial Photographs
  ___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: 1 (in.)

Depth to Free Water in Pit: 0 (in.)

Depth to Saturated Soils: 0 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
  ___ Inundated
  _x_ Saturated in Upper 12 Inches
  ___ Water Marks
  ___ Drift Lines
  ___ Sediment Deposits
  _x_ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
  ___ Oxidized Root Channels in Upper 12 Inches
  ___ Water Stained Leaves
  ___ Local Soil Survey Data
  _x_ FAC-Neutral Test
  ___ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series & Phase): Vf – VOLUSIA CHANNERY SILT LOAM (3–8%)

Drainage Class: Somewhat poorly drained

Field Observations
Confirmed Map Type? [✓ Yes] No

Taxonomy (Subgroup): Aeric Fragiochrepts

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0–10	A	10YR/3/2	2.5Y/5/8	5% faint	Silty Loam
10+	B	2.5Y/4/2	7.5YR/5/8	15%	Silty Loam

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
_x_ Gleyed or Low Chroma Colors

___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? [✓ Yes] No

(Circle)
Is This Sampling Point Within a Wetland? [✓ Yes] No

Remarks:

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 3/30/07
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: ___
Transect ID: ___
Plot ID: K (upland)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Pinus Strobus	T	FACU	9.		
2. Populus Tremuloides	T	FACU	10.		
3. Cornus Foemina, ssp. Racemosa	SS	FAC–	11.		
4. Solidago Canadensis	H	FACU	12.		
5. Prunus Virginiana	T/SS	FACU	13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC–). 0%

Remarks:

HYDROLOGY

___Recorded Data (Described in Remarks)
- ___Stream, Lake, or Tide Gauge
- ___Aerial Photographs
- ___Other

___No Recorded Data Available

Field Observations:

Depth of Surface Water: n/a (in.)

Depth to Free Water in Pit: n/a (in.)

Depth to Saturated Soils: n/a (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ___Inundated
- ___Saturated in Upper 12 Inches
- ___Water Marks
- ___Drift Lines
- ___Sediment Deposits
- ___Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___Oxidized Root Channels in Upper 12 Inches
- ___Water Stained Leaves
- ___Local Soil Survey Data
- ___FAC-Neutral Test
- ___Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series & Phase): Vf – VOLUSIA CHANNERY SILT LOAM (3–8%)

Drainage Class: Somewhat poorly drained
Field Observations
Confirmed Map Type? [✓ Yes] No

Taxonomy (Subgroup): Aeric Fragiochrepts

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0–12	A	10YR/4/2	none	none	Silty Loam
12+	B	2.5Y/4/2	7.5YR/6/8	7%	Silty Loam

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes [✓ No] (Circle)
Wetland Hydrology Present? Yes [✓ No]
Hydric Soils Present? [✓ Yes] No

(Circle)
Is This Sampling Point Within a Wetland? Yes [✓ No]

Remarks:

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 3/30/07
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID:
Transect ID:
Plot ID: IS10

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Salix, sp.	SS	FACW	9.		
2.			10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC–). 100%

Remarks:
There was only one species of vegetation found to be growing within the actual stream/ditch channel.

HYDROLOGY

___ Recorded Data (Described in Remarks)
 ___ Stream, Lake, or Tide Gauge
 ___ Aerial Photographs
 ___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: 3 (in.)

Depth to Free Water in Pit: 0 (in.)

Depth to Saturated Soils: 0 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
 x Inundated
 x Saturated in Upper 12 Inches
 ___ Water Marks
 ___ Drift Lines
 ___ Sediment Deposits
 x Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
 ___ Oxidized Root Channels in Upper 12 Inches
 ___ Water Stained Leaves
 ___ Local Soil Survey Data
 x FAC–Neutral Test
 ___ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series & Phase): Vf – VOLUSIA CHANNERY SILT LOAM (3–8%)

Taxonomy (Subgroup): Aeric Fragiochrepts

Drainage Class: Somewhat poorly drained
Field Observations
Confirmed Map Type? [✓ Yes] No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:
No soils data taken within the stream/ditch channel.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? [✓ Yes] No

(Circle)
Is This Sampling Point Within a Wetland? [✓ Yes] No

Remarks:
The wetland consists of a man maded drainage ditch carrying field runoff. The channel is recessed below approximately 0.5 feet below adjacent grade.

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 3/30/07
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID:
Transect ID:
Plot ID: L (wet)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Symplocarpus Foetidus	H	OBL	9.		
2. Osmunda Cinnamomea	H	FACW	10.		
3. Euthamia Graminifolia	H	FAC	11.		
4. Fraxinus Pennsylvanica	SS	FACW	12.		
5. Acer Rubrum	SS	FAC	13.		
6. Fagus Grandifolia	SS	FACU	14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 83%

Remarks:

HYDROLOGY

___ Recorded Data (Described in Remarks)
- ___ Stream, Lake, or Tide Gauge
- ___ Aerial Photographs
- ___ Other

___ No Recorded Data Available

Field Observations:

Depth of Surface Water: 1 (in.)

Depth to Free Water in Pit: 0 (in.)

Depth to Saturated Soils: 0 (in.)

Wetland Hydrology Indicators:
- Primary Indicators:
  - x Inundated
  - x Saturated in Upper 12 Inches
  - ___ Water Marks
  - ___ Drift Lines
  - ___ Sediment Deposits
  - x Drainage Patterns in Wetlands
- Secondary Indicators (2 or more required):
  - ___ Oxidized Root Channels in Upper 12 Inches
  - x Water Stained Leaves
  - ___ Local Soil Survey Data
  - x FAC-Neutral Test
  - ___ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series & Phase): Cz – Chippewa Silt Loam (3–8%)

Drainage Class: Poorly/Very poorly drained

Field Observations
Confirmed Map Type? [✓ Yes] No

Taxonomy (Subgroup): Typic Fragiaquepts

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0–10	A	10YR/4/2	none	none	Silty Loam
10+	B	GLEY1/7/1	7.5YR/5/8	35%	Silty Loam

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- _x_ Gleyed or Low Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- _x_ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? Yes [✓ No]

(Circle)
Is This Sampling Point Within a Wetland? [✓ Yes] No

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 3/30/07
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: ______
Transect ID: ______
Plot ID: L (upland)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Crataegus, sp.	SS	FACU	9.		
2. Fraxinus Pennsylvanica	T	FACW	10.		
3. Carya Ovata	T	FACU-	11.		
4. Rosa Multiflora	H	FACU	12.		
5. Acer Rubrum	SS	FAC	13.		
6. Fagus Grandifolia	SS	FACU	14.		
7. Quercus Alba	T	FACU-	15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 29%

Remarks:

HYDROLOGY

___ Recorded Data (Described in Remarks)
  ___ Stream, Lake, or Tide Gauge
  ___ Aerial Photographs
  ___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: n/a (in.)

Depth to Free Water in Pit: n/a (in.)

Depth to Saturated Soils: n/a (in.)

Wetland Hydrology Indicators:
Primary Indicators:
  ___ Inundated
  ___ Saturated in Upper 12 Inches
  ___ Water Marks
  ___ Drift Lines
  ___ Sediment Deposits
  ___ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
  ___ Oxidized Root Channels in Upper 12 Inches
  ___ Water Stained Leaves
  x Local Soil Survey Data
  ___ FAC-Neutral Test
  ___ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series & Phase): Cz – Chippewa Silt Loam (3–8%)

Taxonomy (Subgroup): Typic Fragiaquepts

Drainage Class: Poorly/Very poorly drained
Field Observations
Confirmed Map Type? [✓ Yes] No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0–8	A	10YR/4/2	7.5YR/5/8	10%	Silty Loam
8+	B	GLEY1/7/1	7.5YR/5/8	35%	Silty Loam

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
_x_ Gleyed or Low Chroma Colors

___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
_x_ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes [✓ No] (Circle)
Wetland Hydrology Present? Yes [✓ No]
Hydric Soils Present? [✓ Yes] No

(Circle)
Is This Sampling Point Within a Wetland? Yes [✓ No]

Remarks:

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 3/30/07
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: ____
Transect ID: ____
Plot ID: IS11

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1.			9.		
2.			10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC−). ____

Remarks:
No vegetation found to be growing within channel.

HYDROLOGY

___Recorded Data (Described in Remarks)
  ___Stream, Lake, or Tide Gauge
  ___Aerial Photographs
  ___Other
___No Recorded Data Available

Field Observations:

Depth of Surface Water: 2 (in.)
Depth to Free Water in Pit: 0 (in.)
Depth to Saturated Soils: 0 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
  _x_ Inundated
  _x_ Saturated in Upper 12 Inches
  ___ Water Marks
  ___ Drift Lines
  ___ Sediment Deposits
  _x_ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
  ___ Oxidized Root Channels in Upper 12 Inches
  ___ Water Stained Leaves
  _x_ Local Soil Survey Data
  ___ FAC-Neutral Test
  ___ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series & Phase): Cz – Chippewa Silt Loam (3-8%)

Drainage Class: Poorly/Very poorly drained

Field Observations
Confirmed Map Type? [✓ Yes] No

Taxonomy (Subgroup): Typic Fragiaquepts

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- x Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:
No soils data taken within stream channel.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes [✓ No] (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? [✓ Yes] No

(Circle)
Is This Sampling Point Within a Wetland? [✓ Yes] No

Remarks:
The wetland consists of a flowing stream channel. The site was determined to be a wetland even though there is an absence of vegetation based on its apprent continuous flow of water throughout the year as well as the fact that it serves as the drainage to wetland "L".

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 3/30/07
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID:
Transect ID:
Plot ID: IS12

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Carex, sp.	H	FACW	9.		
2. Salix, sp.	SS	FACW	10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC–). 100%

Remarks:
Only the vegetation found to be growing within the water channel was noted.

HYDROLOGY

___ Recorded Data (Described in Remarks)
- ___ Stream, Lake, or Tide Gauge
- ___ Aerial Photographs
- ___ Other

___ No Recorded Data Available

Field Observations:

Depth of Surface Water: 2 (in.)
Depth to Free Water in Pit: 0 (in.)
Depth to Saturated Soils: 0 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
- _x_ Inundated
- _x_ Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- _x_ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water Stained Leaves
- _x_ Local Soil Survey Data
- ___ FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name (Series & Phase): Wg – WOOSTERN GRAVELY LOAM, eroded, (5–15%)

Drainage Class: Well Drained

Taxonomy (Subgroup): Not provided in local survey desc. (WOOSTERN SERIES)

Field Observations
Confirmed Map Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:
The local soil survey depicts the site being in or nearly in a Woostern Series soil type, no description of the Woostern series was found on the NRCS website, the website did however list the Wooster series but it is unclear if the are intended to be the same series. The Wooster series is listed as being an Oxyoquic Fragiudalf. No soils data was taken within the ditch/stream channel.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? Yes No

(Circle)
Is This Sampling Point Within a Wetland? [✓ Yes] No

Remarks:
The wetland consists of a man made diversion ditch/stream.

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 4/24/07
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID:
Transect ID:
Plot ID: LL (wet)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Solidago, sp.	H	FAC	9.		
2. Fraxinus Pennsylvanica	SS	FACW	10.		
3. Symplocarpus Foetidus	H	OBL	11.		
4. Impatiens Capensis	H	FACW	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC–). 100%

Remarks:

There is a species of grass growing within the wetland that is unidentifiable due to the early stages of its growing season. The grass therefore was assumed to have an indicator status of FAC or wetter based on the appearance that it grows well in wet conditions.

HYDROLOGY

☐ Recorded Data (Described in Remarks)
  ☐ Stream, Lake, or Tide Gauge
  ☐ Aerial Photographs
  ☐ Other
☐ No Recorded Data Available

Field Observations:

Depth of Surface Water: n/a (in.)

Depth to Free Water in Pit: 7 (in.)

Depth to Saturated Soils: 0 (in.)

Wetland Hydrology Indicators:
  Primary Indicators:
    ☐ Inundated
    ☒ Saturated in Upper 12 Inches
    ☐ Water Marks
    ☐ Drift Lines
    ☐ Sediment Deposits
    ☒ Drainage Patterns in Wetlands
  Secondary Indicators (2 or more required):
    ☐ Oxidized Root Channels in Upper 12 Inches
    ☐ Water Stained Leaves
    ☐ Local Soil Survey Data
    ☒ FAC-Neutral Test
    ☐ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series & Phase): Vk – VOLUSIA CHANNERY SILT LOAM, eroded (15–25%)

Taxonomy (Subgroup): Aeric Fragiochrepts

Drainage Class: Somewhat poorly drained

Field Observations
Confirmed Map Type? [✓ Yes] No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0–7	A	10YR/4/2	none	none	Silty Loam
7–12	B	10YR/3/2	10YR/5/8	10%	Silty Loam
12+	C	2.5Y/6/2	10YR/5/8	25%	Silty Loam

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
x Gleyed or Low Chroma Colors

x Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? [✓ Yes] No

(Circle)
Is This Sampling Point Within a Wetland? [✓ Yes] No

Remarks:

Wetland LL consists of a small drainage channel/stream and its adjacent lowland areas.

