TOWN OF WINDHAM, MAINE

PRELIMINARY SUBDIVISION APPLICATION FOR

DURANT HOMESTEAD SUBDIVISION

SUBMITTED BY:

MATT HANCOCK PROPERTIES, LLC
PO BOX 295
CASCO, MAINE 04015

WITH ASSISTANCE BY:

Acheron Engineering Services.
Engineering, Environmental & Geologic Consultants
www.AcheronEngineering.com

147 Main Street	24466 Powell Road
Newport, Maine 04953	Brooksville, Florida 34602
(207) 368-5700	(352) 796-6236

SUBMITTAL DATE:

AUGUST, 2018

TOWN OF WINDHAM
MAJOR SUBDIVISION APPLICATION

Preliminary Plan

(Section 910 – Subdivision Review, Submission Requirements)

The original signed copy of this application must be accompanied by:

- The required application and review escrow fees,
- Five (5) collated submission packets, which must include
  - Full size paper copies of each plan, map, or drawing, and
  - A bound copy of the required information found in Section 910 of the Land Use Ordinance.
    - The checklist below offers a brief description of these requirements for the purpose of determining the completeness of a submission. Please use the Ordinance for assembling the submission packets.
    - Only two (2) full copies of Stormwater Management Plan and Traffic Impact Study are required. Summaries and conclusions of the Stormwater Management Plan and Traffic Impact Study are adequate for the remaining three (3) submission packets.
- Electronic submission in PDF format of:
  - All plans, maps, and drawings.
    - These may be submitted as a single PDF file or a PDF for each sheet in the plan set.
  - A PDF of the required information found in Section 910 of the Land Use Ordinance

The submission deadline for Preliminary plans is three (3) weeks before the Planning Board meeting for which it will be scheduled.

Applicants are strongly encouraged to schedule a brief submission meeting with Planning Staff, to walk through the application checklist at the time a Planning Board submission is made. This will allow applicants to receive a determination of completeness, or a punch list of outstanding items, at the time a submission is made.

If you have questions about the submission requirements, please contact:

Windham Planning Department	(207) 894-5960, ext. 2
Amanda Lessard, Planner	allessard@windhammaine.us
Ben Smith, Planning Director	bwsmith@windhammaine.us

Project Name: DURANT HOMESTEAD SUBDIVISION

Tax Map: 6 **Lot:** 25

Number of lots/dwelling units: 26 **Estimated road length:** 2,500 - FT

Is the total disturbance proposed > 1 acre? □ Yes □ No

Contact Information

1. Applicant

Name: MATT HANCOCK PROPERTIES, LLC

Mailing Address: PO BOX 295, CASCO, ME 04015

Telephone: 207-655-5886 Fax: _____ E-mail: MATT@MEABRAM.COM

2. Record owner of property

X (Check here if same as applicant)

Name: _____

Mailing Address: _____

Telephone: _____ Fax: _____ Email: _____

3. Contact Person/Agent (if completed and signed by applicant's agent, provide written documentation of authority to act on behalf of applicant)

Name: KIRK BALL, P.E.

Company Name: ACHERON ENGINEERING SERVICES

Mailing Address: 147 MAIN STREET, NEWPORT, ME 04953

Telephone: 207-368-5700 Fax: 207-368-5120 E-mail: KBALL@ACHERONENGINEERING.COM

I certify all the information in this application form and accompanying materials is true and accurate to the best of my knowledge.

Signature _____ Date 8/17/2018

Preliminary Plan - Major Subdivision: Submission Requirements

A.	Mandatory Written Information	Applicant	Staff
1	A fully executed and signed application form	✓	
2	Evidence of payment of the application and escrow fees		
3	Proposed name of the subdivision	✓	
4	Verification of right, title, or interest in the property, and any abutting property, by deed, purchase and sales agreement, option to purchase, or some other proof of interest.	✓	
5	Copy of the most recently recorded deed for the parcel, along with a copy of all existing deed restrictions, easements, rights-of-way, or some other proof of interest	✓	
6	Copy of any existing or proposed covenants or deed restrictions intended to cover all or part of the lots or dwellings in the subdivision	✓	
7	Copy of any existing or proposed easements on the property	N/A	
8	Name, registration number and seal of the Maine Licensed Professional Land Surveyor who conducted the survey	✓	
9	Name, registration number and seal of any other licensed professional of the state who prepared the plan (if applicable)	✓	
10	An indication of the type of sewage disposal to be used in the subdivision	✓	
	i. If connecting to public sewer, provide a letter from Portland Water District stating the District has the capacity to collect and treat the waste water	N/A	
	ii. If using subsurface waste water disposal systems (septic), submit test pit analyses prepared by a Maine Licensed Site Evaluator or Certified Soil Scientist. Test pit locations must be shown on a map.	✓	
11	Indicate type of water supply system(s) to be used in the subdivision.	✓	
12	If connecting to public water, submit a written statement from the Portland Water District indicating there is adequate supply and pressure for the subdivision.	N/A	
13	Names and addresses of the record owner, applicant, and adjoining property owners	✓	
14	An acceptable title opinion proving right of access to the proposed subdivision or site for any property proposed for development on or off of a private way or private road.	N/A	
15	The name and contact information for the road association who's private way or road is used to access the subdivision.	N/A	

Applicant Staff

16	Financial Capacity.	✓	
	i. Estimated costs of development, and itemization of major costs	✓	
	ii. Financing - provide one of the following:	✓	
	a. Letter of commitment to fund from financial institution, governmental agency, or other funding agency	N/A	
	b. Annual corporate report with explanatory material showing availability of liquid assets to finance development	N/A	
	c. Bank statement showing availability of funds if personally financing development	N/A	
	d. Cash equity commitment	✓	
	e. Financial plan for remaining financing	N/A	
	f. Letter from financial institution indicating an intention to finance	N/A	
	iii. If a corporation, Certificate of Good Standing from the Secretary of State	✓	
17	Technical Capacity	✓	
	i. A statement of the applicant's experience and training related to the nature of the development, including developments receiving permits from the Town.	✓	
	ii. Resumes or similar documents showing experience and qualifications of full-time, permanent or temporary staff contracted with or employed by the applicant who will design the development.	✓	

B.	**Mandatory Plan Information**		
1	Name of subdivision, date and scale	✓	
2	Stamp of the Maine License Professional Land Surveyor that conducted the survey, including at least one copy of original stamped seal that is embossed and signed	✓	
3	Stamp with date and signature of the Maine Licensed Professional Engineer that prepared the plans.	✓	
4	North arrow identifying all of the following: Grid North, Magnetic North, declination between Grid and Magnetic, and whether Magnetic or Grid bearings were used in the plan design	✓	
5	Location map showing the subdivision within the municipality	✓	
6	Vicinity plan showing the area within 250 feet, to include:	✓	
	i. approximate location of all property lines and acreage of parcels	✓	
	ii. locations, widths, and names of existing, filed, or proposed streets, easements or building footprints	✓	
	iii. location and designations of any public spaces	N/A	
	iv. outline of proposed subdivision, together with its street system and indication of future probably street system, if the proposed subdivision encompasses only part of the applicants entire property.	✓	
7	Standard boundary survey of parcel, including all contiguous land in common ownership within the last 5 years	✓	
8	Proposed lot lines with approximate dimensions and area of each lot.	✓	
9	Contour lines at 2-foot intervals, or at intervals required by the Board, showing elevations in relation to the required datum.	✓	

		Applicant	Staff
10	Typical cross sections of the proposed grading for roadways, sidewalks, etc., including width, type of pavement, elevations, and grades.	✓	
11	Wetland areas shall be delineated on the survey. If none, please note.	✓	
12	Number of acres within the proposed subdivision, location of property lines, existing buildings, vegetative cover type, specimen trees, if present, and other essential existing physical features.	✓	
13	Rivers, streams, and brooks within or adjacent to the proposed subdivision. If any portion of the proposed subdivision is located in the direct watershed of a great pond, note which great pond.	✓	
14	Zoning district in which the proposed subdivision is located, and the location of any zoning boundaries affecting the subdivision.	✓	
15	Location & size of existing and proposed sewers, water mains, culverts, bridges, and drainage ways on or adjacent to the property to be subdivided. The Board may require this information to be depicted via cross-section, plan or profile views.	✓	
16	Location, names, and present width of existing streets, highways, easements, building lines, parks, and other open spaces on or adjacent to the subdivision	✓	
17	Location and widths of any streets, public improvements, or open space within the subdivision (if any) shown on the official map and the comprehensive plan	✓	
18	All parcels of land proposed to be dedicated to public use and the conditions of such dedication.	N/A	
19	Location of any open space to be preserved or common areas to be created, and general description of proposed ownership, improvement, and management	✓	
20	Approximate location of treeline after development	✓	
21	Delineate boundaries of any flood hazard areas and the 100-year flood elevation as depicted on the Town's Flood Insurance Rate Map	✓	
22	Show any areas within or adjacent to the proposed subdivision which have been identified by the Maine Department of Inland Fisheries and Wildlife "Beginning with Habitat project maps or within the Comprehensive Plan..	✓	
23	Show areas within or adjacent to the proposed subdivision which are either listed on or eligible for the National Register of Historic Places, or have been identified in the comprehensive plan or by the Maine Historic Preservation Commission as sensitive or likely to contain such sites	✓	
24	Erosion & Sedimentation control plan, prepared in accordance with MDEP Stormwater Law Chapter 500 Basic Standards, and the MDEP Maine Erosion and Sediment Control Best Management Practices, published March 2003.	✓	
25	Stormwater management plan, prepared by a Maine Licensed Professional Engineer in accordance with the most recent edition of Stormwater Management for Maine: BMPS Technical Design Manual, published by the MDEP 2006.	✓	

C.	Submission information for which a waiver may be granted.	Applicant	Staff
1	High-intensity soil survey by a Certified Soil Scientist	✓	
2	Landscape Plan	✓	
3	Hydrogeologic assessment - required if i) subdivision is not served by public sewer and either any part of the subdivision is over a sand and gravel aquifer or has an average density of more than one dwelling unit per 100,000 square feet, or ii) where site considerations or development design indicate greater potential of adverse impacts on groundwater quality.	✓	
	a) map showing basic soil types	✓	
	b) depth to the water table at representative points	✓	
	c) Drainage conditions throughout the subdivision	✓	
	d) data on existing ground water quality	N/A	
	e) analysis and evaluation of the effect of the subdivision on groundwater	✓	
	f) map showing location of any subsurface wastewater disposal systems and drinking water wells within the subdivision & within 200 feet of the subdivision boundaries.	✓	
4	Estimate of the amount and type of vehicular traffic to be generated on a daily basis and at peak hours	✓	
5	Traffic Impact Analysis for subdivisions involving 28 or more parking spaces or projected to generate more than 140 vehicle trips per day.	✓	
6	If any portion of the subdivision is in the direct watershed of a great pond,	N/A	
	i) phosphorous impact analysis and control plan		
	ii) long term maintenance plan for all phosphorous control measures		
	iii) contour lines at an interval of 2 feet		
	iv) delineate areas with sustained slopes greater than 25% covering more than one acre		

Electronic Submission		

A. Mandatory Written Information:

A.1 *Fully executed and signed application*:

See page 2 of this application.

A.2 *Evidence of payment of the application and escrow fees:*

See Appendix A for copy of the receipt from the town.

A.3 *Proposed name of subdivision:*

Durant Homestead Subdivision

A.4 *Verification of right, title, or interest in the property, and any abutting property, by deed, purchase and sales agreement, option to purchase, or some other proof of interest:*

The owner of record for the parcel is Matt Hancock Properties LLC, a copy of the deed can be found in Appendix A.

A.5 *Copy of the most recently recorded deed for the parcel, along with a copy of all existing deed restrictions, easements, rights-of-way, or some other proof of interest:*

The most recent recorded deed for the parcel can be found in Appendix A.

A.6 *Copy of any existing or proposed covenants or deed restrictions intended to cover all or part of the lots or dwellings in the subdivision:*

Copies of the Durant Homestead, Restated Declaration of Establishment of Lot Owners Association and Durant Homestead Restated Declaration of Restrictive Covenants are included in Appendix A.

A.7 *Copy of any existing or proposed easements on the property:*

There are no existing or proposed easements associated with the project.

A.8 *Name, registration number and seal of the Maine Licensed Professional Land Surveyor who conducted the survey:*

Adam Robison, PLS No. 2361of Plisga & Day Land Surveyors, prepared the survey plan of the parcel. Mr. Robinson's seal is affixed to the Survey Plan found in Appendix A.

A.9 *Name, registration number and seal of any other licensed professional of the state who prepared the plan (if applicable):*

Kirk Ball, PE No. 11681, provided road design, stormwater management design and oversaw the preparation of the application. Mr. Ball seal is affixed to the attached design plans.

Aleita Burman, CSS No. SS430, CWS No. 178, SSE No. SE 344, performed or over saw the delineation of wetlands, soil survey and soil site evaluation. Mrs. Burman's seals are affixed to the attached Protected Natural Resource report, Soil Survey and Preliminary Soil Site Evaluation report.

John Marchewka, CG No 319, performed the nitrate impact analysis and groundwater supply evaluation. Mr. Marchewka's seal is affixed to the attached Nitrate Impact Analysis report.

Diane Morabito, PE No. 5077 perform the traffic impact study. Ms. Morabito's seal is affixed to the attached Traffic Impact Study.

A.10 *An indication of the type of sewage disposal to be used in the subdivision:*

The project will utilize subsurface wastewater disposal systems located on each lot for wastewater disposal. Please see Appendix A for the Preliminary Soil Site Evaluation report, prepared by Burman Land and Tree Company. Included in the report is a site plan showing all test pits.

A.11 *Indicate type of water supply system(s) to be used in the subdivision:*

Potable water will be provided by wells install on individual lots. Please see Section 8.0 of the Nitrate Impact Analysis Report for the determination of adequate water supply.

A.12 *If connecting to public water, submit a written statement from the Portland Water District indicating there is adequate supply and pressure for the subdivision:*

Not applicable to this project see A.11 above.

A.13 *Names and addresses of the record owner, applicant, and adjoining property owners:*

An abutters list with addresses is provide in Appendix A.

A.14 *An acceptable title opinion proving right of access to the proposed subdivision or site for any property proposed for development on or off of a private way or private road.*

Not applicable to this project access to the proposed project is from Chute Road.

A.15 *The name and contact information for the road association who's private way or road is used to access the subdivision:*

Not applicable to this project see A.14 above.

A.16 *Financial Capacity:*

Please see Appendix A for cost estimate prepared by R. N. Willey and Sons Excavating, Inc.

Please see Appendix A for a letter form RBC Wealth Management indicating adequate funds available to Mr. Hancock.

Please see Appendix A for the certificate of good standing for Matt Hancock Properties, LLC.

A.17 *Technical Capacity*

Please see Appendix A for a statement of Matt Hancock Properties, LLC experience with comparative developments. Please note a subdivision of similar size was approved by the Windham Planning Board in 2007. Resumes for Kirk Ball, PE and Aleita Burman are also included in Appendix A.

B. Mandatory Plan Information:

B.1 *Name of subdivision, date and scale:*

The name of the subdivision, date and scale is included on the attached Preliminary Subdivision Plan by Plisga & Day Land Surveyors.

B.2 *Stamp of the Maine License Professional Land Surveyor that conducted the survey, including at least one copy of original stamped seal that is embossed and signed.*

The attached Preliminary Subdivision Plan is stamped and signed by Adam Robinson, PLS No. 2361.

B.3 *Stamp with date and signature of the Maine Licensed Professional Engineer that prepared the plans.*

Appendix A includes a set of design drawings for the road and stormwater management. Each design drawing is stamped, signed and dated by Kirk Ball, PE No. 11681.

B.4 *North arrow identifying all of the following: Grid North, Magnetic North, declination between Grid and Magnetic, and whether Magnetic or Grid bearings were used in the plan design:*

The attached Preliminary Subdivision Plan includes Grid North, Magnetic North, declination between Grid and Magnetic and Note 2 indicates that all bearings are oriented to Grid North of the Maine State Coordinate System, West Zone, NAD 83.

B.5 *Location map showing the subdivision within the municipality:*

Attached is a site location map showing the project parcel on the Gorham USGS map.

B.6 *Vicinity plan showing the area within 250 feet, to include: approximate location of all property lines and acreage of parcels, locations, widths, and names of existing, filed, or proposed streets, easements or building footprints, location and designations of any public spaces, outline of proposed subdivision, together with its street system and indication of future probably street system, if the proposed subdivision encompasses only part of the applicant's entire property.*

Please refer to sheets C-2, Proposed Site Plan and Site Location Map for the information required for the vicinity plan.

B.7 *Standard boundary survey of parcel, including all contiguous land in common ownership within the last 5 years:*

Please see the attached Survey Plan by Plisga and Day Land Surveyors, dated June 15, 2018.

B.8 *Proposed lot lines with approximate dimensions and area of each lot.*

The attached Preliminary Subdivision Plan includes the approximate dimensions and area of all 26 lots.

B.9 *Contour lines at 2-foot intervals, or at intervals required by the Board, showing elevations in relation to the required datum.*

2-foot contours are shown on all site plans.

B-10 *Typical cross sections of the proposed grading for roadways, sidewalks, etc., including width, type of pavement, elevations, and grades.*

Roadway profile, cross section and details can be found on sheets C-9 to C-13 of the design drawins prepared by Acheron Engineering Services. Widths, type of pavement, elevations and grade are included on the plan, profile and cross sections. Sidewalks are not being proposed, additional paved shoulders are included in the design to compensate.

B.11 *Wetland areas shall be delineated on the survey. If none, please note.*

All wetlands within the parcel are shown on the Preliminary Subdivision Plan.

B.12 *Number of acres within the proposed subdivision, location of property lines, existing buildings, vegetative cover type, specimen trees, if present, and other essential existing physical features:*

All essential existing features are included on plans.

B.13 *Rivers, streams, and brooks within or adjacent to the proposed subdivision. If any portion of the proposed subdivision is located in the direct watershed of a great pond, note which great pond:*

Black Brook is adjacent to the project parcel. The 100 year flood boundary for Black Brook is identified on the plans. No development is proposed within the shoreland zone of Black Brook. The project is not located in the direct watershed of a great pond.

B.14 *Zoning district in which the proposed subdivision is located, and the location of any zoning boundaries affecting the subdivision.*

The project is located within the Farm Zone and is indicated on drawing Sheet C-2. There are no zone boundaries within the parcel.

B.15 *Location & size of existing and proposed sewers, water mains, culverts, bridges, and drainage ways on or adjacent to the property to be subdivided. The Board may require this information to be depicted via cross-section, plan or profile views.*

All proposed stormwater utilities are shown on the attached design drawings.

B.16 *Location, names, and present width of existing streets, highways, easements, building lines, parks, and other open spaces on or adjacent to the subdivision:*

Chute Road and proposed open space is identified on the plans.

B.17 *Location and widths of any streets, public improvements, or open space within the subdivision (if any) shown on the official map and the comprehensive plan:*

The proposed open space within the subdivision and ROW extension to the parcel to the north are shown on the Preliminary Subdivision Plan.

B.18 *All parcels of land proposed to be dedicated to public use and the conditions of such dedication:*

Not applicable, no land area is proposed to be dedicated for public use.

B.19 *Location of any open space to be preserved or common areas to be created, and general description of proposed ownership, improvement, and management:*

The location of the proposed open space area is identified on the attached plans. Description of ownership, improvement and management can be found in the Durant Homestead, Restated Declaration of Establishment of Lot Owners Association and Durant Homestead Restated Declaration of Restrictive Covenants (attached).

B.20 *Approximate location of treeline after development:*

Proposed tree line is depicted on the attached design drawings.

B.21 *Delineate boundaries of any flood hazard areas and the 100-year flood elevation as depicted on the Town's Flood Insurance Rate Map:*

There are no flood hazard areas, the 100-year flood boundary of Black Brook is shown on the design drawings. Please note, no development is proposed within the 100-year flood boundary.

B.22 *Show any areas within or adjacent to the proposed subdivision which have been identified by the Maine Department of Inland Fisheries and Wildlife "Beginning with Habitat project maps or within the Comprehensive Plan:*

There are no areas within or adjacent to the proposed subdivision which have been identified by the Maine Department of Inland Fisheries and Wildlife "Beginning with Habitat project maps or within the Comprehensive Plan. Please see the attached "Protected Natural Resources Delineation and Verification Report," dated July 15, 2018 by Burman Land & Tree Company.

B.23 *Show areas within or adjacent to the proposed subdivision which are either listed on or eligible for the National Register of Historic Places, or have been identified in the comprehensive plan or by the Maine Historic Preservation Commission as sensitive or likely to contain such sites:*

There are no areas within or adjacent to the proposed subdivision which are either listed on or eligible for the National Register of Historic Places, or have been identified in the comprehensive plan or by the Maine Historic Preservation Commission as sensitive or likely to contain such sites. Please see the attached consultation letters between Mr. Ball and SHPO Mr. Kirk F. Mohney.

B.24 *Erosion & Sedimentation control plan, prepared in accordance with MDEP Stormwater Law Chapter 500 Basic Standards, and the MDEP Maine Erosion and Sediment Control Best Management Practices, published March 2003:*

Please see the attached design drawings and the attached "Erosion and Sedimentation Control Plan" prepared by Acheron Engineering Services.

B.25 *Stormwater management plan, prepared by a Maine Licensed Professional Engineer in accordance with the most recent edition of Stormwater Management for Maine: BMPS Technical Design Manual, published by the MDEP 2006.*

Please see the attached design drawings and the attached "Stormwater Management Plan" prepared by Acheron Engineering Services.

C. Submission information for which a waiver may be granted:

C.1 *High-intensity soil survey by a Certified Soil Scientist:*

Please see the attached "Soil Survey Report" prepared by Burman Land and Tree Company and "Soils Report, Class B High Intensity Soil Survey" prepared by Main-Land Development Consultants, Inc.

C.2 *Landscape Plan:*

See design drawing sheet C-2 for planting plan along the subdivision road.

C.3 *Hydrogeologic assessment - required if i) subdivision is not served by public sewer and either any part of the subdivision is over a sand and gravel aquifer or has an average density of more than one dwelling unit per 100,000 square feet, or ii) where site considerations or development design indicate greater potential of adverse impacts on groundwater quality.*

Please see the attached "Nitrate Impact Analysis Report" prepared by Marchewka Associates Incorporated and "Preliminary Soil Site Evaluation report" prepared by Burman Land and Tree.

C.4 *Estimate of the amount and type of vehicular traffic to be generated on a daily basis and at peak hours:*

Please refer to the "Traffic Impact Study" prepared by Maine Traffic Resources.

C.5 *Traffic Impact Analysis for subdivisions involving 28 or more parking spaces or projected to generate more than 140 vehicle trips per day.*

Please refer to the "Traffic Impact Study" prepared by Maine Traffic Resources.

C.6 *If any portion of the subdivision is in the direct watershed of a great pond:*

Not applicable, the project is not within the direct watershed of a great pond.

TOWN OF WINDHAM SUBDIVISION & SITE PLAN APPLICATION

Performance and Design Standards Waiver Request Form

(Section 808 – Site Plan Review, Waivers)
(Section 908 – Subdivision Review, Waivers)

For each waiver request from the Performance and Design Standards detailed in Section 811 or Section 911 of the Town of Windham Land Use Ordinance, as applicable, please submit a separate completed copy of this waiver request form.

Subdivision or Project Name: Durant Homestead Subdivision

Tax Map: 6 Lot: 25

Waivers are requested from the following Performance and Design Standards (add rows as necessary):

Ordinance Section	Standard	Mark which waiver this form is for
911.B.1.(a)	Water Supply	X
911.K.4.(g)	Recreation and Open Space Requirements	

a. Describe how a waiver from the standard indicated above will improve the ability of the project to take the property's pre-development natural features into consideration. Natural features include, but are not limited to, topography, location of water bodies, location of unique or valuable natural resources, relation to abutting properties or land uses. Attach a separate sheet if necessary.

The proposed Durant Homestead Subdivision is located on Chute Road approximately .06 miles northeast from the Chute Road, Depot Street and River Road intersection. The project consists of a 26 lot clustered subdivision where approximately 54% of the developable land will be open space. In addition, approximately 13 acres of wetland would be preserved including land near Black Brook and the unnamed stream within the parcel. Per ordinance section 911.B.1.(a) the project shall connect to the public water system if the closest water main is within 2,600 feet. Based on information provided by Portland Water District in 2009 the closest water main is 2,565 feet from the project, triggering the requirement by 35 feet. Including the installation of over 4,800 feet of water main will likely

affect preservation of the land mention above. Therefore, Matt Hancock Properties requests that the Windham Planning Board grant a performance waiver from section 911.B.1.(a) for the Durant Homestead Project.

Ordinance Section: 911.B.1.(a)

b. Will the waiver have an impact on any of the following criteria?

	Yes	No
Water or air pollution		X
Light pollution or glare		X
Water supply	X	
Soil erosion		X
Traffic congestion or safety		X
Pedestrian safety or access		X
Supply of parking		X
Sewage disposal capacity		X
Solid waste disposal capacity		X
Scenic or natural beauty, aesthetics, historic sites, or rare or irreplaceable natural areas		X
Flooding or drainage issues on abutting properties		X
The Town's ability to provide the subdivision with public safety services (if subdivision)		X

If granting the waiver will result in an impact on any of the criteria above, please provide more detail below.

Individual wells at each lot is being proposed for the water supply for the project.

TOWN OF WINDHAM SUBDIVISION & SITE PLAN APPLICATION

Performance and Design Standards Waiver Request Form

(Section 808 – Site Plan Review, Waivers)
(Section 908 – Subdivision Review, Waivers)

For each waiver request from the Performance and Design Standards detailed in Section 811 or Section 911 of the Town of Windham Land Use Ordinance, as applicable, please submit a separate completed copy of this waiver request form.

Subdivision or Project Name: Durant Homestead Subdivision

Tax Map: 6 Lot: 25

Waivers are requested from the following Performance and Design Standards (add rows as necessary):

Ordinance Section	Standard	Mark which waiver this form is for
911.B.1.(a)	Water Supply	
911.K.4.(g)	Recreation and Open Space Requirements	X
911.M.5.(b).(5).(i).(a)	Dead End Streets	
910.C.1.(c).(2)	Landscape Plan	

a. Describe how a waiver from the standard indicated above will improve the ability of the project to take the property's pre-development natural features into consideration. Natural features include, but are not limited to, topography, location of water bodies, location of unique or valuable natural resources, relation to abutting properties or land uses. Attach a separate sheet if necessary.

The proposed Durant Homestead Subdivision is located on Chute Road approximately .06 miles northeast from the Chute Road, Depot Street and River Road intersection. The project consists of a 26 lot clustered subdivision where approximately 55% of the developable land will be open space. However, the open space is not contiguous as required by section 911.K.4.(g) because of the layout of proposed road.

The road layout was designed to limit the amount of disturbance to the natural landscape, topography and natural resources. Unfortunately, after taking all factors into consideration the road splits the open space in two pieces that are not connected. However, there is

approximately 26.5 acres of developable land proposed for open space, 21 acres west of the proposed road and 5.5 acres east of the proposed road. The project also includes over 13 acres of wetland that will not be disturbed, 11 acres west of the proposed road and 2 acres east of the proposed road. Combined over 40 acres of the 65 acre parcel will be excluded from future development. Which meets the intent of the open space requirement for a cluster subdivision. Therefore, Matt Hancock Properties requests that the Windham Planning Board grant a performance waiver from section 911.K.4.(g) for the Durant Homestead Project.

Ordinance Section: 911.K.4.(g)

b. Will the waiver have an impact on any of the following criteria?

	Yes	No
Water or air pollution		X
Light pollution or glare		X
Water supply		X
Soil erosion		X
Traffic congestion or safety		X
Pedestrian safety or access		X
Supply of parking		X
Sewage disposal capacity		X
Solid waste disposal capacity		X
Scenic or natural beauty, aesthetics, historic sites, or rare or irreplaceable natural areas		X
Flooding or drainage issues on abutting properties		X
The Town's ability to provide the subdivision with public safety services (if subdivision)		X

If granting the waiver will result in an impact on any of the criteria above, please provide more detail below.

Appendix A

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A.10	Preliminary Soil Site Evaluation Report
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TOWN OF WINDHAM

8 SCHOOL ROAD
WINDHAM, MAINE 04062
TAX TREASURER'S NO.

Ck# 028371032

DATE: 8/10/2018

AMOUNT: $10,100.00

PREVIOUS BALANCE:
NEW BALANCE:

DESCRIPTION DURANT HOMESTEAD PRELIM SUBDIV PLAN APPLICATION FEE + ESCROW

THANK YOU

RECEIVED
FROM: MATT HANCOCK PROPERTIES

MATT HANCOCK PROPERTIES, LLC

ACTION BY UNANIMOUS WRITTEN CONSENT

OF MEMBERS

The undersigned, being all of the Members of Matt Hancock, LLC (hereinafter the "Company"), hereby consent to the taking of and hereby do take the following actions in lieu of a special meeting:

RESOLVED: *Authority/Designation of Agent:* That Kirk Ball of Acheron Engineering Services is hereby appointed and named to act as an Agent of the Company, and to represent and bind the Company before the following and concerning the real property owned by the Company and located on the Chute Road in the Town of Windham, Maine more commonly known as the Durant Homestead Property (hereinafter the "Premises");

a) Before all departments of the Town of Windham, including without limitation the Town of Windham's Zoning Board and Planning Board for matters related to the application and approval of subdividing the Premises;

b) Before all departments, agencies and bureaus of the State of Maine, including without limitation the Department of Environmental Protection for matter related to the application and approval of subdividing the Premises.

RESOLVED: *Signing Authorities*: That Kirk Ball shall have the authority to bind the Company and sign all documents necessary and/or required by the above listed entities to effectuate the subdivision of the Premises.

Date: 7/30/18

K. Matthew Hancock, Sole Member

MATT HANCOCK PROPERTIES, LLC

P.O. BOX 295

CASCO, MAINE 04015

July 30, 2018

To Whom It May Concern:

Please take this letter as notice that Kirk Ball of Acheron Engineering Services has been appointed to act as an Agent for Matt Hancock Properties, LLC before all departments of the Town of Windham as well as before all agencies, bureaus, and departments of the State of Maine, for matters related to and concerning the permitting and approval of subdivision for the real property owned by Matt Hancock Properties, LLC and located on the Chute Road in the Town of Windham, Maine. Such property is more commonly known and referred to as the Durant Homestead Property.

Please find attached a true and exact copy of Resolutions recently executed by the Company granting such authority to Mr. Ball.

Sincerely,

Matt Hancock
Sole Member of Matt Hancock Properties, LLC

Doc#: 27339 Bk:33191 Pg: 124

QUITCLAIM DEED
WITH COVENANT

KNOW ALL PERSONS BY THESE PRESENTS

THAT, K. MATTHEW HANCOCK, of the Town of Casco, County of Cumberland, and State of Maine, being the sole member and successor-in-interest of **MATT HANCOCK INTERNATIONAL, LLC,** a Maine Limited Liability Company originally duly organized and existing under the laws of the State of Maine, and subsequently duly dissolved on March 12, 2013 pursuant to a Plan of Complete Liquidation and Dissolution authorized by a meeting of its Members held in March, 2013,

for consideration paid,

grants to **MATT HANCOCK PROPERTIES, LLC,** a Maine Limited Liability Company with a mailing address of PO Box 295, Casco, ME 04015, and a principal place of business in the Town of Casco, County of Cumberland, and State of Maine,

with **QUITCLAIM COVENANTS,** a certain lot or parcel of land located in the Town of Windham, County of Cumberland, and State of Maine, more particularly bounded and described in the Exhibit A attached hereto.

IN WITNESS WHEREOF, I, **K. MATTHEW HANCOCK,** being the sole member of the aforesaid dissolved and liquidated Limited Liability Company known as **MATT HANCOCK INTERNATIONAL, LLC** has hereunto set my hand and seal this 6 day of June, 2016.

Witness

K. Matthew Hancock

STATE OF MAINE
Cumberland, ss.

June 6, 2016

Then personally appeared the above-named K. Matthew Hancock, Sole Successor and Member of Matt Hancock International, LLC, signor of the foregoing instrument, and acknowledged the signing of this instrument to be his respective free act and deed, individually, and in his capacity as shareholder of said dissolved corporation.

Before me, Melissa J. Palmer
Notary Public - Attorney-at-Law
Print Name: Melissa J. Palmer
My Commission Expires: 12/21/2020

SEAL

EXHIBIT A

A certain lot or parcel of land with the buildings thereon, situated on the northwesterly side of Chute Road, so-called, in the Town of Windham, County of Cumberland, State of Maine being more particularly bounded and described as follows:

Beginning at a 5/8 inch iron rod capped, "1313", found on the apparent northwesterly right-of-way limit of said Chute Road at the southeasterly corner of a parcel of land conveyed from Dorothy L. Ward to Ingrid D. Sardinha by a deed dated October 18, 1996 and recorded in Book 12779, Page 133 at the Cumberland County Registry of Deeds. Said rebar being located about 0.5 miles from the intersection of said Chute Road with River Road, so-called. Said rebar also being located about twenty-two (22) feet northwesterly from the center of said Chute Road at a point about sixty-seven (67) feet northeasterly of Central Maine Power Co. utility pole #17. Said rebar also marking the *Point of Beginning* of the first parcel of land conveyed from Edith M. Durant to Reginald I. and Edith M. Durant by a deed dated February 6, 1978 and recorded in Book 4172, Page 331 at the Cumberland County Registry of Deeds.

Thence from the Point of Beginning North 53 degrees, 49 minutes, 04 seconds West, along land now or formerly of Ingrid Sardinha (Book 12779, Page 131), a distance of two hundred fifty-three and sixty-three hundredths (253.63) feet to a 5/8 inch rebar capped, "1313".

Thence North 36 degrees, 08 minutes, 20 seconds East, along land now or formerly of Ingrid Sardinha (Book 12779, Page 131), a distance of eighty-two and thirty-nine hundredths (82.39) feet to a 5/8 inch rebar capped, "1313".

Thence North 35 degrees, 53 minutes, 43 seconds West, along land now or formerly of Ingrid Sardinha (Book 12779, Page 13), a distance of three hundred twenty-six and ninety-one hundredths (326.91) feet to a point to be marked with a 5/8 inch rebar.

Thence North 33 degrees, 31 minutes, 45 seconds East, along land now or formerly of Ingrid Sardinha (Book 12779, Page 132), a distance of two hundred forty-three and zero hundredths (243.00) feet to a 5/8 inch rebar capped, "1313".

Thence South 35 degrees, 52 minutes, 57 seconds East, along land now or formerly of Ingrid Sardinha (Book 12779, Page 133), a distance of one hundred twenty-nine and twenty-three hundredths (129.23) feet to a 5/8 inch rebar capped, "1313".

Thence North 33 degrees, 16 minutes, 47 seconds East, along land now or formerly of Paul and Sheila Blanchard (Book 18397, Page 115), a distance of two hundred and twenty-five hundredths (200.25) feet to a 5/8 inch rebar capped, "1313".

Thence South 35 degrees, 46 minutes, 41 seconds East, along land now or formerly of Paul and Sheila Blanchard (Book 18397, Page 115), a distance of twenty-nine and seventy-eight hundredths (29.78) feet to a 5/8 inch rebar capped, "1313".

Thence North 33 degrees, 16 minutes, 47 seconds East, along land now or formerly of Christopher and Lori Lord (Book 8550, Page 072), a distance of two hundred and zero hundredths (200.00) feet to a point to be marked with a 5/8 inch rebar.

Thence North 35 degrees, 52 minutes, 17 seconds West, along land now or formerly of John C. Jordan (Book 10519, Page 343), and land now or formerly of Michael Eichhorn (Book 15892, Pages 317 & 319) a distance of eight hundred twenty-six and seventy-two hundredths (826.72) feet to a 5/8 inch rebar found on the easterly line of land now or formerly of Fred Staples (Book 20767, Page 229).

Thence South 32 degrees, 56 minutes, 30 seconds West, along land now or formerly of Fred Staples (Book 20767, Page 229), a distance of eighty-two and seventy-four hundredths (82.74) feet to a two inch iron pipe.

Thence South 32 degrees, 55 minutes, 28 seconds West, along land now or formerly of Fred Staples (Book 20767, Page 229), a distance of three hundred and twenty-four hundredths (300.24) feet to a 1- 1/2-inch iron pipe.

Thence South 32 degrees, 54 minutes, 55 seconds West, along land now or formerly of Fred Staples (Book 20767, Page 229), a distance of two hundred ninety-nine and ninety-three hundredths (299.93) feet to a 1-1/4 inch iron pipe.

Thence South 32 degrees, 55 minutes, 22 seconds West, along land now or formerly of Fred Staples (Book 20767, Page 229), a distance of three hundred and twelve hundredths (300.12) feet to a one inch iron pipe.

Thence South 32 degrees, 55 minutes, 45 seconds West, along land now or formerly of Fred Staples (Book 20767, Page 229), a distance of three hundred one and twelve hundredths (301.12) feet to a point at or near the end of a stonewall. Said point to be marked with a 5/8 inch rebar.

Thence North 37 degrees, 05 minutes, 36 seconds West, along land now or formerly of Fred Staples (Book 20767, Page 229), and along the center of said stonewall, a distance of one hundred forty-seven and seventy-five hundredths (147.75) feet to a point at the end of said stonewall.

Thence North 35 degrees, 19 minutes, 55 seconds West, along land now or formerly of Fred Staples (Book 20767, Page 229), a distance of one hundred fifty and eighty-four hundredths (1 50.84) feet to a 1-1/4 inch iron pipe.

Thence North 36 degrees, 12 minutes, 13 seconds West, along land now or formerly of Phyllis Colby (Book 1971, Page 111), a distance of four hundred seventy and forty-eight hundredths (470.48) feet to a point to be marked with a 5/8 inch rebar.

Thence South 45 degrees, 37 minutes, 55 seconds West, along land now or formerly of Phyllis Colby (Book] 971, Page 111), a distance of eight hundred sixty-two and ninety-four hundredths (862.94) feet to the center of a 4 inch by 6 inch stone monument.

Thence South 35 degrees, 53 minutes, 03 seconds East, along land now or formerly of Colebrook Corp. (Book 18946, Page 340), a distance of one thousand two hundred eighty-three and ninety-eight hundredths (1283.98) feet to a drill hole in a field stone.

Thence South 32 degrees, 42 minutes, 25 seconds East, along land now or formerly of Clifford Plummer (Book 2570, Page 108), a distance of two hundred fifty-seven and seventy-one hundredths (257.71) feet to a 3/4 inch iron pipe.

Thence North 47 degrees, 06 minutes, 34 seconds East, along land now or formerly of Elizabeth Dube (Book 6230, Page 231), a distance of two hundred thirty-five and seventy-three hundredths (235.73) feet to a 1-1/2 inch iron pipe.

Thence South 55 degrees, 38 minutes, 38 seconds East, along land now or formerly of Elizabeth Dube (Book 6230, Page 231), a distance of seven hundred fifteen and eighty--nine hundredths (715.89) feet to a 3/4 inch iron rod found on the apparent northwesterly right-of-way limit of said Chute Road.

Thence North 25 degrees, 42 minutes, 17 seconds East, along the apparent northwesterly right-of-way limit of said Chute Road a distance of two hundred sixteen and forty-seven hundredths (216.47) feet to a point.

Thence North 18 degrees, 51 minutes, 58 seconds East, along the apparent northwesterly right-of-way limit of said Chute Road a distance of three hundred forty-six and fifty-one hundredths (346.51) feet to a point.

Thence North 31 degrees, 25 minutes, 30 seconds East, along the apparent northwesterly right-of-way limit of said Chute Road a distance of five hundred sixty-one and fifty-nine hundredths (561.59) feet to a 5/8 inch rebar capped, "1313" and the Point of Beginning.

All bearings are referenced to Maine State Grid West Zone NAD-83. Magnetic declination in 2006 being about 16 degrees, 12 minutes west.

All rebars to be set, will be capped, "PLS 1271".

The above-described parcel of land is subject to easements granted to Central Maine Power Company and New England Telephone and Telegraph. Said easements being recorded at the Cumberland County Registry of Deeds in Book 6884, Page 233 and Book 6103, Page 183, respectively.

Meaning and intending to convey the same premises conveyed to Matt Hancock International, LLC from Dorothy L. Ward, Personal Representative of the Estate of Edith M. Durant by deed dated March 3, 2006 and recorded in the Cumberland County Registry of Deeds in Book 23725, Page 141.

Received
Recorded Register of Deeds
Jun 15,2016 10:03:14A
Cumberland County
Nancy A. Lane

DURANT HOMESTEAD

RESTATED DECLARATION OF ESTABLISHMENT OF LOT OWNERS ASSOCIATION

This Restated Declaration dated as of the ___ day of _____, 2018 is made by Matt Hancock Properties, LLC, the Grantor herein, ("Matt Hancock Properties" or "Grantor") with a mailing address of: P.O. Box 295, Casco, ME 04015

WITNESSETH

WHEREAS, Matt Hancock Properties is the owner in fee simple of a certain parcel of land in the Town of Windham, Cumberland County, Maine as conveyed by a deed from Matt Hancock as the sole member and successor-in-interest to Matt Hancock International, LLC recorded in the Cumberland County Registry of Deeds at Book 33191, Page 124, and as shown on a survey plan entitled "Subdivision Plan of 'Durant Homestead Cumberland County Windham, Maine" prepared by Plisga and Day Land Surveyors. dated _____, 2018 and recorded in the Cumberland County Registry of Deeds on _____, 2018 as Plan #_____which said subdivision was approved by the Town of Windham Planning Board on _____, 2018 and by the Maine Department of Environmental Protection by Findings of Fact and Order signed by the Commissioner on _____, 2018 (hereinafter "the Property" or "the subdivision"); and

WHEREAS, the Grantor's predecessor in title, Matt Hancock International, LLC, recorded the Durant Homestead Declaration of Establishment of Lot Owners Association, such Declaration is recorded in the Cumberland County Registry of Deed at Book 25535, Page 151; and

WHEREAS, the Grantor's predecessor in title, Matt Hancock International, LLC, recorded the Durant Homestead Declaration of Restrictive Covenants in the Cumberland County Registry of Deeds at Book 25535, Page 140; and

WHEREAS the Grantor's predecessor in title, Matt Hancock International, LLC, recorded the First Amendment to Durant Homestead Declaration of Restrictive Covenants in the Cumberland County Registry of Deeds at Book 27075, Page 16; and

WHEREAS, no lots of the Durant Homestead were conveyed from the Grantor's predecessor in title prior to the Grantor taking title to the Property; and

WHEREAS the Grantor wishes to restate the Declaration of Establishment of the Durant Homestead Lot Owners Association; and

WHEREAS, the Restated Declaration of Restrictive Covenants for Durant Homestead of near or even date to be recorded in the Cumberland County Registry of Deeds provides that each

lot owner in Durant Homestead shall join a lot owners association (the "Association") which may be formed by the Grantor; and

WHEREAS, it is the intent of the Grantor that the Association be organized for the purpose of ownership, maintenance and control of the roads and rights-of-way in Durant Homestead and the common land and infrastructure of said subdivision located within Durant Homestead, and for the purpose of providing to the lot owners, their heirs, executors, administrators, successors or assigns, the means, organization, and financial ability to maintain and improve the Property; and

WHEREAS, pursuant to the Site Location of Development Law promulgated by the Maine Department of Environmental Protection, the Grantor has agreed to impose certain covenants and restrictions on the Buffer Areas as more particularly described in the Restated Declaration of Restrictive Covenants; and

WHEREAS, said Restated Declaration of Restrictive Covenants imposes upon the lot owners and upon the Lot Owners' Association to be formed the obligation of following the Maintenance Plan for the subdivision's infrastructure and for the inspection and maintenance of the Buffer Area as more particularly set forth in Exhibit A to said Restated Declaration of Restrictive Covenants.

NOW, THEREFORE, in consideration of the premises, except as otherwise set forth herein, the Grantor does hereby subject all of the lots in the subdivision to the following property restrictions, covenants, charges and assessments, all of which shall run with and bind all such lots within the development and shall be binding upon said Association and the lot owners and their successors and assigns:

ASSOCIATION RULES AND REGULATIONS

1. Subject to the terms of this section, each lot in Durant Homestead is subject to an annual maintenance charge or assessment. Said maintenance charge or assessment shall be paid to the Association. Any vacant lot owned by the Grantor or any builder who has purchased a vacant lot from the Grantor for the purposes of erecting a dwelling thereon shall pay a reduced annual maintenance charge and assessment equal to Ten Percent (10%) of the annual maintenance charge and assessment paid by lots with dwellings constructed thereon. Any such reduced maintenance charges and assessments shall cease upon the earlier of the lot becoming occupied, the termination of any construction thereon for a period of time greater than ninety (90) days, or the completion of any dwelling thereon. If required by law or upon consent by the Grantor, or for any other reasons, the Grantor is required to pay full annual maintenance charges and assessments on unoccupied lots, any builders who have purchased lots from the Grantor for the purpose of erecting a dwelling thereon shall likewise be required to pay full annual maintenance charges and assessments with respect to any such lots owned by them.

2. The annual assessments shall be set by the Association and may be increased or decreased by the Association. The Association may levy in any year a special assessment for the purpose of defraying the cost of any construction or reconstruction, unexpected repair or replacement, and shall further have the ability to set up a reserve account in advance for repair and replacement as may be determined by the Association.

3. Such charges or assessments collected by the Association shall be applied by said Association towards payment for taxes, insurance, charges incurred for maintenance, including snow removal, repair or improvement of any private roads and drainage improvements or common infrastructure serving said roads within the subdivision, and charges incurred for enforcing the covenants and lot owners' rights. The rights of the Association include but are not limited to the following:

a. To maintain, improve and repair any private roads, drainage improvements serving said roads within the subdivision, including but not limited to snow removal, and common subdivision infrastructure as described in the Maintenance Plan attached to the Restated Declaration of Restrictive Covenants for Durant Homestead

b. To enforce, either in its own name or in names of the lot owners, any or all property restrictions or covenants set forth in the Restated Declaration of Restrictive Covenants for Durant Homestead dated _____ and recorded in the Cumberland County Registry of Deeds in Plan File #_____, and in any deeds from Grantor to the lot owners. Provided, however, that this right of enforcement shall not serve to prevent the right of the owner or owners of any lot or lots to enforce such restrictive covenants in the event they or any one of them elects to do so.

4. If any person or entity obligated to pay an assessment levied by the Association fails to do so, the Association shall have a lien as provided in this Section 4, against the lot owned by such person or entity for the amount due and not paid plus interest from the date payment was due at the rate of twelve percent (12%) per annum, or at other such rate as may be set from time to time by the Association, plus all costs and expenses of collecting the unpaid amount, including reasonable attorney's fees. The lien may be foreclosed by the Association in the manner of foreclosure of mortgages on real estate in the State of Maine or by any other means presently or hereafter provided by law or in equity.

5. The owner or owners of a lot within the subdivision shall be a member of the Association and each such owner or owners shall be entitled to participate at meetings of the Association, provided nevertheless, there shall be allowed only one vote per lot. Upon transfer, conveyance or sale by any owner of his interest in a lot within the development, said owner's membership in the Association shall thereupon cease and terminate. Except as herein provided, the Association shall be the sole judge of the qualifications of its members and of their right to participate in and vote at its meetings. The fact of non-membership in the Association shall not

serve in any way to release or relieve the lot or lots owned by said owner from the assessment hereinabove provided for.

6. The Association shall have the right to make such reasonable rules and regulations and provide such means and employ such agents as will enable it adequately and properly to carry out the provisions of this Restated Declaration, subject to the limitations hereinabove and hereinafter set forth, and subject to the Bylaws of Durant Homestead Lot Owners Association, attached hereto as Exhibit A and incorporated herein.

7. All of the provisions of this Restated Declaration shall be deemed to be covenants running with the land and shall bind each lot owner, his heirs and assigns, and all parties claiming by, through or under them shall be taken to hold, agree and covenant with the Association, its successors in title and with each of them to conform to and observe all the terms and conditions herein contained.

8. The duration of the Association shall be for a term of thirty (30) years from the date this Restated Declaration of Establishment of Lot Owners Association is recorded, after which time all provisions of this Restated Declaration of Establishment of Lot Owners Association, as they may be amended, shall be automatically extended for successive periods of five (5) years unless an instrument signed by seventy-five percent (75%) of the lot owners has been recorded agreeing to terminate the Lot Owners Association as of a specified date following such recording date. In the event that the Association is abolished, the lot owners shall be responsible for all maintenance required of the Association pursuant to this Restated Declaration of Establishment of Lot Owners Association and the Restated Declaration of Restrictive Covenants.

8. The covenants and restrictions provided herein may be enforced by temporary injunctive relief without notice and preliminary and permanent injunctive relief by any court having jurisdiction in an action brought by the Association. Such relief may, in appropriate cases, include an order to take such affirmative steps as may be required to cure any violation of the restrictions herein. In addition to the foregoing, the Association may impose and collect a civil forfeiture of up to $100.00 per day for every day of violation, and any party maintaining a legal action to enforce these provisions shall, in addition to the other relief available, be entitled to recover reasonable attorney fees and costs of suit.

IN WITNESS WHEREOF, the said Matt Hancock Properties, LLC has caused this instrument to be signed and sealed by _____, its Member thereunto duly authorized, as of the date first written above.

Matt Hancock Properties, LLC

_____

_____

By:

Its: Member

STATE OF MAINE
Cumberland, ss. _____, 2018

Then personally appeared the above-named _____, Member of Matt Hancock Properties, LLC and acknowledged the foregoing instrument to be his free act and deed and the free act and deed of said Matt Hancock Properties, LLC

Before me,

_____
Notary Public – Attorney at Law

Print Name: _____

EXHIBIT A

BYLAWS

OF

DURANT HOMESTEAD LOT OWNERS ASSOCIATION

ARTICLE I

Articles of Incorporation, Office, Location, Seal and Section Headings

Section 1. Articles of Incorporation. The name of this corporation shall be as set forth in the Articles of Incorporation. References in these bylaws to the Articles of Incorporation shall mean this corporation's Articles of Incorporation as from time to time in effect. References in these bylaws to the Maine Nonprofit Corporation Act and to particular sections of said Act are to said Act and said sections as from time to time in effect.

Section 2. Office and Location. The registered office shall be that office specified in the Articles of Incorporation. This corporation is located in the State of Maine at that place specified in the Articles of Incorporation. The principal office and place of business of this corporation shall be at such place as the Board of Directors shall fix, and the corporation may have such other offices and places of business, both within and without the State of Maine as the Board of Directors may from time to time fix, or as the business of the corporation may from time to time require.

Section 3. Seal. The seal of this corporation shall be circular in form with the name of the corporation, the word "Maine" and the year of its incorporation so engraved on its face that it may be embossed on paper by pressure, provided that the Board of Directors may adopt a Maine common embossing-type seal or a wafer seal in any form in respect of any particular document or instrument, in which case such embossing-type or wafer seal affixed to such document or instrument shall be the corporate seal of this corporation thereon for all purposes provided by law.

Section 4. Section Headings. The headings of Articles and Sections in these bylaws are for convenience only, and shall not be taken into account in construing these bylaws.

Section 5. Purposes. The purposes of the corporation are to establish an association of lot owners for the government, operation and maintenance of the roads, rights of way, and any common land and infrastructure of said subdivision located in the premises known as DURANT HOMESTEAD in WINDHAM, Maine (the "Property") under the Restated Declaration of

Restrictive Covenants and Restated Declaration of Establishment of Lot Owners Association to be recorded in the Cumberland County Registry of Deeds (the "Declarations").

Section 6. Powers. In addition to all the powers, authority and responsibilities granted to or imposed upon this corporation by the laws of the State of Maine, specifically including those set forth or referred to in the Maine Non-Profit Corporation Act (the "Act") all of which the corporation shall have to the extent permitted by the law and by the Declarations, the corporation shall have the specific powers to:

A. Adopt and amend Bylaws and Rules and Regulations;

B. Adopt and amend budgets for revenues, expenditures and reserves, and to collect assessments for common expenses and service charges from owners;

C. Hire and terminate managers and other employees, agents, and independent contractors;

D. Institute, defend, or intervene in litigation or administrative proceedings in its own name on behalf of itself or two (2) or more owners on matters affecting the roads located in the Property (including without limitation the power to enforce the Declarations and these Bylaws) and the corporation shall be deemed to be the attorney in fact of each owner for such purposes;

E. Make contracts and incur liabilities;

F. Maintain, improve and repair any private roads, rights of way, and any common land and infrastructure of said subdivision including drainage improvements serving said roads within the Property;

G. Impose reasonable charges for the preparation of statements of unpaid common charges and assessments;

H. Provide for the indemnification of its officers and directors and maintain directors' and officers' liability insurance;

I. Exercise any other powers, rights and authority conferred by Declarations or Bylaws;

J. Exercise all other powers that may be exercised pursuant to the Maine Nonprofit Corporation Act.

The Board of Directors of the corporation shall manage the Property and exercise such powers on behalf of the corporation, subject to the terms of these Bylaws and the Declarations.

Section 7. Non-Profit Status. The corporation is not organized for profit and no property or profit thereof shall inure to the benefit of any person except in furtherance of the nonprofit-making purposes of the corporation or in the course of acquiring, constructing or providing management, maintenance and care of the Property, or by virtue of a rebate of excess membership dues, fees, assessments or common charges.

ARTICLE II

Members

Section 1. Eligibility. All owners of lots in DURANT HOMESTEAD subdivision shall automatically be and become, and by virtue of such ownership shall remain, members.

Section 2. Termination of Membership. A member shall cease to be a member upon any sale, transfer, or conveyance of his interest in and to his lot in DURANT HOMESTEAD.

Section 3. Voting Rights. Each member shall be allowed a single vote for each lot owned in DURANT HOMESTEAD. For purposes of this section, if a lot is owned jointly by two or more persons, whether tenants in common, joint tenants, or otherwise, the voting rights attaching to such lot may be exercised by any one of such persons or, if more than one attempts to exercise such rights, by a majority of those persons seeking to exercise such rights or by such person as a majority such persons may designate in writing to act on their behalf. The voting rights of lots owned by a corporation shall be exercised by the person designated by its Board of Directors, or by the shareholders in lieu thereof. The voting rights of any lot owned by or held in trust shall be exercised by the trustee or trustees thereof, and the voting rights of any lot held by an estate shall be exercised by the personal representative thereof or majority of them if more than one.

Section 4. Meetings of the Members. The annual meeting of the members shall be held annually each successive year and at such time and place as shall from time to time be fixed by the Board of Directors. Notice of the annual meeting shall state the place, date and hour of the meeting and shall be given by the President or the Secretary, or other office of the corporation, to each member entitled to vote at such meeting at least ten (10) and no more than fifty (50) days before the date of the meeting either personally, by telephone or by mail (at the last known address of such member appearing in the records of the corporation) or telefax. The members, at their annual meeting, shall elect a Board of Directors and shall undertake such other business as may be presented to the meeting by the Board of Directors. Special meetings of the members may be called by the Board, the President, or by any two Directors, or upon the request in writing of members owning one-third or more of the lots. The person or persons calling the special meeting shall fix the time and place hereof, and unless notice of the special meeting is waived as provided by law, notice of such special meeting shall be given by the President, Secretary, other officers of the corporation, or the person or persons calling the special meeting by to each member entitled to vote at such meeting either personally, by telephone or by mail (at the last known address of such member appearing in the records of the corporation) or telefax at least seven days prior to the date set for the meeting. The written notice of any special meeting

shall state the purpose or business to be transacted thereat, and no other business shall be transacted at such special meeting.

Section 5. Quorum and Vote Required. At any meeting of the Members, Members holding ***one third*** of the votes entitled to be cast on the matter to be voted upon represented in person or by proxy shall constitute a quorum. The Members present at a duly called for held meeting at which a quorum was once present may continue to do business and take action at the meeting notwithstanding the withdrawal of enough Members to leave less than a quorum. Any meeting may be adjourned from time to time by a majority of the votes cast upon the question, whether or not a quorum is present, and the meeting may be held as adjourned without further notice if the time and place to which it is adjourned is fixed and announced at such meeting. A majority of the votes to be cast at a meeting at which a quorum is present shall be the act of the Members unless the vote of a greater number is required by these bylaws or the Maine Nonprofit Corporation Act.

Section 6. Action by Consent. Any action required or permitted to be taken at a meeting of the Members may be taken without a meeting if all of the Members, sign written consents setting forth the action taken or to be taken, at any time before or after the intended effective date of such action. Such consents shall be filed with the minutes of Members' meetings and shall have, and may be stated by any officer of the corporation to have, the same effect as a unanimous vote or resolution of the Members at a legal meeting thereof. Any such action taken by unanimous written consents may, but need not be, set forth in such consents in the form of resolutions or votes.

ARTICLE III

Directors

Section 1. Number, Qualification and Term. The number of Directors shall be not less than three (3) and not more than five (5) persons as shall be fixed by the Board of Directors from time to time. The Directors shall be elected at the annual meeting and each director elected shall serve until the next succeeding annual meeting and until his successor shall have been elected and qualified. Any Director may be re-elected to the Board. The majority of the Directors must be year-round residents of the State of Maine with their full-time residence in the DURANT HOMESTEAD Subdivision. If there are not sufficient candidates to fulfill this requirement then the residency requirement is waived.

Section 2. Vacancies, Resignation and Removal. Any vacancy in the Board of Directors, including newly created Directorships created by increase in the number of Directors, may be filled by a majority of the Directors present at any meeting. Any Director may resign his office by delivering a written resignation to the President or Clerk. Directors may be removed from office in the manner prescribed by the Maine Nonprofit Corporation Act, including without limitation Section 704 thereof.

Section 3. Powers. The Board of Directors shall manage and control the business, property and affairs of the corporation. In the management and control of the business, property and affairs of the corporation, the Board of Directors is hereby vested with all of the powers and authority of the corporation itself, so far as not inconsistent with the Maine Nonprofit Corporation Act or other laws of the State of Maine, the Articles of Incorporation or these bylaws.

Section 4. Compensation and Expenses. Directors as such shall not receive any stated salaries for their services, but by resolution of the Board of Directors, a fixed sum and expenses of attendance, if any, may be allowed for attendance at each regular or special meeting of the Board; provided that nothing herein contained shall be construed to preclude any Director from serving the corporation in any other capacity and receiving compensation therefor.

ARTICLE IV

Meetings of the Board of Directors

Section 1. Annual Meeting. The annual meeting shall be held in the [third] quarter of each calendar year upon notice, or without notice, and at such time and place as shall from time to time be fixed by the Board of Directors. Unless otherwise specified by the Board, no notice of such annual meetings shall be necessary, except as otherwise provided by the Maine Nonprofit Corporation Act. The Board, at its annual meeting, shall elect a President who shall preside over all Board meetings and shall, together with the Secretary, prepare and be responsible for the agenda for all Board of Directors meetings.

Section 2. Regular Meetings. Regular meetings of the Board of Directors shall be held from time to time upon notice, or without notice, and at such time and place as shall from time to time be fixed by the Board. Unless otherwise specified by the Board, no notice of such regular meetings shall be necessary, except as otherwise provided by the Maine Nonprofit Corporation Act.

Section 3. Special Meetings. Special meetings of the Board of Directors may be called by the President or any two (2) Directors. The person or persons calling the special meeting shall fix the time and place thereof; provided that the location is within Cumberland County, Maine

Unless notice of a special meeting is waived in the manner prescribed by the Maine Nonprofit Corporation Act, notice of each special meeting of the Board of Directors shall be given by the Clerk, Secretary or the person or persons calling the special meeting. It shall be sufficient notice to a Director of a special meeting to send notice by mail at least 48 hours, or by telegram at least 24 hours, before the meeting addressed to him at his usual or last known business or residence address, or to give notice to him in person or by telephone at least 24 hours before the meeting. Neither the business to be transacted at, nor the purpose of, any regular or special meeting of the Board of Directors need be specified in the notice of the meeting, except as otherwise required by the Maine Nonprofit Corporation Act. The giving of notice of a special

meeting of the Board of Directors by the person or persons authorized to call the same shall constitute the call thereof.

Section 4. Attendance as Waiver of Notice. Attendance of a Director at any meeting shall constitute a waiver of notice of such meeting, except where a Director attends for the express purpose, stated at the commencement of the meeting, of objecting to the transaction of any business because the meeting is not lawfully called, noticed or convened.

Section 5. Quorum and Vote Required. At any meeting of the Directors, one-half (1/2) of the Directors then in office shall constitute a quorum for the transaction of business. The Directors present at a duly called for held meeting at which a quorum was once present may continue to do business and take action at the meeting notwithstanding the withdrawal of enough Directors to leave less than a quorum. Any meeting may be adjourned from time to time by a majority of the votes cast upon the question, whether or not a quorum is present, and the meeting may be held as adjourned without further notice if the time and place to which it is adjourned is fixed and announced at such meeting. The vote of a majority of the Directors present at a meeting at which a quorum is present shall be the act of the Board of Directors unless the vote of a greater number is required by these bylaws or the Maine Nonprofit Corporation Act. No Director shall be permitted to vote by proxy at a meeting of the Board.

Section 6. Action by Consent. Any action required or permitted to be taken at a meeting of the Directors, or of a committee of the Directors, may be taken without a meeting if all of the Directors, or all of the members of the committee, as the case may be, sign written consents setting forth the action taken or to be taken, at any time before or after the intended effective date of such action. Such consents shall be filed with the minutes of Directors' meetings or committee meetings, as the case may be, and shall have, and may be stated by any officer of the corporation to have, the same effect as a unanimous vote or resolution of the Board of Directors at a legal meeting thereof. Any such action taken by unanimous written consents may, but need not be, set forth in such consents in the form of resolutions or votes.

Section 7. Telephone Meetings. Members of the Board of Directors or of any committee designated thereby may participate in a meeting of the Board or of such committee by means of conference telephone or similar communications equipment by means of which all persons participating in the meeting can hear each other, and participating in a meeting in such manner by any member who does not object at the beginning of such meeting to the holding thereof in such manner shall constitute presence in person at such meeting.

ARTICLE V

Officers

Section 1. Number. The officers of the corporation shall be chosen by the Board of Directors and shall be a President, a Registered Agent as required by the Maine Nonprofit Corporation Act, who shall be a resident of Maine, a Secretary and a Treasurer. The Board of Directors may also elect one or more Vice-Presidents, (one of whom may be designated by the

Board of Directors as the Executive Vice-President), and one or more Assistant Secretaries and Assistant Treasurers.

Section 2. When Chosen. The Board of Directors at each annual meeting shall choose such officers, none of whom need be a member of the Board; but the Registered Agent need not be elected annually and shall hold office until the corporation changes its Registered Agent in the manner provided by the Maine Nonprofit Corporation Act.

Section 3. Additional Officers. The Board of Directors may appoint such other officers and agents as it shall deem necessary who shall hold their offices for such terms and shall exercise such powers and perform such duties as shall be determined from time to time by the Board of Directors.

Section 4. Compensation of Officers. The salaries of all officers of the corporation shall be fixed by the Board of Directors.

Section 5. Vacancies, Term and Removal. The officers of the corporation shall hold office until their successors are chosen and qualify. Any officer elected or appointed by the Board of Directors may be removed with or without cause at any time by the Board of Directors in the manner prescribed by the Maine Nonprofit Corporation Act, including without limitation Section 711 thereof. Any vacancy occurring in any office of the corporation may be filled by the Board of Directors.

Section 6. President. The President shall be the chief executive officer of the corporation, shall have the general and active management of the business of the corporation and shall see that all orders and resolutions of the Board of Directors are carried into effect.

Section 7. Vice-President. The Vice-President, if any, or if there shall be more than one, the Vice-Presidents in the order determined by the Board of Directors, shall, in the absence of or in the case of the disability of the President, perform the duties and exercise the powers of the President and shall perform such other duties and have such other powers as the Board of Directors may from time to time prescribe. If the Board of Directors shall appoint or elect an Executive Vice-President, it shall be presumed that he is the Vice-President determined by the Board of Directors to act in case of the absence or disability of the President.

Section 8. Secretary. The Secretary shall attend all meetings of the Board of Directors and record all the proceedings of the Board of Directors in a book kept for that purpose, and shall give notice of special meetings of the Board of Directors. The Secretary shall perform such other duties as may be prescribed by the Board of Directors or President, under whose supervision he shall be. He, or an Assistant Secretary, shall have authority to affix the corporate seal to any instrument requiring it and when so affixed, it may be attested by his signature or by the signature of such Assistant Secretary. The Board of Directors may give general authority to any other officer to affix the seal of the corporation and to attest the same. The Secretary shall have such other powers and duties as are prescribed by law or by the Board of Directors. In case of the absence of or disability of the Secretary, all of the powers of the Secretary may be

exercised by the Assistant Secretary, or if none, the President. Unless the Board determines otherwise, the Secretary shall also act as Registered Agent.

Section 9. Assistant Secretaries. The Assistant Secretary, or if there be more than one, the Assistant Secretaries, in the order determined by the Board of Directors, shall, in case of the absence or disability of the Secretary, perform the duties and exercise the powers of the Secretary and shall perform such other duties and have such other powers as the Board of Directors may from time to time prescribe.

Section 10. Treasurer. The Treasurer shall have the custody of the corporate funds and securities and shall keep full and accurate accounts of receipts and disbursements in books belonging to the corporation and shall deposit all moneys and other valuable effects in the name and to the credit of the corporation in such depositories as may be designated by the Board of Directors. He shall disburse the funds of the corporation as may be ordered by the Board of Directors, taking proper vouchers for such disbursements, and shall render to the President and the Board of Directors, at its regular meetings, or when the Board of Directors so requires, an account of all his transactions as Treasurer and of the financial condition of the corporation.

Section 11. Assistant Treasurers. The Assistant Treasurer, or, if there shall be more than one, the Assistant Treasurers, in the order determined by the Board of Directors, shall, in the absence of or in case of the disability of the Treasurer, perform the duties and exercise the powers of the Treasurer and shall perform such other duties and have such other powers as the Board of Directors may from time to time prescribe.

ARTICLE VI

Indemnification

Section 1. Basic Indemnification. Any person who was or is a party or is threatened to be made a party to any threatened, pending or completed action, suit or proceeding, whether civil, criminal, administrative or investigative, by reason of the fact that he is or was a Director, officer, employee or agent of the corporation, or is or was serving at the request of the corporation as a Director, officer, employee or agent of another corporation, partnership, joint venture, trust or other enterprise, shall be indemnified by the corporation against expenses, including attorneys' fees, judgments, fines and amounts paid in settlement actually and reasonably incurred by him in connection with such action, suit or proceeding; provided that no indemnification shall be provided for any person with respect to any matter as to which he shall have been finally adjudicated in any action, suit or proceeding not to have acted in good faith in the reasonable belief that his action was in the best interests of the corporation or, with respect to any criminal action or proceeding, had reasonable cause to believe that his conduct was unlawful. The termination of any action, suit or proceeding by judgment, order or conviction adverse to such person, or by settlement or a plea of nolo contendere or its equivalent, shall not of itself create a presumption that such person did not act in good faith in the reasonable belief that his action was in the best interests of the corporation, and, with respect to any criminal action or proceeding, had reasonable cause to believe that his conduct was unlawful.

Section 2. Other Provisions. Any provision of these bylaws to the contrary notwithstanding, to the extent that a Director, officer, employee or agent of the corporation has been successful on the merits or otherwise in defense of any action, suit or proceeding referred to in Section 1 above, or in defense of any claim, issue or matter therein, he shall be indemnified against expenses, including attorneys' fees, actually and reasonably incurred by him in connection therewith. Any such person may enforce the right of indemnification granted by these bylaws by a separate action against the corporation, if an order for indemnification is not entered by a court in the action, suit or proceeding in which he was successful on the merits or otherwise.

Any indemnification under Section 1 hereof, unless ordered by a court, shall be made by the corporation only as authorized in the specific case upon a determination that indemnification of the Director, officer, employee or agent is proper in the circumstances because he has met the applicable standard of conduct set forth in Section 1. Such determination shall be made by the Board of Directors by a majority vote of a quorum consisting of Directors who were not parties to such action, suit or proceeding, or if such a quorum is not obtainable, or even if obtainable, if a quorum of disinterested Directors so directs, by independent legal counsel in a written opinion. Any such determination, once made by the Board of Directors may not be revoked by the Board of Directors, and upon the making of such determination by the Board of Directors, the Director, officer, employee or agent may enforce the indemnification against this corporation by a separate action notwithstanding any attempted or actual subsequent action by the Board of Directors.

Expenses incurred in defending a civil or criminal action, suit or proceeding may be paid by the corporation in advance of the final disposition of such action, suit or proceeding as authorized by the Board of Directors in the manner hereinbefore provided, upon receipt of an undertaking by or on behalf of the Director, officer, employee or agent to repay such amount, unless it shall ultimately be determined that he is entitled to be indemnified by the corporation as authorized in these bylaws.

The indemnification provided in these bylaws for any person shall not be deemed exclusive of any other rights to which such person may be entitled under any other bylaw, agreement, vote of disinterested Directors or by the Maine Nonprofit Corporation Act or otherwise, both as to action in his official capacity and as to action in another capacity while holding such office, and shall continue as to any such person who has ceased to be a Director, officer, employee or agent and shall inure to the benefit of the heirs, executors and administrators of such person.

Section 3. Insurance. The Board of Directors may authorize the purchase and maintenance, at the expense of this corporation, of insurance on behalf of any person who is or was a Director, officer, employee or agent of this corporation, or is or was serving at the request of this corporation as a Director, officer, employee or agent of another corporation, partnership, joint venture, trust or other enterprise against any liability asserted against him and incurred by him in any such capacity, or arising out of his status as such, whether or not the corporation

would have the power to indemnify him against such liability under the provisions of the Maine Nonprofit Corporation Act, these bylaws or otherwise.

ARTICLE VII

Fiscal Year

Section 1. Fiscal Year. The fiscal year of the corporation shall be fixed by resolution of the Board of Directors.

ARTICLE VIII

Execution of Documents

Section 1. Execution of Documents. Unless the Board of Directors or executive committee shall otherwise generally or in any specific instance provide: (a) any bill, note, check, or negotiable instrument may be executed or endorsed in the name and on behalf of the corporation by the President or Treasurer, acting singly, and (b) any other instrument, documents, deeds, bills of sale or other writings of whatever nature shall be executed in the name and on behalf of the corporation by the President or the Treasurer, acting singly, and either officer may seal, acknowledge and deliver the same.

ARTICLE X

Dissolution

Section 1. Dissolution. In the event of the liquidation or dissolution of this corporation, the net assets of this corporation shall be distributed only to the members as their interests may appear.

ARTICLE XI

Amendments

Section 1. Amendments. The Members, by a two-thirds (2/3) vote of the Members present at any meeting, may alter, amend or repeal these bylaws, and adopt new bylaws, provided that the notice of any regular or special meeting at which such action is to be taken shall either set out the text of the proposed new bylaw, amendment or by law to be repealed, or shall summarize the changes to be effected by such adoption, amendment or repeal.

DURANT HOMESTEAD
RESTATED DECLARATION OF RESTRICTIVE COVENANTS

This Declaration dated as of the _____ day of _____, 2018 is made by Matt Hancock Properties, LLC, the Grantor herein, ("Matt Hancock Properties" or "Grantor") with a mailing address of: P.O. Box 295, Casco, ME 04015.

WITNESSETH

WHEREAS, Matt Hancock Properties is the owner in fee simple of a certain parcel of land in the Town of Windham, Cumberland County, Maine, as conveyed by a deed from Matt Hancock as the sole member and successor-in-interest Matt Hancock International, LLC, recorded in the Cumberland County Registry of Deeds at Book 33191, Page 124, and as shown on a survey plan entitled "Subdivision Plan of 'Durant Homestead Cumberland County Windham, Maine" prepared by Plisga & Day Land Surveyors. dated _____, 2018 and recorded in the Cumberland County Registry of Deeds on _____, 2018 as Plan #_____which said subdivision was approved by the Town of Windham Planning Board on _____, 2018 and by the Maine Department of Environmental Protection by Findings of Fact and Order signed by the Commissioner on _____, 2018 (hereinafter "the Property" or "the subdivision"); and

WHEREAS, the Grantor's predecessor in title, Matt Hancock International, LLC, recorded the Durant Homestead Declaration of Establishment of Lot Owners Association, such Declaration is recorded in the Cumberland County Registry of Deed at Book 25535, Page 151; and

WHEREAS, the Grantor's predecessor in title, Matt Hancock International, LLC, recorded the Durant Homestead Declaration of Restrictive Covenants in the Cumberland County Registry of Deeds at Book 25535, Page 140; and

WHEREAS, the Grantor's predecessor in title, Matt Hancock International, LLC, recorded the First Amendment to Durant Homestead Declaration of Restrictive Covenants in the Cumberland County Registry of Deeds at Book 27075, Page 16; and

WHEREAS, no lots of the Durant Homestead were conveyed from the Grantor's predecessor in title prior to the Grantor taking title to the Property; and

WHEREAS the Grantor wishes to restate the Declaration of Restrictive Covenants of the Durant Homestead Lot Owners Association; and

WHEREAS, the Restated Declaration of Establishment of the Durant Homestead Lot Owners Association of near or even date to be recorded in the Cumberland County Registry of Deeds provides that each lot owner in Durant Homestead shall join a lot owners association (the "Association"), which may be formed by the Grantor; and

WHEREAS, the Grantor of this Declaration wishes to control future development on the Property and to preserve and protect in perpetuity the appearance and features of the Property for the benefit of the lot owners, as shall be specified in this Declaration; and

WHEREAS, Declarant desires to place certain deed covenants over the portion of said real property depicted on the Plan as "FORESTED BUFFER," and "MEADOW BUFFER" (hereinafter referred to collectively as the "Buffer Areas"); and

WHEREAS, Declarant desires to place certain restriction, under the terms and conditions herein, over a portion of said real property (hereinafter referred to as the “Forested Buffer Area”) being that area on those portions of Lots 3, 7, 8, 14, 15, 16, 18, 24, 25, 26 and over such Open or Common Space as depicted on the Plan; and

WHEREAS, Declarant desires to place certain restrictions, under the terms and conditions herein, over a portion of said real property (hereinafter the “Meadow Buffer Area”) being that area on those portions of Lots 1, 2, and on such Open or Common Space as depicted on the Plan;

WHEREAS, pursuant to the Site Location of Development Law promulgated by the Maine Department of Environmental Protection, Declarant has agreed, in satisfaction of paragraph _____and Conditions _____ of the Order, to impose certain covenants and restrictions on the Buffer Areas as more particularly set forth in Paragraphs 20 and 21 of this Declaration and has agreed that such covenants and agreements may be enforced by the Maine Department of Environmental Protection (hereinafter the "MDEP") or any successor in interest; and

WHEREAS, Declarant desires to place certain other deed covenants over the Durant Homestead Subdivision above and beyond those relating to the Buffer Areas;

NOW THEREFORE, the Grantor does hereby declare that all of the lots and premises shown as Durant Homestead Subdivision on the above plan are conveyed subject to the DEP Order, the Plan and all matters depicted thereon, and to the following restrictive covenants, which shall be real covenants running with the land, not conditions or restraints on alienability, and shall be binding upon the Grantor herein, Matt Hancock Properties, LLC, and the future owners of said lots, their heirs, personal representatives, devisees, successors and assigns. These restrictive covenants are imposed upon the premises for the benefit of all of the lots shown on the above-mentioned Plan as well as for the benefit of the owners of said premises and lots, their heirs, personal representatives, devisees, successors and assigns. These restrictive covenants shall be enforceable either in law or in equity by the Grantor, the owner or owners of the premises or any lot contained therein, and their respective heirs, personal representatives, devisees, successors and assigns, but said parties shall not be required to enforce said restrictive covenants, which are as follows:

1. Each lot will be for residential use only. Seasonal rentals of single family homes shall be considered a residential use.

2. Only one single-family dwelling with one attached garage which must be built and one detached garage is permitted on any lot. No more than one additional small outbuilding, with a footprint not to exceed two hundred (200) square feet with a similar outside appearance as the principal structure shall be permitted on any single lot at any time. No outside fuel tanks are permitted unless they are completely covered by a frame structure attached to the residence and designed to visually blend with the residence. Garage doors facing the Subdivision Roads shall remain closed when not in use. Driveways shall be paved.

3. Each dwelling unit shall be limited to two stories and supported by a full perimeter foundation or frost walls. No homes having a living area of less than fifteen hundred (1,500) square feet shall be constructed or occupied. Cellars, whether finished or unfinished, porches, garages and decks shall not be considered living areas. Buildings must have a minimum of 8" wide gable end overhangs. All portions of a chimney visible from the exterior, if any, must be constructed of natural stone, cultured stone, or brick. House siding colors shall fit in with the natural surroundings.

4. Lighting causing unreasonable glare to abutting lots or property is prohibited. Mercury vapor or other high intensity lighting and upward lighting is not permitted. Any exterior lighting shall be shielded from other lots or abutting property and access roads. To preserve night skies or dark skies, lights shall not be directed skyward.

5. No mobile homes, double-wide trailers, house trailers, motor homes, camping trailers, tents and/or temporary residences of any kind shall be stored or constructed on the premises. This restriction shall not apply to small tents for play by children. A lot owner may park on its lot a camper trailer, travel trailer, recreational vehicle, or other similar vehicular accessory provided that it shall not be used as a temporary or permanent living quarters at any time.

6. No further Subdivision of any lot is allowed.

7. Until Grantor no longer owns any lot depicted on said Plan of "Durant Homestead," a hand-drawn sketch of the locations of the septic system, well, buildings and driveway will be submitted by the lot owner to the Grantor for approval prior to the beginning of all construction.

8. No more than twenty-five percent (25%) of the trees of the size of five inches (5") in diameter or larger, measured at breast height, shall be cut within any five (5) year period within a thirty (30) foot interior buffer zone from each lot's property lines, other than the property line on the driveway side of the lot. For the driveway side of the lot, in this thirty (30) foot buffer zone no more than fifty percent (50%) of the trees of the size of five inches (5") in diameter or larger, measured at breast height, shall be cut within any five (5) year period except for the purposes of construction of a driveway or for clearing and establishing a lawn. These 30-foot buffers are not to interfere with restrictions imposed on the Buffer Area designated by the State of Maine Department of Environmental Protection as provided in Paragraphs 20 and 21 of this Declaration. The stipulated Buffer Area therein takes precedence over the buffers specified in this paragraph.

9. No business or commercial activities shall be conducted on any lot. This prohibition is not to be construed to prohibit professional activities such as the practice of craft work, artistic endeavors, private office work or occupations that are conducted entirely from within living areas of a private residence as defined in paragraph 3 above. No business or commercial signs shall be allowed.

10. No animals, livestock or poultry of any kind or species shall be raised, bred or kept on any lot except that dogs, cats or other domestic pets may be kept provided they are not bred, kept or maintained for any commercial purpose, and further provided that no pit bulls shall be allowed on any lot. So as not to become noisome or offensive to other owners, a maximum of two (2) dogs shall reside per lot and a maximum of two (2) cats shall reside per lot. All pets shall be restrained according to local leash laws.

11. No dumping of garbage, rubbish, or other refuse or hazardous or toxic material shall be permitted on any lot.

12. No more than one unregistered motor vehicle will be allowed on any lot.

13. No rooftop antennas, satellite dishes larger than 18" in diameter, or communications towers of any kind are allowed.

14. Any building under construction shall be completed on the outside within one year from receipt of a plumbing permit.

15. Although it is the intention of the Grantor that the Durant Homestead Subdivision roads shown on said plan, to wit, Pennywhistle Drive, will meet the Town of Windham's standards for private roads, Grantor makes no warranty or assurance that the Town will ever accept the roads as Town roads. Said roads shall remain private roads unless and until a duly organized lot owners association successfully petitions the Town to accept the Road.

16. Each owner who is granted a lot in said Durant Homestead Subdivision is hereby granted a right of way to that owner's lot as depicted on said Plan, but the Grantor is not obligated to provide any maintenance to or for said right-of-way or for any part or feature of the Property. Said rights of way shall be in common with the Grantor and others. Each lot is further subject to a right of the lot owners association created under paragraph 17 hereunder to maintain any common infrastructure as shown on the Plan, including the right to access and maintain the stormwater control devices described in the Maintenance Plan attached hereto as Exhibit A and the Buffer Areas as defined in the Recitals to this Declaration.

17. Each lot owner shall join the lot owners' association, which may be formed by the Grantor, its successors and assigns, or other lot owners, for the purpose of owning, maintaining, and controlling Pennywhistle Drive in Durant Homestead, any common infrastructure, and the common land of said Subdivision. The lot owners' association shall be governed by the terms set forth on the recorded Subdivision plan, this Restated Declaration, and a Restated Declaration of Establishment of Lot Owners Association of near or recent date and its duly enacted bylaws and provisions.

18. The lot owners' association described in paragraph 17 shall become operational no later than at such point as fourteen (14) lots in Durant Homestead have been sold and the Grantor no longer owns a majority of the lots in the Subdivision, or two years past from the date of the sale of the first lot, whichever shall occur first. Each lot owner must be a member of said lot owner association. Until the lot owners' association is formed, all costs associated with maintaining the Subdivision's roads, rights-of-ways, and common land and infrastructure shall be handled as follows:

> Each lot owner shall contribute a proportionate share, based on the number of lots owned, of all costs of repairs, improvements, and maintenance of the roads and rights-of-way shown on said Plan and any common land or infrastructure. Said costs shall be personal obligations of each lot owner and may be assessed quarterly and enforced by notice of delinquency duly filed on the public land records by the Grantor. Notwithstanding the foregoing, Any vacant lot owned by the Grantor or any builder who has purchased a vacant lot from the Grantor for the purposes of erecting a dwelling thereon shall pay a reduced annual maintenance charge and assessment equal to Ten Percent (10%) of the

annual maintenance charge and assessment paid by lots with dwellings constructed thereon. Any such reduced maintenance charges and assessments shall cease upon the earlier of the lot becoming occupied, the termination of any construction thereon for a period of time greater than ninety (90) days, or the completion of any dwelling thereon. If required by law or upon consent by the Grantor, or for any other reasons, the Grantor is required to pay full annual maintenance charges and assessments on unoccupied lots, any builders who have purchased lots from the Grantor for the purpose of erecting a dwelling thereon shall likewise be required to pay full annual maintenance charges and assessments with respect to any such lots owned by them.

19. Each owner agrees to contribute to the Association, when formed, according to its rules and bylaws, and the Association shall have same right to enforce contributions as stated in the preceding paragraph. Said Grantor, and its successors and assigns, may transfer to such Association, and said Association shall accept title to all said roads and rights-of-way shown on said Plan, and any common land or infrastructure, and upon such transfer, the Association shall succeed to said Grantor's title, rights, liabilities, and duties therein. Said Association shall be responsible for the Subdivision infrastructure as provided in the "Maintenance Plan" attached hereto as Exhibit A. The President of the Association shall be responsible for overseeing, implementing and enforcing the “Maintenance Plan.” All lot owners agree to indemnify and hold harmless Grantor, its successors and assigns, from any liability arising out of the use of the road or rights-of-way shown on the Plan or use of the common land or infrastructure by any lot owner, his family, guests, or licensees.

In the event of breach of any of the above restrictive covenants, the Grantor, as the Declarant hereof, and its successors and assigns, may exercise any remedies at law or equity to enforce the terms of these restrictions or of any corporate by-laws and acts pursuant hereto, and all costs, including reasonable attorney fees, incurred by Grantor, its successors and assigns, in enforcing these restrictions shall be paid personally by the owner of the lot which is in violation of any provision of the Declaration, together with all other rights and remedies permitted by law, which may be enforced personally and in rem.

20. Special Covenants and Restrictions with Respect to Forested Buffer Area. Pursuant to the Stormwater Management Law, 38 M.R.S. Section 420-D and Chapter 500 of rules promulgated by the Maine Board of Environmental Protection ("Stormwater Management Rules"), Declarant has agreed to impose certain restrictions on the Forested Buffer Area as located on the Plan and more particularly set forth herein and has agreed that these restrictions may be enforced by the Maine Department of Environmental Protection or any successor (hereinafter the "MDEP"). Declarant hereby declares that the Forested Buffer Area is and shall forever be held, transferred, sold, conveyed, occupied and maintained subject to the conditions and restrictions set forth herein. The Restrictions shall run with the Forested Buffer Area and shall be binding on all parties having any right, title or interest in and to the Forested Buffer Area, or any portion thereof, and their heirs, personal representatives, successors, and assigns. Any present or future owner or occupant of the Forested Buffer Area or any portion thereof, by the acceptance of a deed of conveyance of all or part of the Covenant Area or an instrument conveying any interest therein, whether or not the deed or instrument shall so express, shall be deemed to have accepted the Forested Buffer Area subject to the Restrictions and shall agree to be bound by, to comply with and to be subject to each and every one of the Restrictions hereinafter set forth.

1) **Restrictions on Forested Buffer Area**. Unless the owner of the Forested Buffer Area, or any successors or assigns, obtains the prior written approval of the MDEP, the Forested Buffer Area

must remain undeveloped in perpetuity. To maintain the ability of the Forested Buffer Area to filter and absorb stormwater, and to maintain compliance with the Stormwater Management Law and the permit issued thereunder to the Declarant, the use of the Forested Buffer Area is hereinafter limited as follows.

a) No soil, loam, peat, sand, gravel, concrete, rock or other mineral substance, refuse, trash, vehicle bodies or parts, rubbish, debris, junk waste, pollutants or other fill material may be placed, stored or dumped on the Restricted Buffer Area, nor may the topography of the area be altered or manipulated in any way;
b) Any removal of trees or other vegetation within the Restricted Buffer Area must be limited to the following:

    i) No purposefully cleared openings may be created and an evenly distributed stand of trees and other vegetation must be maintained. An "evenly distributed stand of trees" is defined as maintaining a minimum rating score of 24 points in any 25 foot by 50 foot rectangle (1,250 square feet) area, as determined by the rating scheme in the following Point System Table:

Point System for Determining an Evenly Distributed Stand of Trees

Diameter of tree at 4 1/2 feet above ground level	Points
2 - 4 inches	1
4 - 8 inches	2
8 - 12 inches	4
>12 inches	8

    Where existing trees and other vegetation result in a rating score less than 24 points, no trees may be cut or sprayed with biocides except for the normal maintenance of dead, windblown or damaged trees and for pruning of tree branches below a height of 12 feet provided two thirds of the tree's canopy is maintained;

    ii) No undergrowth, ground cover vegetation, leaf litter, organic duff layer or mineral soil may be disturbed except that one winding path, that is no wider than six feet and that does not provide a downhill channel for runoff, is allowed through the area;

c) No building or other temporary or permanent structure may be constructed, placed or permitted to remain on the Restricted Buffer Area, except for a sign, utility pole (whether constructed of wood, steel or other materials) and appurtenant equipment such as guys and guy anchors, or fence;

d) No trucks, cars, dirt bikes, ATVs, bulldozers, backhoes, or other motorized vehicles or mechanical equipment may be permitted on the Restricted Buffer Area.

21. Special Covenants and Restrictions with Respect to Meadow Buffer Area. Pursuant to the Stormwater Management Law, 38 M.R.S. Section 420-D and Chapter 500 of rules promulgated by the Maine Board of Environmental Protection ("Stormwater Management Rules"), Declarant

has agreed to impose certain restrictions on the Meadow Buffer Area as more particularly set forth herein and has agreed that these restrictions may be enforced by the Maine Department of Environmental Protection or any successor (hereinafter the "MDEP"). The Declarant hereby declares that the Meadow Buffer Area is and shall forever be held, transferred, sold, conveyed, occupied and maintained subject to the conditions and restrictions set forth herein. The Restrictions shall run with the Meadow Buffer Area and shall be binding on all parties having any right, title or interest in and to the Meadow Buffer Area, or any portion thereof, and their heirs, personal representatives, successors, and assigns. Any present or future owner or occupant of the Meadow Buffer Area or any portion thereof, by the acceptance of a deed of conveyance of all or part of the Covenant Area or an instrument conveying any interest therein, whether or not the deed or instrument shall so express, shall be deemed to have accepted the Meadow Buffer Area subject to the Restrictions and shall agree to be bound by, to comply with and to be subject to each and every one of the Restrictions hereinafter set forth.

1) **Restrictions on Meadow Buffer Area**. Unless the owner of the Meadow Buffer Area, or any successors or assigns, obtains the prior written approval of the MDEP, the Meadow Buffer Area must remain undeveloped in perpetuity. To maintain the ability of the Meadow Buffer Area to filter and absorb stormwater, and to maintain compliance with the Stormwater Management Law and the permit issued thereunder to the Declarant, the use of the Meadow Buffer Area is hereinafter limited as follows.

    a) No soil, loam, peat, sand, gravel, concrete, rock or other mineral substance, refuse, trash, vehicle bodies or parts, rubbish, debris, junk waste, pollutants or other fill material will be placed, stored or dumped on the Meadow Buffer Area, nor may the topography or the natural mineral soil of the area be altered or manipulated in any way;

    b) A dense cover of grassy vegetation must be maintained over the Meadow Buffer Area, except that shrubs, trees and other woody vegetation may also be planted or allowed to grow in the area. The Meadow Buffer Area may not be maintained as a lawn or used as a pasture. If vegetation in the Meadow Buffer Area is mowed, it may be mown no more than two times per year.

    c) No building or other temporary or permanent structure may be constructed, placed or permitted to remain on the Meadow Buffer Area, except for a sign, utility pole or fence (whether constructed of wood, steel or other materials) and appurtenant equipment such as guys and guy anchors;

    d) No trucks, cars, dirt bikes, ATVs, bulldozers, backhoes, or other motorized vehicles or mechanical equipment may be permitted on the Meadow Buffer Area, except for vehicles used in mowing;

    e) Any level lip spreader directing flow to the Meadow Buffer Area must be regularly inspected and adequately maintained to preserve the function of the level spreader.

    f) Any activity on or use of the Meadow Buffer Area inconsistent with the purpose of these Restrictions is prohibited. Any future alterations or changes in use of the Meadow Buffer Area must receive prior approval in writing from the MDEP. The MDEP may approve such alterations and changes in use if such alterations and uses do not impede the stormwater control and treatment capability of the Meadow Buffer Area or if adequate and appropriate alternative means of stormwater control and treatment are provided.

22. Enforcement. The MDEP may enforce any of the Restrictions set forth in Paragraphs 20 and 21 above.

23. Binding Effect. The restrictions set forth herein shall be binding on any present or future owner of the Buffer Areas. If a Buffer Area is at any time owned by more than one owner, each owner shall be bound by the foregoing restrictions to the extent that any of the Buffer Areas are included within such owner's property.

24. Amendment. Any provision contained in this Declaration may be amended or revoked only by the recording of a written instrument or instruments specifying the amendment or the revocation signed by the owner or owners of the Buffer Areas and by the MDEP.

25. Effective Provisions of Declaration. Each provision of this Declaration, and any agreement, promise, covenant and undertaking to comply with each provision of this Declaration, shall be deemed a land use restriction running with the land as a burden and upon the title to the Buffer Areas.

IN WITNESS WHEREOF, the said Matt Hancock Properties, LLC, has caused this instrument to be signed and sealed by _____, its Member thereunto duly authorized, as of the date first written above.

Matt Hancock Properties, LLC

_____ _____

By:
Its: Member

STATE OF MAINE
Cumberland, ss. _____, 2018

Then personally appeared the above-named _____, Member of Matt Hancock Properties, LLC, and acknowledged the foregoing instrument to be his free act and deed and the free act and deed of said Matt Hancock Properties, LLC.

Before me,

_____
Notary Public – Attorney at Law

Print Name: _____

Exhibit A

SCALE: 1"= 100'

100' 0 100' 200' 300' 400'

North

Symbols Legend

- Iron rod set
- Iron pipe found
- Iron rod/bolt found
- Granite/concrete monument
- Wood post
- Utility pole
- Guy/anchor
- Overhead wires
- Edge pavement/gravel
- Property line

Lands n/f of
Anita Lampron
Volume 32067, Page 271
Tax Map 6 - Lot 38E

Lands n/f of
Fred A. Staples
Volume 20767, Page 228
Tax Map 6 - Lot 29

Lands n/f of
Michael R. Eichhorn
Volume 29316, Page 162
Tax Map 6 - Lot 26C-2

Lands n/f of
Kenneth & Brenda S. Jordan
Volume 3997, Page 126
Tax Map 6 - Lot 26C

Lands n/f of
Christopher H. & Lori L. Lord
Volume 8550, Page 72
Tax Map 6 - Lot 25C

Lands n/f of
Paul S. Blanchard & Sheila Snow
Volume 18397, Page 115
Tax Map 6 - Lot 25D

Lands n/f of
Ingrid D. Sardinha
Volume 12779, Page 133
Tax Map 6 - Lot 25B

Lands of
Matt Hancock Properties, Inc.
Volume 33191, Page 124
Tax Map 6 - Lot 25

Parcel Area
65.55 acres

Lands n/f of
River's Edge Common Land
Volume 18946, Page 340
Plan Book 203, Page 105
Tax Map 6 - Lot 42

River's Edge Subdivision - Common Open Space
See plan reference a.

Lands n/f of
Lillian M. Plummer
Volume 29006, Page 147
Tax Map 3 - Lot 18

Lands n/f of
John A. & Claire H. Streeter
Volume 8501, Page 223
Tax Map 3 - Lot 22A

Lands n/f of
Elizabeth W. Dube
Volume 6230, Page 231
Tax Map 6 - Lot 25A

Chute Road
(see Note 5)

No. 6 rebar PLS 1271 found
N 45°37'55" E 4.0' from corner
S 45°37'55" W 862.94'
Granite monument found
S 35°53'03" E 1283.98'
Drill hole in stone found
S 32°42'25" E 257.71'
1"Ø Iron rod found
N 47°06'34" E 235.73'
1½"Ø Iron pipe found
S 55°38'38" E 715.89'
¾"Ø Iron rod found
N 25°42'17" E 216.47'
N 18°51'58" E
346.51'
Pole easement
Volume 6103, Page 183
(assumed location)
N 31°25'30" E 561.59'
Pole easement
Volume 6884, Page 233
N 53°49'04" W 253.63'
No. 6 rebar found
PLS 1313
82.39'
N 36°09'20" E
No. 5 rebar found
N 33°31'45" E 243.00'
No. 6 rebar found
PLS 1271
No. 6 rebar found
PLS 1313
129.23'
S 35°52'57" E
N 33°16'47" E 200.25'
29.78'
S 35°46'41" E
See plan reference c.
No. 5 rebar found
N 33°16'47" E 200.00'
No. 6 rebar found
PLS 1313
N 35°52'17" W 826.72'
See plan reference b.
No. 5 rebar found
N 36°12'13" W 470.48'
1¼"Ø pipe found
N 35°19'55" W
150.84'
Stonewall (typ)
N 37°05'36" W
147.75'
S 32°55'45" W 301.12'
S 32°55'22" W 300.12'
1¼"Ø iron pipe found
No. 5 rebar found
2"Ø pipe found
82.74'
S 32°56'30" W
S 32°55'28" W 300.24'
1½"Ø pipe found
No. 6 rebar found
PLS 1271?
S 32°54'55" W 299.93'
No. 6 rebar found
PLS 1271
1¼"Ø iron pipe found
N 35°53'43" W 326.91'
Treeline (typ)
See plan reference c.

Notes:

(1) Documents referenced on this plan are recorded in the Cumberland County Registry of Deeds unless otherwise noted.

(2) Bearings are oriented to Grid North of the Maine State Coordinate System, West Zone, NAD 83.

(3) Reference is made to the following plans:

a. Subdivision Plan of River's Edge Subdivision, River Road, Windham, Maine for Colebrook Corporation by Sebago Technics dated September 24, 2002 recorded in Plan Book 203, Page 105.

b. Property Plan, Chute Road, Windham, Maine made for Kenneth Jordan by Robert P. Titcomb, Inc. dated April 22, 1980 recorded in Plan Book 126, Page 37.

c. Plan Showing a Standard Boundary Survey made for Edith M. Durant located on the northwesterly sideline of the Chute Road, Windham, Maine by Bruce R. Bowman, Inc. dated July 29, 1992 recorded in Plan Book 192, Page 189.

d. Plan of Property for Peter Kluchnik, Webb Road, South Windham, Maine by Land Use Consultants, Inc. dated January 19, 1977 recorded in Plan Book 116, Page 22.

(4) The premises is subject to utility easements conveyed to Central Maine Power Co. and New England Telephone and Telegraph Company as described in Volume 6103, Page 183 and Volume 6884, Page 233. See plan for approximate locations.

(5) Chute Road (f.k.a. Wyer Ledge Road) right of way is depicted hereon based on geometry contained within the description of the subject premises in Volume 33191, Page 124. No additional road research was conducted.

(6) Reference is made to the subdivision plan of the subject premises by Main-Land Development Consultants, Inc. approved September 24, 2007 recorded in Plan Book 207, Page 635 and the subsequent Vacancy and Termination Order dated October 22, 2012 recorded in Volume 30081, Page 168.

(7) Planimetric detail as provided by Aerial Survey & Mapping, Norridgewock, Maine.

PLISGA & DAY
LAND SURVEYORS
72 MAIN STREET
BANGOR, MAINE
DATE: June 15, 2018
PROJ. NO. 17010
Email: info@WeMapIt.com
Phone: (207) 947-0019
Toll-Free: 1-800-734-0019
DRAWING FILE: 17010.dwg
www.WeMapIt.com

Survey Standard:

These plans were prepared from information obtained by a survey conforming substantially to the requirements of Technical Standards contained in Chapter 90, Part 2, of the Rules of the Board of Licensure for Professional Land Surveyors, effective April 1, 2001. Monuments not set at all angle points. Records research conducted from 2006 to the present.

Adam N. Robinson, Maine Licensed
Professional Land Surveyor No. 2361

STATE OF MAINE
ADAM N. ROBINSON
NO. 2361
PROFESSIONAL LAND SURVEYOR

Survey Plan
property of
Matt Hancock Properties, LLC
Cumberland County Registry of Deeds
Volume 33191, Page 124
Chute Road - Windham, Maine

Notes:

(1) Documents referenced on this plan are recorded in the Cumberland County Registry of Deeds unless otherwise noted.

(2) Bearings are oriented to Grid North of the Maine State Coordinate System, West Zone, NAD 83.

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(7) Planimetric detail as provided by Aerial Survey & Mapping, Norridgewock, Maine.

(8) For source of title see deed to Matt Hancock Properties, Inc. recorded in Volume 33191, Page 124. Subject premises is identified by th e Town of Windham as Tax Map 6, Lot 25.

(9) Total area subdivided equals 65.55 acres.

Planning Board Approval

This is to certify that after reviewing the subdivision shown by this plan and considering each of the criteria set forth in 30-A M.R.S.A. § 4404, as amended, and considering each of the criteria set forth in the subdivision ordinance of the Town of Windham, the undersigned having made findings of fact establishing that the proposed subdivision meets all of the criteria set forth therein, and therefore the subdivision is approved.

Dated: _____

The Town of Windham Planning Board

STATE OF MAINE
CUMBERLAND, ss, REGISTRY OF DEEDS
Received _____
at ____ h____ m __M, and recorded
in Plan File _____
ATTEST:
_____
REGISTER

Curve Table

Curve	Radius	Arc length	Chord bearing	Chord length
C1	60.00'	78.03'	N 18°23'20" W	72.64'
C2	275.00'	199.38'	N 34°52'25" W	195.04'
C3	205.00'	45.63'	N 07°43'34" W	45.54'
C4	205.00'	202.93'	N 27°00'36" E	194.75'
C5	155.00'	105.43'	N 35°52'59" E	103.41'
C6	205.00'	68.90'	N 26°01'32" E	68.57'
C7	6.00'	5.24'	N 10°38'31" E	5.07'
C8	6.00'	11.56'	S 69°34'18" E	9.85'
C9	205.00'	66.26'	N 64°29'09" E	65.97'
C10	57.00'	228.81'	S 08°44'43" W	103.32'
C11	11.27'	7.08'	N 75°24'44" W	6.97'
C12	155.00'	155.14'	S 45°04'17" W	148.75'
C13	205.00'	139.44'	S 35°52'59" W	136.76'
C14	125.00'	123.74'	S 27°00'36" W	118.75'
C15	155.00'	34.50'	S 07°43'34" E	34.43'
C16	225.00'	163.13'	S 34°52'25" E	159.58'
C17	60.00'	110.47'	N 71°36'40" E	95.51'

Net Residential Density:
Total acreage of project site = 65.55 acres
Acreage of slopes greater than 25% = 0.91 acres
Acreage of wetlands = 12.73 acres
Potential wetland impact = 0.33 acres
Road rights-of-way = 3.38 acres
Land in the 100 year flood zone = 0 acres
Net residential area = 48.53 acres
Net residential density = 60,000 sf
Subdivision lots allowed = 35.23

SCALE: 1"= 100'

100' 0 100' 200' 300' 400'

Mag North
Decl 15° 18'
Grid North

Symbols Legend

- Iron rod set
- Iron pipe found
- Iron rod/bolt found
- Granite/concrete monument
- Wood post
- Utility pole
- Guy/anchor
- Overhead wires
- Edge pavement/gravel
- Property line

Granite monument found

S 45°37'55" W 862.94'

Lands n/f of
Anita Lampron
Volume 32067, Page 271
Tax Map 6 - Lot 38E

No. 6 rebar PLS 1271 found
N 45°37'55" E 4.0' from corner

N 38°12'13" W 470.48'

Lands n/f of
Anita Lampron
Volume 32067, Page 271
Tax Map 6 - Lot 38E

Lands n/f of
River's Edge Common Land
Volume 18946, Page 340
Plan Book 203, Page 105
Tax Map 6 - Lot 42

River's Edge Subdivision - Common Open Space
See plan reference a.

S 35°53'03" E 1288.98'

Lands of
Matt Hancock Properties, Inc.
Volume 33191, Page 124
Tax Map 6 - Lot 25

Open Space

1¼"Ø pipe found

N 35°19'05" W 150.84'

Stonewall (typ)

N 37°05'36" W 147.76'

No. 5 rebar found

See plan reference d.

Lands n/f of
Fred A. Staples
Volume 20767, Page 228
Tax Map 6 - Lot 29

S 32°55'45" W 301.12'

1¼"Ø iron pipe found

N 32°55'22" E 249.83'

1¼"Ø iron pipe found

47.72'

86.37'

No. 6 rebar found
PLS 1271

N 32°54'54" E 213.57'

1¼"Ø pipe found

35.24'

68.79'

2"Ø pipe found

N 32°55'28" E 196.21'

N 32°56'30" E 82.74'

No. 5 rebar found

Drill hole in stone found

Lands n/f of
Lillian M. Plummer
Volume 29006, Page 147
Tax Map 3 - Lot 18

S 32°42'25" E 457.71'

1"Ø Iron rod found

N 47°06'34" E 235.73'

Lands n/f of
John A. & Claire H. Streeter
Volume 8501, Page 223
Tax Map 3 - Lot 22A

1½"Ø Iron pipe found

Lands n/f of
Elizabeth W. Dube
Volume 6230, Page 231
Tax Map 6 - Lot 25A

N 14°06'12" W 53.92'

383.42'

112.29'

Open Space

Open Space

Open Space

BURMAN
LAND & TREE COMPANY, LLC.

P.O. Box 145, Orrington, ME 04474 (207) 825-4050

17-005
July 13, 2018

Matt Hancock Properties
Attention: Matt Hancock
P.O. Box 295
Casco, ME04015

Subject: Preliminary Soil Site Evaluation Report
Durant Homestead
Chute Road
Windham, Maine

Dear Matt,

We are pleased to present the findings of our Preliminary Soil Site Evaluation services for the proposed Durant Homestead subdivision on Chute Road (Town of Windham Tax Map 6, Lot 25) in Windham, Maine. The purpose of our services was to assess each of the proposed 26 lots for suitability for subsurface wastewater disposal for a typical 3-bedroom residence, as per the Maine Subsurface Wastewater Disposal Rules[1], and applicable portions of the Maine Department of Environmental Protection (MDEP) Site Location of Development Act (Site Law). The subdivision design was conducted by Acheron Engineering, Inc.

This Report is subject to the Limitations attached in Appendix A. Appendix B contains a Site Location Map and Preliminary Soil Site Evaluation Plan. Appendix C contains a Soil Conditions Summary Table (Form E) and test pit logs (Form F).

We understand that this Report will be submitted to the MDEP as part of a Site Law permit application prepared by Acheron Engineering for the proposed development. This report is intended to be used in conjunction with the Soil Solutions Preliminary Soil Evaluation report and the MAI Environmental nitrate-nitrogen report.

[1] State of Maine. Subsurface Wastewater Disposal Rules, 10-144 Chapter 241. Department of Health and Human Services, Maine Center for Disease Control & Prevention, Division of Environmental Health. Effective August 03, 3,2015.

William H. Burman
Licensed Professional Forester
Master Arborist
Master Pesticide Applicator

Aleita M. Burman
Certified Wetland Scientist
Certified Soil Scientist
Licensed Site Evaluator

Scope of Work and Methodology

Soil Solutions conducted preliminary soil site evaluation services on a preliminary 26-lot subdivision layout in June of 2017, as reported on August 09, 2017. MAI Environmental conducted a nitrate-nitrogen impact assessment on the preliminary lot layout, and based on their findings, a new layout was designed (Acheron Engineering) requiring additional preliminary soil site evaluation services. Burman Land & Tree, LLC conducted the additional preliminary soil site evaluation services on the new lot layout on June 12, 13 and 22, 2018. The Preliminary Soil Site Evaluation Plan shows the explorations of both Soil Solutions and Burman Land & Tree, LLC, and the Soil Conditions Summary Table (Form E) includes both companies test pits as the lot numbers changed since Soil Solutions services.

Soil Solutions evaluated 54 hand-dug test pits on the site, of which 15 were applicable to the final lot layout. Burman Land & Tree, LLC evaluated 37 hand-dug test pits, 4 auger borings, and 3 excavator-dug test pits on the site, all of which were applicable to the final lot layout. Test pits are marked in the field with labeled orange flagging.

Our preliminary soil site evaluation services were conducted in general accordance with the soil suitability and setback sections of the Maine Subsurface Wastewater Disposal Rules. Our services also included collection and reporting of information required for a Site Law permit application, including Forms E and F, additional explorations in certain soil conditions; and a site plan that includes additional information such as location of proposed wells, existing wells within 300 feet of the proposed development, and depiction of approximate fill extensions where the slopes are 10% or greater. Also included are minimum areas of suitable soils at each suitable leachfield location, as per a requirement of the Town of Windham.

Findings and Recommendations

Based on the findings of Burman Land & Tree, LLC and the reported findings of Soil Solutions, there is a suitable area for a subsurface wastewater disposal leachfield for a 3-bedroom residence on each of the 26 proposed lots, at the locations indicated on the attached Preliminary Soil Site Evaluation Plan, in conformance with the Subsurface Wastewater Disposal Rules. Table 1, below, provides details of the findings with examples of systems that could potentially be designed on each lot.

TABLE 1 – Summary of Findings				
Lot #	**Soil Profile/Condition**	**Type of System**	**SSWWDS Size**	**Area of Suitable Soils (minimum)**
1	8 AIII / C	35 Quick 4 Hi-Cap Plastic Chambers	30.41'L X 27'W	32' X 32'
2	8 AIII / C	35 Quick 4 Hi-Cap Plastic Chambers	30.41'L X 27'W	32' X 32'
3	8D	35 Quick 4 Hi-Cap Plastic Chambers	30.41'L X 27'W	32' X 32'
4	8D	35 Quick 4 Hi-Cap Plastic Chambers	30.41'L X 27'W	32' X 32'
5	8D	35 Quick 4 Hi-Cap Plastic Chambers	30.41'L X 27'W	32' X 32'
6	8D	35 Quick 4 Hi-Cap Plastic Chambers	30.41'L X 27'W	32' X 32'
7	2C	28 Quick 4 Hi-Cap Plastic Chambers	30.41'L X 21'W	32' X 32'
8	3 AIII / C	28 Quick 4 Hi-Cap Plastic Chambers	30.41'L X 21'W	32' X 32'
9	3C	28 Quick 4 Hi-Cap Plastic Chambers	30.41'L X 21'W	32' X 32'
10	8C	35 Quick 4 Hi-Cap Plastic Chambers	30.41'L X 27'W	32' X 32'
11	3 AIII / D	28 Quick 4 Hi-Cap Plastic Chambers	30.41'L X 21'W	32' X 32'
12	8C	35 Quick 4 Hi-Cap Plastic Chambers	30.41'L X 27'W	32' X 32'
13	8 AIII / C	24 Eljen In-Drain B43 Modules	25.5'L X 16.5'W	32' X 32'
14	8D	24 Eljen In-Drain B43 Modules	25.5'L X 16.5'W	32' X 32'
15	8D	35 Quick 4 Hi-Cap Plastic Chambers	30.41'L X 27'W	32' X 32'
16	8 AIII / D	24 Eljen In-Drain B43 Modules	25.5'L X 16.5'W	32' X 32'
17	8D	24 Eljen In-Drain B43 Modules	25.5'L X 16.5'W	32' X 32'
18	8C	35 Quick 4 Hi-Cap Plastic Chambers	30.41'L X 27'W	32' X 32'
19	8 AIII / D	35 Quick 4 Hi-Cap Plastic Chambers	30.41'L X 27'W	32' X 32'
20	8 AIII / D	35 Quick 4 Hi-Cap Plastic Chambers	30.41'L X 27'W	32' X 32'
21	8 AIII / D	35 Quick 4 Hi-Cap Plastic Chambers	30.41'L X 27'W	32' X 32'
22	8 AIII / D	35 Quick 4 Hi-Cap Plastic Chambers	30.41'L X 27'W	32' X 32'
23	8 AIII/C	35 Quick 4 Hi-Cap Plastic Chambers	30.41'L X 27'W	32' X 32'
24	8D	35 Quick 4 Hi-Cap Plastic Chambers	30.41'L X 27'W	32' X 32'
25	3 AIII / C	28 Quick 4 Hi-Cap Plastic Chambers	30.41'L X 21'W	32' X 32'
26	8D	35 Quick 4 Hi-Cap Plastic Chambers	30.41'L X 27'W	32' X 32'

Please note that the system type, configuration, and design will be as per the determination of the Licensed Site Evaluator who designs the system. Smaller system examples were given on Lots 13, 14, 16 and 17 to create smaller footprints with smaller fill extensions to avoid and minimize alteration of nearby wetlands. System requirements would also include a 1000 gallon (minimum) septic tank between the house and leachfield.

Please also note that the area of Lots 20, 21 and 22 was recently graded and was the location of previous residences and associated parking/lawn areas. This area has

compaction in the upper soil layers. The area of the Lot 20 bed is also within and adjacent to an existing gravel driveway and is also compacted for this reason. Based on nearby test pits, the compaction does not reflect natural conditions at the site. It is recommended that the compact soils in the leachfield footprints and fill extensions in these lots be removed and replaced with suitable backfill to the depth of compaction. The backfill should be tilled into the original soil to a 6-inch depth in the leachfield footprint and fill extensions to form a transitional horizon.

Based on review of the MDEP Chapter 376: Soil Types Standard of the Site Location Law, Lots 1, 2, 17, 18, 20, 21, and 22 do not meet the minimum lot size as indicated on Table A. According to the standard, "*Lots smaller than the minimum area specified in Table A may be allowed if a developer can present evidence that, because of unique characteristics of the site, or because of an innovative and acceptable method of on-lot sewage disposal, the minimum lot size requirement should not apply*." This preliminary soil site evaluation report, in conjunction with the MAI Environmental nitrate-nitrogen impact assessment, finds that there are acceptable locations on each lot for leachfields for typical 3-bedroom residential dwellings. While this is not a "unique characteristic" of the site, it does show that the development is suitable for the site from a wastewater perspective. If, during their review of the Site Law Application and this Report, the MDEP requires additional measures, we recommend that wastewater pre-treatment systems (ex: SeptiTech) be part of the wastewater system design for those Lots that do not meet the standard.

This Report is subject to approval of the MDEP Site Law permit for the development, which will also require review and approval of the nitrate-nitrogen impact assessment. This Report is not an Application for Subsurface Wastewater Disposal Permit. Such an application must be completed by a Licensed Site Evaluator and approved by the Local Plumbing Inspector of the Municipality (and by the Div. of Health Engineering, Augusta, when necessary) before the owner may discharge any wastewater.

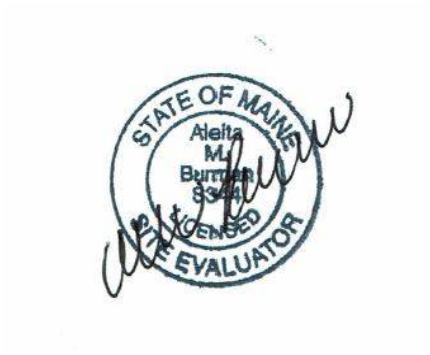
BURMAN
LAND & TREE COMPANY, LLC.

17-005
July 13, 2018

We appreciate the opportunity to assist you during this phase of your project. If you have any questions, or need further assistance, please contact me.

Sincerely,

Burman Land & Tree, LLC



Aleita M. Burman, L.S.E.
Licensed Site Evaluator #344

(207) 825-4050 office / (207) 385-6056 cell
blburman@gmail.com

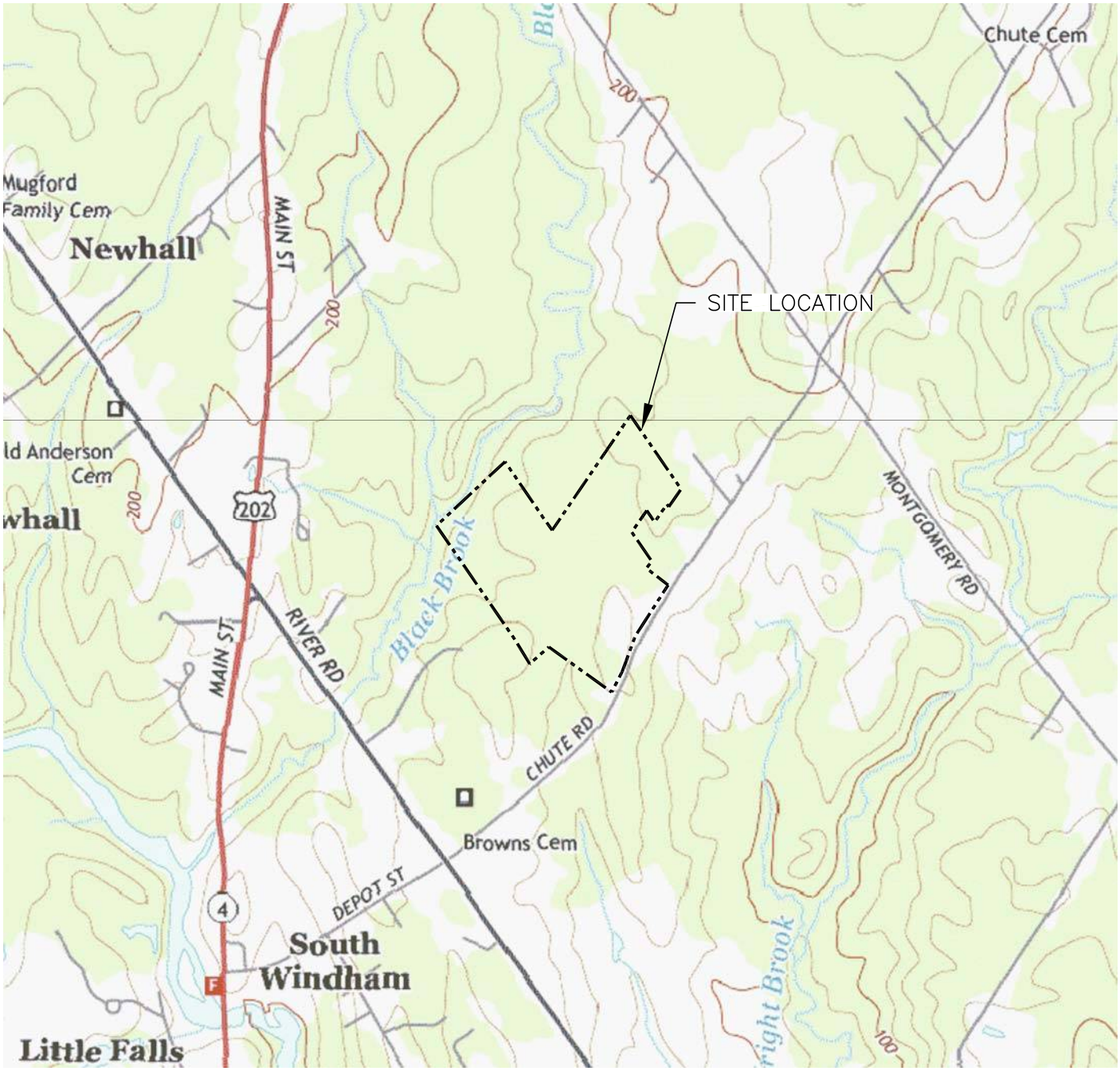
cc: Kirk Ball, Acheron Engineering

APPENDIX A
Limitations

Appendix A – Limitations

The scope of Burman Land & Tree, LLC services has been limited to Preliminary Soil Site Evaluation services for the proposed Durant Homestead subdivision on Chute Road (Town of Windham Tax Map 6, Lot 25) in Windham, Maine. The Report has been prepared for the exclusive use Matt Hancock Properties and Acheron Engineering. No warranty, expressed or implied, is made. The conclusions made in this report are based on the data obtained from the areas explored at the time of services.

APPENDIX B
Site Location Map
Preliminary Soil Site Evaluation Plan



SITE LOCATION MAP

BURMAN
LAND & TREE COMPANY, LLC.

1,000 0 1,000 2,000

Scale in Feet

SITE LOCATION MAP DURANT HOMESTEAD CHUTE ROAD WINDHAM, MAINE	
Job No.: BLT #17-005	Scale: 1" = 1000'
Date: 7-13-18	Sheet: B-1

LEGEND

EXISTING

- PROPERTY LINE
- CONTOURS
- WETLAND
- EXISTING DRILLED WELL ON NEIGHBORING PROPERTIES (WITHIN 300 FEET)

PROPOSED

- LOT PROPERTY LINES
- CONTOURS
- WETLAND IMPACT
- SOIL SOLUTIONS TEST PITS
- BURMAN LAND & TREE, LLC TEST PITS
- PROPOSED DRILLED WELL LOCATION
- PROPOSED SUBSURFACE WASTEWATER DISPOSAL SYSTEM LEACHFIELD

NOTES:

1. OWNER OF RECORD: MATT HANCOCK PROPERTIES, PO BOX 295, CASCO, ME. 04015. BOOK 3319, PAGE 124.
2. TOPOGRAPHIC FEATURES ON THIS PLAN ARE BASED ON WORK DONE BY AERIAL SURVEY AND PHOTO, INC. NORRIDGEWOCK, ME., ELEVATIONS FOR GROUND CONTROL WERE PERFORMED BY MAIN–LAND DEVELOPMENT CONSULTANTS, LIVERMORE FALLS, ME. ALL BEARINGS ARE REFERENCED TO MAINE WEST ZONE NAD–83.
3. PROPERTY BOUNDARY SURVEY COMPLETED BY PLISGA AND DAY SURVEYORS, INC. ON JUNE, 2018.
4. THIS PRELIMINARY SOIL SITE EVALUATION PLAN DETAILS THE FINDINGS OF PRELIMINARY SOIL SITE EVALUATION SERVICES CONDUCTED ON TOWN OF WINDHAM TAX MAP 6, LOT 25 BY BURMAN LAND & TREE, LLC AND SOIL SOLUTIONS IN 2017 AND 2018.
5. PRELIMINARY SOIL SITE EVALUATION SERVICES WERE CONDUCTED IN GENERAL ACCORDANCE WITH THE STATE OF MAINE SUBSURFACE WASTEWATER DISPOSAL RULES, 10–144 CHAPTER 241 (EFFECTIVE AUGUST 3, 2015).
6. PRELIMINARY SOIL SITE EVALUATION TEST PITS WERE LOCATED USING A TRIMBLE MAPPING GRADE GPS RECEIVER. THE GPS DATA WAS OVERLAID ONTO THE BASE MAP BY ACHERON ENGINEERING, INC.
7. THIS PLAN SHOULD BE USED IN CONJUNCTION WITH THE BURMAN LAND & TREE, LLC PRELIMINARY SOIL SITE EVALUATION REPORT, DATED 7–13–18, AND THE SOIL SOLUTIONS PRELIMINARY SOIL EVALUATION REPORT DATED AUGUST 9, 2017. THIS PLAN IS FOR PLANNING AND PERMITTING PURPOSES.

MAINE GRID WEST NAD–83

COMMON OPEN SPACE OF "RIVER'S EDGE SUBDIVISION"

NOW OR FORMERLY OF RIVER'S EDGE COMMON LAND BOOK 18946, PAGE 340 PLAN BOOK 203, PAGE 105 TAX MAP 6 – LOT 42

NOW OR FORMERLY OF ANITA LAMPRON BOOK 32067, PAGE 271 TAX MAP 6 – LOT 38E

(FORMERLY PHYLLIS COLBY)

NOW OR FORMERLY OF FRED STAPLES BOOK 20767, PAGE 228 TAX MAP 6 – LOT 29

NOW OR FORMERLY OF LILLIAN M. PLUMMER BOOK 29006, PAGE 147 TAX MAP 3 – LOT 18

(FORMERLY CLIFFORD PLUMMER)

NOW OR FORMERLY OF JOHN A & CLAIRE STREETER BOOK 8501, PAGE 223 TAX MAP 3 – LOT 22A

NOW OR FORMERLY OF ELIZABETH DUBE BOOK 6230, PAGE 231 TAX MAP 6 – LOT 25A

(FORMERLY ANNIE BLANCHARD COLE)

NOW OR FORMERLY OF WILLIAM WESCOTT BOOK 24127, PAGE 26

RESIDENCE WELL NOT OBSERVED

NOW OR FORMERLY OF AUDREY GOLDER TRUSTEE BOOK 15212, PAGE 227 TAX MAP 6 – LOT 23C

NOW OR FORMERLY OF MATTHEW & DEBORAH STOVER BOOK 14843, PAGE 190 TAX MAP 6 – LOT 23A

NOW OR FORMERLY OF INGRID D. SARDINHA BOOK 12779, PAGE 133 TAX MAP 6 – LOT 25B

NOW OR FORMERLY OF PAUL S. BLANCHARD & SHEILA SNOW BOOK 18397, PAGE 115 TAX MAP 6 – LOT 25D

NOW OR FORMERLY OF CHRISTOPHER & LORI LORD BOOK 8550, PAGE 072 TAX MAP 6 – LOT 25C

NOW OR FORMERLY OF BRENDA JORDAN BOOK 3997, PAGE 126 TAX MAP 6 – LOT 26C

NOW OR FORMERLY OF MICHAEL R. EICHORN BOOK 15892, PAGE 319 TAX MAP 6 – LOT 26C–2

NOW OR FORMERLY OF MICHAEL R. EICHORN BOOK 15892, PAGE 317

OUTFALL STRUCTURE

STORMWATER POND 2

STORMWATER POND 1

24"ø CULVERT

3–36"ø CULVERTS

ROCK PILE (10'x25')

CONC PAD

LIMIT FILL EXTENSION

LOT #1 33,643 SF 0.71 ACRES

LOT #2 33,636 SF 0.70 ACRES

LOT #3 33,636 SF 0.71 ACRES

LOT #4 46,920 SF 1.07 ACRES

LOT #5 35,700 SF 0.82 ACRES

LOT #6 34,426 SF 0.80 ACRES

LOT #7 31,971 SF 0.73 ACRES

LOT #8 37,842 SF 0.87 ACRES

LOT #9 49,916 SF 1.15 ACRES

LOT #10 49,580 SF 1.14 ACRES

LOT #11 41,430 SF 0.95 ACRES

LOT #12 39,371 SF 0.90 ACRES

LOT #13 39,143 SF 0.9 ACRES

LOT #14 45,774 SF 1.05 ACRES

LOT #15 48,104 SF 1.10 ACRES

LOT #16 47,251 SF 1.1 ACRES

LOT #17 49,759 SF 1.22 ACRES

LOT #18 32,388 SF 0.74 ACRES

LOT #19 31,832 SF 0.73 ACRES

LOT #20 34,773 SF 0.79 ACRES

LOT #21 30,177 SF 0.69 ACRES

LOT #22 30,210 SF 0.69 ACRES

LOT #23 30,241 SF 0.69 ACRES

LOT #24 34,517 SF 0.79 ACRES

LOT #25 34,517 SF 0.79 ACRES

LOT #26 34,282 SF 0.78 ACRES

CHUTE ROAD

DRILLED WELL

POS WELL

CONCRETE WELL

WELL

0 100 200 300

GRAPHIC SCALE 1" = 100'

STATE OF MAINE Aiello M.J. Burman 9340 LICENSED SOIL EVALUATOR

BURMAN LAND & TREE COMPANY, LLC.

PRELIMINARY SOIL SITE EVALUATION PLAN
DURANT HOMESTEAD
CHUTE ROAD
WINDHAM, MAINE

Job No.: BLT #17–005	Scale: 1" = 100'
Date: 7–13–18	Sheet: B–2

APPENDIX C
Soil Conditions Summary Table (Form E)
Test Pit Logs (Form F)

FORM E Rev. 07/11

SOIL CONDITIONS SUMMARY TABLE

SUMMARY LOG OF SUBSURFACE EXPLORATIONS AT PROJECT SITES

Project Name:	Applicant Name:	Project Location (municipality):
Durant Homestead, Chute Road	Matt Hancock Properties	Windham

Lot No.	Exploration Symbol (TP 1, B 2, etc.)	✖ if at SSWD Field	Description of subsurface materials by: ● Soil profile/condition (if by S.E.), ● Soil series name (if by C.S.S.), or by ● Geologic unit (if by C.G.)	Depths to (inches): Redoximorphic Features	Bedrock	Hydraulically Restrictive Layer	Limit of Exploration	Ground Surface Slope (%)	Ground Surface Elevation
1	SE TP 1C	☒	8 AIII / C (BLT)	16"	see TP desc	16"	24"	2	
1	SE TP 1D	☒	8 AIII / C (BLT)	16"	see TP desc	16"	24"	2	
2	SE TP 2C	☒	8 AIII / C (BLT)	18"	see TP desc	18"	24"	0-2	
2	SE TP 2D	☒	8 AIII / C (BLT)	18"	see TP desc	18"	24"	0-2	
3	SE TP 3C	☒	8D (BLT)	10"	n.o.	10"	24"	3	
3	SE TP 3D	☒	8D (BLT)	10"	n.o.	10"	24"	2	
4	SE TP 4C	☒	8D (BLT)	12"	n.o.	12"	24"	6-18	
4	TP 23	☒	8D (SS)	13"	n.o.	13"	35"	8-15	
4	TP 23a	☒	8D (SS)	13"	n.o.	13"	35"	8-15	
5	TP 22	☒	8D (SS)	13"	n.o.	13"	35"	8-15	
5	TP 22a	☒	8C (SS)	16"	n.o.	16"	35"	8-15	
6	SE TP 6C	☒	8C (BLT)	16"	n.o.	16"	24"	0-3	
6	SE TP 6D	☒	8D (BLT)	14"	n.o.	14"	24"	0-3	
7	SE TP 7C	☒	2C (BLT)	22"	n.o.	n.o.	34"	10	
7	SE TP 7D	☒	2C (BLT)	22"	n.o.	n.o.	34"	10	
8	SE TP 8C	☒	3 AIII / C (BLT)	16"	see TP desc	16"	28"	5	
8	SE TP 8D	☒	3 AIII / C (BLT)	18"	see TP desc	18"	30"	5-10	
9	SE TP 9C	☒	3C (BLT)	16"	n.o.	16"	28"	6	
9	SE TP 9D	☒	3C (BLT)	16"	n.o.	16"	28"	6	
10	SE TP10C	☒	8C (BLT)	16"	n.o.	16"	28"	10	
10	SE TP10D	☒	8C (BLT)	16"	n.o.	16"	28"	10	
11	SE TP11C	☒	3 AIII / D (BLT)	12"	see TP desc	12"	24"	7	
11	SE TP11D	☒	3 AIII / C (BLT)	15"	see TP desc	15"	24"	5	
12	TP 15	☒	8C (SS)	18"	n.o.	18"	35"	1	
12	TP 15a	☒	8C (SS)	18"	n.o.	18"	35"	1-6	
12	SE TP12C	☒	8C (BLT)	16"	n.o.	16"	24"	5	
13	TP 14	☒	7C (SS)	24"	n.o.	24"	35"	1-6	
13	SE TP13C	☒	8 AIII / C (BLT)	16"	see TP desc	16"	24"	4	
14	SE TP14C	☒	8D (BLT)	14"	n.o.	14"	24"	5	
14	SE TP14D	☒	8D (BLT)	14"	n.o.	14"	24"	7	
15	TP 12	☒	8C (SS)	21"	n.o.	21"	35"	1-8	
15	SE TP15C	☒	8D (BLT)	12"	n.o.	12"	24"	5	

INVESTIGATOR INFORMATION AND SIGNATURE

Signature	Date
Aleita Burman	06/12; 06/13; 06/22,2018
Name Printed	**Cert/Lic/Reg. #**
Aleita Burman	S344

Qualification: ☒ Licensed Site Evaluator ☐ Certified Soil Scientist ☐ Certified Geologist ☐ Other:

STATE OF MAINE Aleita M. Burman S344 LICENSED SITE EVALUATOR

official professional seal

FORM E Rev. 07/11

SOIL CONDITIONS SUMMARY TABLE

SUMMARY LOG OF SUBSURFACE EXPLORATIONS AT PROJECT SITES

Project Name:	Applicant Name:	Project Location (municipality):
Durant Homestead, Chute Road	Matt Hancock Properties	Windham

Lot No.	Exploration Symbol (TP 1, B 2, etc.)	✖ if at SSWD Field	Description of subsurface materials by: • Soil profile/condition (if by S.E.), • Soil series name (if by C.S.S.), or by • Geologic unit (if by C.G.)	Depths to (inches): Redoximorphic Features	Bedrock	Hydraulically Restrictive Layer	Limit of Exploration	Ground Surface Slope (%)	Ground Surface Elevation
15	SE TP15D	☒	8D (BLT)	12"	n.o.	12"	24"	5	
16	TP 11	☒	8 AIII / D (SS)	14"	see TP desc	14"	35"	1-8	
16	TP 11a	☒	8 AIII / D (SS)	14"	see TP desc	14"	35"	1-8	
17	TP 10	☒	8D (SS)	11"	n.o.	11"	35"	0-3	
17	TP 10a	☒	8D (SS)	13"	n.o.	13"	35"	0-3	
17	TP 17C	☒	8D (BLT)	12"	n.o.	12"	35"	3-8	
18	TP 9	☒	8C (SS)	17"	n.o.	17"	35"	3-8	
18	TP 9a	☒	8C (SS)	18"	n.o.	18"	35"	3-8	
19	TP8	☒	8D(BLT)	13"	n.o.	13"	35"	3-8	
19	SE TP19C	☒	8 AIII / C (BLT)	16"	see TP desc	16"	24"	5	
20	SE TP20C	☒	8 AIII / D (BLT SSTP31)	12"	see TP desc	n.o.	32"	0	
20	SE TP20D	☒	8 AIII / C (BLT)	15"	see TP desc	15'	17"	0	
21	SE TP21C	☒	8 AIII / D (BLT)	12"	36"	n.o.	36"	0	
21	SE TP21D	☒	8 AIII / D (BLT)	12"	36"	n.o.	36"	0	
22	SE TP22C	☒	8 AIII / C (BLT)	16"	see TP desc	16"	24"	0	
22	SE TP22D	☒	8 AIII / D (BLT)	12"	see TP desc	12"	24"	0	
23	SE TP23C	☒	8AIII/C (BLT)	17"	18"	17"	18"	0-3	
23	SE TP23D	☒	8AIII/C (BLT)	17"	18"	17"	18"	0-3	
23	SEAB23E	☒	AIII (BLT)		18"		18"	0-3	
23	SEAB23F	☒	AIII (BLT)		18"		18"	0-3	
23	SEAB23G	☒	AIII (BLT)		18"		18"	0-3	
23	SEAB23H	☒	AIII (BLT)		18"		18"	0-3	
24	SE TP24C	☒	8D (BLT)	13"	n.o.	13"	24"	6	
24	SE TP24D	☒	8D (BLT)	13"	n.o.	13"	24"	6	
25	SE TP25C	☒	3 AIII / C (BLT)	15"	see TP desc	15"'	24"	5	
25	SE TP25D	☒	3 AIII / C (BLT)	16"	see TP desc	16"	24"	8	
26	SE TP26C	☒	8D (BLT)	12"	n.o.	12"	24"	5	
26	SE TP26D	☒	8D (BLT	14"	n.o.	14"	24"	5	
		☐							
		☐							
		☐							
		☐							

INVESTIGATOR INFORMATION AND SIGNATURE

Signature	Date
Aleita Burman	6/12; 6/13; 6/22, 2018
Name Printed	**Cert/Lic/Reg. #**
Aleita Burman	S344

Qualification

☒ Licensed Site Evaluator ☐ Certified Soil Scientist
☐ Certified Geologist ☐ Other:

STATE OF MAINE Aleita M. Burman S344 LICENSED SITE EVALUATOR

Affix professional seal

~~SUBSURFACE WASTEWATER DISPOSAL SYSTEM APPLICATION~~

~~Maine Dept. Health & Human Services~~
~~Division of Environmental Health~~
~~(207) 287-5672 Fax: (207) 287-3165~~

Town, City, Plantation	Street, Road, Subdivision	Owner's Name
Windham	Durant Homestead, Chute Road	Matt Hancock Properties

SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole SE TP 6C [X] Test Pit [ ] Boring

2" " Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0 Ap	silt loam	friable	10YR 3/3	none observed
10 Bs	silt loam	friable	2.5Y 4/4	
BC	silt loam	very firm	2.5Y 5/3	cfp 10YR3/6
20	LOI = 24" very firm			
30				
40				
50				

Soil Classification	Slope	Limiting Factor	
8 Profile / C Condition	0-3 %	16 "	[X] Ground Water [X] Restrictive Layer [ ] Bedrock [ ] Pit Depth 24"

Observation Hole SE TP 6D [X] Test Pit [ ] Boring

2 " Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0 Ap	silt loam	friable	10YR 3/3	
Bs	silt loam	friable	10YR 3/6	none observed
10 Bw	silt loam	friable	2.5Y 4/4	
BC	silt loam	very firm	2.5Y5/3	cfp 10YR3/6
20	LOI = 24" very firm			
30				
40				
50				

Soil Classification	Slope	Limiting Factor	
8 Profile / D Condition	0-3 %	14 "	[X] Ground Water [X] Restrictive Layer [ ] Bedrock [ ] Pit Depth 24"

SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole SE TP 7C [X] Test Pit [ ] Boring

3" " Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
Bs1	loam	friable	7.5YR 4/6	
Bs2	vfsloam	friable	10 YR 4/6	none observed
10 Bw	cobbley vfsloam	friable	2.5Y4/4	
20 BC	cobbley vfsloam	friable	2.5Y 4/4	cfp 10YR4/6
30	LOI = 34"			
40				
50				

Soil Classification	Slope	Limiting Factor	
2 Profile / C Condition	10 %	22 "	[X] Ground Water [ ] Restrictive Layer [ ] Bedrock [ ] Pit Depth 34"

Observation Hole SE TP 7D [X] Test Pit [ ] Boring

2 " Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0 Bs	vfsloam	friable	10YR 4/6	
10 Bw	cobbley vfsloam	friable	2.5Y 4/4	none observed
20 BC	cobbley vfsloam	friable	2.5Y 4/4	cfd10YR4/6
30	LOI = 34"			
40				
50				

Soil Classification	Slope	Limiting Factor	
2 Profile / C Condition	10 %	22 "	[X] Ground Water [ ] Restrictive Layer [ ] Bedrock [ ] Pit Depth 34"

Site Evaluator Signature | #S344 SE # | 06/12/18 Date

~~HHE-200 Rev. 05/08~~

SUBSURFACE WASTEWATER DISPOSAL SYSTEM APPLICATION

Maine Dept. Health & Human Services
Division of Environmental Health
(207) 287-5672 Fax: (207) 287-3165

Town, City, Plantation	Street, Road, Subdivision	Owner's Name
Windham	Durant Homestead, Chute Road	Matt Hancock Properties

SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole SE TP 8C [X] Test Pit [ ] Boring
2 " Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0 Ap	loam	friable	10YR 3/3	none observed
10 Bw	vfsloam	friable	2.5Y 4/4	
20 BC	vfsloam	firm	2.5Y 4/3	cmp10YR3/6
30	LOI = 28"			
40	Nearby BLT SSTP 15 and MLD TP 46 show bedrock at 27" and 32" respectively. Bedrock anticipated within 48".			
50				

Soil Classification	Slope	Limiting Factor	
3 Profile / AIII/C Condition	5 %	16 "	[X] Ground Water [X] Restrictive Layer [ ] Bedrock [ ] Pit Depth 28"

Observation Hole SE TP 8D [X] Test Pit [ ] Boring
2 " Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0 Bs	loam	friable	10YR 3/3	none observed
10 Bw	vfsloam	friable	2.5Y 4/4	
20 BC	vfsloam	firm	2.5Y 4/3	cmp10YR 3/6
30	LOI = 30"			
40	Nearby BLT SSTP 15 and MLD TP 46 show bedrock at 27" and 32" respectively. Bedrock anticipated within 48".			
50				

Soil Classification	Slope	Limiting Factor	
3 Profile / AIII/C Condition	5-10 %	18 "	[x] Ground Water [X] Restrictive Layer [ ] Bedrock [ ] Pit Depth 30"

SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole SE TP 9C [X] Test Pit [ ] Boring
2 " Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0 Bs	vfsloam	friable	10YR 4/4	none observed
10 B	vfsloam	friable	2.5Y4/4	
20 BC	vfsloam	firm	2.5Y 4/3	cfp10YR3/6
30	LOI = 28"			
40				
50				

Soil Classification	Slope	Limiting Factor	
3 Profile / C Condition	6 %	16 "	[X] Ground Water [X] Restrictive Layer [ ] Bedrock [ ] Pit Depth 28"

Observation Hole SE TP 9D [X] Test Pit [ ] Boring
2 " Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0 Bs1	vfsloam	friable	10YR 3/3	none observed
Bs2	vfsloam	friable	10YR 4/4	
10 B	vfsloam	friable	2.5Y 4/4	
20 BC	vfsloam	firm	2.5Y 4/3	cmp10YR3/6
30	LOI = 28"			
40				
50				

Soil Classification	Slope	Limiting Factor	
3 Profile / C Condition	6 %	16 "	[X] Ground Water [X] Restrictive Layer [ ] Bedrock [ ] Pit Depth 28"

Site Evaluator Signature | #S344 SE # | 06/12/18 Date

HHE-200 Rev. 05/08

~~SUBSURFACE WASTEWATER DISPOSAL SYSTEM APPLICATION~~

~~Maine Dept. Health & Human Services~~
~~Division of Environmental Health~~
~~(207) 287-5672 Fax: (207) 287-3165~~

Town, City, Plantation	Street, Road, Subdivision	Owner's Name
Windham	Durant Homestead, Chute Road	Matt Hancock Properties

SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole SE TP10C [X] Test Pit [ ] Boring
2 " Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0 Bs	loam	friable	10YR 3/3	none observed
10 BC	silt loam	firm	2.5Y 4/3	cmp 10YR 3/6
20	LOI = 28"			
30				
40				
50				

Soil Classification	Slope	Limiting Factor	
8 Profile / C Condition	10 %	16 "	[X] Ground Water [X] Restrictive Layer [ ] Bedrock [ ] Pit Depth 28"

Observation Hole TP 10D [X] Test Pit [ ] Boring
" Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0 Bs	loam	friable	10YR 3/3	none observed
10 B	silt loam	friable	2.5Y 4/4	
20 BC	silt loam	firm	2.5Y 4/3	cmp10YR3/6
30	LOI = 28"			
40				
50				

Soil Classification	Slope	Limiting Factor	
8 Profile / C Condition	10 %	16 "	[X] Ground Water [X] Restrictive Layer [ ] Bedrock [ ] Pit Depth 28"

SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole SE TP11C [X] Test Pit [ ] Boring
1 " Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0 Ap	loam	friable	10YR 3/3	none observed
10 B	vfsloam	friable	10YR 4/4	
BC	vfsloam	firm	2.5Y 5/2	cmd 2.5Y5/2
20	LOI = 24"			
30				
40	Nearby BLT SS TP19 shows bedrock at 24". Bedrock anticipated within 48".			
50				

Soil Classification	Slope	Limiting Factor	
3 Profile / AIII / D Condition	7 %	12 "	[X] Ground Water [X] Restrictive Layer [ ] Bedrock [ ] Pit Depth 24"

Observation Hole SE TP 11D [X] Test Pit [ ] Boring
1 " Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0 Ap	loam	friable	10YR 3/3	none observed
10 BC	vfsloam	firm	2.5Y 4/3	cmd 2.5Y5/2
20	LOI = 24"			
30	TP appears disturbed - possible wind throw			
40	Nearby BLT SS TP19 shows bedrock at 24". Bedrock anticipated within 48".			
50				

Soil Classification	Slope	Limiting Factor	
3 Profile / AIII / C Condition	5 %	15 "	[X] Ground Water [X] Restrictive Layer [ ] Bedrock [ ] Pit Depth 24"

Site Evaluator Signature | #S344 SE # | 06/12/18 Date

~~HHE-200 Rev. 05/08~~

~~SUBSURFACE WASTEWATER DISPOSAL SYSTEM APPLICATION~~

~~Maine Dept. Health & Human Services~~
~~Division of Environmental Health~~
~~(207) 287-5672 Fax: (207) 287-3165~~

Town, City, Plantation: Windham

Street, Road, Subdivision: Durant Homestead, Chute Road

Owner's Name: Matt Hancock Properties

SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole SE TP 14C [X] Test Pit [ ] Boring
1 " Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0 Ap	silt loam	friable	10YR 3/3	none observed
10 Bw	silt loam	friable	2.5Y 4/4	
BC	silt loam	very firm	2.5Y 4/3	cfd 2.5Y5/3
20	LOI = 24"			
30				
40				
50				

Soil Classification	Slope	Limiting Factor	
8 Profile / D Condition	5 %	14 "	[X] Ground Water [X] Restrictive Layer [ ] Bedrock [ ] Pit Depth 24"

Observation Hole SE TP 14D [X] Test Pit [ ] Boring
1 " Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0 Ap	silt loam	friable	10YR 3/3	none observed
10 Bw	silt loam	friable	2.5Y 4/4	
BC	silt loam	very firm	2.5Y 4/3	cmd2.5Y5/3
20	LOI = 24"			
30				
40				
50				

Soil Classification	Slope	Limiting Factor	
8 Profile / D Condition	7 %	14 "	[X] Ground Water [X] Restrictive Layer [ ] Bedrock [ ] Pit Depth 24"

SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole SE TP 12C [X] Test Pit [ ] Boring
0 " Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0 Ap	silt loam	friable	2.5YR 3/3	none observed
10 Bw	silt loam	friable	2.5YR 4/3	
BC	silt loam	very firm	2.5Y 4/3	cmd 2.5Y5/3
20	LOI = 24"			
30				
40				
50				

Soil Classification	Slope	Limiting Factor	
8 Profile / D Condition	5 %	10 "	[X] Ground Water [X] Restrictive Layer [ ] Bedrock [ ] Pit Depth 24"

Observation Hole SE TP 17C [X] Test Pit [ ] Boring
0 " Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0 Ap	vfsloam	friable	10YR 3/2	none observed
10 Bw	vfsloam	friable	2.5Y 4/3	
BC	silt loam	firm	2.5Y 4/3	cmd2.5Y 5/3
20				
30				
40				
50				

Soil Classification	Slope	Limiting Factor	
8 Profile / D Condition	5 %	12 "	[X] Ground Water [X] Restrictive Layer [ ] Bedrock [ ] Pit Depth

Site Evaluator Signature: [signature] #S344 (SE #) 06/12/18 (Date)

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~~SUBSURFACE WASTEWATER DISPOSAL SYSTEM APPLICATION~~

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~~Division of Environmental Health~~
~~(207) 287-5672 Fax: (207) 287-3165~~

Town, City, Plantation	Street, Road, Subdivision	Owner's Name
Windham	Durant Homestead, Chute Road	Matt Hancock Properties

SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole SE TP 20D [X] Test Pit [ ] Boring
0 " Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0	fill silt loam	v.firm (compacted)	10YR 3/3	none observed
10	B silt loam	v.firm (compacted)	2.5Y 4/4	
	B silt loam	v.firm (compacted	2.5Y 4/3	
20	BC silt loam	very firm	2.5Y 4/3	2.5Y 5/2
30	LOI = 17" very firm			
40	Excavator TP within 10' reveals no ledge w/in 24" This area will need to have topsoil removed and replaced with suitable granular fill for leachfield installation Nearby SE TP 20C shows 32" to bedrock. Bedrock anticipated at <48".			
50				

Soil Classification	Slope	Limiting Factor	
8 Profile / AIII / C Condition	0 %	15 "	[X] Ground Water [X] Restrictive Layer [ ] Bedrock [ ] Pit Depth 24"

Observation Hole SE TP 20C [X] Test Pit [ ] Boring
0 " Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0	Fill gravelly	compact	10YR 4/2	NONE OBSERVED
10	Bw silt loam	firm	2.5Y 5/3	
20	2Bw sandy loam	friable	10YR 4/3	ffp 7.5YR4/4
30	R @ 32"			
40				
50				

Soil Classification	Slope	Limiting Factor	
8 Profile / AIII / D Condition	0 %	12 "	[ ] Ground Water [X] Restrictive Layer [ ] Bedrock 32" [ ] Pit Depth

SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole SE TP 3C [X] Test Pit [ ] Boring
0 " Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0	Ap silt loam	friable	2.5Y 3/3	none observed
10	BC silt loam	very firm	2.5Y 4/3	cmd5Y5/2
20	LOI = 24"			
30				
40				
50				

Soil Classification	Slope	Limiting Factor	
8 Profile / D Condition	3 %	10 "	[X] Ground Water [X] Restrictive Layer [ ] Bedrock [ ] Pit Depth 24"

Observation Hole SE TP 3D [X] Test Pit [ ] Boring
0 " Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0	Ap silt loam	friable	2.5Y 3/3	none observed
10	BC silt loam	very firm	2.5Y 4/3	cmd 5Y5/2
20	LOI = 24"			
30				
40				
50				

Soil Classification	Slope	Limiting Factor	
8 Profile / D Condition	2 %	10 "	[X] Ground Water [X] Restrictive Layer [ ] Bedrock [ ] Pit Depth 24"

Alli Burns — Site Evaluator Signature
#S344 — SE #
06/12/18 — Date

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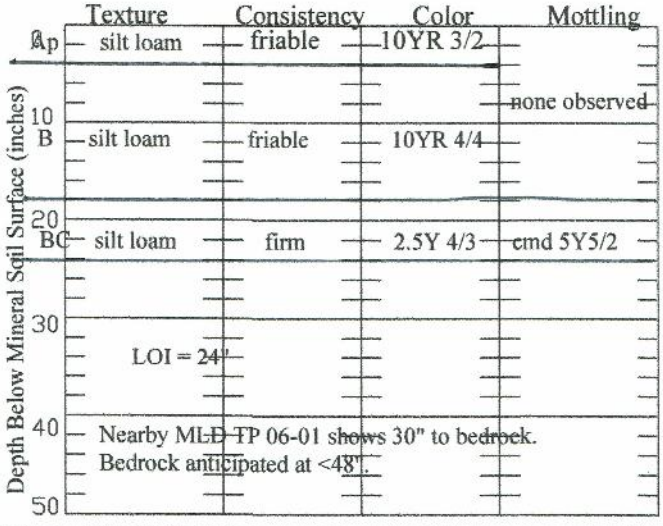
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Town, City, Plantation	Street, Road, Subdivision	Owner's Name
Windham	Durant Homestead, Chute Road	Matt Hancock Properties

SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole SE TP 2C [X] Test Pit [ ] Boring

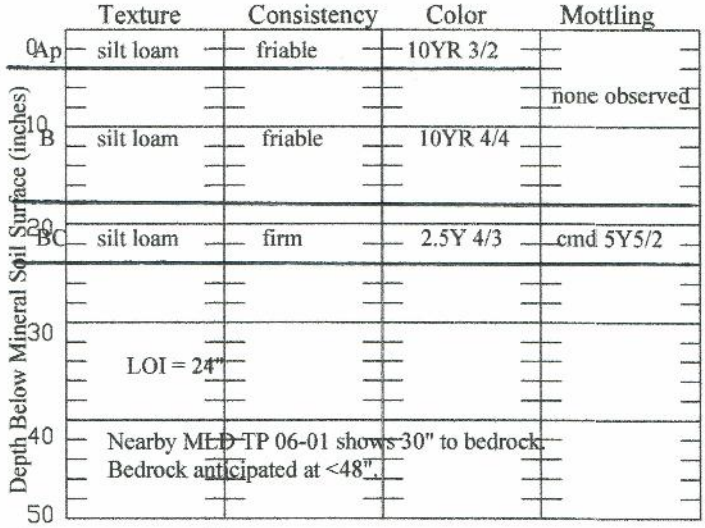
0 " Depth of Organic Horizon Above Mineral Soil



Soil Classification	Slope	Limiting Factor	
8 / AIII / C (Profile / Condition)	0-2 %	18 "	[X] Ground Water [X] Restrictive Layer [ ] Bedrock [ ] Pit Depth 24"

