Date:September 11, 2019To:Town of Cumberland Planning BoardFrom:Carla Nixon, Town PlannerSubject:Compost & Brush Pad/ Sand/Salt Storage – Site Plan Review

I. REQUEST/OVERVIEW:

The applicant and owner is the Town of Cumberland. This application is for Planning Board Site Plan Review for the construction of an 80' x 100' salt shed and a 2 acres gravel pad for brush storage and composting. There will be no utilities on site.

The site is set approximately 2100 feet from Tuttle Road and a 22 wide access drive will be constructed over an existing gravel railroad bed.

The buildings will be placed on a portion of a 31.67 acre parcel which is depicted on Tax Assessor Map R 03, Lot 50 and 53 in the Rural Residential 1 (RR 1) zoning district.

The project will disturb less than five acres of the 31.67 acre parcel and create approximately 2.94 acres of impervious surface.

The Applicant is represented by Dan Diffin, P.E., of Sevee and Maher Engineering.

II. **PROJECT HISTORY:** None

III. DESCRIPTION:

Parcel size:	31.67 acres
Net Residential Density:	N/A
Proposed number of lots:	N/A
Zoning:	Rural Residential 1
Development Type:	Major Site Plan
Min. Lot Size:	RR 1: 4 acre minimum lot size.
Setbacks:	Front: 50', Rear: 75', Side: 30' (combined = 75')
Water:	No water proposed
Septic:	No septic proposed
Open Space:	N/A
Wetlands:	Have been mapped
Utilities:	None proposed

Street Lighting: None proposed.

Days/Hours of Operation: Saturdays (9-4) Tuesdays (1-4) and during snow storms.

Right, Title and Interest: Deed

Waiver Requests: 1) Hydrogeologic Evaluation; 2) Market Study

Outside Agency Approvals Required:

Agency	Type of Permit	Status
MDEP	Stormwater	Under Review
	NRPA Permit by Rule	
	NRPA Tier 1	
Maine DOT	Entrance Permit	Under Review
Maine Historic Preservation	Review	Letter on file
Commission		
Maine Natural Areas	Review	Outstanding
Program		
Maine Dept. of Inland	Review	Outstanding
Fisheries and Wildlife		

IV. PLANNING DIRECTOR'S COMMENTS:

- 1. Why will the access road not be paved?
- 2. Will there be any markers or guardrails along the access road?
- 3. There are no utilities proposed and as such, no proposed lighting. It would seem that some security lighting on the buildings might be needed. Should there be some minimal amount of street lighting given that the use of the site will be primarily during inclement weather events?
- 4. Are there any existing trails on the site?
- 5. Distance from structures to any abutting wells?
- 6. What precautions are being taken to protect groundwater from salt?
- 7. Is the proposed location for snow storage workable? Will snow from other locations in town (e.g., schools) be trucked to this location?

V. **DEPARTMENT HEAD REVIEWS:** No comments submitted.

VI. Lands and Conservation Commission:

The Lands and Conservation Commission writes in opposition to the plan to relocate the Compost Operation and Salt Shed to the town owned property adjacent to the Town Forest.

This opposition is consistent with the stance the Commission took in regard to the recent plan to develop this property for senior housing and other related purposes.

The property in question is now an open meadow with significant wetlands and is the site of the butterfly garden. This use complements the use of the adjacent town forest and will be compromised severely by proposed relocations.

While we recognize the Town is operating under a tight deadline due to its agreement with the Maine Department of Environmental Protection, we lament the fact that the Commission was only allowed the briefest of opportunities to provide comment prior to the vote of the Town Council to move forward with this proposal.

If the project is to go forward, we urge that the Planning Board consider reversing the proposed positions of the Salt Shed and Compost, thus reducing the visual and other impacts of the more intrusive Salt Shed.

VII. PEER REVIEW ENGINEER REVIEW:

То:	Town of Cumberland
From:	Alton Palmer, Principal
Date:	September 9, 2019
Project:	Town of Cumberland Compost Pad and Sand/Salt Shed Relocation
Subject:	Peer Review

As requested by the Town, Gorrill Palmer has conducted an Engineering Peer Review for the above referenced project. Information received for this assignment included:

- Site Plan Review application and attachments, dated August 27, 2019, prepared by Sevee & Maher Engineers on behalf of the Town of Cumberland, consisting of 155 pages
- Site Plan Drawing Set, dated August 2019, prepared by Sevee & Maher Engineers consisting of 16 drawings.

Based on our review of this information, general engineering principles and the Town of Cumberland Zoning Ordinance and Site Plan Review Ordinance, we offer the following comments related to the engineering and design aspects of this project:

- Site Plan Review Application
 - As the Applicant proposes a modest increase in the post development peak runoff rate leaving the site, is a waiver of Chapter 229, Section 10.C(b) required?
 - With respect to the Stormwater Analysis, we offer the following comments:
 - The site is tributary to culverts under the adjacent rail line. Has an inspection of the condition of the culverts under the rail line been conducted to ensure that they are functional and operating in a fashion consistent with the assumptions of the Stormwater Analysis?
 - A secondary discharge (Broad Crested Rectangular Weir) is noted in the modeling of Pond AP-1 which is activated for the 25-year storm. Could additional information/description be provided for this discharge?

- It is noted that for the 10 and 25 year events, Pond AP-1 (24" CMP Culvert) results in a tailwater condition for Pond IBP (36" HDPE Culvert) in both the pre and post development condition. As the Applicant only provided a summary of the 10 and 25-year events, we were unable to verify that the modeling reflects the proper tail water condition for Pond IBP.
- Site Plans
 - Site Layout Plan (C-103)
 - Will there be any signage or other wayfinding information to assist users of the facility as they enter the Compost Pad / Brush Pile Area?
 - Snow storage is shown adjacent to the wetland at the southerly end of the Brush Pile Area. What means will be provided to assist the snow plow operator to prevent piling of snow in the adjacent wetlands? Delineators possibly? This same comment would apply to the snow storage area at the end of the Compost Pad Area.
 - Site Grading and Drainage Plan (C-104)
 - Would a shallow swale and level lip spreader be advisable at the southerly ends of both the Brush Pad and Compost Pad to trap any sediments exiting the gravel surfaces based on length of upgradient sheet flow and assist in reintroducing sheet flow into the adjacent meadow?
 - Landscape Berm Grading (C-106)
 - The 3:1 sideslope grading for the berm penetrates the "Existing 20' Access Easement" by up to 10'. Is this acceptable and in keeping with the spirit of the Access Easement?
 - Will any upgradient drainage be directed at the toe of the slope of the berm, and is any swale treatment necessary to prevent erosion?
 - Gravel Access Drive Plan and Profile (C-200)
 - We note that the gate for the access road is approximately 50' from Tuttle Road which appears reasonable to allow maintenance/operation staff to park off-road while they lock/unlock the gate. Is there a need for a turnaround for users of the facility in the event that they arrive at a time when the facility is closed to prevent them from backing onto Tuttle Road?
 - Any signage for the facility proposed at Tuttle Road?

We appreciate the opportunity to assist the Planning Department with this project. Do not hesitate to contact our office with any questions.

VIII. REQUESTED WAIVERS:

- 1. A waiver from performing a hydrogeological evaluation for the project. There will be no subsurface wastewater disposal or other anticipated groundwater impacts associated with this project.
- 2. A waiver from performing a market study. Based on the use and function of this property, a market study does not apply to this project.

IX. FINDINGS OF FACT

SECTION 229:10: APPROVAL STANDARDS AND CRITERIA

The following criteria shall be used by the Planning Board in reviewing applications for site plan review and shall serve as minimum requirements for approval of the application. The application shall be approved unless the Planning Board determines that the applicant has failed to meet one or more of these standards. In all

instances, the burden of proof shall be on the applicant who must produce evidence sufficient to warrant a finding that all applicable criteria have been met.

Please refer to Section 2-1 of the Site Plan Review application submitted by the Applicant for responses to the Approval Standards and Criteria.

1. Utilization of the Site

Utilization of the Site - The plan for the development, including buildings, lots, and support facilities, must reflect the natural capabilities of the site to support development. Environmentally sensitive areas, including but not limited to, wetlands, steep slopes, floodplains, significant wildlife habitats, fisheries, scenic areas, habitat for rare and endangered plants and animals, unique natural communities and natural areas, and sand and gravel aquifers must be maintained and preserved to the maximum extent. The development must include appropriate measures for protecting these resources, including but not limited to, modification of the proposed design of the site, timing of construction, and limiting the extent of excavation.

2. Traffic, Circulation and Parking

(1) Traffic Access and Parking. Vehicular access to and from the development must be safe and convenient.

(a) Any driveway or proposed street must be designed so as to provide the minimum sight distance according to the Maine Department of Transportation standards, to the maximum extent possible.

(b) Points of access and egress must be located to avoid hazardous conflicts with existing turning movements and traffic flows.

(c) The grade of any proposed drive or street must be not more than +3% for a minimum of two (2) car lengths, or forty (40) feet, from the intersection.

(d) The intersection of any access/egress drive or proposed street must function: (a) at a Level of Service D, or better, following development if the project will generate one thousand (1,000) or more vehicle trips per twenty-four (24) hour period; or (b) at a level which will allow safe access into and out of the project if less than one thousand (1,000) trips are generated.

(e) Where a lot has frontage on two (2) or more streets, the primary access to and egress from the lot must be provided from the street where there is less potential for traffic congestion and for traffic and pedestrians hazards. Access from other streets may be allowed if it is safe and does not promote short cutting through the site.

(f) Where it is necessary to safeguard against hazards to traffic and pedestrians and/ or to avoid traffic congestion, the applicant shall be responsible for providing turning lanes, traffic directional islands, and traffic controls within public streets. (g) Access ways must be designed and have sufficient capacity to avoid queuing of entering vehicles on any public street.

(h) The following criteria must be used to limit the number of driveways serving a proposed project:

a. No use which generates less than one hundred (100) vehicle trips per day shall have more than one (1) two-way driveway onto a single roadway. Such driveway must be no greater than thirty (30) feet wide.

b. No use which generates one hundred (100) or more vehicle trips per day shall have more than two (2) points of entry from and two (2) points of egress to a single roadway. The combined width of all access ways must not exceed sixty (60) feet.

(2) Access way Location and Spacing

Access ways must meet the following standards:

(a) Private entrance / exits must be located at least fifty (50) feet from the closest un-signalized intersection and one hundred fifty (150) feet from the closest signalized intersection, as measured from the point of tangency for the corner to the point of tangency for the access way. This requirement may be reduced if the shape of the site does not allow conformance with this standard.
(b) Private access ways in or out of a development must be separated by a minimum of seventy-five (75) feet where possible.

(3) Internal Vehicular Circulation

The layout of the site must provide for the safe movement of passenger, service, and emergency vehicles through the site.

(a) Projects that will be served by delivery vehicles must provide a clear route for such vehicles with appropriate geometric design to allow turning and backing.
(b) Clear routes of access must be provided and maintained for emergency vehicles to and around buildings and must be posted with appropriate signage (fire lane - no parking).

(c) The layout and design of parking areas must provide for safe and convenient circulation of vehicles throughout the lot.

(d) All roadways must be designed to harmonize with the topographic and natural features of the site insofar as practical by minimizing filling, grading, excavation, or other similar activities which result in unstable soil conditions and soil erosion, by fitting the development to the natural contour of the land and avoiding substantial areas of excessive grade and tree removal, and by retaining existing vegetation during construction. The road network must provide for vehicular, pedestrian, and cyclist safety, all season emergency access, snow storage, and delivery and collection services.

(4) Parking Layout and Design

Off street parking must conform to the following standards:

(a)Parking areas with more than two (2) parking spaces must be arranged so that it is not necessary for vehicles to back into the street.

(b) All parking spaces, access drives, and impervious surfaces must be located at least fifteen (15) feet from any side or rear lot line, except where standards for buffer yards require a greater distance. No parking spaces or asphalt type surface shall be located within fifteen (15) feet of the front property line. Parking lots on adjoining lots may be connected by accessways not exceeding twenty-four (24) feet in width.

(c) Parking stalls and aisle layout must conform to the following standards.

Parking	Stall	Skew	Stall	Aisle
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Angle	Width Width		Depth	Width	
90°	9'-0"		18'-0"	24'-0" 2-way	
60°	8'-6"	10'-6"	18'-0"	16'-0" 1-way	
45°	8'-6"	12'-9"	17'-6"	12'-0" 1-way	
30°	8'-6"	17'-0"	17'-0"	12'-0" 1 way	

(d)In lots utilizing diagonal parking, the direction of proper traffic flow must be indicated by signs, pavement markings or other permanent indications and maintained as necessary.

(e)Parking areas must be designed to permit each motor vehicle to proceed to and from the parking space provided for it without requiring the moving of any other motor vehicles.

(f) Provisions must be made to restrict the "overhang" of parked vehicles when it might restrict traffic flow on adjacent through roads, restrict pedestrian or bicycle movement on adjacent walkways, or damage landscape materials

(5) Building and Parking Placement

(a) The site design should avoid creating a building surrounded by a parking lot. Parking should be to the side and preferably in the back. In rural, uncongested areas buildings should be set well back from the road so as to conform to the rural character of the area. If the parking is in front, a generous, landscaped buffer between road and parking lot is to be provided. Unused areas should be kept natural, as field, forest, wetland, etc.

(b)Where two or more buildings are proposed, the buildings should be grouped and linked with sidewalks; tree planting should be used to provide shade and break up the scale of the site. Parking areas should be separated from the building by a minimum of five (5) to ten (10) feet. Plantings should be provided along the building edge, particularly where building facades consist of long or unbroken walls.

(6) Pedestrian Circulation

The site plan must provide for a system of pedestrian ways within the development appropriate to the type and scale of development. This system must connect the major building entrances/ exits with parking areas and with existing sidewalks, if they exist or are planned in the vicinity of the project. The pedestrian network may be located either in the street right-of-way or outside of the right-of-way in open space or recreation areas. The system must be designed to link the project with residential, recreational, and commercial facilities, schools, bus stops, and existing sidewalks in the neighborhood or, when appropriate, to connect the amenities such as parks or open space on or adjacent to the site.

3. Stormwater Management and Erosion Control

(1) Stormwater Management

Adequate provisions must be made for the collection and disposal of all stormwater that runs off proposed streets, parking areas, roofs, and other surfaces, through a stormwater drainage system and maintenance plan, which must not have adverse impacts on abutting or downstream properties.

(a) To the extent possible, the plan must retain stormwater on the site using the natural features of the site.

(b) Unless the discharge is directly to the ocean or major river segment, stormwater runoff systems must detain or retain water such that the rate of flow from the site after development does not exceed the predevelopment rate.

(c) The applicant must demonstrate that on - and off-site downstream channel or system capacity is sufficient to carry the flow without adverse effects, including but not limited to, flooding and erosion of shoreland areas, or that he / she will be responsible for whatever improvements are needed to provide the required increase in capacity and / or mitigation.

(d) All natural drainage ways must be preserved at their natural gradients and must not be filled or converted to a closed system unless approved as part of the site plan review.

(e) The design of the stormwater drainage system must provide for the disposal of stormwater without damage to streets, adjacent properties, downstream properties, soils, and vegetation.

(f) The design of the storm drainage systems must be fully cognizant of upstream runoff which must pass over or through the site to be developed and provide for this movement.

(g) The biological and chemical properties of the receiving waters must not be degraded by the stormwater runoff from the development site. The use of oil and grease traps in manholes, the use of on-site vegetated waterways, and vegetated buffer strips along waterways and drainage swales, and the reduction in use of deicing salts and fertilizers may be required, especially where the development stormwater discharges into a gravel aquifer area or other water supply source, or a great pond.

(2) Erosion Control

(a) All building, site, and roadway designs and layouts must harmonize with existing topography and conserve desirable natural surroundings to the fullest extent possible, such that filling, excavation and earth moving activity must be kept to a minimum. Parking lots on sloped sites must be terraced to avoid undue cut and fill, and / or the need for retaining walls. Natural vegetation must be preserved and protected wherever possible.

(b) Soil erosion and sedimentation of watercourses and water bodies must be minimized by an active program meeting the requirements of the Maine Erosion and Sediment Control Handbook for Construction: Best Management Practices, dated March 1991, and as amended from time to time.

4. Water, Sewer, and Fire Protection

(1) Water Supply Provisions

The development must be provided with a system of water supply that provides each use with an adequate supply of water. If the project is to be served by a public water supply, the applicant must secure and submit a written statement from the supplier that the proposed water supply system conforms with its design and construction standards, will not result in an undue burden on the source of distribution system, and will be installed in a manner adequate to provide needed domestic and fire protection flows.

(2) Sewage Disposal Provisions

The development must be provided with a method of disposing of sewage which is in compliance with the State Plumbing Code. If provisions are proposed for on-site waste disposal, all such systems must conform to the Subsurface Wastewater Disposal Rules.

(3) Utilities

The development must be provided with electrical, telephone, and telecommunication service adequate to meet the anticipated use of the project. New utility lines and facilities must be screened from view to the extent feasible. If the service in the street or on adjoining lots is underground, the new service must be placed underground.

(4) Fire Protection

The Fire Chief or his/her designee shall review the site plan for conformance with the Fire Protection Ordinance and may provide the Town Planner a list of suggested conditions of approval.

5. Water Protection

(1) Groundwater Protection

The proposed site development and use must not adversely impact either the quality or quantity of groundwater available to abutting properties or to the public water supply systems. Applicants whose projects involve on-site water supply or sewage disposal systems with a capacity of two thousand (2,000) gallons per day or greater must demonstrate that the groundwater at the property line will comply, following development, with the standards for safe drinking water as established by the State of Maine.

(2) Water Quality

All aspects of the project must be designed so that:

(a) No person shall locate, store, discharge, or permit the discharge of any treated, untreated, or inadequately treated liquid, gaseous, or solid materials of such nature, quantity, obnoxious, toxicity, or temperature that may run off, seep, percolate, or wash into surface or groundwaters so as to contaminate, pollute, or harm such waters or cause nuisances, such as objectionable shore deposits, floating or submerged debris, oil or scum, color, odor, taste, or unsightliness or be harmful to human, animal, plant, or aquatic life.

(b) All storage facilities for fuel, chemicals, chemical or industrial wastes, and biodegradable raw materials, must meet the standards of the Maine Department of Environmental Protection and the State Fire Marshall's Office.

(3) Aquifer Protection

If the site is located within the Town Aquifer Protection Area, a positive finding by the Board that the proposed plan will not adversely affect the aquifer is required.

6. Floodplain Management

If any portion of the site is located within a special flood hazard area as identified by the Federal Emergency Management Agency, all use and development of that portion of the site must be consistent with the Town's Floodplain Management Ordinance.

7. Historic and Archaeological Resources

If any portion of the site has been identified as containing historic or archaeological resources, the development must include appropriate measures for protecting these resources, including but not limited to, modification of the proposed design of the site, timing of construction, and limiting the extent of excavation.

8. Exterior Lighting

The proposed development must have adequate exterior lighting to provide for its safe use during nighttime hours, if such use is contemplated. All exterior lighting must be designed and shielded to avoid undue glare, adverse impact on neighboring properties and rights - of way, and the unnecessary lighting of the night sky.

9. Buffering and Landscaping

(1) Buffering of Adjacent Uses

The development must provide for the buffering of adjacent uses where there is a transition from one type of use to another use and for the screening of mechanical equipment and service and storage areas. The buffer may be provided by distance, landscaping, fencing, changes in grade, and / or a combination of these or other techniques.

(2) Landscaping

Landscaping must be provided as part of site design. The landscape plan for the entire site must use landscape materials to integrate the various elements on site, preserve and enhance the particular identity of the site, and create a pleasing site character. The landscaping should define street edges, break up parking areas, soften the appearance of the development, and protect abutting properties.

10. Noise

The development must control noise levels such that it will not create a nuisance for neighboring properties.

<u>11.</u> Storage of Materials

(1) Exposed nonresidential storage areas, exposed machinery, and areas used for the storage or collection of discarded automobiles, auto parts, metals or other articles of salvage or refuse must have sufficient setbacks and screening (such as a stockade fence or a dense evergreen hedge) to provide a visual buffer sufficient to minimize their impact on abutting residential uses and users of public streets.

(2) All dumpsters or similar large collection receptacles for trash or other wastes must be located on level surfaces which are paved or graveled. Where the dumpster or receptacle is located in a yard which abuts a residential or institutional use or a public street, it must be screened by fencing or landscaping.

(3) Where a potential safety hazard to children is likely to arise, physical screening sufficient to deter small children from entering the premises must be provided and maintained in good condition.

12. Capacity of the Applicant

The applicant must demonstrate that he / she has the financial and technical capacity to carry out the project in accordance with this ordinance and the approved plan.

13. Design and Performance Standards

(1) Route 100 Design Standards : <u>Not Applicable</u>

All development in the Village Center Commercial, Village Office Commercial I and II, and the MUZ Districts shall be consistent with the Town of Cumberland Route 100 Design Standards; in making determination of consistency, the Planning Board may utilize peer review analysis provided by qualified design professionals

(2) Route 1 Design Guidelines: Not Applicable

All development in the Office Commercial North and Office Commercial South districts is encouraged to be consistent with the Route 1 Design Guidelines.

(3) Town Center District Performance Standards: Not Applicable

All development in the Town Center District is encouraged to be consistent with the Town Center Performance Standards. Not Applicable.

(4) Village Mixed Use Performance Standards: Not Applicable

All development in the Village Mixed Use Zone is encouraged to be consistent with the VMUZ Performance Standards.

SECTION 229-11: LIMITATION OF APPROVAL

Construction of the improvements covered by any site plan approval must be substantially commenced within twelve (12) months of the date upon which the approval was granted. If construction has not been substantially commenced within 12 months of the date upon which the approval was granted, the approval shall be null and vid. If construction has not been substantially completed within 24 months of the date upon which approval

was granted or within a time period as specified by the Planning Board, the approval shall be null and void. The applicant may request an extension of the deadline to commence or complete construction prior to expiration of the period. Such request must be in writing and must be made to the Planning Board. The Planning Board may grant up to two one-year extensions to the period if the approved plan conforms to the ordinances in effect at the time the extension is granted and any and all federal and state approvals and permits are current.

SECTION 229-12: STANDARD CONDITION OF APPROVAL:

This approval is dependent upon and limited to the proposals and plans contained in the application and supporting documents submitted and affirmed to by the applicant. Any variation from the plans, proposals and supporting documents, except minor changes as so determined by the Town Planner which do not affect approval standards, is subject to review and approval of the Planning Board (if Staff Review, the Town Planner or Staff Review Committee) prior to implementation. This condition shall be included on all site plans.

CONDITIONS OF APPROVAL:

- 1. All required local, state and federal permits shall be submitted prior to the preconstruction conference.
- 2. A preconstruction conference shall be held prior to the start of construction.
- 3. All clearing limits shall be flagged prior to the preconstruction conference and inspected and approved by the Town Engineer.
- 4. A blasting permit, if blasting is required, shall be obtained from the Code Enforcement Officer prior to blasting.

2.0 CHAPTER 229 – SITE PLAN REVIEW

§229-4 Waivers and Modifications

As part of this application, the Town requests the following waivers from the Site Plan Review ordinance:

- 1. A waiver from performing a hydrogeological evaluation for the project. There will be no subsurface wastewater disposal or other anticipated groundwater impacts associated with this project. The site is not in a significant sand and gravel aquifer. The salt shed is on an asphalt pad. The compost pad is constructed to MEDEP Chapter 400 standards.
- 2. A waiver from performing a market study. This is a municipal project proposed to meet specific town needs. Based on the use and function of this property, a market study does not apply to this project

§229-8 Financial and Technical Capacity

The Town will be funding the project through the municipal bonding recently approved by the Town Council. Technical capacity for SME and Boundary Points Survey is provided in Attachment B.

§229-10 Approval Standards and Criteria

A. <u>Utilization of the Site</u>

The property is currently an open meadow that is routinely harvested for hay multiple times in a typical season. The site is not situated over a sand and gravel aquifer, and there is no habitat for rare or endangered species present on the existing property as currently mapped by the U.S. Fish and Wildlife Service. SME has submitted a review letter to the Maine Inland Fisheries and Wildlife and will forward a response as soon as received.

Wetlands at the site have been delineated by Albert Frick Associates (Frick) and are shown on the attached design drawing set. There are wetlands on various portions of the property generally consisting of open meadow wetlands. There is an unnamed stream delineated along the west portion of the access drive into the property. The proposed improvements to the access drive are within 75 feet of the stream, but remain outside of the MEDEP required 25-foot stream setback. A Natural Resources Protection Act (NRPA) Permit-by-Rule application for the activity adjacent to stream will be required by MEDEP prior to the start of construction.

The compost pad is also within the 250-foot setback for critical terrestrial habitat of an identified significant vernal pool. The construction within the setback will occur in an open mowed hayfield and will

not include impacts to forested habitat. A NRPA Permit-by-Rule application for construction within a significant vernal pool habitat will be required by MEDEP prior to the start of construction.

Finally, in order to provide the Town with the appropriate storage, maneuvering, and operational space, approximately 14,375 sf of wetlands will be impacted. Generally, most of the impacted wetlands will be in the area of the compost pad (10,360 sf) with a smaller amount along the proposed access drive (4,015 sf). This level of impact will require a NRPA Tier 1 application for the wetland prior to the start of construction. The NRPA permits are being prepared and will be submitted to MEDEP by August 30, 2019.

The Town evaluated multiple properties prior to selecting the current site for proposed development. From early 2014 to present, several existing municipal, commercial, and privately-owned parcels have been considered for the proposed relocation. Locations included Harris Road, Greely Road, Longwoods Road, Range Road, Skillins Road, and Middle Road. These sites were not selected because of cost considerations, concerns about impacts to abutters and natural resources, and not being centrally located. The current proposed site provides the best combination of available land, central location, and the best options for minimizing impact to the natural environment and abutting property owners.

B. Traffic, Circulation, and Parking

Access to the project site will be from a 22-foot-wide gravel driveway with a 50-foot paved apron at the intersection of Tuttle Road. Sight distances in excess of 1,000 feet exist in both directions at the intersection. Driveways to adjacent properties are over 250 feet away. SME does not anticipate conflict with site access adjacent to the properties from Tuttle Road.

The driveway is designed to minimize wetland impacts and to eliminate construction within the 25-foot stream setback west of the access drive. The driveway is to service the Compost Pad and Sand/Salt shed only. Therefore, the Town proposes a limited section of 12 inches of MEDOT Type D gravel over a structural geotextile topped with Reclaimed Asphalt Pavement (RAP). The Town proposes to surface the drive with RAP to minimize maintenance and dust from a typical gravel road.

Traffic to the site will be controlled with a locked gate at the entrance on Tuttle Road. The gate will only be open when the compost pad is receiving materials or there is a storm that requires winter sanding and slating of the roads.

The compost operation will be open to the public on Tuesdays from 1 pm to 5 pm and on Saturdays from 9 am to 4 pm from the middle of April to the end of November. During peak use on a busy Saturday, the existing compost facility generates up to 60 daily trips. Otherwise, on average, the compost facility generates 15 trips when open to the public on Tuesdays. The use of the relocated compost pad is expected to remain similar to existing conditions.

The sand/salt shed will be accessed during storm events that require municipal sanding and salting of Town Roads. Currently, Cumberland operates nine (9) plow trucks that are used for sand and salt application. The trucks themselves will still be stored at the Public Works Garage on Drowne Road during periods of inactivity. In addition, the sand/salt mixture available for residents to pick up will be at the Public Works Garage. This will minimize traffic in and out of the gated entrance on Tuttle Road.

SME anticipates the compost and salt operations will have a minimal impact to traffic on Tuttle Road. A MEDOT Driveway Entrance Application has been filed and a copy of the permit will be provided once received.

There is no proposed parking at the site. During compost operations the Town will have one (1) staff member present to manage pick-up and drop-off during the months between April and November. Staff parking will occur within the limits of the pavement surrounding the sand/salt shed. Because the two uses on the site will not likely overlap, there is more than ample space for parking without designated parking areas.

C. Stormwater Management and Erosion Control

The stormwater management for the site is described in the Stormwater Management Report included as Attachment D. Erosion control measures are included on the drawings and were designed in compliance with the October 2016 edition of the Maine Erosion Control Best Management Practices Manual for Designers and Engineers.

D. Water, Sewer, and Fire Protection

The site will not be served with public water or sewer. A portable bathroom will be provided for staff and resident use during compost operations. The sand/salt truck drivers will remain based out of the Public Works building and will use the facilities there as necessary. There are no wells or subsurface wastewater disposal systems proposed as part of site development.

E. Water Protection

There will be no groundwater used or hazardous materials discharged as a result of this project. The proposed composting will be on the gravel pad constructed to MEDEP Chapter 400 standards. Sand and salt will be stored, mixed, loaded, and unloaded inside the proposed sand/salt shed which will be constructed on an asphalt pad designed to drain internally. The pavement outside of the building will be graded to drain away to minimize and runoff or snow melt inside of the building.

There will be no hazardous materials stored on site. The property is not located within an area designated as a source protection area or a sand and gravel aquifer. No effects to groundwater are anticipated from this project.

The Town is required to operate the sand/salt shed in accordance with MEDEP Water Quality Bureau Chapter 574 Siting and Operation of Road Salt and Sand-Salt Storage Areas. As part of the project, the Town is submitting a Salt and Sand-Salt Storage Area Registration Form and Request for Variance. Approval will be forward to the Planning Board once received.

F. Floodplain Management

The Flood Insurance Rate Map for the project area is included in Attachment C. The project is not located in a mapped floodplain area.

G. Historic and Archaeological Resources.

A site review has been requested from the Maine Historic Preservation Commission (MHPC). A copy of the request for review and the written response from the MHPC is provided in Attachment E. There are no known National Register eligible properties or areas considered sensitive for archaeological resources.

H. Exterior Lighting

There will be no exterior lighting at this facility. Composting operations will occur during daylight hours only, and loading and unloading of sand and salt will be performed via the truck and equipment headlights.

I. Buffering and Landscaping

The Town plans to provide landscaping and buffering through:

- Siting the building and compost operations as far from abutters as possible to the north and the south. The closest residence will be on the Verrier property to the north, which is approximately 1,300 feet from the proposed sand/salt shed. The house on the Harwood property is approximately 2,100 feet from the proposed shed location.
- Providing a colored dark green building cover to camouflage the building with the surrounding tree lines as much as possible. The Town is in discussions with pre-fabricated building suppliers for a building with a dark green finish and a more barn-like structure. Example images and specifications will be provided to the Planning Board prior to the September 17, 2019 meeting.
- Preservation of existing buffers north of the proposed salt shed location.

- Additional plantings on Verrier Property to the north See Attachment H for a commitment letter from the Town.
 - Replacement plantings for the existing buffer impacted by driveway construction.
 - Planting of 10- to 12-foot White Pine along the south and west lines of the Verrier Property for additional screening.
- NELMA property Construction of a landscape berm and plantings along the north property line with the NELMA property as agreed upon when the parcel abutting NELMA was purchased. See the Buffer Planting Plan, Drawing L-1 for more details. This buffer will screen the compost operations from the NELMA property and the traffic along Tuttle Road.
- Additional plantings on the Simmons and Gordon Lot (old Harwood property) to the south The Town has committed to provide up to \$18,000 for buffer plantings on the Simmons/Gordon property. The approximate locations of the buffer plantings are shown in the drawing set. The final locations will be coordinated with the property Owners after completion of the project, likely in the spring of 2020. The commitment letter from the Town is included in Attachment H.