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 4/24/07
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID:
Transect ID:
Plot ID: LL (upland)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Rubus Idaeus	H	FAC–	9.		
2. Rosa Multiflora	H	FACU	10.		
3. Crataegus, sp.	T/SS	FACU	11.		
4. Elaeagnus Umbellata	SS	FACU	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC–). 0%

Remarks:

HYDROLOGY

___Recorded Data (Described in Remarks)
  - ___Stream, Lake, or Tide Gauge
  - ___Aerial Photographs
  - ___Other

___No Recorded Data Available

Field Observations:

Depth of Surface Water: n/a (in.)

Depth to Free Water in Pit: n/a (in.)

Depth to Saturated Soils: n/a (in.)

Wetland Hydrology Indicators:
- Primary Indicators:
  - ___Inundated
  - ___Saturated in Upper 12 Inches
  - ___Water Marks
  - ___Drift Lines
  - ___Sediment Deposits
  - ___Drainage Patterns in Wetlands
- Secondary Indicators (2 or more required):
  - ___Oxidized Root Channels in Upper 12 Inches
  - ___Water Stained Leaves
  - ___Local Soil Survey Data
  - ___FAC-Neutral Test
  - ___Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series & Phase): Vk – VOLUSIA CHANNERY SILT LOAM, eroded (15–25%)

Taxonomy (Subgroup): Aeric Fragiochrepts

Drainage Class: Somewhat poorly drained

Field Observations
Confirmed Map Type? [✓ Yes] No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0–8	A	10YR/3/2	none	none	Silty Loam
7–12	B	10YR/4/3	none	none	Silty Loam
12+	C	2.5Y/5/2	10YR/5/8	15%	Silty Loam

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes [✓ No] (Circle)
Wetland Hydrology Present? Yes [✓ No]
Hydric Soils Present? Yes [✓ No]

(Circle)
Is This Sampling Point Within a Wetland? Yes [✓ No]

Remarks:

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 4/24/07
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: ___
Transect ID: ___
Plot ID: IS97, IS9 & IS99 (wetland sample)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Symplocarpus Foetidus	H	OBL	9.		
2. Solidago, sp.	H	FAC	10.		
3. Carex, sp.	H	FACW	11.		
4. Elaeagnus Umbellata	SS	FACU	12.		
5. Onoclea Sensibilis	H	FACW	13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC−). 100%

Remarks:

HYDROLOGY

___ Recorded Data (Described in Remarks)
- ___ Stream, Lake, or Tide Gauge
- ___ Aerial Photographs
- ___ Other

___ No Recorded Data Available

Field Observations:

Depth of Surface Water: n/a (in.)
Depth to Free Water in Pit: 6 (in.)
Depth to Saturated Soils: 0 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
- ___ Inundated
- _x_ Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- _x_ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water Stained Leaves
- ___ Local Soil Survey Data
- _x_ FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series & Phase): Vk – VOLUSIA CHANNERY SILT LOAM, eroded (15–25%)

Drainage Class: Somewhat poorly drained
Field Observations
Confirmed Map Type? Yes [✓ No]

Taxonomy (Subgroup): Aeric Fragiochrepts

Profile Description:

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0–6	A	2.5Y/3/1	7.5YR/5/8	10%	Silty Loam
6+	B	2.5Y/4/1	7.5YR/5/8	30%	Silty Loam

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
x Gleyed or Low Chroma Colors

___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? [✓ Yes] No

(Circle)
Is This Sampling Point Within a Wetland? [✓ Yes] No

Remarks:

Wetlands IS97, IS98 & IS 99 consist of drainage channels/streams (possibly man made) that carry surface runoff from the uphill agricultural fields to the adjacent lowland area. Due to the fact that the three channels were in vary close proximity to each other and exhibited the same hydrologic and vegetation characteristics, only one central sample point was taken.

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 4/24/07
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID:
Transect ID:
Plot ID: IS97, IS9 & IS99
(upland sample)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Crataegus, sp.	T/SS	FACU	9.		
2. Cornus Foemina, ssp. Racemosa	SS	FAC-	10.		
3. Fraxinus Americana	T	FACU	11.		
4. Elaeagnus Umbellata	SS	FACU	12.		
5. Solidago, sp.	H	FAC	13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 20%

Remarks:

HYDROLOGY

___Recorded Data (Described in Remarks)
  ___Stream, Lake, or Tide Gauge
  ___Aerial Photographs
  ___Other
___No Recorded Data Available

Field Observations:

Depth of Surface Water: n/a (in.)
Depth to Free Water in Pit: n/a (in.)
Depth to Saturated Soils: n/a (in.)

Wetland Hydrology Indicators:
Primary Indicators:
  ___Inundated
  ___Saturated in Upper 12 Inches
  ___Water Marks
  ___Drift Lines
  ___Sediment Deposits
  ___Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
  ___Oxidized Root Channels in Upper 12 Inches
  ___Water Stained Leaves
  ___Local Soil Survey Data
  ___FAC-Neutral Test
  ___Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series & Phase): Vk – VOLUSIA CHANNERY SILT LOAM, eroded (15–25%)

Taxonomy (Subgroup): Aeric Fragiochrepts

Drainage Class: Somewhat poorly drained
Field Observations
Confirmed Map Type? Yes [✓ No]

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0–12	A	2.5Y/4/2	none	none	Silty Loam
12+	B	2.5Y/6/1	7.5YR/5/8	5%	Silty Loam

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low Chroma Colors

___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes [✓ No] (Circle)
Wetland Hydrology Present? Yes [✓ No]
Hydric Soils Present? Yes [✓ No]

(Circle)
Is This Sampling Point Within a Wetland? Yes [✓ No]

Remarks:

Wetlands IS97, IS98 & IS 99 consist of drainage channels/streams (possibly man made) that carry surface runoff from the uphill agricultural fields to the adjacent lowland area. Due to the fact that the three channels were in vary close proximity to each other and exhibited the same hydrologic and vegetation characteristics, only one central sample point was taken.

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 3/30/07
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID:
Transect ID:
Plot ID: M (south end wet)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Quercus Bicolor, Willd	T	FACW+	9.		
2. Fraxinus Americana	T	FACU	10.		
3. Fraxinus Pennsylvanica	T	FACW	11.		
4. Carex, sp.	H	FACW	12.		
5. Cornus Amomum	SS	FACW	13.		
6. Solidago, sp.	H	FAC	14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC−). 83%

Remarks:

HYDROLOGY

___Recorded Data (Described in Remarks)
  ___Stream, Lake, or Tide Gauge
  ___Aerial Photographs
  ___Other
___No Recorded Data Available

Field Observations:

Depth of Surface Water: n/a (in.)

Depth to Free Water in Pit: 2 (in.)

Depth to Saturated Soils: 0 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
  ___Inundated
  x Saturated in Upper 12 Inches
  ___Water Marks
  ___Drift Lines
  ___Sediment Deposits
  x Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
  ___Oxidized Root Channels in Upper 12 Inches
  ___Water Stained Leaves
  x Local Soil Survey Data
  ___FAC-Neutral Test
  ___Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name (Series & Phase): Ha – Holly Silt Loam (0 to 1%)

Drainage Class: Poorly Drained

Taxonomy (Subgroup): Fluvaquentic Endoaquepts

Field Observations Confirmed Map Type? [✓ Yes] No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0-6	A	2.5Y/3/1	none	none	Silty Loam
6-10	B	2.5Y/3/2	10YR/5/6	5%	Silty Clay Loam
10+	C	5Y/3/1	10YR/5/6	20%	Silty Clay Loam

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☒ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? [✓ Yes] No

(Circle)
Is This Sampling Point Within a Wetland? [✓ Yes] No

Remarks:

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 3/30/07
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: ___________
Transect ID: ___________
Plot ID: M (south end upl)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Quercus Bicolor, Willd	T	FACW+	9.		
2. Fraxinus Americana	T	FACU	10.		
3. Rosa Multiflora	H	FACU	11.		
4. Crataegus, sp.	T/SS	FACU	12.		
5. Cornus Amomum	SS	FACW	13.		
6. Solidago, sp.	H	FAC	14.		
7. Elaeagnus Umbellata	SS	FACU	15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC–). 43%

Remarks:

HYDROLOGY

___ Recorded Data (Described in Remarks)
  ___ Stream, Lake, or Tide Gauge
  ___ Aerial Photographs
  ___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: n/a (in.)

Depth to Free Water in Pit: n/a (in.)

Depth to Saturated Soils: n/a (in.)

Wetland Hydrology Indicators:
Primary Indicators:
- ___ Inundated
- ___ Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- ___ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water Stained Leaves
- x Local Soil Survey Data
- ___ FAC–Neutral Test
- ___ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name (Series & Phase): Ho – Holly Silt Loam (0 to 1%)

Taxonomy (Subgroup): Fluvaquentic Endoaquepts

Drainage Class: Poorly Drained

Field Observations Confirmed Map Type? [✓ Yes] No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0-B	A	2.5Y/4/2	none	none	Silty Loam
6-13	B	2.5Y/3/2	10YR/5/6	5%	Silty Clay Loam
13+	C	5Y/3/2	10YR/5/6	15%	Silty Clay Loam

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
_x_ Gleyed or Low Chroma Colors

___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
_x_ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes [✓ No] (Circle)
Wetland Hydrology Present? Yes [✓ No]
Hydric Soils Present? [✓ Yes] No

(Circle)
Is This Sampling Point Within a Wetland? Yes [✓ No]

Remarks:

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 4/3/07
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID:
Transect ID:
Plot ID: M (north end wet)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Crataegus, sp.	T/SS	FACU	9.		
2. Cornus Amomum	SS	FACW	10.		
3. Fraxinus Pennsylvanica	SS	FACW	11.		
4. Carex, sp.	H	FACW	12.		
5. Symplocarpus Foetidus	H	OBL	13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC–). 80%

Remarks:

HYDROLOGY

☐ Recorded Data (Described in Remarks)
  ☐ Stream, Lake, or Tide Gauge
  ☐ Aerial Photographs
  ☐ Other
☐ No Recorded Data Available

Field Observations:

Depth of Surface Water: n/a (in.)

Depth to Free Water in Pit: 5 (in.)

Depth to Saturated Soils: 0 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
  ☐ Inundated
  ☒ Saturated in Upper 12 Inches
  ☐ Water Marks
  ☐ Drift Lines
  ☒ Sediment Deposits
  ☒ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
  ☐ Oxidized Root Channels in Upper 12 Inches
  ☐ Water Stained Leaves
  ☐ Local Soil Survey Data
  ☒ FAC–Neutral Test
  ☐ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name (Series & Phase): Mm – Middlebury Silt Loam (0 to 1%)

Taxonomy (Subgroup): Fluvaquentic Eutrudepts

Drainage Class: Moderately Well Drained

Field Observations Confirmed Map Type? [✓ Yes] No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0-6	A	10YR/3/2	7.5YR/5/8	15%	Silty Loam
6+	B	10YR/6/2	10YR/5/6	35%	Silty Loam

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- _x_ Gleyed or Low Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)

Wetland Hydrology Present? [✓ Yes] No

Hydric Soils Present? [✓ Yes] No

(Circle)

Is This Sampling Point Within a Wetland? [✓ Yes] No

Remarks:

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 4/3/07
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID:
Transect ID:
Plot ID: M (north and upland)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Solidago Canadensis	H	FACU	9.		
2. Euphamia Graminifolia	H	FAC	10.		
3. Dactylis Glomerata	H	FACU	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 33%

Remarks:

HYDROLOGY

___Recorded Data (Described in Remarks)
- ___Stream, Lake, or Tide Gauge
- ___Aerial Photographs
- ___Other

___No Recorded Data Available

Field Observations:

Depth of Surface Water: n/a (in.)

Depth to Free Water in Pit: n/a (in.)

Depth to Saturated Soils: n/a (in.)

Wetland Hydrology Indicators:
- Primary Indicators:
  - ___Inundated
  - ___Saturated in Upper 12 Inches
  - ___Water Marks
  - ___Drift Lines
  - ___Sediment Deposits
  - ___Drainage Patterns in Wetlands
- Secondary Indicators (2 or more required):
  - ___Oxidized Root Channels in Upper 12 Inches
  - ___Water Stained Leaves
  - ___Local Soil Survey Data
  - ___FAC-Neutral Test
  - ___Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name (Series & Phase): Mm – Middlebury Silt Loam (0 to 1%)

Drainage Class: Moderately Well Drained

Taxonomy (Subgroup): Fluvaquentic Eutrudepts

Field Observations Confirmed Map Type? [✓ Yes] No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0-10	A	10YR/4/3	none	none	Silty Loam
10+	B	10YR/6/3	10YR/5/6	15%	Silty Loam

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes [✓ No] (Circle)

Wetland Hydrology Present? Yes [✓ No]

Hydric Soils Present? Yes [✓ No]

(Circle)

Is This Sampling Point Within a Wetland? Yes [✓ No]

Remarks:

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 3/31/07
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: ___
Transect ID: ___
Plot ID: IS13

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Euthamia Graminifolia	H	FAC	9.		
2.			10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC–). 100%

Remarks:

There is a species of grass growing in the stream/ditch channel that is unidentifiable due to the early stages of its growing season. The grass therefore was assumed to have an indicator status of FAC or wetter based on the appearance that it grows well in the wet conditions of the stream/ditch channel.