Observation Hole SE TP 2D [X] Test Pit [ ] Boring

" Depth of Organic Horizon Above Mineral Soil

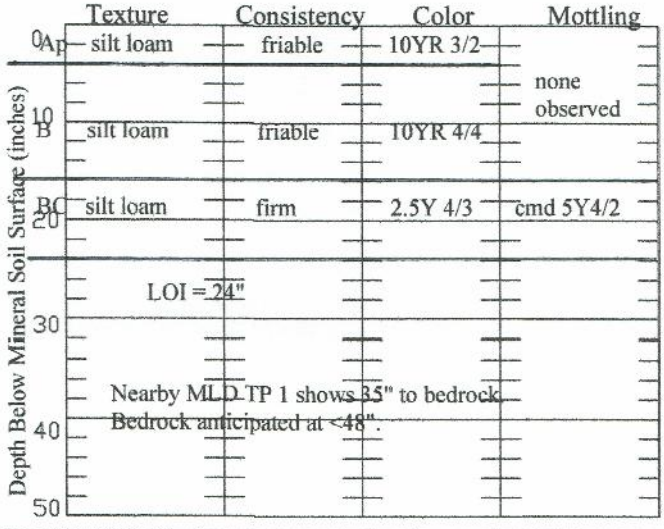


Soil Classification	Slope	Limiting Factor	
8 / AIII / C (Profile / Condition)	0-2 %	18 "	[X] Ground Water [X] Restrictive Layer [ ] Bedrock [ ] Pit Depth 24"

SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole SE TP 1C [X] Test Pit [ ] Boring

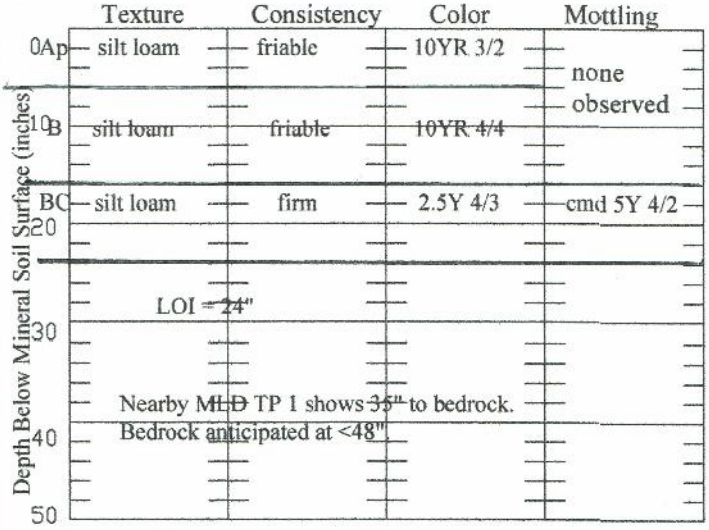
0 " Depth of Organic Horizon Above Mineral Soil



Soil Classification	Slope	Limiting Factor	
8 / AIII / C (Profile / Condition)	2 %	16 "	[X] Ground Water [X] Restrictive Layer [ ] Bedrock [ ] Pit Depth 24"

Observation Hole SE TP 1D [X] Test Pit [ ] Boring

0 " Depth of Organic Horizon Above Mineral Soil



Soil Classification	Slope	Limiting Factor	
8 / AIII / C (Profile / Condition)	2 %	16 "	[X] Ground Water [X] Restrictive Layer [ ] Bedrock [ ] Pit Depth 24"

Site Evaluator Signature | #S344 (SE #) | 06/12/18 (Date)

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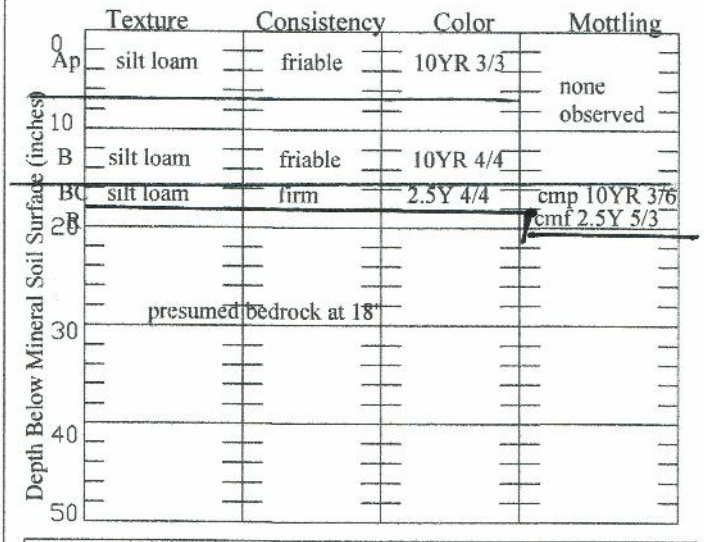
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Town, City, Plantation	Street, Road, Subdivision	Owner's Name
Windham	Durant Homestead, Chute Road	Matt Hancock Properties

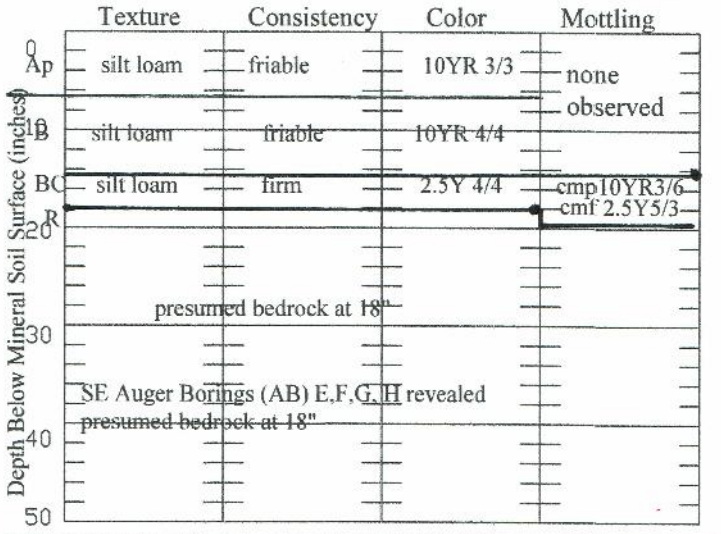
SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole SE TP 23C [X] Test Pit [ ] Boring
0 " Depth of Organic Horizon Above Mineral Soil



Soil Classification	Slope	Limiting Factor	
8 Profile / AIII/C Condition	0-3 %	18 "	[ ] Ground Water [ ] Restrictive Layer [X] Bedrock [ ] Pit Depth

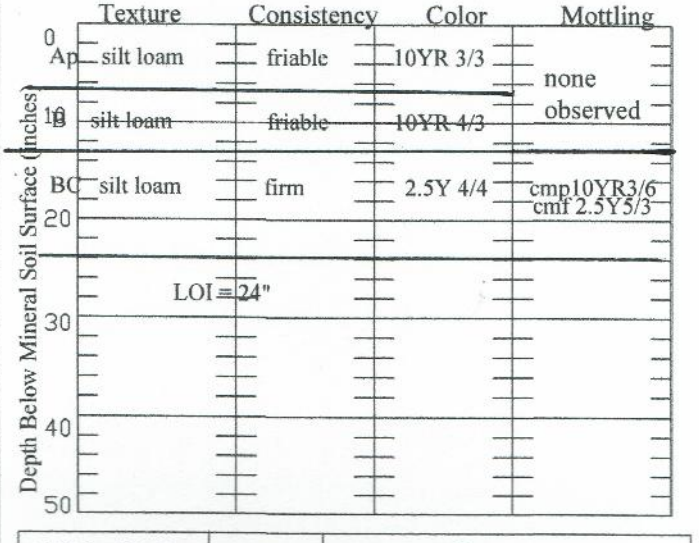
Observation Hole SE TP 23D [X] Test Pit [ ] Boring
0 " Depth of Organic Horizon Above Mineral Soil



Soil Classification	Slope	Limiting Factor	
8 Profile / AIII/D Condition	0-3 %	18 "	[ ] Ground Water [ ] Restrictive Layer [X] Bedrock [ ] Pit Depth

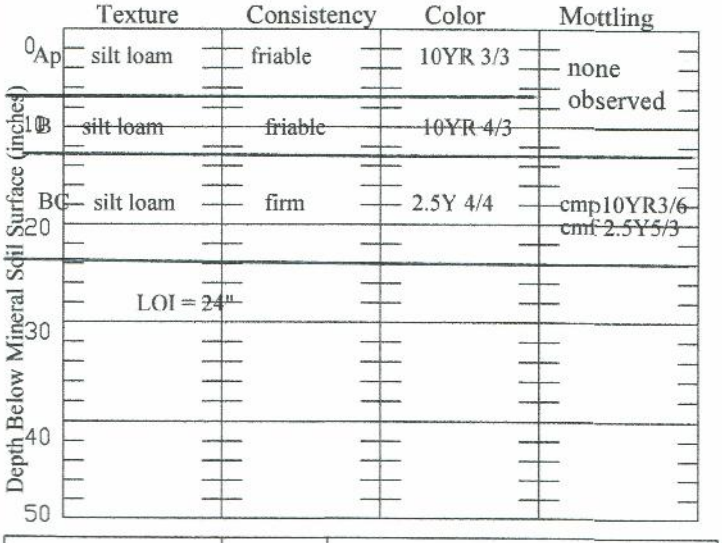
SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole SE TP 24C [X] Test Pit [ ] Boring
0 " Depth of Organic Horizon Above Mineral Soil



Soil Classification	Slope	Limiting Factor	
8 Profile / D Condition	6 %	13 "	[X] Ground Water [X] Restrictive Layer [ ] Bedrock [ ] Pit Depth 24"

Observation Hole SE TP 24D [X] Test Pit [ ] Boring
0 " Depth of Organic Horizon Above Mineral Soil



Soil Classification	Slope	Limiting Factor	
8 Profile / D Condition	6 %	13 "	[X] Ground Water [X] Restrictive Layer [ ] Bedrock [ ] Pit Depth 24"

Site Evaluator Signature	SE #	Date	
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~~SUBSURFACE WASTEWATER DISPOSAL SYSTEM APPLICATION~~

~~Maine Dept.Health & Human Services~~
~~Division of Environmental Health~~
~~(207) 287-5672 Fax: (207) 287-3165~~

Town, City, Plantation: Windham

Street, Road, Subdivision: Durant Homestead, Chute Road

Owner's Name: Matt Hancock Properties

SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole SE TP 25C [X] Test Pit [ ] Boring
0 " Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0 Ap	loam	friable	10YR 3/3	none observed
10 B	vfsandy loam	friable	10YR 4/4	
BC 20	vfsandy loam	firm	10YR 4/4	cfp 10YR3/6 cfd 10YR5/3
30	LOI = 24"			
40	Nearby BLT SS TP 26 shows 31" to bedrock. Bedrock anticipated at <48".			
50				

Soil Classification	Slope	Limiting Factor	
3 Profile / AIII / C Condition	7 %	15 "	[X] Ground Water [X] Restrictive Layer [ ] Bedrock [ ] Pit Depth 24"

Observation Hole SE TP 25D [X] Test Pit [ ] Boring
0 " Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0 Ap	loam	friable	10YR 3/3	none observed
10 B	vfsandy loam	friable	10YR 4/4	
BC 20	vfsandy loam	firm	10YR 4/4	cfp 10YR 3/6 cfd 10YR 5/3
30	LOI = 24"			
40	Nearby BLT SS TP 26 shows 31" to bedrock. Bedrock anticipated at <48".			
50				

Soil Classification	Slope	Limiting Factor	
3 Profile / AIII / C Condition	8 %	16 "	[X] Ground Water [X] Restrictive Layer [ ] Bedrock [ ] Pit Depth 24"

SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole SE TP 26C [X] Test Pit [ ] Boring
0 " Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0 Ap	silt loam	friable	10YR 3/3	none observed
10 B	silt loam	friable	10YR 4/3	
BC 20	silt loam	firm	2.5Y 4/4	cmp 10YR 3/6 cmd 2.5Y 5/3
30	LOI = 24"			
40				
50				

Soil Classification	Slope	Limiting Factor	
8 Profile / D Condition	5 %	12 "	[X] Ground Water [X] Restrictive Layer [ ] Bedrock [ ] Pit Depth 24"

Observation Hole SE TP 26D [X] Test Pit [ ] Boring
0 " Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0 Ap	silt loam	friable	10YR 3/3	none observed
10 B	silt loam	friable	10YR 4/3	
BC 20	silt loam	firm	2.5Y 4/4	cmp 10YR3/6 cmd 2.5Y 5/3
30	LOI = 24"			
40				
50				

Soil Classification	Slope	Limiting Factor	
8 Profile / D Condition	5 %	14 "	[X] Ground Water [X] Restrictive Layer [ ] Bedrock [ ] Pit Depth 24"

Site Evaluator Signature | #S344 SE # | 06/13/18 Date

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SUBSURFACE WASTEWATER DISPOSAL SYSTEM APPLICATION

Maine Dept.Health & Human Services
Division of Environmental Health
(207) 287-5672 Fax: (207) 287-3165

Town, City, Plantation	Street, Road, Subdivision	Owner's Name
Windham	Durant Homestead, Chute Road	Matt Hancock Properties

SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole SE TP 19C [X] Test Pit [ ] Boring
0 " Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0 Ap	vf sandy loam	friable	10YR 3/3	none observed
10 B	silt loam	friable	10YR 4/4	
20 BC	silt loam	firm	2.5Y 4/3	cm 10YR 4/6
30	LOI = 24"			
40	Nearby MLD TP 36 shows 25" to bedrock. Bedrock anticipated at <48".			
50				

Soil Classification	Slope	Limiting Factor	
8 Profile / AIII / C Condition	5 %	16 "	[X] Ground Water [X] Restrictive Layer [ ] Bedrock [ ] Pit Depth 24"

Observation Hole SE TP 22C [X] Test Pit [ ] Boring
0 " Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0 Ap	silt loam	~~friable~~ (compacted)	10YR 3/3	none observed
10 B	silt loam	~~friable~~ (top 2" compacted)	10YR 4/4	
20 BC	silt loam	firm	2.5Y 4/3	cmp10YR 4/6
30	LOI = 24"			
	surface compaction appears due to recent surface grading but profile appears intact mostly			
40	Nearby BLT SS TP's 2 and ~~33~~ show 31" to bedrock. Bedrock anticipated at <48".			
50				

Soil Classification	Slope	Limiting Factor	
8 Profile / AIII / C Condition	0 %	16 "	[X] Ground Water [X] Restrictive Layer [ ] Bedrock [ ] Pit Depth 24"

SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole SE TP 15C [X] Test Pit [ ] Boring
0 " Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0 Ap	vf sandy loam	friable	10YR 3/3	none observed
10 B	vf sandy loam	friable	10YR 4/4	
BC	silt loam	friable	2.5Y 4/4	cmp10YR 4/6
20 C	silt loam	firm	2.5Y 4/3	cmp 10YR 4/6 cmf 2.5Y 5/3
30	LOI = 24"			
40				
50				

Soil Classification	Slope	Limiting Factor	
8 Profile / D Condition	5 %	12 "	[X] Ground Water [X] Restrictive Layer [ ] Bedrock [ ] Pit Depth 24"

Observation Hole SE TP 15D [X] Test Pit [ ] Boring
0 " Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0 Ap	vf sandy loam	friable	10YR 3/3	none observed
10 B	vf sandy loam	friable	10YR 4/4	
BC	silt loam	friable	2.5Y 4/4	cmp 10YR4/6
20 C	silt loam	firm	2.5Y 4/3	cmp 10YR4/6 cmf 2.5Y 5/3
30	LOI = 24"			
40				
50				

Soil Classification	Slope	Limiting Factor	
8 Profile / D Condition	5 %	12 "	[X] Ground Water [X] Restrictive Layer [ ] Bedrock [ ] Pit Depth 24"

Site Evaluator Signature | #S344 SE # | 06/22/18 Date

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SUBSURFACE WASTEWATER DISPOSAL SYSTEM APPLICATION

Maine Dept. Health & Human Services
Division of Environmental Health
(207) 287-5672 Fax: (207) 287-3165

Town, City, Plantation	Street, Road, Subdivision	Owner's Name
Windham	Durant Homestead, Chute Road	Matt Hancock Properties

SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole SE TP 12C [X] Test Pit [ ] Boring

0 " Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0 Ap	silt loam	friable	10YR 3/3	none observed
10 B	silt loam	friable	2.5Y 4/4	
20 BC	silt loam	firm	2.5Y 4/3	cmp 10YR 4/6 cmd 2.5Y 5/2
30	LOI = 24"			
40				
50				

Soil Classification	Slope	Limiting Factor	
8 Profile / C Condition	5 %	16 "	[X] Ground Water [X] Restrictive Layer [ ] Bedrock [ ] Pit Depth 24"

Observation Hole SE TP 13C [X] Test Pit [ ] Boring

0 " Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0 Ap	vf sandy loam	friable	10YR 3/3	none observed
10 B	vf sandy loam	friable	2.5Y 4/4	
20 BC	silt loam	firm	2.5Y 4/3	cmp 10YR 4/6
C	silt loam	firm	2.5Y 4/3	cmp 10YR 4/6 cmf 2.5Y 5/3
30	LOI = 24"			
40	Nearby BLT SS TP 22 shows 32" to bedrock. Bedrock anticipated at <48".			
50				

Soil Classification	Slope	Limiting Factor	
8 Profile / AIII / C Condition	4 %	16 "	[X] Ground Water [X] Restrictive Layer [ ] Bedrock [ ] Pit Depth 24"

SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole SE TP 4C [X] Test Pit [ ] Boring

0 " Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0 Ap	silt loam	friable	10YR 3/2	none observed
10 B	silt loam	friable	2.5Y 4/3	
20 BC	silt loam	firm	2.5Y 4/3	cmd 2.5Y5/2 cmd 2.5Y5/2
30	LOI = 24"			
40				
50				

Soil Classification	Slope	Limiting Factor	
8 Profile / D Condition	6-18 %	12 "	[X] Ground Water [X] Restrictive Layer [ ] Bedrock [ ] Pit Depth 24"

Observation Hole SE TP 22D [X] Test Pit [ ] Boring

0 " Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0 Ap	silt loam	compact	10YR 3/3 &2.5Y 4/4	none observed
10 B	silt loam	compact top 4"	2.5Y 4/4	
20 BC	silt loam	firm	2.5 Y 4/4	emp10YR4/6 cmd 2.5Y 5/2
C	silt loam	firm	2.5Y 4/3	cmd 2.5Y5/3
30	LOI = 24"			
40	surface compaction appears due to recent surface grading but profile appears intact mostly. Nearby BLT SS TP's 2 and 33 show 31" to bedrock. Bedrock anticipated at <48".			
50				

Soil Classification	Slope	Limiting Factor	
8 Profile / AIII / D Condition	0 %	12 "	[X] Ground Water [X] Restrictive Layer [ ] Bedrock [ ] Pit Depth 24"

Site Evaluator Signature | #S344 SE # | 06/22/18 Date

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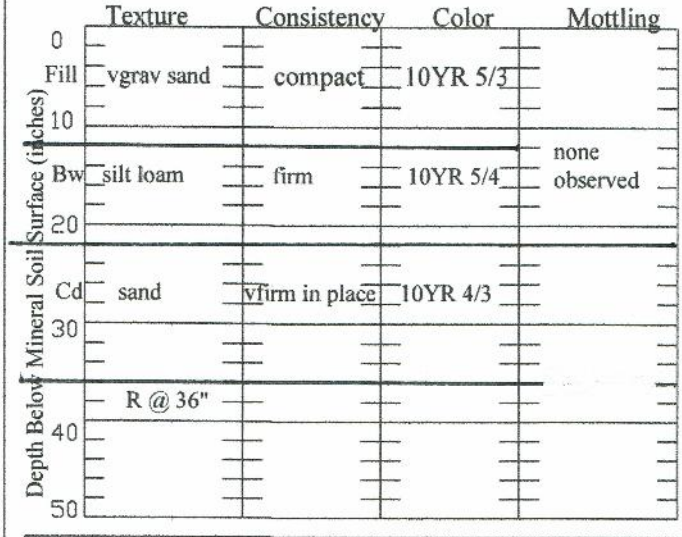
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Windham	Durant Homestead, Chute Road	Matt Hancock Properties

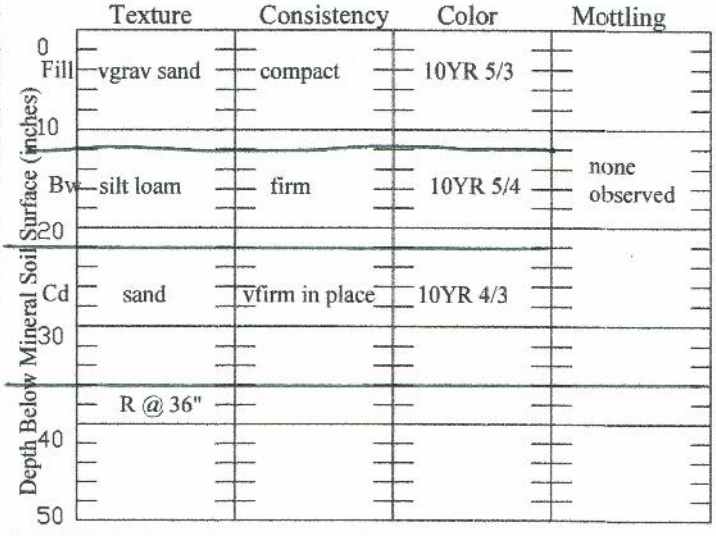
SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole SETP21C [X] Test Pit [ ] Boring
0 " Depth of Organic Horizon Above Mineral Soil



Soil Classification	Slope	Limiting Factor	
8 / AIII / D Profile / Condition	0 %	12 "	[ ] Ground Water [X] Restrictive Layer [ ] Bedrock 36" [ ] Pit Depth

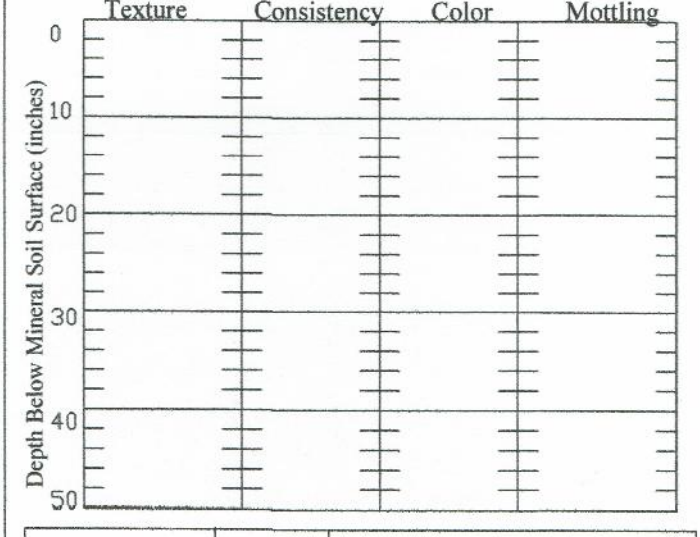
Observation Hole SETP 21D [X] Test Pit [ ] Boring
0 " Depth of Organic Horizon Above Mineral Soil



Soil Classification	Slope	Limiting Factor	
8 / AIII / D Profile / Condition	0 %	12 "	[ ] Ground Water [X] Restrictive Layer [ ] Bedrock 36" [ ] Pit Depth

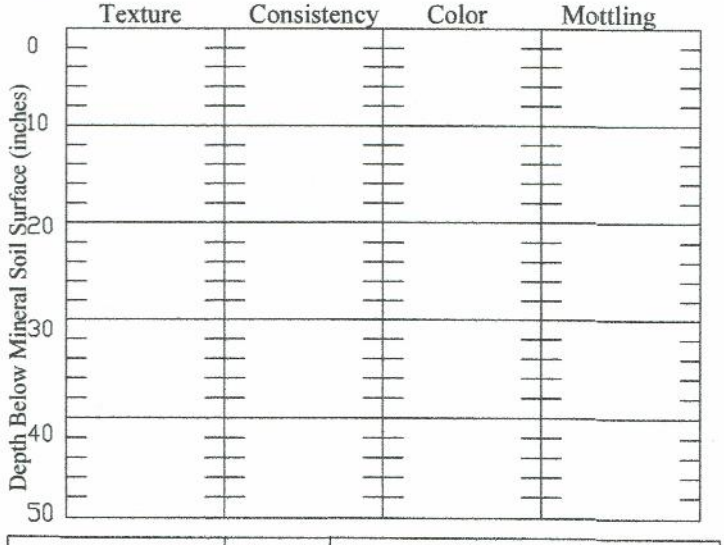
SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole _____ [ ] Test Pit [ ] Boring
_____ " Depth of Organic Horizon Above Mineral Soil



Soil Classification	Slope	Limiting Factor	
Profile / Condition	%	"	[ ] Ground Water [ ] Restrictive Layer [ ] Bedrock [ ] Pit Depth

Observation Hole _____ [ ] Test Pit [ ] Boring
_____ " Depth of Organic Horizon Above Mineral Soil



Soil Classification	Slope	Limiting Factor	
Profile / Condition	%	"	[ ] Ground Water [ ] Restrictive Layer [ ] Bedrock [ ] Pit Depth

Site Evaluator Signature | #S344 (SE #) | 06/13/18 (Date)

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Soil
Solutions
276 HOXIE HILL ROAD, ORRINGTON, MAINE 04474 (207) 825 - 4792

August 9, 2017

Matt Hancock Properties
c/o Mr. Matt Hancock
P.O. Box 295
Casco, ME 04015

RE: Preliminary Soil Evaluation of a proposed 26 lot subdivision on Chute Road in Windham, ME

Dear Mr. Hancock;

As you requested, on June 27 and 28, 2017, I conducted preliminary soil evaluations for subsurface wastewater disposal on a proposed 26 lots subdivision on Chute Road in Windham, Maine. The location of our test pits was based on a Site Plan prepared by Acheron Engineering Services of Newport, Maine.

Evaluation of 54 hand dug test pits, with at least one test pit in each of the proposed 26 lots, revealed at least one area on each lot where soil conditions meet the minimum drainage requirements for subsurface wastewater disposal. Soil conditions observed ranged from 2A, 3C, 7C, 8C and 8D with evidence of a seasonal groundwater table, restrictive layer, or bedrock from 11 to 35 inches in depth. Soil condition and depth to seasonal groundwater table, restrictive layer, or bedrock for each lot and each test pit are summarized in the attached "Soil Conditions Summary Table" and specified in the attached "Soil Condition and Classification" test pit logs. Where soil conditions 2A, 3C and 7C were observed, a 1000 gallon septic tank followed by a 900 square foot disposal bed, would provide adequate treatment of wastewater for a 3 bedroom house. Where 8C and 8D soil conditions were observed, a 1000 gallon septic tank followed by a 1200 square foot disposal bed, would provide adequate treatment of wastewater for a 3 bedroom house. Each test pit location is identified on the ground with a wooden stake or orange flagging and is shown on a plan prepared by our office titled "Preliminary Soil and Site Evaluation Test Pit Location".

As with any subsurface wastewater disposal system, proper setback of a disposal system from well, structures, lot lines, bodies of water, and protected natural resources is a necessary consideration in determining whether an area that appears suitable for subsurface wastewater disposal can meet minimum setback requirements. Based on information available and my evaluation, it appears the suitable areas observed at the test pits described in this report meets minimum setback requirements under the Maine State Plumbing Code. In addition, in anticipation of a possible subdivision permit application to the Maine Department of Environmental Protection (DEP) under a Site Location of Development Application (SLODA) we have excavated and described a sufficient

number of test pits to meet minimum SLODA requirements. We have also prepared the Maine DEP required test pit reporting forms identified as Form E and Form F in the SLODA permit application. As with any DEP SLODA application, additional testing, such as nitrate-nitrogen impact assessment, may be requested during the permit review process, to evaluate proposed subsurface wastewater disposal systems. This potential additional testing cannot be determined at this time prior to the preapplication meeting.

It is the responsibility of the owner or his agent to contact appropriate local officials, such as the Code Enforcement Officer or Planning Board in the Town of Windham, to check on local ordinances, such as setback requirements, that may be more restrictive than the Plumbing Code. This information may be important prior to submitting a subdivision or subsurface wastewater disposal permit applications to the Town.

Please call me at (207) 825-4792 if you have any questions.

Sincerely,

Stephen H. Howell
Site Evaluator # 213

FORM E Rev. 07/11

SOIL CONDITIONS SUMMARY TABLE

SUMMARY LOG OF SUBSURFACE EXPLORATIONS AT PROJECT SITES

Project Name:	Applicant Name:	Project Location (municipality):
Chute Road Proposed Subdivision	Matt Hancock Properties	Windham

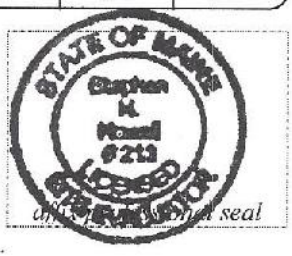
Lot No.	Exploration Symbol (TP 1, B 2, etc.)	✖ if at SSWD Field	Description of subsurface materials by: • Soil profile/condition (if by S.E.), • Soil series name (if by C.S.S.), or by • Geologic unit (if by C.G.)	Depths to (inches): Redoximorphic Features	Bedrock	Hydraulically Restrictive Layer	Limit of Exploration	Ground Surface Slope (%)	Ground Surface Elevation
1	TP1	☒	Lamoine/8C	16	>35	16	35	1-5	NA
1	TP1A	☒	Lamoine/8C	15	>35	15	35	1-5	NA
2	TP2	☒	Buxton/8C	18	>35	18	35	1-5	NA
2	TP2A	☒	Buxton/8C	18	>35	18	35	1-5	NA
3	TP3	☒	Lamoine/8D	14	>35	14	35	1-8	NA
3	TP3A	☒	Lamoine/8D	14	>35	14	35	1-8	NA
4	TP23	☒	Lamoine/8D	13	>35	13	35	8-15	NA
4	TP23A	☒	Lamoine/8D	13	>35	13	35	8-15	NA
5	TP22	☒	Lamoine/8D	13	>35	13	35	8-15	NA
5	TP22A	☒	Lamoine/8C	16	>35	16	35	8-15	NA
6	TP21	☒	Lamoine/8D	14	>35	14	35	0-5	NA
6	TP21A	☒	Lamoine/8D	14	>35	14	35	0-5	NA
7	TP20	☒	Lamoine/8C	15	>35	15	35	3-8	NA
7	TP20A	☒	Lamoine/8C	15	>35	15	35	3-8	NA
8	TP19	☒	Lamoine variant/7C	24	>35	24	35	1-6	NA
8	TP19A	☒	Lamoine variant/7C	24	>35	24	35	1-6	NA
9	TP18	☒	Lamoine/8C	15	>35	15	35	1-5	NA
9	TP18A	☒	Lamoine/8C	15	>35	15	35	1-5	NA
10	TP17	☒	Lamoine/8C	17	>35	17	35	1-6	NA
10	TP17A	☒	Buxton/8C	18	>35	18	35	1-6	NA
11	TP16	☒	Lamoine/8D	14	>35	14	35	1-5	NA
11	TP16A	☒	Buxton/8C	18	>35	18	35	1-5	NA
12	TP15	☒	Buxton/8C	18	>35	18	35	1	NA
12	TP15A	☒	Buxton/8C	18	>35	18	35	1-6	NA
13	TP14	☒	Buxton variant/7C	24	>35	24	35	1-6	NA
13	TP14A	☒	Buxton variant/7C	24	>35	24	35	1-6	NA
14	TP13	☒	Lamoine/8D	12	>35	12	35	1-6	NA
14	TP13A	☒	Buxton/8C	22	>35	22	35	1-5	NA
15	TP12	☒	Buxton/8C	21	>35	21	35	1-8	NA
15	TP12A	☒	Buxton/8C	21	>35	21	35	1-8	NA
16	TP11	☒	Lamoine/8D	14	>35	14	35	1-8	NA
16	TP11A	☒	Lamoine/8D	14	>35	14	35	1-8	NA

INVESTIGATOR INFORMATION AND SIGNATURE

Signature	Date
	8/03/17
Name Printed	**Cert/Lic/Reg. #**
Stephen H. Howell	SS # 187

Qualification

☒ Licensed Site Evaluator ☒ Certified Soil Scientist
☐ Certified Geologist ☐ Other:



affix registered seal

FORM E Rev. 07/11

SOIL CONDITIONS SUMMARY TABLE

SUMMARY LOG OF SUBSURFACE EXPLORATIONS AT PROJECT SITES

Project Name:	Applicant Name:	Project Location (municipality):
Chute Road Subdivision	Matt Hancock Properties	Windham

Lot No.	Exploration Symbol (TP 1, B 2, etc.)	☒ if at SSWD Field	Description of subsurface materials by: • Soil profile/condition (if by S.E.), • Soil series name (if by C.S.S.), or by • Geologic unit (if by C.G.)	Depths to (inches): Redoximorphic Features	Bedrock	Hydraulically Restrictive Layer	Limit of Exploration	Ground Surface Slope (%)	Ground Surface Elevation
17	TP10	☒	Lamoine/8D	11	>35	11	35	0-3	NA
17	TP10A	☒	Lamoine/8D	13	>35	13	35	0-3	NA
18	TP9	☒	Lamoine/8C	17	>35	17	35	3-8	NA
18	TP9A	☒	Lamoine/8C	18	>35	18	35	3-8	NA
19	TP8	☒	Lamoine/8D	13	>35	13	35	3-8	NA
19	TP8A	☒	Lamoine/8C	16	>35	16	35	3-8	NA
20	TP7	☒	Tunbridge/2A	NO	20	NO	20	1-5	NA
20	TP7B&C	☒	Lyman/2A	NO	12	NO	12	1-5	NA
20	TP7A&D	☒	Lyman/2A	NO	16	NO	16	1-5	NA
21	TP6	☒	Lyman/2A	NO	16	NO	16	1	NA
21	TP6A&B	☒	Lyman/2A	NO	18	NO	18	1-5	NA
21	TP6C&D	☒	Lyman/2A	NO	18	NO	18	1-5	NA
22	TP5	☒	Tunbridge/2A	NO	30	NO	30	1-5	NA
-	-	☐	-	-	-	-	-	-	-
23	TP4	☒	Buxton/8C	25	>40	25	40	8-15	NA
23	TP4A	☒	Buxton/8C	25	>40	25	40	8-15	NA
24	TP24	☒	Lamoine/8D	14	>35	14	35	5-12	NA
24	TP24A	☒	Lamoine/8D	14	>35	14	35	5-12	NA
25	TP5	☒	Lamoine/8D	14	>35	14	35	3-8	NA
25	TP5A	☒	Lamoine/8D	12	>35	12	35	1-5	NA
25	TP27	☒	Dixfield/3C	35	>35	35	35	5-15	NA
26	TP26	☒	Lamoine/8D	12	>35	12	35	1-8	NA
26	TP26A	☒	Lamoine/8D	14	>35	14	35	1-8	NA
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INVESTIGATOR INFORMATION AND SIGNATURE

Signature	Date
	8/03/17
Name Printed: Stephen H. Howell	Cert/Lic/Reg. #: SS # 187

Qualification: ☒ Licensed Site Evaluator ☒ Certified Soil Scientist ☐ Certified Geologist ☐ Other:



affix professional seal

SUBSURFACE WASTEWATER DISPOSAL SYSTEM APPLICATION

Maine Dept.Health & Human Services
Division of Environmental Health
(207) 287-5672 Fax: (207) 287-3165

Town, City, Plantation	Street, Road, Subdivision	Owner's Name
WINDHAM	WINDHAM SUBDIV., CHUTE ROAD	MATT HANCOCK PROPERTIES

SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole TP1 [X] Test Pit [ ] Boring
<1" Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0–10	VERY FINE SANDY LOAM	FRIABLE	BROWN; DARK YELLOWISH BROWN	NONE
10–20	LOAM	FIRM	LIGHT OLIVE BROWN	COMMON DISTINCT
20–30	SILTY CLAY LOAM	VERY FIRM	OLIVE	MANY DISTINCT
30–40	LIMIT OF OBSERVATION = 35"			
40–50				

Soil Classification	Slope	Limiting Factor	
Profile: B; Condition: C	1-5%	16"	[X] Ground Water; [X] Restrictive Layer; [ ] Bedrock; [ ] Pit Depth

Observation Hole TP1A [X] Test Pit [ ] Boring
<1" Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0–10	VERY FINE SANDY LOAM	FRIABLE	BROWN; DARK YELLOWISH BROWN	NONE
10–20	LOAM	FIRM	LIGHT OLIVE BROWN	COMMON DISTINCT
20–30	SILTY CLAY LOAM	VERY FIRM	OLIVE	MANY DISTINCT
30–40	LIMIT OF OBSERVATION = 35"			
40–50				

Soil Classification	Slope	Limiting Factor	
Profile: B; Condition: C	1-5%	15"	[X] Ground Water; [X] Restrictive Layer; [ ] Bedrock; [ ] Pit Depth

SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole TP2+2A [X] Test Pit [ ] Boring
<1" Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0–10	VERY FINE SANDY LOAM	FRIABLE	BROWN; YELLOWISH BROWN	NONE
10–20	LOAM	FIRM	LIGHT OLIVE BROWN	COMMON DISTINCT
20–30	SILTY CLAY LOAM	VERY FIRM	OLIVE	MANY DISTINCT
30–40	LIMIT OF OBSERVATION = 35"			
40–50				

Soil Classification	Slope	Limiting Factor	
Profile: B; Condition: C	1-5%	18"	[X] Ground Water; [X] Restrictive Layer; [ ] Bedrock; [ ] Pit Depth

Observation Hole TP3+3A [X] Test Pit [ ] Boring
<1" Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0–10	VERY FINE SANDY LOAM	FRIABLE	BROWN; YELL. BROWN	NONE
10–20	LOAM	FIRM	LIGHT OLIVE BROWN	COMMON DISTINCT
20–30	SILTY CLAY LOAM	VERY FIRM	OLIVE	MANY DISTINCT
30–40	LIMIT OF OBSERVATION = 35"			
40–50				

Soil Classification	Slope	Limiting Factor	
Profile: B; Condition: D	1-8%	14"	[X] Ground Water; [X] Restrictive Layer; [ ] Bedrock; [ ] Pit Depth

Site Evaluator Signature | #213 SE.# | 7/20/17 Date

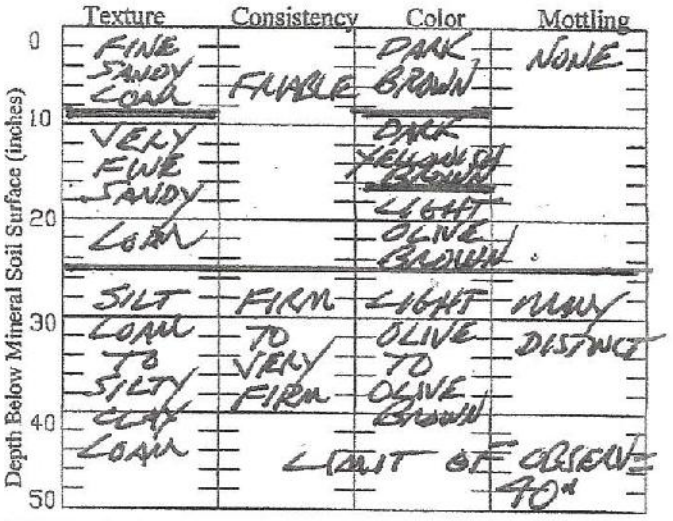
SUBSURFACE WASTEWATER DISPOSAL SYSTEM APPLICATION

Maine Dept.Health & Human Services
Division of Environmental Health
(207) 287-5672 Fax: (207) 287-3165

Town, City, Plantation	Street, Road, Subdivision	Owner's Name
WINDHAM	WINDHAM SUBDIV., CHUTE ROAD	MATT HANCOCK FLOORTILES

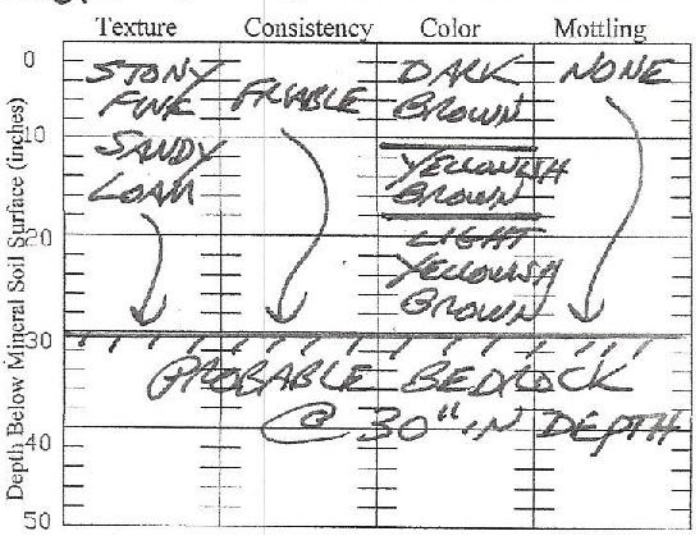
SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole TP1+1A ☒ Test Pit ☐ Boring
<1 " Depth of Organic Horizon Above Mineral Soil



Soil Classification	Slope	Limiting Factor	
8 C (Profile / Condition)	8-15%	25"	☒ Ground Water ☒ Restrictive Layer [ ] Bedrock [ ] Pit Depth

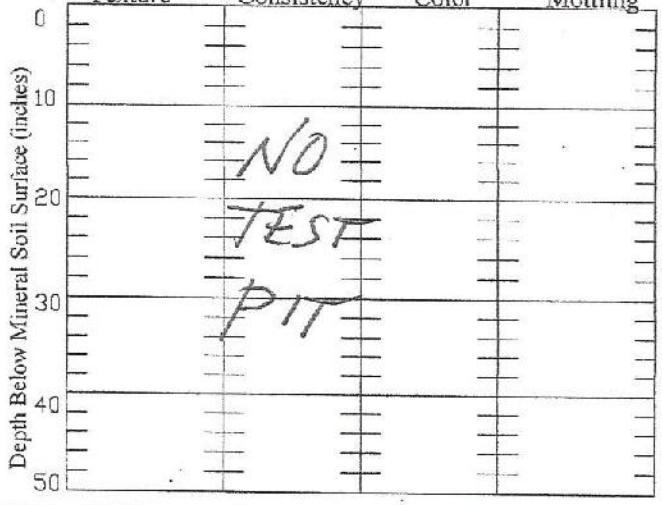
Observation Hole TP5 ☒ Test Pit ☐ Boring
<1 " Depth of Organic Horizon Above Mineral Soil



Soil Classification	Slope	Limiting Factor	
2 A (Profile / Condition)	1-5%	30"	[ ] Ground Water [ ] Restrictive Layer ☒ Bedrock [ ] Pit Depth

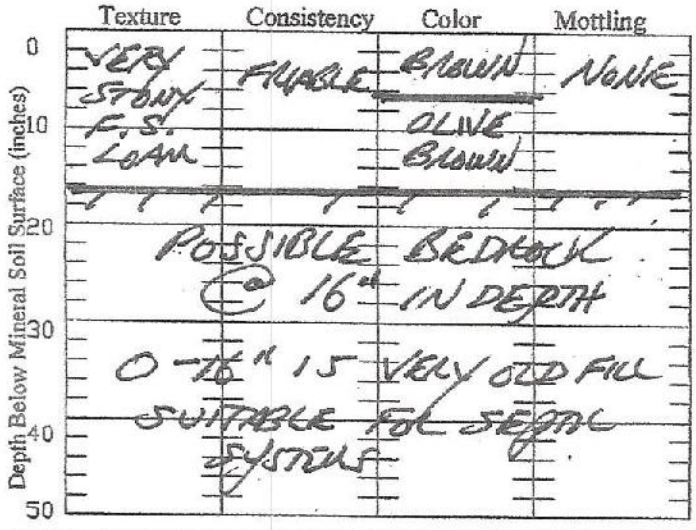
SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole _____ ☐ Test Pit ☐ Boring
_____ " Depth of Organic Horizon Above Mineral Soil



Soil Classification	Slope	Limiting Factor	
Profile / Condition	%	"	[ ] Ground Water [ ] Restrictive Layer [ ] Bedrock [ ] Pit Depth

Observation Hole TP6 ☒ Test Pit ☐ Boring
<1 " Depth of Organic Horizon Above Mineral Soil



Soil Classification	Slope	Limiting Factor	
2 A (Profile / Condition)	1-5%	16"	[ ] Ground Water [ ] Restrictive Layer ☒ Bedrock [ ] Pit Depth

Site Evaluator Signature | #213 SE # | 7/20/17 Date

SUBSURFACE WASTEWATER DISPOSAL SYSTEM APPLICATION

Maine Dept.Health & Human Services
Division of Environmental Health
(207) 287-5672 Fax: (207) 287-3165

Town, City, Plantation: WINDHAM

Street, Road, Subdivision: WINDHAM SUBDIV., CHUTE ROAD

Owner's Name: MATT HANCOCK PROPERTIES

SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole TP 6A&B ☒ Test Pit ☐ Boring

<1 " Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0–10	VERY STONY FINE SANDY LOAM	FRIABLE	BROWN	NONE
10–20			LIGHT OLIVE BROWN	
20–30	POSSIBLE BEDROCK @ 18" IN DEPTH			
30–40	0–18" IS VERY OLD FILL SUITABLE FOR SEPTIC SYSTEMS			
40–50				

Soil Classification	Slope	Limiting Factor	
2 A (Profile / Condition)	1-5%	18"	[ ] Ground Water [ ] Restrictive Layer [X] Bedrock [ ] Pit Depth

Observation Hole TP 7 ☒ Test Pit ☐ Boring

<1 " Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0–10	VERY STONY FINE SANDY LOAM	FRIABLE	BROWN	NONE
10–20			LIGHT OLIVE BROWN	
20–30	POSSIBLE BEDROCK @ 20" IN DEPTH			
30–40	0–20" IS A MIX OF NATIVE SOIL + VERY OLD FILL, SUITABLE FOR SEPTIC SYSTEMS			
40–50				

Soil Classification	Slope	Limiting Factor	
2 A (Profile / Condition)	1-5%	20"	[ ] Ground Water [ ] Restrictive Layer [X] Bedrock [ ] Pit Depth

SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole TP 8+C ☒ Test Pit ☐ Boring

<1 " Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0–10	VERY STONY F.S. LOAM	FRIABLE	BROWN	NONE
10–20			LIGHT OLIVE BROWN	
20–30	POSSIBLE BEDROCK @ 12" IN DEPTH			
30–40	0–12" IS A MIX OF NATIVE SOIL + VERY OLD FILL SUITABLE FOR SEPTIC SYSTEMS			
40–50				

Soil Classification	Slope	Limiting Factor	
2 A (Profile / Condition)	1-5%	12"	[ ] Ground Water [ ] Restrictive Layer [X] Bedrock [ ] Pit Depth

Observation Hole TP 11+D ☒ Test Pit ☐ Boring

<1 " Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0–10	VERY STONY F.S. LOAM	FRIABLE	BROWN	NONE
10–20			LIGHT OLIVE BROWN	
20–30	POSSIBLE BEDROCK @ 16" IN DEPTH			
30–40	0–16" IS A MIX OF VERY OLD FILL + NATIVE SOIL SUITABLE FOR SEPTIC SYSTEMS			
40–50				

Soil Classification	Slope	Limiting Factor	
2 A (Profile / Condition)	1-5%	16"	[ ] Ground Water [ ] Restrictive Layer [X] Bedrock [ ] Pit Depth

Site Evaluator Signature: [signature] #213 (SE #) 7/20/17 (Date)

SUBSURFACE WASTEWATER DISPOSAL SYSTEM APPLICATION

Maine Dept.Health & Human Services
Division of Environmental Health
(207) 287-5672 Fax: (207) 287-3165

Town, City, Plantation: WINDHAM

Street, Road, Subdivision: WINDHAM SUBDIV., CHUTE ROAD

Owner's Name: MATT HANCOCK PROPERTIES

SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole TP8 ☒ Test Pit ☐ Boring
2" Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0–10	VERY FINE SANDY LOAM	FRIABLE	BROWN; LIGHT OLIVE BROWN	NONE
10–20	SILT LOAM TO SILTY CLAY LOAM	FIRM TO VERY FIRM	OLIVE BROWN TO OLIVE	MANY DISTINCT
20–30				
30–40		LIMIT OF OBSERV= 35"		
40–50				

Soil Classification	Slope	Limiting Factor	
Profile: B; Condition: D	3-8%	13"	☒ Ground Water; ☒ Restrictive Layer; [ ] Bedrock; [ ] Pit Depth

Observation Hole TP8A ☒ Test Pit ☐ Boring
4" Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0–10	VERY FINE SANDY LOAM	FRIABLE	BROWN; LIGHT YELL. BROWN	NONE
10–20	SILT LOAM TO SILTY CLAY LOAM	FIRM TO V. FIRM	OLIVE BROWN TO OLIVE	MANY DISTINCT
20–30				
30–40		LIMIT OF OBSERV= 35"		
40–50				

Soil Classification	Slope	Limiting Factor	
Profile: B; Condition: C	3-8%	16"	☒ Ground Water; ☒ Restrictive Layer; [ ] Bedrock; [ ] Pit Depth

SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole TP9 ☒ Test Pit ☐ Boring
2" Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0–10	F.S. LOAM; VERY F.S. LOAM	FRIABLE	BROWN; LIGHT YELLOWISH BROWN	NONE
10–20	SILT LOAM TO SILTY CLAY LOAM	FIRM TO V. FIRM	OLIVE BROWN TO OLIVE	COMMON TO MANY DISTINCT
20–30				
30–40		LIMIT OF OBSERV= 35"		
40–50				

Soil Classification	Slope	Limiting Factor	
Profile: B; Condition: C	3-8%	17"	☒ Ground Water; ☒ Restrictive Layer; [ ] Bedrock; [ ] Pit Depth

Observation Hole TP9A ☒ Test Pit ☐ Boring
2" Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0–10	F.S. LOAM; V. F. SANDY LOAM	FRIABLE	BROWN; LIGHT YELLOWISH BROWN	NONE
10–20	SILT LOAM TO SILTY CLAY LOAM	FIRM TO V. FIRM	OLIVE BROWN TO OLIVE	COMMON TO MANY DISTINCT
20–30				
30–40		LIMIT OF OBSERV= 35"		
40–50				

Soil Classification	Slope	Limiting Factor	
Profile: B; Condition: C	3-8%	18"	☒ Ground Water; ☒ Restrictive Layer; [ ] Bedrock; [ ] Pit Depth

Site Evaluator Signature: [signature] SE #: #213 Date: 7/20/17

SUBSURFACE WASTEWATER DISPOSAL SYSTEM APPLICATION

Maine Dept.Health & Human Services
Division of Environmental Health
(207) 287-5672 Fax: (207) 287-3165

Town, City, Plantation	Street, Road, Subdivision	Owner's Name
WINDHAM	WINDHAM SUBDIV., CHUTE ROAD	MATT HANCOCK PROPERTIES

SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole TP10 ☒ Test Pit ☐ Boring
1" Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0–10	FINE SANDY LOAM	FRIABLE	V. DARK GRAYISH BROWN	NONE
10–20	SILT LOAM TO SILTY CLAY LOAM	FIRM TO VERY FIRM	OLIVE BROWN TO OLIVE	MANY DISTINCT
20–30			LIGHT OLIVE BROWN	
30–40	LIMIT OF OBSERV= 35"			
40–50				

Soil Classification	Slope	Limiting Factor	
Profile: B / Condition: D	0-3%	11"	☒ Ground Water ☒ Restrictive Layer ☐ Bedrock ☐ Pit Depth

Observation Hole TP10A ☒ Test Pit ☐ Boring
1" Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0–10	FINE SANDY LOAM	FRIABLE	V. DARK GRAYISH BROWN	NONE
10–20	SILT LOAM TO SILTY CLAY LOAM	FIRM TO VERY FIRM	OLIVE BROWN TO OLIVE	MANY DISTNCT
20–30			LIGHT OLIVE BROWN	
30–40	LIMIT OF OBSERV= 35"			
40–50				

Soil Classification	Slope	Limiting Factor	
Profile: B / Condition: D	0-3%	13"	☒ Ground Water ☒ Restrictive Layer ☐ Bedrock ☐ Pit Depth

SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole TP11HA ☒ Test Pit ☐ Boring
1" Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0–10	VERY FINE SANDY LOAM	FRIABLE	BROWN	NONE
10–20	SILT LOAM TO SILTY CLAY LOAM	FIRM TO V. FIRM	LIGHT YELL. BROWN / OLIVE BROWN TO OLIVE	COMMON TO MANY DISTINCT
20–30				
30–40	LIMIT OF OBSERV= 35"			
40–50				

Soil Classification	Slope	Limiting Factor	
Profile: B / Condition: D	1-8%	14"	☒ Ground Water ☒ Restrictive Layer ☐ Bedrock ☐ Pit Depth

Observation Hole TP12HA ☒ Test Pit ☐ Boring
2" Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0–10	FINE SANDY LOAM	FRIABLE	BROWN	NONE
10–20	V. FINE SANDY LOAM		LIGHT YELLOWISH BROWN / LIGHT OLIVE BROWN	
20–30	SILT LOAM TO SILTY CLAY LOAM	FIRM TO V. FIRM	OLIVE BROWN TO OLIVE	COMMON TO MANY DISTNCT
30–40	LIMIT OF OBSERV= 35"			
40–50				

Soil Classification	Slope	Limiting Factor	
Profile: B / Condition: C	1-8%	21"	☒ Ground Water ☒ Restrictive Layer ☐ Bedrock ☐ Pit Depth

Site Evaluator Signature | #213 SE # | 7/20/17 Date

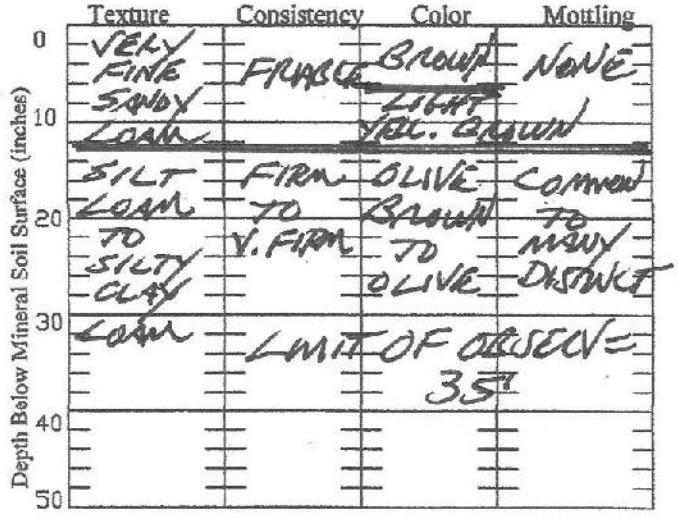
SUBSURFACE WASTEWATER DISPOSAL SYSTEM APPLICATION

Maine Dept. Health & Human Services
Division of Environmental Health
(207) 287-5672 Fax: (207) 287-3165

Town, City, Plantation	Street, Road, Subdivision	Owner's Name
WINDHAM	WINDHAM SUBDIV., CHUTE ROAD	MATT HANCOCK PROPERTIES

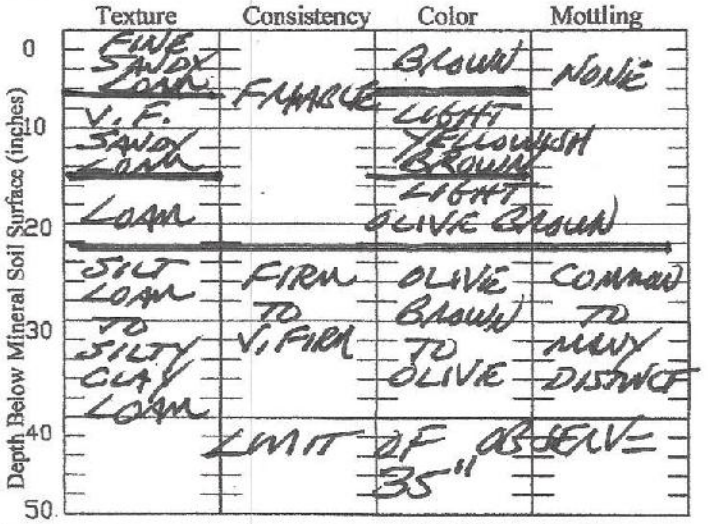
SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole TP13 ☒ Test Pit ☐ Boring
2 " Depth of Organic Horizon Above Mineral Soil



Soil Classification	Slope	Limiting Factor	
8 / D (Profile / Condition)	1-6 %	12"	☒ Ground Water ☒ Restrictive Layer ☐ Bedrock ☐ Pit Depth

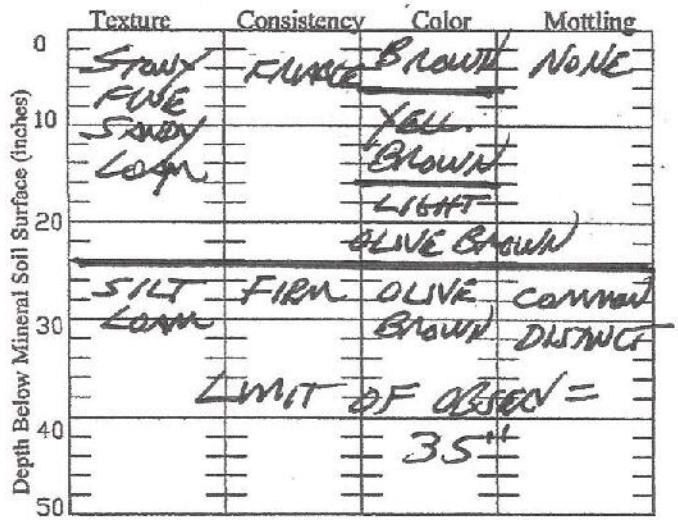
Observation Hole TP13A ☐ Test Pit ☐ Boring
2 " Depth of Organic Horizon Above Mineral Soil



Soil Classification	Slope	Limiting Factor	
8 / C (Profile / Condition)	15	22"	☒ Ground Water ☒ Restrictive Layer ☐ Bedrock ☐ Pit Depth

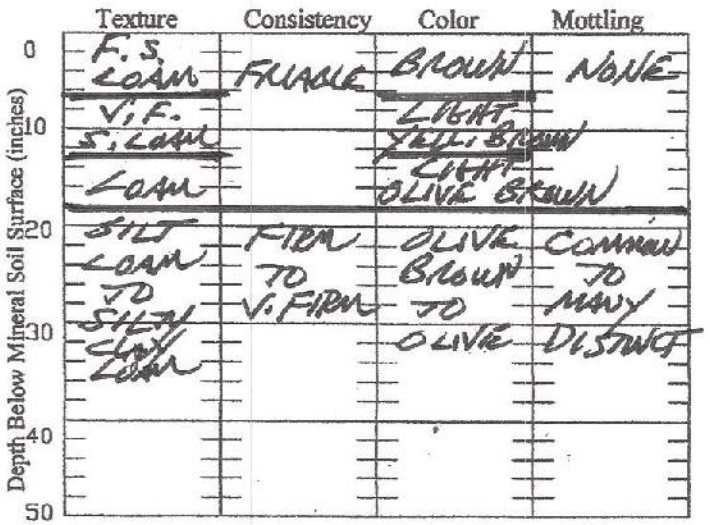
SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole TP14HHA ☒ Test Pit ☐ Boring
3 " Depth of Organic Horizon Above Mineral Soil



Soil Classification	Slope	Limiting Factor	
7 / C (Profile / Condition)	1-6%	24"	☒ Ground Water ☒ Restrictive Layer ☐ Bedrock ☐ Pit Depth

Observation Hole TP15HHA ☒ Test Pit ☐ Boring
2 " Depth of Organic Horizon Above Mineral Soil



Soil Classification	Slope	Limiting Factor	
8 / C (Profile / Condition)	1-6%	18"	☒ Ground Water ☒ Restrictive Layer ☐ Bedrock ☐ Pit Depth

Site Evaluator Signature | #213 (SE #) | 7/20/17 (Date)

SUBSURFACE WASTEWATER DISPOSAL SYSTEM APPLICATION

Maine Dept.Health & Human Services
Division of Environmental Health
(207) 287-5672 Fax: (207) 287-3165

Town, City, Plantation	Street, Road, Subdivision	Owner's Name
WINDHAM	WINDHAM SUBDIV., CHUTE ROAD	MATT HANCOCK PROPERTIES

SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole TP16 [X] Test Pit [ ] Boring
1 " Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0	V.F. SANDY LOAM	FRIABLE	DARK BROWN	NONE
10	SILT LOAM		LIGHT OLIVE BROWN	
			OLIVE BROWN	
20	SILTY CLAY LOAM	FIRM TO V. FIRM	OLIVE	MANY DISTINCT
30		LIMIT OF OBSERV= 30"		
40				
50				

Soil Classification	Slope	Limiting Factor	
Profile: B / Condition: D	1-5%	14"	[X] Ground Water; [X] Restrictive Layer; [ ] Bedrock; [ ] Pit Depth

Observation Hole TP16A [X] Test Pit [ ] Boring
2 " Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0	STONY F.S. LOAM	FRIABLE	BROWN	NONE
10	STONY LOAM		LIGHT YELL. BROWN	
			LIGHT OLIVE BROWN	
20	SILT LOAM	FIRM TO V. FIRM	OLIVE BROWN	COMMON DISTINCT
30		LIMIT OF OBSERV= 35"		
40				
50				

Soil Classification	Slope	Limiting Factor	
Profile: B / Condition: C	1-5%	18"	[X] Ground Water; [X] Restrictive Layer; [ ] Bedrock; [ ] Pit Depth

SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole TP17 [X] Test Pit [ ] Boring
3 " Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0	VERY FINE SANDY LOAM	FRIABLE	BROWN	NONE
10			LIGHT YEL. BROWN	
			LIGHT OLIVE BROWN	
20	SILT LOAM TO SILTY CLAY LOAM	FIRM TO V. FIRM	OLIVE BROWN TO OLIVE	MANY DISTINCT
30		LIMIT OF OBSERV= 35"		
40				
50				

Soil Classification	Slope	Limiting Factor	
Profile: B / Condition: C	1-6%	17"	[X] Ground Water; [X] Restrictive Layer; [ ] Bedrock; [ ] Pit Depth

Observation Hole TP17A [X] Test Pit [ ] Boring
3 " Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0	VERY FINE SANDY LOAM	FRIABLE	BROWN	NONE
10			YEL. BROWN	
			LIGHT OLIVE BROWN	
20	SILT LOAM TO SILTY CLAY LOAM	FIRM TO V. FIRM	OLIVE BROWN TO OLIVE	COMMON TO MANY DISTINCT
30		LIMIT OF OBSERV= 35"		
40				
50				

Soil Classification	Slope	Limiting Factor	
Profile: B / Condition: C	1-6%	18"	[X] Ground Water; [X] Restrictive Layer; [ ] Bedrock; [ ] Pit Depth

Site Evaluator Signature | #213 SE # | 7/20/17 Date

SUBSURFACE WASTEWATER DISPOSAL SYSTEM APPLICATION

Maine Dept. Health & Human Services
Division of Environmental Health
(207) 287-5672 Fax: (207) 287-3165

Town, City, Plantation	Street, Road, Subdivision	Owner's Name
WINDHAM	WINDHAM SUBDIV., CHUTE ROAD	MATT HANCOCK PROPERTIES

SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole TP18+18A [X] Test Pit [ ] Boring
2 " Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0	FINE SANDY LOAM	FRIABLE	DK. BROWN / GRAY. BROWN	NONE
10	V.F.S. LOAM		YELL. BROWN	
	SILT LOAM		LIGHT OLIVE BROWN	COMMON DISTINCT
20	SILT LOAM TO SILTY CLAY LOAM	FIRM TO V. FIRM	OLIVE BROWN	MANY DISTINCT
30				
40		LIMIT OF OBSERV = 35"		
50				

Soil Classification	Slope	Limiting Factor	
8 C (Profile / Condition)	1-5%	15"	[X] Ground Water [ ] Restrictive Layer [ ] Bedrock [ ] Pit Depth

Observation Hole TP19+19A [X] Test Pit [ ] Boring
2 " Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0	FINE SANDY LOAM	FRIABLE	BROWN	NONE
10			YELL. BROWN	
			LIGHT OLIVE BROWN	
20	SILT LOAM	FIRM	OLIVE BROWN	COMMON DISTINCT
30				
40		LIMIT OF OBSERV = 35"		
50				

Soil Classification	Slope	Limiting Factor	
7 C (Profile / Condition)	1-6%	24"	[X] Ground Water [X] Restrictive Layer [ ] Bedrock [ ] Pit Depth

SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole TP20+20A [X] Test Pit [ ] Boring
2 " Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0	VERY FINE SANDY LOAM	FRIABLE	BROWN	NONE
10			YELL. BROWN / LIGHT OLIVE BROWN	
20	SILT LOAM TO SILTY CLAY LOAM	FIRM TO V. FIRM	OLIVE	MANY DISTINCT
30				
40		LIMIT OF OBSERV = 35"		
50				

Soil Classification	Slope	Limiting Factor	
8 C (Profile / Condition)	3-8%	15"	[X] Ground Water [X] Restrictive Layer [ ] Bedrock [ ] Pit Depth

Observation Hole TP21+21A [X] Test Pit [ ] Boring
3 " Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0	V.F. SANDY LOAM	FRIABLE	DK. GRAY. BROWN	NONE
10			YELL. BROWN	
			LIGHT OLIVE BROWN	
20	SILT LOAM TO SILTY CLAY LOAM	FIRM TO V. FIRM	OLIVE BROWN TO OLIVE	COMMON TO MANY DISTINCT
30				
40		LIMIT OF OBSERV = 35"		
50				

Soil Classification	Slope	Limiting Factor	
8 D (Profile / Condition)	0-5%	14"	[X] Ground Water [X] Restrictive Layer [ ] Bedrock [ ] Pit Depth

Site Evaluator Signature | #213 SE # | 7/20/17 Date

SUBSURFACE WASTEWATER DISPOSAL SYSTEM APPLICATION

Maine Dept.Health & Human Services
Division of Environmental Health
(207) 287-5672 Fax: (207) 287-3165

Town, City, Plantation: WINDHAM

Street, Road, Subdivision: WINDHAM SUBDIV., CHUTE ROAD

Owner's Name: MATT HANCOCK PROPERTIES

SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole TP22 ☒ Test Pit ☐ Boring
2" Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0–10	STONY F.S. LOAM	FRIABLE	V. DK. GRAY. BROWN; LIGHT YELL. BROWN	NONE
10–20	ST. LOAM; SILT LOAM TO SILTY CLAY LOAM	FIRM TO V. FIRM	LT. OLIVE BROWN; OLIVE BROWN TO OLIVE	COMMON TO MANY DISTINCT
20–30	SILT LOAM TO SILTY CLAY LOAM	FIRM TO V. FIRM	OLIVE BROWN TO OLIVE	COMMON TO MANY DISTINCT
30–40	SILT LOAM TO SILTY CLAY LOAM	LIMIT OF OBSERV = 35"	OLIVE BROWN TO OLIVE	COMMON TO MANY DISTINCT
40–50				

Soil Classification Profile	Condition	Slope	Limiting Factor	
B	D	8-15%	13"	☒ Ground Water ☒ Restrictive Layer [ ] Bedrock [ ] Pit Depth

Observation Hole TP22A ☒ Test Pit ☐ Boring
2" Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0–10	STONY F.S. LOAM	FRIABLE	V. DK. GRAY. BROWN; LIGHT YELL. BROWN	NONE
10–20	STONY LOAM; SILT LOAM TO SILTY CLAY LOAM	FIRM TO V. FIRM	LIGHT OLIVE BROWN; OLIVE BROWN	COMMON TO MANY DISTINCT
20–30	SILT LOAM TO SILTY CLAY LOAM	FIRM TO V. FIRM	OLIVE BROWN	COMMON TO MANY DISTINCT
30–40	SILT LOAM TO SILTY CLAY LOAM	LIMIT OF OBSERV = 35"	OLIVE BROWN	COMMON TO MANY DISTINCT
40–50				

Soil Classification Profile	Condition	Slope	Limiting Factor	
B	C	8-15%	16"	☒ Ground Water ☒ Restrictive Layer [ ] Bedrock [ ] Pit Depth

SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole TP23+23A ☒ Test Pit ☐ Boring
2" Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0–10	VERY FINE S. LOAM	FRIABLE	V. DARK GRAY. BROWN; LIGHT YELL. BROWN	NONE
10–20	LOAM; SILT LOAM TO SILTY CLAY LOAM	FIRM TO V. FIRM	LT. OLIVE BROWN; OLIVE BROWN TO OLIVE	COMMON TO MANY DISTINCT
20–30	SILT LOAM TO SILTY CLAY LOAM	FIRM TO V. FIRM	OLIVE BROWN TO OLIVE	COMMON TO MANY DISTINCT
30–40	SILT LOAM TO SILTY CLAY LOAM	LIMIT OF OBSERV = 35"	OLIVE BROWN TO OLIVE	COMMON TO MANY DISTINCT
40–50				

Soil Classification Profile	Condition	Slope	Limiting Factor	
B	D	8-15%	13"	☒ Ground Water ☒ Restrictive Layer [ ] Bedrock [ ] Pit Depth

Observation Hole TP24+24A ☒ Test Pit ☐ Boring
4" Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0–10	VERY FINE SANDY LOAM	FRIABLE	BROWN; YELLOWISH BROWN	NONE
10–20	LOAM; SILTY CLAY LOAM	FIRM; VERY FIRM	LIGHT OLIVE BROWN; OLIVE	COMMON DISTINCT; MANY DISTINCT
20–30	SILTY CLAY LOAM	VERY FIRM	OLIVE	MANY DISTINCT
30–40	SILTY CLAY LOAM	LIMIT OF OBSERV = 35"	OLIVE	MANY DISTINCT
40–50				

Soil Classification Profile	Condition	Slope	Limiting Factor	
B	D	5-12%	14"	☒ Ground Water ☒ Restrictive Layer [ ] Bedrock [ ] Pit Depth

Site Evaluator Signature: [signature] #213 7/20/17
SE # Date

SUBSURFACE WASTEWATER DISPOSAL SYSTEM APPLICATION

Maine Dept.Health & Human Services
Division of Environmental Health
(207) 287-5672 Fax: (207) 287-3165

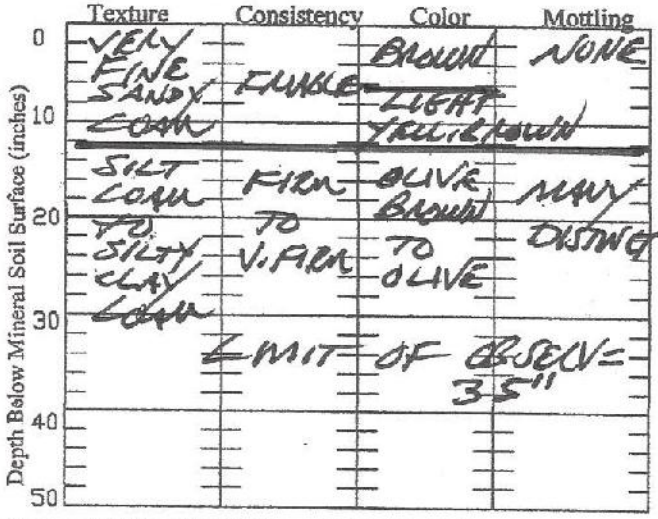
Town, City, Plantation: WINDHAM

Street, Road, Subdivision: WINDHAM SUBDIV., CHUTE ROAD

Owner's Name: MATT HANCOCK PROPERTIES

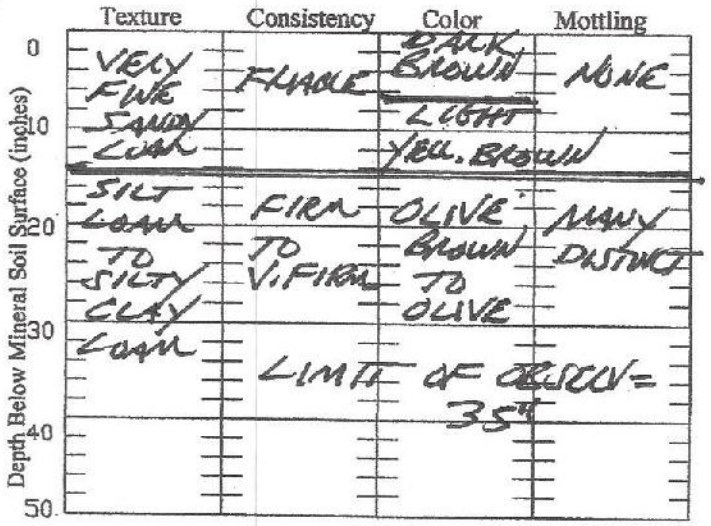
SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole TP 26 [X] Test Pit [ ] Boring
<1" Depth of Organic Horizon Above Mineral Soil



Soil Classification	Slope	Limiting Factor	
Profile: 8 / Condition: D	1-8 %	12"	[X] Ground Water [X] Restrictive Layer [ ] Bedrock [ ] Pit Depth

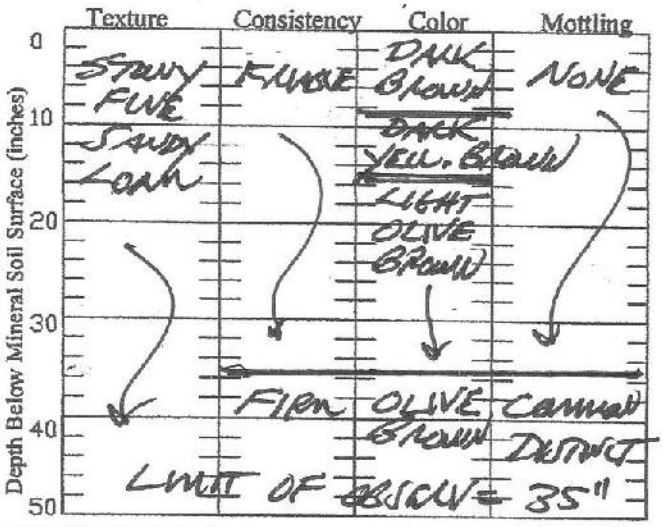
Observation Hole TP26A [X] Test Pit [ ] Boring
<1" Depth of Organic Horizon Above Mineral Soil



Soil Classification	Slope	Limiting Factor	
Profile: 8 / Condition: D	1-8%	14"	[X] Ground Water [X] Restrictive Layer [ ] Bedrock [ ] Pit Depth

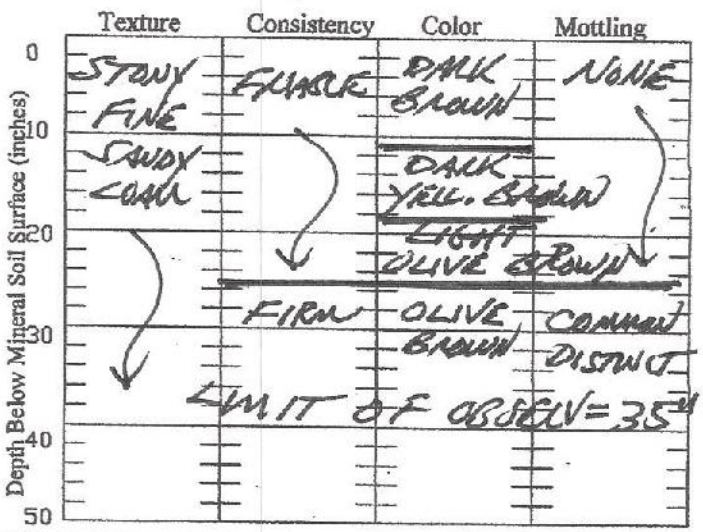
SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole TP27 [X] Test Pit [ ] Boring
<1" Depth of Organic Horizon Above Mineral Soil



Soil Classification	Slope	Limiting Factor	
Profile: 3 / Condition: C	6-15%	35"	[X] Ground Water [X] Restrictive Layer [ ] Bedrock [ ] Pit Depth

Observation Hole TP28 [X] Test Pit [ ] Boring
<1" Depth of Organic Horizon Above Mineral Soil



Soil Classification	Slope	Limiting Factor	
Profile: 3 / Condition: C	1-5%	25"	[X] Ground Water [X] Restrictive Layer [ ] Bedrock [ ] Pit Depth

Site Evaluator Signature

#213
SE #

7/20/17
Date

HHE-200 Rev. 05/08

Abutters List

Ingrid D. Sardinha
72 Chute Road
Windham, ME 04062

Paul S. Blanchard
74 Chute Road
Windham, ME 04062

Christopher H. Lord
76 Chute Road
Windham, ME 04062

Brenda Jordan
78 Chute Road
Windham, ME 04062

Michael R. Eichorn
12 Falcon Road
Windham, ME 04062

Fred A. Staples
9 Webb Road
Windham, ME 04062

Elizabeth Dube
32 Chute Road
Windham, ME 04062

John A. Streeter

18 Chute Road

Windham, ME 04062

Lillian M. Plummer

358 River Road

Windham, ME 04062

River's Edge Common Land

Victoria LN

Windham, ME 04062

Anita Lampron

129 Westerlea Way

Standish, ME 04084

Easterly side of Chute Road

Conrad and Suzanne Maurais

39 Chute Road

Windham, ME 04062

William R. Wescott

P.O. Box 37

South Windham, ME 04082

Audrey L. Golder Trustee

65 Chute Road

Windham, ME 04062

Matthew Stover

71 Chute Road

Windham, ME 04062

Ryan Additon

73 Chute Road

Windham, ME 04062

Town of Windham

8 School Road

Windham, ME 04062

R. N. Willey & Sons Excavating, Inc.
P O Box 28

S. Casco, ME 04077
Development * House Packages * General Contracting
(207) 655-7345 fax (207) 655-2664

Durant Property-Windham

COST ESTIMATE
clearing and stumping
constructing road
drainage
pavement

$540,000.

**this estimate is only an estimate based on current available information provided.



Wealth Management

Two Portland Square, 5th Floor
P.O. Box 17600
Portland, ME 04112-8600

Toll Free: 800.341.0336
Fax: 207.871.1778
www.rbcwm-usa.com

April 13, 2018

K. Matthew Hancock
PO Box 295
Casco ME 04015-0295

Re: K. Matthew Hancock RBC Wealth Management Accounts

Dear Mr. Hancock:

This letter shall serve as your notification that as of today, there are sufficient funds available in the above referenced accounts to cover the payment of any check and/or transfer of funds in excess of the amount of $750,000.00.

Sincerely,

John Beaulieu
Branch Service Manager

The material presented above has been obtained from sources believed to be reliable. However it is not guaranteed as to accuracy and does not purport to be complete. Your RBC Wealth Management monthly statement is the official record of your account.

Non-deposit investment products: • Not FDIC insured • Not bank guaranteed • May lose value

RBC Wealth Management, a division of RBC Capital Markets, LLC, member NYSE/FINRA/SIPC.

Page 1 of 1 received on 4/13/2018 12:04:51 PM [Eastern Daylight Time] RBC server SE122493

State of Maine

Department of the Secretary of State

I, the Secretary of State of Maine, certify that according to the provisions of the Constitution and Laws of the State of Maine, the Department of the Secretary of State is the legal custodian of the Great Seal of the State of Maine which is hereunto affixed and that the paper to which this is attached is a true copy from the records of this Department.

In testimony whereof, I have caused the Great Seal of the State of Maine to be hereunto affixed. Given under my hand at Augusta, Maine, this twenty-third day of July 2018.

Matthew Dunlap
Secretary of State

Additional Addresses

Legal Name	Title	Name	Charter #	Status
MATT HANCOCK PROPERTIES, LLC	Registered Agent		20071760DC	GOOD STANDING
Home Office Address (of foreign entity)	**Other Mailing Address**			

Technical Ability Statement

Matt Hancock Properties consists of two partners; Matt Hancock, and Dave Fowler. Together they have over 40 years experience in the development and construction industry as project managers and financers. Successful residential subdivision projects include but are not limited to; Cathedral Pines in Raymond, Hancock Beach in Casco, Mayberry Highlands in Casco, Mountain Meadows in Casco, and Heathview Estates also in Casco, Bridal Path in Gorham, Mt Abram Ski Resort, and several utility scale wind and solar projects.

For the design phase of the project, the Applicant has retained Acheron Engineering, professionals in the field of surveying, engineering, Burman Land and Tree Co. for soil evaluation, and Plisga & Day for surveying. The applicant has a longstanding relationship with all the consultants.

For the roadway and drainage construction, the applicant will allow qualified, local, contractors the opportunity to bid on the work to be done. Contractors that Matt Hancock Properties has been associated with in the past include, R.N. Wiley, P&K Sand and Gravel, Shaw Bros., Grondin, and Tanberg. The selected contractor will have demonstrated the ability and capacity to construct the roadway and associated infrastructure according to the design specifications.

Kirk Ball, P.E.

Acheron Engineering Services
147 Main Street
Newport, Maine 04953
Cell: 207-341-2590
Tel. (207) 368-5786
KBall@AcheronEngineering.com

Maine Professional Engineer #11681

EDUCATIONAL HISTORY

University of Maine Orono, Maine	B.S. Construction Management 2003
Maine Central Institute Pittsfield, Maine	College Course Curriculum, 1985

PROFESSIONAL EXPERIENCE

2008 - Present	Vice President & Project Manager Acheron Engineering Services 147 Main Street, Newport, Maine 04953
2003 - 2008	Project Engineer Acheron Engineering Services 147 Main Street, Newport, Maine 04953
1998 - 2003	Engineering Technician Acheron Engineering Services 147 Main Street, Newport, Maine 04953
1988 - 1998	Piping & Machinery Designer Bath Iron Works, Bath Maine

PROJECT RELATED WORK HISTORY

2018 Modification of Site Location of Development Act Permit for MHC Moody Beach: Provided engineering and permitting service for expansion of existing RV resort, Wells Maine. Services included, site design, stormwater management design, erosion control design, coordinating work by other consultants.

2018 MWDCA Permit Application, Saccarappa Hydro Sappi North America:

ALEITA "LEE" BURMAN

Senior Wetland Scientist, Certified Soil Scientist

Address: Burman Land & Tree Company, LLC, 16 Steep Hill Road, Orrington, Maine 04474
Phone: (207) 825-4050 home, (207) 385-6056 cell
E-Mail: blburman@gmail.com

Services Summary

I am a natural resources consultant serving clients in Maine. My services include protected natural resource delineation and mapping, soil science and mapping, vernal pool documentation, stream identification, wetland functional assessments and mitigation plans, invasive species management, and natural resource alteration permitting assistance with the Corps, EPA, DEP, LUPC and municipalities. I give presentations to interested groups on ecology and natural resources topics and on State and Federal permitting standards.

Senior Wetland Scientist

- New Hampshire Certified Wetland Scientist #178
- Protected Natural Resources identification, delineation, and classification
- Wetland Data Forms, Wetland Functional Assessments, Wetland Mitigation Plans
- State and Federal natural resources alteration permitting: preparation and submission of permit applications, alternatives analyses, liaison between client and regulatory agencies, project presentations
- Presentations and Training

Certified Soil Scientist

- Maine Certified Soil Scientist #SS430
- Soil Surveys for Maine Site Location of Development Applications
- Soil Documentation for stormwater system design
- Soil Documentation for waste facility licensing

Licensed Site Evaluator

- Maine Licensed Soil Site Evaluator #SE344
- Soil Site Evaluation and Septic Design

Education

- B.S. High Distinction, Natural Resources, Soil and Water Conservation. University of Maine, Orono, Maine. 1992
- A.A.S. Ecology and Environmental Technology. Paul Smiths College, Paul Smiths, N.Y. 1988

Professional Associations

- Maine Association of Wetland Scientists, Member;
  Treasurer (2014 to present), , Technical Committee (2015 to present) Legislative Committee (2011 to present); Ethics Chair (2013 to 2014)
- Maine Association of Professional Soil Scientists, Member;
  Vice President (1999-2000); Membership Chair (2000-2002)
- Maine Association of Soil Site Evaluators, Member

Experience

2015 – present	Burman Land & Tree Company, LLC, Orrington, ME. Independent Environmental Consultant. Wetland, vernal pool and stream delineation. Corps, MDEP, LUPC and municipal resource alteration permitting assistance. Soil surveys. Work with regulatory agencies, clients and team members/stakeholders to facilitate project success.
1997 – 2015	S.W. Cole Engineering, Inc., Bangor, ME. Ecological Services Team Leader. Project Manager of Protected Natural Resources and Soils services. Senior Scientist. Team Leader of 4 to 5 person soil/wetland scientist team. Responsible for client projects from beginning to end including initial client contact, scoping, writing contracts, budgeting, fieldwork, writing reports, MDEP NRPA, Corps, Maine LURC, and NHDES permitting, presentations, and meetings. Required to represent work at regulatory meetings, planning board meetings, and client and team meetings. Responsible for mentoring, training and supervising junior scientists. Presentations at technical seminars and workshops.
1993 to 1997	Allan Ott, C.S.S., L.S.E., Bar Harbor, ME. Conducted soil site evaluation and septic designs, and soil surveys. Apprentice to 1995, then licensed.
Summer 1992	University of Maine, Research Assistant, Orono, ME. Supported graduate students in natural resources research.
Summers 1990/91	Southwestern Environmental Consulting, Sedona, AZ. Timber Cruiser/Wildlife Research Technician. Conducted timber inventory in the Bitterroot National Forest in Montana, and Santa Fe and Cibeola National Forests in New Mexico. Conducted spotted owl research in the Kaibob National Forest in Arizona.
1989 – 1990	Clean Air Corp., Service Engineering, Champion Intl Paper Mill, Bucksport, ME. Branch Manager, Site Supervisor. Coordinated and supervised long-term asbestos abatement project in industrial environment. Indoor Air Quality Testing certification.
Summer 1988	Dartmouth College, Hanover, NH. Field technician – red spruce decline study. Sampled forestry plots at over 4,000 ft. on mountains in NY, VT, NH, and ME.

Volunteer Activities/Interests:

- Orrington Boy Scouts. Committee Member, Merit Badge Councilor (2011 to present)
- Orrington Cub Scouts. Chair (2009/11), Co-Chair (2008/09)
- Envirothon Volunteer, 2011, 2012, 2013
- Orrington Planning Board, 1998 to 2000
- Professional Vocalist, 1988 to 2000

Provided engineering services for the removal of the Saccarappa Hydro Station. Services included, oversight of site design, structural design, fishway design, hydraulic modeling and coordination of work by other conslutants.

2018 Penobscot McCrum, Belfast, Maine: Provided engineering service related to drafting a Stormwater Pollution Prevention Plan and Oil Spill Prevention, Control and Countermeasure Plan for the Belfast facility.

2017 FERC Surender Application Saccarappa Hydro Sappi North America:
Provided engineering services for the removal of the Saccarappa Hydro Station. Services included, oversight of site design, structural design, fishway design, hydraulic modeling and coordination of work by other conslutants.

2007 – 2018 Pratt & Whitney Quarterly Stormwater Inspection and Plan Updates:
Perform quarterly stormwater inspections of the Pratt and Whitney North Berwick Facility per the facility's Stormwater Pollution Prevention Plan and the Maine Multi Sector General Permit. Provided assistance updating plans upon State of Maine renewing the MSGP.

2016 Modification of Site Location of Development Act Permit for MHC Naples KOA Campground: Provided engineering and permitting service for expansion of existing RV resort, Naples Maine. Services included, site design, stormwater management design, erosion control design, coordinating work by other consultants.

2014 MWDCA Application Cumberland Mills Fish Passage Sappi North America:
Provided engineering services for fish passage for the Cumberland Mill Dam, Westbrook, Maine. Services included, oversight of site design, structural design, fishway design, hydraulic modeling and coordination of work by other conslutants.

Older relevant project includes:

- Stormwater Permit for Sebasticook Lumber, St. Albans, Maine
- Stormwater Permit for Hemlock Grove Campground, Arundel, Maine
- Stormwater Permit for Northeastern Log Homes, Kenduskeag, Maine
- LUPC Permit, Chewonki Campground, Golden Road, Maine
- LUPC Permit, Chewonki Camp for Girls, Forth Debsconeag
- Stormwater Permit, Garland Pond Residential Subdivision, Garland, Maine
- Design and Local Permitting, Smith Residential Subdivision, Dover, Maine

BURMAN
LAND & TREE COMPANY, LLC.

P.O. Box 145, Orrington, ME 04474 (207) 825-4050

17-005
July 05, 2018

Matt Hancock Properties
Attention: Matt Hancock
P.O. Box 295
Casco, ME04015

Subject: Protected Natural Resources Delineation and Verification Report
Durant Homestead
Chute Road
Windham, Maine

Dear Matt,

We are pleased to present the findings of our Protected Natural Resources delineation and verification services for the proposed Durant Homestead residential subdivision on Chute Road in Windham, Maine. The purpose of our services was to identify and delineate Protected Natural Resources within the proposed development area, and verify the identification and delineation of Protected Natural Resources conducted on the remainder of the property by Main-Land Development Consultants in 2006.

The property is identified by the Town of Windham as Tax Map 6, Lot 25, and is approximately 65 acres in size. Our delineation services were conducted in the proposed development area, on about 20-25 acres in the east-central portion of the property. Our verification services were conducted on the western approximately 40-45 acres of the property and other areas outside of the development area. The previously delineated resource features were shown on an Acheron Engineering, Inc. plan dated May 10, 2017.

This Report is subject to the Limitations attached in Appendix A. Appendix B contains a Site Location Map and Protected Natural Resources Plan. Appendix C contains color photographs. Appendix D contains resource agency responses and database searches,

William H. Burman
Licensed Professional Forester
Master Arborist
Master Pesticide Applicator

Aleita M. Burman
Certified Wetland Scientist
Certified Soil Scientist
Licensed Site Evaluator

and copies of published resource mapping. Appendix E contains U.S. Corps of Engineers Wetland Data Forms. Appendix F contains a copy of the 2006 Main-Land Development Consultants Wetland Delineation Report.

Previous Services by Others

Main-Land Development Consultants previously conducted Protected Natural Resources identification and delineation work on the property, reported in their Wetlands Delineation Report dated August 03, 2006. Based on this Report, we understand that Main-Land Development Consultants identified and delineated freshwater wetlands on the site, and that other Protected Natural Resources such as streams were not identified. The previous services did not include vernal pool documentation as the vernal pool rules were not yet in effect at the time of their services. Based on the report, Main-Land Development Consultants followed resource identification and delineation standards in place at the time, and resource boundary flagging was located using a GPS receiver.

Protected Natural Resources Services

Burman Land & Tree Company, LLC visited the site on April 27, May 04, and June 28, 2017 and June 16, 2018 to conduct identification and delineation of field-observable Protected Natural Resources within the proposed development area, and a verification of the Main-Land Development Consultants 2006 delineated field-observable Protected Natural Resources. Our Protected Natural Resources delineation and verification services were conducted following standards as defined by the MDEP[1] and U.S. Army Corps of Engineers[2] (Corps). Our wetland identification and delineation was conducted using the 1987 Corps Wetland Delineation Manual[3] and Northeast Regional Supplement[4]. Our stream identification and delineation was conducted using the MDEP Natural Resources Protection Act Statute. Our vernal pool identification and

[1] State of Maine, Department of Environmental Protection, Natural Resources Protection Act Statute, 38 M.R.S.A. §480-A to 480-HH, DEPLW284-W2010, Revised August 12, 2011.
[2] United States Department of the Army, General Permit, State of Maine, Effective: October 13, 2015 to October 13, 2020.
[3] Environmental Laboratory. 1987. "Corps of Engineers Wetland Delineation Manual", Technical Report Y-87-1, U.S. Army Engineers Waterways Experiment Station, Vicksburg, Miss.
[4] U.S. Army Corps of Engineers. 2011. Regional Supplement to the Corps of Engineers Wetland Delineation Manual:Northcentral and Northeast Region (Version 2.0), ed. J. S. Wakeley, R. W. Lichvar, C. V. Noble, and J. F. Berkowitz.ERDC/EL TR-12-1. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

documentation was conducted using MDEP Chapter 335[5], the Corps General Permit and the Maine Association of Wetland Scientists Vernal Pool Protocol[6].

Delineation – Burman Land & Tree, LLC delineated three wetlands within the proposed development area, labeled Wetlands A, B and C, as shown on the Protected Natural Resources Plan in Appendix B. We collected soils, vegetation and hydrology data in four data plots within the wetlands, and one in the uplands. Corps Wetland Data Forms are attached in Appendix E.

Wetland A was located in the southern and central portion of the site. Wetland A contained forested wetlands with greater than 50% hydrophytic vegetation. Wetland A was dominated by red maple (*Acer rubrum*) with other species such as white pine (*Pinus strobus*), balsam fir (*Abies balsamea*), green ash (*Fraxinus pennsylvanica*), brown ash (*Fraxinus nigra*), American elm (*Ulmus americana*), and quaking aspen (*Populus tremuloides*). Observed soils in a test pit in a representative area of the wetter portion of the wetland consisted of 4 inches of black muck, underlain by 8 inches of mucky silt loam, underlain by greater than 4 inches of firm, depleted and mottled silt loam. Soils in the wetland are closest to classification as Soil Indicator F3: Depleted Matrix. The Primary Hydrology Indicators observed were A1: Surface Water, A2: High Water Table, A3: Saturation.

Wetland B was located in the northern portion of the site. Wetland B contained forested wetlands with greater than 50% hydrophytic vegetation. Wetland B was dominated by red maple with other species such as balsam fir and quaking aspen. Observed soils in a test pit in a representative area of the wetland consisted of 2 inches of organic matter underlain by 3 inches of mucky silt loam soil, underlain by 3 inches of a depleted and mottled silt loam soil, underlain by greater than 6 inches of a firm, depleted and mottled silt loam soil. Soils in the wetland are closest to classification as Soil Indicator F3: Depleted Matrix. The Primary Hydrology Indicators observed were A1: Surface Water, A2: High Water Table, A3: Saturation.

Wetland C was located in the northeastern portion of the site. Wetland C contained forested wetlands with greater than 50% hydrophytic vegetation. Wetland C was

[5] State of Maine, Department of Environmental Protection, Chapter 335 Significant Wildlife Habitat, amended January 7, 2014.
[6] Maine Association of Wetland Scientists. Vernal Pool Technical Committee. Vermal Pool Survey Protocol. April 2014

dominated by red maple with other species such as green ash, balsam fir and quaking aspen. Observed soils in a test pit in a representative area of the wetland consisted of 2 inches of organic matter underlain by 3 inches of mucky silt loam soil, underlain by 3 inches of a depleted and mottled silt loam soil, underlain by greater than 6 inches of a firm, depleted and mottled silt loam soil. Soils in the wetland are closest to classification as Soil Indicator F3: Depleted Matrix. The Primary Hydrology Indicators observed were A1: Surface Water, A2: High Water Table, A3: Saturation.

We did not observe streams or vernal pools within the proposed development area.

Verification - For our verification fieldwork, we used a Trimble mapping grade GPS receiver with the base map uploaded onto it. We transected the site and observed forested wetlands, generally in the configuration as previously delineated by Main-Land Development Consultants. Some of the blue wetland boundary flags from the previous services were evident during our fieldwork. While the site had been logged between the time of the previous delineation and our services, we did not observe permanent changes on or adjacent to the site (such as large-scale development) that would significantly change hydrology. We observed wetland soils, vegetation and hydrology within the previously delineated wetlands, as per the most current technical guidance for wetland delineation. Based on our findings, the previous wetland delineation in the areas outside of the proposed development area, as shown on the Protected Natural Resources Plan in Appendix B, generally meets current wetland delineation standards.

The wetlands we observed in the verification area were forested (recently harvested) with greater than 50% hydrophytic vegetation dominated by red maple (*Acer rubrum*). Observed soils were generally silt loam textured with a black, mucky surface horizon underlain by a depleted and mottled subsurface horizon, underlain by a depleted and mottled, firm subsoil. Soils in the wetland are closest to classification as Soil Indicator F3: Depleted Matrix. The Primary Hydrology Indicators observed were A1: Surface Water, A2: High Water Table, and A3: Saturation.

We observed a stream in the southwestern portion of the property, outside of the proposed development area. The stream ranged up to about 2 feet wide and less than 6 inches deep. It was an apparently intermittent stream with a cobble-gravel and mud

bottom. We observed Black Brook, a perennial stream, within 250 feet outside of the northern border of the site. We did not observe vernal pools in the verification area.

Due to the US FWS mapping the site as within the potential habitat of the small whorled pogonia (*Isotria medeoloides* – see below), we noted if the habitat requirements for it were present on the site during our field verification services, specifically within the proposed development area. Based on our review, the small whorled pogonia prefers older hardwood stands dominated by oak, beech, birch, hickory and maple, with an open understory, and acidic soils with a thick leaf layer, often on slopes near canopy breaks. The site does not contain this habitat. While the site overstory is hardwood dominated by beech, birch, oak and maple, it has been recently harvested and has a relatively thick understory and herbaceous layer. The site soils are acidic, however, there are no natural canopy breaks. Common witchhazel (*Hamamelis virginiana*) and Indian cucumber-root *(Medeola virginiana*) are common associates of the small whorled pogonia. We did not observe the Small Whorled pogonia, witchhazel or cucumber-root on the site during our services.

Published Mapping Review and Update - Burman Land & Tree Company, LLC contacted and/or accessed the databases of natural resource agencies to identify if there are Threatened, Endangered, Significant or Essential species and/or habitats mapped on the site. Agencies we contacted included the U.S. Fish and Wildlife Service (US FWS), Maine Department of Inland Fisheries and Wildlife (IF&W), and Maine Natural Areas Program (MNAP). Response letters and/or database searches are included in Appendix D.

The MNAP response letter dated June 16, 2017 states that "*according to the information currently in our Biological and Conservation Data System files*, *there are no rare botanical features documented specifically within the project area."*

According to the IF&W response letter and map, dated June 21, 2017, IF&W maps eight bat species as potentially on the site. Of the eight species of bats listed as potentially being on the site, three are protected under the Maine Endangered Species Act, and five are listed as being of Special Concern in Maine. IF&W recommends that the US FWS be contacted regarding the bat habitat. IF&W also recommends that a 100-foot

undisturbed buffer be maintained along streams, and recommends that stream crossings be avoided, if possible. If stream crossings are required, IF&W makes recommendations pertaining to the crossing design.

The US FWS database, accessed on July 05, 2017, indicates that two federally-listed species "*should be considered as part of an effect analysis for this project*"; the Northern Long-eared Bat and Small Whorled Pogonia (*Isotria medeoloides*), both of which are federally-listed Threatened species. If the project will require a federal permit or will use federal funding, the federal action agency will determine if there are concerns regarding the project affecting this mapped habitat. Generally, bats are a concern if the site is near a known hibernacula or brooding tree, or if trees will be cut between about April 1 to October 15; and the Pogonia is a concern if it is mapped or has been observed on the site.

Burman Land & Tree Company, LLC also reviewed available published mapping for the site including USGS topographic mapping, U.S. Fish and Wildlife National Wetland Inventory (NWI), U.S. Emergency Management Agency flood hazard mapping (FEMA), and U.S. Natural Resources Conservation Service (NRCS) soil mapping, as available, to provide an indication of potential areas of protected natural resources on the property.

The NWI does not map wetlands on or adjacent to the site. The NRCS Soil Survey maps Buxton, Lamoine, Scantic and Biddeford soils on the site. Scantic and Biddeford soils are classified as hydric soils, which are a component of wetlands. The USGS topographic map does not show features indicating potential wetlands or streams on the site, but shows Black Brook to the west of the site. According to the FEMA map, the site is outside of the mapped 100-year flood zone.

Classification - Based on the Cowardin Classification system[7], the wetlands on the site are PFO1E, or palustrine, forested, broad-leaved deciduous wetland with a seasonally

[7] Cowardin, et al. 1979. United States, Fish and Wildlife Service, "Classification of Wetlands and Deepwater Habitats of the United States". Biological services program ; FWS/OBS-79/31) FWS/OBS-79/31 . QH76.U54a 79/31 [QH104] 574.5'0973s [574.5'2632] 79-607795

flooded/saturated water regime. The stream on the site is a R4SB3/5 or riverine, intermittent, streambed, cobble-gravel and mud bottom stream.

The freshwater wetlands within 25 feet of the stream meet MDEP classification as "Wetlands of Special Significance". The freshwater wetlands on the remainder of the site, including within the development area, meet MDEP classification as "Wetlands Not of Special Significance".

Conclusion and Recommendations

Burman Land & Tree Company, LLC conducted identification and delineation of Protected Natural Resources within the proposed Durant Homestead development area, and verification of the identification and delineation of Protected Natural Resources conducted by Main-Land Development Consultants in 2006 on the remainder of the property, on the Matt Hancock Properties property on Chute Road in Windham, Maine.

We delineated three forested wetlands in the proposed development area, labeled Wetlands A, B and C. We observed forested wetlands in a similar configuration as previously delineated on the portion of the site on which we verified the previous delineation. We observed an intermittent stream in the verification area. We did not observe vernal pools on the property.

The observed wetlands on the site are forested wetlands classified as PFO1E. The freshwater wetlands within 25 feet of the stream meet MDEP classification as "Wetlands of Special Significance". The freshwater wetlands on the remainder of the site, including within the development area, meet MDEP classification as "Wetlands Not of Special Significance".

The Maine Department of Inland Fisheries and Wildlife (IF&W) lists the site as within potential habitat of one or more of the eight species of bats that are currently Endangered, Threatened or species of Special Concern in Maine. IF&W recommends that the USFWS be contacted regarding bats and site development.

The US FWS maps the site as being within the habitat of the Northern Long Eared Bat and the Small Whorled Pogonia, which are federally listed Threatened species. If the project will require a federal permit or will use federal funding, the federal action agency will determine if there are concerns regarding the project affecting these mapped habitats. Generally, bats are a concern if the site is near a known hibernacula or brooding tree, or if trees will be cut between about April 1 to October 15; and the Pogonia is a concern if it is mapped or has been observed on the site. We did not observe the Small Whorled Pogonia on the site nor did we observe its specific habitat on the site.

If development is planned on the property that will trigger Site Location of Development Act permitting, will alter greater than 15,000 square feet of wetlands, including historic impacts, or involves tree cutting between about April 1 to October 15, we recommend that a pre-application meeting be held with the MDEP and Corps to discuss the project and potential permitting requirements.

Closure

We appreciate the opportunity to assist you with this project. If you have any questions, please contact me.

Sincerely,

Burman Land & Tree Company, LLC

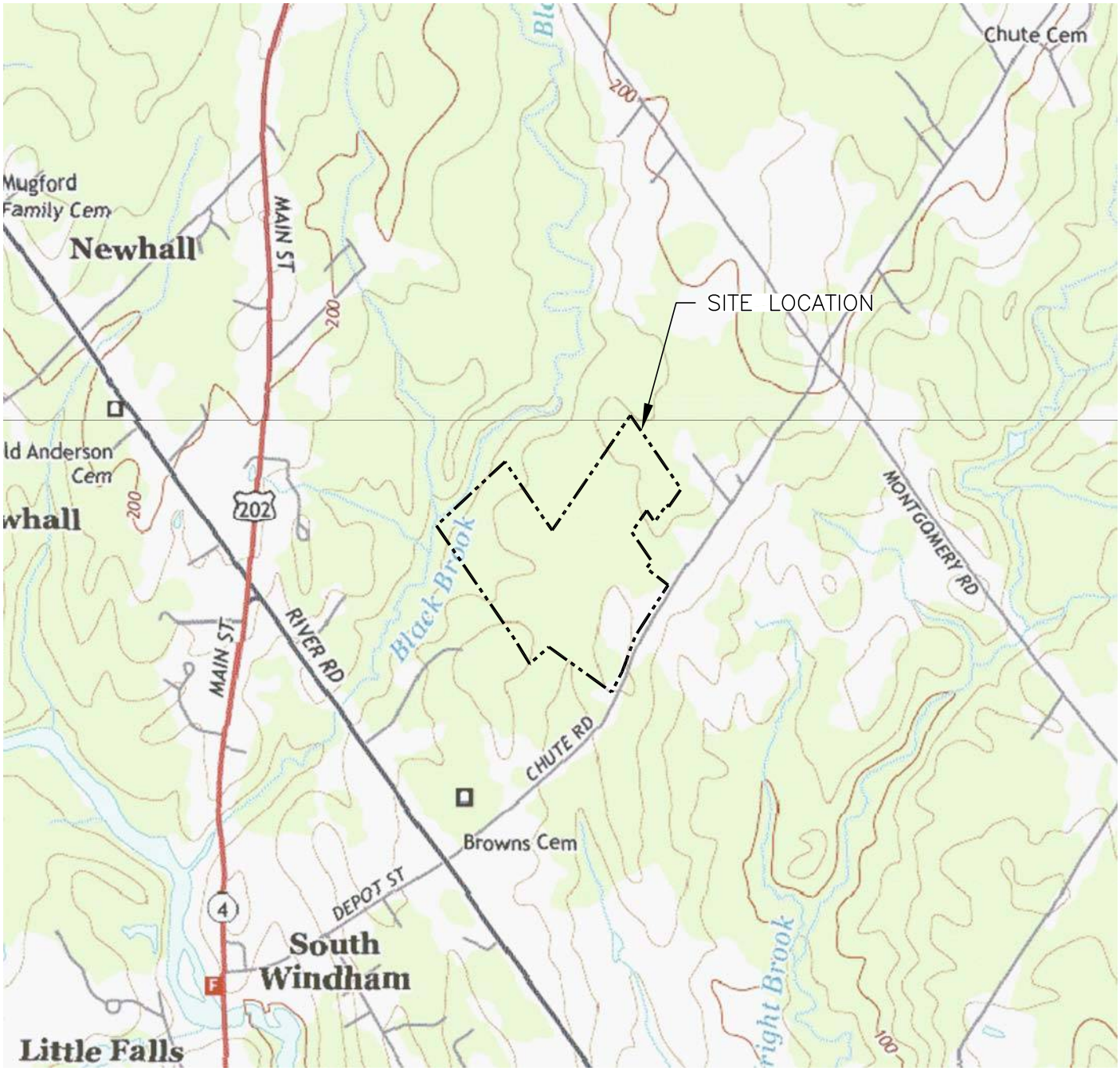
Aleita M. Burman, C.W.S., C.S.S., L.S.E.
Senior Wetland Scientist
blburman@gmail.com

APPENDIX A
Limitations

Appendix A – Limitations

The scope of Burman Land & Tree Company, LLC services has been limited to identification and delineation of Protected Natural Resources within the proposed Durant Homestead development area, and verification of the identification and delineation of Protected Natural Resources conducted on the remainder of the property by Main-Land Development Consultants in 2006, on the Matt Hancock Properties property on Chute Road in Windham, Maine. This Report has been prepared for the exclusive use of Matt Hancock Properties. No warranty, expressed or implied, is made. The conclusions made in this report are based on the data obtained from the areas explored at the time of services.

APPENDIX B
Site Location Map
Protected Natural Resources Plan



SITE LOCATION MAP

BURMAN
LAND & TREE COMPANY, LLC.

1,000 0 1,000 2,000

Scale in Feet

SITE LOCATION MAP
DURANT HOMESTEAD
CHUTE ROAD
WINDHAM, MAINE

Job No.: BLT #17-005	Scale: 1" = 1000'
Date: 7-5-18	Sheet: B-1

LEGEND

– Main–Land Development Company Wetland Boundaries 2006

– Burman Land & Tree, LLC Wetland Boundaries 2018

– MDEP classified "Wetlands Not of Special Significance"

– MDEP classified "Wetlands of Special Significance"

– Stream

DP 1 – Wetland Data Point (DP)

PF01E – Palustrine, Forested, Broad–Leaved Deciduous Wetland with a Seasonally Saturated/Flooded Water Regime

R4SB3/5 – Riverine, Intermittent, Streambed, Cobble–Gravel/Mud Bottom Stream

NOTES

1. This Protected Natural Resources Plan details the findings of Protected Natural Resources services conducted on Town of Windham Tax Map 6, Lot 25 by Burman Land & Tree, LLC, between April 2017 and June 2018. Burman Land & Tree, LLC conducted a general verification of wetland boundaries delineated by Main–Land Development Consultants, Inc. in 2006 on the approximately 65–acre property, and an identification and delineation of Protected Natural Resources in most of the currently proposed development area and within applicable setbacks, to include stream and vernal pool documentation services.

2. Protected Natural Resources were identified and delineated in general accordance with the Maine Department of Environmental Protection Natural Resources Protection Act definitions; the United States Department of the Army State of Maine General Permit (October 2015–2020), the Corps of Engineers Wetland Delineation Manual (1987), and the U.S. Army Corps of Engineers Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (2012).

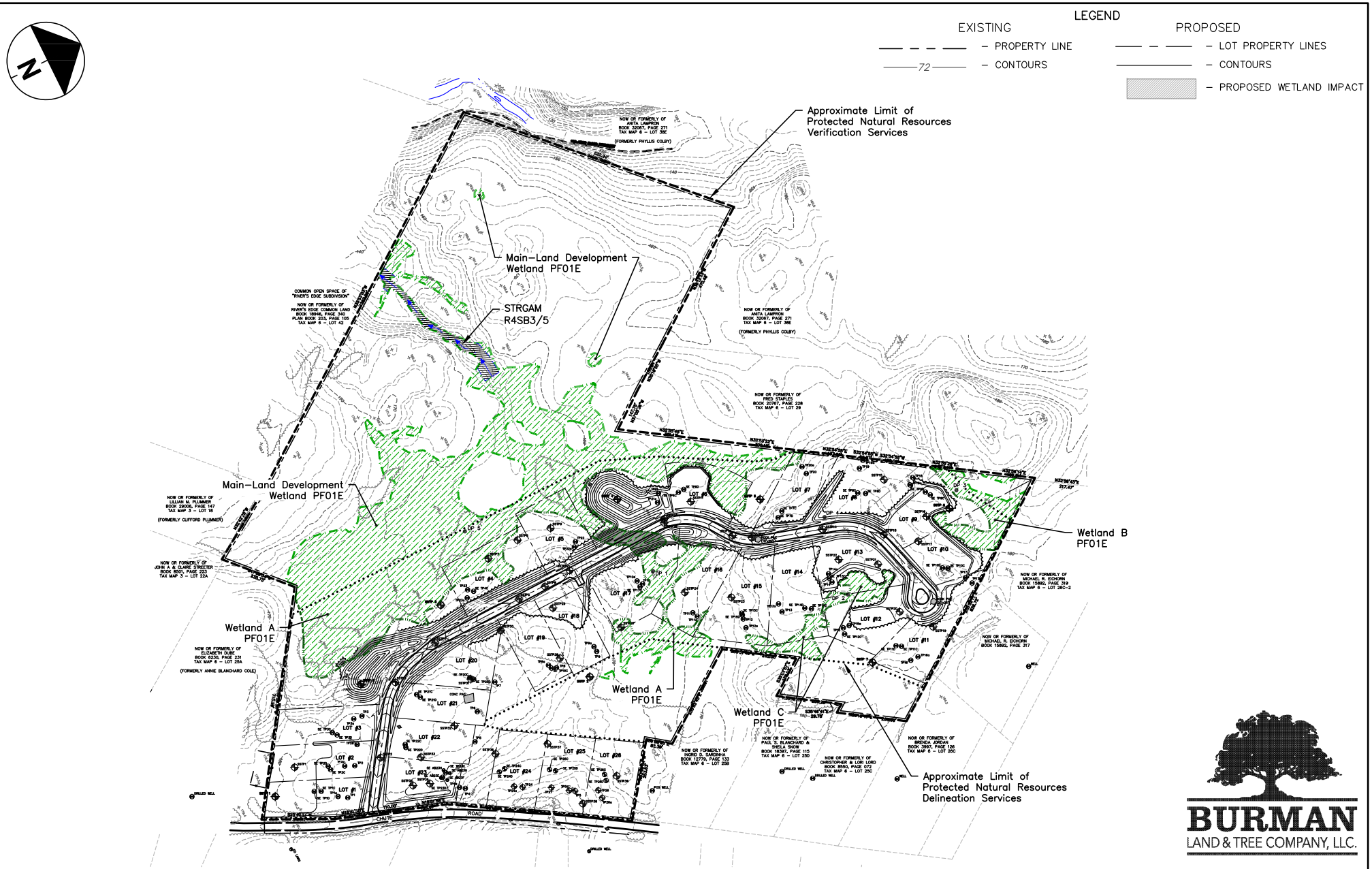
3. Main–Land Development Consultants 2006 wetland delineation was verified using a Trimble mapping grade GPS receiver with the base map uploaded onto it. Protected Natural Resources delineated by Burman Land & Tree, LLC were located using a Trimble mapping grade GPS receiver. The GPS data was overlaid onto the base map by Acheron Engineering, Inc.

4. This Plan should be used in conjunction with the Burman Land & Tree, LLC Protected Natural Resources Report, dated 7–5–18. This Plan is for planning and resource alteration permitting purposes.

BURMAN
LAND & TREE COMPANY, LLC.

PROTECTED NATURAL RESOURCES LEGEND & NOTES
DURANT HOMESTEAD
CHUTE ROAD
WINDHAM, MAINE

Job No.: BLT #17–005	Scale: nts
Date: 7–5–18	Sheet: B–2



BURMAN
LAND & TREE COMPANY, LLC.

PROTECTED NATURAL RESOURCES PLAN
DURANT HOMESTEAD
CHUTE ROAD
WINDHAM, MAINE

Job No.: BLT #17–005	Scale: 1" = 400'
Date: 7–5–18	Sheet: B–3

APPENDIX C
Color Photographs



Photo 1: Wetland A at DP1: PFO1E wetland (typical). Photograph taken June 28, 2017.



Photo 2: Wetland C at DP2: PFO1E wetland (typical). Photograph taken June 28, 2017.



Photo 3: Wetland B at DP3: PFO1E wetland (typical). Photograph taken June 28, 2017.



Photo 4: Wetland A at DP5: PFO1E wetland (typical). Photograph taken June 28, 2017.



Photo 5: Stream within verification area (typical). Photograph taken April 27, 2017.

APPENDIX D
Resource Agency Reponses/Database Searches
Published Mapping

PAUL R. LEPAGE
GOVERNOR

STATE OF MAINE
DEPARTMENT OF
INLAND FISHERIES & WILDLIFE
284 STATE STREET
41 STATE HOUSE STATION
AUGUSTA ME 04333-0041

CHANDLER E. WOODCOCK
COMMISSIONER

June 21, 2017

Aleita Burman
Burman Land & Tree Company, LLC
P.O. Box 145
Orrington, ME 04474

RE: Information Request - 60 Chute Road subdivision, Windham

Dear Lee:

Per your request received June 16, 2017, we have reviewed current Maine Department of Inland Fisheries and Wildlife (MDIFW) information for known locations of Endangered, Threatened, and Special Concern species; designated Essential and Significant Wildlife Habitats; and fisheries habitat concerns within the vicinity of the *60 Chute Road subdivision Project* in Windham.

Our Department has not mapped any Essential Habitats that would be directly affected by your project.

Endangered, Threatened, and Special Concern Species

Bats

Of the eight species of bats that occur in Maine, the three *Myotis* species are protected under Maine's Endangered Species Act (MESA) and are afforded special protection under 12 M.R.S §12801 - §12810. The three *Myotis* species include little brown bat (*M. lucifugus*, State Endangered); northern long-eared bat (*M. septentrionalis*, State Endangered); and eastern small-footed bat (*M. leibii*, State Threatened). The five remaining bat species are listed as Special Concern: big brown bat (*Eptesicus fuscus*); red bat (*Lasiurus borealis*), hoary bat (*Lasiurus cinereus*), silver-haired bat (*Lasionycteris noctivagans*), and tri-colored bat (*Perimyotis subflavus*).

While a comprehensive statewide inventory for bats has not been completed, it is likely that several of these species occur within the project area during migration and/or the breeding season. We recommend that you contact the U.S. Fish and Wildlife Service--Maine Fish and Wildlife Complex (Wende Mahaney, 207-902-1569) for further guidance, as the northern long-eared bat is also listed as a Threatened Species under the Federal Endangered Species Act. Otherwise, our Agency does not anticipate significant impacts to any of the bat species as a result of this project.

Significant Wildlife Habitat

Significant Vernal Pools

At this time, MDIFW Significant Wildlife Habitat (SWH) maps indicate no known presence of SWHs within the project area, which include Waterfowl and Wading Bird Habitats, Deer Wintering Areas, Seabird Nesting Islands, Shorebird Areas, and Significant Vernal Pools. However, a comprehensive statewide inventory for Significant Vernal Pools has not been completed. Therefore, we strongly recommend that surveys for vernal pools be conducted within the project boundary by qualified wetland scientists prior to final project design to determine whether there are Significant Vernal Pools present in the area. These surveys should extend up to 250 feet beyond the anticipated project footprint because of potential performance standard requirements for off-site Significant Vernal Pools, assuming such pools are located on land owned or controlled by the applicant. Once surveys are completed, our Department will need to review and verify any vernal pool data prior to final determination of significance.

Fisheries Habitat

Without details, it is difficult to know what impacts your project may have on the mapped streams within the search area. That being said, MDIFW makes the following general recommendations as they pertain to streams.

We recommend that a 100-foot undisturbed vegetated buffer be maintained along these streams. Buffers should be measured from the edge of stream or associated fringe and floodplain wetlands. Maintaining and enhancing buffers along streams that support coldwater fisheries is critical to the protection of water temperatures, water quality, natural inputs of coarse woody debris, and various forms of aquatic life necessary to support conditions required by many fish species. Stream crossings should be avoided, but if a stream crossing is necessary, or an existing crossing needs to be modified, it should be designed to provide full fish passage. Small streams, including intermittent streams, can provide crucial rearing habitat, cold water for thermal refugia, and abundant food for juvenile salmonids on a seasonal basis and undersized crossings may inhibit these functions. Generally, MDIFW recommends that all new, modified, and replacement stream crossings be sized to span 1.2 times the bankfull width of the stream. In addition, we generally recommend that stream crossings be open bottomed (i.e. natural bottom), although embedded structures which are backfilled with representative streambed material have been shown to be effective in not only providing habitat connectivity for fish but also for other aquatic organisms. We encourage you to contact our Region A Fisheries staff (207-657-2345) for crossing design recommendations that best maintain fish passage. Construction Best Management Practices should be closely followed to avoid erosion, sedimentation, alteration of stream flow, and other impacts as eroding soils from construction activities can travel significant distances as well as transport other pollutants resulting in direct impacts to fish and fisheries habitat. In addition, we recommend that any necessary instream work occur between July 15 and October 1.

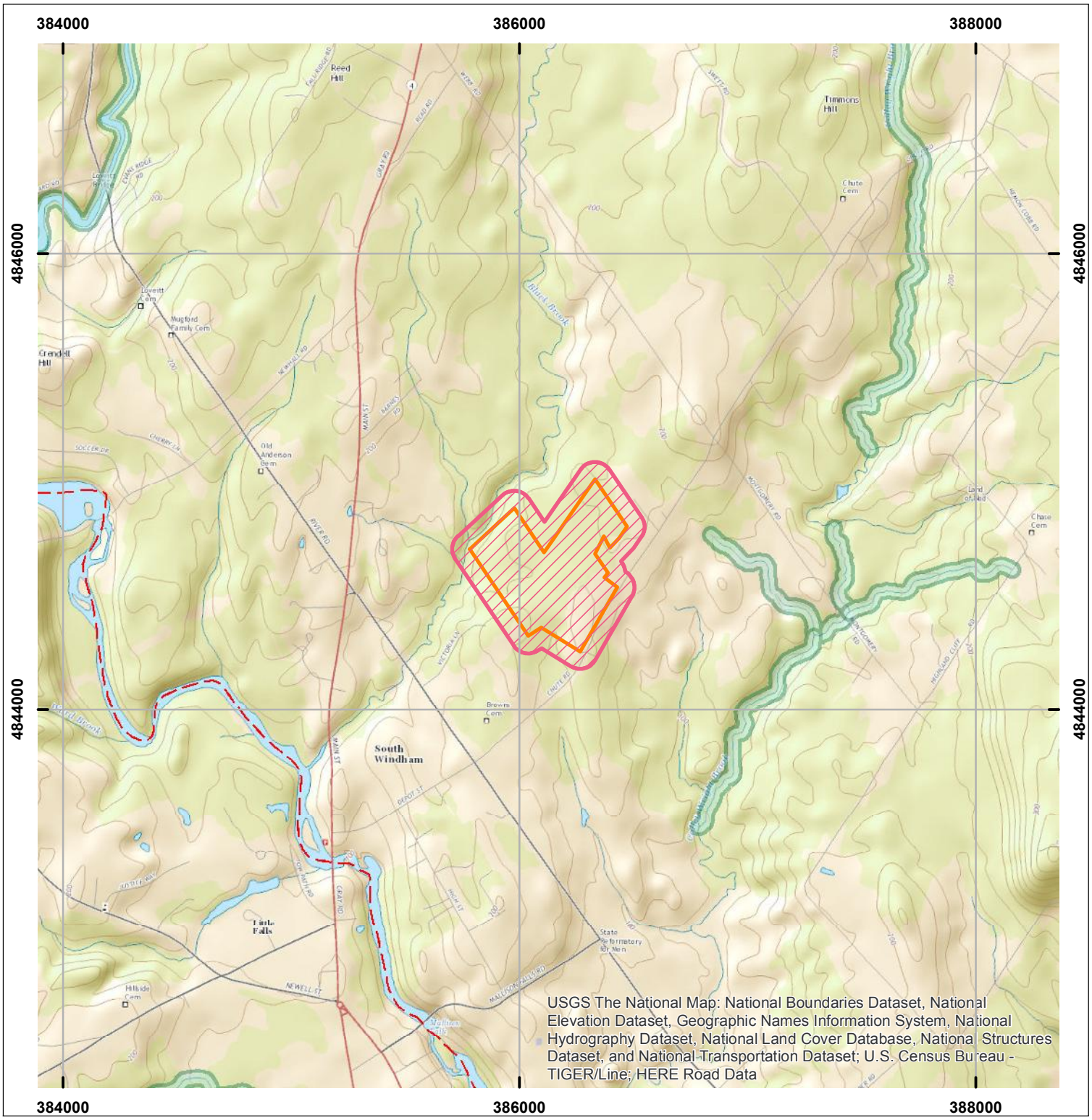
This consultation review has been conducted specifically for known MDIFW jurisdictional features and should not be interpreted as a comprehensive review for the presence of other regulated features that may occur in this area. Prior to the start of any future site disturbance we recommend additional consultation with the municipality, and other state resource agencies including the Maine Natural Areas Program and Maine Department of Environmental Protection in order to avoid unintended protected resource disturbance.

Please feel free to contact my office if you have any questions regarding this information, or if I can be of any further assistance.

Best regards,



John Perry
Environmental Review Coordinator



Environmental Review of Fish and Wildlife Observations and Priority Habitats

Project Name: Windham, 60 Chute Rd subdivision (Version 1)

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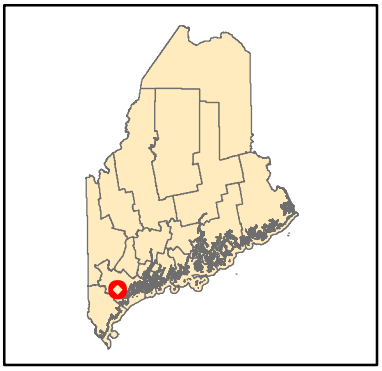
Maine Department of Inland Fisheries and Wildlife

0 0.125 0.25 0.5 0.75 1 Miles

Projection: UTM, NAD83, Zone 19N

Date: 6/21/2017

- ProjectPolys
- ProjectSearchAreas
- Special Concern-occupied habitats(100ft buffer)



STATE OF MAINE
DEPARTMENT OF AGRICULTURE, CONSERVATION & FORESTRY
93 STATE HOUSE STATION
AUGUSTA, MAINE 04333

PAUL R. LEPAGE
GOVERNOR

WALTER E. WHITCOMB
COMMISSIONER

June 16, 2017

Aleita Burman
Burman Land & Tree
PO Box 145
Orrington, ME 04474

Via email: blburman@gmail.com

Re: Rare and exemplary botanical features in proximity to: Job 17-005, Residential Subdivision, 60 Chute Road, Windham, Maine

Dear Ms. Burman:

I have searched the Natural Areas Program's Biological and Conservation Data System files in response to your request received June16, 2017 for information on the presence of rare or unique botanical features documented from the vicinity of the project in Windham, Maine. Rare and unique botanical features include the habitat of rare, threatened, or endangered plant species and unique or exemplary natural communities. Our review involves examining maps, manual and computerized records, other sources of information such as scientific articles or published references, and the personal knowledge of staff or cooperating experts.

Our official response covers only botanical features. For authoritative information and official response for zoological features you must make a similar request to the Maine Department of Inland Fisheries and Wildlife, 284 State Street, Augusta, Maine 04333.

According to the information currently in our Biological and Conservation Data System files, there are no rare botanical features documented specifically within the project area. This lack of data may indicate minimal survey efforts rather than confirm the absence of rare botanical features. You may want to have the site inventoried by a qualified field biologist to ensure that no undocumented rare features are inadvertently harmed.

If a field survey of the project area is conducted, please refer to the enclosed supplemental information regarding rare and exemplary botanical features documented to occur in the vicinity of the project site. The list may include information on features that have been known to occur historically in the area as well as recently field-verified information. While historic records have not been documented in several years, they may persist in the area if suitable habitat exists. The enclosed list identifies features with potential to occur in the area, and it should be considered if you choose to conduct field surveys.

This finding is available and appropriate for preparation and review of environmental assessments, but it is not a substitute for on-site surveys. Comprehensive field surveys do not exist for all natural areas in Maine, and in the absence of a specific field investigation, the Maine Natural Areas Program cannot provide a definitive statement on the presence or absence of unusual natural features at this site.

MOLLY DOCHERTY, DIRECTOR
MAINE NATURAL AREAS PROGRAM

DEPARTMENT OF Agriculture Conservation & Forestry

PHONE: (207) 287-8044
FAX: (207) 287-8040
WWW.MAINE.GOV/DACF/MNAP

The Natural Areas Program is continuously working to achieve a more comprehensive database of exemplary natural features in Maine. We would appreciate the contribution of any information obtained should you decide to do field work. The Natural Areas Program welcomes coordination with individuals or organizations proposing environmental alteration, or conducting environmental assessments. If, however, data provided by the Natural Areas Program are to be published in any form, the Program should be informed at the outset and credited as the source.

The Natural Areas Program has instituted a fee structure of $75.00 an hour to recover the actual cost of processing your request for information. You will receive an invoice for $150.00 for two hours of our services.

Thank you for using the Natural Areas Program in the environmental review process. Please do not hesitate to contact me if you have further questions about the Natural Areas Program or about rare or unique botanical features on this site.

Sincerely,



Don Cameron | Ecologist | Maine Natural Areas Program
207-287-8041 | don.s.cameron@maine.gov

Rare and Exemplary Botanical Features within 4 miles of
Project: #17-005, Residential Subdivision, 60 Chute Road, Windham, Maine

Common Name	State Status	State Rank	Global Rank	Date Last Observed	Occurrence Number	Habitat
Broad Beech Fern						
	SC	S2	G5	1872-08	15	Hardwood to mixed forest (forest, upland)
Clothed Sedge						
	E	S1	G5	2000-06-06	5	Dry barrens (partly forested, upland)
Ebony Spleenwort						
	SC	S2	G5	1910-06-06	10	Rocky summits and outcrops (non-forested, upland),Hardwood to mixed forest (forest, upland)
Engelmann's Spikerush						
	PE	SH	G4G5Q	1916-08-31	2	Open wetland, not coastal nor rivershore (non-forested, wetland)
Fern-leaved False Foxglove						
	SC	S3	G5	1902-09-02	13	Dry barrens (partly forested, upland),Hardwood to mixed forest (forest, upland)
Great Blue Lobelia						
	PE	SX	G5	1905-09	3	Forested wetland,Non-tidal rivershore (non-forested, seasonally wet)
Horned Pondweed						
	SC	S2	G5	1913-09-13	9	Tidal wetland (non-forested, wetland)
Marsh Milkwort						
	PE	SH	G5T4	1903-08-18	1	Dry barrens (partly forested, upland),Open wetland, not coastal nor rivershore (non-forested, wetland)
Missouri Rockcress						
	T	S1	G5?Q	1905-06-11	5	Rocky summits and outcrops (non-forested, upland),Hardwood to mixed forest (forest, upland)
Mountain Honeysuckle						
	E	S2	G5	2007-10-05	11	Dry barrens (partly forested, upland),Hardwood to mixed forest (forest, upland)
Pitch Pine Woodland						

Rare and Exemplary Botanical Features within 4 miles of
Project: #17-005, Residential Subdivision, 60 Chute Road, Windham, Maine

Common Name	State Status	State Rank	Global Rank	Date Last Observed	Occurrence Number	Habitat
	<null>	S3	G2	2005-12-08	28	Rocky summits and outcrops (non-forested, upland)
Small Reed Grass						
	SC	S3	G5	2011-08-28	18	Old field/roadside (non-forested, wetland or upland)
Small Whorled Pogonia						
	E	S2	G2	2015-07-22	18	Hardwood to mixed forest (forest, upland)
Spotted Pondweed						
	T	S1	G5	1995-10-01	3	Open water (non-forested, wetland)
Vasey's Pondweed						
	SC	S2	G4	1901-08-04	7	Open water (non-forested, wetland)

STATE RARITY RANKS

S1 Critically imperiled in Maine because of extreme rarity (five or fewer occurrences or very few remaining individuals or acres) or because some aspect of its biology makes it especially vulnerable to extirpation from the State of Maine.

S2 Imperiled in Maine because of rarity (6-20 occurrences or few remaining individuals or acres) or because of other factors making it vulnerable to further decline.

S3 Rare in Maine (20-100 occurrences).

S4 Apparently secure in Maine.

S5 Demonstrably secure in Maine.

SU Under consideration for assigning rarity status; more information needed on threats or distribution.

SNR Not yet ranked.

SNA Rank not applicable.

S#? Current occurrence data suggests assigned rank, but lack of survey effort along with amount of potential habitat create uncertainty (e.g. S3?).

Note: **State Rarity Ranks** are determined by the Maine Natural Areas Program for rare plants and rare and exemplary natural communities and ecosystems. The Maine Department of Inland Fisheries and Wildlife determines State Rarity Ranks for animals.

GLOBAL RARITY RANKS

G1 Critically imperiled globally because of extreme rarity (five or fewer occurrences or very few remaining individuals or acres) or because some aspect of its biology makes it especially vulnerable to extinction.

G2 Globally imperiled because of rarity (6-20 occurrences or few remaining individuals or acres) or because of other factors making it vulnerable to further decline.

G3 Globally rare (20-100 occurrences).

G4 Apparently secure globally.

G5 Demonstrably secure globally.

GNR Not yet ranked.

Note: **Global Ranks** are determined by NatureServe.

STATE LEGAL STATUS

Note: State legal status is according to 5 M.R.S.A. § 13076-13079, which mandates the Department of Conservation to produce and biennially update the official list of Maine's **Endangered** and **Threatened** plants. The list is derived by a technical advisory committee of botanists who use data in the Natural Areas Program's database to recommend status changes to the Department of Conservation.

E ENDANGERED; Rare and in danger of being lost from the state in the foreseeable future; or federally listed as Endangered.

T THREATENED; Rare and, with further decline, could become endangered; or federally listed as Threatened.

NON-LEGAL STATUS

SC SPECIAL CONCERN; Rare in Maine, based on available information, but not sufficiently rare to be considered Threatened or Endangered.

PE Potentially Extirpated; Species has not been documented in Maine in past 20 years or loss of last known occurrence has been documented.

ELEMENT OCCURRENCE RANKS - EO RANKS

Element Occurrence ranks are used to describe the quality of a rare plant population or natural community based on three factors:

- **Size**: Size of community or population relative to other known examples in Maine. Community or population's viability, capability to maintain itself.
- **Condition**: For communities, condition includes presence of representative species, maturity of species, and evidence of human-caused disturbance. For plants, factors include species vigor and evidence of human-caused disturbance.
- **Landscape context**: Land uses and/or condition of natural communities surrounding the observed area. Ability of the observed community or population to be protected from effects of adjacent land uses.

These three factors are combined into an overall ranking of the feature of **A**, **B**, **C**, or **D**, where **A** indicates an **excellent** example of the community or population and **D** indicates a **poor** example of the community or population. A rank of **E** indicates that the community or population is **extant** but there is not enough data to assign a quality rank. The Maine Natural Areas Program tracks all occurrences of rare (S1-S3) plants and natural communities as well as A and B ranked common (S4-S5) natural communities.

Note: **Element Occurrence Ranks** are determined by the Maine Natural Areas Program for rare plants and rare and exemplary natural communities and ecosystems. The Maine Department of Inland Fisheries and Wildlife determines Element Occurrence ranks for animals.

Visit our website for more information on rare, threatened, and endangered species!
http://www.maine.gov/dacf/mnap

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Maine Ecological Services Field Office
P. O. Box A
East Orland, ME 04431
Phone: (207) 469-7300 Fax: (207) 902-1588
http://www.fws.gov/mainefieldoffice/index.html

In Reply Refer To: July 05, 2017
Consultation Code: 05E1ME00-2017-SLI-0728
Event Code: 05E1ME00-2017-E-01492
Project Name: Residential Subdivision

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies the threatened, endangered, candidate, and proposed species and designated or proposed critical habitat that may occur within the boundary of your proposed project or may be affected by your proposed project. This species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC Web site at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having

similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the Endangered Species Consultation Handbook at:
http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

This species list also identifies candidate species under review for listing and those species that the Service considers species of concern. Candidate species have no protection under the Act but are included for consideration because they could be listed prior to completion of your project. Species of concern are those taxa whose conservation status is of concern to the Service (i.e., species previously known as Category 2 candidates), but for which further information is needed.

If a proposed project may affect only candidate species or species of concern, you are not required to prepare a Biological Assessment or biological evaluation or to consult with the Service. However, the Service recommends minimizing effects to these species to prevent future conflicts. Therefore, if early evaluation indicates that a project will affect a candidate species or species of concern, you may wish to request technical assistance from this office to identify appropriate minimization measures.

Please be aware that bald and golden eagles are not protected under the Endangered Species Act but are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 et seq.). Projects affecting these species may require development of an eagle conservation plan: http://www.fws.gov/windenergy/eagle_guidance.html Information on the location of bald eagle nests in Maine can be found on the Maine Field Office Web site:
http://www.fws.gov/mainefieldoffice/Project%20review4.html

Additionally, wind energy projects should follow the wind energy guidelines:
http://www.fws.gov/windenergy/ for minimizing impacts to migratory birds and bats. Projects may require development of an avian and bat protection plan.

Migratory birds are also a Service trust resource. Under the Migratory Bird Treaty Act, construction activities in grassland, wetland, stream, woodland, and other habitats that would result in the take of migratory birds, eggs, young, or active nests should be avoided. Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at:

http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm and at: http://www.towerkill.com; and at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Maine Ecological Services Field Office
P. O. Box A
East Orland, ME 04431
(207) 469-7300

Project Summary

Consultation Code: 05E1ME00-2017-SLI-0728

Event Code: 05E1ME00-2017-E-01492

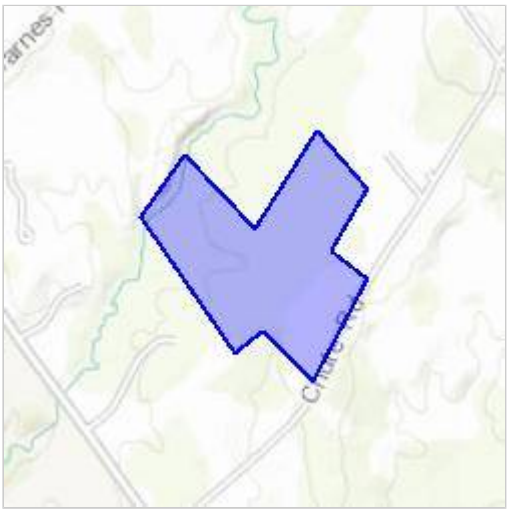
Project Name: Residential Subdivision

Project Type: DEVELOPMENT

Project Description: The project is an approximately 26 lot residential subdivision on Chute Road in Windham, ME.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/43.74580088531383N70.4147631424729W



Counties: Cumberland, ME

Endangered Species Act Species

There is a total of 2 threatened, endangered, or candidate species on your species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area. Please contact the designated FWS office if you have questions.

Mammals

NAME	STATUS
Northern Long-eared Bat *(Myotis septentrionalis)*	Threatened

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/9045

Flowering Plants

NAME	STATUS
Small Whorled Pogonia *(Isotria medeoloides)*	Threatened

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/1890

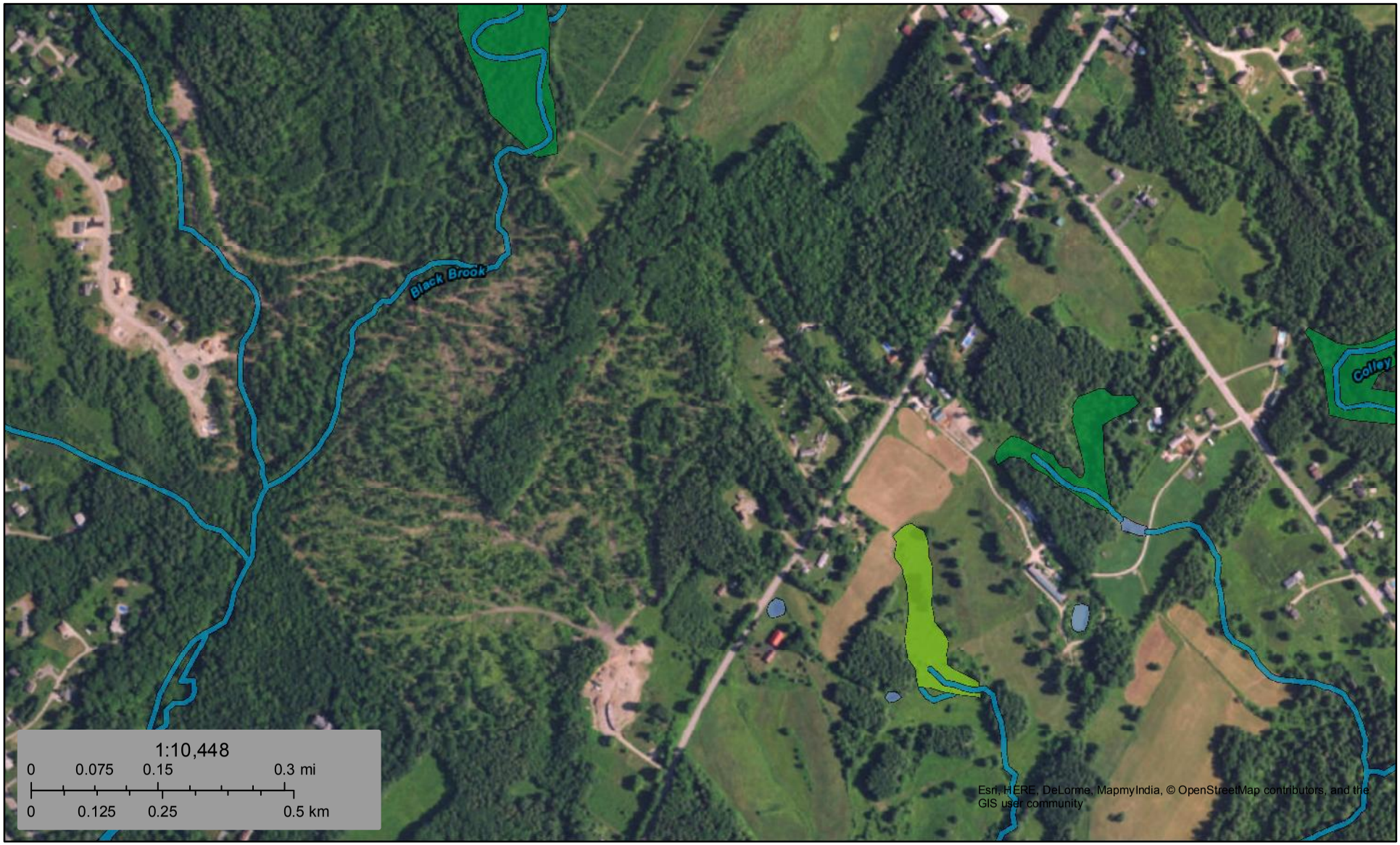
Critical habitats

There are no critical habitats within your project area.

U.S. Fish and Wildlife Service

National Wetlands Inventory

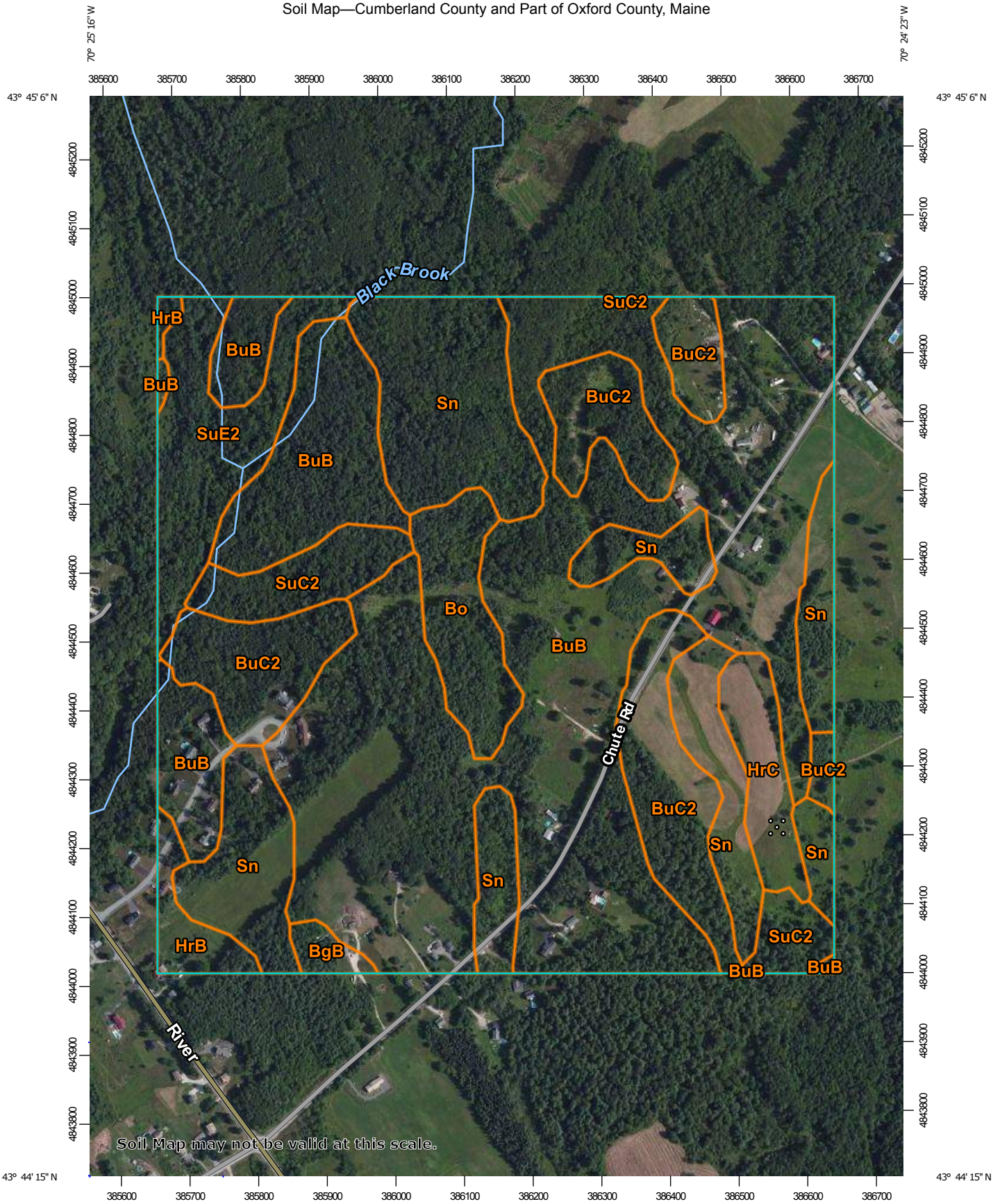
Chute Road, Windham, ME



March 30, 2017

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.



Map Scale: 1:7,640 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 100 200 400 600

Feet: 0 350 700 1400 2100

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

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

Soil Survey Area: Cumberland County and Part of Oxford County, Maine
Survey Area Data: Version 12, Sep 15, 2016

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 20, 2010—Jul 18, 2010

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

Map Unit Legend

Cumberland County and Part of Oxford County, Maine (ME005)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
BgB	Belgrade very fine sandy loam, 0 to 8 percent slopes	1.5	0.6%
Bo	Biddeford mucky peat, 0 to 3 percent slopes	8.9	3.7%
BuB	Lamoine silt loam, 3 to 8 percent slopes	122.1	50.8%
BuC2	Buxton silt loam, 8 to 15 percent slopes	30.2	12.6%
HrB	Hollis fine sandy loam, 3 to 8 percent slopes	3.9	1.6%
HrC	Hollis fine sandy loam, 8 to 15 percent slopes	6.1	2.5%
Sn	Scantic silt loam, 0 to 3 percent slopes	44.8	18.7%
SuC2	Suffield silt loam, 8 to 15 percent slopes, eroded	9.1	3.8%
SuE2	Suffield silt loam, 25 to 45 percent slopes, eroded	13.5	5.6%
Totals for Area of Interest		**240.2**	**100.0%**



APPROXIMATE SCALE

800 0 800 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

TOWN OF
WINDHAM, MAINE
CUMBERLAND COUNTY

PANEL 30 OF 35
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
230189 0030 B

EFFECTIVE DATE:
SEPTEMBER 2, 1981

federal emergency management agency
federal insurance administration

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

APPENDIX E
Corps Wetland Data Forms

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Durant Homestead Residential Subdivision City/County: Windham Sampling Date: 06/28/17

Applicant/Owner: Matt Hancock Properties State: ME Sampling Point: DP 1

Investigator(s): Aleita Burman Section, Township, Range:

Landform (hillside, terrace, etc.): Wetland Swale Local relief (concave, convex, none): concave Slope %: 0-2

Subregion (LRR or MLRA): LRR R, MLRA 144B Lat: 43.746307 Long: -70.412925 Datum: WGS 1984

Soil Map Unit Name: Scantic silt loam NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation X, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area**
Hydric Soil Present?	Yes X	No ____	**within a Wetland?** **Yes** X **No** ____
Wetland Hydrology Present?	Yes X	No ____	If yes, optional Wetland Site ID: Wetland A

Remarks: (Explain alternative procedures here or in a separate report.)
The site was logged within the past 5 years.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ____	Depth (inches): 4
Water Table Present?	Yes X	No ____	Depth (inches): 0
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
DP 1 is near the proposed road crossing

VEGETATION – Use scientific names of plants. Sampling Point: DP 1

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer rubrum*	40	Yes	FAC
2. *Fraxinus pennsylvanica*	40	Yes	FACW
3. *Pinus strobus*	10	No	FACU
4. *Fraxinus nigra*	5	No	FACW
5. *Ulmus americana*	5	No	FACW
6. *Populus tremuloides*	5	No	FACU
7.			
	105	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15' radius)			
1. *Carpinus caroliniana*	20	Yes	FAC
2. *Ilex verticillata*	5	Yes	FACW
3.			
4.			
5.			
6.			
7.			
	25	=Total Cover	
Herb Stratum (Plot size: 5' radius)			
1. *Onoclea sensibilis*	40	Yes	FACW
2. *Carex gynandra*	40	Yes	OBL
3. *Calamagrostis canadensis*	15	No	OBL
4. *Symplocarpus foetidus*	15	No	OBL
5. *Juncus effusus*	10	No	OBL
6. *Solidago rugosa*	5	No	FAC
7. *Carex intumescens*	5	No	FACW
8. *Carex stipata*	5	No	OBL
9. *Thelypteris noveboracensis*	3	No	FAC
10. *Glyceria striata*	2	No	OBL
11. *Galium asprellum*	2	No	OBL
12.			
	142	=Total Cover	
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	89	x 1 =	89
FACW species	100	x 2 =	200
FAC species	68	x 3 =	204
FACU species	15	x 4 =	60
UPL species	0	x 5 =	0
Column Totals:	272 (A)		553 (B)

Prevalence Index = B/A = 2.03

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point DP 1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4							muck	Oa
4-12	5Y 2.5/1	100					Mucky Loam/Clay	O/A
12-16	5Y 4/2	50	5Y 2.5/1	50	RM	M	Loamy/Clayey	BC

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: firm BC horizon

Depth (inches): 12

Hydric Soil Present? **Yes** X **No** ___

Remarks:

This data form is revised from Northcentral and Northeast Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Durant Homestead Residential Subdivision City/County: Windham Sampling Date: 06/28/17

Applicant/Owner: Matt Hancock Properties State: ME Sampling Point: DP 2

Investigator(s): Aleita Burman Section, Township, Range:

Landform (hillside, terrace, etc.): Wetland Swale Local relief (concave, convex, none): concave Slope %: 0-2

Subregion (LRR or MLRA): LRR R, MLRA 144B Lat: 43.747643 Long: -70.411589 Datum: WGS 1984

Soil Map Unit Name: Buxton Silt Loam NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No ____ (If no, explain in Remarks.)