J. <u>Noise</u>

Noise from the composting operations will be limited to Tuesdays from 1 pm to 5 pm and Saturdays from 9 am to 4 pm between the middle of April and end of November. There may be times when the compost piles are observed and turned over with a loader, but these are generally intermittent depending on the temperature of the compost piles. For most of the time, the facility will be unmanned and unoccupied with no major noise producers.

Noise from access to the sand and salt shed will be generally limited to during winter storm events and material deliveries. The deliveries will occur during daytime hours, but the storm events will require access whenever the sand/salt mixture is needed to treat the roads. In these instances, equipment back-up alarms will be the main source of noise from the site. Because these alarms are required for safe operations of the equipment in the area, they are generally not regulated by the State or Town for noise considerations.

Some of this noise will be attenuated over the distance that the sand/salt building is separated from the abutting neighbors. Figure 3 below outlines the distance for the separation. The house on the neighbor's property to the south is approximately 2,200 feet from the proposed salt shed. In addition, the Town will maintain as many of the existing trees as possible to the north and provide landscape buffers to further mitigate noise impacts from the back-up alarms. The site has been designed to provide adequate maneuvering space such that the plow trucks will not be required to make more than one back up maneuver to enter the shed.

K. Storage of Materials

The site will generally store brush dropped off from residents or local contractors. This pile will be located on the proposed gravel pad south of the sand/salt building. The brush pile is then chipped and removed from the site or added to the compost windrows. In addition, the site will accommodate MEDEP defined Type 1A Residuals (leaf and yard waste, wood chips, brush) for composting. The Town plans to compost between 2,500 to 3,000 cubic yards of material annually.

Composting operations will require the use of regulated animal manure to make sure that the Carbon-Nitrogen balance in the windrows is maintained. The compost operations proposed by the Town is generally permitted to use as much as 10,000 cubic yards of animal manure without having to file for a more comprehensive permit with the MEDEP Solid Waste Bureau. The Town will maintain compost operations with animal manure, but it will be provided and mixed in on an as needed basis with limited stockpiling at the site.

A 45-yard pile of finished compost will be available for resident pick-up in the compost pick-up bins shown on the plans.

The site will also store the sand and salt required for the Town's winter operations. The material storage, mixing operations, and loading and unloading of trucks will all occur within the proposed 8,000-sf salt shed. The salt shed will be constructed on an asphalt pad, enclosed, and graded to drain away from building. There will be no hazardous materials stored on site

L. Capacity of the Applicant

- Financial Capacity The project will be funded with Town Council approved funds.
- The Town has hired Boundary Points Professional Land Surveyors, Albert Frick Associates for the wetlands, Terrence J. DeWan & Associates for landscaping plan, and SME to assist with the project design. Construction and maintenance of the project will be performed by experienced contractors as necessary.

M. Design and Performance Standards

Not applicable to this project.



4 Blanchard Road, P.O. Box 85A Cumberland, ME 04021 Tel: 207.829.5016 • Fax: 207.829.5692 info@smemaine.com smemaine.com

September 16, 2019

Carla Nixon, Town Planner Cumberland Town Hall 290 Tuttle Road Cumberland, Maine 04021

Subject:Compost Pad and Sand/Salt Shed RelocationTown of Cumberland Site Plan Review ApplicationResponse to Peer Review Comment dated 9/11/19

Dear Ms. Nixon,

On behalf of the Town of Cumberland (Town), Sevee & Maher Engineers, Inc. (SME) has prepared the following response to staff review comments for the Compost Pad and Sand/Salt Shed Relocation project. The comments were received in a draft of the Planning Board Packet dated September 11, 2019.

Comment headings and numbers correspond to staff review sections included in the Planning Board Packet. The plans and application materials were revised in response as indicated below:

Planning Director's Comments

1. Why will the access road not be paved?

<u>SME Response</u>: The driveway into the site is not proposed as paved to protect future flexibility for the potential for development of the remainder of the Town lot. If additional development should occur, the driveway will be impacted to install utilities to service the new development. To protect this flexibility and provide a stable and dust-free surface the Town is proposing to provide 3 inches of reclaimed asphalt pavement (RAP) as a surface material. This same treatment was installed on the lower portion of Beach Drive for the access to the Town Beach and has proven to be a stable surface.

2. Will there be any markers or guardrails along the access road?

<u>SME Response</u>: There are no markers or guardrail proposed along the 22-foot driveway. The driveway was sized at 22 feet to provide adequate travel lanes for comfortable passing for residents to the compost facility and the Town trucks.



3. There are no utilities proposed and as such, no proposed lighting. It would seem that some security lighting on the buildings might be needed. Should there be some minimal amount of street lighting given that the use of the site will be primarily during inclement weather events?

<u>SME Response</u>: Security lighting is not required or desired for the building. The site will be secured with a gate at the entrance off Tuttle Road and night time use will be limited to winter during a snow event. Lighting during these events will be from the equipment working at the facility.

4. Are there any existing trails on the site?

<u>SME Response</u>: There are no formal trails identified on the site, but there is a butterfly garden approximately 140 feet north of the compost pad and a vernal pool observation area at the vernal pool near the railroad tracks. These two site features will be protected from construction and access will be provided for hikers or walkers.

5. Distance from structures to any abutting wells?

<u>SME Response</u>: The proposed compost pad and Sand/Salt building will be located more than 250 feet from the closest adjacent property line and greater than 1,300 feet from the nearest abutting structure. The proposed setback distances conform to requirements outlined in the MEDEP Solid Waste and Water Quality Division standards. Impacts to existing wells on adjacent properties are not anticipated.

6. What precautions are being taken to protect groundwater from salt?

<u>SME Response</u>: The improved storage and mixing practices will protect groundwater from salt. The sand and salt stored at the site will be fully contained within the proposed building on a surface constructed of bituminous concrete to minimize infiltration potential. Mixing of the sand and salt will also take place within the building to minimize the impact of weather, including wind and rain. There will be no material handling or storage outside of the sand salt shed. In addition, the interior of the building will be graded to drain to the center. The project will require a Water Quality Certification from the Maine Department of Environmental Protection which will further ensure the new facility meets the regulations for sand and salt storage.

7. Is the proposed location for snow storage workable? Will snow from other locations in town (e.g., schools) be trucked to this location?

<u>SME Response</u>: Composting operations at this site are seasonal and will not require snow removal during the winter months. Snow management at the site will be limited to the areas around the sand/salt shed for access to the facility by the Public Works crews. The municipal snow dumping area will remain at its existing location in Twin Brooks, therefore, no snow from outside the facility will be brought in. Snow management areas outlined in the project plan set are anticipated to be more than adequate to manage winter conditions for the proposed use at this site.



Engineer Peer Review Comments

- Site Plan Review Application
 - As the Applicant proposes a modest increase in the post development peak runoff rate leaving the site, is a waiver of Chapter 229, Section 10.C(b) (sic) required?

<u>SME Response</u>: As outlined in the Stormwater Management Report submitted with this application, this project discharges to an unnamed tributary of the Piscataquis River. This tributary is not identified as one of the significant river segments includes in 38 M.R.S.A. § 437. The applicant respectfully requests a waiver from Chapter 229, Section 10.C(1)b.

- With respect to the Stormwater Analysis, we offer the following comments:
 - The site is tributary to culverts under the adjacent rail line. Has an inspection of the condition of the culverts under the rail line been conducted to ensure that they are functional and operating in a fashion consistent with the assumptions of the Stormwater Analysis?

<u>SME Response</u>: SME has inspected the condition of the culverts under the rail line. The culverts are functional and operating in a fashion consistent with the assumptions of the stormwater model completed for this project.

 A secondary discharge (Broad Crested Rectangular Weir) is noted in the modeling of Pond AP-1 which is activated for the 25-year storm. Could additional information/description be provided for this discharge?

<u>SME Response</u>: Storage capacity at AP-1 is limited by a high point in the trackside ditch which leads to the adjacent downstream culvert at AP-3. During the modeled 25-year storm event, the storage threshold at AP-1 is reached and approximately 1.23 cfs flow over the high point in the trackside ditch to the existing culvert under the rail line at AP-3.

It is noted that for the 10 and 25 year events, Pond AP-1 (24" CMP Culvert) results in a tailwater condition for Pond 1BP (36" HDPE Culvert) in both the pre and post development condition. As the Applicant only provided a summary of the 10- and 25-year events, we were unable to verify that the modeling reflects the proper tail water condition for Pond 1BP.

<u>SME Response</u>: The stormwater Management Report was prepared to meet MEDEP Solid Waste permitting standards the State regulating authority for stormwater permitting on this project. Tailwater impacts associated with the proposed construction are minimal. Copies of the 10-year and 25-year calculations are included with this letter.



- Site Plans
 - Site Layout Plan (C-103)
 - Will there be any signage or other wayfinding information to assist users of the facility as they enter the Compost Pad / Brush Pile Area?

<u>SME Response</u>: There is no signage or wayfinding information planned for the compost pad / brush pile area. The facility will be staffed by the Public Works Department during hours the facility is open to the public. Staff on site will direct residents as necessary during hours of operation.

 Snow storage is shown adjacent to the wetland at the southerly end of the Brush Pile Area. What means will be provided to assist the snow plow operator to prevent piling of snow in the adjacent wetlands? Delineators possibly? This same comment would apply to the snow storage area at the end of the Compost Pad Area.

<u>SME Response</u>: See response to Planning Director comment 7. Wetland delineators are not planned or anticipated for the wetlands adjacent to the snow storage areas.

- Site Grading and Drainage Plan (C-104)
 - Would a shallow swale and level lip spreader be advisable at the southerly ends of both the Brush Pad and Compost Pad to trap any sediments exiting the gravel surfaces based on length of upgradient sheet flow and assist in reintroducing sheet flow into the adjacent meadow?

<u>SME Response</u>: SME does not believe shallow swales and level lip spreaders are necessary to trap sediments and reintroduce sheet flow at the suggested locations. Public Woks staff will be on site to observe conditions at the project site and address any erosion or sedimentation as necessary during ongoing operation of the facility.

- Landscape Berm Grading (C-106)
 - The 3:1 sideslope grading for the berm penetrates the "Existing 20-foot Access Easement" by up to 10 feet. Is this acceptable and in keeping with the spirit of the Access Easement?

<u>SME Response</u>: The 20-foot easement was created when the Town acquired a portion of the Northeastern Lumber Manufacturers Institute property to provide a vegetated buffer on the Town parcel to benefit abutters to the north. More than 10 feet will remain undisturbed between the toe of the berm and the north property line, and plantings will be located near the top of the berm outside the access easement. Sufficient access will be maintained for maintenance of the berm and plantings, or any other access requirement at the property line, which is in keeping with the spirit of the easement.



Will any upgradient drainage be directed at the toe of the slope of the berm, and is any swale treatment necessary to prevent erosion?

<u>SME Response</u>: The landscaped berm follows the crest of a broad, natural shoulder at the property line between the Town parcel and abutters to the north. Surface grades in this area are generally less than 1.5 percent. Any upgradient drainage toward the toe of the slope of the berm will be minimal and mitigated by the thick vegetation and flat slopes (less than 1.5 percent) in this area. Additional swale treatment will not be necessary to prevent erosion in this area.

- Gravel Access Drive Plan and Profile (C-200)
 - We note that the gate for the access road is approximately 50 feet from Tuttle Road which appears reasonable to allow maintenance/operation staff to park off-road while they lock/unlock the gate. Is there a need for a turnaround for users of the facility in the event that they arrive at a time when the facility is closed to prevent them from backing onto Tuttle Road?

<u>SME Response</u>: The site distance along Tuttle Road will allow for vehicles that inadvertently turn into the site to back out safely. A turnaround would result in an excessive amount of wetland impact, which is not desirable for project permitting and construction.

Any signage for the facility proposed at Tuttle Road?

<u>SME Response</u>: See response to Engineer Peer Review comment for Site Layout Plan (C-103). If you have any questions or comments, please do not hesitate to contact me.

Sincerely,

SEVEE & MAHER ENGINEERS, INC.

Daniel P. Diffin, P.E., LEED AP BD+C Vice President

Attachments



Existing 082719r	Type III 24-hr 10-yr Storm Rainfall=4.60
Prepared by Sevee & Maher Engineers, Inc.	Printed 9/16/2019
HydroCAD® 10.00-22 s/n 01260 © 2018 HydroCAD Softwa	are Solutions LLC Page 2

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

Subcatchment SC-1A	: Northeast	Runoff Area Flow Length=1,15	=787,640 sf 0. 9' Tc=45.2 mir	.00% Imperviou n CN=78 Rur	s Runoff Dep loff=23.19 cfs	oth>2.18" 3.281 af
Subcatchment SC-1B	: Northwest	Runoff Area= Flow Length=1,98	1,486,320 sf 0. 5' Tc=44.5 mir	.00% Imperviou n CN=77 Rur	s Runoff Dep loff=42.54 cfs	oth>2.10" 5.966 af
Subcatchment SC-1C	: Town Hall	Runoff Area=1, Flow Length=1,81	513,369 sf 11. 5' Tc=71.0 mir	.73% Imperviou n CN=72 Rur	s Runoff Dep loff=26.71 cfs	oth>1.70" 4.916 af
Subcatchment SC-2: I	NELMA	Runoff Area= Flow Length=1,38	1,007,352 sf 4. 8' Tc=25.2 mir	.40% Imperviou n CN=77 Rur	s Runoff Dep loff=37.78 cfs	oth>2.11" 4.073 af
Subcatchment SC-3: \$	Southeast	Runoff Area Flow Length=7	=175,454 sf 0. 83' Tc=24.5 m	.00% Imperviou iin CN=79 Ru	s Runoff Dep inoff=7.17 cfs	oth>2.28" 0.764 af
Subcatchment SC-4: S	Southwest	Runoff Area Flow Length=1,42	=588,377 sf 0. 3' Tc=92.8 mir	.00% Imperviou n CN=78 Rur	s Runoff Dep loff=11.18 cfs	oth>2.14" 2.404 af
Reach 1BR: Wetland I	Reach n=0.035 L=5	Avg. Flow Depth= 543.0' S=0.0055 '/	0.49' Max Vel ' Capacity=717	=1.77 fps Inflo 7.02 cfs Outflo	w=53.09 cfs w=52.86 cfs	10.813 af 10.720 af
Reach 1CR: Stream	n=0.100 L=	Avg. Flow Depth 961.0' S=0.0163	=1.49' Max Ve '/' Capacity=1´	el=1.86 fps Infl 16.18 cfs Outfl	ow=26.71 cfs ow=26.11 cfs	4.916 af 4.847 af
Reach 4R: Wetland Re	each n=0.800	Avg. Flow Depth L=196.0' S=0.019	i=1.27' Max Ve 95 '/' Capacity=	el=0.21 fps Infl =6.71 cfs Outfl	ow=11.00 cfs ow=10.52 cfs	2.396 af 2.342 af
Pond 1BP: 3x3 Stone	Box Culvert Primary=53.09 cfs	Peak Elev= 10.813 af Secon	60.72' Storage dary=0.00 cfs(=5,064 cf Inflo).000 af Outflo	w=54.11 cfs w=53.09 cfs	10.813 af 10.813 af
Pond 4P: Culvert	Primary=11.00 c	Peak Elev fs 2.396 af Seco	=55.77' Storag ndary=0.00 cfs	e=3,025 cf Infl 0.000 af Outfl	ow=11.18 cfs ow=11.00 cfs	2.404 af 2.396 af
Pond AP-1: AP-1	Primary=25.34 cfs	Peak Elev=58 13.209 af Secon	.51' Storage=2 dary=0.00 cfs(39,265 cf Inflo).000 af Outflo	w=70.30 cfs w=25.34 cfs	14.001 af 13.209 af
Pond AP-2: AP-2				Infl Prim	ow=37.78 cfs ary=37.78 cfs	4.073 af 4.073 af
Pond AP-3: AP-3	Primary=11.40 c	Peak Elev fs 3.096 af Seco	=50.39' Storag ndary=0.00 cfs	e=2,743 cf Infl 0.000 af Outfl	ow=11.44 cfs ow=11.40 cfs	3.106 af 3.096 af

Summary for Subcatchment SC-1A: Northeast

Runoff = 23.19 cfs @ 12.63 hrs, Volume= 3.281 af, Depth> 2.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr 10-yr Storm Rainfall=4.60"

			rescription		ica (SI)	
		ls, HSG D	Gravel road	91 0	3,043	
	HSG D	on-grazed,	leadow, no	78 N	84,597	7
		verage	Veighted A	78 V	87,640	7
	a	ervious Are	00.00% Pe	1	87,640	7
	Description	Capacity	Velocity	Slope	Length	Тс
		(cfs)	(ft/sec)	(ft/ft)	(feet)	(min)
	Sheet Flow, A-B		0.07	0.0050	100	25.2
	Grass: Dense n= 0.240 P2= 3.10"					
	Shallow Concentrated Flow, B-C		0.80	0.0130	941	19.7
	Short Grass Pasture Kv= 7.0 fps					
	Channel Flow, C-D	135.97	6.80	0.0200	118	0.3
	Area= 20.0 sf Perim= 16.6' r= 1.20'					
	n= 0.035 Earth, dense weeds					
1	Insol D ia Description Sheet Flow, A-B Grass: Dense n= 0.240 P2= 3.10" Shallow Concentrated Flow, B-C Short Grass Pasture Kv= 7.0 fps Channel Flow, C-D Area= 20.0 sf Perim= 16.6' r= 1.20' n= 0.035 Earth, dense weeds	verage ervious Are Capacity (cfs) 135.97	Veighted A 00.00% Pe Velocity (ft/sec) 0.07 0.80 6.80	78 V 78 V 1 Slope (ft/ft) 0.0050 0.0130 0.0200	87,640 87,640 (feet) 100 941 118	7 7 7 (min) 25.2 19.7 0.3

45.2 1,159 Total

Summary for Subcatchment SC-1B: Northwest

Runoff = 42.54 cfs @ 12.62 hrs, Volume= 5.966 af, Depth> 2.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr 10-yr Storm Rainfall=4.60"

	A	rea (sf)	CN E	Description		
	4	51,869	78 N	/leadow, no	on-grazed,	HSG D
		6,595	96 C	Gravel surfa	ace, HSG C	
_	1,0	27,856	77 V	Voods, Go	od, HSG D	
	1,4	86,320	77 V	Veighted A	verage	
	1,4	86,320	1	00.00% Pe	ervious Are	а
	Tc	Length	Slope	Velocity	Capacity	Description
	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
	14.5	100	0.0200	0.11		Sheet Flow, A-B
						Grass: Dense n= 0.240 P2= 3.10"
	2.0	310	0.1400	2.62		Shallow Concentrated Flow, B-C
						Short Grass Pasture Kv= 7.0 fps
	23.3	796	0.0130	0.57		Shallow Concentrated Flow, C-D
						Woodland Kv= 5.0 fps
	4.7	779	0.0180	2.75	362.73	Channel Flow, D-E
						Area= 132.0 sf Perim= 114.0' r= 1.16'
						n= 0.080 Earth, long dense weeds
	44.5	4 005	-			

44.5 1,985 Total

Summary for Subcatchment SC-1C: Town Hall

Runoff = 26.71 cfs @ 13.00 hrs, Volume= 4.916 af, Depth> 1.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr 10-yr Storm Rainfall=4.60"

A	rea (sf)	CN I	Description		
8	09,968	77 \	Woods, Go	od, HSG D	
	9,665	98	Paved park	ing, HSG D	
	55,432	30 I	Meadow, no	on-grazed,	HSG A
	53,363	30	Woods, Go	od, HSG A	
	45,721	98	Paved park	ing, HSG A	
	17,927	98	Roofs, HSG	βA	
1	91,094	55	Woods, Go	od, HSG B	
	74,486	58 I	Meadow, no	on-grazed,	HSG B
	70,436	98 I	Paved park	ing, HSG B	
	23,116	98	Roofs, HSG	ЪВ	
1	24,650	70	Woods, Go	od, HSG C	
	26,882	71	Meadow, no	on-grazed,	HSG C
	4,662	98 I	Paved park	ing, HSG C	
	5,967	98	Roofs, HSG	S C	
1,5	13,369	72	Weighted A	verage	
1,3	35,875	8	38.27% Per	vious Area	
1	77,494		11.73% Imp	pervious Are	ea
Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
38.0	100	0.0200	0.04		Sheet Flow, A-B
					Woods: Dense underbrush n= 0.800 P2= 3.10"
33.0	1,715	0.0300	0.87		Shallow Concentrated Flow, B-C
					Woodland Kv= 5.0 fps
71.0	1.815	Total			

Summary for Subcatchment SC-2: NELMA

Runoff = 37.78 cfs @ 12.36 hrs, Volume= 4.073 af, Depth> 2.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr 10-yr Storm Rainfall=4.60"

	Area (sf)	CN	Description					
*	44,300	98	Impervious					
	12,000	91	Gravel roads, HSG D					
	51,794	51,794 77 Woods, Good, HSG D						
	635,982	78	Meadow, non-grazed, HSG D					
	34,809	70	Woods, Good, HSG C					
	228,467	71	Meadow, non-grazed, HSG C					
	1,007,352	77	Weighted Average					
	963,052		95.60% Pervious Area					
	44,300		4.40% Impervious Area					

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.3	100	0.0300	0.14		Sheet Flow, A_B Grass: Dense n= 0.240 P2= 3.10"
11.3	645	0.0186	0.95		Shallow Concentrated Flow, B-C Short Grass Pasture Kv= 7.0 fps
1.6	643	0.0187	6.70	335.19	Channel Flow, C-D Area= 50.0 sf Perim= 40.3' r= 1.24' n= 0.035 Earth, dense weeds

25.2 1,388 Total

Summary for Subcatchment SC-3: Southeast

Runoff 7.17 cfs @ 12.34 hrs, Volume= 0.764 af, Depth> 2.28" =

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr 10-yr Storm Rainfall=4.60"

	A	rea (sf)	CN [Description		
		82,626	78 N	Aeadow, no	on-grazed,	HSG D
		13,968	96 (Gravel surfa	ace, HSG D	
_		78,860	77 \	Noods, Go	od, HSG D	
	1	75,454	79 \	Veighted A	verage	
	1	75,454		100.00% Pe	ervious Are	a
	Tc	Length	Slope	Velocity	Capacity	Description
_	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
	19.1	100	0.0100	0.09		Sheet Flow, A-B
						Grass: Dense n= 0.240 P2= 3.10"
	4.5	262	0.0190	0.96		Shallow Concentrated Flow, B-C
						Short Grass Pasture Kv= 7.0 fps
	0.9	421	0.0260	7.71	369.85	Channel Flow, C-D
						Area= 48.0 sf Perim= 40.2' r= 1.19'
_						n= 0.035 Earth, dense weeds
	01 E	702	Total			

24.5 783 Total

Summary for Subcatchment SC-4: Southwest

11.18 cfs @ 13.28 hrs, Volume= 2.404 af, Depth> 2.14" Runoff =

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr 10-yr Storm Rainfall=4.60"

Area (sf) CN	Description
272,287	7 80	Pasture/grassland/range, Good, HSG D
1,292	2 96	Gravel surface, HSG D
314,798	3 77	Woods, Good, HSG D
588,37	7 78	Weighted Average
588,377	7	100.00% Pervious Area

Type III 24-hr 10-yr Storm Rainfall=4.60" Printed 9/16/2019

Prepared by Sevee	& Maher	Engineers, Inc.	
HydroCAD® 10.00-22	s/n 01260	© 2018 HydroCAD	Software Solutions LLC

Тс	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
44.6	100	0.0134	0.04		Sheet Flow, A-B
					Woods: Dense underbrush n= 0.800 P2= 3.10"
41.3	849	0.0047	0.34		Shallow Concentrated Flow, B-C
					Woodland Kv= 5.0 fps
6.9	474	0.0270	1.15		Shallow Concentrated Flow, C-D
					Short Grass Pasture Kv= 7.0 fps

92.8 1,423 Total

Summary for Reach 1BR: Wetland Reach

Inflow /	Area	ı =	68.863 ac,	5.92% Impervious,	Inflow Depth > 1.3	88" for 10-yr Storm event
Inflow		=	53.09 cfs @	2 12.88 hrs, Volume	= 10.813 af	-
Outflov	N	=	52.86 cfs @	13.03 hrs, Volume	= 10.720 af,	Atten= 0%, Lag= 8.9 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Max. Velocity= 1.77 fps, Min. Travel Time= 5.1 min Avg. Velocity = 0.87 fps, Avg. Travel Time= 10.4 min

Peak Storage= 16,190 cf @ 12.95 hrs Average Depth at Peak Storage= 0.49' Bank-Full Depth= 2.00' Flow Area= 184.0 sf, Capacity= 717.02 cfs

50.00' x 2.00' deep channel, n= 0.035 Earth, dense weeds Side Slope Z-value= 20.0 22.0 '/' Top Width= 134.00' Length= 543.0' Slope= 0.0055 '/' Inlet Invert= 57.00', Outlet Invert= 54.00'



Summary for Reach 1CR: Stream

Inflow Are	ea =	34.742 ac, 11.73% Impervious, Ir	nflow Depth > 1.70" for 10-yr Storm event
Inflow	=	26.71 cfs @ 13.00 hrs, Volume=	4.916 af
Outflow	=	26.11 cfs @ 13.25 hrs, Volume=	4.847 af, Atten= 2%, Lag= 14.9 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Max. Velocity= 1.86 fps, Min. Travel Time= 8.6 min Avg. Velocity = 1.00 fps, Avg. Travel Time= 16.0 min

Peak Storage= 13,513 cf @ 13.10 hrs Average Depth at Peak Storage= 1.49' Bank-Full Depth= 3.00' Flow Area= 40.0 sf, Capacity= 116.18 cfs 20.00' x 3.00' deep Parabolic Channel, n= 0.100 Earth, dense brush, high stage Length= 961.0' Slope= 0.0163 '/' Inlet Invert= 72.00', Outlet Invert= 56.31'



Summary for Reach 4R: Wetland Reach

Inflow	Area	=	13.507 ac,	0.00% Impervious,	Inflow Depth > 2	.13" for 10-yr	Storm event
Inflow		=	11.00 cfs @	13.37 hrs, Volume	e 2.396 at	:	
Outflo	N	=	10.52 cfs @	13.84 hrs, Volume	e= 2.342 at	, Atten= 4%, L	ag= 28.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Max. Velocity= 0.21 fps, Min. Travel Time= 15.4 min Avg. Velocity = 0.13 fps, Avg. Travel Time= 24.4 min

Peak Storage= 9,740 cf @ 13.58 hrs Average Depth at Peak Storage= 1.27' Bank-Full Depth= 1.00' Flow Area= 35.0 sf, Capacity= 6.71 cfs

15.00' x 1.00' deep channel, n= 0.800 Sheet flow: Woods+dense brush Side Slope Z-value= 20.0 '/' Top Width= 55.00' Length= 196.0' Slope= 0.0195 '/' Inlet Invert= 52.82', Outlet Invert= 49.00'



Summary for Pond 1BP: 3x3 Stone Box Culvert

Inflow Area =	68.863 ac,	5.92% Impervious, Ir	nflow Depth > 1.88	" for 10-yr Storm event
Inflow =	54.11 cfs @	12.78 hrs, Volume=	10.813 af	-
Outflow =	53.09 cfs @	12.88 hrs, Volume=	10.813 af, <i>A</i>	Atten= 2%, Lag= 6.5 min
Primary =	53.09 cfs @	12.88 hrs, Volume=	10.813 af	
Secondary =	0.00 cfs @	5.00 hrs, Volume=	0.000 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Peak Elev= 60.72' @ 12.88 hrs Surf.Area= 7,703 sf Storage= 5,064 cf

Plug-Flow detention time= 0.5 min calculated for 10.813 af (100% of inflow) Center-of-Mass det. time= 0.5 min (847.7 - 847.2)

Existin	ng 082719	r		Type III 24	I-hr 10-yr Storm Rainfall=4.60"			
Prepare	ed by Seve	e & Maher Er	igineers, Inc.	Cofficience Collutions I.I.C.	Printed 9/16/2019			
HydroCA	D® 10.00-22	s/n 01260 © 2		Soliware Solutions LLC	Page 8			
Volume	Inver	t Avail.Sto	rage Storage	Description				
#1	58.00	' 379,78	30 cf Custom	n Stage Data (Prismatio	c) Listed below (Recalc)			
Elevatio	on S	urf.Area	Inc.Store	Cum.Store				
(fee	et)	(sq-ft)	(cubic-feet)	(cubic-feet)				
58.0	00	7	0	0				
59.0	00	377	192	192				
60.0	00	2,198	1,288	1,480				
61.0	00	9,800	5,999	7,479				
62.0	00	29,558	19,679	27,158				
63.0	00	53,497	41,528	68,685				
64.0	00	76,964	65,231	133,916				
65.0	00	123,349	100,157	234,072				
66.0	00	168,066	145,708	379,780				
Device	Routing	Invert	Outlet Device	S				
#1	Primary	56.31'	36.0" W x 36	.0" H Box Culvert				
			L= 54.0' Box	د, headwall w/3 square د	edges, Ke= 0.500			
			Inlet / Outlet Invert= 56.13' / 56.31' S= -0.0033 '/' Cc= 0.900					
			n= 0.025 Rul	n= 0.025 Rubble masonry, cemented, Flow Area= 9.00 sf				
#2	Secondary	/ 65.00'	20.0' long x	5.0' breadth Broad-Cre	ested 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 5.5				
			Coef. (English	Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65				
			2.65 2.67 2.	66 2.68 2.70 2.74 2.7	9 2.88			
Primary	OutFlow	/lax=53.07 cfs	@ 12.88 hrs +	HW=60.72' (Free Disch	arge)			

└─1=Culvert (Barrel Controls 53.07 cfs @ 5.90 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=58.00' (Free Discharge) 2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 4P: Culvert

Inflow Area	=	13.507 ac,	0.00% Impervious,	Inflow Depth > 2.	14" for 10-yr Storm event
Inflow :	=	11.18 cfs @	13.28 hrs, Volume=	= 2.404 af	
Outflow :	=	11.00 cfs @	13.37 hrs, Volume=	= 2.396 af,	Atten= 2%, Lag= 5.4 min
Primary :	=	11.00 cfs @	13.37 hrs, Volume=	= 2.396 af	
Secondary :	=	0.00 cfs @	5.00 hrs, Volume=	= 0.000 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Peak Elev= 55.77' @ 13.37 hrs Surf.Area= 3,098 sf Storage= 3,025 cf

Plug-Flow detention time= 4.6 min calculated for 2.388 af (99% of inflow) Center-of-Mass det. time= 3.5 min (865.6 - 862.1)

Volume	Invert	Avail.Storage	Storage Description
#1	52.00'	190,452 cf	Custom Stage Data (Prismatic)Listed below (Recalc)

Prepared by Sevee & Maher Engineers, Inc.