HYDROLOGY

___Recorded Data (Described in Remarks)
  ___Stream, Lake, or Tide Gauge
  ___Aerial Photographs
  ___Other
___No Recorded Data Available

Field Observations:

Depth of Surface Water: 2 (in.)

Depth to Free Water in Pit: 0 (in.)

Depth to Saturated Soils: 0 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
  ___Inundated
  x Saturated in Upper 12 Inches
  ___Water Marks
  ___Drift Lines
  ___Sediment Deposits
  x Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
  ___Oxidized Root Channels in Upper 12 Inches
  ___Water Stained Leaves
  ___Local Soil Survey Data
  x FAC-Neutral Test
  ___Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name (Series & Phase): Ct – Chenango and Tioga Gravely Silt Loams (2 to 5%)

Drainage Class: Well Drained

Taxonomy (Subgroup): Typic Dystrochrepts

Field Observations Confirmed Map Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

No soil sample was taken in the stream/ditch channel.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)

Wetland Hydrology Present? [✓ Yes] No

Hydric Soils Present? Yes No

(Circle)

Is This Sampling Point Within a Wetland? [✓ Yes] No

Remarks:

The wetland consists of a man made road side ditch/stream that drains into wetland PS4 and on into wetland "M".

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 3/31/07
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: ______
Transect ID: ______
Plot ID: PS4

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1.			9.		
2.			10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC–). ______

Remarks:
There was no vegetation found to be growing within the stream/creek channel.

HYDROLOGY

___Recorded Data (Described in Remarks)
  ___Stream, Lake, or Tide Gauge
  ___Aerial Photographs
  ___Other
___No Recorded Data Available

Field Observations:

Depth of Surface Water: 4 (in.)

Depth to Free Water in Pit: 0 (in.)

Depth to Saturated Soils: 0 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
 x Inundated
 x Saturated in Upper 12 Inches
 ___Water Marks
 ___Drift Lines
 ___Sediment Deposits
 x Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
 ___Oxidized Root Channels in Upper 12 Inches
 ___Water Stained Leaves
 ___Local Soil Survey Data
 ___FAC–Neutral Test
 ___Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name (Series & Phase): Ct – Chenango and Tioga Gravely Silt Loams (2 to 5%)

Drainage Class: Well Drained

Field Observations

Confirmed Map Type? Yes No

Taxonomy (Subgroup): Typic Dystrochrepts

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

No soil sample was taken in the stream/creek channel. The bottom of the channel consists of rocky and gravely unconsolidated material.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes [✓ No] (Circle)

Wetland Hydrology Present? [✓ Yes] No

Hydric Soils Present? Yes No

(Circle)

Is This Sampling Point Within a Wetland? [✓ Yes] No

Remarks:

Wetland PS4 consists of a flowing stream/creek channel that appears to consistently carry water throughout the majority of the year as evidenced by the lack of vegetation and gravel & rock material that compose the bottom of the channel.

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE

Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.

Investigator: RICHARD DAUGHERTY

Date: 3/31/07

County: YATES

State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No

Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]

Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: ____

Transect ID: ____

Plot ID: IS14

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1.			9.		
2.			10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). ____

Remarks:

There was no vegetation found to be growing within the stream/creek channel.

HYDROLOGY

___Recorded Data (Described in Remarks)
- ___Stream, Lake, or Tide Gauge
- ___Aerial Photographs
- ___Other

___No Recorded Data Available

Field Observations:

Depth of Surface Water: 2 (in.)

Depth to Free Water in Pit: n/a (in.)

Depth to Saturated Soils: n/a (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- x Inundated
- ___Saturated in Upper 12 Inches
- ___Water Marks
- ___Drift Lines
- ___Sediment Deposits
- x Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___Oxidized Root Channels in Upper 12 Inches
- ___Water Stained Leaves
- ___Local Soil Survey Data
- ___FAC-Neutral Test
- ___Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name (Series & Phase): Wh – WOOSTERN GRAVELY LOAM (15–25%)
Mg – Mardin Channery Silt Loam (8 to 15%)

Taxonomy (Subgroup): Not provided in local survey desc. (WOOSTERN SERIES)
Typic Fragiochrepts (MARDIN SERIES)

Drainage Class: Well Drained
Moderatly Well Drained

Field Observations
Confirmed Map Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:
The local soil survey depicts the site being in or nearly in a Woostern Series soil type, no description of the Woostern series was found on the NRCS website, the website did however list the Wooster series but it is unclear if the are intended to be the same series. The Wooster series is listed as being an Oxyaquic Fragiudalf. No soils data was taken within the ditch/stream channel.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes [✓ No] (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? Yes No

(Circle)
Is This Sampling Point Within a Wetland? [✓ Yes] No

Remarks:
Wetland IS14 consists of a flowing stream channel approximately 4 feet in width that appears to carry water througout the majority of the year.

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 3/31/07
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: ___
Transect ID: ___
Plot ID: PS5

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1.			9.		
2.			10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC−). ___

Remarks:
There was no vegetation found to be growing within the stream/creek channel.

HYDROLOGY

___Recorded Data (Described in Remarks)
  ___Stream, Lake, or Tide Gauge
  ___Aerial Photographs
  ___Other
___No Recorded Data Available

Field Observations:

Depth of Surface Water: 4 (in.)

Depth to Free Water in Pit: n/a (in.)

Depth to Saturated Soils: n/a (in.)

Wetland Hydrology Indicators:
Primary Indicators:
  x Inundated
  x Saturated in Upper 12 Inches
  ___Water Marks
  ___Drift Lines
  ___Sediment Deposits
  x Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
  ___Oxidized Root Channels in Upper 12 Inches
  ___Water Stained Leaves
  ___Local Soil Survey Data
  ___FAC-Neutral Test
  ___Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name (Series & Phase): Mg – Mardin Channery Silt Loam (8 to 15%)

Taxonomy (Subgroup): Typic Fragiochrepts

Drainage Class: Moderatly Well Drained
Field Observations
Confirmed Map Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks:
No soils data was taken within the ditch/stream channel.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes [✓ No] (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? Yes No

(Circle)
Is This Sampling Point Within a Wetland? [✓ Yes] No

Remarks:
Wetland PS5 consists of a flowing stream channel approximately 12 feet in total width that appears to carry water throughout the majority of the year. The bottom of the channel is composed of large loose rock fragments, bedrock and gravely deposits and is recessed 5 to 6 feet below normal adjacent grade.

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 3/31/07
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: ___
Transect ID: ___
Plot ID: IS15

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Typha Angustifolia	H	OBL	9.		
2. Carex, sp.	H	FACW	10.		
3. Euthamia Graminifolia	H	FAC	11.		
4. Salix, sp.	SS	FACW	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC–). 75%

Remarks:

The majority of the stream/ditch channel is exposed bedrock. The vegetation noted is growing in fissures int he bedrock and the area immediately adjacent to the edges of the flowing channel.

HYDROLOGY

___Recorded Data (Described in Remarks)
    ___Stream, Lake, or Tide Gauge
    ___Aerial Photographs
    ___Other
___No Recorded Data Available

Field Observations:

Depth of Surface Water: 2 (in.)

Depth to Free Water in Pit: n/a (in.)

Depth to Saturated Soils: n/a (in.)

Wetland Hydrology Indicators:
Primary Indicators:
- _x_ Inundated
- _x_ Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- _x_ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water Stained Leaves
- ___ Local Soil Survey Data
- ___ FAC–Neutral Test
- ___ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series & Phase): Mg – Mardin Channery Silt Loam (8 to 15%)

Taxonomy (Subgroup): Typic Fragiochrepts

Drainage Class: Moderatly Well Drained
Field Observations
Confirmed Map Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:
No soils data was taken within the ditch/stream channel or adjacent area due to the fact that the layer of underlying bedrock is at the surface of the channel and 1 to 2 inches below the areas adjacent to the stream/ditch channel.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? [✓ Yes] No

(Circle)
Is This Sampling Point Within a Wetland? [✓ Yes] No

Remarks:
Wetland IS15 consists of a roadside stream/ditch channel that appears to carry flowing water frequentlly over the course of a year.

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 3/31/07
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: ___
Transect ID: ___
Plot ID: N (wet)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Osmunda Cinnamomea	H	FACW	9.		
2. Carex, sp.	H	FACW	10.		
3. Euthamia Graminifolia	H	FAC	11.		
4. Salix, sp.	SS	FACW	12.		
5. Fraxinus Pennsylvanica	T/SS	FACW	13.		
6. Rubus Idaeus	H	FAC-	14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC–). 83%

Remarks:

HYDROLOGY

___Recorded Data (Described in Remarks)
  ___Stream, Lake, or Tide Gauge
  ___Aerial Photographs
  ___Other
___No Recorded Data Available

Field Observations:

Depth of Surface Water: n/a (in.)

Depth to Free Water in Pit: 5 (in.)

Depth to Saturated Soils: 0 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
  ___Inundated
  _x_ Saturated in Upper 12 Inches
  ___Water Marks
  ___Drift Lines
  ___Sediment Deposits
  _x_ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
  ___Oxidized Root Channels in Upper 12 Inches
  ___Water Stained Leaves
  ___Local Soil Survey Data
  _x_ FAC-Neutral Test
  ___Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name (Series & Phase): Mg – Mardin Channery Silt Loam (8 to 15%)

Taxonomy (Subgroup): Typic Fragiochrepts

Drainage Class: Moderatly Well Drained

Field Observations
Confirmed Map Type? Yes [✓ No]

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0-4	A	2.5Y/3/2	none	none	Silty Loam
4+	B	Gley1/4/N	none	none	Silty Loam

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- _x_ Gleyed or Low Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? [✓ Yes] No

(Circle)
Is This Sampling Point Within a Wetland? [✓ Yes] No

Remarks:

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 3/31/07
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID:
Transect ID:
Plot ID: N (upland)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Crataegus, sp.	SS	FACU	9.		
2. Rosa Multiflora	H	FACU	10.		
3. Euthamia Graminifolia	H	FAC	11.		
4. Fraxinus Pennsylvanica	T/SS	FACW	12.		
5. Rubus Idaeus	H	FAC-	13.		
6. Juglans Nigra	T	FACU	14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 33%

Remarks:

HYDROLOGY

___Recorded Data (Described in Remarks)
  ___Stream, Lake, or Tide Gauge
  ___Aerial Photographs
  ___Other
___No Recorded Data Available

Field Observations:

Depth of Surface Water: n/a (in.)

Depth to Free Water in Pit: n/a (in.)

Depth to Saturated Soils: n/a (in.)

Wetland Hydrology Indicators:
Primary Indicators:
  ___Inundated
  ___Saturated in Upper 12 Inches
  ___Water Marks
  ___Drift Lines
  ___Sediment Deposits
  ___Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
  ___Oxidized Root Channels in Upper 12 Inches
  ___Water Stained Leaves
  ___Local Soil Survey Data
  ___FAC-Neutral Test
  ___Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name (Series & Phase): Mg – Mardin Channery Silt Loam (8 to 15%)

Taxonomy (Subgroup): Typic Fragiochrepts

Drainage Class: Moderatly Well Drained

Field Observations Confirmed Map Type? Yes [✓ No]

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0–10	A	10YR/4/2	none	none	Silty Loam
10+	B	10YR/6/2	7.5YR/5/8	5%	Silty Loam

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- x Gleyed or Low Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes [✓ No] (Circle)	
Wetland Hydrology Present?	Yes [✓ No]	
Hydric Soils Present?	[✓ Yes] No	
		(Circle)
Is This Sampling Point Within a Wetland?	Yes [✓ No]	

Remarks:

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 3/31/07
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID:
Transect ID:
Plot ID: 0 (wet)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Salix, sp.	SS	FACW	9.		
2. Phragmites Australis	H	FACW	10.		
3. Cornus Amomum	SS	FACW	11.		
4. Carex, sp.	H	FACW	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC−). 100%

Remarks:

HYDROLOGY

___ Recorded Data (Described in Remarks)
  ___ Stream, Lake, or Tide Gauge
  ___ Aerial Photographs
  ___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: 3 (in.)

Depth to Free Water in Pit: 0 (in.)