Are Vegetation X, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area**
Hydric Soil Present?	Yes X	No ____	**within a Wetland?** **Yes** X **No** ____
Wetland Hydrology Present?	Yes X	No ____	If yes, optional Wetland Site ID: Wetland C

Remarks: (Explain alternative procedures here or in a separate report.)
Site was logged within past 5 years.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ____ Water Marks (B1)
- ____ Sediment Deposits (B2)
- ____ Drift Deposits (B3)
- ____ Algal Mat or Crust (B4)
- ____ Iron Deposits (B5)
- ____ Inundation Visible on Aerial Imagery (B7)
- ____ Sparsely Vegetated Concave Surface (B8)
- ____ Water-Stained Leaves (B9)
- ____ Aquatic Fauna (B13)
- ____ Marl Deposits (B15)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ____ Surface Soil Cracks (B6)
- ____ Drainage Patterns (B10)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Stunted or Stressed Plants (D1)
- ____ Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- ____ Microtopographic Relief (D4)
- ____ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ____	Depth (inches): 6
Water Table Present?	Yes X	No ____	Depth (inches): 0
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: DP 2

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer rubrum*	75	Yes	FAC
2. *Quercus rubra*	15	No	FACU
3. *Populus tremuloides*	5	No	FACU
4.			
5.			
6.			
7.			
	95	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15' radius)			
1. *Populus tremuloides*	25	Yes	FACU
2. *Fraxinus pennsylvanica*	5	No	FACW
3. *Ilex verticillata*	5	No	FACW
4.			
5.			
6.			
7.			
	35	=Total Cover	
Herb Stratum (Plot size: 5' radius)			
1. *Calamagrostis canadensis*	90	Yes	OBL
2. *Osmunda regalis*	10	No	OBL
3. *Onoclea sensibilis*	5	No	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	105	=Total Cover	
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66.7% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	100	x 1 =	100
FACW species	15	x 2 =	30
FAC species	75	x 3 =	225
FACU species	45	x 4 =	180
UPL species	0	x 5 =	0
Column Totals:	235 (A)		535 (B)

Prevalence Index = B/A = 2.28

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point DP 2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	2.5Y 3/2	100					Mucky Loam/Clay	O/A
3-6	2.5Y 4/2	90	5Y 5/2	10	D	M	Loamy/Clayey	Bg
6-12	2.5Y 4/2	80	10YR 3/6	10	C	M	Loamy/Clayey	BC
			5Y 5/2	10	D	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ? Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: firm BC

Depth (inches): 6

Hydric Soil Present? **Yes** X **No** ___

Remarks:

This data form is revised from Northcentral and Northeast Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Durant Homestead Residential Subdivision City/County: Windham Sampling Date: 06/28/17

Applicant/Owner: Matt Hancock Properties State: ME Sampling Point: DP 3

Investigator(s): Aleita Burman Section, Township, Range:

Landform (hillside, terrace, etc.): Wetland Swale Local relief (concave, convex, none): concave Slope %: 0-2

Subregion (LRR or MLRA): LRR R, MLRA 144B Lat: 43.748994 Long: -70.412191 Datum: WGS 1984

Soil Map Unit Name: Suffield Silt Loam NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation X, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area**
Hydric Soil Present?	Yes X	No ____	**within a Wetland?** **Yes** X **No** ____
Wetland Hydrology Present?	Yes X	No ____	If yes, optional Wetland Site ID: Wetland C

Remarks: (Explain alternative procedures here or in a separate report.)
Site was logged within past 5 years

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ____	Depth (inches): 4
Water Table Present?	Yes X	No ____	Depth (inches): 0
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: DP 3

Tree Stratum (Plot size: 20' X 50')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer rubrum*	30	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
	30	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15' radius)			
1. *Carpinus caroliniana*	20	Yes	FAC
2. *Populus tremuloides*	15	Yes	FACU
3. *Acer rubrum*	15	Yes	FAC
4. *Quercus rubra*	5	No	FACU
5.			
6.			
7.			
	55	=Total Cover	
Herb Stratum (Plot size: 5' radius)			
1. *Onoclea sensibilis*	90	Yes	FACW
2. *Equisetum arvense*	10	No	FAC
3. *Carex scoparia*	3	No	FACW
4. *Carex lurida*	3	No	OBL
5. *Carex intumescens*	2	No	FACW
6. *Thelypteris novaboracensis*	2	No	FACW
7. *Glyceria striata*	1	No	OBL
8.			
9.			
10.			
11.			
12.			
	111	=Total Cover	
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 80.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	4	x 1 =	4
FACW species	97	x 2 =	194
FAC species	75	x 3 =	225
FACU species	20	x 4 =	80
UPL species	0	x 5 =	0
Column Totals:	196 (A)		503 (B)

Prevalence Index = B/A = 2.57

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point DP 3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	2.5Y 4/2	90	5Y 5/2	10	D	M	Loamy/Clayey	Bg
3-10	2.5Y 4/2	80	10YR 3/6	10	C	M	Loamy/Clayey	BC
			5Y 5/2	10	D	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: firm BC

Depth (inches): 3

Hydric Soil Present? **Yes** X **No** ___

Remarks:

This data form is revised from Northcentral and Northeast Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Durant Homestead Residential Subdivision City/County: Windham Sampling Date: 06/28/17

Applicant/Owner: Matt Hancock Properties State: ME Sampling Point: DP 4

Investigator(s): Aleita Burman Section, Township, Range:

Landform (hillside, terrace, etc.): Hill Local relief (concave, convex, none): convex Slope %: 3-8

Subregion (LRR or MLRA): LRR R, MLRA 144B Lat: 43.747691 Long: -70.412599 Datum: WGS 1984

Soil Map Unit Name: Lamoine Silt Loam NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation X, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area**
Hydric Soil Present?	Yes ____	No X	**within a Wetland?** **Yes** ____ **No** X
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID:

Remarks: (Explain alternative procedures here or in a separate report.)
Site was logged within past 5 years

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____
Water Table Present?	Yes ____	No X	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches): ____

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: DP 4

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Quercus rubra*	40	Yes	FACU
2. *Fagus grandifolia*	30	Yes	FACU
3. *Tsuga canadensis*	10	No	FACU
4. *Pinus strobus*	10	No	FACU
5. *Acer rubrum*	10	No	FAC
6. *Populus grandidentata*	10	No	FACU
7.			
	110	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15' radius)			
1. *Populus grandidentata*	10	Yes	FACU
2. *Ostrya virginiana*	10	Yes	FACU
3. *Quercus rubra*	10	Yes	FACU
4. *Acer rubrum*	5	No	FAC
5. *Abies balsamea*	5	No	FAC
6.			
7.			
	40	=Total Cover	
Herb Stratum (Plot size: 5' radius)			
1. *Trientalis borealis*	10	Yes	FAC
2. *Maianthemum canadense*	5	Yes	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	15	=Total Cover	
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 14.3% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	30	x 3 =	90
FACU species	135	x 4 =	540
UPL species	0	x 5 =	0
Column Totals:	165 (A)		630 (B)

Prevalence Index = B/A = 3.82

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point DP 4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 3/2	100					Loamy/Clayey	Ap, fsloam
2-5	10YR 3/6	100					Loamy/Clayey	Bs, fsloam
5-10	10YR 4/6	100					Loamy/Clayey	Bs2, flsoam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

This data form is revised from Northcentral and Northeast Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Durant Homestead Residential Subdivision City/County: Windham Sampling Date: 06/28/17

Applicant/Owner: Matt Hancock Properties State: ME Sampling Point: DP 5

Investigator(s): Aleita Burman Section, Township, Range:

Landform (hillside, terrace, etc.): Wetland Flat Local relief (concave, convex, none): concave Slope %: 0-3

Subregion (LRR or MLRA): LRR R, MLRA 144B Lat: 43.744707 Long: -70.414250 Datum: WGS 1984

Soil Map Unit Name: Biddeford mucky peat NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation X, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area**
Hydric Soil Present?	Yes X	No ____	**within a Wetland?** **Yes** X **No** ____
Wetland Hydrology Present?	Yes X	No ____	If yes, optional Wetland Site ID: Wetland A

Remarks: (Explain alternative procedures here or in a separate report.)
Site was logged within past 5 years

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____
Water Table Present?	Yes X	No ____	Depth (inches): 4
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: DP 5

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer rubrum*	30	Yes	FAC
2. *Ulmus americana*	10	No	FACW
3. *Fraxinus pennsylvanica*	10	No	FACW
4. *Betula populifolia*	5	No	FAC
5.			
6.			
7.			
	55	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15' radius)			
1. *Swida amomum*	25	Yes	FACW
2. *Ilex verticillata*	20	Yes	FACW
3. *Alnus incana*	10	No	FACW
4. *Viburnum nudum*	5	No	FACW
5. *Lonicera morrowii*	5	No	FACU
6.			
7.			
	65	=Total Cover	
Herb Stratum (Plot size: 5' radius)			
1. *Onoclea sensibilis*	25	Yes	FACW
2. *Solidago graminifolia*	25	Yes	FAC
3. *Juncus effusus*	5	No	OBL
4. *Carex scoparia*	5	No	FACW
5. *Carex lurida*	2	No	OBL
6. *Equisetum arvense*	2	No	FACU
7. *Galium palustre*	1	No	OBL
8.			
9.			
10.			
11.			
12.			
	65	=Total Cover	
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	8	x 1 =	8
FACW species	110	x 2 =	220
FAC species	60	x 3 =	180
FACU species	7	x 4 =	28
UPL species	0	x 5 =	0
Column Totals:	185 (A)		436 (B)

Prevalence Index = B/A = 2.36

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point DP 5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	5Y 5/1	100					Muck	Oa, mucky silt loam
8-15	2.5Y 4/2	80	10YR 3/6	10	C	M	Loamy/Clayey	Bg, firm
			5Y 5/2	10	D	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- X Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: firm BC

Depth (inches): 8

Hydric Soil Present? **Yes** X **No** ___

Remarks:

This data form is revised from Northcentral and Northeast Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

APPENDIX F
Main-Land Development Consultants Wetland Delineation Report (2006)

WETLANDS DELINEATION REPORT

NRPA Tier I Wetland Impacts
"Durant Homestead' Subdivision
Chute Road, Windham, Maine

August 3, 2006

METHODOLOGY:

The 'Durant Homestead' Subdivision project area wetlands delineation for mapping was conducted initially during the Fall 2005 and finished in the Spring of 2006. Additionally, streams were identified in the project area. The Wetlands Scientist at the site was Donald Murphy of Main-Land Development Consultants, Inc. He completed the U. S. Army Corps of Engineers Course for Wetlands Delineation in July 2001 at the Humboldt Institute, Stuben, Maine and has been the wetlands delineator and natural resource specialist at Main-Land for five years.

Streams on the project parcel were also identified; field flagged, and GPS mapped. The Maine Department of Environmental Protection stream criteria were used to determine the stream identification. The development layout design was modified to avoid any regulatory impact on the parcel stream.

Initially, the site was traversed to determine where the wetlands would likely be identified based on topography, position in landscape, and vegetation. The wetland boundary and stream were blue flagged in the field and located with a Trimble GPS device and CAD plotted on the project parcel. These areas are defined and labeled on the subdivision project plot plans.

The wetlands mapping was conducted in accordance with the Field Guide for Wetland Delineation, Unified Federal Method in accordance with the 1987 federal standards. The U.S. Army Corps of Engineers data sheets are attached with the results of the wetland boundary delineations. Field Indicators for Identifying Hydric Soils in New England, Version 1, May, 1995 was also used as a guide for determining Hydric soils. To be classified as a jurisdictional wetland, a site must possess indicators in all of the three essential characteristics:

(1) Hydrophytic Vegetation
(2) Hydric Soils
(3) Wetland Hydrology

(1) Hydrophytic Vegetation: At the wetlands vegetative borders the prevalence of dominant wetland species is Obligate (OBL), which occur over 99% estimated probability under natural conditions in wetlands, and Facultative Wetland (FACW), which usually occur in wetlands with an estimated probability of 67-99%. Facultative (FAC) species are equally as likely to occur in wetlands or non-wetlands with an estimated probability of 34-67%. Facultative Upland (FACU) usually occur in non wetlands with an estimated probability there of 67-99% but occasionally found on wetlands with an estimated probability of 1-33%. Symbols of (+) and (-) are sometimes included to deal with preferences indifferent regional habitats. These species designations are listed by the U.S. Fish & Wildlife Service on the National List of Plant Species that Occur in Wetlands. These are some examples of wetlands indicators that are dominant in the habitat of this vegetation and site identified including genus and species with the indicator category:

Speckled Alder *Alnus rugosa* (FAC/OBL)
Red Maple *Acer rubrum* (FACW)

Balsam Fir *Abies balsema* (FAC/FACW)
Black Spruce *Picea mariana* (FACW-)
White Birch *Betula alba* (FACU)
Yellow Birch *Betula alleghaniensis* (FACU+)
Eastern Hemlock *Tsuga canadensis* (FACU)
Eastern White Pine *Pinus strobus* (FACU)
Striped Maple *Acer pensylvanicum* (FACU-)

(2) *Hydric Soils*: The Hydric Soils investigation included review of the Soil Survey for Oxford County Area, Maine and numerous auger borings on the project site to determine wetland upland boundaries. Soil test pits were also conducted on site by Soil Scientist Darryl Brown of Main-Land Development to create a high intensity soils map of the project area. Wetland delineation auger borings were conducted to identify soil profiles to determine specific hydric soil profiles and orient them with area hydrological and vegetative features.
The Field Indicators for Identifying Hydric Soils in New England was used as a guide to analyze these soil profiles and determine the boundaries of the hydric soils. In accordance with that guide quoted above, the following is an example of the analysis of a profile of a hydric soil identified on this project site exhibiting the described characteristics:

'Hydric Soil Conditions III. Soils that have aquic conditions within the upper part of the soil for some time in most years; and

F. Do not have a spodic horizon and the dominant textures in the upper 20 inches of the soil are loamy fine sand or coarser and:

1. have a layer 4 – 8 inches thick of partially-to-well-decomposed (hemic or sapric) organic soil material and/or mucky A or Ap horizon; and are directly underlain by a horizon with 5 percent or more redoximorphic features; or

2. within 10 inches of the top of the mineral soil material and directly underlying a dark A or Ap horizon (or, if they are not present, an O horizon) is a horizon with a matrix color due to wetness of chroma 3 or less, value 4 or more, with 5 percent or more redoximorphic features; or

3. within 15 inches of the top of the mineral soil material and directly underlying a thick, very dark Ap horizon is a horizon with a matrix color due to wetness of chroma 3 or less, value 4 or more, with other redoximorphic features present'.

(3) *Wetland Hydrology:* In accordance with the Federal Manual, wetland hydrology characterizes those areas that are periodically inundated or that have soils saturated to the surface at some time during the growing season. Wetland hydrology indicators include the following: 1) Visual observation of inundation; 2) Visual observation of soil saturation; 3) Oxidized channels associated with living roots and rhizomes; 4) Water marks; 5) Drift lines; 6) Waterborne sediment deposits; 7) Water stained leaves; 8) Surface scoured areas; 9) Wetland drainage patterns; 10) Morphological plant adaptation; 11) Hydric soil characteristics.

WETLANDS OVERVIEW:

The wetlands on this project parcel are Palustrine Forested. They are supplied by subsurface groundwater that emerges over ledge and/or restrictive soil layers. They occur in recessed surface contours or flattened terraces .In some case they relieve the hydrology of these terraces as the contours fall away below them. These forested wetlands share some boundaries with moderately and poorly drained soils of upland forests. A portion of the parcel and adjacent to the larger terraced wetland is poorly drained upland forest caused by the topographic and hydro-geological features. Narrowing wetlands follow down to these wetlands following surface contours and

hyrdo-geological features. Some of the wetlands on the project parcel are narrow wetlands following contours and hydro-geologic features. The project area mostly drains down toward the stream at the back of the parcel.

RESULTS:

All delineated wetlands on this parcel have Hydric soils and a dominance of Obligate and Facultative (Wet) wetland vegetation, both in the forested under story and as shrubs and forested vegetation. Upslope wetland areas possess a blend of Facultative (Plus) and Facultative (Minus) species that occur in mixed upland and wetland habitats. Field notes and photos were taken at each wetland crossing upland/wetland edge of the crossing and in the wetland for the delineation.

CONCLUSION:

Based on the methodology described above and the field results, the jurisdictional wetlands were delineated at the site. All boundaries are marked in the field with blue flagging and based on soil profile auger test pits.

The streams were also identified in the field and blue flagged. The Maine Department of Environmental Protection Stream criteria were used to determine the stream identification.

All wetland and stream boundaries were located using a Trimble GPS device and then CAD plotted on the subdivision plan to determine natural resource protection setbacks for building envelopes, lot layout, and road design.



Donald E. Murphy
Wetlands Scientist
Main-Land Development Consultants, Inc
Livermore Falls, Maine

Recd 6-15-18

MAINE HISTORIC PRESERVATION COMMISSION
55 CAPITOL STREET
65 STATE HOUSE STATION
AUGUSTA, MAINE
04333

PAUL R. LEPAGE
GOVERNOR

KIRK F. MOHNEY
DIRECTOR

June 11, 2018

Mr. Kirk Ball
Acheron
147 Main Street
Newport, ME 04953

Project: MHPC #0635-18 Matt Hancock Properties; Chute Road Proposed Subdivision

Town: Windham, ME

Dear Mr. Ball:

In response to your recent request, I have reviewed the information received May 21, 2018 to initiate consultation on the above referenced project in accordance with the requirements of the Maine Department of Environmental Protection.

Based on the information submitted, I have concluded that there will be no historic properties (archaeological or architectural) affected by the proposed undertaking, as defined by Section 106 of the National Historic Preservation Act.

Please contact Megan Hopkin at (207) 287-2992 or megan.m.hopkin@maine.gov if we can be of further assistance in this matter.

Sincerely,

Kirk F. Mohney

Kirk F. Mohney
State Historic Preservation Officer

PHONE: (207) 287-2132 FAX: (207) 287-2335

2018

DURANT HOMESTEAD RESIDENTIAL SUBDIVISION

EROSION AND SEDIMENTATION CONTROL PLAN

SUBMITTED BY:

MATT HANCOCK PROPERTIES, LLC
PO BOX 295
CASCO, MAINE 04015

WITH ASSISTANCE BY:

Acheron Engineering Services
Engineering, Environmental & Geologic Consultants
www.AcheronEngineering.com

147 Main Street	24466 Powell Road
Newport, Maine 04953	Brooksville, Florida 34602
(207) 368-5700	(352) 796-6236

SUBMITTAL DATE:

AUGUST 2018

1.0 Project Description

The applicant, Matt Hancock Properties, owns a 65.5 acre parcel located on Chute Road in the Town of Windham, Cumberland County, Maine. The lot is identified by the Town of Windham as Tax Map 0006, Lot 025. The project includes subdividing the parcel to create 26 residential lots, ranging from 0.69 to 1.15 acres and includes approximately 40.2 acres of common/open space conveyed to the Durant Homestead Home Owners Association (DHHOA). Access to the lots is provided by a paved road that is approximately 2,500 feet long.

2.0 Site Description

The existing land cover of the parcel is best described as undeveloped recently harvested woodland with an open area located near Chute Road. The woodland area is predominately made of smaller tree growth with scattered mature growth in a combination of upland and forested wetland. From 2013 to 2018 a portion of the open area was occupied by a firewood processing operation; the remaining field area has not been maintained for over ten years and has become overgrown

3.0 Soils

The on-site soils at the location of the proposed project consist of coarse loamy glacial till, fine illitic clay and fine sandy loam. The sandy deposits are moderately well-drained soils that promote moderate surface runoff. Soil permeability ranges moderate to somewhat poorly drained. Test pits indicate that depth to bedrock ranges from 30 to 96 inches in the project area.

4.0 Construction Schedule and Sequence

It is anticipated that construction will commence in April, 2019 and be completed in August 2019. The following schedule outlines the anticipated sequence of events for the construction of the proposed project.

- Install temporary erosion control measures
- Clear stormwater management areas and road
- Stockpile and seed any disturbed areas
- Construct stormwater management facilities
- Cut/fill roadway to subgrade
- Construct roadway ditches and stabilize
- Install underground utilities
- Final grading and reseeding of disturbed areas
- Remove erosion control devices pending sufficient growth in seeded areas
- Completion by August, 2019

5.0 Erosion and Sedimentation Control Practices and Procedures

The proposed expansion of the Moody Beach RV Campground seeks to minimize erosion and sedimentation by implementing temporary control measures during construction and permanent control methods post-construction. All proposed erosion and sedimentation control measures comply with the requirements set forth in the most recent version of the State of Maine Erosion and Sediment Control BMP Manual.

A. Proposed Erosion and Sedimentation Control Practices

1. *Silt Fence*

   A silt fence will be constructed around any material stockpiles and along the downgradient areas of the construction site to prevent sediment from leaving the construction site. Silt fencing shall also be placed to prevent sediment from entering any stormwater features.

2. *Level Spreader*

   Level spreaders will serve as the outlets to the proposed wet ponds located in the north western and south eastern portions of the site. Refer to the design drawings for level spreader specifications.

3. *Land Grading and Surface Stabilization*

   Grading will be required over the developed portion of the site. The slope in this area will be reduced from approximately 8% - 20% to 1.5% - 2%, which will reduce the potential for erosion in this area. All cut and fill slopes will be stabilized according to the methods outlined in Section 5.B.

4. *Dust Control*

   Dust control is not anticipated to be a problem due to the relatively small construction area, undisturbed vegetated area surrounding the site and short duration of construction. In the event that excessive dust is produced, it will be controlled by sprinkling.

5. *Seed Mix*

   The seed mixture shall consist of seed proportioned by weight as follows:

Kentucky Blue Grass	20 lbs/acre
Creeping Red Fescue	20 lbs/acre
Perennial Ryegrass	5 lbs/acre

B. Proposed Erosion and Sedimentation Control Procedures

1. During construction reasonable precaution will be taken to avoid any erosion and to prevent silting of oceans, rivers, streams, lakes, reservoirs, impoundments, and drainage ditches and swales.

2. Locate and mark all project boundaries prior to construction.

3. Mark all soil disturbance limits and install sediment barriers prior to disturbing soils.
4. Install sediment barriers down slope of soil stock piles.
5. Do not site soil stock pile in areas of concentrated stormwater flow or areas of potential flooding.
6. The duration of exposure of uncompleted cut slopes, embankments, trench excavations, and site graded areas shall be minimized. Initiate seeding and other erosion control measures on each segment as soon as reasonably possible.
7. Should it become necessary to suspend construction for more than 7 days, shape and stabilize all excavated and graded areas. Provide and maintain temporary erosion and sediment control measures, such as berms, dikes, slope drains, silt stops, and sedimentation basins, until permanent drainage facilities or erosion control features have been completed and are operative. If disturbed areas are within 75 feet of a wetland or waterbody, stabilize disturbance within 48 hours or prior to any storm event, whichever comes first.
8. Fine material placed or exposed during the work shall be handled and treated as to minimize the possibility of its reaching any surface waters. Use diversion channels, dikes, sediment traps, or any other effective and approved control measures.
9. Provide silt stops wherever erosion control measures may not be totally capable of controlling erosion, such as in drainage channels and where steep slopes may exist.
10. Before water is allowed to flow in any ditch, swale, or channel, install the permanent erosion control measures in the waterway so that the waterway will be safe against erosion.
11. Take special precautions in the use of construction equipment to minimize erosion. Do not leave wheel tracks where erosion might begin.
12. Mulching shall follow the seeding operation by not more than 24 hours.
13. Should any protective measures employed indicate any deficiencies or erosion taking place, immediately provide additional materials or employ different techniques to correct the situation and to prevent subsequent erosion.
14. Disturbance within 30 feet of any protected natural resource will require doubling the perimeter erosion controls and disturbed areas must be stabilized within 7 days.
15. Continue erosion control measures until the permanent measures have been sufficiently established and are capable of controlling erosion on their own.
16. Remove all temporary control measures within 30 days after permanent stabilization is attained.
17. Comply with all Federal, State, and local laws, ordinances, rules and regulations. All work shall comply with the requirements set forth in the Best Management Practices of Maine as prepared by the Department of Environmental Protection.

18. Areas containing exposed soils must be stabilized within 7 days of cessation of an activity.
19. Inspect erosion control BMP weekly and before and after a storm event
20. Begin permanent stabilization within 7 days of obtaining final grade.

C. Winter Construction and Stabilization

1. *Winterization Schedule*

   i. All stone lined ditches and channels shall be constructed and stabilized by November 15th.

   ii. All stone covered slopes shall be constructed and stabilized by November 15th.

   iii. All disturbed slopes having a slope less than 15% to be seeded and mulched by September 15th.

   iv. All vegetated slope greater than 15% to be seed and mulched by September 1st.

   v. All vegetated ditches and channels to be seeded and mulched by September 1st.

2. *Site Winterization*

   i. If the September 1st deadline cannot be met for vegetated slopes, then by October 1st the slope shall be seeded with winter rye at the rate of 3 pounds per 1000 square feet and covered with erosion control mats or anchored mulch. If rye fails to grow 3 inches by November 1st the slope shall be covered with an erosion control mix or covered with stone riprap.

   ii. If the September 1st deadline cannot be met for grassed lined ditches, then a sod or stone lining shall be installed.

   iii. If the September 15th deadline cannot be met for disturbed areas with a slope less than 15%, then by November 15th mulch areas at a rate of 150 pounds per 1000 square feet such that no soil is visible through mulch.

3. *Winter Construction*

   i. Winter construction is construction activity performed between November 1st and April 15th.

   ii. If an area is not stabilized in accordance with the above schedule or permanently stabilized than additional stabilization measures must be employed.

   iii. Permanent stabilization consists of at least 90% vegetation, pavement, gravel base or riprap.

   iv. Apply hay mulch at 150 pounds per 1000 square feet such that no soil is visible through mulch.

   v. Use mulch and netting or an erosion control blanket or mix on all slopes grater that 8 percent.

vi. Install an erosion control blanket in all drainage ways with a slope greater than 3 percent.

vii. Winter excavation and earth work shall not expose more than 1 acre of the site without stabilization at any one time.

viii. In an area within 75 feet of a natural protected resource, double row sediment barriers shall be installed.

ix. Temporary mulch must be applied within 7 days of soil exposure or prior to any storm event, but after every working day in areas within 75 feet of a natural protected resource.

x. Areas that have been brought to final grade shall be mulched the same day.

xi. No mulch shall be spread over snow. Snow shall be removed within one quarter inch prior to mulching.

xii. Loam shall be free of frozen clumps before being applied.

xiii. Inspect periodically and after each storm to check for erosion and repair immediately.

xiv. In spring, remove any excess mulch, seed and monitor for erosion and plant growth.

6.0 Erosion Control and Stormwater Maintenance Plan

This plan applies to all temporary and permanent erosion control features/structures. During construction all erosion control structures that remain in place and stormwater features shall be inspected weekly, or after each rainstorm producing 1" or greater rainfall, whichever is more frequent. After construction is finished inspections must take place once per quarter, or after each rainstorm producing at least 1 inch of rainfall, whichever is more frequent (Appendix A). Such inspection is necessary to ensure the structures are functioning properly and is necessary as part of the 5-year recertification process for long-term maintenance of stormwater systems. If any structures are not functioning properly, they shall be repaired or replaced. All control structures shall be inspected and maintained for but not limited to the following:

A. <u>Ditches and Swales</u>

1. Inspect annually, in spring and late fall and after heavy rains.
2. Sediment deposits shall be removed grater if the depth is greater than 3".
3. Erosion has scoured the ditch inverts and shall be repaired with new loam, seed, fertilizer, and protective mulch or mesh until a new catch of grass is established.
4. Slumping of the banks which should be repaired, seeded, and protected with mulch until a new catch of grass is established.
5. Water is flowing by or around check dams which shall be rebuilt or repaired with more stone.

6. Remove any woody vegetation growing through riprap.
7. Repair riprap where underlying filter fabric or gravel is showing or stone have been dislodged.

B. Culverts

1. Inspect late fall and after heavy rains.
2. Pipe entrances blocked with sediments should have sediments removed from pipe(s) and from sump or sediment trap.
3. Catch basin sumps that have filled up and overflowed with sediments should have sediments removed and re-used as grass growing medium where needed.
4. Repair any erosion damage at culvert inlet and outlet.

C. Silt Fencing

1. Inspect after heavy rain until area stabilized.
2. Water that is flowing under the silt-fence without treatment requires resetting the silt fence so the bottom of the fabric is buried into or covered with soil or stone.
3. Sediments that have built up behind silt fence should be removed and the section of the silt fence reset (with new fabric and posts if signs of damage are evident).
4. Rips or holes in fabric require replacement of the section of silt fence with new fabric from post to post. Examine area for cause of problem and remove the threat.
5. Silt Fencing should be removed after threat of erosion has diminished.

D. Wet Pond

1. MHC Moody Beach LLC has the responsibility for inspecting and maintaining the wet pond.
2. The inlet and outlet of the pond should be checked periodically to ensure that flow structures are not blocked by debris. All ditches or pipes connecting ponds in series should be checked for debris that may obstruct flow. Inspections should be conducted monthly during wet weather conditions from March to November and after heavy rains.
3. The gravel trench outlet should be inspected after every major storm in the first few months to ensure proper function. Thereafter, the gravel trench should be inspected at least once every six months. Inspection consists of verifying that the pond is slowly emptying through the gravel filter for a short time (12 – 24 hours) after a storm and that potentially clogging material such as accumulations of decaying leaves are not preventing discharge through gravel.
4. The top several inches of the gravel in the outlet trench must be replaced with fresh material when the water ponds above the permanent pool for more than 72 hours. The removed sediments should be disposed of in an acceptable manner.

5. Wet ponds shall be inspected annually for erosion, destabilization of the side slopes, embankment settling and other signs of structural failure. Corrective action should be taken immediately upon identification of problems.
6. Wet ponds lose 0.5% - 1.0% of their volume annually due to sediment accumulation. Dredging is required when accumulated volume loss reaches 15%, or approximately every 15-20 years.
7. Mow embankments to control woody vegetation.
8. Inspect outlet structure for broken seals, obstructed orifices and plugged trash racks.
9. Remove and dispose of sediments and debris within controls structure.
10. Repair damage to trash rack or debris guard.
11. Replace any dislodged stone in riprap spillways.

E. Level Spreaders:

1. Inspect annually in fall and after heavy rains for sand accumulation and debris that may reduce level spreader capacity.
2. Sediment build up within the level spreader should be removed when it has accumulated to approximately 25% of design volume or channel capacity. Dispose of sediments appropriately.
3. Remove debris, such as leaf litter, branches, and tree growth, as needed from the spreader.
4. Vegetated spreaders may require mowing.

(See Appendix B for Inspection and Maintenance Log)

7.0 Housekeeping

A. Spill Prevention

Controls must be used to prevent pollutants from construction and waste materials stored on site to enter stormwater, which includes storage practices to minimize exposure of the materials to stormwater. The site contractor or operator must develop, and implement as necessary, appropriate spill prevention, containment, and response planning measures.

NOTE: Any spill or release of toxic or hazardous substances must be reported to the Maine Department of Environmental Protection. For oil spills, call 1-800-482-0777 which is available 24 hours a day. For spills of toxic or hazardous material, call 1-800-452-4664 which is available 24 hours a day. For more information, visit the Department's website at: http://www.maine.gov/dep/spills/emergspillresp/

B. Groundwater protection

During construction, liquid petroleum products and other hazardous materials with the potential to contaminate groundwater may not be stored or handled in areas of the site draining to an infiltration area. An "infiltration area" is any area of the site that by design or as a result of soils, topography and other relevant factors accumulates runoff that infiltrates into the soil. Dikes, berms, sumps, and other forms of secondary containment that prevent discharge to groundwater may be used to isolate portions of the site for the purposes of storage and handling of these materials. Any project proposing infiltration of stormwater must provide adequate pre-treatment of stormwater prior to discharge of stormwater to the infiltration area, or provide for treatment within the infiltration area, in order to prevent the accumulation of fines, reduction in infiltration rate, and consequent flooding and destabilization. During dry months all access roads should be wet down weekly or as needed.

C. Fugitive Sediment and Dust

Actions must be taken to ensure that activities do not result in noticeable erosion of soils or fugitive dust emissions during or after construction. Oil may not be used for dust control, but other water additives may be considered as needed. A stabilized construction entrance (SCE) should be included to minimize tracking of mud and sediment. If off-site tracking occurs, public roads should be swept immediately and no less than once a week and prior to significant storm events. Operations during dry months, that experience fugitive dust problems, should wet down unpaved access roads once a week or more frequently as needed with a water additive to suppress fugitive sediment and dust.

D. Debris and Other Materials

Minimize the exposure of construction debris, building and landscaping materials, trash, fertilizers, pesticides, herbicides, detergents, sanitary waste and other materials to

precipitation and stormwater runoff. These materials must be prevented from becoming a pollutant source.

E. Excavation Dewatering

Excavation de-watering is the removal of water from trenches, foundations, coffer dams, ponds, and other areas within the construction area that retain water after excavation. In most cases the collected water is heavily silted and hinders correct and safe construction practices. The collected water removed from the ponded area, either through gravity or pumping, must be spread through natural wooded buffers or removed to areas that are specifically designed to collect the maximum amount of sediment possible, like a cofferdam sedimentation basin. Avoid allowing the water to flow over disturbed areas of the site. Equivalent measures may be taken if approved by the Department of Environmental Protection.

F. Authorized Non-stormwater Discharges

Identify and prevent contamination by non-stormwater discharges. Where allowed non-stormwater discharges exist, they must be identified and steps should be taken to ensure the implementation of appropriate pollution prevention measures for the non-stormwater component(s) of the discharge. Authorized non-stormwater discharges are:

1. Discharges from firefighting activity;
2. Fire hydrant flushings;
3. Vehicle wash water if detergents are not used and washing is limited to the exterior of vehicles (engine, undercarriage and transmission washing is prohibited);
4. Dust control runoff in accordance with permit conditions;
5. Routine external building wash down, not including surface paint removal, that does not involve detergents;
6. Pavement wash water (where spills/leaks of toxic or hazardous materials have not occurred, unless all spilled material had been removed) if detergents are not used;
7. Uncontaminated air conditioning or compressor condensate;
8. Uncontaminated groundwater or spring water;
9. Foundation or footer drain-water where flows are not contaminated;
10. Uncontaminated excavation dewatering;
11. Potable water sources including waterline flushings; and
12. Landscape irrigation

G. **Unauthorized Non-stormwater Discharges**

The Department of Environmental Protections' approval does not authorize a discharge that is mixed with a source of non stormwater, other than those discharges in compliance with Department regulations. Specifically, the Department's approval does not authorize discharges of the following:

1. Wastewater from the washout or cleanout of concrete, stucco, paint, form release oils, curing compounds or other construction materials;
2. Fuels, oils or other pollutants used in vehicle and equipment operation and maintenance;
3. Soaps, solvents, or detergents used in vehicle and equipment washing; and
4. Toxic or hazardous substances from a spill or other release.

APPENDIX A: INSPECTION & MAINTENANCE PLAN FOR STORMWATER MANAGEMENT

INSPECTION AND MAINTENANCE PLAN FOR STORMWATER MANAGEMENT STRUCTURES		
	INSPECTION SCHEDULE	CORRECTIVE ACTIONS
VEGETATED AREAS	Annually early spring and after heavy rains	Inspect all slopes and embankments and replant areas of bare soil or with sparse growth
		Armor rill erosion areas with riprap or divert the runoff to a stable area
		Inspect and repair down-slope of all spreaders and turn-outs for erosion
		Mow vegetation as specified for the area
DITCHES, SWALES AND OPEN STORMWATER CHANNELS	Annually spring and late fall and after heavy rains	Remove obstructions, sediments or debris from ditches, swales and other open channels
		Repair any erosion of the ditch lining
		Mow vegetated ditches
		Remove woody vegetation growing through riprap
		Repair any slumping side slopes
		Repair riprap where underlying filter fabric or gravel is showing or if stones have dislodge
CULVERTS	Spring and late fall and after heavy rains	Remove accumulated sediments and debris at the inlet, outlet, or within the conduit
		Remove any obstruction to flow
		Repair any erosion damage at the culvert's inlet and outlet
CATCHBASINS	Annually in the spring	Remove sediments and debris from the bottom of the basin and inlet grates
		Remove floating debris and oils (using oil absorptive pads) from any trap
ROADWAYS AND PARKING AREAS	Annually in the spring or as needed	Clear and remove accumulated winter sand in parking lots and along roadways
		Sweep pavement to remove sediment
		Grade road shoulders and remove accumulated winter sand
		Grade gravel roads and gravel shoulders
		Clean-out the sediment within water bars or open-top culverts
		Ensure that stormwater runoff is not impeded by false ditches of sediment in the shoulder
WETPONDS AND DETENTION BASINS	Annually in fall and after heavy rains	Inspect the embankments for settlement, slope erosion, piping, and slumping
		Mow the embankment to control woody vegetation
		Inspect the outlet structure for broken seals, obstructed orifices, and plugged trash racks
		Remove and dispose of sediments and debris within the control structure
		Repair any damage to trash racks or debris guards
		Replace any dislodged stone in riprap spillways
		Remove and dispose of accumulated sediments within the impoundment and forebay

APPENDIX B: STORMWATER BMP INSPECTION AND MAINTENANCE LOG

Facility Name
Address

Date	BMP Description	Inspected by	Cause for Inspection	Exceptions Noted	Comments and Actions Taken

Record all inspections and maintenance for all treatment BMPs on this form. Use additional log sheets and/or attach extended comments or documentation as necessary.

- Cause for inspection — Note if the inspection is routine, pre-rainy-season, post-storm, annual, or in response to a noted problem or complaint. Refer to attached document for inspection maintenance plan.
- Exceptions noted — Note any condition that requires correction or indicates a need for maintenance.
- Comments and actions taken — Describe any maintenance done and need for follow-up

12.0 Stormwater Management (Flooding and General Standards)

A. Project Narrative

Project Description

The applicant, Matt Hancock Properties, LLC, (MHP) owns a 65.5 acre parcel located on Chute Road in the Town of Windham, Cumberland County, Maine. The lot is identified by the Town of Windham as Tax Map 0006, Lot 025. The Durant Homestead Subdivision (the project) includes subdividing the parcel to create 26 residential lots, ranging from 0.69 to 1.15 acres and includes approximately 42.8 acres of common/open space conveyed to the Durant Homestead Home Owners Association (DHHOA). Access to the lots is provided by a paved road that is approximately 2,500 feet long. Each of the 26 lots will include a subsurface disposal system and potable water will be provided by installing a well within each lot. The project has been designed to include a sequence of construction where the subdivision road and single family homes can be constructed concurrently, if the housing market allows.

The proposed project includes the following:

- Construction of a 26 wide paved subdivision road, consisting of 20 foot travel way and 3 foot paved shoulders and 2 foot gravel shoulders, within a 50 foot right of way.
- The design includes ditches on both side of road.
- Clearing, grubbing and regrading potions of lots 1, 2, 3, 6, 8, 9, 10, 12, 13, 18 and 23, to convey stormwater to treatment areas (wet ponds or buffers).
- Construction of two wet ponds for stormwater treatment and retention.
- Establishing 16 vegetated stormwater buffers both forested and meadow.

Based on MHP's understanding of the requirements of Chapter 500: Stormwater Management, the basic, general and flooding standards have been applied to the project. The basic standards are described in detail in Section 14.0 of this application. Specific details of the project and how the project meets the general and flooding standards is provided below:

Development Location

The proposed development is located on a sloped piece of property that drains westerly to Black Brook, and easterly across Chute Road to Calley Wright Brook. Both brooks are tributaries of the Presumpscot River.

Surface Water on or Abutting the Site

Forested wetlands are located thought the parcel. There are no other surface waters on or abutting the site.

Downstream Ponds and Lakes
There are no ponds or lakes downstream from the project site.

General Topography
Topography of the site is best described as rolling. A majority of the site slopes westerly to Black Brook. The portion of the parcel along Chute Road slopes easterly to Calley Wright Brook. Slopes within the project area of the parcel range from of 2% to 15%.

Flooding
There are no areas or structures that are subject to flooding either historically or as result of this project.

Alterations to Natural Drainage Ways
There are no alterations to natural drainage ways proposed.

Alteration to Land Cover
The existing land cover consists of an open area that approximately 8.5 acres in size at the south end on the parcel. Historically this area was the location of the small field and farm house. More recently, a firewood processing operation occupied the open area. The remaining area of the parcel and project area is wooded that was selectively cut for firewood sometime in 2013 and 2014.

Alterations associated with the project include the clearing of trees and removal of stumps for the construction of the paved subdivision road, the two stormwater wet ponds, and regrading of lots 1, 2, 3, 6, 8, 9, 10, 12, 13, 18 and 23. Other land cover change includes the typical alteration for single family homes.

Modeling Assumptions
The hydrology model for the proposed project was completed using HydroCAD 10.0. Runoff curve numbers were determined using SCS published charts (contained within the HydroCAD program) and the proposed site development soil types. Time of concentration flow values were determined from site topography maps and the type of ground cover. Please refer to the attached HydroCAD printouts in this section for additional information on specific assumptions utilized in the model.

Water Quantity Control
The project as described above, some of the proposed activities will entail the conversion of wooded and meadow to paved and landscaped areas. These conversions will cause a change in the peak runoff rate. The project design includes two separate stormwater wet ponds that have been specifically designed to mitigate the change in peak runoff rates. The ponds incorporate primary outlets and emergency spillways designed in accordance with applicable Best Management Practices (BMPs).

The pre- and post-development stormwater flows generated from the HydroCAD Durant Homestead model for the site are presented in the following table.

Durant Homestead Subdivision						
Peak Runoff Flow Rates Summary Table						
July, 2018						
Point of Analysis	**2-yr Storm**		**10-yr Storm**		**25-yr Storm**	
	Pre	**Post**	**Pre**	**Post**	**Pre**	**Post**
1L	4.65	4.22	9.63	8.42	13.95	11.98
2L	4.49	4.49	9.12	8.96	13.11	12.76
3L	24.47	24.34	48.76	46.52	69.53	64.92
4L	7.89	7.89	15.42	15.42	21.77	21.77

The results of the hydrologic analysis demonstrate that under both pre- and post-development conditions, site stormwater is conveyed to approximately the same offsite locations that existed prior to development of the site. During the 2-, 10-, and 25-year, 24-hour storm events, total peak runoff rate is less for the post-development condition from the project site

Water Quality Treatment

The project as described above, some of the proposed activities will entail the conversion of wooded and meadow to paved and landscaped areas. These conversions will require stormater treatment per Chapter 500. The project design includes two separate stormwater wet ponds that have been specifically designed to treat stormwater. The ponds incorporate primary outlets and emergency spillways designed in accordance with applicable Best Management Practices (BMPs). Additionally, the project includes vegetated buffers for treatment of the stormwater runoff. Please see the General Standard Submission section of the application for specific details.

Offset Credits

MHP is not proposing offset credits with this submission.

Compensation Fees

The proposed project does not require compensation fees.

Project Impact

The project has been specifically designed to minimize or eliminate any potential impacts to the watersheds, adjacent property and downstream properties. The post-development peak run off rate is equal or less than the pre-development run off rate for the 2-, 10- and 25 year 24-hour storm event as required by the applicable stormwater regulation of the State of Maine. Stormwater is

converted to sheet flow at each discharge point and must flow through an extensive forested wetland before reaching Black Brook. Only a small portion of the project is within the drainage area of Calley Wright Brook. Stormwater from this portion of the project will be treated by vegetated buffers. Therefore, the project as proposed will not have any adverse impact on Balck Brook, Calley Wright Brook and adjacent properties or downstream properties.

B. Project Maps

Topographic Map
A site location map with project boundaries is included in Section 1.0.

Soils Map
A soils map of the project area is included in Section 11.0.

C. Drainage Plans

Pre and post drainage plans are included in Appendix A.

Contours
Drainage plans include contours at 2-foot intervals**.**

Plan Elements
The plans include a legend, north arrow, title block, revisions block and area for professional stamps.

Land Cover Types and Boundaries
Cover types as defined by the stormwater model are included on the site plans.

Soil Group Boundaries
The boundaries for all the hydrologic soil groups are included on the attached soils map (Section 11.0).

Stormwater Quantity Subwatershed Boundaries
All of the drainage boundaries are indicated on the site plans.

Stormwater Quality Subwatershed Boundaries
All of the drainage boundaries are indicated on the site plans.

Watershed Analysis Points
All of the points of analysis are indicated on the site plans.

Hydrologic Flow Lines
All of the hydrologic flow lines used to determine time of concentration and travel times are indicated on the site plans.

Runoff Storage Area
All existing or proposed storage areas (ponds, wetlands) are indicated on the site plans.

Existing and Proposed Roads and Drives
All existing and proposed roads and drives on the site and bordering the site are indicated on the site plans.

Existing and Proposed Facilities
All existing and proposed facilities such as buildings, parking areas and other facilities are indicated on the site plans.

Existing and Proposed Drainage Systems
All existing and proposed culverts, catch basins and drainage ditches are indicated on the site plans.

Natural and Man-Made Drainage Ways
Any existing streams, brooks, swales, ditches, and other open drainage ways are indicated on the site plans.

Wetlands
All wetlands are indicated one the site plans.

Flooded Areas
There are no known areas that are susceptible to flooding from any 10-year or 25-year, 24-hour storm event. Therefore, none are indicated on the site plans with the exception of the stormwater wet ponds.

Benchmark
The bench mark for the project is indicated on the site plans

Stormwater Detention, Retention and Infiltration Facilities
Wet ponds are used for detention and are shown on plans.

Stormwater Treatment Facilities
Wet ponds and vegetated buffer are used for treatment and are shown on plans.

Drainage Easements
There are no drainage easements associated with this project

D. Runoff Analysis

Curve Number Computations
All curve computations can be found in the attached HydroCAD model report.

Time of Concentration Calculations
Time of concentration calculations were performed using HydroCAD, please refer to the attached model results.

Peak Discharge Calculations
Peak Discharge calculations were performed using HydroCAD, please refer to the attached model results.

Reservoir Routing Calculations
Time of concentration calculations were performed using HydroCAD, please refer to the attached model results.

E. Flooding Standards Submissions

The project as described above, some of the proposed activities will entail the conversion of wooded and meadow to paved and landscaped areas. These conversions will cause a change in the peak runoff rate. The project design includes two separate stormwater wet ponds that have been specifically designed to mitigate the change in peak runoff rates. The ponds incorporate primary outlets and emergency spillways designed in accordance with applicable Best Management Practices (BMPs).

The pre- and post-development stormwater flows generated from the HydroCAD Durant Homestead model for the site are presented in the following table:

Durant Homestead Subdivision
Peak Runoff Flow Rates Summary Table
July, 2018

Point of Analysis	2-yr Storm		10-yr Storm		25-yr Storm	
	Pre	Post	Pre	Post	Pre	Post
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3L	24.47	24.34	48.76	46.52	69.53	64.92
4L	7.89	7.89	15.42	15.42	21.77	21.77

The results of the hydrologic analysis demonstrate that under both pre- and post-development conditions, site stormwater is conveyed to approximately the same offsite locations that existed prior to development of the site. During the 2-, 10-, and 25-year, 24-hour storm events, total peak runoff rate is less for the post-development condition from the project site. Please refer to attached plans, design calculations and HydroCAD model for details.

F. General Standards Submissions

The project requires compliance with the General Standards, as designed the project includes 3.88 acres (168,990 SF) of impervious area, which includes 1.73 acres (75,325 SF) of paved road, 0.78 acres (33,440 SF) for lots 1 through 10 and 17, (3,040 SF/lot which includes driveway and structures), and 1.37 acres (60,225 SF) for lots 11 through 16 and 18 through 26 (4,015 SF/lot which includes driveway and structures). Disturbed area equals 13.96 acres (60,8064 SF) and total developed area equals 17.84 acres (777,054 SF).

The percentage of developed area to land available for development equals 37%, (total land area available for development = 48.53 acres, total area of development 17.84) Based on Chapter 500, Section 4.C.(2).(a).(iii) the treatment level required for the project is 90% of the total impervious area and 75% of the total developed area. To meet the treatment requirements of the general standards above the project includes two (2) wet ponds and 17 vegetated buffers. Combined these treatment BMPs achieve a treatment level of 90% for the project impervious area and 77% of the developed area. Please see drawing C-5 for specific locations of treatment BMPs. Each of the treatment measures are described in detail below.

Wet Pond #1:

Wet Pond #1 is designed to treat stormwater runoff from drainage catchment areas 4aS and 4bS (see design drawing C-4). These catchments areas include both lanes of the road from station 2+00 to Station 7+80, the northwest corner of Lot 3, Lot 20, most of Lot 21 and approximately two thirds of Lot 22. Stormwater is conveyed to a forebay at the inlet end of pond via ditched on both sides the road and a 24 inch culvert. The impervious area within these catchments equals 30,944 SF and landscaped area equals 112,166 SF. Stormwater wet pond #2 is clay lined and has been designed using a channel protection volume of 6,318 cubic feet (1-inch times the impervious area and 0.4-inches time the landscaped area). The permanent pool of the pond is design to have a permanent pool volume of greater than 12,635 cubic feet (2-inches times the impervious area and 0.8-inches time the landscaped area). Design of wetpond #2 includes an outlet structure to control the flow of stormwater exiting the pond to provide 24 to 48 hours of maximum detention time. Treated stormwater will be converted to sheet flow via a level lip spreader before discharging to the adjacent forested wetland. The length to width ratio at the permanent pool equals 3.1:1.

Per the Discharge from a wetpond exception from the General Standards 4.C.(5).(a), the underdrain outlet was omitted from the design of Wet Pond #1. The function of the wetland will be maintained without the underdrain outlet. Stormwater discharges into a large forested wetland and the discharge from Wet pond #1 is a small fraction of the stormwater entering the wetland naturally.

Wet Pond #2:

Wet Pond #2 is designed to treat stormwater runoff from drainage catchment areas 5aS and 5bS (see design drawing C-4). These catchments areas include both lanes of the road from station 7+80 to Station 24+90, the upland area of Lot 6, approximately half of Lot 8, upland area of Lot 9, upland area of Lot 10, upland area of Lot 13 and western third of Lot 14. Stormwater is conveyed to a forebay at the inlet end of pond via ditched on both sides the road and a 24 inch culvert. The impervious area within these catchments equals 74,591 SF and landscaped area equals 172,009 SF. Stormwater wet pond #2 is clay lined and has been designed using a channel protection volume of 11,950 cubic feet (1-inch times the impervious area and 0.4-inches time the landscaped area). The permanent pool of the pond is design to have a permanent pool volume of greater than 23,899 cubic feet (2-inches times the impervious area and 0.8-inches time the landscaped area). Design of wetpond #2 includes an outlet structure to control the flow of stormwater exiting the pond to provide 24 to 48 hours of maximum detention time. Treated stormwater will be converted to sheet flow via a level lip spreader before discharging to the adjacent forested wetland. The length to width ratio at the permanent pool equals 3.6:1.

Per the Discharge from a wetpond exception from the General Standards 4.C.(5).(a), the underdrain outlet was omitted from the design of Wet Pond #2. The function of the wetland will be maintained without the underdrain outlet. Stormwater discharges into a large forested wetland and the discharge from Wet pond #2 is a small fraction of the stormwater entering the wetland naturally.

Vegetated Buffer A:

Buffer A, is a vegetated meadow buffer within Lot 1, with a flow path length of 70 feet based on Chapter 500, Appendix F, Table 10 “Alternative Buffer Size Requirements for Residential Subdivisions.” Soils within the buffer are predominantly HSG C loamy sand with a small portion HSG D. The project includes grading Lot 1 to promote sheet flow through the buffer. The design does not require grading within the buffer limits. Please see the photo below for the vegetative cover of Buffer A. Buffer A will be protected from alteration through the execution of a deed restriction with the language for a non-wooded meadow buffer in Appendix G of Chapter 500.



Vegetated Buffer B:

Buffer B, is a vegetated meadow buffer within Lot 2, with a flow path length of 70 feet based on Chapter 500, Appendix F, Table 10 “Alternative Buffer Size Requirements for Residential Subdivisions.” Soils within the buffer are predominantly HSG C loamy sand with a small portion HSG D. The project includes grading Lot 2 to promote sheet flow through the buffer. The design does not require grading within the buffer limits. Please see the photo below for the vegetative cover of Buffer B. Buffer B will be protected from alteration through the execution of a deed restriction with the language for a non-wooded meadow buffer in Appendix G of Chapter 500.



Vegetated Buffer C:

Buffer C, is a combination vegetated meadow/forested buffer some of the buffer is within Lot 3, and the remaining is located in an area designated as open space. The buffer within the lot has a flow path length of 70 feet, soils within this portion of the buffer are predominantly HSG C loamy sand. The portion of the buffer located outside of Lot 3 has a flow path length of 100 feet. Soils in this area are HSG D and land cover is forested. Both portions of the buffer are sized based on Chapter 500, Appendix F, Table 10 "Alternative Buffer Size Requirements for Residential Subdivisions." Please see the photo below for the vegetative cover of Buffer C. Buffer C will be protected from alteration through the execution of a deed restriction with the language for a Forested buffer, limited disturbance in Appendix G of Chapter 500.



Vegetated Buffer D:

Buffer B, is a vegetated forested buffer a portion of the buffer is within Lot 7, and the remaining buffer is in an area designated as open space. The flow path length is 100 feet and based on Chapter 500, Appendix F, Table 10 "Alternative Buffer Size Requirements for Residential Subdivisions." Soils within the buffer are predominantly HSG D. see the photo below for the vegetative cover of Buffer D. Buffer D will be protected from alteration through the execution of a deed restriction with the language for a Forested buffer, limited disturbance in Appendix G of Chapter 500.



Vegetated Buffer E:

Buffer E, is a vegetated forested buffer within Lot 8, with a flow path length of 70 feet based on Chapter 500, Appendix F, Table 10 "Alternative Buffer Size Requirements for Residential Subdivisions." Soils within the buffer are predominantly HSG C loamy sand. Buffer E will be protected from alteration through the execution of a deed restriction with the language for a Forested buffer, limited disturbance in Appendix G of Chapter 500.

Vegetated Buffer F:

Buffer F, is a vegetated forested buffer to treat stormwater from Lot 11 and is located in the project's open space. The flow path length for Buffer F is50 feet based on Chapter 500, Appendix F, Table 10 "Alternative Buffer Size Requirements for Residential Subdivisions." Soils within the buffer are predominantly HSG C loamy sand. Please see the photo below for the vegetative cover of Buffer F. Buffer F will be protected from alteration through the execution of a deed restriction with the language for a Forested buffer, limited disturbance in Appendix G of Chapter 500.



Vegetated Buffer G:

Buffer G, is a vegetated forested buffer to treat stormwater from Lot 12 and is located in the project's open space. The flow path length for Buffer G is50 feet based on Chapter 500, Appendix F, Table 10 "Alternative Buffer Size Requirements for Residential Subdivisions." Soils within the buffer are predominantly HSG C loamy sand. The project includes grading Lot 12 to promote sheet flow through the buffer. The design does not require grading within the buffer limits. Please see the photo below for the vegetative cover of Buffer G. Buffer G will be protected from alteration through the execution of a deed restriction with the language for a Forested buffer, limited disturbance in Appendix G of Chapter 500.



Vegetated Buffer H:

Buffer H, is a vegetated forested buffer within Lot 14, with a flow path length of 70 feet based on Chapter 500, Appendix F, Table 10 “Alternative Buffer Size Requirements for Residential Subdivisions.” Soils within the buffer are predominantly HSG C silt loam. Please see the photo below for the vegetative cover of Buffer H. Buffer H will be protected from alteration through the execution of a deed restriction with the language for a Forested buffer, limited disturbance in Appendix G of Chapter 500.



Vegetated Buffer I:

Buffer I, is a vegetated forested buffer within Lot 15, with a flow path length of 70 feet based on Chapter 500, Appendix F, Table 10 “Alternative Buffer Size Requirements for Residential Subdivisions.” Soils within the buffer are predominantly HSG C silt loam. Please see the photo below for the vegetative cover of Buffer I. Buffer I will be protected from alteration through the execution of a deed restriction with the language for a Forested buffer, limited disturbance in Appendix G of Chapter 500.



Vegetated Buffer J:

Buffer E, is a vegetated forested buffer within Lot 16, with a flow path length of 100 feet based on Chapter 500, Appendix F, Table 10 "Alternative Buffer Size Requirements for Residential Subdivisions." Soils within the buffer are predominantly HSG D. Please see the photo below for the vegetative cover of Buffer J. Buffer J will be protected from alteration through the execution of a deed restriction with the language for a Forested buffer, limited disturbance in Appendix G of Chapter 500.



Vegetated Buffer K:

Buffer K, is a vegetated forested buffer located within the open space area of the project and treat a portion of the stormwater from Lot 17, with a flow path length of the 100 feet based on Chapter 500, Appendix F, Table 10 "Alternative Buffer Size Requirements for Residential Subdivisions." Soils within the buffer are predominantly HSG D. Please see the photo below for the vegetative cover of Buffer K. Buffer K will be protected from alteration through the execution of a deed restriction with the language for a Forested buffer, limited disturbance in Appendix G of Chapter 500.



Vegetated Buffer L:

Buffer L, is a vegetated meadow buffer located within the open space area of the project and treat a portion of the stormwater from Lot 19, with a flow path length of the 100 feet based on Chapter 500, Appendix F, Table 10 "Alternative Buffer Size Requirements for Residential Subdivisions." Soils within the buffer are predominantly HSG C. Please see the photo below for the vegetative cover of Buffer L. Buffer L will be protected from alteration through the execution of a deed restriction with the language for a non-wooded meadow buffer in Appendix G of Chapter 500.



Vegetated Buffer M:

Buffer M, is a vegetated meadow buffer located within the open space area of the project and treat a portion of the stormwater from Lots 22 and 23, with a flow path length over 100 feet. The design calls for lot 23 to be regraded to ensure stormwater enters the buffer. Additionally, a 35 foot level spreader is required to covert stormwater runoff to sheet flow prior to entering the buffer. The length flow path through the buffer and length of level spreader is based on Chapter 500, Appendix F, Table 6 "Sizing Requirements for buffer with 0-8% slope and stone berm level lip spreader." Buffer M also treats stormwater runoff from Lot 22 and the flow path length of the buffer is greater than 70 as required in Table 10 "Alternative Buffer Size Requirements for Residential Subdivisions." Soils within the buffer are HSG C. Please see the photo below for the vegetative cover of Buffer M. Buffer M will be protected from alteration through the execution of a deed restriction with the language for a non-wooded meadow buffer in Appendix G of Chapter 500.



Vegetated Buffer N:

Buffer N, is a vegetated buffer located within Lot 24 with a flow path length of the 100 feet. Soils within the buffer are predominantly HSG D and land cover is a mix of meadow and trees. To establish the buffer as forested, MHC proposes to protected from alteration through the execution of a deed restriction with the language for a Forested buffer, limited disturbance in Appendix G of Chapter 500. Please see the photo below for the vegetative cover of Buffer N.



Vegetated Buffer O:

Buffer O, is a vegetated forested buffer located within Lot 25 with a flow path length of the 100 feet based on Chapter 500, Appendix F, Table 10 "Alternative Buffer Size Requirements for Residential Subdivisions." Soils within the buffer are predominantly HSG D. Please see the photo below for the vegetative cover of Buffer O. Buffer O will be protected from alteration through the execution of a deed restriction with the language for a Forested buffer, limited disturbance in Appendix G of Chapter 500.



Vegetated Buffer P:

Buffer P, is a vegetated forested buffer located within Lot 26 with a flow path length of the 100 feet based on Chapter 500, Appendix F, Table 10 "Alternative Buffer Size Requirements for Residential Subdivisions." Soils within the buffer are predominantly HSG D. Please see the photo below for the vegetative cover of Buffer P. Buffer P will be protected from alteration through the execution of a deed restriction with the language for a Forested buffer, limited disturbance in Appendix G of Chapter 500.



Drainage Plans
Pre and post drainage plans are included in Appendix A.

Calculations
Water quality volume calculations are provided on the attached excel spreadsheets for each wet pond.

Project:	2018 Windham Subdivision			
Location:	Cumberland County, Windham, Maine			
Date:	7/25/2018			
Wet pond #1 Design Calculations				
Required Treatment Level for Catchment Area				
Impervious Area	30,944	SF		
Landscaped Area	112,166	SF		
Channel Protection Volume:				
Impervious Area *	1	inch		
Landscaped Area *	0.4	inches		
	6318	CF		
Permanent Pool Volume:				
Impervious Area *	2	inch		
Landscaped Area *	0.8	inches		
	12635	CF		
Wetpond #1 Total Volume	18953	CF		
Underdrain Gravel Trench Outlet:				
Minimum Dimensions:				
Length	N/A	Feet		
Width	N/A	Feet		
Depth	N/A	Feet		
Material	MEDOT #703.22 (underdrain gravel)			

Wet pond #1 Volume Check as designed on:				7/25/2018			
Elevation	Area (SF)	Accumulative Volume (CF)	Mean Depth (feet)				
157.0	429						
158.0	1026	727					
159.0	1756	2,118	0.71				
160.0	2578	4,285	1.21				
161.0	3490	7,319	1.66				
162.0	4478	11,303	2.10				
163.0	5525	16,304	2.52				
163.5	6265	19,252	2.95				
164.0	7084	22,589	2.95				
164.5	7741	26,295	3.07	Perm pool >12635 & Mean depth > 3.0			
165.0	10051	30,743	3.40				

Project:	2018 Windham Subdivision			
Location:	Cumberland County, Windham, Maine			
Date:	7/25/2018			
Wet pond #2 Design Calculations				
Required Treatment Level for Catchment Area				
Impervious Area	74,591	SF		
Landscaped Area	172,009	SF		
Channel Protection Volume:				
Impervious Area *	1	inch		
Landscaped Area *	0.4	inches		
	11950	CF		
Permanent Pool Volume:				
Impervious Area *	2	inch		
Landscaped Area *	0.8	inches		
	23899	CF		
Wetpond #2 Total Volume	35849	CF		
Underdrain Gravel Trench Outlet:				
Minimum Dimensions:				
Length	N/A	Feet		
Width	N/A	Feet		
Depth	N/A	Feet		
Material	MEDOT #703.22 (underdrain gravel)			

Wet pond #2 Volume Check as designed on:				7/25/2018			
Elevation	Area (SF)	Accumulative Volume (CF)	Mean Depth (feet)				
154.0	989.42						
155.0	1,592.52	1,290.97	0.00				
156.0	2,197.64	3,186.05	0.81				
157.0	2,859.31	5,714.53	1.45				
158.0	3,929.79	9,109.08	2.00				
159.0	4,939.88	13,543.91	2.32				
160.0	6,113.04	19,070.37	2.74				
161.0	7,446.05	22,460.14	3.12				
162.0	8,854.35	26,535.24	3.02	Perm pool >23899 & Mean depth > 3.0'			
163.0	12,555.60	31,887.73		Mean Depth @ Elevation 161.5 = 3.07'			
164.0	14,557.04	38,665.89					
165.0	17,300.35	46,630.24					
166.0	19,127.39	55,737.17					

Details, Designs and Specifications

Designs, construction details, and technical specifications for each stormwater management measures are indicated on the attached design drawing package.

Phosphorus Control Plan

The proposed project is not within a lake watershed, and phosphorus standard does not apply.

Control Plan for Thermal Impacts to Coldwater Fisheries

The project will not cause a thermal impact to Black Brook, Calley Wright Brook or Presumpscot River, due to the small size of the development within the watershed and the size and vegetative cover of the common space between the project and the receiving waters.

Control Plan for Other Pollutants

Not required for this project.

Engineering Inspection of Stormwater Management Facilities

MHP will ensure that a professional engineer or qualified representative will visit the site periodically, once construction of the project begins, then on an as needs basis, to verify that the stormwater management facilities are functioning properly.

G. Long Term Maintenance Plan

Please see the attached long term maintenance plan.

2018

DURANT HOMESTEAD RESIDENTIAL SUBDIVISION

STORMWATER MANAGEMENT MAINTENANCE PLAN

SUBMITTED BY:

MATT HANCOCK PROPERTIES, LLC
PO BOX 295
CASCO, MAINE 04015

WITH ASSISTANCE BY:

Acheron Engineering Services
Engineering, Environmental & Geologic Consultants
www.AcheronEngineering.com

147 Main Street	24466 Powell Road
Newport, Maine 04953	Brooksville, Florida 34602
(207) 368-5700	(352) 796-6236

SUBMITTAL DATE:

AUGUST 2018

1.0 Project Description

The applicant, Matt Hancock Properties, owns a 65.5 acre parcel located on Chute Road in the Town of Windham, Cumberland County, Maine. The lot is identified by the Town of Windham as Tax Map 0006, Lot 025. The project includes subdividing the parcel to create 26 residential lots, ranging from 0.69 to 1.15 acres and includes approximately 40.2 acres of common/open space conveyed to the Durant Homestead Home Owners Association (DHHOA). Access to the lots is provided by a paved road that is approximately 2,500 feet long.

2.0 Site Description

The existing land cover of the parcel is best described as undeveloped recently harvested woodland with an open area located near Chute Road. The woodland area is predominately made of smaller tree growth with scattered mature growth in a combination of upland and forested wetland. From 2013 to 2018 a portion of the open area was occupied by a firewood processing operation; the remaining field area has not been maintained for over ten years and has become overgrown

3.0 Soils

The on-site soils at the location of the proposed project consist of coarse loamy glacial till, fine illitic clay and fine sandy loam. The sandy deposits are moderately well-drained soils that promote moderate surface runoff. Soil permeability ranges moderate to somewhat poorly drained. Test pits indicate that depth to bedrock ranges from 30 to 96 inches in the project area.

4.0 Maintenance

This plan applies to all temporary and permanent erosion control features/structures. During construction all erosion control structures that remain in place and stormwater features shall be inspected weekly, or after each rainstorm producing 1" or greater rainfall, whichever is more frequent and is the reasonability of the contractor. After construction is finished inspections must take place once per quarter, or after each rainstorm producing at least 1 inch of rainfall, whichever is more frequent (Appendix A) and is the responsibility of the developer of the project until the Durant Homestead Home Owners Association is established to assume responsibility of inspection and maintenance (see end of section for contact information). Such inspection is necessary to ensure the structures are functioning properly and is necessary as part of the 5-year recertification process for long-term maintenance of stormwater systems. If any structures are not functioning properly, they shall be repaired or replaced. All control structures shall be inspected and maintained for but not limited to the following:

A. <u>Ditches and Swales</u>

1. Inspect annually, in spring and late fall and after heavy rains.
2. Sediment deposits shall be removed grater if the depth is greater than 3".

3. Erosion has scoured the ditch inverts and shall be repaired with new loam, seed, fertilizer, and protective mulch or mesh until a new catch of grass is established.
4. Slumping of the banks which should be repaired, seeded, and protected with mulch until a new catch of grass is established.
5. Water is flowing by or around check dams which shall be rebuilt or repaired with more stone.
6. Remove any woody vegetation growing through riprap.
7. Repair riprap where underlying filter fabric or gravel is showing or stone have been dislodged.

B. Culverts

1. Inspect late fall and after heavy rains.
2. Pipe entrances blocked with sediments should have sediments removed from pipe(s) and from sump or sediment trap.
3. Catch basin sumps that have filled up and overflowed with sediments should have sediments removed and re-used as grass growing medium where needed.
4. Repair any erosion damage at culvert inlet and outlet.

C. Silt Fencing

1. Inspect after heavy rain until area stabilized.
2. Water that is flowing under the silt-fence without treatment requires resetting the silt fence so the bottom of the fabric is buried into or covered with soil or stone.
3. Sediments that have built up behind silt fence should be removed and the section of the silt fence reset (with new fabric and posts if signs of damage are evident).
4. Rips or holes in fabric require replacement of the section of silt fence with new fabric from post to post. Examine area for cause of problem and remove the threat.
5. Silt Fencing should be removed after threat of erosion has diminished.

D. Wet Pond

1. The inlet and outlet of the pond should be checked periodically to ensure that flow structures are not blocked by debris. All ditches or pipes connecting ponds in series should be checked for debris that may obstruct flow. Inspections should be conducted monthly during wet weather conditions from March to November and after heavy rains.
2. The gravel trench outlet should be inspected after every major storm in the first few months to ensure proper function. Thereafter, the gravel trench should be inspected at least once every six months. Inspection consists of verifying that the pond is slowly emptying through the gravel filter for a short time (12 – 24 hours) after a storm and that

potentially clogging material such as accumulations of decaying leaves are not preventing discharge through gravel.

3. The top several inches of the gravel in the outlet trench must be replaced with fresh material when the water ponds above the permanent pool for more than 72 hours. The removed sediments should be disposed of in an acceptable manner.
4. Wet ponds shall be inspected annually for erosion, destabilization of the side slopes, embankment settling and other signs of structural failure. Corrective action should be taken immediately upon identification of problems.
5. Wet ponds lose 0.5% - 1.0% of their volume annually due to sediment accumulation. Dredging is required when accumulated volume loss reaches 15%, or approximately every 15-20 years.
6. Mow embankments to control woody vegetation.
7. Inspect outlet structure for broken seals, obstructed orifices and plugged trash racks.
8. Remove and dispose of sediments and debris within controls structure.
9. Repair damage to trash rack or debris guard.
10. Replace any dislodged stone in riprap spillways.

E. Level Spreaders:

1. Inspect annually in fall and after heavy rains for sand accumulation and debris that may reduce level spreader capacity.
2. Sediment build up within the level spreader should be removed when it has accumulated to approximately 25% of design volume or channel capacity. Dispose of sediments appropriately.
3. Remove debris, such as leaf litter, branches, and tree growth, as needed from the spreader.
4. Vegetated spreaders may require mowing.

F. Treatment Buffers:

1. Inspect annually in the spring for evidence of erosion, concentrated flow, or encroachment by development.
2. Manage buffer’s vegetation with the requirements in any deed restriction.
3. Repair any sign of erosion within a buffer.
4. Inspect and repair down-slope of all spreaders and turnouts for erosion.
5. Mow non-wooded buffers no shorter than six inches and no more than two times per year.

G. Responsible Parties:

1. Developer: Matt Hancock Properties LLC.
   P.O. Box 295
   Casco, Maine 04015
   207-655-5886

2. President Durant Homestead Home Owners Association

5.0 Housekeeping

A. Spill Prevention

Controls must be used to prevent pollutants from construction and waste materials stored on site to enter stormwater, which includes storage practices to minimize exposure of the materials to stormwater. The site contractor or operator must develop, and implement as necessary, appropriate spill prevention, containment, and response planning measures.

NOTE: Any spill or release of toxic or hazardous substances must be reported to the Maine Department of Environmental Protection. For oil spills, call 1-800-482-0777 which is available 24 hours a day. For spills of toxic or hazardous material, call 1-800-452-4664 which is available 24 hours a day. For more information, visit the Department's website at: http://www.maine.gov/dep/spills/emergspillresp/

B. Groundwater protection

During construction, liquid petroleum products and other hazardous materials with the potential to contaminate groundwater may not be stored or handled in areas of the site draining to an infiltration area. An "infiltration area" is any area of the site that by design or as a result of soils, topography and other relevant factors accumulates runoff that infiltrates into the soil. Dikes, berms, sumps, and other forms of secondary containment that prevent discharge to groundwater may be used to isolate portions of the site for the purposes of storage and handling of these materials. Any project proposing infiltration of stormwater must provide adequate pre-treatment of stormwater prior to discharge of stormwater to the infiltration area, or provide for treatment within the infiltration area, in order to prevent the accumulation of fines, reduction in infiltration rate, and consequent flooding and destabilization. During dry months all access roads should be wet down weekly or as needed.

C. Fugitive Sediment and Dust

Actions must be taken to ensure that activities do not result in noticeable erosion of soils or fugitive dust emissions during or after construction. Oil may not be used for dust control, but other water additives may be considered as needed. A stabilized construction entrance (SCE) should be included to minimize tracking of mud and sediment. If off-site tracking

occurs, public roads should be swept immediately and no less than once a week and prior to significant storm events. Operations during dry months, that experience fugitive dust problems, should wet down unpaved access roads once a week or more frequently as needed with a water additive to suppress fugitive sediment and dust.

D. Debris and Other Materials

Minimize the exposure of construction debris, building and landscaping materials, trash, fertilizers, pesticides, herbicides, detergents, sanitary waste and other materials to precipitation and stormwater runoff. These materials must be prevented from becoming a pollutant source.

E. Excavation Dewatering

Excavation de-watering is the removal of water from trenches, foundations, coffer dams, ponds, and other areas within the construction area that retain water after excavation. In most cases the collected water is heavily silted and hinders correct and safe construction practices. The collected water removed from the ponded area, either through gravity or pumping, must be spread through natural wooded buffers or removed to areas that are specifically designed to collect the maximum amount of sediment possible, like a cofferdam sedimentation basin. Avoid allowing the water to flow over disturbed areas of the site. Equivalent measures may be taken if approved by the Department of Environmental Protection.

F. Authorized Non-stormwater Discharges

Identify and prevent contamination by non-stormwater discharges. Where allowed non-stormwater discharges exist, they must be identified and steps should be taken to ensure the implementation of appropriate pollution prevention measures for the non-stormwater component(s) of the discharge. Authorized non-stormwater discharges are:

1. Discharges from firefighting activity;
2. Fire hydrant flushings;
3. Vehicle wash water if detergents are not used and washing is limited to the exterior of vehicles (engine, undercarriage and transmission washing is prohibited);
4. Dust control runoff in accordance with permit conditions;
5. Routine external building wash down, not including surface paint removal, that does not involve detergents;
6. Pavement wash water (where spills/leaks of toxic or hazardous materials have not occurred, unless all spilled material had been removed) if detergents are not used;
7. Uncontaminated air conditioning or compressor condensate;
8. Uncontaminated groundwater or spring water;

9. Foundation or footer drain-water where flows are not contaminated;
10. Uncontaminated excavation dewatering;
11. Potable water sources including waterline flushings; and
12. Landscape irrigation

G. **Unauthorized Non-stormwater Discharges**

The Department of Environmental Protections' approval does not authorize a discharge that is mixed with a source of non stormwater, other than those discharges in compliance with Department regulations. Specifically, the Department's approval does not authorize discharges of the following:

1. Wastewater from the washout or cleanout of concrete, stucco, paint, form release oils, curing compounds or other construction materials;
2. Fuels, oils or other pollutants used in vehicle and equipment operation and maintenance;
3. Soaps, solvents, or detergents used in vehicle and equipment washing; and
4. Toxic or hazardous substances from a spill or other release.

APPENDIX A: INSPECTION & MAINTENANCE PLAN FOR STORMWATER MANAGEMENT

INSPECTION AND MAINTENANCE PLAN FOR STORMWATER MANAGEMENT STRUCTURES		
	INSPECTION SCHEDULE	CORRECTIVE ACTIONS
VEGETATED AREAS	Annually early spring and after heavy rains	Inspect all slopes and embankments and replant areas of bare soil or with sparse growth
		Armor rill erosion areas with riprap or divert the runoff to a stable area
		Inspect and repair down-slope of all spreaders and turn-outs for erosion
		Mow vegetation as specified for the area
DITCHES, SWALES AND OPEN STORMWATER CHANNELS	Annually spring and late fall and after heavy rains	Remove obstructions, sediments or debris from ditches, swales and other open channels
		Repair any erosion of the ditch lining
		Mow vegetated ditches
		Remove woody vegetation growing through riprap
		Repair any slumping side slopes
		Repair riprap where underlying filter fabric or gravel is showing or if stones have dislodge
CULVERTS	Spring and late fall and after heavy rains	Remove accumulated sediments and debris at the inlet, outlet, or within the conduit
		Remove any obstruction to flow
		Repair any erosion damage at the culvert's inlet and outlet
CATCHBASINS	Annually in the spring	Remove sediments and debris from the bottom of the basin and inlet grates
		Remove floating debris and oils (using oil absorptive pads) from any trap
ROADWAYS AND PARKING AREAS	Annually in the spring or as needed	Clear and remove accumulated winter sand in parking lots and along roadways
		Sweep pavement to remove sediment
		Grade road shoulders and remove accumulated winter sand
		Grade gravel roads and gravel shoulders
		Clean-out the sediment within water bars or open-top culverts
		Ensure that stormwater runoff is not impeded by false ditches of sediment in the shoulder
WETPONDS AND DETENTION BASINS	Annually in fall and after heavy rains	Inspect the embankments for settlement, slope erosion, piping, and slumping
		Mow the embankment to control woody vegetation
		Inspect the outlet structure for broken seals, obstructed orifices, and plugged trash racks
		Remove and dispose of sediments and debris within the control structure
		Repair any damage to trash racks or debris guards
		Replace any dislodged stone in riprap spillways
		Remove and dispose of accumulated sediments within the impoundment and forebay
RESOURCE AND TREATMENT BUFFERS	Annually in the spring	Inspect buffers for evidence of erosion, concentrated flow, or encroachment development
		Manage the buffer's vegetation with the requirements in any deed restrictions
		Repair any sign of erosion within a buffer
		Mow non-wooded buffers no shorter than six inches and less than two times per year

APPENDIX B: STORMWATER BMP INSPECTION AND MAINTENANCE LOG

Facility Name
Address

Date	BMP Description	Inspected by	Cause for Inspection	Exceptions Noted	Comments and Actions Taken

Record all inspections and maintenance for all treatment BMPs on this form. Use additional log sheets and/or attach extended comments or documentation as necessary.

- Cause for inspection — Note if the inspection is routine, pre-rainy-season, post-storm, annual, or in response to a noted problem or complaint. Refer to attached document for inspection maintenance plan.
- Exceptions noted — Note any condition that requires correction or indicates a need for maintenance.
- Comments and actions taken — Describe any maintenance done and need for follow-up

H. Maintenance by homeowner association

Please see the attached, Durant Homestead, Restated Declaration of Establishment of Lot Owners Association.

DURANT HOMESTEAD

RESTATED DECLARATION OF ESTABLISHMENT OF LOT OWNERS ASSOCIATION

This Restated Declaration dated as of the ___ day of _____, 2018 is made by Matt Hancock Properties, LLC, the Grantor herein, ("Matt Hancock Properties" or "Grantor") with a mailing address of: P.O. Box 295, Casco, ME 04015

WITNESSETH

WHEREAS, Matt Hancock Properties is the owner in fee simple of a certain parcel of land in the Town of Windham, Cumberland County, Maine as conveyed by a deed from Matt Hancock as the sole member and successor-in-interest to Matt Hancock International, LLC recorded in the Cumberland County Registry of Deeds at Book 33191, Page 124, and as shown on a survey plan entitled "Subdivision Plan of 'Durant Homestead Cumberland County Windham, Maine" prepared by Plisga and Day Land Surveyors. dated _____, 2018 and recorded in the Cumberland County Registry of Deeds on _____, 2018 as Plan #_____which said subdivision was approved by the Town of Windham Planning Board on _____, 2018 and by the Maine Department of Environmental Protection by Findings of Fact and Order signed by the Commissioner on _____, 2018 (hereinafter "the Property" or "the subdivision"); and

WHEREAS, the Grantor's predecessor in title, Matt Hancock International, LLC, recorded the Durant Homestead Declaration of Establishment of Lot Owners Association, such Declaration is recorded in the Cumberland County Registry of Deed at Book 25535, Page 151; and

WHEREAS, the Grantor's predecessor in title, Matt Hancock International, LLC, recorded the Durant Homestead Declaration of Restrictive Covenants in the Cumberland County Registry of Deeds at Book 25535, Page 140; and

WHEREAS the Grantor's predecessor in title, Matt Hancock International, LLC, recorded the First Amendment to Durant Homestead Declaration of Restrictive Covenants in the Cumberland County Registry of Deeds at Book 27075, Page 16; and

WHEREAS, no lots of the Durant Homestead were conveyed from the Grantor's predecessor in title prior to the Grantor taking title to the Property; and

WHEREAS the Grantor wishes to restate the Declaration of Establishment of the Durant Homestead Lot Owners Association; and

WHEREAS, the Restated Declaration of Restrictive Covenants for Durant Homestead of near or even date to be recorded in the Cumberland County Registry of Deeds provides that each

lot owner in Durant Homestead shall join a lot owners association (the "Association") which may be formed by the Grantor; and

WHEREAS, it is the intent of the Grantor that the Association be organized for the purpose of ownership, maintenance and control of the roads and rights-of-way in Durant Homestead and the common land and infrastructure of said subdivision located within Durant Homestead, and for the purpose of providing to the lot owners, their heirs, executors, administrators, successors or assigns, the means, organization, and financial ability to maintain and improve the Property; and

WHEREAS, pursuant to the Site Location of Development Law promulgated by the Maine Department of Environmental Protection, the Grantor has agreed to impose certain covenants and restrictions on the Buffer Areas as more particularly described in the Restated Declaration of Restrictive Covenants; and

WHEREAS, said Restated Declaration of Restrictive Covenants imposes upon the lot owners and upon the Lot Owners' Association to be formed the obligation of following the Maintenance Plan for the subdivision's infrastructure and for the inspection and maintenance of the Buffer Area as more particularly set forth in Exhibit A to said Restated Declaration of Restrictive Covenants.

NOW, THEREFORE, in consideration of the premises, except as otherwise set forth herein, the Grantor does hereby subject all of the lots in the subdivision to the following property restrictions, covenants, charges and assessments, all of which shall run with and bind all such lots within the development and shall be binding upon said Association and the lot owners and their successors and assigns:

ASSOCIATION RULES AND REGULATIONS

1. Subject to the terms of this section, each lot in Durant Homestead is subject to an annual maintenance charge or assessment. Said maintenance charge or assessment shall be paid to the Association. Any vacant lot owned by the Grantor or any builder who has purchased a vacant lot from the Grantor for the purposes of erecting a dwelling thereon shall pay a reduced annual maintenance charge and assessment equal to Ten Percent (10%) of the annual maintenance charge and assessment paid by lots with dwellings constructed thereon. Any such reduced maintenance charges and assessments shall cease upon the earlier of the lot becoming occupied, the termination of any construction thereon for a period of time greater than ninety (90) days, or the completion of any dwelling thereon. If required by law or upon consent by the Grantor, or for any other reasons, the Grantor is required to pay full annual maintenance charges and assessments on unoccupied lots, any builders who have purchased lots from the Grantor for the purpose of erecting a dwelling thereon shall likewise be required to pay full annual maintenance charges and assessments with respect to any such lots owned by them.

2. The annual assessments shall be set by the Association and may be increased or decreased by the Association. The Association may levy in any year a special assessment for the purpose of defraying the cost of any construction or reconstruction, unexpected repair or replacement, and shall further have the ability to set up a reserve account in advance for repair and replacement as may be determined by the Association.

3. Such charges or assessments collected by the Association shall be applied by said Association towards payment for taxes, insurance, charges incurred for maintenance, including snow removal, repair or improvement of any private roads and drainage improvements or common infrastructure serving said roads within the subdivision, and charges incurred for enforcing the covenants and lot owners' rights. The rights of the Association include but are not limited to the following:

a. To maintain, improve and repair any private roads, drainage improvements serving said roads within the subdivision, including but not limited to snow removal, and common subdivision infrastructure as described in the Maintenance Plan attached to the Restated Declaration of Restrictive Covenants for Durant Homestead

b. To enforce, either in its own name or in names of the lot owners, any or all property restrictions or covenants set forth in the Restated Declaration of Restrictive Covenants for Durant Homestead dated _____ and recorded in the Cumberland County Registry of Deeds in Plan File #_____, and in any deeds from Grantor to the lot owners. Provided, however, that this right of enforcement shall not serve to prevent the right of the owner or owners of any lot or lots to enforce such restrictive covenants in the event they or any one of them elects to do so.

4. If any person or entity obligated to pay an assessment levied by the Association fails to do so, the Association shall have a lien as provided in this Section 4, against the lot owned by such person or entity for the amount due and not paid plus interest from the date payment was due at the rate of twelve percent (12%) per annum, or at other such rate as may be set from time to time by the Association, plus all costs and expenses of collecting the unpaid amount, including reasonable attorney's fees. The lien may be foreclosed by the Association in the manner of foreclosure of mortgages on real estate in the State of Maine or by any other means presently or hereafter provided by law or in equity.

5. The owner or owners of a lot within the subdivision shall be a member of the Association and each such owner or owners shall be entitled to participate at meetings of the Association, provided nevertheless, there shall be allowed only one vote per lot. Upon transfer, conveyance or sale by any owner of his interest in a lot within the development, said owner's membership in the Association shall thereupon cease and terminate. Except as herein provided, the Association shall be the sole judge of the qualifications of its members and of their right to participate in and vote at its meetings. The fact of non-membership in the Association shall not

serve in any way to release or relieve the lot or lots owned by said owner from the assessment hereinabove provided for.

6. The Association shall have the right to make such reasonable rules and regulations and provide such means and employ such agents as will enable it adequately and properly to carry out the provisions of this Restated Declaration, subject to the limitations hereinabove and hereinafter set forth, and subject to the Bylaws of Durant Homestead Lot Owners Association, attached hereto as Exhibit A and incorporated herein.

7. All of the provisions of this Restated Declaration shall be deemed to be covenants running with the land and shall bind each lot owner, his heirs and assigns, and all parties claiming by, through or under them shall be taken to hold, agree and covenant with the Association, its successors in title and with each of them to conform to and observe all the terms and conditions herein contained.

8. The duration of the Association shall be for a term of thirty (30) years from the date this Restated Declaration of Establishment of Lot Owners Association is recorded, after which time all provisions of this Restated Declaration of Establishment of Lot Owners Association, as they may be amended, shall be automatically extended for successive periods of five (5) years unless an instrument signed by seventy-five percent (75%) of the lot owners has been recorded agreeing to terminate the Lot Owners Association as of a specified date following such recording date. In the event that the Association is abolished, the lot owners shall be responsible for all maintenance required of the Association pursuant to this Restated Declaration of Establishment of Lot Owners Association and the Restated Declaration of Restrictive Covenants.

8. The covenants and restrictions provided herein may be enforced by temporary injunctive relief without notice and preliminary and permanent injunctive relief by any court having jurisdiction in an action brought by the Association. Such relief may, in appropriate cases, include an order to take such affirmative steps as may be required to cure any violation of the restrictions herein. In addition to the foregoing, the Association may impose and collect a civil forfeiture of up to $100.00 per day for every day of violation, and any party maintaining a legal action to enforce these provisions shall, in addition to the other relief available, be entitled to recover reasonable attorney fees and costs of suit.

IN WITNESS WHEREOF, the said Matt Hancock Properties, LLC has caused this instrument to be signed and sealed by _____, its Member thereunto duly authorized, as of the date first written above.

Matt Hancock Properties, LLC

_____

_____

By:

Its: Member

STATE OF MAINE
Cumberland, ss. _____, 2018

Then personally appeared the above-named _____, Member of Matt Hancock Properties, LLC and acknowledged the foregoing instrument to be his free act and deed and the free act and deed of said Matt Hancock Properties, LLC

Before me,

_____
Notary Public – Attorney at Law

Print Name: _____

EXHIBIT A

BYLAWS

OF

DURANT HOMESTEAD LOT OWNERS ASSOCIATION

ARTICLE I

Articles of Incorporation, Office, Location, Seal and Section Headings

Section 1. Articles of Incorporation. The name of this corporation shall be as set forth in the Articles of Incorporation. References in these bylaws to the Articles of Incorporation shall mean this corporation's Articles of Incorporation as from time to time in effect. References in these bylaws to the Maine Nonprofit Corporation Act and to particular sections of said Act are to said Act and said sections as from time to time in effect.

Section 2. Office and Location. The registered office shall be that office specified in the Articles of Incorporation. This corporation is located in the State of Maine at that place specified in the Articles of Incorporation. The principal office and place of business of this corporation shall be at such place as the Board of Directors shall fix, and the corporation may have such other offices and places of business, both within and without the State of Maine as the Board of Directors may from time to time fix, or as the business of the corporation may from time to time require.

Section 3. Seal. The seal of this corporation shall be circular in form with the name of the corporation, the word "Maine" and the year of its incorporation so engraved on its face that it may be embossed on paper by pressure, provided that the Board of Directors may adopt a Maine common embossing-type seal or a wafer seal in any form in respect of any particular document or instrument, in which case such embossing-type or wafer seal affixed to such document or instrument shall be the corporate seal of this corporation thereon for all purposes provided by law.

Section 4. Section Headings. The headings of Articles and Sections in these bylaws are for convenience only, and shall not be taken into account in construing these bylaws.

Section 5. Purposes. The purposes of the corporation are to establish an association of lot owners for the government, operation and maintenance of the roads, rights of way, and any common land and infrastructure of said subdivision located in the premises known as DURANT HOMESTEAD in WINDHAM, Maine (the "Property") under the Restated Declaration of

Restrictive Covenants and Restated Declaration of Establishment of Lot Owners Association to be recorded in the Cumberland County Registry of Deeds (the "Declarations").

Section 6. Powers. In addition to all the powers, authority and responsibilities granted to or imposed upon this corporation by the laws of the State of Maine, specifically including those set forth or referred to in the Maine Non-Profit Corporation Act (the "Act") all of which the corporation shall have to the extent permitted by the law and by the Declarations, the corporation shall have the specific powers to:

A. Adopt and amend Bylaws and Rules and Regulations;

B. Adopt and amend budgets for revenues, expenditures and reserves, and to collect assessments for common expenses and service charges from owners;

C. Hire and terminate managers and other employees, agents, and independent contractors;

D. Institute, defend, or intervene in litigation or administrative proceedings in its own name on behalf of itself or two (2) or more owners on matters affecting the roads located in the Property (including without limitation the power to enforce the Declarations and these Bylaws) and the corporation shall be deemed to be the attorney in fact of each owner for such purposes;

E. Make contracts and incur liabilities;

F. Maintain, improve and repair any private roads, rights of way, and any common land and infrastructure of said subdivision including drainage improvements serving said roads within the Property;

G. Impose reasonable charges for the preparation of statements of unpaid common charges and assessments;

H. Provide for the indemnification of its officers and directors and maintain directors' and officers' liability insurance;

I. Exercise any other powers, rights and authority conferred by Declarations or Bylaws;

J. Exercise all other powers that may be exercised pursuant to the Maine Nonprofit Corporation Act.

The Board of Directors of the corporation shall manage the Property and exercise such powers on behalf of the corporation, subject to the terms of these Bylaws and the Declarations.

Section 7. Non-Profit Status. The corporation is not organized for profit and no property or profit thereof shall inure to the benefit of any person except in furtherance of the nonprofit-making purposes of the corporation or in the course of acquiring, constructing or providing management, maintenance and care of the Property, or by virtue of a rebate of excess membership dues, fees, assessments or common charges.

ARTICLE II

Members

Section 1. Eligibility. All owners of lots in DURANT HOMESTEAD subdivision shall automatically be and become, and by virtue of such ownership shall remain, members.

Section 2. Termination of Membership. A member shall cease to be a member upon any sale, transfer, or conveyance of his interest in and to his lot in DURANT HOMESTEAD.

Section 3. Voting Rights. Each member shall be allowed a single vote for each lot owned in DURANT HOMESTEAD. For purposes of this section, if a lot is owned jointly by two or more persons, whether tenants in common, joint tenants, or otherwise, the voting rights attaching to such lot may be exercised by any one of such persons or, if more than one attempts to exercise such rights, by a majority of those persons seeking to exercise such rights or by such person as a majority such persons may designate in writing to act on their behalf. The voting rights of lots owned by a corporation shall be exercised by the person designated by its Board of Directors, or by the shareholders in lieu thereof. The voting rights of any lot owned by or held in trust shall be exercised by the trustee or trustees thereof, and the voting rights of any lot held by an estate shall be exercised by the personal representative thereof or majority of them if more than one.

Section 4. Meetings of the Members. The annual meeting of the members shall be held annually each successive year and at such time and place as shall from time to time be fixed by the Board of Directors. Notice of the annual meeting shall state the place, date and hour of the meeting and shall be given by the President or the Secretary, or other office of the corporation, to each member entitled to vote at such meeting at least ten (10) and no more than fifty (50) days before the date of the meeting either personally, by telephone or by mail (at the last known address of such member appearing in the records of the corporation) or telefax. The members, at their annual meeting, shall elect a Board of Directors and shall undertake such other business as may be presented to the meeting by the Board of Directors. Special meetings of the members may be called by the Board, the President, or by any two Directors, or upon the request in writing of members owning one-third or more of the lots. The person or persons calling the special meeting shall fix the time and place hereof, and unless notice of the special meeting is waived as provided by law, notice of such special meeting shall be given by the President, Secretary, other officers of the corporation, or the person or persons calling the special meeting by to each member entitled to vote at such meeting either personally, by telephone or by mail (at the last known address of such member appearing in the records of the corporation) or telefax at least seven days prior to the date set for the meeting. The written notice of any special meeting

shall state the purpose or business to be transacted thereat, and no other business shall be transacted at such special meeting.

Section 5. Quorum and Vote Required. At any meeting of the Members, Members holding ***one third*** of the votes entitled to be cast on the matter to be voted upon represented in person or by proxy shall constitute a quorum. The Members present at a duly called for held meeting at which a quorum was once present may continue to do business and take action at the meeting notwithstanding the withdrawal of enough Members to leave less than a quorum. Any meeting may be adjourned from time to time by a majority of the votes cast upon the question, whether or not a quorum is present, and the meeting may be held as adjourned without further notice if the time and place to which it is adjourned is fixed and announced at such meeting. A majority of the votes to be cast at a meeting at which a quorum is present shall be the act of the Members unless the vote of a greater number is required by these bylaws or the Maine Nonprofit Corporation Act.

Section 6. Action by Consent. Any action required or permitted to be taken at a meeting of the Members may be taken without a meeting if all of the Members, sign written consents setting forth the action taken or to be taken, at any time before or after the intended effective date of such action. Such consents shall be filed with the minutes of Members' meetings and shall have, and may be stated by any officer of the corporation to have, the same effect as a unanimous vote or resolution of the Members at a legal meeting thereof. Any such action taken by unanimous written consents may, but need not be, set forth in such consents in the form of resolutions or votes.

ARTICLE III

Directors

Section 1. Number, Qualification and Term. The number of Directors shall be not less than three (3) and not more than five (5) persons as shall be fixed by the Board of Directors from time to time. The Directors shall be elected at the annual meeting and each director elected shall serve until the next succeeding annual meeting and until his successor shall have been elected and qualified. Any Director may be re-elected to the Board. The majority of the Directors must be year-round residents of the State of Maine with their full-time residence in the DURANT HOMESTEAD Subdivision. If there are not sufficient candidates to fulfill this requirement then the residency requirement is waived.

Section 2. Vacancies, Resignation and Removal. Any vacancy in the Board of Directors, including newly created Directorships created by increase in the number of Directors, may be filled by a majority of the Directors present at any meeting. Any Director may resign his office by delivering a written resignation to the President or Clerk. Directors may be removed from office in the manner prescribed by the Maine Nonprofit Corporation Act, including without limitation Section 704 thereof.

Section 3. Powers. The Board of Directors shall manage and control the business, property and affairs of the corporation. In the management and control of the business, property and affairs of the corporation, the Board of Directors is hereby vested with all of the powers and authority of the corporation itself, so far as not inconsistent with the Maine Nonprofit Corporation Act or other laws of the State of Maine, the Articles of Incorporation or these bylaws.

Section 4. Compensation and Expenses. Directors as such shall not receive any stated salaries for their services, but by resolution of the Board of Directors, a fixed sum and expenses of attendance, if any, may be allowed for attendance at each regular or special meeting of the Board; provided that nothing herein contained shall be construed to preclude any Director from serving the corporation in any other capacity and receiving compensation therefor.

ARTICLE IV

Meetings of the Board of Directors

Section 1. Annual Meeting. The annual meeting shall be held in the [third] quarter of each calendar year upon notice, or without notice, and at such time and place as shall from time to time be fixed by the Board of Directors. Unless otherwise specified by the Board, no notice of such annual meetings shall be necessary, except as otherwise provided by the Maine Nonprofit Corporation Act. The Board, at its annual meeting, shall elect a President who shall preside over all Board meetings and shall, together with the Secretary, prepare and be responsible for the agenda for all Board of Directors meetings.

Section 2. Regular Meetings. Regular meetings of the Board of Directors shall be held from time to time upon notice, or without notice, and at such time and place as shall from time to time be fixed by the Board. Unless otherwise specified by the Board, no notice of such regular meetings shall be necessary, except as otherwise provided by the Maine Nonprofit Corporation Act.

Section 3. Special Meetings. Special meetings of the Board of Directors may be called by the President or any two (2) Directors. The person or persons calling the special meeting shall fix the time and place thereof; provided that the location is within Cumberland County, Maine

Unless notice of a special meeting is waived in the manner prescribed by the Maine Nonprofit Corporation Act, notice of each special meeting of the Board of Directors shall be given by the Clerk, Secretary or the person or persons calling the special meeting. It shall be sufficient notice to a Director of a special meeting to send notice by mail at least 48 hours, or by telegram at least 24 hours, before the meeting addressed to him at his usual or last known business or residence address, or to give notice to him in person or by telephone at least 24 hours before the meeting. Neither the business to be transacted at, nor the purpose of, any regular or special meeting of the Board of Directors need be specified in the notice of the meeting, except as otherwise required by the Maine Nonprofit Corporation Act. The giving of notice of a special

meeting of the Board of Directors by the person or persons authorized to call the same shall constitute the call thereof.

Section 4. Attendance as Waiver of Notice. Attendance of a Director at any meeting shall constitute a waiver of notice of such meeting, except where a Director attends for the express purpose, stated at the commencement of the meeting, of objecting to the transaction of any business because the meeting is not lawfully called, noticed or convened.

Section 5. Quorum and Vote Required. At any meeting of the Directors, one-half (1/2) of the Directors then in office shall constitute a quorum for the transaction of business. The Directors present at a duly called for held meeting at which a quorum was once present may continue to do business and take action at the meeting notwithstanding the withdrawal of enough Directors to leave less than a quorum. Any meeting may be adjourned from time to time by a majority of the votes cast upon the question, whether or not a quorum is present, and the meeting may be held as adjourned without further notice if the time and place to which it is adjourned is fixed and announced at such meeting. The vote of a majority of the Directors present at a meeting at which a quorum is present shall be the act of the Board of Directors unless the vote of a greater number is required by these bylaws or the Maine Nonprofit Corporation Act. No Director shall be permitted to vote by proxy at a meeting of the Board.

Section 6. Action by Consent. Any action required or permitted to be taken at a meeting of the Directors, or of a committee of the Directors, may be taken without a meeting if all of the Directors, or all of the members of the committee, as the case may be, sign written consents setting forth the action taken or to be taken, at any time before or after the intended effective date of such action. Such consents shall be filed with the minutes of Directors' meetings or committee meetings, as the case may be, and shall have, and may be stated by any officer of the corporation to have, the same effect as a unanimous vote or resolution of the Board of Directors at a legal meeting thereof. Any such action taken by unanimous written consents may, but need not be, set forth in such consents in the form of resolutions or votes.

Section 7. Telephone Meetings. Members of the Board of Directors or of any committee designated thereby may participate in a meeting of the Board or of such committee by means of conference telephone or similar communications equipment by means of which all persons participating in the meeting can hear each other, and participating in a meeting in such manner by any member who does not object at the beginning of such meeting to the holding thereof in such manner shall constitute presence in person at such meeting.

ARTICLE V

Officers

Section 1. Number. The officers of the corporation shall be chosen by the Board of Directors and shall be a President, a Registered Agent as required by the Maine Nonprofit Corporation Act, who shall be a resident of Maine, a Secretary and a Treasurer. The Board of Directors may also elect one or more Vice-Presidents, (one of whom may be designated by the

Board of Directors as the Executive Vice-President), and one or more Assistant Secretaries and Assistant Treasurers.

Section 2. When Chosen. The Board of Directors at each annual meeting shall choose such officers, none of whom need be a member of the Board; but the Registered Agent need not be elected annually and shall hold office until the corporation changes its Registered Agent in the manner provided by the Maine Nonprofit Corporation Act.

Section 3. Additional Officers. The Board of Directors may appoint such other officers and agents as it shall deem necessary who shall hold their offices for such terms and shall exercise such powers and perform such duties as shall be determined from time to time by the Board of Directors.

Section 4. Compensation of Officers. The salaries of all officers of the corporation shall be fixed by the Board of Directors.

Section 5. Vacancies, Term and Removal. The officers of the corporation shall hold office until their successors are chosen and qualify. Any officer elected or appointed by the Board of Directors may be removed with or without cause at any time by the Board of Directors in the manner prescribed by the Maine Nonprofit Corporation Act, including without limitation Section 711 thereof. Any vacancy occurring in any office of the corporation may be filled by the Board of Directors.

Section 6. President. The President shall be the chief executive officer of the corporation, shall have the general and active management of the business of the corporation and shall see that all orders and resolutions of the Board of Directors are carried into effect.

Section 7. Vice-President. The Vice-President, if any, or if there shall be more than one, the Vice-Presidents in the order determined by the Board of Directors, shall, in the absence of or in the case of the disability of the President, perform the duties and exercise the powers of the President and shall perform such other duties and have such other powers as the Board of Directors may from time to time prescribe. If the Board of Directors shall appoint or elect an Executive Vice-President, it shall be presumed that he is the Vice-President determined by the Board of Directors to act in case of the absence or disability of the President.

Section 8. Secretary. The Secretary shall attend all meetings of the Board of Directors and record all the proceedings of the Board of Directors in a book kept for that purpose, and shall give notice of special meetings of the Board of Directors. The Secretary shall perform such other duties as may be prescribed by the Board of Directors or President, under whose supervision he shall be. He, or an Assistant Secretary, shall have authority to affix the corporate seal to any instrument requiring it and when so affixed, it may be attested by his signature or by the signature of such Assistant Secretary. The Board of Directors may give general authority to any other officer to affix the seal of the corporation and to attest the same. The Secretary shall have such other powers and duties as are prescribed by law or by the Board of Directors. In case of the absence of or disability of the Secretary, all of the powers of the Secretary may be

exercised by the Assistant Secretary, or if none, the President. Unless the Board determines otherwise, the Secretary shall also act as Registered Agent.

Section 9. Assistant Secretaries. The Assistant Secretary, or if there be more than one, the Assistant Secretaries, in the order determined by the Board of Directors, shall, in case of the absence or disability of the Secretary, perform the duties and exercise the powers of the Secretary and shall perform such other duties and have such other powers as the Board of Directors may from time to time prescribe.

Section 10. Treasurer. The Treasurer shall have the custody of the corporate funds and securities and shall keep full and accurate accounts of receipts and disbursements in books belonging to the corporation and shall deposit all moneys and other valuable effects in the name and to the credit of the corporation in such depositories as may be designated by the Board of Directors. He shall disburse the funds of the corporation as may be ordered by the Board of Directors, taking proper vouchers for such disbursements, and shall render to the President and the Board of Directors, at its regular meetings, or when the Board of Directors so requires, an account of all his transactions as Treasurer and of the financial condition of the corporation.

Section 11. Assistant Treasurers. The Assistant Treasurer, or, if there shall be more than one, the Assistant Treasurers, in the order determined by the Board of Directors, shall, in the absence of or in case of the disability of the Treasurer, perform the duties and exercise the powers of the Treasurer and shall perform such other duties and have such other powers as the Board of Directors may from time to time prescribe.

ARTICLE VI

Indemnification

Section 1. Basic Indemnification. Any person who was or is a party or is threatened to be made a party to any threatened, pending or completed action, suit or proceeding, whether civil, criminal, administrative or investigative, by reason of the fact that he is or was a Director, officer, employee or agent of the corporation, or is or was serving at the request of the corporation as a Director, officer, employee or agent of another corporation, partnership, joint venture, trust or other enterprise, shall be indemnified by the corporation against expenses, including attorneys' fees, judgments, fines and amounts paid in settlement actually and reasonably incurred by him in connection with such action, suit or proceeding; provided that no indemnification shall be provided for any person with respect to any matter as to which he shall have been finally adjudicated in any action, suit or proceeding not to have acted in good faith in the reasonable belief that his action was in the best interests of the corporation or, with respect to any criminal action or proceeding, had reasonable cause to believe that his conduct was unlawful. The termination of any action, suit or proceeding by judgment, order or conviction adverse to such person, or by settlement or a plea of nolo contendere or its equivalent, shall not of itself create a presumption that such person did not act in good faith in the reasonable belief that his action was in the best interests of the corporation, and, with respect to any criminal action or proceeding, had reasonable cause to believe that his conduct was unlawful.

Section 2. Other Provisions. Any provision of these bylaws to the contrary notwithstanding, to the extent that a Director, officer, employee or agent of the corporation has been successful on the merits or otherwise in defense of any action, suit or proceeding referred to in Section 1 above, or in defense of any claim, issue or matter therein, he shall be indemnified against expenses, including attorneys' fees, actually and reasonably incurred by him in connection therewith. Any such person may enforce the right of indemnification granted by these bylaws by a separate action against the corporation, if an order for indemnification is not entered by a court in the action, suit or proceeding in which he was successful on the merits or otherwise.

Any indemnification under Section 1 hereof, unless ordered by a court, shall be made by the corporation only as authorized in the specific case upon a determination that indemnification of the Director, officer, employee or agent is proper in the circumstances because he has met the applicable standard of conduct set forth in Section 1. Such determination shall be made by the Board of Directors by a majority vote of a quorum consisting of Directors who were not parties to such action, suit or proceeding, or if such a quorum is not obtainable, or even if obtainable, if a quorum of disinterested Directors so directs, by independent legal counsel in a written opinion. Any such determination, once made by the Board of Directors may not be revoked by the Board of Directors, and upon the making of such determination by the Board of Directors, the Director, officer, employee or agent may enforce the indemnification against this corporation by a separate action notwithstanding any attempted or actual subsequent action by the Board of Directors.

Expenses incurred in defending a civil or criminal action, suit or proceeding may be paid by the corporation in advance of the final disposition of such action, suit or proceeding as authorized by the Board of Directors in the manner hereinbefore provided, upon receipt of an undertaking by or on behalf of the Director, officer, employee or agent to repay such amount, unless it shall ultimately be determined that he is entitled to be indemnified by the corporation as authorized in these bylaws.

The indemnification provided in these bylaws for any person shall not be deemed exclusive of any other rights to which such person may be entitled under any other bylaw, agreement, vote of disinterested Directors or by the Maine Nonprofit Corporation Act or otherwise, both as to action in his official capacity and as to action in another capacity while holding such office, and shall continue as to any such person who has ceased to be a Director, officer, employee or agent and shall inure to the benefit of the heirs, executors and administrators of such person.

Section 3. Insurance. The Board of Directors may authorize the purchase and maintenance, at the expense of this corporation, of insurance on behalf of any person who is or was a Director, officer, employee or agent of this corporation, or is or was serving at the request of this corporation as a Director, officer, employee or agent of another corporation, partnership, joint venture, trust or other enterprise against any liability asserted against him and incurred by him in any such capacity, or arising out of his status as such, whether or not the corporation

would have the power to indemnify him against such liability under the provisions of the Maine Nonprofit Corporation Act, these bylaws or otherwise.

ARTICLE VII

Fiscal Year

Section 1. Fiscal Year. The fiscal year of the corporation shall be fixed by resolution of the Board of Directors.

ARTICLE VIII

Execution of Documents

Section 1. Execution of Documents. Unless the Board of Directors or executive committee shall otherwise generally or in any specific instance provide: (a) any bill, note, check, or negotiable instrument may be executed or endorsed in the name and on behalf of the corporation by the President or Treasurer, acting singly, and (b) any other instrument, documents, deeds, bills of sale or other writings of whatever nature shall be executed in the name and on behalf of the corporation by the President or the Treasurer, acting singly, and either officer may seal, acknowledge and deliver the same.

ARTICLE X

Dissolution

Section 1. Dissolution. In the event of the liquidation or dissolution of this corporation, the net assets of this corporation shall be distributed only to the members as their interests may appear.

ARTICLE XI

Amendments

Section 1. Amendments. The Members, by a two-thirds (2/3) vote of the Members present at any meeting, may alter, amend or repeal these bylaws, and adopt new bylaws, provided that the notice of any regular or special meeting at which such action is to be taken shall either set out the text of the proposed new bylaw, amendment or by law to be repealed, or shall summarize the changes to be effected by such adoption, amendment or repeal.

DURANT HOMESTEAD
RESTATED DECLARATION OF RESTRICTIVE COVENANTS

This Declaration dated as of the _____ day of _____, 2018 is made by Matt Hancock Properties, LLC, the Grantor herein, ("Matt Hancock Properties" or "Grantor") with a mailing address of: P.O. Box 295, Casco, ME 04015.

WITNESSETH

WHEREAS, Matt Hancock Properties is the owner in fee simple of a certain parcel of land in the Town of Windham, Cumberland County, Maine, as conveyed by a deed from Matt Hancock as the sole member and successor-in-interest Matt Hancock International, LLC, recorded in the Cumberland County Registry of Deeds at Book 33191, Page 124, and as shown on a survey plan entitled "Subdivision Plan of 'Durant Homestead Cumberland County Windham, Maine" prepared by Plisga & Day Land Surveyors. dated _____, 2018 and recorded in the Cumberland County Registry of Deeds on _____, 2018 as Plan #_____which said subdivision was approved by the Town of Windham Planning Board on _____, 2018 and by the Maine Department of Environmental Protection by Findings of Fact and Order signed by the Commissioner on _____, 2018 (hereinafter "the Property" or "the subdivision"); and

WHEREAS, the Grantor's predecessor in title, Matt Hancock International, LLC, recorded the Durant Homestead Declaration of Establishment of Lot Owners Association, such Declaration is recorded in the Cumberland County Registry of Deed at Book 25535, Page 151; and

WHEREAS, the Grantor's predecessor in title, Matt Hancock International, LLC, recorded the Durant Homestead Declaration of Restrictive Covenants in the Cumberland County Registry of Deeds at Book 25535, Page 140; and

WHEREAS, the Grantor's predecessor in title, Matt Hancock International, LLC, recorded the First Amendment to Durant Homestead Declaration of Restrictive Covenants in the Cumberland County Registry of Deeds at Book 27075, Page 16; and

WHEREAS, no lots of the Durant Homestead were conveyed from the Grantor's predecessor in title prior to the Grantor taking title to the Property; and

WHEREAS the Grantor wishes to restate the Declaration of Restrictive Covenants of the Durant Homestead Lot Owners Association; and

WHEREAS, the Restated Declaration of Establishment of the Durant Homestead Lot Owners Association of near or even date to be recorded in the Cumberland County Registry of Deeds provides that each lot owner in Durant Homestead shall join a lot owners association (the "Association"), which may be formed by the Grantor; and

WHEREAS, the Grantor of this Declaration wishes to control future development on the Property and to preserve and protect in perpetuity the appearance and features of the Property for the benefit of the lot owners, as shall be specified in this Declaration; and

WHEREAS, Declarant desires to place certain deed covenants over the portion of said real property depicted on the Plan as "FORESTED BUFFER," and "MEADOW BUFFER" (hereinafter referred to collectively as the "Buffer Areas"); and

WHEREAS, Declarant desires to place certain restriction, under the terms and conditions herein, over a portion of said real property (hereinafter referred to as the “Forested Buffer Area”) being that area on those portions of Lots 3, 7, 8, 14, 15, 16, 18, 24, 25, 26 and over such Open or Common Space as depicted on the Plan; and

WHEREAS, Declarant desires to place certain restrictions, under the terms and conditions herein, over a portion of said real property (hereinafter the “Meadow Buffer Area”) being that area on those portions of Lots 1, 2, and on such Open or Common Space as depicted on the Plan;

WHEREAS, pursuant to the Site Location of Development Law promulgated by the Maine Department of Environmental Protection, Declarant has agreed, in satisfaction of paragraph _____and Conditions _____ of the Order, to impose certain covenants and restrictions on the Buffer Areas as more particularly set forth in Paragraphs 20 and 21 of this Declaration and has agreed that such covenants and agreements may be enforced by the Maine Department of Environmental Protection (hereinafter the "MDEP") or any successor in interest; and

WHEREAS, Declarant desires to place certain other deed covenants over the Durant Homestead Subdivision above and beyond those relating to the Buffer Areas;

NOW THEREFORE, the Grantor does hereby declare that all of the lots and premises shown as Durant Homestead Subdivision on the above plan are conveyed subject to the DEP Order, the Plan and all matters depicted thereon, and to the following restrictive covenants, which shall be real covenants running with the land, not conditions or restraints on alienability, and shall be binding upon the Grantor herein, Matt Hancock Properties, LLC, and the future owners of said lots, their heirs, personal representatives, devisees, successors and assigns. These restrictive covenants are imposed upon the premises for the benefit of all of the lots shown on the above-mentioned Plan as well as for the benefit of the owners of said premises and lots, their heirs, personal representatives, devisees, successors and assigns. These restrictive covenants shall be enforceable either in law or in equity by the Grantor, the owner or owners of the premises or any lot contained therein, and their respective heirs, personal representatives, devisees, successors and assigns, but said parties shall not be required to enforce said restrictive covenants, which are as follows:

1. Each lot will be for residential use only. Seasonal rentals of single family homes shall be considered a residential use.

2. Only one single-family dwelling with one attached garage which must be built and one detached garage is permitted on any lot. No more than one additional small outbuilding, with a footprint not to exceed two hundred (200) square feet with a similar outside appearance as the principal structure shall be permitted on any single lot at any time. No outside fuel tanks are permitted unless they are completely covered by a frame structure attached to the residence and designed to visually blend with the residence. Garage doors facing the Subdivision Roads shall remain closed when not in use. Driveways shall be paved.

3. Each dwelling unit shall be limited to two stories and supported by a full perimeter foundation or frost walls. No homes having a living area of less than fifteen hundred (1,500) square feet shall be constructed or occupied. Cellars, whether finished or unfinished, porches, garages and decks shall not be considered living areas. Buildings must have a minimum of 8" wide gable end overhangs. All portions of a chimney visible from the exterior, if any, must be constructed of natural stone, cultured stone, or brick. House siding colors shall fit in with the natural surroundings.

4. Lighting causing unreasonable glare to abutting lots or property is prohibited. Mercury vapor or other high intensity lighting and upward lighting is not permitted. Any exterior lighting shall be shielded from other lots or abutting property and access roads. To preserve night skies or dark skies, lights shall not be directed skyward.

5. No mobile homes, double-wide trailers, house trailers, motor homes, camping trailers, tents and/or temporary residences of any kind shall be stored or constructed on the premises. This restriction shall not apply to small tents for play by children. A lot owner may park on its lot a camper trailer, travel trailer, recreational vehicle, or other similar vehicular accessory provided that it shall not be used as a temporary or permanent living quarters at any time.

6. No further Subdivision of any lot is allowed.

7. Until Grantor no longer owns any lot depicted on said Plan of "Durant Homestead," a hand-drawn sketch of the locations of the septic system, well, buildings and driveway will be submitted by the lot owner to the Grantor for approval prior to the beginning of all construction.

8. No more than twenty-five percent (25%) of the trees of the size of five inches (5") in diameter or larger, measured at breast height, shall be cut within any five (5) year period within a thirty (30) foot interior buffer zone from each lot's property lines, other than the property line on the driveway side of the lot. For the driveway side of the lot, in this thirty (30) foot buffer zone no more than fifty percent (50%) of the trees of the size of five inches (5") in diameter or larger, measured at breast height, shall be cut within any five (5) year period except for the purposes of construction of a driveway or for clearing and establishing a lawn. These 30-foot buffers are not to interfere with restrictions imposed on the Buffer Area designated by the State of Maine Department of Environmental Protection as provided in Paragraphs 20 and 21 of this Declaration. The stipulated Buffer Area therein takes precedence over the buffers specified in this paragraph.

9. No business or commercial activities shall be conducted on any lot. This prohibition is not to be construed to prohibit professional activities such as the practice of craft work, artistic endeavors, private office work or occupations that are conducted entirely from within living areas of a private residence as defined in paragraph 3 above. No business or commercial signs shall be allowed.

10. No animals, livestock or poultry of any kind or species shall be raised, bred or kept on any lot except that dogs, cats or other domestic pets may be kept provided they are not bred, kept or maintained for any commercial purpose, and further provided that no pit bulls shall be allowed on any lot. So as not to become noisome or offensive to other owners, a maximum of two (2) dogs shall reside per lot and a maximum of two (2) cats shall reside per lot. All pets shall be restrained according to local leash laws.

11. No dumping of garbage, rubbish, or other refuse or hazardous or toxic material shall be permitted on any lot.

12. No more than one unregistered motor vehicle will be allowed on any lot.

13. No rooftop antennas, satellite dishes larger than 18" in diameter, or communications towers of any kind are allowed.

14. Any building under construction shall be completed on the outside within one year from receipt of a plumbing permit.

15. Although it is the intention of the Grantor that the Durant Homestead Subdivision roads shown on said plan, to wit, Pennywhistle Drive, will meet the Town of Windham's standards for private roads, Grantor makes no warranty or assurance that the Town will ever accept the roads as Town roads. Said roads shall remain private roads unless and until a duly organized lot owners association successfully petitions the Town to accept the Road.

16. Each owner who is granted a lot in said Durant Homestead Subdivision is hereby granted a right of way to that owner's lot as depicted on said Plan, but the Grantor is not obligated to provide any maintenance to or for said right-of-way or for any part or feature of the Property. Said rights of way shall be in common with the Grantor and others. Each lot is further subject to a right of the lot owners association created under paragraph 17 hereunder to maintain any common infrastructure as shown on the Plan, including the right to access and maintain the stormwater control devices described in the Maintenance Plan attached hereto as Exhibit A and the Buffer Areas as defined in the Recitals to this Declaration.

17. Each lot owner shall join the lot owners' association, which may be formed by the Grantor, its successors and assigns, or other lot owners, for the purpose of owning, maintaining, and controlling Pennywhistle Drive in Durant Homestead, any common infrastructure, and the common land of said Subdivision. The lot owners' association shall be governed by the terms set forth on the recorded Subdivision plan, this Restated Declaration, and a Restated Declaration of Establishment of Lot Owners Association of near or recent date and its duly enacted bylaws and provisions.

18. The lot owners' association described in paragraph 17 shall become operational no later than at such point as fourteen (14) lots in Durant Homestead have been sold and the Grantor no longer owns a majority of the lots in the Subdivision, or two years past from the date of the sale of the first lot, whichever shall occur first. Each lot owner must be a member of said lot owner association. Until the lot owners' association is formed, all costs associated with maintaining the Subdivision's roads, rights-of-ways, and common land and infrastructure shall be handled as follows:

> Each lot owner shall contribute a proportionate share, based on the number of lots owned, of all costs of repairs, improvements, and maintenance of the roads and rights-of-way shown on said Plan and any common land or infrastructure. Said costs shall be personal obligations of each lot owner and may be assessed quarterly and enforced by notice of delinquency duly filed on the public land records by the Grantor. Notwithstanding the foregoing, Any vacant lot owned by the Grantor or any builder who has purchased a vacant lot from the Grantor for the purposes of erecting a dwelling thereon shall pay a reduced annual maintenance charge and assessment equal to Ten Percent (10%) of the

annual maintenance charge and assessment paid by lots with dwellings constructed thereon. Any such reduced maintenance charges and assessments shall cease upon the earlier of the lot becoming occupied, the termination of any construction thereon for a period of time greater than ninety (90) days, or the completion of any dwelling thereon. If required by law or upon consent by the Grantor, or for any other reasons, the Grantor is required to pay full annual maintenance charges and assessments on unoccupied lots, any builders who have purchased lots from the Grantor for the purpose of erecting a dwelling thereon shall likewise be required to pay full annual maintenance charges and assessments with respect to any such lots owned by them.

19. Each owner agrees to contribute to the Association, when formed, according to its rules and bylaws, and the Association shall have same right to enforce contributions as stated in the preceding paragraph. Said Grantor, and its successors and assigns, may transfer to such Association, and said Association shall accept title to all said roads and rights-of-way shown on said Plan, and any common land or infrastructure, and upon such transfer, the Association shall succeed to said Grantor's title, rights, liabilities, and duties therein. Said Association shall be responsible for the Subdivision infrastructure as provided in the "Maintenance Plan" attached hereto as Exhibit A. The President of the Association shall be responsible for overseeing, implementing and enforcing the “Maintenance Plan.” All lot owners agree to indemnify and hold harmless Grantor, its successors and assigns, from any liability arising out of the use of the road or rights-of-way shown on the Plan or use of the common land or infrastructure by any lot owner, his family, guests, or licensees.

In the event of breach of any of the above restrictive covenants, the Grantor, as the Declarant hereof, and its successors and assigns, may exercise any remedies at law or equity to enforce the terms of these restrictions or of any corporate by-laws and acts pursuant hereto, and all costs, including reasonable attorney fees, incurred by Grantor, its successors and assigns, in enforcing these restrictions shall be paid personally by the owner of the lot which is in violation of any provision of the Declaration, together with all other rights and remedies permitted by law, which may be enforced personally and in rem.

20. Special Covenants and Restrictions with Respect to Forested Buffer Area. Pursuant to the Stormwater Management Law, 38 M.R.S. Section 420-D and Chapter 500 of rules promulgated by the Maine Board of Environmental Protection ("Stormwater Management Rules"), Declarant has agreed to impose certain restrictions on the Forested Buffer Area as located on the Plan and more particularly set forth herein and has agreed that these restrictions may be enforced by the Maine Department of Environmental Protection or any successor (hereinafter the "MDEP"). Declarant hereby declares that the Forested Buffer Area is and shall forever be held, transferred, sold, conveyed, occupied and maintained subject to the conditions and restrictions set forth herein. The Restrictions shall run with the Forested Buffer Area and shall be binding on all parties having any right, title or interest in and to the Forested Buffer Area, or any portion thereof, and their heirs, personal representatives, successors, and assigns. Any present or future owner or occupant of the Forested Buffer Area or any portion thereof, by the acceptance of a deed of conveyance of all or part of the Covenant Area or an instrument conveying any interest therein, whether or not the deed or instrument shall so express, shall be deemed to have accepted the Forested Buffer Area subject to the Restrictions and shall agree to be bound by, to comply with and to be subject to each and every one of the Restrictions hereinafter set forth.

1) **Restrictions on Forested Buffer Area**. Unless the owner of the Forested Buffer Area, or any successors or assigns, obtains the prior written approval of the MDEP, the Forested Buffer Area

must remain undeveloped in perpetuity. To maintain the ability of the Forested Buffer Area to filter and absorb stormwater, and to maintain compliance with the Stormwater Management Law and the permit issued thereunder to the Declarant, the use of the Forested Buffer Area is hereinafter limited as follows.

a) No soil, loam, peat, sand, gravel, concrete, rock or other mineral substance, refuse, trash, vehicle bodies or parts, rubbish, debris, junk waste, pollutants or other fill material may be placed, stored or dumped on the Restricted Buffer Area, nor may the topography of the area be altered or manipulated in any way;
b) Any removal of trees or other vegetation within the Restricted Buffer Area must be limited to the following:

    i) No purposefully cleared openings may be created and an evenly distributed stand of trees and other vegetation must be maintained. An "evenly distributed stand of trees" is defined as maintaining a minimum rating score of 24 points in any 25 foot by 50 foot rectangle (1,250 square feet) area, as determined by the rating scheme in the following Point System Table:

Point System for Determining an Evenly Distributed Stand of Trees

Diameter of tree at 4 1/2 feet above ground level	Points
2 - 4 inches	1
4 - 8 inches	2
8 - 12 inches	4
>12 inches	8

    Where existing trees and other vegetation result in a rating score less than 24 points, no trees may be cut or sprayed with biocides except for the normal maintenance of dead, windblown or damaged trees and for pruning of tree branches below a height of 12 feet provided two thirds of the tree's canopy is maintained;

    ii) No undergrowth, ground cover vegetation, leaf litter, organic duff layer or mineral soil may be disturbed except that one winding path, that is no wider than six feet and that does not provide a downhill channel for runoff, is allowed through the area;

c) No building or other temporary or permanent structure may be constructed, placed or permitted to remain on the Restricted Buffer Area, except for a sign, utility pole (whether constructed of wood, steel or other materials) and appurtenant equipment such as guys and guy anchors, or fence;

d) No trucks, cars, dirt bikes, ATVs, bulldozers, backhoes, or other motorized vehicles or mechanical equipment may be permitted on the Restricted Buffer Area.

21. Special Covenants and Restrictions with Respect to Meadow Buffer Area. Pursuant to the Stormwater Management Law, 38 M.R.S. Section 420-D and Chapter 500 of rules promulgated by the Maine Board of Environmental Protection ("Stormwater Management Rules"), Declarant

has agreed to impose certain restrictions on the Meadow Buffer Area as more particularly set forth herein and has agreed that these restrictions may be enforced by the Maine Department of Environmental Protection or any successor (hereinafter the "MDEP"). The Declarant hereby declares that the Meadow Buffer Area is and shall forever be held, transferred, sold, conveyed, occupied and maintained subject to the conditions and restrictions set forth herein. The Restrictions shall run with the Meadow Buffer Area and shall be binding on all parties having any right, title or interest in and to the Meadow Buffer Area, or any portion thereof, and their heirs, personal representatives, successors, and assigns. Any present or future owner or occupant of the Meadow Buffer Area or any portion thereof, by the acceptance of a deed of conveyance of all or part of the Covenant Area or an instrument conveying any interest therein, whether or not the deed or instrument shall so express, shall be deemed to have accepted the Meadow Buffer Area subject to the Restrictions and shall agree to be bound by, to comply with and to be subject to each and every one of the Restrictions hereinafter set forth.

1) **Restrictions on Meadow Buffer Area**. Unless the owner of the Meadow Buffer Area, or any successors or assigns, obtains the prior written approval of the MDEP, the Meadow Buffer Area must remain undeveloped in perpetuity. To maintain the ability of the Meadow Buffer Area to filter and absorb stormwater, and to maintain compliance with the Stormwater Management Law and the permit issued thereunder to the Declarant, the use of the Meadow Buffer Area is hereinafter limited as follows.

    a) No soil, loam, peat, sand, gravel, concrete, rock or other mineral substance, refuse, trash, vehicle bodies or parts, rubbish, debris, junk waste, pollutants or other fill material will be placed, stored or dumped on the Meadow Buffer Area, nor may the topography or the natural mineral soil of the area be altered or manipulated in any way;

    b) A dense cover of grassy vegetation must be maintained over the Meadow Buffer Area, except that shrubs, trees and other woody vegetation may also be planted or allowed to grow in the area. The Meadow Buffer Area may not be maintained as a lawn or used as a pasture. If vegetation in the Meadow Buffer Area is mowed, it may be mown no more than two times per year.

    c) No building or other temporary or permanent structure may be constructed, placed or permitted to remain on the Meadow Buffer Area, except for a sign, utility pole or fence (whether constructed of wood, steel or other materials) and appurtenant equipment such as guys and guy anchors;

    d) No trucks, cars, dirt bikes, ATVs, bulldozers, backhoes, or other motorized vehicles or mechanical equipment may be permitted on the Meadow Buffer Area, except for vehicles used in mowing;

    e) Any level lip spreader directing flow to the Meadow Buffer Area must be regularly inspected and adequately maintained to preserve the function of the level spreader.

    f) Any activity on or use of the Meadow Buffer Area inconsistent with the purpose of these Restrictions is prohibited. Any future alterations or changes in use of the Meadow Buffer Area must receive prior approval in writing from the MDEP. The MDEP may approve such alterations and changes in use if such alterations and uses do not impede the stormwater control and treatment capability of the Meadow Buffer Area or if adequate and appropriate alternative means of stormwater control and treatment are provided.

22. Enforcement. The MDEP may enforce any of the Restrictions set forth in Paragraphs 20 and 21 above.

23. Binding Effect. The restrictions set forth herein shall be binding on any present or future owner of the Buffer Areas. If a Buffer Area is at any time owned by more than one owner, each owner shall be bound by the foregoing restrictions to the extent that any of the Buffer Areas are included within such owner's property.

24. Amendment. Any provision contained in this Declaration may be amended or revoked only by the recording of a written instrument or instruments specifying the amendment or the revocation signed by the owner or owners of the Buffer Areas and by the MDEP.

25. Effective Provisions of Declaration. Each provision of this Declaration, and any agreement, promise, covenant and undertaking to comply with each provision of this Declaration, shall be deemed a land use restriction running with the land as a burden and upon the title to the Buffer Areas.

IN WITNESS WHEREOF, the said Matt Hancock Properties, LLC, has caused this instrument to be signed and sealed by _____, its Member thereunto duly authorized, as of the date first written above.

Matt Hancock Properties, LLC

_____

_____
By:
Its: Member

STATE OF MAINE
Cumberland, ss. _____, 2018

Then personally appeared the above-named _____, Member of Matt Hancock Properties, LLC, and acknowledged the foregoing instrument to be his free act and deed and the free act and deed of said Matt Hancock Properties, LLC.