Elevation		Surf.Area	Inc.Store	Cum.Store	
(feet)		(sq-ft)	(cubic-feet)	(cubic-feet)	
52.0	00	1	0	0	
53.0	00	7	4	4	
54.0	00	556	282	286	
55.0	00	1,423	990	1,275	
56.0	00	3,587	2,505	3,780	
57.0	00	6,301	4,944	8,724	
58.0	00	9,663	7,982	16,706	
59.0	00	14,490	12,077	28,783	
60.0	00	22,192	18,341	47,124	
61.0	00	34,805	28,499	75,622	
62.0	00	57,427	46,116	121,738	
63.0	00	80,000	68,714	190,452	
Device	Routing	Invert	Outlet Devices		
#1	Primary	53.82'	18.0" W x 24.0"	H Box Culver	t
			L= 50.0' Box, h	neadwall w/3 sq	uare edges, Ke= 0.500
			Inlet / Outlet Inv	ert= 53.82' / 52.	.82' S= 0.0200 '/' Cc= 0.900
			n= 0.025 Rubbl	e masonry, cen	nented, Flow Area= 3.00 sf
#2 Second		ry 62.50'	100.0' long x 1	0.0' breadth Br	oad-Crested Rectangular Weir

Primary OutFlow Max=10.99 cfs @ 13.37 hrs HW=55.77' (Free Discharge) **1=Culvert** (Barrel Controls 10.99 cfs @ 5.00 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=52.00' (Free Discharge) 2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond AP-1: AP-1

Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Inflow Area	=	86.945 ac,	4.69% Impe	ervious,	Inflow Depth	> 1.9	93" for	10-y	r Storm	i event
Inflow	=	70.30 cfs @	12.85 hrs,	Volume	= 14.0	01 af				
Outflow :	=	25.34 cfs @	14.28 hrs,	Volume	= 13.2	09 af,	Atten=	64%,	Lag= 8	35.9 min
Primary :	=	25.34 cfs @	14.28 hrs,	Volume=	= 13.2	09 af			-	
Secondary	=	0.00 cfs @	5.00 hrs,	Volume	= 0.0	00 af				

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Peak Elev= 58.51' @ 14.28 hrs Surf.Area= 77,148 sf Storage= 239,265 cf

Plug-Flow detention time= 115.5 min calculated for 13.165 af (94% of inflow) Center-of-Mass det. time= 97.9 min (947.5 - 849.7)

Volume	Invert	Avail.Storage	Storage Description
#1	53.00'	580,540 cf	Custom Stage Data (Prismatic)Listed below (Recalc)

Prepared by Sevee & Maher Engineers, Inc.

Elevatio	levation Surf.Area		Inc.Store	Cum.Store				
(fee	(feet) (sq-ft)		(cubic-feet)	(cubic-feet)				
53.0	00	18,129	0	0				
54.0	00	26,167	22,148	22,148				
55.0	00	34,797	30,482	52,630				
56.0	00	44,050	39,424	92,054				
57.0	00	54,092	49,071	141,125				
58.0	00	68,472	61,282	202,407				
59.0	00	85,610	77,041	279,448				
60.0	00	122,767	104,189	383,636				
61.0	00	271,041	196,904	580,540				
Device	Routing	Invert	Outlet Devices					
#1	Primary	53.00'	24.0" Round C	ulvert				
			L= 75.0' CMP,	end-section co	onforming to fill, Ke= 0.500			
			Inlet / Outlet Inv	ert= 53.00' / 51	1.50' S= 0.0200 '/' Cc= 0.900			
			n= 0.025 Corru	gated metal, F	Flow Area= 3.14 sf			
#2	Seconda	iry 60.00'	10.0' long x 5.0) breadth Bro	ad-Crested Rectangular Weir			
		•	Head (feet) 0.2	0 0.40 0.60 0).80 1.00 1.20 1.40 1.60 1.80 2.00			
			2.50 3.00 3.50	2 50 3 00 3 50 4 00 4 50 5 00 5 50				
			Coef. (English)	2.34 2.50 2.7	0 2.68 2.68 2.66 2.65 2.65 2.65			
			2.65 2.67 2.66	2.68 2.70 2.	74 2.79 2.88			

Primary OutFlow Max=25.34 cfs @ 14.28 hrs HW=58.51' (Free Discharge) -1=Culvert (Barrel Controls 25.34 cfs @ 8.06 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=53.00' (Free Discharge) 2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond AP-2: AP-2

Inflow .	Area	a =	23.126 ac,	4.40% Impervious,	Inflow Depth > 2	2.11" for	10-yr Storm event
Inflow		=	37.78 cfs @	12.36 hrs, Volume	e 4.073 a	f	•
Primar	у	=	37.78 cfs @	12.36 hrs, Volume	e= 4.073 a	f, Atten= (0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Pond AP-3: AP-3

Inflow Area =	17.535 ac,	0.00% Impervious, Inflo	ow Depth > 2.13"	for 10-yr Storm event
Inflow =	11.44 cfs @	13.82 hrs, Volume=	3.106 af	
Outflow =	11.40 cfs @	13.89 hrs, Volume=	3.096 af, Atte	en= 0%, Lag= 3.7 min
Primary =	11.40 cfs @	13.89 hrs, Volume=	3.096 af	-
Secondary =	0.00 cfs @	5.00 hrs, Volume=	0.000 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Peak Elev= 50.39' @ 13.89 hrs Surf.Area= 3,240 sf Storage= 2,743 cf

Plug-Flow detention time= 4.7 min calculated for 3.096 af (100% of inflow) Center-of-Mass det. time= 3.6 min (875.5 - 871.9)

Type III 24-hr 10-yr Storm Rainfall=4.60"Printed 9/16/2019utions LLCPage 11

Prepared by Sevee & Maner Engineers, Inc.	
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Volume	Inve	ert Avail.Sto	rage Storage	e Description	
#1	49.0	0' 492,0	19 cf Custon	n Stage Data (P	rismatic)Listed below (Recalc)
Elevatio	on	Surf.Area	Inc.Store	Cum.Store	
(fee	et)	(sq-ft)	(cubic-feet)	(cubic-feet)	
49.0	00	695	0	0	
50.0	00	2,545	1,620	1,620	
51.0	00	4,335	3,440	5,060	
52.0	00	6,672	5,504	10,564	
53.0	00	10,072	8,372	18,936	
54.0	00	16,185	13,129	32,064	
55.0	00	21,770	18,978	51,042	
56.0	00	27,163	24,467	75,508	
57.0	00	43,138	35,151	110,659	
58.0	0	56,033	49,586	160,244	
59.0	0	71,132	63,583	223,827	
60.0	0	97,106	84,119	307,946	
61.0	00	271,041	184,074	492,019	
Device	Routing	Invert	Outlet Device	es	
#1	Primarv	49.00'	36.0" Round	d Culvert	
#2 Secondary 60.50'		L= 75.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 49.00' / 47.50' S= 0.0200 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 7.07 sf 10.0' long x 5.0' 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. Coef. (Englis 2.65 2.67 2.	50 4.00 4.50 5 h) 2.34 2.50 2. 66 2.68 2.70 2	0.00 5.50 70 2.68 2.68 2.66 2.65 2.65 2.65 0.74 2.79 2.88

Primary OutFlow Max=11.38 cfs @ 13.89 hrs HW=50.39' (Free Discharge) -1=Culvert (Barrel Controls 11.38 cfs @ 5.22 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=49.00' (Free Discharge) 2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Existing 082719r	Type III 24-hr 25-yr Storm Rainfall=5.80"
Prepared by Sevee & Maher Engineers, Inc.	Printed 9/16/2019
HydroCAD® 10.00-22 s/n 01260 © 2018 HydroCAD Softwa	are Solutions LLC Page 12

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

SubcatchmentSC-1A	: Northeast	Runoff Area=7 Flow Length=1,159'	787,640 sf 0.0 Tc=45.2 min	0% Imperviou CN=78 Run	s Runoff Dep off=33.34 cfs	oth>3.14" 4.729 af
SubcatchmentSC-1B	: Northwest	Runoff Area=1,4 Flow Length=1,985'	86,320 sf 0.0 Tc=44.5 min	0% Imperviou CN=77 Run	s Runoff Dep off=61.62 cfs	oth>3.04" 8.658 af
SubcatchmentSC-1C	: Town Hall	Runoff Area=1,51 Flow Length=1,815'	3,369 sf 11.7 Tc=71.0 min	73% Imperviou CN=72 Run	s Runoff Dep off=40.59 cfs	oth>2.56" 7.413 af
SubcatchmentSC-2:	NELMA	Runoff Area=1,0 Flow Length=1,388'	007,352 sf 4.4 Tc=25.2 min	0% Imperviou CN=77 Run	s Runoff Dep off=54.69 cfs	oth>3.07" 5.908 af
SubcatchmentSC-3:	Southeast	Runoff Area=1 Flow Length=783'	75,454 sf 0.0 Tc=24.5 min	0% Imperviou CN=79 Run	s Runoff Dep off=10.20 cfs	oth>3.26" 1.093 af
SubcatchmentSC-4:	Southwest	Runoff Area=5 Flow Length=1,423'	588,377 sf 0.0 Tc=92.8 min	0% Imperviou CN=78 Run	s Runoff Dep off=16.06 cfs	oth>3.08" 3.470 af
Reach 1BR: Wetland	Reach n=0.035 L=:	Avg. Flow Depth=0. 543.0' S=0.0055 '/'	59' Max Vel= Capacity=717.	1.97 fps Inflo .02 cfs Outflo	w=72.40 cfs w=72.30 cfs	15.986 af 15.874 af
Reach 1CR: Stream	n=0.100 L	Avg. Flow Depth=* =961.0' S=0.0163 '/'	1.82' Max Vel Capacity=110	=2.11 fps Infl 6.18 cfs Outfl	ow=40.59 cfs ow=39.88 cfs	7.413 af 7.328 af
Reach 4R: Wetland R	each n=0.800	Avg. Flow Depth=" L=196.0' S=0.0195	1.59' Max Vel '/' Capacity=(=0.22 fps Infl 6.71 cfs Outfl	ow=15.67 cfs ow=15.04 cfs	3.461 af 3.394 af
Pond 1BP: 3x3 Stone	Box Culvert Primary=72.40 cfs	Peak Elev=62. 15.986 af Seconda	09' Storage=3 ry=0.00 cfs 0.	0,048 cf Inflo 000 af Outflo	w=82.11 cfs w=72.40 cfs	15.986 af 15.986 af
Pond 4P: Culvert	Primary=15.67 o	Peak Elev=5 ofs 3.461 af Second	6.38' Storage ary=0.00 cfs(=5,361 cf Infl).000 af Outfl	ow=16.06 cfs ow=15.67 cfs	3.470 af 3.461 af
Pond AP-1: AP-1	Primary=29.23 cfs	Peak Elev=60.1 17.380 af Seconda	6' Storage=40 ry=1.55 cfs 0.	5,309 cf Inflo 121 af Outflo	w=95.19 cfs 2 w=30.77 cfs	20.603 af 17.501 af
Pond AP-2: AP-2				Infl Prima	ow=54.69 cfs ary=54.69 cfs	5.908 af 5.908 af
Pond AP-3: AP-3	Primary=16.34 (Peak Elev=5 cfs 4.596 af Second	60.70' Storage ary=0.00 cfs(=3,854 cf Infl).000 af Outfl	ow=16.40 cfs ow=16.34 cfs	4.608 af 4.596 af

Summary for Subcatchment SC-1A: Northeast

Runoff = 33.34 cfs @ 12.62 hrs, Volume= 4.729 af, Depth> 3.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr 25-yr Storm Rainfall=5.80"

A	rea (sf)	CN D			
	3,043	91 0	Gravel road	ls, HSG D	
7	784,597	78 N	leadow, no	on-grazed,	HSG D
787,640 78 Weighted Average					
7	787,640	1	00.00% Pe	ervious Are	а
Тс	Length	Slope	Velocity	Capacity	Description
<u>(min)</u>	(feet)	(ft/ft)	(ft/sec)	(cfs)	
25.2	100	0.0050	0.07		Sheet Flow, A-B
					Grass: Dense n= 0.240 P2= 3.10"
19.7	941	0.0130	0.80		Shallow Concentrated Flow, B-C
					Short Grass Pasture Kv= 7.0 fps
0.3	118	0.0200	6.80	135.97	Channel Flow, C-D
					Area= 20.0 sf Perim= 16.6' r= 1.20'
					n= 0.035 Earth, dense weeds

45.2 1,159 Total

Summary for Subcatchment SC-1B: Northwest

Runoff = 61.62 cfs @ 12.61 hrs, Volume= 8.658 af, Depth> 3.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr 25-yr Storm Rainfall=5.80"

	A	rea (sf)	CN E	Description		
451,869 78 Meadow, non-grazed, H					on-grazed,	HSG D
		6,595	96 C	Gravel surfa	ace, HSG C	
_	1,0	27,856	77 V	Voods, Go	od, HSG D	
	1,4	86,320	77 V	Veighted A	verage	
	1,4	86,320	1	00.00% Pe	ervious Are	а
	Tc	Length	Slope	Velocity	Capacity	Description
	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
	14.5	100	0.0200	0.11		Sheet Flow, A-B
						Grass: Dense n= 0.240 P2= 3.10"
	2.0	310	0.1400	2.62		Shallow Concentrated Flow, B-C
						Short Grass Pasture Kv= 7.0 fps
	23.3	796	0.0130	0.57		Shallow Concentrated Flow, C-D
						Woodland Kv= 5.0 fps
	4.7	779	0.0180	2.75	362.73	Channel Flow, D-E
						Area= 132.0 sf Perim= 114.0' r= 1.16'
						n= 0.080 Earth, long dense weeds
	44.5	4 005	-			

44.5 1,985 Total
Summary for Subcatchment SC-1C: Town Hall

Runoff = 40.59 cfs @ 12.98 hrs, Volume= 7.413 af, Depth> 2.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr 25-yr Storm Rainfall=5.80"

A	rea (sf)	CN I	Description		
8	09,968	77 \	Woods, Go	od, HSG D	
	9,665	98	Paved park	ing, HSG D	
	55,432	30 I	Meadow, no	on-grazed,	HSG A
	53,363	30	Woods, Go	od, HSG A	
	45,721	98	Paved park	ing, HSG A	
	17,927	98	Roofs, HSG	βA	
1	91,094	55	Woods, Go	od, HSG B	
	74,486	58 I	Meadow, no	on-grazed,	HSG B
	70,436	98 I	Paved park	ing, HSG B	
	23,116	98	Roofs, HSG	βB	
1	24,650	70	Woods, Go	od, HSG C	
	26,882	71	Meadow, no	on-grazed,	HSG C
	4,662	98 I	Paved park	ing, HSG C	
	5,967	98	Roofs, HSG	S C	
1,5	13,369	72	Weighted A	verage	
1,3	35,875	8	38.27% Per	vious Area	
1	77,494		11.73% Imp	pervious Are	ea
Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
38.0	100	0.0200	0.04		Sheet Flow, A-B
					Woods: Dense underbrush n= 0.800 P2= 3.10"
33.0	1,715	0.0300	0.87		Shallow Concentrated Flow, B-C
					Woodland Kv= 5.0 fps
71.0	1.815	Total			

Summary for Subcatchment SC-2: NELMA

Runoff = 54.69 cfs @ 12.35 hrs, Volume= 5.908 af, Depth> 3.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr 25-yr Storm Rainfall=5.80"

	Area (sf)	CN	Description
*	44,300	98	Impervious
	12,000	91	Gravel roads, HSG D
	51,794	77	Woods, Good, HSG D
	635,982	78	Meadow, non-grazed, HSG D
	34,809	70	Woods, Good, HSG C
	228,467	71	Meadow, non-grazed, HSG C
	1,007,352	77	Weighted Average
	963,052		95.60% Pervious Area
	44,300		4.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.3	100	0.0300	0.14		Sheet Flow, A_B
					Grass: Dense n= 0.240 P2= 3.10"
11.3	645	0.0186	0.95		Shallow Concentrated Flow, B-C
					Short Grass Pasture Kv= 7.0 fps
1.6	643	0.0187	6.70	335.19	Channel Flow, C-D

Area= 50.0 sf Perim= 40.3' r= 1.24' n= 0.035 Earth, dense weeds

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25.2 1,388 Total

Summary for Subcatchment SC-3: Southeast

Runoff 10.20 cfs @ 12.34 hrs, Volume= 1.093 af, Depth> 3.26" =

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr 25-yr Storm Rainfall=5.80"

_	A	rea (sf)	CN I	Description		
		82,626	78	Meadow, no	on-grazed,	HSG D
		13,968	96	Gravel surfa	ace, HSG D	
_		78,860	77 \	Noods, Go	od, HSG D	
	1	75,454	79	Neighted A	verage	
	1	75,454		100.00% Pe	ervious Are	а
	-		01	N / 1 · · ·	0	
		Length	Slope	Velocity	Capacity	Description
_	(min)	(teet)	(π/π)	(II/SeC)	(CIS)	
	19.1	100	0.0100	0.09		Sheet Flow, A-B
						Grass: Dense n= 0.240 P2= 3.10"
	4.5	262	0.0190	0.96		Shallow Concentrated Flow, B-C
						Short Grass Pasture Kv= 7.0 fps
	0.9	421	0.0260	7.71	369.85	Channel Flow, C-D
						Area= 48.0 sf Perim= 40.2' r= 1.19'
						n= 0.035 Earth, dense weeds
	24 5	702	Total			

l otal 24.5 183

Summary for Subcatchment SC-4: Southwest

16.06 cfs @ 13.26 hrs, Volume= 3.470 af, Depth> 3.08" Runoff =

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr 25-yr Storm Rainfall=5.80"

Ar	rea (sf)	CN	Description
2	72,287	80	Pasture/grassland/range, Good, HSG D
	1,292	96	Gravel surface, HSG D
3	14,798	77	Woods, Good, HSG D
58	88,377	78	Weighted Average
58	88,377		100.00% Pervious Area

Type III 24-hr 25-yr Storm Rainfall=5.80" Printed 9/16/2019

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Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	·
44.6	100	0.0134	0.04		Sheet Flow, A-B
					Woods: Dense underbrush n= 0.800 P2= 3.10"
41.3	849	0.0047	0.34		Shallow Concentrated Flow, B-C
					Woodland Kv= 5.0 fps
6.9	474	0.0270	1.15		Shallow Concentrated Flow, C-D
					Short Grass Pasture Kv= 7.0 fps
~~ ~					

92.8 1,423 Total

Summary for Reach 1BR: Wetland Reach

Inflow A	Area	ı =	6	8.863 ac,	5.92% Imp	ervious,	Inflow Depth	> 2.7	79" for	25-yı	r Storm e	event
Inflow		=	72	2.40 cfs @	13.11 hrs,	Volume	= 15.98	36 af				
Outflov	N	=	72	2.30 cfs @	13.24 hrs,	Volume	= 15.87	74 af,	Atten=	0%, L	_ag= 7.7	min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Max. Velocity= 1.97 fps, Min. Travel Time= 4.6 min Avg. Velocity = 0.95 fps, Avg. Travel Time= 9.5 min

Peak Storage= 19,971 cf @ 13.16 hrs Average Depth at Peak Storage= 0.59' Bank-Full Depth= 2.00' Flow Area= 184.0 sf, Capacity= 717.02 cfs

50.00' x 2.00' deep channel, n= 0.035 Earth, dense weeds Side Slope Z-value= 20.0 22.0 '/' Top Width= 134.00' Length= 543.0' Slope= 0.0055 '/' Inlet Invert= 57.00', Outlet Invert= 54.00'



Summary for Reach 1CR: Stream

Inflow Are	ea =	34.742 ac, 1 [·]	1.73% Impervious,	Inflow Depth >	2.56" fo	r 25-yr Storm event
Inflow	=	40.59 cfs @	12.98 hrs, Volume	e 7.413 a	af	•
Outflow	=	39.88 cfs @	13.20 hrs, Volume	e= 7.328 a	af, Atten=	2%, Lag= 12.8 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Max. Velocity= 2.11 fps, Min. Travel Time= 7.6 min Avg. Velocity = 1.09 fps, Avg. Travel Time= 14.7 min

Peak Storage= 18,174 cf @ 13.07 hrs Average Depth at Peak Storage= 1.82' Bank-Full Depth= 3.00' Flow Area= 40.0 sf, Capacity= 116.18 cfs

Existing 082719rType III 24-hr25-yrStorm Rainfall=5.80"Prepared by Sevee & Maher Engineers, Inc.Printed9/16/2019HydroCAD® 10.00-22s/n 01260© 2018 HydroCAD Software Solutions LLCPage 17

20.00' x 3.00' deep Parabolic Channel, n= 0.100 Earth, dense brush, high stage Length= 961.0' Slope= 0.0163 '/' Inlet Invert= 72.00', Outlet Invert= 56.31'



Summary for Reach 4R: Wetland Reach

Inflow .	Area	a =	13.507 ac,	0.00% Impervious,	Inflow Depth >	3.07" fo	r 25-yr Storm event
Inflow		=	15.67 cfs @	13.39 hrs, Volume	= 3.461 a	af	
Outflov	N	=	15.04 cfs @	13.84 hrs, Volume	= 3.394 a	af, Atten=	4%, Lag= 27.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Max. Velocity= 0.22 fps, Min. Travel Time= 14.6 min Avg. Velocity = 0.14 fps, Avg. Travel Time= 23.1 min

Peak Storage= 13,150 cf @ 13.60 hrs Average Depth at Peak Storage= 1.59' Bank-Full Depth= 1.00' Flow Area= 35.0 sf, Capacity= 6.71 cfs

15.00' x 1.00' deep channel, n= 0.800 Sheet flow: Woods+dense brush Side Slope Z-value= 20.0 '/' Top Width= 55.00' Length= 196.0' Slope= 0.0195 '/' Inlet Invert= 52.82', Outlet Invert= 49.00'



Summary for Pond 1BP: 3x3 Stone Box Culvert

Inflow Area =	68.863 ac,	5.92% Impervious,	Inflow Depth > 2.7	9" for 25-yr Storm event
Inflow =	82.11 cfs @	12.77 hrs, Volume=	15.986 af	
Outflow =	72.40 cfs @	13.11 hrs, Volume=	= 15.986 af,	Atten= 12%, Lag= 20.6 min
Primary =	72.40 cfs @	13.11 hrs, Volume=	= 15.986 af	
Secondary =	0.00 cfs @	5.00 hrs, Volume=	• 0.000 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Peak Elev= 62.09' @ 13.11 hrs Surf.Area= 31,813 sf Storage= 30,048 cf

Plug-Flow detention time= 2.4 min calculated for 15.986 af (100% of inflow) Center-of-Mass det. time= 2.4 min (841.1 - 838.6)

Existing	082719r			Тур	e III 24-hr	25-yr Storm Rainfall=5.80"
Prepared	by Sevee &	Maher En	gineers, Inc.			Printed 9/16/2019
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			<u>.</u>	D		
Volume	Invert	Avail.Stor	age Storag	e Description		
#1	58.00'	379,78	0 cf Custo	m Stage Data (Pr	ismatic)Lis	ted below (Recalc)
Elevation	Surf.	Area	Inc.Store	Cum.Store		
(feet)	(:	sq-ft)	(cubic-feet)	(cubic-feet)		
58.00		7	0	0		
59.00		377	192	192		
60.00	2	2,198	1,288	1,480		
62.00	20	9,800 9,559	5,999	7,479		
63.00	28	,556 8 497	41 528	68 685		
64.00	76	5,964	65 231	133 916		
65.00	123	3,349	100,157	234,072		
66.00	168	8,066	145,708	379,780		
Device F	Routing	Invert	Outlet Devic	es		
#1 F	Primary	56.31'	36.0" W x 3	6.0" H Box Culve	ert	
	-		L= 54.0' Bo	ox, headwall w/3 s	quare edge	s, Ke= 0.500
			Inlet / Outlet	Invert= 56.13' / 56	6.31' S= -().0033 '/' Cc= 0.900
			n= 0.025 Ri	ubble masonry, ce	mented, F	low Area= 9.00 sf
#2 8	Secondary	65.00 [°]	20.0' long >	(5.0' breadth Bro	ad-Creste	d Rectangular Weir
			Head (feet)			1.20 1.40 1.60 1.80 2.00
			2.30 3.00 3 Coef (Englis	sh) 234 250 27	00 0.00 70 2 68 2 6	38 266 265 265 265
			2.65 2.67 2	2.66 2.68 2.70 2.	74 2.79 2	.88
.		70.00 (0 40 44 1		D ¹	`
Primary 0 1=Culv	outFlow Max rert (Barrel C	=72.39 cfs ontrols 72.3	@ 13.11 hrs 39 cfs @ 8.04	HVV=62.09' (Free fps)	e Discharge	?)
Secondar		1av=0.00 af		$\frac{1}{100}$	o Diochora	o)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=58.00' (Free Discharge) —2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 4P: Culvert

Inflow Area	=	13.507 ac,	0.00% Impervious, In	nflow Depth > 3.0	08" for 25-yr Storm event
Inflow :	=	16.06 cfs @	13.26 hrs, Volume=	3.470 af	
Outflow :	=	15.67 cfs @	13.39 hrs, Volume=	3.461 af,	Atten= 2%, Lag= 7.7 min
Primary :	=	15.67 cfs @	13.39 hrs, Volume=	3.461 af	
Secondary :	=	0.00 cfs @	5.00 hrs, Volume=	0.000 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Peak Elev= 56.38' @ 13.39 hrs Surf.Area= 4,631 sf Storage= 5,361 cf

Plug-Flow detention time= 4.8 min calculated for 3.449 af (99% of inflow) Center-of-Mass det. time= 4.0 min (858.4 - 854.4)

Volume	Invert	Avail.Storage	Storage Description
#1	52.00'	190,452 cf	Custom Stage Data (Prismatic)Listed below (Recalc)

Weir

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Elevatio	on	Surf.Area	Inc.Store	Cum.Store	
(fee	et)	(sq-ft)	(cubic-feet)	(cubic-feet)	
52.0	00	1	0	0	
53.0	00	7	4	4	
54.0	00	556	282	286	
55.0	00	1,423	990	1,275	
56.0	00	3,587	2,505	3,780	
57.0	00	6,301	4,944	8,724	
58.0	00	9,663	7,982	16,706	
59.0	00	14,490	12,077	28,783	
60.0	00	22,192	18,341	47,124	
61.0	00	34,805	28,499	75,622	
62.0	00	57,427	46,116	121,738	
63.0	00	80,000	68,714	190,452	
	_	_			
Device	Routing	Invert	Outlet Devices		
#1	Primary	53.82'	18.0" W x 24.0	" H Box Culve	rt
			L= 50.0' Box, I	headwall w/3 so	quare edges, Ke= 0.500
			Inlet / Outlet Inv	/ert= 53.82' / 52	2.82' S= 0.0200 '/' Cc= 0.900
			n= 0.025 Rubb	le masonry, cer	mented, Flow Area= 3.00 sf
#2	Seconda	ry 62.50'	100.0' long x 1	10.0' breadth B	road-Crested Rectangular W
			Head (feet) 0.2	20 0.40 0.60 0	.80 1.00 1.20 1.40 1.60
			Coef. (English)	2.49 2.56 2.7	0 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=15.67 cfs @ 13.39 hrs HW=56.38' (Free Discharge) **1=Culvert** (Barrel Controls 15.67 cfs @ 5.43 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=52.00' (Free Discharge) 2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond AP-1: AP-1

Inflow Area	=	86.945 ac,	4.69% Impervious	s, Inflow Depth >	2.84"	for 25-yr	Storm event
Inflow :	=	95.19 cfs @	12.81 hrs, Volun	ne= 20.603	af		
Outflow :	=	30.77 cfs @	14.47 hrs, Volun	ne= 17.501	af, Atte	en= 68%,	Lag= 99.7 min
Primary :	=	29.23 cfs @	14.47 hrs, Volun	ne= 17.380	af		
Secondary =	=	1.55 cfs @	14.47 hrs, Volun	ne= 0.121	af		

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Peak Elev= 60.16' @ 14.47 hrs Surf.Area= 146,625 sf Storage= 405,309 cf

Plug-Flow detention time= 152.0 min calculated for 17.442 af (85% of inflow) Center-of-Mass det. time= 112.9 min (955.1 - 842.2)

Volume	Invert	Avail.Storage	Storage Description
#1	53.00'	580,540 cf	Custom Stage Data (Prismatic)Listed below (Recalc)

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on	Surf.Area	Inc.Store	Cum.Store	
et)	(sq-ft)	(cubic-feet)	(cubic-feet)	
00	18,129	0	0	
00	26,167	22,148	22,148	
)0	34,797	30,482	52,630	
)0	44,050	39,424	92,054	
00	54,092	49,071	141,125	
)0	68,472	61,282	202,407	
)0	85,610	77,041	279,448	
00	122,767	104,189	383,636	
)0	271,041	196,904	580,540	
Routing	Invert	Outlet Devices		
Primary	53.00'	24.0" Round C	ulvert	
		L= 75.0' CMP,	end-section c	onforming to fill, Ke= 0.500
		Inlet / Outlet Inv	ert= 53.00' / 5	1.50' S= 0.0200 '/' Cc= 0.900
		n= 0.025 Corru	gated metal, I	Flow Area= 3.14 sf
Seconda	iry 60.00'	10.0' long x 5.0) breadth Bro	oad-Crested Rectangular Weir
	•	Head (feet) 0.20	0 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)	2.34 2.50 2.7	70 2.68 2.68 2.66 2.65 2.65 2.65
		2.65 2.67 2.66	2.68 2.70 2	.74 2.79 2.88
	on et) 00 00 00 00 00 00 00 00 Primary Seconda	on Surf.Area (sq-ft) 00 18,129 00 26,167 00 34,797 00 44,050 00 54,092 00 68,472 00 85,610 00 122,767 00 271,041 <u>Routing Invert</u> Primary 53.00' Secondary 60.00'	on Surf.Area (sq-ft) Inc.Store (cubic-feet) 00 18,129 0 00 26,167 22,148 00 34,797 30,482 00 44,050 39,424 00 54,092 49,071 00 68,472 61,282 00 85,610 77,041 00 122,767 104,189 00 271,041 196,904 Routing Primary 53.00' 24.0" Round C L= 75.0' CMP, Inlet / Outlet Invert Secondary 60.00' 10.0' long x 5.0 Head (feet) 0.24 2.50 3.00 3.50 Coef. (English) 2.65 2.67 2.66	on Surf.Area (sq-ft) Inc.Store (cubic-feet) Cum.Store (cubic-feet) 00 18,129 0 0 00 26,167 22,148 22,148 00 34,797 30,482 52,630 00 44,050 39,424 92,054 00 54,092 49,071 141,125 00 68,472 61,282 202,407 00 85,610 77,041 279,448 00 122,767 104,189 383,636 00 271,041 196,904 580,540 Routing Primary 53.00' 24.0" Round Culvert L= 75.0' CMP, end-section c Inlet / Outlet Invert= 53.00' / 5 n= 0.025 Corrugated metal, n= 0.025 Corrugated metal, Secondary 60.00' 10.0' long x 5.0' breadth Brow Head (feet) 0.20 0.40 0.60 2.50 3.00 3.50 4.00 4.50 5 Coef. (English) 2.34 2.50 2.7 2.65