Depth to Saturated Soils: 0 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
- x Inundated
- x Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- x Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water Stained Leaves
- ___ Local Soil Survey Data
- x FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series & Phase): Vf – VOLUSIA CHANNERY SILT LOAM (3–8%)

Taxonomy (Subgroup): Aeric Fraglochrepts

Drainage Class: Somewhat poorly drained

Field Observations
Confirmed Map Type? Yes [✓ No]

Profile Description:

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0–8	A	2.5Y/3/2	7.5YR/5/8	5%	Silty Loam
8+	B	2.5Y/6/2	7.5YR/5/8	30%	Silty Loam

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
_x_ Gleyed or Low Chroma Colors

___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? [✓ Yes] No

(Circle)
Is This Sampling Point Within a Wetland? [✓ Yes] No

Remarks:

Wetland O consists primarily of a lowland swampy area to the west of the proposed pipeline route. The majority of the wetland that the proposed route crosses is a drainage ditch/stream that carries water away from the lowland brushy/wooded area.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 3/31/07
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: ______
Transect ID: ______
Plot ID: 0 (upland)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Carex, sp.	H	FACW	9.		
2. Dactylis Glomerata	H	FACU	10.		
3. Trifoleum Pratense	H	FACU	11.		
4. Phleum Pratense	H	FACU	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC−). 25%

Remarks:

HYDROLOGY

___Recorded Data (Described in Remarks)
  ___Stream, Lake, or Tide Gauge
  ___Aerial Photographs
  ___Other
___No Recorded Data Available

Field Observations:

Depth of Surface Water: n/a (in.)

Depth to Free Water in Pit: n/a (in.)

Depth to Saturated Soils: n/a (in.)

Wetland Hydrology Indicators:
Primary Indicators:
- ___Inundated
- ___Saturated in Upper 12 Inches
- ___Water Marks
- ___Drift Lines
- ___Sediment Deposits
- ___Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___Oxidized Root Channels in Upper 12 Inches
- ___Water Stained Leaves
- ___Local Soil Survey Data
- ___FAC-Neutral Test
- ___Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series & Phase): Vf – VOLUSIA CHANNERY SILT LOAM (3–8%)

Taxonomy (Subgroup): Aeric Fragiochrepts

Drainage Class: Somewhat poorly drained
Field Observations
Confirmed Map Type? Yes [✓ No]

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0–10	A	2.5Y/4/3	none	none	Silty Loam
10+	B	2.5Y/6/2	7.5YR/5/8	20%	Silty Loam

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes [✓ No] (Circle)
Wetland Hydrology Present? Yes [✓ No]
Hydric Soils Present? [✓ Yes] No

(Circle)
Is This Sampling Point Within a Wetland? Yes [✓ No]

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 3/31/07
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID:
Transect ID:
Plot ID: P (wet)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Prunus Virginiana	T	FACU	9.		
2. Salix, sp.	T/SS	FACW	10.		
3. Fraxinus Pennsylvanica	T/SS	FACW	11.		
4. Carex, sp.	H	FACW	12.		
5. Cornus Foemina, ssp. Racemosa	SS	FAC-	13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 60%

Remarks:

HYDROLOGY

___ Recorded Data (Described in Remarks)
  ___ Stream, Lake, or Tide Gauge
  ___ Aerial Photographs
  ___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: 1 (in.)

Depth to Free Water in Pit: 0 (in.)

Depth to Saturated Soils: 0 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
- x Inundated
- x Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- x Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 Inches
- x Water Stained Leaves
- ___ Local Soil Survey Data
- x FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series & Phase): Vf - VOLUSIA CHANNERY SILT LOAM (3-8%)

Drainage Class: Somewhat poorly drained

Taxonomy (Subgroup): Aeric Fragiochrepts

Field Observations
Confirmed Map Type? Yes [✓ No]

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0-8	A	2.5Y/4/2	7.5YR/5/8	15%	Silty Loam
8+	B	2.5Y/6/1	7.5YR/5/8	35%	Silty Loam

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- _X_ Gleyed or Low Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? [✓ Yes] No

(Circle)
Is This Sampling Point Within a Wetland? [✓ Yes] No

Remarks:

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 3/31/07
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID:
Transect ID:
Plot ID: P (upland)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Pinus Strobus	T	FACU	9.		
2. Cornus Foemina, ssp. Racemosa	SS	FAC-	10.		
3. Fraxinus Pennsylvanica	T/SS	FACW	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 33%

Remarks:

HYDROLOGY

☐ Recorded Data (Described in Remarks)
  ☐ Stream, Lake, or Tide Gauge
  ☐ Aerial Photographs
  ☐ Other
☐ No Recorded Data Available

Field Observations:

Depth of Surface Water: n/a (in.)

Depth to Free Water in Pit: n/a (in.)

Depth to Saturated Soils: n/a (in.)

Wetland Hydrology Indicators:
Primary Indicators:
  ☐ Inundated
  ☐ Saturated in Upper 12 Inches
  ☐ Water Marks
  ☐ Drift Lines
  ☐ Sediment Deposits
  ☐ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
  ☐ Oxidized Root Channels in Upper 12 Inches
  ☐ Water Stained Leaves
  ☐ Local Soil Survey Data
  ☐ FAC-Neutral Test
  ☐ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series & Phase): Vf – VOLUSIA CHANNERY SILT LOAM (3-8%)

Drainage Class: Somewhat poorly drained

Field Observations
Confirmed Map Type? [✓ Yes] No

Taxonomy (Subgroup): Aeric Fraglochrepts

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0-8	A	10YR/4/3	none	none	Silty Loam
8+	B	10YR/6/2	10YR/4/6	few-faint	Silty Loam

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes [✓ No] (Circle)
Wetland Hydrology Present? Yes [✓ No]
Hydric Soils Present? Yes [✓ No]

(Circle)
Is This Sampling Point Within a Wetland? Yes [✓ No]

Remarks:

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 3/31/07
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID:
Transect ID:
Plot ID: Q (wet)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Cornus Sericea	SS	FACW+	9.		
2. Fraxinus Pennsylvanica	T/SS	FACW	10.		
3. Carex, sp.	H	FACW	11.		
4. Phragmites Australis	H	FACW	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 75%

Remarks:

HYDROLOGY

___Recorded Data (Described in Remarks)
- ___Stream, Lake, or Tide Gauge
- ___Aerial Photographs
- ___Other

___No Recorded Data Available

Field Observations:

Depth of Surface Water: 3 (in.)
Depth to Free Water in Pit: 0 (in.)
Depth to Saturated Soils: 0 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
- x Inundated
- x Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- x Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water Stained Leaves
- ___ Local Soil Survey Data
- x FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name (Series & Phase): Vf – VOLUSIA CHANNERY SILT LOAM (3–8%)

Drainage Class: Somewhat poorly drained

Taxonomy (Subgroup): Aeric Fragiochrepts

Field Observations Confirmed Map Type? [✓ Yes] No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0–8	A	10YR/4/3	none	none	Silty Loam
8+	B	10YR/5/2	10YR/4/6	few–faint	Silty Loam

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes [✓ No] (Circle)
Wetland Hydrology Present? Yes [✓ No]
Hydric Soils Present? Yes [✓ No]

(Circle)
Is This Sampling Point Within a Wetland? Yes [✓ No]

Remarks:

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 3/31/07
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID:
Transect ID:
Plot ID: Q (upland)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Prunus Virginiana	T/SS	FACU	9.		
2. Fraxinus Pennsylvanica	T/SS	FACW	10.		
3. Carex, sp.	H	FACW	11.		
4. Cornus Foemina, ssp. Racemosa	SS	FAC-	12.		
5. Dactylis Glomerata	H	FACU	13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 40%

Remarks:

HYDROLOGY

___ Recorded Data (Described in Remarks)
  ___ Stream, Lake, or Tide Gauge
  ___ Aerial Photographs
  ___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: n/a (in.)

Depth to Free Water in Pit: n/a (in.)

Depth to Saturated Soils: n/a (in.)

Wetland Hydrology Indicators:
Primary Indicators:
  ___ Inundated
  ___ Saturated in Upper 12 Inches
  ___ Water Marks
  ___ Drift Lines
  ___ Sediment Deposits
  ___ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
  ___ Oxidized Root Channels in Upper 12 Inches
  ___ Water Stained Leaves
  ___ Local Soil Survey Data
  ___ FAC-Neutral Test
  ___ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series & Phase): Vf – VOLUSIA CHANNERY SILT LOAM (3–8%)

Drainage Class: Somewhat poorly drained

Field Observations
Confirmed Map Type? [✓ Yes] No

Taxonomy (Subgroup): Aeric Fragiochrepts

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0–8	A	10YR/3/2	7.5YR/4/6	5%	Silty Loam
8+	B	10YR/6/2	7.5YR/4/6	15%	Silty Loam

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
_x_ Gleyed or Low Chroma Colors

___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? [✓ Yes] No

(Circle)
Is This Sampling Point Within a Wetland? [✓ Yes] No

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 3/31/07
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: ___
Transect ID: ___
Plot ID: IS16

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1.			9.		
2.			10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC–). ___

Remarks:

There were no plant species found to be growing in the actual stream/ditch channel.

HYDROLOGY

- ___ Recorded Data (Described in Remarks)
  - ___ Stream, Lake, or Tide Gauge
  - ___ Aerial Photographs
  - ___ Other
- ___ No Recorded Data Available

Field Observations:

Depth of Surface Water: 2 (in.)

Depth to Free Water in Pit: 0 (in.)

Depth to Saturated Soils: 0 (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- x Inundated
- x Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- x Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 Inches
- x Water Stained Leaves
- ___ Local Soil Survey Data
- ___ FAC–Neutral Test
- ___ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series & Phase): Vf - VOLUSIA CHANNERY SILT LOAM (3-8%)

Taxonomy (Subgroup): Aeric Fragiochrepts

Drainage Class: Somewhat poorly drained

Field Observations
Confirmed Map Type? [✓ Yes] No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low Chroma Colors

___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

No soil sample taken in stream/ditch channel.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? [✓ Yes] No

(Circle)
Is This Sampling Point Within a Wetland? [✓ Yes] No

Remarks:

Wetland IS15 is a manmade diversion ditch that drains under the existing drive, through a culvert and into wetland "Q".

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 4/3/07
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: ___
Transect ID: ___
Plot ID: R (wet)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Cornus Amomum	SS	FACW	9.		
2. Carex, sp.	H	FACW	10.		
3. Phragmites Australis	H	FACW	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC–). 100%

Remarks:

HYDROLOGY

___ Recorded Data (Described in Remarks)
  ___ Stream, Lake, or Tide Gauge
  ___ Aerial Photographs
  ___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: 6 (in.)

Depth to Free Water in Pit: 0 (in.)

Depth to Saturated Soils: 0 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
  x Inundated
  x Saturated in Upper 12 Inches
  ___ Water Marks
  ___ Drift Lines
  ___ Sediment Deposits
  x Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
  ___ Oxidized Root Channels in Upper 12 Inches
  ___ Water Stained Leaves
  ___ Local Soil Survey Data
  x FAC-Neutral Test
  ___ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series & Phase): Vf ~ VOLUSIA CHANNERY SILT LOAM (3-8%)

Taxonomy (Subgroup): Aeric Fragiochrepts

Drainage Class: Somewhat poorly drained

Field Observations
Confirmed Map Type? [✓ Yes] No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0-10	A	10YR/4/2	7.5YR/5/8	5%	Silty Loam
10+	B	2.5Y/5/2	7.5YR/5/8	10%	Silty Loam

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
_x_ Gleyed or Low Chroma Colors

___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? [✓ Yes] No

(Circle)
Is This Sampling Point Within a Wetland? [✓ Yes] No

Remarks:

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 4/3/07
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: ___
Transect ID: ___
Plot ID: R (upland)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Phleum Pratense	H	FACU	9.		
2. Carex, sp.	H	FACW	10.		
3. Dactylis Glomerata	H	FACU	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC–). 33%

Remarks:

HYDROLOGY

___Recorded Data (Described in Remarks)
  ___Stream, Lake, or Tide Gauge
  ___Aerial Photographs
  ___Other
___No Recorded Data Available

Field Observations:

Depth of Surface Water: n/a (in.)

Depth to Free Water in Pit: n/a (in.)

Depth to Saturated Soils: n/a (in.)

Wetland Hydrology Indicators:
Primary Indicators:
  ___Inundated
  ___Saturated in Upper 12 Inches
  ___Water Marks
  ___Drift Lines
  ___Sediment Deposits
  ___Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
  ___Oxidized Root Channels in Upper 12 Inches
  ___Water Stained Leaves
  ___Local Soil Survey Data
  ___FAC-Neutral Test
  ___Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series & Phase): Vf – VOLUSIA CHANNERY SILT LOAM (3–8%)

Drainage Class: Somewhat poorly drained

Field Observations
Confirmed Map Type? [✓ Yes] No

Taxonomy (Subgroup): Aeric Fragiochrepts

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0–10	A	10YR/4/2	none	none	Silty Loam
10+	B	2.5Y/5/4	7.5YR/5/6	few–faint	Silty Loam

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes [✓ No] (Circle)
Wetland Hydrology Present? Yes [✓ No]
Hydric Soils Present? Yes [✓ No]

(Circle)
Is This Sampling Point Within a Wetland? Yes [✓ No]

Remarks:

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 4/3/07
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID:
Transect ID:
Plot ID: S (wet)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Phragmites Australis	H	FACW	9.		
2. Alnus Incana, ssp. Rugosa	T/SS	FACW+	10.		
3. Acer Rubrum	T/SS	FAC	11.		
4. Fraxinus Pennsylvanica	T/SS	FACW	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC−). 100%

Remarks:

HYDROLOGY

___Recorded Data (Described in Remarks)
- ___Stream, Lake, or Tide Gauge
- ___Aerial Photographs
- ___Other

___No Recorded Data Available

Field Observations:

Depth of Surface Water: n/a (in.)