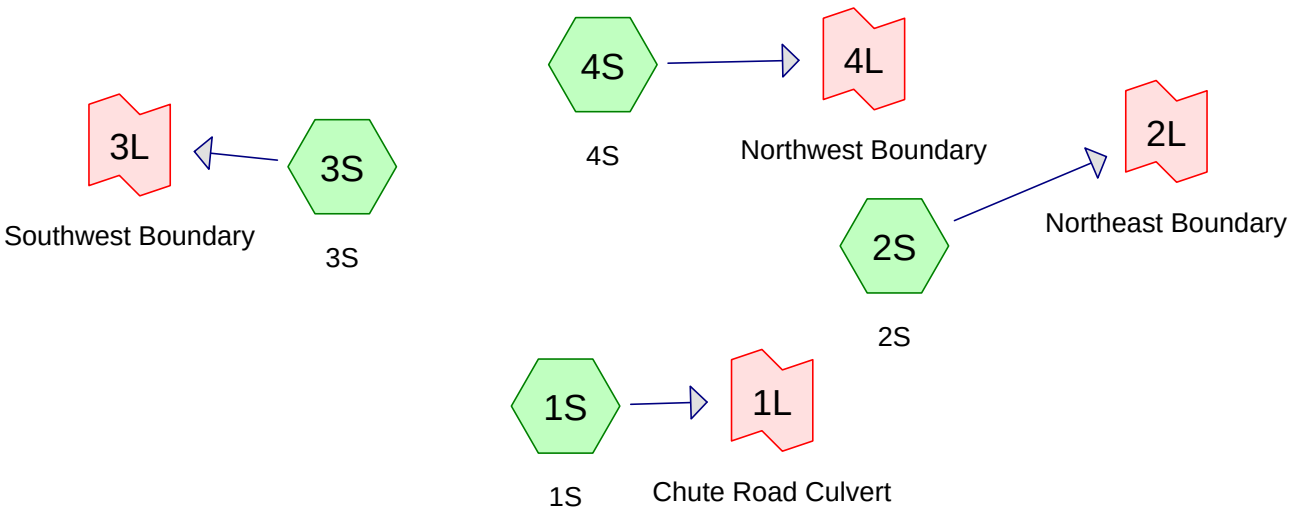
Before me,

_____
Notary Public – Attorney at Law

Print Name: _____

Exhibit A

HydroCAD Model Results



Subcat Reach Pond Link

Routing Diagram for 2018-06-07 Durant Homestead Pre
Prepared by Acheron Engineering, Printed 8/5/2018
HydroCAD® 10.00-12 s/n 00774 © 2014 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
9.960	77	Brush, Poor, HSG C (1S, 3S)
1.945	83	Brush, Poor, HSG D (3S)
0.161	87	Dirt roads, HSG C (1S, 3S)
13.301	83	Wetland, Woods, Poor, HSG D (2S, 3S, 4S)
32.628	77	Woods, Poor, HSG C (2S, 3S, 4S)
9.868	83	Woods, Poor, HSG D (2S, 3S, 4S)
67.863	**79**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
42.749	HSG C	1S, 2S, 3S, 4S
25.114	HSG D	2S, 3S, 4S
0.000	Other	
67.863		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	9.960	1.945	0.000	11.905	Brush, Poor	1S, 3S
0.000	0.000	0.161	0.000	0.000	0.161	Dirt roads	1S, 3S
0.000	0.000	0.000	13.301	0.000	13.301	Wetland, Woods, Poor	2S, 3S, 4S
0.000	0.000	32.628	9.868	0.000	42.496	Woods, Poor	2S, 3S, 4S
0.000	**0.000**	**42.749**	**25.114**	**0.000**	**67.863**	**TOTAL AREA**	

Time span=0.00-50.00 hrs, dt=0.01 hrs, 5001 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: 1S Runoff Area=254,993 sf 0.00% Impervious Runoff Depth=3.31"
Flow Length=631' Tc=24.8 min CN=77 Runoff=13.95 cfs 1.612 af

Subcatchment 2S: 2S Runoff Area=234,249 sf 0.00% Impervious Runoff Depth=3.40"
Flow Length=476' Tc=25.3 min CN=78 Runoff=13.11 cfs 1.525 af

Subcatchment 3S: 3S Runoff Area=2,152,640 sf 0.00% Impervious Runoff Depth=3.50"
Flow Length=2,367' Tc=74.9 min CN=79 Runoff=69.53 cfs 14.420 af

Subcatchment 4S: 4S Runoff Area=314,233 sf 0.00% Impervious Runoff Depth=3.60"
Flow Length=369' Tc=17.3 min CN=80 Runoff=21.77 cfs 2.165 af

Link 1L: Chute Road Culvert Inflow=13.95 cfs 1.612 af
Primary=13.95 cfs 1.612 af

Link 2L: Northeast Boundary Inflow=13.11 cfs 1.525 af
Primary=13.11 cfs 1.525 af

Link 3L: Southwest Boundary Inflow=69.53 cfs 14.420 af
Primary=69.53 cfs 14.420 af

Link 4L: Northwest Boundary Inflow=21.77 cfs 2.165 af
Primary=21.77 cfs 2.165 af

Total Runoff Area = 67.863 ac Runoff Volume = 19.722 af Average Runoff Depth = 3.49"
100.00% Pervious = 67.863 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1S: 1S

Runoff = 13.95 cfs @ 12.34 hrs, Volume= 1.612 af, Depth= 3.31"

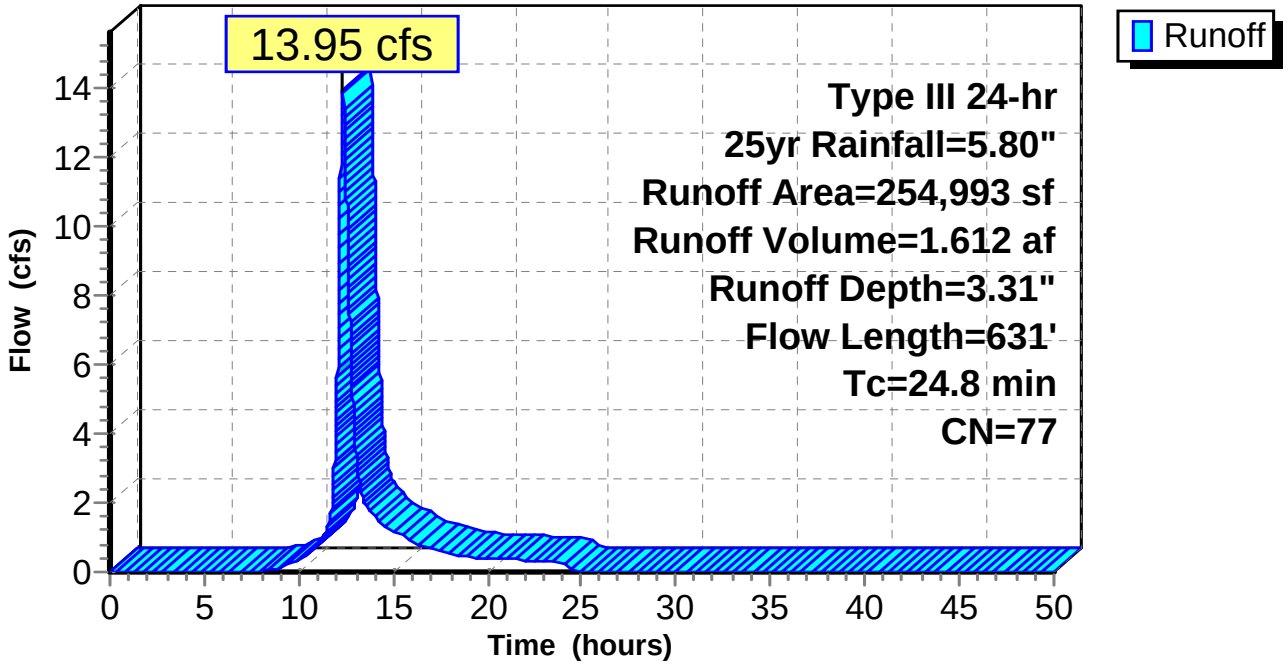
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type III 24-hr 25yr Rainfall=5.80"

	Area (sf)	CN	Description
	4,727	87	Dirt roads, HSG C
*	250,266	77	Brush, Poor, HSG C
	254,993	77	Weighted Average
	254,993		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.3	35	0.0380	0.08		**Sheet Flow, Woods 34.5** Woods: Light underbrush n= 0.400 P2= 3.10"
3.4	30	0.0660	0.15		**Sheet Flow, Field 30.3** Grass: Dense n= 0.240 P2= 3.10"
8.0	61	0.0330	0.13		**Sheet Flow, Field 60.5** Grass: Dense n= 0.240 P2= 3.10"
0.5	47	0.0420	1.43		**Shallow Concentrated Flow, Field 47.4** Short Grass Pasture Kv= 7.0 fps
0.7	67	0.0590	1.70		**Shallow Concentrated Flow, Field 67.4** Short Grass Pasture Kv= 7.0 fps
0.3	31	0.0650	1.78		**Shallow Concentrated Flow, Field 31.0** Short Grass Pasture Kv= 7.0 fps
0.7	57	0.0350	1.31		**Shallow Concentrated Flow, Field 57.2** Short Grass Pasture Kv= 7.0 fps
2.0	113	0.0180	0.94		**Shallow Concentrated Flow, Field 112.7** Short Grass Pasture Kv= 7.0 fps
0.2	22	0.0900	2.10		**Shallow Concentrated Flow, Field 22.3** Short Grass Pasture Kv= 7.0 fps
0.2	35	0.1140	2.36		**Shallow Concentrated Flow, Field 35.0** Short Grass Pasture Kv= 7.0 fps
0.5	56	0.0710	1.87		**Shallow Concentrated Flow, Field 56.0** Short Grass Pasture Kv= 7.0 fps
0.5	42	0.0480	1.53		**Shallow Concentrated Flow, Field 41.7** Short Grass Pasture Kv= 7.0 fps
0.5	35	0.0290	1.19		**Shallow Concentrated Flow, Field** Short Grass Pasture Kv= 7.0 fps
24.8	631	Total			

Subcatchment 1S: 1S

Hydrograph



Summary for Subcatchment 2S: 2S

Runoff = 13.11 cfs @ 12.34 hrs, Volume= 1.525 af, Depth= 3.40"

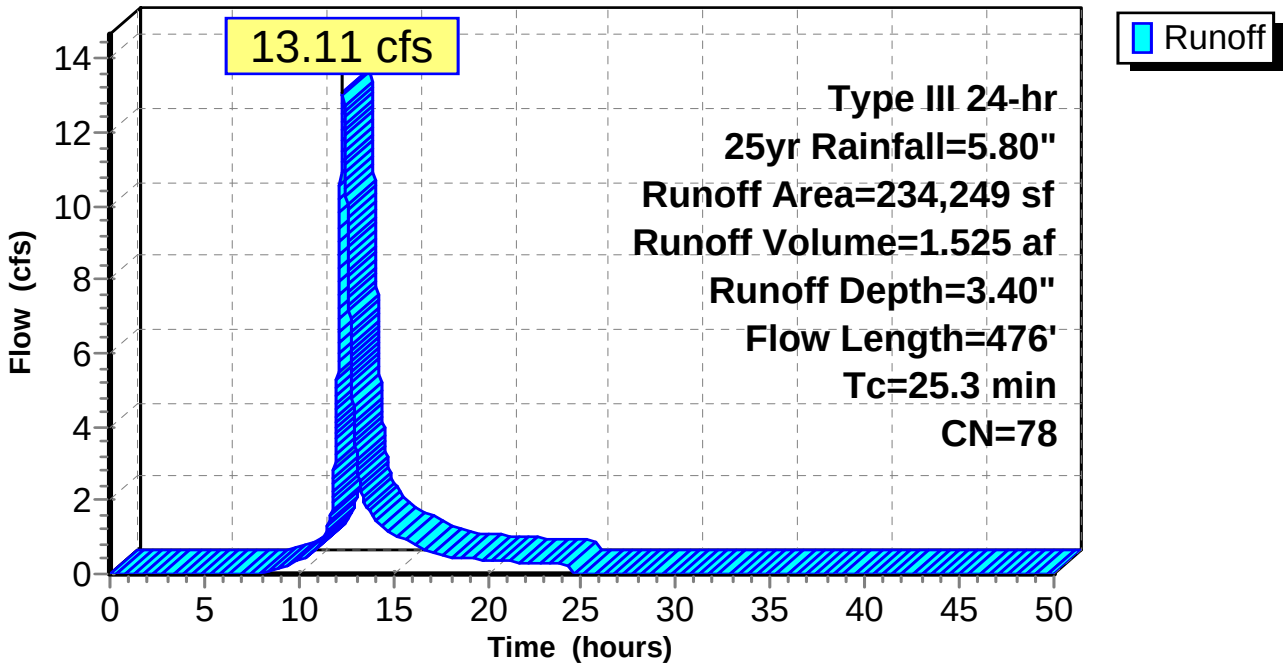
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type III 24-hr 25yr Rainfall=5.80"

	Area (sf)	CN	Description
*	30,820	83	Wetland, Woods, Poor, HSG D
	10,993	83	Woods, Poor, HSG D
	192,436	77	Woods, Poor, HSG C
	234,249	78	Weighted Average
	234,249		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.2	74	0.0580	0.11		**Sheet Flow, Woods 73.8** Woods: Light underbrush n= 0.400 P2= 3.10"
2.1	14	0.1425	0.11		**Sheet Flow, Woods 13.78** Woods: Light underbrush n= 0.400 P2= 3.10"
5.8	182	0.0110	0.52		**Shallow Concentrated Flow, Woods 182.4** Woodland Kv= 5.0 fps
5.1	166	0.0120	0.55		**Shallow Concentrated Flow, Woods 166.29** Woodland Kv= 5.0 fps
1.1	40	0.0140	0.59		**Shallow Concentrated Flow, Woods 40.3** Woodland Kv= 5.0 fps
25.3	476	Total			

Subcatchment 2S: 2S

Hydrograph



Summary for Subcatchment 3S: 3S

Runoff = 69.53 cfs @ 12.99 hrs, Volume= 14.420 af, Depth= 3.50"

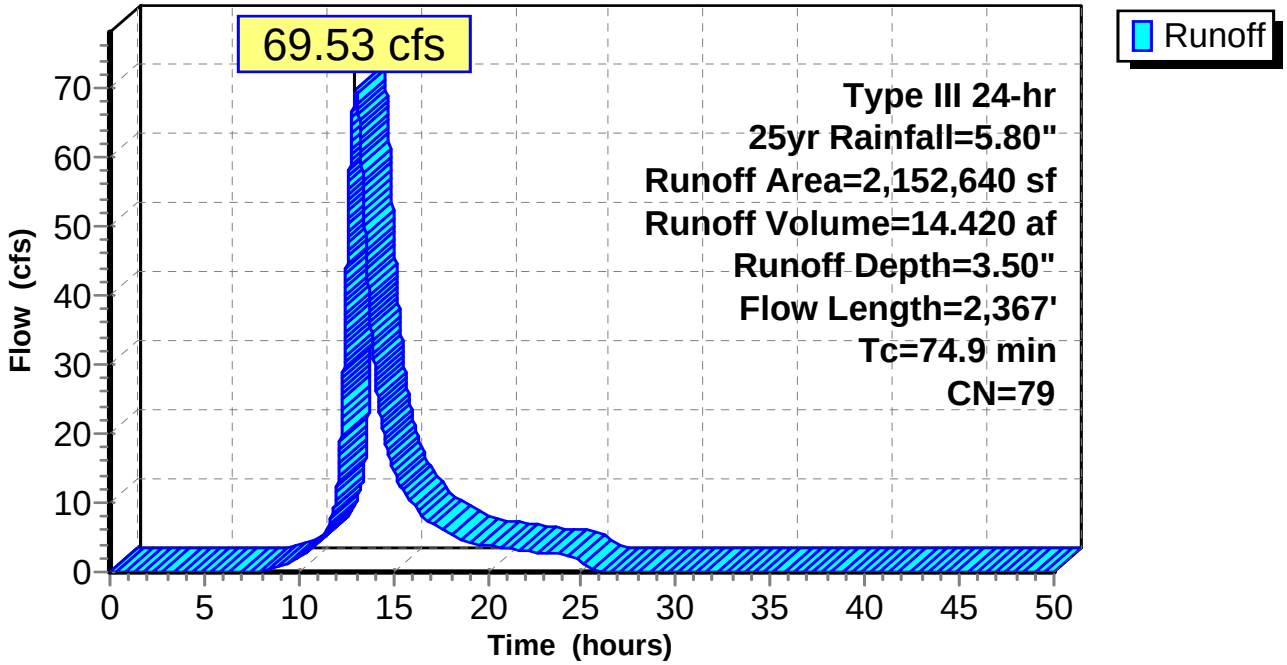
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type III 24-hr 25yr Rainfall=5.80"

	Area (sf)	CN	Description
	2,265	87	Dirt roads, HSG C
	84,712	83	Brush, Poor, HSG D
*	546,609	83	Wetland, Woods, Poor, HSG D
	154,044	83	Woods, Poor, HSG D
	183,613	77	Brush, Poor, HSG C
	1,081,732	77	Woods, Poor, HSG C
	99,665	83	Woods, Poor, HSG D
	2,152,640	79	Weighted Average
	2,152,640		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	11	0.0600	0.08		**Sheet Flow, Woods 11.4** Woods: Light underbrush n= 0.400 P2= 3.10"
1.9	13	0.1600	0.12		**Sheet Flow, Woods 12.5** Woods: Light underbrush n= 0.400 P2= 3.10"
3.0	19	0.1030	0.11		**Sheet Flow, Woods 19.4** Woods: Light underbrush n= 0.400 P2= 3.10"
4.1	144	0.0140	0.59		**Shallow Concentrated Flow, Woods 144.2** Woodland Kv= 5.0 fps
6.1	183	0.0100	0.50		**Shallow Concentrated Flow, Woods 182.8** Woodland Kv= 5.0 fps
4.6	157	0.0130	0.57		**Shallow Concentrated Flow, Woods 157.4** Woodland Kv= 5.0 fps
1.1	75	0.0530	1.15		**Shallow Concentrated Flow, Woods 75** Woodland Kv= 5.0 fps
0.8	51	0.0400	1.00		**Shallow Concentrated Flow, Woods 51** Woodland Kv= 5.0 fps
0.4	33	0.0600	1.22		**Shallow Concentrated Flow, Woods 33.3** Woodland Kv= 5.0 fps
2.2	93	0.0200	0.71		**Shallow Concentrated Flow, Woods 93.4** Woodland Kv= 5.0 fps
3.3	181	0.0330	0.91		**Shallow Concentrated Flow, Woods 180.7** Woodland Kv= 5.0 fps
4.0	141	0.0140	0.59		**Shallow Concentrated Flow, Woods 141** Woodland Kv= 5.0 fps
2.1	92	0.0220	0.74		**Shallow Concentrated Flow, Woods 92.3** Woodland Kv= 5.0 fps
0.6	38	0.0530	1.15		**Shallow Concentrated Flow, Woods 38** Woodland Kv= 5.0 fps
14.8	343	0.0060	0.39		**Shallow Concentrated Flow, Woods 343** Woodland Kv= 5.0 fps
10.5	271	0.0074	0.43		**Shallow Concentrated Flow, Woods 271.2** Woodland Kv= 5.0 fps
0.4	29	0.0700	1.32		**Shallow Concentrated Flow, Woods 28.7** Woodland Kv= 5.0 fps
2.7	110	0.0180	0.67		**Shallow Concentrated Flow, Woods 110.4** Woodland Kv= 5.0 fps
5.1	167	0.0120	0.55		**Shallow Concentrated Flow, Woods 166.5** Woodland Kv= 5.0 fps
1.3	67	0.0300	0.87		**Shallow Concentrated Flow, Woods 66.5** Woodland Kv= 5.0 fps
3.4	149	0.0210	0.72		**Shallow Concentrated Flow, Woods 148.7** Woodland Kv= 5.0 fps
74.9	2,367	Total			

Subcatchment 3S: 3S

Hydrograph



Summary for Subcatchment 4S: 4S

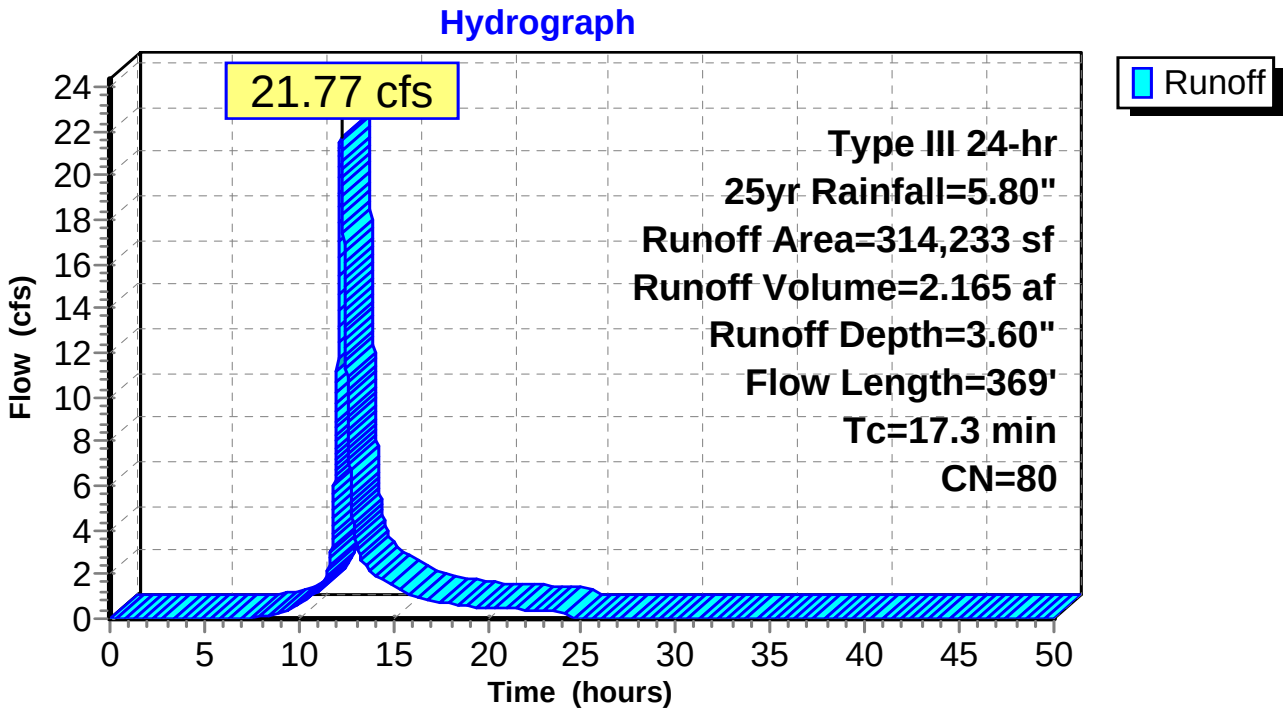
Runoff = 21.77 cfs @ 12.24 hrs, Volume= 2.165 af, Depth= 3.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type III 24-hr 25yr Rainfall=5.80"

	Area (sf)	CN	Description
*	751	83	Wetland, Woods, Poor, HSG D
*	1,210	83	Wetland, Woods, Poor, HSG D
	165,167	83	Woods, Poor, HSG D
	147,105	77	Woods, Poor, HSG C
	314,233	80	Weighted Average
	314,233		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	28	0.0360	0.07		**Sheet Flow, Woods 27.5** Woods: Light underbrush n= 0.400 P2= 3.10"
5.6	175	0.0110	0.52		**Shallow Concentrated Flow, Woods 175.2** Woodland Kv= 5.0 fps
1.3	67	0.0300	0.87		**Shallow Concentrated Flow, Woods 66.7** Woodland Kv= 5.0 fps
4.2	99	0.0063	0.40		**Shallow Concentrated Flow, Woods 99.2** Woodland Kv= 5.0 fps
17.3	369	Total			

Subcatchment 4S: 4S

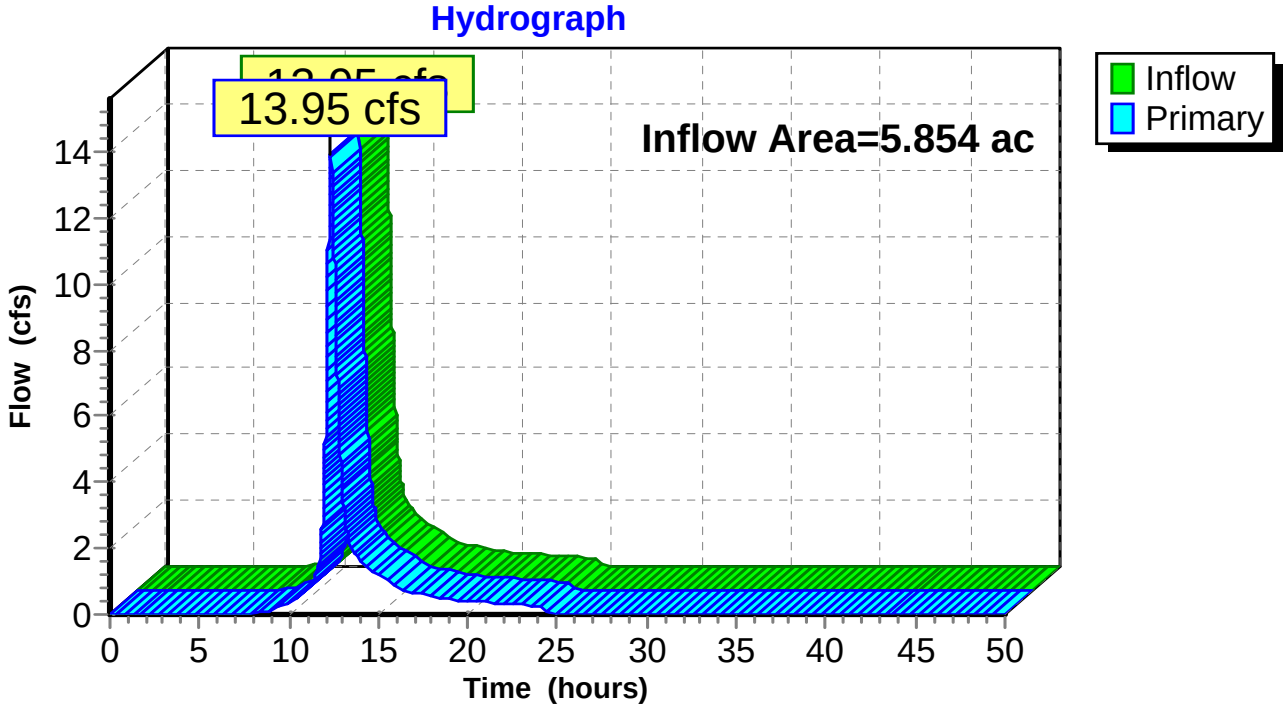


Summary for Link 1L: Chute Road Culvert

Inflow Area = 5.854 ac, 0.00% Impervious, Inflow Depth = 3.31" for 25yr event
Inflow = 13.95 cfs @ 12.34 hrs, Volume= 1.612 af
Primary = 13.95 cfs @ 12.34 hrs, Volume= 1.612 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs

Link 1L: Chute Road Culvert

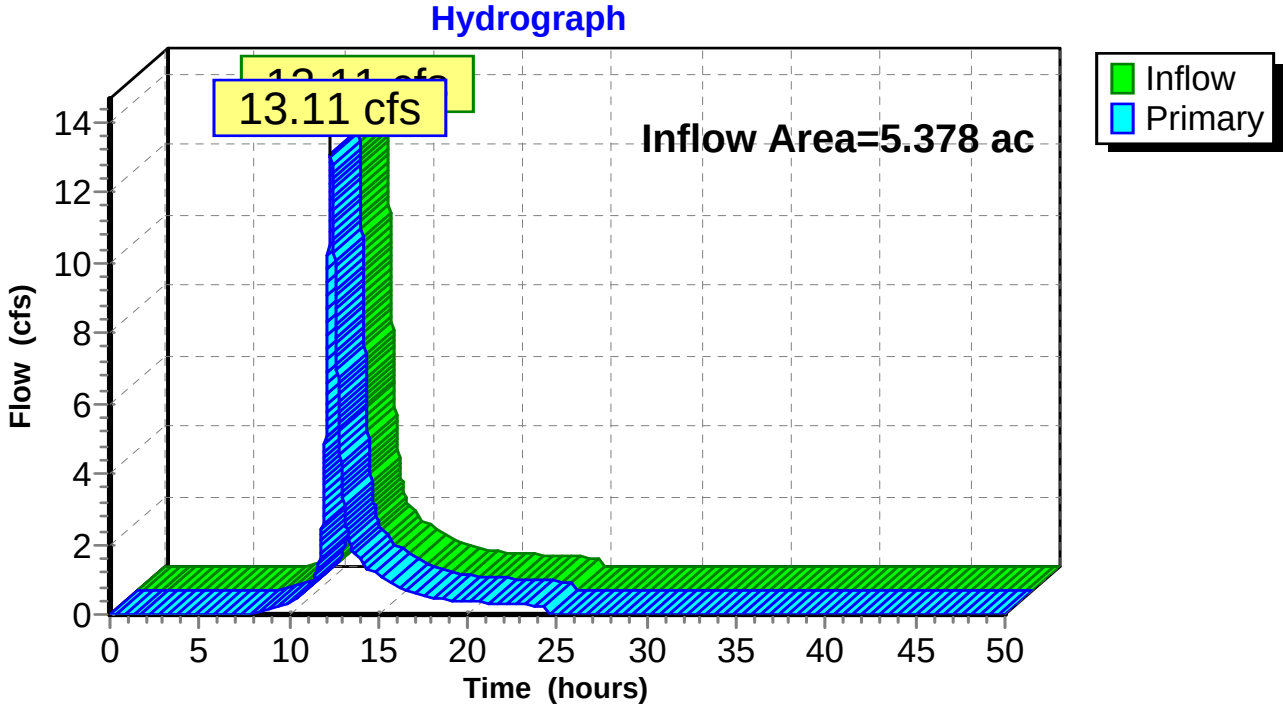


Summary for Link 2L: Northeast Boundary

Inflow Area = 5.378 ac, 0.00% Impervious, Inflow Depth = 3.40" for 25yr event
Inflow = 13.11 cfs @ 12.34 hrs, Volume= 1.525 af
Primary = 13.11 cfs @ 12.34 hrs, Volume= 1.525 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs

Link 2L: Northeast Boundary

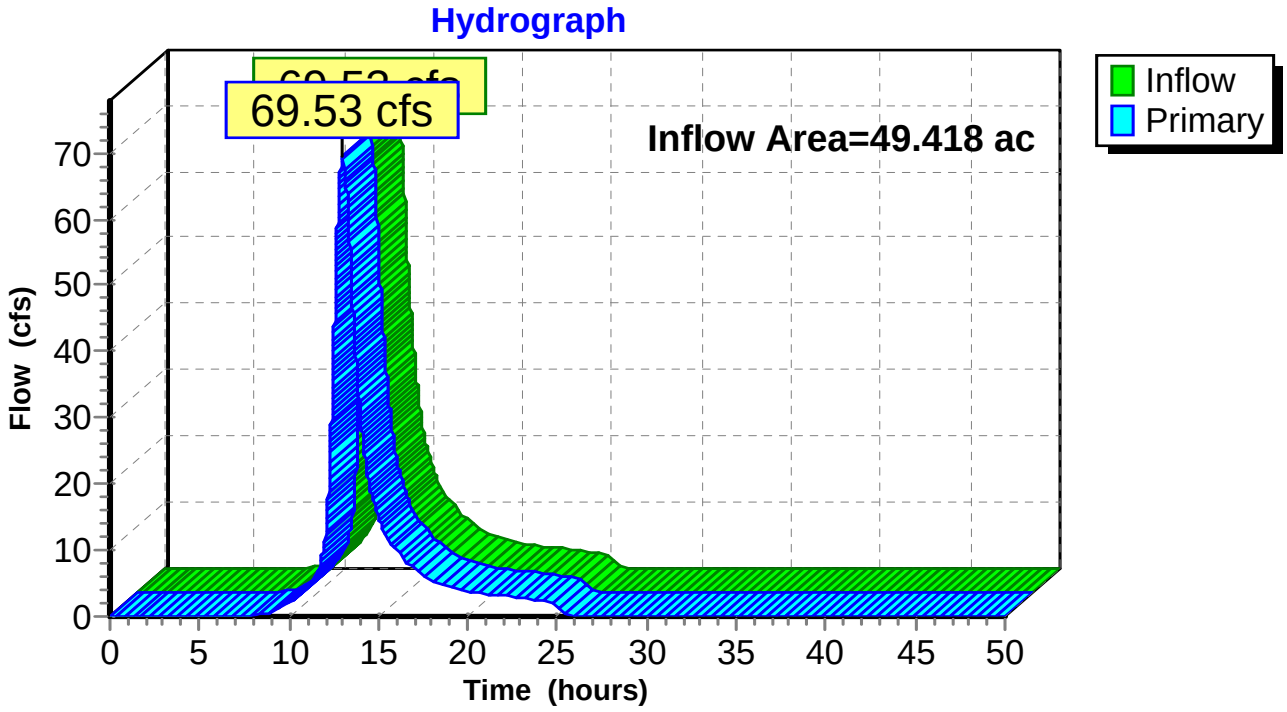


Summary for Link 3L: Southwest Boundary

Inflow Area = 49.418 ac, 0.00% Impervious, Inflow Depth = 3.50" for 25yr event
Inflow = 69.53 cfs @ 12.99 hrs, Volume= 14.420 af
Primary = 69.53 cfs @ 12.99 hrs, Volume= 14.420 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs

Link 3L: Southwest Boundary

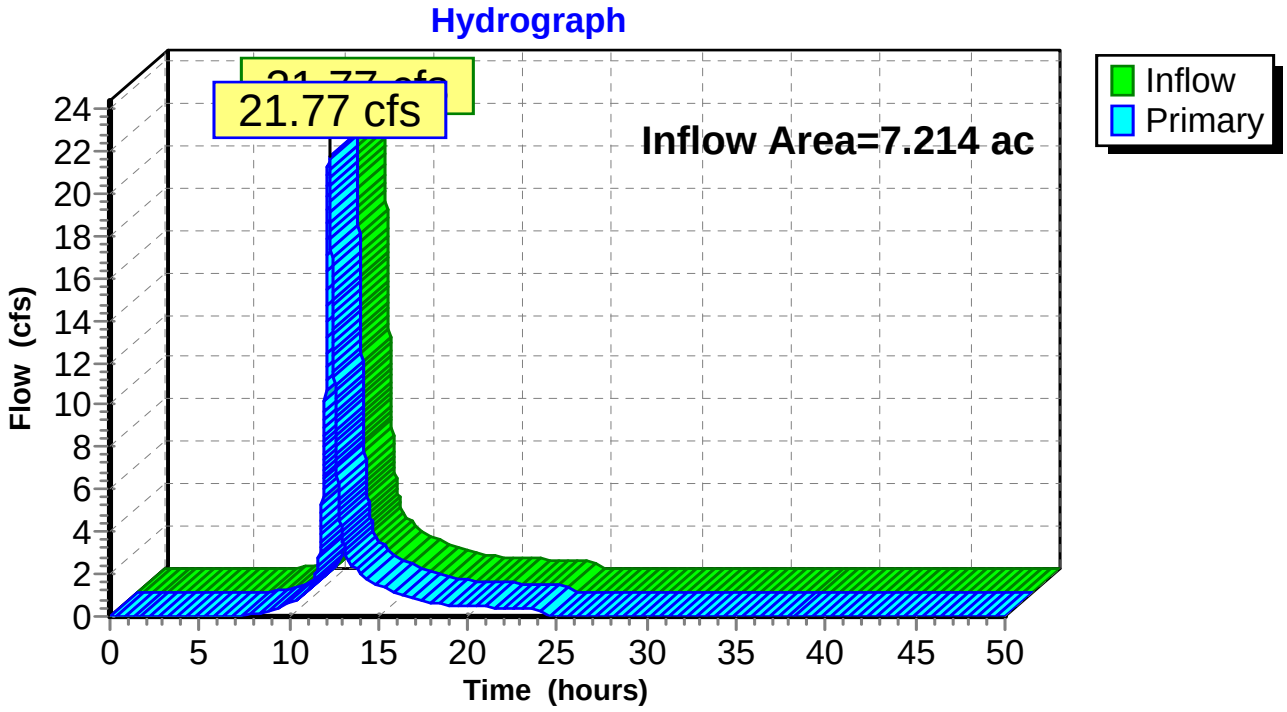


Summary for Link 4L: Northwest Boundary

Inflow Area = 7.214 ac, 0.00% Impervious, Inflow Depth = 3.60" for 25yr event
Inflow = 21.77 cfs @ 12.24 hrs, Volume= 2.165 af
Primary = 21.77 cfs @ 12.24 hrs, Volume= 2.165 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs

Link 4L: Northwest Boundary



Summary for Subcatchment 1S: 1S

Runoff = 9.63 cfs @ 12.35 hrs, Volume= 1.118 af, Depth= 2.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type III 24-hr 10yr Rainfall=4.60"

	Area (sf)	CN	Description
	4,727	87	Dirt roads, HSG C
*	250,266	77	Brush, Poor, HSG C
	254,993	77	Weighted Average
	254,993		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.3	35	0.0380	0.08		**Sheet Flow, Woods 34.5** Woods: Light underbrush n= 0.400 P2= 3.10"
3.4	30	0.0660	0.15		**Sheet Flow, Field 30.3** Grass: Dense n= 0.240 P2= 3.10"
8.0	61	0.0330	0.13		**Sheet Flow, Field 60.5** Grass: Dense n= 0.240 P2= 3.10"
0.5	47	0.0420	1.43		**Shallow Concentrated Flow, Field 47.4** Short Grass Pasture Kv= 7.0 fps
0.7	67	0.0590	1.70		**Shallow Concentrated Flow, Field 67.4** Short Grass Pasture Kv= 7.0 fps
0.3	31	0.0650	1.78		**Shallow Concentrated Flow, Field 31.0** Short Grass Pasture Kv= 7.0 fps
0.7	57	0.0350	1.31		**Shallow Concentrated Flow, Field 57.2** Short Grass Pasture Kv= 7.0 fps
2.0	113	0.0180	0.94		**Shallow Concentrated Flow, Field 112.7** Short Grass Pasture Kv= 7.0 fps
0.2	22	0.0900	2.10		**Shallow Concentrated Flow, Field 22.3** Short Grass Pasture Kv= 7.0 fps
0.2	35	0.1140	2.36		**Shallow Concentrated Flow, Field 35.0** Short Grass Pasture Kv= 7.0 fps
0.5	56	0.0710	1.87		**Shallow Concentrated Flow, Field 56.0** Short Grass Pasture Kv= 7.0 fps
0.5	42	0.0480	1.53		**Shallow Concentrated Flow, Field 41.7** Short Grass Pasture Kv= 7.0 fps
0.5	35	0.0290	1.19		**Shallow Concentrated Flow, Field** Short Grass Pasture Kv= 7.0 fps
24.8	631	Total			

Summary for Subcatchment 2S: 2S

Runoff = 9.12 cfs @ 12.35 hrs, Volume= 1.065 af, Depth= 2.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type III 24-hr 10yr Rainfall=4.60"

	Area (sf)	CN	Description
*	30,820	83	Wetland, Woods, Poor, HSG D
	10,993	83	Woods, Poor, HSG D
	192,436	77	Woods, Poor, HSG C
	234,249	78	Weighted Average
	234,249		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.2	74	0.0580	0.11		**Sheet Flow, Woods 73.8** Woods: Light underbrush n= 0.400 P2= 3.10"
2.1	14	0.1425	0.11		**Sheet Flow, Woods 13.78** Woods: Light underbrush n= 0.400 P2= 3.10"
5.8	182	0.0110	0.52		**Shallow Concentrated Flow, Woods 182.4** Woodland Kv= 5.0 fps
5.1	166	0.0120	0.55		**Shallow Concentrated Flow, Woods 166.29** Woodland Kv= 5.0 fps
1.1	40	0.0140	0.59		**Shallow Concentrated Flow, Woods 40.3** Woodland Kv= 5.0 fps
25.3	476	Total			

Summary for Subcatchment 3S: 3S

Runoff = 48.76 cfs @ 13.06 hrs, Volume= 10.133 af, Depth= 2.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type III 24-hr 10yr Rainfall=4.60"

	Area (sf)	CN	Description
	2,265	87	Dirt roads, HSG C
	84,712	83	Brush, Poor, HSG D
*	546,609	83	Wetland, Woods, Poor, HSG D
	154,044	83	Woods, Poor, HSG D
	183,613	77	Brush, Poor, HSG C
	1,081,732	77	Woods, Poor, HSG C
	99,665	83	Woods, Poor, HSG D
	2,152,640	79	Weighted Average
	2,152,640		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	11	0.0600	0.08		**Sheet Flow, Woods 11.4** Woods: Light underbrush n= 0.400 P2= 3.10"
1.9	13	0.1600	0.12		**Sheet Flow, Woods 12.5** Woods: Light underbrush n= 0.400 P2= 3.10"
3.0	19	0.1030	0.11		**Sheet Flow, Woods 19.4** Woods: Light underbrush n= 0.400 P2= 3.10"
4.1	144	0.0140	0.59		**Shallow Concentrated Flow, Woods 144.2** Woodland Kv= 5.0 fps
6.1	183	0.0100	0.50		**Shallow Concentrated Flow, Woods 182.8** Woodland Kv= 5.0 fps
4.6	157	0.0130	0.57		**Shallow Concentrated Flow, Woods 157.4** Woodland Kv= 5.0 fps
1.1	75	0.0530	1.15		**Shallow Concentrated Flow, Woods 75** Woodland Kv= 5.0 fps
0.8	51	0.0400	1.00		**Shallow Concentrated Flow, Woods 51** Woodland Kv= 5.0 fps
0.4	33	0.0600	1.22		**Shallow Concentrated Flow, Woods 33.3** Woodland Kv= 5.0 fps
2.2	93	0.0200	0.71		**Shallow Concentrated Flow, Woods 93.4** Woodland Kv= 5.0 fps
3.3	181	0.0330	0.91		**Shallow Concentrated Flow, Woods 180.7** Woodland Kv= 5.0 fps
4.0	141	0.0140	0.59		**Shallow Concentrated Flow, Woods 141** Woodland Kv= 5.0 fps
2.1	92	0.0220	0.74		**Shallow Concentrated Flow, Woods 92.3** Woodland Kv= 5.0 fps
0.6	38	0.0530	1.15		**Shallow Concentrated Flow, Woods 38** Woodland Kv= 5.0 fps
14.8	343	0.0060	0.39		**Shallow Concentrated Flow, Woods 343** Woodland Kv= 5.0 fps
10.5	271	0.0074	0.43		**Shallow Concentrated Flow, Woods 271.2** Woodland Kv= 5.0 fps
0.4	29	0.0700	1.32		**Shallow Concentrated Flow, Woods 28.7** Woodland Kv= 5.0 fps
2.7	110	0.0180	0.67		**Shallow Concentrated Flow, Woods 110.4** Woodland Kv= 5.0 fps
5.1	167	0.0120	0.55		**Shallow Concentrated Flow, Woods 166.5** Woodland Kv= 5.0 fps
1.3	67	0.0300	0.87		**Shallow Concentrated Flow, Woods 66.5** Woodland Kv= 5.0 fps
3.4	149	0.0210	0.72		**Shallow Concentrated Flow, Woods 148.7** Woodland Kv= 5.0 fps
74.9	2,367	Total			

Summary for Subcatchment 4S: 4S

Runoff = 15.42 cfs @ 12.24 hrs, Volume= 1.531 af, Depth= 2.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type III 24-hr 10yr Rainfall=4.60"

	Area (sf)	CN	Description
*	751	83	Wetland, Woods, Poor, HSG D
*	1,210	83	Wetland, Woods, Poor, HSG D
	165,167	83	Woods, Poor, HSG D
	147,105	77	Woods, Poor, HSG C
	314,233	80	Weighted Average
	314,233		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	28	0.0360	0.07		**Sheet Flow, Woods 27.5** Woods: Light underbrush n= 0.400 P2= 3.10"
5.6	175	0.0110	0.52		**Shallow Concentrated Flow, Woods 175.2** Woodland Kv= 5.0 fps
1.3	67	0.0300	0.87		**Shallow Concentrated Flow, Woods 66.7** Woodland Kv= 5.0 fps
4.2	99	0.0063	0.40		**Shallow Concentrated Flow, Woods 99.2** Woodland Kv= 5.0 fps
17.3	369	Total			

Summary for Link 1L: Chute Road Culvert

Inflow Area = 5.854 ac, 0.00% Impervious, Inflow Depth = 2.29" for 10yr event
Inflow = 9.63 cfs @ 12.35 hrs, Volume= 1.118 af
Primary = 9.63 cfs @ 12.35 hrs, Volume= 1.118 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs

Summary for Link 2L: Northeast Boundary

Inflow Area = 5.378 ac, 0.00% Impervious, Inflow Depth = 2.38" for 10yr event
Inflow = 9.12 cfs @ 12.35 hrs, Volume= 1.065 af
Primary = 9.12 cfs @ 12.35 hrs, Volume= 1.065 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs

Summary for Link 3L: Southwest Boundary

Inflow Area = 49.418 ac, 0.00% Impervious, Inflow Depth = 2.46" for 10yr event
Inflow = 48.76 cfs @ 13.06 hrs, Volume= 10.133 af
Primary = 48.76 cfs @ 13.06 hrs, Volume= 10.133 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs

Summary for Link 4L: Northwest Boundary

Inflow Area = 7.214 ac, 0.00% Impervious, Inflow Depth = 2.55" for 10yr event
Inflow = 15.42 cfs @ 12.24 hrs, Volume= 1.531 af
Primary = 15.42 cfs @ 12.24 hrs, Volume= 1.531 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs

Summary for Subcatchment 1S: 1S

Runoff = 4.65 cfs @ 12.37 hrs, Volume= 0.557 af, Depth= 1.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type III 24-hr 2yr Rainfall=3.10"

	Area (sf)	CN	Description
	4,727	87	Dirt roads, HSG C
*	250,266	77	Brush, Poor, HSG C
	254,993	77	Weighted Average
	254,993		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.3	35	0.0380	0.08		**Sheet Flow, Woods 34.5** Woods: Light underbrush n= 0.400 P2= 3.10"
3.4	30	0.0660	0.15		**Sheet Flow, Field 30.3** Grass: Dense n= 0.240 P2= 3.10"
8.0	61	0.0330	0.13		**Sheet Flow, Field 60.5** Grass: Dense n= 0.240 P2= 3.10"
0.5	47	0.0420	1.43		**Shallow Concentrated Flow, Field 47.4** Short Grass Pasture Kv= 7.0 fps
0.7	67	0.0590	1.70		**Shallow Concentrated Flow, Field 67.4** Short Grass Pasture Kv= 7.0 fps
0.3	31	0.0650	1.78		**Shallow Concentrated Flow, Field 31.0** Short Grass Pasture Kv= 7.0 fps
0.7	57	0.0350	1.31		**Shallow Concentrated Flow, Field 57.2** Short Grass Pasture Kv= 7.0 fps
2.0	113	0.0180	0.94		**Shallow Concentrated Flow, Field 112.7** Short Grass Pasture Kv= 7.0 fps
0.2	22	0.0900	2.10		**Shallow Concentrated Flow, Field 22.3** Short Grass Pasture Kv= 7.0 fps
0.2	35	0.1140	2.36		**Shallow Concentrated Flow, Field 35.0** Short Grass Pasture Kv= 7.0 fps
0.5	56	0.0710	1.87		**Shallow Concentrated Flow, Field 56.0** Short Grass Pasture Kv= 7.0 fps
0.5	42	0.0480	1.53		**Shallow Concentrated Flow, Field 41.7** Short Grass Pasture Kv= 7.0 fps
0.5	35	0.0290	1.19		**Shallow Concentrated Flow, Field** Short Grass Pasture Kv= 7.0 fps
24.8	631	Total			

Summary for Subcatchment 2S: 2S

Runoff = 4.49 cfs @ 12.37 hrs, Volume= 0.538 af, Depth= 1.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type III 24-hr 2yr Rainfall=3.10"

	Area (sf)	CN	Description
*	30,820	83	Wetland, Woods, Poor, HSG D
	10,993	83	Woods, Poor, HSG D
	192,436	77	Woods, Poor, HSG C
	234,249	78	Weighted Average
	234,249		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.2	74	0.0580	0.11		**Sheet Flow, Woods 73.8** Woods: Light underbrush n= 0.400 P2= 3.10"
2.1	14	0.1425	0.11		**Sheet Flow, Woods 13.78** Woods: Light underbrush n= 0.400 P2= 3.10"
5.8	182	0.0110	0.52		**Shallow Concentrated Flow, Woods 182.4** Woodland Kv= 5.0 fps
5.1	166	0.0120	0.55		**Shallow Concentrated Flow, Woods 166.29** Woodland Kv= 5.0 fps
1.1	40	0.0140	0.59		**Shallow Concentrated Flow, Woods 40.3** Woodland Kv= 5.0 fps
25.3	476	Total			

Summary for Subcatchment 3S: 3S

Runoff = 24.47 cfs @ 13.06 hrs, Volume= 5.197 af, Depth= 1.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type III 24-hr 2yr Rainfall=3.10"

	Area (sf)	CN	Description
	2,265	87	Dirt roads, HSG C
	84,712	83	Brush, Poor, HSG D
*	546,609	83	Wetland, Woods, Poor, HSG D
	154,044	83	Woods, Poor, HSG D
	183,613	77	Brush, Poor, HSG C
	1,081,732	77	Woods, Poor, HSG C
	99,665	83	Woods, Poor, HSG D
	2,152,640	79	Weighted Average
	2,152,640		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	11	0.0600	0.08		**Sheet Flow, Woods 11.4** Woods: Light underbrush n= 0.400 P2= 3.10"
1.9	13	0.1600	0.12		**Sheet Flow, Woods 12.5** Woods: Light underbrush n= 0.400 P2= 3.10"
3.0	19	0.1030	0.11		**Sheet Flow, Woods 19.4** Woods: Light underbrush n= 0.400 P2= 3.10"
4.1	144	0.0140	0.59		**Shallow Concentrated Flow, Woods 144.2** Woodland Kv= 5.0 fps
6.1	183	0.0100	0.50		**Shallow Concentrated Flow, Woods 182.8** Woodland Kv= 5.0 fps
4.6	157	0.0130	0.57		**Shallow Concentrated Flow, Woods 157.4** Woodland Kv= 5.0 fps
1.1	75	0.0530	1.15		**Shallow Concentrated Flow, Woods 75** Woodland Kv= 5.0 fps
0.8	51	0.0400	1.00		**Shallow Concentrated Flow, Woods 51** Woodland Kv= 5.0 fps
0.4	33	0.0600	1.22		**Shallow Concentrated Flow, Woods 33.3** Woodland Kv= 5.0 fps
2.2	93	0.0200	0.71		**Shallow Concentrated Flow, Woods 93.4** Woodland Kv= 5.0 fps
3.3	181	0.0330	0.91		**Shallow Concentrated Flow, Woods 180.7** Woodland Kv= 5.0 fps
4.0	141	0.0140	0.59		**Shallow Concentrated Flow, Woods 141** Woodland Kv= 5.0 fps
2.1	92	0.0220	0.74		**Shallow Concentrated Flow, Woods 92.3** Woodland Kv= 5.0 fps
0.6	38	0.0530	1.15		**Shallow Concentrated Flow, Woods 38** Woodland Kv= 5.0 fps
14.8	343	0.0060	0.39		**Shallow Concentrated Flow, Woods 343** Woodland Kv= 5.0 fps
10.5	271	0.0074	0.43		**Shallow Concentrated Flow, Woods 271.2** Woodland Kv= 5.0 fps
0.4	29	0.0700	1.32		**Shallow Concentrated Flow, Woods 28.7** Woodland Kv= 5.0 fps
2.7	110	0.0180	0.67		**Shallow Concentrated Flow, Woods 110.4** Woodland Kv= 5.0 fps
5.1	167	0.0120	0.55		**Shallow Concentrated Flow, Woods 166.5** Woodland Kv= 5.0 fps
1.3	67	0.0300	0.87		**Shallow Concentrated Flow, Woods 66.5** Woodland Kv= 5.0 fps
3.4	149	0.0210	0.72		**Shallow Concentrated Flow, Woods 148.7** Woodland Kv= 5.0 fps
74.9	2,367	Total			

Summary for Subcatchment 4S: 4S

Runoff = 7.89 cfs @ 12.25 hrs, Volume= 0.797 af, Depth= 1.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type III 24-hr 2yr Rainfall=3.10"

	Area (sf)	CN	Description
*	751	83	Wetland, Woods, Poor, HSG D
*	1,210	83	Wetland, Woods, Poor, HSG D
	165,167	83	Woods, Poor, HSG D
	147,105	77	Woods, Poor, HSG C
	314,233	80	Weighted Average
	314,233		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	28	0.0360	0.07		**Sheet Flow, Woods 27.5** Woods: Light underbrush n= 0.400 P2= 3.10"
5.6	175	0.0110	0.52		**Shallow Concentrated Flow, Woods 175.2** Woodland Kv= 5.0 fps
1.3	67	0.0300	0.87		**Shallow Concentrated Flow, Woods 66.7** Woodland Kv= 5.0 fps
4.2	99	0.0063	0.40		**Shallow Concentrated Flow, Woods 99.2** Woodland Kv= 5.0 fps
17.3	369	Total			

Summary for Link 1L: Chute Road Culvert

Inflow Area = 5.854 ac, 0.00% Impervious, Inflow Depth = 1.14" for 2yr event
Inflow = 4.65 cfs @ 12.37 hrs, Volume= 0.557 af
Primary = 4.65 cfs @ 12.37 hrs, Volume= 0.557 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs

Summary for Link 2L: Northeast Boundary

Inflow Area = 5.378 ac, 0.00% Impervious, Inflow Depth = 1.20" for 2yr event
Inflow = 4.49 cfs @ 12.37 hrs, Volume= 0.538 af
Primary = 4.49 cfs @ 12.37 hrs, Volume= 0.538 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs

Summary for Link 3L: Southwest Boundary

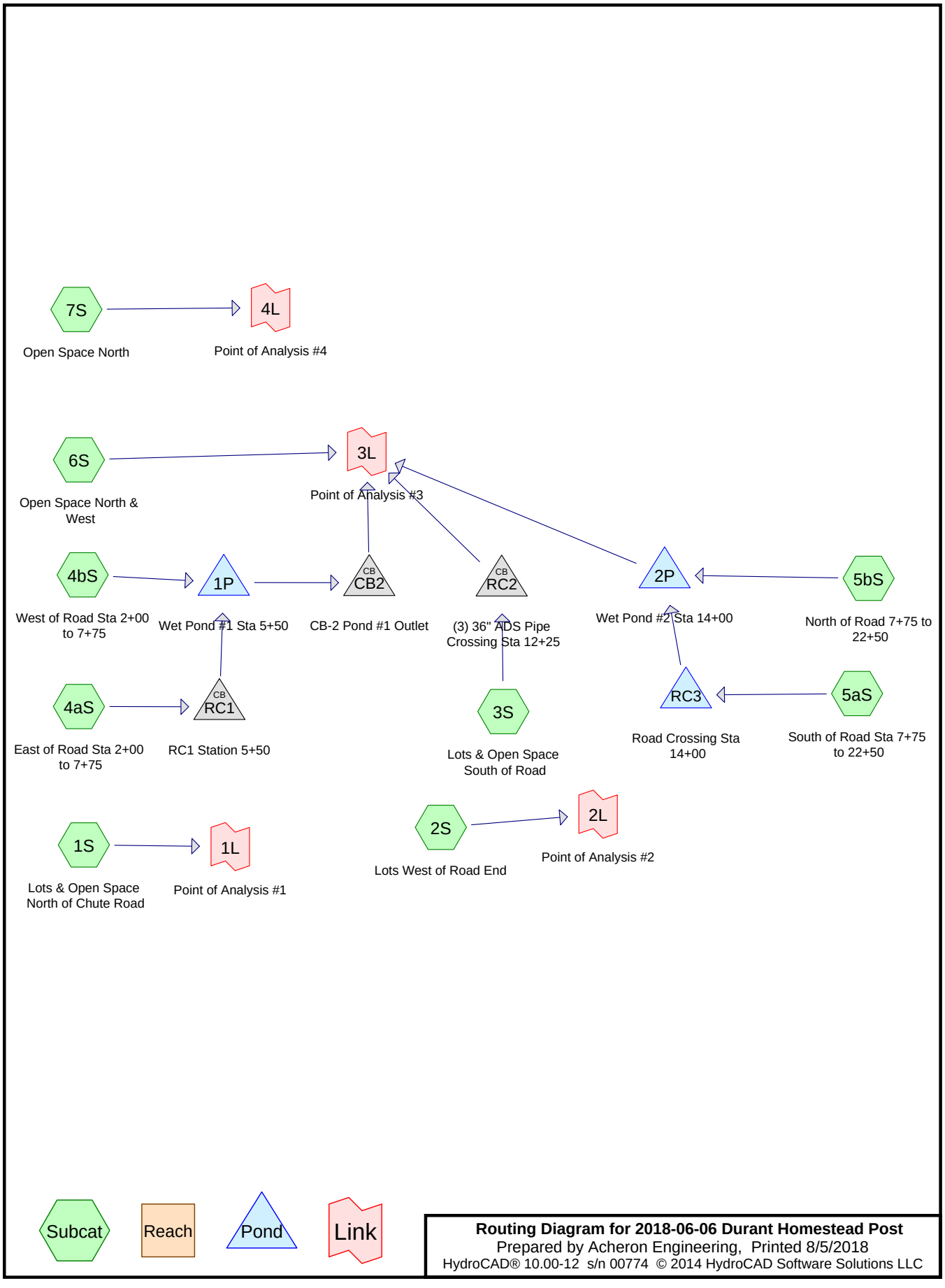
Inflow Area = 49.418 ac, 0.00% Impervious, Inflow Depth = 1.26" for 2yr event
Inflow = 24.47 cfs @ 13.06 hrs, Volume= 5.197 af
Primary = 24.47 cfs @ 13.06 hrs, Volume= 5.197 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs

Summary for Link 4L: Northwest Boundary

Inflow Area = 7.214 ac, 0.00% Impervious, Inflow Depth = 1.33" for 2yr event
Inflow = 7.89 cfs @ 12.25 hrs, Volume= 0.797 af
Primary = 7.89 cfs @ 12.25 hrs, Volume= 0.797 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs


7S
Open Space North
4L
Point of Analysis #4
6S
Open Space North & West
3L
Point of Analysis #3
4bS
West of Road Sta 2+00 to 7+75
1P
Wet Pond #1 Sta 5+50
CB
CB2
CB-2 Pond #1 Outlet
CB
RC2
(3) 36" ADS Pipe Crossing Sta 12+25
2P
Wet Pond #2 Sta 14+00
5bS
North of Road 7+75 to 22+50
4aS
East of Road Sta 2+00 to 7+75
CB
RC1
RC1 Station 5+50
3S
Lots & Open Space South of Road
RC3
Road Crossing Sta 14+00
5aS
South of Road Sta 7+75 to 22+50
1S
Lots & Open Space North of Chute Road
1L
Point of Analysis #1
2S
Lots West of Road End
2L
Point of Analysis #2
Subcat
Reach
Pond
Link
Routing Diagram for 2018-06-06 Durant Homestead Post
Prepared by Acheron Engineering, Printed 8/5/2018
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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
7.860	79	50-75% Grass cover, Fair, HSG C (1S, 2S, 3S, 4aS, 4bS, 5aS, 5bS, 6S)
2.598	77	Brush, Poor, HSG C (1S, 4aS)
1.181	83	Brush, Poor, HSG D (3S, 6S)
0.951	96	Gravel surface, HSG C (1S, 2S, 3S, 4aS, 4bS, 5aS, 5bS, 6S)
1.729	92	Paved roads w/open ditches, 50% imp, HSG C (1S, 4aS, 4bS, 5aS, 5bS)
0.193	98	Pond #2, Water Surface, HSG C (5bS)
1.232	98	Unconnected roofs, HSG C (1S, 2S, 3S, 4aS, 5aS, 5bS, 6S)
0.178	98	Water Surface, HSG C (4bS)
17.612	83	Wetland, Woods, Poor, HSG D (2S, 3S, 6S, 7S)
28.242	77	Woods, Poor, HSG C (1S, 2S, 3S, 5aS, 5bS, 6S, 7S)
6.080	83	Woods, Poor, HSG D (3S, 6S, 7S)
67.858	**81**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
42.984	HSG C	1S, 2S, 3S, 4aS, 4bS, 5aS, 5bS, 6S, 7S
24.874	HSG D	2S, 3S, 6S, 7S
0.000	Other	
67.858		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchr Numbers
0.000	0.000	7.860	0.000	0.000	7.860	50-75% Grass cover, Fair	
0.000	0.000	2.598	1.181	0.000	3.780	Brush, Poor	
0.000	0.000	0.951	0.000	0.000	0.951	Gravel surface	
0.000	0.000	1.729	0.000	0.000	1.729	Paved roads w/open ditches, 50% imp	
0.000	0.000	0.193	0.000	0.000	0.193	Pond #2, Water Surface	
0.000	0.000	1.232	0.000	0.000	1.232	Unconnected roofs	
0.000	0.000	0.178	0.000	0.000	0.178	Water Surface	
0.000	0.000	0.000	17.612	0.000	17.612	Wetland, Woods, Poor	
0.000	0.000	28.242	6.080	0.000	34.322	Woods, Poor	
0.000	**0.000**	**42.984**	**24.874**	**0.000**	**67.858**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	1P	163.52	163.35	43.0	0.0040	0.010	12.0	0.0	0.0
2	2P	161.46	161.33	33.4	0.0039	0.010	12.0	0.0	0.0
3	CB2	163.25	163.00	65.0	0.0038	0.010	12.0	0.0	0.0
4	RC1	166.40	166.00	50.0	0.0080	0.010	24.0	0.0	0.0
5	RC2	162.00	158.00	145.0	0.0276	0.011	36.0	0.0	0.0
6	RC3	165.25	165.00	62.0	0.0040	0.010	24.0	0.0	0.0

Time span=0.00-50.00 hrs, dt=0.01 hrs, 5001 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Lots & Open Space Runoff Area=230,929 sf 4.97% Impervious Runoff Depth=3.50"
Flow Length=630' Tc=31.9 min CN=79 Runoff=11.98 cfs 1.547 af

Subcatchment 2S: Lots West of Road End Runoff Area=191,225 sf 2.16% Impervious Runoff Depth=3.50"
Flow Length=449' Tc=17.8 min CN=79 Runoff=12.76 cfs 1.281 af

Subcatchment 3S: Lots & Open Space Runoff Area=420,547 sf 2.21% Impervious Runoff Depth=3.60"
Flow Length=1,038' Tc=48.1 min CN=80 Runoff=18.23 cfs 2.897 af

Subcatchment 4aS: East of Road Sta 2+00 Runoff Area=94,743 sf 11.06% Impervious Runoff Depth=3.70"
Flow Length=303' Tc=1.1 min UI Adjusted CN=81 Runoff=11.18 cfs 0.671 af

Subcatchment 4bS: West of Road Sta 2+00 Runoff Area=46,768 sf 25.96% Impervious Runoff Depth=4.11"
Flow Length=350' Tc=1.4 min CN=85 Runoff=6.01 cfs 0.368 af

Subcatchment 5aS: South of Road Sta Runoff Area=131,638 sf 13.87% Impervious Runoff Depth=3.80"
Flow Length=857' Tc=7.1 min CN=82 Runoff=12.87 cfs 0.958 af

Subcatchment 5bS: North of Road 7+75 Runoff Area=149,957 sf 19.56% Impervious Runoff Depth=3.80"
Flow Length=955' Tc=7.3 min UI Adjusted CN=82 Runoff=14.57 cfs 1.091 af

Subcatchment 6S: Open Space North & Runoff Area=1,375,837 sf 0.90% Impervious Runoff Depth=3.60"
Flow Length=1,983' Tc=77.2 min UI Adjusted CN=80 Runoff=44.75 cfs 9.479 af

Subcatchment 7S: Open Space North Runoff Area=314,233 sf 0.00% Impervious Runoff Depth=3.60"
Flow Length=369' Tc=17.3 min CN=80 Runoff=21.77 cfs 2.165 af

Pond 1P: Wet Pond #1 Sta 5+50 Peak Elev=166.59' Storage=50,691 cf Inflow=17.18 cfs 1.039 af
Primary=1.54 cfs 1.037 af Secondary=0.00 cfs 0.000 af Outflow=1.54 cfs 1.037 af

Pond 2P: Wet Pond #2 Sta 14+00 Peak Elev=164.50' Storage=68,081 cf Inflow=25.39 cfs 2.049 af
Primary=4.75 cfs 2.039 af Secondary=0.00 cfs 0.000 af Outflow=4.75 cfs 2.039 af

Pond CB2: CB-2 Pond #1 Outlet Peak Elev=164.01' Inflow=1.54 cfs 1.037 af
12.0" Round Culvert n=0.010 L=65.0' S=0.0038 '/' Outflow=1.54 cfs 1.037 af

Pond RC1: RC1 Station 5+50 Peak Elev=168.26' Inflow=11.18 cfs 0.671 af
24.0" Round Culvert n=0.010 L=50.0' S=0.0080 '/' Outflow=11.18 cfs 0.671 af

Pond RC2: (3) 36" ADS Pipe Crossing Sta 12+25 Peak Elev=162.99' Inflow=18.23 cfs 2.897 af
36.0" Round Culvert x 3.00 n=0.011 L=145.0' S=0.0276 '/' Outflow=18.23 cfs 2.897 af

Pond RC3: Road Crossing Sta 14+00 Peak Elev=167.08' Storage=3,075 cf Inflow=12.87 cfs 0.958 af
24.0" Round Culvert n=0.010 L=62.0' S=0.0040 '/' Outflow=11.39 cfs 0.958 af

Link 1L: Point of Analysis #1 Inflow=11.98 cfs 1.547 af
Primary=11.98 cfs 1.547 af

Link 2L: Point of Analysis #2 Inflow=12.76 cfs 1.281 af
Primary=12.76 cfs 1.281 af

Link 3L: Point of Analysis #3 Inflow=64.92 cfs 15.452 af
Primary=64.92 cfs 15.452 af

Link 4L: Point of Analysis #4 Inflow=21.77 cfs 2.165 af
Primary=21.77 cfs 2.165 af

Total Runoff Area = 67.858 ac Runoff Volume = 20.457 af Average Runoff Depth = 3.62"
96.36% Pervious = 65.390 ac 3.64% Impervious = 2.468 ac

Summary for Subcatchment 1S: Lots & Open Space North of Chute Road

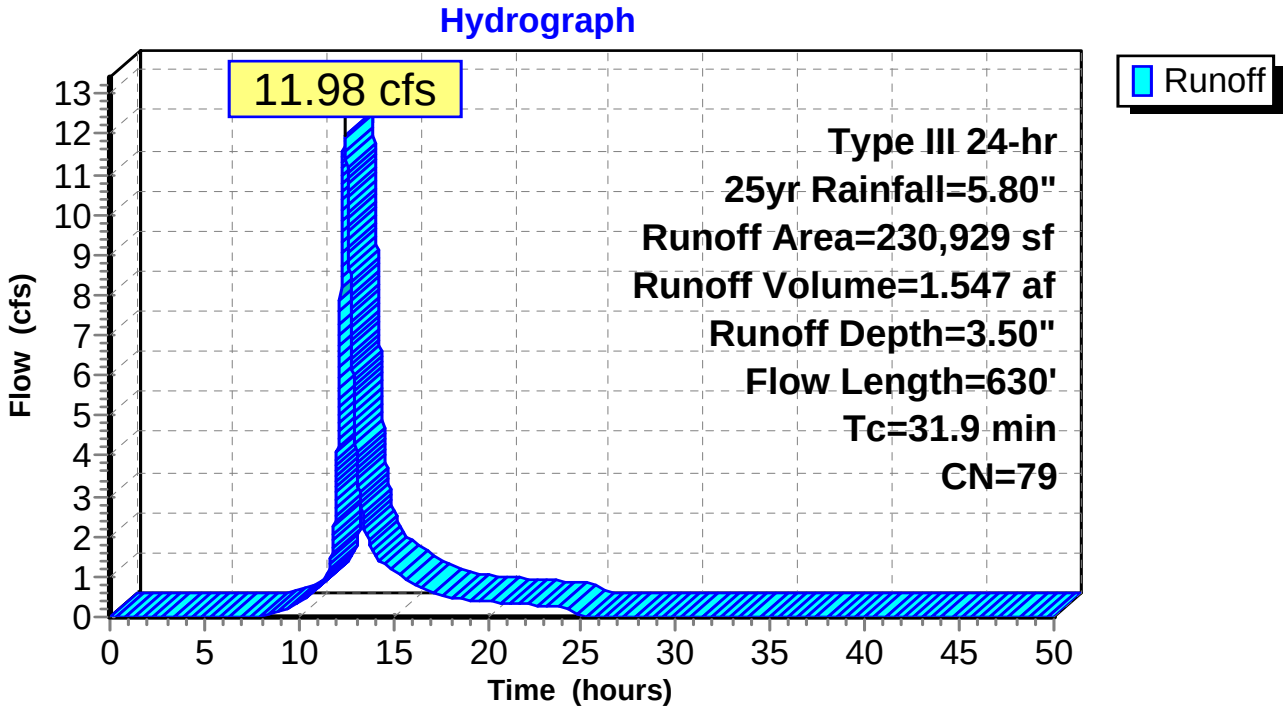
Runoff = 11.98 cfs @ 12.44 hrs, Volume= 1.547 af, Depth= 3.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type III 24-hr 25yr Rainfall=5.80"

	Area (sf)	CN	Description
	8,256	98	Unconnected roofs, HSG C
	6,447	92	Paved roads w/open ditches, 50% imp, HSG C
	8,776	96	Gravel surface, HSG C
*	85,410	77	Brush, Poor, HSG C
	53,426	79	50-75% Grass cover, Fair, HSG C
	68,614	77	Woods, Poor, HSG C
	230,929	79	Weighted Average
	219,450		95.03% Pervious Area
	11,480		4.97% Impervious Area
	8,256		71.92% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.3	35	0.0380	0.08		**Sheet Flow, Woods 34.5** Woods: Light underbrush n= 0.400 P2= 3.10"
5.2	30	0.0660	0.10		**Sheet Flow, Woodland 30.3** Woods: Light underbrush n= 0.400 P2= 3.10"
12.0	61	0.0330	0.08		**Sheet Flow, Woodland 60.5** Woods: Light underbrush n= 0.400 P2= 3.10"
0.8	47	0.0420	1.02		**Shallow Concentrated Flow, Woodland 47.4** Woodland Kv= 5.0 fps
0.9	67	0.0590	1.21		**Shallow Concentrated Flow, Woodland 67.4** Woodland Kv= 5.0 fps
0.4	31	0.0650	1.27		**Shallow Concentrated Flow, Woodland 31.0** Woodland Kv= 5.0 fps
1.0	57	0.0350	0.94		**Shallow Concentrated Flow, Woodland 57.2** Woodland Kv= 5.0 fps
1.4	55	0.0180	0.67		**Shallow Concentrated Flow, Wooland 55** Woodland Kv= 5.0 fps
1.0	57	0.0180	0.94		**Shallow Concentrated Flow, Field 57** Short Grass Pasture Kv= 7.0 fps
0.2	22	0.0900	2.10		**Shallow Concentrated Flow, Field 22.3** Short Grass Pasture Kv= 7.0 fps
0.2	35	0.1140	2.36		**Shallow Concentrated Flow, Field 35.0** Short Grass Pasture Kv= 7.0 fps
0.5	56	0.0710	1.87		**Shallow Concentrated Flow, Field 56.0** Short Grass Pasture Kv= 7.0 fps
0.5	42	0.0480	1.53		**Shallow Concentrated Flow, Field 41.7** Short Grass Pasture Kv= 7.0 fps
0.5	35	0.0290	1.19		**Shallow Concentrated Flow, Field** Short Grass Pasture Kv= 7.0 fps
31.9	630	Total			

Subcatchment 1S: Lots & Open Space North of Chute Road



Summary for Subcatchment 2S: Lots West of Road End

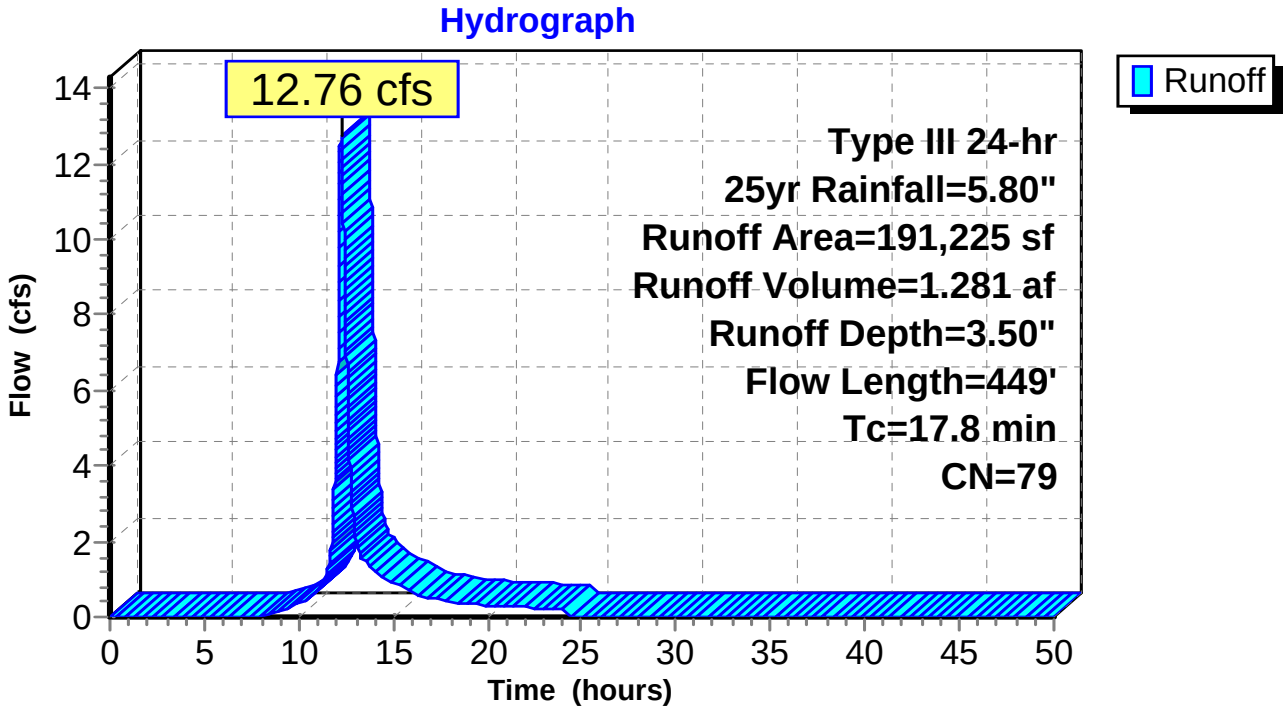
Runoff = 12.76 cfs @ 12.24 hrs, Volume= 1.281 af, Depth= 3.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type III 24-hr 25yr Rainfall=5.80"

	Area (sf)	CN	Description
	4,128	98	Unconnected roofs, HSG C
	2,438	96	Gravel surface, HSG C
	28,965	79	50-75% Grass cover, Fair, HSG C
	113,880	77	Woods, Poor, HSG C
*	41,814	83	Wetland, Woods, Poor, HSG D
	191,225	79	Weighted Average
	187,097		97.84% Pervious Area
	4,128		2.16% Impervious Area
	4,128		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	56	0.1050	0.13		**Sheet Flow, Sheet** Woods: Light underbrush n= 0.400 P2= 3.10"
4.0	178	0.0110	0.73		**Shallow Concentrated Flow, Landscaped 167.5** Short Grass Pasture Kv= 7.0 fps
5.6	175	0.0110	0.52		**Shallow Concentrated Flow, Woods 166.29** Woodland Kv= 5.0 fps
1.1	40	0.0140	0.59		**Shallow Concentrated Flow, Woods 40.3** Woodland Kv= 5.0 fps
17.8	449	Total			

Subcatchment 2S: Lots West of Road End



Summary for Subcatchment 3S: Lots & Open Space South of Road

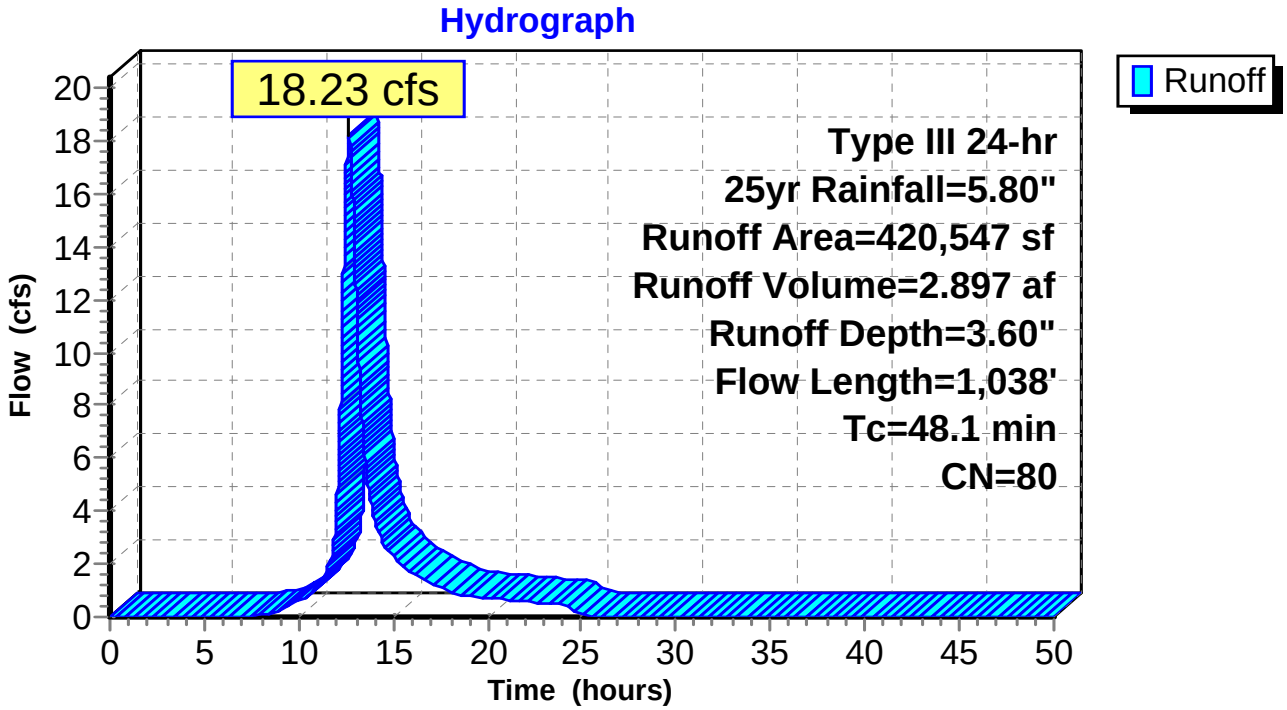
Runoff = 18.23 cfs @ 12.66 hrs, Volume= 2.897 af, Depth= 3.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type III 24-hr 25yr Rainfall=5.80"

	Area (sf)	CN	Description
	9,288	98	Unconnected roofs, HSG C
	7,312	96	Gravel surface, HSG C
	42,243	83	Brush, Poor, HSG D
	46,000	79	50-75% Grass cover, Fair, HSG C
	210,187	77	Woods, Poor, HSG C
*	70,883	83	Wetland, Woods, Poor, HSG D
	34,634	83	Woods, Poor, HSG D
	420,547	80	Weighted Average
	411,259		97.79% Pervious Area
	9,288		2.21% Impervious Area
	9,288		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	14	0.1420	0.25		**Sheet Flow, Grass 14.0** Grass: Short n= 0.150 P2= 3.10"
24.6	110	0.0180	0.07		**Sheet Flow, Woods 110.0** Woods: Light underbrush n= 0.400 P2= 3.10"
6.1	183	0.0100	0.50		**Shallow Concentrated Flow, Woods 182.8** Woodland Kv= 5.0 fps
4.6	157	0.0130	0.57		**Shallow Concentrated Flow, Woods 157.4** Woodland Kv= 5.0 fps
1.1	75	0.0530	1.15		**Shallow Concentrated Flow, Woods 75** Woodland Kv= 5.0 fps
0.8	51	0.0400	1.00		**Shallow Concentrated Flow, Woods 51** Woodland Kv= 5.0 fps
0.4	33	0.0600	1.22		**Shallow Concentrated Flow, Woods 33.3** Woodland Kv= 5.0 fps
2.2	93	0.0200	0.71		**Shallow Concentrated Flow, Woods 93.4** Woodland Kv= 5.0 fps
3.3	181	0.0330	0.91		**Shallow Concentrated Flow, Woods 180.7** Woodland Kv= 5.0 fps
4.0	141	0.0140	0.59		**Shallow Concentrated Flow, Woods 141** Woodland Kv= 5.0 fps
48.1	1,038	Total			

Subcatchment 3S: Lots & Open Space South of Road



Summary for Subcatchment 4aS: East of Road Sta 2+00 to 7+75

[49] Hint: Tc<2dt may require smaller dt

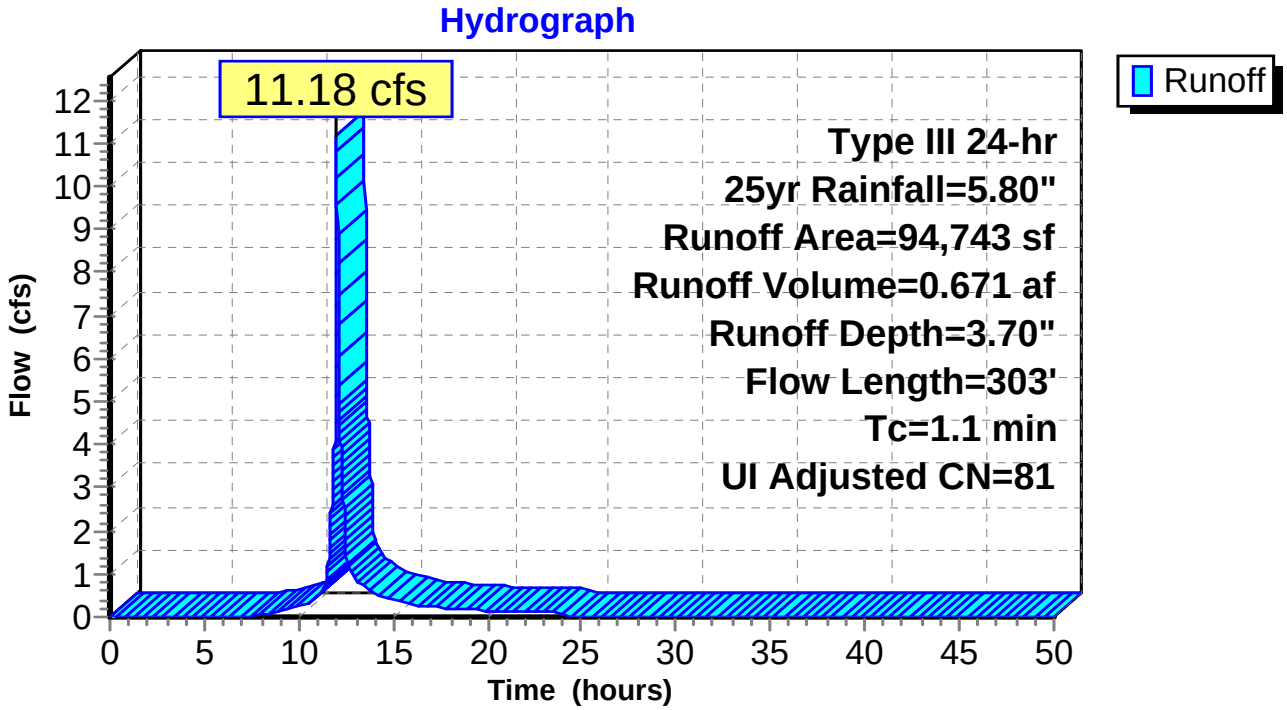
Runoff = 11.18 cfs @ 12.02 hrs, Volume= 0.671 af, Depth= 3.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type III 24-hr 25yr Rainfall=5.80"

Area (sf)	CN	Adj	Description
6,192	98		Unconnected roofs, HSG C
8,573	92		Paved roads w/open ditches, 50% imp, HSG C
5,850	96		Gravel surface, HSG C
27,769	77		Brush, Poor, HSG C
46,359	79		50-75% Grass cover, Fair, HSG C
94,743	82	81	Weighted Average, UI Adjusted
84,265			88.94% Pervious Area
10,479			11.06% Impervious Area
6,192			59.09% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	57	0.0350	4.72	75.50	**Channel Flow, Ditch 56.8 (Rock Bot with grass sides)** Area= 16.0 sf Perim= 28.6' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
0.2	52	0.0385	4.95	79.19	**Channel Flow, Ditch 51.8 (Rock Bot with grass sides)** Area= 16.0 sf Perim= 28.6' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
0.2	48	0.0414	5.13	82.11	**Channel Flow, Ditch 48.3 (Rock Bot with grass sides)** Area= 16.0 sf Perim= 28.6' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
0.3	94	0.0430	5.23	83.69	**Channel Flow, Ditch 93.7 (Rock Bot with grass sides)** Area= 16.0 sf Perim= 28.6' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
0.2	52	0.0380	4.92	78.67	**Channel Flow, Ditch 52.2 (Rock Bot with grass sides)** Area= 16.0 sf Perim= 28.6' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
1.1	303	Total			

Subcatchment 4aS: East of Road Sta 2+00 to 7+75



Summary for Subcatchment 4bS: West of Road Sta 2+00 to 7+75

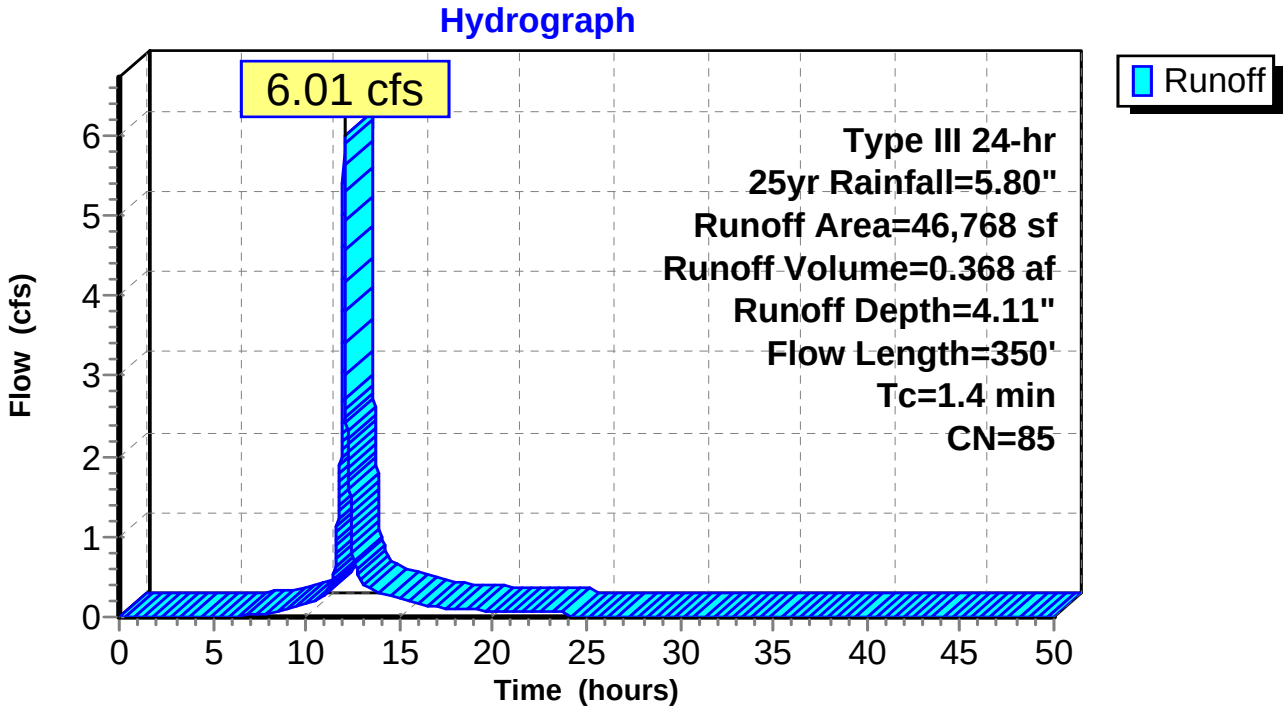
Runoff = 6.01 cfs @ 12.02 hrs, Volume= 0.368 af, Depth= 4.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type III 24-hr 25yr Rainfall=5.80"

Area (sf)	CN	Description
8,798	92	Paved roads w/open ditches, 50% imp, HSG C
975	96	Gravel surface, HSG C
7,741	98	Water Surface, HSG C
29,254	79	50-75% Grass cover, Fair, HSG C
46,768	85	Weighted Average
34,628		74.04% Pervious Area
12,140		25.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	13	0.0200	0.90		**Sheet Flow, Road** Smooth surfaces n= 0.011 P2= 3.10"
0.2	59	0.0340	4.65	74.41	**Channel Flow, Ditch 58.8 (Rock Bot with grass sides)** Area= 16.0 sf Perim= 28.6' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
0.2	52	0.0380	4.92	78.67	**Channel Flow, Ditch 52 (Rock Bot with grass sides)** Area= 16.0 sf Perim= 28.6' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
0.2	54	0.0370	4.85	77.63	**Channel Flow, Ditch 54 (Rock Bot with grass sides)** Area= 16.0 sf Perim= 28.6' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
0.4	112	0.0360	4.79	76.57	**Channel Flow, Ditch 112 (Rock Bot with grass sides)** Area= 16.0 sf Perim= 28.6' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
0.2	60	0.0330	4.58	73.31	**Channel Flow, Ditch 60 (Rock Bot with grass sides)** Area= 16.0 sf Perim= 28.6' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
1.4	350	Total			

Subcatchment 4bS: West of Road Sta 2+00 to 7+75



Summary for Subcatchment 5aS: South of Road Sta 7+75 to 22+50

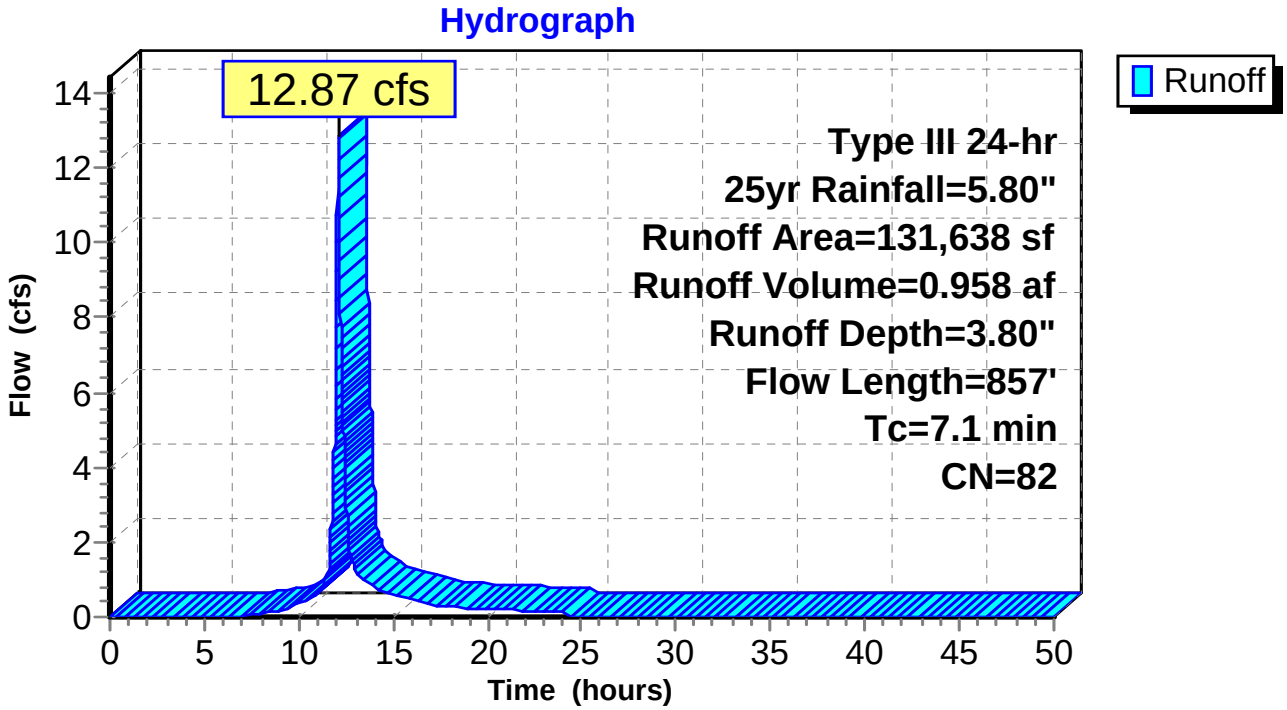
Runoff = 12.87 cfs @ 12.10 hrs, Volume= 0.958 af, Depth= 3.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type III 24-hr 25yr Rainfall=5.80"

Area (sf)	CN	Description
5,160	98	Unconnected roofs, HSG C
26,203	92	Paved roads w/open ditches, 50% imp, HSG C
8,288	96	Gravel surface, HSG C
26,000	79	50-75% Grass cover, Fair, HSG C
65,987	77	Woods, Poor, HSG C
131,638	82	Weighted Average
113,377		86.13% Pervious Area
18,262		13.87% Impervious Area
5,160		28.26% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	34	0.0591	0.21		**Sheet Flow, Lawn 33.8** Grass: Short n= 0.150 P2= 3.10"
0.2	50	0.0400	5.04	80.71	**Channel Flow, Ditch 50 (Coble bot with grass sides)** Area= 16.0 sf Perim= 28.6' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
1.7	235	0.0085	2.33	37.21	**Channel Flow, Ditch 235 (Coble bot with grass sides)** Area= 16.0 sf Perim= 28.6' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
1.0	171	0.0116	2.72	43.47	**Channel Flow, Ditch 171.3 (Coble bot with grass sides)** Area= 16.0 sf Perim= 28.6' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
0.6	142	0.0282	4.24	67.77	**Channel Flow, Ditch 141.63 (Coble bot with grass sides)** Area= 16.0 sf Perim= 28.6' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
0.3	73	0.0275	4.18	66.92	**Channel Flow, Ditch 72.7 (Coble bot with grass sides)** Area= 16.0 sf Perim= 28.6' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
0.3	78	0.0257	4.04	64.70	**Channel Flow, Ditch 77.7 (Coble bot with grass sides)** Area= 16.0 sf Perim= 28.6' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
0.3	74	0.0271	4.15	66.44	**Channel Flow, Ditch 73.6 (Coble bot with grass sides)** Area= 16.0 sf Perim= 28.6' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
7.1	857	Total			

Subcatchment 5aS: South of Road Sta 7+75 to 22+50



Summary for Subcatchment 5bS: North of Road 7+75 to 22+50

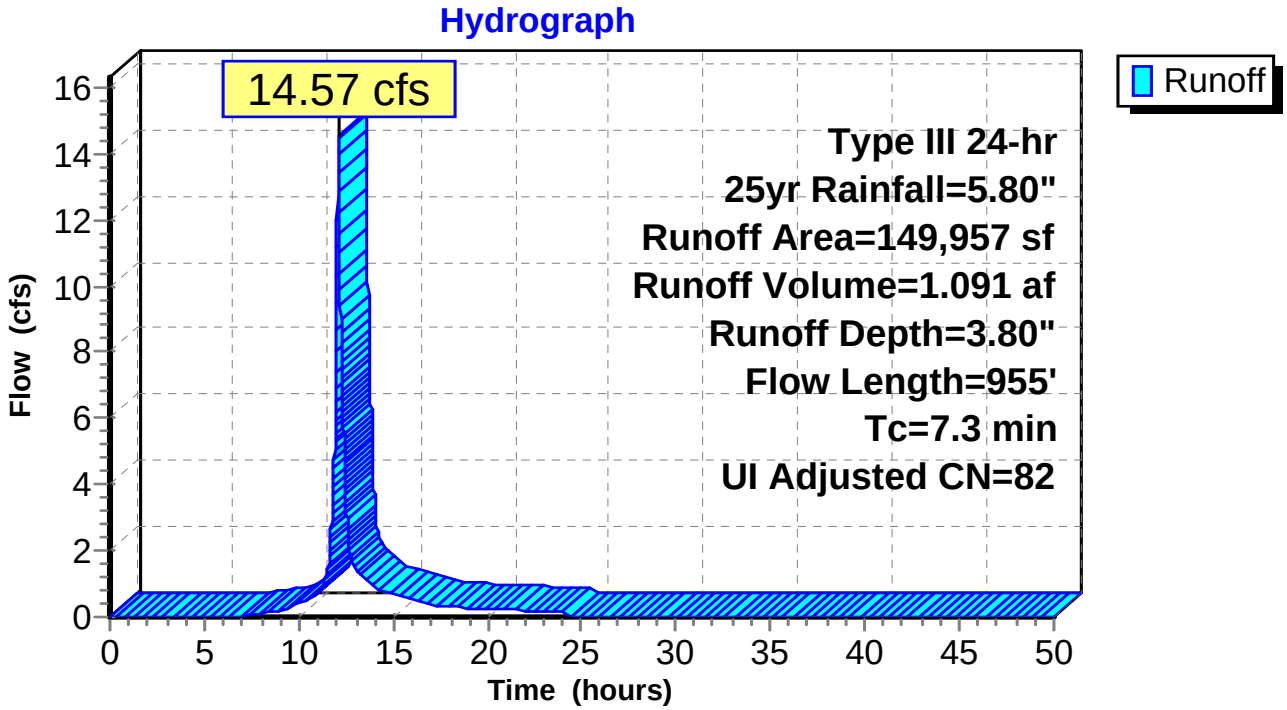
Runoff = 14.57 cfs @ 12.10 hrs, Volume= 1.091 af, Depth= 3.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type III 24-hr 25yr Rainfall=5.80"

	Area (sf)	CN	Adj	Description
	8,256	98		Unconnected roofs, HSG C
	25,305	92		Paved roads w/open ditches, 50% imp, HSG C
	3,900	96		Gravel surface, HSG C
*	8,420	98		Pond #2, Water Surface, HSG C
	27,035	79		50-75% Grass cover, Fair, HSG C
	77,041	77		Woods, Poor, HSG C
	149,957	83	82	Weighted Average, UI Adjusted
	120,629			80.44% Pervious Area
	29,329			19.56% Impervious Area
	8,256			28.15% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	29	0.0680	0.21		**Sheet Flow, Lawn 29** Grass: Short n= 0.150 P2= 3.10"
0.2	48	0.0410	5.11	81.72	**Channel Flow, Ditch 48 (Coble bot with grass sides)** Area= 16.0 sf Perim= 28.6' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
1.7	238	0.0084	2.31	36.99	**Channel Flow, Ditch 238 (Coble bot with grass sides)** Area= 16.0 sf Perim= 28.6' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
1.4	209	0.0096	2.47	39.54	**Channel Flow, Ditch 208.5 (Coble bot with grass sides)** Area= 16.0 sf Perim= 28.6' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
0.3	72	0.0280	4.22	67.53	**Channel Flow, Ditch 72 (Coble bot with grass sides)** Area= 16.0 sf Perim= 28.6' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
1.0	263	0.0300	4.37	69.90	**Channel Flow, Ditch 263 (Coble bot with grass sides)** Area= 16.0 sf Perim= 28.6' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
0.4	96	0.0210	3.66	58.48	**Channel Flow, Ditch 96 (Coble bot with grass sides)** Area= 16.0 sf Perim= 28.6' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
7.3	955	Total			

Subcatchment 5bS: North of Road 7+75 to 22+50



Summary for Subcatchment 6S: Open Space North & West

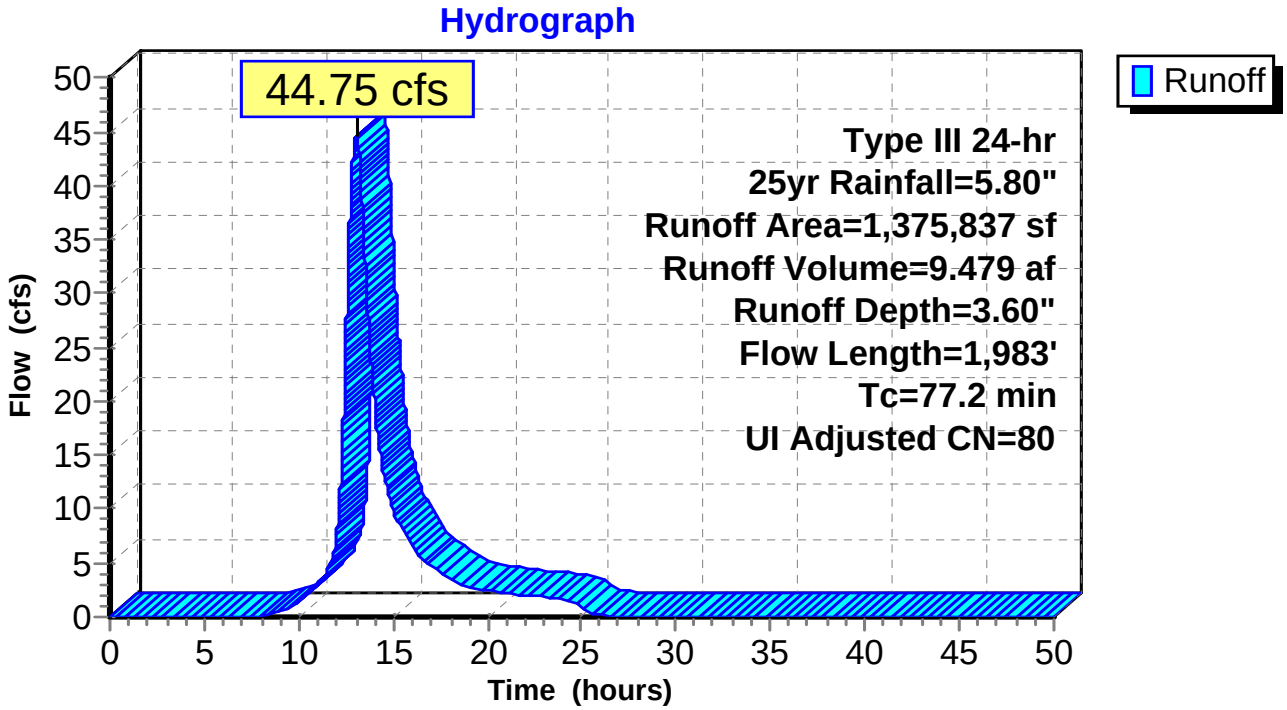
Runoff = 44.75 cfs @ 13.04 hrs, Volume= 9.479 af, Depth= 3.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type III 24-hr 25yr Rainfall=5.80"

	Area (sf)	CN	Adj	Description
	12,384	98		Unconnected roofs, HSG C
	3,901	96		Gravel surface, HSG C
	9,223	83		Brush, Poor, HSG D
	85,345	79		50-75% Grass cover, Fair, HSG C
	547,412	77		Woods, Poor, HSG C
*	652,541	83		Wetland, Woods, Poor, HSG D
	65,031	83		Woods, Poor, HSG D
	1,375,837	81	80	Weighted Average, UI Adjusted
	1,363,453			99.10% Pervious Area
	12,384			0.90% Impervious Area
	12,384			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	34	0.0200	0.13		**Sheet Flow, Lawn 34** Grass: Short n= 0.150 P2= 3.10"
7.8	82	0.0250	0.18		**Sheet Flow, Lawn 82** Grass: Short n= 0.150 P2= 3.10"
1.9	25	0.0780	0.22		**Sheet Flow, Lawn 25.4** Grass: Short n= 0.150 P2= 3.10"
0.6	39	0.0510	1.13		**Shallow Concentrated Flow, Woods 39** Woodland Kv= 5.0 fps
0.1	9	0.2330	2.41		**Shallow Concentrated Flow, Woods 8.5** Woodland Kv= 5.0 fps
0.1	14	0.1459	1.91		**Shallow Concentrated Flow, Woods 13.7** Woodland Kv= 5.0 fps
0.0	6	0.3267	2.86		**Shallow Concentrated Flow, Woods Wetland 6.12** Woodland Kv= 5.0 fps
0.2	16	0.1250	1.77		**Shallow Concentrated Flow, Woods 1Wetland 5.95** Woodland Kv= 5.0 fps
0.1	11	0.1910	2.19		**Shallow Concentrated Flow, Woods Wetland 10.5** Woodland Kv= 5.0 fps
1.1	62	0.0324	0.90		**Shallow Concentrated Flow, Woods Wetland 61.7** Woodland Kv= 5.0 fps
0.4	33	0.0615	1.24		**Shallow Concentrated Flow, Woods Wetland 32.5** Woodland Kv= 5.0 fps
7.3	167	0.0030	0.38		**Shallow Concentrated Flow, Field Wetland 166.5** Short Grass Pasture Kv= 7.0 fps
5.3	156	0.0096	0.49		**Shallow Concentrated Flow, Woods Wetland 155.7** Woodland Kv= 5.0 fps
15.9	224	0.0022	0.23		**Shallow Concentrated Flow, Woods Wetland 223.8** Woodland Kv= 5.0 fps
2.6	122	0.0123	0.78		**Shallow Concentrated Flow, Field Wetland 121.8** Short Grass Pasture Kv= 7.0 fps
6.6	198	0.0100	0.50		**Shallow Concentrated Flow, Woods Wetland 197.9** Woodland Kv= 5.0 fps
10.1	263	0.0076	0.44		**Shallow Concentrated Flow, Woods 262.8** Woodland Kv= 5.0 fps
0.4	29	0.0700	1.32		**Shallow Concentrated Flow, Woods 28.7** Woodland Kv= 5.0 fps
2.7	110	0.0180	0.67		**Shallow Concentrated Flow, Woods 110.4** Woodland Kv= 5.0 fps
5.1	167	0.0120	0.55		**Shallow Concentrated Flow, Woods 166.5** Woodland Kv= 5.0 fps
1.3	67	0.0300	0.87		**Shallow Concentrated Flow, Woods 66.5** Woodland Kv= 5.0 fps
3.4	149	0.0210	0.72		**Shallow Concentrated Flow, Woods 148.7** Woodland Kv= 5.0 fps
77.2	1,983	Total			

Subcatchment 6S: Open Space North & West



Summary for Subcatchment 7S: Open Space North

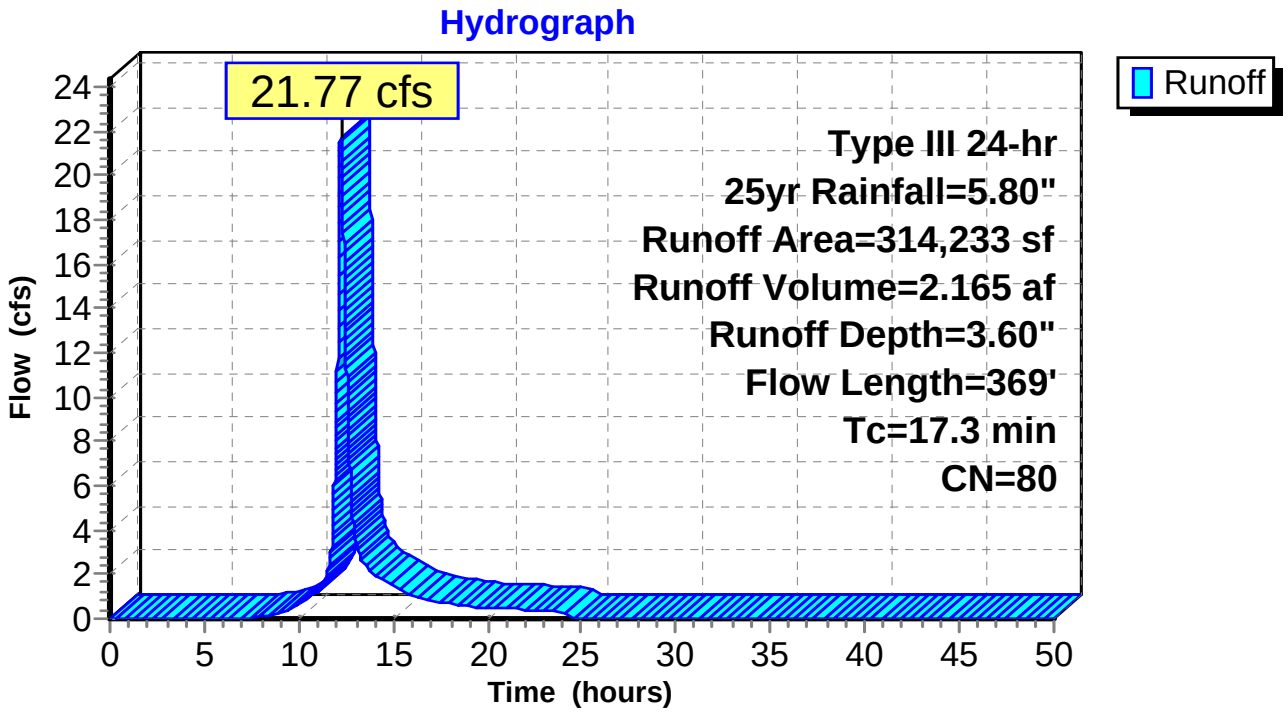
Runoff = 21.77 cfs @ 12.24 hrs, Volume= 2.165 af, Depth= 3.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type III 24-hr 25yr Rainfall=5.80"

	Area (sf)	CN	Description
*	751	83	Wetland, Woods, Poor, HSG D
*	1,210	83	Wetland, Woods, Poor, HSG D
	165,167	83	Woods, Poor, HSG D
	147,105	77	Woods, Poor, HSG C
	314,233	80	Weighted Average
	314,233		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	28	0.0360	0.07		**Sheet Flow, Woods 27.5** Woods: Light underbrush n= 0.400 P2= 3.10"
5.6	175	0.0110	0.52		**Shallow Concentrated Flow, Woods 175.2** Woodland Kv= 5.0 fps
1.3	67	0.0300	0.87		**Shallow Concentrated Flow, Woods 66.7** Woodland Kv= 5.0 fps
4.2	99	0.0063	0.40		**Shallow Concentrated Flow, Woods 99.2** Woodland Kv= 5.0 fps
17.3	369	Total			

Subcatchment 7S: Open Space North



Summary for Pond 1P: Wet Pond #1 Sta 5+50

Inflow Area = 3.249 ac, 15.98% Impervious, Inflow Depth = 3.84" for 25yr event
Inflow = 17.18 cfs @ 12.02 hrs, Volume= 1.039 af
Outflow = 1.54 cfs @ 12.80 hrs, Volume= 1.037 af, Atten= 91%, Lag= 46.7 min
Primary = 1.54 cfs @ 12.80 hrs, Volume= 1.037 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs / 3
Starting Elev= 164.70' Surf.Area= 9,358 sf Storage= 28,923 cf
Peak Elev= 166.59' @ 12.80 hrs Surf.Area= 13,444 sf Storage= 50,691 cf (21,768 cf above start)
Flood Elev= 168.00' Surf.Area= 16,261 sf Storage= 71,545 cf (42,622 cf above start)

Plug-Flow detention time= 589.4 min calculated for 0.373 af (36% of inflow)
Center-of-Mass det. time= 195.9 min (1,000.5 - 804.6)

Volume	Invert	Avail.Storage	Storage Description
#1	157.00'	71,545 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
157.00	429	0	0
158.00	1,026	728	728
159.00	1,756	1,391	2,119
160.00	2,578	2,167	4,286
161.00	3,490	3,034	7,320
162.00	4,478	3,984	11,304
163.00	5,525	5,002	16,305
164.00	7,741	6,633	22,938
165.00	10,051	8,896	31,834
166.00	12,373	11,212	43,046
167.00	14,182	13,278	56,324
168.00	16,261	15,222	71,545

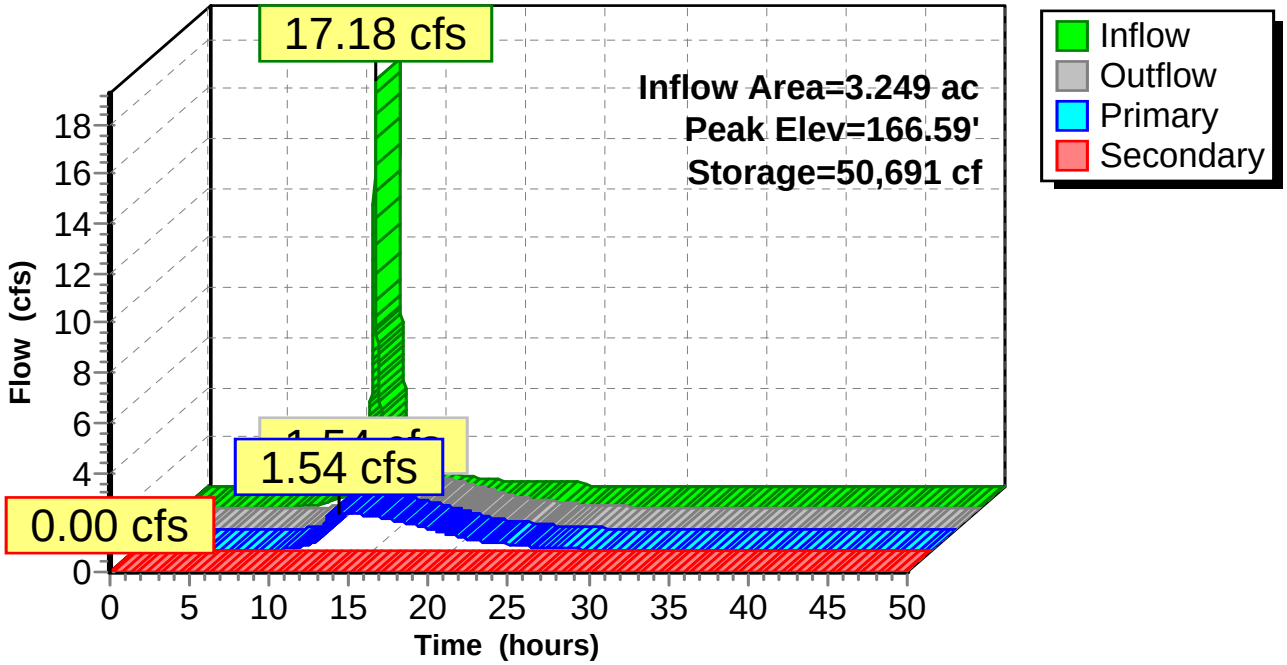
Device	Routing	Invert	Outlet Devices
#1	Primary	163.52'	**12.0" Round ADS N12** L= 43.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 163.52' / 163.35' S= 0.0040 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#2	Device 1	164.70'	**6.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#3	Secondary	166.60'	**10.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=1.54 cfs @ 12.80 hrs HW=166.59' TW=164.01' (Dynamic Tailwater)
└**1=ADS N12** (Passes 1.54 cfs of 6.07 cfs potential flow)
└**2=Orifice/Grate** (Orifice Controls 1.54 cfs @ 6.16 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=164.70' (Free Discharge)
└**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 1P: Wet Pond #1 Sta 5+50

Hydrograph



Summary for Pond 2P: Wet Pond #2 Sta 14+00

Inflow Area = 6.465 ac, 16.90% Impervious, Inflow Depth = 3.80" for 25yr event
Inflow = 25.39 cfs @ 12.12 hrs, Volume= 2.049 af
Outflow = 4.75 cfs @ 12.62 hrs, Volume= 2.039 af, Atten= 81%, Lag= 30.0 min
Primary = 4.75 cfs @ 12.62 hrs, Volume= 2.039 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs / 3
Starting Elev= 161.50' Surf.Area= 9,283 sf Storage= 30,033 cf
Peak Elev= 164.50' @ 12.62 hrs Surf.Area= 15,917 sf Storage= 68,081 cf (38,048 cf above start)
Flood Elev= 166.00' Surf.Area= 19,127 sf Storage= 94,670 cf (64,637 cf above start)

Plug-Flow detention time= 340.8 min calculated for 1.350 af (66% of inflow)
Center-of-Mass det. time= 139.1 min (953.7 - 814.7)

Volume	Invert	Avail.Storage	Storage Description
#1	154.00'	94,670 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

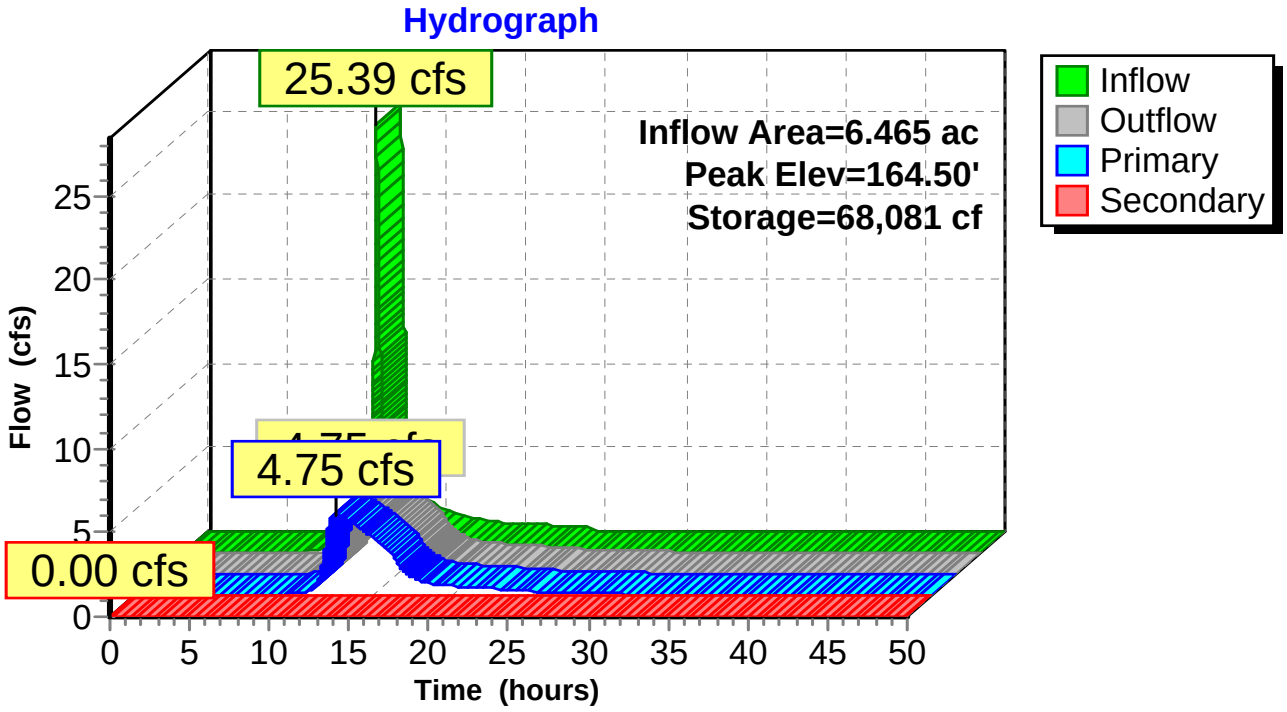
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
154.00	989	0	0
155.00	1,593	1,291	1,291
156.00	2,198	1,896	3,187
157.00	2,859	2,529	5,715
158.00	3,930	3,395	9,110
159.00	4,940	4,435	13,545
160.00	6,113	5,527	19,071
161.00	7,446	6,780	25,851
162.00	11,120	9,283	35,134
163.00	12,556	11,838	46,972
164.00	14,557	13,557	60,528
165.00	17,300	15,929	76,457
166.00	19,127	18,214	94,670

Device	Routing	Invert	Outlet Devices
#1	Primary	161.46'	**12.0" Round ADS N12** L= 33.4' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 161.46' / 161.33' S= 0.0039 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#2	Device 1	161.50'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	162.00'	**16.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600
#4	Secondary	164.75'	**10.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=4.75 cfs @ 12.62 hrs HW=164.50' TW=0.00' (Dynamic Tailwater)
└─**1=ADS N12** (Inlet Controls 4.75 cfs @ 6.05 fps)
  └─**2=Orifice/Grate** (Passes < 0.71 cfs potential flow)
  └─**3=Orifice/Grate** (Passes < 9.05 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=161.50' (Free Discharge)
└─**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 2P: Wet Pond #2 Sta 14+00



Summary for Pond CB2: CB-2 Pond #1 Outlet

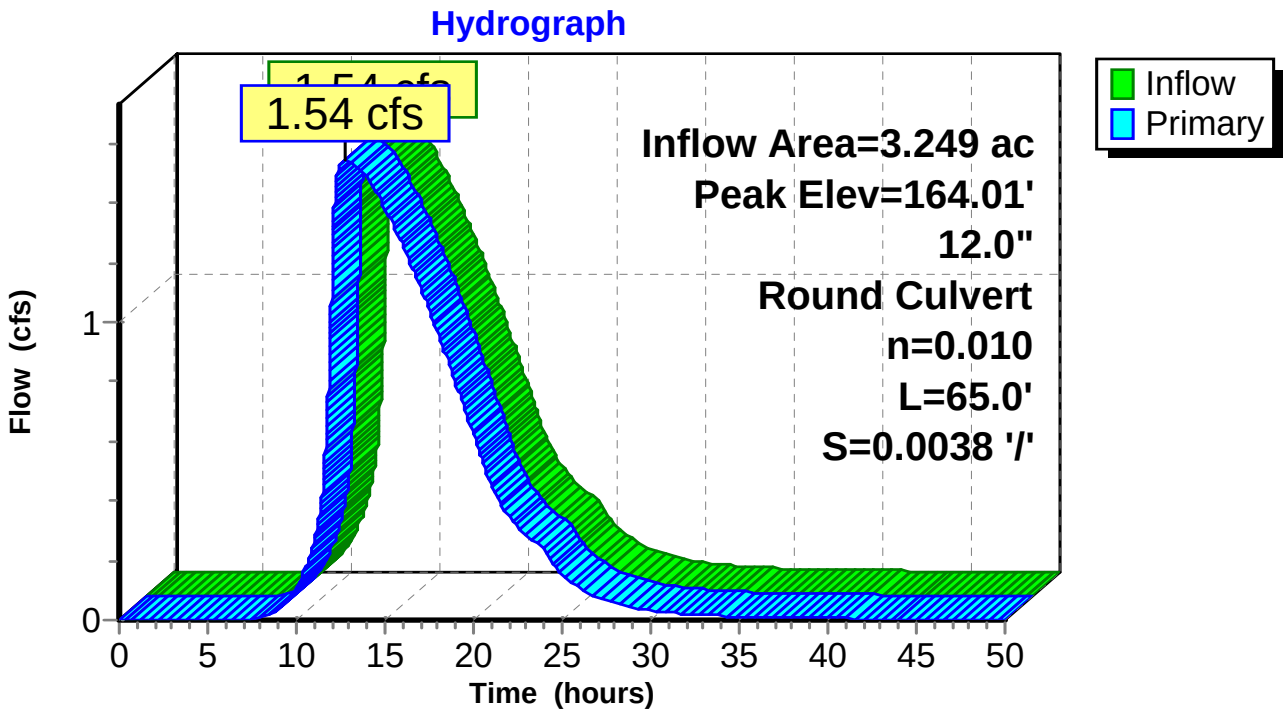
Inflow Area = 3.249 ac, 15.98% Impervious, Inflow Depth > 3.83" for 25yr event
Inflow = 1.54 cfs @ 12.80 hrs, Volume= 1.037 af
Outflow = 1.54 cfs @ 12.80 hrs, Volume= 1.037 af, Atten= 0%, Lag= 0.0 min
Primary = 1.54 cfs @ 12.80 hrs, Volume= 1.037 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 164.01' @ 12.80 hrs
Flood Elev= 164.70'

Device	Routing	Invert	Outlet Devices
#1	Primary	163.25'	**12.0" Round Culvert** L= 65.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 163.25' / 163.00' S= 0.0038 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.54 cfs @ 12.80 hrs HW=164.01' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 1.54 cfs @ 3.31 fps)

Pond CB2: CB-2 Pond #1 Outlet



Summary for Pond RC1: RC1 Station 5+50

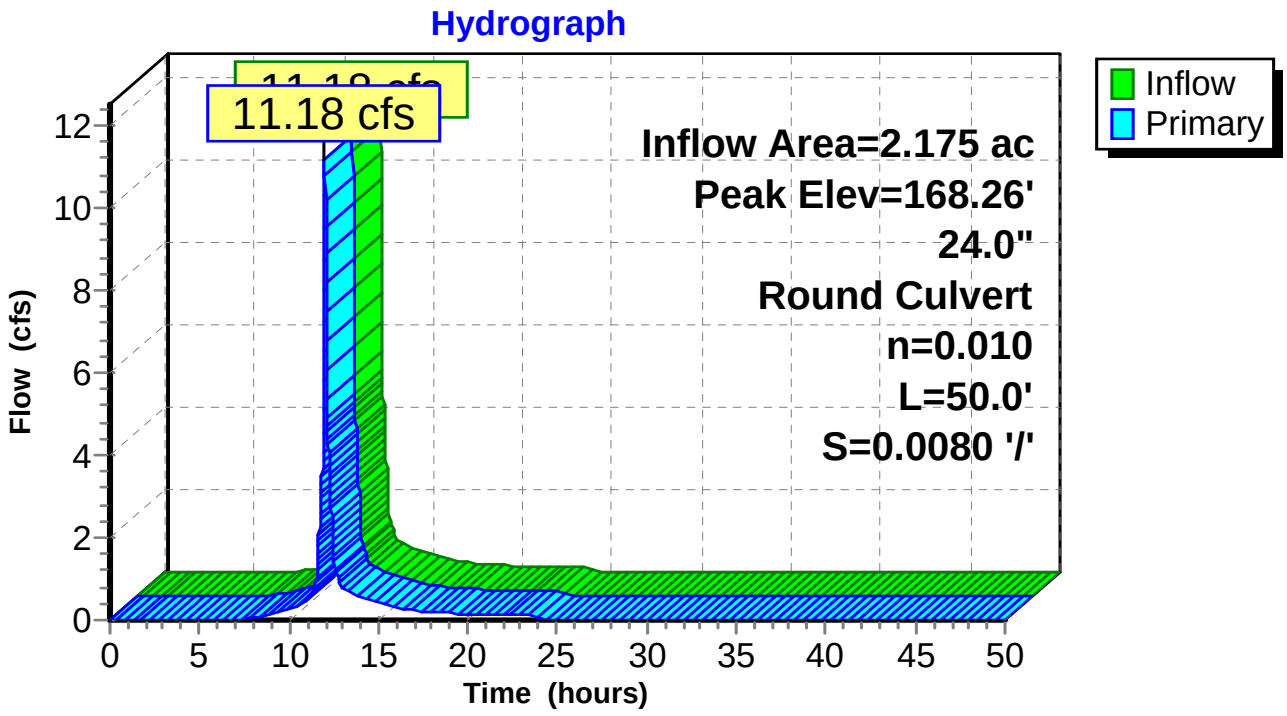
Inflow Area = 2.175 ac, 11.06% Impervious, Inflow Depth = 3.70" for 25yr event
Inflow = 11.18 cfs @ 12.02 hrs, Volume= 0.671 af
Outflow = 11.18 cfs @ 12.02 hrs, Volume= 0.671 af, Atten= 0%, Lag= 0.0 min
Primary = 11.18 cfs @ 12.02 hrs, Volume= 0.671 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 168.26' @ 12.02 hrs
Flood Elev= 169.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	166.40'	**24.0" Round Culvert** L= 50.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 166.40' / 166.00' S= 0.0080 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=11.14 cfs @ 12.02 hrs HW=168.26' TW=165.88' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 11.14 cfs @ 3.66 fps)

Pond RC1: RC1 Station 5+50



Summary for Pond RC2: (3) 36" ADS Pipe Crossing Sta 12+25

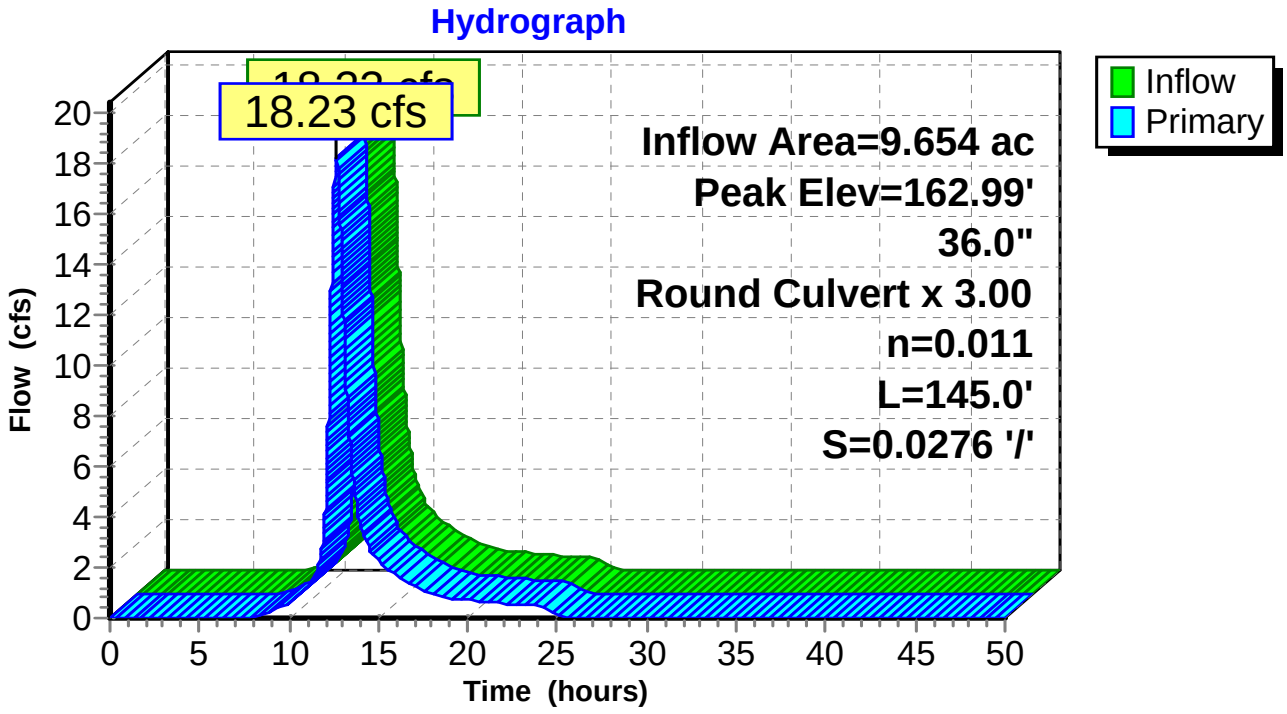
Inflow Area = 9.654 ac, 2.21% Impervious, Inflow Depth = 3.60" for 25yr event
Inflow = 18.23 cfs @ 12.66 hrs, Volume= 2.897 af
Outflow = 18.23 cfs @ 12.66 hrs, Volume= 2.897 af, Atten= 0%, Lag= 0.0 min
Primary = 18.23 cfs @ 12.66 hrs, Volume= 2.897 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 162.99' @ 12.66 hrs
Flood Elev= 163.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	162.00'	**36.0" Round Culvert X 3.00** L= 145.0' CMP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 162.00' / 158.00' S= 0.0276 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 7.07 sf

Primary OutFlow Max=18.23 cfs @ 12.66 hrs HW=162.99' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 18.23 cfs @ 2.99 fps)

Pond RC2: (3) 36" ADS Pipe Crossing Sta 12+25



Summary for Pond RC3: Road Crossing Sta 14+00

Inflow Area = 3.022 ac, 13.87% Impervious, Inflow Depth = 3.80" for 25yr event
Inflow = 12.87 cfs @ 12.10 hrs, Volume= 0.958 af
Outflow = 11.39 cfs @ 12.15 hrs, Volume= 0.958 af, Atten= 12%, Lag= 2.7 min
Primary = 11.39 cfs @ 12.15 hrs, Volume= 0.958 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs / 3
Starting Elev= 165.25' Surf.Area= 781 sf Storage= 654 cf
Peak Elev= 167.08' @ 12.15 hrs Surf.Area= 2,109 sf Storage= 3,075 cf (2,421 cf above start)
Flood Elev= 168.00' Surf.Area= 3,432 sf Storage= 5,612 cf (4,958 cf above start)

Plug-Flow detention time= 21.3 min calculated for 0.943 af (98% of inflow)
Center-of-Mass det. time= 7.0 min (818.3 - 811.3)

Volume	Invert	Avail.Storage	Storage Description
#1	164.00'	15,601 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

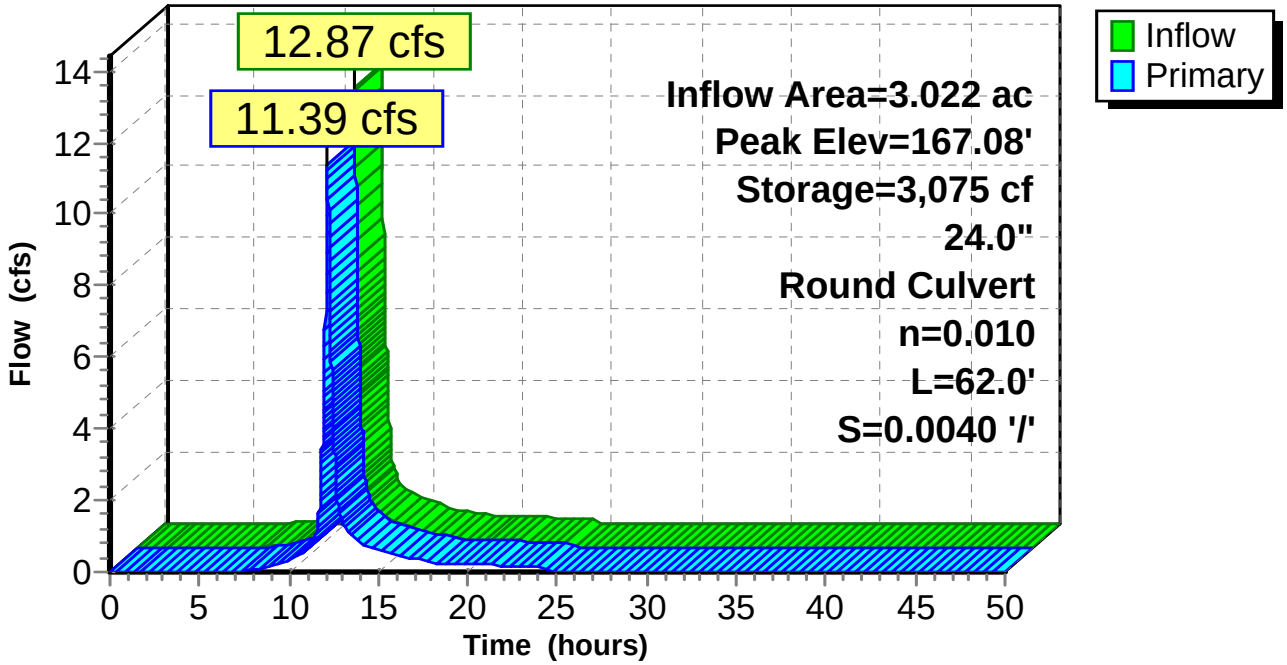
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
164.00	268	0	0
165.00	675	472	472
166.00	1,100	888	1,359
167.00	1,987	1,544	2,903
168.00	3,432	2,710	5,612
170.00	6,557	9,989	15,601

Device	Routing	Invert	Outlet Devices
#1	Primary	165.25'	**24.0" Round Culvert** L= 62.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 165.25' / 165.00' S= 0.0040 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=11.38 cfs @ 12.15 hrs HW=167.08' TW=163.62' (Dynamic Tailwater)
1=Culvert (Barrel Controls 11.38 cfs @ 4.94 fps)

Pond RC3: Road Crossing Sta 14+00

Hydrograph

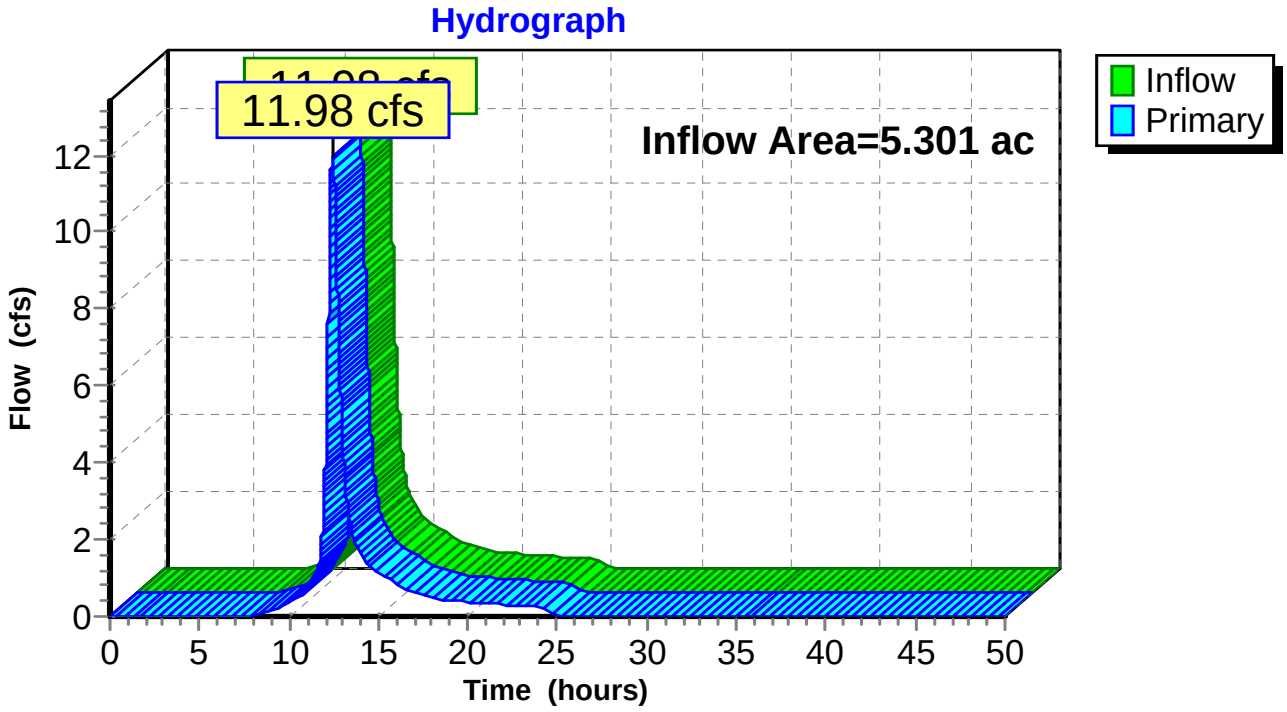


Summary for Link 1L: Point of Analysis #1

Inflow Area = 5.301 ac, 4.97% Impervious, Inflow Depth = 3.50" for 25yr event
Inflow = 11.98 cfs @ 12.44 hrs, Volume= 1.547 af
Primary = 11.98 cfs @ 12.44 hrs, Volume= 1.547 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs

Link 1L: Point of Analysis #1

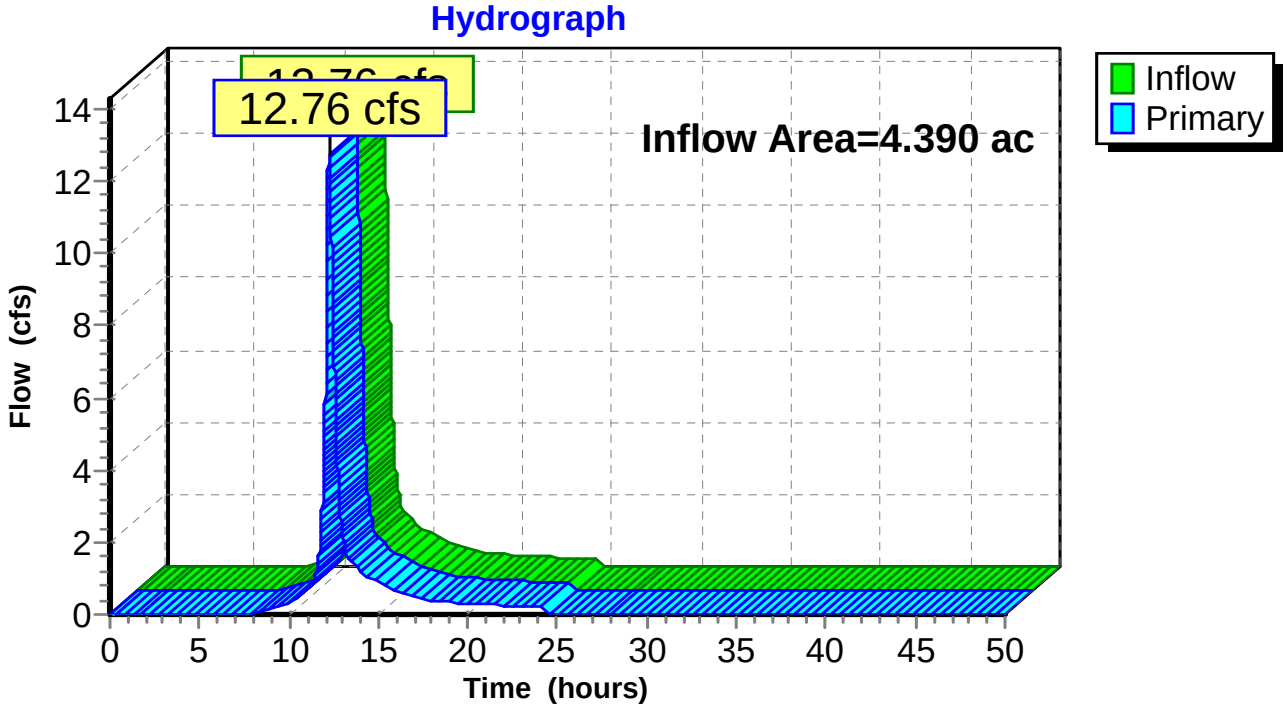


Summary for Link 2L: Point of Analysis #2

Inflow Area = 4.390 ac, 2.16% Impervious, Inflow Depth = 3.50" for 25yr event
Inflow = 12.76 cfs @ 12.24 hrs, Volume= 1.281 af
Primary = 12.76 cfs @ 12.24 hrs, Volume= 1.281 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs

Link 2L: Point of Analysis #2

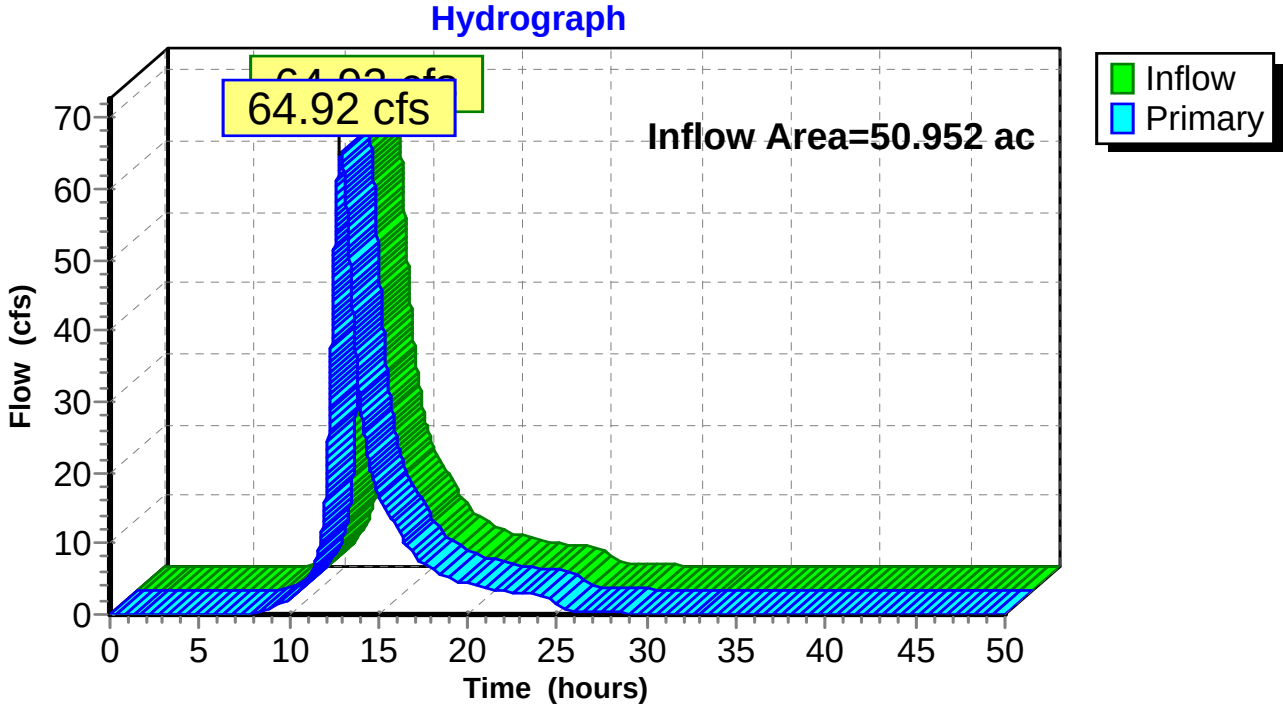


Summary for Link 3L: Point of Analysis #3

Inflow Area = 50.952 ac, 4.14% Impervious, Inflow Depth > 3.64" for 25yr event
Inflow = 64.92 cfs @ 12.88 hrs, Volume= 15.452 af
Primary = 64.92 cfs @ 12.88 hrs, Volume= 15.452 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs

Link 3L: Point of Analysis #3

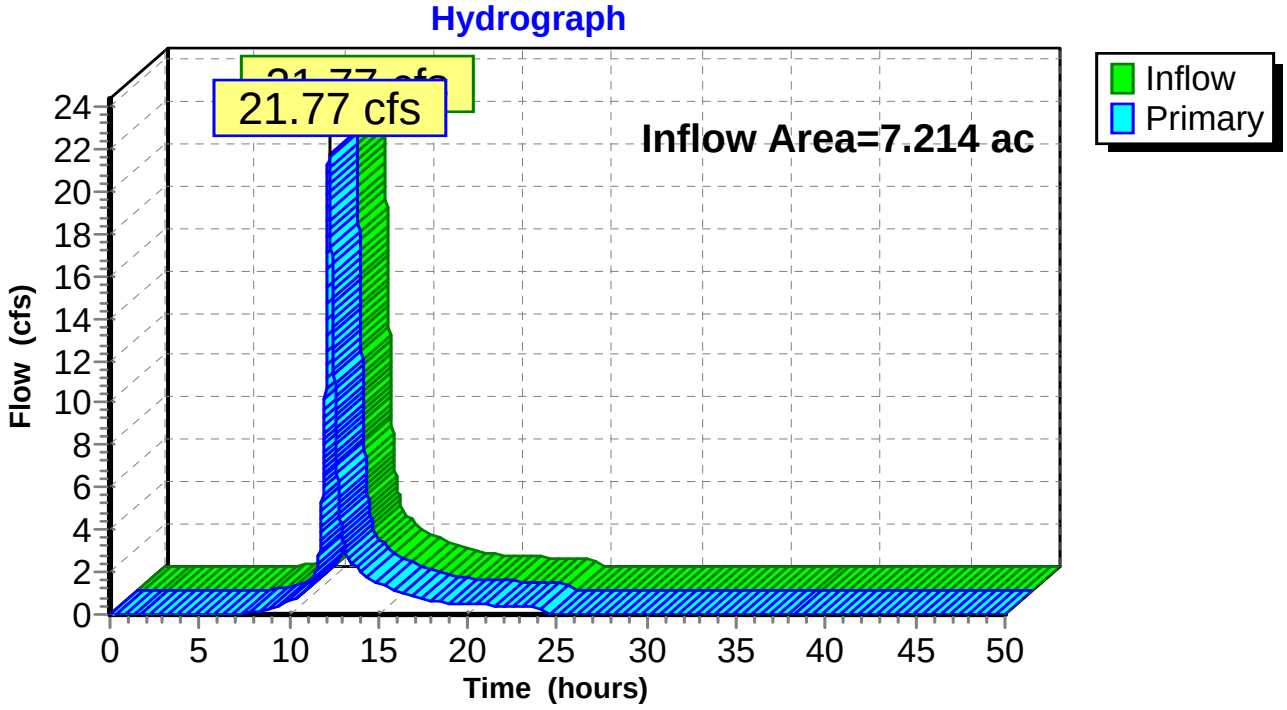


Summary for Link 4L: Point of Analysis #4

Inflow Area = 7.214 ac, 0.00% Impervious, Inflow Depth = 3.60" for 25yr event
Inflow = 21.77 cfs @ 12.24 hrs, Volume= 2.165 af
Primary = 21.77 cfs @ 12.24 hrs, Volume= 2.165 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs

Link 4L: Point of Analysis #4



Summary for Subcatchment 1S: Lots & Open Space North of Chute Road

Runoff = 8.42 cfs @ 12.44 hrs, Volume= 1.087 af, Depth= 2.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type III 24-hr 10yr Rainfall=4.60"

	Area (sf)	CN	Description
	8,256	98	Unconnected roofs, HSG C
	6,447	92	Paved roads w/open ditches, 50% imp, HSG C
	8,776	96	Gravel surface, HSG C
*	85,410	77	Brush, Poor, HSG C
	53,426	79	50-75% Grass cover, Fair, HSG C
	68,614	77	Woods, Poor, HSG C
	230,929	79	Weighted Average
	219,450		95.03% Pervious Area
	11,480		4.97% Impervious Area
	8,256		71.92% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.3	35	0.0380	0.08		**Sheet Flow, Woods 34.5** Woods: Light underbrush n= 0.400 P2= 3.10"
5.2	30	0.0660	0.10		**Sheet Flow, Woodland 30.3** Woods: Light underbrush n= 0.400 P2= 3.10"
12.0	61	0.0330	0.08		**Sheet Flow, Woodland 60.5** Woods: Light underbrush n= 0.400 P2= 3.10"
0.8	47	0.0420	1.02		**Shallow Concentrated Flow, Woodland 47.4** Woodland Kv= 5.0 fps
0.9	67	0.0590	1.21		**Shallow Concentrated Flow, Woodland 67.4** Woodland Kv= 5.0 fps
0.4	31	0.0650	1.27		**Shallow Concentrated Flow, Woodland 31.0** Woodland Kv= 5.0 fps
1.0	57	0.0350	0.94		**Shallow Concentrated Flow, Woodland 57.2** Woodland Kv= 5.0 fps
1.4	55	0.0180	0.67		**Shallow Concentrated Flow, Wooland 55** Woodland Kv= 5.0 fps
1.0	57	0.0180	0.94		**Shallow Concentrated Flow, Field 57** Short Grass Pasture Kv= 7.0 fps
0.2	22	0.0900	2.10		**Shallow Concentrated Flow, Field 22.3** Short Grass Pasture Kv= 7.0 fps
0.2	35	0.1140	2.36		**Shallow Concentrated Flow, Field 35.0** Short Grass Pasture Kv= 7.0 fps
0.5	56	0.0710	1.87		**Shallow Concentrated Flow, Field 56.0** Short Grass Pasture Kv= 7.0 fps
0.5	42	0.0480	1.53		**Shallow Concentrated Flow, Field 41.7** Short Grass Pasture Kv= 7.0 fps
0.5	35	0.0290	1.19		**Shallow Concentrated Flow, Field** Short Grass Pasture Kv= 7.0 fps
31.9	630	Total			

Summary for Subcatchment 2S: Lots West of Road End

Runoff = 8.96 cfs @ 12.24 hrs, Volume= 0.900 af, Depth= 2.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type III 24-hr 10yr Rainfall=4.60"

	Area (sf)	CN	Description
	4,128	98	Unconnected roofs, HSG C
	2,438	96	Gravel surface, HSG C
	28,965	79	50-75% Grass cover, Fair, HSG C
	113,880	77	Woods, Poor, HSG C
*	41,814	83	Wetland, Woods, Poor, HSG D
	191,225	79	Weighted Average
	187,097		97.84% Pervious Area
	4,128		2.16% Impervious Area
	4,128		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	56	0.1050	0.13		**Sheet Flow, Sheet** Woods: Light underbrush n= 0.400 P2= 3.10"
4.0	178	0.0110	0.73		**Shallow Concentrated Flow, Landscaped 167.5** Short Grass Pasture Kv= 7.0 fps
5.6	175	0.0110	0.52		**Shallow Concentrated Flow, Woods 166.29** Woodland Kv= 5.0 fps
1.1	40	0.0140	0.59		**Shallow Concentrated Flow, Woods 40.3** Woodland Kv= 5.0 fps
17.8	449	Total			

Summary for Subcatchment 3S: Lots & Open Space South of Road

Runoff = 12.91 cfs @ 12.67 hrs, Volume= 2.049 af, Depth= 2.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type III 24-hr 10yr Rainfall=4.60"

	Area (sf)	CN	Description
	9,288	98	Unconnected roofs, HSG C
	7,312	96	Gravel surface, HSG C
	42,243	83	Brush, Poor, HSG D
	46,000	79	50-75% Grass cover, Fair, HSG C
	210,187	77	Woods, Poor, HSG C
*	70,883	83	Wetland, Woods, Poor, HSG D
	34,634	83	Woods, Poor, HSG D
	420,547	80	Weighted Average
	411,259		97.79% Pervious Area
	9,288		2.21% Impervious Area
	9,288		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	14	0.1420	0.25		**Sheet Flow, Grass 14.0** Grass: Short n= 0.150 P2= 3.10"
24.6	110	0.0180	0.07		**Sheet Flow, Woods 110.0** Woods: Light underbrush n= 0.400 P2= 3.10"
6.1	183	0.0100	0.50		**Shallow Concentrated Flow, Woods 182.8** Woodland Kv= 5.0 fps
4.6	157	0.0130	0.57		**Shallow Concentrated Flow, Woods 157.4** Woodland Kv= 5.0 fps
1.1	75	0.0530	1.15		**Shallow Concentrated Flow, Woods 75** Woodland Kv= 5.0 fps
0.8	51	0.0400	1.00		**Shallow Concentrated Flow, Woods 51** Woodland Kv= 5.0 fps
0.4	33	0.0600	1.22		**Shallow Concentrated Flow, Woods 33.3** Woodland Kv= 5.0 fps
2.2	93	0.0200	0.71		**Shallow Concentrated Flow, Woods 93.4** Woodland Kv= 5.0 fps
3.3	181	0.0330	0.91		**Shallow Concentrated Flow, Woods 180.7** Woodland Kv= 5.0 fps
4.0	141	0.0140	0.59		**Shallow Concentrated Flow, Woods 141** Woodland Kv= 5.0 fps
48.1	1,038	Total			

Summary for Subcatchment 4aS: East of Road Sta 2+00 to 7+75

Runoff = 8.00 cfs @ 12.02 hrs, Volume= 0.478 af, Depth= 2.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type III 24-hr 10yr Rainfall=4.60"

Area (sf)	CN	Adj	Description
6,192	98		Unconnected roofs, HSG C
8,573	92		Paved roads w/open ditches, 50% imp, HSG C
5,850	96		Gravel surface, HSG C
27,769	77		Brush, Poor, HSG C
46,359	79		50-75% Grass cover, Fair, HSG C
94,743	82	81	Weighted Average, UI Adjusted
84,265			88.94% Pervious Area
10,479			11.06% Impervious Area
6,192			59.09% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	57	0.0350	4.72	75.50	**Channel Flow, Ditch 56.8 (Rock Bot with grass sides)** Area= 16.0 sf Perim= 28.6' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
0.2	52	0.0385	4.95	79.19	**Channel Flow, Ditch 51.8 (Rock Bot with grass sides)** Area= 16.0 sf Perim= 28.6' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
0.2	48	0.0414	5.13	82.11	**Channel Flow, Ditch 48.3 (Rock Bot with grass sides)** Area= 16.0 sf Perim= 28.6' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
0.3	94	0.0430	5.23	83.69	**Channel Flow, Ditch 93.7 (Rock Bot with grass sides)** Area= 16.0 sf Perim= 28.6' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
0.2	52	0.0380	4.92	78.67	**Channel Flow, Ditch 52.2 (Rock Bot with grass sides)** Area= 16.0 sf Perim= 28.6' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
1.1	303	Total			

Summary for Subcatchment 4bS: West of Road Sta 2+00 to 7+75

Runoff = 4.43 cfs @ 12.02 hrs, Volume= 0.268 af, Depth= 3.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type III 24-hr 10yr Rainfall=4.60"

Area (sf)	CN	Description
8,798	92	Paved roads w/open ditches, 50% imp, HSG C
975	96	Gravel surface, HSG C
7,741	98	Water Surface, HSG C
29,254	79	50-75% Grass cover, Fair, HSG C
46,768	85	Weighted Average
34,628		74.04% Pervious Area
12,140		25.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	13	0.0200	0.90		**Sheet Flow, Road** Smooth surfaces n= 0.011 P2= 3.10"
0.2	59	0.0340	4.65	74.41	**Channel Flow, Ditch 58.8 (Rock Bot with grass sides)** Area= 16.0 sf Perim= 28.6' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
0.2	52	0.0380	4.92	78.67	**Channel Flow, Ditch 52 (Rock Bot with grass sides)** Area= 16.0 sf Perim= 28.6' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
0.2	54	0.0370	4.85	77.63	**Channel Flow, Ditch 54 (Rock Bot with grass sides)** Area= 16.0 sf Perim= 28.6' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
0.4	112	0.0360	4.79	76.57	**Channel Flow, Ditch 112 (Rock Bot with grass sides)** Area= 16.0 sf Perim= 28.6' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
0.2	60	0.0330	4.58	73.31	**Channel Flow, Ditch 60 (Rock Bot with grass sides)** Area= 16.0 sf Perim= 28.6' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
1.4	350	Total			

Summary for Subcatchment 5aS: South of Road Sta 7+75 to 22+50

Runoff = 9.28 cfs @ 12.10 hrs, Volume= 0.686 af, Depth= 2.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type III 24-hr 10yr Rainfall=4.60"

Area (sf)	CN	Description
5,160	98	Unconnected roofs, HSG C
26,203	92	Paved roads w/open ditches, 50% imp, HSG C
8,288	96	Gravel surface, HSG C
26,000	79	50-75% Grass cover, Fair, HSG C
65,987	77	Woods, Poor, HSG C
131,638	82	Weighted Average
113,377		86.13% Pervious Area
18,262		13.87% Impervious Area
5,160		28.26% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	34	0.0591	0.21		**Sheet Flow, Lawn 33.8** Grass: Short n= 0.150 P2= 3.10"
0.2	50	0.0400	5.04	80.71	**Channel Flow, Ditch 50 (Coble bot with grass sides)** Area= 16.0 sf Perim= 28.6' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
1.7	235	0.0085	2.33	37.21	**Channel Flow, Ditch 235 (Coble bot with grass sides)** Area= 16.0 sf Perim= 28.6' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
1.0	171	0.0116	2.72	43.47	**Channel Flow, Ditch 171.3 (Coble bot with grass sides)** Area= 16.0 sf Perim= 28.6' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
0.6	142	0.0282	4.24	67.77	**Channel Flow, Ditch 141.63 (Coble bot with grass sides)** Area= 16.0 sf Perim= 28.6' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
0.3	73	0.0275	4.18	66.92	**Channel Flow, Ditch 72.7 (Coble bot with grass sides)** Area= 16.0 sf Perim= 28.6' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
0.3	78	0.0257	4.04	64.70	**Channel Flow, Ditch 77.7 (Coble bot with grass sides)** Area= 16.0 sf Perim= 28.6' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
0.3	74	0.0271	4.15	66.44	**Channel Flow, Ditch 73.6 (Coble bot with grass sides)** Area= 16.0 sf Perim= 28.6' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
7.1	857	Total			

Summary for Subcatchment 5bS: North of Road 7+75 to 22+50

Runoff = 10.50 cfs @ 12.11 hrs, Volume= 0.781 af, Depth= 2.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type III 24-hr 10yr Rainfall=4.60"

	Area (sf)	CN	Adj	Description
	8,256	98		Unconnected roofs, HSG C
	25,305	92		Paved roads w/open ditches, 50% imp, HSG C
	3,900	96		Gravel surface, HSG C
*	8,420	98		Pond #2, Water Surface, HSG C
	27,035	79		50-75% Grass cover, Fair, HSG C
	77,041	77		Woods, Poor, HSG C
	149,957	83	82	Weighted Average, UI Adjusted
	120,629			80.44% Pervious Area
	29,329			19.56% Impervious Area
	8,256			28.15% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	29	0.0680	0.21		**Sheet Flow, Lawn 29** Grass: Short n= 0.150 P2= 3.10"
0.2	48	0.0410	5.11	81.72	**Channel Flow, Ditch 48 (Coble bot with grass sides)** Area= 16.0 sf Perim= 28.6' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
1.7	238	0.0084	2.31	36.99	**Channel Flow, Ditch 238 (Coble bot with grass sides)** Area= 16.0 sf Perim= 28.6' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
1.4	209	0.0096	2.47	39.54	**Channel Flow, Ditch 208.5 (Coble bot with grass sides)** Area= 16.0 sf Perim= 28.6' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
0.3	72	0.0280	4.22	67.53	**Channel Flow, Ditch 72 (Coble bot with grass sides)** Area= 16.0 sf Perim= 28.6' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
1.0	263	0.0300	4.37	69.90	**Channel Flow, Ditch 263 (Coble bot with grass sides)** Area= 16.0 sf Perim= 28.6' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
0.4	96	0.0210	3.66	58.48	**Channel Flow, Ditch 96 (Coble bot with grass sides)** Area= 16.0 sf Perim= 28.6' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
7.3	955	Total			

Summary for Subcatchment 6S: Open Space North & West

Runoff = 31.62 cfs @ 13.04 hrs, Volume= 6.704 af, Depth= 2.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type III 24-hr 10yr Rainfall=4.60"

	Area (sf)	CN	Adj	Description
	12,384	98		Unconnected roofs, HSG C
	3,901	96		Gravel surface, HSG C
	9,223	83		Brush, Poor, HSG D
	85,345	79		50-75% Grass cover, Fair, HSG C
	547,412	77		Woods, Poor, HSG C
*	652,541	83		Wetland, Woods, Poor, HSG D
	65,031	83		Woods, Poor, HSG D
	1,375,837	81	80	Weighted Average, UI Adjusted
	1,363,453			99.10% Pervious Area
	12,384			0.90% Impervious Area
	12,384			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	34	0.0200	0.13		**Sheet Flow, Lawn 34** Grass: Short n= 0.150 P2= 3.10"
7.8	82	0.0250	0.18		**Sheet Flow, Lawn 82** Grass: Short n= 0.150 P2= 3.10"
1.9	25	0.0780	0.22		**Sheet Flow, Lawn 25.4** Grass: Short n= 0.150 P2= 3.10"
0.6	39	0.0510	1.13		**Shallow Concentrated Flow, Woods 39** Woodland Kv= 5.0 fps
0.1	9	0.2330	2.41		**Shallow Concentrated Flow, Woods 8.5** Woodland Kv= 5.0 fps
0.1	14	0.1459	1.91		**Shallow Concentrated Flow, Woods 13.7** Woodland Kv= 5.0 fps
0.0	6	0.3267	2.86		**Shallow Concentrated Flow, Woods Wetland 6.12** Woodland Kv= 5.0 fps
0.2	16	0.1250	1.77		**Shallow Concentrated Flow, Woods 1Wetland 5.95** Woodland Kv= 5.0 fps
0.1	11	0.1910	2.19		**Shallow Concentrated Flow, Woods Wetland 10.5** Woodland Kv= 5.0 fps
1.1	62	0.0324	0.90		**Shallow Concentrated Flow, Woods Wetland 61.7** Woodland Kv= 5.0 fps
0.4	33	0.0615	1.24		**Shallow Concentrated Flow, Woods Wetland 32.5** Woodland Kv= 5.0 fps
7.3	167	0.0030	0.38		**Shallow Concentrated Flow, Field Wetland 166.5** Short Grass Pasture Kv= 7.0 fps
5.3	156	0.0096	0.49		**Shallow Concentrated Flow, Woods Wetland 155.7** Woodland Kv= 5.0 fps
15.9	224	0.0022	0.23		**Shallow Concentrated Flow, Woods Wetland 223.8** Woodland Kv= 5.0 fps
2.6	122	0.0123	0.78		**Shallow Concentrated Flow, Field Wetland 121.8** Short Grass Pasture Kv= 7.0 fps
6.6	198	0.0100	0.50		**Shallow Concentrated Flow, Woods Wetland 197.9** Woodland Kv= 5.0 fps
10.1	263	0.0076	0.44		**Shallow Concentrated Flow, Woods 262.8** Woodland Kv= 5.0 fps
0.4	29	0.0700	1.32		**Shallow Concentrated Flow, Woods 28.7** Woodland Kv= 5.0 fps
2.7	110	0.0180	0.67		**Shallow Concentrated Flow, Woods 110.4** Woodland Kv= 5.0 fps
5.1	167	0.0120	0.55		**Shallow Concentrated Flow, Woods 166.5** Woodland Kv= 5.0 fps
1.3	67	0.0300	0.87		**Shallow Concentrated Flow, Woods 66.5** Woodland Kv= 5.0 fps
3.4	149	0.0210	0.72		**Shallow Concentrated Flow, Woods 148.7** Woodland Kv= 5.0 fps
77.2	1,983	Total			

Summary for Subcatchment 7S: Open Space North

Runoff = 15.42 cfs @ 12.24 hrs, Volume= 1.531 af, Depth= 2.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type III 24-hr 10yr Rainfall=4.60"

	Area (sf)	CN	Description
*	751	83	Wetland, Woods, Poor, HSG D
*	1,210	83	Wetland, Woods, Poor, HSG D
	165,167	83	Woods, Poor, HSG D
	147,105	77	Woods, Poor, HSG C
	314,233	80	Weighted Average
	314,233		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	28	0.0360	0.07		**Sheet Flow, Woods 27.5** Woods: Light underbrush n= 0.400 P2= 3.10"
5.6	175	0.0110	0.52		**Shallow Concentrated Flow, Woods 175.2** Woodland Kv= 5.0 fps
1.3	67	0.0300	0.87		**Shallow Concentrated Flow, Woods 66.7** Woodland Kv= 5.0 fps
4.2	99	0.0063	0.40		**Shallow Concentrated Flow, Woods 99.2** Woodland Kv= 5.0 fps
17.3	369	Total			

Summary for Pond 1P: Wet Pond #1 Sta 5+50

Inflow Area = 3.249 ac, 15.98% Impervious, Inflow Depth = 2.76" for 10yr event
Inflow = 12.43 cfs @ 12.02 hrs, Volume= 0.746 af
Outflow = 1.28 cfs @ 12.69 hrs, Volume= 0.744 af, Atten= 90%, Lag= 40.0 min
Primary = 1.28 cfs @ 12.69 hrs, Volume= 0.744 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs / 3
Starting Elev= 164.70' Surf.Area= 9,358 sf Storage= 28,923 cf
Peak Elev= 166.08' @ 12.69 hrs Surf.Area= 12,513 sf Storage= 44,006 cf (15,083 cf above start)
Flood Elev= 168.00' Surf.Area= 16,261 sf Storage= 71,545 cf (42,622 cf above start)

Plug-Flow detention time= 944.6 min calculated for 0.080 af (11% of inflow)
Center-of-Mass det. time= 180.1 min (994.1 - 813.9)

Volume	Invert	Avail.Storage	Storage Description
#1	157.00'	71,545 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
157.00	429	0	0
158.00	1,026	728	728
159.00	1,756	1,391	2,119
160.00	2,578	2,167	4,286
161.00	3,490	3,034	7,320
162.00	4,478	3,984	11,304
163.00	5,525	5,002	16,305
164.00	7,741	6,633	22,938
165.00	10,051	8,896	31,834
166.00	12,373	11,212	43,046
167.00	14,182	13,278	56,324
168.00	16,261	15,222	71,545

Device	Routing	Invert	Outlet Devices
#1	Primary	163.52'	**12.0" Round ADS N12** L= 43.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 163.52' / 163.35' S= 0.0040 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#2	Device 1	164.70'	**6.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#3	Secondary	166.60'	**10.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=1.28 cfs @ 12.69 hrs HW=166.08' TW=163.93' (Dynamic Tailwater)
└**1=ADS N12** (Passes 1.28 cfs of 5.42 cfs potential flow)
└**2=Orifice/Grate** (Orifice Controls 1.28 cfs @ 5.10 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=164.70' (Free Discharge)
└**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 2P: Wet Pond #2 Sta 14+00

Inflow Area = 6.465 ac, 16.90% Impervious, Inflow Depth = 2.72" for 10yr event
Inflow = 18.42 cfs @ 12.12 hrs, Volume= 1.467 af
Outflow = 3.95 cfs @ 12.59 hrs, Volume= 1.458 af, Atten= 79%, Lag= 28.2 min
Primary = 3.95 cfs @ 12.59 hrs, Volume= 1.458 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs / 3
Starting Elev= 161.50' Surf.Area= 9,283 sf Storage= 30,033 cf
Peak Elev= 163.71' @ 12.59 hrs Surf.Area= 13,985 sf Storage= 56,451 cf (26,418 cf above start)
Flood Elev= 166.00' Surf.Area= 19,127 sf Storage= 94,670 cf (64,637 cf above start)

Plug-Flow detention time= 428.3 min calculated for 0.768 af (52% of inflow)
Center-of-Mass det. time= 144.4 min (969.0 - 824.6)

Volume	Invert	Avail.Storage	Storage Description
#1	154.00'	94,670 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
154.00	989	0	0
155.00	1,593	1,291	1,291
156.00	2,198	1,896	3,187
157.00	2,859	2,529	5,715
158.00	3,930	3,395	9,110
159.00	4,940	4,435	13,545
160.00	6,113	5,527	19,071
161.00	7,446	6,780	25,851
162.00	11,120	9,283	35,134
163.00	12,556	11,838	46,972
164.00	14,557	13,557	60,528
165.00	17,300	15,929	76,457
166.00	19,127	18,214	94,670

Device	Routing	Invert	Outlet Devices
#1	Primary	161.46'	**12.0" Round ADS N12** L= 33.4' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 161.46' / 161.33' S= 0.0039 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#2	Device 1	161.50'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	162.00'	**16.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600
#4	Secondary	164.75'	**10.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=3.95 cfs @ 12.59 hrs HW=163.71' TW=0.00' (Dynamic Tailwater)
└─**1=ADS N12** (Inlet Controls 3.95 cfs @ 5.03 fps)
  ├─**2=Orifice/Grate** (Passes < 0.60 cfs potential flow)
  └─**3=Orifice/Grate** (Passes < 7.02 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=161.50' (Free Discharge)
└─**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond CB2: CB-2 Pond #1 Outlet

Inflow Area = 3.249 ac, 15.98% Impervious, Inflow Depth > 2.75" for 10yr event
Inflow = 1.28 cfs @ 12.69 hrs, Volume= 0.744 af
Outflow = 1.28 cfs @ 12.69 hrs, Volume= 0.744 af, Atten= 0%, Lag= 0.0 min
Primary = 1.28 cfs @ 12.69 hrs, Volume= 0.744 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 163.93' @ 12.69 hrs
Flood Elev= 164.70'

Device	Routing	Invert	Outlet Devices
#1	Primary	163.25'	**12.0" Round Culvert** L= 65.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 163.25' / 163.00' S= 0.0038 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.28 cfs @ 12.69 hrs HW=163.93' TW=0.00' (Dynamic Tailwater)
1=Culvert (Barrel Controls 1.28 cfs @ 3.17 fps)