Primary OutFlow Max=29.22 cfs @ 14.47 hrs HW=60.16' (Free Discharge) -1=Culvert (Barrel Controls 29.22 cfs @ 9.30 fps)

Secondary OutFlow Max=1.51 cfs @ 14.47 hrs HW=60.16' (Free Discharge) 2=Broad-Crested Rectangular Weir (Weir Controls 1.51 cfs @ 0.94 fps)

Summary for Pond AP-2: AP-2

Inflow /	Area =	23.126 ac,	4.40% Impervious,	Inflow Depth > 3	8.07" for 25-y	r Storm event
Inflow	=	54.69 cfs @	12.35 hrs, Volume	= 5.908 a	f	
Primary	y =	54.69 cfs @	12.35 hrs, Volume	= 5.908 a	f, Atten= 0%, I	_ag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Pond AP-3: AP-3

Inflow Area	=	17.535 ac,	0.00% Impervious,	Inflow Depth > 3.	15" for 25-yr Storm event
Inflow	=	16.40 cfs @	14.01 hrs, Volume=	= 4.608 af	
Outflow :	=	16.34 cfs @	14.06 hrs, Volume=	= 4.596 af,	Atten= 0%, Lag= 2.5 min
Primary :	=	16.34 cfs @	14.06 hrs, Volume=	= 4.596 af	-
Secondary	=	0.00 cfs @	5.00 hrs, Volume=	= 0.000 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Peak Elev= 50.70' @ 14.06 hrs Surf.Area= 3,805 sf Storage= 3,854 cf

Plug-Flow detention time= 4.4 min calculated for 4.596 af (100% of inflow) Center-of-Mass det. time= 3.5 min (867.4 - 863.9)

Type III 24-hr 25-yr Storm Rainfall=5.80" Printed 9/16/2019 utions LLC Page 21

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Volume	Inve	ert Avail.Sto	orage Storag	e Description	
#1	49.0	0' 492,0	19 cf Custo	m Stage Data (P	rismatic)Listed below (Recalc)
Elevatio (fee	on et)	Surf.Area (sg-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
49.0)()	695	0	0	
50.0	0	2 545	1 620	1 620	
51 0	0	4 335	3 440	5 060	
52.0	0	6.672	5.504	10.564	
53.0	0	10,072	8,372	18,936	
54.0	00	16,185	13,129	32,064	
55.0	00	21,770	18,978	51,042	
56.0	00	27,163	24,467	75,508	
57.0	00	43,138	35,151	110,659	
58.0	0	56,033	49,586	160,244	
59.0	00	71,132	63,583	223,827	
60.0	00	97,106	84,119	307,946	
61.0	00	271,041	184,074	492,019	
Device	Routing	Invert	Outlet Devic	es	
#1	Primary	49.00'	36.0" Roun	d Culvert	
			L= 75.0' R0	CP, end-section c	onforming to fill, Ke= 0.500
			Inlet / Outlet	Invert= 49.00' / 4	7.50' S= 0.0200 '/' Cc= 0.900
	- ·		n= 0.025 C	orrugated metal,	Flow Area= 7.07 sf
#2	Seconda	ry 60.50'	10.0' long >	c 5.0' breadth Br	oad-Crested Rectangular Weir
			Head (feet)		
			2.50 3.00 3	3.50 4.00 4.50 5 	
				SN) 2.34 2.30 2.	70 2.08 2.08 2.00 2.05 2.05 2.05
			2.00 2.07 2	2.00 2.08 2.70 2	2.14 2.19 2.00
	0	Max-16 22 of	@ 11.06 hm		

Primary OutFlow Max=16.33 cfs @ 14.06 hrs HW=50.70' (Free Discharge) —1=Culvert (Barrel Controls 16.33 cfs @ 5.69 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=49.00' (Free Discharge) 2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)



Proposed 082719r	Type III 24-hr 10-yr Storm Rainfa	all=4.60"
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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points Runoff by SCS TR-20 method, UH=SCS, Weighted-CN Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentSC-1A: No	ortheast	Runoff Area=7 Flow Length=1,159'	′98,350 sf 0.0 Tc=45.2 min	0% Impervious CN=79 Runo	Runoff Dept ff=24.40 cfs	th>2.26" 3.451 af
SubcatchmentSC-1B: No	orthwest	Runoff Area=1,4 Flow Length=1,985'	24,359 sf 0.7 Tc=44.5 min	2% Impervious CN=77 Runo	Runoff Dept ff=40.77 cfs	th>2.10" 5.717 af
SubcatchmentSC-1C: To	own Hall	Runoff Area=1,51 Flow Length=1,815'	3,369 sf 11.7 Tc=71.0 min	3% Impervious CN=72 Runo	Runoff Dept f=26.71 cfs	th>1.70" 4.916 af
SubcatchmentSC-2: NEI	_MA	Runoff Area=1,0 Flow Length=1,388'	007,352 sf 4.5 Tc=25.2 min	2% Impervious CN=77 Runo	Runoff Dept ff=37.78 cfs	th>2.11" 4.073 af
Subcatchment SC-3: Sou	Itheast	Runoff Area=1 Flow Length=596	94,599 sf 2.1 5' Tc=18.3 mir	6% Impervious n CN=82 Run	Runoff Dept off=9.94 cfs	th>2.54" 0.944 af
SubcatchmentSC-4: Sou	Ithwest	Runoff Area=6 Flow Length=1,423'	20,476 sf 0.9 Tc=93.1 min	0% Impervious CN=79 Runo	Runoff Dept ff=12.15 cfs	th>2.22" 2.631 af
Reach 1BR: Wetland Rea	n=0.030 L=54	Avg. Flow Depth=0. 43.0' S=0.0055 '/'	44' Max Vel= [,] Capacity=836.	1.94 fps Inflow 52 cfs Outflow	=51.05 cfs 1 =50.88 cfs 1	0.564 af 0.481 af
Reach 1CR: Stream	n=0.100 L=	Avg. Flow Depth=* 961.0' S=0.0161 '/'	1.50' Max Vel Capacity=115	=1.85 fps Inflov 5.44 cfs Outflov	v=26.71 cfs v=26.11 cfs	4.916 af 4.847 af
Reach 4R: Wetland Reac	h n=0.800 l	Avg. Flow Depth=* _=196.0' S=0.0195	I.33' Max Vel= '/' Capacity=6	=0.22 fps Inflov 6.71 cfs Outflov	v=11.96 cfs v=11.46 cfs	2.623 af 2.566 af
Pond 1BP: 36-in HDPE C Prin	ulvert nary=51.05 cfs	Peak Elev=60 10.564 af Seconda	0.79' Storage={ ry=0.00 cfs 0.0	5,557 cf Inflow 000 af Outflow	=52.44 cfs 1 =51.05 cfs 1	0.564 af 0.564 af
Pond 4P: Culvert	rimary=11.96 cf	Peak Elev=5 s 2.623 af Second	5.90' Storage ary=0.00 cfs_0	=3,446 cf Inflov .000 af Outflov	v=12.15 cfs v=11.96 cfs	2.631 af 2.623 af
Pond AP-1: AP-1 Prin	nary=25.28 cfs	Peak Elev=58.44 13.159 af Seconda	8' Storage=23 ry=0.00 cfs 0.0	7,584 cf Inflow 000 af Outflow	=68.90 cfs 1 =25.28 cfs 1	3.932 af 3.159 af
Pond AP-2: AP-2				Inflov Primar	v=37.78 cfs y=37.78 cfs	4.073 af 4.073 af
Pond AP-3: AP-3	rimary=12.45 cf	Peak Elev=5 s 3.500 af Second	0.46' Storage ary=0.00 cfs_0	=2,976 cf Inflov .000 af Outflov	v=12.49 cfs v=12.45 cfs	3.511 af 3.500 af

Summary for Subcatchment SC-1A: Northeast

Runoff = 24.40 cfs @ 12.62 hrs, Volume= 3.451 af, Depth> 2.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr 10-yr Storm Rainfall=4.60"

	A	rea (sf)	CN [Description		
		37,018	91 (Gravel road	ls, HSG D	
	7	61,332	78 N	Meadow, no	on-grazed,	HSG D
	7	798,350 79 Weighted Average				
	7	98,350	1	100.00% Pe	ervious Are	a
	Тс	Length	Slope	Velocity	Capacity	Description
_	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
	25.2	100	0.0050	0.07		Sheet Flow, A-B
						Grass: Dense n= 0.240 P2= 3.10"
	19.7	941	0.0130	0.80		Shallow Concentrated Flow, B-C
						Short Grass Pasture Kv= 7.0 fps
	0.3	118	0.0200	6.80	135.97	Channel Flow, C-D
						Area= 20.0 sf Perim= 16.6' r= 1.20'
_						n= 0.035 Earth, dense weeds
	45 0	4 4 5 0	- · ·			

45.2 1,159 Total

Summary for Subcatchment SC-1B: Northwest

Runoff = 40.77 cfs @ 12.62 hrs, Volume= 5.717 af, Depth> 2.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr 10-yr Storm Rainfall=4.60"

A	rea (sf)	CN E	Description				
3	86,242	242 78 Meadow, non-grazed, HSG D					
1,0	27,856	77 V	Voods, Go	od, HSG D			
	5,200	98 F	Roofs, HSG	G C			
	5,061	98 F	aved park	ing, HSG C			
1,4	24,359	77 V	Veighted A	verage			
1,4	14,098	g	9.28% Per	vious Area			
	10,261	C	.72% Impe	ervious Area	а		
			·				
Tc	Length	Slope	Velocity	Capacity	Description		
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)			
14.5	100	0.0200	0.11		Sheet Flow, A-B		
					Grass: Dense n= 0.240 P2= 3.10"		
2.0	310	0.1400	2.62		Shallow Concentrated Flow, B-C		
					Short Grass Pasture Kv= 7.0 fps		
23.3	796	0.0130	0.57		Shallow Concentrated Flow, C-D		
					Woodland Kv= 5.0 fps		
4.7	779	0.0180	2.75	362.73	Channel Flow, D-E		
					Area= 132.0 sf Perim= 114.0' r= 1.16'		
					n= 0.080 Earth, long dense weeds		

44.5 1,985 Total

Summary for Subcatchment SC-1C: Town Hall

Runoff = 26.71 cfs @ 13.00 hrs, Volume= 4.916 af, Depth> 1.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr 10-yr Storm Rainfall=4.60"

Ar	rea (sf)	CN [Description					
8	09,968	77 \	Noods, Go	od, HSG D				
	9,665	98 F	Paved parking, HSG D					
	55,432	30 I	Meadow, no	on-grazed,	HSG A			
:	53,363	30 \	Noods, Go	od, HSG A				
4	45,721	98 F	Paved park	ing, HSG A				
	17,927	98 F	Roofs, HSO	βA				
19	91,094	55 \	Noods, Go	od, HSG B				
	74,486	58 I	Meadow, no	on-grazed,	HSG B			
	70,436	98 F	Paved park	ing, HSG B				
	23,116	98 F	Roofs, HSG	βB				
1:	124,650 70 Woods, Good, HSG C							
-	26,882 71 Meadow, non-grazed, HSG C							
	4,662	98 F	Paved park	ing, HSG C				
	5,967	98 F	Roofs, HSC	G C				
1,5	13,369	72 \	Neighted A	verage				
1,3	35,875	8	38.27% Pei	vious Area				
1	77,494		11.73% Imp	pervious Are	ea			
_								
TC	Length	Slope	Velocity	Capacity	Description			
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)				
38.0	100	0.0200	0.04		Sheet Flow, A-B			
					Woods: Dense underbrush n= 0.800 P2= 3.10"			
33.0	1,715	0.0300	0.87		Shallow Concentrated Flow, B-C			
					Woodland Kv= 5.0 fps			
71.0	1,815	Total						

Summary for Subcatchment SC-2: NELMA

Runoff = 37.78 cfs @ 12.36 hrs, Volume= 4.073 af, Depth> 2.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr 10-yr Storm Rainfall=4.60" Proposed 082719r

Type III 24-hr 10-yr Storm Rainfall=4.60" Printed 9/16/2019 utions LLC Page 5

Prepared by Sevee & Maher Engineers, Inc. HydroCAD® 10.00-22 s/n 01260 © 2018 HydroCAD Software Solutions LLC

	A	rea (sf)	CN I	Description		
*		45,542	98 I	mpervious		
		21,643	91 (Gravel road	ls, HSG D	
		51,673	77 \	Noods, Go	od, HSG D	
	2	17,703	71 I	Meadow, no	on-grazed,	HSG C
		34,809	70 \	Noods, Go	od, HSG C	
	6	35,982	78 I	Meadow, no	on-grazed,	HSG D
	1,0	07,352	77 \	Neighted A	verage	
961,810 95.48% Pervious Area					vious Area	
		45,542	42 4.52% Impervious Area			а
	т	1	01.000	Mala site :	0	Description
		Length	Siope	Velocity	Capacity	Description
	(min)	(feet)	(π/π)	(IT/SEC)	(CIS)	
	12.3	100	0.0300	0.14		Sheet Flow, A_B
						Grass: Dense n= 0.240 P2= 3.10"
	11.3	645	0.0186	0.95		Shallow Concentrated Flow, B-C
						Short Grass Pasture Kv= 7.0 fps
	1.6	643	0.0187	6.70	335.19	Channel Flow, C-D
						Area= 50.0 sf Perim= 40.3' r= 1.24'
						n= 0.035 Earth, dense weeds
		4 000	Tatal			

25.2 1,388 Total

Summary for Subcatchment SC-3: Southeast

Runoff = 9.94 cfs @ 12.25 hrs, Volume= 0.944 af, Depth> 2.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr 10-yr Storm Rainfall=4.60"

_	A	rea (sf)	CN [Description					
		67,722	78 N	Meadow, non-grazed, HSG D					
		43,812	96 (Gravel surfa	ace, HSG D)			
		78,860	77 V	Noods, Go	od, HSG D				
_		4,205	98 F	Paved park	ing, HSG D				
	1	94,599	82 V	Neighted A	verage				
	1	90,394	ç	97.84% Pei	rvious Area				
		4,205	2	2.16% Impe	ervious Area	а			
	Тс	Length	Slope	Velocity	Capacity	Description			
_	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)				
	16.3	100	0.0150	0.10		Sheet Flow, A-B			
						Grass: Dense n= 0.240 P2= 3.10"			
	1.1	75	0.0267	1.14		Shallow Concentrated Flow, B-C			
						Short Grass Pasture Kv= 7.0 fps			
	0.9	421	0.0260	7.71	369.85	Channel Flow, C-D			
						Area= 48.0 sf Perim= 40.2' r= 1.19'			
_						n= 0.035 Earth, dense weeds			
	18.3	596	Total						

Summary for Subcatchment SC-4: Southwest

Runoff = 12.15 cfs @ 13.26 hrs, Volume= 2.631 af, Depth> 2.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr 10-yr Storm Rainfall=4.60"

A	rea (sf)	CN [Description				
2	69,993	78 N	78 Meadow, non-grazed, HSG D				
	30,080	96 (Gravel surfa	ace, HSG D			
3	14,798	77 V	Voods, Go	od, HSG D			
	2,800	98 F	Roofs, HSG	6 D			
	2,805	98 F	Paved park	ing, HSG D			
6	20,476	79 V	Veighted A	verage			
6	14,871	ę	9.10% Pei	vious Area			
	5,605	().90% Impe	ervious Area	а		
Тс	Length	Slope	Velocity	Capacity	Description		
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)			
44.6	100	0.0134	0.04		Sheet Flow, A-B		
					Woods: Dense underbrush n= 0.800 P2= 3.10"		
41.3	849	0.0047	0.34		Shallow Concentrated Flow, B-C		
					Woodland Kv= 5.0 fps		
7.2	474	0.0248	1.10		Shallow Concentrated Flow, C-D		
					Short Grass Pasture Kv= 7.0 fps		
93.1	1,423	Total					

Summary for Reach 1BR: Wetland Reach

Inflow /	Area	=	67.441 ac,	6.39% Impervious,	Inflow Depth > 1.8	38" for 10-yr Storm event
Inflow		=	51.05 cfs @	12.93 hrs, Volume=	10.564 af	-
Outflov	N	=	50.88 cfs @	13.06 hrs, Volume=	= 10.481 af,	Atten= 0%, Lag= 8.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Max. Velocity= 1.94 fps, Min. Travel Time= 4.7 min Avg. Velocity = 0.95 fps, Avg. Travel Time= 9.5 min

Peak Storage= 14,248 cf @ 12.99 hrs Average Depth at Peak Storage= 0.44' Bank-Full Depth= 2.00' Flow Area= 184.0 sf, Capacity= 836.52 cfs

50.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding Side Slope Z-value= 20.0 22.0 '/' Top Width= 134.00' Length= 543.0' Slope= 0.0055 '/' Inlet Invert= 57.00', Outlet Invert= 54.00'



Peak Storage= 10,446 cf @ 13.59 hrs Average Depth at Peak Storage= 1.33' Bank-Full Depth= 1.00' Flow Area= 35.0 sf, Capacity= 6.71 cfs

15.00' x 1.00' deep channel, n= 0.800 Sheet flow: Woods+dense brush Side Slope Z-value= 20.0 '/' Top Width= 55.00' Length= 196.0' Slope= 0.0195 '/' Inlet Invert= 52.82', Outlet Invert= 49.00'

Proposed 082719r

Type III 24-hr 10-yr Storm Rainfall=4.60" Printed 9/16/2019 Plutions LLC Page 8





Summary for Pond 1BP: 36-in HDPE Culvert

Inflow Area =	67.441 ac,	6.39% Impervious,	Inflow Depth > 1.8	38" for 10-yr Storm event
Inflow =	52.44 cfs @	12.78 hrs, Volume=	= 10.564 af	
Outflow =	51.05 cfs @	12.93 hrs, Volume=	= 10.564 af,	Atten= 3%, Lag= 8.7 min
Primary =	51.05 cfs @	12.93 hrs, Volume=	= 10.564 af	
Secondary =	0.00 cfs @	5.00 hrs, Volume=	= 0.000 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Peak Elev= 60.79' @ 12.93 hrs Surf.Area= 8,175 sf Storage= 5,557 cf

Plug-Flow detention time= 0.5 min calculated for 10.529 af (100% of inflow) Center-of-Mass det. time= 0.5 min (848.2 - 847.7)

Volume	Inve	rt Avail.Sto	rage Storage [Description	
#1	58.00)' 645,0	95 cf Custom	Stage Data (Pi	rismatic)Listed below (Recalc)
Elevatio (fee	on S	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
58 ()))	7	0	0	
59.0	00	377	192	192	
60.0	00	2.198	1.288	1.480	
61.0	00	9,800	5,999	7,479	
62.0	00	24,409	17,105	24,583	
63.0	00	49,900	37,155	61,738	
64.0	00	67,484	58,692	120,430	
65.0	00	96,865	82,175	202,604	
66.0	00	129,107	112,986	315,590	
67.0	00	165,716	147,412	463,002	
68.0	00	198,471	182,094	645,095	
Device	Routing	Invert	Outlet Devices		
#1	Primary	56.51'	36.0" Round	Culvert	
	-		L= 75.0' CPP	, end-section c	onforming to fill, Ke= 0.500
			Inlet / Outlet In	vert= 56.51' / 5	6.13' S= 0.0051 '/' Cc= 0.900
			n= 0.013 Corr	ugated PE, sm	ooth interior, Flow Area= 7.07 sf
#2	Secondar	y 67.00'	20.0' long x 5	.0' breadth Bro	oad-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 3.5	0 4.00 4.50 5	
			Coet. (English)	2.34 2.50 2.	70 2.68 2.68 2.66 2.65 2.65 2.65
			2.05 2.07 2.6	0 2.08 2.70 2	.14 2.19 2.88

Primary OutFlow Max=51.03 cfs @ 12.93 hrs HW=60.78' (Free Discharge) **1=Culvert** (Barrel Controls 51.03 cfs @ 7.22 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=58.00' (Free Discharge) 2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 4P: Culvert

Inflow Area	=	14.244 ac,	0.90% Impervious,	Inflow Depth >	2.22" for	10-yr Storm event
Inflow	=	12.15 cfs @	13.26 hrs, Volume	= 2.631	af	
Outflow	=	11.96 cfs @	13.38 hrs, Volume	= 2.623	af, Atten=2	2%, Lag= 7.4 min
Primary	=	11.96 cfs @	13.38 hrs, Volume	= 2.623	af	
Secondary	=	0.00 cfs @	5.00 hrs, Volume	= 0.000	af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Peak Elev= 55.90' @ 13.38 hrs Surf.Area= 3,379 sf Storage= 3,446 cf

Plug-Flow detention time= 4.6 min calculated for 2.623 af (100% of inflow) Center-of-Mass det. time= 3.6 min (863.8 - 860.2)

Volume	Inver	t Avail.Sto	rage Stora	age Description	
#1	52.00	' 190,48	52 cf Cust	tom Stage Data (P	rismatic)Listed below (Recalc)
Elevatio	on S	Surf.Area	Inc.Store	e Cum.Store	
(fee	et)	(sq-ft)	(cubic-feet)) (cubic-feet)	
52.0	00	1	0) 0	
53.0	00	7	4	4	
54.0	00	556	282	2 286	
55.0	00	1,423	990) 1,275	
56.0	00	3,587	2,505	5 3,780	
57.0	00	6,301	4,944	8,724	
58.0	00	9,663	7,982	2 16,706	
59.0	00	14,490	12,077	28,783	
60.0	00	22,192	18,341	47,124	
61.0	00	34,805	28,499	75,622	
62.0	00	57,427	46,116	6 121,738	
63.0	00	80,000	68,714	190,452	
Device	Routing	Invert	Outlet Dev	vices	
#1	Primary	53.82'	18.0" W x	24.0" H Box Culv	vert
#2	Secondary	/ 62.50'	L= 50.0' I Inlet / Outl n= 0.025 100.0' Ion Head (feet Coef. (Eng	Box, headwall w/3 s et Invert= 53.82' / 5 Rubble masonry, c g x 10.0' breadth t) 0.20 0.40 0.60 glish) 2.49 2.56 2.	square edges, Ke= 0.500 52.82' S= 0.0200 '/' Cc= 0.900 emented, Flow Area= 3.00 sf Broad-Crested Rectangular Weir 0.80 1.00 1.20 1.40 1.60 .70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=11.95 cfs @ 13.38 hrs HW=55.90' (Free Discharge) **1=Culvert** (Barrel Controls 11.95 cfs @ 5.10 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=52.00' (Free Discharge) 2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond AP-1: AP-1

Inflow Area	=	85.769 ac,	5.03% Impe	ervious, Inflow	Depth >	1.95"	for	10-yr	Storm eve	ent
Inflow	=	68.90 cfs @	12.80 hrs,	Volume=	13.932	af		-		
Outflow	=	25.28 cfs @	14.26 hrs,	Volume=	13.159	af, At	ten= 6	3%,	Lag= 87.9	min
Primary	=	25.28 cfs @	14.26 hrs,	Volume=	13.159	af			-	
Secondary	=	0.00 cfs @	5.00 hrs,	Volume=	0.000	af				

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Peak Elev= 58.48' @ 14.26 hrs Surf.Area= 76,773 sf Storage= 237,584 cf

Plug-Flow detention time= 114.9 min calculated for 13.115 af (94% of inflow) Center-of-Mass det. time= 97.5 min (946.1 - 848.5)

Volume	Inver	t Avail.Stor	age Storage	Description	
#1	53.00)' 580,54	0 cf Custom	Stage Data (Pi	rismatic)Listed below (Recalc)
Elevatio	n S	Surf.Area	Inc.Store	Cum.Store	
53.0	0	18 129	0	0	
54.0	0	26,167	22,148	22,148	
55.0	0	34,797	30,482	52,630	
56.0	0	44,050	39,424	92,054	
57.0	0	54,092	49,071	141,125	
58.0 59.0		68,472 85,610	61,282 77 041	202,407 279 448	
60.0	0	122.767	104.189	383.636	
61.0	0	271,041	196,904	580,540	
Device	Routing	Invert	Outlet Devices	S	
#1	Primary	53.00'	24.0" Round	Culvert	
#2 Secondary		y 60.00'	L= 75.0' CMI Inlet / Outlet II n= 0.025 Cor 10.0' long x 9 Head (feet) 0 2.50 3.00 3.5 Coef. (English 2.65 2.67 2.6	P, end-section c nvert= 53.00' / 5 rugated metal, 5.0' breadth Bro .20 0.40 0.60 50 4.00 4.50 5 1) 2.34 2.50 2. 56 2.68 2.70 2	conforming to fill, Ke= 0.500 1.50' S= 0.0200 '/' Cc= 0.900 Flow Area= 3.14 sf coad-Crested Rectangular Weir 0.80 1.00 1.20 1.40 1.60 1.80 2.00 .00 5.50 70 2.68 2.68 2.66 2.65 2.65 2.65 .74 2.79 2.88

Primary OutFlow Max=25.28 cfs @ 14.26 hrs HW=58.48' (Free Discharge) -1=Culvert (Barrel Controls 25.28 cfs @ 8.05 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=53.00' (Free Discharge)

Summary for Pond AP-2: AP-2

4.52% Impervious, Inflow Depth > 2.11" for 10-yr Storm event Inflow Area = 23.126 ac, 37.78 cfs @ 12.36 hrs, Volume= Inflow = 4.073 af 37.78 cfs @ 12.36 hrs, Volume= Primary = 4.073 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Pond AP-3: AP-3

Inflow Area	=	18.712 ac,	1.20% Impervious,	Inflow Depth > 2	2.25" for 10	-yr Storm event
Inflow =	=	12.49 cfs @	13.82 hrs, Volume	= 3.511 a	f	
Outflow =	=	12.45 cfs @	13.88 hrs, Volume	= 3.500 a	f, Atten= 0%,	, Lag= 3.7 min
Primary =	=	12.45 cfs @	13.88 hrs, Volume	= 3.500 a	f	•
Secondary =	=	0.00 cfs @	5.00 hrs, Volume	= 0.000 a	f	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Peak Elev= 50.46' @ 13.88 hrs Surf.Area= 3,366 sf Storage= 2,976 cf

Plug-Flow detention time= 4.6 min calculated for 3.488 af (99% of inflow) Center-of-Mass det. time= 3.6 min (868.8 - 865.2)

Volume	Inve	ert Avail.Sto	rage Storage [Description				
#1	49.0	0' 492,0	19 cf Custom	Stage Data (Pi	rismatic)Listed below (Recalc)			
Elevatio (fee	on et)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)				
49.0)0	695	0					
50.0	00	2,545	1,620	1,620				
51.0	00	4,335	3,440	5,060				
52.0	00	6,672	5,504	10,564				
53.0	00	10,072	8,372	18,936				
54.0	00	16,185	13,129	32,064				
55.0	00	21,770	18,978	51,042				
56.0	00	27,163	24,467	75,508				
57.0	00	43,138	35,151	110,659				
58.0	00	56,033	49,586	160,244				
59.0	00	/1,132	63,583	223,827				
60.0	00	97,106	84,119	307,946				
61.0	00	271,041	184,074	492,019				
Device	Routing	Invert	Outlet Devices					
#1	Primary	49.00'	36.0" Round	Culvert				
	•		L= 75.0' RCP	, end-section c	onforming to fill, Ke= 0.500			
			Inlet / Outlet In	vert= 49.00' / 4	7.50' S= 0.0200 '/' Cc= 0.900			
			n= 0.025 Corr	ugated metal,	Flow Area= 7.07 sf			
#2 Second		ry 60.50'	10.0' long x 5 Head (feet) 0 2.50 3.00 3.5 Coef. (English) 2.65 2.67 2.6	.0' long x 5.0' breadth Broad-Crested Rectangular Weir ad (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 50 3.00 3.50 4.00 4.50 5.00 5.50 bef. (English) 2.34 2.50 2.70 2.68 2.66 2.65 2.65 65 2.67 2.66 2.68 2.70 2.74 2.79 2.88				

Primary OutFlow Max=12.44 cfs @ 13.88 hrs HW=50.46' (Free Discharge) **1=Culvert** (Barrel Controls 12.44 cfs @ 5.34 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=49.00' (Free Discharge) 2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Proposed 082719r	Type III 24-hr 25-yr Storm Rainfall=5.80"
Prepared by Sevee & Maher Engineers, Inc.	Printed 9/16/2019
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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points Runoff by SCS TR-20 method, UH=SCS, Weighted-CN Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment SC-1A: Northeast	Runoff Area=798,350 sf 0.00% Impervious Runoff Depth>3.23" Flow Length=1,159' Tc=45.2 min CN=79 Runoff=34.76 cfs 4.940 af
Subcatchment SC-1B: Northwest	Runoff Area=1,424,359 sf 0.72% Impervious Runoff Depth>3.04" Flow Length=1,985' Tc=44.5 min CN=77 Runoff=59.05 cfs 8.297 af
Subcatchment SC-1C: Town Hall	Runoff Area=1,513,369 sf 11.73% Impervious Runoff Depth>2.56" Flow Length=1,815' Tc=71.0 min CN=72 Runoff=40.59 cfs 7.413 af
Subcatchment SC-2: NELMA	Runoff Area=1,007,352 sf 4.52% Impervious Runoff Depth>3.07" Flow Length=1,388' Tc=25.2 min CN=77 Runoff=54.69 cfs 5.908 af
Subcatchment SC-3: Southeast	Runoff Area=194,599 sf 2.16% Impervious Runoff Depth>3.56" Flow Length=596' Tc=18.3 min CN=82 Runoff=13.82 cfs 1.325 af
SubcatchmentSC-4: Southwest	Runoff Area=620,476 sf 0.90% Impervious Runoff Depth>3.18" Flow Length=1,423' Tc=93.1 min CN=79 Runoff=17.35 cfs 3.771 af
Reach 1BR: Wetland Reach n=0.030 L:	Avg. Flow Depth=0.53' Max Vel=2.16 fps Inflow=69.96 cfs 15.625 af =543.0' S=0.0055 '/' Capacity=836.52 cfs Outflow=69.89 cfs 15.524 af
Reach 1CR: Stream n=0.100	Avg. Flow Depth=1.83' Max Vel=2.10 fps Inflow=40.59 cfs 7.413 af _=961.0' S=0.0161 '/' Capacity=115.44 cfs Outflow=39.87 cfs 7.328 af
Reach 4R: Wetland Reach n=0.800	Avg. Flow Depth=1.63' Max Vel=0.23 fps Inflow=16.06 cfs 3.762 af L=196.0' S=0.0195 '/' Capacity=6.71 cfs Outflow=15.67 cfs 3.692 af
Pond 1BP: 36-in HDPE Culvert Primary=69.96 cf	Peak Elev=62.25' Storage=31,347 cf Inflow=79.71 cfs 15.625 af s 15.625 af Secondary=0.00 cfs 0.000 af Outflow=69.96 cfs 15.625 af
Pond 4P: Culvert Primary=16.06	Peak Elev=56.75' Storage=7,222 cf Inflow=17.35 cfs 3.771 af cfs 3.762 af Secondary=0.00 cfs 0.000 af Outflow=16.06 cfs 3.762 af
Pond AP-1: AP-1 Primary=29.18 cf	Peak Elev=60.14' Storage=402,093 cf Inflow=93.89 cfs 20.464 af s 17.358 af Secondary=1.23 cfs 0.089 af Outflow=30.41 cfs 17.446 af
Pond AP-2: AP-2	Inflow=54.69 cfs 5.908 af Primary=54.69 cfs 5.908 af
Pond AP-3: AP-3 Primary=17.42	Peak Elev=50.77' Storage=4,105 cf Inflow=17.51 cfs 5.105 af cfs 5.092 af Secondary=0.00 cfs 0.000 af Outflow=17.42 cfs 5.092 af