Depth to Free Water in Pit: 5 (in.)

Depth to Saturated Soils: 0 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
- ___Inundated
- x Saturated in Upper 12 Inches
- ___Water Marks
- ___Drift Lines
- ___Sediment Deposits
- x Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___Oxidized Root Channels in Upper 12 Inches
- ___Water Stained Leaves
- ___Local Soil Survey Data
- x FAC-Neutral Test
- ___Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series & Phase): Vf – VOLUSIA CHANNERY SILT LOAM (3–8%)

Drainage Class: Somewhat poorly drained

Taxonomy (Subgroup): Aeric Fragiochrepts

Field Observations
Confirmed Map Type? [✓ Yes] No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0–12	A	10YR/4/1	7.5YR/5/8	20%	Silty Loam
12+	B	2.5Y/6/1	7.5YR/5/8	30%	Silty Loam

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- X Gleyed or Low Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? [✓ Yes] No

(Circle)
Is This Sampling Point Within a Wetland? [✓ Yes] No

Remarks:

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 4/3/07
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: ______
Transect ID: ______
Plot ID: S (upland)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Cornus Foemina, ssp. Racemosa	SS	FAC-	9.		
2. Fraxinus Pennsylvanica	T/SS	FACW	10.		
3. Acer Rubrum	T/SS	FAC	11.		
4. Prunus Serotina	T	FACU	12.		
5. Rubus Idaeus	H	FACU-	13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 40%

Remarks:

HYDROLOGY

___Recorded Data (Described in Remarks)
 ___Stream, Lake, or Tide Gauge
 ___Aerial Photographs
 ___Other
___No Recorded Data Available

Field Observations:

Depth of Surface Water: n/a (in.)

Depth to Free Water in Pit: n/a (in.)

Depth to Saturated Soils: n/a (in.)

Wetland Hydrology Indicators:
 Primary Indicators:
 ___Inundated
 ___Saturated in Upper 12 Inches
 ___Water Marks
 ___Drift Lines
 ___Sediment Deposits
 ___Drainage Patterns in Wetlands
 Secondary Indicators (2 or more required):
 ___Oxidized Root Channels in Upper 12 Inches
 ___Water Stained Leaves
 ___Local Soil Survey Data
 ___FAC-Neutral Test
 ___Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name (Series & Phase): Vf – VOLUSIA CHANNERY SILT LOAM (3–8%)

Drainage Class: Somewhat poorly drained

Taxonomy (Subgroup): Aeric Fragiochrepts

Field Observations Confirmed Map Type? [✓ Yes] No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0–12	A	10YR/4/2	none	none	Silty Loam
12+	B	2.5Y/5/2	7.5YR/5/8	10%	Silty Loam

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
_x_ Gleyed or Low Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes [✓ No] (Circle)
Wetland Hydrology Present? Yes [✓ No]
Hydric Soils Present? [✓ Yes] No

(Circle)
Is This Sampling Point Within a Wetland? Yes [✓ No]

Remarks:

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 4/3/07
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: ______
Transect ID: ______
Plot ID: T (wet)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Carex, sp.	H	FACW	9.		
2. Panicum virgatum	H	FAC	10.		
3. Juncus Effusus	H	FACW+	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC–). 100%

Remarks:

HYDROLOGY

___ Recorded Data (Described in Remarks)
  ___ Stream, Lake, or Tide Gauge
  ___ Aerial Photographs
  ___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: n/a (in.)
Depth to Free Water in Pit: 5 (in.)
Depth to Saturated Soils: 4 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
- ___ Inundated
- x Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- x Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water Stained Leaves
- x Local Soil Survey Data
- x FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series & Phase): Cy – CHIPPEWA SILT LOAM (0–1%)

Taxonomy (Subgroup): Typic Fragiaquepts

Drainage Class: Very poorly drained

Field Observations
Confirmed Map Type? [✓ Yes] No

Profile Description:

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0–9	A	10YR/3/1	7.5YR/5/8	10%	Silty Loam
9+	B	2.5Y/5/1	7.5YR/5/8	20%	Silty Loam

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- _x_ Gleyed or Low Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- _x_ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? [✓ Yes] No

(Circle)
Is This Sampling Point Within a Wetland? Yes [✓ No]

Remarks:

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 4/3/07
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: ___
Transect ID: ___
Plot ID: T (upland)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Trifolium Protense	H	FACU	9.		
2. Panicum virgatum	H	FAC	10.		
3. Dactylis Glomerata	H	FACU	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC–). 33%

Remarks:

HYDROLOGY

___ Recorded Data (Described in Remarks)
  ___ Stream, Lake, or Tide Gauge
  ___ Aerial Photographs
  ___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: n/a (in.)

Depth to Free Water in Pit: n/a (in.)

Depth to Saturated Soils: n/a (in.)

Wetland Hydrology Indicators:
  Primary Indicators:
    ___ Inundated
    ___ Saturated in Upper 12 Inches
    ___ Water Marks
    ___ Drift Lines
    ___ Sediment Deposits
    ___ Drainage Patterns in Wetlands
  Secondary Indicators (2 or more required):
    ___ Oxidized Root Channels in Upper 12 Inches
    ___ Water Stained Leaves
    _x_ Local Soil Survey Data
    ___ FAC-Neutral Test
    ___ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series & Phase): Cy – CHIPPEWA SILT LOAM (0-1%)

Taxonomy (Subgroup): Typic Fragiaquepts

Drainage Class: Very poorly drained

Field Observations
Confirmed Map Type? [✓ Yes] No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0-9	A	10YR/3/1	7.5YR/5/8	10%	Silty Loam
9+	B	2.5Y/4/2	7.5YR/5/8	15%	Silty Loam

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- x Gleyed or Low Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- x Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes [✓ No] (Circle)
Wetland Hydrology Present? Yes [✓ No]
Hydric Soils Present? [✓ Yes] No

(Circle)
Is This Sampling Point Within a Wetland? Yes [✓ No]

Remarks:

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 4/24/07
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID:
Transect ID:
Plot ID: BB (wet)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Carex, sp.	H	FACW	9.		
2. Juncus Effusus	H	FACW+	10.		
3. Dactylis Glomerata	H	FACU	11.		
4. Acer Rubrum	T/SS	FAC	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 75%

Remarks:

HYDROLOGY

___Recorded Data (Described in Remarks)
  ___Stream, Lake, or Tide Gauge
  ___Aerial Photographs
  ___Other
___No Recorded Data Available

Field Observations:

Depth of Surface Water: 2 (in.)

Depth to Free Water in Pit: 0 (in.)

Depth to Saturated Soils: 0 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
  x Inundated
  x Saturated in Upper 12 Inches
  ___Water Marks
  ___Drift Lines
  ___Sediment Deposits
  x Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
  ___Oxidized Root Channels in Upper 12 Inches
  ___Water Stained Leaves
  ___Local Soil Survey Data
  x FAC-Neutral Test
  ___Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series & Phase): Vf – VOLUSIA CHANNERY SILT LOAM (3–8%)

Taxonomy (Subgroup): Aeric Fragiochrepts

Drainage Class: Somewhat poorly drained

Field Observations
Confirmed Map Type? [✓ Yes] No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0–10	A	2.5Y/4/2	7.5YR/5/8	5%	Silty Loam
10+	B	2.5Y/6/2	7.5YR/5/8	30%	Silty Loam

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- _x_ Gleyed or Low Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? [✓ Yes] No

(Circle)
Is This Sampling Point Within a Wetland? [✓ Yes] No

Remarks:

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 4/24/07
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: ____
Transect ID: ____
Plot ID: BB (upland)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Acer Rubrum	T/SS	FAC	9.		
2. Cornus Foemina, ssp. Racemosa	SS	FAC–	10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC–). 50%

Remarks:

HYDROLOGY

___Recorded Data (Described in Remarks)
  ___ Stream, Lake, or Tide Gauge
  ___ Aerial Photographs
  ___ Other
___No Recorded Data Available

Field Observations:

Depth of Surface Water: n/a (in.)

Depth to Free Water in Pit: 8 (in.)

Depth to Saturated Soils: 3 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
  ___ Inundated
  _x_ Saturated in Upper 12 Inches
  ___ Water Marks
  ___ Drift Lines
  ___ Sediment Deposits
  ___ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
  ___ Oxidized Root Channels in Upper 12 Inches
  ___ Water Stained Leaves
  ___ Local Soil Survey Data
  _x_ FAC-Neutral Test
  ___ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series & Phase): Vf – VOLUSIA CHANNERY SILT LOAM (3–8%)

Drainage Class: Somewhat poorly drained

Taxonomy (Subgroup): Aeric Fragiochrepts

Field Observations
Confirmed Map Type? [✓ Yes] No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0-8	A	2.5Y/5/3	none	none	Silty Loam
8+	B	2.5Y/6/3	7.5YR/6/8	5%	Silty Loam

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ *Gleyed or Low Chroma Colors*
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ *Other (Explain in Remarks)*

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? Yes [✓ No]

(Circle)
Is This Sampling Point Within a Wetland? Yes [✓ No]

Remarks:

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 4/24/07
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: ______
Transect ID: ______
Plot ID: CC

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Juncus Effusus	H	FACW+	9.		
2.			10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC−). 100%

Remarks:
Very Little vegetation found growing within the wetland water body with the exception of an unidentifiable of submerged moss like vegetation.

HYDROLOGY

___ Recorded Data (Described in Remarks)
- ___ Stream, Lake, or Tide Gauge
- ___ Aerial Photographs
- ___ Other

___ No Recorded Data Available

Field Observations:

Depth of Surface Water: 24 (in.)

Depth to Free Water in Pit: 0 (in.)

Depth to Saturated Soils: 0 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
- x Inundated
- x Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- ___ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water Stained Leaves
- ___ Local Soil Survey Data
- x FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series & Phase): Vf – VOLUSIA CHANNERY SILT LOAM (3–8%)

Taxonomy (Subgroup): Aeric Fragiochrepts

Drainage Class: Somewhat poorly drained

Field Observations
Confirmed Map Type? [✓ Yes] No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:
No soil sample taken within wetland.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? [✓ Yes] No

(Circle)
Is This Sampling Point Within a Wetland? [✓ Yes] No

Remarks:
Wetland CC consists of an excavated pit that has ponded and appears to be permanently inundated.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 4/24/07
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: ___
Transect ID: ___
Plot ID: DD

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Juncus Effusus	H	FACW+	9.		
2. Carex, sp.	H	FACW	10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC–). 100%

Remarks:

HYDROLOGY

___Recorded Data (Described in Remarks)
- ___Stream, Lake, or Tide Gauge
- ___Aerial Photographs
- ___Other

___No Recorded Data Available

Field Observations:

Depth of Surface Water: 24 (in.)

Depth to Free Water in Pit: 0 (in.)

Depth to Saturated Soils: 0 (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- x Inundated
- x Saturated in Upper 12 Inches
- ___Water Marks
- ___Drift Lines
- ___Sediment Deposits
- ___Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___Oxidized Root Channels in Upper 12 Inches
- ___Water Stained Leaves
- ___Local Soil Survey Data
- x FAC–Neutral Test
- ___Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series & Phase): Vf – VOLUSIA CHANNERY SILT LOAM (3–8%)

Drainage Class: Somewhat poorly drained

Field Observations
Confirmed Map Type? [✓ Yes] No

Taxonomy (Subgroup): Aeric Fragiochrepts

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low Chroma Colors

___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:
No soil sample taken within wetland.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? [✓ Yes] No

(Circle)
Is This Sampling Point Within a Wetland? [✓ Yes] No

Remarks:
Wetland DD consists of an excavated pit that has ponded and appears to be permanently inundated.

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 4/24/07
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: ___
Transect ID: ___
Plot ID: EE

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Typha Angustifolia	H	OBL	9.		
2. Salix, sp.	SS	FACW	10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC–). 100%

Remarks:

HYDROLOGY

___ Recorded Data (Described in Remarks)
  ___ Stream, Lake, or Tide Gauge
  ___ Aerial Photographs
  ___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: 24 (in.)

Depth to Free Water in Pit: 0 (in.)

Depth to Saturated Soils: 0 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
- x Inundated
- x Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- ___ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water Stained Leaves
- ___ Local Soil Survey Data
- x FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series & Phase): Vf – VOLUSIA CHANNERY SILT LOAM (3-8%)

Drainage Class: Somewhat poorly drained

Field Observations
Confirmed Map Type? [✓ Yes] No

Taxonomy (Subgroup): Aeric Fragiochrepts

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:
No soil sample taken within wetland.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? [✓ Yes] No

(Circle)
Is This Sampling Point Within a Wetland? [✓ Yes] No

Remarks:
Wetland EE consists of an excavated pit that has ponded and appears to be permanently inundated.