Summary for Pond RC1: RC1 Station 5+50

Inflow Area = 2.175 ac, 11.06% Impervious, Inflow Depth = 2.63" for 10yr event
Inflow = 8.00 cfs @ 12.02 hrs, Volume= 0.478 af
Outflow = 8.00 cfs @ 12.02 hrs, Volume= 0.478 af, Atten= 0%, Lag= 0.0 min
Primary = 8.00 cfs @ 12.02 hrs, Volume= 0.478 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 167.86' @ 12.02 hrs
Flood Elev= 169.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	166.40'	**24.0" Round Culvert** L= 50.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 166.40' / 166.00' S= 0.0080 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=7.98 cfs @ 12.02 hrs HW=167.86' TW=165.55' (Dynamic Tailwater)
1=Culvert (Inlet Controls 7.98 cfs @ 3.25 fps)

Summary for Pond RC2: (3) 36" ADS Pipe Crossing Sta 12+25

Inflow Area = 9.654 ac, 2.21% Impervious, Inflow Depth = 2.55" for 10yr event
Inflow = 12.91 cfs @ 12.67 hrs, Volume= 2.049 af
Outflow = 12.91 cfs @ 12.67 hrs, Volume= 2.049 af, Atten= 0%, Lag= 0.0 min
Primary = 12.91 cfs @ 12.67 hrs, Volume= 2.049 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 162.82' @ 12.67 hrs
Flood Elev= 163.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	162.00'	**36.0" Round Culvert X 3.00** L= 145.0' CMP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 162.00' / 158.00' S= 0.0276 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 7.07 sf

Primary OutFlow Max=12.91 cfs @ 12.67 hrs HW=162.82' TW=0.00' (Dynamic Tailwater)
1=Culvert (Inlet Controls 12.91 cfs @ 2.73 fps)

Summary for Pond RC3: Road Crossing Sta 14+00

Inflow Area = 3.022 ac, 13.87% Impervious, Inflow Depth = 2.72" for 10yr event
Inflow = 9.28 cfs @ 12.10 hrs, Volume= 0.686 af
Outflow = 8.31 cfs @ 12.15 hrs, Volume= 0.686 af, Atten= 10%, Lag= 2.6 min
Primary = 8.31 cfs @ 12.15 hrs, Volume= 0.686 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs / 3
Starting Elev= 165.25' Surf.Area= 781 sf Storage= 654 cf
Peak Elev= 166.75' @ 12.15 hrs Surf.Area= 1,762 sf Storage= 2,427 cf (1,774 cf above start)
Flood Elev= 168.00' Surf.Area= 3,432 sf Storage= 5,612 cf (4,958 cf above start)

Plug-Flow detention time= 26.5 min calculated for 0.671 af (98% of inflow)
Center-of-Mass det. time= 7.9 min (828.7 - 820.8)

Volume	Invert	Avail.Storage	Storage Description
#1	164.00'	15,601 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
164.00	268	0	0
165.00	675	472	472
166.00	1,100	888	1,359
167.00	1,987	1,544	2,903
168.00	3,432	2,710	5,612
170.00	6,557	9,989	15,601

Device	Routing	Invert	Outlet Devices
#1	Primary	165.25'	**24.0" Round Culvert** L= 62.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 165.25' / 165.00' S= 0.0040 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=8.30 cfs @ 12.15 hrs HW=166.75' TW=163.05' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 8.30 cfs @ 4.58 fps)

Summary for Link 1L: Point of Analysis #1

Inflow Area = 5.301 ac, 4.97% Impervious, Inflow Depth = 2.46" for 10yr event
Inflow = 8.42 cfs @ 12.44 hrs, Volume= 1.087 af
Primary = 8.42 cfs @ 12.44 hrs, Volume= 1.087 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs

Summary for Link 2L: Point of Analysis #2

Inflow Area = 4.390 ac, 2.16% Impervious, Inflow Depth = 2.46" for 10yr event
Inflow = 8.96 cfs @ 12.24 hrs, Volume= 0.900 af
Primary = 8.96 cfs @ 12.24 hrs, Volume= 0.900 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs

Summary for Link 3L: Point of Analysis #3

Inflow Area = 50.952 ac, 4.14% Impervious, Inflow Depth > 2.58" for 10yr event
Inflow = 46.52 cfs @ 12.88 hrs, Volume= 10.955 af
Primary = 46.52 cfs @ 12.88 hrs, Volume= 10.955 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs

Summary for Link 4L: Point of Analysis #4

Inflow Area = 7.214 ac, 0.00% Impervious, Inflow Depth = 2.55" for 10yr event
Inflow = 15.42 cfs @ 12.24 hrs, Volume= 1.531 af
Primary = 15.42 cfs @ 12.24 hrs, Volume= 1.531 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs

Summary for Subcatchment 1S: Lots & Open Space North of Chute Road

Runoff = 4.22 cfs @ 12.47 hrs, Volume= 0.558 af, Depth= 1.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type III 24-hr 2yr Rainfall=3.10"

	Area (sf)	CN	Description
	8,256	98	Unconnected roofs, HSG C
	6,447	92	Paved roads w/open ditches, 50% imp, HSG C
	8,776	96	Gravel surface, HSG C
*	85,410	77	Brush, Poor, HSG C
	53,426	79	50-75% Grass cover, Fair, HSG C
	68,614	77	Woods, Poor, HSG C
	230,929	79	Weighted Average
	219,450		95.03% Pervious Area
	11,480		4.97% Impervious Area
	8,256		71.92% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.3	35	0.0380	0.08		**Sheet Flow, Woods 34.5** Woods: Light underbrush n= 0.400 P2= 3.10"
5.2	30	0.0660	0.10		**Sheet Flow, Woodland 30.3** Woods: Light underbrush n= 0.400 P2= 3.10"
12.0	61	0.0330	0.08		**Sheet Flow, Woodland 60.5** Woods: Light underbrush n= 0.400 P2= 3.10"
0.8	47	0.0420	1.02		**Shallow Concentrated Flow, Woodland 47.4** Woodland Kv= 5.0 fps
0.9	67	0.0590	1.21		**Shallow Concentrated Flow, Woodland 67.4** Woodland Kv= 5.0 fps
0.4	31	0.0650	1.27		**Shallow Concentrated Flow, Woodland 31.0** Woodland Kv= 5.0 fps
1.0	57	0.0350	0.94		**Shallow Concentrated Flow, Woodland 57.2** Woodland Kv= 5.0 fps
1.4	55	0.0180	0.67		**Shallow Concentrated Flow, Wooland 55** Woodland Kv= 5.0 fps
1.0	57	0.0180	0.94		**Shallow Concentrated Flow, Field 57** Short Grass Pasture Kv= 7.0 fps
0.2	22	0.0900	2.10		**Shallow Concentrated Flow, Field 22.3** Short Grass Pasture Kv= 7.0 fps
0.2	35	0.1140	2.36		**Shallow Concentrated Flow, Field 35.0** Short Grass Pasture Kv= 7.0 fps
0.5	56	0.0710	1.87		**Shallow Concentrated Flow, Field 56.0** Short Grass Pasture Kv= 7.0 fps
0.5	42	0.0480	1.53		**Shallow Concentrated Flow, Field 41.7** Short Grass Pasture Kv= 7.0 fps
0.5	35	0.0290	1.19		**Shallow Concentrated Flow, Field** Short Grass Pasture Kv= 7.0 fps
31.9	630	Total			

Summary for Subcatchment 2S: Lots West of Road End

Runoff = 4.49 cfs @ 12.25 hrs, Volume= 0.462 af, Depth= 1.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type III 24-hr 2yr Rainfall=3.10"

	Area (sf)	CN	Description
	4,128	98	Unconnected roofs, HSG C
	2,438	96	Gravel surface, HSG C
	28,965	79	50-75% Grass cover, Fair, HSG C
	113,880	77	Woods, Poor, HSG C
*	41,814	83	Wetland, Woods, Poor, HSG D
	191,225	79	Weighted Average
	187,097		97.84% Pervious Area
	4,128		2.16% Impervious Area
	4,128		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	56	0.1050	0.13		**Sheet Flow, Sheet** Woods: Light underbrush n= 0.400 P2= 3.10"
4.0	178	0.0110	0.73		**Shallow Concentrated Flow, Landscaped 167.5** Short Grass Pasture Kv= 7.0 fps
5.6	175	0.0110	0.52		**Shallow Concentrated Flow, Woods 166.29** Woodland Kv= 5.0 fps
1.1	40	0.0140	0.59		**Shallow Concentrated Flow, Woods 40.3** Woodland Kv= 5.0 fps
17.8	449	Total			

Summary for Subcatchment 3S: Lots & Open Space South of Road

Runoff = 6.60 cfs @ 12.67 hrs, Volume= 1.066 af, Depth= 1.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type III 24-hr 2yr Rainfall=3.10"

	Area (sf)	CN	Description
	9,288	98	Unconnected roofs, HSG C
	7,312	96	Gravel surface, HSG C
	42,243	83	Brush, Poor, HSG D
	46,000	79	50-75% Grass cover, Fair, HSG C
	210,187	77	Woods, Poor, HSG C
*	70,883	83	Wetland, Woods, Poor, HSG D
	34,634	83	Woods, Poor, HSG D
	420,547	80	Weighted Average
	411,259		97.79% Pervious Area
	9,288		2.21% Impervious Area
	9,288		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	14	0.1420	0.25		**Sheet Flow, Grass 14.0** Grass: Short n= 0.150 P2= 3.10"
24.6	110	0.0180	0.07		**Sheet Flow, Woods 110.0** Woods: Light underbrush n= 0.400 P2= 3.10"
6.1	183	0.0100	0.50		**Shallow Concentrated Flow, Woods 182.8** Woodland Kv= 5.0 fps
4.6	157	0.0130	0.57		**Shallow Concentrated Flow, Woods 157.4** Woodland Kv= 5.0 fps
1.1	75	0.0530	1.15		**Shallow Concentrated Flow, Woods 75** Woodland Kv= 5.0 fps
0.8	51	0.0400	1.00		**Shallow Concentrated Flow, Woods 51** Woodland Kv= 5.0 fps
0.4	33	0.0600	1.22		**Shallow Concentrated Flow, Woods 33.3** Woodland Kv= 5.0 fps
2.2	93	0.0200	0.71		**Shallow Concentrated Flow, Woods 93.4** Woodland Kv= 5.0 fps
3.3	181	0.0330	0.91		**Shallow Concentrated Flow, Woods 180.7** Woodland Kv= 5.0 fps
4.0	141	0.0140	0.59		**Shallow Concentrated Flow, Woods 141** Woodland Kv= 5.0 fps
48.1	1,038	Total			

Summary for Subcatchment 4aS: East of Road Sta 2+00 to 7+75

Runoff = 4.19 cfs @ 12.02 hrs, Volume= 0.252 af, Depth= 1.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type III 24-hr 2yr Rainfall=3.10"

Area (sf)	CN	Adj	Description
6,192	98		Unconnected roofs, HSG C
8,573	92		Paved roads w/open ditches, 50% imp, HSG C
5,850	96		Gravel surface, HSG C
27,769	77		Brush, Poor, HSG C
46,359	79		50-75% Grass cover, Fair, HSG C
94,743	82	81	Weighted Average, UI Adjusted
84,265			88.94% Pervious Area
10,479			11.06% Impervious Area
6,192			59.09% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	57	0.0350	4.72	75.50	**Channel Flow, Ditch 56.8 (Rock Bot with grass sides)** Area= 16.0 sf Perim= 28.6' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
0.2	52	0.0385	4.95	79.19	**Channel Flow, Ditch 51.8 (Rock Bot with grass sides)** Area= 16.0 sf Perim= 28.6' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
0.2	48	0.0414	5.13	82.11	**Channel Flow, Ditch 48.3 (Rock Bot with grass sides)** Area= 16.0 sf Perim= 28.6' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
0.3	94	0.0430	5.23	83.69	**Channel Flow, Ditch 93.7 (Rock Bot with grass sides)** Area= 16.0 sf Perim= 28.6' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
0.2	52	0.0380	4.92	78.67	**Channel Flow, Ditch 52.2 (Rock Bot with grass sides)** Area= 16.0 sf Perim= 28.6' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
1.1	303	Total			

Summary for Subcatchment 4bS: West of Road Sta 2+00 to 7+75

Runoff = 2.49 cfs @ 12.02 hrs, Volume= 0.150 af, Depth= 1.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type III 24-hr 2yr Rainfall=3.10"

Area (sf)	CN	Description
8,798	92	Paved roads w/open ditches, 50% imp, HSG C
975	96	Gravel surface, HSG C
7,741	98	Water Surface, HSG C
29,254	79	50-75% Grass cover, Fair, HSG C
46,768	85	Weighted Average
34,628		74.04% Pervious Area
12,140		25.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	13	0.0200	0.90		**Sheet Flow, Road** Smooth surfaces n= 0.011 P2= 3.10"
0.2	59	0.0340	4.65	74.41	**Channel Flow, Ditch 58.8 (Rock Bot with grass sides)** Area= 16.0 sf Perim= 28.6' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
0.2	52	0.0380	4.92	78.67	**Channel Flow, Ditch 52 (Rock Bot with grass sides)** Area= 16.0 sf Perim= 28.6' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
0.2	54	0.0370	4.85	77.63	**Channel Flow, Ditch 54 (Rock Bot with grass sides)** Area= 16.0 sf Perim= 28.6' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
0.4	112	0.0360	4.79	76.57	**Channel Flow, Ditch 112 (Rock Bot with grass sides)** Area= 16.0 sf Perim= 28.6' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
0.2	60	0.0330	4.58	73.31	**Channel Flow, Ditch 60 (Rock Bot with grass sides)** Area= 16.0 sf Perim= 28.6' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
1.4	350	Total			

Summary for Subcatchment 5aS: South of Road Sta 7+75 to 22+50

Runoff = 4.95 cfs @ 12.11 hrs, Volume= 0.367 af, Depth= 1.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type III 24-hr 2yr Rainfall=3.10"

Area (sf)	CN	Description
5,160	98	Unconnected roofs, HSG C
26,203	92	Paved roads w/open ditches, 50% imp, HSG C
8,288	96	Gravel surface, HSG C
26,000	79	50-75% Grass cover, Fair, HSG C
65,987	77	Woods, Poor, HSG C
131,638	82	Weighted Average
113,377		86.13% Pervious Area
18,262		13.87% Impervious Area
5,160		28.26% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	34	0.0591	0.21		**Sheet Flow, Lawn 33.8** Grass: Short n= 0.150 P2= 3.10"
0.2	50	0.0400	5.04	80.71	**Channel Flow, Ditch 50 (Coble bot with grass sides)** Area= 16.0 sf Perim= 28.6' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
1.7	235	0.0085	2.33	37.21	**Channel Flow, Ditch 235 (Coble bot with grass sides)** Area= 16.0 sf Perim= 28.6' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
1.0	171	0.0116	2.72	43.47	**Channel Flow, Ditch 171.3 (Coble bot with grass sides)** Area= 16.0 sf Perim= 28.6' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
0.6	142	0.0282	4.24	67.77	**Channel Flow, Ditch 141.63 (Coble bot with grass sides)** Area= 16.0 sf Perim= 28.6' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
0.3	73	0.0275	4.18	66.92	**Channel Flow, Ditch 72.7 (Coble bot with grass sides)** Area= 16.0 sf Perim= 28.6' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
0.3	78	0.0257	4.04	64.70	**Channel Flow, Ditch 77.7 (Coble bot with grass sides)** Area= 16.0 sf Perim= 28.6' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
0.3	74	0.0271	4.15	66.44	**Channel Flow, Ditch 73.6 (Coble bot with grass sides)** Area= 16.0 sf Perim= 28.6' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
7.1	857	Total			

Summary for Subcatchment 5bS: North of Road 7+75 to 22+50

Runoff = 5.60 cfs @ 12.11 hrs, Volume= 0.418 af, Depth= 1.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type III 24-hr 2yr Rainfall=3.10"

	Area (sf)	CN	Adj	Description
	8,256	98		Unconnected roofs, HSG C
	25,305	92		Paved roads w/open ditches, 50% imp, HSG C
	3,900	96		Gravel surface, HSG C
*	8,420	98		Pond #2, Water Surface, HSG C
	27,035	79		50-75% Grass cover, Fair, HSG C
	77,041	77		Woods, Poor, HSG C
	149,957	83	82	Weighted Average, UI Adjusted
	120,629			80.44% Pervious Area
	29,329			19.56% Impervious Area
	8,256			28.15% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	29	0.0680	0.21		**Sheet Flow, Lawn 29** Grass: Short n= 0.150 P2= 3.10"
0.2	48	0.0410	5.11	81.72	**Channel Flow, Ditch 48 (Coble bot with grass sides)** Area= 16.0 sf Perim= 28.6' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
1.7	238	0.0084	2.31	36.99	**Channel Flow, Ditch 238 (Coble bot with grass sides)** Area= 16.0 sf Perim= 28.6' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
1.4	209	0.0096	2.47	39.54	**Channel Flow, Ditch 208.5 (Coble bot with grass sides)** Area= 16.0 sf Perim= 28.6' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
0.3	72	0.0280	4.22	67.53	**Channel Flow, Ditch 72 (Coble bot with grass sides)** Area= 16.0 sf Perim= 28.6' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
1.0	263	0.0300	4.37	69.90	**Channel Flow, Ditch 263 (Coble bot with grass sides)** Area= 16.0 sf Perim= 28.6' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
0.4	96	0.0210	3.66	58.48	**Channel Flow, Ditch 96 (Coble bot with grass sides)** Area= 16.0 sf Perim= 28.6' r= 0.56' n= 0.040 Earth, cobble bottom, clean sides
7.3	955	Total			

Summary for Subcatchment 6S: Open Space North & West

Runoff = 16.10 cfs @ 13.12 hrs, Volume= 3.489 af, Depth= 1.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type III 24-hr 2yr Rainfall=3.10"

	Area (sf)	CN	Adj	Description
	12,384	98		Unconnected roofs, HSG C
	3,901	96		Gravel surface, HSG C
	9,223	83		Brush, Poor, HSG D
	85,345	79		50-75% Grass cover, Fair, HSG C
	547,412	77		Woods, Poor, HSG C
*	652,541	83		Wetland, Woods, Poor, HSG D
	65,031	83		Woods, Poor, HSG D
	1,375,837	81	80	Weighted Average, UI Adjusted
	1,363,453			99.10% Pervious Area
	12,384			0.90% Impervious Area
	12,384			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	34	0.0200	0.13		**Sheet Flow, Lawn 34** Grass: Short n= 0.150 P2= 3.10"
7.8	82	0.0250	0.18		**Sheet Flow, Lawn 82** Grass: Short n= 0.150 P2= 3.10"
1.9	25	0.0780	0.22		**Sheet Flow, Lawn 25.4** Grass: Short n= 0.150 P2= 3.10"
0.6	39	0.0510	1.13		**Shallow Concentrated Flow, Woods 39** Woodland Kv= 5.0 fps
0.1	9	0.2330	2.41		**Shallow Concentrated Flow, Woods 8.5** Woodland Kv= 5.0 fps
0.1	14	0.1459	1.91		**Shallow Concentrated Flow, Woods 13.7** Woodland Kv= 5.0 fps
0.0	6	0.3267	2.86		**Shallow Concentrated Flow, Woods Wetland 6.12** Woodland Kv= 5.0 fps
0.2	16	0.1250	1.77		**Shallow Concentrated Flow, Woods 1Wetland 5.95** Woodland Kv= 5.0 fps
0.1	11	0.1910	2.19		**Shallow Concentrated Flow, Woods Wetland 10.5** Woodland Kv= 5.0 fps
1.1	62	0.0324	0.90		**Shallow Concentrated Flow, Woods Wetland 61.7** Woodland Kv= 5.0 fps
0.4	33	0.0615	1.24		**Shallow Concentrated Flow, Woods Wetland 32.5** Woodland Kv= 5.0 fps
7.3	167	0.0030	0.38		**Shallow Concentrated Flow, Field Wetland 166.5** Short Grass Pasture Kv= 7.0 fps
5.3	156	0.0096	0.49		**Shallow Concentrated Flow, Woods Wetland 155.7** Woodland Kv= 5.0 fps
15.9	224	0.0022	0.23		**Shallow Concentrated Flow, Woods Wetland 223.8** Woodland Kv= 5.0 fps
2.6	122	0.0123	0.78		**Shallow Concentrated Flow, Field Wetland 121.8** Short Grass Pasture Kv= 7.0 fps
6.6	198	0.0100	0.50		**Shallow Concentrated Flow, Woods Wetland 197.9** Woodland Kv= 5.0 fps
10.1	263	0.0076	0.44		**Shallow Concentrated Flow, Woods 262.8** Woodland Kv= 5.0 fps
0.4	29	0.0700	1.32		**Shallow Concentrated Flow, Woods 28.7** Woodland Kv= 5.0 fps
2.7	110	0.0180	0.67		**Shallow Concentrated Flow, Woods 110.4** Woodland Kv= 5.0 fps
5.1	167	0.0120	0.55		**Shallow Concentrated Flow, Woods 166.5** Woodland Kv= 5.0 fps
1.3	67	0.0300	0.87		**Shallow Concentrated Flow, Woods 66.5** Woodland Kv= 5.0 fps
3.4	149	0.0210	0.72		**Shallow Concentrated Flow, Woods 148.7** Woodland Kv= 5.0 fps
77.2	1,983	Total			

Summary for Subcatchment 7S: Open Space North

Runoff = 7.89 cfs @ 12.25 hrs, Volume= 0.797 af, Depth= 1.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type III 24-hr 2yr Rainfall=3.10"

	Area (sf)	CN	Description
*	751	83	Wetland, Woods, Poor, HSG D
*	1,210	83	Wetland, Woods, Poor, HSG D
	165,167	83	Woods, Poor, HSG D
	147,105	77	Woods, Poor, HSG C
	314,233	80	Weighted Average
	314,233		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	28	0.0360	0.07		**Sheet Flow, Woods 27.5** Woods: Light underbrush n= 0.400 P2= 3.10"
5.6	175	0.0110	0.52		**Shallow Concentrated Flow, Woods 175.2** Woodland Kv= 5.0 fps
1.3	67	0.0300	0.87		**Shallow Concentrated Flow, Woods 66.7** Woodland Kv= 5.0 fps
4.2	99	0.0063	0.40		**Shallow Concentrated Flow, Woods 99.2** Woodland Kv= 5.0 fps
17.3	369	Total			

Summary for Pond 1P: Wet Pond #1 Sta 5+50

Inflow Area = 3.249 ac, 15.98% Impervious, Inflow Depth = 1.48" for 2yr event
Inflow = 6.68 cfs @ 12.02 hrs, Volume= 0.402 af
Outflow = 0.83 cfs @ 12.54 hrs, Volume= 0.400 af, Atten= 88%, Lag= 31.0 min
Primary = 0.83 cfs @ 12.54 hrs, Volume= 0.400 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs / 3
Starting Elev= 164.70' Surf.Area= 9,358 sf Storage= 28,923 cf
Peak Elev= 165.44' @ 12.54 hrs Surf.Area= 11,073 sf Storage= 36,484 cf (7,561 cf above start)
Flood Elev= 168.00' Surf.Area= 16,261 sf Storage= 71,545 cf (42,622 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 176.5 min (1,008.1 - 831.6)

Volume	Invert	Avail.Storage	Storage Description
#1	157.00'	71,545 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
157.00	429	0	0
158.00	1,026	728	728
159.00	1,756	1,391	2,119
160.00	2,578	2,167	4,286
161.00	3,490	3,034	7,320
162.00	4,478	3,984	11,304
163.00	5,525	5,002	16,305
164.00	7,741	6,633	22,938
165.00	10,051	8,896	31,834
166.00	12,373	11,212	43,046
167.00	14,182	13,278	56,324
168.00	16,261	15,222	71,545

Device	Routing	Invert	Outlet Devices
#1	Primary	163.52'	**12.0" Round ADS N12** L= 43.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 163.52' / 163.35' S= 0.0040 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#2	Device 1	164.70'	**6.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#3	Secondary	166.60'	**10.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=0.83 cfs @ 12.54 hrs HW=165.44' TW=163.78' (Dynamic Tailwater)
└**1=ADS N12** (Passes 0.83 cfs of 4.34 cfs potential flow)
└**2=Orifice/Grate** (Orifice Controls 0.83 cfs @ 3.33 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=164.70' (Free Discharge)
└**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 2P: Wet Pond #2 Sta 14+00

Inflow Area = 6.465 ac, 16.90% Impervious, Inflow Depth = 1.46" for 2yr event
Inflow = 9.83 cfs @ 12.12 hrs, Volume= 0.785 af
Outflow = 2.57 cfs @ 12.56 hrs, Volume= 0.777 af, Atten= 74%, Lag= 26.3 min
Primary = 2.57 cfs @ 12.56 hrs, Volume= 0.777 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs / 3
Starting Elev= 161.50' Surf.Area= 9,283 sf Storage= 30,033 cf
Peak Elev= 162.70' @ 12.56 hrs Surf.Area= 12,126 sf Storage= 43,280 cf (13,247 cf above start)
Flood Elev= 166.00' Surf.Area= 19,127 sf Storage= 94,670 cf (64,637 cf above start)

Plug-Flow detention time= 1,100.5 min calculated for 0.087 af (11% of inflow)
Center-of-Mass det. time= 181.5 min (1,025.2 - 843.6)

Volume	Invert	Avail.Storage	Storage Description
#1	154.00'	94,670 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
154.00	989	0	0
155.00	1,593	1,291	1,291
156.00	2,198	1,896	3,187
157.00	2,859	2,529	5,715
158.00	3,930	3,395	9,110
159.00	4,940	4,435	13,545
160.00	6,113	5,527	19,071
161.00	7,446	6,780	25,851
162.00	11,120	9,283	35,134
163.00	12,556	11,838	46,972
164.00	14,557	13,557	60,528
165.00	17,300	15,929	76,457
166.00	19,127	18,214	94,670

Device	Routing	Invert	Outlet Devices
#1	Primary	161.46'	**12.0" Round ADS N12** L= 33.4' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 161.46' / 161.33' S= 0.0039 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#2	Device 1	161.50'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	162.00'	**16.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600
#4	Secondary	164.75'	**10.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=2.57 cfs @ 12.56 hrs HW=162.70' TW=0.00' (Dynamic Tailwater)
└─**1=ADS N12** (Inlet Controls 2.57 cfs @ 3.27 fps)
  ├─**2=Orifice/Grate** (Passes < 0.43 cfs potential flow)
  └─**3=Orifice/Grate** (Passes < 2.51 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=161.50' (Free Discharge)
└─**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond CB2: CB-2 Pond #1 Outlet

Inflow Area = 3.249 ac, 15.98% Impervious, Inflow Depth > 1.48" for 2yr event
Inflow = 0.83 cfs @ 12.54 hrs, Volume= 0.400 af
Outflow = 0.83 cfs @ 12.54 hrs, Volume= 0.400 af, Atten= 0%, Lag= 0.0 min
Primary = 0.83 cfs @ 12.54 hrs, Volume= 0.400 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 163.78' @ 12.54 hrs
Flood Elev= 164.70'

Device	Routing	Invert	Outlet Devices
#1	Primary	163.25'	**12.0" Round Culvert** L= 65.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 163.25' / 163.00' S= 0.0038 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.83 cfs @ 12.54 hrs HW=163.78' TW=0.00' (Dynamic Tailwater)
1=Culvert (Barrel Controls 0.83 cfs @ 2.87 fps)

Summary for Pond RC1: RC1 Station 5+50

Inflow Area = 2.175 ac, 11.06% Impervious, Inflow Depth = 1.39" for 2yr event
Inflow = 4.19 cfs @ 12.02 hrs, Volume= 0.252 af
Outflow = 4.19 cfs @ 12.02 hrs, Volume= 0.252 af, Atten= 0%, Lag= 0.0 min
Primary = 4.19 cfs @ 12.02 hrs, Volume= 0.252 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 167.40' @ 12.02 hrs
Flood Elev= 169.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	166.40'	**24.0" Round Culvert** L= 50.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 166.40' / 166.00' S= 0.0080 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=4.19 cfs @ 12.02 hrs HW=167.40' TW=165.13' (Dynamic Tailwater)
1=Culvert (Inlet Controls 4.19 cfs @ 2.68 fps)

Summary for Pond RC2: (3) 36" ADS Pipe Crossing Sta 12+25

Inflow Area = 9.654 ac, 2.21% Impervious, Inflow Depth = 1.33" for 2yr event
Inflow = 6.60 cfs @ 12.67 hrs, Volume= 1.066 af
Outflow = 6.60 cfs @ 12.67 hrs, Volume= 1.066 af, Atten= 0%, Lag= 0.0 min
Primary = 6.60 cfs @ 12.67 hrs, Volume= 1.066 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 162.58' @ 12.67 hrs
Flood Elev= 163.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	162.00'	**36.0" Round Culvert X 3.00** L= 145.0' CMP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 162.00' / 158.00' S= 0.0276 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 7.07 sf

Primary OutFlow Max=6.60 cfs @ 12.67 hrs HW=162.58' TW=0.00' (Dynamic Tailwater)
1=Culvert (Inlet Controls 6.60 cfs @ 2.29 fps)

Summary for Pond RC3: Road Crossing Sta 14+00

Inflow Area = 3.022 ac, 13.87% Impervious, Inflow Depth = 1.46" for 2yr event
Inflow = 4.95 cfs @ 12.11 hrs, Volume= 0.367 af
Outflow = 4.45 cfs @ 12.15 hrs, Volume= 0.367 af, Atten= 10%, Lag= 2.5 min
Primary = 4.45 cfs @ 12.15 hrs, Volume= 0.367 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs / 3
Starting Elev= 165.25' Surf.Area= 781 sf Storage= 654 cf
Peak Elev= 166.28' @ 12.15 hrs Surf.Area= 1,350 sf Storage= 1,704 cf (1,051 cf above start)
Flood Elev= 168.00' Surf.Area= 3,432 sf Storage= 5,612 cf (4,958 cf above start)

Plug-Flow detention time= 40.9 min calculated for 0.352 af (96% of inflow)
Center-of-Mass det. time= 10.0 min (848.9 - 838.8)

Volume	Invert	Avail.Storage	Storage Description
#1	164.00'	15,601 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
164.00	268	0	0
165.00	675	472	472
166.00	1,100	888	1,359
167.00	1,987	1,544	2,903
168.00	3,432	2,710	5,612
170.00	6,557	9,989	15,601

Device	Routing	Invert	Outlet Devices
#1	Primary	165.25'	**24.0" Round Culvert** L= 62.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 165.25' / 165.00' S= 0.0040 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=4.45 cfs @ 12.15 hrs HW=166.28' TW=162.31' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 4.45 cfs @ 3.96 fps)

Summary for Link 1L: Point of Analysis #1

Inflow Area = 5.301 ac, 4.97% Impervious, Inflow Depth = 1.26" for 2yr event
Inflow = 4.22 cfs @ 12.47 hrs, Volume= 0.558 af
Primary = 4.22 cfs @ 12.47 hrs, Volume= 0.558 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs

Summary for Link 2L: Point of Analysis #2

Inflow Area = 4.390 ac, 2.16% Impervious, Inflow Depth = 1.26" for 2yr event
Inflow = 4.49 cfs @ 12.25 hrs, Volume= 0.462 af
Primary = 4.49 cfs @ 12.25 hrs, Volume= 0.462 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs

Summary for Link 3L: Point of Analysis #3

Inflow Area = 50.952 ac, 4.14% Impervious, Inflow Depth > 1.35" for 2yr event
Inflow = 24.34 cfs @ 12.95 hrs, Volume= 5.731 af
Primary = 24.34 cfs @ 12.95 hrs, Volume= 5.731 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs

Summary for Link 4L: Point of Analysis #4

Inflow Area = 7.214 ac, 0.00% Impervious, Inflow Depth = 1.33" for 2yr event
Inflow = 7.89 cfs @ 12.25 hrs, Volume= 0.797 af
Primary = 7.89 cfs @ 12.25 hrs, Volume= 0.797 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs

Summary for Pond 1P: Wet Pond #1 Sta 5+50

[80] Warning: Exceeded Pond RC1 by 0.23' @ 24.06 hrs (0.24 cfs 0.101 af)

Inflow Area = 3.249 ac, 15.98% Impervious, Inflow Depth = 3.84" for 25yr event
Inflow = 17.18 cfs @ 12.02 hrs, Volume= 1.039 af
Outflow = 2.62 cfs @ 12.47 hrs, Volume= 0.537 af, Atten= 85%, Lag= 27.1 min
Secondary = 2.62 cfs @ 12.47 hrs, Volume= 0.537 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs / 3
Starting Elev= 164.70' Surf.Area= 9,358 sf Storage= 28,923 cf
Peak Elev= 166.83' @ 12.47 hrs Surf.Area= 13,871 sf Storage= 53,915 cf (24,992 cf above start)
Flood Elev= 168.00' Surf.Area= 16,261 sf Storage= 71,545 cf (42,622 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 139.3 min (943.9 - 804.6)

Volume	Invert	Avail.Storage	Storage Description
#1	157.00'	71,545 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
157.00	429	0	0
158.00	1,026	728	728
159.00	1,756	1,391	2,119
160.00	2,578	2,167	4,286
161.00	3,490	3,034	7,320
162.00	4,478	3,984	11,304
163.00	5,525	5,002	16,305
164.00	7,741	6,633	22,938
165.00	10,051	8,896	31,834
166.00	12,373	11,212	43,046
167.00	14,182	13,278	56,324
168.00	16,261	15,222	71,545

Device	Routing	Invert	Outlet Devices
#1	Secondary	166.60'	**10.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Secondary OutFlow Max=2.62 cfs @ 12.47 hrs HW=166.83' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 2.62 cfs @ 1.15 fps)

Summary for Pond 2P: Wet Pond #2 Sta 14+00

Inflow Area = 6.465 ac, 16.90% Impervious, Inflow Depth = 3.80" for 25yr event
Inflow = 25.39 cfs @ 12.12 hrs, Volume= 2.049 af
Outflow = 7.04 cfs @ 12.52 hrs, Volume= 1.156 af, Atten= 72%, Lag= 24.2 min
Secondary = 7.04 cfs @ 12.52 hrs, Volume= 1.156 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs / 3
Starting Elev= 161.50' Surf.Area= 9,283 sf Storage= 30,033 cf
Peak Elev= 164.97' @ 12.52 hrs Surf.Area= 17,227 sf Storage= 75,995 cf (45,963 cf above start)
Flood Elev= 166.00' Surf.Area= 19,127 sf Storage= 94,670 cf (64,637 cf above start)

Plug-Flow detention time= 471.6 min calculated for 0.466 af (23% of inflow)
Center-of-Mass det. time= 121.8 min (936.5 - 814.7)

Volume	Invert	Avail.Storage	Storage Description
#1	154.00'	94,670 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
154.00	989	0	0
155.00	1,593	1,291	1,291
156.00	2,198	1,896	3,187
157.00	2,859	2,529	5,715
158.00	3,930	3,395	9,110
159.00	4,940	4,435	13,545
160.00	6,113	5,527	19,071
161.00	7,446	6,780	25,851
162.00	11,120	9,283	35,134
163.00	12,556	11,838	46,972
164.00	14,557	13,557	60,528
165.00	17,300	15,929	76,457
166.00	19,127	18,214	94,670

Device	Routing	Invert	Outlet Devices
#1	Secondary	164.55'	**10.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Secondary OutFlow Max=7.04 cfs @ 12.52 hrs HW=164.97' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 7.04 cfs @ 1.66 fps)

BURMAN
LAND & TREE COMPANY, LLC.

P.O. Box 145, Orrington, ME 04474 (207) 825-4050

17-005
July 31, 2018

Matt Hancock Properties
Attention: Matt Hancock
P.O. Box 295
Casco, ME 04015

Subject: Soil Survey Report
Proposed Durant Homestead
Chute Road
Windham, Maine

Dear Matt,

We are pleased to present this Soil Survey Report for the proposed 26-lot Durant Homestead residential subdivision on a portion of the Matt Hancock Properties, LLC property on Chute Road in Windham, Maine. The purpose of our services was to document and classify the soils within the proposed project area, and to identify potential limitations of the soil with respect to the proposed development. Specifically, our services were conducted at a modified[1] Class B-High Intensity, Class C – Medium High Intensity, and Class L – Linear Soil Survey level of soils mapping, as defined by the Maine Association of Professional Soil Scientists[2]. The area of our services was the proposed development area, which is the eastern approximately 20-25 acres of larger property.

We understand that our findings will be submitted as an exhibit in a Maine Department of Environmental Protection (MDEP) Site Location of Development Application (SLODA) to be prepared by Acheron Engineering Services.

[1] See Section 3.1 for an explanation of "modified"
[2] Maine Association of Professional Soil Scientists. Guidelines for Maine Certified Soil Scientists for Soil Identification and Mapping. February 2004, revised March 2009.

This report is subject to the Limitations in Appendix A. Appendix B contains a Site Location Map and Class B / Class C / Class L Soil Survey Plan. Appendix C contains a Soil Survey Legend, a table showing soil map unit test pit representation, and Soil Map Unit Descriptions. Appendix D contains a Soil Conditions Summary Table and Test Pit Logs. Appendix E is a Glossary of terms.

Christopher C. Dorion, C.G. and C.S.S. of C.C. Dorion Geological Services, LLC assisted Burman Land & Tree, LLC with this soil survey, documenting soil test pits, interpreting site soils and writing this report.

1.0 Site Location and Description

The proposed Durant Homestead residential subdivision is located on a larger, approximately 65-acre property identified by the Town of Windham as Tax Map 6, Lot 25, on Chute Road in Windham, Maine. Our soil survey services were conducted in the proposed development area, which is about 20-25 acres in the eastern portion of the property (i.e. the "site"). A Site Location Map is attached in Appendix B.

2.0 Previous Services

Main-Land Development Consultants previously conducted a Class B – High Intensity Soil Survey on the larger property, as reported in the Soils Report, Class B – High Intensity Soil Survey, Durant Homestead, Windham, Maine, dated June, 2006. Based on this Report, we understand that Main-Land Development Consultants conducted the Class B – High Intensity Soil Survey in accordance with the MAPSS standards in place at the time.

Based on a September 08, 2017 meeting with Mr. Robert Green, Project Manager at the MDEP, we understand that we were allowed to use the test pit information gathered by MLD for our soil survey. Our soil survey was conducted at a higher level of mapping than MLD's services. The MLD test pits are shown on the Class B / Class C / Class L Soil Survey Plan in Appendix B. We also understand that the MDEP will accept the MLD Soils Report as a Class B – High Intensity Soil Survey on the portion of the property that is not proposed for development.

Burman Land & Tree, LLC (BLT) conducted stormwater test pit and preliminary soil site evaluation services on the proposed subdivision in 2017 and 2018. Soil Solutions conducted preliminary soil site evaluation services on the proposed subdivision in 2017. The BLT and Soil Solutions test pits were used in our soil survey services and are shown on the Class B / Class C / Class L Soil Survey Plan.

3.0 Methodology

3.1 Soil Classification Methods

Soil classification is a broad term used to describe the process by which Soil Scientists consistently identify, describe and map soils for a specific use or purpose. For this project, we conducted a modified Class B- High Intensity in uplands within the proposed development area, a Class C – Medium High Intensity in wetlands within the proposed development area, and a Class L – Linear Soil Survey in the proposed roadway, for the purpose of identifying potential limitations of the soil with respect to the proposed residential subdivision development. Mapping and soil classification was conducted in accordance with MAPSS standards and guidelines in place at the time of our reporting.

The MDEP generally requires a Class A – High Intensity Soil Survey for this type and density of development. In response to our request, Mr. John Hopeck, C.G. at the MDEP consulted with Mr. Dave Rocque, State Soil Scientist, and they determined that a partial waiver could be granted. Specifically, the waiver allows a maximum dissimilar inclusion size of 1/3rd acre, as opposed to 1/8th acre that is allowed in the Class A standards. Our soil survey meets the Class A standards, with the exception of the larger dissimilar limiting inclusion, and so is considered a “modified” Class B – High Intensity Soil Survey.

The following are the mapping standards used for the modified Class B Soil Survey:

1. Map units do not contain dissimilar limiting individual inclusions larger than 1/3 acre. Dissimilar limiting inclusions may total more than 1/3 acre per map unit delineation, in the aggregate, if not contiguous.
2. Scale is 1” equals 100 feet.

3. Ground control – Topographic features were determined by Aerial Survey & Photo, Inc. of Norridgewock, Maine. Elevations for ground control were performed by Main-Land Development Consultants of Livermore Falls, Maine. All bearings were referenced to Maine West Zone NAD-83. The property boundary survey was conducted by Plisga & Day Land Surveyors, Inc. of Bangor, Maine in 2018. MLD test pits were located using a Trimble GPS (according to their report). BLT and Soil Solutions test pits were located using a mapping grade Trimble GPS receiver. BLT and Soil Solutions test pits were overlaid onto the survey plan by Acheron Engineering Services.
4. The base map from Aerial Survey & Photo, Inc. contained 2-foot contour lines.

The Class C and Class L Soil Survey mapping standards used were the same as above with the exception that the Class C dissimilar limiting inclusions were no larger than 5 acres, and the Class L no larger than ¼ acre.

The identification and description of soil morphological features are tools typically used to map soils. It is well documented that soil morphological features that typically are used as indicators of soil drainage are more poorly expressed in" disturbed" soils which include areas where surface conditions have been altered by activities such as plowing, harrowing, trampling by livestock, flooding, draining, timber harvest, and forest fires. Some of these conditions appear to have occurred on portions of the project area. On "disturbed" areas, soil classification is typically based on the morphology of the most "undisturbed" or "relict" areas. On the project area, "undisturbed" or "relict" conditions were best expressed in test pits where disturbance by timber harvest and skid trails was minimal. However, several test pits were conducted in skid trails to determine if these areas met classification as hydric.

Prior to initiating field work, we consulted the Natural Resources Conservation Service (NRCS) published soil survey, National Wetland Inventory (NWI) published wetland mapping, and United States Geological Service (USGS) topographic maps of the site to gain insight into general site conditions.

3.2 Exploration and Testing

We conducted our field assessment for the soil survey on June 12, 13, and 22, 2018. We selected test pit locations in the field based on our site research, perceived differences in landform, topography, landscape features and vegetation, and in consideration of the proposed development at the site.

We explored a total of 40 excavator dug test pits, one of which was within the proposed leachbed location on Lot 21. We examined exposed soil profiles for horizon development, color, depth of redoximorphic features (mottling), texture, coarse fragment content, root abundance, consistence, structure, depth of saturation, and other pertinent soil characteristics. We examined surficial features such as rock outcrops, stoniness, and groundwater seepage when encountered. In addition, we made numerous probes into the soil with a hand auger throughout the site in order to observe and confirm anticipated soil profiles.

Soil Conditions Summary Tables for the BLT, MLD and Soil Solutions test pits are included in Appendix D. Soil test pit logs for the BLT soil survey services are also included in Appendix D. The Class B / Class C / Class L Soil Survey Plan attached in Appendix B illustrates the location, type, and extent of the soils we observed at the site.

3.3 Soil Map and Map Unit Design

We used the connotative soil survey method for naming our soil map units. Because of the large amount of data collected from other soil scientists and used in our findings, and because of the variability of the site (i.e. lacustrine sediments over ledge), which would have required phasing of named soil series, the connotative legend was used. The connotative soil survey uses numbers to codify classes of each of the following: drainage class, parent material, depth to bedrock, slope class and hydrologic soil group. An Explanation and Usage Guide is in Appendix C and on the Soil Survey Plan in Appendix B.

One of the limitations of the connotative soil survey method is that the soil map units are not named and correlated to the NRCS named series, which limits our ability to access permeability data and soil taxonomy. Therefore, this information was not included in the

soil map unit descriptions attached in Appendix C. We did, however, provide hydrologic soil groups based on our knowledge of named soil series that our soil map units would most closely correlate to.

According to the MLD Soils Report, the majority of their test pits were dug with an excavator. The BLT soil survey and stormwater test pits were dug with an excavator. The BLT and Soil Solutions Preliminary Soil Site Evaluation test pits were documented using a hand spade, auger and bedrock probe. This soil survey weights the data to favor the excavator dug test pits, as they were dug deep enough to classify the soil and determine depth to the documented soil characteristics. The hand-dug test pit information assisted in map unit boundary placement and surficial textures. It should be noted that the MLD test pits do not show a lower limit of investigation (test pit depth), therefore, the MLD test pits were weighted less than the BLT soil survey and stormwater test pits in our map unit naming and boundary placement.

Hydric soils were identified using the Field Indicators for Identifying Hydric Soils in New England, 2018 (Version 4.0) and the 2012 (Version 2.0) Supplement to the 1987 Corps of Engineers Wetland Delineation Manual. Soil map until boundaries are based on our observations at the site, landform features, and our professional judgment. A delineated map unit represents an area dominated by one or more named soil map units. On the landscape, however, soils are naturally variable bodies. As a result, map units often have inclusions of soils for which the map unit is not named.

Similar inclusions are soils that have properties and management potentials similar to the dominant soils for which the map unit was named. Dissimilar soils differ enough in one of more characteristics that their use and management differs from the mapped soil. Soil map units and the soil survey plan were designed in accordance with the standards of MAPSS (2004) and the National Cooperative Soil Survey (1993, 1996). Standards set forth by NCSS and MAPSS dictate the amount of allowable dissimilar inclusions.

We mapped soil consociations and complexes in this survey. A soil consociation consists of one dominant soil that occurs in the map unit, an example being soil map unit #4 – 3/3/2/1/C. A soil complex consists of two or more named dissimilar soils that

regularly repeat on the landscape but are intricate enough that they cannot be delineated at the scale of mapping, an example being soil map unit #1 – ¾,8/2,3/1/D.

It should be noted that soil map unit design is at least in part influenced by the intended use of the soil survey and information provided may not always be adequate for uses other than that for which the soil survey was originally developed. Soils which are considered non-limiting for one use may be considered limiting for another use.

4.0 General Site and Subsurface Conditions

The site is mostly wooded and undeveloped. It was historically developed with up to three residences along a driveway from Chute Road. This general area was also used as a log yard for harvesting operations that occurred in the recent past, and was most recently used for a firewood processing operation. This general area was graded in 2018 upon the removal of the firewood operation. The general outline of the graded/disturbed area, as well as the filled and compact driveway is shown on the Class B / Class C / Class L Soil Survey Plan, and the soil map units in this area include a dual parent material classification “8” which is filled, regraded, or excavated materials. The harvesting operations resulted in several skid trails throughout the site, these areas were not given a parent material dual classification of “8” as the skid trails are not anticipated to affect use and management. Some of the soil map units given the dual parent material classification of “8” were not graded in their entirety but appear to have been part of the log landing and so were included in the “8” classification.

The site was submerged by the late glacial Gulf of Maine during deglaciation. Nearby glaciomarine deltas in the Windham area show that the ocean reached a maximum elevation of 297 to 307 feet above present sea level[3]. This submergence is seen in the thick deposits of marine sediments (the "blue clays" of Maine) in many of the test pits. As the land rebounded, sea level fell, and eventually the nearshore zone and surf zone crossed the site, reworking the "blue clays" to produce coarser textured intertidal and

[3] Thompson, W. B., Crossen, K. J., Borns, H. W., Jr., and Andersen, B. G., 1989, Glaciomarine deltas of Maine and their relation to late Pleistocene-Holocene crustal movements, in Anderson, W.A., and Borns, H.W., Jr., eds., Neotectonics of Maine: Studies in seismicity, crustal warping, and sea-level change: Maine Geological Survey, Bulletin 40, p. 43-68

beach deposits. Thus, these land areas in Maine are extremely complex amalgamations of landforms and parent materials.

The site topography is characterized by two bedrock-controlled hills, in the northern and southern portions of the site, their side slopes, and base slopes that contain wetlands. The hilltops are topographically level to gently sloping, the sideslopes are gently sloping to moderately steep, and the base slope wetlands are level to gently sloping. The site soils are generally bedrock controlled glacial till sediments on the hill tops, and lacustrine and marine sediments on the side and base slopes. Bedrock was observed ranging from 18” in depth on the southernmost hilltop to greater than 60” in the central portions of the site.

The dominant soils on the hilltops were well to somewhat poorly drained, shallow to very deep, ablation and dense basal till as seen in soil map units #2, 3, 5, 6, 7, 12, 18, 28, and 35. These soils are similar to those generally described in the Lyman-Tunbridge and Dixfield-Colonel catenas.

The dominant soils on the hilltops and side slopes, where not glacial till, were well to somewhat poorly drained, shallow to very deep, reworked marine and glacio-lacustrine sediments as seen in soil map units #4, 8, 13, 16, 17, 19, 20, 24, 26, 27, 29, 30, 31, 32, and 33. These soils are similar to those generally described in the Nicholville-Roundabout catena.

The dominant soils on the side slopes and base slopes were moderately well to poorly drained, moderately deep to very deep, marine sediments as seen in soil map units #9, 10, 14, 15, 21, 22, 23, 25, 34, 36, and 37. These soils are similar to those generally described in the Buxton-Lamoine-Scantic catena.

5.0 Use and Management Considerations

Based on our observations of the site, information obtained in our explorations, and our knowledge of the proposed use of the site, the site soils are generally suitable for the proposed use, but with limitations due to depth to bedrock where less than 60” below the soil surface; seasonal high-water table on the poorly to moderately well drained soils; and slopes of greater than 15%. For the proposed use we considered building site

development which includes dwellings, roads, development and subsurface wastewater disposal. Use and management potential ratings, limitations and potential corrective measures are included in the Map Unit Descriptions attached in Appendix C.

Wetlands, which include hydric soils, are protected by Federal and Maine law, and may present permitting limitations. Site limitations due to wetlands can be mitigated by avoiding and minimizing impact to these.

6.0 Statement

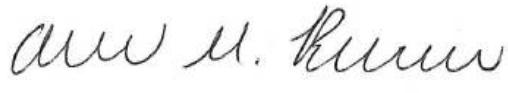
The accompanying soil profile descriptions, soil survey map and this soil narrative report entitled Soil Survey Report, Proposed Durant Homestead, Chute Road, Windham, Maine, dated July 31, 2018, were done in accordance with the standards adopted by the Maine Association of Professional Soil Scientists, February 1995, as amended, and prepared by Aleita M. Burman, C.S.S. #430 and Christopher C. Dorion, C.S.S. #454.

7.0 Closure

It has been a pleasure to be of assistance to you with this phase of your project. If you have any further questions, or if we may be of further assistance, please do not hesitate to contact us.

Sincerely,

Burman Land & Tree Company, LLC





Aleita M. Burman, C.W.S., C.S.S., L.S.E.
Soil and Wetland Scientist
blburman@gmail.com

and

C.C. Dorion Geological Services, LLC





Christopher C. Dorion, C.S.S., C.G.
Geologist and Soil Scientist
cdorion@infionline.net

cc: Kirk Ball, Acheron Engineering Services

APPENDIX A
Limitations

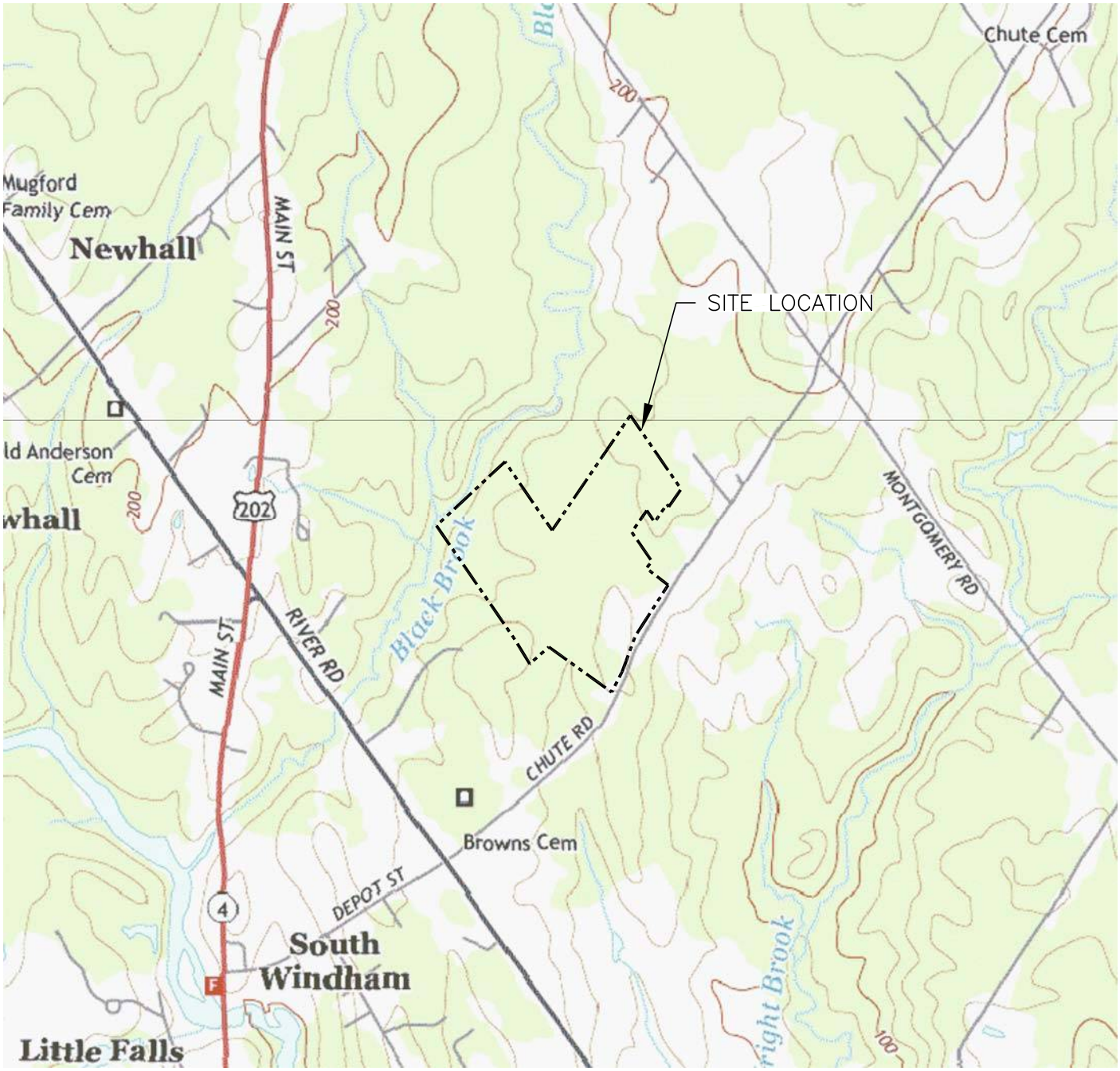
APPENDIX A - Limitations

This report has been prepared for the exclusive use of Matt Hancock Properties and Acheron Engineering Services for specific application to the proposed Durant Homestead on Chute Road in Windham, Maine. Burman Land & Tree, LLC has conducted the work in accordance with generally accepted soil science practices. No warranty, expressed or implied, is made.

Out services were conducted, compiled and reported in general accordance with guidelines described in the National Soil Survey Handbook (1996), the Soil Survey Manual (1993), and the Guidelines for Maine Certified Soil Scientists for Soil Identification and Mapping (2004, revised 2009). Hydric soils were identified using the Field Indicators for Identifying Hydric Soils in New England, 2018 (Version 4.0) and the 2012 (Version 2.0) Supplement to the 1987 Corps of Engineers Wetland Delineation Manual.

The analyses performed during these services and the recommendations presented in this report are based in part upon the data obtained from subsurface explorations made at the site, and published information from the USDA Natural Resources Conservation Service. Variations in subsurface conditions may occur between explorations and may not become evident until construction. If variations in subsurface conditions become evident after submission of this report, it will be necessary to evaluate their nature and to review the recommendations of this report.

APPENDIX B
Site Location Map
Class B / Class C / Class L Soil Survey Plan



SITE LOCATION MAP

BURMAN
LAND & TREE COMPANY, LLC.

1,000 0 1,000 2,000

Scale in Feet

SITE LOCATION MAP
DURANT HOMESTEAD
CHUTE ROAD
WINDHAM, MAINE

Job No.: BLT #17-005	Scale: 1" = 1000'
Date: 7-31-18	Sheet: B-1

LEGEND

EXISTING

- PROPERTY LINE
- 72 – CONTOURS
- WETLAND
- TREE LINE
- SOIL BOUNDARY
- (2) – SOIL LABEL
- 18 – MAINLAND TEST PITS DATED, 06/2006
- TP22 – SOIL SOLUTIONS TEST PITS DATED, 08/2017
- SWTP 4 – BURMAN STORMWATER TEST PITS DATED, 12/2017
- SSTP21 – BURMAN SOIL SURVEY TEST PITS DATED, 07/2018
- SE TP7D – BURMAN SOIL EVALUATION TEST PITS DATED, 07/2018

PROPOSED

- LOT PROPERTY LINES
- WETLAND IMPACT
- LIMIT OF SOIL SURVEY DELINEATION
- AREA OF PREVIOUS DEVELOPMENT AND CURRENT REGRADING ACTIVITY (NOT ANTICIPATED TO EFFECT USE AND MANAGEMENT)
- TREE LINE

EXPLANATION AND USAGE GUIDE: I / II / III / IV / V

I – DRAINAGE CLASS
1. EXCESSIVELY AND SOMEWHAT EXCESSIVELY DRAINED
2. WELL DRAINED
3. MODERATELY WELL DRAINED
4. SOMEWHAT POORLY DRAINED
5. POORLY DRAINED
6. VERY POORLY DRAINED
9. NOT ABLE TO DETERMINE

II – PARENT MATERIAL
1. GLACIOFLUVIAL DEPOSITS
2A. ABLATION TILL
2B. DENSE BASAL TILL
3. VERY FINE SAND AND SILT DEPOSITS (EOLIAN/LACUSTRINE)
4. MULTIPLE PARENT MATERIALS
5. SILT AND CLAY DEPOSITS (MARINE)
6. ALLUVIAL DEPOSITS
7. ORGANIC MATERIALS
8. FILLED, REGRADED, OR EXCAVATED MATERIALS
9. OTHER – DESCRIBE IN NARRATIVE

III – BEDROCK CLASS
1. 0–10"
2. 10–20"
3. 20–40"
4. 40–60"
5. >60"

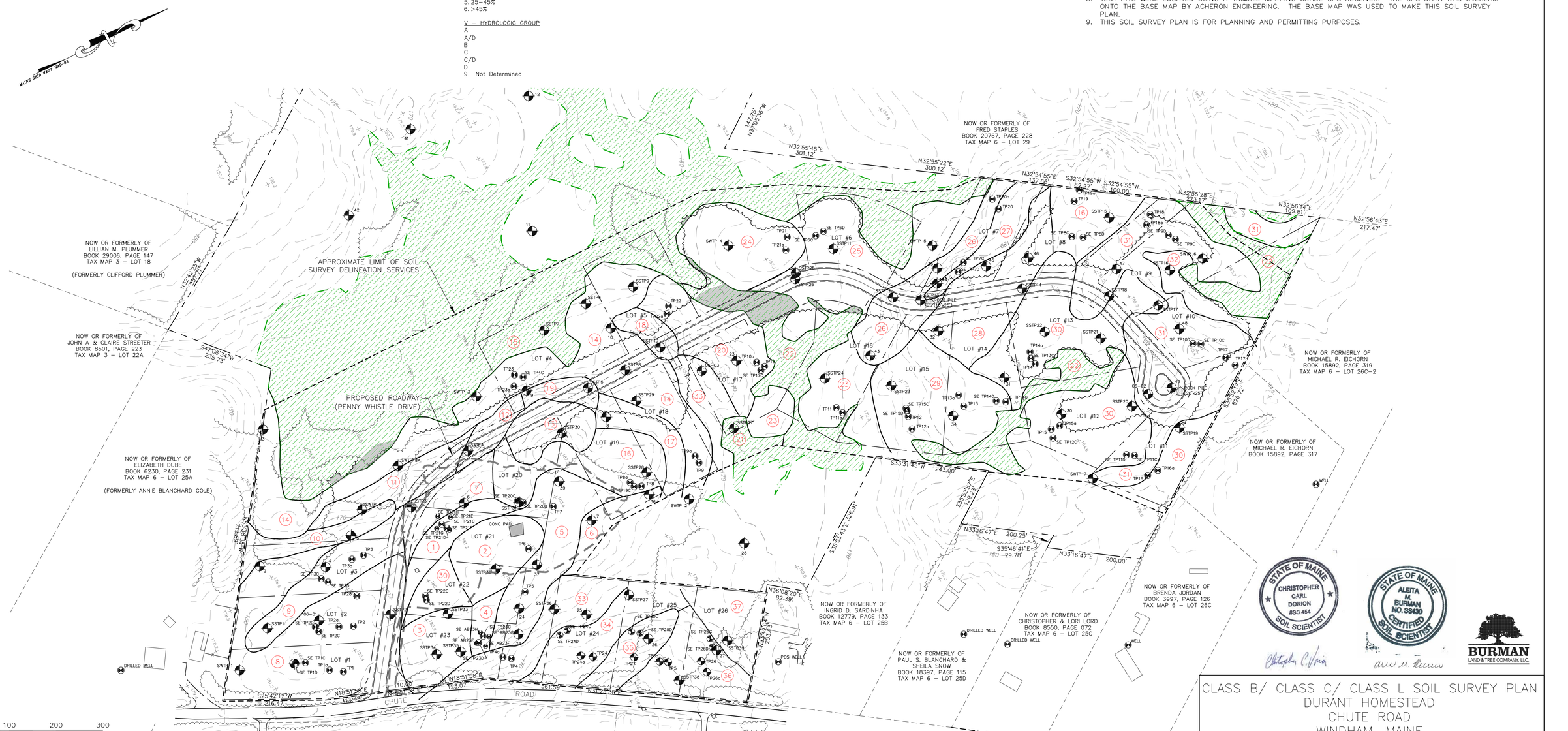
IV – SLOPE CLASS
1. 0–3%
2. 1–8%
3. 8–15%
4. 15–25%
5. 25–45%
6. >45%

V – HYDROLOGIC GROUP
A
A/D
B
C
C/D
D
9 Not Determined

SOIL MAP UNIT LEGEND

1. 3 / 4,8 / 2,3 / 1 / D
2. 1 / 2A,8 / 2 / 1 / C
3. 2,3 / 2A,8 / 3 / 1 / C
4. 3 / 3 / 2 / 1 / C
5. 2,4 / 2A,8 / 3 / 2 / C
6. 3 / 2A,8 / 3 / 2 / C
7. 3 / 2B,8 / 3 / 2 / C
8. 3 / 3 / 3 / 2 / C
9. 3,4 / 5 / 5 / 1 / D
10. 4 / 5 / 5 / 4 / D
11. 4 / 4 / 5 / 3 / D
12. 3 / 2B / 4 / 4 / C
13. 2 / 3 / 5 / 3 / C
14. 4 / 5 / 5 / 2 / D
15. 5 / 5 / 5 / 1 / D
16. 3 / 3,8 / 3 / 2 / C
17. 4 / 3 / 5 / 2 / C
18. 2 / 2B / 5 / 3 / C
19. 3 / 3 / 3 / 4 / C
20. 3,4 / 3 / 5 / 3 / C
21. 5 / 5 / 4 / 2 / D
22. 5 / 5 / 5 / 2 / D
23. 4 / 5 / 3 / 2 / D
24. 3 / 3 / 5 / 2 / C
25. 4 / 5 / 5 / 2 / D
26. 4 / 3 / 4 / 4 / C
27. 4 / 3 / 5 / 3 / C
28. 2,3 / 2A, 2B / 3 / 2 / C
29. 3,4 / 3 / 4 / 2 / C
30. 3,4 / 3 / 3 / 1 / C
31. 3,4 / 3 / 5 / 2 / C
32. 4 / 3 / 5 / 1 / C
33. 3 / 3 / 3 / 3 / C
34. 3,4 / 5 / 4 / 2 / D
35. 2,3 / 2A / 3 / 3 / C
36. 3,4 / 5 / 5 / 2 / D
37. 3 / 5 / 5 / 1 / D

NOTES:
1. OWNER OF RECORD: MATT HANCOCK PROPERTIES, PO BOX 295, CASCO, ME. 04015. BOOK 3319, PAGE 124.
2. TOPOGRAPHIC FEATURES ON THIS PLAN ARE BASED ON WORK DONE BY AERIAL SURVEY AND PHOTO, INC. NORRIDGEWOCK, ME., ELEVATIONS FOR GROUND CONTROL WERE PERFORMED BY MAIN–LAND DEVELOPMENT CONSULTANTS, LIVERMORE FALLS, ME. ALL BEARINGS ARE REFERENCED TO MAINE WEST ZONE NAD–83.
3. PROPERTY BOUNDARY SURVEY COMPLETED BY PLISGA AND DAY SURVEYORS, INC. ON JUNE 15, 2018.
4. THIS CLASS B – HIGH INTENSITY / CLASS C – MEDIUM HIGH INTENSITY / CLASS L – LINEAR SOIL SURVEY PLAN DETAILS THE FINDINGS OF SOIL SURVEY SERVICES CONDUCTED FOR THE PROPOSED DURANT HOMESTEAD RESIDENTIAL SUBDIVISION BY BURMAN LAND & TREE, LLC ON AN APPROXIMATELY 20–25 ACRE PORTION OF THE MATT HANCOCK PROPERTIES PROPERTY ON CHUTE ROAD IN WINDHAM, MAINE. THE CLASS B – HIGH INTENSITY SOIL SURVEY WAS CONDUCTED IN THE PROPOSED DEVELOPMENT AREA, THE CLASS L – LINEAR SOIL SURVEY WAS CONDUCTED IN THE PROPOSED ROAD, AND THE CLASS C – MEDIUM INTENSITY SOIL SURVEY WAS CONDUCTED IN THE MAPPED WETLANDS / HYDRIC SOILS. THE CLASS B – HIGH INTENSITY SOIL SURVEY PORTION MEETS MOST OF THE MAPPS STANDARDS FOR A CLASS A – HIGH INTENSITY SOIL SURVEY WITH THE EXCEPTION THAT THE MAP UNITS CAN CONTAIN DISSIMILAR LIMITING INCLUSIONS OF UP TO 1/3 ACRE.
5. THE SOIL SURVEY (SS) TEST PITS SHOWN ON THIS PLAN WERE DOCUMENTED ON JUNE 12, 13, AND 22, 2018. BURMAN LAND & TREE, LLC USED TEST PITS CONDUCTED DURING STORMWATER TEST PIT AND PRELIMINARY SOIL SITE EVALUATION SERVICES ON THE PROPOSED DURANT HOMESTEAD RESIDENTIAL SUBDIVISION IN 2017 AND 2018 IN THEIR FINDINGS, THE TEST PITS AS SHOWN ON THIS PLAN. BURMAN LAND & TREE, LLC USED TEST PITS CONDUCTED DURING A CLASS B – HIGH INTENSITY SOIL SURVEY ON THE LARGER PROPERTY BY MAIN–LAND DEVELOPMENT CONSULTANTS IN 2006 IN THEIR FINDINGS, THE TEST PITS AS SHOWN ON THIS PLAN. BURMAN LAND & TREE, LLC ALSO USED TEST PITS CONDUCTED DURING PRELIMINARY SOIL SITE EVALUATION SERVICES BY SOIL SOLUTIONS ON THE PROPOSED DURANT HOMESTEAD RESIDENTIAL SUBDIVISION IN 2017 IN THEIR FINDINGS, THE TEST PITS AS SHOWN ON THIS PLAN.
6. THIS SOIL SURVEY PLAN SHOULD BE USED IN CONJUNCTION WITH THE ACCOMPANYING SOIL PROFILE DESCRIPTIONS AND SOIL SURVEY NARRATIVE IN THE REPORT TITLED "CLASS B – HIGH INTENSITY / CLASS C – MEDIUM HIGH INTENSITY / CLASS L – LINEAR SOIL SURVEY SOIL SURVEY REPORT", DATED JULY 31, 2018 AS PREPARED BY BURMAN LAND & TREE, LLC WITH CERTIFIED SOIL SCIENTISTS ALEITA M. BURMAN, C.S.S. #430 AND CHRISTOPHER DORION, C.S.S. #454. THIS SOIL SURVEY WAS CONDUCTED GENERALLY FOLLOWING THE STANDARDS ADOPTED BY THE MAINE ASSOCIATION OF PROFESSIONAL SOIL SCIENTISTS, FEBRUARY 2004, AS AMENDED MARCH 2009, WITH EXCEPTIONS AS NOTED IN THE REPORT.
7. THE HYDRIC SOIL BOUNDARIES AS INDICATED ON THIS PLAN CORRELATE TO THE WETLAND DELINEATION BOUNDARIES AS DELINEATED BY BURMAN LAND & TREE, LLC IN 2018. INFORMATION ON WETLANDS AND OTHER RESOURCE FEATURES IS INCLUDED IN THE PROTECTED NATURAL RESOURCES DELINEATION AND VERIFICATION REPORT DATED JULY 05, 2018, SUBMITTED UNDER SEPARATE COVER.
8. TEST PITS WERE LOCATED USING A TRIMBLE MAPPING GRADE GPS RECEIVER. THE GPS DATA WAS OVERLAID ONTO THE BASE MAP BY ACHERON ENGINEERING. THE BASE MAP WAS USED TO MAKE THIS SOIL SURVEY PLAN.
9. THIS SOIL SURVEY PLAN IS FOR PLANNING AND PERMITTING PURPOSES.



0 100 200 300
GRAPHIC SCALE
1" = 100'

STATE OF MAINE CHRISTOPHER CARL DORION #SS 454 SOIL SCIENTIST

STATE OF MAINE ALEITA M. BURMAN NO. SS430 CERTIFIED SOIL SCIENTIST

BURMAN LAND & TREE COMPANY, LLC.

CLASS B/ CLASS C/ CLASS L SOIL SURVEY PLAN
DURANT HOMESTEAD
CHUTE ROAD
WINDHAM, MAINE

Job No.: BLT #17–005	Scale: 1" = 100'
Date: 7–31–18	Sheet: B–2

APPENDIX C
Soil Survey Legend
Table of Soil Map Unit Test Pit Representation
Soil Map Unit Descriptions

Explanation and Usage Guide: I / II / III / IV / V

I – Drainage Class

1. Excessively and Somewhat Excessively Drained
2. Well Drained
3. Moderately Well Drained
4. Somewhat Poorly Drained
5. Poorly Drained
6. Very Poorly Drained
9. Not Able to Determine

II – Parent Material

1. Glaciofluvial Deposits

2A. Ablation Till

2B. Dense Basal Till

3. Very Fine Sand and Silt Deposits (eolian/lacustrine)

4. Multiple Parent Materials

5. Silt and Clay Deposits (marine)

6. Alluvial Deposits

7. Organic Materials

8. Filled, Regraded, or Excavated Materials

9. Other – Describe in Narrative

III – Bedrock Class

1. 0-10”
2. 10-20”
3. 20-40”
4. 40-60”
5. >60”

IV - Slope Class

1. 0-3%
2. 1-8%
3. 8-15%
4. 15-25%
5. 25-45%
6. >45%

V – Hydrologic Group

A

A/D

B

C

C/D

D

9 Not Determined

Soil Map Unit Legend

1. 3 / 4,8 / 2,3 / 1 / D
2. 1 / 2A,8 / 2 / 1 / C
3. 2,3 / 2A,8 / 3 / 1 / C
4. 3 / 3 / 2 / 1 / C
5. 2,4 / 2A,8 / 3 / 2 / C
6. 3 / 2A,8 / 3 / 2 / C
7. 3 / 2B,8 / 3 / 2 / C
8. 3 / 3 / 3 / 2 / C
9. 3,4 / 5 / 5 / 1 / D
10. 4 / 5 / 5 / 4 / D
11. 4 / 4 / 5 / 3 / D
12. 3 / 2B / 4 / 4 / C
13. 2 / 3 / 5 / 3 / C
14. 4 / 5 / 5 / 2 / D
15. 5 / 5 / 5 / 1 / D
16. 3 / 3,8 / 3 / 2 / C
17. 4 / 3 / 5 / 2 / C
18. 2 / 2B / 5 / 3 / C
19. 3 / 3 / 3 / 4 / C
20. 3,4 / 3 / 5 / 3 / C
21. 5 / 5 / 4 / 2 / D
22. 5 / 5 / 5 / 2 / D
23. 4 / 5 / 3 / 2 / D
24. 3 / 3 / 5 / 2 / C
25. 4 / 5 / 5 / 2 / D
26. 4 / 3 / 4 / 4 / C
27. 4 / 3 / 5 / 3 / C
28. 2,3 / 2A, 2B / 3 / 2 / C
29. 3,4 / 3 / 4 / 2 / C
30. 3,4 / 3 / 3 / 1 / C
31. 3,4 / 3 / 5 / 2 / C
32. 4 / 3 / 5 / 1 / C
33. 3 / 3 / 3 / 3 / C
34. 3,4 / 5 / 4 / 2 / D
35. 2,3 / 2A / 3 / 3 / C
36. 3,4 / 5 / 5 / 2 / D
37. 3 / 5 / 5 / 1 / D

TABLE: SMU Test Pit Representation					
SMU	BLT SS TP's (backhoe)	BLT SW TP's (backhoe)	MLD TP's (backhoe *)	Soil Solutions TP's (hand dug)	BLT SE TP's (hand dug)
1	Bed 21				SE TP 21C, 21D
2	SS TP 32			TP 6	
3	SS TP 33, 34, 35				SE TP 22C, 22D
4					SE TP 23C, 23D & AB's
5			TP 24, 37, 38, 39	TP 7	SE TP 21C, 21D
6			TP 7, 36		
7	SS TP 3		TP 6		
8		SW TP 1	TP 1, 2, 06-01	TP 28, 1, 1A, 2, 2A	SE TP 1C, 1D, 2C, 2D
9	SS TP 1		TP 4	TP 3, 3A	SE TP3C, 3D
10			TP 5		
11		SW TP 8			
12	SS TP 4				
13	SS TP 30				
14	SS TP 6, 8, 9, 29	SW TP 2, 3	TP 3, 10	TP 9, 9A, 23, 23A	SE TP 4C
15	SS TP 7				
16	SS TP 28, 15			TP 8, 8A, 19, 19A	SE TP 8C, 8D, 19C, 20C, 20D
17			TP 8		
18	SS TP 10				
19	SS TP 5		TP 9		
20			TP 23	TP 10, 10A, 22, 22A	
21	SS TP 27				
22					Wetland DP's
23	SS TP 24			TP 11, 11A	
24		SW TP 4		TP 21, 21A	
25	SS TP 11, 25, 26	SW TP 5			SE TP 6C, 6D
26	SS TP 12, 13		TP 13, 43	TP 20A	
27			TP 14	TP 20	SE TP 7C, 7D
28	SS TP 14		TP 32, 45, 46		
29	SS TP 23		TP 34	TP 13, 13A	SE TP 14C, 14D, 15C, 15D
30	SS TP 17, 20, 21, 22		TP 30, 31	TP 14, 14A, 15, 15A, 16A	SE TP 13C, 12C, 22C, 22D
31	SS TP 18	SW TP 6	TP 47, 48, 49, 06-02	TP 16, 17, 17A, 18, 18A	SE TP 10C, 10D, 19C, 19D
32	SS TP 16				
33	SS TP 36		TP 25	TP 4, 4A	
34	SS TP 37			TP 24, 24A	SE TP 24C, 24D
35			TP 26	TP 27	SE TP 25C, 25D
36	SS TP 38		TP 27	TP 5, 5A, 26, 26A	SE TP 26C, 26D
37	SS TP 39				

MAP UNIT #1: 3/4,8/2,3/1/D

Setting

Parent Material	Fill over marine and glacio-lacustrine, and glacial till deposits, on bedrock
Landform	Upland hilltop
Landscape Position	Level to nearly level upland hilltop
Slope Gradient Range	0-3%

Composition and Soil Characteristics

Drainage Class	**3**	Moderately Well Drained
Parent Material	**4,8**	Multiple (fill over lacustrine/marine), Regraded
Depth to Bedrock	**2,3**	Shallow to Moderately Deep (depth to bedrock is 10 to 40 inches)
Slope Class	**1**	0-3%
Hydrologic Group	**D**	D
Permeability	Unknown; variable due to fill	
Flooding Potential	None	
Surface Run-Off	Very Low to Low	

Typical Profile Description (at Bed 21)

Surface	0-12” compact, brown, very gravelly sand fill in roadway
Subsurface	
Subsoil	12–23” firm, yellowish brown, silt loam
Substratum	23-36” firm in place, brown, sand over bedrock at 36”

Inclusions

Similar	2,4/4,8/2,3/2/D
Dissimliar	1/2A,8/2/1/C; 2,3,4/2A,8/23/1/C; 3/2B/3/2/C; 2,4/2A,8/3/1/C

Use and Management – Residential Subdivision

Proposed Use	**NRCS Limitation Rating**	**Limitation**	**Corrective Measures**
Dwellings with Basements	Very Limited – 1.00	Depth to Bedrock	Limitations due to shallow depth to bedrock can be mitigated by additions of granular fill, blasting, proper feature design, extensive site preparation or a combination of all.
Dwellings without Basements	Very Limited – 1.00	Depth to Bedrock	
Local Roads	Very Limited – 1.00	Depth to Bedrock	
Lawns/Landscaping	Very Limited – 1.00	Depth to Bedrock	
Subsurface Wastewater Disposal Leachbeds	Very Limited – 1.00	Depth to Bedrock	

MAP UNIT #2: 1/2A,8/2/1/C

Setting

Parent Material	Glacial till
Landform	Upland hilltop
Landscape Position	Level to nearly level upland hilltop
Slope Gradient Range	0-3%

Composition and Soil Characteristics

Drainage Class	**1**	Somewhat Excessively Drained
Parent Material	**2A,8**	Ablation Till, Regraded
Depth to Bedrock	**2**	Shallow (depth to bedrock is 10 to <20 inches)
Slope Class	**1**	0-3%
Hydrologic Group	**C**	C
Permeability	Unknown	
Flooding Potential	None	
Surface Run-Off	Very Low to Low	

Typical Profile Description (at SS TP 32)

Surface	0-5” compact (firm), brown, gravelly sandy loam
Subsurface	
Subsoil	5-8” compact (firm), brown, loam over 8-12” compact (firm), brown, very fine sandy loam
Substratum	12-19” firm, yellowish brown, very fine sandy loam over bedrock at 19”

Inclusions

Similar	1/2A,8/2/2/C
Dissimliar	2,3,4/2A,8/23/1/C; 2/2A/3/1/C; 2,4/2A,8/3/1/C; 2,4/4,8/2,3/1/D

Use and Management – Residential Subdivision

Proposed Use	**NRCS Limitation Rating**	**Limitation**	**Corrective Measures**
Dwellings with Basements	Very Limited – 1.00	Depth to Bedrock	Limitations due to shallow depth to bedrock can be mitigated by additions of granular fill, blasting, proper feature design, extensive site preparation or a combination of all.
Dwellings without Basements	Very Limited – 1.00	Depth to Bedrock	
Local Roads	Very Limited – 1.00	Depth to Bedrock	
Lawns/Landscaping	Very Limited – 1.00	Depth to Bedrock	
Subsurface Wastewater Disposal Leachbeds	Very Limited – 1.00	Depth to Bedrock	

MAP UNIT #3: 2,3/2A,8/3/1/C

Setting

Parent Material	Glacial till
Landform	Upland hilltop
Landscape Position	Level to nearly level upland hilltop
Slope Gradient Range	0-3%

Composition and Soil Characteristics

Drainage Class	**2,3**	Well Drained and Moderately Well Drained
Parent Material	**2A,8**	Ablation Till, Regraded (some gravelly fill)
Depth to Bedrock	**3**	Moderately Deep (depth to bedrock is 20 to <40 inches)
Slope Class	**1**	0-3%
Hydrologic Group	**C**	C
Permeability	Unknown	
Flooding Potential	None	
Surface Run-Off	Very Low to Low	

Typical Profile Description (at SS TP 34)

Surface	0-9” loose, very dark grayish brown, gravelly sand
Subsurface	
Subsoil	9-15” friable, dark brown, channery sandy loam
Substratum	15-37”” friable, yellowish brown, channery sandy loam over bedrock at 37”

Inclusions

Similar	2,3,4/2A/3/1/C; 2,3,4/2A/3/2/C
Dissimliar	2,4/4,8/2,3/1/D;1/2A,8/2/1/C; 3/2A/3/1/C;3/3/3/2/C;3/2B/3/2/C

Use and Management – Residential Subdivision

Proposed Use	**NRCS Limitation Rating**	**Limitation**	**Corrective Measures**
Dwellings with Basements	Very Limited – 1.00	Depth to Bedrock	Limitations due to shallow depth to bedrock can be mitigated by additions of granular fill, blasting, proper feature design, extensive site preparation or a combination of all.
Dwellings without Basements	Very Limited – 1.00	Depth to Bedrock	
Local Roads	Very Limited – 1.00	Depth to Bedrock	
Lawns/Landscaping	Very Limited – 1.00	Depth to Bedrock	
Subsurface Wastewater Disposal Leachbeds	Very Limited – 1.00	Depth to Bedrock	

MAP UNIT #4: 3/3/2/1/C

Setting

Parent Material	Marine and Glacio-Lacustrine Sediments
Landform	Upland hilltop
Landscape Position	Level to nearly level upland hilltop
Slope Gradient Range	0-3%

Composition and Soil Characteristics

Drainage Class	**3**	Well Drained
Parent Material	**3**	Marine and Glacio-Lacustrine Sediments
Depth to Bedrock	**2**	Shallow (depth to bedrock is 10 to <20 inches)
Slope Class	**1**	0-3%
Hydrologic Group	**C**	C
Permeability	Unknown	
Flooding Potential	None	
Surface Run-Off	Very Low to Low	

Typical Profile Description (at SE TP23C)

Surface	0-7” friable, dark brown, silt loam
Subsurface	
Subsoil	7-16” friable, dark yellowish brown, silt loam
Substratum	16-18” firm, mottled, olive brown, silt loam over bedrock at 18”

Inclusions

Similar	3/3/3/2/C
Dissimliar	3/3/3/3/C; 2,4/2A,8/3/1/C; 2,3,4/2A,8/3/1/C; 1/2A,8/2/1/C

Use and Management – Residential Subdivision

Proposed Use	**NRCS Limitation Rating**	**Limitation**	**Corrective Measures**
Dwellings with Basements	Very Limited – 1.00	Depth to Bedrock and Saturated Zone	Limitations due to shallow depth to bedrock can be mitigated by additions of granular fill, blasting, proper feature design, extensive site preparation or a combination of all. Limitations due to shallow depth to saturated zone can be mitigated by additions of granular fill, proper feature design, drainage, or a combination of all.
Dwellings without Basements	Very Limited – 1.00	Depth to Bedrock and Saturated Zone	
Local Roads	Very Limited – 1.00	Depth to Bedrock and Saturated Zone	
Lawns/Landscaping	Very Limited – 1.00	Depth to Bedrock and Saturated Zone	
Subsurface Wastewater Disposal Leachbeds	Very Limited – 1.00	Depth to Bedrock and Saturated Zone	

MAP UNIT #5: 2,4/2A,8/3/2/C

Setting

Parent Material	Glacial till
Landform	Hilltop shouderslope
Landscape Position	Nearly level to gently sloping shoulderslope
Slope Gradient Range	1-8%

Composition and Soil Characteristics

Drainage Class	**2,4**	Well Drained and Somewhat Poorly Drained (depending on depth to Bedrock)
Parent Material	**2A,8**	Fill over Ablation Till, regraded
Depth to Bedrock	**3**	Moderately Deep (depth to bedrock is 20 to <40 inches)
Slope Class	**2**	1-8%
Hydrologic Group	**C**	C
Permeability	Unknown	
Flooding Potential	None	
Surface Run-Off	Low to Medium	

Typical Profile Description (at MLD TP 38)

Surface	0-5” friable, brown, sandy loam
Subsurface	
Subsoil	5-23” friable, reddish brown, sandy loam
Substratum	23-35”” friable, olive brown, sandy loam over bedrock at 35”

Inclusions

Similar	2,4/2A,8/3/1/C; 2,3,4/2A,8/3/1/C
Dissimliar	1/2A,8/2/1/C; 3/3/3/3/C

Use and Management – Residential Subdivision

Proposed Use	**NRCS Limitation Rating**	**Limitation**	**Corrective Measures**
Dwellings with Basements	Very Limited – 1.00	Depth to Bedrock	Limitations due to shallow depth to bedrock can be mitigated by additions of granular fill, blasting, proper feature design, extensive site preparation or a combination of all.
Dwellings without Basements	Very Limited – 1.00	Depth to Bedrock	
Local Roads	Very Limited – 1.00	Depth to Bedrock	
Lawns/Landscaping	Very Limited – 1.00	Depth to Bedrock	
Subsurface Wastewater Disposal Leachbeds	Very Limited – 1.00	Depth to Bedrock	

MAP UNIT #6: 3/2A,8/3/2/C

Setting

Parent Material	Glacial till
Landform	Hilltop sideslope
Landscape Position	Nearly level to gently sloping upland sideslope
Slope Gradient Range	1-8%

Composition and Soil Characteristics

Drainage Class	**3**	Moderately Well Drained
Parent Material	**2A,8**	Ablation Till, Graded
Depth to Bedrock	**3**	Moderately Deep (depth to bedrock is 20 to <40 inches)
Slope Class	**2**	1-8%
Hydrologic Group	**C**	C
Permeability	Unknown	
Flooding Potential	None	
Surface Run-Off	Low to medium	

Typical Profile Description (at MLD TP 36)

Surface	0-5” friable, brown, fine sandy loam
Subsurface	
Subsoil	5-13” friable, reddish brown, fine sandy loam
Substratum	13-25”” friable, olive brown, fine sandy loam over bedrock at 25”

Inclusions

Similar	2,4/2A,8/3/1/C; 3/2A,8/3/1/C
Dissimliar	3/3/3/3/C; 3/3/3/2/C

Use and Management – Residential Subdivision

Proposed Use	**NRCS Limitation Rating**	**Limitation**	**Corrective Measures**
Dwellings with Basements	Very Limited – 1.00	Depth to Bedrock	Limitations due to shallow depth to bedrock can be mitigated by additions of granular fill, blasting, proper feature design, extensive site preparation or a combination of all.
Dwellings without Basements	Very Limited – 1.00	Depth to Bedrock	
Local Roads	Very Limited – 1.00	Depth to Bedrock	
Lawns/Landscaping	Very Limited – 1.00	Depth to Bedrock	
Subsurface Wastewater Disposal Leachbeds	Very Limited – 1.00	Depth to Bedrock	

MAP UNIT #7: 3/2B,8/3/2/C

Setting

Parent Material	Glacial Till
Landform	Hilltop shoulderslope
Landscape Position	Gently sloping hilltop shoulderslope
Slope Gradient Range	1-8%

Composition and Soil Characteristics

Drainage Class	**3**	Moderately Well Drained
Parent Material	**2B,8**	Dense Basal Till, Regraded
Depth to Bedrock	**3**	Moderately Deep (depth to bedrock is 20 to <40 inches)
Slope Class	**2**	1-8%
Hydrologic Group	**C**	C
Permeability	Unknown	
Flooding Potential	None	
Surface Run-Off	Low to medium	

Typical Profile Description (at MLD TP 6)

Surface	0-10” friable, brown, fine sandy loam (up to 6” gravelly sand in old roadbed)
Subsurface	
Subsoil	10-17” friable, reddish brown, fine sandy loam
Substratum	17-22”” friable, olive brown, fine sandy loam over firm, olive sandy loam. Bedrock at 41” in SS TP 3.

Inclusions

Similar	2,4/2A,8/3/1/C; 3/2A,8/3/1/C
Dissimliar	3/3/3/3/C; 3/3/3/2/C; 3,4/2B/4/4/C; 4/5/5/3/D; 3,4/5/4/2/D;2,4/4,8/2,3/1/D

Use and Management – Residential Subdivision

Proposed Use	**NRCS Limitation Rating**	**Limitation**	**Corrective Measures**
Dwellings with Basements	Very Limited – 1.00	Depth to Bedrock	Limitations due to shallow depth to bedrock can be mitigated by additions of granular fill, blasting, proper feature design, and/or extensive site preparation.
Dwellings without Basements	Very Limited – 1.00	Depth to Bedrock	
Local Roads	Very Limited – 1.00	Depth to Bedrock	
Lawns/Landscaping	Very Limited – 1.00	Depth to Bedrock	
Subsurface Wastewater Disposal Leachbeds	Very Limited – 1.00	Depth to Bedrock	

MAP UNIT #8: 3/3/3/2/C

Setting

Parent Material	Marine and Glacio-Lacustrine Sediments
Landform	Hilltop
Landscape Position	Nearly level to gently sloping upland hilltop
Slope Gradient Range	1-8%

Composition and Soil Characteristics

Drainage Class	**3**	Moderately Well Drained
Parent Material	**3**	Marine and Glacio-Lacustrine Sediments
Depth to Bedrock	**3**	Moderately Deep (depth to bedrock is 20 to <40 inches)
Slope Class	**2**	1-8%
Hydrologic Group	**C**	C
Permeability	Unknown	
Flooding Potential	None	
Surface Run-Off	Low to Medium	

Typical Profile Description (at SW TP 1)

Surface	0-12” friable, dark yellowish brown, loam
Subsurface	
Subsoil	12-23” friable, olive brown, silt loam over bedrock at 23”
Substratum	

Inclusions

Similar	3/3/3/1/C
Dissimliar	2,3,4/2A,8/2/1/C; 3,4/5/4/2/D; 4/5/5/4/D; 3/2B,8/3/2/C

Use and Management – Residential Subdivision

Proposed Use	**NRCS Limitation Rating**	**Limitation**	**Corrective Measures**
Dwellings with Basements	Very Limited – 1.00	Depth to Bedrock and Saturated Zone	Limitations due to shallow depth to bedrock can be mitigated by additions of granular fill, blasting, proper feature design, and/or extensive site preparation. Limitations due to shallow depth to saturated zone can be mitigated by additions of granular fill, proper design of features, and/or drainage.
Dwellings without Basements	Very Limited – 1.00	Depth to Bedrock and Saturated Zone	
Local Roads	Very Limited – 1.00	Depth to Bedrock and Saturated Zone	
Lawns/Landscaping	Very Limited – 1.00	Depth to Bedrock and Saturated Zone	
Subsurface Wastewater Disposal Leachbeds	Very Limited – 1.00	Depth to Bedrock and Saturated Zone	

MAP UNIT #9: 3,4/5/5/2/D

Setting

Parent Material	Marine Sediments
Landform	Hilltop
Landscape Position	Level to nearly level upland hilltop
Slope Gradient Range	0-3%

Composition and Soil Characteristics

Drainage Class	**3,4**	Moderately well and somewhat poorly drained (10-17" to SWT)
Parent Material	**5**	Marine Sediments
Depth to Bedrock	**5**	Deep (depth to bedrock is 40 to <60 inches)
Slope Class	**1**	0-3%
Hydrologic Group	**D**	D
Permeability	Unknown	
Flooding Potential	None	
Surface Run-Off	Very low to low	

Typical Profile Description (at SS TP 1)

Surface	0-9" friable, brown, silt loam
Subsurface	
Subsoil	9-26" friable, brown, silt loam (8") over firm, mottled and depleted, olive brown silt loam
Substratum	26-66" firm, mottled and depleted, olive brown silty clay loam over bedrock at 66"

Inclusions

Similar	4/5/5/3/D; 3/5/5/2/D; 4/5/5/2/D
Dissimliar	3/3/3/2/C; 4/5/5/4/D; 3/2B,8/3/2/C; 2,3,4/2A,8/3/1/C

Use and Management – Residential Subdivision

Proposed Use	NRCS Limitation Rating	Limitation	Corrective Measures
Dwellings with Basements	Very Limited – 1.00	Depth to Saturated Zone	Limitations due to shallow depth to saturated zone and shrink-swell potential can be mitigated by additions of granular fill, and/or proper design of features.
Dwellings without Basements			
Local Roads		Shrink-Swell Potential	
Lawns/Landscaping	Limited – 0.04		
Subsurface Wastewater Disposal Leachbeds			

MAP UNIT #10: 4/5/5/4/D

Setting

Parent Material	Marine Sediments
Landform	Hilltop shoulderslope
Landscape Position	Moderately steep hilltop shoulderslope
Slope Gradient Range	15-25%

Composition and Soil Characteristics

Drainage Class	**4**	Somewhat poorly drained
Parent Material	**5**	Marine Sediments
Depth to Bedrock	**5**	Very Deep (depth to bedrock is greater than 60 inches)
Slope Class	**4**	15-25%
Hydrologic Group	**D**	D
Permeability	Unknown	
Flooding Potential	None	
Surface Run-Off	High to very high	

Typical Profile Description (at MLD TP 5)

Surface	0-4" friable, brown, silt loam
Subsurface	
Subsoil	4-13" friable, olive brown, silty clay loam
Substratum	13" to unknown depth - firm, gray, silty clay loam. Depth to bedrock between 40-60" is anticipated based on nearby TP's.

Inclusions

Similar	4/5/9/4/D
Dissimliar	3/3/3/2/C; 3,4/5/5/2/D; 4/5/5/2/D; 4/5/5/3/D; 3/2B,8/3/2/C

Use and Management – Residential Subdivision

Proposed Use	**NRCS Limitation Rating**	**Limitation**	**Corrective Measures**
Dwellings with Basements Dwellings without Basements Local Roads Lawns/Landscaping Subsurface Wastewater Disposal Leachbeds	Very Limited – 1.00 Limited – 0.04	Depth to Bedrock, Saturated Zone, and Slope Shrink-Swell Potential	Limitations due to shallow depth to bedrock can be mitigated by additions of granular fill, blasting, proper feature design, and/or extensive site preparation. Limitations due to shallow depth to saturated zone and shrink-swell potential can be mitigated by additions of granular fill, proper feature design, and/or drainage. Limitations due to slope can be mitigated by additions of granular fill, cut and fill slopes and/or proper feature design.

MAP UNIT #11: 4/4/5/3/D

Setting

Parent Material	Glacial Till over Marine Sediments
Landform	Upland sideslope
Landscape Position	Strongly sloping upland sideslope
Slope Gradient Range	8-15%

Composition and Soil Characteristics

Drainage Class	**4**	Somewhat poorly drained
Parent Material	**4**	Glacial Till over Marine Sediments
Depth to Bedrock	**5**	Deep (depth to bedrock is greater than 60 inches)
Slope Class	**3**	8-15%
Hydrologic Group	**D**	D
Permeability	Unknown	
Flooding Potential	None	
Surface Run-Off	Medium to High	

Typical Profile Description (at SW TP 8)

Surface	0-8" friable, dark brown, loam
Subsurface	
Subsoil	8-15" friable, yellowish brown, very fine sandy loam
Substratum	15-78" firm, mottled, grayish brown, silty clay loam (23") over firm, mottled, grayish brown silty clay over bedrock at 78"

Inclusions

Similar	4/4/5/2/D
Dissimliar	3,4/5/5/2/D; 4/5/5/4/D; 4/5/5/2/D; 3,4/2B/4/4/C; 3/2B,8/3/2/C;4/5/5/3/D

Use and Management – Residential Subdivision

Proposed Use	NRCS Limitation Rating	Limitation	Corrective Measures
Dwellings with Basements	Very Limited – 1.00	Depth to Saturated Zone	Limitations due to shallow depth to bedrock can be mitigated by additions of granular fill, blasting, proper feature design, and/or extensive site preparation. Limitations due to shallow depth to saturated zone and shrink-swell potential can be mitigated by additions of granular fill, proper feature design, and/or drainage. Limitations due to slope can be mitigated by additions of granular fill, cut and fill slopes and/or proper feature design.
Dwellings without Basements			
Local Roads	Limited – 0.63	Slope	
Lawns/Landscaping			
Subsurface Wastewater Disposal Leachbeds	Limited – 0.04	Shrink-Swell Potential	

MAP UNIT #12: 3/2B/4/4/C

Setting

Parent Material	Glacial Till
Landform	Upland sideslope
Landscape Position	Moderately steep upland sideslope
Slope Gradient Range	15-25%

Composition and Soil Characteristics

Drainage Class	**3**	Moderately Well Drained
Parent Material	**2B**	Dense Basal Till
Depth to Bedrock	**4**	Deep (depth to bedrock is 40 to <60 inches)
Slope Class	**4**	15-25%
Hydrologic Group	**C**	C
Permeability	Unknown	
Flooding Potential	None	
Surface Run-Off	High to Very High	

Typical Profile Description (at SS TP 4)

Surface	0-14” friable, brown, loam (7”) over friable, dark brown loam (7”)
Subsurface	
Subsoil	14-30” friable, brown, very fine sandy loam (8”) over friable, brown, very fine sandy loam (8”)
Substratum	30-49” firm, mottled, brown very fine sandy loam (10”) over very friable, brown, mottled, loamy very fine sandy loam (9”) over bedrock at 49”

Inclusions

Similar	3/2A/4/4/C
Dissimliar	4/5/5/2/D; 3/3/3/4/C; 2/3/5/3/C; 3/3/3/2/C; 3/2B/3/2/C; 3/2B/5/4/D

Use and Management – Residential Subdivision

Proposed Use	**NRCS Limitation Rating**	**Limitation**	**Corrective Measures**
Dwellings with Basements Dwellings without Basements Local Roads Lawns/Landscaping Subsurface Wastewater Disposal Leachbeds	Very Limited – 1.00 Limited – unknown Limited – 0.04	Slope Depth to Bedrock Shrink-Swell Potential	Limitations due to slope can be mitigated by additions of granular fill, cut and fill slopes and/or proper feature design. Limitations due to shrink-swell potential can be mitigated by additions of granular fill, proper feature design, and/or drainage. Limitations due to deep depth to bedrock can be mitigated by additions of granular fill, blasting, proper feature design, and/or extensive site preparation.

MAP UNIT #13: 2/3/5/3/C

Setting

Parent Material	Marine and Glacio-Lacustrine Sediments
Landform	Upland sideslope
Landscape Position	Strongly sloping upland sideslope
Slope Gradient Range	8-15%

Composition and Soil Characteristics

Drainage Class	**2**	Well Drained
Parent Material	**3**	Marine and Glacio-Lacustrine Sediments
Depth to Bedrock	**5**	Very Deep (depth to bedrock is greater than 60 inches)
Slope Class	**3**	8-15%
Hydrologic Group	**C**	C
Permeability	Unknown	
Flooding Potential	None	
Surface Run-Off	Medium to High	

Typical Profile Description (at SS TP 30)

Surface	0-6” friable, brown, very fine sandy loam
Subsurface	
Subsoil	6-24” friable, dark yellowish brown, very fine sandy loam
Substratum	24-72” friable, yellowish brown, very fine sandy loam over bedrock at 72”

Inclusions

Similar	3/3/5/3/C
Dissimliar	3/3/3/4/C; 4/3/5/2/C; 3/3/3/2/C; 3/2B/4/4/C; 3/2B/4/3/C

Use and Management – Residential Subdivision

Proposed Use	**NRCS Limitation Rating**	**Limitation**	**Corrective Measures**
Dwellings with Basements	Very Limited – 1.00	Depth to Saturated Zone	Limitations due to shallow depth to saturated zone can be mitigated by additions of granular fill, proper design of features, and/or drainage. Limitations due to slope can be mitigated by additions of granular fill, cut and fill slopes and/or proper feature design.
Dwellings without Basements			
Local Roads			
Lawns/Landscaping			
Subsurface Wastewater Disposal Leachbeds	Limited – 0.63	Slope	

MAP UNIT #14: 4/5/5/2/D

Setting

Parent Material	Marine Sediments
Landform	Upland toeslope
Landscape Position	Nearly level to gently sloping upland toeslope
Slope Gradient Range	1-8%

Composition and Soil Characteristics

Drainage Class	**4**	Somewhat poorly drained
Parent Material	**5**	Marine Sediments
Depth to Bedrock	**5**	Very Deep (depth to bedrock is greater than 60 inches)
Slope Class	**2**	1-8%
Hydrologic Group	**D**	D
Permeability	Unknown	
Flooding Potential	None	
Surface Run-Off	Low to Medium	

Typical Profile Description (at SS TP 8)

Surface	0-6” friable, brown, loam
Subsurface	
Subsoil	6-34” friable, brown, silt loam (9”) over firm, mottled, grayish brown silty clay loam
Substratum	34-90” - firm, mottled, olive gray, silt loam (20”) over friable, mottled, yellowish brown loamy very fine sand (36”) over bedrock at 90”.

Inclusions

Similar	4/5/5/2/1/D
Dissimliar	4/5/5/4/D; 4/4/5/3/D; 3/2B/4/4/C; 3/3/3/4/C; 3,4/3/5/3/C; 3/3/5/2/C; 2/2B/5/3/C

Use and Management – Residential Subdivision

Proposed Use	**NRCS Limitation Rating**	**Limitation**	**Corrective Measures**
Dwellings with Basements	Very Limited – 1.00 Limited – 0.04	Depth to Saturated Zone Shrink-Swell Potential	Limitations due to shallow depth to saturated zone and shrink-swell potential can be mitigated by additions of granular fill, proper feature design, and/or drainage.
Dwellings without Basements			
Local Roads			
Lawns/Landscaping			
Subsurface Wastewater Disposal Leachbeds			

MAP UNIT #15: 5/5/5/1/D

Setting

Parent Material	Marine Sediments
Landform	Base slope and flat
Landscape Position	Level and nearly level wetland flat
Slope Gradient Range	0-3%

Composition and Soil Characteristics

Drainage Class	**5**	Poorly drained
Parent Material	**5**	Marine Sediments
Depth to Bedrock	**5**	Very Deep (depth to bedrock is greater than 60 inches)
Slope Class	**1**	0-3%
Hydrologic Group	**D**	D
Permeability	Unknown	
Flooding Potential	None	
Surface Run-Off	Very low to low	

Typical Profile Description (at SS TP 7)

Surface	0-9” friable, dark gray, silt loam
Subsurface	
Subsoil	9-49” firm, mottled, gray, silt loam (27”) over firm, mottled, grayish brown silty clay loam (13”)
Substratum	49->58” - firm, mottled, gray, silty clay loam

Inclusions

Similar	5/5/5/2/D
Dissimliar	4/5/5/2/D; 3,4/3/5/3/C; 3/3/5/2/C; 4/5/5/2/D

Use and Management – Residential Subdivision

Proposed Use	**NRCS Limitation Rating**	**Limitation**	**Corrective Measures**
Dwellings with Basements Dwellings without Basements Local Roads Lawns/Landscaping Subsurface Wastewater Disposal Leachbeds	Very Limited – 1.00 Limited – 0.13	Depth to Saturated Zone Shrink-Swell Potential	Limitations due to shallow depth to saturated zone and shrink-swell potential can be mitigated by additions of granular fill, proper feature design, and/or drainage. This map unit is hydric and in a mapped wetland. Wetlands have permitting limitations.

MAP UNIT #16: 3/3,8/3/2/C

Setting

Parent Material	Marine and Glacio-Lacustrine Sediments
Landform	Upland sideslope
Landscape Position	Level to nearly level upland sideslope
Slope Gradient Range	1-8%

Composition and Soil Characteristics

Drainage Class	**3**	Moderately Well Drained
Parent Material	**3**	Marine and Glacio-Lacustrine Sediments
Depth to Bedrock	**3**	Moderately Deep (depth to bedrock is 20 to <40 inches)
Slope Class	**2**	1-8%
Hydrologic Group	**C**	C
Permeability	Unknown	
Flooding Potential	None	
Surface Run-Off	Low to Medium	

Typical Profile Description (at SS TP 28)

Surface	0-8” friable, brown, silt loam
Subsurface	
Subsoil	8-26” friable, dark yellowish brown, silt loam (5”) over firm, light olive brown, silt loam (5”) over firm, mottled, brown, silt loam (8”)
Substratum	26-45” friable, yellowish brown, loamy fine sand over bedrock at 45”

Inclusions

Similar	3/3/3/1/C
Dissimliar	4/3/5/2/C; 3/2A,8/3/2/C; 2,4/2A,8/3/1/C; 3/3/2/2/C; 3/3/4/2/C

Use and Management – Residential Subdivision

Proposed Use	**NRCS Limitation Rating**	**Limitation**	**Corrective Measures**
Dwellings with Basements	Very Limited – 1.00	Depth to Bedrock and Saturated Zone	Limitations due to shallow depth to bedrock can be mitigated by additions of granular fill, blasting, proper feature design, and/or extensive site preparation. Limitations due to shallow depth to saturated zone can be mitigated by additions of granular fill, proper design of features, and/or drainage.
Dwellings without Basements	Very Limited – 1.00	Depth to Bedrock and Saturated Zone	
Local Roads	Very Limited – 1.00	Depth to Bedrock and Saturated Zone	
Lawns/Landscaping	Very Limited – 1.00	Depth to Bedrock and Saturated Zone	
Subsurface Wastewater Disposal Leachbeds	Very Limited – 1.00	Depth to Bedrock and Saturated Zone	

MAP UNIT #17: 4/3/5/2/C

Setting

Parent Material	Marine and Glacio-Lacustrine Sediments
Landform	Upland Sideslope
Landscape Position	Nearly level to gently sloping sideslope
Slope Gradient Range	1-8%

Composition and Soil Characteristics

Drainage Class	**4**	Somewhat Poorly Drained
Parent Material	**3**	Marine and Glacio-Lacustrine Sediments
Depth to Bedrock	**5**	Very Deep (depth to bedrock is greater than 60 inches)
Slope Class	**2**	1-8%
Hydrologic Group	**C**	C
Permeability	Unknown	
Flooding Potential	None	
Surface Run-Off	Low to Medium	

Typical Profile Description (at MLD TP 8)

Surface	0-4” friable, brown, fine sandy loam
Subsurface	
	4-18” friable, reddish brown, fine sandy loam (10”) over friable, olive brown, fine sandy loam (4”)
Substratum	18”-unknown depth – firm, mottled, gray, silt and very fine sand

Inclusions

Similar	4/3/5/1/C
Dissimliar	4/5/5/2/D; 3/3/3/2/C; 2/3/5/3/C; 3/3/3/4/C; 4/4/5/2/C

Use and Management – Residential Subdivision

Proposed Use	**NRCS Limitation Rating**	**Limitation**	**Corrective Measures**
Dwellings with Basements	Very Limited – 1.00	Depth to Saturated Zone	Limitations due to shallow depth to saturated zone can be mitigated by additions of granular fill, proper design of features, and/or drainage.
Dwellings without Basements	Very Limited – 1.00	Depth to Saturated Zone	
Local Roads	Very Limited – 1.00	Depth to Saturated Zone	
Lawns/Landscaping	Very Limited – 1.00	Depth to Saturated Zone	
Subsurface Wastewater Disposal Leachbeds	Very Limited – 1.00	Depth to Saturated Zone	

MAP UNIT #18: 2/2B/5/3/C

Setting

Parent Material	Glacial Till
Landform	Upland sideslope
Landscape Position	Strongly sloping upland sideslope
Slope Gradient Range	8-15%

Composition and Soil Characteristics

Drainage Class	**2**	Well Drained
Parent Material	**2B**	Dense Basal Till
Depth to Bedrock	**5**	Very Deep (depth to bedrock is greater than 60 inches)
Slope Class	**3**	8-15%
Hydrologic Group	**C**	C
Permeability	Unknown	
Flooding Potential	None	
Surface Run-Off	Medium to High	

Typical Profile Description (at SS TP 10)

Surface	0-8” friable, dark brown, loam
Subsurface	
Subsoil	8-21” friable, brown, very fine sandy loam (3”) over friable, brown very fine sandy loam (10”)
Substratum	21-78” friable, yellowish brown, sandy loam (8”) over very firm, brown, loamy fine sand (49”) over bedrock at 78”.

Inclusions

Similar	2/2B/5/2/C
Dissimliar	4/5/5/2/D; 3,4/3/5/3/C; 3/3/3/3/C; 3/2B/5/3/C; 2/2B/4/3/C; 2/2B/5/1/C

Use and Management – Residential Subdivision

Proposed Use	**NRCS Limitation Rating**	**Limitation**	**Corrective Measures**
Dwellings with Basements	Limited – 0.63	Slope	Limitations due to slope can be mitigated by additions of granular fill, cut and fill slopes and/or proper feature design.
Dwellings without Basements			
Local Roads			
Lawns/Landscaping			
Subsurface Wastewater Disposal Leachbeds			

MAP UNIT #19: 3/3/3/4/C

Setting

Parent Material	Marine and Glacio-Lacustrine Sediments
Landform	Upland sideslope
Landscape Position	Moderately steep upland sideslope
Slope Gradient Range	15-25%

Composition and Soil Characteristics

Drainage Class	**3**	Moderately Well Drained
Parent Material	**3**	Marine and Glacio-Lacustrine Sediments
Depth to Bedrock	**3**	Moderately Deep (depth to bedrock is 20 to <40 inches)
Slope Class	**4**	15-25%
Hydrologic Group	**C**	C
Permeability	Unknown	
Flooding Potential	None	
Surface Run-Off	High to Very High	

Typical Profile Description (at SS TP 5)

Surface	0-7" friable, dark brown, loam
Subsurface	
Subsoil	7-21" friable, yellowish red, very fine sandy loam (9") over friable, brown, very fine sandy loam (5")
Substratum	21-29" friable, mottled, dark yellowish brown, loamy very fine sand over bedrock at 29"

Inclusions

Similar	3/3/3/3/C
Dissimliar	3/2B/4/4/C; 4/5/5/2/D; 4/3/5/2/C;2/3/5/3/C; 2/3/3/4/C; 2/3/4/4/C

Use and Management – Residential Subdivision

Proposed Use	**NRCS Limitation Rating**	**Limitation**	**Corrective Measures**
Dwellings with Basements Dwellings without Basements Local Roads Lawns/Landscaping Subsurface Wastewater Disposal Leachbeds	Very Limited – 1.00	Depth to Bedrock, Saturated Zone, and Slope	Limitations due to shallow depth to bedrock can be mitigated by additions of granular fill, blasting, proper feature design, and/or extensive site preparation. Limitations due to shallow depth to saturated zone can be mitigated by additions of granular fill, proper design of features, and/or drainage. Limitations due to slope can be mitigated by additions of granular fill, cut and fill slopes and/or proper feature design.

MAP UNIT #20: 3,4/3/5/3/C

Setting

Parent Material	Marine and Glacio-Lacustrine Sediments
Landform	Upland sideslope
Landscape Position	Strongly sloping upland sideslope
Slope Gradient Range	8-15%

Composition and Soil Characteristics

Drainage Class	**3,4**	Moderately Well and Somewhat Poorly Drained (11-17" to SWT)
Parent Material	**3**	Marine and Glacio-Lacustrine Sediments
Depth to Bedrock	**5**	Very Deep (depth to bedrock is greater than 60 inches)
Slope Class	**3**	8-15%
Hydrologic Group	**C**	C
Permeability	Unknown	
Flooding Potential	None	
Surface Run-Off	Medium to High	

Typical Profile Description (at MLD TP 23)

Surface	0-3" friable, brown, very fine sandy loam
Subsurface	
Subsoil	3-30" friable, reddish brown, very fine sandy loam (15") over friable, mottled, olive, very fine sandy loam (12")
Substratum	30" to unknown depth – firm, gray, silt and clay

Inclusions

Similar	3/3/5/3/C; 4/3/5/3/C; 4/3/5/2/C
Dissimliar	4/5/5/2/D; 2/2B/5/3/C; 5/5/5/2/D; 4/5/3/2/D; 5/5/4/2/D; 3/3/3/3/C

Use and Management – Residential Subdivision

Proposed Use	**NRCS Limitation Rating**	**Limitation**	**Corrective Measures**
Dwellings with Basements	Very Limited – 1.00 Limited – 0.63	Depth Saturated Zone Slope	Limitations due to shallow depth to saturated zone can be mitigated by additions of granular fill, proper design of features, and/or drainage. Limitations due to slope can be mitigated by additions of granular fill, cut and fill slopes and/or proper feature design.
Dwellings without Basements			
Local Roads			
Lawns/Landscaping			
Subsurface Wastewater Disposal Leachbeds			

MAP UNIT #21: 5/5/4/2/D

Setting

Parent Material	Marine Sediments
Landform	Base slope
Landscape Position	Nearly level to gently sloping base slope wetland
Slope Gradient Range	1-8%

Composition and Soil Characteristics

Drainage Class	**5**	Poorly Drained
Parent Material	**5**	Marine Sediments
Depth to Bedrock	**4**	Deep (depth to bedrock is 40 to <60 inches)
Slope Class	**2**	1-8%
Hydrologic Group	**D**	D
Permeability	Unknown	
Flooding Potential	None	
Surface Run-Off	Low to Medium	

Typical Profile Description (at SS TP 27)

Surface	0-12” friable, brown, silt loam
Subsurface	
Subsoil	12-33” firm, mottled, grayish brown, silt loam (11”) over firm, mottled, light olive brown, silty clay loam (10”)
Substratum	33-53” firm, grayish brown, silty clay loam over bedrock at 53”

Inclusions

Similar	5/5/4/1/C
Dissimliar	3/3/3/3/C; 3,4/3/5/3/C; 4/5/3/2/D; 5/5/5/2/D; 5/5/3/2/C

Use and Management – Residential Subdivision

Proposed Use	**NRCS Limitation Rating**	**Limitation**	**Corrective Measures**
Dwellings with Basements	Very Limited – 1.00	Depth to Saturated Zone	Limitations due to shallow depth to saturated zone and shrink-swell potential can be mitigated by additions of granular fill, proper feature design, and/or drainage. Limitations due to deep depth to bedrock can be mitigated by additions of granular fill, blasting, proper feature design, and/or extensive site preparation. This map unit is hydric and in a mapped wetland. Wetlands have permitting limitations.
Dwellings without Basements			
Local Roads	Limited – 0.13	Shrink-Swell Potential	
Lawns/Landscaping			
Subsurface Wastewater Disposal Leachbeds	Limited - unknown	Bedrock	

MAP UNIT #22: 5/5/5/2/D

Setting

Parent Material	Marine Sediments
Landform	Base slope
Landscape Position	Nearly level to gently sloping base slope wetland
Slope Gradient Range	1-8%

Composition and Soil Characteristics

Drainage Class	**5**	Poorly Drained
Parent Material	**5**	Marine Sediments
Depth to Bedrock	**5**	Very Deep (depth to bedrock is greater than 60 inches)
Slope Class	**2**	1-8%
Hydrologic Group	**D**	D
Permeability	Unknown	
Flooding Potential	None	
Surface Run-Off	Low to Medium	

Typical Profile Description (at Wetland Data Point 1 (see PNR Report))

Surface	4-0” Oa over 0-8” friable, black, mucky silt loam
Subsurface	
Subsoil	8-14+” firm, mottled, olive gray, silt loam to silty clay loam
Substratum	

Inclusions

Similar	5/5/5/1/D
Dissimliar	4/5/3/2/D; 3,4/3/5/3/C; 4/5/5/2/D; 5/5/5/1/D; 3/3/5/2/C; 4/5/5/2/D; 3,4/3/4/2/C; 3,4/3/3/1/C; 3,4/3/5/2/C; 3,4/3/3/1/C; 4/3/5/1/C; 5/5/4/2/D

Use and Management – Residential Subdivision

Proposed Use	**NRCS Limitation Rating**	**Limitation**	**Corrective Measures**
Dwellings with Basements Dwellings without Basements Local Roads Lawns/Landscaping Subsurface Wastewater Disposal Leachbeds	Very Limited – 1.00 Limited – 0.13	Depth to Saturated Zone Shrink-Swell Potential	Limitations due to shallow depth to saturated zone and shrink-swell potential can be mitigated by additions of granular fill, proper feature design, and/or drainage. This map unit is hydric and in a mapped wetland. Wetlands have permitting limitations.

MAP UNIT #23: 4/5/3/2/D

Setting

Parent Material	Marine Sediments
Landform	Upland toeslope
Landscape Position	Nearly level to gently sloping upland toeslope
Slope Gradient Range	1-8%

Composition and Soil Characteristics

Drainage Class	**4**	Somewhat poorly drained
Parent Material	**5**	Marine Sediments
Depth to Bedrock	**3**	Moderately Deep (depth to bedrock is 20 to <40 inches)
Slope Class	**2**	1-8%
Hydrologic Group	**D**	D
Permeability	Unknown	
Flooding Potential	None	
Surface Run-Off	Low to Medium	

Typical Profile Description (at SS TP 24)

Surface	0-7” friable, brown, silt loam
Subsurface	
Subsoil	7-21” friable, yellowish brown, silt loam (6”) over friable, mottled, grayish brown silt loam (8”)
Substratum	21-26” - firm, mottled, gray, silty clay loam over bedrock at 26”.

Inclusions

Similar	4/5/3/1/D; 4/5/4/2/D
Dissimliar	5/5/4/2/D; 5/5/5/2/D; 3,4/3/5/3/C; 4/3/5/4/C; 3,4/3/4/2/C

Use and Management – Residential Subdivision

Proposed Use	**NRCS Limitation Rating**	**Limitation**	**Corrective Measures**
Dwellings with Basements	Very Limited – 1.00	Depth to Bedrock and Saturated Zone	Limitations due to shallow depth to saturated zone and shrink-swell potential can be mitigated by additions of granular fill, proper feature design, and/or drainage. Limitations due to deep depth to bedrock can be mitigated by additions of granular fill, blasting, proper feature design, and/or extensive site preparation. Limitations due to moderate depth to bedrock can be mitigated by additions of granular fill, blasting, proper feature design, and/or extensive site preparation.
Dwellings without Basements			
Local Roads			
Lawns/Landscaping	Limited – 0.04	Shrink-Swell Potential	
Subsurface Wastewater Disposal Leachbeds			

MAP UNIT #24: 3/3/5/2/C

Setting

Parent Material	Marine and Glacio-Lacustrine Sediments
Landform	Upland sideslope
Landscape Position	Nearly level to gently sloping upland sideslope
Slope Gradient Range	1-8%

Composition and Soil Characteristics

Drainage Class	**3**	Moderately Well Drained
Parent Material	**3**	Marine and Glacio-Lacustrine Sediments
Depth to Bedrock	**5**	Very Deep (depth to bedrock is greater than 60 inches)
Slope Class	**2**	1-8%
Hydrologic Group	**C**	C
Permeability	Unknown	
Flooding Potential	None	
Surface Run-Off	Low to Medium	

Typical Profile Description (at SW TP 4)

Surface	0-5” friable, dark brown, fine sandy loam
Subsurface	
Subsoil	5-47” friable, strong brown, fine sandy loam (4”) over friable, dark yellowish brown, fine sandy loam (9”); friable, yellowish brown, fine sandy loam (8”) over firm, mottled, olive brown, fine sandy loam (21”)
Substratum	47-144+” firm, mottled , olive brown, gravelly fine sandy loam (33”) over loose, mottled, olive brown, gravelly loamy sand to 144+” in depth

Inclusions

Similar	3/3/5/1/C
Dissimliar	5/5/5/1/D; 4/5/5/2/D; 5/5/5/2/D; 3/3/4/2/C

Use and Management – Residential Subdivision

Proposed Use	**NRCS Limitation Rating**	**Limitation**	**Corrective Measures**
Dwellings with Basements	Very Limited – 1.00	Depth to Saturated Zone	Limitations due to shallow depth to saturated zone can be mitigated by additions of granular fill, proper design of features, and/or drainage.
Dwellings without Basements			
Local Roads			
Lawns/Landscaping			
Subsurface Wastewater Disposal Leachbeds			

MAP UNIT #25: 4/5/5/2/D

Setting

Parent Material	Marine Sediments
Landform	Upland sideslope
Landscape Position	Nearly level to gently sloping upland sideslope
Slope Gradient Range	1-8%

Composition and Soil Characteristics

Drainage Class	**4**	Somewhat poorly drained
Parent Material	**5**	Marine Sediments
Depth to Bedrock	**5**	Very Deep (depth to bedrock is greater than 60 inches)
Slope Class	**2**	1-8%
Hydrologic Group	**D**	D
Permeability	Unknown	
Flooding Potential	None	
Surface Run-Off	Low to Medium	

Typical Profile Description (at SS TP 11)

Surface	0-3” friable, dark brown, silt loam (oxidized rhizospheres due to compaction)
Subsurface	
Subsoil	3-17” friable, olive brown, silt loam (6”) over very firm, mottled, olive gray silt loam (8”)
Substratum	17-96+” very firm, mottled, olive, silt loam (25”) over firm, mottled, olive gray, silty clay loam (30”) over friable, mottled, yellowish brown, loamy very fine sand

Inclusions

Similar	4/5/5/1/D
Dissimliar	3/3/5/2/C; 5/5/5/1/D; 5/5/5/2/D; 4/3/5/4/C; 4/5/4/2/D

Use and Management – Residential Subdivision

Proposed Use	**NRCS Limitation Rating**	**Limitation**	**Corrective Measures**
Dwellings with Basements	Very Limited – 1.00 Limited – 0.04	Saturated Zone Shrink-Swell Potential	Limitations due to shallow depth to saturated zone and shrink-swell potential can be mitigated by additions of granular fill, proper feature design, and/or drainage.
Dwellings without Basements			
Local Roads			
Lawns/Landscaping			
Subsurface Wastewater Disposal Leachbeds			

MAP UNIT #26: 4/3/4/4/C

Setting

Parent Material	Marine and Glacio-Lacustrine Sediments
Landform	Upland sideslope
Landscape Position	Moderately steep upland sideslope
Slope Gradient Range	15-25%

Composition and Soil Characteristics

Drainage Class	**4**	Somewhat Poorly Drained
Parent Material	**3**	Marine and Glacio-Lacustrine Sediments
Depth to Bedrock	**4**	Deep (depth to bedrock is 40 - <60 inches)
Slope Class	**4**	15-25%
Hydrologic Group	**C**	C
Permeability	Unknown	
Flooding Potential	None	
Surface Run-Off	High to Very High	

Typical Profile Description (at SS TP 12)

Surface	0-7" friable, dark brown, silt loam
Subsurface	
Subsoil	7-20" friable, dark yellowish brown, silt loam (5") over very firm, mottled, olive brown, silt loam (8")
Substratum	20-57" very firm, mottled, olive gray, silt loam (4") over very firm, mottled, olive brown, silt loam (16") over friable, mottled, yellowish brown, loamy very fine sand (17") over bedrock at 57"

Inclusions

Similar	4/3/5/4/C
Dissimliar	4/5/3/2/D; 4/5/5/2/D; 4/3/5/3/C; 2,3/2A,2B/3/2/C; 5/5/5/1/D; 5/5/5/2/D; 4/3/4/3/C

Use and Management – Residential Subdivision

Proposed Use	**NRCS Limitation Rating**	**Limitation**	**Corrective Measures**
Dwellings with Basements	Very Limited – 1.00	Depth to Saturated Zone and Slope	Limitations due to shallow depth to saturated zone can be mitigated by additions of granular fill, proper design of features, and/or drainage. Limitations due to slope can be mitigated by additions of granular fill, cut and fill slopes and/or proper feature design. Limitations due to deep depth to bedrock can be mitigated by additions of granular fill, blasting, proper feature design, and/or extensive site preparation.
Dwellings without Basements			
Local Roads			
Lawns/Landscaping			
Subsurface Wastewater Disposal Leachbeds	Limited - unknown	Depth to Bedrock	

MAP UNIT #27: 4/3/5/3/C

Setting

Parent Material	Marine and Glacio-Lacustrine Sediments
Landform	Upland sideslope
Landscape Position	Strongly sloping upland sideslope
Slope Gradient Range	8-15%

Composition and Soil Characteristics

Drainage Class	**4**	Somewhat Poorly Drained
Parent Material	**3**	Marine and Glacio-Lacustrine Sediments
Depth to Bedrock	**5**	Very Deep (depth to bedrock is greater than 60 inches)
Slope Class	**3**	8-15%
Hydrologic Group	**C**	C
Permeability	Unknown	
Flooding Potential	None	
Surface Run-Off	Medium to High	

Typical Profile Description (at MLD TP 14)

Surface	0-4” friable, brown, very fine sandy loam
Subsurface	
Subsoil	4-15” friable, reddish brown, very fine sandy loam (4”) over friable, olive, very fine sandy loam (7”)
Substratum	15”-unknown depth – firm, mottled, gray, silt with sand

Inclusions

Similar	4/3/5/2/C
Dissimliar	4/3/4/4/C; 2,3/2A,2B/3/2/C; 3/3/3/2/C; 4/3/5/4/C

Use and Management – Residential Subdivision

Proposed Use	**NRCS Limitation Rating**	**Limitation**	**Corrective Measures**
Dwellings with Basements Dwellings without Basements Local Roads Lawns/Landscaping Subsurface Wastewater Disposal Leachbeds	Very Limited – 1.00 Limited – 0.63	Depth to Saturated Zone Slope	Limitations due to shallow depth to saturated zone can be mitigated by additions of granular fill, proper design of features, and/or drainage. Limitations due to slope can be mitigated by additions of granular fill, cut and fill slopes and/or proper feature design.

MAP UNIT #28: 2,3/2A,2B/3/2/C

Setting

Parent Material	Glacial till
Landform	Hilltop and shoulderslope
Landscape Position	Nearly level to gently sloping hilltop and shoulderslope
Slope Gradient Range	1-8%

Composition and Soil Characteristics

Drainage Class	**2,3**	Well and Moderately Well Drained
Parent Material	**2A, 2B**	Dense Basal Till and Ablation Till
Depth to Bedrock	**3**	Moderately Deep (depth to bedrock is 20 to <40 inches)
Slope Class	**2**	1-8%
Hydrologic Group	**C**	C
Permeability	Unknown	
Flooding Potential	None	
Surface Run-Off	Low to medium	

Typical Profile Description (at SS TP 14)

Surface	0-3” friable, dark brown, very fine sandy loam
Subsurface	
Subsoil	3-26” friable, brown, very fine sandy loam (8”) over friable, strong brown, very fine sandy loam (10”) over friable, brown, very fine sandy loam (6”)
Substratum	26-40” rippable bedrock and very fine sandy loam

Inclusions

Similar	2/2A/3/1/C; 3/2A/3/1/C; 2/2B/3/1/C; 3/2A/3/1/C
Dissimliar	3,4/3/4/2/C; 4/3/4/4/C; 4//35/3/C; 3/3/3/2/C; 3,4/3/3/1/C

Use and Management – Residential Subdivision

Proposed Use	**NRCS Limitation Rating**	**Limitation**	**Corrective Measures**
Dwellings with Basements	Very Limited – 1.00	Depth to Bedrock	Limitations due to moderate depth to bedrock can be mitigated by additions of granular fill, blasting, proper feature design, and/or extensive site preparation.
Dwellings without Basements			
Local Roads			
Lawns/Landscaping			
Subsurface Wastewater Disposal Leachbeds			

MAP UNIT #29: 3,4/3/4/2/C

Setting

Parent Material	Marine and Glacio-Lacustrine Sediments
Landform	Upland sideslope
Landscape Position	Level to nearly level upland sideslope
Slope Gradient Range	1-8%

Composition and Soil Characteristics

Drainage Class	**3,4**	Moderately Well and Somewhat Poorly Drained (12-17" to SWT)
Parent Material	**3**	Marine and Glacio-Lacustrine Sediments
Depth to Bedrock	**4**	Deep (depth to bedrock is 40 to <60 inches)
Slope Class	**2**	1-8%
Hydrologic Group	**C**	C
Permeability	Unknown	
Flooding Potential	None	
Surface Run-Off	Low to Medium	

Typical Profile Description (at SS TP 23)

Surface	0-6" friable, brown, silt loam
Subsurface	
Subsoil	6-24" friable, yellowish brown, silt loam (12") over firm, light olive brown, silt loam (6")
Substratum	24-44" rippable bedrock and soil

Inclusions

Similar	3,4/3/4/1/C
Dissimliar	4/5/3/2/D; 4/3/4/4/C; 2,3/2A,2B/3/2/C; 3,4/3/3/1/C; 5/5/5/2/D

Use and Management – Residential Subdivision

Proposed Use	**NRCS Limitation Rating**	**Limitation**	**Corrective Measures**
Dwellings with Basements	Very Limited – 1.00	Depth to Saturated Zone	Limitations due to shallow depth to saturated zone can be mitigated by additions of granular fill, proper design of features, and/or drainage. Limitations due to deep depth to bedrock can be mitigated by additions of granular fill, blasting, proper feature design, and/or extensive site preparation.
Dwellings without Basements			
Local Roads			
Lawns/Landscaping			
Subsurface Wastewater Disposal Leachbeds	Limited - unknown	Depth to Bedrock	

MAP UNIT #30: 3,4/3/3/1/C

Setting

Parent Material	Marine and Glacio-Lacustrine Sediments
Landform	Upland sideslope
Landscape Position	Level to nearly level upland sideslope
Slope Gradient Range	0-3%

Composition and Soil Characteristics

Drainage Class	**3,4**	Moderately Well and Somewhat Poorly Drained (12-17" to SWT)
Parent Material	**3**	Marine and Glacio-Lacustrine Sediments
Depth to Bedrock	**3**	Moderately Deep (depth to bedrock is 20 to <40 inches)
Slope Class	**1**	0-3%
Hydrologic Group	**C**	C
Permeability	Unknown	
Flooding Potential	None	
Surface Run-Off	Very Low to Low	

Typical Profile Description (at SS TP 22)

Surface	
Subsurface	
Subsoil	0-20" friable, brown, very fine sandy loam (14") over friable, yellowish brown, loam (6")
Substratum	20-32" friable, yellowish brown, loam over bedrock at 32"

Inclusions

Similar	3,4/3/3/2/C
Dissimliar	3,4/3/4/2/C; 2,3/2A,2B/3/2/C; 3/3/3/2/C; 3,4/3/5/2/C; 3,4/3/5/2/C; 3,4/3/3/1/C; 5/5/5/2/C

Use and Management – Residential Subdivision

Proposed Use	**NRCS Limitation Rating**	**Limitation**	**Corrective Measures**
Dwellings with Basements	Very Limited – 1.00	Depth to Saturated Zone	Limitations due to shallow depth to saturated zone can be mitigated by additions of granular fill, proper design of features, and/or drainage. Limitations due to moderate depth to bedrock can be mitigated by additions of granular fill, blasting, proper feature design, and/or extensive site preparation.
Dwellings without Basements			
Local Roads			
Lawns/Landscaping			
Subsurface Wastewater Disposal Leachbeds	Limited - unknown	Depth to Bedrock	

MAP UNIT #31: 3,4/3/5/2/C

Setting

Parent Material	Marine and Glacio-Lacustrine Sediments
Landform	Upland Sideslope
Landscape Position	Nearly level to gently sloping upland sideslope
Slope Gradient Range	1-8%

Composition and Soil Characteristics

Drainage Class	**3,4**	Moderately Well and Somewhat Poorly Drained (15-19" to SWT)
Parent Material	**3**	Marine and Glacio-Lacustrine Sediments
Depth to Bedrock	**5**	Very Deep (depth to bedrock is greater than 60 inches)
Slope Class	**2**	1-8%
Hydrologic Group	**C**	C
Permeability	Unknown	
Flooding Potential	None	
Surface Run-Off	Low to Medium	

Typical Profile Description (at SS TP 18)

Surface	0-3" friable, dark brown, silt loam
Subsurface	
Subsoil	3-19" friable, yellowish brown, silt loam (7") over firm, dark yellowish brown, silt loam (5") over firm, yellowish brown silt loam (11")
Substratum	19-96" firm, mottled, grayish brown, silty clay loam (35") over firm in place, mottled, yellowish brown, loamy fine sand (42") over bedrock at 96"

Inclusions

Similar	3,4/3/5/1/C
Dissimliar	3/3/3/2/C; 3,4/3/3/1/C; 4/3/5/1/C; 5/5/5/2/D; 3,4/3/5/2/C

Use and Management – Residential Subdivision

Proposed Use	**NRCS Limitation Rating**	**Limitation**	**Corrective Measures**
Dwellings with Basements	Very Limited – 1.00	Depth to Saturated Zone	Limitations due to shallow depth to saturated zone can be mitigated by additions of granular fill, proper design of features, and/or drainage.
Dwellings without Basements			
Local Roads			
Lawns/Landscaping			
Subsurface Wastewater Disposal Leachbeds			

MAP UNIT #32: 4/3/5/1/C

Setting

Parent Material	Marine and Glacio-Lacustrine Sediments
Landform	Upland toeslope
Landscape Position	Level to nearly level toeslope
Slope Gradient Range	0-3%

Composition and Soil Characteristics

Drainage Class	**4**	Somewhat Poorly Drained
Parent Material	**3**	Marine and Glacio-Lacustrine Sediments
Depth to Bedrock	**5**	Very Deep (depth to bedrock is greater than 60 inches)
Slope Class	**1**	0-3%
Hydrologic Group	**C**	C
Permeability	Unknown	
Flooding Potential	None	
Surface Run-Off	Very Low to Low	

Typical Profile Description (at SS TP 16)

Surface	0-6” friable, dark brown, silt loam
Subsurface	
Subsoil	6-30” friable, mottled, brown, silt loam (9”) over friable, light olive brown, silt loam (7”) over firm, mottled, light olive gray, silty clay loam (8”)
Substratum	30->80” very firm, mottled, light olive gray, silty clay loam (27”) over firm in place, mottled, yellowish brown, loamy fine sand to at least 80”

Inclusions

Similar	4/3/5/2/C
Dissimliar	3,4/3/5/2/C; 5/5/5/2/D; 3,4/3/5/2/C

Use and Management – Residential Subdivision

Proposed Use	**NRCS Limitation Rating**	**Limitation**	**Corrective Measures**
Dwellings with Basements	Very Limited – 1.00	Depth to Saturated Zone	Limitations due to shallow depth to saturated zone can be mitigated by additions of granular fill, proper design of features, and/or drainage.
Dwellings without Basements			
Local Roads			
Lawns/Landscaping			
Subsurface Wastewater Disposal Leachbeds			

MAP UNIT #33: 3/3/3/3/C

Setting

Parent Material	Marine and Glacio-Lacustrine Sediments
Landform	Upland sideslope
Landscape Position	Strongly sloping upland sideslope
Slope Gradient Range	8-15%

Composition and Soil Characteristics

Drainage Class	**3**	Moderately Well Drained
Parent Material	**3**	Marine and Glacio-Lacustrine Sediments
Depth to Bedrock	**3**	Moderately Deep (depth to bedrock is 20 to <40 inches)
Slope Class	**3**	8-15%
Hydrologic Group	**C**	C
Permeability	Unknown	
Flooding Potential	None	
Surface Run-Off	Medium to High	

Typical Profile Description (at SS TP 36)

Surface	0-12” friable, brown, silt loam
Subsurface	
Subsoil	12-26” friable, yellowish brown, silt loam (5”) over friable, brown, silt loam (4”) over firm, mottled, brown, silt loam (5”)
Substratum	26-28” very firm, yellowish brown, fine sandy loam over bedrock at 28”

Inclusions

Similar	3/3/3/2/C
Dissimliar	2,3,4/2A,8/3/1/C; 3/3/3/1/C; 2,4/2A,8/3/1/C; 3/2A,8/3/2/C; 3,4/5/4/2/D

Use and Management – Residential Subdivision

Proposed Use	**NRCS Limitation Rating**	**Limitation**	**Corrective Measures**
Dwellings with Basements Dwellings without Basements Local Roads Lawns/Landscaping Subsurface Wastewater Disposal Leachbeds	Very Limited – 1.00 Limited – 0.63 Limited - unknown	Depth to Saturated Zone Slope Depth to Bedrock	Limitations due to shallow depth to saturated zone can be mitigated by additions of granular fill, proper design of features, and/or drainage. Limitations due to slope can be mitigated by additions of granular fill, cut and fill slopes and/or proper feature design. Limitations due to moderate depth to bedrock can be mitigated by additions of granular fill, blasting, proper feature design, and/or extensive site preparation.