Summary for Subcatchment SC-1A: Northeast

Runoff = 34.76 cfs @ 12.62 hrs, Volume= 4.940 af, Depth> 3.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr 25-yr Storm Rainfall=5.80"

_	A	rea (sf)	CN [Description		
		37,018	91 (Gravel road	ls, HSG D	
_	7	61,332	78 N	Meadow, no	on-grazed,	HSG D
798,350 79 Weighted Average			Neighted A	verage		
	7	98,350	1	100.00% Pe	ervious Are	а
	Тс	l enath	Slope	Velocity	Canacity	Description
	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
	25.2	100	0.0050	0.07		Sheet Flow, A-B
						Grass: Dense n= 0.240 P2= 3.10"
	19.7	941	0.0130	0.80		Shallow Concentrated Flow, B-C
						Short Grass Pasture Kv= 7.0 fps
	0.3	118	0.0200	6.80	135.97	Channel Flow, C-D
						Area= 20.0 sf Perim= 16.6' r= 1.20'
_						n= 0.035 Earth, dense weeds
	45 0	4 4 5 0				

45.2 1,159 Total

Summary for Subcatchment SC-1B: Northwest

Runoff = 59.05 cfs @ 12.61 hrs, Volume= 8.297 af, Depth> 3.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr 25-yr Storm Rainfall=5.80"

A	rea (sf)	CN E	Description		
3	86,242	78 N	leadow, no	on-grazed,	HSG D
1,0	27,856	77 V	Voods, Go	od, HSG D	
	5,200	98 F	Roofs, HSG	G C	
	5,061	98 F	aved park	ing, HSG C	
1,4	24,359	77 V	Veighted A	verage	
1,4	14,098	g	9.28% Per	vious Area	
	10,261	C	.72% Impe	ervious Area	а
			·		
Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
14.5	100	0.0200	0.11		Sheet Flow, A-B
					Grass: Dense n= 0.240 P2= 3.10"
2.0	310	0.1400	2.62		Shallow Concentrated Flow, B-C
					Short Grass Pasture Kv= 7.0 fps
23.3	796	0.0130	0.57		Shallow Concentrated Flow, C-D
					Woodland Kv= 5.0 fps
4.7	779	0.0180	2.75	362.73	Channel Flow, D-E
					Area= 132.0 sf Perim= 114.0' r= 1.16'
					n= 0.080 Earth, long dense weeds

44.5 1,985 Total

Summary for Subcatchment SC-1C: Town Hall

Runoff = 40.59 cfs @ 12.98 hrs, Volume= 7.413 af, Depth> 2.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr 25-yr Storm Rainfall=5.80"

Ar	rea (sf)	CN I	Description		
8	09,968	77 \	Woods, Go	od, HSG D	
	9,665	98 I	Paved park	ing, HSG D	
:	55,432	30 I	Meadow, no	on-grazed,	HSG A
	53,363	30	Woods, Go	od, HSG A	
4	45,721	98 I	Paved park	ing, HSG A	
	17,927	98 I	Roofs, HSC	βA	
19	91,094	55	Woods, Go	od, HSG B	
	74,486	58 I	Meadow, no	on-grazed,	HSG B
	70,436	98 I	Paved park	ing, HSG B	
	23,116	98 I	Roofs, HSC	βB	
1:	24,650	70	Woods, Go	od, HSG C	
	26,882	71 I	Meadow, no	on-grazed,	HSG C
	4,662	98 I	Paved park	ing, HSG C	
	5,967	98 I	Roofs, HSC	G C	
1,5	13,369	72	Weighted A	verage	
1,3	35,875	8	38.27% Pei	rvious Area	
1	77,494		11.73% Imp	pervious Are	ea
_		-			
TC	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cts)	
38.0	100	0.0200	0.04		Sheet Flow, A-B
					Woods: Dense underbrush n= 0.800 P2= 3.10"
33.0	1,715	0.0300	0.87		Shallow Concentrated Flow, B-C
					Woodland Kv= 5.0 fps
71.0	1,815	Total			

Summary for Subcatchment SC-2: NELMA

Runoff = 54.69 cfs @ 12.35 hrs, Volume=

5.908 af, Depth> 3.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr 25-yr Storm Rainfall=5.80" Proposed 082719r

Type III 24-hr 25-yr Storm Rainfall=5.80" Printed 9/16/2019

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_	A	rea (sf)	CN E	Description		
*		45,542	98 I	mpervious		
		21,643	91 (Gravel road	ls, HSG D	
		51,673	77 V	Voods, Go	od, HSG D	
	2	17,703	71 N	/leadow, no	on-grazed,	HSG C
		34,809	70 V	Voods, Go	od, HSG C	
	6	35,982	78 N	/leadow, no	on-grazed,	HSG D
	1,0	07,352	77 V	Veighted A	verage	
	9	61,810	ç	95.48% Pei	vious Area	
		45,542	4	.52% Imp€	ervious Are	а
	т.	1	0	V/-1!+	0	Description
		Length	Siope	Velocity	Capacity	Description
	(min)	(teet)	(π/π)	(TT/SeC)	(CIS)	
	12.3	100	0.0300	0.14		Sheet Flow, A_B
		o / -				Grass: Dense n= 0.240 P2= 3.10"
	11.3	645	0.0186	0.95		Shallow Concentrated Flow, B-C
		0.40	o o 4 o -		005 40	Short Grass Pasture Kv= 7.0 tps
	1.6	643	0.0187	6.70	335.19	Channel Flow, C-D
						Area= 50.0 sf Perim= 40.3' r= 1.24'
						n= 0.035 Earth, dense weeds
	25.2	1,388	Total			

Summary for Subcatchment SC-3: Southeast

Runoff = 13.82 cfs @ 12.25 hrs, Volume= 1.325 af, Depth> 3.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr 25-yr Storm Rainfall=5.80"

	Ai	rea (sf)	CN E	Description						
		67,722	78 N	78 Meadow, non-grazed, HSG D						
		43,812	96 C	Gravel surfa	ace, HSG D					
		78,860	77 V	Voods, Go	od, HSG D					
_		4,205	98 F	Paved park	ing, HSG D					
	1	94,599	82 V	Veighted A	verage					
	1	90,394	ç	97.84% Pei	rvious Area					
		4,205	2	2.16% Impe	ervious Area	а				
	-				o ::					
		Length	Slope	Velocity	Capacity	Description				
	(min)	(teet)	(π/π)	(IT/Sec)	(CIS)					
	16.3	100	0.0150	0.10		Sheet Flow, A-B				
						Grass: Dense n= 0.240 P2= 3.10"				
	1.1	75	0.0267	1.14		Shallow Concentrated Flow, B-C				
				/		Short Grass Pasture Kv= 7.0 fps				
	0.9	421	0.0260	1.11	369.85	Channel Flow, C-D				
						Area= 48.0 sf Perim= 40.2' r= 1.19'				
						n= 0.035 Earth, dense weeds				
	18.3	596	Total							

Summary for Subcatchment SC-4: Southwest

Runoff = 17.35 cfs @ 13.24 hrs, Volume= 3.771 af, Depth> 3.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr 25-yr Storm Rainfall=5.80"

A	rea (sf)	CN [Description		
2	69,993	78 N	/leadow, no	on-grazed,	HSG D
	30,080	96 (Gravel surfa	ace, HSG D	
3	14,798	77 V	Voods, Go	od, HSG D	
	2,800	98 F	Roofs, HSG	6 D	
	2,805	98 F	Paved park	ing, HSG D	
6	20,476	79 V	Veighted A	verage	
6	14,871	ę	9.10% Pei	vious Area	
	5,605	().90% Impe	ervious Area	а
Тс	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
44.6	100	0.0134	0.04		Sheet Flow, A-B
					Woods: Dense underbrush n= 0.800 P2= 3.10"
41.3	849	0.0047	0.34		Shallow Concentrated Flow, B-C
					Woodland Kv= 5.0 fps
7.2	474	0.0248	1.10		Shallow Concentrated Flow, C-D
					Short Grass Pasture Kv= 7.0 fps
93.1	1,423	Total			

Summary for Reach 1BR: Wetland Reach

Inflow A	Area	=	67.441 ac,	6.39% Impervious,	Inflow Depth > 2.7	78" for 25-yr Storm event
Inflow		=	69.96 cfs @	13.14 hrs, Volume=	= 15.625 af	-
Outflov	N	=	69.89 cfs @	13.25 hrs, Volume=	= 15.524 af,	Atten= 0%, Lag= 7.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Max. Velocity= 2.16 fps, Min. Travel Time= 4.2 min Avg. Velocity = 1.05 fps, Avg. Travel Time= 8.6 min

Peak Storage= 17,598 cf @ 13.18 hrs Average Depth at Peak Storage= 0.53' Bank-Full Depth= 2.00' Flow Area= 184.0 sf, Capacity= 836.52 cfs

50.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding Side Slope Z-value= 20.0 22.0 '/' Top Width= 134.00' Length= 543.0' Slope= 0.0055 '/' Inlet Invert= 57.00', Outlet Invert= 54.00'



Peak Storage= 13,624 cf @ 13.70 hrs Average Depth at Peak Storage= 1.63' Bank-Full Depth= 1.00' Flow Area= 35.0 sf, Capacity= 6.71 cfs

15.00' x 1.00' deep channel, n= 0.800 Sheet flow: Woods+dense brush Side Slope Z-value= 20.0 '/' Top Width= 55.00' Length= 196.0' Slope= 0.0195 '/' Inlet Invert= 52.82', Outlet Invert= 49.00'

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Type III 24-hr 25-yr Storm Rainfall=5.80" Printed 9/16/2019 Duttions LLC Page 19





Summary for Pond 1BP: 36-in HDPE Culvert

Inflow Area =	67.441 ac,	6.39% Impervious, In	nflow Depth > 2.78"	for 25-yr Storm event
Inflow =	79.71 cfs @	12.78 hrs, Volume=	15.625 af	
Outflow =	69.96 cfs @	13.14 hrs, Volume=	15.625 af, At	tten= 12%, Lag= 21.6 min
Primary =	69.96 cfs @	13.14 hrs, Volume=	15.625 af	-
Secondary =	0.00 cfs @	5.00 hrs, Volume=	0.000 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Peak Elev= 62.25' @ 13.14 hrs Surf.Area= 30,669 sf Storage= 31,347 cf

Plug-Flow detention time= 2.7 min calculated for 15.625 af (100% of inflow) Center-of-Mass det. time= 2.7 min (841.8 - 839.1)

Volume	Invei	rt Avail.Sto	rage Storage E	Description	
#1	58.00)' 645,09	95 cf Custom	Stage Data (Pi	rismatic)Listed below (Recalc)
Elevatio	on S	Surf.Area	Inc.Store	Cum.Store	
	20	7			
50.0		377	102	102	
59.0 60.0		2 108	1 288	192	
61 (9 800	5 000	7 400	
62 (24 409	17 105	24 583	
63 (29,403	37 155	61 738	
64 (20	67 484	58 692	120 430	
65.0	00	96.865	82,175	202.604	
66.0	00	129.107	112,986	315.590	
67.0	00	165,716	147,412	463,002	
68.0	00	198,471	182,094	645,095	
Device	Routing	Invert	Outlet Devices		
#1	Primary	56.51'	36.0" Round (Culvert	
	,		L= 75.0' CPP,	end-section c	onforming to fill, Ke= 0.500
			Inlet / Outlet In	vert= 56.51' / 5	6.13' S= 0.0051 '/' Cc= 0.900
			n= 0.013 Corru	ugated PE, sm	ooth interior, Flow Area= 7.07 sf
#2	Secondar	y 67.00'	20.0' long x 5.	.0' breadth Bro	oad-Crested Rectangular Weir
			Head (feet) 0.2	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	0 4.00 4.50 5	.00 5.50
			Coef. (English)	2.34 2.50 2.	70 2.68 2.68 2.66 2.65 2.65 2.65
			2.65 2.67 2.66	5 2.68 2.70 2	.74 2.79 2.88

Primary OutFlow Max=70.01 cfs @ 13.14 hrs HW=62.24' (Free Discharge) **1=Culvert** (Barrel Controls 70.01 cfs @ 9.90 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=58.00' (Free Discharge) 2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 4P: Culvert

Inflow Area =	14.244 ac,	0.90% Impervious,	Inflow Depth > 3.	18" for 25-yr Storm event
Inflow =	17.35 cfs @	13.24 hrs, Volume	= 3.771 af	
Outflow =	16.06 cfs @	13.51 hrs, Volume	= 3.762 af,	Atten= 7%, Lag= 16.4 min
Primary =	16.06 cfs @	13.51 hrs, Volume	= 3.762 af	-
Secondary =	0.00 cfs @	5.00 hrs, Volume	= 0.000 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Peak Elev= 56.75' @ 13.51 hrs Surf.Area= 5,617 sf Storage= 7,222 cf

Plug-Flow detention time= 5.2 min calculated for 3.762 af (100% of inflow) Center-of-Mass det. time= 4.4 min (857.0 - 852.6)

Volume	Invert	Avail.Sto	rage Storag	ge Description	
#1	52.00'	190,45	52 cf Custo	om Stage Data (P	rismatic)Listed below (Recalc)
Elevatio	on S	urf.Area	Inc.Store	Cum.Store	
(fee	et)	(sq-ft)	(cubic-feet)	(cubic-feet)	
52.0	00	1	0	0	
53.0	00	7	4	4	
54.0	00	556	282	286	
55.0	00	1,423	990	1,275	
56.0	00	3,587	2,505	3,780	
57.0	00	6,301	4,944	8,724	
58.0	00	9,663	7,982	16,706	
59.0	00	14,490	12,077	28,783	
60.0	00	22,192	18,341	47,124	
61.0	00	34,805	28,499	75,622	
62.0	00	57,427	46,116	121,738	
63.0	00	80,000	68,714	190,452	
Device	Routing	Invert	Outlet Devi	ces	
#1	Primary	53.82'	18.0" W x 2	24.0" H Box Culv	ert
	-		L= 50.0' B	ox, headwall w/3 s	square edges, Ke= 0.500
			Inlet / Outle	t Invert= 53.82' / 5	52.82' S= 0.0200 '/' Cc= 0.900
			n= 0.025 R	Rubble masonry, ce	emented, Flow Area= 3.00 sf
#2	Secondary	62.50'	100.0' long	x 10.0' breadth	Broad-Crested Rectangular Weir
			Head (feet)	0.20 0.40 0.60	0.80 1.00 1.20 1.40 1.60
			Coet. (Engl	ish) 2.49 2.56 2.	/0 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=16.06 cfs @ 13.51 hrs HW=56.75' (Free Discharge) **1=Culvert** (Barrel Controls 16.06 cfs @ 5.35 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=52.00' (Free Discharge) 2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond AP-1: AP-1

Inflow Area	=	85.769 ac,	5.03% Imper	rvious, Inflow	Depth >	2.86"	for 25-yr	Storm event
Inflow	=	93.89 cfs @	12.80 hrs, V	/olume=	20.464	af		
Outflow	=	30.41 cfs @	14.46 hrs, ∖	/olume=	17.446	af, Atte	en= 68%,	Lag= 99.6 min
Primary	=	29.18 cfs @	14.46 hrs, ∖	/olume=	17.358	af		-
Secondary	=	1.23 cfs @	14.46 hrs, ∖	/olume=	0.089	af		

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Peak Elev= 60.14' @ 14.46 hrs Surf.Area= 143,336 sf Storage= 402,093 cf

Plug-Flow detention time= 151.8 min calculated for 17.446 af (85% of inflow) Center-of-Mass det. time= 113.0 min (954.3 - 841.3)

Volume	Inver	t Avail.Stor	rage Storage	Description	
#1	53.00)' 580,54	0 cf Custom	Stage Data (Pr	rismatic)Listed below (Recalc)
Elevatio	n S	Surf.Area	Inc.Store	Cum.Store	
53.0	0	18 120			
54.0	0	26,167	22,148	22,148	
55.0	0	34,797	30,482	52,630	
56.0	0	44,050	39,424	92,054	
57.0	0	54,092	49,071	141,125	
58.0	0	68,472	61,282	202,407	
59.0	0	85,610	77,041	279,448	
60.0	0	122,767	104,189	383,636	
61.0	0	271,041	196,904	580,540	
Device	Routing	Invert	Outlet Device	S	
#1	Primary	53.00'	24.0" Round	Culvert	
#2	Secondar	y 60.00'	L= 75.0' CMI Inlet / Outlet II n= 0.025 Cor 10.0' long x Head (feet) 0 2.50 3.00 3.5 Coef. (English 2.65 2.67 2.6	P, end-section c nvert= 53.00' / 5 rugated metal, 5.0' breadth Bro 20 0.40 0.60 50 4.00 4.50 5 1) 2.34 2.50 2. 56 2.68 2.70 2	onforming to fill, Ke= 0.500 1.50' S= 0.0200 '/' Cc= 0.900 Flow Area= 3.14 sf Dad-Crested Rectangular Weir 0.80 1.00 1.20 1.40 1.60 1.80 2.00 .00 5.50 70 2.68 2.68 2.66 2.65 2.65 2.65 .74 2.79 2.88

Primary OutFlow Max=29.18 cfs @ 14.46 hrs HW=60.14' (Free Discharge) -1=Culvert (Barrel Controls 29.18 cfs @ 9.29 fps)

Secondary OutFlow Max=1.21 cfs @ 14.46 hrs HW=60.14' (Free Discharge) 2=Broad-Crested Rectangular Weir (Weir Controls 1.21 cfs @ 0.87 fps)

Summary for Pond AP-2: AP-2

Inflow A	Area	=	23.126 ac,	4.52% Imper	vious,	Inflow Depth >	3.0)7" for 2	5-yr Storm event
Inflow		=	54.69 cfs @	12.35 hrs, V	/olume	= 5.908	3 af		-
Primary	у	=	54.69 cfs @	12.35 hrs, ∖	/olume	= 5.908	3 af,	Atten= 0%	6, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Pond AP-3: AP-3

Inflow Area	=	18.712 ac,	1.20% Impervious,	Inflow Depth >	3.27" for	25-yr Storm event
Inflow =	=	17.51 cfs @	14.14 hrs, Volume	= 5.105 a	af	
Outflow =	=	17.42 cfs @	14.18 hrs, Volume	= 5.092 a	af, Atten= ()%, Lag= 2.7 min
Primary =	=	17.42 cfs @	14.18 hrs, Volume	= 5.092 a	af	•
Secondary =	=	0.00 cfs @	5.00 hrs, Volume	= 0.000 a	af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Peak Elev= 50.77' @ 14.18 hrs Surf.Area= 3,921 sf Storage= 4,105 cf

Plug-Flow detention time= 4.4 min calculated for 5.075 af (99% of inflow) Center-of-Mass det. time= 3.5 min (861.5 - 858.0)

Volume	Inv	ert Avail.Sto	orage Storage E	Description	
#1	49.0	00' 492,0	19 cf Custom	Stage Data (Pi	rismatic)Listed below (Recalc)
Elevatio	on et)	Surf.Area	Inc.Store (cubic-feet)	Cum.Store	
49 (00	<u> </u>	0	0	
50 (00	2 545	1 620	1 620	
51.0	00	4,335	3,440	5,060	
52.0	00	6.672	5.504	10,564	
53.0	00	10,072	8,372	18,936	
54.0	00	16,185	13,129	32,064	
55.0	00	21,770	18,978	51,042	
56.0	00	27,163	24,467	75,508	
57.0	00	43,138	35,151	110,659	
58.0	00	56,033	49,586	160,244	
59.0	00	71,132	63,583	223,827	
60.0	00	97,106	84,119	307,946	
61.0	00	271,041	184,074	492,019	
Device	Routing	Invert	Outlet Devices		
#1	Primary	49.00'	36.0" Round	Culvert	
			L= 75.0' RCP	, end-section c	onforming to fill, Ke= 0.500
			Inlet / Outlet In	vert= 49.00' / 4	7.50' S= 0.0200 '/' Cc= 0.900
			n= 0.025 Corr	ugated metal,	Flow Area= 7.07 sf
#2	Seconda	ary 60.50'	10.0' long x 5 Head (feet) 0.2 2.50 3.00 3.50 Coef. (English) 2.65 2.67 2.60	.0' breadth Bro 20 0.40 0.60 0 4.00 4.50 5 0 2.34 2.50 2. 6 2.68 2.70 2	Dad-Crested Rectangular Weir 0.80 1.00 1.20 1.40 1.60 1.80 2.00 .00 5.50 70 2.68 2.66 2.65 2.65 2.65 .74 2.79 2.88

Primary OutFlow Max=17.40 cfs @ 14.18 hrs HW=50.77' (Free Discharge) **1=Culvert** (Barrel Controls 17.40 cfs @ 5.78 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=49.00' (Free Discharge) 2=Broad-Crested Rectangular Weir (Controls 0.00 cfs) Carla Nixon, AICP Director of Planning Town of Cumberland 290 Tuttle Road Cumberland, ME 04021 (207) 829-2206 cnixon@cumberlandmaine.com

From: Al Palmer [mailto:apalmer@gorrillpalmer.com]
Sent: Tuesday, September 17, 2019 11:43 AM
To: Dan Diffin <dpd@smemaine.com>
Cc: Carla Nixon <cnixon@cumberlandmaine.com>; William Shane
<wshane@cumberlandmaine.com>; Chris Bolduc <cbolduc@cumberlandmaine.com>
Subject: [External] Re: Compost Pad and Sand/Salt Shed Relocation - Comment Response

Hi

We have reviewed the SME Response and have no further comments.

Thanks,

Al Palmer

Sent from my iPhone

On Sep 17, 2019, at 8:06 AM, Dan Diffin <<u>dpd@smemaine.com</u>> wrote:

Hi Carla,

Please find attached the comment response for the staff review of the Compost Pad and Sand/Salt Shed Relocation project in Cumberland, Maine.

Please let me know if you need anything else for the response. We look forward to presenting to the Planning Board tonight.

Thanks,

Dan

Daniel P. Diffin, P.E., LEED AP BD+C Vice President/Senior Civil Engineer

<image003.jpg>

Sevee & Maher Engineers, Inc.

4 Blanchard Road, P.O. Box 85A Cumberland, ME 04021 Office: 207.829.5016 Cell: 207.240.3315 Fax: 207.829.5692

This electronic message contains information from Sevee & Maher Engineers, Inc. (SME), which may be confidential, privileged, or otherwise protected from disclosure. The information is intended to be used solely by the recipient(s) named. If you are not an intended recipient, be aware that any review, disclosure, copying, distribution, or use of this transmission or its contents is prohibited. If you have received this transmission in error, please notify SME immediately at <u>postmaster@smemaine.com</u>.

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4 Blanchard Road, P.O. Box 85A Cumberland, ME 04021 Tel: 207.829.5016 + Fax: 207.829.5692 info@smemaine.com smemaine.com

August 27, 2019

Carla Nixon, Town Planner Cumberland Town Hall 290 Tuttle Road Cumberland, Maine 04021

Subject: Compost Pad and Sand/Salt Shed Relocation Town of Cumberland Site Plan Review Application

Dear Ms. Nixon:

On behalf of the Town of Cumberland (Town), Sevee & Maher Engineers, Inc. (SME) is pleased to submit the attached Planning Board Site Plan Review Application for the proposed Compost Pad and Sand/Salt Shed Relocation.

The Town plans to relocate their existing municipal compost pad facility and salt shed to a new site located off Tuttle Road in Cumberland between the Maine Central Railroad tracks and eastern edge of the Town Forest. The project will include a 2-acre gravel pad for brush storage and composting and an approximately 80- by 100-foot salt shed. The site is set approximately 2,100 feet from Tuttle Road, and an access drive will be constructed over an existing gravel railroad bed.

We have enclosed one hard copy and a USB with a digital copy of the application package and drawings.

We appreciate your consideration of our application and look forward to reviewing the project in more detail with the Planning Board on September 17, 2019. Please feel free to contact me at 207.829.5016 or <u>dpd@smemaine.com</u> if you have any questions or need additional information.

Very truly yours,

SEVEE & MAHER ENGINEERS, INC.

Daniel P. Diffin, P.E., LEED AP BD+C Vice President/Senior Civil Engineer

Attachments

ENVIRONMENTAL . CIVIL . GEOTECHNICAL . WATER . COMPLIANCE

SITE PLAN REVIEW Town of Cumberland

Appendix C Planning Board Site Plan Review Application

Applicant's name
Applicant's address
Cell phone <u>N/A</u> Home phone <u>N/A</u> Office phone <u>207-829-2205</u>
Email Address
Project addressTuttle Road, Cumberland, ME
Project name Compost Facility Relocation
Describe project
Number of employees
Days and hours of operation
Project review and notice fee
Name of representative Daniel Diffin, P.E., Sevee & Maher Engineers, Cumberland, ME
Contact information: Cell: 207-240-3315 Office: 207-829-5016
What is the applicant's interest in the property? Own X Lease Purchase and sale agreement (provide copy of document) If you are not the owner, list owner's name, address and phone number N/A
If you are not the owner, list owner's name, address and phone number <u>N/A</u> Boundary Survey Submitted? Yes <u>x</u> No
Are there any deed restrictions or easements? Yes $\ No_{\underline{x}}^{\underline{x}}$ If yes, provide information and show easement location on site plan.
Building Information Are there existing buildings on the site? Yes No_X Number:N/A Will they be removed? Yes No_X (Note: A demolition permit is required 10 days prior to demolition.)
Will a new structure(s) be built on the site? Yes X No Describe: Sand/Salt storage building Number of new buildings 1 Square footage 8,000 sf Number of floor levels including basement 1

Parking

 Number of existing parking spaces
 N/A

 Number of new parking spaces
 N/A

 Number of handicapped spaces
 N/A

 Will parking area be paved?
 X
 Yes

Entrance

 Location:
 Former Rail Bed, at Tuttle Road

 Width 22
 Length 2100

 Is it paved?
 Yes
 No X

 If not, do you plan to pave it? No

Where will snow storage for entrance and parking be located? Show on site plan. Around the perimeter of the site

Utilities

Water: Public water N/A Well N/A (Show location on site plan.)

Sewer/septic: Public sewer N/A Private septic N/A Show location on site plan and submit HHE-200 septic design or location of passing test pit locations if new system is proposed. Also show any wells on abutting properties within 200 feet of the site.

Electric: On site? Yes No X

Show location of existing and proposed utilities on the site plan and indicate if they are above or below ground.

Signs

 Number: N/A

 Size: N/A

 Material: N/A

 Submit sign design and completed sign application.

 Will the sign be lighted? N/A

 Submit information on type and wattage of lights.

 Show location of sign(s) on the site plan.

Natural Features

Show location of any of the following on the site plan: River N/A Stream X Wetland X Pond N.A Lake N/A Stone walls N/A Are there any other historic or natural features? N.A

Lighting

Will there be any exterior lights? Yes <u>No ×</u> Show location on site plan (e.g., pole fixtures, wall packs on building) and provide fixture and lumen information.

Trees

Show location of existing trees on the site plan and indicate if any are to be removed.

Landscaping

Is there existing landscaping on the site? Yes $No \times No \times$ Show type and location on site plan.

Is new landscaping proposed? (Note: if property has frontage on Route 100, a twenty-five-foot landscape easement to the Town is required.) Yes Landscaped Berms
Buffering

Show any existing or proposed buffering measures for adjacent properties, e.g., plantings, fences.

Erosion Control

Has an erosion and sedimentation control plan been submitted? Yes <u>x</u> No _____

Stormwater Management Plan

Provide stormwater information for both pre and post development of the site. Show location of any detention areas and/or culverts on the site plan.

Fire Protection

Location of nearest hydrant >1,000 Sprinklers? Yes No X Do you plan to have an alarm system? Yes No X Please contact the Fire/EMS Department at 829-4573 to discuss any Town or state requirements.

Trash

Will trash be stored inside N/A outside N/A. If outside, will a dumpster be used? Yes N/A No N/A. Show location on site plan and show type of screening proposed (e.g., fencing, plantings).

Technical Capacity

List and provide contact information for all consultants who worked on the project, for example: licensed land surveyor, licensed soils evaluator, professional engineer, attorney, etc. See Appendix B

Financial Capacity

Please indicate how project will be financed. If obtaining a bank loan, provide a letter from the bank Town Funded

- Zoning district: RR1
- Minimum lot size: 4 acres
- Classification of proposed use: <u>Municipal</u>
- Parcel size: <u>31.67 acres</u>
- Frontage: 22 feet Frontage on Tuttle Road
- ${
 m Side}$ 30 ft, 75 ft combined ${
 m Rear}$ 75 ft Setbacks: Front 50 ft
- Board of Appeals Required? No
- Tax Map R03 Lot 50, 53 Deed book 32938/31907 Deed page 261/253
- Floodplain map number 230162 0015B Designation Zone C
- Vernal pool identified? Yes
- Is parcel in a subdivision? <u>No</u>
- Outside agency permits required:
 NPRA Section 2, 19 PBR, Soild Waste-Compost Facility, Salt and Sand-Salt Storage Area Registration Form MDEP Tier 1 Yes MDEP Tier 2 N/A Army Corps of Engineers N/A MDEP general construction (stormwater) permit (for disturbance of 1 acre or more)
- MDOT entrance permit Yes
- MDOT traffic movement permit <u>No</u>
- Traffic study required <u>No</u>
- Hydrogeologic evaluation <u>Wavier Requested</u>
- Market study Wavier Requested
- Route 1 Design Guidelines? N/A
- Route 100, VMU or TCD Design Standards? N/A •

Applicant's signature

Submission date: _____ 08/27/2019



TOWN OF CUMBERLAND PLANNING BOARD SITE PLAN REVIEW APPLICATION COMPOST PAD AND SAND/SALT SHED RELOCATION

Prepared for

TOWN OF CUMBERLAND 290 Tuttle Road Cumberland, Maine



August 2019



4 Blanchard Road P.O. Box 85A Cumberland, Maine 04021 Phone: 207.829.5016 smemaine.com

ENVIRONMENTAL • CIVIL • GEOTECHNICAL • WATER • COMPLIANCE

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LIST OF FIGURES (END OF DOCUMENT)

Figure No. Title

- 1 SITE LOCATION MAP
- 2 SITE COLOR PLAN

TOWN OF CUMBERLAND PLANNING BOARD SITE PLAN REVIEW APPLICATION COMPOST FACILITY RELOCATION CUMBERLAND, MAINE

1.0 PROJECT DESCRIPTION

The Town of Cumberland (Town) plans to relocate the existing municipal compost facility and the sand pile and salt shed from its existing location on Drowne Road to a new location off Tuttle Road in Cumberland. The project requires Site Plan Review from the Town of Cumberland Planning Board.