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE

Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.

Investigator: RICHARD DAUGHERTY

Date: 4/24/07

County: YATES

State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No

Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]

Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID:

Transect ID:

Plot ID: FF

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Carex, sp.	H	FACW	9.		
2. Salix, sp.	SS	FACW	10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC−). 100%

Remarks:

HYDROLOGY

___Recorded Data (Described in Remarks)
  ___Stream, Lake, or Tide Gauge
  ___Aerial Photographs
  ___Other
___No Recorded Data Available

Field Observations:

Depth of Surface Water: 12 (in.)

Depth to Free Water in Pit: 0 (in.)

Depth to Saturated Soils: 0 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
  x Inundated
  x Saturated in Upper 12 Inches
  ___Water Marks
  ___Drift Lines
  ___Sediment Deposits
  ___Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
  ___Oxidized Root Channels in Upper 12 Inches
  ___Water Stained Leaves
  ___Local Soil Survey Data
  x FAC–Neutral Test
  ___Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series & Phase): Vf - VOLUSIA CHANNERY SILT LOAM (3-8%)

Drainage Class: Somewhat poorly drained

Taxonomy (Subgroup): Aeric Fraglochrepts

Field Observations
Confirmed Map Type? [✓ Yes] No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low Chroma Colors

___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:
No soil sample taken within wetland.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? [✓ Yes] No

(Circle)
Is This Sampling Point Within a Wetland? [✓ Yes] No

Remarks:
Wetland FF consists of an excavated pit that has ponded and appears to be permanently inundated.

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 4/3/07
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: ___
Transect ID: ___
Plot ID: U (wet)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Phragmites Australis	H	FACW	9.		
2. Carex, sp.	H	FACW	10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC−). 100%

Remarks:

HYDROLOGY

___ Recorded Data (Described in Remarks)
- ___ Stream, Lake, or Tide Gauge
- ___ Aerial Photographs
- ___ Other

___ No Recorded Data Available

Field Observations:

Depth of Surface Water: n/a (in.)

Depth to Free Water in Pit: 3 (in.)

Depth to Saturated Soils: 0 (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ___ Inundated
- x Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- x Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water Stained Leaves
- ___ Local Soil Survey Data
- ___ FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name (Series & Phase): Ve – VOLUSIA CHANNERY SILT LOAM (0–3%)

Drainage Class: Somewhat poorly drained

Taxonomy (Subgroup): Aeric Fragiochrepts

Field Observations Confirmed Map Type? [✓ Yes] No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0–7	A	10YR/3/1	none	none	Silty Loam
7–10	B	10YR/4/1	7.5YR/5/8	few – faint	Silty Loam
10+	C	2.5Y/6/2	7.5YR/5/8	15%	Silty Loam

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- x Gleyed or Low Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)

Wetland Hydrology Present? [✓ Yes] No

Hydric Soils Present? [✓ Yes] No

(Circle)

Is This Sampling Point Within a Wetland? [✓ Yes] No

Remarks:

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 4/3/07
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: ___
Transect ID: ___
Plot ID: U (upland)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Phragmites Australis	H	FACW	9.		
2. Dactylis Glomerata	H	FACU	10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC−). 50%

Remarks:

HYDROLOGY

___Recorded Data (Described in Remarks)
  ___Stream, Lake, or Tide Gauge
  ___Aerial Photographs
  ___Other
___No Recorded Data Available

Field Observations:

Depth of Surface Water: n/a (in.)

Depth to Free Water in Pit: n/a (in.)

Depth to Saturated Soils: n/a (in.)

Wetland Hydrology Indicators:
Primary Indicators:
  ___Inundated
  ___Saturated in Upper 12 Inches
  ___Water Marks
  ___Drift Lines
  ___Sediment Deposits
  ___Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
  ___Oxidized Root Channels in Upper 12 Inches
  ___Water Stained Leaves
  ___Local Soil Survey Data
  _x_ FAC-Neutral Test
  ___Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name (Series & Phase): Ve – VOLUSIA CHANNERY SILT LOAM (0–3%)

Drainage Class: Somewhat poorly drained

Taxonomy (Subgroup): Aeric Fragiochrepts

Field Observations Confirmed Map Type? [✓ Yes] No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0–10	A	10YR/3/1	none	none	Silty Loam
10+	B	2.5Y/6/2	7.5YR/5/8	15%	Silty Loam

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- _x_ Gleyed or Low Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)

Wetland Hydrology Present? Yes [✓ No]

Hydric Soils Present? [✓ Yes] No

(Circle)

Is This Sampling Point Within a Wetland? Yes [✓ No]

Remarks:

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 4/5/07
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID:
Transect ID:
Plot ID: IS17

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Juncus Effusus	H	FACW+	9.		
2. Carex, sp.	H	FACW	10.		
3. Panicum Virgatum	H	FAC	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC–). 100%

Remarks:

Vegetation samples were limited to those species found to be growing within the ditch/stream channel.

HYDROLOGY

___ Recorded Data (Described in Remarks)
- ___ Stream, Lake, or Tide Gauge
- ___ Aerial Photographs
- ___ Other

___ No Recorded Data Available

Field Observations:

Depth of Surface Water: 2 (in.)

Depth to Free Water in Pit: 0 (in.)

Depth to Saturated Soils: 0 (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- x Inundated
- x Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- x Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water Stained Leaves
- ___ Local Soil Survey Data
- x FAC–Neutral Test
- ___ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series & Phase): Me – MARDIN CHANNERY SILT LOAM (3-8%)

Drainage Class: Moderatly Well Drained

Taxonomy (Subgroup): Typic Fragiochrepts

Field Observations
Confirmed Map Type? [✓ Yes] No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:
No soil sample was taken.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? [✓ Yes] No

(Circle)
Is This Sampling Point Within a Wetland? [✓ Yes] No

Remarks:
Wetland IS17 consists of a man made drainage ditch/stream.

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 4/14/07
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: ___
Transect ID: ___
Plot ID: V (wet)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Cornus Foemina, ssp. Racemosa	SS	FAC-	9.		
2. Phragmites Australis	H	FACW	10.		
3. Euthamia Graminifolia	H	FAC	11.		
4. Populus Tremuloides	T/SS	FACU	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 50%

Remarks:

There are several incidents of Osmunda Cinnamomea growing within the delineated wetland however none fell within the limits of the sample plot area.

HYDROLOGY

___Recorded Data (Described in Remarks)
  ___Stream, Lake, or Tide Gauge
  ___Aerial Photographs
  ___Other
___No Recorded Data Available

Field Observations:

Depth of Surface Water: n/a (in.)

Depth to Free Water in Pit: 6 (in.)

Depth to Saturated Soils: 2 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
  ___ Inundated
  x Saturated in Upper 12 Inches
  ___ Water Marks
  ___ Drift Lines
  ___ Sediment Deposits
  x Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
  ___ Oxidized Root Channels in Upper 12 Inches
  ___ Water Stained Leaves
  ___ Local Soil Survey Data
  x FAC-Neutral Test
  ___ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series & Phase): Vf - VOLUSIA CHANNERY SILT LOAM (3-8%)

Taxonomy (Subgroup): Aeric Fraglochrepts

Drainage Class: Somewhat poorly drained

Field Observations
Confirmed Map Type? [✓ Yes] No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0-4	A	2.5Y/4/2	none	none	Silty Loam
4-8	B	2.5Y/4/2	7.5YR/5/8	5%	Silty Loam
8+	C	2.5Y/6/2	7.5YR/5/8	35%	Silty Loam

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
_X_ Gleyed or Low Chroma Colors

___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? [✓ Yes] No

(Circle)
Is This Sampling Point Within a Wetland? [✓ Yes] No

Remarks:

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 4/14/07
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: ____
Transect ID: ____
Plot ID: V (upland)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Cornus Foemina, ssp. Racemosa	SS	FAC-	9.		
2. Acer Saccharum	T	FACU-	10.		
3. Euthamia Graminifolia	H	FAC	11.		
4. Populus Tremuloides	T/SS	FACU	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 25%

Remarks:

HYDROLOGY

___Recorded Data (Described in Remarks)
___Stream, Lake, or Tide Gauge
___Aerial Photographs
___Other
___No Recorded Data Available

Field Observations:

Depth of Surface Water: n/a (in.)

Depth to Free Water in Pit: n/a (in.)

Depth to Saturated Soils: n/a (in.)

Wetland Hydrology Indicators:
Primary Indicators:
___Inundated
___*Saturated in Upper 12 Inches*
___Water Marks
___*Drift Lines*
___Sediment Deposits
___*Drainage Patterns in Wetlands*
Secondary Indicators (2 or more required):
___*Oxidized Root Channels in Upper 12 Inches*
___Water Stained Leaves
___*Local Soil Survey Data*
___FAC-Neutral Test
___*Other (Explain in Remarks)*

Remarks:

SOILS

Map Unit Name
(Series & Phase): Vf – VOLUSIA CHANNERY SILT LOAM (3–8%)

Taxonomy (Subgroup): Aeric Fragiochrepts

Drainage Class: Somewhat poorly drained

Field Observations
Confirmed Map Type? [✓ Yes] No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0–10	A	10YR/4/2	none	none	Silty Loam
10+	B	2.5Y/6/3	7.5YR/5/8	5%	Silty Loam

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes [✓ No] (Circle)
Wetland Hydrology Present? Yes [✓ No]
Hydric Soils Present? Yes [✓ No]

(Circle)
Is This Sampling Point Within a Wetland? Yes [✓ No]

Remarks:

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 4/14/07
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: ___
Transect ID: ___
Plot ID: W (wet)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Cornus Foemina, ssp. Racemosa	SS	FAC–	9.		
2. Salix, sp.	SS	FACW	10.		
3. Panicum Virgatum	H	FAC	11.		
4. Populus Tremuloides	T/SS	FACU	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC–). 50%

Remarks:

HYDROLOGY

___Recorded Data (Described in Remarks)
  ___Stream, Lake, or Tide Gauge
  ___Aerial Photographs
  ___Other
___No Recorded Data Available

Field Observations:

Depth of Surface Water: n/a (in.)

Depth to Free Water in Pit: 6 (in.)

Depth to Saturated Soils: 3 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
- ___Inundated
- _x_ Saturated in Upper 12 Inches
- ___Water Marks
- ___Drift Lines
- ___Sediment Deposits
- _x_ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___Oxidized Root Channels in Upper 12 Inches
- ___Water Stained Leaves
- ___Local Soil Survey Data
- _x_ FAC–Neutral Test
- ___Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series & Phase): Vf - VOLUSIA CHANNERY SILT LOAM (3-8%)

Drainage Class: Somewhat poorly drained

Taxonomy (Subgroup): Aeric Fragiochrepts

Field Observations
Confirmed Map Type? [✓ Yes] No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0-4	A	2.5Y/3/2	none	none	Silty Loam
4+	B	2.5Y/4/2	7.5YR/5/8	10%	Silty Loam

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- _x_ Gleyed or Low Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? [✓ Yes] No

(Circle)
Is This Sampling Point Within a Wetland? [✓ Yes] No

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 4/14/07
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: ___
Transect ID: ___
Plot ID: W (upland)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Cornus Foemina, ssp. Racemosa	SS	FAC-	9.		
2. Populus Tremuloides	T/SS	FACU	10.		
3. Pinus Strobus	T	FACU	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 50%

Remarks:

HYDROLOGY

___ Recorded Data (Described in Remarks)
    ___ Stream, Lake, or Tide Gauge
    ___ Aerial Photographs
    ___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: n/a (in.)

Depth to Free Water in Pit: n/a (in.)

Depth to Saturated Soils: n/a (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ___ Inundated
- ___ Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- ___ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water Stained Leaves
- ___ Local Soil Survey Data
- ___ FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series & Phase): Vf – VOLUSIA CHANNERY SILT LOAM (3–8%)

Drainage Class: Somewhat poorly drained
Field Observations
Confirmed Map Type? [✓ Yes] No

Taxonomy (Subgroup): Aeric Fragiochrepts

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0–6	A	2.5Y/3/2	none	none	Silty Loam
6+	B	2.5Y/4/3	7.5YR/5/8	few – faint	Silty Loam

Hydric Soil Indicators:

___ *Histosol*
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low Chroma Colors
___ *Concretions*
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes [✓ No] (Circle)
Wetland Hydrology Present? Yes [✓ No]
Hydric Soils Present? Yes [✓ No]

(Circle)
Is This Sampling Point Within a Wetland? Yes [✓ No]

Remarks:

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 4/14/07
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID:
Transect ID:
Plot ID: IS18

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Salix, sp.	SS	FACW	9.		
2. Euthamia Graminifolia	H	FAC	10.		
3. Phragmites Australis	H	FACW	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC−). 100%

Remarks:

HYDROLOGY

☐ Recorded Data (Described in Remarks)
  ☐ Stream, Lake, or Tide Gauge
  ☐ Aerial Photographs
  ☐ Other
☐ No Recorded Data Available

Field Observations:

Depth of Surface Water: 3 (in.)

Depth to Free Water in Pit: 0 (in.)