MAP UNIT #34: 3,4/5/4/2/D

Setting

Parent Material	Marine Sediments
Landform	Upland sideslope
Landscape Position	Level to nearly level upland sideslope
Slope Gradient Range	1-8%

Composition and Soil Characteristics

Drainage Class	**3,4**	Moderately Well and Somewhat Poorly Drained (13-18" to SWT)
Parent Material	**5**	Marine Sediments
Depth to Bedrock	**4**	Deep (depth to bedrock is 40 to <60 inches)
Slope Class	**2**	1-8%
Hydrologic Group	**D**	D
Permeability	Unknown	
Flooding Potential	None	
Surface Run-Off	Low to Medium	

Typical Profile Description (at SS TP 37)

Surface	0-10" friable, brown, very fine sandy loam
Subsurface	
Subsoil	10-24" friable, brown, very fine sandy loam (3") over friable, yellowish brown, silt loam (5") over firm, mottled, pale brown, silt loam (6")
Substratum	24-44" firm, mottled, grayish brown, silty clay over bedrock at 44"

Inclusions

Similar	3,4/5/4/1/D; 3,4/5/5/2/D
Dissimliar	3/3/3/3/C; 2,3/2A/3/3/C;3/5/5/1/D

Use and Management – Residential Subdivision

Proposed Use	**NRCS Limitation Rating**	**Limitation**	**Corrective Measures**
Dwellings with Basements	Very Limited – 1.00	Saturated Zone	Limitations due to shallow depth to saturated zone and shrink-swell potential can be mitigated by additions of granular fill, proper feature design, and/or drainage. Limitations due to deep depth to bedrock can be mitigated by additions of granular fill, blasting, proper feature design, and/or extensive site preparation.
Dwellings without Basements			
Local Roads	Limited – 0.04	Shrink-Swell Potential	
Lawns/Landscaping			
Subsurface Wastewater Disposal Leachbeds	Limited - unknown	Depth to Bedrock	

MAP UNIT #35: 2,3/2A/3/3/C

Setting

Parent Material	Glacial till
Landform	Upland sideslope
Landscape Position	Strongly sloping upland sideslope
Slope Gradient Range	8-15%

Composition and Soil Characteristics

Drainage Class	**2,3**	Well and Moderately Well Drained (depending on depth to Bedrock)
Parent Material	**2A**	Ablation Till
Depth to Bedrock	**3**	Moderately Deep (depth to bedrock is 20 to <40 inches)
Slope Class	**3**	8-15%
Hydrologic Group	**C**	C
Permeability	Unknown	
Flooding Potential	None	
Surface Run-Off	Medium to High	

Typical Profile Description (at MLD TP 26)

Surface	0-4” friable, brown, fine sandy loam
Subsurface	
Subsoil	4-31” friable, reddish brown, fine sandy loam (8”) over friable, olive brown, fine sandy loam (19”) over bedrock at 31”
Substratum	

Inclusions

Similar	2,3/2B/3/3/C; 2,3/2A/3/2/C
Dissimliar	3,4/5/4/2/D; 3,4/5/5/2/D; 3/5/5/1/D; 4/2A/3/3/C

Use and Management – Residential Subdivision

Proposed Use	**NRCS Limitation Rating**	**Limitation**	**Corrective Measures**
Dwellings with Basements	Very Limited – 1.00	Depth to Bedrock	Limitations due to moderate depth to bedrock can be mitigated by additions of granular fill, blasting, proper feature design, and/or extensive site preparation. Limitations due to slope can be mitigated by additions of granular fill, cut and fill slopes and/or proper feature design.
Dwellings without Basements			
Local Roads			
Lawns/Landscaping			
Subsurface Wastewater Disposal Leachbeds	Limited – 0.63	Slope	

MAP UNIT #36: 3,4/5/5/2/D

Setting

Parent Material	Marine Sediments
Landform	Upland Sideslope
Landscape Position	Nearly level to gently sloping upland sideslope
Slope Gradient Range	1-8%

Composition and Soil Characteristics

Drainage Class	**3,4**	Moderately Well and Somewhat Poorly Drained (12-18" to SWT)
Parent Material	**5**	Marine Sediments
Depth to Bedrock	**5**	Very Deep (depth to bedrock is greater than 60 inches)
Slope Class	**2**	1-8%
Hydrologic Group	**D**	D
Permeability	Upland	
Flooding Potential	None	
Surface Run-Off	Low to Medium	

Typical Profile Description (at SS TP 38)

Surface	0-7" friable, dark brown, loam
Subsurface	
Subsoil	7-22" friable, yellowish brown, silt loam (5") over friable, brown, silt loam (5") over firm, mottled, light olive brown silt loam (5")
Substratum	22-66+" firm, mottled, grayish brown, silty clay loam (21") over firm, mottled, gray, silty clay loam to at least 66" in depth

Inclusions

Similar	3,4/5/5/1/D
Dissimliar	2,3/2A/3/3/C; 3/5/5/1/D; 3,4/542/D; 3,4/5/5/3/D; 3,4/5/4/2/D

Use and Management – Residential Subdivision

Proposed Use	**NRCS Limitation Rating**	**Limitation**	**Corrective Measures**
Dwellings with Basements	Very Limited – 1.00 Limited – 0.04	Saturated Zone Shrink-Swell Potential	Limitations due to shallow depth to saturated zone and shrink-swell potential can be mitigated by additions of granular fill, proper feature design, and/or drainage.
Dwellings without Basements			
Local Roads			
Lawns/Landscaping			
Subsurface Wastewater Disposal Leachbeds			

MAP UNIT #37: 3/5/5/1/D

Setting

Parent Material	Marine Sediments
Landform	Upland toeslope
Landscape Position	Level and nearly level upland toeslope
Slope Gradient Range	0-3%

Composition and Soil Characteristics

Drainage Class	**3**	Moderately well drained
Parent Material	**5**	Marine Sediments
Depth to Bedrock	**5**	Very Deep (depth to bedrock is greater than 60 inches)
Slope Class	**1**	0-3%
Hydrologic Group	**D**	D
Permeability	Unknown	
Flooding Potential	None	
Surface Run-Off	Very low to low	

Typical Profile Description (at SS TP 39)

Surface	0-6” friable, dark brown, silt loam
Subsurface	
Subsoil	6-21” friable, brown, silt loam (5”) over friable, strong brown, loam (5”) over firm, mottled, light olive brown, silt loam (5”)
Substratum	21-70” - firm, mottled, dark grayish brown, silty clay loam (22”) over firm, mottled, dark grayish brown, silty clay loam (6”) over loose, mottled, yellowish brown, loamy fine sand (21”) over bedrock at 70”

Inclusions

Similar	3/5/5/2/D
Dissimliar	3,4/5/5/2/D2,3/2A/3/3/C

Use and Management – Residential Subdivision

Proposed Use	**NRCS Limitation Rating**	**Limitation**	**Corrective Measures**
Dwellings with Basements	Very Limited – 1.00 Limited – 0.04	Saturated Zone Shrink-Swell Potential	Limitations due to shallow depth to saturated zone and shrink-swell potential can be mitigated by additions of granular fill, proper feature design, and/or drainage.
Dwellings without Basements			
Local Roads			
Lawns/Landscaping			
Subsurface Wastewater Disposal Leachbeds			

APPENDIX D
Soil Conditions Summary Table
Soil Test Pit Logs

FORM E Rev. 07/11

SOIL CONDITIONS SUMMARY TABLE

SUMMARY LOG OF SUBSURFACE EXPLORATIONS AT PROJECT SITES

Project Name:	Applicant Name:	Project Location (municipality):
Durant Homestead	Matt Hancock Properties	Windham, Maine

Lot No.	Exploration Symbol (TP 1, B 2, etc.)	If at SSWD Field	Description of subsurface materials by: ● Soil profile/condition (If by S.E.), ● Soil series name (If by C.S.S.), or by ● Geologic unit (If by C.G.)	Depths to (inches): Redoximorphic Features	Bedrock	Hydraulically Restrictive Layer	Limit of Exploration	Ground Surface Slope (%)	Ground Surface Elevation
2	SSTP1	☐	3,4/5/5/1/D (Soil Map Unit 9)	14	66	14	66	0-3	181
ROAD	SSTP2	☐	3/3/3/2/C (Soil Map Unit 8)	14	31	9	31	3-8	182
ROAD	SSTP3	☐	3/2B,8/3/2/C (Soil Map Unit 7)	*N.O. (Not Observed)	41	35	41	3-8	175
ROAD	SSTP4	☐	3/2B/4/4/C (Soil Map Unit 12)	29	49	29	49	15-25	169
ROAD	SSTP5	☐	3/3/3/4/C (Soil Map Unit 19)	21	29	29	29	15-25	171
4	SSTP6	☐	4/5/5/2/D (Soil Map Unit 14)	7	84	14	84	3-8	163
4	SSTP7	☐	5/5/5/1/D (Soil Map Unit 15)	9	>58	9	58	0-3	162
ROAD	SSTP8	☐	4/5/5/2/D (Soil Map Unit 14)	15	90	15	90	3-8	169
storm water	SWTP8	☐	4/4/5/3/D (Soil Map Unit 11)	24	68	24	68	8-15	169
storm water	SWTP8A	☐	4/4/5/3/D (Soil Map Unit 11)	16	78-90	16	78-90	8-15	169
5	SSTP9	☐	4/5/5/2/D (Soil Map Unit 14)	19	60	16	60	3-8	162
ROAD	SSTP10	☐	2/2B/5/3/C (Soil Map Unit 18)	29	78	29	78	8-15	172
6	SSTP11	☐	4/5/5/2/D (Soil Map Unit 25)	3	>96	3	96	3-8	165
ROAD	SSTP12	☐	4/3/4/4/C (Soil Map Unit 26)	12	57	12	57	15-25	174
ROAD	SSTP13	☐	4/3/4/4/C (Soil Map Unit 26)	15	40	15	40	15-25	178
ROAD	SSTP14	☐	2,3/2A,2B/3/2/C (Soil Map Unit 28)	*N.O. (Not Observed)	40	*N.O. (Not Observed)	40	3-8	185
8	SSTP15	☐	3/3,8/3/2/C (Soil Map Unit 16)	16	27	16	27	3-8	185
9	SSTP16	☐	4/3/5/1/C (Soil Map Unit 32)	6	>108	23	108	0-3	183
10	SSTP17	☐	3,4/3/3/1/C (Soil Map Unit 30)	14	63	14	63	0-3	186
ROAD	SSTP18	☐	3,4/3/5/2/C (Soil Map Unit 32)	19	96	10	96	3-8	186
11	SSTP19	☐	3,4/3/3/1/C (Soil Map Unit 30)	7	24	16	24	0-3	181
12	SSTP20	☐	3,4/3/3/1/C (Soil Map Unit 30)	*N.O. (Not Observed)	32-36	13	32-36	0-3	186
13	SSTP21	☐	3,4/3/3/1/C (Soil Map Unit 30)	11	66	11	66	0-3	187
21	BED-21	☒	3/4,8/2,3/1/D (Soil Map Unit 1)	*N.O. (Not Observed)	15-36	0	15-36	0-3	180
13	SSTP22	☐	3,4/3/3/1/C (Soil Map Unit 30)	*N.O. (Not Observed)	32	32	32	0-3	186
15	SSTP23	☐	3,4/3/4/2/C (Soil Map Unit 29)	17	44-54	17	44-54	3-8	176
16	SSTP24	☐	4/5/3/2/D (Soil Map Unit 23)	14	26-37	14	26-37	3-8	168
ROAD	SSTP25-trench	☐	4/5/5/2/D (Soil Map Unit 25)	3	*N.O. (Not Observed)	3	37	3-8	163
ROAD	SSTP26	☐	4/5/5/2/D (Soil Map Unit 25)	3	96	3	96	3-8	163
17	SSTP27	☐	5/5/4/2/D (Soil Map Unit 21)	12	53	12	53	3-8	167
19	SSTP28	☐	3/3,8/3/2/C (Soil Map Unit 16)	18	45	18	45	3-8	180
		☐							

INVESTIGATOR INFORMATION AND SIGNATURE

Signature	Christopher C. Dorion	Date	July 19, 2018
Name Printed	Christopher C. Dorion	Cert/Lic/Reg. #	SS-454

Qualification: ☐ Licensed Site Evaluator ☒ Certified Soil Scientist ☐ Certified Geologist ☐ Other:

STATE OF MAINE CHRISTOPHER CARL DORION #SS 454 SOIL SCIENTIST

FORM E Rev. 07/11

SOIL CONDITIONS SUMMARY TABLE

SUMMARY LOG OF SUBSURFACE EXPLORATIONS AT PROJECT SITES

Project Name:	Applicant Name:	Project Location (municipality):
Durant Homestead	Matt Hancock Properties	Windham, Maine

Lot No.	Exploration Symbol (TP 1, B 2, etc.)	If at SSWD Field	Description of subsurface materials by: • Soil profile/condition (If by S.E.), • Soil series name (If by C.S.S.), or by • Geologic unit (If by C.G.)	Depths to (inches): Redoximorphic Features	Bedrock	Hydraulically Restrictive Layer	Limit of Exploration	Ground Surface Slope (%)	Ground Surface Elevation
18	SSTP29	☐	4/5/5/2/D (Soil Map Unit 14)	13	86	13	86	3-8	173
20	SSTP30	☐	2/3/5/3/C (Soil Map Unit 13)	46	72-108	46	72-108	8-15	185
20	SSTP31	☒	3/3,8/3/2/C (Soil Map Unit 16)	22	32	5	32	3-8	182
22	SSTP32	☐	1/2A,8/2/1/C (Soil Map Unit 2)	*N.O. (Not Observed)	19	0	19	0-3	182
22	SSTP33	☐	2,3/2A,8/3/1/C (Soil Map Unit 3)	21	31	*N.O. (Not Observed)	31	0-3	181
23	SSTP34	☐	2,3/2A,8/3/1/C (Soil Map Unit 3)	*N.O. (Not Observed)	37	*N.O. (Not Observed)	37	0-3	180
23	SSTP35	☐	2,3/2A,8/3/1/C (Soil Map Unit 3)	*N.O. (Not Observed)	36	*N.O. (Not Observed)	36	0-3	179
23	SSTP36	☐	2,3/2A,8/3/1/C (Soil Map Unit 3)	21	28	21	28	0-3	179
24	SSTP37	☐	3,4/5/4/2/D (Soil Map Unit 34)	18	44	18	44	3-8	171
25	SSTP38	☐	3,4/5/5/2/D (Soil Map Unit 36)	17	>66	17	66	3-8	159
26	SSTP39	☐	3/5/5/1/D (Soil Map Unit 37)	16	70	16	70	0-3	171
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INVESTIGATOR INFORMATION AND SIGNATURE

Signature	Christopher C. Dorion	Date	July 19, 2018
Name Printed	Christopher C. Dorion	Cert/Lic/Reg. #	SS-454

Qualification: ☐ Licensed Site Evaluator ☒ Certified Soil Scientist ☐ Certified Geologist ☐ Other:

STATE OF MAINE CHRISTOPHER CARL DORION #SS 454 SOIL SCIENTIST

FORM E Rev. 07/11

SOIL CONDITIONS SUMMARY TABLE

SUMMARY LOG OF SUBSURFACE EXPLORATIONS AT PROJECT SITES

Project Name:	Applicant Name:	Project Location (municipality):
Durant Homestead	Matt Hancock Properties, LLC	Windham

SMU	Exploration Symbol *(TP 1, B 2, etc.)*	☒ if at SSWD Field	Description of subsurface materials by: ● Soil profile/condition *(if by S.E.),* ● Soil series name *(if by C.S.S.),* or by ● Geologic unit *(if by C.G.)*	Depths to *(inches)*: Redoximorphic Features	Bedrock	Hydraulically Restrictive Layer	Limit of Exploration	Ground Surface Slope (%)	Ground Surface Elevation
8	MLD 1	☒	3/3/9/2/C	16"	n.o.	16"	unk	1-8	181
8	MLD 2	☐	3/3/9/2/C	18"	n.o.	18"	unk	1-8	178
9	MLD 4	☒	4/5/9/1/D	12"	n.o.	12"	unk	0-3	180
10	MLD 5	☐	4/5/9/4/D	13"	n.o.	13"	unk	15-25	176
7	MLD 6	☐	3/2B/9/2/C	17"	n.o.	17"	unk	1-8	180
6	MLD 7	☐	3/2B/9/2/C	20"	n.o.	29"	unk	1-8	176
17	MLD 8	☐	3/3/9/2/C	16"	n.o.	16"	unk	1-8	176
19	MLD 9	☐	2/2A/3/4/C	n.o.	26"	n.o.	26"	15-25	176
14	MLD 10	☐	3/2B/9/2/C	24"	n.o.	24"	n.o.	1-8	180
26	MLD 13	☐	3/2B/9/4/C	18"	n.o.	24"	n.o.	15-25	172
27	MLD 14	☐	4/3/9/3/C	15"	n.o.	15"	unk	8-15	175
20	MLD 23	☐	3/3/9/3/C	20'	n.o.	30"	unk	8-15	170
5	MLD 24	☐	2/2A/3/2/C	n.o.	30"	n.o.	30"	1-8	180
33	MLD 25	☐	3/3/9/2/C	17"	n.o.	17"	unk	1-8	172
35	MLD 26	☐	2/2A/3/3/C	15"	27"	n.o.	27"	8-15	168
36	MLD 27	☒	3/3/9/2/C	16"	n.o.	16"	unk	1-8	168
30	MLD 30	☐	4/3/9/1/C	15"	n.o.	15"	unk	0-3	182
30	MLD 31	☐	4/3/9/1/C	15"	n.o.	15"	unk	0-3	186
28	MLD 32	☐	3/2B/9/2/C	20"	n.o.	20"	unk	1-8	182
29	MLD 34	☐	4/3/9/2/C	15"	n.o.	15"	unk	1-8	182
6	MLD 36	☐	4/2A/3/2/C	15"	25"	n.o.	25"	1-8	174
5	MLD 37	☐	2/2A/3/2/C	n.o.	36"	n.o.	36"	1-8	182
5	MLD 38	☐	2/2A/3/2/C	n.o.	35"	n.o.	35"	1-8	176
5	MLD 39	☐	3/2A/3/2/C	20"	n.o.	n.o.	35"	1-8	182
26	MLD 43	☐	3/2A/3/4/C	16"	29"	n.o.	29"	15-25	174
28	MLD 45	☐	3/2B/3/2/C	20"	38"	24"	38"	1-8	182
28	MLD 46	☐	3/2A/3/2/C	22"	32"	n.o.	32"	1-8	184
31	MLD 47	☐	3/3/9/2/C	19"	n.o.	19"	unk	1-8	190
31	MLD 48	☐	3/3/9/2/C	16"	n.o.	16"	unk	1-8	186
31	MLD 49	☐	3/3/9/2/C	18"	n.o.	26"	unk	1-8	190
8	MLD 06-1	☒	2/2A/3/2/C	n.o.	30"	n.o.	30"	1-8	182
31	MLD 06-2	☐	4/3/9/2/C	15"	n.o.	20"	unk	1-8	190
14	MLD 3		3/3/9/2/C	19"	n.o.	19"	unk	1-8	186

INVESTIGATOR INFORMATION AND SIGNATURE

Signature	Date
Name Printed: Transposed from MLD Report - Darryl Brown , 2006	Cert/Lic/Reg. #

Qualification: ☐ Licensed Site Evaluator ☐ Certified Soil Scientist ☐ Certified Geologist ☐ Other:

affix professional seal

SOIL CONDITIONS SUMMARY TABLE

SUMMARY LOG OF SUBSURFACE EXPLORATIONS AT PROJECT SITES

Project Name:	Applicant Name:	Project Location (municipality):
Durant Homestead, Chute Road	Matt Hancock Properties	Windham

Lot No.	Exploration Symbol *(TP 1, B 2, etc.)*	☒ if at SSWD Field	Description of subsurface materials by: ● Soil profile/condition *(if by S.E.),* ● Soil series name *(if by C.S.S.),* or by ● Geologic unit *(if by C.G.)*	Depths to *(inches)*: Redoximorphic Features	Bedrock	Hydraulically Restrictive Layer	Limit of Exploration	Ground Surface Slope (%)	Ground Surface Elevation
1	SE TP 1C	☒	8 AIII / C (BLT) 3/3/3/2/C	16"	see TP desc	16"	24"	2	182
1	SE TP 1D	☒	8 AIII / C (BLT) 3/3/3/2/C	16"	see TP desc	16"	24"	2	182
2	SE TP 2C	☒	8 AIII / C (BLT) 3/3/3/2/C	18"	see TP desc	18"	24"	0-2	182
2	SE TP 2D	☒	8 AIII / C (BLT) 3/3/3/2/C	18"	see TP desc	18"	24"	0-2	182
3	SE TP 3C	☒	8D (BLT) 4/5/5/1/D	10"	n.o.	10"	24"	3	180
3	SE TP 3D	☒	8D (BLT) 4/5/5/1/D	10"	n.o.	10"	24"	2	180
4	SE TP 4C	☒	8D (BLT) 4/5/5/2/D	12"	n.o.	12"	24"	6-18	162
4	TP 23	☒	8D (SS) 4/5/5/2/D	13"	n.o.	13"	35"	8-15	164
4	TP 23a	☒	8D (SS) 4/5/5/2/D	13"	n.o.	13"	35"	8-15	164
5	TP 22	☒	8D (SS) 4/3/5/3/C	13"	n.o.	13"	35"	8-15	168
5	TP 22a	☒	8C (SS) 3/3/5/3/C	16"	n.o.	16"	35"	8-15	168
6	SE TP 6C	☒	8C (BLT) 3/5/5/2/D	16"	n.o.	16"	24"	0-3	162
6	SE TP 6D	☒	8D (BLT) 4/5/5/2/D	14"	n.o.	14"	24"	0-3	162
7	SE TP 7C	☒	2C (BLT) 4/3/5/3/C	22"	n.o.	n.o.	34"	10	180
7	SE TP 7D	☒	2C (BLT) 4/3/5/3/C	22"	n.o.	n.o.	34"	10	180
8	SE TP 8C	☒	3 AIII / C (BLT) 3/3/3/2/C	16"	see TP desc	16"	28"	5	182
8	SE TP 8D	☒	3 AIII / C (BLT) 3/3/3/2/C	18"	see TP desc	18"	30"	5-10	182
9	SE TP 9C	☒	3C (BLT) 3/3/5/2/C	16"	n.o.	16"	28"	6	186
9	SE TP 9D	☒	3C (BLT) 3/3/5/2/C	16"	n.o.	16"	28"	6	186
10	SE TP10C	☒	8C (BLT) 3/3/5/2/C	16"	n.o.	16"	28"	10	188
10	SE TP10D	☒	8C (BLT) 3/3/5/2/C	16"	n.o.	16"	28"	10	188
11	SE TP11C	☒	3 AIII / D (BLT) 4/3/3/1/C	12"	see TP desc	12"	24"	7	184
11	SE TP11D	☒	3 AIII / C (BLT) 4/3/3/1/C	15"	see TP desc	15"	24"	5	184
12	TP 15	☒	8C (SS) 3/3/3/1/C	18"	n.o.	18"	35"	1	182
12	TP 15a	☒	8C (SS) 3/3/3/1/C	18"	n.o.	18"	35"	1-6	182
12	SE TP12C	☒	8C (BLT) 3/3/3/1/C	16"	n.o.	16"	24"	5	182
13	TP 14	☒	7C (SS) 3/3/3/1/C	24"	n.o.	24"	35"	1-6	186
13	SE TP13C	☒	8 AIII / C (BLT) 3/3/3/1/C	16"	see TP desc	16"	24"	4	186
14	SE TP14C	☒	8D (BLT) 4/3/4/2/C	14"	n.o.	14"	24"	5	184
14	SE TP14D	☒	8D (BLT) 4/3/4/2/C	14"	n.o.	14"	24"	7	184
15	TP 12	☒	8C (SS) 3/3/4/2/C	21"	n.o.	21"	35"	1-8	176
15	SE TP15C	☒	8D (BLT) 4/3/4/2/C	12"	n.o.	12"	24"	5	176

INVESTIGATOR INFORMATION AND SIGNATURE

Signature	Date
Transposed from BLT and SS Site Evaluation TP Logs	06/12; 06/13; 06/22,2018
Name Printed	**Cert/Lic/Reg. #**
Connotative shows what SMU TP is in, except drg class	

Qualification

☒ Licensed Site Evaluator ☐ Certified Soil Scientist
☐ Certified Geologist ☐ Other:

affix professional seal

SOIL CONDITIONS SUMMARY TABLE

SUMMARY LOG OF SUBSURFACE EXPLORATIONS AT PROJECT SITES

Project Name:	Applicant Name:	Project Location (municipality):
Durant Homestead, Chute Road	Matt Hancock Properties	Windham

Lot No.	Exploration Symbol *(TP 1, B 2, etc.)*	☒ if at SSWD Field	Description of subsurface materials by: ● Soil profile/condition *(if by S.E.),* ● Soil series name *(if by C.S.S.),* or by ● Geologic unit *(if by C.G.)*	Depths to *(inches)*: Redoximorphic Features	Bedrock	Hydraulically Restrictive Layer	Limit of Exploration	Ground Surface Slope (%)	Ground Surface Elevation
15	SE TP15D	☒	8D (BLT) 4/3/4/2/C	12"	n.o.	12"	24"	5	176
16	TP 11	☒	8 AIII / D (SS) 4/5/3/2/D	14"	see TP desc	14"	35"	1-8	168
16	TP 11a	☒	8 AIII / D (SS) 4/5/3/2/D	14"	see TP desc	14"	35"	1-8	168
17	TP 10	☒	8D (SS) 4/3/5/3/C	11"	n.o.	11"	35"	0-3	165
17	TP 10a	☒	8D (SS) 4/3/5/3/C	13"	n.o.	13"	35"	0-3	165
17	TP 17C	☒	8D (BLT) 4/3/5/3/C	12"	n.o.	12"	35"	3-8	165
18	TP 9	☒	8C (SS) 3/5/5/2/D	17"	n.o.	17"	35"	3-8	173
18	TP 9a	☒	8C (SS) 3/5/5/2/D	18"	n.o.	18"	35"	3-8	173
19	TP8	☒	8D(BLT) 4/3/3/2/C	13"	n.o.	13"	35"	3-8	180
19	SE TP19C	☒	8 AIII / C (BLT) 3/3/3/2/C	16"	see TP desc	16"	24"	5	180
20	SE TP20C	☒	8 AIII / D (BLT SSTP31) 4/3,8/3/2/C	12"	see TP desc	n.o.	32"	0	186
20	SE TP20D	☒	8 AIII / C (BLT) 4/3,8/3/2/C	15"	see TP desc	15'	17"	0	186
21	SE TP21C	☒	8 AIII / D (BLT) 3/4,8/2,3/1/D	12"	36"	n.o.	36"	0	180
21	SE TP21D	☒	8 AIII / D (BLT) 3/4,8/2,3/1/D	12"	36"	n.o.	36"	0	180
22	SE TP22C	☒	8 AIII / C (BLT) 3/3/3/1/C	16"	see TP desc	16"	24"	0	180
22	SE TP22D	☒	8 AIII / D (BLT) 4/3/3/1/C	12"	see TP desc	12"	24"	0	180
23	SE TP23C	☒	8AIII/C (BLT) 3/3/2/1/C	17"	18"	17"	18"	0-3	180
23	SE TP23D	☒	8AIII/C (BLT) 3/3/2/1/C	17"	18"	17"	18"	0-3	180
23	SEAB23E	☒	AIII (BLT)		18"		18"	0-3	180
23	SEAB23F	☒	AIII (BLT)		18"		18"	0-3	180
23	SEAB23G	☒	AIII (BLT)		18"		18"	0-3	180
23	SEAB23H	☒	AIII (BLT)		18"		18"	0-3	180
24	SE TP24C	☒	8D (BLT) 4/5/4/2/D	13"	n.o.	13"	24"	6	170
24	SE TP24D	☒	8D (BLT) 4/5/4/2/D	13"	n.o.	13"	24"	6	170
25	SE TP25C	☒	3 AIII / C (BLT) 4/2A/3/3/C	15"	see TP desc	15"'	24"	5	166
25	SE TP25D	☒	3 AIII / C (BLT) 3/2A/3/3/C	16"	see TP desc	16"	24"	8	166
26	SE TP26C	☒	8D (BLT) 4/5/5/2/C	12"	n.o.	12"	24"	5	166
26	SE TP26D	☒	8D (BLT) 4/5/5/2/C	14"	n.o.	14"	24"	5	166
		☐							
		☐							
		☐							
		☐							

INVESTIGATOR INFORMATION AND SIGNATURE

Signature	Transposed from BLT and SS Site Evaluation TP Logs	Date	6/12; 6/13; 6/22, 2018
Name Printed	Connotative shows what SMU TP is in, except drg class	Cert/Lic/Reg. #	

Qualification: ☒ Licensed Site Evaluator ☐ Certified Soil Scientist ☐ Certified Geologist ☐ Other:

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SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name:	Applicant Name:	Project Location (municipality):
Durant Homestead	Matt Hancock Properties	Chute Road, Windham, Maine

Exploration Symbol: SSTP1 ☒ Test Pit ☐ Boring

1/2 in. Organic horizon thickness — Ground surface elev. 181 ft.

Horizon	Texture	Consistence	Color	Concentrations	Depletions
Ap	silt loam	friable	10YR 4/3	NONE	NONE
Bw			10YR 5/3		
Bg1		firm; platey	2.5Y 4/2	7.5YR 4/4 common, fine, prominent	2.5Y 5/1 many, medium, distinct
Bg2	silty clay loam	firm; prismatic			

Depth below mineral soil surface (inches): 0, 6, 12, 18, 24, 30, 36, 42, 48, 54, 60

R @ 66 in. (mica schist; rippable)

soil data by M.C.S.S.	Soil series / phase name:	
☒	3,4/5/5/1/D (Soil Map Unit 9)	
☐ Hydric ☒ Non-hydric		Hydrologic Soil Group: D

Exploration Symbol: SSTP2 ☒ Test Pit ☐ Boring

1/2 in. Organic horizon thickness — Ground surface elev. 182 ft.

Horizon	Texture	Consistence	Color	Concentrations	Depletions
Ap	sandy loam, 15% cobbles	friable	10YR 4/3	NONE	NONE
Bw	silt loam	firm	10YR 5/4		
C			2.5Y 5/3		2.5Y 5/2 common, coarse, faint

Depth below mineral soil surface (inches): 0, 6, 12, 18, 24, 30, 36, 42, 48, 54, 60

R @ 31 in. (mica schist; rippable)

soil data by M.C.S.S.	Soil series / phase name:	
☒	3/3/3/2/C (Soil Map Unit 8)	
☐ Hydric ☒ Non-hydric		Hydrologic Soil Group: C

INVESTIGATOR INFORMATION AND SIGNATURE

Signature:	Date:
Christopher C. Dorion	July 19, 2018
Name Printed / typed: Christopher C. Dorion	**Cert / Lic /Reg. #** SS-454
Title: ☒ Maine Certified Soil Scientist	

STATE OF MAINE
CHRISTOPHER CARL DORION #SS 454
SOIL SCIENTIST

SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name:	Applicant Name:	Project Location (municipality):
Durant Homestead	Matt Hancock Properties	Chute Road, Windham, Maine

Exploration Symbol: SSTP3 ☒ Test Pit ☐ Boring

1/2 in. Organic horizon thickness — Ground surface elev. 175 ft.

Depth below mineral soil surface (inches)	Horizon	Texture	Consistence	Color	Concentrations	Depletions
0	C1	sand	loose: single grain	10YR 5/3	NONE	NONE
6		35% cobbles + stones				
12	C2			10YR 6/3		
36	C3	very fine sandy loam: 2% gravel	firm; sub-angular blocky	10YR 3/3		
42	R @ 41 in. (mica schist)					
60	R @ 66 in. (mica schist; rippable)					

soil data by M.C.S.S.	Soil series / phase name:
☒	3/2B,8/3/2/C (Soil Map Unit 7)

☐ Hydric ☒ Non-hydric	Hydrologic Soil Group: C

Exploration Symbol: SSTP4 ☒ Test Pit ☐ Boring

1/2 in. Organic horizon thickness — Ground surface elev. 169 ft.

Depth below mineral soil surface (inches)	Horizon	Texture	Consistence	Color	Concentrations	Depletions
0	Ap1	loam; 2% gravel	friable	10YR 3/2	NONE	NONE
6	Ap2			10YR 3/3		
12	Bs1	very fine sandy loam; 2% gravel		7.5YR 4/3		
18	Bs2			7.5YR 4/4		
30	BC		firm	10YR 5/3	7.5YR 4/4 common, fine, prominent	2.5Y 5/2 common, coarse, distinct
42	C	loamy very fine sand; 15% gravel + cobbles	very friable	10YR 3/2		
48	R @ 49 in. (mica schist; rippable)					

soil data by M.C.S.S.	Soil series / phase name:
☒	3/2B/4/4/C (Soil Map Unit 12)

☐ Hydric ☒ Non-hydric	Hydrologic Soil Group: C

INVESTIGATOR INFORMATION AND SIGNATURE

Signature: Christopher C. Dorion	Date: July 19, 2018
Name Printed / typed: Christopher C. Dorion	Cert / Lic /Reg. # SS-454
Title: ☒ Maine Certified Soil Scientist	



SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name:	Applicant Name:	Project Location (municipality):
Durant Homestead	Matt Hancock Properties	Chute Road, Windham, Maine

Exploration Symbol: SSTP5 ☒ Test Pit ☐ Boring

1/2 in. Organic horizon thickness — Ground surface elev. 171 ft.

Horizon	Texture	Consistence	Color	Concentrations	Depletions
Ap	loam	friable	10YR 3/3	NONE	NONE
Bs1	very fine sandy loam		5YR 4/6		
Bs2			7.5YR 4/4		
Cr	loamy very fine sand; 15% channers		10YR 4/4	7.5YR 4/4 common, fine, prominent	2.5Y 5/2 common, medium, distinct

Depth below mineral soil surface (inches): 0, 6, 12, 18, 24, 30, 36, 42, 48, 54, 60

R @ 29 in. (mica schist); rippable

R @ 66 in. (mica schist; rippable)

soil data by M.C.S.S.	Soil series / phase name:
☒	3/3/3/4/C (Soil Map Unit 19)

☐ Hydric ☒ Non-hydric	Hydrologic Soil Group: C

Exploration Symbol: SSTP6 ☒ Test Pit ☐ Boring

1/2 in. Organic horizon thickness — Ground surface elev. 163 ft.

Horizon	Texture	Consistence	Color	Concentrations	Depletions
Ap	loam	friable	10YR 3/3	NONE	NONE
Bw			10YR 6/3	10YR 4/4 common, fine, prominent	2.5Y 6/1 common, medium, distinct
Bg	silt loam	firm	2.5Y 5/1		depleted matrix
Cg	silty clay loam		5Y 5/1		
2C	loamy very fine sand; 5% gravel + cobbles	friable	10YR 5/4	10YR 5/6 many, medium, distinct	NONE

Depth below mineral soil surface (inches): 0, 6, 12, 18, 24, 30, 36, 42, 48, 54, 60

R @ 84 in. (mica schist; rippable)

soil data by M.C.S.S.	Soil series / phase name:
☒	4/5/5/2/D (Soil Map Unit 14)

☐ Hydric ☒ Non-hydric	Hydrologic Soil Group: D

INVESTIGATOR INFORMATION AND SIGNATURE

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STATE OF MAINE
CHRISTOPHER CARL DORION
#SS 454
SOIL SCIENTIST

SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name:	Applicant Name:	Project Location (municipality):
Durant Homestead	Matt Hancock Properties	Chute Road, Windham, Maine

Exploration Symbol: SSTP7 ☒ Test Pit ☐ Boring

1/2 in. Organic horizon thickness — Ground surface elev. 162 ft.

Horizon	Texture	Consistence	Color	Concentrations	Depletions	Depth below mineral soil surface (inches)
A	silt loam	friable	2.5Y 4/1	NONE	NONE	0
Bg1		firm	2.5Y 5/1	10YR 4/4 many, fine, prominent	2.5Y 6/1 many, fine, faint	6
						12
						18
						24
						30
Bg2	silty clay loam		2.5Y 5/2	7.5YR 4/4 many, fine, prominent	5Y 5/1 many, medium, faint	36
						42
Cg			5Y 5/1		depleted matrix	48
						54
58 in. +						60

soil data by M.C.S.S.	Soil series / phase name:
☒	5/5/5/1/D (Soil Map Unit 15)

☒ Hydric ☐ Non-hydric	Hydrologic Soil Group: D

Exploration Symbol: SSTP8 ☒ Test Pit ☐ Boring

1 in. Organic horizon thickness — Ground surface elev. 169 ft.

Horizon	Texture	Consistence	Color	Concentrations	Depletions	Depth below mineral soil surface (inches)
Ap	loam	friable	10YR 3/2	NONE	NONE	0
Bw	silt loam		10YR 4/3			6
						12
Bg	silty clay loam	firm	2.5Y 5/2	7.5YR 5/6 common, fine, prominent	2.5Y 6/1 many, coarse, distinct	18
						24
						30
Cg	silt loam		5Y 5/2	7.5YR 4/4 common, medium, prominent	5Y 6/2 many, coarse, distinct	36
						42
						48
						54
2C	loamy very fine sand; 5% gravel	friable	10YR 5/4	10YR 5/6 many, medium, distinct	NONE	60

R @ 90 in. (mica schist; rippable)

soil data by M.C.S.S.	Soil series / phase name:
☒	4/5/5/2/D (Soil Map Unit 14)

☐ Hydric ☒ Non-hydric	Hydrologic Soil Group: D

INVESTIGATOR INFORMATION AND SIGNATURE

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STATE OF MAINE CHRISTOPHER CARL DORION #SS 454 SOIL SCIENTIST

SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name:	Applicant Name:	Project Location (municipality):
Durant Homestead	Matt Hancock Properties	Chute Road, Windham, Maine

Exploration Symbol: SWTP8A ☒ Test Pit ☐ Boring

1/2 in. Organic horizon thickness — Ground surface elev. 169 ft.

Horizon	Texture	Consistence	Color	Concentrations	Depletions
Ap	loam	friable	10YR 3/3	NONE	NONE
Bw	very fine loam		10YR 5/4		
BC	silty clay loam	firm	2.5Y 5/2	10YR 4/4 common, medium, prominent	2.5Y 6/2 many, medium, distinct
C	silty clay			10YR 4/4 many, coarse, prominent	5Y 5/1 many, coarse, distinct

Depth below mineral soil surface (inches): 0, 6, 12, 18, 24, 30, 36, 42, 48, 54, 60

R @ 78-90 in. (mica schist sloping across trench

soil data by M.C.S.S. ☒

Soil series / phase name: 4/4/5/3/D (Soil Map Unit 11)

☐ Hydric ☒ Non-hydric

Hydrologic Soil Group: D

Exploration Symbol: _____ ☐ Test Pit ☐ Boring

_____ in. Organic horizon thickness — Ground surface elev. _____ ft.

Horizon	Texture	Consistence	Color	Concentrations	Depletions

Depth below mineral soil surface (inches): 0, 6, 12, 18, 24, 30, 36, 42, 48, 54, 60

soil data by M.C.S.S. ☐

Soil series / phase name:

☐ Hydric ☐ Non-hydric

Hydrologic Soil Group: _____

INVESTIGATOR INFORMATION AND SIGNATURE

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Christopher C. Dorion	July 19, 2018
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STATE OF MAINE
CHRISTOPHER CARL DORION #SS 454
SOIL SCIENTIST

SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name:	Applicant Name:	Project Location (municipality):
Durant Homestead	Matt Hancock Properties	Chute Road, Windham, Maine

Exploration Symbol: SWTP8 ☒ Test Pit ☐ Boring

1/2 in. Organic horizon thickness — Ground surface elev. 169 ft.

Depth below mineral soil surface (inches)

Horizon	Texture	Consistence	Color	Concentrations	Depletions
Ap	loam	friable	10YR 4/3	NONE	NONE
Bw			10YR 4/4		
C1	silty clay loam	firm	2.5Y 5/3	7.5YR 4/4 many, coarse, distinct	2.5Y 6/2 many, coarse, distinct
C2	silty clay			10YR 4/4 many, medium, prominent	2.5Y 5/1 many, coarse, distinct

R @ 68 in. (mica schist sloping across trench

soil data by M.C.S.S. ☒

Soil series / phase name: 4/4/5/3/D (Soil Map Unit 11)

☐ Hydric ☒ Non-hydric

Hydrologic Soil Group: D

Exploration Symbol: SSTP9 ☒ Test Pit ☐ Boring

3 in. Organic horizon thickness — Ground surface elev. 162 ft.

Depth below mineral soil surface (inches)

Horizon	Texture	Consistence	Color	Concentrations	Depletions
Ap	silt loam	friable	10YR 4/3	oxidized rhizospheres from skidder compactions	NONE
Bw	loam		10YR 5/4		
BC	silt loam	firm	10YR 5/3	10YR 4/4 common, fine, distinct	2.5Y 6/1 many, medium, distinct
Cg	silty clay loam		2.5Y 5/2	10YR 4/4 many, medium, prominent	
Cg2	loamy very fine sand; 5% gravel		5Y 5/1 and 10YR 5/4		depleted matrix

R @ 60 in. (mica schist; rippable)

soil data by M.C.S.S. ☒

Soil series / phase name: 4/5/5/2/D (Soil Map Unit 14)

☐ Hydric ☒ Non-hydric

Hydrologic Soil Group: D

INVESTIGATOR INFORMATION AND SIGNATURE

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STATE OF MAINE CHRISTOPHER CARL DORION #SS 454 SOIL SCIENTIST

SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name:	Applicant Name:	Project Location (municipality):
Durant Homestead	Matt Hancock Properties	Chute Road, Windham, Maine

Exploration Symbol: SSTP10 ☒ Test Pit ☐ Boring

4 in. Organic horizon thickness — Ground surface elev. 172 ft.

Depth below mineral soil surface (inches)

Horizon	Texture	Consistence	Color	Concentrations	Depletions
Ap	loam	friable	10YR 3/3	NONE	NONE
Bs1	very fine sandy loam		7.5YR 4/4		
Bs2			7.5YR 5/4		
BC	sandy loam		10YR 5/4		
Cd	loamy fine sand	very firm	10YR 5/3		10YR 6/2 common, medium, faint

R @ 78 in. (mica schist)

soil data by M.C.S.S. ☒

Soil series / phase name: 2/2B/5/3/C (Soil Map Unit 18)

☐ Hydric ☒ Non-hydric

Hydrologic Soil Group: C

Exploration Symbol: SSTP11 ☒ Test Pit ☐ Boring

1 in. Organic horizon thickness — Ground surface elev. 165 ft.

Depth below mineral soil surface (inches)

Horizon	Texture	Consistence	Color	Concentrations	Depletions
Ap	silt loam	friable	10YR 3/3	oxidized rhizospheres from skidder compactions	NONE
Bw			2.5Y 4/3		
BC		very firm	5Y 5/2	10YR 3/6 many, medium, prominent	5Y 5/1 common, medium, faint
C1			5Y 4/3	10YR 4/6 common, medium, prominent	
C2	silt clay loam	firm	5Y 4/2		NONE
72 in. 2C	loamy very fine sand	friable	10YR 5/4	10YR 5/6 many, fine, distinct	

96 in.+

soil data by M.C.S.S. ☒

Soil series / phase name: 4/5/5/2/D (Soil Map Unit 25)

☐ Hydric ☒ Non-hydric

Hydrologic Soil Group: D

INVESTIGATOR INFORMATION AND SIGNATURE

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STATE OF MAINE CHRISTOPHER CARL DORION #SS 454 SOIL SCIENTIST

SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name:	Applicant Name:	Project Location (municipality):
Durant Homestead	Matt Hancock Properties	Chute Road, Windham, Maine

Exploration Symbol: SSTP12 ☒ Test Pit ☐ Boring

2 in. Organic horizon thickness — Ground surface elev. 174 ft.

Depth below mineral soil surface (inches)

Horizon	Texture	Consistence	Color	Concentrations	Depletions
Ap	silt loam	friable	10YR 3/3	NONE	NONE
Bs			10YR 4/4		
BC		very firm	2.5Y 4/3	10YR 3/6 common, fine, prominent	2.5Y 5/2 common, coarse, faint
C			5Y 4/2		5Y 5/2 common, medium, faint
C2			2.5Y 4/3	10YR 4/6 common, fine, prominent	2.5Y 4/2 many, medium, faint
2C	loamy very fine sand	friable	10YR 5/4	10YR 5/6 many, fine, distinct	NONE
R @ 57in. (mica schist)					

soil data by M.C.S.S. ☒

Soil series / phase name: 4/3/4/4/C (Soil Map Unit 26)

☐ Hydric ☒ Non-hydric

Hydrologic Soil Group: C

Exploration Symbol: SSTP13 ☒ Test Pit ☐ Boring

1 in. Organic horizon thickness — Ground surface elev. 174 ft.

Depth below mineral soil surface (inches)

Horizon	Texture	Consistence	Color	Concentrations	Depletions
Ap	loam	friable	10YR 3/3	NONE	NONE
Bs			10YR 4/4		
BC		firm	2.5Y 4/4		2.5Y 5/2 common, medium, distinct
2C	very fine sandy loam			10YR 4/6 common, fine, prominent	
R @ 40 in. (mica schist)					

soil data by M.C.S.S. ☒

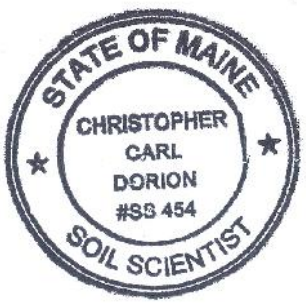
Soil series / phase name: 4/3/4/4/C (Soil Map Unit 26)

☐ Hydric ☒ Non-hydric

Hydrologic Soil Group: C

INVESTIGATOR INFORMATION AND SIGNATURE

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SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name:	Applicant Name:	Project Location (municipality):
Durant Homestead	Matt Hancock Properties	Chute Road, Windham, Maine

Exploration Symbol: SSTP14 ☒ Test Pit ☐ Boring

1 in. Organic horizon thickness — Ground surface elev. 185 ft.

Depth below mineral soil surface (inches)

Horizon	Texture	Consistence	Color	Concentrations	Depletions
A	very fine sandy loam	friable	7.5YR 3/2	NONE	NONE
Bs1			7.5YR 4/4		
Bs2			7.5YR 4/6		
Bs3			7.5YR 5/4		
Cr			rippable mica schist with intercalated very fine sandy loam		
R @ 40 in. (mica schist)					

soil data by M.C.S.S. ☒

Soil series / phase name: 2,3/2A,2B/3/2/C (Soil Map Unit 28)

☐ Hydric ☒ Non-hydric

Hydrologic Soil Group: C

Exploration Symbol: SSTP15 ☒ Test Pit ☐ Boring

1/2 in. Organic horizon thickness — Ground surface elev. 185 ft.

Depth below mineral soil surface (inches)

Horizon	Texture	Consistence	Color	Concentrations	Depletions
Ap1	silt loam	friable	10YR 3/3	NONE	NONE
Ap2					
Bs			10YR 4/4		
2C	very fine sandy loam	firm	2.5Y 4/4	10YR 4/6 common, medium, distinct	2.5Y 5/3 common, medium, distinct
R @ 27 in. (mica schist)					

soil data by M.C.S.S. ☒

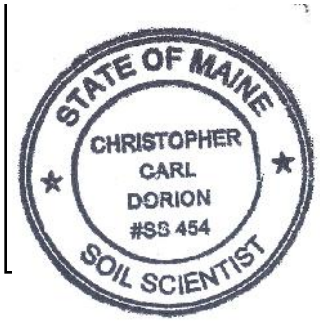
Soil series / phase name: 3/3,8/3/2/C (Soil Map Unit 16)

☐ Hydric ☒ Non-hydric

Hydrologic Soil Group: C

INVESTIGATOR INFORMATION AND SIGNATURE

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SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name:	Applicant Name:	Project Location (municipality):
Durant Homestead	Matt Hancock Properties	Chute Road, Windham, Maine

Exploration Symbol: SSTP16 ☒ Test Pit ☐ Boring

1/2 in. Organic horizon thickness — Ground surface elev. 183 ft.

Horizon	Texture	Consistence	Color	Concentrations	Depletions
Ap	silt loam	friable	7.5YR 3/2	NONE	NONE
Bw1			10YR 4/3	7.5YR 4/6 common, fine, prominent	
Bw2			2.5Y 5/3		
Bg	silty clay loam	firm	5Y 6/2	7.5YR 4/4 many, medium, prominent	
Cg		very firm		10YR 4/4 many, medium, prominent	5Y 5/1 many, medium, distinct
2C	loamy fine sand	firm in place	10YR 5/4		

Depth below mineral soil surface (inches): 0, 6, 12, 18, 24, 30, 36, 42, 48, 54, 60

soil data by M.C.S.S. ☒

Soil series / phase name: 4/3/5/1/C (Soil Map Unit 32)

☐ Hydric ☒ Non-hydric

Hydrologic Soil Group: C

Exploration Symbol: SSTP17 ☒ Test Pit ☐ Boring

2 in. Organic horizon thickness — Ground surface elev. 186 ft.

Horizon	Texture	Consistence	Color	Concentrations	Depletions
Bw1	silt loam	friable	10YR 5/4	NONE	NONE
Bw2			10YR 5/3		
Bw3		firm	2.5Y 5/3	10YR 4/6 few, fine, prominent	2.5Y 5/2 common, medium, faint
Cg	silty clay loam		5Y 4/2	7.5YR 4/4 many, medium, faint	5Y 5/1 many, medium, faint

Depth below mineral soil surface (inches): 0, 6, 12, 18, 24, 30, 36, 42, 48, 54, 60

R @ 63 in. (mica schist)

soil data by M.C.S.S. ☒

Soil series / phase name: 3,4/3/3/1/C (Soil Map Unit 30)

☐ Hydric ☒ Non-hydric

Hydrologic Soil Group: C

INVESTIGATOR INFORMATION AND SIGNATURE

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Title: ☒ Maine Certified Soil Scientist	



SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name:	Applicant Name:	Project Location (municipality):
Durant Homestead	Matt Hancock Properties	Chute Road, Windham, Maine

Exploration Symbol: SSTP18 ☒ Test Pit ☐ Boring

1/2 in. Organic horizon thickness — Ground surface elev. 186 ft.

Horizon	Texture	Consistence	Color	Concentrations	Depletions
Ap	silt loam	friable	7.5YR 3/2	NONE	NONE
Bw1			10YR 5/4		
Bw2		firm	10YR 4/4		
BC			10YR 5/3		
C	silty clay loam		2.5Y 5/2	10YR 4/4 few, fine, prominent	2.5Y 5/1 few, fine, faint
2C	loamy fine sand	firm in place	10YR 5/4		

R @ 96 in. (mica schist)

Depth below mineral soil surface (inches): 0, 6, 12, 18, 24, 30, 36, 42, 48, 54, 60

soil data by M.C.S.S. ☒

Soil series / phase name: 3,4/3/5/2/C (Soil Map Unit 32)

☐ Hydric ☒ Non-hydric

Hydrologic Soil Group: C

Exploration Symbol: SSTP19 ☒ Test Pit ☐ Boring

2 in. Organic horizon thickness — Ground surface elev. 181 ft.

Horizon	Texture	Consistence	Color	Concentrations	Depletions
A	silt loam	friable	10YR 3/3	NONE	NONE
Bg1			2.5Y 5/2	7.5YR 4/4 common, fine, prominent	2.5Y 6/2 common, medium, faint
Bg2		firm	2.5Y 6/1		depleted matrix

R @ 24 in. (mica schist)

Depth below mineral soil surface (inches): 0, 6, 12, 18, 24, 30, 36, 42, 48, 54, 60

soil data by M.C.S.S. ☒

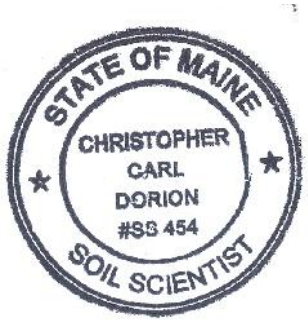
Soil series / phase name: 3,4/3/3/1/C (Soil Map Unit 30)

☐ Hydric ☒ Non-hydric

Hydrologic Soil Group: C

INVESTIGATOR INFORMATION AND SIGNATURE

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SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name:	Applicant Name:	Project Location (municipality):
Durant Homestead	Matt Hancock Properties	Chute Road, Windham, Maine

Exploration Symbol: SSTP20 ☒ Test Pit ☐ Boring

4 in. Organic horizon thickness — Ground surface elev. 186 ft.

Horizon	Texture	Consistence	Color	Concentrations	Depletions
Bs1	fine sandy loam	friable	7.5YR 4/4	NONE	NONE
Bs2			7.5YR 5/4		
BC		firm	10YR 5/4		
Cd		very firm	10YR 5/3		

R @ 32-36 in. (mica schist)

Depth below mineral soil surface (inches): 0, 6, 12, 18, 24, 30, 36, 42, 48, 54, 60

soil data by M.C.S.S. ☒

Soil series / phase name: 3,4/3/3/1/C (Soil Map Unit 30)

☐ Hydric ☒ Non-hydric

Hydrologic Soil Group: C

Exploration Symbol: SSTP21 ☒ Test Pit ☐ Boring

3 in. Organic horizon thickness — Ground surface elev. 187 ft.

Horizon	Texture	Consistence	Color	Concentrations	Depletions
Bw	silt loam	friable	10YR 5/4	NONE	NONE
Bg	silty clay loam	firm	2.5Y 6/2	10YR 4/4 many, fine, prominent	2.5Y 6/1 many, coarse, faint
Cg	silty clay		5Y 5/1 85% 10YR 5/3 15%		depleted matrix

R @ 66 in. (mica schist)

Depth below mineral soil surface (inches): 0, 6, 12, 18, 24, 30, 36, 42, 48, 54, 60

soil data by M.C.S.S. ☒

Soil series / phase name: 3,4/3/3/1/C (Soil Map Unit 30)

☐ Hydric ☒ Non-hydric

Hydrologic Soil Group: C

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STATE OF MAINE CHRISTOPHER CARL DORION #SS 454 SOIL SCIENTIST

SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name:	Applicant Name:	Project Location (municipality):
Durant Homestead	Matt Hancock Properties	Chute Road, Windham, Maine

Exploration Symbol: BED-21 ☒ Test Pit ☐ Boring

0 in. Organic horizon thickness — Ground surface elev. 180 ft.

Horizon	Texture	Consistence	Color	Concentrations	Depletions
gravel road	very gravelly sand	very firm in place	10YR 5/3	NONE	NONE
Bw	silt loam	firm	10YR 5/4		
Cd	sand	very firm in place	10YR 4/3		
R @ 36 in. (mica schist)					

Depth below mineral soil surface (inches): 0, 6, 12, 18, 24, 30, 36, 42, 48, 54, 60

soil data by M.C.S.S.	Soil series / phase name:
☒	3/4,8/2,3/1/D (Soil Map Unit 1)

☐ Hydric ☒ Non-hydric	Hydrologic Soil Group: D

Exploration Symbol: SSTP22 ☒ Test Pit ☐ Boring

2 in. Organic horizon thickness — Ground surface elev. ft.

Horizon	Texture	Consistence	Color	Concentrations	Depletions
Bs	very fine sandy loam	friable	7.5YR 4/4	NONE	NONE
BC	loam		10YR 5/4		
Cr	loam intercalated with schist channers				
R @ 32 in. (mica schist)					

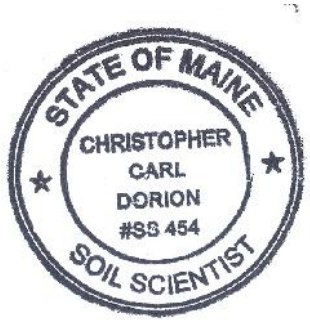
Depth below mineral soil surface (inches): 0, 6, 12, 18, 24, 30, 36, 42, 48, 54, 60

soil data by M.C.S.S.	Soil series / phase name:
☒	3,4/3/3/1/C (Soil Map Unit 30)

☐ Hydric ☒ Non-hydric	Hydrologic Soil Group: C

INVESTIGATOR INFORMATION AND SIGNATURE

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SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name:	Applicant Name:	Project Location (municipality):
Durant Homestead	Matt Hancock Properties	Chute Road, Windham, Maine

Exploration Symbol: SSTP23 ☒ Test Pit ☐ Boring

1/2 in. Organic horizon thickness — Ground surface elev. 176 ft.

Depth below mineral soil surface (inches)	Horizon	Texture	Consistence	Color	Concentrations	Depletions
0	Ap	silt loam	friable	10YR 4/3	NONE	NONE
6	Bw			10YR 5/4		
12						
18	Bg		firm	2.5Y 5/3	10YR 4/4 coarse, fine, prominent	2.5Y 5/2 many, medium, faint
24						
30	Cr	rippable schist bedrock channers and flaggers		rippable schist bedrock channers and flaggers		
36						
42	R @ 44-54 in. (mica schist)					
48						
54						
60						

soil data by M.C.S.S.	Soil series / phase name:	
☒	3,4/3/4/2/C (Soil Map Unit 29)	
☐ Hydric ☒ Non-hydric		Hydrologic Soil Group: C

Exploration Symbol: SSTP24 ☒ Test Pit ☐ Boring

1/2 in. Organic horizon thickness — Ground surface elev. 168 ft.

Depth below mineral soil surface (inches)	Horizon	Texture	Consistence	Color	Concentrations	Depletions
0	Ap	silt loam	friable	10YR 4/3	NONE	NONE
6	Bw			10YR 5/4		
12	Bg1			2.5Y 5/2	7.5YR 4/6 few, fine, prominent	depleted matrix
18						
24	Bg2	silty clay loam	firm	5Y 5/1 95% 10YR 6/3 5%		
30						
36	R @ 26-37 in. (mica schist)					
42						
48						
54						
60						

soil data by M.C.S.S.	Soil series / phase name:	
☒	4/5/3/2/D (Soil Map Unit 23)	
☐ Hydric ☒ Non-hydric		Hydrologic Soil Group: D

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SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name:	Applicant Name:	Project Location (municipality):
Durant Homestead	Matt Hancock Properties	Chute Road, Windham, Maine

Exploration Symbol: SSTP25-trench ☒ Test Pit ☐ Boring

1 in. Organic horizon thickness — Ground surface elev. 163 ft.

Horizon	Texture	Consistence	Color	Concentrations	Depletions
Ap	silt loam	friable	10YR 3/3	NONE	NONE
Bw			2.5Y 4/3	10YR 4/6	2.5Y 4/2
BC		very firm	5Y 5/2	oxidized rhizospheres due to skidder compaction. Vegetation is upland.	depletions are due to skidder compaction. Vegetation is upland.
C			5Y 4/3	10YR 3/6	5Y 4/3
				many, medium, prominent	common, medium, distinct

Depth below mineral soil surface (inches): 0, 6, 12, 18, 24, 30, 36, 42, 48, 54, 60

R @ 78 in. (mica schist)

soil data by M.C.S.S. ☒

Soil series / phase name: 4/5/5/2/D (Soil Map Unit 25)

☐ Hydric ☒ Non-hydric

Hydrologic Soil Group: D

Exploration Symbol: SSTP26 ☒ Test Pit ☐ Boring

1 in. Organic horizon thickness — Ground surface elev. 163 ft.

Horizon	Texture	Consistence	Color	Concentrations	Depletions
Ap	silt loam	friable	10YR 3/3	NONE	NONE
Bw			2.5Y 4/3	10YR 4/6	2.5Y 4/2
BC		very firm	5Y 5/2	oxidized rhizospheres due to skidder compaction. Vegetation is upland.	depletions are due to skidder compaction. Vegetation is upland.
C1			5Y 4/3	10YR 3/6	5Y 5/1
				many, medium, prominent	common, medium, distinct
C2	silty clay loam	firm	5Y 4/2	10YR 4/6	NONE
84 in. 2C	loamy very fine sand	friable	10YR 5/4	10YR 5/6 many, fine, distinct	

Depth below mineral soil surface (inches): 0, 6, 12, 18, 24, 30, 36, 42

R @ 96 in. (mica schist)

soil data by M.C.S.S. ☒

Soil series / phase name: 4/5/5/2/D (Soil Map Unit 25)

☐ Hydric ☒ Non-hydric

Hydrologic Soil Group: D

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STATE OF MAINE CHRISTOPHER CARL DORION #SS 454 SOIL SCIENTIST

SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name:	Applicant Name:	Project Location (municipality):
Durant Homestead	Matt Hancock Properties	Chute Road, Windham, Maine

Exploration Symbol: SSTP27 ☒ Test Pit ☐ Boring

1/2 in. Organic horizon thickness — Ground surface elev. 180 ft.

Depth below mineral soil surface (inches)

Horizon	Texture	Consistence	Color	Concentrations	Depletions
Ap	silt loam	friable	10YR 3/2	NONE	NONE
Bg1		firm	2.5Y 5/2	7.5YR 4/4 many, fine, prominent	depleted matrix
Bg2	silty clay loam		2.5Y 5/3		5Y 5/1 common, coarse, faint
Cg			2.5Y 5/2		depleted matrix
R @ 53 in. (mica schist)					

R @ 78 in. (mica schist)

soil data by M.C.S.S. ☒

Soil series / phase name: 5/5/4/2/D (Soil Map Unit 21)

☒ Hydric ☐ Non-hydric

Hydrologic Soil Group: D

Exploration Symbol: SSTP28 ☒ Test Pit ☐ Boring

1 in. Organic horizon thickness — Ground surface elev. 168 ft.

Depth below mineral soil surface (inches)

Horizon	Texture	Consistence	Color	Concentrations	Depletions
Ap	silt loam	friable	10YR 4/3	NONE	NONE
Bw1			10YR 4/4		
Bw2		firm	2.5Y 5/3		
BC			10YR 5/3	7.5YR 3/3 few, fine, distinct	2.5Y 5/2 common, medium, faint
2C	loamy fine sand	friable	10YR 5/4		
Cr	rippable mica schist				
R @ 45 in. (mica schist)					

soil data by M.C.S.S. ☒

Soil series / phase name: 3/3,8/3/2/C (Soil Map Unit 16)

☐ Hydric ☒ Non-hydric

Hydrologic Soil Group: C

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SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name:	Applicant Name:	Project Location (municipality):
Durant Homestead	Matt Hancock Properties	Chute Road, Windham, Maine

Exploration Symbol: SSTP29 ☒ Test Pit ☐ Boring

4 in. Organic horizon thickness — Ground surface elev. 173 ft.

Depth below mineral soil surface (inches)

Horizon	Texture	Consistence	Color	Concentrations	Depletions
Bw (0–6)	silt loam	friable	10YR 4/3	NONE	NONE
Bg (6–18)	silty clay loam	firm	10YR 5/2	10YR 4/4 few, fine, distinct	2.5Y 5/2 common, fine, faint
Cg (18–48)	silt loam		5Y 5/2 on SIL beds 10YR 5/3 on VFS laminae	7.5YR 4/4 many, medium, prominent	depleted matrix
2C (48–60)	loamy very fine sand	friable	10YR 5/4	10YR 5/6 many, fine, distinct	NONE

R @ 86 in. (mica schist)

soil data by M.C.S.S. ☒

Soil series / phase name: 4/5/5/2/D (Soil Map Unit 14)

☐ Hydric ☒ Non-hydric

Hydrologic Soil Group: D

Exploration Symbol: SSTP30 ☒ Test Pit ☐ Boring

1/2 in. Organic horizon thickness — Ground surface elev. 185 ft.

Depth below mineral soil surface (inches)

Horizon	Texture	Consistence	Color	Concentrations	Depletions
Ap (0–6)	very fine sandy loam	very friable	10YR 4/3	NONE	NONE
Bw (6–24)		friable	10YR 4/4		
BC (24–48)			10YR 5/4		
C (48–72)		firm	2.5Y 5/3	7.5YR 4/4 few, fine, distinct	2.5Y 5/2 many, fine, faint

R @ 72-108 in. along trench(mica schist)

soil data by M.C.S.S. ☒

Soil series / phase name: 2/3/5/3/C (Soil Map Unit 13)

☐ Hydric ☒ Non-hydric

Hydrologic Soil Group: C

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STATE OF MAINE ★ CHRISTOPHER CARL DORION #SS 454 ★ SOIL SCIENTIST

SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name:	Applicant Name:	Project Location (municipality):
Durant Homestead	Matt Hancock Properties	Chute Road, Windham, Maine

Exploration Symbol: SSTP31 ☒ Test Pit ☐ Boring

0 in. Organic horizon thickness — Ground surface elev. 182 ft.

Depth below mineral soil surface (inches)

Horizon	Texture	Consistence	Color	Concentrations	Depletions
	compacted gravelly fill	firm	10YR 4/2	NONE	NONE
Bw	silt loam		2.5Y 5/3		
2Bw	sandy loam	friable	10YR 4/3	7.5YR 4/4 few, fine, prominent	
R @ 32 in. (mica schist)					

soil data by M.C.S.S.	Soil series / phase name:	
☒	3/3,8/3/2/C (Soil Map Unit 16)	
☐ Hydric ☒ Non-hydric		Hydrologic Soil Group: C

Exploration Symbol: SSTP32 ☒ Test Pit ☐ Boring

0 in. Organic horizon thickness — Ground surface elev. 182 ft.

Depth below mineral soil surface (inches)

Horizon	Texture	Consistence	Color	Concentrations	Depletions
Ap	gravelly sandy loam	firm	10YR 4/3	NONE	NONE
Bs1	loam		7.5YR 4/4		
Bs2	very fine sandy loam		7.5YR 5/4		
BC			10YR 5/4		
R @ 19 in. (mica schist)					

soil data by M.C.S.S.	Soil series / phase name:	
☒	1/2A,8/2/1/C (Soil Map Unit 2)	
☐ Hydric ☒ Non-hydric		Hydrologic Soil Group: C

INVESTIGATOR INFORMATION AND SIGNATURE

Signature:	Date:
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SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name:	Applicant Name:	Project Location (municipality):
Durant Homestead	Matt Hancock Properties	Chute Road, Windham, Maine

Exploration Symbol: SSTP33 ☒ Test Pit ☐ Boring

1/2 in. Organic horizon thickness — Ground surface elev. 181 ft.

Depth below mineral soil surface (inches)

Horizon	Texture	Consistence	Color	Concentrations	Depletions
Ap1	loam	friable	10YR 3/2	NONE	NONE
Ap2	very fine sandy loam		10YR 4/3		
Cr	90% sand 10% channers	loose	10YR 5/3 60% 2.5Y 3/2 20% 10YR 4/4 20%	7.5YR 4/4 many, medium prominent	2.5Y 5/2 many, medium distinct

R @ 31 in. (mica schist)

soil data by M.C.S.S.	Soil series / phase name:	
☒	2,3/2A,8/3/1/C (Soil Map Unit 3)	
☐ Hydric ☒ Non-hydric		Hydrologic Soil Group: C

Exploration Symbol: SSTP34 ☒ Test Pit ☐ Boring

1/2 in. Organic horizon thickness — Ground surface elev. 180 ft.

Depth below mineral soil surface (inches)

Horizon	Texture	Consistence	Color	Concentrations	Depletions
Ap1	fill of gravelly sand	loose	10YR 3/2	NONE	NONE
Ap2	85% sandy loam 15% channers	friable	10YR 3/3		
Cr			10YR 5/4		

R @ 37 in. (mica schist)

soil data by M.C.S.S.	Soil series / phase name:	
☒	2,3/2A,8/3/1/C (Soil Map Unit 3)	
☐ Hydric ☒ Non-hydric		Hydrologic Soil Group: C

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STATE OF MAINE CHRISTOPHER CARL DORION #SS 454 SOIL SCIENTIST

SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name:	Applicant Name:	Project Location (municipality):
Durant Homestead	Matt Hancock Properties	Chute Road, Windham, Maine

Exploration Symbol: SSTP35 ☒ Test Pit ☐ Boring

1/2 in. Organic horizon thickness — Ground surface elev. 179 ft.

Depth below mineral soil surface (inches)

Horizon	Texture	Consistence	Color	Concentrations	Depletions
Ap1	very fine sandy loam	friable	10YR 3/2	NONE	NONE
Ap2			10YR 3/3		
Cr	90% sandy loam 10% channers		10YR 5/4		
R @ 36 in. (mica schist)					

soil data by M.C.S.S. ☒

Soil series / phase name: 2,3/2A,8/3/1/C (Soil Map Unit 3)

☐ Hydric ☒ Non-hydric

Hydrologic Soil Group: C

Exploration Symbol: SSTP36 ☒ Test Pit ☐ Boring

1/2 in. Organic horizon thickness — Ground surface elev. 179 ft.

Depth below mineral soil surface (inches)

Horizon	Texture	Consistence	Color	Concentrations	Depletions
Ap1	silt loam	friable	10YR 4/3	NONE	NONE
Bw1			10YR 5/4		
Bw2			10YR 5/3		
BC		firm	2.5Y 5/3	7.5YR 4/6 few, fine, distinct	
Cd	fine sandy loam	very firm	10YR 5/4		
R @ 28 in. (mica schist)					

soil data by M.C.S.S. ☒

Soil series / phase name: 2,3/2A,8/3/1/C (Soil Map Unit 3)

☐ Hydric ☒ Non-hydric

Hydrologic Soil Group: C

INVESTIGATOR INFORMATION AND SIGNATURE

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STATE OF MAINE
CHRISTOPHER CARL DORION #SS 454
SOIL SCIENTIST

SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name:	Applicant Name:	Project Location (municipality):
Durant Homestead	Matt Hancock Properties	Chute Road, Windham, Maine

Exploration Symbol: SSTP37 ☒ Test Pit ☐ Boring

1/2 in. Organic horizon thickness — Ground surface elev. 171 ft.

Horizon	Texture	Consistence	Color	Concentrations	Depletions
Ap1	very fine sandy loam	friable	10YR 4/3	NONE	NONE
Bs1			7.5YR 4/4		
Bs2	silt loam		10YR 5/4		
BC		firm	10YR 6/3	10YR 4/4 common, fine, prominent	10YR 6/2 common, fine, faint
C	silt y clay		2.5Y 5/2	7.5YR 4/6 many, medium, prominent	2.5Y 6/2 many, medium, distinct
R @ 44 in. (mica schist)					

Depth below mineral soil surface (inches): 0, 6, 12, 18, 24, 30, 36, 42, 48, 54, 60

soil data by M.C.S.S. ☒

Soil series / phase name: 3,4/5/4/2/D (Soil Map Unit 34)

☐ Hydric ☒ Non-hydric

Hydrologic Soil Group: D

Exploration Symbol: SSTP38 ☒ Test Pit ☐ Boring

1/2 in. Organic horizon thickness — Ground surface elev. 159 ft.

Horizon	Texture	Consistence	Color	Concentrations	Depletions
Ap	loam	friable	10YR 3/3	NONE	NONE
Bw1	silt loam		10YR 5/4		
Bw2			10YR 5/3		
BC		firm	2.5Y 5/3	10YR 4/4 common, fine, prominent 7.5YR 4/6 many, medium, prominent	2.5Y 5/1 many, medium, distinct
Cg1	silty clay loam		2.5Y 5/2		
Cg2			5Y 5/1 SICL beds 10YR 6/3 VFS laminae		
66+					

Depth below mineral soil surface (inches): 0, 6, 12, 18, 24, 30, 36, 42, 48, 54, 60

soil data by M.C.S.S. ☒

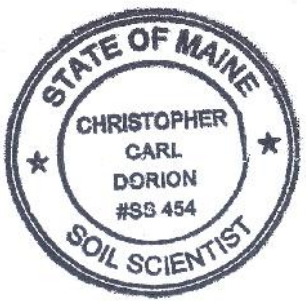
Soil series / phase name: 3,4/5/5/2/D (Soil Map Unit 36)

☐ Hydric ☒ Non-hydric

Hydrologic Soil Group: D

INVESTIGATOR INFORMATION AND SIGNATURE

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SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name:	Applicant Name:	Project Location (municipality):
Durant Homestead	Matt Hancock Properties	Chute Road, Windham, Maine

Exploration Symbol: SSTP39 ☒ Test Pit ☐ Boring

1/2 in. Organic horizon thickness — Ground surface elev. 171 ft.

Depth below mineral soil surface (inches)

Horizon	Texture	Consistence	Color	Concentrations	Depletions
Ap	loam	friable	10YR 3/3	NONE	NONE
Bw	silt loam		10YR 5/3		
Bsb	loam		7.5YR 4/6		
BC	silt loam	firm	2.5Y 5/3		2.5Y 5/2 common, fine, faint
Cg1	silty clay loam		2.5Y 4/2	7.5YR 4/4 many, medium, prominent	2.5Y 4/1 many, fine, distinct
Cg2					
2C	loamy fine sand	loose	10YR 5/4	7.5YR 4/6 common, fine, prominent	10YR 5/2 common, medium, distinct

R @ 70 in. (mica schist)

soil data by M.C.S.S.	Soil series / phase name:	
☒	3/5/5/1/D (Soil Map Unit 37)	
☐ Hydric ☒ Non-hydric		Hydrologic Soil Group: D

Exploration Symbol: _____ ☐ Test Pit ☐ Boring

_____ in. Organic horizon thickness — Ground surface elev. _____ ft.

Depth below mineral soil surface (inches)

Horizon	Texture	Consistence	Color	Concentrations	Depletions

soil data by M.C.S.S.	Soil series / phase name:	
☐		
☐ Hydric ☐ Non-hydric		Hydrologic Soil Group:

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STATE OF MAINE CHRISTOPHER CARL DORION #SS 454 SOIL SCIENTIST

APPENDIX E
Glossary of Terms

APPENDIX E - Glossary of Terms

SOIL ERODIBILITY FACTOR {K}

The soil erodibility factor (K) is a measure of the susceptibility of a soil to particle detachment and transport by rainfall. It is a quantitative value, experimentally determined. Values of K range from 0.02 to 0.69. The higher the value the more susceptible the soil to sheet and rill erosion by water. In the table below, K factors are assigned to each surface textural phase of all soil series in the survey area. The major subhorizons that would be exposed by cutting or scalping are listed below the existing surface phase for each series.

Soil properties that influence rainfall erosion are: (1) those that affect infiltration rate, movement of water through the soil, and the water storage capacity; and (2) those that affect dispersion, detachability, abrasion, and mobility of soil particles by rainfall and runoff. Some of the most important properties are texture and organic matter content of the exposed soil layer, size and stability of structural aggregates in the exposed permeability of the subsoil, and depth to slowly permeable layers. Antecedent soil moisture and presence of frozen soil also influence rainfall erosion.

SOIL CONSISTENCE

Soil consistence refers to "attributes of soil material as expressed in degree of cohesion and adhesion or in resistance to deformation or rupture" (USDA). Consistence includes resistance of soil material to rupture, resistance to penetration, plasticity, toughness, and stickiness of puddled soil material, and the manner in which the soil material behaves when subject to compression (USDA).

HYDROLOGIC SOIL GROUPS

A hydrologic soil group is a class of soils having the same runoff potential under similar storm and vegetative cover conditions. Soil properties that influence runoff potential are those that influence the minimum rate of infiltration for a bare soil after prolonged wetting and when not frozen. These properties are depth to seasonally high water table, intake rate, permeability after prolonged wetting, and depth to a very slowly permeable layer. The influence of ground cover is treated independently {not in hydrologic soil groups). The soils in the U.S. are placed into four groups: A, 8, C, and D.In the following definitions of the groups, infiltration rate is the rate at which water enters into the soil at the surface and is controlled by the surface conditions. Transmission rate is the rate at

which water moves within the soil and is controlled by the inherent properties of each horizon.

A. (Low runoff potential) Soils in this class have high infiltration rates even when thoroughly wetted and consist chiefly of deep, well drained to excessively drained sands or gravels. These soils have a high rate of water transmission.

B. (Moderately low runoff potential} Soils in this group have moderate infiltration rates when thoroughly wetted. They consist primarily of moderately deep to deep, moderately well drained to well drained soils with moderately fine to moderately coarse textures. These soils have a moderate rate of water transmission.

C. (Moderately low runoff potential) Soils in this class have slow infiltration rates when thoroughly wetted. They consist mainly of soils with a layer that impedes downward movement of water, or soils with moderately fine to fine textures. These soils have a slow rate of water transmission.

D. (High runoff potential) Soils in this class have very slow infiltration rates when thoroughly wetted. They consist primarily of clays oils with a high shrink/swell potential, soils with a permanent high water table, soils with a clay pan or clay layer at or near the surface, and shallow soils over nearly impervious material. These soils have a very slow rate of water transmission.

USDA TEXTURE

USDA texture refers to the U.S. Department of Agriculture's soil texture classification. Soil texture is the relative proportions by weight, of the several soil particle size classes finer than 2 mm in equivalent diameter. The material finer than 2 mm is called the fine earth fraction. Material larger than 2 mm is called the rock fragments.

Soil texture influences both engineering works and plant growth. Soil texture has a strong influence on soil mechanics and the behavior of soil when it is used as a construction or foundations material. It influences such properties as bearing strength, compressibility, permeability, shrink/swell potential, and compaction. Rock fragments also affect construction applications.

Soil texture influences plant growth by its influence on aeration, water intake rate, available water capacity, cation exchange capacity, permeability and workability.

Soil Texture Modifiers

The texture classes may be modified by the addition of suitable adjectives when rock fragments exceed about 15 percent by volume (for example, gravelly loam). The terms "very and "extremely" are used when rock fragments exceed about 35 and 60 percent by volume respectively. "Mucky" and "peaty" are terms used to modify soils when the organic matter content is more then 40 percent (for example, mucky loam).

Terms Used in Lieu of Textures

Organic materials, materials coarser than 2 mm, or materials that limit root penetration are used in a way similar to texture terms. Examples are fibric material, sand and gravel, and unweathered bedrock.

DEPTH CLASSES

Depth Classes	
Very Shallow	<10 inches
Shallow	10 to ≤20 inches
Moderately Deep	>20 to ≤40 inches
Deep	>40 to ≤60 inches
Very Deep	>60 inches

DRAINAGE CLASSES

Drainage Class refers to the frequency and duration of periods of saturation or particle saturation. Seven classes of soil drainage are recognized:

Excessively drained -Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some have steep slopes. All are free of mottling related to wetness.

Somewhat excessively drained -Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of mottling related to wetness.

Well drained -Water is removed.from the soil readily, but not rapidly. It is not available to plants throughout most of the growing season. Wetness does not inhibit growth of roots

for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.

Moderately well drained -Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season. They commonly have a slowly pervious layer within or directly below the solum, or periodically receive.

Somewhat poorly drained -Water is removed slowly enough that the soil is wet for significant periods during the growing season. Somewhat poorly drained soils commonly have slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.

Poorly drained -Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. The soil is not continuously saturated in layers below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.

Very poorly drained -Water is removed from these soils so slowly that free water remains at or on the surface during most of the growing season. They are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate of high slope gradients.

PERMEABILITY

Permeability is the quality of the soil that enables water to move downward through the profile. Permeability is measured as the number of inches per hour that water moves downward though the saturated soil. Terms describing permeability are:

SURFACE RUNOFF

Surface runoff is the water that flows away from the soil over the surface without infiltrating. The water may come from precipitation or run-on from adjacent areas. The rate and amount of runoff are determined by internal and external characteristics of the soil and by climate and plant cover. Runoff can be significantly different on a soil under natural cover, under cultivation, and under different kinds of management. Differences in runoff can also be caused by difference sin topography and rainfall density. Soils usually have a high rate of runoff when frozen.

Six classes of runoff rates are recognized:

Ponded - Little or none of the precipitation and run-on escapes as runoff. Free water stands on the surtace for significant periods of time. The amount of water that must be removed from ponded areas by percolation into and through the soil, by plants, or by evaporation is usually greater than the total rainfall. Ponding normally occurs on level to nearly level soils in depressions or concave positions of the micro relief. Water depth may fluctuate greatly.

Very slow - Sur1ace water flows away slowly, and tree water stands on the surface for long periods or immediately enters the soil. Most of the water passes through the soil, is used by plants, or evaporates. These soils are commonly level to nearly level or are very open and porous.

Slow - Surface water flows away slowly enough that free water stands on the surface for moderate periods or enters the soil rapidly. Most of the water passes through the soil, is used by plants, or evaporates. The soils are nearly level to gently sloping, or they are steeper and absorb precipitation very rapidly.

Medium - Surface water flows away fast enough that free water stands on the surface for only short periods. Part of the precipitation enters the soil and is used by plants, is lost by evaporation, or moves into underground channels. The soils are nearly level to gently sloping and absorb precipitation at a moderate rate, or they are steeper and absorb water rapidly.

Rapidly - Surface water flows away fast enough that the period of concentration is brief and free water does not stand on the surface. Only small portion of the water enters the soil. The soils are mainly moderately steep or steep and have moderate to slow rates of absorption.

Very rapidly - Surface water flows away so fast that the period of concentration is brief and free water does not stand on the surface. Only a small portion of the water enters the soil. The soils are mainly steep or very steep and absorb precipitation slowly.

ADDITIONAL TERMS

Complex - A map unit that consists of areas of two or more kinds of soils that are in a consistently repeating pattern so intricate that the two components cannot be delineated separately at the scale of mapping selected.

Flooding - Flooding is the temporary covering of soil surface by flowing water from any source, such as streams overflowing their banks, runoff from adjacent or surrounding slopes, inflow from high tides, or any combination of sources. Shallow water, standing

or flowing during or shortly after rain or snowmelt is excluded form the definition of flooding. Standing water (see ponding) or water that forms a permanent cover is excluded from the definition.

Flooding hazard is expressed by frequency classes, duration classes, and time of year flooding occurs. Also important are velocity and depth of floodwater.

Map Unit - A collection of soil areas delineated during mapping. It is generally an aggregate of several different bodies of a soil type and named for the principal components.

Ponding - Ponding is standing water in a closed depression. The water is removed only by percolation, transpiration, or evaporation.

Soil Slope - The slope of the soil surface has several distinct properties: gradient, complexity, configuration, length, and aspect. In soil science, slope is considered a property of the soil, not a landform like a ridge or a valley side.

Stoniness - See table of surface phase names and stoniness class attached.

Classes of Surface Stones and Boulders

Class	% Surface Covered	Distance (meters) between stones or boulders if the diameter is:			Name
		0.25m	0.6m	1.2m	
1	0.01-0.1	≥8	≥0	≥37	Stony or Bouldery
2	0.1-3.0	1-8	3-20	6-37	Very Stony or Very Bouldery
3	3.0-15	0.5-1	1-3	2-6	Extremely Stony or Extremely Bouldery
4	15-50	0.3-0.5	0.5-1	1-2	Rubbly
5	50-90	<0.3	<0.3	<1	Very Rubbly

SOILS REPORT

CLASS B HIGH INTENSITY SOIL SURVEY

DURANT HOMESTEAD
WINDHAM, MAINE

Prepared For:
Matt Hancock International, LLC

Prepared By:
Darryl N. Brown
Main-Land Development Consultants, Inc.
P. O. Box Q
Livermore Falls, ME 04254

June, 2006

SOIL LEGEND

- SOIL TEST SITE
- SOIL TYPE AND/OR SLOPE BOUNDARY
- Dx – DIXFIELD FINE SANDY LOAM
- Lm – LAMOINE SILT LOAM
- Ni – NICHOLVILLE VERY FINE SANDY LOAM
- Ro – ROUNDABOUT SILT LOAM
- Tn – TUNBRIDGE FINE SANDY LOAM
- A – 0% TO 3% SLOPE
- B – 3% TO 8% SLOPE
- C – 8% TO 15% SLOPE
- D – 15% TO 25% SLOPE

NOTES

1. ALL BEARINGS ARE REFERENCED TO MAINE WEST ZONE NAD–83.
2. OWNER OF RECORD AT TIME OF SURVEY: EDITH M. DURANT 60 CHUTE RD. WINDHAM, MAINE 04062 BOOK 4172, PAGE 331, BOOK 12779, PAGE 132
3. TOTAL AREA: 65.41 ACRES, MORE OR LESS
4. ALL BOOK AND PAGES REFER TO THE CUMBERLAND COUNTY REGISTRY OF DEEDS.

LEGEND

- 5/8" REBAR CAPPED, "PLS 1271" SET
- MONUMENTATION FOUND, AS LABELLED
- SOIL TEST SITE
- UTILITY POLE
- WETLAND

MAINE GRID WEST NAD–83

COMMON AREA (29.05 ACRES)

LOT 1 – 34,324 SQ FT–N.R.D – 34,324 SQ FT–TOTAL
LOT 2 – 33,072 SQ FT–N.R.D – 33,072 SQ FT–TOTAL
LOT 3 – 41,799 SQ FT N.R.D – 41,799 SQ FT TOTAL
LOT 4 – 46,632 SQ FT N.R.D – 46,632 SQ FT TOTAL
LOT 5 – 36,214 SQ FT N.R.D – 36,214 SQ FT TOTAL
LOT 6 – 32,103 SQ FT–N.R.D – 33,357 SQ FT–TOTAL
LOT 7 – 31,760 SQ FT–N.R.D – 39,671 SQ FT–TOTAL
LOT 8 – 32,716 SQ FT–N.R.D – 42,941 SQ FT–TOTAL
LOT 9 – 35,591 SQ FT N.R.D – 35,591 SQ FT TOTAL
LOT 10 – 32,037 SQ FT–N.R.D – 46,029 SQ FT–TOTAL
LOT 11 – 37,532 SQ FT–N.R.D – 38,581 SQ FT–TOTAL
LOT 12 – 30,554 SQ FT N.R.D – 30,524 SQ FT TOTAL
LOT 13 – 38,567 SQ FT N.R.D – 45,172 SQ FT TOTAL
LOT 14 – 47,152 SQ FT–N.R.D – 49,348 SQ FT–TOTAL
LOT 15 – 49,342 SQ FT N.R.D – 49,342 SQ FT TOTAL
LOT 16 – 40,370 SQ FT–N.R.D – 40,370 SQ FT–TOTAL
LOT 17 – 38,360 SQ FT–N.R.D – 39,444 SQ FT–TOTAL
LOT 18 – 35,277 SQ FT N.R.D – 39,369 SQ FT TOTAL
LOT 19 – 42,681 SQ FT–N.R.D – 43,193 SQ FT–TOTAL
LOT 20 – 58,267 SQ FT–N.R.D – 61,489 SQ FT–TOTAL
LOT 21 – 30,970 SQ FT N.R.D – 47,340 SQ FT TOTAL
LOT 22 – 34,584 SQ FT–N.R.D – 40,403 SQ FT–TOTAL
LOT 23 – 38,623 SQ FT–N.R.D – 38,623 SQ FT–TOTAL
LOT 24 – 46,883 SQ FT–N.R.D – 46,883 SQ FT–TOTAL
LOT 25 – 35,580 SQ FT–N.R.D – 35,580 SQ FT–TOTAL
LOT 26 – 43,143 SQ FT–N.R.D – 43,143 SQ FT–TOTAL

50' BUFFER
R/W TO COMMON AREA
60' WIDE EASEMENT
80' WIDE EASEMENT
NEW SNOWMOBILE TRAIL
CHUTE ROAD
0.3 MILES +–, TO RIVER ROAD

NOW OR FORMERLY OF PHYLLIS COLBY BOOK 1971, PAGE 111
NOW OR FORMERLY OF COLEBROOK CORP. BOOK 18946, PAGE 340 PLAN BOOK 203, PAGE 105
COMMON OPEN SPACE OF "RIVER'S EDGE SUBDIVISION"
NOW OR FORMERLY OF FRED STAPLES BOOK 20767, PAGE 229 SEE PLAN BOOK 118, PAGE 22
NOW OR FORMERLY OF CLIFFORD PLUMMER BOOK 2570, PAGE 108 ALSO SEE BOOK 1027, PAGE 103
NOW OR FORMERLY OF WILLIAM WESCOTT BOOK 4956, PAGE 171
NOW OR FORMERLY OF ELIZABETH DUBE BOOK 6230, PAGE 231 (FORMERLY ANNIE BLANCHARD COLE)
NOW OR FORMERLY OF INGRID D. SARDINHA BOOK 12779, PAGE 133 ALSO SEE BOOK 6858, PAGE 066 EDITH DURANT TO DAVID WARD
NOW OR FORMERLY OF PAUL S. BLANCHARD & SHEILA SNOW BOOK 18397, PAGE 115 SEE PLAN BOOK 192, PAGE 189
NOW OR FORMERLY OF CHRISTOPHER & LORI LORD BOOK 8550, PAGE 072
NOW OR FORMERLY OF JOHN C. JORDAN BOOK 10519, PAGE 343 SEE PLAN BOOK 126, PAGE 37
NOW OR FORMERLY OF MICHAEL R. EICHORN BOOK 15892, PAGE 318
NOW OR FORMERLY OF MICHAEL R. EICHORN BOOK 15892, PAGE 317
FORMERLY OF DOROTHY DURANT BOOK 2510, PAGE 012 PART OF PARCEL 1 OF SUBJECT DEED, BOOK 4172, PAGE 331
6' WIDE STRIP CONVEYED FROM DOROTHY WARD TO EDITH DURANT BOOK 12779, PAGE 132
LINE AS DESCRIBED IN DEED

I CERTIFY THAT THIS CLASS B HIGH INTENSITY SOILS MAP WAS CONDUCTED AND PREPARED IN ACCORDANCE WITH STANDARDS DEVELOPED BY THE MAINE ASSOCIATION OF PROFESSIONAL SOIL SCIENTISTS.

DARRYL N. BROWN – CERTIFIED SOIL SCIENTIST #9 — 6-21-06 DATE

STATE OF MAINE — DARRYL N. BROWN 9 — CERTIFIED SOIL SCIENTIST

MAIN-LAND DEVELOPMENT CONSULTANTS, INC.
P.O. BOX Q, 42 CHURCH STREET LIVERMORE FALLS, MAINE 04254
PHONE: (207)–897–6752 FAX: (207)–897–5404
WEB PAGE: http://www.main-landdevelopment.com/

GRAPHIC SCALE
(IN FEET)
1 inch = 100 ft.

SCALE:

SCALE:

SUBMISSIONS/REVISIONS: CAL
26-23-06 SOILS MAP

JOB #: 05-150
FILE #:
FIELD BOOKS: 424

PROJECT LOCATION: CHUTE ROAD WINDHAM, MAINE 04062

CLIENT: HANCOCK INTERNATIONAL LLC P.O. BOX 259 CASCO, MAINE 04015

DRAWING STATUS: REVIEW NOT FOR CONSTRUCTION

PROJECT: DURANT HOMESTEAD

DRAWING NAME: CLASS B HIGH INTENSITY SOIL SURVEY

DRAWING NUMBER: SL1.1

OVERVIEW

Throughout the summer and fall of 2005 and the winter and spring of 2006, numerous soil investigations have been conducted at property of Matt Hancock International, LLC. The property is located on Chute Road in Windham. The soil survey was prepared as a tool to be used in the planning and engineering of the project. The Class B High Intensity Soil Survey is also a requirement of the Maine Department of Environmental Protection as that agency has jurisdiction over the project in response to the following laws of the State of Maine:

Site Location of Development Act
Natural Resources Protection Act
Stormwater Law

METHODOLOGY

Planning for the project began during the summer of 2005 and has continued through the spring of 2006. The majority of the test pits were dug using an excavator while the remaining pits were dug using a hand shovel and auger. All test pits were located in the field using standard GPS (Trimble) methodology and later transferred to all working documents as well as the field plan. Logs of those test pits are presented as the Appendix to this narrative. In addition to the test pits, numerous auger borings were conducted throughout the property at strategic locations to confirm soil conditions between pits.

The soils mapping was coordinated with wetlands mapping conducted by Donald Murphy, Wetland Scientist, of Main-Land Development Consultants, Inc.

The Class B High Intensity Soil Survey was conducted in accordance with standards developed by the Maine Association of Professional Soil Scientists. The Class B High Intensity Soil Survey included the following standards:

1. Map units will not contain dissimilar limiting individual inclusions larger than one acre. Dissimilar limiting inclusions may total more than one acre per map unit delineation, in the aggregate, if not contiguous.

2. Map scale of 1 inch equals 200 feet or larger. The map scale for "Durant Homestead" is 1 inch equals 100 feet.

3. Ground control was provided using standard GPS methodology (sub-meter accuracy).

4. Base Map with 2-foot interval contour lines.

RESULTS

The Appendix to this narrative contains logs of all test pit data presented as DEP Form F.

The following soils were identified on the property:

Dixfield fine sandy loam
Lamoine silt loam
Nicholville very fine sandy loam
Raynham very fine sandy loam
Roundabout silt loam
Tunbridge fine sandy loam

A brief description of each of the soil types follow:

Dixfield fine sandy loam (coarse-loamy, mixed, frigid Typic Haplorthods)

The Dixfield soils are deep moderately well drained soils developed on firm (basal) glacial till. They occur on nearly level to steep landforms consisting of drumlins or glacial ridges.

These soils are moderately well drained with a "perched" seasonal high water table generally between 15 and 40 inches. Permeability is moderate in the solum and moderately slow or slow in the compact substratum.

Lamoine silt loam (Fine, illitic, nonacid, frigid Aeric Haplaquepts)

Lamoine soils are very deep, somewhat poorly drained soils formed in glaciolacustrine or glaciomarine sediments. They are nearly level to strongly sloping with slope gradients ranging from 0 to 15 percent.

Permeability is moderate or moderately slow in the surface layer, moderately slow or slow in the upper portion of the subsoil and slow or very slow in the lower portions of the subsoil.

Depth to "perched" seasonal high water table is between 7 and 15 inches of the surface.

Nicholville very fine sandy loam (Coarse-silty, mixed, frigid, Aquic Haplorthods)

Nicholville soils are very deep, moderately well drained soils developed in wind or water deposited material having a high content of silt and very fine sand. They occur generally on lake plains and moderately low benches in uplands. Slopes will range from 0 to 15 percent.

Depth to seasonal high water table is generally between 15 and 40 inches of the surface.

Runoff is medium and permeability is moderate throughout the profile.

Raynham very fine sandy loamy (Coarse, silty, mixed, non-acid, frigid Aeric Haplaquepts)

Raynham soils are very deep poorly drained soils that formed in glaciolacustrine and glaciomarine sediments. Slopes range from 0 to 8 percent.

They are generally associated with wetlands.

Permeability is moderately slow in the solum and moderately slow or slow in the subsurface material. (C horizon).

Depth to seasonal high water table as identified by redoximorphic features is at or near the surface.

Roundabout silt loam (Coarse-silty, mixed non-acid, frigid Aeric Haplaquepts)

Roundabout soils are very deep somewhat poorly drained soils that developed on glaciolacustrine and glaciomarine sediments. Slopes range from 0 to 8 percent.

Depth to seasonal high water table as identified by redoximorphic features is generally between 7 and 15 inches of the surface.

Permeability is moderate or moderately slow in the solum and moderately slow or slow in the C horizon.

Tunbridge fine sandy loam (Coarse-loamy, mixed, frigid Typic Haplorthods)

Tunbridge soils are moderately deep, well-drained soils developed on glaciated uplands. Depth to bedrock ranges from 20 to 40 inches from the surface.

These soils are generally found on mountainside slopes, mountaintops, mountain ridges, hilltops and hillside slopes.

Permeability is moderate or moderately rapid.

SOIL LIMITATIONS

The following land uses are proposed at the proposed subdivision, "Durant Homestead":

- Building construction consisting of individual single family residences
- Road construction
- On-site wastewater disposal

The limitation to land uses proposed and methods of overcoming those limitations are presented as follows:

Dixfield fine sandy loam

Building Construction

The major limitation of Dixfield soils to construction of structures is a function of the firm substratum and the "perched" seasonal high water table above the impervious layer. The slopes of the development area provide for the

opportunity to utilize foundation drains to intercept surface and subsurface water around building sites.

Road Construction
Depth to seasonal high water table is the major limiting factor of Dixfield soils to road construction. Removing all organic material and raising road grades above the water table will overcome that limitation. Further engineering details are provided in the engineering section of the Site Location of Development application.

On-site Wastewater Disposal
The major limiting factors for on-site wastewater disposal include both the restrictive layer and the "perched" seasonal high water table. The State of Maine Wastewater Disposal Rules requires a minimum of 18 inches between the bottom of the system and the seasonal high water table.

This limitation is overcome by the placement of gravelly coarse sand in the area of the disposal field to satisfy the separation requirement.

Lamoine silt loam

Lamoine soil represents a small area of the overall property and is significant on only one of the lots, Lot #25.

Building Construction
The major limitation of Lamoine soil to building construction is the seasonal high water table and the relative instability of the substratum during very wet times of the year when the clay content will add to the shrink-swell potential of the site. This is best overcome by providing a thick base of coarse gravelly material beneath the foundation and creating a buffer between the building and the silt and clay substratum. Drainage immediately around the foundation can best be controlled by raising the level of the building and providing foundation drains around the footings to intercept and remove free water from around the building sites during the wettest time of year.

Road Construction
The proposed road passes through no areas mapped as Lamoine.

On-site Wastewater Disposal
The most limiting factor to on-site wastewater disposal in Lamoine soil is depth to seasonal high water table. The State of Maine Wastewater Disposal Rules requires an 18-inch separation between the bottom of the system and the seasonal high water table. That limitation is overcome by raising the system through the placement of gravelly coarse sand to satisfy the separation requirement.

Nicholville very fine sandy loam

Building Construction

The major limiting factor for building construction is depth to seasonal high water table and a heavy concentration of silt and clay in the substratum. This limitation is overcome by placement of a thicker base of coarse gravelly material creating a buffer between the foundation and the original soil substratum.

The potential problem of wet basements as a result of a seasonal water table can be controlled by proper placement of foundation drainage around the footings. Foundation drains will intercept all free water around the foundation and move it away from the building site.

Road Construction

The major limiting factors to road construction are a combination of seasonal high water table and the silty texture of the substratum. These limitations are overcome by a combination of "best practices" engineering recommendations. Some of the most common practices include removal of the surface material high in organic material and replacement with coarse gravelly material, creating a thick road base and raising the roadway above existing grade.

On-Site Wastewater Disposal

The major limitation to on-site wastewater disposal is the seasonal high water table. State of Maine Wastewater Disposal Rules require a 12-inch separation between the bottom of the bed and the seasonal high water table. This limitation is overcome by raising the system with the placement of gravelly coarse sand to satisfy the Maine State Rule requirements.

Roundabout silt loam

Building Construction

Building construction is not proposed in any area described as Roundabout.

Road Construction

Minimal areas described as Roundabout will be impacted by proposed road construction. Only three relatively narrow sections of proposed roads will cross the areas described as Roundabout. The subdivision has been designed to minimize those impacts.

The three areas of crossing are also described and delineated as wetlands.

The major limitation to road construction is seasonal high water table (at or near the surface) in these areas and the unstable substratum. This is overcome by elevating the roadway significantly above the seasonal water table. Further discussion and design information is provided in the engineering section of the Site Location of Development Application as well as the Natural Resources Protection Act (NRPA) application.

On-Site Wastewater Disposal
There are no on-site wastewater disposal systems proposed on any area described as Roundabout.

Tunbridge fine sandy loam

Building Construction
The major limitation to building construction is the presence of ledge. This can be overcome by:

- Raising the building site so that the structure is above the bedrock
- Blasting the ledge to create the building/foundation site
- Utilize slab construction with no full foundation

Road Construction
Tunbridge makes up only a very small portion of the overall development site.

The major limiting factor to road construction is depth to bedrock. Some localized blasting may be required.

On-site Wastewater Disposal
The major limiting factor to on-site wastewater disposal is depth to bedrock. The State of Maine On-site Wastewater Disposal Rules requires a minimum separation of 24 inches between the bottom of the disposal system and the top of the bedrock.

Placement of gravelly coarse sandy fill will overcome this limitation by satisfying the separation requirement.

SUMMARY

A Class B High Intensity Soil Survey has been conducted on the project known as "Durant Homestead" in Windham, Maine. All predominant soil types have been described along with the identification of all limitations to development. Recommendations to overcome those limitations have been provided.

I certify that the class B High Intensity Soil Survey was conducted in accordance with standards developed by the Maine Association of Professional Soil Scientists.

STATE OF MAINE
BARRY N. BROWN
9
CERTIFIED SOIL SCIENTIST

Barry N. Brown, C.S.S. #9

APPENDIX

SOIL CONDITIONS SUMMARY TABLE

for SUBSURFACE INVESTIGATIONS at DEP SITE LOCATION PROJECTS

Project Name:	DEP Project #:
Durant Homestead	
Applicant Name:	Consultant Name:
Matt Hancock International, LLC	Darryl N. Brown - Main-Land Development, Inc.
Project Location *(municipality)*:	Type of Investigation:
Windham	Excavator

Lot No.	Exploration Symbol *(alph/num)*	4 or 8 if at SSWD field	• soil profile/condition *(S.E.)* • soil series name *(C.S.S.)* • geologic unit *(C.G.)* *(as appropriate to the investigation)*	Depths to *(check one)*: ☒ inches ☐ cm			Ground Surface Slope *(%)*
				Mottling	Bedrock	Restrictive Layer	
1	TP 38		Tunbridge 2-AIII/B		35		6-10
2	TP 37		Tunbridge 2-AIII/B		36		3-5
3	TP 25		Nicholville 8-C	17		23	6-10
4	TP 26		Tunbridge 2-AIII/B		31		8-12
5	TP 28		Tunbridge 2-AIII/C	15	27		6-8
6	TP 34		Nicholville 8-C	15		18	3-5
7	TP 31		Nicholville 8-C	15		18	4-6
8	TP 30		Nicholville 8-C	15		19	4-8
9	TP 49		Nicholville 8-C	18		28	6-8
10	TP 48		Nicholville 8-C	16		20	6-10
11	TP 47		Nicholville 8-C	19		21	6-10
12	TP 46		Tunbridge 2-AIII/C	22	33		4-6
13	TP 44		Nicholville 8-C	18		18	6-10

Professional Endorsements *(as applicable)*

S.E. D	signature:	Date: 6-21-06	
	name printed/typed: Darryl N. Brown	Lic. #: 45	
C.S.S. D	signature:	Date: 6-21-06	
	name printed/typed: Darryl N. Brown	Cert. #: 09	
C.G. D	signature:	Date:	
	name printed/typed:	Cert. #:	

DARRYL N BROWN 9 CERTIFIED SOIL

affix professional seal

SOIL CONDITIONS SUMMARY TABLE

for SUBSURFACE INVESTIGATIONS at DEP SITE LOCATION PROJECTS

Project Name:	DEP Project #:
Durant Homestead	
Applicant Name:	Consultant Name:
Matt Hancock International, LLC	Darryl Brown Main-Land Consultants, Inc.
Project Location *(municipality)*:	Type of Investigation:
Windham	Excavator

Lot No.	Exploration Symbol *(alph/num)*	4 or 8 if at SSWD field	• soil profile/condition *(S.E.)* • soil series name *(C.S.S.)* • geologic unit *(C.G.)* *(as appropriate to the investigation)*	Depths to *(check one)*: ☒ inches ☐ cm — Mottling	Bedrock	Restrictive Layer	Ground Surface Slope (%)
14	TP 43		Tunbridge 2-A III/C	16	29		6-8
15	TP 36		Tunbridge 2-A III/C	15	25		6-8
16	TP 23		Nicholville 8-C	20		30	4-8
17	TP 10		Dixfield 3-C	24		28	6-10
18	TP 13		Dixfield 3-C	18		24	4-8
19	TP 15		Dixfield 3-C	22		27	6-10
20	TP 41		Nicholville 8-C	16		24	6-8
21	TP 42		Nicholville 8-C	16		18	6-8
22	TP 9		Tunbridge 2-A III/B		26		12-15
23	TP 39		Tunbridge 2-A III/C	20	34		6-8
24	TP 6		Dixfield 3-C	17		24	6-8
25	TP 4		Lamoine 9-D	12		16	4-6
26	TP 1		Nicholville 8-C	16		18	0-5

Professional Endorsements *(as applicable)*

S.E. D	signature:	Date: 6-21-06	STATE OF MAINE DARRYL N BROWN 9 affix professional seal
	name printed/typed: Darryl N. Brown	Lic. #: 45	
C.S.S. D	signature:	Date: 6-21-06	
	name printed/typed: Darryl N. Brown	Cert. #: 09	
C.G. D	signature:	Date:	
	name printed/typed:	Cert. #:	

SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name:	Applicant Name:	Project Location (municipality):
Durant Homestead	MHI	Windham

Exploration Symbol: 1 ☒ Test Pit ☐ Boring

0 " Organic horizon thickness Ground surface elev. ____

Depth below mineral soil surface (inches)

Depth	Texture	Consistency	Color	Mottling
0–6	f.s.l.	friable	brown	
6–12	fine sandy loam	friable	reddish brown	
12–18	v.f.s.l.	friable	olive	16"
18–24	silt with alternating strata of very fine sand	firm	gray	
24–30				
30–36				
36–42				
42–48				

soil data by S.E.: Soil Profile: B; Classification Condition: C; Slope Percent: 0-5; Limiting Factor Depth: 16; ☒ Groundwater ☐ Restrictive Layer ☐ Bedrock

soil data by S.S.: Soil series/phase name: Nicholville; ☐ Hydric ☒ Non-hydric; Hydrologic Soil Group: C

Exploration Symbol: 2 ☒ Test Pit ☐ Boring

0 " Organic horizon thickness Ground surface elev. ____

Depth below mineral soil surface (inches)

Depth	Texture	Consistency	Color	Mottling
0–6	f.s.l.	friable	brown	
6–12	fine sandy loam	friable	reddish brown	18"
12–18				
18–24	silt with alternating strata of very fine sand	firm	gray	
24–30				
30–36				
36–42				
42–48				

soil data by S.E.: Soil Profile: B; Classification Condition: C; Slope Percent: 6-8; Limiting Factor Depth: 18; ☒ Groundwater ☐ Restrictive Layer ☐ Bedrock

soil data by S.S.: Soil series/phase name: Nicholville; ☐ Hydric ☒ Non-hydric; Hydrologic Soil Group: C

Exploration Symbol: 3 ☒ Test Pit ☐ Boring

0 " Organic horizon thickness Ground surface elev. ____

Depth below mineral soil surface (inches)

Depth	Texture	Consistency	Color	Mottling
0–6	f.s.l.	friable	brown	
6–12	f.s.l.	friable	reddish brown	
12–18	fine sandy loam	friable	olive	19"
18–24				
24–30	silt with alternating strata of very fine sand	firm	gray	
30–36				
36–42				
42–48				

soil data by S.E.: Soil Profile: B; Classification Condition: C; Slope Percent: 4-6; Limiting Factor Depth: 19; ☒ Groundwater ☐ Restrictive Layer ☐ Bedrock

soil data by S.S.: Soil series/phase name: Nicholville; ☐ Hydric ☒ Non-hydric; Hydrologic Soil Group: C

Exploration Symbol: 4 ☒ Test Pit ☐ Boring

0 " Organic horizon thickness Ground surface elev. ____

Depth below mineral soil surface (inches)

Depth	Texture	Consistency	Color	Mottling
0–6	silt loam	friable	brown	
6–12	silty clay loam	friable	olive	12"
12–18				
18–24	silt and clay	firm	gray	
24–30				
30–36				
36–42				
42–48				

soil data by S.E.: Soil Profile: 9; Classification Condition: D; Slope Percent: 4-6; Limiting Factor Depth: 12.; ☒ Groundwater ☐ Restrictive Layer ☐ Bedrock

soil data by S.S.: Soil series/phase name: Lamoine; ☐ Hydric ☒ Non-hydric; Hydrologic Soil Group: D

INVESTIGATOR INFORMATION AND SIGNATURE

Signature:	Date: 1-25-06
Name Printed/typed: Darryl N. Brown	Cert/Lic/Reg. # 9

Title: ☐ Licensed Site Evaluator ☒ Certified Soil Scientist ☐ Certified Geologist ☐ Other:

Darryl N. Brown 9 Professional Seal

SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name:	Applicant Name:	Project Location (municipality):
Durant Homestead	MHI	Windham

Exploration Symbol: 5 ☒ Test Pit ☐ Boring

0 " Organic horizon thickness Ground surface elev. ____

Depth below mineral soil surface (inches)

Depth	Texture	Consistency	Color	Mottling
0–6	silt loam	friable	brown	
6–12	silty clay loam	friable	olive brown	13"
18–24	silt and clay	firm	gray	

soil data by S.E.	Soil Profile	Classification Condition	Slope Percent	Limiting Factor Depth	
	9	D	8-10	13	☒ Groundwater ☒ Restrictive Layer ☐ Bedrock

soil data by S.S.	Soil series/phase name:		Hydrologic Soil Group
	Lamoine	☐ Hydric ☒ Non-hydric	D

Exploration Symbol: 6 ☒ Test Pit ☐ Boring

0 " Organic horizon thickness Ground surface elev. ____

Depth below mineral soil surface (inches)

Depth	Texture	Consistency	Color	Mottling
0–6	fine sandy loam	friable	brown	
12–18	fine sandy loam	friable	reddish brown	17"
18–24	f.s.l.	friable	olive brown	
30–36	sandy loam pan	firm	olive	

soil data by S.E.	Soil Profile	Classification Condition	Slope Percent	Limiting Factor Depth	
	3	C	6-8	17	☒ Groundwater ☐ Restrictive Layer ☐ Bedrock

soil data by S.S.	Soil series/phase name:		Hydrologic Soil Group
	Dixfield	☐ Hydric ☒ Non-hydric	C

Exploration Symbol: 7 ☒ Test Pit ☐ Boring

0 " Organic horizon thickness Ground surface elev. ____

Depth below mineral soil surface (inches)

Depth	Texture	Consistency	Color	Mottling
0–6	fine sandy loam	friable	brown	
12–18	fine sandy loam	friable	reddish brown	
18–24	fine sandy loam	friable	olive brown	20"
30–36	fine sandy loam pan	firm	olive	

soil data by S.E.	Soil Profile	Classification Condition	Slope Percent	Limiting Factor Depth	
	3	C	4-6	20	☒ Groundwater ☐ Restrictive Layer ☐ Bedrock

soil data by S.S.	Soil series/phase name:		Hydrologic Soil Group
	Dixfield	☐ Hydric ☒ Non-hydric	C

Exploration Symbol: 8 ☒ Test Pit ☐ Boring

0 " Organic horizon thickness Ground surface elev. ____

Depth below mineral soil surface (inches)

Depth	Texture	Consistency	Color	Mottling
0–6	f.s.l.	friable	brown	
6–12	fine sandy loam	friable	reddish brown	
18–24	f.s.l.	friable	olive brown	16"
24–30	silt with alternating strata of very fine sand	firm	gray	

soil data by S.E.	Soil Profile	Classification Condition	Slope Percent	Limiting Factor Depth	
	8	C	10	16	☒ Groundwater ☐ Restrictive Layer ☐ Bedrock

soil data by S.S.	Soil series/phase name:		Hydrologic Soil Group
	Nicholville	☐ Hydric ☒ Non-hydric	C

INVESTIGATOR INFORMATION AND SIGNATURE

Signature	Date: 1-25-06
Name Printed/typed: Darryl N. Brown	Cert/Lic/Reg. # 9

Title: ☐ Licensed Site Evaluator ☒ Certified Soil Scientist ☐ Certified Geologist ☐ Other:

DARRYL N. BROWN 9 affix professional seal

SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name: Durant Homestead | Applicant Name: MHI | Project Location (municipality): Windham

Exploration Symbol: 9 ☒ Test Pit ☐ Boring

0 " Organic horizon thickness Ground surface elev. ____

Depth below mineral soil surface (inches)

	Texture	Consistency	Color	Mottling
0–6	f.s.l.	friable	brown	
6–18	fine sandy loam	friable	reddish brown	
18–24	f.s.l.	friable	olive brown	
24–48	BEDROCK			

soil data by S.E.	Soil Profile	Classification Condition	Slope Percent	Limiting Factor Depth	
	2-AIII	B	12-15	26	☐ Groundwater ☐ Restrictive Layer ☒ Bedrock

soil data by S.S.	Soil series/phase name:		Hydrologic Soil Group
	Tunbridge	☐ Hydric ☒ Non-hydric	C

Exploration Symbol: 10 ☒ Test Pit ☐ Boring

0 " Organic horizon thickness Ground surface elev. ____

Depth below mineral soil surface (inches)

	Texture	Consistency	Color	Mottling
0–6	f.s.l.	friable	brown	
6–12	f.s.l.	friable	reddish brown	
12–24	fine sandy loam	friable	olive brown	24
24–48	sandy loam pan	firm	olive	

soil data by S.E.	Soil Profile	Classification Condition	Slope Percent	Limiting Factor Depth	
	3	C	6-8	24	☒ Groundwater ☐ Restrictive Layer ☐ Bedrock

soil data by S.S.	Soil series/phase name:		Hydrologic Soil Group
	Dixfield	☐ Hydric ☒ Non-hydric	C

Exploration Symbol: 11 ☐ Test Pit ☐ Boring

2 " Organic horizon thickness Ground surface elev. ____

Depth below mineral soil surface (inches)

	Texture	Consistency	Color	Mottling
0–6	s.loam	friable	brown	
6–18	sandy loam	friable	reddish brown	
18–24	sandy loam	friable	olive brown	22"
24–48	sandy loam pan	firm	olive	

soil data by S.E.	Soil Profile	Classification Condition	Slope Percent	Limiting Factor Depth	
	3	C	4-6	22	☒ Groundwater ☐ Restrictive Layer ☐ Bedrock

soil data by S.S.	Soil series/phase name:		Hydrologic Soil Group
	Dixfield	☐ Hydric ☒ Non-hydric	C

Exploration Symbol: 12 ☒ Test Pit ☐ Boring

0 " Organic horizon thickness Ground surface elev. ____

Depth below mineral soil surface (inches)

	Texture	Consistency	Color	Mottling
0–6	s.loam	friable	brown	
6–12	fine sandy loam	friable	reddish brown	
12–18	f.s.l.	friable	olive brown	17"
18–24				
24–48	fine sandy loam pan	firm	olive	

soil data by S.E.	Soil Profile	Classification Condition	Slope Percent	Limiting Factor Depth	
	3	C	4-6	17	☒ Groundwater ☐ Restrictive Layer ☐ Bedrock

soil data by S.S.	Soil series/phase name:		Hydrologic Soil Group
	Dixfield	☐ Hydric ☒ Non-hydric	C

INVESTIGATOR INFORMATION AND SIGNATURE

Signature: [signature] Date: 1-25-06

Name Printed/typed: Darryl N. Brown Cert/Lic/Reg. # 9

Title: ☒ Licensed Site Evaluator ☒ Certified Soil Scientist ☐ Certified Geologist ☐ Other:

[signature] affix professional seal

SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name:	Applicant Name:	Project Location (municipality):
Durant Homestead	MHI	Windham

Exploration Symbol: 13 ☒ Test Pit ☐ Boring

0 " Organic horizon thickness Ground surface elev. ____

Depth below mineral soil surface (inches)

Texture	Consistency	Color	Mottling
f.s.l.	friable	brown	
fine sandy loam	friable	reddish brown	18"
f.s.l.	friable	olive brown	
fine sandy loam	firm	olive	
pan			

soil data by S.E.	Soil Profile	Classification Condition	Slope Percent	Limiting Factor Depth	
	3	C	4-8	18	☒ Groundwater ☐ Restrictive Layer ☐ Bedrock

soil data by S.S.	Soil series/phase name:		Hydrologic Soil Group
	Dixfield	☐ Hydric ☒ Non-hydric	C

Exploration Symbol: 14 ☒ Test Pit ☐ Boring

0 " Organic horizon thickness Ground surface elev. ____

Depth below mineral soil surface (inches)

Texture	Consistency	Color	Mottling
v.f.s.l.	friable	brown	
v.f.s.l.	friable	reddish brown	
v.f.s.l.	friable	olive	15"
silt with alternating strata of very fine sand	firm	gray	

soil data by S.E.	Soil Profile	Classification Condition	Slope Percent	Limiting Factor Depth	
	8	C	4-8	15	☒ Groundwater ☐ Restrictive Layer ☐ Bedrock

soil data by S.S.	Soil series/phase name:		Hydrologic Soil Group
	Nicholville	☐ Hydric ☒ Non-hydric	C

Exploration Symbol: 15 ☒ Test Pit ☐ Boring

0 " Organic horizon thickness Ground surface elev. ____

Depth below mineral soil surface (inches)

Texture	Consistency	Color	Mottling
s.loam	friable	brown	
sandy loam	friable	reddish brown	
sandy loam	friable	olive brown	22"
sandy loam	firm	olive	
pan			

soil data by S.E.	Soil Profile	Classification Condition	Slope Percent	Limiting Factor Depth	
	3	C	6-10	22	☒ Groundwater ☐ Restrictive Layer ☐ Bedrock

soil data by S.S.	Soil series/phase name:		Hydrologic Soil Group
	Dixfield	☐ Hydric ☒ Non-hydric	C

Exploration Symbol: 16 ☒ Test Pit ☐ Boring

0 " Organic horizon thickness Ground surface elev. ____

Depth below mineral soil surface (inches)

Texture	Consistency	Color	Mottling
v.f.s.l.	friable	brown	
fine sandy loam	friable	reddish brown	
f.s.l.	friable	olive brown	15"
sandy loam	firm	olive	
pan			

soil data by S.E.	Soil Profile	Classification Condition	Slope Percent	Limiting Factor Depth	
	3	C	6-8	15	☒ Groundwater ☐ Restrictive Layer ☐ Bedrock

soil data by S.S.	Soil series/phase name:		Hydrologic Soil Group
	Dixfield	☐ Hydric ☒ Non-hydric	C

INVESTIGATOR INFORMATION AND SIGNATURE

Signature:	Date: 1-25-06
Name Printed/typed: Darryl N. Brown	Cert/Lic/Reg. # 9

Title: ☐ Licensed Site Evaluator ☒ Certified Soil Scientist ☐ Certified Geologist ☐ Other:

affix professional seal

SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name:	Applicant Name:	Project Location (municipality):
Durant Homestead	MHI	Windham

Exploration Symbol: 17 — ☒ Test Pit ☐ Boring

0 " Organic horizon thickness — Ground surface elev. ____

Depth below mineral soil surface (inches)

Depth	Texture	Consistency	Color	Mottling
0	v.f.s.l.	friable	brown	
6	very fine sandy loam	friable	reddish brown	
12				
18	v.f.s.l.	friable	olive	18"
24	silt with fine strata of very fine sand	firm	gray	
30				
36				
42				
48				

soil data by S.E.	Soil Profile	Classification Condition	Slope Percent	Limiting Factor Depth	Groundwater / Restrictive Layer / Bedrock
	B	C	6-8	18	☒ Groundwater ☐ Restrictive Layer ☐ Bedrock

soil data by S.S.	Soil series/phase name:	Hydric / Non-hydric	Hydrologic Soil Group
	Nicholville	☐ Hydric ☒ Non-hydric	C

Exploration Symbol: 18 — ☒ Test Pit ☐ Boring

0 " Organic horizon thickness — Ground surface elev. ____

Depth below mineral soil surface (inches)

Depth	Texture	Consistency	Color	Mottling
0	v.f.s.l.	friable	brown	
6			reddish	
	v.f.s.l.	friable	brown	
12			olive	
	v.f.s.l.	friable	brown	15"
18	silt with strata of very fine sand	firm	gray	
24				
30				
36				
42				
48				

soil data by S.E.	Soil Profile	Classification Condition	Slope Percent	Limiting Factor Depth	Groundwater / Restrictive Layer / Bedrock
	B	C	6-10	15	☒ Groundwater ☐ Restrictive Layer ☐ Bedrock

soil data by S.S.	Soil series/phase name:	Hydric / Non-hydric	Hydrologic Soil Group
	Nicholville	☐ Hydric ☒ Non-hydric	C

Exploration Symbol: 19 — ☒ Test Pit ☐ Boring

0 " Organic horizon thickness — Ground surface elev. ____

Depth below mineral soil surface (inches)

Depth	Texture	Consistency	Color	Mottling
0	v.f.s.l.	friable	brown	
6	very fine sandy loam	friable	reddish brown	
12				
18	v.f.s.l.	friable	olive	15"
24	silt with alternating strata of fine sand	firm	gray	
30				
36				
42				
48				

soil data by S.E.	Soil Profile	Classification Condition	Slope Percent	Limiting Factor Depth	Groundwater / Restrictive Layer / Bedrock
	B	C	4-6	15	☒ Groundwater ☐ Restrictive Layer ☐ Bedrock

soil data by S.S.	Soil series/phase name:	Hydric / Non-hydric	Hydrologic Soil Group
	Nicholville	☐ Hydric ☒ Non-hydric	C

Exploration Symbol: 20 — ☒ Test Pit ☐ Boring

0 " Organic horizon thickness — Ground surface elev. ____

Depth below mineral soil surface (inches)

Depth	Texture	Consistency	Color	Mottling
0	s.loam	friable	brown	
6				
	sandy loam	friable	reddish brown	
12				
18	sandy loam	friable	olive brown	24"
24				
30	sandy loam pan	firm	olive	
36				
42				
48				

soil data by S.E.	Soil Profile	Classification Condition	Slope Percent	Limiting Factor Depth	Groundwater / Restrictive Layer / Bedrock
	3	C	4-6	24	☒ Groundwater ☐ Restrictive Layer ☐ Bedrock

soil data by S.S.	Soil series/phase name:	Hydric / Non-hydric	Hydrologic Soil Group
	Dixfield	☐ Hydric ☒ Non-hydric	C

INVESTIGATOR INFORMATION AND SIGNATURE

Signature	Date:
Darryl N. Brown	1-25-06
Name Printed/typed: Darryl N. Brown	Cert/Lic/Reg. # 9

Title: ☐ Licensed Site Evaluator ☒ Certified Soil Scientist ☐ Certified Geologist ☐ Other:

DARRYL N. BROWN 9 affix professional seal CERTIFIED SOIL SCIENTIST

SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name: Durant Homestead | Applicant Name: MHI | Project Location (municipality): Windham

Exploration Symbol: 21 ☒ Test Pit ☐ Boring

0 " Organic horizon thickness Ground surface elev. ____

Depth below mineral soil surface (inches)

Texture	Consistency	Color	Mottling
f.s.l.	friable	brown	
f.s.l.	friable	reddish brown	
fine sandy loam	friable	olive brown	16"
sandy loam	firm	olive	
pan			

soil data by S.E.: Soil Profile 3 | Classification Condition C | Slope Percent 6-8 | Limiting Factor Depth 16 | ☒ Groundwater ☐ Restrictive Layer ☐ Bedrock

soil data by S.S.: Soil series/phase name: Dixfield | ☐ Hydric ☒ Non-hydric | Hydrologic Soil Group C

Exploration Symbol: 22 ☒ Test Pit ☐ Boring

2 " Organic horizon thickness Ground surface elev. ____

Depth below mineral soil surface (inches)

Texture	Consistency	Color	Mottling
f.s.l.	friable	brown	
fine sandy loam	friable	reddish brown	
f.s.l.	friable	olive brown	16"
fine sandy loam	firm	olive	
pan			

soil data by S.E.: Soil Profile 3 | Classification Condition C | Slope Percent 4-6 | Limiting Factor Depth 16 | ☒ Groundwater ☐ Restrictive Layer ☐ Bedrock

soil data by S.S.: Soil series/phase name: Dixfield | ☐ Hydric ☒ Non-hydric | Hydrologic Soil Group C

Exploration Symbol: 23 ☒ Test Pit ☐ Boring

1 " Organic horizon thickness Ground surface elev. ____

Depth below mineral soil surface (inches)

Texture	Consistency	Color	Mottling
V.f.s.l.	friable	brown	
very fine sandy loam	friable	reddish brown	20"
V.f.s.l.	friable	olive	
silt + clay	firm	gray	

soil data by S.E.: Soil Profile 8 | Classification Condition C | Slope Percent 4-8 | Limiting Factor Depth 20 | ☒ Groundwater ☐ Restrictive Layer ☐ Bedrock

soil data by S.S.: Soil series/phase name: Nicholville | ☐ Hydric ☒ Non-hydric | Hydrologic Soil Group C

Exploration Symbol: 24 ☒ Test Pit ☐ Boring

0 " Organic horizon thickness Ground surface elev. ____

Depth below mineral soil surface (inches)

Texture	Consistency	Color	Mottling
f.s.l	friable	brown	
fine sandy loam	friable	reddish brown	
BEDROCK			

soil data by S.E.: Soil Profile 2-AIII | Classification Condition B | Slope Percent 6-10 | Limiting Factor Depth 30 | ☐ Groundwater ☐ Restrictive Layer ☒ Bedrock

soil data by S.S.: Soil series/phase name: Tunbridge | ☐ Hydric ☒ Non-hydric | Hydrologic Soil Group C

INVESTIGATOR INFORMATION AND SIGNATURE

Signature: [signature] | Date: 1-25-06

Name Printed/typed: Barry N. Brown | Cert/Lic/Reg. # 9

Title: ☐ Licensed Site Evaluator ☒ Certified Soil Scientist ☐ Certified Geologist ☐ Other:

affix professional seal

SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name:	Applicant Name:	Project Location (municipality):
Durant Homestead	MHI	Windham

Exploration Symbol: 25 — ☒ Test Pit ☐ Boring

0 " Organic horizon thickness Ground surface elev. _____

Depth below mineral soil surface (inches)

Depth	Texture	Consistency	Color	Mottling
0–6	very fine sandy loam	friable	brown	
6–18	vfsl	friable	reddish brown	17"
18–30	silt with alternating strata of fine sand	firm	gray	

soil data by S.E.	Soil Profile	Classification Condition	Slope Percent	Limiting Factor Depth	Groundwater / Restrictive Layer / Bedrock
	B	C	C-10	17"	☒ Groundwater ☐ Restrictive Layer ☐ Bedrock

soil data by S.S.	Soil series/phase name:	Hydric / Non-hydric	Hydrologic Soil Group
	Nicholville	☐ Hydric ☒ Non-hydric	C

Exploration Symbol: 26 — ☒ Test Pit ☐ Boring

0 " Organic horizon thickness Ground surface elev. _____

Depth below mineral soil surface (inches)

Depth	Texture	Consistency	Color	Mottling
0–6	f.s.l.	friable	brown	
6–12	f.s.l.	friable	reddish brown	
12–30	fine sandy loam	friable	olive brown	
30–48	BEDROCK			

soil data by S.E.	Soil Profile	Classification Condition	Slope Percent	Limiting Factor Depth	Groundwater / Restrictive Layer / Bedrock
	2-AIII	B	8-12	31"	☐ Groundwater ☐ Restrictive Layer ☒ Bedrock

soil data by S.S.	Soil series/phase name:	Hydric / Non-hydric	Hydrologic Soil Group
	Tunbridge	☐ Hydric ☒ Non-hydric	C

Exploration Symbol: 27 — ☒ Test Pit ☐ Boring

0 " Organic horizon thickness Ground surface elev. _____

Depth below mineral soil surface (inches)

Depth	Texture	Consistency	Color	Mottling
0–6	v.f.s.l.	friable	dark brown	
6–12	very fine sandy loam	friable	reddish brown	
12–18	v.f.s.l.	friable	olive	16"
18–48	silt	firm	gray	

soil data by S.E.	Soil Profile	Classification Condition	Slope Percent	Limiting Factor Depth	Groundwater / Restrictive Layer / Bedrock
	7	C	6-10	16"	☒ Groundwater ☐ Restrictive Layer ☐ Bedrock

soil data by S.S.	Soil series/phase name:	Hydric / Non-hydric	Hydrologic Soil Group
	Elmwood	☐ Hydric ☒ Non-hydric	C

Exploration Symbol: 28 — ☒ Test Pit ☐ Boring

1 " Organic horizon thickness Ground surface elev. _____

Depth below mineral soil surface (inches)

Depth	Texture	Consistency	Color	Mottling
0–6	v.f.s.l.	friable	brown	
6–12	v.f.s.l.	friable	reddish brown	
12–18				15"
18–30	silt loam	friable	olive	
30–48	BEDROCK			

soil data by S.E.	Soil Profile	Classification Condition	Slope Percent	Limiting Factor Depth	Groundwater / Restrictive Layer / Bedrock
	2-AIII	C	6-8		☐ Groundwater ☐ Restrictive Layer ☐ Bedrock

soil data by S.S.	Soil series/phase name:	Hydric / Non-hydric	Hydrologic Soil Group
	Tunbridge	☐ Hydric ☒ Non-hydric	C

INVESTIGATOR INFORMATION AND SIGNATURE

Signature:	Date: 1-25-06
Name Printed/typed: Darryl N. Brown	Cert/Lic/Reg. # 09

Title: ☐ Licensed Site Evaluator ☒ Certified Soil Scientist ☐ Certified Geologist ☐ Other:

affix professional seal

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SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name:	Applicant Name:	Project Location (municipality):
Durant Homestead	MHI	Windham

Exploration Symbol: 29 ☐ Test Pit ☐ Boring

1 " Organic horizon thickness Ground surface elev. _____

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Mottling
0–6	vfsl	friable	dark	
6–12	v.f.s.l.	friable	reddish brown	
12–18	v.f.s.l.	friable	olive	17"
18–24	silt with alternating			
24–30	strata of	firm	olive	
30–36	very fine			
36–42	sand			
42–48				

soil data by S.E.	Soil Profile	Classification Condition	Slope Percent	Limiting Factor Depth	Groundwater / Restrictive Layer / Bedrock
	B	C	8-10	17"	☒ Groundwater ☐ Restrictive Layer ☐ Bedrock

soil data by S.S.	Soil series/phase name:	Hydric / Non-hydric	Hydrologic Soil Group
	Nicholville	☐ Hydric ☒ Non-hydric	C

Exploration Symbol: 30 ☒ Test Pit ☐ Boring

1 " Organic horizon thickness Ground surface elev. _____

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Mottling
0–6	vfsl	friable	brown	
6–12	very fine sandy loam	friable	reddish brown	
12–18	vfsl	friable	olive	15"
18–24	silt w/			
24–30	strata of	firm	olive	
30–36	very fine			
36–42	sand			
42–48				

soil data by S.E.	Soil Profile	Classification Condition	Slope Percent	Limiting Factor Depth	Groundwater / Restrictive Layer / Bedrock
	B	C	4-8	15"	☒ Groundwater ☐ Restrictive Layer ☐ Bedrock

soil data by S.S.	Soil series/phase name:	Hydric / Non-hydric	Hydrologic Soil Group
	Nicholville	☐ Hydric ☒ Non-hydric	C

Exploration Symbol: 31 ☒ Test Pit ☐ Boring

0 " Organic horizon thickness Ground surface elev. _____

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Mottling
0–6	v.f.s.l.	friable	brown	
6–12	v.f.s.l.	friable	reddish brown	
12–18	v.f.s.l.	friable	olive brown	15"
18–24	silt	firm	olive	
24–30				
30–36				
36–42				
42–48				

soil data by S.E.	Soil Profile	Classification Condition	Slope Percent	Limiting Factor Depth	Groundwater / Restrictive Layer / Bedrock
	B	C	4-6	15"	☒ Groundwater ☐ Restrictive Layer ☐ Bedrock

soil data by S.S.	Soil series/phase name:	Hydric / Non-hydric	Hydrologic Soil Group
	Nicholville	☐ Hydric ☒ Non-hydric	C

Exploration Symbol: 32 ☒ Test Pit ☐ Boring

1 " Organic horizon thickness Ground surface elev. _____

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Mottling
0–6	s.loam	friable	brown	
6–12	v.f.s.l.	friable	reddish brown	
12–18	sandy loam	friable	olive brown	20"
18–24				
24–30	sandy loam	firm	olive	
30–36	par			
36–42				
42–48				

soil data by S.E.	Soil Profile	Classification Condition	Slope Percent	Limiting Factor Depth	Groundwater / Restrictive Layer / Bedrock
	3	C	4-6	20"	☒ Groundwater ☐ Restrictive Layer ☐ Bedrock

soil data by S.S.	Soil series/phase name:	Hydric / Non-hydric	Hydrologic Soil Group
	Dixfield	☐ Hydric ☒ Non-hydric	C

INVESTIGATOR INFORMATION AND SIGNATURE

Signature:	Date: 1-25-06
Name Printed/typed: Darryl N. Brown	Cert/Lic/Reg. # 09

Title: ☐ Licensed Site Evaluator ☒ Certified Soil Scientist ☐ Certified Geologist ☐ Other:

STATE OF MAINE — DARRYL N. BROWN — 9 — affix professional seal — CERTIFIED SOIL SCIENTIST

DEP Form F-DEP/SW/01

SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name: Durant Homestead | Applicant Name: MHI | Project Location (municipality): Windham

Exploration Symbol: 33 ☐ Test Pit ☐ Boring

0 " Organic horizon thickness Ground surface elev. _____

Depth below mineral soil surface (inches)

	Texture	Consistency	Color	Mottling
0–6	v.f.s.l.	friable	brown	
6–12	v.f.s.l.	friable	reddish brown	
12–18	v.f.s.l.	friable	olive	16"
18–24				
24–30	silt	firm	gray	
30–36				
36–42				
42–48				

soil data by S.E.: Soil Profile 7 | Classification Condition C | Slope Percent 10-12 | Limiting Factor Depth 16 | ☒ Groundwater ☐ Restrictive Layer ☐ Bedrock

soil data by S.S.: Soil series/phase name: Elmwood | ☐ Hydric ☒ Non-hydric | Hydrologic Soil Group C

Exploration Symbol: 34 ☒ Test Pit ☐ Boring

0 " Organic horizon thickness Ground surface elev. _____

Depth below mineral soil surface (inches)

	Texture	Consistency	Color	Mottling
0–6	v.f.s.l.	friable	brown	
6–12	v.f.s.l.	friable	reddish brown	
12–18	v.f.s.l.	friable	olive	15"
18–24				
24–30	silt	firm	gray	
30–36				
36–42				
42–48				

soil data by S.E.: Soil Profile 8 | Classification Condition C | Slope Percent 3-5 | Limiting Factor Depth 15 | ☒ Groundwater ☐ Restrictive Layer ☐ Bedrock

soil data by S.S.: Soil series/phase name: Nicholville | ☐ Hydric ☒ Non-hydric | Hydrologic Soil Group C

Exploration Symbol: 35 ☒ Test Pit ☐ Boring

0 " Organic horizon thickness Ground surface elev. _____

Depth below mineral soil surface (inches)

	Texture	Consistency	Color	Mottling
0–6	silt loam	friable	brown	
6–12	silt loam	friable	olive brown	11"
12–18	sicl	friable	olive	
18–24				
24–30	silt	firm	gray	
30–36				
36–42				
42–48				

soil data by S.E.: Soil Profile 9 | Classification Condition D | Slope Percent 2-5 | Limiting Factor Depth 11 | ☒ Groundwater ☐ Restrictive Layer ☐ Bedrock

soil data by S.S.: Soil series/phase name: Lamoine | ☐ Hydric ☒ Non-hydric | Hydrologic Soil Group D

Exploration Symbol: 36 ☒ Test Pit ☐ Boring

0 " Organic horizon thickness Ground surface elev. _____

Depth below mineral soil surface (inches)

	Texture	Consistency	Color	Mottling
0–6	f.s.l.	friable	brown	
6–12	f.s.l.	friable	reddish brown	15"
12–18	fine sandy loam	friable	olive brown	
18–24				
24–30	BEDROCK			
30–36				
36–42				
42–48				

soil data by S.E.: Soil Profile 2-A III | Classification Condition C | Slope Percent 6-8 | Limiting Factor Depth 25 | ☐ Groundwater ☒ Restrictive Layer ☒ Bedrock

soil data by S.S.: Soil series/phase name: Tunbridge | ☐ Hydric ☒ Non-hydric | Hydrologic Soil Group C

INVESTIGATOR INFORMATION AND SIGNATURE

Signature: [signature] | Date: 1-25-06

Name Printed/typed: Darryl N. Brown | Cert/Lic/Reg. # 09

Title: ☐ Licensed Site Evaluator ☒ Certified Soil Scientist ☐ Certified Geologist ☐ Other:

affix professional seal

DEP Form F Rev. 9/01

SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name:	Applicant Name:	Project Location (municipality):
Durant Homestead	MHI	Windham

Exploration Symbol: 37 ☒ Test Pit ☐ Boring

0 " Organic horizon thickness Ground surface elev. _____

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Mottling
0–6	Sandy loam	friable	brown	
6–12	Sandy		reddish	
12–18	loam	friable	brown	
18–24				
24–30	Sandy loam	friable	olive brown	
30–36				
36–42	BEDROCK			
42–48				

soil data by S.E.	Soil Profile	Classification Condition	Slope Percent	Limiting Factor Depth	Groundwater / Restrictive Layer / Bedrock
	2-AIII	B	3-5	36	☐ ☐ ☒

soil data by S.S.	Soil series/phase name:	Hydric	Hydrologic Soil Group
	Tunbridge	☐ Non-hydric	C

Exploration Symbol: 38 ☒ Test Pit ☐ Boring

0 " Organic horizon thickness Ground surface elev. _____

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Mottling
0–6	Sandy loam	friable	brown	
6–12	Sandy		reddish	
12–18	loam	friable	brown	
18–24				
24–30	Sandy loam	friable	olive brown	
30–36				
36–42	BEDROCK			
42–48				

soil data by S.E.	Soil Profile	Classification Condition	Slope Percent	Limiting Factor Depth	Groundwater / Restrictive Layer / Bedrock
	2-AIII	B	6-10	35	☐ ☐ ☒

soil data by S.S.	Soil series/phase name:	Hydric	Hydrologic Soil Group
	Tunbridge	☐ Non-hydric	C

Exploration Symbol: 39 ☒ Test Pit ☐ Boring

_____ " Organic horizon thickness Ground surface elev. _____

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Mottling
0–6	v.f.s.l.	friable	brown	
6–12	very fine Sandy loam	friable	olive brown	
12–18				
18–24	Silt loam	somewhat firm	olive	20"
24–30	f.s.l. till	friable	olive	
30–36				
36–42	BEDROCK			
42–48				

soil data by S.E.	Soil Profile	Classification Condition	Slope Percent	Limiting Factor Depth	Groundwater / Restrictive Layer / Bedrock
	8-AIII	C	6-8	35	☐ ☐ ☒

soil data by S.S.	Soil series/phase name:	Hydric	Hydrologic Soil Group
	Tunbridge	☒ Non-hydric	C

Exploration Symbol: 41 ☒ Test Pit ☐ Boring

NO TRAO

0 " Organic horizon thickness Ground surface elev. _____

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Mottling
0–6	f.s.l.	friable	brown	
6–12	fine Sandy loam	friable	reddish brown	
12–18				
18–24	v.f.s.l.	friable	olive brown	16"
24–30	Silt with Strata of very fine Sandy loam	firm	gray	
30–36				
36–42				
42–48				

soil data by S.E.	Soil Profile	Classification Condition	Slope Percent	Limiting Factor Depth	Groundwater / Restrictive Layer / Bedrock
	8	C	6-8	16	☒ ☐ ☐

soil data by S.S.	Soil series/phase name:	Hydric	Hydrologic Soil Group
	Nicholville	☒ Non-hydric	C

INVESTIGATOR INFORMATION AND SIGNATURE

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Title: ☐ Licensed Site Evaluator ☒ Certified Soil Scientist ☐ Certified Geologist ☐ Other:

DARRYL N. BROWN 9 affix professional seal

DER Form 8 Rev. 9/01

SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name:	Applicant Name:	Project Location (municipality):
Durant Homestead	MHI	Windham

Exploration Symbol: 42 ☒ Test Pit ☐ Boring

0 " Organic horizon thickness Ground surface elev. _____

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Mottling
0–6	f.s.l.	friable	brown	
6–12	v.f.s.l.	friable	reddish brown	
12–18	v.f.s.l.	friable	olive brown	
18–24	silt with strata of very fine sandy loam	firm	gray	16"
24–30				
30–36				
36–42				
42–48				

soil data by S.E.	Soil Profile	Classification Condition	Slope Percent	Limiting Factor Depth	Groundwater / Restrictive Layer / Bedrock
	B	C	6-8	16"	☒ Groundwater ☐ Restrictive Layer ☐ Bedrock

soil data by S.S.	Soil series/phase name:	Hydric / Non-hydric	Hydrologic Soil Group
	Nicholville	☐ Hydric ☒ Non-hydric	C

Exploration Symbol: 43 ☒ Test Pit ☐ Boring

0 " Organic horizon thickness Ground surface elev. _____

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Mottling
0–6	v.f.s.l.	friable	brown	
6–12	v.f.s.l.	friable	reddish brown	
12–18	silt with strata of very fine sand	somewhat firm	olive	16"
18–24				
24–30				
30–36				
36–42				
42–48				

soil data by S.E.	Soil Profile	Classification Condition	Slope Percent	Limiting Factor Depth	Groundwater / Restrictive Layer / Bedrock
	B-A III	C	6-8	29	☐ Groundwater ☐ Restrictive Layer ☒ Bedrock

soil data by S.S.	Soil series/phase name:	Hydric / Non-hydric	Hydrologic Soil Group
	Tunbridge	☐ Hydric ☒ Non-hydric	C

Exploration Symbol: 44 ☒ Test Pit ☐ Boring

0 " Organic horizon thickness Ground surface elev. _____

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Mottling
0–6	v.f.s.l.	friable	dark	
6–12	v.f.s.l.	friable	yellowish brown	15"
12–18				
18–24	silt with strata of very fine sand	firm	olive	
24–30				
30–36				
36–42				
42–48				

soil data by S.E.	Soil Profile	Classification Condition	Slope Percent	Limiting Factor Depth	Groundwater / Restrictive Layer / Bedrock
	B	C	6-10	18	☒ Groundwater ☐ Restrictive Layer ☐ Bedrock

soil data by S.S.	Soil series/phase name:	Hydric / Non-hydric	Hydrologic Soil Group
	Nicholville	☐ Hydric ☒ Non-hydric	C

Exploration Symbol: 45 ☒ Test Pit ☐ Boring

0 " Organic horizon thickness Ground surface elev. _____

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Mottling
0–6	f.s.l.	friable	brown	
6–12	fine sandy loam	friable	reddish brown	
12–18				
18–24	fine sandy loam	friable	olive brown	20"
24–30				
30–36	sandy loam pan	firm	olive	
36–42	BEDROCK			
42–48				

soil data by S.E.	Soil Profile	Classification Condition	Slope Percent	Limiting Factor Depth	Groundwater / Restrictive Layer / Bedrock
	3-A III	C		20	☒ Groundwater ☐ Restrictive Layer ☐ Bedrock

soil data by S.S.	Soil series/phase name:	Hydric / Non-hydric	Hydrologic Soil Group
	Tunbridge	☐ Hydric ☒ Non-hydric	C

INVESTIGATOR INFORMATION AND SIGNATURE

Signature:	Date: 2-5-06
Name Printed/typed: Darryl N. Brown	Cert/Lic/Reg. # 09

Title: ☐ Licensed Site Evaluator ☒ Certified Soil Scientist ☐ Certified Geologist ☐ Other:

affix professional seal

SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name:	Applicant Name:	Project Location (municipality):
Durant Homestead	MHI	Windham

Exploration Symbol: 46 ☒ Test Pit ☐ Boring

0 " Organic horizon thickness Ground surface elev. _____

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Mottling
0–6	f.s.l.	friable	brown	
6–12	f.s.l.	friable	reddish brown	
18–24	fine sandy loam	friable	olive brown	22"
36		BEDROCK		

soil data by S.E.	Soil Profile	Classification Condition	Slope Percent	Limiting Factor Depth	
	2-A III	C	4-6	32	☐ Groundwater ☐ Restrictive Layer ☒ Bedrock

soil data by S.S.	Soil series/phase name:		Hydrologic Soil Group
	Tunbridge	☐ Hydric ☒ Non-hydric	C

Exploration Symbol: 47 ☒ Test Pit ☐ Boring

0 " Organic horizon thickness Ground surface elev. _____

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Mottling
0–6	v.f.s.l.	friable	brown	
6–12	very fine sandy loam	friable	yellowish brown	
18–24	VFSL	friable	olive brown	19"
30–36	silt with strata of very fine sand	firm	olive	

soil data by S.E.	Soil Profile	Classification Condition	Slope Percent	Limiting Factor Depth	
	B	C	6-10	19	☒ Groundwater ☐ Restrictive Layer ☐ Bedrock

soil data by S.S.	Soil series/phase name:		Hydrologic Soil Group
	Nicholville	☐ Hydric ☐ Non-hydric	C

Exploration Symbol: 48 ☒ Test Pit ☐ Boring

0 " Organic horizon thickness Ground surface elev. _____

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Mottling
0–6	VFSL	friable	dark reddish brown	
6–12	VFSL	friable	reddish brown	
12–18	very fine sandy loam	friable	olive brown	16
24–30	silt with strata of very fine sand	firm	olive	

soil data by S.E.	Soil Profile	Classification Condition	Slope Percent	Limiting Factor Depth	
	B	C	6-10	16	☒ Groundwater ☐ Restrictive Layer ☐ Bedrock

soil data by S.S.	Soil series/phase name:		Hydrologic Soil Group
	Nicholville	☐ Hydric ☒ Non-hydric	C

Exploration Symbol: 49 ☒ Test Pit ☐ Boring

_____ " Organic horizon thickness Ground surface elev. _____

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Mottling
0–6	VFSL	friable	brown	
6–12	VFSL	friable	reddish brown	
18–24	very fine sandy loam	friable	olive brown	18"
30–36	silt with strata of very fine sand	firm	olive	

soil data by S.E.	Soil Profile	Classification Condition	Slope Percent	Limiting Factor Depth	
	B	C	6-8	18	☒ Groundwater ☐ Restrictive Layer ☐ Bedrock

soil data by S.S.	Soil series/phase name:		Hydrologic Soil Group
	Nicholville	☐ Hydric ☒ Non-hydric	C

INVESTIGATOR INFORMATION AND SIGNATURE

Signature:	Date: 2-5-06
Name Printed/typed: Darryl N. Brown	Cert/Lic/Reg. # 09

Title: ☐ Licensed Site Evaluator ☒ Certified Soil Scientist ☐ Certified Geologist ☐ Other:

affix professional seal

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SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name:	Applicant Name:	Project Location (municipality):
Durant Homestead	Matt Hancock International, LLC	Windham

Exploration Symbol: 06-1 ☒ Test Pit ☐ Boring

0 " Organic horizon thickness Ground surface elev. _____

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Mottling
0–6	Sandy loam	friable	brown	
6–12	Sandy loam	friable	reddish brown	
12–18				
18–24	Sandy loam	friable	olive brown	
24–30				
30–36	BEDROCK			
36–42				
42–48				

soil data by S.E.	Soil Profile	Classification Condition	Slope Percent	Limiting Factor Depth	
	2-A III	B	1-5	30	☐ Groundwater ☐ Restrictive Layer ☒ Bedrock

soil data by S.S.	Soil series/phase name:		Hydrologic Soil Group
	Tunbridge	☐ Hydric ☒ Non-hydric	C

Exploration Symbol: 06-2 ☒ Test Pit ☐ Boring

_____ " Organic horizon thickness Ground surface elev. _____

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Mottling
0–6	fine sandy loam	friable	brown	
6–12	V.f.s.l.	friable	yellowish brown	
12–18	very fine sandy loam	friable	olive brown	15"
18–24				
24–30	silt w/strata of very fine sandy loam	firm	olive	
30–36				
36–42		REFUSAL		
42–48				

soil data by S.E.	Soil Profile	Classification Condition	Slope Percent	Limiting Factor Depth	
	B	C	4-8	15	☒ Groundwater ☐ Restrictive Layer ☐ Bedrock

soil data by S.S.	Soil series/phase name:		Hydrologic Soil Group
	Nicholville	☐ Hydric ☒ Non-hydric	C

Exploration Symbol: 06-3 ☒ Test Pit ☐ Boring

0 " Organic horizon thickness Ground surface elev. _____

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Mottling
0–6	f.s.l.	friable	brown	
6–12	f.s.l.	friable	reddish brown	
12–18				
18–24	fine sandy loam	friable	olive brown	24"
24–30				
30–36	fine sandy loam w/strata of silt	friable	olive	
36–42				
42–48				

soil data by S.E.	Soil Profile	Classification Condition	Slope Percent	Limiting Factor Depth	
	B	C	4-6	24	☒ Groundwater ☐ Restrictive Layer ☐ Bedrock

soil data by S.S.	Soil series/phase name:		Hydrologic Soil Group
	Nicholville	☐ Hydric ☒ Non-hydric	C

Exploration Symbol: 06-4 ☒ Test Pit ☐ Boring

_____ " Organic horizon thickness Ground surface elev. _____

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Mottling
0–6	fine sandy loam	friable	brown	
6–12				
12–18	f.s.l.	friable	reddish brown	15"
18–24	f.s.l.	friable	olive brown	
24–30				
30–36	fine sandy loam w/strata of silt	somewhat firm	olive	
36–42				
42–48				

soil data by S.E.	Soil Profile	Classification Condition	Slope Percent	Limiting Factor Depth	
	B	C	4-6	15	☒ Groundwater ☐ Restrictive Layer ☐ Bedrock

soil data by S.S.	Soil series/phase name:		Hydrologic Soil Group
	Nicholville	☐ Hydric ☒ Non-hydric	C

INVESTIGATOR INFORMATION AND SIGNATURE

Signature:	Date: 11-13-06
Name Printed/typed: Darryl N. Brown	Cert/Lic/Reg. # 09

Title: ☐ Licensed Site Evaluator ☒ Certified Soil Scientist ☐ Certified Geologist ☐ Other:

STATE OF VERMONT DARRYL N. BROWN 9 affix professional seal

NITRATE IMPACT ANALYSIS

WINDHAM SUBDIVISION
Chute Road
Windham, Maine

May 2018

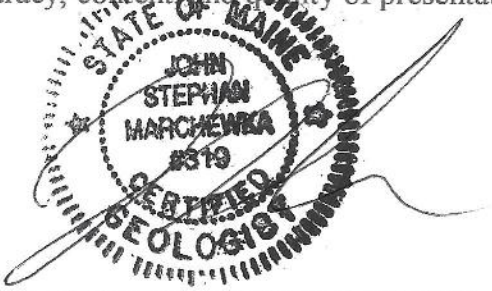
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The following personnel have prepared and/or reviewed this report for accuracy, content, and quality of presentation.



John S. Marchewka, C.G., P.G.
President

5-15-18

Date

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FIGURES

Figure 1: Site Location Map
Figure 2: Nitrate Plume Map
Figure 3: Surficial Geology Map

APPENDICES

Appendix A: Soil Solutions Preliminary Soil Evaluation Report, August 2017
Appendix B: Nitrate Steady State and Water Supply Calculations and Input Data

1.0 Introduction

MAI Environmental (MAI) was retained by Acheron Engineering to conduct a Nitrate Impact Analysis and Water Supply Recharge assessment of the Windham Subdivision, a proposed 26 lot residential subdivision off Chute Road in Windham, Maine (hereinafter "Site") (**Figure 1, Site Location Map**). The purpose of the study was to assess the potential for groundwater impacts associated with the proposed use of subsurface wastewater disposal systems (SWDSs) and to determine if there is adequate recharge to the Site for individual private water supply wells.

2.0 Potential Contaminant of Concern

Based on the nature of the project (i.e., residential subdivision), the contaminant of concern is Nitrate-Nitrogen (NO_3-N) or Nitrate (NO_3), which is released to the aquifer from the SWDSs.

For the purpose of estimating NO_3 concentrations in groundwater, the Maine Department of Environmental Protection (MEDEP) recommends assuming NO_3 enters the groundwater at a concentration of 40 milligrams per liter (mg/l) in residential SWDSs. The Primary Drinking Water Standard (PDWS) for NO_3 is 10mg/l.

3.0 Disposal Systems and Water Supplies

The proposed SWDSs will include 26 on-site stone bed disposal fields, and will be designed to serve three-bedroom homes with 270 gallons per day design flows. Individual water supply wells are proposed to be located outside the modeled "non-attainment" zones (i.e., the 10 mg/l NO_3 plumes as determined by this analysis) and at least 100 feet from the SWDSs. Locations of the proposed wells are presented on **Figure 2 – Nitrate Plume Map**.

4.0 Geological Conditions

The surficial geology map of the Gorham Quadrangle prepared by the Maine Geological Survey (MGS) (Open File No. 99-84) indicates that the subject site is located in an area mapped as till and Presumpscot Formation fine sand, silt, and marine clay (Pt and Pp). The surficial materials consist of till, loamy silt and sand. **Figure 3 - Surficial Geology Map**, shows the location of the surficial deposits on the subject site.

Hand dug test pits conducted by Stephen H. Howell, ME Site Evaluator #213 of Soil Solutions in August 2017 reveal that on-site soils consist soil profiles 2A, 3C, 7C, 8C and 8D. Hand dug test pits revealed the possibility of bedrock at Lots 20, 21, and 22 in the higher northern portions of the lots. A copy of the Soils report, logs and map showing the test pit locations are provided in **Appendix A – Soil Solutions Preliminary Soils Evaluation Report, August 2017**. Copies of the test pit and boring logs are presented in Appendix A.

Slopes on the subject site are slight to moderate and range from three to 19 percent. Drainage on-site is generally to the south-southeast.

5.0 Hydrogeological Conditions

This study evaluates the overburden unconfined aquifer of each proposed subdivision lot. Overburden groundwater flow is generally perpendicular to ground surface contours and migration of a nitrate plume will follow a flow path perpendicular to the contours with additional lateral and vertical spread due to dispersion and diffusion. MAI estimated plume migration and configuration downgradient of proposed SWDSs through the analysis of surface topographic contours.

The estimated hydraulic conductivity (K) of the on-site soils is estimated at 4.50 feet-per-day (ft/day) and the effective porosity of the on-site soils is estimated at 15 percent (Fetter, C.W., 1994, Todd, D.K., 1980, Freeze and Cherry, 1979).

6.0 Fate and Transport

Research has shown that NO_3 does not form insoluble minerals that precipitate, nor is NO_3 absorbed significantly under aquifer conditions. NO_3 can be removed from the groundwater by reduction (denitrification); however, this requires organic-rich soils, which will support a bacterially catalyzed reaction. In the absence of organic rich deposits, the primary process of NO_3 reduction is by dispersion and dilution within the aquifer. In areas of organic-rich soils (i.e., wetlands), significant additional NO_3 removal will occur through denitrification, Appelo, C.A.J. and Postma, D. (2005).

The organic-rich, anaerobic conditions in the on-site wetland soils will facilitate the denitrification process. Studies indicate NO_3 removal rates of 70% to 90% in riparian (i.e., forested wetlands) areas, Gilliam (1994). Furthermore, a study conducted on forested wetlands in New England showed NO_3 removal rates of 84% to 97%, Simmons et. al. (1992). Similar removal rates are expected from forested wetlands located on the subject site. A 70% nitrate removal rate at wetland boundaries was used for this nitrate plume analysis.

Groundwater within the aquifer flows very slowly. As the NO_3 infiltrates downward and intercepts the groundwater of the underlying aquifer, it is mixed and diluted into the groundwater. The NO_3 is transported with the flow of the groundwater. At some point in time, as a specific concentration of NO_3 is constantly discharged into an aquifer, the NO_3 concentrations will reach a "steady state" within the aquifer. Under "steady state" conditions, dilution rates from mixing with groundwater and recharge from precipitation combined with dispersion and diffusion will reach an equilibrium with the loading rate of NO_3 from the SWDSs.

7.0 Methods

MAI evaluated the potential for NO_3 impacts to the aquifer using a "steady state" analysis. This method determines the NO_3 concentration of a plume when the NO_3 loading rate equals the dilution rate.

A background NO_3 concentration of 1.22 mg/l was used for the steady state calculations. This background value is referenced in a June 1999, Maine Department of Environmental Protection (MEDEP) nitrate characterization study (Document No. DEPLW 1999-7), as the mean NO_3 concentration of 17,000 private wells that were tested for NO_3 between

January 1989 and December 1991. We consider this to be a conservative value for background NO_3 based on the fact that the values collected for the study were from wells potentially influenced by agricultural use or septic systems. In cases where leach fields are located topographically down-gradient of another leach field the distance between the two leach fields is used to calculate the steady state concentration of the NO_3 upon interception with the down-gradient leach field or NO_3 plume. In turn, the calculated NO_3 steady state concentration is added to the background NO_3 concentration to more accurately depict the NO_3 steady state concentrations for SWDS's that are "stacked." SWDS's for this project were modified to eliminate NO_3 plume stacking.

The precipitation value used in the steady state calculations comes from the National Oceanic and Atmospheric Administration (NOAA) average annual precipitation for Portland, Maine for the years 1981 to 2010 47 inches per year. Calculations and input data are presented in **Appendix B**.

8.0 Recharge for Water Supply Wells

The subdivision plan calls for each of the 26 lots to have a private bedrock water supply well. A water balance analysis of recharge from precipitation versus water usage was completed to evaluate if recharge to the bedrock aquifer is adequate to support 26 private wells within the area of the subdivision.

Each private supply well is assumed to use 270 gallons per day (gpd) or 36.1 ft^3/day for a total daily water usage of 939 ft^3/day for the 26 lots. Recharge was calculated for each lot based on precipitation, drought and infiltration values provided in the Department of Health and Human Services (DHS), Waste Water Pluming Code, Nitrate-Nitrogen Impact Analysis for Engineered Systems and soil profile types from Soil Solutions Preliminary Soils Evaluation Report, August 2017 (Appendix A). Calculations are provided in **Appendix B**.

Recharge analysis shows that there is 2,883 ft^3/day of available water recharge based on annual precipitation of 25.2 inches per year, which is 60% of the 42 inches per year annual average precipitation to adjust for drought years. Water usage by the 26 lots is approximately 33% of the available recharge.

9.0 Conclusions

- Using the layout of SWDSs as shown in Figure 2, the proposed development of the subject site into a 26 lot residential subdivision will not increase groundwater concentrations of NO_3 above 10mg/l outside the Site property boundary. Assuming the proposed individual drinking water wells are bedrock and located over 100 feet from the on-site SWDSs and are outside the "Nitrate non-attainment" zones, sufficient setbacks exist from the Site boundaries to ensure proper groundwater resource management with respect to on-site septic system discharges.

- Based on the aquifer recharge analysis, 2,883ft^3/day is available to the aquifer from recharge. A well usage of 939 ft^3/day by the 26 lots is approximately 33% of the available recharge. Therefore, there is adequate available water recharge to support the subdivision wells.

10.0 References

Appelo, C.A.J. and Postma, D., 2005. *Geochemistry, groundwater and pollution*, A.A. Balkema, Rotterdam, Netherlands.

Bouwer, Herman, 1978. *Groundwater hydrology*. McGraw-Hill, New York.

Fetter, C.W., 1994. *Applied Hydrogeology (Third Edition)*, Prentice Hall, Englewood Cliffs, New Jersey.

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Maine Department of Environmental Protection, 1999, Residential Septic System Impacts on Groundwater Quality in Maine, PART 1: Characterization of Nitrate Concentrations in Domestic Wells At 18 Subdivisions (Document No. DEPLW 1999-7).

Maine Department of Human Services, 1980. "Subsurface Wastewater Disposal Rules, CMR 241."

Maine Geological Survey, 1999. Surficial Geology of The Gorham Quadrangle, Maine (Open File No. 99-84)

Sawyer, Clair N., McCarty, Perry L., 1978. *Water Resources and Environmental Engineering*, McGraw-Hill, New York.

Simmons, Robert C., et al, Nitrate Dynamics in Riparian Forests: Groundwater Studies. Journal of Environmental Quality, Vol. 21:659-665.

United States Department of Agriculture, 1974. *Soil Survey Cumberland County, Maine.*

Department of Health and Human Services (DHS), Waste Water Pluming Code, Nitrate-Nitrogen Impact Analysis for Engineered Systems.

Preliminary Soil Evaluation Report, Chute Road, Windham, Soil Solutions, Orrington, ME, August 9, 2017

FIGURES

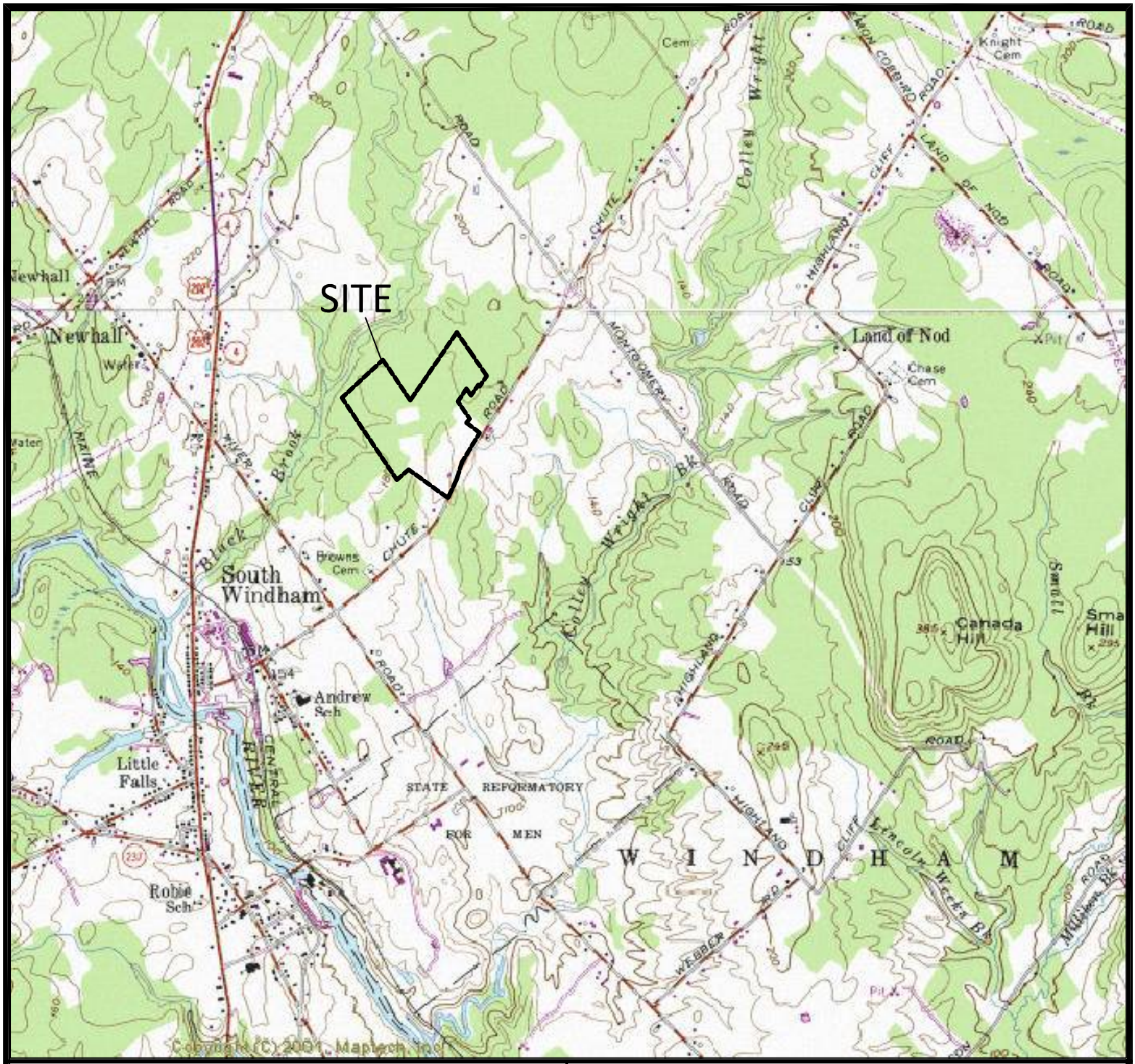


FIGURE 1

Site Location Map
Chute Rd Nitrate Analysis

Windham Subdivision
Chute Road
Windham, ME

SOURCE: U.S.G.S. 7.5 Minute Topographic Quadrangle of Gorham, Maine.