The property proposed for development is a collection of properties that the Town has acquired off Tuttle Road, including portions of the former NELMA property, a parcel from the Maine Central Railroad adjacent to the tracks, and the back portion of the old Harwood property. The site is bordered by existing residential development along Tuttle Road to the north, an active railroad corridor to the east, farm and residential property to the south, and the Town Forest to the west.

The proposed compost pad will result in the operations at Drowne Road being discontinued and replaced with a new 2-acre gravel pad for brush storage and compost operations. Development will include construction of a 22-foot-wide, 2,100-foot-long gravel access drive. The proposed site access will be constructed over a former railroad bed. A portion of the existing track ballast will be excavated and removed to provide a 22-foot-wide travel surface for safe vehicle access to the property.

The new facility will also house a new municipal sand/salt storage building. The proposed 8,000-squarefoot (sf) structure will be sited on a 20,500-sf paved pad to provide maneuvering and easy plowable access to and around the building.

There are no structures currently in the project area. The project site has historically been used as a hay field and is typically harvested multiple times each season. The ground surface is rolling and generally slopes from northwest to southeast at grades ranging from 0 to 5 percent. The edges of the existing fields are bordered by woods and wetlands. Wetlands have been mapped across the property and adjacent to the site access road. A small stream also exists along the western edge of the proposed site access road that drains to a culvert and to the east across the property. A vernal pool has been mapped near the eastern property line adjacent to the existing railroad corridor.

This project will disturb less than five acres of land and will result in approximately 2.94 acres of new impervious surface. Stormwater will be permitted under MEDEP Waste Management Division rules, and water quality treatment for stormwater runoff will not be required based on MEDEP Chapter 400 standards. However, separate MEDEP permits will be required for the facility, including Natural Resource Protection Act (NRPA) Permit-by-Rule applications for activity adjacent to a resource, critical habitat, and

a NRPA Tier 1 Application for anticipated wetland impacts. Additional MEDEP permitting and registration will also be required for the salt storage building and the compost facility.

With the proposed improvements at the access drive intersection with Tuttle Road, the project will also require an entrance permit from the Maine Department of Transportation (MEDOT) at the intersection of Tuttle Road and the gravel access road. This application was submitted to MEDOT on August 26, 2019 and is currently under review.

The Town is subject to a directive from the MEDEP Solid Waste Bureau to cease operations at the existing compost facility due to an error in the original permit process where MEDEP did not provide a formal variance for homes within 500 feet of the Compost facility. This was brought to MEDEP's attention through complaints about the compost operations from an abutter. The Town is now required to cease accepting compost material by November 30, 2019 and will need to remove all compost and regulated compost feedstock before January 31, 2020. Therefore, the Town intends to construct the gravel pad for the compost this fall as soon as Town and State permits are received. The construction of the salt shed and paved pad will occur next spring/summer to be ready for the 2020/2021 winter season.

The following describes how the project complies with the applicable Chapters of the Town of Cumberland Zoning and Site Plan Review Ordinances.

2.0 CHAPTER 229 – SITE PLAN REVIEW

§229-4 Waivers and Modifications

As part of this application, the Town requests the following waivers from the Site Plan Review ordinance:

- 1. A waiver from performing a hydrogeological evaluation for the project. There will be no subsurface wastewater disposal or other anticipated groundwater impacts associated with this project. The site is not in a significant sand and gravel aquifer. The salt shed is on an asphalt pad. The compost pad is constructed to MEDEP Chapter 400 standards.
- 2. A waiver from performing a market study. This is a municipal project proposed to meet specific town needs. Based on the use and function of this property, a market study does not apply to this project

§229-8 Financial and Technical Capacity

The Town will be funding the project through the municipal bonding recently approved by the Town Council. Technical capacity for SME and Boundary Points Survey is provided in Attachment B.

§229-10 Approval Standards and Criteria

A. Utilization of the Site

The property is currently an open meadow that is routinely harvested for hay multiple times in a typical season. The site is not situated over a sand and gravel aquifer, and there is no habitat for rare or endangered species present on the existing property as currently mapped by the U.S. Fish and Wildlife Service. SME has submitted a review letter to the Maine Inland Fisheries and Wildlife and will forward a response as soon as received.

Wetlands at the site have been delineated by Albert Frick Associates (Frick) and are shown on the attached design drawing set. There are wetlands on various portions of the property generally consisting of open meadow wetlands. There is an unnamed stream delineated along the west portion of the access drive into the property. The proposed improvements to the access drive are within 75 feet of the stream, but remain outside of the MEDEP required 25-foot stream setback. A Natural Resources Protection Act (NRPA) Permit-by-Rule application for the activity adjacent to stream will be required by MEDEP prior to the start of construction.

The compost pad is also within the 250-foot setback for critical terrestrial habitat of an identified significant vernal pool. The construction within the setback will occur in an open mowed hayfield and will

not include impacts to forested habitat. A NRPA Permit-by-Rule application for construction within a significant vernal pool habitat will be required by MEDEP prior to the start of construction.

Finally, in order to provide the Town with the appropriate storage, maneuvering, and operational space, approximately 14,375 sf of wetlands will be impacted. Generally, most of the impacted wetlands will be in the area of the compost pad (10,360 sf) with a smaller amount along the proposed access drive (4,015 sf). This level of impact will require a NRPA Tier 1 application for the wetland prior to the start of construction. The NRPA permits are being prepared and will be submitted to MEDEP by August 30, 2019.

The Town evaluated multiple properties prior to selecting the current site for proposed development. From early 2014 to present, several existing municipal, commercial, and privately-owned parcels have been considered for the proposed relocation. Locations included Harris Road, Greely Road, Longwoods Road, Range Road, Skillins Road, and Middle Road. These sites were not selected because of cost considerations, concerns about impacts to abutters and natural resources, and not being centrally located. The current proposed site provides the best combination of available land, central location, and the best options for minimizing impact to the natural environment and abutting property owners.

B. Traffic, Circulation, and Parking

Access to the project site will be from a 22-foot-wide gravel driveway with a 50-foot paved apron at the intersection of Tuttle Road. Sight distances in excess of 1,000 feet exist in both directions at the intersection. Driveways to adjacent properties are over 250 feet away. SME does not anticipate conflict with site access adjacent to the properties from Tuttle Road.

The driveway is designed to minimize wetland impacts and to eliminate construction within the 25-foot stream setback west of the access drive. The driveway is to service the Compost Pad and Sand/Salt shed only. Therefore, the Town proposes a limited section of 12 inches of MEDOT Type D gravel over a structural geotextile topped with Reclaimed Asphalt Pavement (RAP). The Town proposes to surface the drive with RAP to minimize maintenance and dust from a typical gravel road.

Traffic to the site will be controlled with a locked gate at the entrance on Tuttle Road. The gate will only be open when the compost pad is receiving materials or there is a storm that requires winter sanding and slating of the roads.

The compost operation will be open to the public on Tuesdays from 1 pm to 5 pm and on Saturdays from 9 am to 4 pm from the middle of April to the end of November. During peak use on a busy Saturday, the existing compost facility generates up to 60 daily trips. Otherwise, on average, the compost facility generates 15 trips when open to the public on Tuesdays. The use of the relocated compost pad is expected to remain similar to existing conditions.

The sand/salt shed will be accessed during storm events that require municipal sanding and salting of Town Roads. Currently, Cumberland operates nine (9) plow trucks that are used for sand and salt application. The trucks themselves will still be stored at the Public Works Garage on Drowne Road during periods of inactivity. In addition, the sand/salt mixture available for residents to pick up will be at the Public Works Garage. This will minimize traffic in and out of the gated entrance on Tuttle Road.

SME anticipates the compost and salt operations will have a minimal impact to traffic on Tuttle Road. A MEDOT Driveway Entrance Application has been filed and a copy of the permit will be provided once received.

There is no proposed parking at the site. During compost operations the Town will have one (1) staff member present to manage pick-up and drop-off during the months between April and November. Staff parking will occur within the limits of the pavement surrounding the sand/salt shed. Because the two uses on the site will not likely overlap, there is more than ample space for parking without designated parking areas.

C. Stormwater Management and Erosion Control

The stormwater management for the site is described in the Stormwater Management Report included as Attachment D. Erosion control measures are included on the drawings and were designed in compliance with the October 2016 edition of the Maine Erosion Control Best Management Practices Manual for Designers and Engineers.

D. Water, Sewer, and Fire Protection

The site will not be served with public water or sewer. A portable bathroom will be provided for staff and resident use during compost operations. The sand/salt truck drivers will remain based out of the Public Works building and will use the facilities there as necessary. There are no wells or subsurface wastewater disposal systems proposed as part of site development.

E. Water Protection

There will be no groundwater used or hazardous materials discharged as a result of this project. The proposed composting will be on the gravel pad constructed to MEDEP Chapter 400 standards. Sand and salt will be stored, mixed, loaded, and unloaded inside the proposed sand/salt shed which will be constructed on an asphalt pad designed to drain internally. The pavement outside of the building will be graded to drain away to minimize and runoff or snow melt inside of the building.

There will be no hazardous materials stored on site. The property is not located within an area designated as a source protection area or a sand and gravel aquifer. No effects to groundwater are anticipated from this project.

The Town is required to operate the sand/salt shed in accordance with MEDEP Water Quality Bureau Chapter 574 Siting and Operation of Road Salt and Sand-Salt Storage Areas. As part of the project, the Town is submitting a Salt and Sand-Salt Storage Area Registration Form and Request for Variance. Approval will be forward to the Planning Board once received.

F. Floodplain Management

The Flood Insurance Rate Map for the project area is included in Attachment C. The project is not located in a mapped floodplain area.

G. Historic and Archaeological Resources.

A site review has been requested from the Maine Historic Preservation Commission (MHPC). A copy of the request for review and the written response from the MHPC is provided in Attachment E. There are no known National Register eligible properties or areas considered sensitive for archaeological resources.

H. Exterior Lighting

There will be no exterior lighting at this facility. Composting operations will occur during daylight hours only, and loading and unloading of sand and salt will be performed via the truck and equipment headlights.

I. Buffering and Landscaping

The Town plans to provide landscaping and buffering through:

- Siting the building and compost operations as far from abutters as possible to the north and the south. The closest residence will be on the Verrier property to the north, which is approximately 1,300 feet from the proposed sand/salt shed. The house on the Harwood property is approximately 2,100 feet from the proposed shed location.
- Providing a colored dark green building cover to camouflage the building with the surrounding tree lines as much as possible. The Town is in discussions with pre-fabricated building suppliers for a building with a dark green finish and a more barn-like structure. Example images and specifications will be provided to the Planning Board prior to the September 17, 2019 meeting.
- Preservation of existing buffers north of the proposed salt shed location.

- Additional plantings on Verrier Property to the north See Attachment H for a commitment letter from the Town.
 - Replacement plantings for the existing buffer impacted by driveway construction.
 - Planting of 10- to 12-foot White Pine along the south and west lines of the Verrier Property for additional screening.
- NELMA property Construction of a landscape berm and plantings along the north property line with the NELMA property as agreed upon when the parcel abutting NELMA was purchased. See the Buffer Planting Plan, Drawing L-1 for more details. This buffer will screen the compost operations from the NELMA property and the traffic along Tuttle Road.
- Additional plantings on the Simmons and Gordon Lot (old Harwood property) to the south The Town has committed to provide up to \$18,000 for buffer plantings on the Simmons/Gordon property. The approximate locations of the buffer plantings are shown in the drawing set. The final locations will be coordinated with the property Owners after completion of the project, likely in the spring of 2020. The commitment letter from the Town is included in Attachment H.

J. Noise

Noise from the composting operations will be limited to Tuesdays from 1 pm to 5 pm and Saturdays from 9 am to 4 pm between the middle of April and end of November. There may be times when the compost piles are observed and turned over with a loader, but these are generally intermittent depending on the temperature of the compost piles. For most of the time, the facility will be unmanned and unoccupied with no major noise producers.

Noise from access to the sand and salt shed will be generally limited to during winter storm events and material deliveries. The deliveries will occur during daytime hours, but the storm events will require access whenever the sand/salt mixture is needed to treat the roads. In these instances, equipment back-up alarms will be the main source of noise from the site. Because these alarms are required for safe operations of the equipment in the area, they are generally not regulated by the State or Town for noise considerations.

Some of this noise will be attenuated over the distance that the sand/salt building is separated from the abutting neighbors. Figure 3 below outlines the distance for the separation. The house on the neighbor's property to the south is approximately 2,200 feet from the proposed salt shed. In addition, the Town will maintain as many of the existing trees as possible to the north and provide landscape buffers to further mitigate noise impacts from the back-up alarms. The site has been designed to provide adequate maneuvering space such that the plow trucks will not be required to make more than one back up maneuver to enter the shed.

K. Storage of Materials

The site will generally store brush dropped off from residents or local contractors. This pile will be located on the proposed gravel pad south of the sand/salt building. The brush pile is then chipped and removed from the site or added to the compost windrows. In addition, the site will accommodate MEDEP defined Type 1A Residuals (leaf and yard waste, wood chips, brush) for composting. The Town plans to compost between 2,500 to 3,000 cubic yards of material annually.

Composting operations will require the use of regulated animal manure to make sure that the Carbon-Nitrogen balance in the windrows is maintained. The compost operations proposed by the Town is generally permitted to use as much as 10,000 cubic yards of animal manure without having to file for a more comprehensive permit with the MEDEP Solid Waste Bureau. The Town will maintain compost operations with animal manure, but it will be provided and mixed in on an as needed basis with limited stockpiling at the site.

A 45-yard pile of finished compost will be available for resident pick-up in the compost pick-up bins shown on the plans.

The site will also store the sand and salt required for the Town's winter operations. The material storage, mixing operations, and loading and unloading of trucks will all occur within the proposed 8,000-sf salt shed. The salt shed will be constructed on an asphalt pad, enclosed, and graded to drain away from building. There will be no hazardous materials stored on site

L. Capacity of the Applicant

- Financial Capacity The project will be funded with Town Council approved funds.
- The Town has hired Boundary Points Professional Land Surveyors, Albert Frick Associates for the wetlands, Terrence J. DeWan & Associates for landscaping plan, and SME to assist with the project design. Construction and maintenance of the project will be performed by experienced contractors as necessary.

M. Design and Performance Standards

Not applicable to this project.

FIGURES







ATTACHMENT A

TITLE, RIGHT, OR INTEREST





DAVID J. JONES RICHARD H. SPENCER, JR. LAWRENCE R. CLOUGH RONALD A. EPSTEIN WILLIAM H. DALE F. BRUCE SLEEPER DEBORAH M. MANN LESLIE E. LOWRY III PATRICIA M. DUNN MICHAEL J. QUINLAN R. LEE IVY ROGER P. ASCH NATALIE L. BURNS SALLY J. DAGGETT ROY T. PIERCE BRENDAN P. RIELLY NICHOLAS J. MORRILL MARK A. BOWER CHARLES M. KATZ-LEAVY ALYSSA C. TIBBETTS J. CASEY MCCORMACK TUDOR N. GOLDSMITH

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March 9, 2016

MERTON G. HENRY KENNETH M. COLE III NICHOLAS S. NADZO FRANK H. FRYE MICHAEL A. NELSON BRIAN C. BROWNE OF COUNSEL

RAYMOND E JENSEN (1908-2002) KENNETH BAIRD (1914-1987) M. DONALD GARDNER (1918-2003) YORK COUNTY OFFICE 11 MAIN STREET, SUITE 4 KENNEBLINK, MAINE 04043 (207) 985-4676 (Phone) (207) 985-4932 (Fax)

William R. Shane, Town Manager Town of Cumberland 290 Tuttle Road Cumberland, Maine 04021

Re: Northeastern Lumber Manufacturers Institute / Town of Cumberland 10.6 acres, more or less, off Tuttle Road, Cumberland, Maine

Dear Bill:

Enclosed herewith please find the following original documents in regard to the above referenced matter.

1. Short Form Quitclaim Deed with Covenant from Northeastern Lumber Manufacturers Institute to the Town, which was recorded in the Cumberland County Registry of Deeds in Book 32938, Page 261; and

2. Owner's Policy of Title Insurance.

If you have any questions, please let me know.

Very truly,

Nicholas J. Morrill

NJM/lts Enclosures

~ Over 60 Years of Service ~

SHORT FORM QUITCLAIM DEED WITH COVENANT

NORTHEASTERN LUMBER MANUFACTURERS INSTITUTE, (formerly known as THE INSTITUTE OF THE NORTHEASTERN LUMBER MANUFACTURERS ASSOCIATION, and also formerly known as the INSTITUTE OF THE NORTHEASTERN LUMBER MANUFACTURERS ASSOCIATION), a Maine non-profit corporation, with a place of business at 272 Tuttle Road, Cumberland, ME 04021 (the "Grantor"), FOR CONSIDERATION PAID, grants to the **TOWN OF CUMBERLAND**, a Maine municipal corporation, with a place of business at 290 Tuttle Road, Cumberland, ME 04021 (the "Grantee"), with QUITCLAIM COVENANT, certain real property, together with any improvements thereon, located in the Town of Cumberland, Cumberland County, Maine and more particularly described on Exhibit A attached hereto.

Meaning and intending to describe a portion of the premises conveyed to the Grantor by Deed of Sale by Personal Representative Paul D. Merrill and Key Bank of Southern Maine, Personal Representatives of the Estate of Virginia S. Merrill dated December 20, 1985 and recorded in the Cumberland County Registry of Deeds in Book 7115, Page 296.

IN WITNESS WHEREOF, Northeastern Lumber Manufacturers Institute has caused this instrument to be executed by Jeff Easterling, its Executive Director, thereunto duly authorized, as of this 25th day of February, 2016.

WITNESS: Name:

State of Maine

County of Cumberland, ss.

NORTHEASTERN LUMBER MANUFACTURERS INSTITUTE

Jeff Easterling

Executive Director

FEBRUARY 25⁴, 2016

PERSONALLY APPEARED the above-named Jeff Easterling, Executive Director of the said Northeastern Lumber Manufacturers Institute, as aforesaid, and acknowledged the foregoing instrument to be his free act and deed in his said capacity and the free act and deed of said corporation.

Before me Notary Public Print Name: Jaimie P. Schwartz Commissions Expires:

3.0

1.

EXHIBIT A

to deed from Northeastern Lumber Manufacturers Institute

A certain lot or parcel of land with any improvements thereon, located on the Southwesterly Side of Tuttle Road, but not adjacent thereto, in the Town of Cumberland, County of Cumberland, State of Maine and more particularly bounded and described as follows:

BEGINNING at a found 5/8 inch iron rebar, being the East Corner of a parcel as described in the deed to the Town of Cumberland dated October 2, 2014 recorded in the Cumberland County Registry of Deeds in Book 31907 Page 253 and on the Northwesterly Side of the Maine Central Railroad Company Land at Station 277+34.2 Left 38 feet:

Thence N 56°50'45" W, a distance of 530.82 feet along the land of Town of Cumberland to a found 5/8 inch iron rebar;

Thence **N 21°10'45''** E, a distance of **680.95 feet** along of Town of Cumberland to a point at the land now or formerly of Robert A. Verrier III and Sarah H. Verrier as described in Book 13259 Page 328;

Thence S 55°30'54" E, a distance of 363.41 feet passing through two iron rebars along land of Verrier and remaining land of Institute of Northeastern Lumber Manufacturing Association as described in Book 7115 Page 296 to a point;

Thence **S** 73°10'49'' E, a distance of 464.54 feet along the land of Verrier to a point opposite or perpendicular, also known as Normal, to Station 285+34.35 of Maine Central Railroad Company as depicted upon the plan entitled Right of Way and Track Map Maine Central Railroad Company Station 264+20 to 316+80 dated June 30, 1916 File V.I./6. on file at the Maine Central Railroad Company in North Billerica, Massachusetts.

Thence S 43°00'45" W, a distance of 800.15 feet along the land of Maine Central Railroad Company to the POINT OF BEGINNING.

The basis of bearings for this description was the Maine State Plane Grid Coordinate System, North American Datum of 1983 located in the West Zone.

RESERVED EASEMENT:

RESERVING to the Grantor, its successors and assigns, for the benefit of the adjacent remaining land of Grantor described in the deed recorded in the Cumberland County Registry of Deeds in Book 7115, Page 296 (the "Benefited Property"), and burdening the foregoing premises of the Grantee, its successors and assigns (the "Burdened Property"), a perpetual easement and covenant as follows: Prior to any improvement or development of the Burdened Property (for example, development of roads and parking areas or construction of buildings or structures of any kind), by any party, Grantee shall create at Grantee's sole cost and expense on the Burdened Property a vegetated buffer area using customary plantings, including trees, grasses and shrubs, approximately

ten to twenty feet wide along the entire common bound of the Burdened Property and the Benefited Property in the area generally depicted on Exhibit A-1 (this swath, the "Buffer Area"), which is a general depiction of the Burdened Property and the Benefited Property, but not meant to substitute for the foregoing legal description, which shall control. The landscape plans for such Buffer Area shall be submitted for approval to Grantor prior to commencement of any work therein, and Grantor's written consent shall be necessary in order to install and improve such Buffer Area, which such consent shall not be unreasonably delayed, conditioned or withheld. The Buffer Area shall initially be developed with plantings that are larger and more mature than seedlings (typical would be two-to-three-season-old shrubs and five-to-ten-year-old trees), be designed to provide maximum screening and shall be constructed and installed concurrently with or immediately after the completion of any improvement or development on the Burdened Property, subject to weather and seasonal limitations. After the installation of such approved plantings and installations in the Buffer Area, Grantee shall maintain the buffer area in good condition, replacing dead or diseased plants, and otherwise maintaining the Buffer Area using good stewardship and sound landscape maintenance techniques and methods. It is acknowledged and agreed that the area designated on Exhibit A-1 as Experimental Forest Plot located on the Benefited Property shall be of particular sensitivity and any activities conducted by Grantee in the vicinity of that Plot shall be conducted in such a way as to minimize disturbance and damage to the plantings and soils of such Plot (e.g., spraying and spreading of herbicides, fertilizers or pesticides within One Hundred (100) feet of the southerly boundary of such Plot (i.e., closest boundary of the plot to the common boundary of the Burdened Property and Benefited Property) is prohibited). There shall be no structures (permanent or temporary) or improvements of any kind (permanent or temporary), including without limit buildings, sheds, lean-tos, woodpiles, drives, walkways, trails, or other disruption permitted in the approximately ten to twenty feet wide Buffer Area. In the event Grantee shall fail to abide by the terms of this Easement, Grantee shall be liable to Grantor for any damage caused to the Experimental Forest Plot or the Benefited Property caused by such failure or breach, and furthermore Grantor may after (a) written notice from Grantor to Grantee, and (b) reasonable opportunity of Grantee to cure not less than thirty (30) days from actual receipt of such notice, or such longer period of time if such cure cannot reasonably be accomplished within such thirty (30) day time period, cure any such failure or breach and may enter upon the Burdened Property for the purpose of such cure. Grantor may charge to Grantee the actual and verifiable cost of such effort. Any amount of such charge that is not paid to the Grantor within fifteen (15) days of written notice thereof shall bear interest at 18% per annum until paid.

The rights, agreements, covenants and Easement herein granted and provided shall be perpetual rights, agreements, covenants and easements running with the land and shall inure to the benefit of and be binding upon Grantor and Grantee and their respective heirs, successors and assigns. This Easement shall burden the Burdened Property and benefit the Benefited Property. In no event shall any owner be liable for any damages resulting from the breach of any of the provisions of this Easement except with respect to any such breach occurring during the time that owner is the record owner of the Burdened Property or the Benefited Property, as the case may be.



9" 264

Chicago Title Insurance Company

POLICY NO.: 1027-1-364.1-2016.72306-95416193

OWNER'S POLICY OF TITLE INSURANCE

Issued by

Chicago Title Insurance Company

Any notice of claim and any other notice or statement in writing required to be given the Company under this Policy must be given to the Company at the address shown in Section 18 of the Conditions.

COVERED RISKS

SUBJECT TO THE EXCLUSIONS FROM COVERAGE, THE EXCEPTIONS FROM COVERAGE CONTAINED IN SCHEDULE B, AND THE CONDITIONS, CHICAGO TITLE INSURANCE COMPANY, a Nebraska corporation (the "Company") insures, as of Date of Policy and, to the extent stated in Covered Risks 9 and 10, after Date of Policy, against loss or damage, not exceeding the Amount of Insurance, sustained or incurred by the Insured by reason of:

- 1. Title being vested other than as stated in Schedule A.
- 2. Any defect in or lien or encumbrance on the Title. This Covered Risk includes but is not limited to insurance against loss from (a) A defect in the Title caused by
 - (i) forgery, fraud, undue influence, duress, incompetency, incapacity, or impersonation;
 - (ii) failure of any person or Entity to have authorized a transfer or conveyance:
 - (iii) a document affecting Title not properly created, executed, witnessed, sealed, acknowledged, notarized, or delivered;
 - (iv) failure to perform those acts necessary to create a document by electronic means authorized by law;
 - (v) a document executed under a falsified, expired, or otherwise invalid power of attorney;
 - (vi) a document not properly filed, recorded, or indexed in the Public Records including failure to perform those acts by electronic means authorized by law; or
 - (vii) a defective judicial or administrative proceeding.
 - (b) The lien of real estate taxes or assessments imposed on the Title by a governmental authority due or payable, but unpaid.
 - (c) Any encroachment, encumbrance, violation, variation, or adverse circumstance affecting the Title that would be disclosed by an accurate and complete land survey of the Land. The term "encroachment" includes encroachments of existing improvements located on the Land onto adjoining land, and encroachments onto the Land of existing improvements located on adjoining land.
- Unmarketable Title. 3.
- No right of access to and from the Land. 4.
- The violation or enforcement of any law, ordinance, permit, or governmental regulation (including those relating to building and zoning) 5. restricting, regulating, prohibiting, or relating to
 - (a) the occupancy, use, or enjoyment of the Land;
 - (b) the character, dimensions, or location of any improvement erected on the Land;
 - (c) the subdivision of land; or
 - (d) environmental protection

if a notice, describing any part of the Land, is recorded in the Public Records setting forth the violation or intention to enforce, but only to the extent of the violation or enforcement referred to in that notice.

- 6. An enforcement action based on the exercise of a governmental police power not covered by Covered Risk 5 if a notice of the enforcement action, describing any part of the Land, is recorded in the Public Records, but only to the extent of the enforcement referred to in that notice.
- 7. The exercise of the rights of eminent domain if a notice of the exercise, describing any part of the Land, is recorded in the Public Records.
- 8. Any taking by a governmental body that has occurred and is binding on the rights of a purchaser for value without Knowledge.
- 9. Title being vested other than as stated Schedule A or being defective
 - (a) as a result of the avoidance in whole or in part, or from a court order providing an alternative remedy, of a transfer of all or any part of the title to or any interest in the Land occurring prior to the transaction vesting Title as shown in Schedule A because that prior transfer constituted a fraudulent or preferential transfer under federal bankruptcy, state insolvency, or similar creditors' rights laws; or
 - (b) because the instrument of transfer vesting Title as shown in Schedule A constitutes a preferential transfer under federal bankruptcy, state insolvency, or similar creditors' rights laws by reason of the failure of its recording in the Public Records (i) to be timely, or
 - (ii) to impart notice of its existence to a purchaser for value or to a judgment or lien creditor.

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10. Any defect in or lien or encumbrance on the Title or other matter included in Covered Risks 1 through 9 that has been created or attached or has been filed or recorded in the Public Records subsequent to Date of Policy and prior to the recording of the deed or other instrument of transfer in the Public Records that vests Title as shown in Schedule A.

The Company will also pay the costs, attorneys' fees, and expenses incurred in defense of any matter insured against by this Policy, but only to the extent provided in the Conditions.

IN WITNESS WHEREOF, CHICAGO TITLE INSURANCE COMPANY has caused this policy to be signed and sealed by its duly authorized officers.

Countersigned:

Authorized Signatory Nicholas J. Morrill

1027ME 364.1 Jensen Baird Gardner & Henry 10 Free St, PO Box 4510 Portland, ME 04112 Tel: (207) 775-7271 Fax: (207) 775-7935

CHICAGO TITLE INSURANCE COMPANY

(Smit Main- 1_ ATTEST Provident

72306 (6/06)

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EXCLUSIONS FROM COVERAGE

The following matters are expressly excluded from the coverage of this policy, and the Company will not pay loss or damage, costs, attorneys' fees, or expenses that arise by reason of:

- 1. (a) Any law, ordinance, permit, or governmental regulation (including those relating to building and zoning) restricting, regulating, prohibiting, or relating to
 - (i) the occupancy, use, or enjoyment of the Land;
 - (ii) the character, dimensions or location of any improvement erected on the Land;
 - (iii) the subdivision of land; or
 - (iv) environmental protection;

or the effect of any violation of these laws, ordinances, or governmental regulations. This Exclusion 1(a) does not modify or limit the coverage provided under Covered Risk 5.

- (b) Any governmental police power. This Exclusion 1(b) does not modify or limit the coverage provided under Covered Risk 6.
- 2. Rights of eminent domain. This Exclusion does not modify or limit the coverage provided under Covered Risk 7 or 8.
- Defects, liens, encumbrances, adverse claims, or other matters: 3.
 - (a) created, suffered, assumed, or agreed to by the Insured Claimant;
 - (b) not Known to the Company, not recorded in the Public Records at Date of Policy, but Known to the Insured Claimant and not disclosed in writing to the Company by the Insured Claimant prior to the date the Insured Claimant became an Insured under this policy;
 - (c) resulting in no loss or damage to the Insured Claimant;
 - (d) attaching or created subsequent to Date of Policy (however, this does not modify or limit the coverage provided under Covered Risk 9 and 10); or
 - (e) resulting in loss or damage that would not have been sustained if the Insured Claimant had paid value for the Title.
- Any claim, by reason of the operation of federal bankruptcy, state insolvency, or similar creditors' rights laws, that the transaction vesting the 4. Title as shown in Schedule A, is
 - (a) a fraudulent conveyance or fraudulent transfer; or
 - (b) a preferential transfer for any reason not stated in Covered Risk 9 of this policy.
- Any lien on the Title for real estate taxes or assessments imposed by governmental authority and created or attaching between Date of Policy 5. and the date of recording of the deed or other instrument of transfer in the Public Records that vests Title as shown in Schedule A.

CONDITIONS

1. DEFINITION OF TERMS

The following terms when used in this policy mean:

(a) "Amount of Insurance": The amount stated in Schedule A, as may be increased or decreased by endorsement to this policy, increased by Section 8(b), or decreased by Sections 10 and 11 of these Conditions.

(b) "Date of Policy": The date designated as 'Date of Policy" in Schedule A.

(c) "Entity": A corporation, partnership, trust, limited liability company, or other similar legal entity.

(d) "Insured": The Insured named in Schedule A.