Depth to Saturated Soils: 0 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
- ☒ Inundated
- ☒ Saturated in Upper 12 Inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☒ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 Inches
- ☐ Water Stained Leaves
- ☐ Local Soil Survey Data
- ☒ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series & Phase): Vf – VOLUSIA CHANNERY SILT LOAM (3–8%)

Taxonomy (Subgroup): Aeric Fragiochrepts

Drainage Class: Somewhat poorly drained
Field Observations
Confirmed Map Type? [✓ Yes] No

Profile Description:

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

No soil sample profile taken.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? [✓ Yes] No

(Circle)
Is This Sampling Point Within a Wetland? [✓ Yes] No

Remarks:

Wetland IS18 consists of a man made or at least altered diversion ditch/stream. The stream is approximately 1.5' in width.

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 4/14/07
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: ___
Transect ID: ___
Plot ID: X (wet)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Salix, sp.	T/SS	FACW	9.		
2. Cornus Foemina, ssp. Racemosa	SS	FAC−	10.		
3. Osmunda Cinnamomea	H	FACW	11.		
4. Phragmites Australis	H	FACW	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC−). 75%

Remarks:

HYDROLOGY

___ Recorded Data (Described in Remarks)
- ___ Stream, Lake, or Tide Gauge
- ___ Aerial Photographs
- ___ Other

___ No Recorded Data Available

Field Observations:

Depth of Surface Water: n/a (in.)

Depth to Free Water in Pit: 6 (in.)

Depth to Saturated Soils: 1 (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ___ Inundated
- x Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- x Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water Stained Leaves
- ___ Local Soil Survey Data
- x FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks:
The majority of Wetland X constitutes the flowing roadside ditch/stream that appears to be permanently inundated. The wetland sample plot was taken in the adjacent area to prove the wetland extends beyond the ditch/stream channel. In the photo of the wetland it can be seen that the ditch stream channel contains up to 6" of surface water.

SOILS

Map Unit Name
(Series & Phase): Vf – VOLUSIA CHANNERY SILT LOAM (3–8%)

Taxonomy (Subgroup): Aeric Fragiochrepts

Drainage Class: Somewhat poorly drained

Field Observations
Confirmed Map Type? [✓ Yes] No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0-12	A	2.5Y/4/2	7.5YR/5/8	5%	Silty Loam
12+	B	2.5Y/6/2	7.5YR/5/8	20%	Silty Loam

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
_x_ Gleyed or Low Chroma Colors

___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? [✓ Yes] No

(Circle)
Is This Sampling Point Within a Wetland? [✓ Yes] No

Remarks:

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 4/14/07
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID:
Transect ID:
Plot ID: X (upland)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Crataegus, sp.	SS	FACU	9.		
2. Cornus Foemina, ssp. Racemosa	SS	FAC–	10.		
3. Osmunda Cinnamomea	H	FACW	11.		
4. Dactylis Glomerata	H	FACU	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC–). 25%

Remarks:

HYDROLOGY

___Recorded Data (Described in Remarks)
- ___Stream, Lake, or Tide Gauge
- ___Aerial Photographs
- ___Other

___No Recorded Data Available

Field Observations:

Depth of Surface Water: n/a (in.)

Depth to Free Water in Pit: n/a (in.)

Depth to Saturated Soils: n/a (in.)

Wetland Hydrology Indicators:
- Primary Indicators:
  - ___Inundated
  - ___Saturated in Upper 12 Inches
  - ___Water Marks
  - ___Drift Lines
  - ___Sediment Deposits
  - ___Drainage Patterns in Wetlands
- Secondary Indicators (2 or more required):
  - ___Oxidized Root Channels in Upper 12 Inches
  - ___Water Stained Leaves
  - ___Local Soil Survey Data
  - ___FAC-Neutral Test
  - ___Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series & Phase): Vf – VOLUSIA CHANNERY SILT LOAM (3–8%)

Drainage Class: Somewhat poorly drained

Field Observations
Confirmed Map Type? [✓ Yes] No

Taxonomy (Subgroup): Aeric Fragiochrepts

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0–10	A	2.5Y/4/2	none	none	Silty Loam
10+	B	2.5Y/6/2	7.5YR/5/8	10%	Silty Loam

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
_x_ Gleyed or Low Chroma Colors

___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes [✓ No] (Circle)
Wetland Hydrology Present? Yes [✓ No]
Hydric Soils Present? [✓ Yes] No

(Circle)
Is This Sampling Point Within a Wetland? Yes [✓ No]

Remarks:

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 4/14/07
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID:
Transect ID:
Plot ID: IS19

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Phragmites Australis	H	FACW	9.		
2.			10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 100%

Remarks:

HYDROLOGY

___ Recorded Data (Described in Remarks)
  ___ Stream, Lake, or Tide Gauge
  ___ Aerial Photographs
  ___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: 1 (in.)

Depth to Free Water in Pit: 0 (in.)

Depth to Saturated Soils: 0 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
  x Inundated
  x Saturated in Upper 12 Inches
  ___ Water Marks
  ___ Drift Lines
  ___ Sediment Deposits
  x Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
  ___ Oxidized Root Channels in Upper 12 Inches
  ___ Water Stained Leaves
  ___ Local Soil Survey Data
  x FAC-Neutral Test
  ___ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series & Phase): Vf – VOLUSIA CHANNERY SILT LOAM (3–8%)

Drainage Class: Somewhat poorly drained

Field Observations
Confirmed Map Type? Yes [✓ No]

Taxonomy (Subgroup): Aeric Fragiochrepts

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0–8	A	2.5Y/4/2	10YR/5/8	few–faint	Silty Loam
8+	B	5Y/5/2	10YR/5/8	30%	Silty Clay Loam

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
_x_ Gleyed or Low Chroma Colors

___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? [✓ Yes] No

(Circle)
Is This Sampling Point Within a Wetland? [✓ Yes] No

Remarks:

No upland sample was taken for Wetland IS19. The wetland consists of a man made diversion ditch approximately 2 feet in width. The northerly side of the ditch is minimally recessed which allows for the water carried by the diversion ditch to seep outside the defined ditch channel. The wetland was flagged to the extent of the verifiable wetland hydrology as no or minimal vegetation evidence was found in the adjacent farm fields.

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 4/14/07
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID:
Transect ID:
Plot ID: IS20

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Phragmites Australis	H	FACW	9.		
2. Panicum Virgatum	H	FAC	10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 100%

Remarks:

HYDROLOGY

___ Recorded Data (Described in Remarks)
  ___ Stream, Lake, or Tide Gauge
  ___ Aerial Photographs
  ___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: 1 (in.)

Depth to Free Water in Pit: 0 (in.)

Depth to Saturated Soils: 0 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
- _x_ Inundated
- _x_ Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- _x_ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water Stained Leaves
- ___ Local Soil Survey Data
- _x_ FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series & Phase): Vf – VOLUSIA CHANNERY SILT LOAM (3-8%)
Taxonomy (Subgroup): Aeric Fraglochrepts

Drainage Class: Somewhat poorly drained
Field Observations
Confirmed Map Type? Yes [✓ No]

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

No soil sample taken in ditch/stream channel.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? [✓ Yes] No

(Circle)
Is This Sampling Point Within a Wetland? [✓ Yes] No

Remarks:

No upland sample was taken for Wetland IS20. The wetland consists of a man made road-side drainage ditch approximately 6 feet in width. The ditch/stream channel is recessed approximately 2 feet below normal adjacent grade.

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 4/14/07
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: ___
Transect ID: ___
Plot ID: IS20A

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Phragmites Australis	H	FACW	9.		
2. Panicum Virgatum	H	FAC	10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC–). 100%

Remarks:

HYDROLOGY

___ Recorded Data (Described in Remarks)
  ___ Stream, Lake, or Tide Gauge
  ___ Aerial Photographs
  ___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: 1 (in.)

Depth to Free Water in Pit: 0 (in.)

Depth to Saturated Soils: 0 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
  x Inundated
  x Saturated in Upper 12 Inches
  ___ Water Marks
  ___ Drift Lines
  ___ Sediment Deposits
  x Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
  ___ Oxidized Root Channels in Upper 12 Inches
  ___ Water Stained Leaves
  ___ Local Soil Survey Data
  x FAC–Neutral Test
  ___ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series & Phase): Vf – VOLUSIA CHANNERY SILT LOAM (3–8%)
Drainage Class: Somewhat poorly drained
Field Observations
Taxonomy (Subgroup): Aeric Fragiochrepts
Confirmed Map Type? Yes [✓ No]

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

No soil sample taken in ditch/stream channel.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? [✓ Yes] No

(Circle)
Is This Sampling Point Within a Wetland? [✓ Yes] No

Remarks:

No upland sample was taken for Wetland IS20A. The wetland consists of a man made field drainage ditch approximately 3 feet in width. The ditch/stream channel is recessed approximately 1 feet below normal adjacent grade.

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 4/14/07
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID:
Transect ID:
Plot ID: Y (wet)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Prunus Virginiana	T/SS	FACU	9.		
2. Vitus, sp.	V	FAC	10.		
3. Rosa Multiflora	H	FACU	11.		
4. Phragmites Australis	H	FACW	12.		
5. Cornus Foemina, ssp. Racemosa	SS	FAC–	13.		
6. Populus Temuloides	T	FACU	14.		
7. Carex, sp.	H	FACW	15.		
8. Osmunda Cinnamomea	H	FACW	16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC–). 50%

Remarks:

HYDROLOGY

___ Recorded Data (Described in Remarks)
  ___ Stream, Lake, or Tide Gauge
  ___ Aerial Photographs
  ___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: n/a (in.)

Depth to Free Water in Pit: 3 (in.)

Depth to Saturated Soils: 0 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
- ___ Inundated
- x Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- x Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water Stained Leaves
- ___ Local Soil Survey Data
- x FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series & Phase): Me – MARDIN CHANNERY SILT LOAM (3–8%)

Drainage Class: Moderatly Well Drained

Field Observations
Confirmed Map Type? Yes [✓ No]

Taxonomy (Subgroup): *Typic Fragiochrepts*

<u>Profile Description:</u>

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0–6	A	2.5Y/3/1	10YR/5/8	5%	Silty Loam
6+	B	2.5Y/6/1	7.5YR/5/8	30%	Silty Loam

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
_x_ Gleyed or Low Chroma Colors

___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? [✓ Yes] No

(Circle)
Is This Sampling Point Within a Wetland? [✓ Yes] No

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 4/14/07
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: ___
Transect ID: ___
Plot ID: Y (upland)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Prunus Virginiana	T/SS	FACU	9.		
2. Rosa Multiflora	H	FACU	10.		
3. Populus Temuloides	T	FACU	11.		
4. Crataegus, sp.	T	FACU	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC–). 0%

Remarks:

HYDROLOGY

___Recorded Data (Described in Remarks)
- ___ Stream, Lake, or Tide Gauge
- ___ Aerial Photographs
- ___ Other

___No Recorded Data Available

Field Observations:

Depth of Surface Water: n/a (in.)

Depth to Free Water in Pit: n/a (in.)

Depth to Saturated Soils: n/a (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ___ Inundated
- ___ Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- ___ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water Stained Leaves
- ___ Local Soil Survey Data
- ___ FAC–Neutral Test
- ___ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series & Phase): Me – MARDIN CHANNERY SILT LOAM (3–8%)

Taxonomy (Subgroup): Typic Fragiochrepts

Drainage Class: Moderatly Well Drained
Field Observations
Confirmed Map Type? Yes [✓ No]

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0–12	A	2.5Y/3/2	none	none	Silty Loam
12+	B	2.5Y/6/3	7.5YR/5/8	15%	Silty Loam

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low Chroma Colors

___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes [✓ No] (Circle)
Wetland Hydrology Present? Yes [✓ No]
Hydric Soils Present? Yes [✓ No]

(Circle)
Is This Sampling Point Within a Wetland? Yes [✓ No]

Remarks:

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 4/14/07
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: ______
Transect ID: ______
Plot ID: IS21

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Cornus Sericea	SS	FACW+	9.		
2. Juncus Effusus	H	FACW+	10.		
3. Populus Temuloides	SS	FACU	11.		
4. Carex, sp.	H	FACW	12.		
5. Pinus Resinosa	T	FACU	13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC–). 60%

Remarks:

HYDROLOGY

___ Recorded Data (Described in Remarks)
  ___ Stream, Lake, or Tide Gauge
  ___ Aerial Photographs
  ___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: 2 (in.)

Depth to Free Water in Pit: 0 (in.)

Depth to Saturated Soils: 0 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
  _x_ Inundated
  _x_ Saturated in Upper 12 Inches
  ___ Water Marks
  ___ Drift Lines
  ___ Sediment Deposits
  _x_ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
  ___ Oxidized Root Channels in Upper 12 Inches
  ___ Water Stained Leaves
  ___ Local Soil Survey Data
  _x_ FAC–Neutral Test
  ___ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series & Phase): Vf – VOLUSIA CHANNERY SILT LOAM (3–8%)

Drainage Class: Somewhat poorly drained

Field Observations
Confirmed Map Type? Yes [✓ No]

Taxonomy (Subgroup): Aeric Fraglochrepts

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

No soil sample taken within stream/ditch channel.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? [✓ Yes] No

(Circle)
Is This Sampling Point Within a Wetland? [✓ Yes] No

Remarks:

Wetland IS21 consists of a man made or altered drainage ditch/stream. The bottom of the ditch/stream is recessed approximately 1 foot below the normal adjacetn grade.