SCALE: 1" = 2000'

DATE: 03/24/18

DWG: A-1047-1-1

1034 BROADWAY ▼ SOUTH PORTLAND, ME 04106 ▼ PHONE: (207) 767-3663

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LEGEND

EXISTING
- PROPERTY LINE
- CONTOURS
- UTILITY POLE
- TREE LINE
- WETLAND

PROPOSED
- LOT PROPERTY LINES
- LOT BUILDING SETBACK LINES
- TREE LINE
- WELL LOCATION
- DISPOSAL BED
- NITRATE PLUME
- COMMON / OPEN SPACE

MAINE GRID #2CF NAD-83

NOTES:
1. OWNER OF RECORD: MATT HANCOCK PROPERTIES, PO BOX 295, CASCO, ME. 04015. BOOK 3319, PAGE 124.
2. TOPOGRAPHIC FEATURES ON THIS PLAN ARE BASED ON WORK DONE BY AERIAL SURVEY AND PHOTO, INC. NORRIDGEWOCK, ME., ELEVATIONS FOR GROUND CONTROL WERE PERFORMED BY MAIN–LAND DEVELOPMENT CONSULTANTS, LIVERMORE FALLS, ME. ALL BEARINGS ARE REFERENCED TO MAINE WEST ZONE NAD–83.
3. PROPERTY BOUNDARY SURVEY COMPLETED BY PLISGA AND DAY SURVEYORS, INC. ON JUNE 15, 2018.
4. SOIL SURVEY HAS BEEN PREPARED BY ALEITA BURMAN OF BURMAN LAND AND TREE COMPANY, LLC. TEST PITS FOR STORMWATER SYSTEMS WAS COMPLETED ON DECEMBER 6, 2017. SITE SOILS SURVEY WAS COMPLETED ON JULY, 2018. IN ACCORDANCE WITH THE STANDARDS ADOPTED BY THE MAINE ASSOCIATION OF PROFESSIONAL SOIL SCIENTISTS, AND THE MAINE BOARD OF CERTIFICATION OF GEOLOGISTS AND SOIL SCIENTISTS.
5. ZONING DISTRICT: SECTION 406 LAND USE ORDINANCE
   DISTRICT: FARM USE: HOME OCCUPATION 1
6. DISTRICT DIMENSIONAL STANDARDS:
   MIN LOT SIZE: CLUSTER = 30,000 SF
   MAX LOT SIZE: CLUSTER = 50,000 SF
   NET RESIDENTIAL DENSITY: CLUSTER = 60,000 SF
   MIN ROAD FRONTAGE: CLUSTER = 100 FT
7. BUILDING SETBACKS ARE: 25' FRONT AND 10' SIDE AND BACK.
8. TOTAL AREA: 65.55 ACRES, MORE OR LESS.
9. DRILLED WELL TO BE INSTALLED WITH MINIMUM SETBACK DISTANCE OF 100FT.
10. NITRATE ANALYSIS PERFORMED BY MARCHEWKA ASSOCIATES INC. SEE NITRATE IMPACT ANALYSIS REPORT DATED MAY, 2018.

NOW OR FORMERLY OF ANITA LAMPRON BOOK 32067, PAGE 271 TAX MAP 6 – LOT 38E (FORMERLY PHYLLIS COLBY)

100–YEAR FLOOD BOUNDARY

862.94' S45°57'55"W

COMMON OPEN SPACE OF "RIVER'S EDGE SUBDIVISION"

NOW OR FORMERLY OF RIVER'S EDGE COMMON LAND BOOK 18946, PAGE 340 PLAN BOOK 203, PAGE 105 TAX MAP 6 – LOT 42

N25°45'05"W 1283.98'

N38°27'13"W 470.48'

NOW OR FORMERLY OF ANITA LAMPRON BOOK 32067, PAGE 271 TAX MAP 6 – LOT 38E (FORMERLY PHYLLIS COLBY)

120.84' N35°59'55"W

147.75' N37°05'36"W

NOW OR FORMERLY OF FRED STAPLES BOOK 20767, PAGE 228 TAX MAP 6 – LOT 29

N32°55'45"E 301.12'

N32°55'22"E 300.12'

N32°54'55"E 137.66'

S32°54'55"W 62.27'

S32°54'55"W 100.00'

N32°55'28"E 273.17'

N32°56'14"E 109.81'

N32°56'43"E 217.47'

LOT #6 LOT #7 LOT #8 LOT #9 LOT #10 LOT #11 LOT #12 LOT #13 LOT #14 LOT #15 LOT #16 LOT #17 LOT #18 LOT #19 LOT #20 LOT #21 LOT #22 LOT #23 LOT #24 LOT #25 LOT #26 LOT #1 LOT #2 LOT #3 LOT #4 LOT #5

NOW OR FORMERLY OF LILLIAN M. PLUMMER BOOK 29006, PAGE 147 TAX MAP 3 – LOT 18 (FORMERLY CLIFFORD PLUMMER)

N32°42'25"W 257.74'

NOW OR FORMERLY OF JOHN A & CLAIRE STREETER BOOK 8501, PAGE 223 TAX MAP 3 – LOT 22A

S47°06'34"W 235.73'

NOW OR FORMERLY OF ELIZABETH DUBE BOOK 6230, PAGE 231 TAX MAP 6 – LOT 25A (FORMERLY ANNIE BLANCHARD COLE)

S68°34' W 85.85'±

S25°42'17"W 216.47'

N18°51'58"E 10.00'

N18°51'58"E 123.07'

561.59'

N51°26'30"E

CHUTE ROAD

N36°08'20"E 82.39'

S53°34'34"W 253.63'

S35°53'34"E 326.81'

S33°31'45"W 243.00'

S35°52'37"E 729.23'

N33°16'47"E 200.25'

S35°46'41"E 29.78'

N33°16'47"E 200.00'

S35°52'17"E 838.72'

NOW OR FORMERLY OF MICHAEL R. EICHORN BOOK 15892, PAGE 319 TAX MAP 6 – LOT 26C–2

NOW OR FORMERLY OF MICHAEL R. EICHORN BOOK 15892, PAGE 317

NOW OR FORMERLY OF BRENDA JORDAN BOOK 3997, PAGE 126 TAX MAP 6 – LOT 26C

NOW OR FORMERLY OF CHRISTOPHER & LORI LORD BOOK 8550, PAGE 072 TAX MAP 6 – LOT 25C

NOW OR FORMERLY OF INGRID D. SARDINHA BOOK 12779, PAGE 133 TAX MAP 6 – LOT 25B

NOW OR FORMERLY OF PAUL S. BLANCHARD & SHEILA SNOW BOOK 18397, PAGE 115 TAX MAP 6 – LOT 25D

0 100 200 300
GRAPHIC SCALE/
1" = 100'

No.	Revision Description	Drwn	Ckkd	Date

Drwn By: BPG
Desg By: MAL
Ckkd By: JM
Aprvd By: JM
Date: MAY, 2018

ACHERON ENGINEERING SERVICES
Engineering, Environmental & Geologic Consultants
24466 Powell Rd
Brooksville, FL 34602
(352)-796-6236
www.AcheronEngineering.com
147 Main St.
Newport, ME. 04953
(207)-368-5700
Acheron International, Inc.

Groundwater Assesment
Overall Site Plan
Durant Homestead
Chute Road, Windham, Maine

Matt Hancock Properties
PO Box 295
Casco, Maine 04015

Job Number: 79800

Drawing No: C–

Sheet 1 of 1

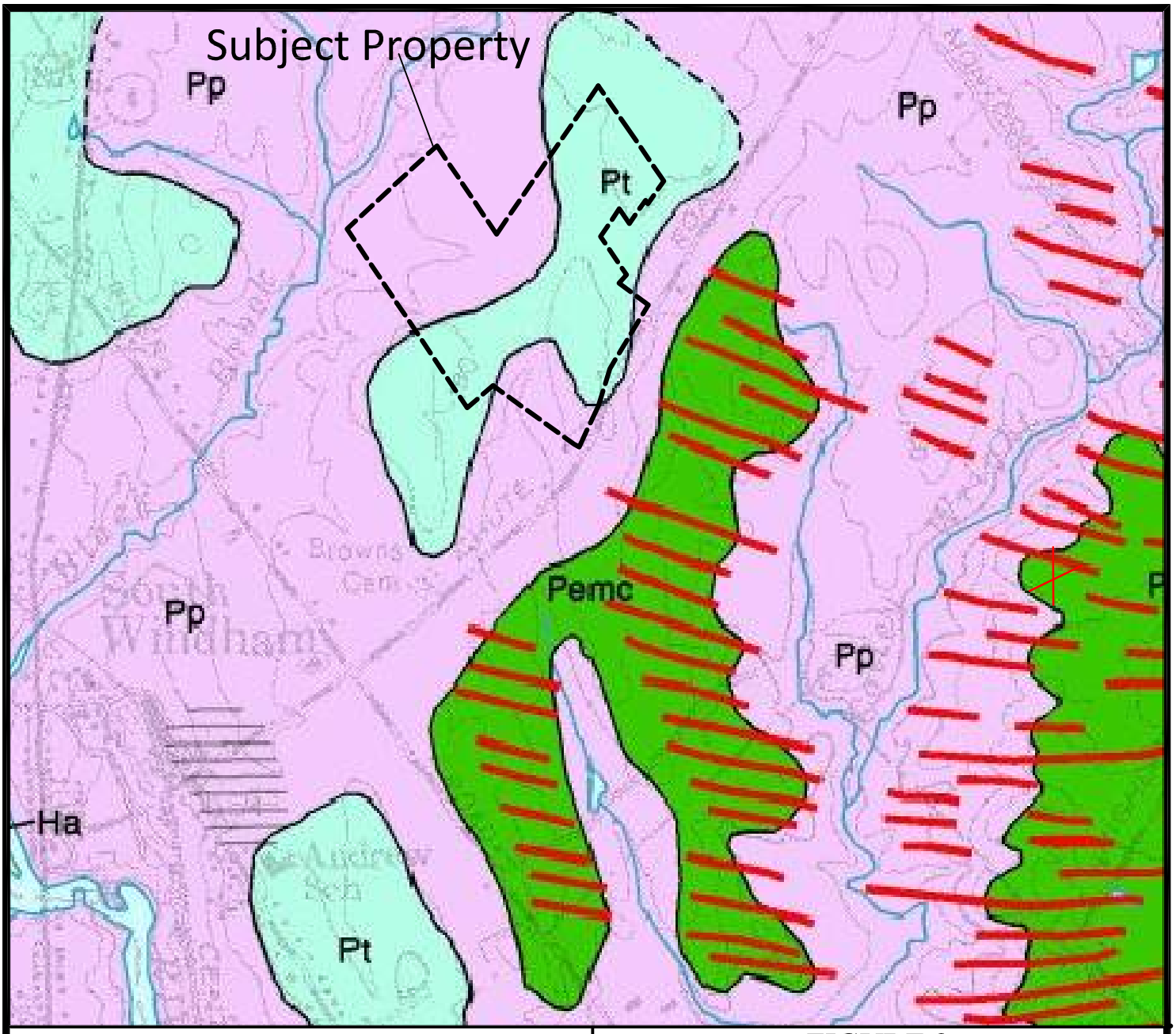


FIGURE 3
Surficial Geology
Chute Rd Nitrate Analysis

Windham Subdivision
Chute Road
Windham, Maine

SCALE: 1" =1000'
DATE: 03/14/18
DWG: A-279-4828

Base Map obtained Main GeologiC Service - Surficial Geology Gorham, ME

1034 BROADWAY ▼ SOUTH PORTLAND, ME 04106 ▼ PHONE: (207) 767-3663

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APPENDIX A

Soil
Solutions

276 HOXIE HILL ROAD, ORRINGTON, MAINE 04474 (207) 825 - 4792

August 9, 2017

Matt Hancock Properties
c/o Mr. Matt Hancock
P.O. Box 295
Casco, ME 04015

RE: Preliminary Soil Evaluation of a proposed 26 lot subdivision on Chute Road in Windham, ME

Dear Mr. Hancock;

As you requested, on June 27 and 28, 2017, I conducted preliminary soil evaluations for subsurface wastewater disposal on a proposed 26 lots subdivision on Chute Road in Windham, Maine. The location of our test pits was based on a Site Plan prepared by Acheron Engineering Services of Newport, Maine.

Evaluation of 54 hand dug test pits, with at least one test pit in each of the proposed 26 lots, revealed at least one area on each lot where soil conditions meet the minimum drainage requirements for subsurface wastewater disposal. Soil conditions observed ranged from 2A, 3C, 7C, 8C and 8D with evidence of a seasonal groundwater table, restrictive layer, or bedrock from 11 to 35 inches in depth. Soil condition and depth to seasonal groundwater table, restrictive layer, or bedrock for each lot and each test pit are summarized in the attached "Soil Conditions Summary Table" and specified in the attached "Soil Condition and Classification" test pit logs. Where soil conditions 2A, 3C and 7C were observed, a 1000 gallon septic tank followed by a 900 square foot disposal bed, would provide adequate treatment of wastewater for a 3 bedroom house. Where 8C and 8D soil conditions were observed, a 1000 gallon septic tank followed by a 1200 square foot disposal bed, would provide adequate treatment of wastewater for a 3 bedroom house. Each test pit location is identified on the ground with a wooden stake or orange flagging and is shown on a plan prepared by our office titled "Preliminary Soil and Site Evaluation Test Pit Location".

As with any subsurface wastewater disposal system, proper setback of a disposal system from well, structures, lot lines, bodies of water, and protected natural resources is a necessary consideration in determining whether an area that appears suitable for subsurface wastewater disposal can meet minimum setback requirements. Based on information available and my evaluation, it appears the suitable areas observed at the test pits described in this report meets minimum setback requirements under the Maine State Plumbing Code. In addition, in anticipation of a possible subdivision permit application to the Maine Department of Environmental Protection (DEP) under a Site Location of Development Application (SLODA) we have excavated and described a sufficient

number of test pits to meet minimum SLODA requirements. We have also prepared the Maine DEP required test pit reporting forms identified as Form E and Form F in the SLODA permit application. As with any DEP SLODA application, additional testing, such as nitrate-nitrogen impact assessment, may be requested during the permit review process, to evaluate proposed subsurface wastewater disposal systems. This potential additional testing cannot be determined at this time prior to the preapplication meeting.

It is the responsibility of the owner or his agent to contact appropriate local officials, such as the Code Enforcement Officer or Planning Board in the Town of Windham, to check on local ordinances, such as setback requirements, that may be more restrictive than the Plumbing Code. This information may be important prior to submitting a subdivision or subsurface wastewater disposal permit applications to the Town.

Please call me at (207) 825-4792 if you have any questions.

Sincerely,

Stephen H. Howell
Site Evaluator # 213

FORM E Rev. 07/11

SOIL CONDITIONS SUMMARY TABLE

SUMMARY LOG OF SUBSURFACE EXPLORATIONS AT PROJECT SITES

Project Name	Applicant Name	Project Location (municipality)
Chute Road Proposed Subdivision	Matt Hancock Properties	Windham

Lot No.	Exploration Symbol (TP 1, B 2, etc.)	✱ if at SW/WD Field	Description of subsurface materials by • Soil profile/condition (if by S.E.) • Soil series name (if by C.S.S.), or by • Geologic unit (if by C.G.)	Depths to (inches): Redoximorphic Features	Bedrock	Hydraulically Restrictive Layer	Limit of Exploration	Ground Surface Slope (%)	Ground Surface Elevation
1	TP1	☒	Lamoine/8C	16	>35	16	35	1-5	NA
1	TP1A	☒	Lamoine/8C	15	>35	15	35	1-5	NA
2	TP2	☒	Buxton/8C	18	>35	18	35	1-5	NA
2	TP2A	☒	Buxton/8C	18	>35	18	35	1-5	NA
3	TP3	☒	Lamoine/8D	14	>35	14	35	1-8	NA
3	TP3A	☒	Lamoine/8D	14	>35	14	35	1-8	NA
4	TP23	☒	Lamoine/8D	13	>35	13	35	8-15	NA
4	TP23A	☒	Lamoine/8D	13	>35	13	35	8-15	NA
5	TP22	☒	Lamoine/8D	13	>35	13	35	8-15	NA
5	TP22A	☒	Lamoine/8C	16	>35	16	35	8-15	NA
6	TP21	☒	Lamoine/8D	14	>35	14	35	0-5	NA
6	TP21A	☒	Lamoine/8D	14	>35	14	35	0-5	NA
7	TP20	☒	Lamoine/8C	15	>35	15	35	3-8	NA
7	TP20A	☒	Lamoine/8C	15	>35	15	35	3-8	NA
8	TP19	☒	Lamoine variant/7C	24	>35	24	35	1-6	NA
8	TP19A	☒	Lamoine variant/7C	24	>35	24	35	1-6	NA
9	TP18	☒	Lamoine/8C	15	>35	15	35	1-5	NA
9	TP18A	☒	Lamoine/8C	15	>35	15	35	1-5	NA
10	TP17	☒	Lamoine/8C	17	>35	17	35	1-6	NA
10	TP17A	☒	Buxton/8C	18	>35	18	35	1-6	NA
11	TP16	☒	Lamoine/8D	14	>35	14	35	1-5	NA
11	TP16A	☒	Buxton/8C	18	>35	18	35	1-5	NA
12	TP15	☒	Buxton/8C	18	>35	18	35	1	NA
12	TP15A	☒	Buxton/8C	18	>35	18	35	1-6	NA
13	TP14	☒	Buxton variant/7C	24	>35	24	35	1-6	NA
13	TP14A	☒	Buxton variant/7C	24	>35	24	35	1-6	NA
14	TP13	☒	Lamoine/8D	12	>35	12	35	1-6	NA
14	TP12A	☒	Buxton/8C	22	>35	22	35	1-5	NA
15	TP12	☒	Buxton/8C	21	>35	21	35	1-8	NA
15	TP12A	☒	Buxton/8C	21	>35	21	35	1-8	NA
16	TP11	☒	Lamoine/8D	14	>35	14	35	1-8	NA
16	TP11A	☒	Lamoine/8D	14	>35	14	35	1-8	NA

INVESTIGATOR INFORMATION AND SIGNATURE

Signature	Date
	8/03/17
Name Printed: Stephen H. Howell	Cert/Lic/Reg. #: SS # 187

Qualification: ☒ Licensed Site Evaluator ☒ Certified Soil Scientist ☐ Certified Geologist ☐ Other:

STATE OF MAINE Stephen H. Howell #213 Licensed Site Evaluator

Affix seal

FORM E Rev. 07/11

SOIL CONDITIONS SUMMARY TABLE

SUMMARY LOG OF SUBSURFACE EXPLORATIONS AT PROJECT SITES

Project Name:	Applicant Name:	Project Location (municipality):
Chris Road Subdivision	Matt Hancock Properties	Windham

Lot No.	Exploration Symbol (TP 1, B 2, etc.)	☒ if at SSWD Field	Description of subsurface materials by: • Soil profile/condition (if by S.E.), • Soil series name (if by C.S.S.), or by • Geologic unit (if by C.G.)	Depths to (inches): Redoximorphic Features	Bedrock	Hydraulically Restrictive Layer	Limit of Exploration	Ground Surface Slope (%)	Ground Surface Elevation
17	TP10	☒	Lamoine/8D	11	>35	11	35	0-3	NA
17	TP10A	☒	Lamoine/8D	13	>35	13	35	0-3	NA
18	TP9	☒	Lamoine/8C	17	>35	17	35	3-8	NA
18	TP9A	☒	Lamoine/8C	18	>35	18	35	3-8	NA
19	TP8	☒	Lamoine/8D	13	>35	13	35	3-8	NA
19	TP8A	☒	Lamoine/8C	16	>35	16	35	3-8	NA
20	TP7	☒	Tunbridge/2A	NO	20	NO	20	1-5	NA
20	TP7B&C	☒	Lyman/2A	NO	12	NO	12	1-5	NA
20	TP7A&D	☒	Lyman/2A	NO	16	NO	16	1-5	NA
21	TP6	☒	Lyman/2A	NO	16	NO	16	1	NA
21	TP6A&B	☒	Lyman/2A	NO	18	NO	18	1-5	NA
21	TP6C&D	☒	Lyman/2A	NO	18	NO	18	1-5	NA
22	TP5	☒	Tunbridge/2A	NO	30	NO	30	1-5	NA
-	-	☐		-	-	-	-	-	-
23	TP4	☒	Buxton/8C	25	>40	25	40	8-15	NA
23	TP4A	☒	Buxton/8C	25	>40	35	40	8-15	NA
24	TP24	☒	Lamoine/8D	14	>35	14	35	5-12	NA
24	TP24A	☒	Lamoine/8D	14	>35	14	35	5-12	NA
25	TP5	☒	Lamoine/8D	14	>35	14	35	3-8	NA
25	TP5A	☒	Lamoine/8D	12	>35	12	35	1-5	NA
25	TP27	☒	Dixfield/3C	35	>35	35	35	5-15	NA
26	TP26	☒	Lyndon/8D	12	>35	12	35	1-8	NA
26	TP26A	☒	Lyndon/8D	14	>35	14	35	1-8	NA
		☐							
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INVESTIGATOR INFORMATION AND SIGNATURE

Signature	Date
	8/03/17
Name Printed	**Cert/Lic/Reg. #**
Stephen H. Howell	SS # 187

Qualification

☒ Licensed Site Evaluator ☒ Certified Soil Scientist
☐ Certified Geologist ☐ Other:

STATE OF MAINE Stephen H. Howell #215 CERTIFIED SOIL SCIENTIST

affix seal

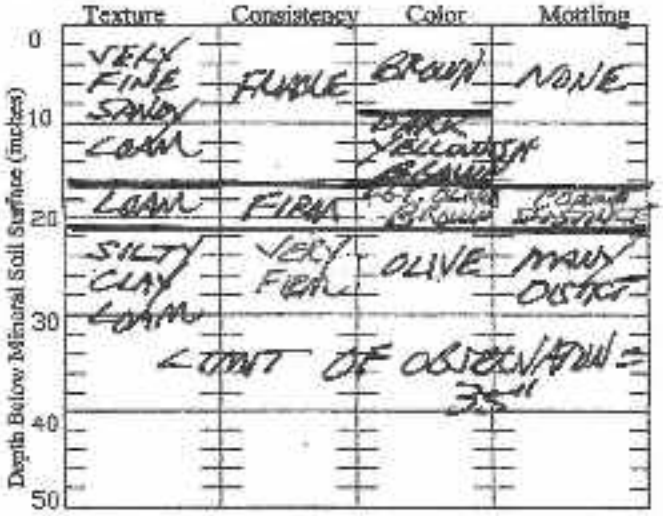
SUBSURFACE WASTEWATER DISPOSAL SYSTEM APPLICATION

Maine Dept. Health & Human Services
Division of Environmental Health
(207) 287-5672 Fax: (207) 287-3165

Town, City, Plantation	Street, Road, Subdivision	Owner's Name
WINDHAM	WINDHAM SUBDIV., CHUTE ROAD	MATT HANCOCK PROPERTIES

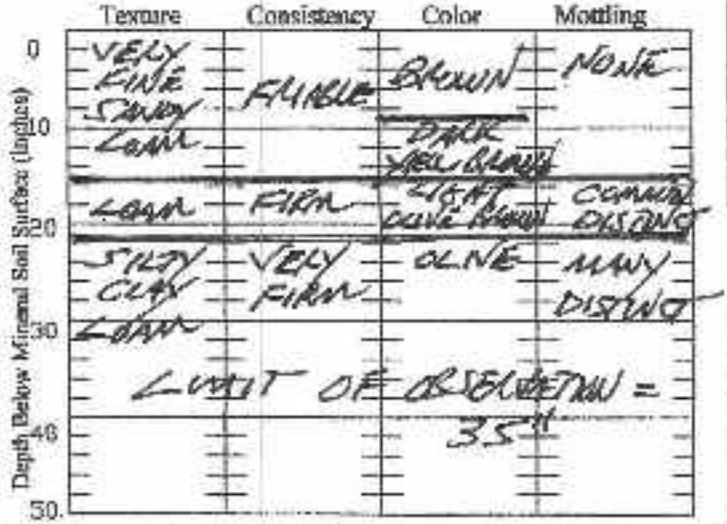
SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole TP1 [X] Test Pit [ ] Boring
1" Depth of Organic Horizon Above Mineral Soil



Soil Classification	Slope	Limiting Factor	
B Profile / C Condition	1-5%	16"	[X] Ground Water [X] Restrictive Layer [ ] Bedrock [ ] Pit Depth

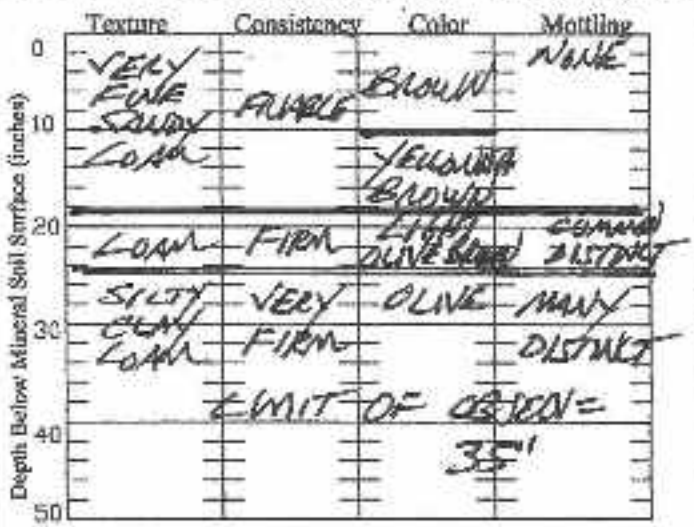
Observation Hole TP1A [X] Test Pit [ ] Boring
1" Depth of Organic Horizon Above Mineral Soil



Soil Classification	Slope	Limiting Factor	
B Profile / C Condition	1-5%	15"	[X] Ground Water [X] Restrictive Layer [ ] Bedrock [ ] Pit Depth

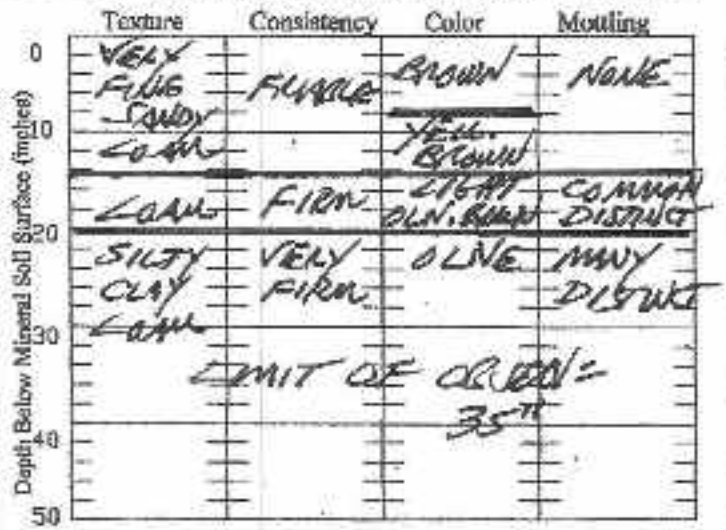
SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole TP2+2A [X] Test Pit [ ] Boring
1" Depth of Organic Horizon Above Mineral Soil



Soil Classification	Slope	Limiting Factor	
B Profile / C Condition	1-5%	18"	[X] Ground Water [X] Restrictive Layer [ ] Bedrock [ ] Pit Depth

Observation Hole TP3+3A [X] Test Pit [ ] Boring
4" Depth of Organic Horizon Above Mineral Soil



Soil Classification	Slope	Limiting Factor	
B Profile / D Condition	1-8%	14"	[X] Ground Water [X] Restrictive Layer [ ] Bedrock [ ] Pit Depth

Site Evaluator Signature | #213 SE # | 7/20/17 Date

SUBSURFACE WASTEWATER DISPOSAL SYSTEM APPLICATION

Maine Dept.Health & Human Services
Division of Environmental Health
(207) 287-5672 Fax: (207) 287-3165

Town, City, Plantation: WINDHAM

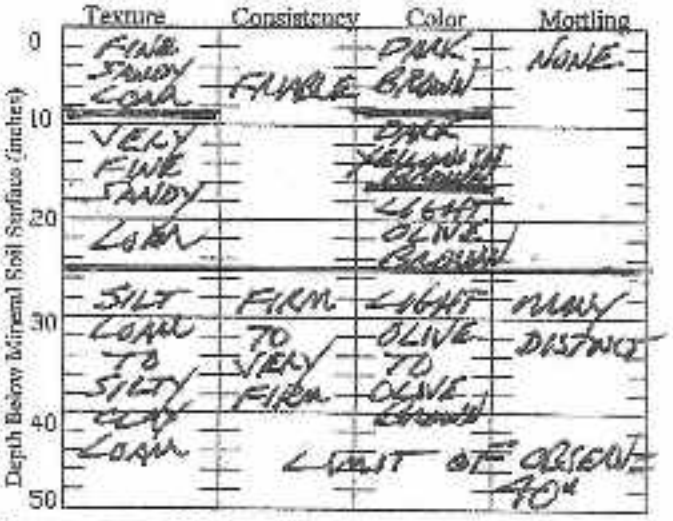
Street, Road, Subdivision: WINDHAM SUBDIV., CHUTE ROAD

Owner's Name: MATT HANCOCK & HAGELDES

SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole TP4 ☒ Test Pit ☐ Boring

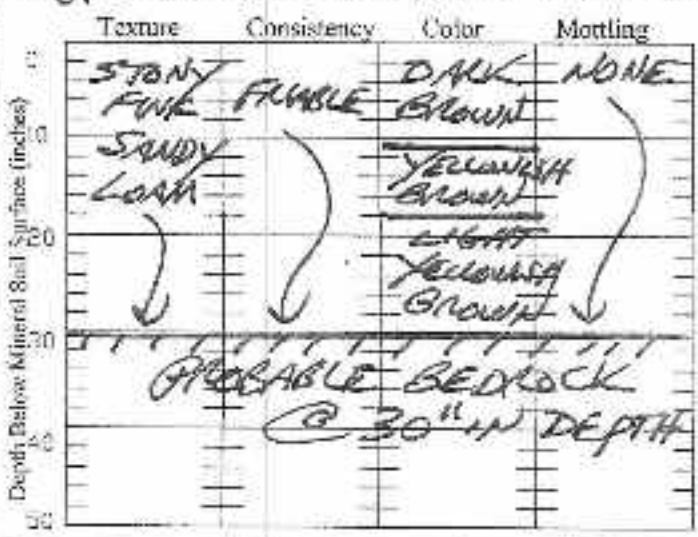
<1" Depth of Organic Horizon Above Mineral Soil



Soil Classification	Slope	Limiting Factor	
Profile: C	8-15%	25"	☒ Ground Water ☒ Restrictive Layer ☐ Bedrock ☐ Pit Depth
Condition: C			

Observation Hole TP5 ☒ Test Pit ☐ Boring

<1" Depth of Organic Horizon Above Mineral Soil

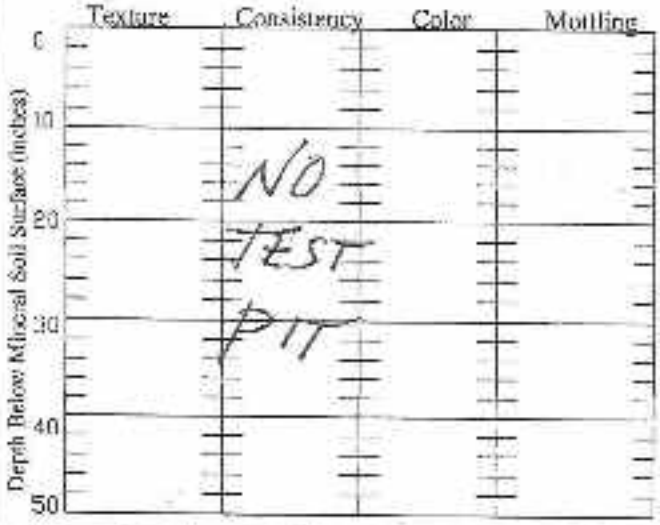


Soil Classification	Slope	Limiting Factor	
Profile: 2	1-5%	30"	☐ Ground Water ☐ Restrictive Layer ☒ Bedrock ☐ Pit Depth
Condition: A			

SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole _____ ☐ Test Pit ☐ Boring

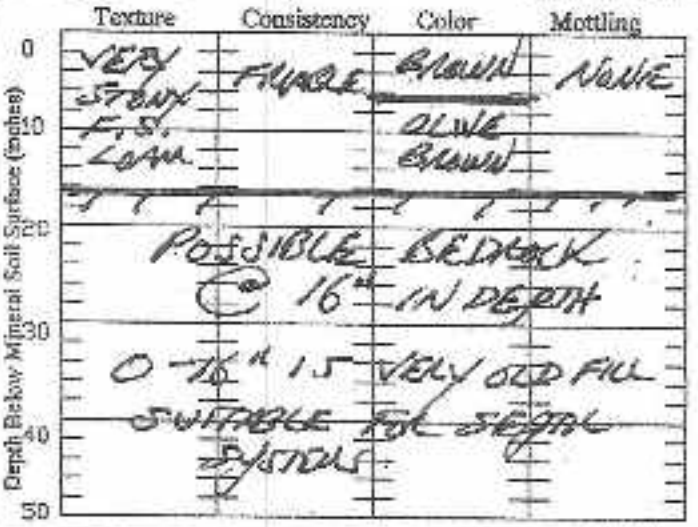
_____" Depth of Organic Horizon Above Mineral Soil



Soil Classification	Slope	Limiting Factor	
Profile:	____%		☐ Ground Water ☐ Restrictive Layer ☐ Bedrock ☐ Pit Depth
Condition:			

Observation Hole TP6 ☒ Test Pit ☐ Boring

<1" Depth of Organic Horizon Above Mineral Soil



Soil Classification	Slope	Limiting Factor	
Profile: 2	1-5%	16"	☐ Ground Water ☐ Restrictive Layer ☒ Bedrock ☐ Pit Depth
Condition: A			

Site Evaluator Signature

#213

SE #

7/20/17

Date

SUBSURFACE WASTEWATER DISPOSAL SYSTEM APPLICATION

Maine Dept. Health & Human Services
Division of Environmental Health
(207) 287-5672 Fax: (207) 287-3165

Town, City, Plantation: WINDHAM

Street, Road, Subdivision: WINDHAM SUBDIV., CHUTE ROAD

Owner's Name: MATT HANCOCK & CHARLENE'S

SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole #4 P.T. ☒ Test Pit ☐ Boring
<1" Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0–10	VERY STONY FINE SANDY LOAM	FRIABLE	BROWN	NONE
10–20			LIGHT OLIVE BROWN	
20–30	POSSIBLE BEDROCK @ 18" IN DEPTH			
30–40	0–18" IS VERY POOR FILL SUITABLE FOR SEPTIC SYSTEMS			
40–50				

Soil Classification	Slope	Limiting Factor	
2 A (Profile / Condition)	1-5%	18"	[ ] Ground Water [ ] Restrictive Layer [X] Bedrock [ ] Pit Depth

Observation Hole #7 ☒ Test Pit ☐ Boring
<1" Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0–10	VERY STONY FINE SANDY LOAM	FRIABLE	BROWN	NONE
10–20			LIGHT OLIVE BROWN	
20–30	POSSIBLE BEDROCK @ 20" IN DEPTH			
30–40	0–20" IS A MIX OF NATIVE SOIL + VERY OLD FILL SUITABLE FOR SEPTIC SYSTEMS			
40–50				

Soil Classification	Slope	Limiting Factor	
2 A (Profile / Condition)	1-5%	20"	[ ] Ground Water [ ] Restrictive Layer [X] Bedrock [ ] Pit Depth

SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole #3 P.T. ☒ Test Pit ☐ Boring
<1" Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0–10	VERY STONY F.S. LOAM	FRIABLE	BROWN LIGHT OLIVE BROWN	NONE
10–20	POSSIBLE BEDROCK @ 12" IN DEPTH			
20–30	0–12" IS A MIX OF NATIVE SOIL + VERY OLD FILL SUITABLE FOR SEPTIC SYSTEMS			
30–40				
40–50				

Soil Classification	Slope	Limiting Factor	
2 A (Profile / Condition)	1-5%	12"	[ ] Ground Water [ ] Restrictive Layer [X] Bedrock [ ] Pit Depth

Observation Hole #5 P.T. ☒ Test Pit ☐ Boring
<1" Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0–10	VERY STONY F.S. LOAM	FRIABLE	BROWN LIGHT OLIVE BROWN	NONE
10–20	POSSIBLE BEDROCK @ 16" IN DEPTH			
20–30	0–16" IS A MIX OF VERY OLD FILL + NATIVE SOIL SUITABLE FOR SEPTIC SYSTEMS			
30–40				
40–50				

Soil Classification	Slope	Limiting Factor	
2 A (Profile / Condition)	1-5%	16"	[ ] Ground Water [ ] Restrictive Layer [X] Bedrock [ ] Pit Depth

Site Evaluator Signature: [signature] SE #213 7/20/17 Date

SUBSURFACE WASTEWATER DISPOSAL SYSTEM APPLICATION

Maine Dept. Health & Human Services
Division of Environmental Health
(207) 287-5672 Fax: (207) 287-3165

Town, City, Plantation	Street, Road, Subdivision	Owner's Name
WINDHAM	WINDHAM SUBDIV., CHUTE ROAD	MATT HANCOCK GUIDELINES

SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole TP8 ☒ Test Pit ☐ Boring
4" Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0	VERY FINE SANDY LOAM	FRIABLE	BROWN	NONE
10			LIGHT OLIVE BROWN	
20	SILT LOAM TO SILTY CLAY LOAM	FIRM TO VERY FIRM	OLIVE BROWN TO OLIVE	MANY DISTINCT
30				
40		LIMIT OF OBSERV= 35"		
50				

Soil Classification	Slope	Limiting Factor	
B Profile / D Condition	3-8%	13"	☒ Ground Water ☒ Restrictive Layer [ ] Bedrock [ ] Pit Depth

Observation Hole TP8A ☒ Test Pit ☐ Boring
4" Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0	VERY FINE SANDY LOAM	FRIABLE	BROWN	NONE
10			LIGHT YELL. BROWN	
20	SILT LOAM TO SILTY CLAY LOAM	FIRM TO V. FIRM	OLIVE BROWN TO OLIVE	MANY DISTINCT
30				
40		LIMIT OF OBSERV= 35"		
50				

Soil Classification	Slope	Limiting Factor	
B Profile / C Condition	3-8%	16"	☒ Ground Water ☒ Restrictive Layer [ ] Bedrock [ ] Pit Depth

SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole TP9 ☒ Test Pit ☐ Boring
2" Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0	F.S. LOAM	FRIABLE	BROWN	NONE
10	VERY F.S. LOAM		LIGHT YELLOWISH BROWN	
20	SILT LOAM TO SILTY CLAY LOAM	FIRM TO V. FIRM	OLIVE BROWN TO OLIVE	COMMON TO MANY DISTINCT
30				
40		LIMIT OF OBSERV= 35"		
50				

Soil Classification	Slope	Limiting Factor	
B Profile / C Condition	3-8%	17"	☒ Ground Water ☒ Restrictive Layer [ ] Bedrock [ ] Pit Depth

Observation Hole TP9A ☒ Test Pit ☐ Boring
2" Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0	F.S. LOAM	FRIABLE	BROWN	NONE
10	V. F. SANDY LOAM		LIGHT YELLOWISH BROWN	
20	SILT LOAM TO SILTY CLAY LOAM	FIRM TO V. FIRM	OLIVE BROWN TO OLIVE	COMMON TO MANY DISTINCT
30				
40		LIMIT OF OBSERV= 35"		
50				

Soil Classification	Slope	Limiting Factor	
B Profile / C Condition	3-8%	18"	☒ Ground Water ☒ Restrictive Layer [ ] Bedrock [ ] Pit Depth

Site Evaluator Signature — #213 SE # — 7/20/17 Date

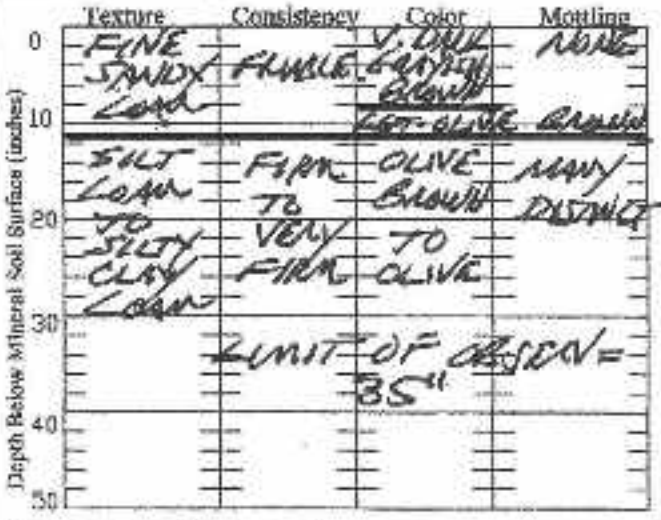
SUBSURFACE WASTEWATER DISPOSAL SYSTEM APPLICATION

Maine Dept. Health & Human Services
Division of Environmental Health
(207) 287-5672 Fax: (207) 287-3165

Town, City, Plantation	Street, Road, Subdivision	Owner's Name
WINDHAM	WINDHAM SUBDIV., CHUTE ROAD	MATT HANCOCK PROPERTIES

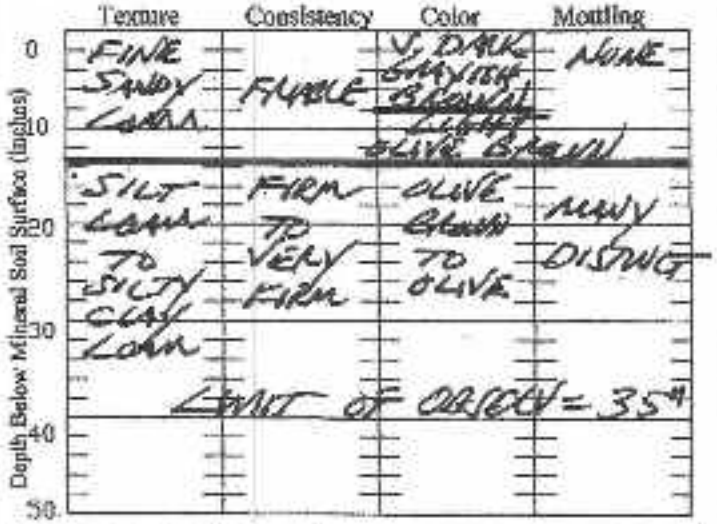
SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole TP 10 ☒ Test Pit ☐ Boring
1" Depth of Organic Horizon Above Mineral Soil



Soil Classification	Slope	Limiting Factor	
8 D (Profile / Condition)	0-3%	11"	☒ Ground Water ☐ Restrictive Layer [ ] Bedrock [ ] Pit Depth

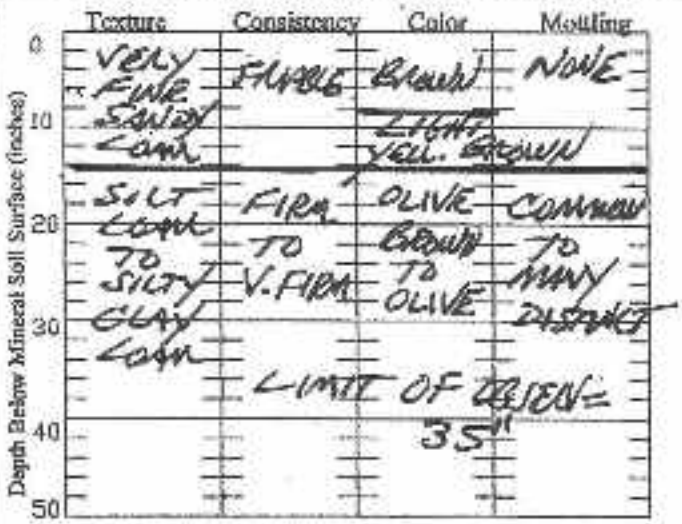
Observation Hole TP 10A ☒ Test Pit ☐ Boring
1" Depth of Organic Horizon Above Mineral Soil



Soil Classification	Slope	Limiting Factor	
8 D (Profile / Condition)	0-3%	13"	☒ Ground Water ☒ Restrictive Layer [ ] Bedrock [ ] Pit Depth

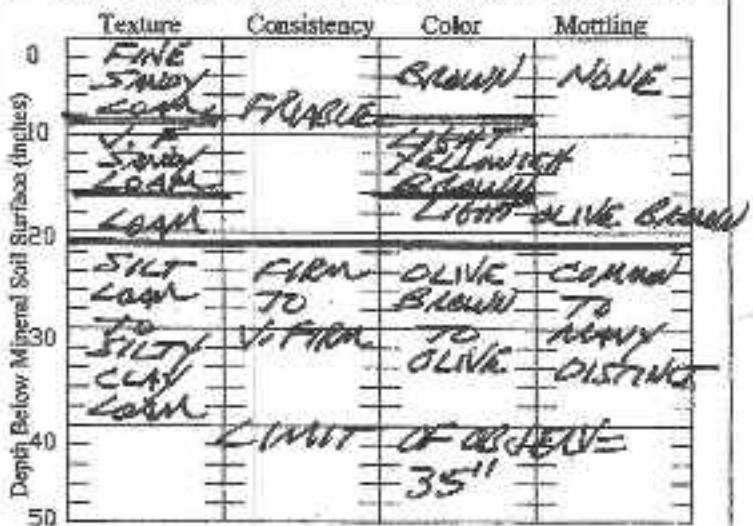
SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole TP 11 HA ☒ Test Pit ☐ Boring
1" Depth of Organic Horizon Above Mineral Soil



Soil Classification	Slope	Limiting Factor	
8 D (Profile / Condition)	1-8%	14"	☒ Ground Water ☐ Restrictive Layer [ ] Bedrock [ ] Pit Depth

Observation Hole TP 12 HA ☒ Test Pit ☐ Boring
2" Depth of Organic Horizon Above Mineral Soil



Soil Classification	Slope	Limiting Factor	
8 C (Profile / Condition)	1-8%	21"	☒ Ground Water ☒ Restrictive Layer [ ] Bedrock [ ] Pit Depth

Site Evaluator Signature — #213 SE # — 7/20/17 Date

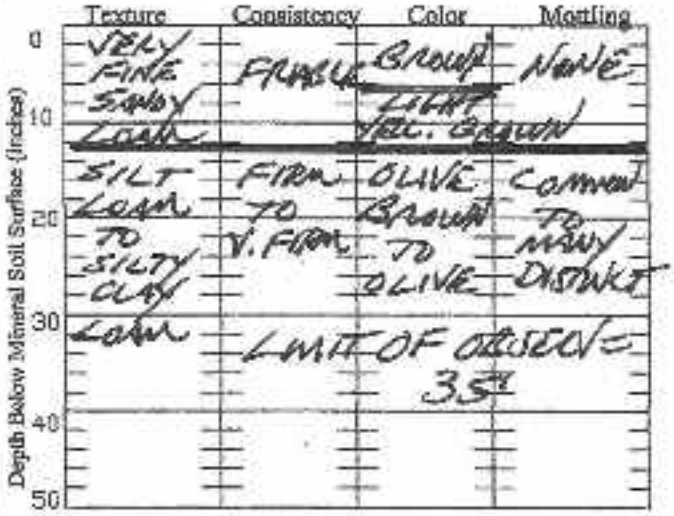
SUBSURFACE WASTEWATER DISPOSAL SYSTEM APPLICATION

Maine Dept.Health & Human Services
Division of Environmental Health
(207) 287-5672 Fax: (207) 287-3165

Town, City, Plantation	Street, Road, Subdivision	Owner's Name
WINDHAM	WINDHAM SUBDIV., CHUTE ROAD	MATT HANCOCK & PAGE LINES

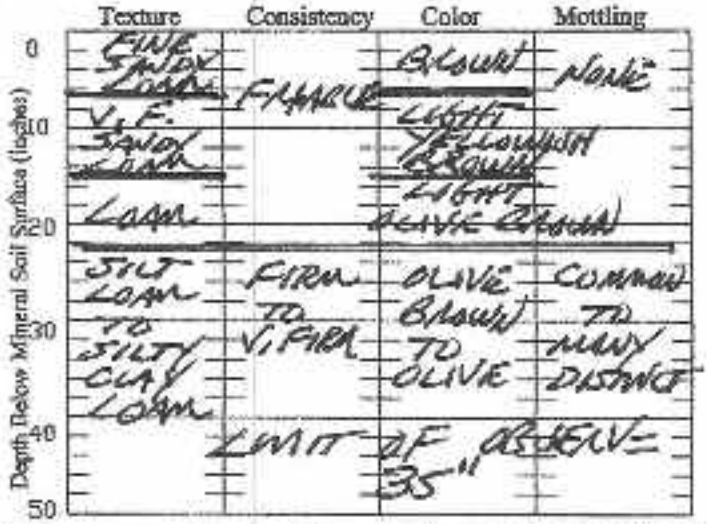
SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole TP13 ☒ Test Pit ☐ Boring
2 " Depth of Organic Horizon Above Mineral Soil



Soil Classification	Slope	Limiting Factor	
8 D (Profile / Condition)	1-6 %	12"	☒ Ground Water ☒ Restrictive Layer [ ] Bedrock [ ] Pit Depth

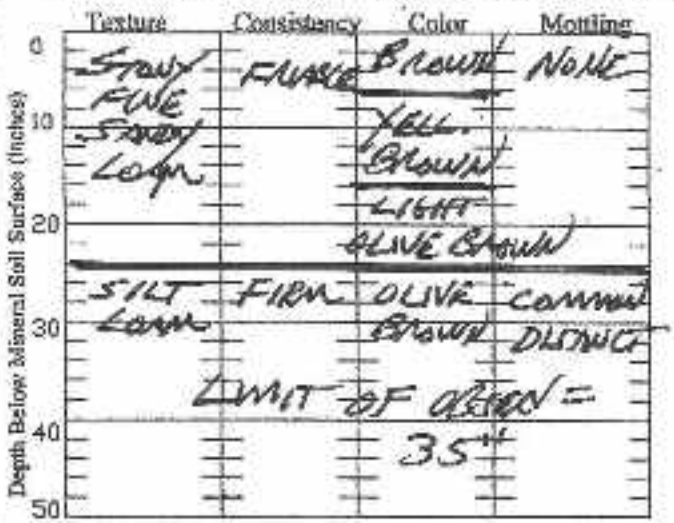
Observation Hole TP13A ☐ Test Pit ☐ Boring
2 " Depth of Organic Horizon Above Mineral Soil



Soil Classification	Slope	Limiting Factor	
8 C (Profile / Condition)	1-5	22"	☒ Ground Water ☒ Restrictive Layer [ ] Bedrock [ ] Pit Depth

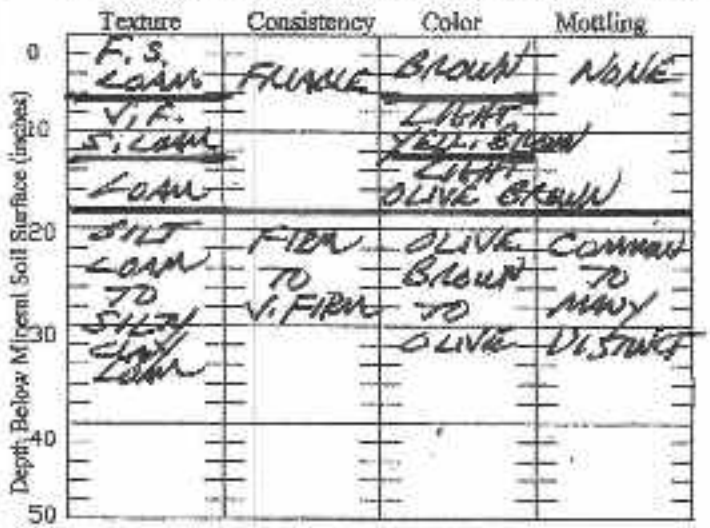
SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole TP14HHA ☒ Test Pit ☐ Boring
3 " Depth of Organic Horizon Above Mineral Soil



Soil Classification	Slope	Limiting Factor	
7 C (Profile / Condition)	1-6%	24"	☒ Ground Water ☒ Restrictive Layer [ ] Bedrock [ ] Pit Depth

Observation Hole TP15HHA ☒ Test Pit ☐ Boring
2 " Depth of Organic Horizon Above Mineral Soil



Soil Classification	Slope	Limiting Factor	
8 C (Profile / Condition)	1-6%	18"	☒ Ground Water ☒ Restrictive Layer [ ] Bedrock [ ] Pit Depth

Site Evaluator Signature — #213 (SE #) — 7/20/17 (Date)

SUBSURFACE WASTEWATER DISPOSAL SYSTEM APPLICATION

Maine Dept.Health & Human Services
Division of Environmental Health
(207) 287-5672 Fax: (207) 287-3165

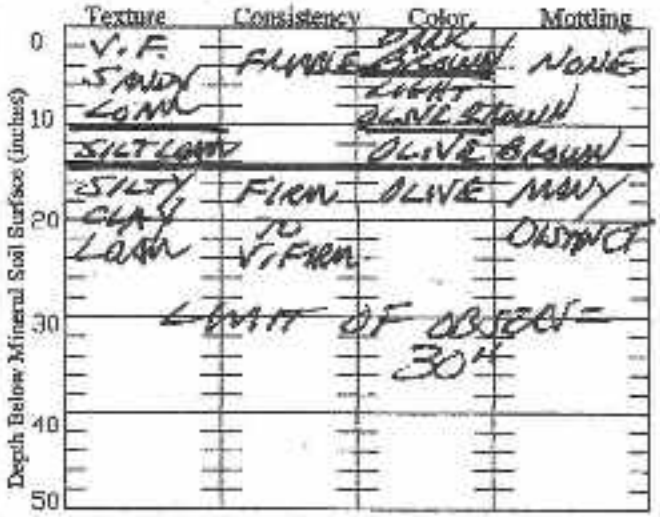
Town, City, Plantation: WINDHAM

Street, Road, Subdivision: WINDHAM SUBDIV., CHUTE ROAD

Owner's Name: MATT HANCOCK GRADELINE'S

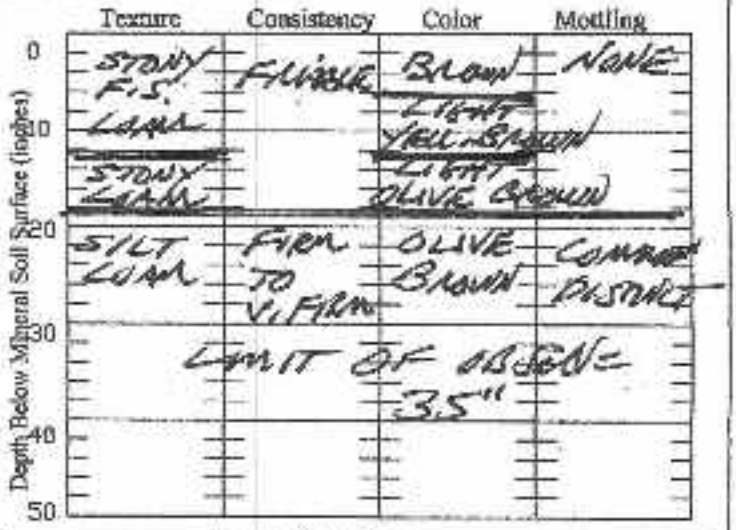
SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole TP16 [X] Test Pit [ ] Boring
1 " Depth of Organic Horizon Above Mineral Soil



Soil Classification: Profile	Condition	Slope	Limiting Factor	
B	D	1-5%	14"	[X] Ground Water [X] Restrictive Layer [ ] Bedrock [ ] Pit Depth

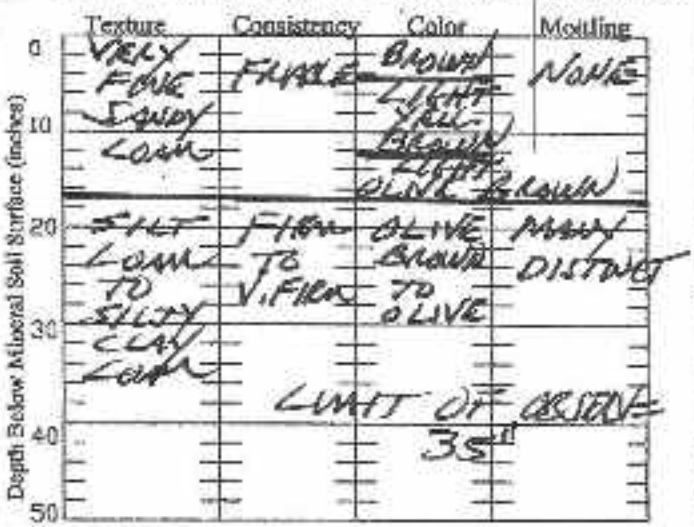
Observation Hole TP16A [X] Test Pit [ ] Boring
2 " Depth of Organic Horizon Above Mineral Soil



Soil Classification: Profile	Condition	Slope	Limiting Factor	
B	C	1-5%	18"	[X] Ground Water [X] Restrictive Layer [ ] Bedrock [ ] Pit Depth

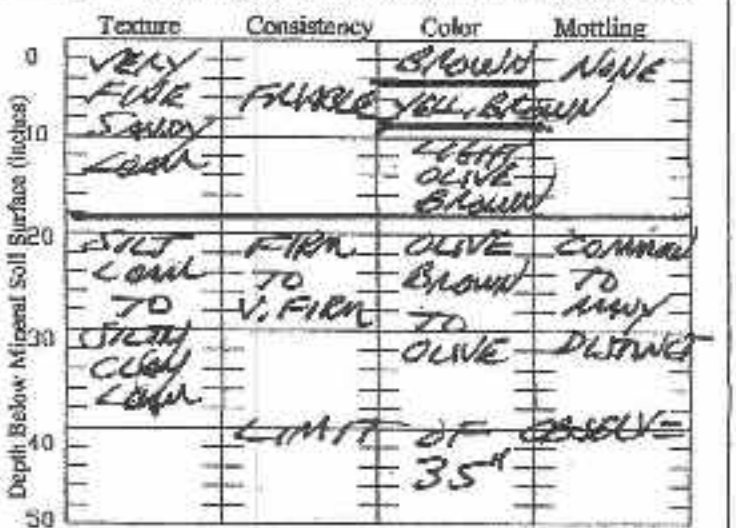
SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole TP17 [X] Test Pit [ ] Boring
3 " Depth of Organic Horizon Above Mineral Soil



Soil Classification: Profile	Condition	Slope	Limiting Factor	
B	C	1-6%	17"	[X] Ground Water [X] Restrictive Layer [ ] Bedrock [ ] Pit Depth

Observation Hole TP17A [X] Test Pit [ ] Boring
3 " Depth of Organic Horizon Above Mineral Soil



Soil Classification: Profile	Condition	Slope	Limiting Factor	
B	C	1-6%	18"	[X] Ground Water [X] Restrictive Layer [ ] Bedrock [ ] Pit Depth

Site Evaluator Signature | #213 SE # | 7/20/17 Date

SUBSURFACE WASTEWATER DISPOSAL SYSTEM APPLICATION

Maine Dept.Health & Human Services
Division of Environmental Health
(207) 287-5672 Fax: (207) 287-3165

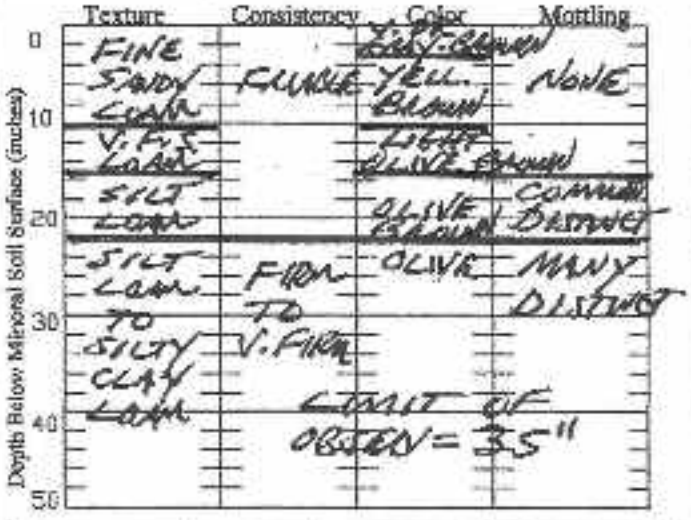
Town, City, Plantation: WINDHAM

Street, Road, Subdivision: WINDHAM SUBDIV., CHUTE ROAD

Owner's Name: MATT HANCOCK & DAUGHTERS

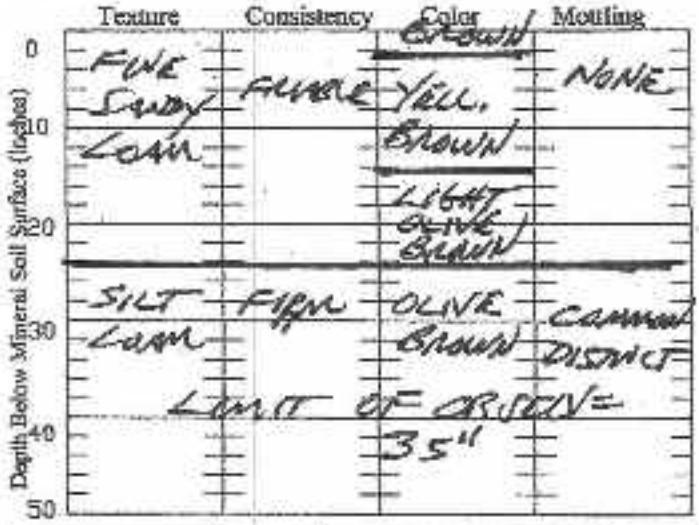
SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole TP18+18A ☒ Test Pit ☐ Boring
2 " Depth of Organic Horizon Above Mineral Soil



Soil Classification	Slope	Limiting Factor	
Profile: 8 / Condition: C	1-5%	15"	☒ Ground Water ☐ Restrictive Layer ☐ Bedrock ☐ Pit Depth

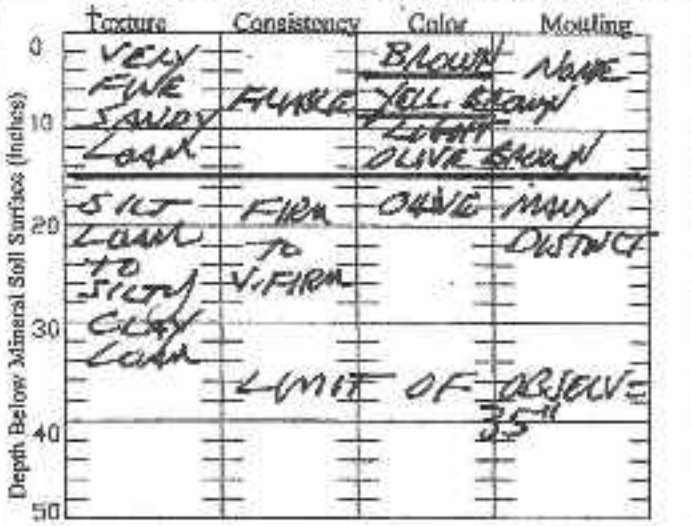
Observation Hole TP19+19A ☒ Test Pit ☐ Boring
2 " Depth of Organic Horizon Above Mineral Soil



Soil Classification	Slope	Limiting Factor	
Profile: 7 / Condition: C	1-6%	24"	☒ Ground Water ☒ Restrictive Layer ☐ Bedrock ☐ Pit Depth

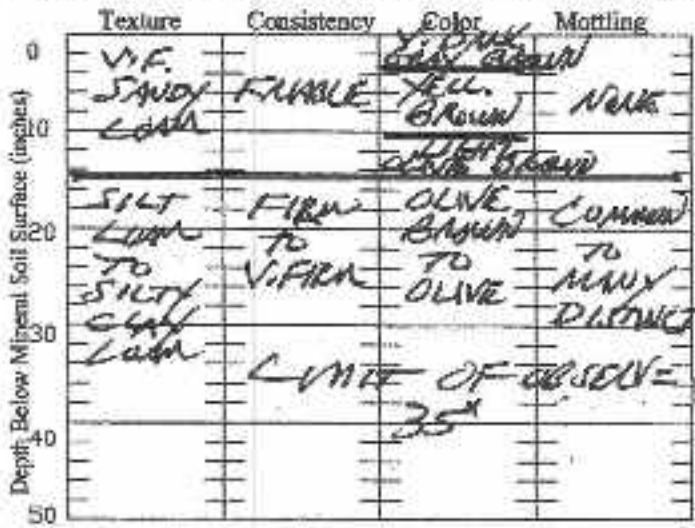
SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole TP20+20A ☒ Test Pit ☐ Boring
2 " Depth of Organic Horizon Above Mineral Soil



Soil Classification	Slope	Limiting Factor	
Profile: 8 / Condition: C	3-8%	15"	☒ Ground Water ☒ Restrictive Layer ☐ Bedrock ☐ Pit Depth

Observation Hole TP21+21A ☒ Test Pit ☐ Boring
3 " Depth of Organic Horizon Above Mineral Soil



Soil Classification	Slope	Limiting Factor	
Profile: 8 / Condition: D	0-5%	14"	☒ Ground Water ☒ Restrictive Layer ☐ Bedrock ☐ Pit Depth

Site Evaluator Signature: [signature] #213 SE # 7/20/17 Date

SUBSURFACE WASTEWATER DISPOSAL SYSTEM APPLICATION

Maine Dept. Health & Human Services
Division of Environmental Health
(207) 287-5672 Fax: (207) 287-3165

Town, City, Plantation: WINDHAM

Street, Road, Subdivision: WINDHAM SUBDIV., CHUTE ROAD

Owner's Name: MATT HANCOCK ARGERIDES

SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole TP22 ☒ Test Pit ☐ Boring
2" Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0	STONY F.S. LOAM	FRIABLE	V. DK. GRAY. BROWN / LIGHT YELLOWISH BROWN	NONE
10	ST. LOAM		LT. OLIVE BROWN	
20	SILT LOAM TO SILTY CLAY LOAM	FIRM TO V. FIRM	OLIVE BROWN TO OLIVE	COMMON TO MANY DISTINCT
30		LIMIT OF OBSERV = 35"		
40				
50				

Soil Classification	Slope	Limiting Factor	
Profile: B / Condition: D	8-15%	13"	☒ Ground Water ☒ Restrictive Layer ☐ Bedrock ☐ Pit Depth

Observation Hole TP22A ☒ Test Pit ☐ Boring
2" Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0	STONY F.S. LOAM	FRIABLE	V. DK. GRAY. BROWN / LIGHT YELLOWISH BROWN	NONE
10	STONY LOAM		LIGHT OLIVE BROWN	
20	SILT LOAM TO SILTY CLAY LOAM	FIRM TO V. FIRM	OLIVE BROWN	COMMON TO MANY DISTINCT
30		LIMIT OF OBSERV = 35"		
40				
50				

Soil Classification	Slope	Limiting Factor	
Profile: B / Condition: C	8-15%	16"	☒ Ground Water ☒ Restrictive Layer ☐ Bedrock ☐ Pit Depth

SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole TP23R3A ☒ Test Pit ☐ Boring
2" Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0	VERY FINE SANDY LOAM	FRIABLE	V. DK. GRAY. BROWN / LIGHT YELLOWISH BROWN	NONE
10	LOAM		LT. OLIVE BROWN	
20	SILT LOAM TO SILTY CLAY LOAM	FIRM TO V. FIRM	OLIVE BROWN TO OLIVE	COMMON TO MANY DISTINCT
30		LIMIT OF OBSERV = 35"		
40				
50				

Soil Classification	Slope	Limiting Factor	
Profile: B / Condition: D	8-15%	13"	☒ Ground Water ☒ Restrictive Layer ☐ Bedrock ☐ Pit Depth

Observation Hole TP24R2A ☒ Test Pit ☐ Boring
1" Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0	VERY FINE SANDY LOAM	FRIABLE	BROWN / YELLOWISH BROWN	NONE
10	LOAM	FIRM	LIGHT OLIVE BROWN	COMMON DISTINCT
20	SILTY CLAY LOAM	VERY FIRM	OLIVE	MANY DISTINCT
30		LIMIT OF OBSERV = 35"		
40				
50				

Soil Classification	Slope	Limiting Factor	
Profile: B / Condition: D	5-12%	14"	☒ Ground Water ☒ Restrictive Layer ☐ Bedrock ☐ Pit Depth

Site Evaluator Signature: [signature] #213 SE # 7/20/17 Date

SUBSURFACE WASTEWATER DISPOSAL SYSTEM APPLICATION

Maine Dept Health & Human Services
Division of Environmental Health
(207) 287-5672 Fax: (207) 287-3165

Town, City, Plantation: WINDHAM

Street, Road, Subdivision: WINDHAM SUBDIV., CHUTE ROAD

Owner's Name: MATT HANCOCK & ROBERTNE'S

SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole TP 26 [X] Test Pit [ ] Boring
<1" Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0–10	VERY FINE SANDY LOAM	FRIABLE	BROWN; LIGHT YELLOWISH BROWN	NONE
10–20	SILT LOAM TO SILTY CLAY LOAM	FIRM TO V. FIRM	OLIVE BROWN TO OLIVE	MANY DISTINCT
30–40	LIMIT OF OBSERV = 35"			

Soil Classification: Profile 8, Condition D
Slope: 16%
Limiting Factor: 12" [X] Ground Water [X] Restrictive Layer [ ] Bedrock [ ] Pit Depth

Observation Hole TP 26A [X] Test Pit [ ] Boring
<1" Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0–10	VERY FINE SANDY LOAM	FRIABLE	DARK BROWN; LIGHT YELL. BROWN	NONE
10–20	SILT LOAM TO SILTY CLAY LOAM	FIRM TO V. FIRM	OLIVE BROWN TO OLIVE	MANY DISTINCT
30–40	LIMIT OF OBSERV = 35"			

Soil Classification: Profile 8, Condition D
Slope: 1-8%
Limiting Factor: 14" [X] Ground Water [X] Restrictive Layer [ ] Bedrock [ ] Pit Depth

SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole TP 27 [X] Test Pit [ ] Boring
<1" Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0–10	STONY FINE SANDY LOAM	FRIABLE	DARK BROWN; DARK YELL. BROWN; LIGHT OLIVE BROWN	NONE
30–40	FIRM	OLIVE BROWN		COMMON DISTINCT
40–50	LIMIT OF OBSERV = 35"			

Soil Classification: Profile 3, Condition C
Slope: 5-15%
Limiting Factor: 35" [X] Ground Water [X] Restrictive Layer [ ] Bedrock [ ] Pit Depth

Observation Hole TP 28 [X] Test Pit [ ] Boring
<1" Depth of Organic Horizon Above Mineral Soil

Depth Below Mineral Soil Surface (inches)	Texture	Consistency	Color	Mottling
0–10	STONY FINE SANDY LOAM	FRIABLE	DARK BROWN; DARK YELL. BROWN; LIGHT OLIVE BROWN	NONE
30–40	FIRM	OLIVE BROWN		COMMON DISTINCT
40–50	LIMIT OF OBSERV = 35"			

Soil Classification: Profile 3, Condition C
Slope: 1-5%
Limiting Factor: 25" [X] Ground Water [X] Restrictive Layer [ ] Bedrock [ ] Pit Depth

Site Evaluator Signature

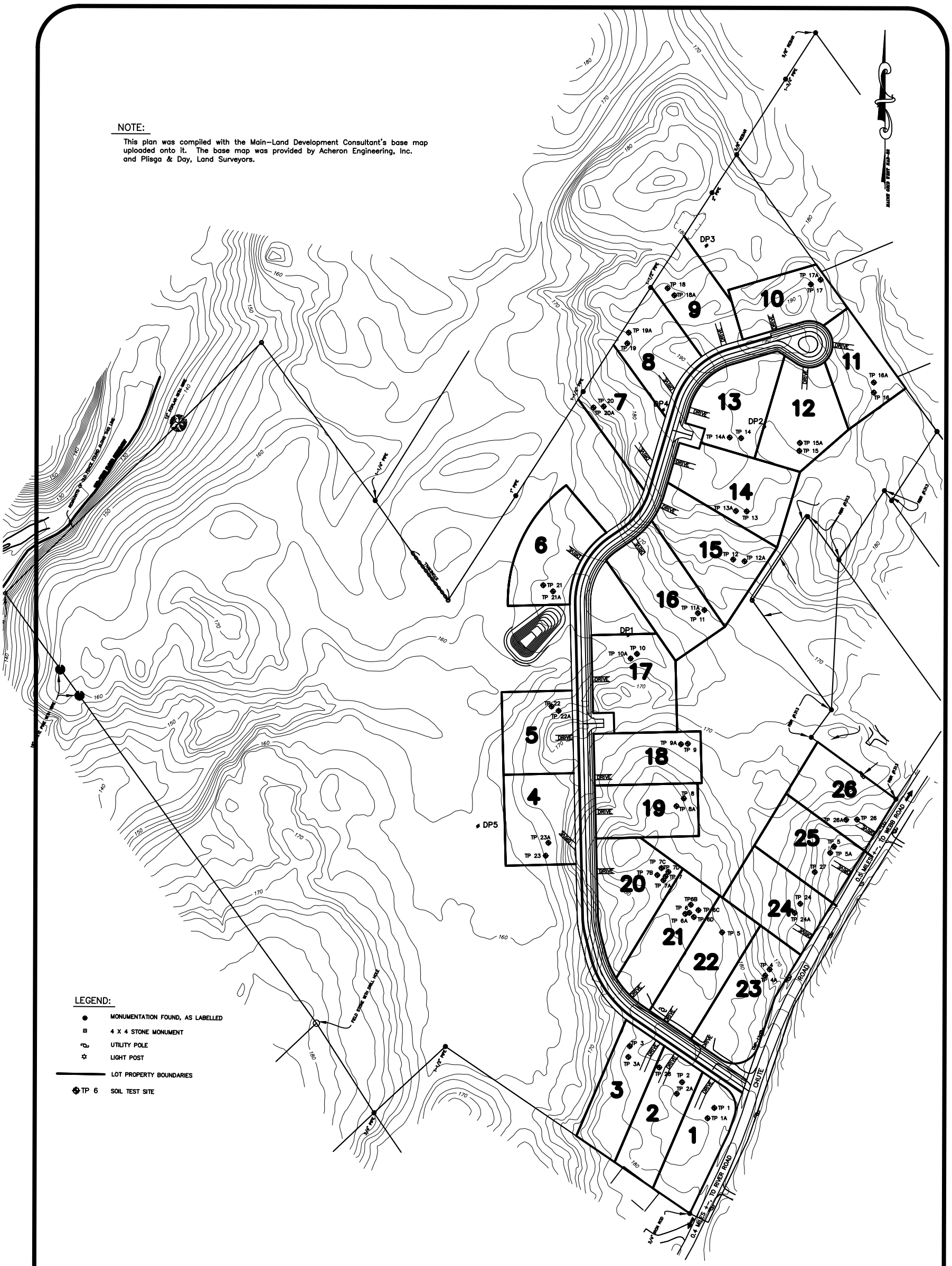
#213
SE #

7/20/17
Date

HHE-200 Rev. 05/08

NOTE:

This plan was compiled with the Main–Land Development Consultant's base map uploaded onto it. The base map was provided by Acheron Engineering, Inc. and Plisga & Day, Land Surveyors.



LEGEND:

- ● MONUMENTATION FOUND, AS LABELLED
- ▣ 4 X 4 STONE MONUMENT
- UTILITY POLE
- ☼ LIGHT POST
- LOT PROPERTY BOUNDARIES
- ✥TP 6 SOIL TEST SITE

Soil Solutions
• Septic System Designs
• Soil Mapping
• Wetland Delineation

Stephen H. Howell
Certified Soil Scientist
Licensed Site Evaluator
Wetland Scientist
276 Hoxie Hill Road, Orrington, Maine 04474 (207) 825 – 4792
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SCALE: 1'' = 100'

0' 100' 200' 400'

Preliminary Soil and Site Evaluation Test Pit Locations

Matt Hancock Properties

Chute Road
Windham, Maine
August 11, 2017

Department of Health and Human Services
Bureau of Health, Division of Health Engineering
Wastewater and Plumbing Control Program

NITRATE-NITROGEN IMPACT ANALYSIS FOR ENGINEERED SYSTEMS

GENERAL

Background: This Appendix is not intended to be enforced as part of the code's minimum requirements. Nitrogen contamination of ground and surface waters, due to on-site disposal of waste water, may be a public health and environmental problem in some areas. A public health problem of particular concern is nitrate contamination of drinking water supplies. Ingestion of water containing concentrations greater than 10 milligrams per liter of nitrate-nitrogen can be a cause of oxygen deficiency in young infants. Of environmental concern is the fact that nitrogen may be the limiting nutrient that controls eutrophication in coastal marine waters, estuaries, and some fresh water lakes and ponds. Therefore, excess nitrogen added to a water body may enhance eutrophication resulting in algal growth and other undesirable effects.

Intent: The intent of this Appendix is to provide a simple screening method for determining whether a more site-specific modeling of the nitrogen impact should be considered for those systems handling 2,000 gpd or more. The function of the nitrogen screening analysis is to show that nitrogen leaving the disposal field should not cause nearby domestic water supplies to exceed the acceptable nitrate-nitrogen limit of 10 milligrams per liter.

NITROGEN SCREENING ANALYSIS

Procedure: The following procedure provides a simple method of determining whether a more site-specific modeling of nitrogen impact is needed.

Step 1: Determine the overall size of the property in square feet;

Step 2: Determine the design flow from Chapter 9; and

Step 3: Using the most prominent soil profile condition, multiply the design flow by figure given in Table F-1. For example, assume a property has a soil profile 6, a soil condition C, and a system design flow of 3000 gpd. Reading down the left-hand column of Table F-1 to soil profile 6 and across to soil condition C gives the figure of 78 square feet needed to dilute each gallon of waste water. Now, multiplying the design flow of 3,000 gpd by the 78 square feet gives an answer of 234,000 square feet.

This answer gives the minimum square footage of land area needed to reduce nitrate-nitrogen to an acceptable level.

TABLE F-1

Minimum square feet needed to dilute each gallon of waste water

Waste water with 40 mg/l NO_3-N

Soil profile	Soil conditions						
	AI	AII	AIII	B	C	D	E
1	112	82	82	78	82	82	112
2	112	82	78	78	78	82	112
3	112	82	82	82	82	82	112
4	112	82	78	78	78	82	112
5	112	82	78	78	78	82	112
6	112	82	78	62	78	82	112
7	112	82	82	82	82	82	112
8	112	82	82	78	82	82	112
9	112	82	82	82	82	82	112
11	112	82	78	78	78	82	112

Waste water with 20 mg/l NO_3-N.

Soil profile	Soil conditions						
	AI	**AII**	**AIII**	**B**	**C**	**D**	**E**
1	37	27	27	26	27	27	37
2	37	27	26	26	26	27	37
3	37	27	27	27	27	27	37
4	37	27	26	26	26	27	37
5	37	27	26	26	26	27	37
6	37	27	26	21	26	27	37
7	37	27	27	27	27	27	37
8	37	27	27	26	27	27	37
9	37	27	27	27	27	27	37
11	37	27	26	26	26	27	37

Questionable sites: If the square footage calculated in "Step 3," is larger than the actual square footage on the property, suggested that a site-specific nitrate impact analysis may be needed.

ASSUMPTIONS USED

General: The NO_3-N impact screening analysis is based on the assumptions in this Section.

Assumption 1: The approach is a simple mass balance model assuming shallow ground water in the "interflow" and "throughflow" regime.

Assumption 2: All the nitrogen is converted to nitrate ions in the soil within the boundaries of the property.

Assumption 3: The nitrate-nitrogen concentration of the treated waste water leaving the disposal field is assumed to be in compliance with Table F-2.

TABLE F-2

NO_3-N concentration of effluent leaving the disposal field

Disposal system type	Initial NO_3-N concentrations
Disposal field	40 mg/l
Peat-bed or filter	20 mg/l
Denitrification (e.g. "RUCK" system)	See note below

Note: Initial NO_3-N concentration is to be determined on a case-by-case basis from valid field-test data provided by the designer and/or manufacturer of the proposed denitrification system.

Assumption 4: No allowance is made for nitrogen removal by vegetation.

Assumption 5: No allowance is made for nitrogen removal by soil sorption.

Assumption 6: No allowance is made for dilution by subsurface water moving onto the site.

Assumption 7: A fraction of the annual precipitation will infiltrate the soil and be available to mix with and dilute the nitrogen in the treated waste water. That fraction depends on ground cover, land usage, hydrologic soil group, and the amount and duration of precipitation. Most of these factors will vary on any given site.

Assumption 8: Dependent on site and soil conditions, varying percentages of the treated waste water and the infiltrated precipitation are able to move down to ground water used for water supplies. The remaining portions of the infiltrating precipitation and the treated waste water tend to move down slope, parallel to the ground surface, as perched water.

Assumption 9: The annual precipitation rate is 25.2 inches per year. (This figure is 60% of the 42 inches per year average annual precipitation rate to adjust for drought years.)

Assumption 10: To dilute each gallon of waste water containing 40 milligrams of nitrate-nitrogen per liter to a desired 10 milligrams of nitrate-nitrogen per liter requires 3 gallons of infiltrating precipitation for each gallon of waste water. For a peat disposal field the assumption is that 1 gallon of infiltrating precipitation is needed for each gallon of waste water for peat disposal field effluent containing 20 milligrams of nitrate-nitrogen per liter.

Assumption 11: A certain amount of background NO_3-N exists in the ground water being evaluated. This parameter is not considered in these calculations because of the conservatism built into assumptions 4, 5, and 6.

Assumption 12: NO_3-N is contained in the precipitation that falls and infiltrates the site at an average concentration of 0.5 mg/l. This parameter is not considered because of the conservatism built into assumptions 4, 5, and 6.

Assumption 13: A certain amount of NO_3-N may be contributed by the development itself or from post-development activity (e.g., lawn fertilizer). This parameter is not considered because of the conservatism built into assumptions 4, 5, and 6.

Assumption 14: Since the nitrate plume may or may not disperse and its width and direction are difficult to predict therefore it is assumed that any precipitation falling on the property may be available for diluting the waste water.

Assumption 15: A certain percentage of the annual precipitation will infiltrate and recharge the soil. This will be available to mix with and dilute NO_3-N as determined by the type of surficial geologic deposits, or by the hydrologic soil group as defined by the U.S. Soil Conservation Service. Used together, Table F-3 and Table F-4 give the percentage of infiltration for each soil group. Note: The percentage of the infiltrating water that reaches the permanent ground water table is in the range of 5% to 20%.

First, read down the side of Table F-3 and find the appropriate soil profile. Then read across to the column for the appropriate soil condition. For example, for a soil profile 4 and a soil condition C, the hydrologic soil group is "B."

Now, using Table F-4, find the slope of the land down the left- hand column. Then read across to the hydrologic soil group to find the annual infiltration rate. For example, for a slope of 8-15% and a hydrologic soil group "B," the annual infiltration rate is 0.024 gallons per day for each square foot of area.

TABLE F-3

Hydrologic soil groups vs soil profile and soil conditions

Soil profile	Soil Conditions						
	AI	**AII**	**AIII**	**B**	**C**	**D**	**E**
1	D	D	C	C	C	C	D
2	D	D	C	B	B	C	D
3	D	D	C	C	C	C	D
4	D	C	C	B	B	C	D
5	D	C	C	B	B	C	D
6	D	C	C	A	B	C	D
7	-	C	C	C	C	C	D
8	D	D	C	C	C	D	D

9	D	D	C	C	C	D	D
11	D	C	C	B	B	C	D

Note: Recharge rates for shallow upland soils that are underlain by fractured bedrock and that are designated in hydrologic soil group D, should be determined according to geologic properties, rather than by the hydrologic soil group.

Some profile conditions have dual designations (C/D,A/B,etc.) The most restrictive hydrologic group was used in preparation of this chart. (Source - Maine Soil and Water Conservation Commission with the assistance by the U.S.D.A. Soil Conservation Service)

TABLE F-4

Annual average infiltration vs hydrologic soil group

Slope	**Average infiltration**			
	Hydrologic soil group			
	A	**B**	**C**	**D**
0-8%	.036	.030	.024	.018
8-15%	.029	.024	.022	.016
16-25%	.023	.019	.019	.014
>25%	.016	.016	.016	.012

APPENDIX B

Steady State Nitrate Plum Calculaitons
Chute Road, Windham, ME

Lot #	Dist. To PL or Wetld (ft)	Width of Plume	K (ft/day)	n	(dh/dl)	I	Xsec A (ft^2)	p (ft/day)	GWF (ft^3/day)	Sa (ft^2)
1	170	190	4.50	0.15	0.025	0.10	1900.00	0.011	213.75	26318
2	240	100	4.50	0.15	0.030	0.10	1000	0.011	135	20803
3	190	90	4.50	0.15	0.070	0.10	900	0.011	284	9410
4	120	80	4.50	0.15	0.027	0.10	800	0.011	97	9645
5	80	70	4.50	0.15	0.088	0.10	700	0.011	277	4685
6	80	70	4.50	0.15	0.025	0.10	700	0.011	79	5600
7	85	60	4.50	0.15	0.060	0.10	600	0.011	162	5100
8	100	80	4.50	0.15	0.067	0.10	800	0.011	241	14032
9	120	100	4.50	0.15	0.036	0.10	1000	0.011	162	9505
10	110	80	4.50	0.15	0.064	0.10	800	0.011	230	10881
11	240	90	4.50	0.15	0.040	0.10	900	0.011	162	23532
12	70	80	4.50	0.15	0.022	0.10	800	0.011	79	9645
13	60	55	4.50	0.15	0.030	0.10	550	0.011	74	2575
14	90	70	4.50	0.15	0.030	0.10	700	0.011	95	6683
15	150	50	4.50	0.15	0.060	0.10	500	0.011	135	8464
16	130	70	4.50	0.15	0.044	0.10	700	0.011	139	10239
17	130	40	4.50	0.15	0.020	0.10	400	0.011	36	6891
18	110	70	4.50	0.15	0.047	0.10	700	0.011	148	7544
19	230	60	4.50	0.15	0.055	0.10	600	0.011	149	18240
20	220	80	4.50	0.15	0.067	0.10	400	0.011	121	15477
21	200	100	4.50	0.15	0.060	0.10	500	0.011	135	24744
22	280	90	4.50	0.15	0.100	0.10	450	0.011	203	12000
23	240	100	4.50	0.15	0.120	0.10	1000	0.011	540	11573
24	150	90	4.50	0.15	0.100	0.10	900	0.011	405	10687
25	130	60	4.50	0.15	0.076	0.10	600	0.011	205	8680
26	160	50	4.50	0.15	0.067	0.10	500	0.011	151	8137

Lot #	PF (ft^3/day)	N_1(mg/L)	L(mg/L)	N_2(mg/L)	SF (ft^3/day)	TF (ft^3/day)	SS (mg/L)	Wetland Discharge (Yes?)	SS (mg/L) 80% reduction
1	28.95	1.22	40	0.5	36.1	278.80	6.17		
2	22.88	1.22	40	0.5	36.1	193.98	8.35	y	1.67
3	10.35	1.22	40	0.5	36.1	329.95	5.44	y	1.09
4	10.61	1.22	40	0.5	36.1	143.91	10.89	y	2.18
5	5.15	1.22	40	0.5	36.1	318.45	5.60	y	1.12
6	6.16	1.22	40	0.5	36.1	121.01	12.75	y	2.55
7	5.61	1.22	40	0.5	36.1	203.71	8.07	y	1.61
8	15.44	1.22	40	0.5	36.1	292.74	5.96		
9	10.46	1.22	40	0.5	36.1	208.56	7.90	y	1.58
10	11.97	1.22	40	0.5	36.1	278.47	6.22	y	1.24
11	25.89	1.22	40	0.5	36.1	223.99	7.39		
12	10.61	1.22	40	0.5	36.1	125.91	12.28	y	2.46
13	2.83	1.22	40	0.5	36.1	113.18	13.57	y	2.71
14	7.35	1.22	40	0.5	36.1	137.95	11.33	y	2.27
15	9.31	1.22	40	0.5	36.1	180.41	8.94	y	1.79
16	11.26	1.22	40	0.5	36.1	185.96	8.70	y	1.74
17	7.58	1.22	40	0.5	36.1	79.68	18.72	y	3.74
18	8.30	1.22	40	0.5	36.1	192.45	8.46	y	1.69
19	20.06	1.22	40	0.5	36.1	204.66	7.99		
20	17.02	1.22	40	0.5	36.1	173.72	9.21	y	1.84
21	27.22	1.22	40	0.5	36.1	198.32	8.18	y	1.64
22	13.20	1.22	40	0.5	36.1	251.80	6.74	y	1.35
23	12.73	1.22	40	0.5	36.1	588.83	3.58		
24	11.76	1.22	40	0.5	36.1	452.86	4.29		
25	9.55	1.22	40	0.5	36.1	250.85	6.77		
26	8.95	1.22	40	0.5	36.1	195.80	8.34		

Appendix B - Well Recharge Calculations
DHS Infiltration Rates based on Soil Survey

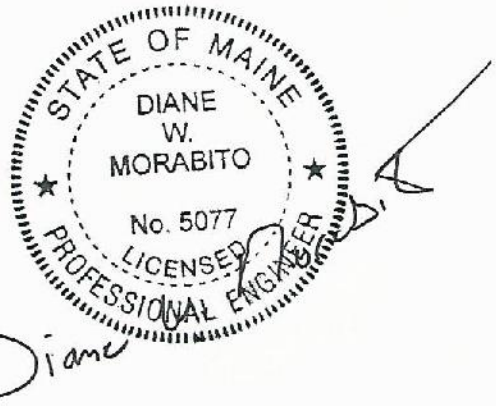
Lot	Area (ft2)	Soil Type	Avg Slope (%)	DHS Recharge Rate (Gallons/day *ft2)	Recharge per Lot (gal/day)	Recahrge per Lot (ft3/day)	Well Useage per Lot (ft3/day)
1	33652	C	3	0.024	808	108	36
2	33636	C	3	0.024	807	108	36
3	33636	D	4.5	0.018	605	81	36
4	37400	D	11.5	0.016	598	80	36
5	34000	D	3	0.018	612	82	36
6	40624	D	3	0.018	731	98	36
7	35503	C	5.5	0.024	852	114	36
8	31189	C	3.5	0.024	749	100	36
9	34306	C	3	0.024	823	110	36
10	31430	C	3.5	0.024	754	101	36
11	30115	D	3	0.018	542	72	36
12	39568	C	3.5	0.024	950	127	36
13	37496	C	3.5	0.024	900	120	36
14	45024	D	3.5	0.018	810	108	36
15	48104	C	4.5	0.024	1154	154	36
16	43771	D	4.5	0.018	788	105	36
17	44330	D	2	0.018	798	107	36
18	32387	C	5.5	0.024	777	104	36
19	31832	D	5.5	0.018	573	77	36
20	42516	A	3	0.036	1531	205	36
21	35474	A	3	0.036	1277	171	36
22	39347	A	3	0.036	1416	189	36
23	41614	C	11.5	0.022	916	122	36
24	34516	D	8.5	0.016	552	74	36
25	34516	D	3	0.018	621	83	36
26	34282	D	4.5	0.018	617	82	36
					Total Recharge (ft3/day)	**2883**	
					Total Usage (ft3/day)		**939**
					Useage as % of Available Racharge		**33%**

Traffic Impact Study
Durant Homestead Subdivision
Chute Road, Windham, Maine

May 9, 2018

Prepared for:

Acheron Engineering Services
147 Main Street
Newport, Maine 04953



Prepared by:

Maine Traffic Resources

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Introduction

The purpose of this study is to assess the traffic impacts of a proposed residential subdivision, Durant Homestead, on Chute Road in Windham, Maine. The proposed subdivision will consist of twenty-six (26) single-family house lots. The site location is shown on the map in Figure 1. Access to the subdivision will be provided by a single full-movement access road to Chute Road. Additionally, three of the lots (#24 – 26) will have direct access to Chute Road with dedicated drive locations, based upon the site plan prepared by Acheron Engineering Services and dated March 14, 2018. The subdivision is expected to be developed and occupied over a two year period. As such, 2020 was used as the analysis year for traffic analysis purposes.

Trip Generation

The number of trips to be generated by the proposed residential subdivision was estimated using the Institute of Transportation Engineers (ITE) "Trip Generation, 9th Edition" report. Land use codes (LUC) 210 – Single-Family Detached Housing was utilized on the basis of twenty-six (26) dwelling units. The results are summarized below:

	ITE Trip Generation (One-Way Trip-Ends)
Time Period	# of Trips
Weekday	248
AM Peak Hour	20
Entering	5
Exiting	15
PM Peak Hour	26
Entering	16
Exiting	10

As demonstrated above, the residential subdivision will generate 20 one-way trips during the weekday AM peak hour and 26 during the PM peak hour. Since peak hour trip generation will be well under 100 trips, a Traffic Movement Permit (TMP) should not be required from the Maine Department of Transportation (MaineDOT), assuming that this parcel was not part of a larger parcel recently subdivided and developed. Given that residential developments generate more entering traffic during the PM peak hour and more exiting traffic during the AM peak hour, both the weekday AM and PM peak hours were selected as analysis periods.

Traffic Volumes

Turning movement counts were conducted at the nearby intersection of Chute Road, River Road and Depot Street to determine existing traffic volumes and area patterns during the weekday AM and PM peak hour periods on April 9, 2018. The intersection of River Road/Depot Street was selected for the analysis since it is higher volume than the Chute Road intersection of Montgomery Road/Webb Road. The count records are included in the appendix of this report and are summarized below:

Chute Road Intersection Description	Peak Hour
River Road/Depot Street AM	7:00 – 8:00 AM
River Road/Depot Street PM	4:45 – 5:45 PM

The above counts were factored to 30th highest hour volumes using published MaineDOT group mean factors. The results are expected to be representative of peak summer volumes in late July or early August of 2018. The resulting 2018 volumes for both the summer AM and PM peak hours are shown in Figure 2.

To be conservative, to represent "worst case", all of the subdivision trips were assigned to and from the southwest to the higher volume River Road intersection, when in reality some trips will be destined to and from the northeast along Chute Road. The resulting trip assignments, based upon the recorded travel patterns at the River Road and Depot Street intersection, for the AM and PM peak hours are shown in Figure 3. All of the trips are assumed to be primary, or new trips, since they are residential in nature.

Based upon the trip assignments, the study area for capacity analysis purposes extends from the subdivision through the intersection of River Road. Given the resulting trip assignments, this level of new traffic is not expected to have any significant impact off-site on traffic operations beyond the site drive. Generally, a project will not have any measurable impact unless it generates in excess of 25 to 35 new lane hour trips. The proposed subdivision will generate a maximum of 16 new lane hour trips, assuming all traffic is to and from River Road.

Existing average annual daily traffic (AADT) data for the vicinity of the site was obtained from "Traffic Volume Counts, 2016, 2014 and 2009 Annual Reports", published by MaineDOT. This data is summarized below:

	Average Annual Daily Traffic			
Location	2007	2010	2013	2015
River Road, northwest of Mallison Falls Street	---	---	---	4,980
River Road, south of Route 202	7,570	6,160	6,420	---
River Road, south of Mallison Falls Street	10,250	8,500	8,940	7,230
Pope Road, southeast of Route 202	1,380	1,180	1,330	---
Pope Road, southwest of Route 302	---	---	1,430	---

As can be seen in the preceding table, traffic volumes in the vicinity have declined over both the longer term (2007 to 2015) and most recent short term (2013 to 2015) periods. To be conservative, a 1 % annual growth rate was used to project the existing 2018 volumes to base 2020 volumes.

Other development projects, which have been approved but not yet constructed or are pending approval, need to be considered in the traffic analysis. The Town of Windham Planner was contacted to determine if there were any other development projects that would impact traffic volumes in the vicinity of the site. One 22-lot subdivision was identified off Swett Road. This subdivision would be expected to generate 17 AM peak hour trips (4 entering and 13 exiting) and 22 PM peak hour trips (14 entering and 8 exiting). It was assumed that 75 % of the Swett Road subdivision's traffic would use the Chute Road and River Road intersection for access. The resulting 2020 no-build volumes, assuming 2 % annual growth and allowing for the Swett Road subdivision to be fully occupied are shown in are shown in Figure 4. The resulting 2020 projected build volumes with the subdivision fully occupied are shown in Figure 5.

Traffic Analysis

Traffic operations are evaluated in terms of level of service (LOS). Level of service is a qualitative measure that describes operations by letter designation. The levels range from A - very little delay to F - extreme delays. Level of service "D" is generally considered acceptable in urban locations while LOS "E" is generally considered the capacity of a facility and the minimum tolerable level. The level of service for unsignalized intersections is based upon average control delay per vehicle for each minor, opposed movement, as defined in the following table excerpted from the 2010 "Highway Capacity Manual":

Unsignalized Intersection Level of Service

LOS	Delay Range
A	< = 10.0 seconds
B	> 10.0 and <= 15.0
C	> 15.0 and <= 25.0
D	> 25.0 and <= 35.0
E	> 35.0 and <= 50.0
F	> 50.0

Unsignalized Intersection Analysis

The level of service was calculated for the unsignalized Chute Road, River Road and Depot Street study intersections using Synchro 9. The results for existing 2018 and projected 2020 conditions for the AM and PM peak hours are included in the appendix and shown below with the level of service followed by the delay, in seconds:

River Road, Depot Street and Chute Road
AM Peak Hour Level of Service

Approach/Movement	2018 Existing	2020 No-Build	2020 Build
Chute Road	C (20.0)	C (21.8)	C (23.8)
Depot Street	C (16.3)	C (16.9)	C (17.3)
Left Turns onto Chute Road	A (0.1)	A (0.1)	A (0.1)
Left Turns onto Depot Street	A (0.1)	A (0.1)	A (0.1)

PM Peak Hour Level of Service

Approach/Movement	2018 Existing	2021 No-Build	2021 Build
Chute Road	C (19.3)	C (20.4)	C (21.7)
Depot Street	C (19.0)	C (20.3)	C (21.7)
Left Turns onto Chute Road	A (0.1)	A (0.1)	A (0.1)
Left Turns onto Depot Street	A (0.3)	A (0.3)	A (0.3)

As seen above, the Chute Road and Depot Street approaches to River Road currently operate at a good LOS “C” during both the AM and PM peak hours. The LOS will remain at “C” during both peak hours in 2020 with the proposed subdivision fully occupied. The increase in delay for Chute Road from no build to build conditions associated with the subdivision is minimal at 2.0 seconds during the AM peak hour and 1.3 seconds during the PM peak hour showing that the subdivision will have minimal impact on offsite traffic operations, as would be expected given the limited number of new generated by the subdivision and the limited number of new trips to Chute Road.

Auxiliary Turn Lane Analysis

Left-turn warrant analysis was performed for the unsignalized intersection of River Road and Chute Road for both the AM and PM peak hours to determine if a formal left turn lane would be required on River Road to serve traffic turning left onto Chute Road. The left-turn warrant was performed according to the procedures in the MaineDOT "Highway Design Guide" for 40 mph roadways since River Road is posted at 40 mph. The warrant chart is shown in Figure 6. The results show that a left-turn lane is not warranted (and not even close to being warranted) on River Road to serve traffic turning left onto Chute Road during either peak hour period.

Safety Analysis

Accident Review

The Maine Department of Transportation uses two criteria to determine high crash locations (HCLs). The first is the critical rate factor (CRF), which is a measure of the accident rate. A CRF greater than one indicates a location which has a higher than expected accident rate. The expected rate is calculated as a statewide average of similar facilities.

The second criterion, which must also be met, is based upon the number of accidents that occur at a particular location. Eight or more accidents must also occur over the three-year study period for the location to be considered a high crash location. Accident data for the vicinity of the site was obtained from MaineDOT and is included in the appendix. The CRF and number of accidents are summarized by location for the most recent three-year period, 2014 to 2016, as follows:

Chute Road Location Description	# of Acc.	CRF
Intersection of Swett Road	1	1.32
Between Swett Road and Herman Cobb Road	2	0.45
Intersection of Herman Cobb Road	1	1.12
Between Herman Cobb Road and Montgomery Road/Webb Road	1	0.25
Between Montgomery Road/Webb Road and River Road/Depot Street	2	0.39
Intersection of River Road and Depot Street	5	1.66

As seen above, there are no high crash locations within the vicinity of the proposed residential subdivision. While the intersection of Chute Road, River Road and Depot Street is not currently a high crash location it must have been in the past since there is a flashing beacon located at this intersection. The beacon appears to have reduced the crash potential at the intersection. As a result, no additional accident review or evaluation is necessary.

Driveway Sight Distance

One of the most important safety factors to consider for a project is sight distance from the access drives. This sight distance is measured ten feet back from the edge of travel way at a driver's eye height of 3.5 feet to an object height of 4.25 feet. Maine Traffic Resources recommends a minimum sight distance of 400' feet for the posted 40 mile per hour speed limit on Chute Road. The Windham Subdivision Ordinance requires the same 400' of sight distance.

Sight distance from the subdivision access drive and from the three proposed lots with direct access to Chute Road (# 24 – 26) were measured in the field by Plisga & Day surveyors. They reported the following sight distances:

Drive Description	To Left	To Right
Main Subdivision Access Road	500'+	355*
Lot # 24	500'+	480'
Lot # 25	500'+	500'+
Lot # 26	500'+	500'+

* Can be increased to over 400' with clearing along property frontage in front of lot #1.

The above sight distances were also field checked by Maine Traffic Resources and found to be correct. Sight distance from the main access road to the right can be increased to over 450' with some simple clearing along the sight frontage in front of lot # 1. It will be important to maintain this clearing in the future to preserve the sight line from the main access road. Additionally, it is important that no landscaping or signage be located within the sight triangle along the property frontages which could obscure the driveway sight distances in the future.

SUMMARY

To summarize, the proposed Durant Homestead residential subdivision is expected to generate just 20 one-way trips during the weekday AM peak hour and 26 during the PM peak hour. Since peak hour trip generation will be well under 100 trips, a Traffic Movement Permit (TMP) should not be required from the Maine Department of Transportation (MaineDOT). Given that residential developments generate more entering traffic during the PM peak hour and more exiting traffic during the AM peak hour, both the weekday AM and PM peak hours were selected as analysis periods.

During both analysis periods, the unsignalized Chute Road and Depot Street approaches to River Road currently operate at LOS "C". Operations will remain at this level under 2020 build volumes showing no capacity concerns. These results demonstrate there is plenty of capacity in the existing roadway system for efficient travel.

A left turn lane warrant analysis was performed to see if a formal left-turn lane is warranted on River Road to serve traffic turning left onto Chute Road. The analysis showed that a left turn lane is not warranted on River Road during either the AM or PM peak hours.

In terms of safety, there are no high crash locations within the vicinity of the proposed residential subdivision. Sight distance from the three proposed lots on Chute Road is more than adequate to meet recommended standards. Sight distance from the main subdivision access drive will be more than adequate with some clearing along the property frontage in front of lot # 1. This clearing will need to be maintained to preserve the sight line. No landscaping or signage should be located within the sight triangle along the property frontage which could obscure the driveway sight distances in the future.

Lastly, since no capacity or safety concerns were identified by the study there are no recommendations for any improvements needed to accommodate the proposed 26-lot Durant Homestead subdivision.

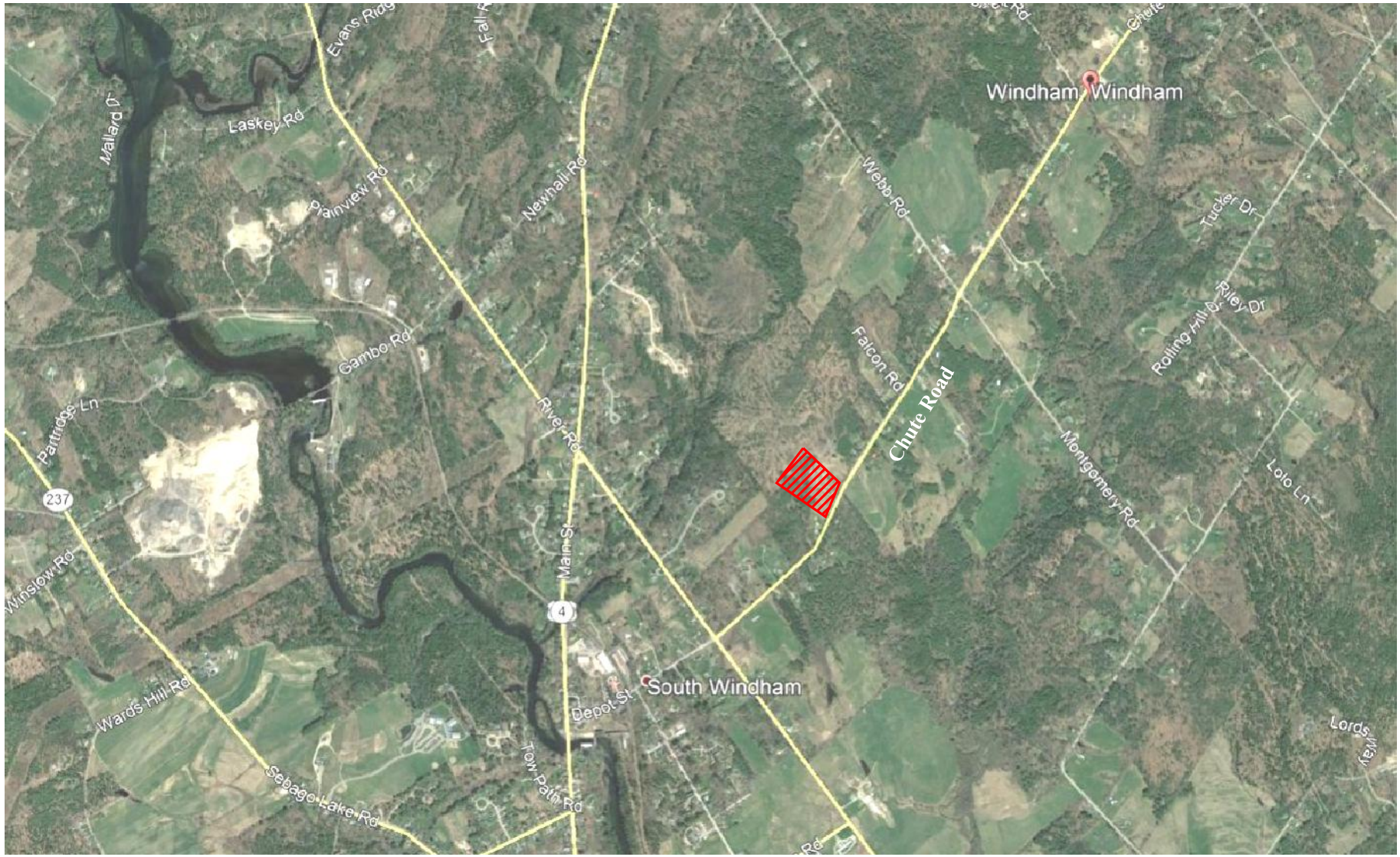
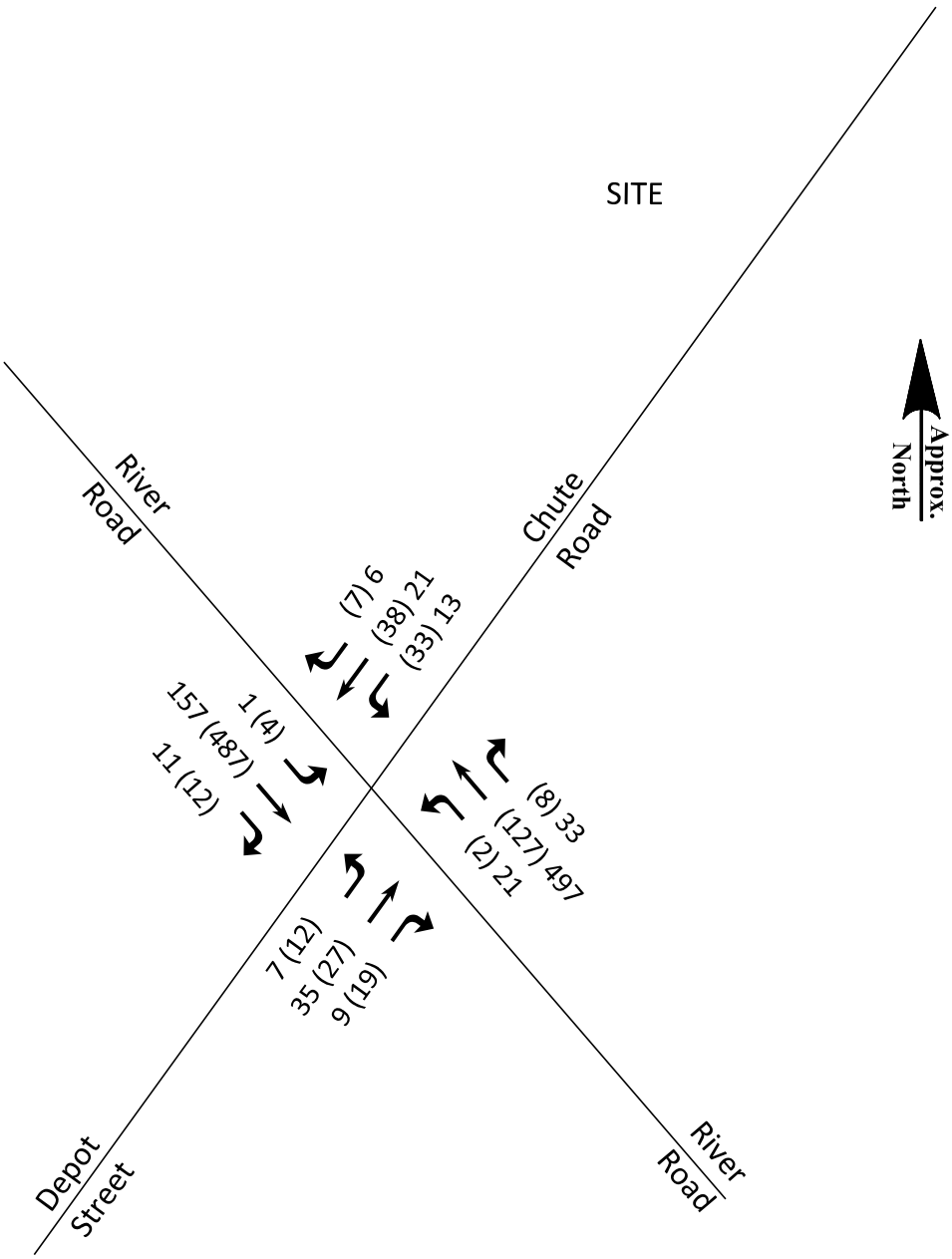


Figure 1
Site Location Map
Durant Homestead Subdivision - Windham, ME

Maine Traffic Resources
25 Vine Street
Gardiner, ME
04345
tel: (207) 582-5252
fax: (207) 582-1677



(--) AM Peak Hour

-- PM Peak Hour

Figure 2

Existing 2018 PM Volumes

Durant Homestead Subdivision - Windham, ME

Maine Traffic Resources
25 Vine Street
Gardiner, ME
04345
tel: (207) 582-5252
fax: (207) 582-1677

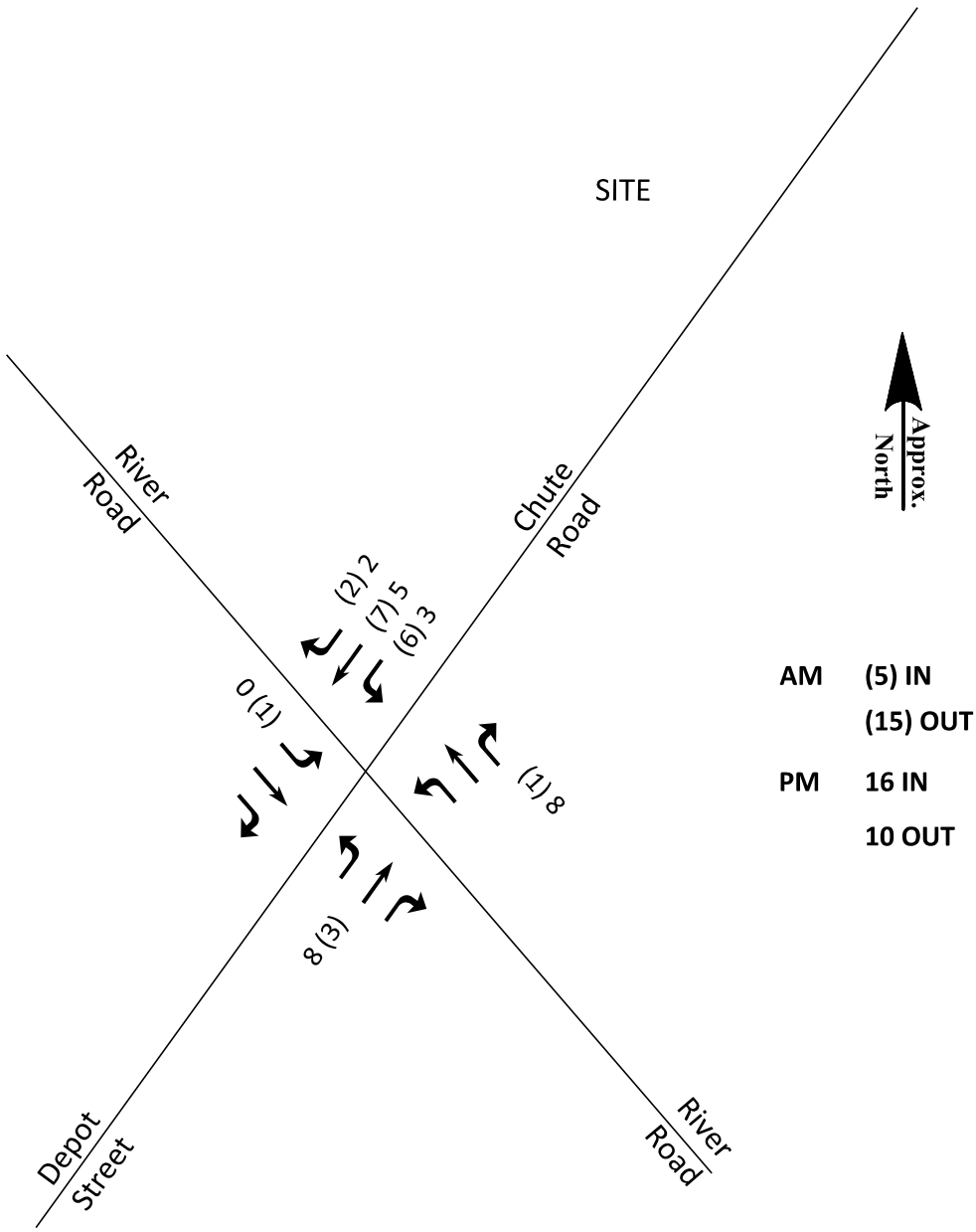
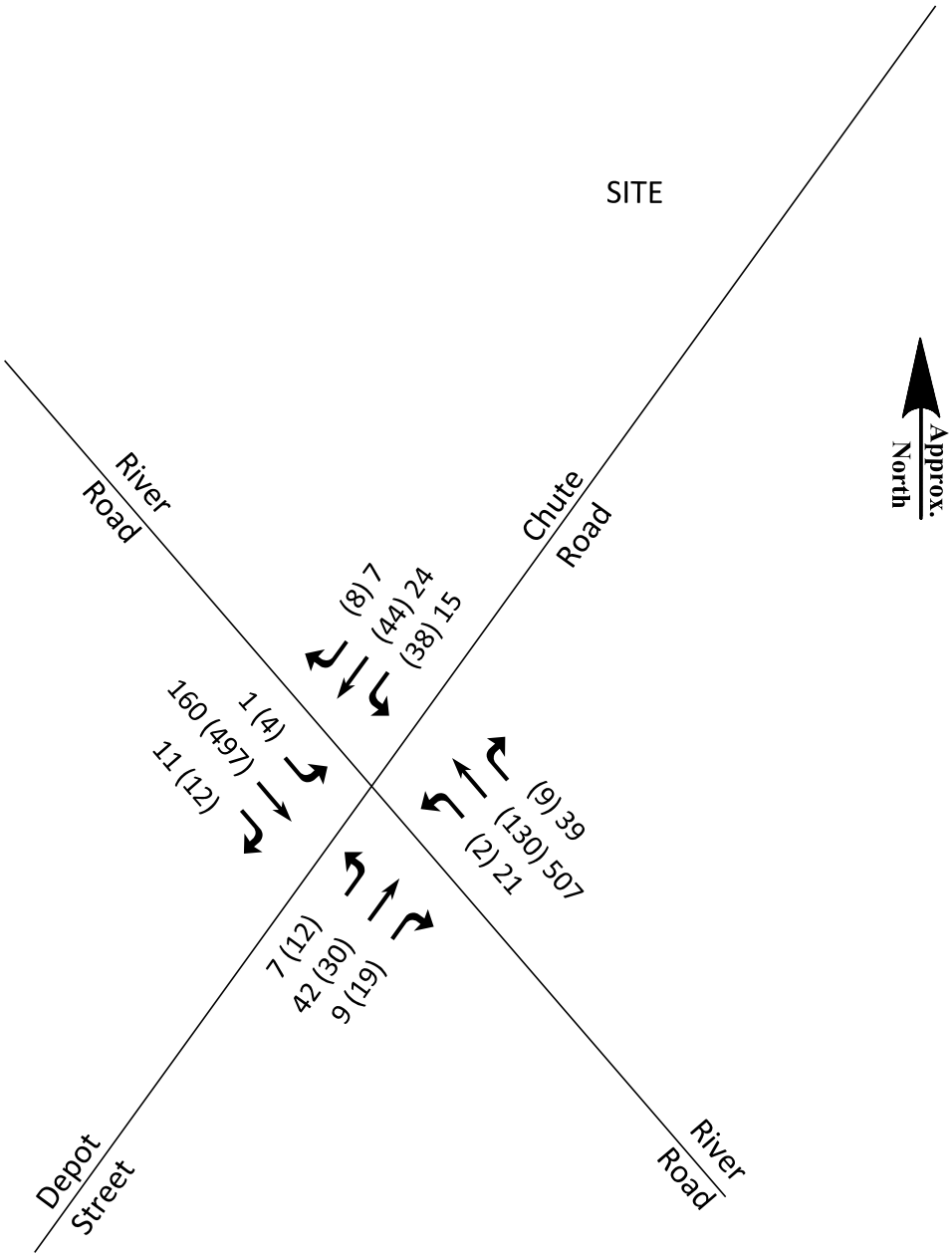


Figure 3

Trip Assignments

Durant Homestead Subdivision - Windham, ME

Maine Traffic Resources
25 Vine Street
Gardiner, ME
04345
tel: (207) 582-5252
fax: (207) 582-1677



(--) AM Peak Hour

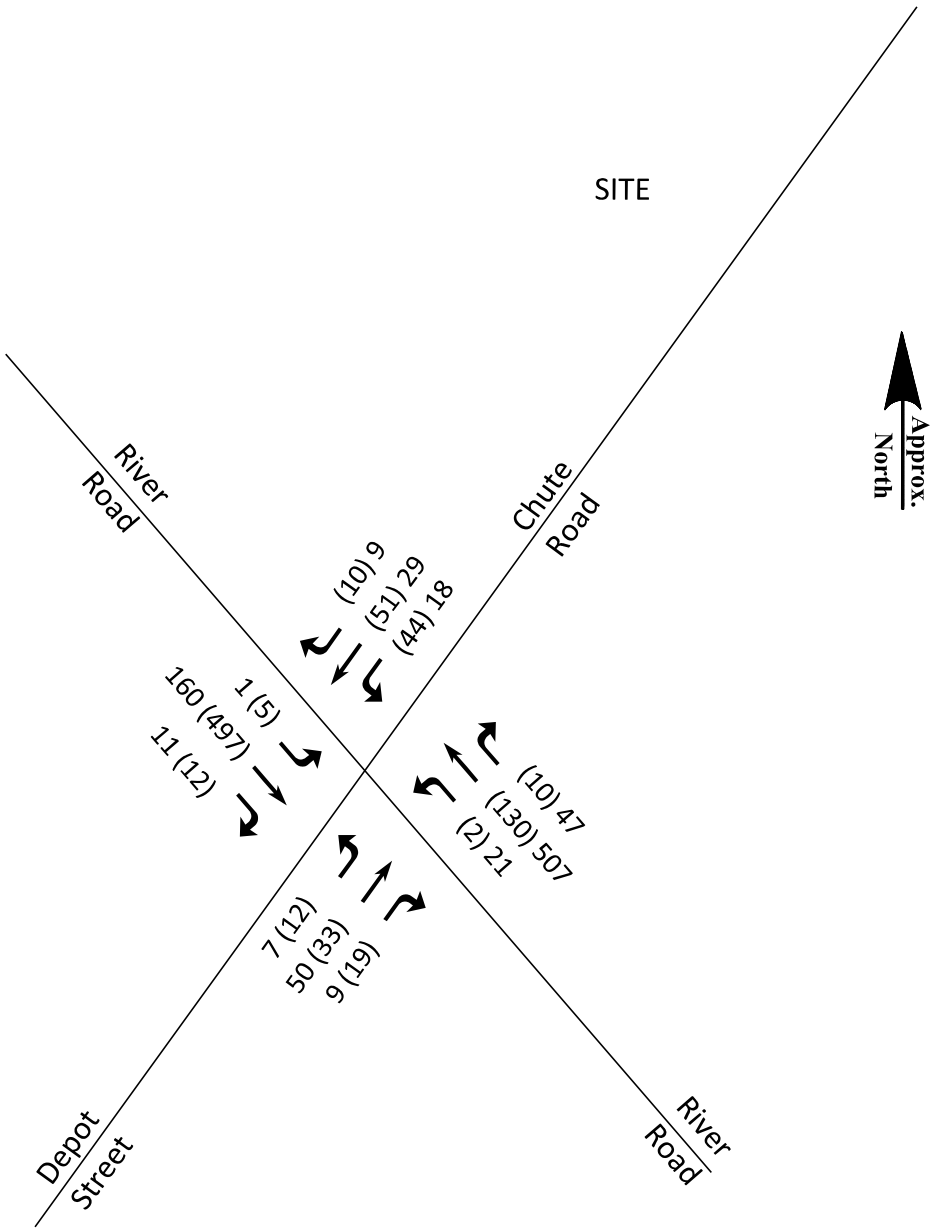
-- PM Peak Hour

Figure 4

2020 No Build Volumes

Durant Homestead Subdivision - Windham, ME

Maine Traffic Resources
25 Vine Street
Gardiner, ME
04345
tel: (207) 582-5252
fax: (207) 582-1677



(--) AM Peak Hour

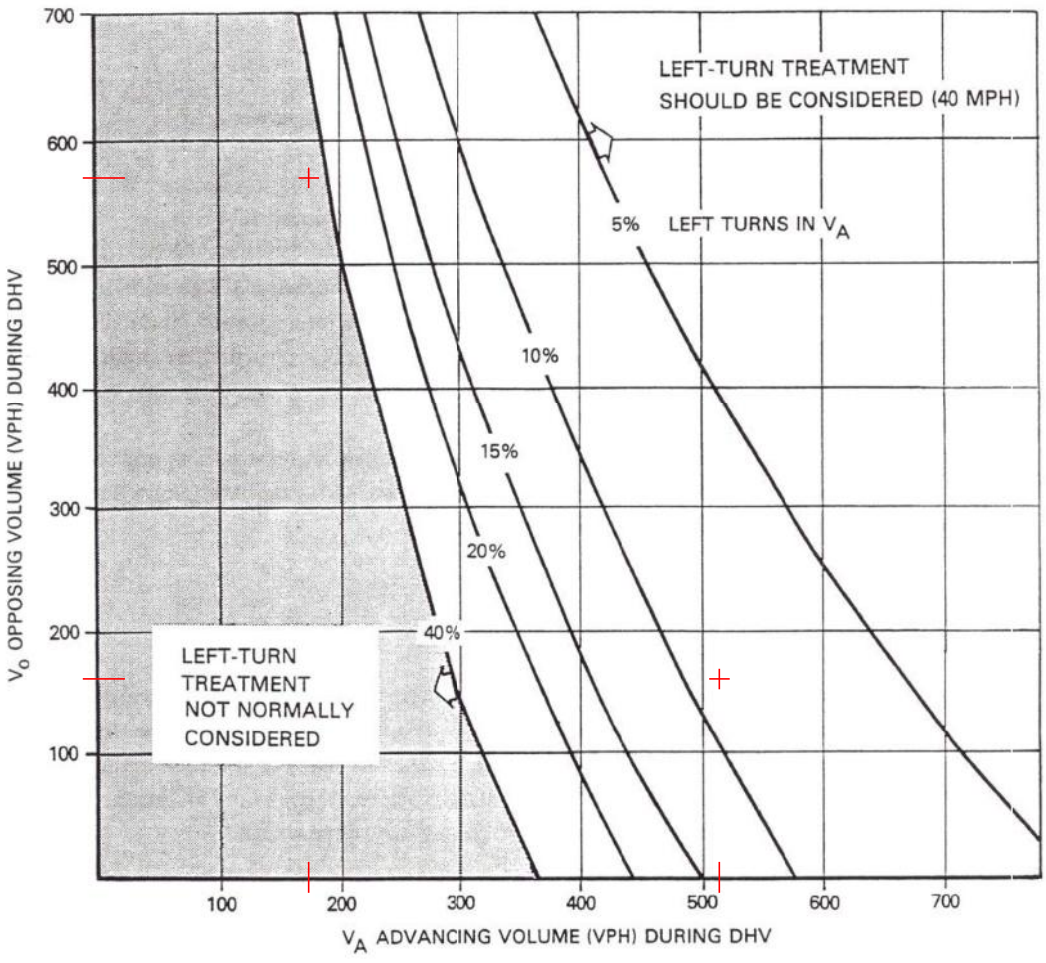
-- PM Peak Hour

Figure 5

2020 Build Volumes

Durant Homestead Subdivision - Windham, ME

Maine Traffic Resources
25 Vine Street
Gardiner, ME
04345
tel: (207) 582-5252
fax: (207) 582-1677



Instructions:

1. The family of curves represent the percent of left turns in the advancing volume (V_A). The designer should locate the curve for the actual percentage of left turns. When this is not an even increment of 5, the designer should estimate where the curve lies.

4. Read V_A and V_O into the chart and locate the intersection of the two volumes.

5. Note the location of the point in #2 relative to the line in #1. If the point is to the right of the line, then a left-turn lane is warranted. If the point is to the left of the line, then a left-turn lane is not warranted based on traffic volumes.

VOLUME WARRANTS FOR LEFT-TURN LANES AT UNSIGNALIZED INTERSECTIONS ON 2-LANE HIGHWAYS (40 mph)

Figure 8-19

PM-
ADV 175
OPD 572
%L = 1/172 = <1.0 %

WARRANTED AT 40% - NO

AM-
ADV 514
OPD 161
%L = = 5/514 = 1%

WARRANTED AT 9% - NO

Figure 6

Durant Homestead Subdivision - Windham, ME

Maine Traffic Resources
25 Vine Street
Gardiner, ME
04345
tel: (207) 582-5252
fax: (207) 582-1677

APPENDIX

Turning Movement Counts

Unsignalized Capacity Analysis

Maine Traffic Resources

25 Vine Street
Gardiner, Maine 04345
www.mainetrafficresources.com

Name: River, Chute & Depot
Town: Windham
Counter: JAM
Weather: Cloudy

File Name : windhamRiverChuteAM
Site Code : 12341113
Start Date : 4/9/2018
Page No : 1

Groups Printed- Passenger Vehicles - Light Trucks - Heavy Trucks

	Chute Road From North					River Road From East					Depot St From South					River Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	1	7	4	0	12	0	34	0	0	34	5	7	3	0	15	3	124	0	0	127	188
07:15 AM	1	7	8	0	16	2	23	1	0	26	6	5	2	0	13	3	120	1	0	124	179
07:30 AM	2	13	11	0	26	2	26	1	0	29	4	5	1	0	10	2	104	2	0	108	173
07:45 AM	2	8	7	0	17	3	33	0	0	36	2	8	5	0	15	3	98	1	0	102	170
Total	6	35	30	0	71	7	116	2	0	125	17	25	11	0	53	11	446	4	0	461	710
08:00 AM	1	11	4	0	16	2	21	3	0	26	5	4	0	0	9	2	64	1	0	67	118
08:15 AM	1	8	6	0	15	1	35	3	0	39	2	7	3	0	12	3	78	0	0	81	147
08:30 AM	2	4	4	0	10	3	21	0	0	24	4	3	4	0	11	1	69	0	0	70	115
08:45 AM	0	4	4	0	8	4	31	2	0	37	2	3	2	0	7	4	49	0	0	53	105
Total	4	27	18	0	49	10	108	8	0	126	13	17	9	0	39	10	260	1	0	271	485
Grand Total	10	62	48	0	120	17	224	10	0	251	30	42	20	0	92	21	706	5	0	732	1195
Apprch %	8.3	51.7	40	0		6.8	89.2	4	0		32.6	45.7	21.7	0		2.9	96.4	0.7	0		
Total %	0.8	5.2	4	0	10	1.4	18.7	0.8	0	21	2.5	3.5	1.7	0	7.7	1.8	59.1	0.4	0	61.3	
Passenger Vehicles	10	62	47	0	119	15	211	9	0	235	30	42	20	0	92	20	694	5	0	719	1165
% Passenger Vehicles	100	100	97.9	0	99.2	88.2	94.2	90	0	93.6	100	100	100	0	100	95.2	98.3	100	0	98.2	97.5
Light Trucks	0	0	1	0	1	2	12	1	0	15	0	0	0	0	0	1	11	0	0	12	28
% Light Trucks	0	0	2.1	0	0.8	11.8	5.4	10	0	6	0	0	0	0	0	4.8	1.6	0	0	1.6	2.3
Heavy Trucks	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
% Heavy Trucks	0	0	0	0	0	0	0.4	0	0	0.4	0	0	0	0	0	0	0.1	0	0	0.1	0.2

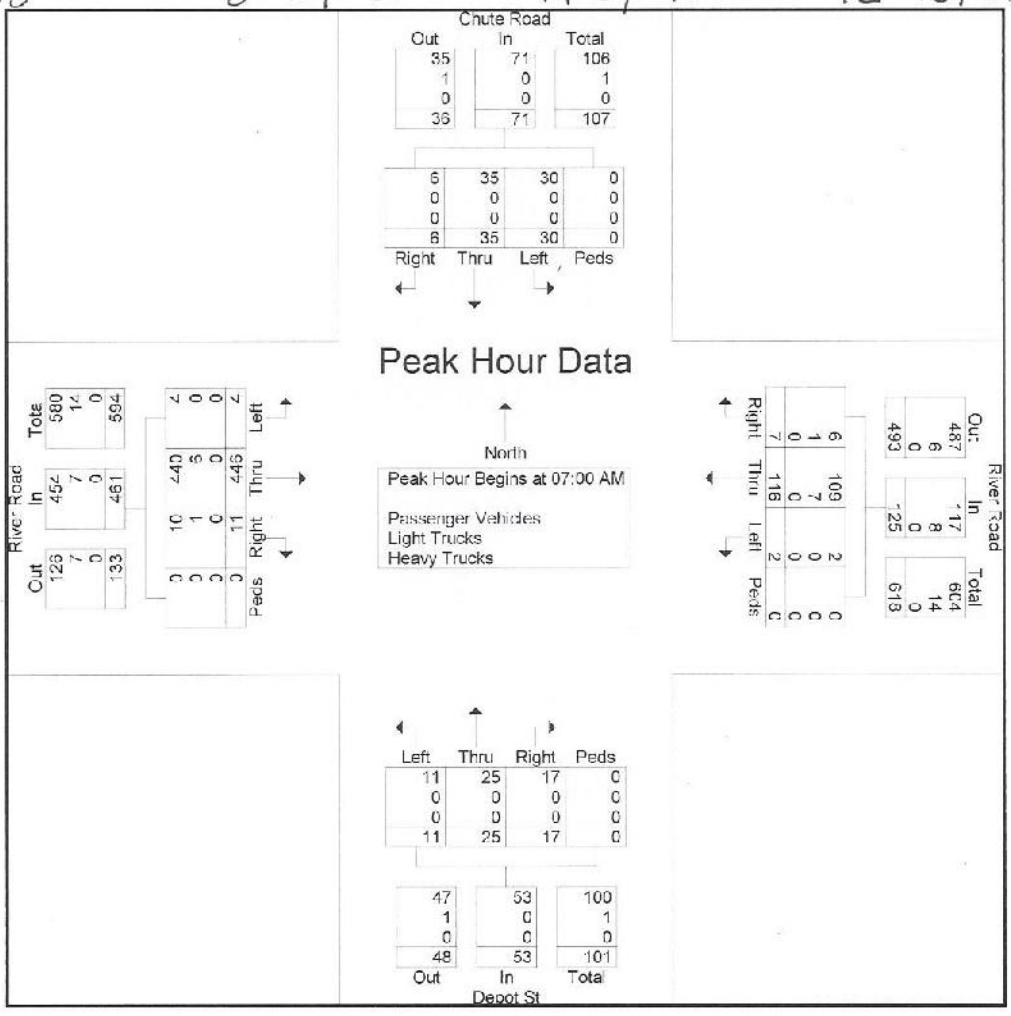
Maine Traffic Resources

25 Vine Street
Gardiner, Maine 04345
www.mainetrafficresources.com

File Name : windhamRiverChuteAM
Site Code : 12341113
Start Date : 4/9/2018
Page No : 2

	Chute Road From North					River Road From East					Depot St From South					River Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	1	7	4	0	12	0	**34**	0	0	34	5	7	3	0	**15**	3	**124**	0	0	**127**	**188**
07:15 AM	1	7	8	0	16	2	23	1	0	26	**6**	5	2	0	13	3	120	1	0	124	179
07:30 AM	**2**	**13**	11	0	**26**	2	26	1	0	29	4	5	1	0	10	2	104	**2**	0	108	173
07:45 AM	2	8	7	0	17	3	33	0	0	**36**	2	**8**	**5**	0	15	3	98	1	0	102	170
Total Volume	6	35	30	0	71	7	116	2	0	125	17	25	11	0	53	11	446	4	0	461	710
% App. Total	8.5	49.3	42.3	0		5.6	92.8	1.6	0		32.1	47.2	20.8	0		2.4	96.7	0.9	0		
PHF	.750	.673	.682	.000	.683	.583	.853	.500	.000	.868	.708	.781	.550	.000	.883	.917	.899	.500	.000	.907	.944
Passenger Vehicles	6	35	30	0	71	6	109	2	0	117	17	25	11	0	53	10	440	4	0	454	695
% Passenger Vehicles	100	100	100	0	100	85.7	94.0	100	0	93.6	100	100	100	0	100	90.9	98.7	100	0	98.5	97.9
Light Trucks	0	0	0	0	0	1	7	0	0	8	0	0	0	0	0	1	6	0	0	7	15
% Light Trucks	0	0	0	0	0	14.3	6.0	0	0	6.4	0	0	0	0	0	9.1	1.3	0	0	1.5	2.1
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7	35	33			8	127	2			19	27	12			12	487	4			

Gr. I
= 0.94/.86
= 1.093



Maine Traffic Resources

25 Vine Street
Gardiner, Maine 04345
www.mainetrafficresources.com

Title: River Road, Chute Rd & Depot St
Town: Windham, ME
Counter: JAM
Weather: Sun/clouds

File Name : Not Named 5
Site Code : 12341114
Start Date : 4/9/2018
Page No : 1

Groups Printed- Passenger Vehicles - Light Trucks - Heavy Trucks

	Chute Road From North					River Road From East					Depot Street From South					River Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
04:00 PM	1	7	2	0	10	10	97	9	0	116	1	9	1	0	11	2	37	1	0	40	177
04:15 PM	1	9	2	0	12	4	101	5	0	110	5	14	2	0	21	1	28	2	0	31	174
04:30 PM	2	9	3	0	14	5	98	6	0	109	4	13	2	0	19	2	47	1	0	50	192
04:45 PM	2	5	1	0	8	9	106	3	0	118	2	8	3	0	13	5	38	0	0	43	182
Total	6	30	8	0	44	28	402	23	0	453	12	44	8	0	64	10	150	4	0	164	725
05:00 PM	1	6	3	0	10	7	115	5	0	127	2	5	0	0	7	4	43	0	0	47	191
05:15 PM	1	3	6	0	10	4	107	7	0	118	1	8	0	0	9	0	36	1	0	37	174
05:30 PM	1	5	2	0	8	10	127	4	0	141	3	11	3	0	17	1	27	0	0	28	194
05:45 PM	0	7	1	0	8	7	97	4	0	108	3	7	2	0	12	1	43	1	0	45	173
Total	3	21	12	0	36	28	446	20	0	494	9	31	5	0	45	6	149	2	0	157	732
Grand Total	9	51	20	0	80	56	848	43	0	947	21	75	13	0	109	16	299	6	0	321	1457
Apprch %	11.2	63.8	25	0		5.9	89.5	4.5	0		19.3	68.8	11.9	0		5	93.1	1.9	0		
Total %	0.6	3.5	1.4	0	5.5	3.8	58.2	3	0	65	1.4	5.1	0.9	0	7.5	1.1	20.5	0.4	0	22	
Passenger Vehicles	9	51	20	0	80	56	842	43	0	941	21	75	12	0	108	16	297	6	0	319	1448
% Passenger Vehicles	100	100	100	0	100	100	99.3	100	0	99.4	100	100	92.3	0	99.1	100	99.3	100	0	99.4	99.4
Light Trucks	0	0	0	0	0	0	6	0	0	6	0	0	1	0	1	0	1	0	0	1	8
% Light Trucks	0	0	0	0	0	0	0.7	0	0	0.6	0	0	7.7	0	0.9	0	0.3	0	0	0.3	0.5
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
% Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0	0	0.3	0.1

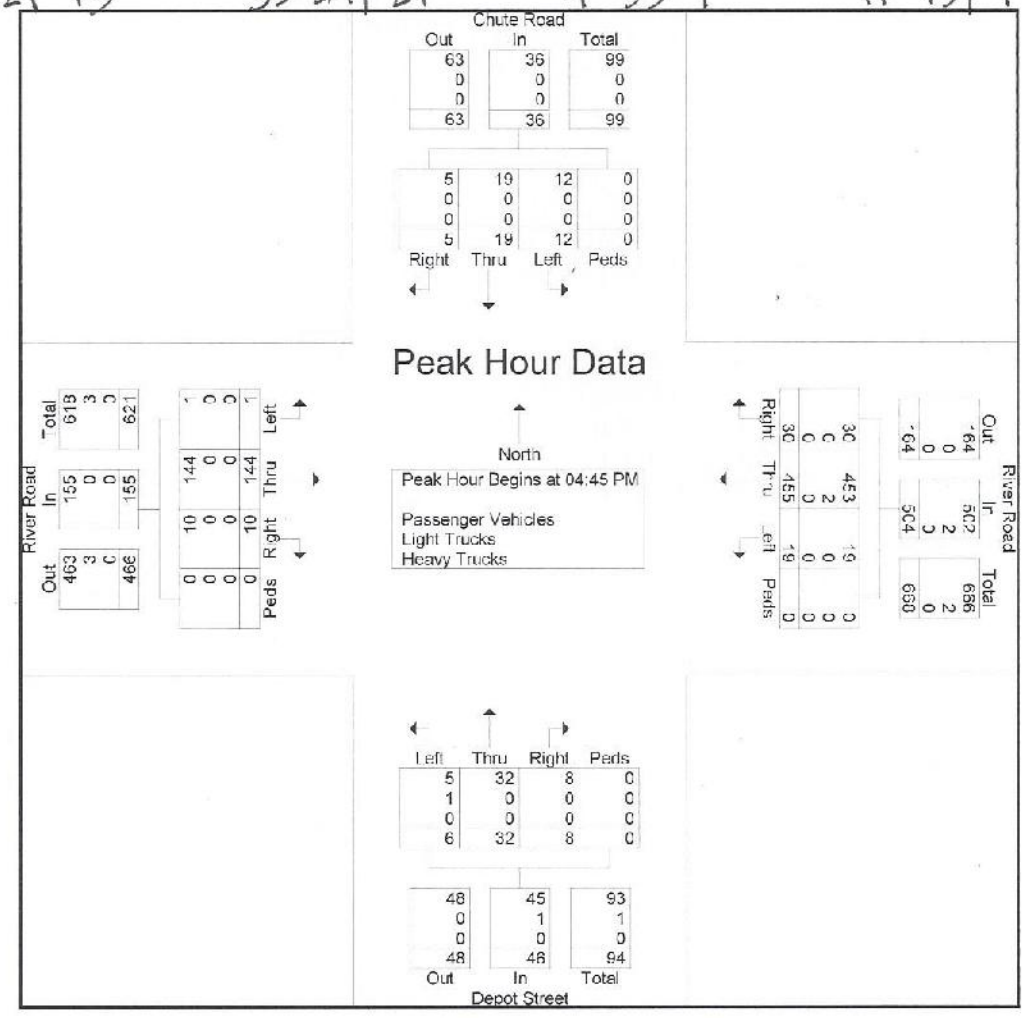
Maine Traffic Resources

25 Vine Street
Gardiner, Maine 04345
www.mainetrafficresources.com

File Name : Not Named 5
Site Code : 12341114
Start Date : 4/9/2018
Page No : 2

	Chute Road From North					River Road From East					Depot Street From South					River Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	2	5	1	0	8	9	106	3	0	118	2	8	**3**	0	13	**5**	38	0	0	43	182
05:00 PM	1	**6**	3	0	**10**	7	115	5	0	127	2	5	0	0	7	4	**43**	0	0	**47**	191
05:15 PM	1	3	**6**	0	10	4	107	**7**	0	118	1	8	0	0	9	0	36	1	0	37	174
05:30 PM	1	5	2	0	8	**10**	**127**	4	0	**141**	**3**	**11**	3	0	**17**	1	27	0	0	28	**194**
Total Volume	5	19	12	0	36	30	455	19	0	504	8	32	6	0	46	10	144	1	0	155	741
% App. Total	13.9	52.8	33.3	0		6	90.3	3.8	0		17.4	69.6	13	0		6.5	92.9	0.6	0		
PHF	.625	.792	.500	.000	.900	.750	.896	.679	.000	.894	.667	.727	.500	.000	.676	.500	.837	.250	.000	.824	.955
Passenger Vehicles	5	19	12	0	36	30	453	19	0	502	8	32	5	0	45	10	144	1	0	155	738
% Passenger Vehicles	100	100	100	0	100	100	99.6	100	0	99.6	100	100	83.3	0	97.8	100	100	100	0	100	99.6
Light Trucks	0	0	0	0	0	0	2	0	0	2	0	0	1	0	1	0	0	0	0	0	3
% Light Trucks	0	0	0	0	0	0	0.4	0	0	0.4	0	0	16.7	0	2.2	0	0	0	0	0	0.4
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

6 21 13 33 497 21 9 35 7 11 157 1



GR.I
0.94/.86
= 1.093

Intersection												
Int Delay, s/veh	3.8											
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	4	487	12	2	127	8	12	27	19	33	38	7
Future Vol, veh/h	4	487	12	2	127	8	12	27	19	33	38	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	87	87	87	88	88	88	70	70	70
Heavy Vehicles, %	2	2	2	2	2	2	0	0	0	0	0	0
Mvmt Flow	4	535	13	2	146	9	14	31	22	47	54	10

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	155	0	0	548	0	0	738	711	542	732	712	151
Stage 1	-	-	-	-	-	-	551	551	-	155	155	-
Stage 2	-	-	-	-	-	-	187	160	-	577	557	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1425	-	-	1021	-	-	336	361	544	339	360	901
Stage 1	-	-	-	-	-	-	522	519	-	852	773	-
Stage 2	-	-	-	-	-	-	819	769	-	506	515	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1425	-	-	1021	-	-	292	359	544	303	358	901
Mov Cap-2 Maneuver	-	-	-	-	-	-	292	359	-	303	358	-
Stage 1	-	-	-	-	-	-	520	517	-	849	771	-
Stage 2	-	-	-	-	-	-	751	767	-	455	513	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	0.1	0.1	16.3	20
HCM LOS			C	C

Minor Lane/Major Mvmt	NELn1	NWL	NWT	NWR	SEL	SET	SERSWLn1
Capacity (veh/h)	384	1021	-	-	1425	-	- 350
HCM Lane V/C Ratio	0.172	0.002	-	-	0.003	-	- 0.318
HCM Control Delay (s)	16.3	8.5	0	-	7.5	0	- 20
HCM Lane LOS	C	A	A	-	A	A	- C
HCM 95th %tile Q(veh)	0.6	0	-	-	0	-	- 1.3

Intersection												
Int Delay, s/veh	4.4											
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	4	497	12	2	130	9	12	30	19	38	44	8
Future Vol, veh/h	4	497	12	2	130	9	12	30	19	38	44	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	87	87	87	88	88	88	70	70	70
Heavy Vehicles, %	2	2	2	2	2	2	0	0	0	0	0	0
Mvmt Flow	4	546	13	2	149	10	14	34	22	54	63	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	160	0	0	559	0	0	758	726	553	748	727	155
Stage 1	-	-	-	-	-	-	562	562	-	159	159	-
Stage 2	-	-	-	-	-	-	196	164	-	589	568	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1419	-	-	1012	-	-	326	354	537	331	353	896
Stage 1	-	-	-	-	-	-	515	513	-	848	770	-
Stage 2	-	-	-	-	-	-	810	766	-	498	510	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1419	-	-	1012	-	-	276	352	537	293	351	896
Mov Cap-2 Maneuver	-	-	-	-	-	-	276	352	-	293	351	-
Stage 1	-	-	-	-	-	-	513	511	-	845	768	-
Stage 2	-	-	-	-	-	-	733	764	-	444	508	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	0.1	0.1	16.9	21.8
HCM LOS			C	C

Minor Lane/Major Mvmt	NELn1	NWL	NWT	NWR	SEL	SET	SERSWLn1
Capacity (veh/h)	372	1012	-	-	1419	-	- 341
HCM Lane V/C Ratio	0.186	0.002	-	-	0.003	-	- 0.377
HCM Control Delay (s)	16.9	8.6	0	-	7.5	0	- 21.8
HCM Lane LOS	C	A	A	-	A	A	- C
HCM 95th %tile Q(veh)	0.7	0	-	-	0	-	- 1.7

Intersection												
Int Delay, s/veh	5.2											
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	5	497	12	2	130	10	12	33	19	44	51	10
Future Vol, veh/h	5	497	12	2	130	10	12	33	19	44	51	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	87	87	87	88	88	88	70	70	70
Heavy Vehicles, %	2	2	2	2	2	2	0	0	0	0	0	0
Mvmt Flow	5	546	13	2	149	11	14	38	22	63	73	14

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	161	0	0	559	0	0	767	730	553	753	730	155
Stage 1	-	-	-	-	-	-	564	564	-	160	160	-
Stage 2	-	-	-	-	-	-	203	166	-	593	570	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1418	-	-	1012	-	-	322	352	537	329	352	896
Stage 1	-	-	-	-	-	-	514	512	-	847	769	-
Stage 2	-	-	-	-	-	-	804	765	-	496	509	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1418	-	-	1012	-	-	265	350	537	288	350	896
Mov Cap-2 Maneuver	-	-	-	-	-	-	265	350	-	288	350	-
Stage 1	-	-	-	-	-	-	511	509	-	843	767	-
Stage 2	-	-	-	-	-	-	715	763	-	439	506	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	0.1	0.1	17.3	23.8
HCM LOS			C	C

Minor Lane/Major Mvmt	NELn1	NWL	NWT	NWR	SEL	SET	SERSWLn1
Capacity (veh/h)	366	1012	-	-	1418	-	- 339
HCM Lane V/C Ratio	0.199	0.002	-	-	0.004	-	- 0.442
HCM Control Delay (s)	17.3	8.6	0	-	7.5	0	- 23.8
HCM Lane LOS	C	A	A	-	A	A	- C
HCM 95th %tile Q(veh)	0.7	0	-	-	0	-	- 2.2

Intersection	
Int Delay, s/veh	2.6

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	157	11	21	497	33	7	35	9	13	21	6
Future Vol, veh/h	1	157	11	21	497	33	7	35	9	13	21	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	90	90	90	70	70	70	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	0	0	0	0	0	0
Mvmt Flow	1	189	13	23	552	37	10	50	13	14	23	7

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	589	0	0	202	0	0	830	834	196	847	822	571
Stage 1	-	-	-	-	-	-	198	198	-	617	617	-
Stage 2	-	-	-	-	-	-	632	636	-	230	205	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	986	-	-	1370	-	-	292	306	850	284	311	524
Stage 1	-	-	-	-	-	-	808	741	-	481	484	-
Stage 2	-	-	-	-	-	-	472	475	-	777	736	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	986	-	-	1370	-	-	266	298	850	239	303	524
Mov Cap-2 Maneuver	-	-	-	-	-	-	266	298	-	239	303	-
Stage 1	-	-	-	-	-	-	807	740	-	481	472	-
Stage 2	-	-	-	-	-	-	432	463	-	713	735	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	0.1	0.3	19	19.3
HCM LOS			C	C

Minor Lane/Major Mvmt	NELn1	NWL	NWT	NWR	SEL	SET	SERSWLn1
Capacity (veh/h)	330	1370	-	-	986	-	- 296
HCM Lane V/C Ratio	0.221	0.017	-	-	0.001	-	- 0.15
HCM Control Delay (s)	19	7.7	0	-	8.7	0	- 19.3
HCM Lane LOS	C	A	A	-	A	A	- C
HCM 95th %tile Q(veh)	0.8	0.1	-	-	0	-	- 0.5

Intersection												
Int Delay, s/veh	3											
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	160	11	21	507	39	7	42	9	15	24	7
Future Vol, veh/h	1	160	11	21	507	39	7	42	9	15	24	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	90	90	90	70	70	70	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	0	0	0	0	0	0
Mvmt Flow	1	193	13	23	563	43	10	60	13	17	27	8

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	607	0	0	206	0	0	851	855	199	870	840	585
Stage 1	-	-	-	-	-	-	202	202	-	632	632	-
Stage 2	-	-	-	-	-	-	649	653	-	238	208	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	971	-	-	1365	-	-	282	298	847	274	304	515
Stage 1	-	-	-	-	-	-	805	738	-	472	477	-
Stage 2	-	-	-	-	-	-	462	467	-	770	734	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	971	-	-	1365	-	-	253	290	847	222	296	515
Mov Cap-2 Maneuver	-	-	-	-	-	-	253	290	-	222	296	-
Stage 1	-	-	-	-	-	-	804	737	-	472	465	-
Stage 2	-	-	-	-	-	-	418	455	-	696	733	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	0.1	0.3	20.3	20.4
HCM LOS			C	C

Minor Lane/Major Mvmt	NELn1	NWL	NWT	NWR	SEL	SET	SERSWLn1
Capacity (veh/h)	317	1365	-	-	971	-	- 284
HCM Lane V/C Ratio	0.261	0.017	-	-	0.001	-	- 0.18
HCM Control Delay (s)	20.3	7.7	0	-	8.7	0	- 20.4
HCM Lane LOS	C	A	A	-	A	A	- C
HCM 95th %tile Q(veh)	1	0.1	-	-	0	-	- 0.6

Intersection	
Int Delay, s/veh	3.6

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	160	11	21	507	47	7	50	9	18	29	9
Future Vol, veh/h	1	160	11	21	507	47	7	50	9	18	29	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	90	90	90	70	70	70	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	0	0	0	0	0	0
Mvmt Flow	1	193	13	23	563	52	10	71	13	20	32	10

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	616	0	0	206	0	0	859	864	199	880	844	589
Stage 1	-	-	-	-	-	-	202	202	-	636	636	-
Stage 2	-	-	-	-	-	-	657	662	-	244	208	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	964	-	-	1365	-	-	279	294	847	270	302	512
Stage 1	-	-	-	-	-	-	805	738	-	469	475	-
Stage 2	-	-	-	-	-	-	457	462	-	764	734	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	964	-	-	1365	-	-	246	286	847	210	294	512
Mov Cap-2 Maneuver	-	-	-	-	-	-	246	286	-	210	294	-
Stage 1	-	-	-	-	-	-	804	737	-	469	463	-
Stage 2	-	-	-	-	-	-	406	450	-	679	733	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	0.1	0.3	21.7	21.7
HCM LOS			C	C

Minor Lane/Major Mvmt	NELn1	NWL	NWT	NWR	SEL	SET	SERSWLn1
Capacity (veh/h)	309	1365	-	-	964	-	- 277
HCM Lane V/C Ratio	0.305	0.017	-	-	0.001	-	- 0.225
HCM Control Delay (s)	21.7	7.7	0	-	8.7	0	- 21.7
HCM Lane LOS	C	A	A	-	A	A	- C
HCM 95th %tile Q(veh)	1.3	0.1	-	-	0	-	- 0.8

Maine Drilling & Blasting

Acheron Engineering
147 Main Street
Newport, ME 04953

July 18, 2018

RE: Blast Plan Assessment for Windham Subdivision - Chute Road

Dear Kirk,

Please find attached our blast plan for the proposed Subdivision located in Windham, Maine on Chute Road. Based on the information that we have received we have prepared the attached blast plan. In the blast plan you will find methods that will help to control the adverse effects of blasting. The blast plan contains information on fly rock prevention, misfire prevention, as well as ways to control air blasts and limit ground vibrations. The plan also contains information on pre-blast surveys, seismic monitoring and general site safety that should be in place for all blasting activities.