(i) The term "Insured" also includes

successors to the Title of the Insured by operation of (A) law as distinguished from purchase, including heirs, devisees, survivors, personal representatives, or next of kin;

(B)successors to an Insured by dissolution, merger, consolidation, distribution, or reorganization;

(C)successors to an Insured by its conversion to another kind of Entity;

a grantee of an Insured under a deed delivered with-(D) out payment of actual valuable consideration conveying the Title

(1) if the stock, shares, memberships, or other equity interests of the grantee are wholly-owned by the named Insured,

(2) if the grantee wholly owns the named Insured,

(3) if the grantee is wholly-owned by an affiliated Entity of the named Insured, provided the affiliated Entity and the named Insured are both wholly-owned by the same person or Entity, or

(4) if the grantee is a trustee or beneficiary of a trust created by a written instrument established by the Insured named in Schedule A for estate planning purposes.

(ii) With regard to (A), (B), (C), and (D) reserving, however, all rights and defenses as to any successor that the Company would have had against any predecessor Insured.

(e) "Insured Claimant": An Insured claiming loss or damage.

(f) "Knowledge" or "Known": Actual knowledge, not constructive knowledge or notice that may be imputed to an Insured by reason of the Public Records or any other records that impart constructive notice of matters affecting the Title.

(g)"Land": The land described in Schedule A, and affixed improvements that by law constitute real property. The term "Land" does not include any property beyond the lines of the area described in Schedule A, nor any right, title, interest, estate, or easement in abutting streets, roads, avenues, alleys, lanes, ways, or waterways, but this does not modify or limit the extent that a right of access to and from the Land is insured by this policy.

(h) "Mortgage": Mortgage, deed of trust, trust deed, or other security instrument, including one evidenced by electronic means authorized by law.

(i) "Public Records": Records established under state statutes at Date of Policy for the purpose of imparting constructive notice of matters relating to real property to purchasers for value and without Knowledge, With respect to Covered Risk 5(d), "Public Records" shall also include environmental protection liens filed in the records of the clerk of the United States District Court for the district where the Land is located.

(i) "Title": The estate or interest described in Schedule A.

(k) "Unmarketable Title": Title affected by an alleged or apparent matter that would permit a prospective purchaser or lessee of the Title or lender on the Title to be released from the obligation to purchase, lease, or lend if there is a contractual condition requiring the delivery of marketable title.

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2. CONTINUATION OF INSURANCE

The coverage of this policy shall continue in force as of Date of Policy in favor of an Insured, but only so long as the Insured retains an estate or interest in the Land, or holds an obligation secured by a purchase money Mortgage given by a purchaser from the Insured, or only so long as the Insured shall have liability by reason of warranties in any transfer or conveyance of the Title. This policy shall not continue in force in favor of any purchaser from the Insured of either (i) an estate or interest in the Land, or (ii) an obligation secured by a purchase money Mortgage given to the Insured.

3. NOTICE OF CLAIM TO BE GIVEN BY INSURED CLAIMANT

The Insured shall notify the Company promptly in writing (i) in case of any litigation as set forth in Section 5(a) of these Conditions, (ii) in case Knowledge shall come to an Insured hereunder of any claim of title or interest that is adverse to the Title, as insured, and that might cause loss or damage for which the Company may be liable by virtue of this policy, or (iii) if the Title, as insured, is rejected as Unmarketable Title. If the Company is prejudiced by the failure of the Insured Claimant to provide prompt notice, the Company's liability to the Insured Claimant under the policy shall be reduced to the extent of the prejudice.

4. PROOF OF LOSS

In the event the Company is unable to determine the amount of loss or damage, the Company may, at its option, require as a condition of payment that the Insured Claimant furnish a signed proof of loss. The proof of loss must describe the defect, lien, encumbrance, or other matter insured against by this policy that constitutes the basis of loss or damage and shall state, to the extent possible, the basis of calculating the amount of the loss or damage.

5. DEFENSE AND PROSECUTION OF ACTIONS

(a) Upon written request by the Insured, and subject to the options contained in Section 7 of these Conditions, the Company, at its own cost and without unreasonable delay, shall provide for the defense of an Insured in litigation in which any third party asserts a claim covered by this policy adverse to the Insured. This obligation is limited to only those stated causes of action alleging matters insured against by this policy. The Company shall have the right to select counsel of its choice (subject to the right of the Insured to object for reasonable cause) to represent the Insured as to those stated causes of action. It shall not be liable for and will not pay the fees of any other counsel. The Company will not pay any fees, costs, or expenses incurred by the Insured in the defense of those causes of action that allege matters not insured against by this policy.

(b) The Company shall have the right, in addition to the options contained in Section 7 of these Conditions, at its own cost, to institute and prosecute any action or proceeding or to do any other act that in its opinion may be necessary or desirable to establish the Title, as insured, or to prevent or reduce loss or damage to the Insured. The Company may take any appropriate action under the terms of this policy, whether or not it shall be liable to the Insured. The exercise of these rights shall not be an admission of liability or waiver of any provision of this policy. If the Company exercises its rights under this subsection, it must do so diligently.

(c) Whenever the Company brings an action or asserts a defense as required or permitted by this policy, the Company may pursue the litigation to a final determination by a court of competent jurisdiction, and it expressly reserves the right, in its sole discretion, to appeal any adverse judgment or order.

6. DUTY OF INSURED CLAIMANT TO COOPERATE

(a) In all cases where this policy permits or requires the Company to prosecute or provide for the defense of any action or proceeding and 72306 (6/06)

any appeals, the Insured shall secure to the Company the right to so prosecute or provide defense in the action or proceeding, including the right to use, at its option, the name of the Insured for this purpose. Whenever requested by the Company, the Insured, at the Company's expense, shall give the Company all reasonable aid (i) in securing evidence, obtaining witnesses, prosecuting or defending the action or proceeding, or effecting settlement, and (ii) in any other lawful act that in the opinion of the Company may be necessary or desirable to establish the Title or any other matter as insured. If the Company is prejudiced by the failure of the Insured to furnish the required cooperation, the Company's obligations to the Insured under the policy shall terminate, including any liability or obligation to defend, prosecute, or continue any litigation, with regard to the matter or matters requiring such cooperation.

(b) The Company may reasonably require the Insured Claimant to submit to examination under oath by any authorized representative of the Company and to produce for examination, inspection, and copying, at such reasonable times and places as may be designated by the authorized representative of the Company, all records, in whatever medium maintained, including books, ledgers, checks, memoranda, correspondence, reports, e-mails, disks, tapes, and videos whether bearing a date before or after Date of Policy, that reasonably pertain to the loss or damage. Further, if requested by any authorized representative of the Company, the Insured Claimant shall grant its permission, in writing, for any authorized representative of the Company to examine, inspect, and copy all of these records in the custody or control of a third party that reasonably pertain to the loss or damage. All information designated as confidential by the Insured Claimant provided to the Company pursuant to this Section shall not be disclosed to others unless, in the reasonable judgment of the Company, it is necessary in the administration of the claim. Failure of the Insured Claimant to submit for examination under oath, produce any reasonably requested information, or grant permission to secure reasonably necessary information from third parties as required in this subsection, unless prohibited by law or governmental regulation, shall terminate any liability of the Company under this policy as to that claim.

7. OPTIONS TO PAY OR OTHERWISE SETTLE CLAIMS; TERMINATION OF LIABILITY

In case of a claim under this policy, the Company shall have the following additional options:

(a) To Pay or Tender Payment of the Amount of Insurance.

To pay or tender payment of the Amount of Insurance under this policy together with any costs, attorneys' fees, and expenses incurred by the Insured Claimant that were authorized by the Company up to the time of payment or tender of payment and that the Company is obligated to pay.

Upon the exercise by the Company of this option, all liability and obligations of the Company to the Insured under this policy, other than to make the payment required in this subsection, shall terminate, including any liability or obligation to defend, prosecute, or continue any litigation.

(b) To Pay or Otherwise Settle With Parties Other Than the Insured or With the Insured Claimant.

(i) To pay or otherwise settle with other parties for or in the name of an Insured Claimant any claim insured against under this policy. In addition, the Company will pay any costs, attorneys' fees, and expenses incurred by the Insured Claimant that were authorized by the Company up to the time of payment and that the Company is obligated to pay; or

(ii) To pay or otherwise settle with the Insured Claimant the loss or damage provided for under this policy, together with any costs, attorneys' fees, and expenses incurred by the Insured Claimant that were ALTA Owner's Policy (6/17/06)

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authorized by the Company up to the time of payment and that the Company is obligated to pay.

Upon the exercise by the Company of either of the options provided for in subsections (b)(i) or (ii), the Company's obligations to the Insured under this policy for the claimed loss or damage, other than the payments required to be made, shall terminate, including any liability or obligation to defend, prosecute, or continue any litigation.

8. DETERMINATION AND EXTENT OF LIABILITY

This policy is a contract of indemnity against actual monetary loss or damage sustained or incurred by the Insured Claimant who has suffered loss or damage by reason of matters insured against by this policy.

(a) The extent of liability of the Company for loss or damage under this policy shall not exceed the lesser of

(i) the Amount of Insurance; or

(ii) the difference between the value of the Title as insured and the value of the Title subject to the risk insured against by this policy.

(b) If the Company pursues its rights under Section 5 of these Conditions and is unsuccessful in establishing the Title, as insured,

(i) the Amount of Insurance shall be increased by 10%, and

(ii) the Insured Claimant shall have the right to have the loss or damage determined either as of the date the claim was made by the Insured Claimant or as of the date it is settled and paid.

(c) In addition to the extent of liability under (a) and (b), the Company will also pay those costs, attorneys' fees, and expenses incurred in accordance with Sections 5 and 7 of these Conditions.

9. LIMITATION OF LIABILITY

(a) If the Company establishes the Title, or removes the alleged defect, lien or encumbrance, or cures the lack of a right of access to or from the Land, or cures the claim of Unmarketable Title, all as insured, in a reasonably diligent manner by any method, including litigation and the completion of any appeals, it shall have fully performed its obligations with respect to that matter and shall not be liable for any loss or damage caused to the Insured.

(b) In the event of any litigation, including litigation by the Company or with the Company's consent, the Company shall have no liability for loss or damage until there has been a final determination by a court of competent jurisdiction, and disposition of all appeals, adverse to the Title, as insured.

(c) The Company shall not be liable for loss or damage to the Insured for liability voluntarily assumed by the Insured in settling any claim or suit without the prior written consent of the Company.

10. REDUCTION OF INSURANCE; REDUCTION OR TERMINATION OF LIABILITY

All payments under this policy, except payments made for costs, attorneys' fees, and expenses, shall reduce the Amount of Insurance by the amount of the payment.

11. LIABILITY NONCUMULATIVE

The Amount of Insurance shall be reduced by any amount the Company pays under any policy insuring a Mortgage to which exception is taken in Schedule B or to which the Insured has agreed, assumed, or taken subject, or which is executed by an Insured after Date of Policy and which is a charge or lien on the Title, and the amount so paid shall be deemed a payment to the Insured under this policy.

12. PAYMENT OF LOSS

When liability and the extent of loss or damage have been definitely fixed in accordance with these Conditions, the payment shall be made within 30 days.

13. RIGHTS OF RECOVERY UPON PAYMENT OR SETTLEMENT

(a) Whenever the Company shall have settled and paid a claim under this policy, it shall be subrogated and entitled to the rights of the In-72306 (6/06) sured Claimant in the Title and all other rights and remedies in respect to the claim that the Insured Claimant has against any person or property, to the extent of the amount of any loss, costs, attorneys' fees, and expenses paid by the Company. If requested by the Company, the Insured Claimant shall execute documents to evidence the transfer to the Company of these rights and remedies. The Insured Claimant shall permit the Company to sue, compromise, or settle in the name of the Insured Claimant and to use the name of the Insured Claimant in any transaction or litigation involving these rights and remedies.

If a payment on account of a claim does not fully cover the loss of the Insured Claimant, the Company shall defer the exercise of its right to recover until after the Insured Claimant shall have recovered its loss.

(b) The Company's right of subrogation includes the rights of the Insured to indemnities, guaranties, other policies of insurance, or bonds, notwithstanding any terms or conditions contained in those instruments that address subrogation rights.

14. ARBITRATION

Either the Company or the Insured may demand that the claim or controversy shall be submitted to arbitration pursuant to the Title Insurance Arbitration Rules of the American Land Title Association ("Rules"). Except as provided in the Rules, there shall be no joinder or consolidation with claims or controversies of other persons. Arbitrable matters may include, but are not limited to, any controversy or claim between the Company and the Insured arising out of or relating to this policy, any service in connection with its issuance or the breach of a policy provision, or to any other controversy or claim arising out of the transaction giving rise to this policy. All arbitrable matters when the Amount of Insurance is \$2,000,000 or less shall be arbitrated at the option of either the Company or the Insured. All arbitrable matters when the Amount of Insurance is in excess of \$2,000,000 shall be arbitrated only when agreed to by both the Company and the Insured. Arbitration pursuant to this policy and under the Rules shall be binding upon the parties. Judgment upon the award rendered by the Arbitrator(s) may be entered in any court of competent jurisdiction.

15. LIABILITY LIMITED TO THIS POLICY; POLICY ENTIRE CONTRACT

(a) This policy together with all endorsements, if any, attached to it by the Company is the entire policy and contract between the Insured and the Company. In interpreting any provision of this policy, this policy shall be construed as a whole.

(b) Any claim of loss or damage that arises out of the status of the Title or by any action asserting such claim shall be restricted to this policy.

(c) Any amendment of or endorsement to this policy must be in writing and authenticated by an authorized person, or expressly incorporated by Schedule A of this policy.

(d) Each endorsement to this policy issued at any time is made a part of this policy and is subject to all of its terms and provisions. Except as the endorsement expressly states, it does not (i) modify any of the terms and provisions of the policy, (ii) modify any prior endorsement, (iii) extend the Date of Policy, or (iv) increase the Amount of Insurance. **16. SEVERABILITY**

In the event any provision of this policy, in whole or in part, is held invalid or unenforceable under applicable law, the policy shall be deemed not to include that provision or such part held to be invalid, but all other provisions shall remain in full force and effect.

17.CHOICE OF LAW; FORUM

(a) Choice of Law: The Insured acknowledges the Company has underwritten the risks covered by this policy and determined the premium charged therefore in reliance upon the law affecting interests in real property and applicable to the interpretation, rights, remedies, or en-

ALTA Owner's Policy (6/17/06)

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forcement of policies of title insurance of the jurisdiction where the Land is located.

Therefore, the court or an arbitrator shall apply the law of the jurisdiction where the Land is located to determine the validity of claims against the Title that are adverse to the Insured and to interpret and enforce the terms of this policy. In neither case shall the court or arbitrator apply its conflicts of law principles to determine the applicable law.

(b) Choice of Forum: Any litigation or other proceeding brought by the Insured against the Company must be filed only in a state or federal court within the United States of America or its territories having appropriate jurisdiction.

18. NOTICES, WHERE SENT

Any notice of claim and any other notice or statement in writing required to be given to the Company under this policy must be given to the Company at Chicago Title Insurance Company, Attn: Claims Department, P. O. Box 45023, Jacksonville, Florida 32232-5023.



CHICAGO TITLE INSURANCE COMPANY OWNER'S POLICY

SCHEDULE A

Agent's File No. 364.1 POLICY NUMBER: 72306-995416193 DATE & TIME OF POLICY: February 25, 2016 at 12:43 p.m. AMOUNT OF INSURANCE: \$250,000 PREMIUM: \$750

ISSUED WITH LOAN POLICY NUMBER: N/A

- 1. Name of Insured: Town of Cumberland
- Title to the estate or interest in the Land is at Date of Policy vested in: Town of Cumberland by Quitclaim Deed from Northeastern Lumber Manufacturers Association (formerly known as the Institute of the Northeastern Lumber Manufacturers Association), dated February 25, 2016 and recorded in the Cumberland County Registry of Deeds in Book 32938, Page 261.
- 3. The estate or interest in the Land that is covered by this Policy is: Fee Simple
- 4. The Land herein described is encumbered by the following Mortgage, and its assignments, if any: None.
- 5. The Land referred to in this policy is described as follows:

Street Address: off Tuttle Road Lot Number/Unit Number: Subdivision/Condominium: City/Town: Cumberland County: Cumberland State/Zip: Maine and is more specifically described on Exhibit A attached hereto and made a part hereof.

CHICAGO TITLE INSURANCE COMPANY BY:

Nicholas J. Morrill, Authorized Agent

This policy is valid only if Schedule B is attached. For use with ALTA 2006 Owner's Policy (6-17-06)

CTIC Form 72306

CHICAGO TITLE INSURANCE COMPANY OWNER'S POLICY

Owner's Policy Number: 72306-995416193

LEGAL DESCRIPTION - EXHIBIT A

A certain lot or parcel of land with any improvements thereon, located on the Southwesterly Side of Tuttle Road, but not adjacent thereto, in the Town of Cumberland, County of Cumberland, State of Maine and more particularly bounded and described as follows:

BEGINNING at a found 5/8 inch iron rebar, being the East Corner of a parcel as described in the deed to the Town of Cumberland dated October 2, 2014 recorded in the Cumberland County Registry of Deeds in Book 31907 Page 253 and on the Northwesterly Side of the Maine Central Railroad Company Land at Station 277+34.2 Left 38 feet:

Thence N 56°50'45" W, a distance of 530.82 feet along the land of Town of Cumberland to a found 5/8 inch iron rebar;

Thence N 21°10'45" E, a distance of 680.95 feet along of Town of Cumberland to a point at the land now or formerly of Robert A. Verrier III and Sarah H. Verrier as described in Book 13259 Page 328;

Thence S 55°30'54" E, a distance of 363.41 feet passing through two iron rebars along land of Verrier and remaining land of Institute of Northeastern Lumber Manufacturing Association as described in Book 7115 Page 296 to a point;

Thence S 73°10'49" E, a distance of 464.54 feet along the land of Verrier to a point opposite or perpendicular, also known as Normal, to Station 285+34.35 of Maine Central Railroad Company as depicted upon the plan entitled Right of Way and Track Map Maine Central Railroad Company Station 264+20 to 316+80 dated June 30, 1916 File V.I./6. on file at the Maine Central Railroad Company in North Billerica, Massachusetts.

Thence S 43°00'45" W, a distance of 800.15 feet along the land of Maine Central Railroad Company to the POINT OF BEGINNING.

The basis of bearings for this description was the Maine State Plane Grid Coordinate System, North American Datum of 1983 located in the West Zone.

CTIC Form 72306

CHICAGO TITLE INSURANCE COMPANY OWNER'S POLICY

Owner's Policy Number: 72306-995416193

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SCHEDULE B – PART I EXCEPTIONS FROM COVERAGE

This policy does not insure against loss or damage (and the Company will not pay costs, attorneys' fees or expenses) which arise by reason of:

- 1. Rights, facts, interests or claims of present tenants, lessees or parties in possession which are not shown by the Public Records, but which could be ascertained by an inspection of said Land or by making inquiry of persons in possession thereof.
- 2. Any liability for mechanics' or materialmen's liens.
- 3. Any encroachment, encumbrance, violation, variation, or adverse circumstance affecting the Title that would be disclosed by an accurate and complete survey of the Land. The term "encroachment" includes encroachments of existing improvements located on the Land onto adjoining land, and encroachments onto the Land of existing improvements located on adjoining land.
- 4. The Mortgage and its assignments, if any, referred to in Item 4 of Schedule A.
- 5. Real estate taxes, assessments and water and sewer charges which become due and payable subsequent to the date of policy. Taxes are paid through December 31, 2015.
- 6. IF THE INSURED PREMISES IS A CONDOMINIUM UNIT:

Covenants, conditions, restrictions, reservations, easements, liens for assessments, options, powers of attorney, and limitations on Title, created by the laws of the state of the insured Land or set forth in the Master Deed or Declaration of Condominium, in the related By-Laws, in the Declaration of Trust, or Site Plans and Floor Plans as duly recorded in the appropriate land records office and as the same may have been lawfully amended, and in any instruments creating the estate or interest insured by this policy.

- 7. There is added after any Special Exception appearing in this Schedule B relative to covenants, conditions and restrictions, the following: '...but omitting any covenants or restrictions, if any, based upon race, color, religion, sex, sexual orientation, familial status, marital status, disability, handicap, national origin, ancestry, or source of income, as set forth in applicable, state or federal laws, except to the extent that said covenant or restriction is permitted by applicable law.'
- 8. The exact acreage or square footage of the Land will not be insured.
- Title to and rights of the public and others entitled thereto in and to any portion of the insured premises located within the bounds of adjacent streets, roads and ways.

The following exceptions are "Special Exceptions" which affect the insured premises:

- 10. A legal right of access to and from the insured premises is not insured.
- 11. Reserved rights, easements and covenants set forth in a Quitclaim Deed from Northeastern Lumber Manufacturers Association (formerly known as the Institute of the Northeastern Lumber Manufacturers Association) to the Town of Cumberland, dated February 25, 2016 and recorded in the Cumberland County Registry of Deeds in Book 32938, Page 261.

□ For additional exceptions, if any, see attached Schedule B – Part I Continuation Sheet.

Exceptions deleted from a Loan Policy, if any, are not deleted from the Owner's Policy unless there is an endorsement attached authorizing specific deletions. Affirmative insurance language under any Schedule B exception does NOT apply to the Owner's Policy unless otherwise specified. Deletion of a specific survey exception from a Loan Policy, if any, does not delete Exception 3 above from the Owner's Policy.

CHICAGO TITLE INSURANCE COMPANY

By:

Nicholas J. Morrill, Authorized Agent

For use with ALTA 2006 Owner's Policy (6-17-06)

CTIC Form 72306

RELEASE DEED

The MAINE CENTRAL RAILROAD COMPANY, a corporation duly organized and existing under the laws of the State of Maine, with offices at Iron Horse Park, North Billerica, Middlesex County, Massachusetts (the "Grantor") in consideration of Forty Thousand and 00/100 (\$40,000.00) Dollars paid to it by TOWN OF CUMBERLAND, with a mailing address of 290 Tuttle Road, Cumberland, Maine 04021 (the "Grantee") hereby grants to the Grantee all the Grantor's right, title and interest, without any warranties or covenants of title whatsoever, in a certain parcel of land, and the buildings, bridges, structures, crossings, fixtures and improvements thereon, if any, situated in Cumberland, County of Cumberland, State of Maine (the "Premises") described as follows:

SEE EXHIBIT "A" ATTACHED HERETO AND MADE A PART HEREOF BY THIS REFERENCE.

This conveyance is subject to the following reservations, conditions, covenants and agreements:

1. This conveyance is made without granting any right of way, either by necessity or otherwise, over any remaining land or location of the Grantor.

2. The Grantor hereby reserves a permanent, exclusive right of way and easement in, on, over, under, across and through the Premises for the purpose of accessing, constructing, installing, operating, maintaining, modifying, repairing, replacing, relocating and removing a telecommunications system or other system for transmission of intelligence or information by any means, whether now existing or hereafter devised, including such poles, pipes, wires, fibers, fiber optic cables, repeater stations, attachments, appurtenances, structures or other equipment and property of any description necessary or useful for the same (the "Telecommunications Easement"). The Grantor further reserves the right to freely lease, license, mortgage, assign, pledge and otherwise alienate the Telecommunications Easement. The Grantee hereby covenants with the Grantor to recognize the Telecommunications Easement and, without the payment of any further consideration, to execute, acknowledge and

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deliver such instruments suitable for recording with the registry of deeds as the Grantor may reasonably require to acknowledge title to the Telecommunications Easement in the Grantor. The Grantor covenants to reasonably repair and restore the surface of the easement area after any work.

3. The Grantor excepts from this conveyance any and all railroad tracks, railroad track materials (including, but not limited to, ties, connections, switches and ballast) and/or related equipment of any description located in whole or in part within the Premises (the "Trackage") and this conveyance is subject to the right of the Grantor to enter the Premises from time to time and at any and all times within the ninety (90) day period commencing with and subsequent to the date of delivery of this deed, with such men, equipment and materials as, in the reasonable opinion of the Principal Engineering Officer of the Grantor, are necessary for the removal of the Trackage. Days during the months of December, January, February and March shall not be included in the aforesaid ninety (90) day period. If the Trackage is not removed from the Premises by the expiration of said ninety (90) day period, the Trackage shall be deemed abandoned by the Grantor and shall then become the property of the Grantee.

4. The Grantor excepts from this conveyance any and all advertising signs and/or billboards located upon the Premises which are not owned by the Grantor. Furthermore, this conveyance is subject to the right of the owners of said signs and/or billboards to go upon the Premises and remove them within ninety (90) days from the date of delivery of this deed.

5. By the acceptance of this deed and as part consideration therefor, the Grantee hereby assumes any and all agreements, covenants, obligations and liabilities of the Grantor in respect to any underground facilities, drainage culverts, walls, crossings and/or other structures of any nature and description located in whole or in part within the Premises.

6. By the acceptance of this deed and as part consideration therefor, the Grantee agrees to irrevocably waives, gives up and renounces any and all claims or causes of action against the Grantor in respect of claims, suits and/or enforcement actions (including any administrative or judicial proceedings and any remedial, removal or response actions) ever asserted, threatened, instituted or requested by any person and/or governmental agency on account of: (a) any release of oil or hazardous materials or substances of any description on, upon or into the Premises in contravention of any ordinance, law or statute (including, but not limited to, the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (42 U.S.C. Section 9601, et seq., as amended); and (b) any and all damage to real or personal property, natural resources and/or harm or injury to persons alleged to have resulted from such release of oil or hazardous materials or substances.

7. By the acceptance of this deed and as part consideration therefor, the Grantee hereby agrees to build and forever maintain fencing (together with any necessary gates), suitable to the Principal Engineering Officer of the Grantor, along the boundaries of the Premises which are common to remaining land or location of the Grantor (the "Fences"), if Fences are ever required in the sole and reasonable opinion of said Principal Engineering Officer.

8. This conveyance is subject to the following restriction for the benefit of other land or location of the Grantor, to wit: that from the date of delivery of this deed, the Grantor shall not be liable to the Grantee or any lessee or user of the Premises (or any part thereof) for any damage to any buildings or property upon them caused by fire, whether communicated directly or indirectly by or from locomotive engines of any description upon the railroad operated by the Grantor, or otherwise.

9. By the acceptance of this deed and as part consideration therefor, the Grantee hereby agrees to make no use of the Premises which, in the sole and reasonable opinion of the Principal Engineering Officer of the Grantor, adversely affects, increases or decreases drainage to, from, upon or in any remaining land or location of the Grantor. The Grantee agrees to indemnify and save the Grantor harmless from and against any and all loss, cost, damage or expense including, but not limited to, the cost of defending all claims and/or suits for property damage, personal injury or death arising out of or in any way attributable to any breach of the foregoing covenant.

10. The Grantor excepts from this conveyance any and all overhead, surface or underground signal and communication line facilities of the Grantor located within the limits of the Premises and this conveyance is subject to the Grantor's use of any such facilities in their present locations and entry upon the Premises from time to time to maintain, repair, replace, renew, relay or remove such facilities.

11. Whenever used in this deed, the term "Grantor" shall not only refer to the MAINE CENTRAL RAILROAD COMPANY, but also its successors, assigns and affiliates and the term "Grantee" shall not only refer to the above-named Grantee, but also the Grantee's successors, assigns and grantees, as the case maybe.

12. The several exceptions, reservations, conditions, covenants and agreements contained in this deed shall be deemed to run with the land and be binding upon the Grantee forever. In addition to the acceptance and recording of this deed, the Grantee hereby signifies assent to the said several exceptions, reservations, conditions, covenants and agreements, by joining in its execution.

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IN WITNESS WHEREOF, the said MAINE CENTRAL RAILROAD COMPANY has caused this release deed to be executed in its name and its corporate seal to be hereto affixed by David A. Fink, its President, thereunto duly authorized this // day of up un 2014.

GRANTOR: MAINE CENTRAL RAILROAD COMPANY

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By:

David A. Fink, President

GRANTEE: TOWN OF CUMBERLAND

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By: Wy William R. Showe Town MANGER 10/2/14

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COMMONWEALTH OF MASSACHUSETTS

Middlesex, ss.

September 16, 2014

On this 16 May of statement, 2014, before me, the undersigned notary public, personally appeared David A. Fink, President as aforesaid, proved to me through satisfactory evidence of identification, which was personal knowledge, to be the person whose name is signed on the preceding or attached document, and acknowledged to me that he signed it voluntarily for its stated purpose.

My Commission Expires

ROLAND L. THERIAULT Notary Public Commonwealth of Massachusetts My Commission Expires August 5, 2016

STATE OF MAINE

Cumberland, ss.

October 2, 2014

On this 2nd day of 0chober, 2014, before me, the undersigned notary public, personally appeared $W_1/l_{iam} R$. Shane, Town Manager as aforesaid, proved to me through satisfactory evidence of identification, which was a Driver's License, to be the person whose name is signed on the preceding or attached document, and acknowledged to me that he signed it voluntarily for its stated purpose.

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Notary Public My Commission Expires:

BRENDA L. MOORE Notary Public, Maine My Commission Expires June 14, 2021
EXHIBIT A

A certain lot or parcel of land with any improvements thereon, located on the Northwesterly Side of remaining land of Maine Central Railroad Company, located southwesterly of Tuttle Road, but not adjacent thereto, in the Town of Cumberland, County of Cumberland, State of Maine and more particularly bounded and described as follows:

BEGINNING at a set 5/8 inch iron rebar on the Northwesterly Side of the Maine Central Railroad Company Land at Station 277+34.2 Left 38 feet;

Thence N 56°50'45" W, a distance of 530.82 feet along land now or formerly of the Institute of Northeastern Lumber Manufacturing Association described in Deed Book 7115, Page 296 to set 5/8 inch iron rebar;

Thence N 21°10'45" E, a distance of 900.33 feet along land now or formerly of the Institute of Northeastern Lumber Manufacturing Association to a set 5/8 inch iron rebar;

Thence S 35°10'33" W, a distance of 341.09 feet along land of the Town of Cumberland as described in Deed Book 589, Page 204 to a set 5/8 inch iron rebar;

Thence S 21°10'45" W, a distance of 1710.70 feet along land now or formerly of Hugh F. Harwood and Pamela D. Harwood as described in Deed Book 7281, Page 154 to a found 5/8 inch iron rebar;

Thence N 54°52'45" W, a distance of 34.00 feet along land now or formerly of Harwood to a set 5/8 inch iron rebar;

Thence S 21°10'45" W, a distance of 282.16 feet along land now or formerly of Harwood to a found 5/8 inch iron rebar;

Thence along a curve turning to the right an Arc length of **333.80 feet**, a radius of **875.96 feet**, a chord bearing of S 32°05'45" W, and a chord length of 331.78 feet along land now or formerly of Harwood to a set 5/8 inch iron rebar;

Thence S 46°59'15" E, a distance of 41.00 feet along land now or formerly of Harwood to a set 5/8 inch iron rebar at Station 259+60.8 Left 38 feet;

Thence N 43°00'45" E, a distance of 1773.40 feet along remaining land of Maine Central Railroad Company to the POINT OF BEGINNING.

Containing an area of 13.17 Acres, more or less.

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The basis of bearings for this description was the Maine State Plane Grid Coordinate System, North American Datum of 1983 located in the West Zone.