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 4/14/07
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: ___
Transect ID: ___
Plot ID: Z (wet)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Vitus, sp.	V	FAC	9.		
2. Euphomia Graminifolia	H	FAC	10.		
3. Prunus Virginiana	T/SS	FACU	11.		
4. Malus Pumila	T	UPL	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 50%

Remarks:

HYDROLOGY

___ Recorded Data (Described in Remarks)
- ___ Stream, Lake, or Tide Gauge
- ___ Aerial Photographs
- ___ Other

___ No Recorded Data Available

Field Observations:

Depth of Surface Water: n/a (in.)

Depth to Free Water in Pit: 5 (in.)

Depth to Saturated Soils: 0 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
- ___ Inundated
- x Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- x Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water Stained Leaves
- ___ Local Soil Survey Data
- x FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series & Phase): Vf – VOLUSIA CHANNERY SILT LOAM (3–8%)

Drainage Class: Somewhat poorly drained

Field Observations
Confirmed Map Type? Yes [✓ No]

Taxonomy (Subgroup): Aeric Fragiochrepts

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0-11	A	2.5Y/3/1	7.5YR/5/8	few/faint	Silty Loam
11+	B	2.5Y/6/1	7.5YR/5/8	30%	Silty Loam

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
x Gleyed or Low Chroma Colors

___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? [✓ Yes] No

(Circle)
Is This Sampling Point Within a Wetland? [✓ Yes] No

Remarks:

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 4/14/07
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: ___
Transect ID: ___
Plot ID: 2 (upland)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Carya Ovata	T	FACU-	9.		
2. Cornus Foemina, ssp. Racemosa	SS	FAC-	10.		
3. Prunus Virginiana	T/SS	FACU	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 0%

Remarks:

HYDROLOGY

___Recorded Data (Described in Remarks)
  ___Stream, Lake, or Tide Gauge
  ___Aerial Photographs
  ___Other
___No Recorded Data Available

Field Observations:

Depth of Surface Water: n/a (in.)
Depth to Free Water in Pit: n/a (in.)
Depth to Saturated Soils: n/a (in.)

Wetland Hydrology Indicators:
Primary Indicators:
  ___Inundated
  ___Saturated in Upper 12 Inches
  ___Water Marks
  ___Drift Lines
  ___Sediment Deposits
  ___Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
  ___Oxidized Root Channels in Upper 12 Inches
  ___Water Stained Leaves
  ___Local Soil Survey Data
  ___FAC-Neutral Test
  ___Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series & Phase): Vf – VOLUSIA CHANNERY SILT LOAM (3–8%)

Drainage Class: Somewhat poorly drained

Field Observations
Confirmed Map Type? [✓ Yes] No

Taxonomy (Subgroup): Aeric Fragiochrepts

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0–10	A	2.5Y/4/3	none	none	Silty Loam
10+	B	2.5Y/6/3	7.5YR/5/8	10%	Silty Loam

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ *Gleyed or Low Chroma Colors*
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ *Other (Explain in Remarks)*

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes [✓ No] (Circle)
Wetland Hydrology Present? Yes [✓ No]
Hydric Soils Present? Yes [✓ No]

(Circle)
Is This Sampling Point Within a Wetland? Yes [✓ No]

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 4/14/07
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: ______
Transect ID: ______
Plot ID: IS22

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Fraxinus Pennsylvanica	SS	FACW	9.		
2. Cornus Foemina, ssp. Racemosa	SS	FAC–	10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC *(excluding FAC–).* 50%

Remarks:
Little vegetation was found to be growing within the actual stream/ditch channel. The majority of the *bottom of the channel is baren gravel/rock material.*

HYDROLOGY

___Recorded Data (Described in Remarks)
- ___Stream, Lake, or Tide Gauge
- ___Aerial Photographs
- ___Other

___No Recorded Data Available

Field Observations:

Depth of Surface Water: 2 (in.)

Depth to Free Water in Pit: 0 (in.)

Depth to Saturated Soils: 0 (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- x Inundated
- x Saturated in Upper 12 Inches
- ___Water Marks
- ___Drift Lines
- ___Sediment Deposits
- x Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___Oxidized Root Channels in Upper 12 Inches
- ___Water Stained Leaves
- ___Local Soil Survey Data
- x FAC-Neutral Test
- ___Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series & Phase): Me ~ MARDIN CHANNERY SILT LOAM (3-8%)

Drainage Class: Moderatly Well Drained
Field Observations
Confirmed Map Type? Yes [✓ No]

Taxonomy (Subgroup): Typic Fragiochrepts

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ *Listed on Local Hydric Soils List*
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

No soil samples taken within stream/ditch channel.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? [✓ Yes] No

(Circle)
Is This Sampling Point Within a Wetland? [✓ Yes] No

Remarks:

Wetland IS22 consists of a man made drainage dtich/stream that carries surface runoff. The bottom of the channel is recessed approximately 1 foot below normal adjacent grade.

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 4/14/07
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID:
Transect ID:
Plot ID: IS23

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1.			9.		
2.			10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC–).

Remarks:
No vegetation was found to be growing within the actual stream/ditch channel. The majority of the bottom of the channel is baren gravel/rock material.

HYDROLOGY

___ Recorded Data (Described In Remarks)
  ___ Stream, Lake, or Tide Gauge
  ___ Aerial Photographs
  ___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: 1 (in.)

Depth to Free Water in Pit: 0 (in.)

Depth to Saturated Soils: 0 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
  x Inundated
  x Saturated in Upper 12 Inches
  ___ Water Marks
  ___ Drift Lines
  ___ Sediment Deposits
  x Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
  ___ Oxidized Root Channels in Upper 12 Inches
  ___ Water Stained Leaves
  ___ Local Soil Survey Data
  ___ FAC–Neutral Test
  ___ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series & Phase): Me and Mf – MARDIN CHANNERY SILT LOAM (3–8% and 8–15%)

Taxonomy (Subgroup): Typic Fragiochrepts

Drainage Class: Moderatly Well Drained
Field Observations
Confirmed Map Type? Yes [✓ No]

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

No soil samples taken within stream/ditch channel.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes [✓ No] (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? [✓ Yes] No

(Circle)
Is This Sampling Point Within a Wetland? [✓ Yes] No

Remarks:

Wetland IS23 consists of a drainage dtich/stream that carries surface runoff. The natural channel is approximately 6 feet in width. No upland sample plot was taken due to the fact that the channel appears to be naturaly confined to its present location –– no evidence of flowing run–off outside the present channel location.

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 4/24/07
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID:
Transect ID:
Plot ID: AA (wet)

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Panicum Virgatum	H	FAC	9.		
2. Rosa Multiflora	H	FACU	10.		
3. Fraxinus Pennsylvanica	T/SS	FACW	11.		
4. Prunus Virginiana	T/SS	FACU	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC–). 50%

Remarks:

HYDROLOGY

___ Recorded Data (Described In Remarks)
  ___ Stream, Lake, or Tide Gauge
  ___ Aerial Photographs
  ___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: 2 (in.)

Depth to Free Water in Pit: 0 (in.)

Depth to Saturated Soils: 0 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
  x Inundated
  x Saturated in Upper 12 Inches
  ___ Water Marks
  ___ Drift Lines
  ___ Sediment Deposits
  x Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
  ___ Oxidized Root Channels in Upper 12 Inches
  ___ Water Stained Leaves
  ___ Local Soil Survey Data
  x FAC-Neutral Test
  ___ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series & Phase): Me – MARDIN CHANNERY SILT LOAM (3-8%)

Taxonomy (Subgroup): Typic Fragiochrepts

Drainage Class: Moderatly Well Drained

Field Observations
Confirmed Map Type? Yes [✓ No]

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0-10	A	2.5Y/4/1	7.5YR/5/8	10%	Silty Loam
10+	B	2.5Y/6/2	7.5YR/5/8	35%	Silty Loam

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- _x_ Gleyed or Low Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? [✓ Yes] No

(Circle)
Is This Sampling Point Within a Wetland? [✓ Yes] No

Remarks:

Wetland AA consists of a pond and the adjacent area saturated by water from the pond. The sample plot was taken in an area that appears to be consistently saturated.

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 4/24/07
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID: ________
Transect ID: ________
Plot ID: AA (upland)

VEGETATION

Dominant Plant Species	Stratum	Indicator
1. Fraxinus Americana	T	FACU
2. Rosa Multiflora	H	FACU
3. Vitus. sp.	V	FAC
4. Prunus Virginiana	T/SS	FACU
5. Carya Ovata	T	FACU-
6.		
7.		
8.		

Dominant Plant Species	Stratum	Indicator
9.		
10.		
11.		
12.		
13.		
14.		
15.		
16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 20%

Remarks:

HYDROLOGY

___Recorded Data (Described in Remarks)
- ___Stream, Lake, or Tide Gauge
- ___Aerial Photographs
- ___Other

___No Recorded Data Available

Field Observations:

Depth of Surface Water: n/a (in.)

Depth to Free Water in Pit: n/a (in.)

Depth to Saturated Soils: n/a (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ___Inundated
- ___Saturated in Upper 12 Inches
- ___Water Marks
- ___Drift Lines
- ___Sediment Deposits
- ___Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___Oxidized Root Channels in Upper 12 Inches
- ___Water Stained Leaves
- ___Local Soil Survey Data
- ___FAC-Neutral Test
- ___Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series & Phase): Me – MARDIN CHANNERY SILT LOAM (3–8%)

Drainage Class: Moderatly Well Drained

Field Observations
Confirmed Map Type? Yes [✓ No]

Taxonomy (Subgroup): Typic Fraglochrepts

Profile Description:

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0–16+	A	2.5Y/4/3	none	none	Silty Loom

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes [✓ No] (Circle)
Wetland Hydrology Present? Yes [✓ No]
Hydric Soils Present? Yes [✓ No]

(Circle)
Is This Sampling Point Within a Wetland? Yes [✓ No]

Remarks:

Wetland AA consists of a pond and the adjacent area saturated by water from the pond. The sample plot was taken in an area that appears to be consistently saturated.

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: SILK PIPELINE
Applicant/Owner: CHESAPEAKE APPALACHIA, L.L.C.
Investigator: RICHARD DAUGHERTY

Date: 5/30/07
County: YATES
State: NEW YORK

Do normal circumstances exist on the site? [✓ Yes] No
Is the site significantly disturbed (Atypical Situation)? Yes [✓ No]
Is the area a potential problem area? Yes [✓ No]
(If needed, explain on reverse.)

Community ID:
Transect ID:
Plot ID: PS6

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Impatiens Capensis	H	FACW	9.		
2. Arisaema Triphyllum	H	FACW–	10.		
3. Phragmites Australis	H	FACW	11.		
4. Salix, sp.	SS	FACW	12.		
5. Equisetum Arvense	H	FAC	13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC–). 100%

Remarks:
The plant species listed as numbers 1 nad 2 above were those found to be growing within the secondary overflow channel to the west of the main channel of Rock Stream. No vegetation was found to be gowing within the flowing channel itself of Rock Stream Creek. The areas within the recessed main channel of Rock Stream Creek included as part of the wetland are listed as numbers 3 through 5 above.

HYDROLOGY

___ Recorded Data (Described in Remarks)
- ___ Stream, Lake, or Tide Gauge
- ___ Aerial Photographs
- ___ Other

___ No Recorded Data Available

Field Observations:

Depth of Surface Water: 4 (in.)

Depth to Free Water in Pit: 0 (in.)

Depth to Saturated Soils: 0 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
- x Inundated
- x Saturated in Upper 12 Inches
- ___ Water Marks
- x Drift Lines
- ___ Sediment Deposits
- x Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water Stained Leaves
- ___ Local Soil Survey Data
- x FAC–Neutral Test
- ___ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name (Series & Phase): BuC – BURDETT SILT LOAM (8–15%)

Drainage Class: Somewhat poorly drained

Taxonomy (Subgroup): Aeric Ochraqualfs

Field Observations Confirmed Map Type? [✓ Yes] No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions Structure, etc.
0–12	A	10YR/3/2	none	none	Silty Loam
12+	B	2.5Y/4/2	7.5YR/6/8	10%	Silty Loam

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
x Gleyed or Low Chroma Colors

___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:
No soil samples were taken in the main channel of Rock Stream.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? [✓ Yes] No (Circle)
Wetland Hydrology Present? [✓ Yes] No
Hydric Soils Present? [✓ Yes] No

(Circle)
Is This Sampling Point Within a Wetland? [✓ Yes] No

Remarks:

Approved by HQUSACE 3/92

APPENDIX C

WETLAND DELINEATION MAPPING