In reviewing the site plan and geotechnical information, it shows that blasting will be required at storm water pond #1 for the project. Rock cuts range from 1ft to 7ft deep. We have based our blasting design and patterns on these cut depths. We have calculated that a PPV of 0.29 in/sec would result at the nearest off site structure, that is approximately 377ft away from the nearest blast. This PPV level is well below the limit of 1.25 in/sec set in the DEP blasting specifications. Generally blasting will take place at a greater distance from structures than the distance used for the above calculations, vibration effects on any existing structures at these distances would be minimal.

As a precaution to verify that no adverse effects are caused by the blasting, seismograph monitoring should be used for all blasts at the nearest off site structure. Pre-blast surveys should also be offered to all property owners within the 500ft blasting radius.

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Maine Drilling & Blasting

There appear to be several existing water wells in close proximity to the potential blast area. However none of these wells are located within the 500ft blasting radius. The closest well is 600ft away. Based on the above calculated PPV's for the project water wells should not be affected by blasting. Water quality and quantity tests should be offered to all wells within the blasting radius to create a base line of water quality and quantity prior to blasting activities. Where there are no wells within the 500ft blasting radius, no water quality or quantity testing will be needed.

In conclusion, the potential for any adverse effects from blasting on natural resources, structures and wells of offsite buildings is negligible at best, based upon the proposed site design. Please let me know if you have any additional questions on this project or need any additional information.

Sincerely,



Brett Doyon
Project Engineer
207-203-1689

Blasting Plan

for

Windham Subdivision

Chute Road
Windham, ME

Date: July 18, 2018

Prepared For:

Acheron Engineering

147 Main Street
Newport, ME 04953

Prepared By: Brett Doyon



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Maine Drilling & Blasting

General
Maine Drilling & Blasting considers safety as the priority during all phases of blasting operations. We are knowledgeable of and will follow all local, state and federal regulations related to transportation and use of explosives. The project specifications and conditions have been reviewed. Details of procedures for pre-blast surveys, explosives use, blast security, monitoring and documentation are enclosed. Blasting will be in accordance with blasting law for site location of development projects: 38 MRSA paragraph 490-Z(14)(Blasting).

Pre-Blast Surveys / Notifications
Pre-blast surveys will be offered to all property owners within a 500 foot radius of the blast site. Appropriate notices will be given and appointments arranged for those owners who desire a survey. Pre-blast surveys will be conducted by a Company Representative. Results of those surveys will be documented through video or still photographs and appropriate narration or written reports. The property owner will be offered to have their well water tested for quantity and quality of water. These results will be submitted to the Department at the property owner's authorization.

Property owners within 500 feet of the blast area will be provided a blasting schedule. The blasting schedule shall contain, at a minimum - (1) Name, address, and telephone number of the operator, (2) Identification of the specific areas in which blasting will take place, (3) Dates and time periods when explosives are to be detonated, (4) Methods to be used to control access to the blasting areas, and (5) Type and patterns of audible warning and all-clear signals to be used before and after blasting.

Blast Monitoring
All blasts will be monitored by a representative of Maine Drilling & Blasting, Inc. who has been properly trained in the setup and use of seismic monitoring equipment. At least one seismograph will be in use at all times. Placement of monitoring equipment will be at the nearest structure to the blast site with the instrument's transducer firmly coupled to the ground. Maine Drilling & Blasting, Inc. monitoring equipment will consist of Instantel type seismographs. Details are enclosed. Seismographs meet all requirements outlined in subsection M of 28 MRSA paragraph 490-Z(14). Results of blast monitoring will typically be available before the next blast, usually immediately following a blast. Results can be reviewed and modifications can be made to the blast design for the next blast if necessary.

Sequence of Blasting
All blasting operations will be strictly coordinated with Engineers, and Fire Department. Emphasis will be on the safe and efficient removal of the rock existing on this project without impact to surrounding structures. Blasts will be developed so as to create adequate relief which will minimize ground vibrations and offer the greatest protection possible to the surrounding structures.

Blasting Procedures

1. Blasting may not occur in the period between sundown and sunrise the following day or in the period between 7:00 p.m. and 7:00 a.m., whichever is greater. Blasting will not occur more frequently than 4 times per day. Blasting will not be allowed on Saturday and Sunday.

2. Blasting cannot be conducted at times different from those announced in the blasting schedule except in emergency situations, such as electrical storms or public safety required unscheduled detonation.

3. Warning and all-clear signals of different character that are audible within a range of one-quarter mile from the point of the blast shall be given. All persons within the permit area shall be notified of the meaning of the signals through appropriate instructions and signs posted.

4. Access to blasting area shall be regulated to protect the public from the effects of blasting. Access to the blasting area shall be controlled to prevent unauthorized entry before each blast and until the perimeter's authorized representative has determined that no unusual circumstances exist after the blast. Access to and travel in or through the area can then safely resume.

5. Areas in which charged holes are awaiting firing shall be guarded, barricaded and posted, or flagged against unauthorized entry.

6. All blasts shall be made in the direction of the stress relieved face previously marked out or previously blasted.

7. All stemming shall be minimum as specified using clean, dry 3/8" crushed stone.

8. Blasting mats shall be used as necessary to cover blasts.

9. The Blasting Contractor shall insure that extra safety and judgment is exercised by his blaster to prevent the simultaneous blasting of numerous holes.

10. If a blast is initiated by a detonating cord, the detonating cord will be covered by crushed stone or other suitable cover to reduce noise and other concussion effects.

Blasting Mats

Blasting mats and backfill will be used to control excessive amounts of rock movement when blasting in close proximity to structures. Placement and number of mats are typically determined by the blaster. Mats will be placed so as to protect all people and structures on, or surrounding the blast site and property, the mats will prevent flyrock from entering protected natural resources or natural buffer strips. Rubber tire type blasting mats will be utilized on

this project and will be approximately 12' x 12' in size; Rubber mat @ 12' x 12' 38 lbs/sqft = 5,472 lbs/ea.

Blast Security and Warning Whistles
Each blast will be preceded by a security check of the affected area and then a series of warning whistles. Communications will be made with job site supervisors and local officials as required to ensure the safest possible operation. All personnel in the vicinity closest to the blast area will be warned. The warning whistles will follow the following sequence:

3 Audible Signal Pulses - 5 Minutes to Blast

2 Audible Signal Pulses - 1 Minute to Blast

1 Audible Signal Pulses - All Clear

No blast will be fired until the area has been secured and determined safe. The blast site will be examined by the blaster prior to the all-clear signal to determine that it is safe to resume work.

Explosives
All explosives will be delivered to the job site on a daily basis. Overnight storage will be a licensed secure magazine site. Only the amount of explosives required to perform the day's work will be brought to the site. All explosives will be stored in approved magazines when not in use.

Enclosed are Technical Data and MSDS sheets for the explosive products proposed for use on this project. Any one of, or a combination of these products may be in use at any one time on the site.

Blaster Qualifications
All Maine Drilling & Blasting, Inc blasters on this job will be licensed in the State of Maine and have received various amounts of training in the safe use and handling of explosives. Additionally, Maine Drilling & Blasting, Inc. blasters are familiar with all OSHA Regulations, State Regulations, and Federal Regulations regarding construction site safety, including transportation, use, and handling of explosive materials. Weekly safety meetings are to be held on site by the Maine Drilling & Blasting, Inc. job foreman, with a record of that meeting returned to the Maine Drilling & Blasting, Inc. office.

Blasting Personnel
All blasting operations shall be conducted by experienced, trained and competent persons who understand the hazards involved. Persons working with explosive materials shall:

1. Have demonstrated knowledge of, and a willingness to comply with, safety and security requirements.

2. Be capable of using mature judgment in all situations.

3. Be of good physical condition and not addicted to intoxicants, narcotics, or other similar type of drugs.

4. The person(s) responsible for the explosives shall possess current knowledge of the local, State and Federal laws and regulations applicable to his work.

5. The person(s) responsible for the explosives shall have obtained a Certificate of Competency or a license as required by State law.

Licenses and Permits
Maine Drilling & Blasting, Inc. is fully licensed and insured for the transportation, use, and handling of explosives. Evidence of insurance is available. Blasting permits will be applied for as required from the local authorities by the Maine Drilling & Blasting, Inc. Blaster/Foreman when blasting is about to begin.

Blast Vibration & Air-Blast
The maximum allowable air-blast at an inhabited building not owned or controlled by the developer may not exceed 129 decibels peak when measured by an instrument having a flat response (+ or - 3 decibels) over the range of 5 to 200 hertz. Additionally, sound from blasting may not exceed the following limits at any inhabited building not owned or controlled by the developer.

- Blast 1: Less than 129 decibel
- Blast 2: Less than 126 decibel
- Blast 3: Less than 124 decibel
- Blast 4: Less than 123 decibel

The maximum allowable air-blast at an uninhabited building not owned or controlled by the developer may not exceed 140 decibels peak when measured by an instrument having a flat response (+ or - 3 decibels) over a range of 5 to 200 hertz.

Blast vibration will be monitored at the blast site, typically at the structure(s) closet to the blast site. Vibration limits will closely follow limits described in the project specifications and the State Regulations. Blast designs will be modified as required to stay within the guidelines and meet project schedules as well. Blasting operations will be modified accordingly when approaching buildings and utilities. Enclosed are preliminary vibration calculations based on known distances to the structures of concern and anticipated initial blast designs.

Ground Vibration peak particle velocity limits shall not exceed:
Refer to Appendix B, Figure B-1, U.S. Bureau of Mines RI 8507.
In addition, the maximum peak particle velocity at inhabitable structures not owned or controlled by the developer will not exceed the levels established below:

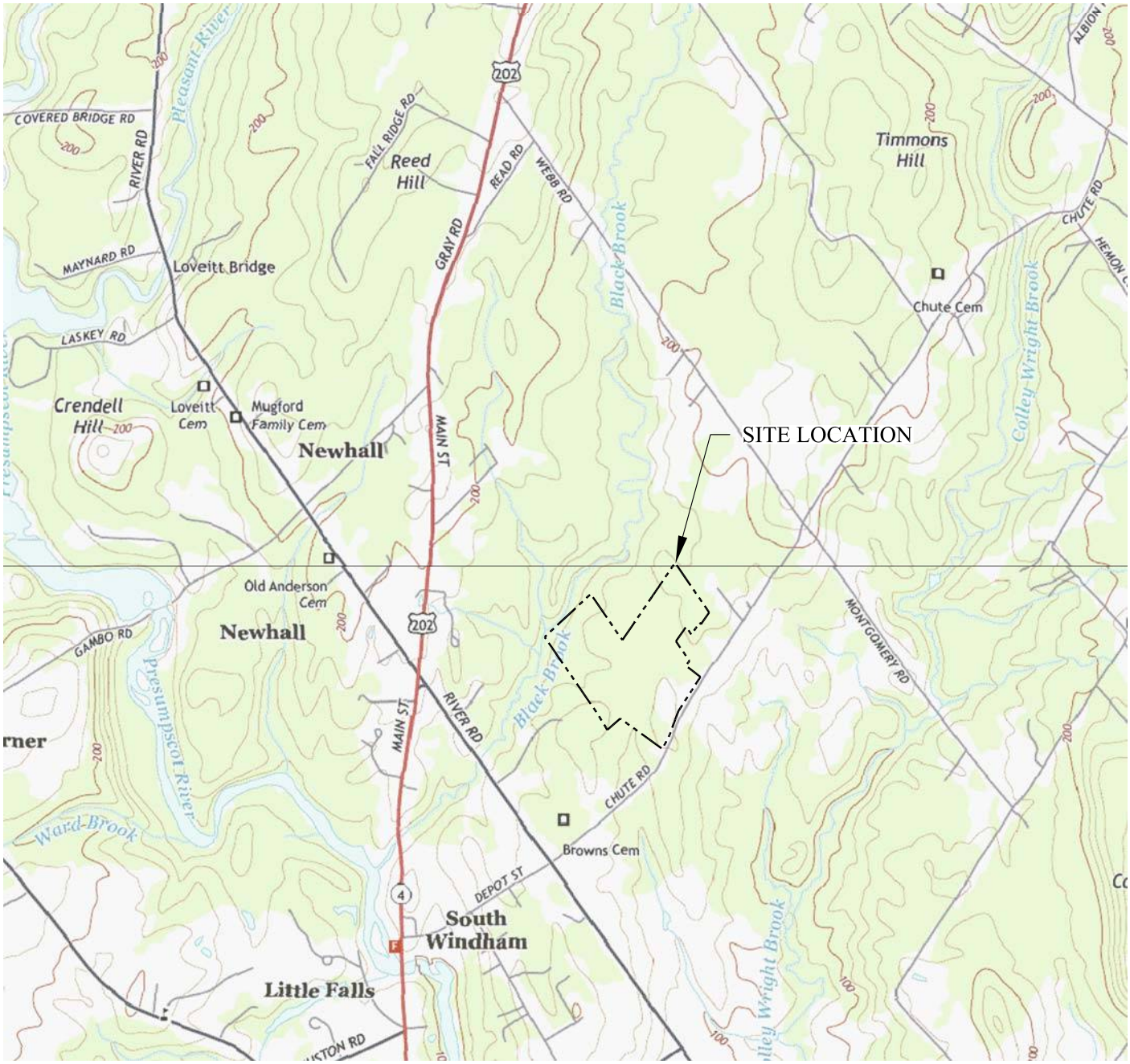
Distance from the Blast (ft.)	Max PPV
0 to 300 feet	1.25 in/sec
301 5000 feet	1.00 in/sec
Greater than 5000 feet	0.75 in/sec

Blast Reports

Enclosed is a sample of a Maine Drilling & Blasting, Inc last Report. This report will be filled out for each blast and copies supplied as needed. The reports will be kept for at least one year and will be available for inspection. The Maine DEP will be notified within 48 hours of any blast which exceeds the standards of 38 MRSA paragraph 490 Z-(14), the information in subsection N will be provided with the notification.

Typical Blast Design

Enclosed is what would be considered typical blast designs for this project. Hole sizes, depths, spacing and loading information is provided. These designs are to be considered a good starting point. Modifications are usually made, if necessary, following the first blast to meet control and seismic considerations.



SITE LOCATION MAP

DURANT HOMESTEAD
WINDHAM, MAINE

ACHERON ENGINEERING SERVICES
Engineering, Environmental & Geologic Consultants

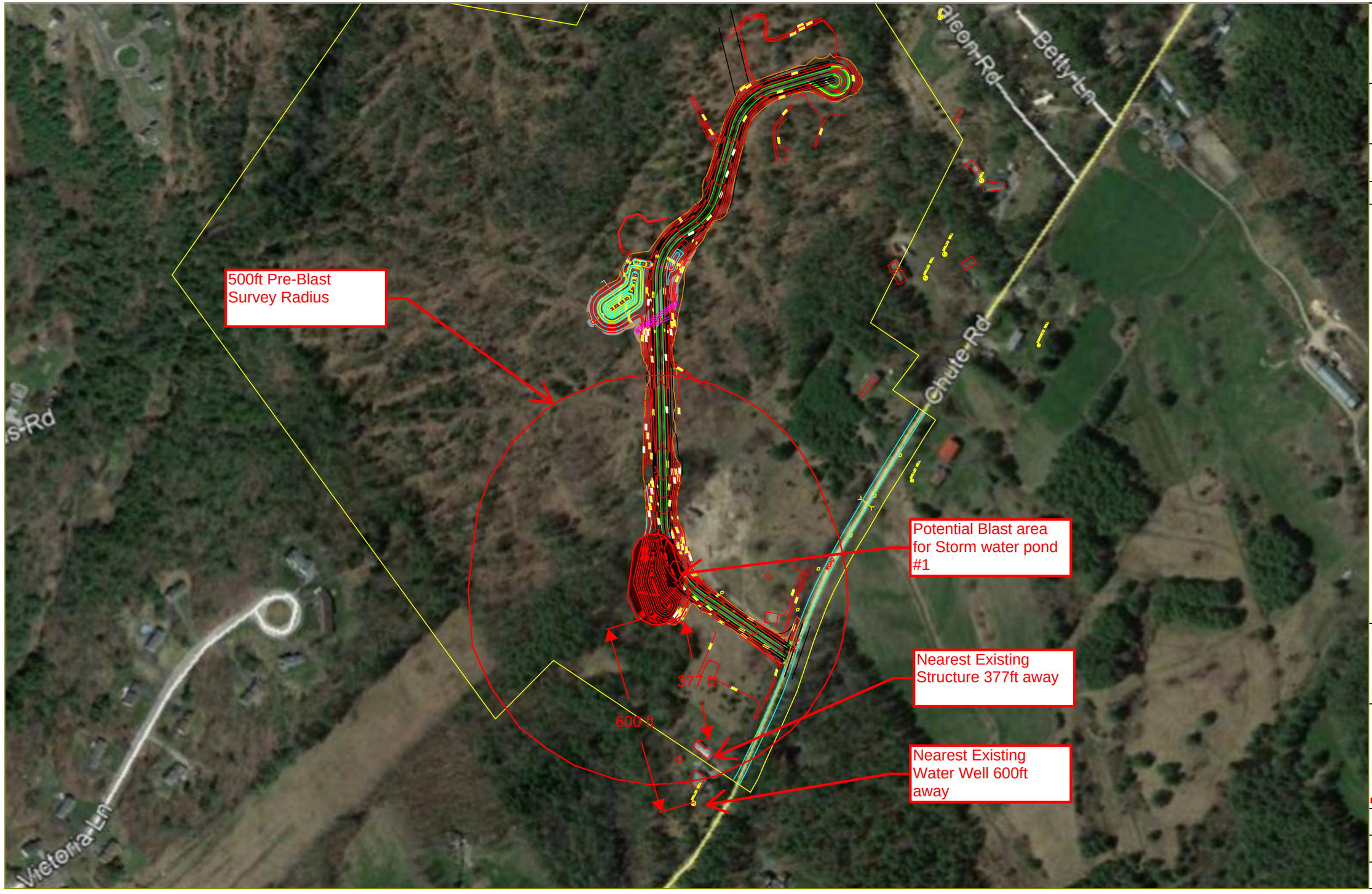
www.AcheronEngineering.com

147 Main St.
Newport, ME. 04953
(207)-368-5700

24466 Powell Rd.
Brooksville, Fl. 34602
(352)-796-6236

Acheron International, Inc.

JOB NO:	*79800*	*DWG NO:*	*A-1806*
SCALE:	*NTS*	*DATE:*	*5-15-18*



REV	DATE	DESCRIPTION

WINDHAM SUBDIVISION

CHUTE ROAD
WINDHAM, ME

PRE-BLAST
RADIUS
DRAWING

MaineDrilling
&Blasting

DRAWN: BJD

DATE: 07/18/18

SCALE: N.T.S

Loaded Hole-Blast Design for:

Maine Drilling & Blasting

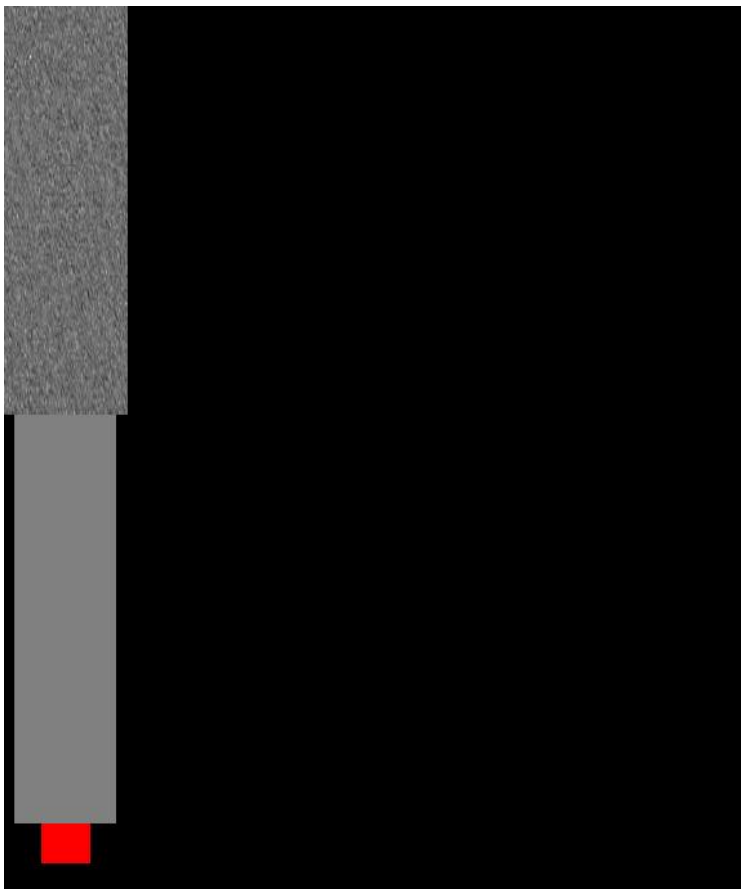
Job Blast Plan
Owner/Site Durant Homestead
Location: Windham, ME **Division:** Eastern
Customer Acheron Engineering Services
Author bdoyon On:7/18/2018 Updated By bdoyon On: 7/18/2018
Blast Plan Description: Pond #1 Blasting

7/18/2018 10:44 AM

APENDIX A. - Blast Design Plan:

Est. Number Of Holes:	*48*
Hole Depth:	*8.00 Ft*
Hole Diameter:	*3 in*
Burden:	*5.00 Ft*
Spacing:	*5.00 Ft*
Holes per Delay:	*2*
Pounds Per Delay:	*21.42 Lbs*
Pounds Per Hole:	*10.71 Lbs*
Total est. Pounds:	*514.08 Lbs*
Powder Factor:	*1.45 Lbs/Cy*
Decks:	*0*

Loaded Hole Depth - Diameter - Product



Blast Plan Notes:

Vibration Prediction (formula based on Dupont Handbook)

Site Factor (k) :	*242*	*Ground Constant based on Site/Rock Conidtions*
Distance Ft (d)	*377*	*Distance to Structure*
Lbs per Delay (w)	*21.42*	*Lbs explosives per 8 milisecond delay*
Scaled Distance (sd)	*81.46*	*(sd = d/ square root of w)*
Estimated PPV	*0.21*	*(ppv = k * sd ^ -1.6)*

Typical for Production work consistent with holes 8 Ft deep at 377 from a structure utilizing 3' In diameter at a 5 Ft by 5 Ft pattern.

Plan View/Timing Design (please see attached timing diagram)

Timing Diagram

Date: _____ Blaster: Blast Plan

Job #: _____ License: _____

Customer Name : _____ Job Address: _____ State: Maine

Shot Number Blast Plan

Note- Typical timing design. Adjustments will be made pursuant to previous results.
*All numbers are in milliseconds (ms)

0	25	50	75	100	125	150	175	200	225	250	275	300
42	67	92	117	142	167	192	217	242	267	292	317	342
84	109	134	159	184	209	234	259	284	309	334	359	384

Loaded Hole-Blast Design for:

Maine Drilling & Blasting

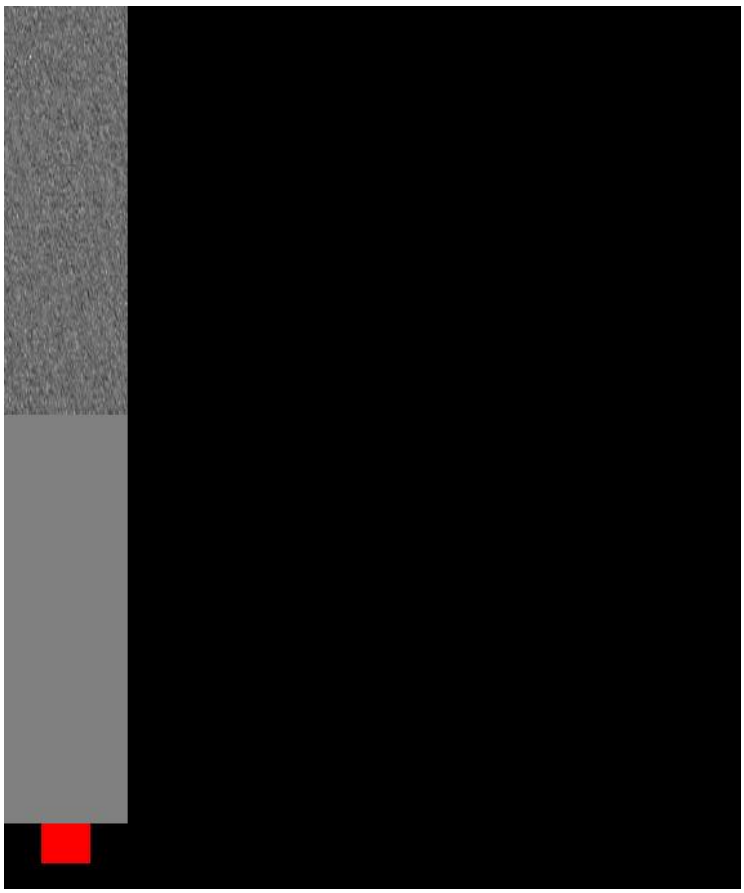
Job Blast Plan
Owner/Site Durant Homestead
Location: Windham, ME **Division:** Eastern
Customer Acheron Engineering Services
Author bdoyon On:7/18/2018 Updated By bdoyon On: 7/18/2018
Blast Plan Description: Pond #1 Blasting

7/18/2018 10:45 AM

APENDIX A. - Blast Design Plan:

Est. Number Of Holes:	*48*
Hole Depth:	*8.00 Ft*
Hole Diameter:	*3 in*
Burden:	*5.00 Ft*
Spacing:	*5.00 Ft*
Holes per Delay:	*2*
Pounds Per Delay:	*31.10 Lbs*
Pounds Per Hole:	*15.55 Lbs*
Total est. Pounds:	*746.40 Lbs*
Powder Factor:	*2.10 Lbs/Cy*
Decks:	*0*

Loaded Hole Depth - Diameter - Product



Blast Plan Notes:

Vibration Prediction (formula based on Dupont Handbook)

Site Factor (k) :	*242*	*Ground Constant based on Site/Rock Conidtions*
Distance Ft (d)	*377*	*Distance to Structure*
Lbs per Delay (w)	*31.10*	*Lbs explosives per 8 milisecond delay*
Scaled Distance (sd)	*67.60*	*(sd = d/ square root of w)*
Estimated PPV	*0.29*	*(ppv = k * sd ^ -1.6)*

Typical for Production work consistent with holes 8 Ft deep at 377 from a structure utilizing 3' In diameter at a 5 Ft by 5 Ft pattern.

Plan View/Timing Design (please see attached timing diagram)

Timing Diagram

Date: _____ Blaster: Blast Plan

Job #: _____ License: _____

Customer Name : _____ Job Address: _____ State: Maine

Shot Number Blast Plan

Note- Typical timing design. Adjustments will be made pursuant to previous results.
*All numbers are in milliseconds (ms)

0	25	50	75	100	125	150	175	200	225	250	275	300
42	67	92	117	142	167	192	217	242	267	292	317	342
84	109	134	159	184	209	234	259	284	309	334	359	384

Company Qualifications

Company Information & Qualifications

YOUR TRUSTED BREED

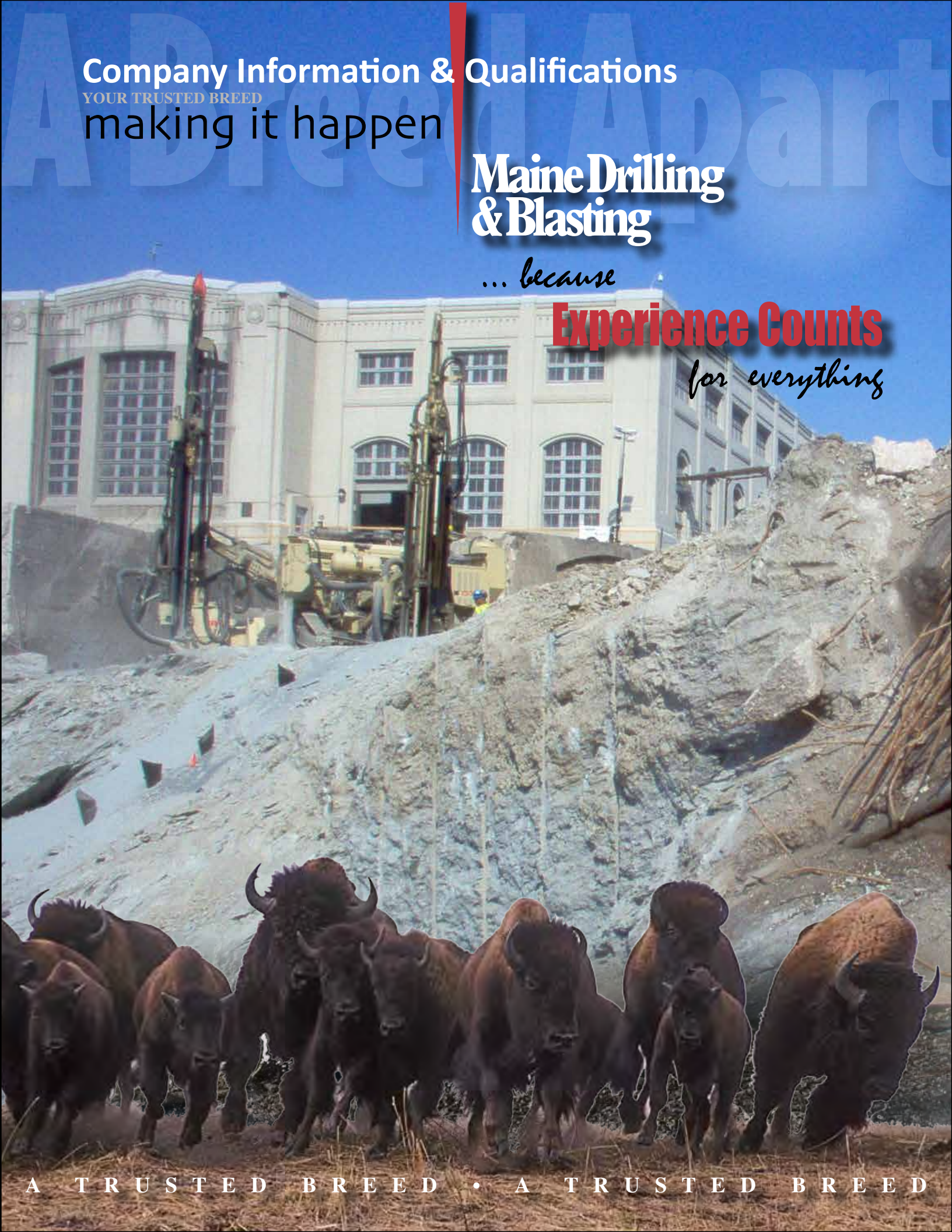
making it happen

Maine Drilling & Blasting

... because

Experience Counts

for everything



A TRUSTED BREED • A TRUSTED BREED

Maine Drilling & Blasting
YOUR TRUSTED BREED
making it happen
with safety, quality & productivity
MD Drilling & Blasting

Maine Drilling & Blasting: Your Trusted Breed Making it Happen



- Need to make way for underground utilities?
- Building a project in an extremely remote location with difficult access?
- Does your project call for rock bolting or hoe rams?
- Need to remove rock in very tight quarters adjacent to existing structures?
- Have hundreds of thousand of cubic yards of rock to move in a tight deadline, under less than ideal conditions?
- Need drilling and blasting for a pipeline, wind farm, or transmission lines?
- Need rock stabilized on a heavily trafficked highway?
- Have new interstate ramp systems to install through granite bedrock?



Whatever your needs, Maine Drilling & Blasting can get the job done skillfully and smoothly. Whether you are a general contractor, commercial contractor, municipality, or homeowner, we can provide you with the professional experience you need to get your job done right, on schedule and in budget. Maine Drilling & Blasting is nearby and at the ready.

It's all about having the resources when you need them and working with someone who offers you proven results on demanding schedules.

- Local resources throughout the Northeast
- Full service company … your true one-stop source.
- Remote access capability for almost all terrains including a proven system for underwater drilling and blasting, and an internally-engineered bulk skid to deliver product to backwoods mountain terrains.
- We optimize drill types and explosive options from in-house sources.

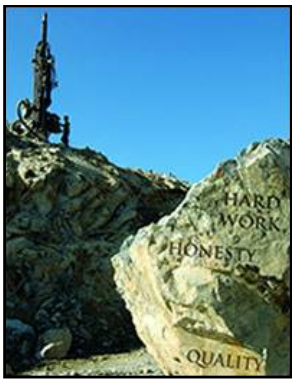


Since 1966, our standards are steeped in the tradition of being family-owned and operated. We're a close and cohesive group. We're also owners. Maine Drilling & Blasting began the transition to employee ownership in 2004, resulting in progressively greater individual responsibility in the work produced. We work with the unity of a family and the determination of business owners. Qualified employees now own 51% of the Company.

Our employees are proud of our past 51 years. We've persevered, adapted, and grown stronger and smarter, all the while holding true to our founding principles of hard work, honesty and quality of services. That's why MD&B is the Trusted Breed for so many throughout the Northeast. Maine Drilling & Blasting: cost competitive AND expert source for your project needs.

Maine Drilling & Blasting Information & Qualifications

This comprehensive package is offered to evidence our Company's ability to perform drilling and blasting work on various projects throughout the Northeast, New York, and Pennsylvania. It includes general corporate information, experience, performance, safety, quality, and environmental management capacity.



COMPANY INFORMATION:

Name of Company: Maine Drilling & Blasting, Inc.

Address: 542 Brunswick Avenue, Gardiner, ME 04345

Phone: 207-582-2338 **Fax: 207-582-8794**

Primary Contacts: Aaron Flewelling

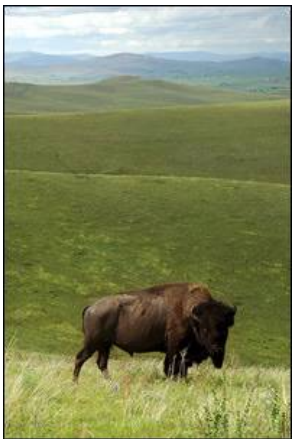
Phone: 603-**647-0299** **Cell: 603-454-8385**



Email Address: aflewelling@mdandb.com

Company Website: www.mainedrilling.com

Ownership/Management: Maine Drilling & Blasting is an employee-owned company started by Ted Purington, Sr. in 1966. Two generations of blasters preceded him. Ted Sr. retired in 1996. Today, Bill Purington is Company Chairman and CEO working out of the corporate office in Gardiner, ME. Ted, Jr. is the Executive V.P. heading up Operations from the Auburn, NH office.



Nature of Business: The Company is one of the largest of its kind in North America, with the majority of the volume of explosives utilized in New England and New York. Core services are drilling and blasting and hoe ram services for construction, quarry and energy markets throughout the Northeast, New York, Pennsylvania, Maryland, Delaware, Virginia and West Virginia. Specialty services include rock anchors, laser profiling, boretraking, training, and public relations.

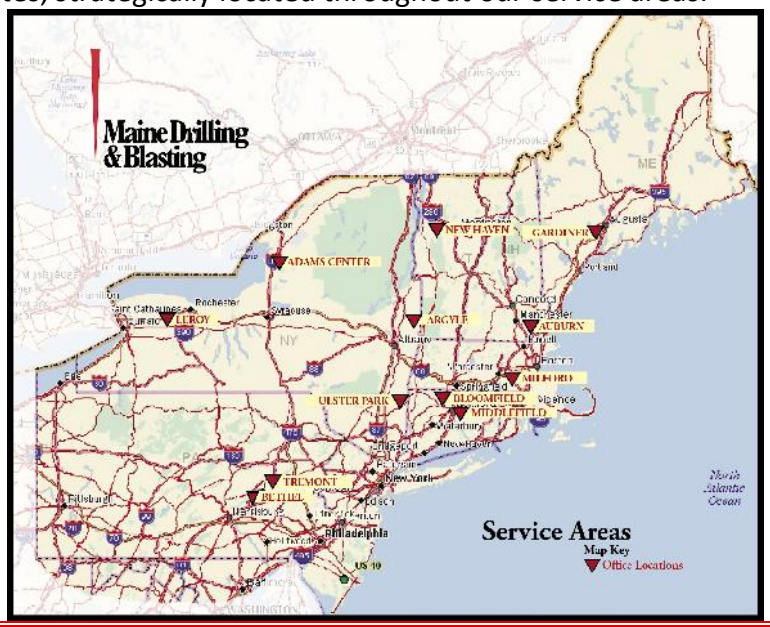
Years in Business: Maine Drilling and Blasting, Inc. has been in business for 51 years.



Service Areas/Facilities: MD&B is currently registered to do business in the following states: Maine, New Hampshire, Massachusetts, Rhode Island, Vermont, New York, Connecticut, New Jersey, Pennsylvania, Maryland, Delaware, Virginia and West Virginia, and has no limitations within our area of expertise.

Local crews operate throughout the Northeast, and Mid Atlantic area with eight operating divisions: six construction – Eastern (Maine), Central (New Hampshire), Southern (Connecticut/Southern Massachusetts/Western Rhode Island, Southeast New York), Northern (Massachusetts/Rhode Island/Eastern Connecticut), Western (Vermont/Eastern New York), Mid Atlantic (Western NY, Pennsylvania New Jersey, Maryland, Delaware, Virginia and West Virginia), and two Mine/Quarry divisions that service New England and New York along with the Mid Atlantic area.

Regional operations are strategically supported with local offices: Our operating hub is in Auburn, NH housing Central and N.E. Quarry North Division, as well as Equipment Services, Purchasing, Engineering and Safety Departments; Western Construction and Quarry Divisions are headquartered in Hartford, NY; Southern Division is headquartered in Bloomfield, CT; Northern Division, N.E. Quarry North Division, and Technical Services in Milford, MA; Mid Atlantic Construction and Quarry Divisions operate out of Bethel, PA, and Eastern Division and the Corporate Office are located in Gardiner, ME. Additionally, the Company is supported with 9 permanent explosive distribution facilities, and 12 to 15 remote sites, strategically located throughout our service areas.



List Professional Affiliations & Licenses:

International Society of Explosives

Associated General Contractors of Maine, Vermont, NH, NY, Mass

Milford Area Chamber of Commerce

Northern NE Concrete Producers Association

Associated Builders & Contractors, Inc. – Maine Chapter

Maine Better Transport Association

Maine Motor Transport Association

Maine State Chamber of Commerce

New Hampshire Good Roads

Construction Financial Management Association

National Association of Women in Construction

Tug Users Group

BA of Greater Boston

Maine Aggregate Association

Kennebec Valley Chamber of Commerce

Construction Industry of MA (CCIA)

MA Aggregate & Asphalt Pavement Association

American Society of Civil Engineers (ASCE)

Society for Human Resources Management (SHRM)

New Hampshire Motor Transport Association

Institute of Makers of Explosives

National Ski Areas Association

New York Construction Materials Association

Maine Economic Research Institute

The ESOP Association

National Center for Employee Ownership

Associated Builders & Contractors, Inc. – Eastern Pennsylvania

American Society of Civil Engineers









Construction Marketing Association
Status of Business/Company: Corporation

Labor Relations: Both Open Shop, and Union served by Maine Drilling & Blasting.

SAFETY CREDENTIALS:

MD&B has an aggressive Safety Program in place with a designated safety officer and support Department: **Michael Weider, Safety Manager, 603-647-0299, mweider@mdandb.com**







- **Safety is the bedrock of our training, the cornerstone of our technology.** Safety-specific training includes: Dupont's Safety Training Observation Program (STOP), MSHA Part 46 Training, OSHA 10-hour Training, Job Hazard Analysis, Division Meeting Safety Topics, Daily Safety Meetings, Lessons Learned. In addition to training specifically related to safety, an array of mandatory, formal job skill training courses ensures the best practices on the job. All MD&B Drillers and Blasters undergo rigorous training and company certification. MD&B Blasters also hold state-specific industry licenses for operation.

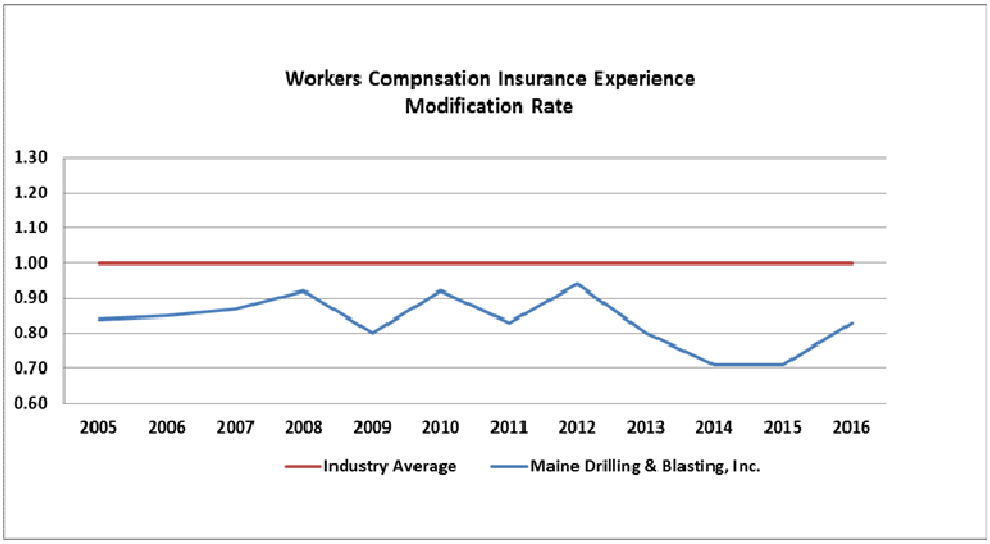
- **Seismic Monitoring is performed on every project.** MD&B holds itself accountable for the seismic monitoring. We objectively measure vibrations caused by our blasts with state of the art equipment, and make those measurements available for analysis.

- **Job Hazard Analysis on each and every project.** MD&B performs a thorough site-specific Job Hazard Analysis on every project, and we reassess for every change in project parameters. Maine Drilling & Blasting instituted this non-industry-mandated process company-wide years ago.



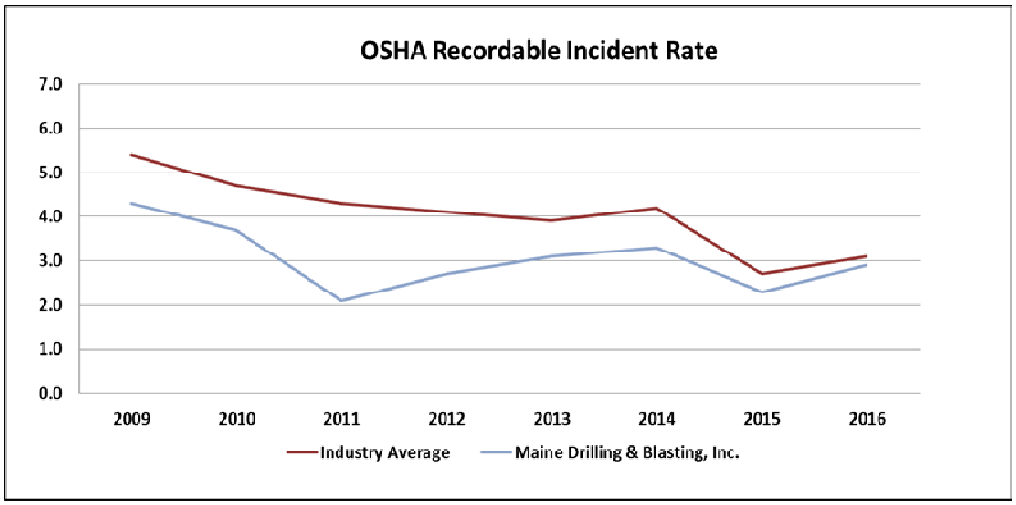
EMR	MD	Ind.Avg
2005	0.84	1.00
2006	0.85	1.00
2007	0.87	1.00
2008	0.92	1.00
2009	0.80	1.00
2010	0.92	1.00
2011	0.83	1.00
2012	0.94	1.00
2013	0.80	1.00
2014	0.71	1.00
2015	0.71	1.00
2016	0.83	1.00

- **Beating the Workers Compensation MOD rate 10+ years running.** For the last 10+ years, our incident rate and subsequent costs for workers compensation claims are lower than industry averages for our workforce.





OSHA RIR below industry average for the past 7 years. As illustrated in our graph, Maine Drilling & Blasting has been below the industry average for Recordable Injury Rates (RIR) over the last seven years. The Company has shown an average reduction in our RIR of 13% for the 7-year period as compared to the industry trend of 10% for the same period. This illustrates a 3% greater improvement rate than that of the industry.





QUALITY ASSURANCE:

MD&B has a Quality Assurance Program with training manuals and programs for both Drilling and Blasting.

Designated QA manager and Regional Technical Supervisor: **Ken Smith, 508-478-0273, ksmith@mdandb.com**



Maine Drilling & Blasting is on the cutting edge, from types of explosive product, to delivery systems, to digital technologies for drilling and blast initiation.

- **Non-electric blasting** techniques permit the blaster to program a series of small explosions, thousandths of a second apart, reducing risk and increasing control.



- **Programmable electronic detonators** deliver even more precise timing. The electronic initiation system allows for better energy usage, resulting in better breakage and decreased vibration.

- **PACKAGED EXPLOSIVE GELS**, water resistant ammonium nitrate and fuel oil (**ANFO WR**), and **BULK EMULSION**, which is pumped directly into holes and has become the product of choice today, provides our blasters with powerful precision tools to perform their task under any conditions. Properly utilized, Bulk Emulsion

reduces drilling cost in all applications, allowing for efficient use of hole diameters and hole patterns, minimizing loading labor.



- **Computer-aided blast design** and test-blast practices have replaced trial-and-error, providing for a controlled blasting environment.

- **Laser Profiling** a rock face provides a 3 dimensional view of the blast area for use in the proper design and layout of the borehole locations for the drilling and blasting operation.

- **Boretrak System:** "BoreTraking" provides a 3 dimensional view of each borehole as it relates to every other borehole in the blast. When it is matched with the laser profile it will show how each borehole relates to the rock face so the blaster will be able to distribute the explosives where they will perform the best.



- **In House Engineering Services** provide added value for our customers. We provide accurate estimates of rock quantities, determine the scope of work, verify the topographical accuracy of the engineering, and provide value engineering to maintain efficiencies and blasting cost reductions. Our engineering department also provides us with the ability to perform Engineer, Perform, and Construct projects, which we have performed successfully.

- **Remote Project Efficiencies:** Maine Drilling & Blasting has the experience, expertise and equipment necessary for any terrain and the most isolated locations commonly found at wind farms, pipelines, transmission lines, substations, and hydroelectric facilities. Maine Drilling & Blasting has adapted and even engineered our own transports capable of bringing our crews, products and supplies to very hard-to-reach places with terrain many consider impassable.



- **Congested/Close Shooting Expertise:** Maine Drilling & Blasting is very experienced performing controlled blasting in areas with very close adjacencies to existing structures, operating railroads, operating power plants, live transmission lines, open hospitals and in-session schools, etc. Maine Drilling & Blasting understands these challenges and delivers based upon 1) our resources and experience with electronic detonator technology and bulk

explosive application, and 2) our strong Safety Culture including our Zero Tolerance policies.



- **Foundation Services:** MD&B utilizes our fleet of drills and experienced craftspeople to install rock anchors, dowels, guy anchors and micro-piles for a variety of construction needs. Foundation components requiring structural connections to bedrock is a specialty that compliments our fundamental service of drilling and blasting. Over the past 20 years, Maine Drilling & Blasting has become recognized as a leader in the installation of rock anchors throughout the Northeast. Our engineers routinely work with customers at the design phase to assist in development of cost-effective and constructible solutions. We perform in diverse conditions from remote access transmission line ROWs and wind site ridgelines to the tight work areas of existing communication tower sites. From atop mountains to on water, from inside cofferdams to the complexities of urban work, we've provided routine and unique rock bolting and ground anchor services for hundreds of projects, installing over 10,000 post tension anchors and reinforcement dowels. We self-perform rock anchor activities starting with the drilling, through the grouting and tensioning activities. Each anchor is tested well above design load. Our experience ranges from small diameter to 3-inch with 700kips.



- **In House Distribution:** Maine Drilling & Blasting has instituted an in-house distribution network with the ability to supply all regions without depending on outside suppliers and distributors.

- **Schedules & Liquidated Damages:** With Maine Drilling & Blasting's access to over 80 drills ad specialty equipment, we meet or exceed schedule deadlines, and we will accept liquidated damages in our contracts.

- **Public Relations:** Maine Drilling & Blasting utilizes the Safety and Technical departments to give presentations to towns, neighbors and public safety departments who have concerns about blasting to help with the permitting and approval process.

ENVIRONMENTAL:

- MD&B has an Environmental Management Program in place. We have taken a leadership role within our industry to improve environmental stewardship. We recognize and accept our own responsibility to proactively apply environmental best practices to all aspects of our business, and work with suppliers and customers to promote environmentally responsible actions and products. In all cases, our aim is to optimize our environmental performance up to the technical limits practically achievable, and to explore environmentally-driven innovations, technologies and business opportunities to expand those limits to achieve nothing less than environmental excellence.



MANAGEMENT, EMPLOYEES, AND RESOURCES:

Principal Officers of our Company:



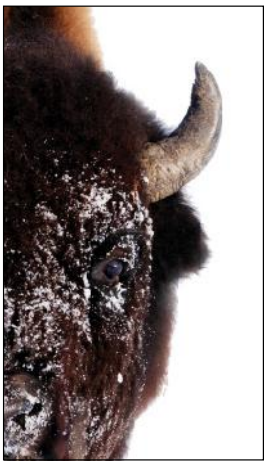
NAME	TITLE	YEARS W/ FIRM
Dan Werner	President & CEO	15
William Purington	Chairman of the Board	35
Ted Purington, Jr.	Executive Vice President	39
Mitchell Green	Regional Vice President	14
Aaron Flewelling	Engineering Manager	6
Todd Barrett	Senior Vice President	21
Timothy Maynard	Chief Financial Officer	9

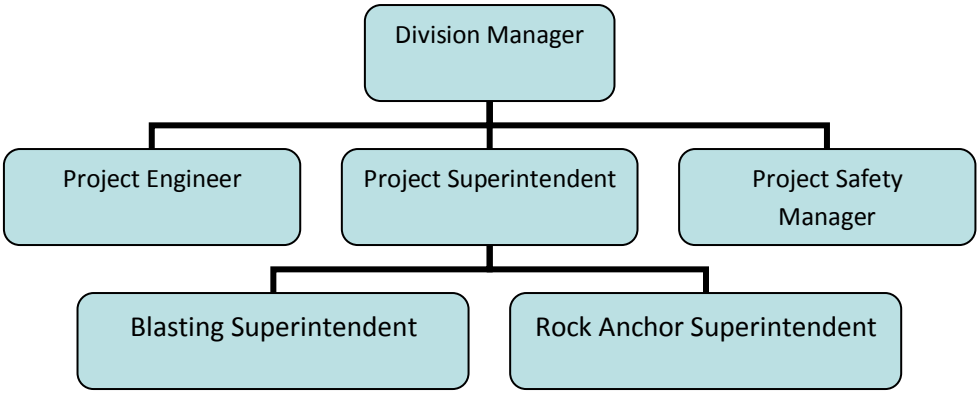


Typical Project Organizational Chart









Project Responsibility:

- Our Supervisory and Management team are all Company employees.
- The Division Manager accepts the Project Manager responsibilities. The principal officers have authorized all construction signatures. The decision-making is done with the division manager or the principals as needed. The Project Manager handles as many as five projects. Assistance from the company departments, the engineering group, and the Division Manager spread the workload.
- The Division Manager provides leadership to the construction team in the areas of safety, resource leveling, scheduling and management of the project. This position is further supported by Regional Superintendents and Project Superintendents, who run the larger jobs for the Company.

Software Support:

- As a specialty contractor, our estimating and contracts software is a proprietary program. GPS, Total Station, Carlson Software and Paydirt software are utilized to predict rock quantities and complexities. This data is used to estimate resources needed for each cut area. As redesigns are considered, the CAD input is

digitized to generate updated input for an updated resource estimate. Our accounting software is Sage Timberline Office.

Number of Employees:

Main Office Staff	**43**
Support Staff (mechanics, safety, engineering, etc.)	**51**
Field Supervisory Staff	**47**
Craft Workers	**119 Blasters, Laborers & Drivers**
Equipment Operators	**81 Drillers & Hoe Ram Operators**



Major Construction Equipment: MD&B currently owns over 80 hydraulic drills and specialty equipment, and 12 excavators. Additional drills are rented during peak season as needed. Maine Drilling & Blasting owns approximately 190 vehicles in its fleet including pickups, tractor/trailer vehicles, box trucks and bulk trucks.

Project Profile:

ANDROSCOGGIN VALLEY HOSPITAL BIOMASS EXPANSION, BERLIN, NH

Completion – November 2013
Owner – Androscoggin Valley Hospital
GC – Langford & Low – A&B Logging

Scope: To drill and blast approximately 600 cubic yards of rock for the construction of a new biomass plant to convert the hospital's energy source.

Challenges: The Berlin NH AVH Biomass project entailed blasting within 20 feet of the occupied hospital. We blasted approximately 600 cubic yards ranging from 2 feet to 12 feet in cut depth. Each blast had to be coordinated with the Site Contractor, General Contractor and Facility Manager of the Hospital. The concerns were coordinating the blasts so that the hospital could still function on a daily basis, and that the ambulance entrance road be accessible at any moment.



Outcome-Summary: Our team met weeks prior to the start and discussed the site security issues and the Hospitals concerns in depth. We were able to have a plan in place that was suitable for all of us. At the end of the project, the Hospital managers and the customer were very pleased with a job well done.

Customer Testimonial: "Recently we had the pleasure of working with Maine Drilling & Blasting on our jobsite at Androscoggin Valley Hospital in Berlin, New Hampshire. The blasting portion of the project was unique being within such a close proximity to the hospital, and was executed without incident and with minimal impact to the hospital's operations. MD&B had excellent communication with project management and hospital staff. In addition, they were reliable and flexible with the hospital's schedule and made safety of the general public and onsite personnel a first priority."

Robert Grafton
Superintendent
Langford and Low, Inc.

Project Profile:

MANSFIELD HOLLOW HYDRO ELECTRIC, MANSFIELD, CT

Completion – September 2013
Owner – Mansfield Hollow Hydro
GC – Sealand Environmenta;

Scope: To drill and blast for a new waterway and turbine building in close proximity to a river and existing dam.

Challenges: Rock needed to be blasted to allow for the installation of large diameter pipe to feed a new turbine building. The integrity of the rock remaining between the excavation and existing river needed to be maintained to prevent the river from coming into the new trench. As a further challenge, the head wall for the intake of the new waterway was located 6 feet from the crest of a dam built in the 1800's. The crest of the dam could not be disturbed as it would lower the height of the existing river and change the dynamic for the function of the turbine. The last piece of blasting was within 10 feet of a Portadam that was constructed to hold the river back from flooding the work site.



Outcome-Summary: With good communication between the blasting crew and site contractor, potential risks were identified and a plan was put into place to mitigate the risk. By using a combination of methods including line drilling, controlled blasting, rock dowels and mechanical removal of rock, the team was able to successfully complete the project on time and without incident.

Testimonial: "The crew who performed the drilling and blasting work at the Mansfield Hollow project exceeded all of our expectations. Their hard work, attention to detail and ability to adjust to changing conditions kept our project on schedule and completed the rock removal portion without incident. The professionalism and safety-first mindset demonstrated by the crew made them a pleasure to work with. Thanks again for the hard work and we will be calling MD for all of our drilling and blasting needs."

Steve Gordon
Sealand Environmental

Project Profile:

UNH DORMITORY, WEST HAVEN, CT

Completion – October 2013
Owner – University of New Haven
GC – Mather Corp. – Consigli Construction

Scope: To drill and blast for a new dormitory for the University of New Haven.

Challenges: The rock that needed to be removed for the new dormitory was within 30 feet of the existing dormitory and neighboring houses. It also abutted the parking lot for the students, the athletic field for the University, and a town road with active underground utilities. The fact that we were working on an active campus with the athletic field in constant use, made site security a challenge.



Outcome-Summary: By starting with a conservative test blast plan, our blast crew was able to analyze the existing conditions of the site and adjust design to meet actual conditions. All blasting was completed well within the vibration specs provided for the project. The use of a well-planned and communicated site security plan insured the safety of the general public and campus population. The project was completed ahead of schedule and without incident.

Testimonial: "I want to thank you for sending your crew to the UNH Dormitory project. The crew conducted themselves as true professionals and always kept safety in the forefront. One of the many things that impressed me was the ability to react to changing circumstances and keep the schedule intact. On a project where your men were drilling and blasting next to an occupied dormitory in a residential neighborhood, finishing on time and without incident is what will have Mather Corporation calling MD Drilling again."

Pierre Bastien
Superintendent
Mather Corporation

Project Profile:

HARBOR POINT, STAMFORD, CT

Completion – November 2013
Owner – Androscoggin Valley Hospital
GC – Langford & Low – A&B Logging

Scope: To drill and blast approximately 30,000 cubic yards of rock for the construction of a new underground parking garage.



Challenges: The excavation limit was 20 feet from the edge of MNR tracks and went around three sides of UI's transmission lines. The cut from top of ground averaged 45 feet and was a combination of earth and rock. Soldier piles and lagging was installed along the property line prior to excavation.

Once the soldier piles were completed, the overburden on top of the ledge was removed. Ledge needed to be removed within 5 feet of the soldier piles. Line drilling was performed at the rock excavation limit prior to blasting within 25 feet of the soldier piles. The line drilling prevented back break from undermining the soldier piles and reduced the vibration limits at MNR and UI facilities. Two geotechnical companies were on site to inspect the blasting activities and monitor the soldier pile wall and surrounding facilities. Six seismographs were used to monitor all blasting vibration. In addition to seismographs, prisms were installed on all the soldier piles and monitored after every blast for deflection. The blasting schedule was regulated by a flagger from MNR. A temporary hold was placed on the tracks for the actual blast. All holds on the tracks and blast times were coordinated between the flagger and MD's foreman.



Outcome-Summary: To drill and blast 30,000 yards of rock in downtown Stamford poses its own challenges. Add the challenge of deep cuts abutting a major rail line as well as electric transmission towers, and you have a challenge with no room for error. Through careful planning and communication, the blasting crew was able to successfully complete their scope of work without incident and ahead of schedule.

Customer Testimonial: "Excellent job, very professional. Job well done, guys. I expected two months of drilling and you got it done in 31 days. Well appreciated."

Steve Holmes
Senior Superintendent, Building and Land Technology (BLT)

Project Profile:

FAIRFIELD METRO NORTH CENTER, FAIRFIELD, CT

Completion – November 2011
Owner- Town of Fairfield, CT
GC - Guerrera Construction

Scope: To drill and blast approximately 90,000 yards of mass rock and 4,000 yards of structure rock for a new train station parking lot and future building pad.

Challenges: The blasting was located anywhere from 400 feet to 20 feet from the tracks. There were 45-foot cuts within 100 feet of the tracks. There were 30-foot cuts within 12 feet of a new bridge abutment. All of the work had to take place without any disturbance to the train traffic. In this area of Connecticut, an estimated 225-250 trains pass by daily. Obviously, all work had to be done without damaging any of Metro-North's structures, UI's towers, or the new bridge.



Schedule: The blasting schedule was driven by concrete being poured on the site. There were two separate general contractors working on the site with different agendas and working in different areas. This required certain areas of the job to be blasted by specific dates. Because blasting was not allowed within 300 feet of fresh concrete, we had to have multiple areas ready to blast, changing from day to day depending on where the two companies were pouring.

Outcome-Summary: The project was completed ahead of schedule and without incident.

Testimonial: "We've worked with other drilling and blasting companies, but when Metro North hears that MD Drilling & Blasting is the d&b contractor on a project, we're very happy to hear it. The procedures they submit for our review and approval are always timely and complete. More importantly, they've always kept us well informed of progress on a day-to-day basis, and we know the quality of their work will be top-notch. We rely on MD Drilling & Blasting's expertise, and we value our good working relationship with them."

Dave Willard, P.E.
Assistant Director – Structural Engineering
Metro North Railroad

Project Profile:

MIXED-USE BUILDING, OLD TRACK ROAD, GREENWICH, CT

Completion – December 2010
Owner- Gateway Development
GC – F & G Construction

Scope: To drill and blast approximately 11,000 cubic yards of rock for the construction of a new mixed-use building.

Challenges: The rock that needed to be removed was a large outcrop sandwiched in between the overflow lot of a car dealership, a congested parking lot for an existing gym, and bordered MNR's tracks. The rock out-crop was 30 feet higher than MNR's tracks. There was zero room for fly rock, and vibration had to be controlled for MNR's facilities and the existing buildings.



Outcome-Summary: Communication with the abutters prior to starting the project was key. Vehicles were moved and parking spots were blocked to allow for more room for the blasting operation. Representatives from MNR were contacted and a game plan was put in place prior to trees being cleared. As an added safety precaution, a flagger was utilized for the blasting closest to the tracks. Through good communication and execution, the project was completed ahead of schedule and without incident.

Testimonial: "From day one on the job, MD Drilling & Blasting has acted with complete professionalism and an exemplary attitude on the Old Track Road project. The Blaster-in-Charge is a self-assured individual who is not afraid of a difficult situation or task. His demeanor and willingness to help is exemplary. He always dutifully considered all of our requests and worked closely with us to work through a challenging terrain and very tight site conditions. This BIC showed great thoughtfulness and resourcefulness throughout the entire project. He also shows tremendous efficiency and dedication to getting the job done in an effective and safe manner."

Jim Carnicelli
Vice President
Gateway Development

Project Profile:

CADET BARRACKS – US MILITARY ACADEMY – WEST POINT, NY

Completion – April 2014
Owner- The U. S. Army Core of Engineers
GC – Walsh Construction



Scope: Controlled blasting for 135,000 yards of mass rock and 60,000 sqft of line drilling/presplit to make way for the construction of a new Cadet Barracks at West Point Military Academy Campus, New York.

Challenges: The work required up to 80 feet of rock cut within 60 feet from the 100+ year-old Campus Chapel. The Chapel's age and condition required vibration and displacement levels well under the normal thresholds. To complicate our work further, the more modern Barracks and Campus structures had rooflines below eye level during most of the work creating additional exposure level for the throw of our blasts. MD&B implemented state-of-the-art electronic detonation systems to have precise controls on the charges.

Very tight horizontal and vertical grade controls were also required to avoid fill concrete for footings and excess shotcrete for rock nail/shotcrete finish on the high walls. MD&B implemented boretraking and GPS Survey technologies to ensure the position and quality of our drilled holes prior to the loading. It took a team effort with all the trades/GC to orchestrate the 175+ blasts. Each one involved operating over 15 seismographs to be maintained and 14 personnel for site security before each blast was initiated.



Outcome-Summary: The work was completed in 9 months and ahead of schedule. We worked in sync with the benched installations of horizontal rock dowels, shotcrete, and soldier pile wall installations at the top of slope. We completed the job without any serious incident, injury, or fly rock to the satisfaction of the General Contractor – Walsh Construction, and Owner – The U.S. Army Core of Engineers.

Testimonial: "During your time here working on this project, the cooperation, effectiveness and overall management was highly noted not only by me but my entire team. Your team proved to be diligent and continually progressed the project during a difficult winter and allowed us to keep the project on track. Your staff on site speaks loudly of your company and I look forward to the chance to work with you and your team again."

Matthew A. Ludwig
PE Team Leader NCB/Administrative Contracting Officer, Dept. of the Army




Maine Drilling & Blasting

Misfire Prevention Guidelines, Fly Rock Prevention Guidelines & IME Blasting Best Practices

Maine Drilling & Blasting

Misfire Prevention Guidelines

Prevention of Misfires

These guidelines were established to provide good work practices that will greatly reduce the possibility of a misfire due to self-induced causes.

Shot Design Nonelectric

1. Use proper hookup procedures as found in the MD&B published guidelines
2. The Blaster-In-Charge may determine the need for extra surface delays to create a dual path system to enhance reliability
3. Ensure that there is enough slack in the shock tube
4. Ensure shot design allows for complete energization or in cases of larger shots appropriate advancement of the initiation sequence.

Shot Design Electric

5. Ensure shot design allows for complete energization
6. Tape connections in wet locations
7. Monitor meter while matting
8. Test equipment regularly
9. Perform stray current tests

Loading

10. "Tape" all non-electric connections to ensure there is a proper connection
11. The Blaster-In-Charge must walk the shot completely and verify all connections prior to shooting
12. The Blaster-In-Charge will have additional competent person(s) walk the shot to ensure all connections are made properly
13. Use caution whenever sticking a loading pole or stemming rod into a loaded hole as it can damage shock tube
14. Re-prime any hole where separation is suspected
15. Re-prime any hole where you have used a powder retriever
16. Do not step on shock tube

Matting

17. Matting shall only be performed under the direction of the Blaster-In-Charge, or their competent designee
18. Ensure that the excavator on the project is sufficient in size to handle the mats in an efficient manner
19. Communicate the matting procedure clearly with the excavator operator, discuss hand signals also.
20. Design the shot with the excavators reach in mind
21. Clean mats by "shaking" them with an excavator. This is more effective when the tire "grain" is sloping downward
22. Do not drag mats over a shot
23. Do not set mats with a front-end loader or other equipment that cannot properly hoist the mat over the shot
24. Place ANFO bags under shock tube exposed to jagged surfaces
25. Utilize sand cover whenever geological conditions warrant extra coverage

General Prevention Techniques

26. Do not cut open detonator boxes with a knife
27. No not allow your powder knife to swing from a lanyard (strap) unless the blade is protected
28. Document and calculate timing before loading the shot
28. After the shot has been tied in – GET OFF THE SHOT!

Maine Drilling & Blasting

Fly-Rock Prevention Plan

Prevention of Fly-Rock

Fly-rock prevention is most effective through good planning, attention to detail on drilling, loading and site security. Each category below contains items that are known to be effective in preventing fly-rock.

Planning

1. It must be clearly established who the (BIC) is and then clearly communicated to the entire crew.
2. The BIC must clearly communicate what the responsibilities are for each crew member.
3. BIC must understand the abilities of the crew. Trainees must be trained and supervised on all job functions, (assign a trainer).
4. Through the use of the Job Hazard Analysis the crew must become familiar with the blast environment and clearly identify all hazards on and around the job site.
5. The BIC must communicate with the drill operators and other blasters with experience to fully understand the geology on site.
6. The blast design must take into consideration all the relevant parameters, blast geometry, hazards, type of products, timing and type and amount of cover in use.
7. All pre-blast calculations must be done prior to the blast and adjusted should conditions change on the site or drilling conditions dictate a modification of the plan. Powder factor should be determined prior to loading the first hole.
8. Each blast should be designed according to the direction of least danger.
9. Start each project with a conservatively designed test blast. that will not only provide information on the geology but will provide relief for the next shot.
10. When location or conditions on the job site change consider your next blast as a test blast. Document your blast plan and have it reaffirmed.
11. Request hold harmless on shots that may cause damage or takes unnecessary risks.

Drilling

12. Carefully monitor and record hole depths, amount of overburden, and any drill hole anomalies with light colored crayons on the cones or another effective method.
13. Use flashlights attached to tapes to determine straightness of holes. If deviation is even slightly suspected, have holes bore tracked.
14. Arrange for Laser Profiling and Bore Tracking for high wall faces with exposures to property.

Loading the Shot

15. Have hole sheets and timing patterns on paper before loading.
16. Profile all faces before loading front row of holes.
17. Have blaster-in-charge load first and second rows of holes.
18. When using pourables (Bulk or ANFO):
    a. Have an appropriate plan to deal with seams, voids, faces, and overloaded holes.

b. Make the appropriate design modifications for the use of bulk.
c. Keep the increased hazards in mind.

19. Take the time necessary to work safely and do not take shortcuts, or unnecessary risks. (DO NOT RUSH!)
20. Know the exact amount of burden on the face and load and cover accordingly, if face is bermed and you're uncertain of face location, excavate to find the face and then reberm.
21. Utilize berms for faces as appropriate.
22. If questioning the necessity to or the amount of cover, add cover.
23. Know the exact amount of overburden over the rock and load and cover accordingly.
24. Use offsets properly.
25. Train the blast crew on proper stemming techniques, what stemming anomalies may look like, why, and how to report them.
26. Monitor the stemming to make certain that all holes are properly stemmed.
27. Use only appropriate crushed stone and non-sparking stemming rods to compact the stone in each hole.
28. Pay attention when using bulk as it can coat the sides of the hole reducing the effectiveness of the stemming.
29. BIC must walk the shot twice and check power, double-up on power and down hole caps when necessary (critical shots).
30. Ensure 100% safe detonation! Misfires can be a source for flyrock. Follow all Misfire Prevention Guidelines!
31. If there is a remote possibility of fly rock from a blast, take the necessary additional precautions.
32. Never make assumptions. If unfamiliar with the situation; figure it out, then get another opinion to confirm your decision.
33. Always communicate with supervisors when safety issues are compromised.

Site Security

34. Secure loading area before, during, and after loading.
35. Have a thorough, written Blast Zone Security Plan:
    a. Design an over cautious plan.
    b. Communicate the plan with our crew, the Contractor and his crew.
    c. Have all blast guards use hand-held radios on the same frequency or another acceptable means of communication.
36. Secure the blast zone by removing people from the blast area (especially keeping them away from the face of the blast) and have them stay at an overly safe distance behind the blast and put them under cover.
37. Blaster must have proper cover.
38. Execute the Blast Zone Security plan to the "T".

INSTITUTE OF MAKERS OF EXPLOSIVES

Blasting; Best Practices

The potential to impact surface or groundwater with the substances used in commercial explosives can be controlled through the implementation of certain measures. Implementing such measures as part of a standard operating procedure will eliminate or minimize the potential for these substances to dissolve in or become associated with water. The specific measures included can be grouped into the following four (4) basic categories:

1. Education/Training of Explosive Users
2. Selection of Appropriate Explosives for the Job and Conditions
3. Explosives Loading and Handling
4. Attention to Technical Matters

1. Education/Training of Explosive Users

Both the owners/operators of the location where explosives are being used and the personnel working with commercial explosives should be well informed of all applicable regulations as well as any potential consequences associated with the products' exposure to water. The federal Clean Water Act, or the equivalent state statute, regulates the release of substances, in particular those that can cause an undue risk to human health or the environment. In addition, the Resource Conservation and Recovery Act, governs the disposal of hazardous wastes.

2. Selection of Appropriate Explosive for the Job and Conditions

Selecting the proper explosive for the particular job is critical to the prevention of surface or groundwater impact.

- ANFO (ammonium nitrate - fuel oil) is not water-resistant and should be avoided if contact with water is likely.

- Various types of commercial explosives are available to withstand exposure to water. Water-resistant explosives include the cartridge forms of gelatinous nitroglycerin, watergels and emulsions and the bulk forms of emulsions which are: 1) Site Mixed Emulsion (ammonium nitrate - fuel oil - emulsifier) is a water-resistant explosive, semi-solid. This is manufactured on site and detonated while still warm assuring complete detonation. 2) Repump Emulsion (ammonium nitrate - fuel oil - emulsifier) is a water-resistant explosive, semi solid, manufactured off site, transported and pumped into the borehole as needed.

3. Explosives Loading and Handling

- All excess product in augers or hoses is to be recovered and used either in the next blasthole or recycled in the mixer/holding tank.
- Explosive spillage around the blasthole collar is to be controlled and any such spillage should be placed into the blasthole before stemming
- Water contacting explosives during cleanup is to be contained and managed in accordance with applicable regulations
- Minimize the amount of time that explosives are exposed to wet conditions within the blasthole. The blast should be initiated as near the time the loading is completed as safety and operational procedures allow.
- Avoid having explosives exposed to precipitation.
- To assure complete detonation of explosives placed into the ground, a sufficient number of boosters must be used.

4. Attention to Technical Matters

- The actual physical conditions into which explosives are being placed must be taken into account.
- Personnel responsible for loading explosives into the boreholes should be in continuous communication with the drillers of those boreholes or supplied with adequate drill logs, so that any knowledge regarding fractures, crevices or cavities is obtained.
- Where Bulk ANFO or Emulsion is used in fractured, creviced or cavitied borcholes, plastic borehole sleeves and/or positioned inert stemming decks will be used to ensure total detonation of the explosives and avoidance of excessive charges.
- Choosing and placing the correct drilling patterns that results in the optimal use of explosives with all the explosives undergoing complete detonation.
- Quality assurance/quality control measures to maintain drilling accuracy that prevents the detonation in one blasthole from impacting the proper detonation in a nearby blasthole.
- Selecting the appropriate drilling equipment so that adequate borehole quality is maintained.
- Where appropriate to ensure complete detonation, two (2) primers will be used in each blasthole; one near the top and one near the bottom of the explosive column.
- Correct selection of delay timing for each blasthole to ensure detonation of the entire pattern, and the prevention of cut-off blastholes.

Maine Drilling & Blasting

Blasting Mats Cut Sheet

DYNAMAT
SUPER HEAVY DUTY BLASTING MATS

Blasting mats

Popular Products :

- 8 ft. x 16 ft. (2.43m x 4.87m)
- 10 ft. x 15 ft. (3m x 4.5m)
- 12 ft. x 24 ft. (3.65m x 7.3m)

Custom Made Products

Our equipment enables us to produce blasting mats to your particular specifications in sizes ranging from 4 x 4 ft. (1.2 x 1.2m.) to 16 x 28 ft. (4.87 x 8.53m.). A flexibility that is unique in the industry.



WHY CHOOSE DYNAMAT BLASTING MATS?		
Our Innovative Processes		
The Dynamat Advantage		Our Goals
Automated processes	We have developed automated processes that let us measure the compaction of the blasting mats.	To ensure consistent quality.
Meticulous tire selection	Our manufacturing processes demand it.	
Our Added Value		
The Dynamat Advantage		Our Goals
Blasting mats over 12 feet (3.66 m) wide	We are the **only manufacturer** in North America to make products of such widths.	To match our client's needs.
12 inches (30 cm) between each cable	We have always spaced them this way. **All** our competitors, on the other hand, leave a gap of 14 to 16 inches (35 to 41 cm) between their cables.	To produce safe blasting mats that control flying debris better.
Forged circular rings	We used forged rings, while the competition used welded ones.	To make blasting mats easier to handle.
Two dimensions of rings	We use 10 and 13-inch (25and 33 cm) rings.	To obtain the resistance required for hoisting.
The benefits of traditional blasting mats vs. blasting mats made of truck tires (transport mat)	• greater flexibility and adaptability to the terrain. • maximal absorption of the energy released by dynamiting. • reduced possibilities of a partial blast. • unequalled ease in handling.	To provide a safe product that not only eliminates all risk of flying debris when dynamiting, but also ensures optimal performance.

Superior quality = safety

Our products are subject to rigorous quality control at every step of the manufacturing process. Carefully selected, the recovered tires that make up our blasting mats are tied together with new cables, and that translates into solidity and resistance. All the rubber pieces are perforated in order to minimize tears. This means that clients can use our blasting mats in total safety.

Traceability

In a process that's unique to Dynamat, blasting mats are individually numbered to allow them to be easily traced and identified wherever they are on a project involving dynamiting. Now that's an advantage that's undeniably Dynamat!

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Maine Drilling & Blasting

Blastmate 3 Seismograph Cut Sheet

Blastmate III™

Full-Featured, Advanced Vibration and Overpressure Monitor

Range of Applications:

- Blast-monitoring for compliance
- Near-field blast analysis
- Pile driving
- Construction activity
- Demolition activity
- Heavy transportation
- Bridge monitoring
- Structural analysis
- Underwater blast monitoring
- 4 or 8 channel data aquisition
- Remote monitoring - Auto Call Home™

Consultants, engineers and contractors the world over recognize the **Instantel® Blastmate III™** vibration and overpressure monitor as the most versatile and most reliable full featured monitor available. It provides all of the industry-leading features of the **Instantel Minimate Plus™** monitor, conveniently packaged with a full keyboard and a high-resolution printer. This allows you to setup, add notes and print complete event reports in the field, without a computer.

Versatile

With standard features like the **Instantel Histogram Combo™** monitoring mode, zero dead-time between events, and flexible sample rates up to 65,536 S/s, the **Blastmate III** system provides you with control and confidence to monitor reliably in any situation. For added versatility, you have the option to add 4 more channels and extra memory, providing two complete standard monitors in a single package.

For more demanding monitoring applications, the **Instantel Blastware® Advanced Module** software provides the capability to monitor a broad selection of vibration and overpressure sensors, as well as sensors for related structural and environmental measurements. Monitor vibration, ambient environmental conditions, and the movement of structural cracks, all at the same time, all using the same **Blastmate III** monitor.

Easy to use

The features and versatility of the **Blastmate III** monitor set it apart, but the fact that it is also easy to use makes it truly revolutionary. The dedicated single use function keys, backlit LCD and simple menu-driven operation make setup and operation quick and easy, even for inexperienced personnel.

Tough

The **Blastmate III** monitor has been built to survive, with a fully sealed top panel, non-corrosive industrial grade connectors and sealed electronics, all packed in a rugged, water-resistant case.

Blastmate III - Reliability and versatility for any monitoring application.



Key Features

- Fast high-resolution thermal printer for event reports in the field without the need for a computer.
- Full keyboard simplifies entry of job-specific notes and information.
- Dedicated function keys and intuitive menu-driven operation enable quick and easy setup.
- **Histogram Combo** mode allows capture of full waveform records while recording in histogram mode.
- Sample rates from 1,024 to 16,384 S/s per channel - up to 65,536 S/s available on a single channel.
- Available 8-channel option allows for 2 standard triaxial geophones and 2 microphones to be used on a single **Blastmate III** monitor.
- Continuous monitoring means zero dead time, even while the unit is processing.
- Any channel can be matched to a wide variety of sensors - geophones, accelerometers, or hydrophones.

714B0053 Rev 07 – Prodcuct Specifications are Subject to Change

Instantel

Blastmate III™

General Specifications	Blastmate III
Channels	Microphone and Triaxial Geophone or 4 independent user-configurable channels (two Microphones and two Triaxial Geophones or 8 independent channels with optional 8-channel upgrade)
Vibration Monitoring (with Standard Triaxial Geophone)	
Range	Up to 254 mm/s (10 in/s)
Resolution	0.127 mm/s (0.005 in/s) or 0.0159 mm/s (0.000625 in/s) with built-in preamp
Accuracy (ISEE / DIN)	+/- 5% or 0.5 mm/s (0.02 in/s), whichever is larger, between 4 and 125 Hz / DIN 45669-1 standard
Transducer Density	2.13 g/cc (133 lbs/ft^3)
Frequency Range (ISEE / DIN)	2 to 250 Hz, within zero to -3 dB of an ideal flat response / 1 to 315 Hz
Maximum Cable Length (ISEE / DIN)	75 m (250 ft) / 1,000 m (3,280 ft)
Air Overpressure Monitoring	
Weighting Scales	Linear or A-weight
Linear Range	88 to 148 dB (500 Pa (0.072 PSI) Peak)
Linear Resolution	0.25 Pa (0.0000363 PSI)
Linear Accuracy	+/- 10% or +/- 1 dB, whichever is larger, between 4 and 125 Hz
Linear Frequency Response	2 to 250 Hz between -3 dB roll off points
A-weight Range	50 to 110 dBA
A-weight Resolution	0.1 dBA

Waveform Recording

Record Modes	Manual, Single-shot, Continuous
Seismic Trigger	0.125 to 254 mm/s (0.005 to 10 in/s)
Acoustic Triggers	
Linear	100 to 148 dB
A-weight	55 to 110 dBA
Sample Rate	1,024 to 16,384 S/s per channel (independent of record time), up to 65,536 S/s in single-channel mode with advanced software (maximum 8,192 S/s per channel for 8 channels)
Record Stop Mode	Fixed record time, **Instantel® AutoRecord™** record stop mode
Record Time	1 to 100 seconds (programmable in one-second steps) or 500 seconds plus 0.25 seconds pre-trigger
AutoRecord Time	Auto window programmable from 1 to 9 seconds, plus a 0.25 second pre-trigger. Event is recorded until activity remains below trigger level for duration of auto window, or until available memory is filled.
Cycle Time	Recording uninterrupted by event processing - No dead time
Storage Capacity	
Full Waveform Events	300 one-second events at 1,024 S/s sample rate (1,500 event capacity with optional memory upgrade)
Event Summaries	1,750 (8,750 event capacity with optional memory upgrade)

Histogram Recording

Record Modes	Histogram and **Instantel Histogram Combo™** (monitor captures triggered waveforms while recording in Histogram mode)
Recording Interval	2, 5 or 15 seconds; 1, 5 or 15 minutes
Storage Capacity	46,656 intervals - 3 days at 5-second intervals or 102 days at 15 minute intervals (with memory upgrade - 15 days at 5-second intervals or 540 days at 15 minute intervals)

Physical Specifications

Dimensions	269 x 355 x 165 mm (10.6 x 14.0 x 6.5 in)
Weight	6.4 kg (14 lbs)
Battery	Rechargeable 6 V sealed gel cell - capacity for 30 days of continuous monitoring
User Interface	63 domed tactile keys including full keyboard and dedicated keys for common functions
Display	4-line x 20 character, high contrast, backlit LCD with online help
Printer	High resolution thermal plotter
PC Interface	RS-232
Auxillary Inputs and Outputs	External Trigger, Remote Alarm, coordinate download from GPS
Environmental	
Printer/LCD Operating Temperature	-10 to 50^{0}C (14 to 122^{0}F)
Electronics Operating Temperature	-20 to 60^{0}C (-4 to 140^{0}F)
Remote Communications	Compatible with Telephone, GSM, Cellular, RF, Satellite, Short-haul modems, and Ethernet® device servers. Automatically transfers events when they occur through **Instantel Auto Call Home™** feature.
Additional Features	Monitor start/stop timer

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714B0053 Rev 07 – Prodcuct Specifications are Subject to Change

Instantel

The World's Most Trusted Vibration Monitors

Maine Drilling & Blasting

Explosive Data Sheets
(SDS Sheets Available Upon Request)

NONEL® Lead Line

Technical Information

Nonelectric Shock Tube



Product Description

NONEL LEAD LINE is NONEL shock tube spooled at the factory in 763 meter (2,500 foot) lengths for easy application and deployment. NONEL LEAD LINE shock tube is a small diameter, three-layer plastic tube coated on the innermost wall with a reactive explosive compound. When initiated, NONEL shock tube propagates a low energy signal, similar to a dust explosion, at approximately 2000 m/sec (6,500 ft/sec) along the tube's length with minimal disturbance to the outside of the tube. The signal is transmitted from one NONEL shock tube to another through field-assembled splices.

NONEL LEAD LINE provides maximum flexibility to the blaster in choosing a position of safety from which to initiate nonelectric blast rounds in either underground or surface applications. NONEL LEAD LINE is the only NONEL product that can be cut and spliced into a NONEL detonator product to construct a custom length nonelectric starter assembly.

Application Recommendations

- **ALWAYS s**plice NONEL LEAD LINE to NONEL EZTL™ nonelectric trunkline delay detonators, NONEL EZ DET® nonelectric blast initiation system, NONEL TD or NONEL Starter detonators to make-up the nonelectric starter assembly when using

Properties

MSDS #1124

Net Explosive Content per 100 units 0.0044 kg
0.0097 lbs

Length		Spools / Case
m	ft	
762	2500	2

- **Length rounded to nearest one-half meter.**
- **See case label for exact case weight.**

Hazardous Shipping Description
Articles, Explosives, N.O.S. (HMX, Aluminum), 1.4S, UN 0349, PG II



See Product Disclaimer on page 2.

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NONEL® Lead Line

Technical Information

Application Recommendations (continued)

NONEL LEAD LINE as the primary initiator for NONEL blast rounds.

- **ALWAYS** trim at least 3 m [10 ft] of tubing before inserting into a nonelectric shock tube starting device or whenever dirt and/or moisture may have compromised the open tube ends before making a splice connection.
- **ALWAYS** replace the plastic tube closure over the open end of any NONEL LEAD LINE that remains on the spool and is intended to be used to make up another nonelectric starter assembly.
- **ALWAYS** make the final hook-up of the nonelectric starter assembly to the blast round only after all equipment and non-essential personnel are clear of the blast area.
- **ALWAYS** unspool NONEL LEAD LINE by hand if the starter assembly has been spliced to it and is attached to the blast round.
- **ALWAYS** keep any NONEL LEAD LINE tube ends sealed and free from dirt and moisture since dirt or moisture in the shock tube may cause a misfire.
- **NEVER** use NONEL LEAD LINE for in-hole use. NONEL LEAD LINE is for use outside the borehole only.
- **NEVER** attempt to knot different lengths of shock tube together. Shock tube will not initiate itself through knot connections. It must be spliced.
- **NEVER** remove the plastic tube closure from the NONEL LEAD LINE shock tube until just before splicing.
- **NEVER** attach the starter assembly to the blast round until after the LEAD LINE deployment is complete whenever NONEL LEAD LINE is to be unspooled by any method other than by hand,

Application Recommendations (continued)

- **NEVER** run over NONEL LEAD LINE with equipment. This may damage the shock tube and may cause a misfire. **ALWAYS** replace the NONEL LEAD LINE if it is damaged.
- When making a nonelectric starter assembly using NONEL LEAD LINE, **ALWAYS** remove the plastic tube closure and save for later use. Splice two freshly-cut ends of NONEL shock tube together (one from the NONEL LEAD LINE and the other from the NONEL detonator) by inserting them into opposite ends of the plastic connector sleeve and pushing them toward one another until they are both at least ½ cm (¼ in) in the splice.

Transportation, Storage and Handling

- NONEL LEAD LINE must be transported, stored, handled and used in conformity with all federal, state, provincial and local laws and regulations.
- For maximum shelf life (3 years), NONEL LEAD LINE must be stored in a cool, dry, well ventilated magazine. Explosive inventory should be rotated. Avoid using new materials before the old. For recommended good practices in transporting, storing, handling and using this product, see the booklet “Prevention of Accidents in the Use of Explosive Materials” packed inside each case and the Safety Library Publications of the Institute of Makers of Explosives.

Case Dimensions

51 x 25 x 28 cm 20 x 9 ⅞ x 10 ⅞ in

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NONEL® EZ DET® 1.4B

Technical Information

Nonelectric Blast Initiation System



Product Description

NONEL® nonelectric delay detonator EZ DET® 1.4B units consist of a length of orange shock tube with a surface detonator attached to one end and a Standard (#8) in-hole detonator on the other. The surface detonator is inside a color-coded plastic EZ™ Connector block to facilitate easy connections to shock tube leads. This block can hold up to 6 shock tube leads. Easy-to-read, color-coded delay tags display the delay number and nominal firing time prominently.

NONEL EZ DET units can be easily connected to one another to satisfy basic blast design requirements in construction, mining, and quarry operations. They can also be used in combination with NONEL MS, NONEL EZTL™ and/or NONEL TD detonators to satisfy complex blast design requirements and minimize inventory of initiation system components.

Application Recommendations

For detailed application recommendations, **ALWAYS** request a copy of Dyno Nobel's *Product Manual: NONEL® and PRIMACORD®* from your Dyno Nobel representative.

- **ALWAYS** select a NONEL EZ DET unit having more than enough tubing length to extend from the planned primer location in the borehole to the collar of the next hole.

Properties

MSDS #1122

Net Explosive Content per 100 units 0.0810 kg / 0.1782 lbs

This product is only available in the United States.

Nominal Time (msec)	Nominal Time (msec)	Nominal Time (msec)	Connector Block Color
17 / 350	17 / 500	17 / 700	Yellow
25 / 350	25 / 500	25 / 700	Red
42 / 350	42 / 500	42 / 700	White
25 / 375			Red

Hazardous Shipping Description

Detonator assemblies nonelectric, 1.4B, UN 0361 PG II



NONEL® EZ DET® 1.4B

Technical Information

Application Recommendations (continued)

- **ALWAYS** protect the plastic EZ Connector block and all shock tube leads from impact or damage during the loading and stemming operations. Use care when placing blasting mats and cover material on top of the blasting circuit. The EZ Connector block contains a detonator and is subject to detonation caused by abuse such as impact. Shock tube which has been cut, ruptured or damaged may cause misfires.
- **ALWAYS** be sure that the shock tube(s) are securely inserted, one at a time, into the EZ Connector block. The head of the EZ Connector block should rise to accept the shock tube and return to a closed position with an audible click.
- **ALWAYS** ensure that individual shock tubes remain aligned side by side in the connector channel and do not cross one over the another on insertion.
- **NEVER** use NONEL EZ DET units with detonating cord. The low strength surface detonator will not initiate detonating cord and may cause misfires.
- **NEVER** attempt to disassemble the delay detonator from the plastic EZ Connector block or use the detonator without the connector.
- **NEVER** place more than 6 shock tube leads into the plastic EZ Connector block. Misfires may result.
- **NEVER** pull, stretch, kink or put tension on shock tube such that the tube could break.
- **NEVER** splice NONEL EZ DET shock tube together to extend between holes.
- **NEVER** connect NONEL EZ DET units together until all holes have been primed, loaded and stemmed and the blast site has been cleared.

Transportation, Storage and Handling

- NONEL EZ DET must be transported, stored, handled and used in conformity with all federal, state, provincial and local laws and regulations.
- For maximum shelf life (3 years), NONEL EZ DET must be stored in a cool, dry, well ventilated magazine. Explosive inventory should be rotated. Avoid using new materials before the old. For recommended good practices in transporting, storing, handling and using this product, see the booklet "Prevention of Accidents in the Use of Explosive Materials" packed inside each case and the Safety Library Publications of the Institute of Makers of Explosives

Packaging

Length		Case Type	Quantity / Case	
m	ft		case	subpack
3.5	12	D	180	90
4.5	16	D	120	60
7	24	D	120	60
9	30	D	80	40
12	40	D	60	30
15	50	D	60	30
18	60	D	50	25
24	80	DC	50	--
30	100	DC	40	--
37	120	DC	30	--

- Length rounded to nearest one-half meter.
- Case weight varies by length & delay; see case label for exact weight.

Note: This product is also available with a High Strength cap. For more information, please contact your local Dyno Nobel sales representative.

Case Dimensions

Detpak Case (DC)	48 x 45 x 26 cm	18¾ x 17¾ x 10¼ in
Detpak (D)		
subpack	44 x 22 x 25 cm	17 ½ x 8 ¾ x 10 in
strapped case	44 x 45 x 25 cm	17 ½ x 17 ⅝ x 10 in

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NONEL® EZTL™

Technical Information

Nonelectric Trunkline Delay Detonators



Product Description

NONEL® nonelectric delay detonator EZTL™ units consist of a length of yellow shock tube, with a surface detonator attached to one end and the other end sealed. The detonator is housed in a plastic EZ Connector block which facilitates easy connection to shock tube. A white J-hook is affixed near the sealed end. Easy-to-read, color-coded delay tags display the delay number and nominal firing time prominently.

EZTL detonators are designed for use with NONEL MS and EZ DET® units to provide effective and accurate surface timing between blastholes and/or rows of blastholes in surface and underground blasting designs.

Application Recommendations

For detailed application recommendations, **ALWAYS** request a copy of Dyno Nobel's *Product Manual: NONEL® and PRIMACORD®* from your Dyno Nobel representative.

- **ALWAYS** be sure that the shock tube(s) are securely inserted, one at a time, into the plastic EZ connector. The head of the connector block should rise to accept the tube, and return to a closed position with an audible click.
- **ALWAYS** ensure that the individual shock tubes remain aligned side by side in the EZ connector channel and do not cross over one another during insertion.
- **ALWAYS** protect the plastic EZ connector and all shock tube leads from impact or

Properties

MSDS #1122

Net Explosive Content per 100 units 0.0240 kg
0.0529 lbs

Delay Time (msec)	Connector Block Color
9	Green
17	Yellow
25	Red
33	Green
42	White
67	Blue
100	Black
109	Black

Hazardous Shipping Description

Detonator assemblies nonelectric,
1.4B, UN 0361 PG II



See Product Disclaimer on page 2.

DYNO® Dyno Nobel

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NONEL® EZTL™

Technical Information

Application Recommendations (continued)

damage. Use care when placing blasting mats and cover material on top of the blasting circuit. The EZ connector contains a detonator and is subject to detonation caused by abuse such as impact. Shock tube which has been cut, ruptured or damaged may cause misfires.

- **NEVER** use NONEL EZTL detonators with detonating cord. The low strength surface detonator will not initiate detonating cord.
- **NEVER** attempt to disassemble the delay detonator from the EZ connector block or use the detonator without the connector.
- **NEVER** place more than 6 shock tube leads into an EZ connector block. Misfires may result.
- **NEVER** tie-in NONEL EZTL units until all holes have been primed, loaded, stemmed and the blast site has been cleared.

Transportation, Storage and Handling

- NONEL EZTL must be transported, stored, handled and used in conformity with all federal, state, provincial and local laws and regulations.
- For maximum shelf life (3 years), NONEL EZTL must be stored in a cool, dry, well ventilated magazine. Explosive inventory should be rotated. Avoid using new materials before the old. For recommended good practices in transporting, storing, handling and using this product, see the booklet "Prevention of Accidents in the Use of Explosive Materials" packed inside each case and the Safety Library Publications of the Institute of Makers of Explosives.

Packaging

Length		Case Type	Quantity / Case	
m	ft		case	subpack
2.5	10	D	180	90
3.5	12	D	180	90
6	20	D	150	75
9	30	D	120	60
12	40	D	100	50
15	50	D	90	45
18	60	D	70	35

- Length rounded to nearest one-half meter.
- Case weight varies by length & delay; see case label for exact weight.

Case Dimensions

Detpak (D)

subpack	44 x 22 x 25 cm	17½ x 8¾ x 10 in
strapped case	44 x 45 x 25 cm	17½ x 17⅝ x 10 in

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TROJAN® SPARTAN® SR™

Technical Information

Shock Resistant Cast Booster



Product Description
TROJAN SPARTAN SR cast boosters are detonator sensitive, high density, high energy molecular explosives available in three sizes designed to optimize initiatiion of all booster detonator sensitive explosives.

In addition to the internal through-tunnel and detonator well, the TROJAN SPARTAN SR (Shock Resistant) cast booster has an internal sleeve to protect the circuit board in electronc detonators and is designed specifically for use with Dyno Nobel's DigiShot®, DigiShot Plus and SmartShot® electronic detonators. The Trojan Spartan SR can, however, also be used with any detonator (minimum length = 8.89 cm / 3.5 in) that may require additional protection from high shock, water hammer, effects during decking, corner operations or in certain geologies

The TROJAN SPARTAN SR (Shock Resistant) cast booster also incorporates the unique Caplock™ feature which holds the detonator in place more securely and makes it more difficult for the detonator to be pulled out of capwell position while it is being lowered into the borehole. Even with this new Caplock feature, the detonator can still be removed if necessary.

Properties

MSDS #1108

Density	(g/cc) Avg	1.65
Velocity	(m/sec)	7,550
	(ft/s)	24,800
Detonation Pressure (Kbars)		235
Water Resistance		6 months with no loss of sensitivity
Shelf Life Maximum		5 years (from date of production)
Maximum Usage Temperature		65°C (150°F)

All Dyno Nobel Inc. energy and gas volume values except Velocity and Detonation Pressure are calculated using PRODET™ the computer code developed by Dyno Nobel Inc. for its exclusive use. Other computer codes may give different values.

Velocity and Detonation Pressure are the result of empirical methods during May 2009.

IMPORTANT!!! WARNING!!!!! IMPORTANT!!!!!

NEVER USE A DETONATOR LESS THAN 8.89 CM / 3.5 in LONG WITH THE TROJAN SPARTAN SR CAST BOOSTER. MISFIRES MAY RESULT.

Product Description continued
TROJAN SPARTAN SR cast boosters are formulated from the highest quality PETN and other high explosive materials ensuring reliability, consistency and durability in all blasting environments.
The fluorescent yellow container makes the TROJAN SPARTAN booster more visible on the blast site and reduces the possibility of misplaced charges.

Hazardous Shipping Description
UN 0042 Boosters, 1.1D PG II



See Product Disclaimer on page 2.

DYNO Dyno Nobel
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TROJAN® SPARTAN® SR™

Technical Information

Application Recommendations

- **NEVER** force the detonator into the through-tunnel, the detonator-well or otherwise attempt to clear these areas if obstructed. If the through-tunnel or detonator-well does not accommodate the detonator, do not use the booster. Notify your Dyno Nobel representative.
- **ALWAYS** use a detonator with a minimum length of 8.89 cm (3.5 in). The detonator well length is 10.2 cm (4.0 in).
- Extremely low temperatures do not affect the performance of cast boosters with commercial detonators. Low temperatures do affect detonators and detonating cord. Be certain your initiation system is suitable for your application in extremely low temperatures. Cast boosters are more susceptible to breakage during handling in extremely cold temperatures.

Transportation, Storage and Handling

- Dyno Nobel cast boosters must be transported, stored, handled and used in conformity with all federal, state, provincial and local laws and regulations.
- For maximum shelf life (5 years), Dyno Nobel cast boosters must be stored in a cool, dry, well ventilated magazine. Explosive inventory should be rotated. Avoid using new materials before the old.

Packaging

Unit Weight		Unit Dimensions				Case Quantity	Gross Weight/ Case	
		Length		Diameter				
g	oz	cm	in	cm	in		kg	lbs
350	12	11.9	4.7	5.0	2.0	49	16.9	39.5
400	14	11.9	4.7	5.5	2.2	40	16.7	36.8
450	16	11.9	4.7	5.8	2.3	36	16.9	37.3

Note: All weights and dimensions are approximate.

Case Dimensions

42 x 33 x 14 cm 16 ½ x 13 x 5 ½ in

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DYNO® Dyno Nobel
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TROJAN SPARTAN®

Technical Information

BOOSTERS • CORDS

Cast Booster



Product Description
TROJAN SPARTAN cast boosters are detonator sensitive, high density, high energy molecular explosives avaliable in various sizes designed to optimize initiation of all booster sensitive explosives. All TROJAN SPARTAN boosters are manufactured with an internal through-tunnel and detonator well for easy application with either electric, electronic or nonelectric detonators or 10.6 g/m (50 gr/ft) minimum strength detonating cord.

TROJAN SPARTAN boosters are formulated from the highest quality PETN and other high explosive materials ensuring reliability, consistency and durability in all blasting environments. The fluorescent green container and clear printing makes the TROJAN SPARTAN booster more visible on the blast site (as well as in low light situations) and reduces the possibility of misplaced charges. The redesigned Caplock™ holds the detonator in place more securely and makes it more difficult for the detonator to be pulled out of the capwell position while it is being lowered into the borehole.

Application Recommendations
- **NEVER** force the detonator into the through-tunnel, the detonator-well or otherwise attempt to clear these areas if obstructed. If the through-tunnel or detonator-well does not accommodate the detonator, do not use the booster. Notify your Dyno Nobel representative.

Properties

MSDS #1108

Density	(g/cc) Avg	1.65
Velocity	(m/sec)	7,550
	(ft/s)	24,800
Detonation Pressure (Kbars)		235
Water Resistance		6 months with no loss of sensitivity
Shelf Life Maximum		5 years (from date of production)
Maximum Usage Temperature		60°C (150°F)

All Dyno Nobel Inc. energy and gas volume values except Velocity and Detonation Pressure are calculated using PRODET™ the computer code developed by Dyno Nobel Inc. for its exclusive use. Other computer codes may give different values.

Velocity and Detonation Pressure are the result of empirical methods during May 2009.

Hazardous Shipping Description
UN 0042 Boosters, 1.1D PG II



TROJAN® SPARTAN®

Technical Information

Application Recommendations (continued)

- **ALWAYS** use detonating cord with a coreload of 10.6 g/m (50 gr/ft) or higher when initiating the TROJAN SPARTAN booster with detonating cord.
- Minimum detonator is No. 8 strength for temperatures above -40º C (-40º F). A high strength detonator is recommended for temperatures below -40º C (-40º F).
- Extremely low temperatures do not affect the performance of cast boosters with commercial detonators. Low temperatures do affect detonators and detonating cord. Be certain your initiation system is suitable for your application in extremely low temperatures. Cast boosters are more susceptible to breakage during handling in extremely cold temperatures.

Transportation, Storage and Handling

- Dyno Nobel cast boosters must be transported, stored, handled and used in conformity with all federal, state, provincial and local laws and regulations.
- For maximum shelf life (5 years), Dyno Nobel cast boosters must be stored in a cool, dry, well ventilated magazine. Explosive inventory should be rotated. Avoid using new materials before the old.

Packaging

Unit Weight		Unit Dimensions				Case Quantity	Gross Weight/ Case	
		Length		Diameter				
g	oz	cm	in	cm	in		kg	lbs
90	3.2	11.9	4.7	2.7	1.1	150	14.0	30.8
150	5.5	11.9	4.7	3.6	1.4	95	16.7	36.7
200	7	11.7	4.6	4.1	1.6	72	16.5	36.4
350	12	11.9	4.7	5.0	2.0	49	17.9	39.5
400	14	11.9	4.7	5.5	2.2	40	17.6	38.8
450	16	11.9	4.7	5.8	2.3	36	17.8	39.2
900	32	12.9	5.1	7.9	3.1	18	17.8	39.2

Note: All weights and dimensions are approximate.

Case Dimensions

42 x 33 x 14 cm 16 ½ x 13 x 5 ½ in

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DYNOMAX™ PRO

Extra Gelatin Nitroglycerin Dynamite

Technical Information



Product Description

DYNOMAX PRO is desensitized extra gelatin dynamite designed to satisfy the majority of explosive application requirements. DYNOMAX PRO is formulated to consistently deliver high detonation velocity and excellent water resistance while reducing cartridge to cartridge gap sensitivity and hole-to-hole propagation problems. DYNOMAX PRO is recommended for bottom loading and as the main explosive charge where high density and energy is required. DYNOMAX PRO is recommended for use as booster, bottom load or floor control solution.

Application Recommendations

- DYNOMAX PRO is an excellent primer for Dynomix (ANFO), Dynomix WR (WR ANFO) or other detonator sensitive packaged product and can be used as a secondary primer in hard seams or at the top of the explosive column.
- Minimum diameter is 32 mm (1¼ in).
- Minimum detonator is No. 8 strength.
- DYNOMAX PRO has been formulated to reduce susceptibility to sympathetic detonation when applied in very wet conditions where boreholes are closely spaced and/or where geological conditions promote this effect. Consult your Dyno Nobel representative for product recommendations where these conditions exist.
- Storage at elevated temperatures and/or high humidity for 12-18 months can reduce the performance of DYNOMAX PRO depending on the diameter. Consult your Dyno Nobel representative for specific recommendations.

Properties

MSDS #1019

Density	(g/cc) Avg	1.45
Energy[a]	(cal/g)	1,055
	(cal/cc)	1,510
Relative Weight Strength[a]		1.20
Relative Bulk Strength[a,b]		2.10
Velocity[c]	(m/s)	6,000
	(ft/s)	19,700
Detonation Pressure[c]	(Kbars)	130
Gas Volume[a]	(moles/kg)	32
Water Resistance		Excellent
Fume Class[d]		IME1

[a] All Dyno Nobel Inc. energy and gas volume values are calculated using PRODET™ the computer code developed by Dyno Nobel Inc. for its exclusive use. Other computer codes may give different values.
[b] ANFO = 1.00 @ 0.82 g/cc
[c] Unconfined @ 50 mm (2 in) diameter.
[d] IME Fume Class 1 in convolute paper shell only. Not Fume Class 1 in paper tube shell. Natural Resources Canada Fume Class approvals pending.

Hazardous Shipping Description

Explosive, Blasting, Type A 1.1D UN 0081 II



See Product Disclaimer on page 2

DYNO Dyno Nobel

Groundbreaking Performance™

DYNOMAX™ PRO

Technical Information

Transportation, Storage and Handling

- For maximum shelf-life, DYNOMAX PRO dynamite must be stored in cool, dry and well-ventilated magazines. Explosive inventory should always be rotated by using the oldest materials first. For recommended good practices in transporting, storing, handling and using this product, see the booklet "Prevention of Accidents in the Use of Explosive Materials" packed inside each case and the Safety Library Publications of the Institute of Makers of Explosives.
- DYNOMAX PRO must be transported, stored, handled and used in conformity with all applicable federal, state, provincial and local laws and regulations.

Packaging

Diameter x Length		Qty / Case	Case Type	Nominal Case Weight	
mm	in			kg	lbs
32 x 200	1 1/4 x 8	88	DA	20	44
32 x 400	1 1/4 x 16	44	DA	20	44
40 x 200	1 1/2 x 8	60	DA	20	44
50 x 200	2 x 8	34	DB	20	43
50 x 400[a]	2 x 16 [a]	17	DB	20	43
65 x 400[a]	2 1/2 x 16 [a]	10	DB	19	41
75 x 200	3 x 8 [a]	16	DE	20	44
75 x 400[a]	3 x 16 [a]	8	DE	20	44

[a] Avaliable in spiral tube shell with tapered end. • Note: All weights are approximate.

**Available upon request. Check with your Dyno Nobel representative should you have any questions.

- Product density is 1.40 g/cc for package diameters less than 50mm (2 in). Use cartridge count to determine actual explosive charge weight.
- DYNOMAX PRO is available in a wide variety of sizes. Custom sizes are subject to surcharge and may require longer than usual lead times.

Case Dimensions

DA	17¾ x 13⅜ x 6⅜ in	34 x 34 x 17 cm
DB	17⅞ x 13⅜ x 5⅞ in	45 x 34 x 15 cm
DE	17⅝ x 13 5/16 x 6¾ in	45 x 34 x 17 cm

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DYNO Dyno Nobel

Groundbreaking Performance™

UNIMAX®

Technical Information

Extra Gelatin Nitroglycerin Dynamite



Product Description

UNIMAX is an extra gelatin dynamite formulated to consistently deliver high detonation velocity and excellent water resistance. UNIMAX is designed to satisfy the vast majority of explosive applications in hard rock and may be used as the main explosive charge where high density and energy is required or as a primer for ANFO.

Application Recommendations

- UNIMAX is an excellent primer for Dynomix (ANFO), Dynomix-WR (WR ANFO) or other detonator sensitive packaged product and can be used as a secondary primer in hard seams or at the top of the explosive column.
- Minimum diameter is 25 mm (1 in).
- Minimum detonator is No. 8 strength.
- Storage at elevated temperatures and/or high humidity for 1 to 6 months can reduce the performance of Unimax depending on the diameter. Consult your Dyno Nobel representative for specific recommendations.
- Dynamites are susceptible to sympathetic detonation when applied in very wet conditions where boreholes are closely spaced and/or where geological conditions promote this effect. Consult your Dyno Nobel representative for recommendations where these conditions exist.

Properties

MSDS #1019

Density	(g/cc) Avg	1.51
Energy[a]	(cal/g)	1,055
	(cal/cc)	1,510
Relative Weight Strength[a]		1.20
Relative Bulk Strength[a,b]		2.10
Velocity[c]	(m/s)	5,300
	(ft/s)	17,400
Detonation Pressure[c]	(Kbars)	106
Gas Volume[a]	(moles/kg)	32
Water Resistance		Excellent
Fume Class		IME1 & NRCan1[d]

[a] All Dyno Nobel Inc. energy and gas volume values are calculated using PRODET™ the computer code developed by Dyno Nobel Inc. for its exclusive use. Other computer codes may give different values.
[b] ANFO = 1.00 @ 0.82 g/cc
[c] Unconfined @ 50 mm (2 in) diameter.
[d] Approved by Natural Resources Canada as Fume Class 1.



Hazardous Shipping Description
Explosive, Blasting, Type A, 1.1D, UN 0081 II

See Product Disclaimer on page 2

DYNO Dyno Nobel
Groundbreaking Performance™

UNIMAX®

Technical Information

Transportation, Storage and Handling

- UNIMAX must be transported, stored, handled and used in conformity with all applicable federal, state, provincial and local laws and regulations.
- For maximum shelf-life, dynamite must be stored in cool, dry and well-ventilated magazines. Dynamite inventory should always be rotated by using the oldest materials first. For recommended good practices in transporting, storing, handling and using this product, see the booklet "Prevention of Accidents in the Use of Explosive Materials" packed inside each case and the Safety Library Publications of the Institute of Makers of Explosives.

Diameter x Length		Quantity / Case	Case Type	Nominal Case Weight	
mm	in			kg	lbs
25 x 200	1 x 8	140	DA	20.4	44.8
32 x 200	1 1/4 x 8	88	DA	20.0	44.0
32 x 400	1 1/4 x 16	44	DA	20.0	44.0
40 x 200	1 1/2 x 8	60	DA	19.4	42.6
40 x 400	1 1/2 x 16	30	DA	20.5	45.0
50 x 200	2 x 8	34	DB	19.3	42.5
50 x 400[a]	2 x 16[a]	17	DB	19.3	42.5
60 x 400[a]	2 1/4 x 16[a]	13	DA	18.1	39.8
65 x 400[a]	2 1/2 x 16[a]	10	DB	18.6	41.0
75 x 200	3 x 8	16	DE	19.9	43.7
75 x 400[a]	3 x 16[a]	8	DE	20.4	44.8

[a] Avaliable in spiral tube shell with tapered end.

- Note: all weights are approximate.
- Product density is 1.50 g/cc for package diameters less than 50 mm (2 in). Use cartridge count to determine actual explosive charge weight.
- UNIMAX is available in a wide variety of sizes. Custom sizes are subject to surcharge and may require longer than usual lead times.

**Available upon request. Check with your Dyno Nobel representative should you have any questions.

Case Dimensions

DA	45 x 34 x 17 cm	17¾ x 13⅜ x 6⅜ in
DB	45 x 34 x 15 cm	17⅞ x 13⅜ x 5⅞ in
DE	45 X 34 X 17 cm	17⅝ x 13 5/16 x 6¾ in

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BLASTEX®

Technical Information

PACKAGED EXPLOSIVES

Small & Large Diameter Cast Booster Sensitive Emulsion



Product Description

BLASTEX is a booster sensitive, water resistant, packaged emulsion explosive designed to satisfy a majority of medium diameter explosive applications for quarry and construction blasting. It is a cost effective alternative to most detonator sensitive, water resistant, packaged emulsion explosives. BLASTEX is available in two grades with increasing energy level for each.

Application Recommendations

- Package diameter and type affect product density. Use cartridge count to determine actual explosive charge weight.
- Ensure continuous column loading. For column lengths in excess of 6 m (20 ft) or whenever column separation is suspected, multiple priming is recommended.
- Emulsion explosives are susceptible to "dynamic shock" and may detonate at low order or fail completely when applied in very wet conditions, where explosive charges or decks are closely spaced and/or where geological conditions promote this effect. Consult your Dyno Nobel representative for alternate product recommendations when these conditions exist.
- **ALWAYS** use a cast booster as a primer for BLASTEX to ensure maximum performance.
- **ALWAYS** use a 340 g (12 oz) or larger cast booster at internal product temperatures higher than -18º C (0º F). At internal product temperatures below -18º C (0º F) and higher than -34º C (-30º F) use a 454 g (16 oz) or larger cast booster.
- **NEVER** use BLASTEX at internal product temperatures below -34º C (-30º F). At internal product temperatures below -34º C (-30º F), adequate product warm-up time must be allowed after loading into boreholes and before initiation.
- Use with detonating cord is not recommended.

Properties

MSDS #1063

		BLASTEX	BLASTEX PLUS
Density	(g/cc) Avg	1.26	1.26
Energy[a]	(cal/g)	740	800
	(cal/cc)	930	1,010
Relative Weight Strength[a]		0.84	0.91
Relative Bulk Strength[a,b]		1.29	1.40
Velocity[c]	(m/s)	5,000	4,900
	(ft/s)	16,400	16,100
Detonation Pressure[c]	(Kbars)	79	76
Gas Volume[a]	(moles/kg)	44	39
Fume Class		IME1 & NRCan[d]	IME1
Shelf Life Maximum		1 year (from date of production)	
Maximum Water Depth		45 m (150 ft)	
Water Resistance		Excellent	

[a] All Dyno Nobel Inc. energy and gas volume values are calculated using PRODET™ the computer code developed by Dyno Nobel Inc. for its exclusive use. Other computer codes may give different values.

[b] ANFO = 1.00 @ 0.82 g/cc

[c] Unconfined @ 75 mm (3 in) diameter

[d] Approved by Natural Resources Canada as Fume Class 1 in:
*valeron chub 50 mm (2 in) diameter and greater
*shot bag 125 mm (5 in) diameter and greater

Hazardous Shipping Description

Explosive, Blasting, Type E, 1.5D, UN 0332 II



See Product Disclaimer on page 2

DYNO® Dyno Nobel

Groundbreaking Performance™

BLASTEX®

Technical Information

PACKAGED EXPLOSIVES

Transportation, Storage and Handling

- BLASTEX and BLASTEX PLUS must be transported, stored, handled and used in conformity with all applicable federal, state, provincial and local laws and regulations.
- Packaged emulsions have a shelf life of one (1) year when stored at temperatures between -18º C and 38º C (0º F and 100º F). Explosive inventory should be rotated. Avoid using new materials before the old. For recommended good practices in transporting, storing, handling and using this product, see the booklet "Prevention of Accidents in the Use of Explosive Materials" packed inside each case ad the Safety Library Publications of the Institute of Makers of Explosives.

Packaging Details

- Package diameter and type affect product density. Use cartridge count to determine actual explosive charge weight.
- All weights are approximate.
- BLASTEX and BLASTEX PLUS are available in a wide variety of sizes. Custom sizes are subject to surcharge and may require longer than usual lead times.
- Check with your Dyno Nobel representative should you have any questions.

Packaging = Chub

Diameter x Length		Blastex	Blastex Plus	Case Quantity	Pallet Box Quantity	Case Weight		Net Explosive Weight / Chub	
mm	in					kg	lbs	kg	lbs
50 x 400	2 x 16	■	■	18	N/A	18.0	40	1.00	2.20
57 x 400	2¼ x 16	■	■	14	N/A	17.7	39	1.26	2.78
65 x 400	2½ x 16	■	■	12	N/A	18.1	40	1.51	3.33
65 x 862	2½ x 34	■		N/A	250	909	2,000	3.63	8.00
70 x 400	2¾ x 16	■	■	9	N/A	17.3	38	1.92	4.23
70 x 862	2¾ x 34	■		N/A	222	908	1,998	4.09	9.00
75 x 400	3 x 16	■	■	8	N/A	18.2	40	2.27	5.00
75 x 862	3 x 34	■		N/A	200	909	2,000	4.54	10.00
89 x 400	3½ x 16	■	■	6	N/A	16.7	37	2.77	6.11

Case Dimensions

44 x 35 x 20 cm 17.25 x 13.875 x 7.875 in

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Maine Drilling & Blasting

Setting Earth Shattering Standards
Since 1966

Safety Data Sheet

SECTION 1 – IDENTIFICATION

Name, Address, and Telephone of the Responsible Party

Date: 03/16/2018

Supersedes: 08/24/2015 & 09/2005

Maine Drilling & Blasting
88 Gold Ledge Ave,
Auburn, NH 03032

Phone: (207) 582-2338 Toll Free: (800) 370-2338

Product Identifier
Product Form: Mixture
Product Name: 1966 Emulsion Blend

Other Means of Identification
Product Class: Emulsion
Trade Names:
1966 Emulsion Blend

Intended Use of the Product
Industrial applications

Emergency Telephone Numbers: DAY: 603-647-0299
FOR 24 HOUR EMERGENCY, CALL CHEMTREC (USA) 800-424-9300
CANUTEC (CANADA) 613-996-6666

SECTION 2 – HAZARD(S) IDENTIFICATION

Classification of the Substance or Mixture
Classification (GHS-US)

Expl. 1.5	H205
Eye Irrit. 2A	H319
Carc. 2	H351
STOT RE 2	H373

Label Elements
GHS-US Labeling
Hazard Pictograms (GHS-US) :



GHS07 GHS08

Signal Word (GHS-US) : Danger

Hazard Statements (GHS-US) :
H205 - May mass explode in fire.
H319 - Causes serious eye irritation.
H351 – Contains materials suspected of causing cancer.
H373 - May cause damage to organs through prolonged or repeated exposure.

Precautionary Statements (GHS-US) :
P201 - Obtain special instructions before use.
P202 - Do not handle until all safety precautions have been read and understood.
P210 - Keep away from heat, hot surfaces, open flames, sparks. - No smoking.
P220 - Keep/Store away from combustible materials.
P221 - Take any precaution to avoid mixing with combustible materials.

P240 - Ground/bond container and receiving equipment. Consult manufacturer for detailed guidance on appropriate grounding/bonding.
P260 - Do not breathe dust, mist, vapors.
P264 - Wash hands, forearms and exposed areas thoroughly after handling.
P273 - Avoid release to the environment.
P280 - Wear eye protection, protective clothing, protective gloves.
P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308+P313 - If exposed or concerned: Get medical advice/attention.
P314 - Get medical advice/attention if you feel unwell.
P337+P313 - If eye irritation persists: Get medical advice/attention.
P370+P378 - In case of fire: Do NOT attempt to fight fire.
P370+P380 - In case of fire: Evacuate area.
P372 - Explosion risk in case of fire.
P373 - DO NOT fight fire when fire reaches explosives.
P401 - Store as defined in the Explosives Act of Canada and the provisions of the Bureau of Alcohol, Tobacco and Firearms regulations contained in 27 CFR Part 555..
P405 - Store locked up.
P501 - Dispose of contents/container in accordance with local, regional, national, territorial, provincial, and international regulations.

SECTION 3 - COMPOSITION/INFORMATION ON INGREDIENTS

Mixture

Name	Product identifier	% (w/w)	Ingredient Classification (GHS-US)
Ammonium nitrate	(CAS No) 6484-52-2	65 - 90	Ox. Sol. 3, H272 Eye Irrit. 2A, H319
Fuel oil / mineral oil blend	(CAS No) 68476-30-2	3 - 9	Flam. Liq. 3, H226 Acute Tox. 4 (Inhalation:dust,mist), H332 Skin Irrit. 2, H315 Carc. 2, H351 STOT RE 2, H373 Asp. Tox. 1, H304 Aquatic Acute 3, H402 Aquatic Chronic 2, H411
Polymeric Surfactant	NA	0.5 – 2	Not available

More than one of the ranges of concentration prescribed by Controlled Products Regulations has been used where necessary, due to varying composition.
Ingredients, other than those mentioned above, as used in this product are not hazardous as defined under current Department of Labor regulations, or are present in deminimus concentrations (less than 0.1% for carcinogens, less than 1.0% for other hazardous materials).

SECTION 4 - FIRST AID MEASURES

Description of First Aid Measures

General: Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible).

Inhalation: Remove to fresh air and keep at rest in a position comfortable for breathing. Obtain medical attention if breathing difficulty persists.

Skin Contact: Remove contaminated clothing and wash before reuse. Gently wash with plenty of soap and water.

Eye Contact: Rinse cautiously with water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Obtain medical attention if irritation develops or persists.

Ingestion: Rinse mouth. Do not induce vomiting. Immediately call a POISON CENTER or doctor/physician.
Most Important Symptoms and Effects Both Acute and Delayed
General: May cause serious eye irritation. Contains material suspected of causing cancer. May cause damage to organs through prolonged or repeated exposure.
Inhalation: May cause respiratory irritation.
Skin Contact: May cause skin irritation.
Eye Contact: May cause serious eye irritation.
Ingestion: Ingestion is likely to be harmful or have adverse effects.
Chronic Symptoms: Contains material suspected of causing cancer. May cause damage to organs through prolonged or repeated exposure.
Indication of Any Immediate Medical Attention and Special Treatment Needed
If exposed or concerned, get medical advice and attention. If ingested, causes methemoglobenemia – emergency response should treat appropriately, such as by intravenous administration of methylene blue.

SECTION 5 - FIRE-FIGHTING MEASURES

Extinguishing Media
Suitable Extinguishing Media: DO NOT FIGHT FIRES INVOLVING EXPLOSIVES.
Unsuitable Extinguishing Media: Do not attempt to fight fires involving explosive materials. Evacuate all personnel to a predetermined safe location, no less than 2,500 feet in all directions.
Special Hazards Arising From the Substance or Mixture
Fire Hazard: Can explode or detonate under fire conditions. Burning material may produce toxic vapors.
Explosion Hazard: Explosion risk in case of fire. This product is an explosive with mass detonation hazard. Heat may build pressure, rupturing closed containers, spreading fire and increasing risk of burns and injuries.
Reactivity: Stable under normal conditions. May explode when subjected to fire, supersonic shock or high-energy projectile impact, especially when confined or in large quantities.
Advice for Firefighters
Firefighting Instructions: DO NOT ATTEMPT TO FIGHT FIRES INVOLVING EXPLOSIVE MATERIALS. Evacuate all personnel to a predetermined safe location, no less than 2,500 feet in all directions. Can explode or detonate under fire conditions. Burning material may produce toxic vapors.
Hazardous Combustion Products: Carbon Monoxide (CO) and Nitrogen Oxides (NOx)
Reference to Other Sections: Refer to section 9 for flammability properties.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures
General Measures: Avoid all contact with skin, eyes, or clothing. Avoid breathing (vapor, mist, dust).
For Non-Emergency Personnel
Protective Equipment: Use appropriate personal protection equipment (PPE).
Emergency Procedures: Evacuate unnecessary personnel.
For Emergency Personnel
Protective Equipment: Use appropriate personal protection equipment (PPE).
Emergency Procedures: Stop release if safe to do so. Eliminate ignition sources. Ventilate area.

Environmental Precautions
Prevent entry to sewers and public waters.

Methods and Material for Containment and Cleaning Up
For Containment: Contain any spills with dikes to prevent migration and entry into sewers or streams. Do not use combustible absorbents and do not mix with other materials.
Methods for Cleaning Up: Collect spillage for possible reuse. Clean up spills immediately and dispose of waste in accordance with appropriate Federal, State and local regulations.
Reference to Other Sections
See heading 8, Exposure Controls and Personal Protection

SECTION 7 - HANDLING AND STORAGE

Precautions for Safe Handling

General: It is recommended that users of explosives material be familiar with the Institute of Makers of Explosives Safety Library publications. Comply with the safety library publication No. 4 “Warnings and Instructions” as adopted by the Institute of Makers of Explosives.

Hygiene Measures: Handle in accordance with good industrial hygiene and safety procedures. Wash hands and forearms thoroughly after handling. Do not eat, drink or smoke when using this product.

Conditions for Safe Storage, Including Any Incompatibilities

Technical Measures: Contact manufacturer for appropriate grounding/bonding guidance. Comply with applicable regulations.

Storage Conditions: Store as defined in the Explosives Act of Canada and the provisions of the Bureau of Alcohol, Tobacco and Firearms regulations contained in 27 CFR Part 555. Store in a dry, cool and well-ventilated place. Keep/Store away from direct sunlight, extremely high or low temperatures, heat sources, ignition sources. Keep container closed when not in use. Store locked up.

Incompatible Materials: Strong acids. Strong bases. Strong oxidizers. Zinc. Copper and its alloys. Organic materials. Combustible materials.

SECTION 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION

Control Parameters

For substances listed in section 3 that are not listed here, there are no established exposure limits from the manufacturer, supplier, importer, or the appropriate advisory agency including: ACGIH (TLV), NIOSH (REL), or OSHA (PEL).

Fuels, diesel, no. 2 (68476-30-2)

USA ACGIH	ACGIH TWA (mg/m³)	100 mg/m³ (inhalable fraction and vapor, as total hydrocarbons) 8 h (skin)
USA ACGIH	ACGIH chemical category	Skin - potential significant contribution to overall exposure by the cutaneous route, Confirmed Animal Carcinogen with Unknown Relevance to Humans

Exposure Controls

Appropriate Engineering Controls: Ventilation System: Indoors: A system of local and / or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, Industrial Ventilation, A Manual of Recommended Practices, most recent edition, for details. Use explosion-proof equipment. / Outdoors: Work upwind.

Personal Protective Equipment: Personal Respirators (NIOSH Approved): A respirator is not needed under normal and intended conditions of use. If the exposure limit is exceeded and engineering controls are not feasible, use a mask with an organic vapor cartridge or positive pressure air supplied (SCBA) unit. Breathing air quality must meet the requirements of the OSHA respiratory protection standard (29CFR1910.134).



Skin Protection: Gloves and additional protection including impervious boots, apron, or coveralls, as needed in areas of unusual exposure - Neoprene, PVC.

Eye Protection: Use chemical safety goggles and / or a full face shield where splashing is possible.

Hygiene Measures: Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

Information on Basic Physical and Chemical Properties

Physical State	:	Solid
Appearance	:	White to tan colored thick cream. If aluminim is present, gray metal particles will be visible. If ammonium nitrate prill is present, white to tan colored granules will be visible.
Odor	:	Slight odor of fuel oil
Odor Threshold	:	Not available
pH	:	Not available
Evaporation Rate	:	Not available
Melting Point	:	Not available
Freezing Point	:	Not available
Boiling Point	:	Not available
Flash Point	:	165 °F (74 °C) (PMCC)
Auto-ignition Temperature	:	Not available
Decomposition Temperature	:	Not available
Flammability (solid, gas)	:	Not available
Lower Flammable Limit	:	Not available
Upper Flammable Limit	:	Not available
Vapor Pressure	:	Not available
Relative Vapor Density at 20 °C	:	Not available
Density	:	Not available
Specific Gravity	:	1.20 – 1.30
Solubility	:	Not available
Partition Coefficient: N-Octanol/Water	:	Not available
Viscosity	:	Not available
Explosive properties	:	Explosive; fire, blast or projection hazard
Explosion Data – Sensitivity to Mechanical Impact	:	Not expected to present an explosion hazard due to mechanical impact.
Explosion Data – Sensitivity to Static Discharge	:	Not expected to present an explosion hazard due to static discharge.

SECTION 10 - STABILITY AND REACTIVITY

Reactivity: May cause or intensify fire; oxidizer. May accelerate the burning of other combustible materials. Contact with organic material or combustible material may cause an explosive situation.

Chemical Stability: Stable under recommended handling and storage conditions (see section 7). May explode when subjected to fire, supersonic shock or high-energy projectile impact, especially when confined or in large quantities.

Possibility of Hazardous Reactions: Hazardous polymerization will not occur.

Conditions to Avoid: Avoid temperatures above (212°F (100°C).

Incompatible Materials: Avoid all contamination, especially peroxides and chlorates. Alkaline contamination may liberate ammonia fumes.

Hazardous Decomposition Products: Gaseous nitrogen oxides and carbon oxides: Toxic decomposition products including carbon monoxide (CO) may migrate to off blast-site areas.

SECTION 11 - TOXICOLOGICAL INFORMATION

Information on Toxicological Effects - Product

Acute Toxicity: Not classified

LD50 and LC50 Data: Not available

Skin Corrosion/Irritation: Not classified
Serious Eye Damage/Irritation: Causes serious eye irritation.
Respiratory or Skin Sensitization: Not classified
Germ Cell Mutagenicity: Not classified
Teratogenicity: Not classified
Carcinogenicity: Contains an ingredient suspected of causing cancer.
Specific Target Organ Toxicity (Repeated Exposure): May cause damage to organs through prolonged or repeated exposure.
Reproductive Toxicity: Not classified
Specific Target Organ Toxicity (Single Exposure): Not classified
Aspiration Hazard: Not classified
Symptoms/Injuries After Inhalation: May cause respiratory irritation.
Symptoms/Injuries After Skin Contact: May cause skin irritation.
Symptoms/Injuries After Eye Contact: May cause serious eye irritation.
Symptoms/Injuries After Ingestion: Ingestion is likely to be harmful or have adverse effects. Overexposure to this material may result in methemoglobinemia. Methemoglobinemia decreases the blood's ability to carry oxygen and results in symptoms such as dizziness, drowsiness, headache, shortness of breath, blue skin and lips, rapid heart rate, unconsciousness, and possibly death.
Chronic Symptoms: Contains an ingredient suspected of causing cancer. May cause damage to organs through prolonged or repeated exposure.

Information on Toxicological Effects - Ingredient(s)

LD50 and LC50 Data:

Fuels, diesel, no. 2 (68476-30-2)	
LD50 Oral Rat	18.7 - 24.9 ml/kg
LD50 Dermal Rabbit	> 4300 mg/kg
ATE US (dust, mist)	3.60 mg/l/4h
Ammonium nitrate (6484-52-2)	
LD50 Oral Rat	2217 mg/kg
LC50 Inhalation Rat	> 88.8 mg/l/4h

SECTION 12: ECOLOGICAL INFORMATION

Toxicity
Ecology - General: This material is hazardous to the aquatic environment. Keep out of sewers and waterways.
Ecology - Water: Harmful to aquatic life with long lasting effects.

Fuels, diesel, no. 2 (68476-30-2)	
LC50 Fish 1	57 mg/l (Exposure time: 96 h - Species: Pimephales promelas [flow-through])

Persistence and Degradability Not available
Bioaccumulative Potential

Ammonium nitrate (6484-52-2)	
BCF fish 1	(no bioaccumulation expected)
Log Pow	-3.1 (at 25 °C)

Mobility in Soil Not available
Other Adverse Effects
Other Information: Avoid release to the environment.

SECTION 13 - DISPOSAL CONSIDERATIONS

Waste Treatment Methods: Uncontaminated and contaminated material may be placed in large diameter boreholes and detonated so that the explosive energy is utilized as originally intended. Dispose of under direct supervision of a qualified person according to local, state and federal regulations. Call Maine Drilling & Blasting Safety and Compliance

Department for recommendations and assistance.

Additional Considerations: This material may become a hazardous waste under certain conditions and must be collected, labeled and disposed of per state and federal hazardous waste regulations.

SECTION 14 - TRANSPORT INFORMATION

In Accordance with DOT

Proper Shipping Name : EXPLOSIVE, BLASTING, TYPE E (AGENT, BLASTING, TYPE E)
Hazard Class : 1.5D
Identification Number : NA0332
Label Codes : 1.5D



Packing Group : II
ERG Number : 140

In Accordance with IMDG

Proper Shipping Name : EXPLOSIVE, BLASTING, TYPE E (AGENT, BLASTING, TYPE E)
Hazard Class : 1
Identification Number : UN0332
Label Codes : 1.5D
EmS-No. (Fire) : F-B
EmS-No. (Spillage) : S-Y



In Accordance with IATA

Proper Shipping Name : AGENT, BLASTING TYPE E
Identification Number : UN0332
Hazard Class : 1
Label Codes : 1.5D



ERG Code (IATA) : 1L

In Accordance with TDG

Proper Shipping Name : EXPLOSIVE, BLASTING, TYPE E
Packing Group : II
Hazard Class : 1.5D
Identification Number : UN0332
Label Codes : 1.5D



SECTION 15 - REGULATORY INFORMATION

US Federal Regulations

MDB Blend 1966

SARA Section 311/312 Hazard Classes	Immediate (acute) health hazard Delayed (chronic) health hazard Sudden release of pressure hazard Fire hazard

Fuels, diesel, no. 2 (68476-30-2)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

Ammonium nitrate (6484-52-2)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

SARA Section 313 - Emission Reporting

US State Regulations
Fuels, diesel, no. 2 (68476-30-2)
U.S. - New Hampshire - Regulated Toxic Air Pollutants - Ambient Air Levels (AALs) - 24-Hour U.S. - New Hampshire - Regulated Toxic Air Pollutants - Ambient Air Levels (AALs) - Annual U.S. - New Jersey - Discharge Prevention - List of Hazardous Substances U.S. - New Jersey - Environmental Hazardous Substances List RTK - U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - California - Safer Consumer Products - Initial List of Candidate Chemicals and Chemical Groups U.S. - Texas - Effects Screening Levels - Long Term U.S. - Texas - Effects Screening Levels - Short Term
Ammonium nitrate (6484-52-2)
U.S. - Massachusetts - Right To Know List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List U.S. - Pennsylvania - RTK (Right to Know) List

Canadian Regulations 1966 Emulsion Blend	
WHMIS Classication	**Note: Explosives are not regulated under WHMIS. They are subject to the regulations of the Explosives Act of Canada.**

Canadian Regulations MDB Blend 1966	
WHMIS Classication	**Note: Explosives are not regulated under WHMIS. They are subject to the regulations of the Explosives Act of Canada.**
Fuels, diesel, no. 2 (68476-30-2)	
Listed on the Canadian DSL (Domestic Substances List)	
WHMIS Classification	Class B Division 3 - Combustible Liquid Class D Division 2 Subdivision A - Very toxic material causing other toxic effects Class D Division 2 Subdivision B - Toxic material causing other toxic effects Class D Division 1 Subdivision B - Toxic material causing immediate and serious toxic effects
Ammonium nitrate (6484-52-2)	
Listed on the Canadian DSL (Domestic Substances List)	
WHMIS Classification	Class C - Oxidizing Material Class D Division 2 Subdivision B - Toxic material causing other toxic effects
WHMIS Classification	Class B Division 6 - Reactive Flammable Material Class B Division 4 - Flammable Solid

SECTION 16: OTHER INFORMATION, INCLUDING DATE OF PREPARATION OR LAST REVISION

Revision Date : 08/24/2015

Other Information : This document has been prepared in accordance with the SDS requirements of the OSHA Hazard Communication Standard 29 CFR 1910.1200.

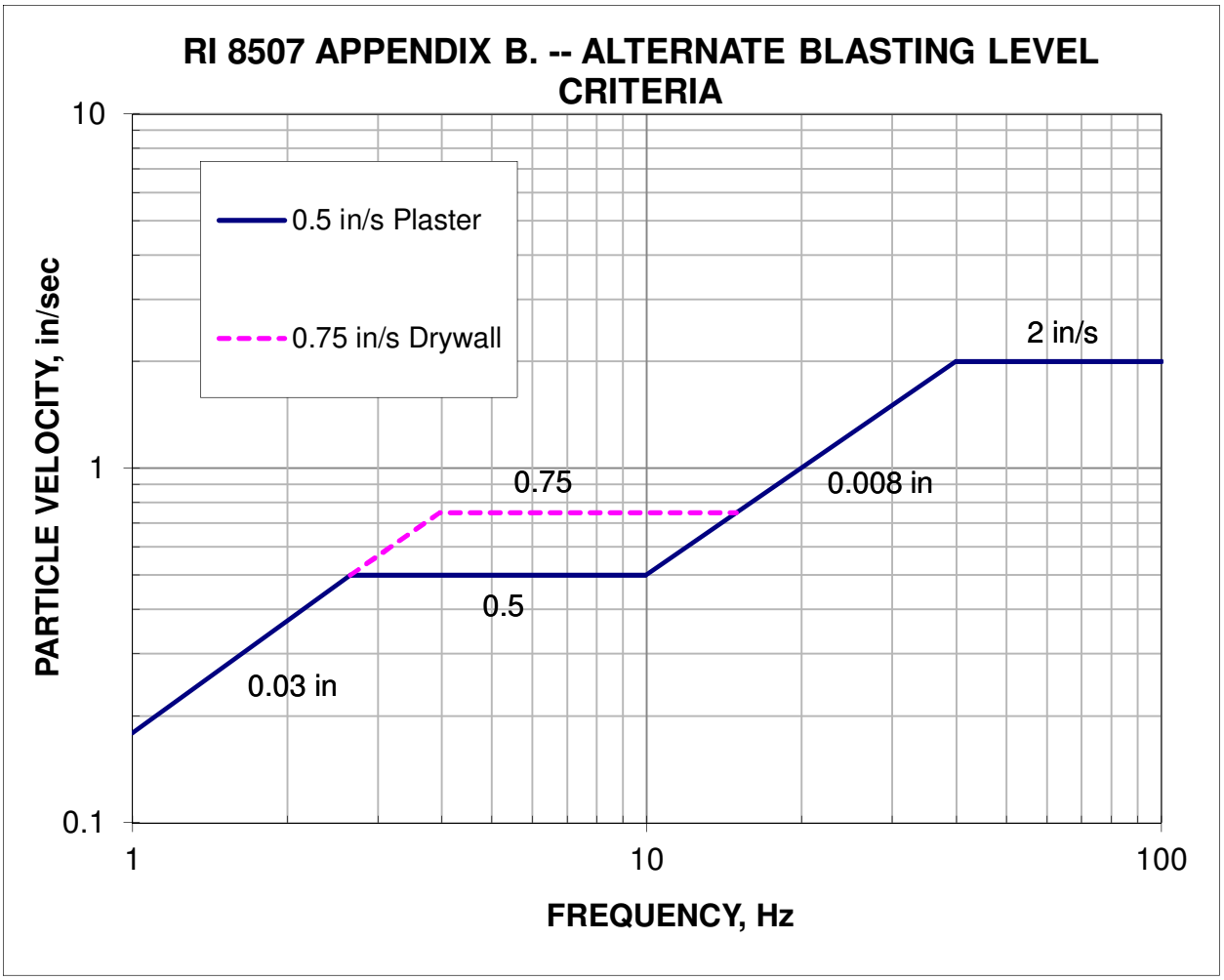
Party Responsible for the Preparation of This Document

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USBM Appendix B Alternative Blasting Level Criteria


RI 8507 APPENDIX B. -- ALTERNATE BLASTING LEVEL CRITERIA
10
1
0.1
PARTICLE VELOCITY, in/sec
0.5 in/s Plaster
0.75 in/s Drywall
2 in/s
0.75
0.008 in
0.5
0.03 in
1
10
100
FREQUENCY, Hz

APPENDIX B.-ALTERNATIVE BLASTING LEVEL CRITERIA

Safe blasting vibration criteria were developed for residential structures, having two frequency ranges and a sharp discontinuity at 40 Hz (table 13). There are blasts that represent an intermediate frequency case, being higher that the structure resonance (4 to 12 Hz) and lower that 40 Hz. The criteria of table 13 apply equally to a 35-Hz and a 10-Hz ground vibration, although the responses and damage potentials are very much different.

Using both the measured structure amplifications (fig. 39) and damage summaries (figs. 52 and 54), a smoother set of criteria was developed. These criteria have more severe measuring requirements, involving both displacement and velocity (fig. B-1).

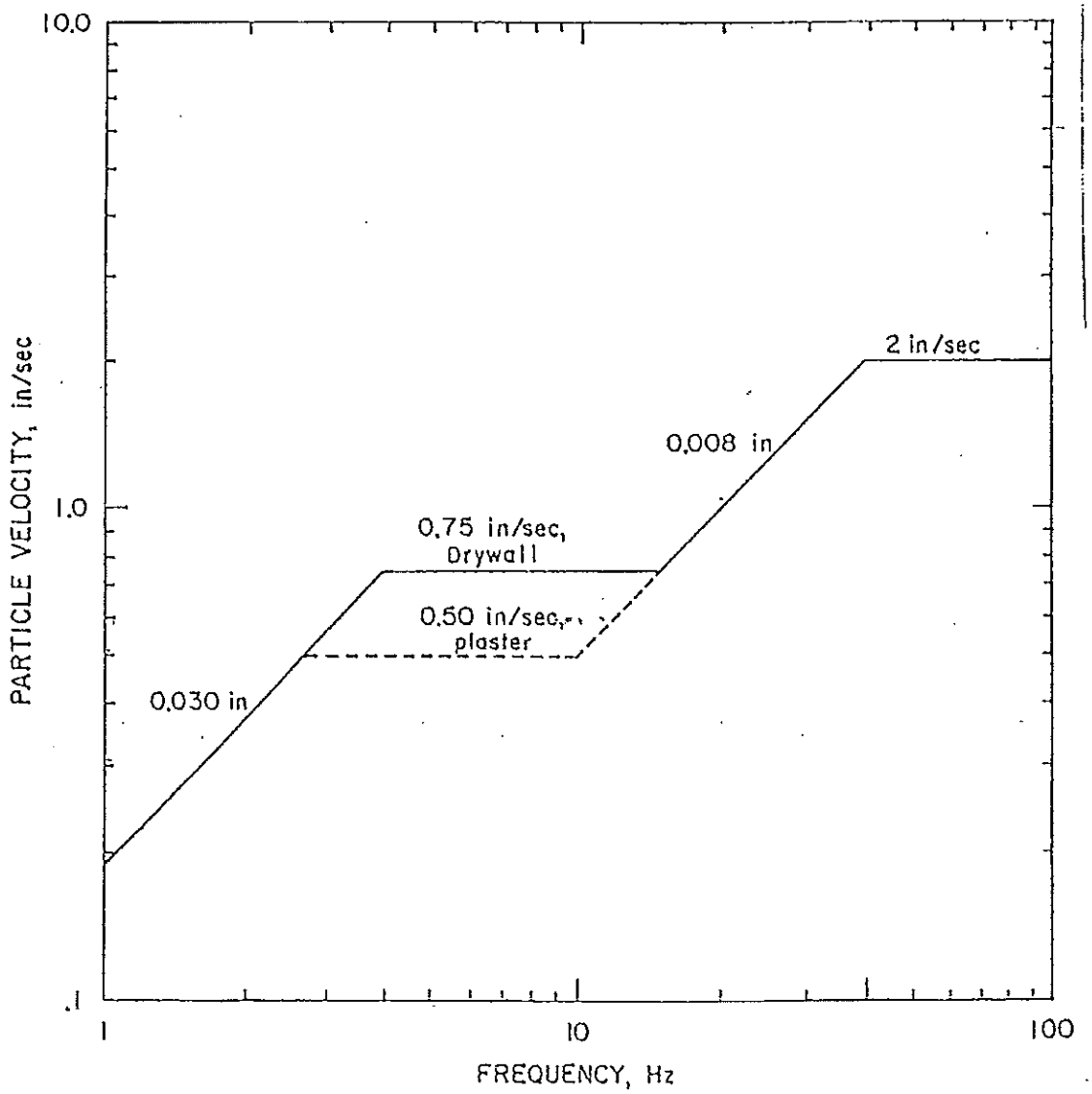


Figure B–1.—Safe levels of blasting vibration for houses using a combination of velocity and displacement.

Maine Drilling & Blasting

Sample Blast Report

Maine Drilling & Blasting

Blast Report

Job#		Cust. PO#	N/A
Date		Cust. Supt. Name	0
Customer Name		Pick Tkts#	0 N/A
Job Address		N/A	N/A N/A
		N/A	N/A N/A
State	Permit No.	Identify Hazards	
Pre Shift Insp.Time (24hrs) :		0	
Post Shift Insp.Time (24hrs):			
Blaster :		Precautions Taken:	
License #:		0	
Signature:			
		Weather Comments:	
		0	
No. of Crew Members	0		

Crew Members Names :

N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Seismograph Monitoring Plan (Not to Scale):

Sample

Shot # 0 Shot Time (24hrs) 0:00 Shot VideoTaped: N

Weather

Notes: N/A

Weather Conditions: N/A
Temp (°F): 0-0
Wind Direction: North
Wind Spd: 0-0 MPH

Preblast

Blast Direction: North
Blast Location: 0
Location of Structure: 0
Max Holes/Delay: 1
Max Weight/Delay: 1 Lbs
Predicted K Factor: 1
Scale Dist.: 1.00
Predicted PPV: 1.00

Measurement: Physical Measurement
Dist. to Closest (Ft) Structure 1 Railroad/Highway N/A Overhead Util N/A Underground Util N/A

Pay Quantities

Fire Detail # of Hrs: N/A

Pay Running Length 0 Feet
N/A N/A N/A
N/A N/A N/A

Pay Calculations Notes: 0

Shot Info

Configuration: 1 - Trench

Total Drill Depth(Ft) 1.00
Total SqFt 1.00
Powder Factor N/A Lbs/Cyd
Total Product Weight (Lbs) : N/A
Total Tons N/A
Total Yards 0.04
N/A Cyd/Lbs
Avg Weight / Hole (Lbs): N/A

Cal Method: Pattern
Holes: 1
Cover Used/No: N/A

	AVG		Min	Max
Drill Depth	1		1	1
Burden(Feet)	1	Feet	1	1
Spacing (Feet)	1	Feet	1	1
Hole Diameter	1		1	1
OverBurden (Ft)	1		1	1

Stone Weight	N/A /Cyd	Top Stemming	1	Min	1	Max
Type of Terrian	Flat	Charges/Hole	1	Min	1	Max
Type of Rock	Shale	Deck Stemming	N/A	Min	N/A	Max
Stemming Type	3/8" Crushed Stone	Charge Wgt/Deck	1	Min	1	Max
Height of Face	0	Depth of Water	0	Min	0	Max

Control Row Taped: N
Angled Holes /Face Bermed: N/N
Laser/BoreTracking: N

Total Pounds 0 Lbs

Type Of Initiation: Non-Electric

Sample

Please See Attached for Seismograph Report

Descripton: Example	
Elevation	**Feet**
Brench (ft)	N/A
Floor (ft)	N/A
Overburden (ft)	0
Sub Drilling(ft)	0
Total Depth (ft)	**N/A**

Descripton: Example	
Elevation	**Feet**
Brench (ft)	N/A
Floor (ft)	N/A
Overburden (ft)	0
Sub Drilling(ft)	0
Total Depth (ft)	**N/A**

N/A									
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N/A
N/A

Seismograhs

Operator Name	Location of Seis	Seis #	Monitor Log Status	Actual PPV	Actual PPV Freq,	Actual db	Actual Dist. (ft)	Actual K Factor
Walsh;Ryan W	0	7447	Triggered	N/A	N/A	N/A	1	N/A

Sample

Maine Drilling & Blasting

WoodsCan Electric Air Horn- Audible Device for Blast Notification

WoodsCan Industries Inc

WoodsCan Hornet

Rechargeable Electric Air Horn

The world's most advanced portable signaling device for industrial and commercial safety

I have been using the WoodsCan blasting horn on a daily basis for urban and downtown blasting procedures since it was first introduced. Never would I want to go back to an aerosol device. With the in-truck quick charge, I have never yet been in a position where my signal warning device fails to work. In my line of work this is imperative. Every blaster that I come in contact with either has one or wants one...they work!

Bruce Rowell - Western Grater Contracting, Ltd.



Reliable

- A consistent 120+ decibels of sound
- Reliable even in cold weather
- Improves crew productivity over disposable compressed gas air horns

Cost Effective

- Pays for itself within a few months
- Save hundreds the first year alone
- Save more each year thereafter

Safe

- No frostbite from leaking gas cans
- No more explosion risks in hot weather
- Transportable on an airplane

Go Green

- No more metal cans to dispose of
- No more tetrafluoroethane (potent greenhouse gas) discharged into the atmosphere
- Ozone friendly

WoodsCan Hornet product highlights:

- Cost-effective signaling device
- Extremely reliable – no more leaky gas cans
- Consistent 120 decibels of sound
- High intensity LED light
- Patented design
- Over 500 one-second pulls per charge
- Rechargeable 14 volt lithium-ion battery
- 30 minute charge time
- Easy to operate
- Environmentally friendly with no greenhouse gas discharged
- Six month limited warranty

Each WoodsCan Hornet kit includes:

- WoodsCan Hornet electric air horn
- 14 volt rechargeable lithium-ion battery
- Charger (120 or 230 VAC)
- 12 volt inverter
- Durable carrying case
- (Optional) second lithium-ion battery
- User's manual

Regardless of your application, the WoodsCan Hornet will meet your signaling needs:

- Mining
- Quarrying
- Construction
- Seismic Exploration
- Animal Control
- Special Events
- Many more…



WoodsCan Industries Inc

For more information, contact us at info@woodscan.com or visit: www.woodscan.com

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