Reference is made to Right of Way and Track Map dated June 30, 1916 Sheets V.I./5 and V.I./6 on file with Maine Central Railroad Company in Billerica, MA. and as depicted on a plan entitled "Land in Town of Cumberland, Maine, Maine Central Railroad Company to The Town of Cumberland, Scale 1"=100', Date June 19, 2014" by Boundary Points Professional Land Surveying, LLC Cumberland, Maine to be recorded at the Cumberland County Registry of Deeds.

Meaning and intending to describe all of the premises to Maine Central Railroad Company from Nancy Wyman dated November 2, 1870 recorded in Cumberland County Registry of Deeds in Book 381, Page 301.

Received Recorded Resister of Deeds Nov 12,2014 11:26:03A Cumberland Counts .Pamela E. Lovley

RELEASE DEED

The MAINE CENTRAL RAILROAD COMPANY, a corporation duly organized and existing under the laws of the State of Maine, with offices at Iron Horse Park, North Billerica, Middlesex County, Massachusetts (the "Grantor") in consideration of Forty Thousand and 00/100 (\$40,000.00) Dollars paid to it by TOWN OF CUMBERLAND, with a mailing address of 290 Tuttle Road, Cumberland, Maine 04021 (the "Grantee") hereby grants to the Grantee all the Grantor's right, title and interest, without any warranties or covenants of title whatsoever, in a certain parcel of land, and the buildings, bridges, structures, crossings, fixtures and improvements thereon, if any, situated in Cumberland, County of Cumberland, State of Maine (the "Premises") described as follows:

SEE EXHIBIT "A" ATTACHED HERETO AND MADE A PART HEREOF BY THIS REFERENCE.

This conveyance is subject to the following reservations, conditions, covenants and agreements:

1. This conveyance is made without granting any right of way, either by necessity or otherwise, over any remaining land or location of the Grantor.

2. The Grantor hereby reserves a permanent, exclusive right of way and easement in, on, over, under, across and through the Premises for the purpose of accessing, constructing, installing, operating, maintaining, modifying, repairing, replacing, relocating and removing a telecommunications system or other system for transmission of intelligence or information by any means, whether now existing or hereafter devised, including such poles, pipes, wires, fibers, fiber optic cables, repeater stations, attachments, appurtenances, structures or other equipment and property of any description necessary or useful for the same (the "Telecommunications Easement"). The Grantor further reserves the right to freely lease, license, mortgage, assign, pledge and otherwise alienate the Telecommunications Easement. The Grantee hereby covenants with the Grantor to recognize the Telecommunications Easement and, without the payment of any further consideration, to execute, acknowledge and

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deliver such instruments suitable for recording with the registry of deeds as the Grantor may reasonably require to acknowledge title to the Telecommunications Easement in the Grantor. The Grantor covenants to reasonably repair and restore the surface of the easement area after any work.

3. The Grantor excepts from this conveyance any and all railroad tracks, railroad track materials (including, but not limited to, ties, connections, switches and ballast) and/or related equipment of any description located in whole or in part within the Premises (the "Trackage") and this conveyance is subject to the right of the Grantor to enter the Premises from time to time and at any and all times within the ninety (90) day period commencing with and subsequent to the date of delivery of this deed, with such men, equipment and materials as, in the reasonable opinion of the Principal Engineering Officer of the Grantor, are necessary for the removal of the Trackage. Days during the months of December, January, February and March shall not be included in the aforesaid ninety (90) day period. If the Trackage is not removed from the Premises by the expiration of said ninety (90) day period, the Trackage shall be deemed abandoned by the Grantor and shall then become the property of the Grantee.

4. The Grantor excepts from this conveyance any and all advertising signs and/or billboards located upon the Premises which are not owned by the Grantor. Furthermore, this conveyance is subject to the right of the owners of said signs and/or billboards to go upon the Premises and remove them within ninety (90) days from the date of delivery of this deed.

5. By the acceptance of this deed and as part consideration therefor, the Grantee hereby assumes any and all agreements, covenants, obligations and liabilities of the Grantor in respect to any underground facilities, drainage culverts, walls, crossings and/or other structures of any nature and description located in whole or in part within the Premises.

6. By the acceptance of this deed and as part consideration therefor, the Grantee agrees to irrevocably waives, gives up and renounces any and all claims or causes of action against the Grantor in respect of claims, suits and/or enforcement actions (including any administrative or judicial proceedings and any remedial, removal or response actions) ever asserted, threatened, instituted or requested by any person and/or governmental agency on account of: (a) any release of oil or hazardous materials or substances of any description on, upon or into the Premises in contravention of any ordinance, law or statute (including, but not limited to, the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (42 U.S.C. Section 9601, et seq., as amended); and (b) any and all damage to real or personal property, natural resources and/or harm or injury to persons alleged to have resulted from such release of oil or hazardous materials or substances.

7. By the acceptance of this deed and as part consideration therefor, the Grantee hereby agrees to build and forever maintain fencing (together with any necessary gates), suitable to the Principal Engineering Officer of the Grantor, along the boundaries of the Premises which are common to remaining land or location of the Grantor (the "Fences"), if Fences are ever required in the sole and reasonable opinion of said Principal Engineering Officer.

8. This conveyance is subject to the following restriction for the benefit of other land or location of the Grantor, to wit: that from the date of delivery of this deed, the Grantor shall not be liable to the Grantee or any lessee or user of the Premises (or any part thereof) for any damage to any buildings or property upon them caused by fire, whether communicated directly or indirectly by or from locomotive engines of any description upon the railroad operated by the Grantor, or otherwise.

9. By the acceptance of this deed and as part consideration therefor, the Grantee hereby agrees to make no use of the Premises which, in the sole and reasonable opinion of the Principal Engineering Officer of the Grantor, adversely affects, increases or decreases drainage to, from, upon or in any remaining land or location of the Grantor. The Grantee agrees to indemnify and save the Grantor harmless from and against any and all loss, cost, damage or expense including, but not limited to, the cost of defending all claims and/or suits for property damage, personal injury or death arising out of or in any way attributable to any breach of the foregoing covenant.

10. The Grantor excepts from this conveyance any and all overhead, surface or underground signal and communication line facilities of the Grantor located within the limits of the Premises and this conveyance is subject to the Grantor's use of any such facilities in their present locations and entry upon the Premises from time to time to maintain, repair, replace, renew, relay or remove such facilities.

11. Whenever used in this deed, the term "Grantor" shall not only refer to the MAINE CENTRAL RAILROAD COMPANY, but also its successors, assigns and affiliates and the term "Grantee" shall not only refer to the above-named Grantee, but also the Grantee's successors, assigns and grantees, as the case maybe.

12. The several exceptions, reservations, conditions, covenants and agreements contained in this deed shall be deemed to run with the land and be binding upon the Grantee forever. In addition to the acceptance and recording of this deed, the Grantee hereby signifies assent to the said several exceptions, reservations, conditions, covenants and agreements, by joining in its execution.

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IN WITNESS WHEREOF, the said MAINE CENTRAL RAILROAD COMPANY has caused this release deed to be executed in its name and its corporate seal to be hereto affixed by David A. Fink, its President, thereunto duly authorized this /6 day of future 2014.

GRANTOR: MAINE CENTRAL RAILROAD COMPANY

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By:

David A. Fink, President

GRANTEE: TOWN OF CUMBERLAND

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Wy By:

William R. Showe Town MANGER 10/2/14

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COMMONWEALTH OF MASSACHUSETTS

Middlesex, ss.

September 11, 2014

16 Hay of Sistenler, 2014, before me, the undersigned notary public, On this personally appeared David A. Fink, President as aforesaid, proved to me through satisfactory evidence of identification, which was personal knowledge, to be the person whose name is signed on the preceding or attached document, and acknowledged to me that he signed it voluntarily for its stated purpose.

Surcell ROLAND L. THERIAULT **Notary Public**

My Commission Expires

STATE OF MAINE

Cumberland, ss.

October 2, 2014

Commonwealth of Massachusetts My Commission Expires August 5, 2016

On this 2nd day of October, 2014, before me, the undersigned notary public, personally appeared William R. Shane, Town Manager as aforesaid, proved to me through satisfactory evidence of identification, which was a Driver's License, to be the person whose name is signed on the preceding or attached document, and acknowledged to me that he signed it voluntarily for its stated purpose.

a L. More

Notary Public My Commission Expires:

BRENDAL. MOORE Notary Public, Maine My Commission Expires June 14, 2021

EXHIBIT A

A certain lot or parcel of land with any improvements thereon, located on the Northwesterly Side of remaining land of Maine Central Railroad Company, located southwesterly of Tuttle Road, but not adjacent thereto, in the Town of Cumberland, County of Cumberland, State of Maine and more particularly bounded and described as follows:

BEGINNING at a set 5/8 inch iron rebar on the Northwesterly Side of the Maine Central Railroad Company Land at Station 277+34.2 Left 38 feet;

Thence N 56°50'45" W, a distance of 530.82 feet along land now or formerly of the Institute of Northeastern Lumber Manufacturing Association described in Deed Book 7115, Page 296 to set 5/8 inch iron rebar;

Thence N 21°10'45" E, a distance of 900.33 feet along land now or formerly of the Institute of Northeastern Lumber Manufacturing Association to a set 5/8 inch iron rebar;

Thence S 35°10'33" W, a distance of 341.09 feet along land of the Town of Cumberland as described in Deed Book 589, Page 204 to a set 5/8 inch iron rebar;

Thence S 21°10'45" W, a distance of 1710.70 feet along land now or formerly of Hugh F. Harwood and Pamela D. Harwood as described in Deed Book 7281, Page 154 to a found 5/8 inch iron rebar;

Thence N 54°52'45" W, a distance of 34.00 feet along land now or formerly of Harwood to a set 5/8 inch iron rebar;

Thence S 21°10'45" W, a distance of 282.16 feet along land now or formerly of Harwood to a found 5/8 inch iron rebar;

Thence along a curve turning to the right an Arc length of 333.80 feet, a radius of 875.96 feet, a chord bearing of S 32°05'45" W, and a chord length of 331.78 feet along land now or formerly of Harwood to a set 5/8 inch iron rebar;

Thence S 46°59'15" E, a distance of 41.00 feet along land now or formerly of Harwood to a set 5/8 inch iron rebar at Station 259+60.8 Left 38 feet;

Thence N 43°00'45" E, a distance of 1773.40 feet along remaining land of Maine Central Railroad Company to the POINT OF BEGINNING.

Containing an area of 13.17 Acres, more or less.

ر

The basis of bearings for this description was the Maine State Plane Grid Coordinate System, North American Datum of 1983 located in the West Zone.

Reference is made to Right of Way and Track Map dated June 30, 1916 Sheets V.I./5 and V.I./6 on file with Maine Central Railroad Company in Billerica, MA. and as depicted on a plan entitled "Land in Town of Cumberland, Maine, Maine Central Railroad Company to The Town of Cumberland, Scale 1"=100', Date June 19, 2014" by Boundary Points Professional Land Surveying, LLC Cumberland, Maine to be recorded at the Cumberland County Registry of Deeds.

Meaning and intending to describe all of the premises to Maine Central Railroad Company from Nancy Wyman dated November 2, 1870 recorded in Cumberland County Registry of Deeds in Book 381, Page 301.

Received Recorded Resister of Deeds Nov 12,2014 11:26:03A Cumberland Counts .Pamela E. Lovley

WARRANTY DEED

(Maine Statutory Short Form)

DLN: 1001740013266

KNOW ALL PERSONS BY THESE PRESENTS, that, Hugh F. Harwood and Pamela D. Harwood of Cumberland, ME 04021, for consideration paid, hereby GRANT to Town of Cumberland, a municipal corporation duly organized and existing under the laws of the State of Maine, with a mailing address of 290 Tuttle Road, Cumberland, ME 04021, with WARRANTY COVENANTS, the land with any buildings thereon situated at 135 Longwoods Road, Cumberland, County of Cumberland and State of Maine, described as follows:

A certain lot or parcel of land, with any improvements thereon, located on the Southwesterly side of Tuttle Road, but not adjacent thereto, in the Town of Cumberland, County of Cumberland, State of Maine, more particularly bounded and described as follows:

Beginning at a found 5/8 inch iron rebar, being the point of beginning of a parcel as described in the deed to the Town of Cumberland dated October 2, 2014 and recorded in the Cumberland County Registry of Deeds in Book 31907, Page 253;

Thence N 54° 52' 45" W, a distance of 34.00 feet along the land of the Town of Cumberland to a set 5/8 inch iron rebar at the land of Hugh F. Harwood and Pamela D. Harwood as described in Book 7281, Page 154;

Thence N 55° 23' 03" W, a distance of 379.78 feet along remaining land of Harwood to a found 1 inch iron pipe at the land of the Town of Cumberland as described in Book 589, Page 204;

Thence N 35° 10' 33" E, a distance of 1663.65 feet along land of the Town of Cumberland to a set 5/8 inch iron rebar at the land of the Town of Cumberland as described in Book 31907, Page 253;

Thence S 21° 10' 45" W, a distance of 1710.70 feet along the land of the Town of Cumberland to the point of beginning.

Containing an area of 7.9 Acres, more or less.

The basis of bearings for this description was the Maine State Plane Grid Coordinate System, North American Datum of 1983, located in the West Zone.

Reference is also made to a plan by Boundary Points Professional Land Surveying, LLC dated December 7, 2015.

Meaning and intending to convey a portion of the premises conveyed to Hugh F. Harwood and Pamela D. Harwood by virtue of a deed from Michael A. Valente, III dated June 23, 1986 and recorded in the Cumberland County Registry of Deeds in Book 7281, Page 154.

Witness our hands and seals this 11th day of April, 2017.)

Vitnéss Witnes

Hugh F./Harwood Pamela D. Harwood

STATE OF MAINE COUNTY OF Cumberland

April 11, 2017

Then personally appeared before me the above named Hugh F. Harwood and Pamela D. Harwood and acknowledged the foregoing instrument to be their free acts and deeds.

Before me, Notary Public/ Attorney at Law Printed Name: My Comm. Exp:/

Matthew J. McDonald Maine Attorney at Law

ATTACHMENT B

FINANCIAL AND TECHNICAL CAPACITY



FINANCIAL CAPACITY

The project will be funded with Town Council approved funds.

TECHNICAL CAPACITY

A. Prior Experience

The following paragraphs provide a summary of related prior experience for firms providing technical services on this project.

Sevee & Maher Engineers, Inc. (SME)

Sevee & Maher Engineers, Inc. (SME) of Cumberland, Maine is providing technical assistance for the site design and environmental permitting. Founded in 1985, SME has obtained hundreds of local, state, and federal permits related to environmental projects throughout the Northeast, including for the Town of Cumberland.

Boundary Engineering Survey Technology (BEST) 25 Toubros Lane, Buxton, ME 04093 Tel: 207.929.2378 bestsurvey@sacoriver.net

BEST Surveyors has been providing high-quality boundary and topographic survey services to clients for more than 22 years. BEST has prepared detail ALTA surveys and/or topographic surveys for projects ranging from large Federal Highway Toll Exchange improvements to 46-acre greenhouse developments.

B. Personnel:

The following personnel are integral to the site planning, design and permitting of the Compost Pad and Salt Shed.

Daniel P. Diffin, P.E., LEED AP - Site Design and Permitting,

Sevee & Maher Engineers, Inc.

Mr. Diffin has more than twelve years of experience on a wide variety of civil engineering design and construction management projects for private and public sector clients. Mr. Diffin has been responsible for the engineering, design, and construction services for land development projects, commercial, industrial, and medical site developments, educational campuses, stormwater management and erosion control projects, and local, state, and federal permitting. Projects include: Backyard Farms, Madison; Maine R&D Station and other facility upgrades; and 2015 Mill Build-out Plan, Woodland Mill, Baileyville Maine.

ATTACHMENT C

FEMA FLOODPLAIN MAP





ATTACHMENT D

STORMWATER MANAGEMENT REPORT



STORMWATER MANAGEMENT REPORT COMPOST PAD AND SAND/SALT SHED CUMBERLAND, MAINE

Prepared for

TOWN OF CUMBERLAND, MAINE 290 Tuttle Road Cumberland, Maine



August 2019



4 Blanchard Road P.O. Box 85A Cumberland, Maine 04021 Phone: 207.829.5016 smemaine.com

ENVIRONMENTAL • CIVIL • GEOTECHNICAL • WATER • COMPLIANCE

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1	STORMWATER QUANTITY SUMMARY		

STORMWATER MANAGEMENT REPORT COMPOST PAD AND SAND/SALT SHED CUMBERLAND, MAINE

1.0 INTRODUCTION

This stormwater management report has been prepared by Sevee & Maher Engineers, Inc. (SME) for the proposed Compost Pad relocation located off Tuttle Road in Cumberland, Maine. The stormwater design is based on the water quantity objectives identified in the Town of Cumberland (Town) Land Use Ordinance and Maine Department of Environmental Protection (MEDEP) Chapter 400 Standards.

2.0 PROJECT DESCRIPTION

The Town plans to relocate the existing municipal compost facility from its current location on Drowne Road to a new location off Tuttle Road in Cumberland. Development will include construction of a 22-foot-wide, 2,100-foot-long gravel access drive and installation of a 2-acre gravel pad to process compost and store brush and grass clippings from Town residents. The proposed site access will be constructed over a former railroad bed. A portion of the existing track ballast will be excavated and removed to provide a 22-foot-wide travel surface for safe vehicle access to the property. The new facility will also house the new municipal sand/salt storage building. The proposed 8,000-square-foot (sf) structure will be sited on a 20,500-sf pad constructed of hot bituminous concrete (asphalt). There are no utilities planned for the new compost facility.

The property is bordered by existing residential development along Tuttle Road to the north, an active railroad corridor to the east, farm and residential property to the south, and the Town Forest to the west. Wetlands have been mapped across the property and adjacent to the site access drive. A small stream also exists along the western edge of the proposed site access drive.

There are no existing structures in the project area. The project site has historically been used as a hay field and is typically harvested multiple times each season. The ground surface is rolling and generally slopes from northwest to southeast at grades ranging from 0 to 5 percent. The edges of the existing fields are bordered by woods and wetlands. A vernal pool has been mapped near the eastern property line adjacent to the existing railroad corridor. A landscaped berm is planned for the northern property line to provide a visual buffer for abutting properties.

This project will disturb less than five acres of land and will result in approximately 2.94 acres of new impervious surface. Stormwater will be permitted under MEDEP Waste Management Division rules, and water quality treatment for stormwater runoff will not be required based on MEDEP Chapter 400 standards. However, separate MEDEP permits will be required for the facility, including Natural Resource Protection Act (NRPA) Permit-by-Rule applications for activity adjacent to a resource, critical habitat, and

a NRPA Tier 1 Application for anticipated wetland impacts. Additional MEDEP permitting and registration will also be required for the salt storage building and the compost facility.

3.0 SITE WATERSHED

On-site soils for the proposed drainage area were identified using the Natural Resources Conservation Service (NRCS) soil information for Cumberland County, Maine. A copy of the custom Soil Resource Report used to develop the stormwater model is included in Appendix A. The soil within the area of work includes Buxton/Lamoine silt loam (BuB) and Scantic silt loam (Sn). Soil classifications range from "Somewhat Poorly Drained" Hydrologic Soil Group C/D to "Poorly Drained" Hydrologic Soil Group D. Hydrologic soil group boundaries and designations are outlined in the Stormwater Management Plan Pre- and Post-Development Conditions Drawings, D-100 and D-101 included in the project plan set.

The ground surface on the property generally slopes from northwest to southeast with grades ranging from 0 to 5 percent. As previously outlined, the central portion of the property is a hay field with woods and wetlands adjacent to the property lines. Under existing conditions, stormwater runoff generally travels across the parcel from northwest to southeast and collects in the wetlands abutting the railroad corridor along the eastern property line.

Stormwater runoff on the central portion of the property discharges to an existing 24-inch diameter reinforced concrete culvert under the active railroad bed bordering the eastern property line. The outlet of this culvert was selected as Analysis Point 1 (AP-1) for this report.

Runoff from portions of the proposed access drive flows through a natural drainage swale across the abutting properties to the north. Runoff from this area collects in a shallow depression near the existing railroad corridor, north of the northeast property corner. Most of this flow occurs on abutting properties. For the purposes of this report, Analysis Point (AP-2) was established off-site at the collection point north of the northeast property corner.

Runoff on the southern portion of the property flows overland to the southeast and collects in a wetland area adjacent to the eastern property line near the southeast corner of the property. This wetland receives the majority of stormwater runoff from the project and was selected as Analysis Point 3 (AP-3) for this report.

In developed conditions, adjustment to existing drainage patterns will be minimal. The majority of surface runoff from site development, including proposed gravel, pavement, and the southern portion of the salt storage building will drain overland to the existing wetland collection area at AP-3. A minor portion of the building and gravel compost pad, and the southern half of the gravel access drive will drain to the existing wetland and culvert under the railroad bed at AP-1. Runoff from the northern portion of the site access

drive will follow existing drainage routes across abutting properties to the collection area adjacent to the existing railroad corridor. Anticipated impacts are measured at the existing depression at AP-2.

The pre-development and post-development stormwater management plans included in the project plan set outline the on-site drainage patterns before and after development (see Drawings D-100 and D-101). Appendices B and C provide pre- and post-development calculations using TR-20 methodologies prepared with the HydroCAD computer stormwater modeling system by Applied Microcomputer Systems of Chocorua, New Hampshire.

4.0 STORMWATER QUALITY ANALYSIS

As a compost facility, stormwater management for this project will be permitted under MEDEP Waste Management Division rules. Water quality treatment for stormwater runoff will not be required based on current MEDEP Chapter 400 standards.

5.0 STORMWATER QUANTITY ANALYSIS

Maine Solid Waste Management Rules Chapter 400 General Provisions outline a solid waste facility may not unreasonably cause or increase flooding on-site or on adjacent properties, or create an unreasonable flood hazard to a structure during a storm of an intensity up to and including a 25-year, 24-hour storm.

Stormwater quantity for this project is managed to the maximum extent practicable through minimizing the amount of impervious area on the site and utilizing natural drainage to convey new flows. Table 1 demonstrates peak flow rates from the subwatershed areas to the analysis point shown on Drawings D-100 and D-101.

TABLE 1

STORMWATER QUANTITY SUMMARY

	2-Year Storm		10-Year Storm		25-Year Storm	
	Existing	Proposed	Existing	Proposed	Existing	Proposed
Analysis Point 1 (cfs)	17.27	17.28	25.34	25.28	30.77	30.41
Analysis Point 2 (cfs)	18.22	18.22	37.78	37.78	54.69	54.69
Analysis Point 3 (cfs)	5.60	6.28	11.40	12.45	16.34	17.42

As indicated, project impacts will result in minor increases in peak flows ranging from 0.01 to 1.08 cubic feet per second (cfs) for the proposed site in the 2-, 10-, and 25-year events. Modeling assumptions are outlined in the HydroCAD reports included in Appendices B and C.

6.0 SUMMARY

Increases in peak flows for the proposed site in the 2-, 10-, and 25-year events when compared to the existing conditions are minor. The 0.01 cfs increase observed for the 2-year storm at AP-1 is within the tolerance of the stormwater modeling program. The minor increases at AP-3 flow to an existing drainage that connects to an unnamed tributary of the Piscataquis River less than 150 feet away from the culvert outlet. This project will not have an adverse impact to the downstream drainage or abutting properties.

APPENDIX A

USDA SOIL REPORT





United States Department of Agriculture



Natural Resources Conservation Service A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants Custom Soil Resource Report for Cumberland County and Part of Oxford County, Maine



Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/? cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report Soil Map



ea of Interest (AOI) Spoil Area Area of Interest (AOI) Stony Spot	The soil surveys that comprise your AOI were mapped at 1:24,000.		
ils Very Stony Spot Soil Map Unit Polygons ∅ Wet Spot Soil Map Unit Lines △ Other Soil Map Unit Points ✓ Special Line Features	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		
Special Point Features Water Features Image: Blowout Water Features Image: Blowout Streams and Canals Image: Blowout Streams and Canals	contrasting soils that could have been shown at a more detailed scale.		
Transportation X Clay Spot Closed Depression Interstate Highways	Please rely on the bar scale on each map sheet for map measurements.		
Gravel Pit Gravelly Spot Major Roads	Source of Map: Natural Resources Conservation Service Web Soil Survey URL: Coordinate System: Web Mercator (EPSG:3857)		
 Landfill Local Roads Lava Flow Background Marsh or swamp Aerial Photography 	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		
Mine or Quarry Miscellaneous Water Perennial Water	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.		
 Rock Outcrop Saline Spot 	Soil Survey Area: Cumberland County and Part of Oxford County, Maine Survey Area Data: Version 15, Sep 6, 2018		
 Sandy Spot Severely Eroded Spot Sinkhole 	Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.		
Ide or Slip Sodic Spot	Date(s) aerial images were photographed: Jun 7, 2019—Jul 2, 2019 The orthophoto or other base map on which the soil lines were compiled and digitized probably differe from the background		

MAP LEGEND

MAP INFORMATION

imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
BgB	Belgrade very fine sandy loam, 0 to 8 percent slopes	18.8	6.2%
BuB	Lamoine silt loam, 3 to 8 percent slopes	67.0	22.2%
BuC2	Buxton silt loam, 8 to 15 percent slopes	4.2	1.4%
DeB	Deerfield loamy fine sand, 3 to 8 percent slopes	0.9	0.3%
EmB	Elmwood fine sandy loam, 0 to 8 percent slopes	28.4	9.4%
HfB	Hartland very fine sandy loam, 3 to 8 percent slopes	7.1	2.4%
HfC2	Hartland very fine sandy loam, 8 to 15 percent slopes, eroded	6.1	2.0%
HfD2	Hartland very fine sandy loam, 15 to 25 percent slopes, eroded	13.6	4.5%
HnC	Hinckley-Suffield complex, 8 to 15 percent slopes	0.4	0.1%
Ls	Limerick-Saco silt loams	34.0	11.3%
Sn	Scantic silt loam, 0 to 3 percent slopes	63.4	21.0%
SuC2	Suffield silt loam, 8 to 15 percent slopes, eroded	5.5	1.8%
SuD2	Suffield silt loam, 15 to 25 percent slopes, eroded	36.5	12.1%
SuE2	Suffield silt loam, 25 to 45 percent slopes, eroded	9.4	3.1%
Sz	Swanton fine sandy loam	2.4	0.8%
WmB	Windsor loamy sand, 0 to 8 percent slopes	4.1	1.4%
Totals for Area of Interest		301.8	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic
class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Cumberland County and Part of Oxford County, Maine

BgB—Belgrade very fine sandy loam, 0 to 8 percent slopes

Map Unit Composition

Belgrade and similar soils: 85 percent Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Belgrade

Setting

Landform: Lakebeds Landform position (two-dimensional): Toeslope Landform position (three-dimensional): Tread Down-slope shape: Linear Across-slope shape: Linear Parent material: Coarse-silty glaciolacustrine deposits

Typical profile

H1 - 0 to 9 inches: very fine sandy loam H2 - 9 to 18 inches: very fine sandy loam H3 - 18 to 28 inches: silt loam H4 - 28 to 65 inches: silt loam

Properties and qualities

Slope: 0 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 18 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: High (about 9.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 2e Hydrologic Soil Group: B Hydric soil rating: No

BuB—Lamoine silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2t0kc Elevation: 10 to 490 feet Mean annual precipitation: 33 to 60 inches Mean annual air temperature: 36 to 52 degrees F Frost-free period: 90 to 160 days Farmland classification: Farmland of statewide importance

Map Unit Composition

Lamoine and similar soils: 85 percent *Estimates are based on observations, descriptions, and transects of the mapunit.*

Description of Lamoine

Setting

Landform: River valleys, marine terraces Landform position (two-dimensional): Footslope Landform position (three-dimensional): Base slope Down-slope shape: Linear Across-slope shape: Linear Parent material: Fine glaciomarine deposits

Typical profile

Ap - 0 to 7 inches: silt loam Bw - 7 to 13 inches: silt loam Bg - 13 to 24 inches: silty clay loam Cg - 24 to 65 inches: silty clay

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 6 to 17 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 3w Hydrologic Soil Group: C/D Hydric soil rating: No

BuC2—Buxton silt loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2x1by Elevation: 10 to 490 feet Mean annual precipitation: 33 to 60 inches Mean annual air temperature: 36 to 52 degrees F Frost-free period: 90 to 160 days Farmland classification: Not prime farmland

Map Unit Composition

Buxton and similar soils: 85 percent *Estimates are based on observations, descriptions, and transects of the mapunit.*

Description of Buxton

Setting

Landform: Marine terraces, river valleys Landform position (two-dimensional): Backslope Landform position (three-dimensional): Side slope Down-slope shape: Linear Across-slope shape: Convex Parent material: Fine glaciomarine deposits

Typical profile

Ap - 0 to 7 inches: silt loam Bw1 - 7 to 18 inches: silt loam Bw2 - 18 to 23 inches: silty clay loam BC - 23 to 35 inches: silty clay loam C - 35 to 65 inches: silty clay

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 17 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: High (about 9.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 3e Hydrologic Soil Group: C/D Hydric soil rating: No

DeB—Deerfield loamy fine sand, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2xfg9 Elevation: 0 to 1,190 feet Mean annual precipitation: 36 to 71 inches Mean annual air temperature: 39 to 55 degrees F Frost-free period: 145 to 240 days Farmland classification: Farmland of statewide importance

Map Unit Composition

Deerfield and similar soils: 85 percent Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Deerfield

Setting

Landform: Outwash plains, outwash terraces, outwash deltas, kame terraces Landform position (three-dimensional): Tread Down-slope shape: Linear, concave, convex Across-slope shape: Concave, linear, convex Parent material: Sandy outwash derived from granite, gneiss, and/or quartzite

Typical profile

Ap - 0 to 9 inches: loamy fine sand Bw - 9 to 25 inches: loamy fine sand BC - 25 to 33 inches: fine sand

Cg - 33 to 60 inches: sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: About 15 to 37 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 11.0
Available water storage in profile: Moderate (about 6.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 2w Hydrologic Soil Group: A Hydric soil rating: No

EmB—Elmwood fine sandy loam, 0 to 8 percent slopes

Map Unit Setting

National map unit symbol: blh8 Elevation: 10 to 900 feet Mean annual precipitation: 38 to 55 inches Mean annual air temperature: 43 to 46 degrees F Frost-free period: 130 to 195 days Farmland classification: All areas are prime farmland

Map Unit Composition

Elmwood and similar soils: 88 percent *Estimates are based on observations, descriptions, and transects of the mapunit.*

Description of Elmwood

Setting

Landform: Stream terraces Landform position (two-dimensional): Footslope Landform position (three-dimensional): Tread Down-slope shape: Linear Across-slope shape: Linear Parent material: Coarse-loamy glaciolacustrine deposits

Typical profile

H1 - 0 to 8 inches: fine sandy loam

H2 - 8 to 25 inches: sandy loam

H3 - 25 to 65 inches: silty clay loam

Properties and qualities

Slope: 0 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: High (about 9.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 2w Hydrologic Soil Group: B Hydric soil rating: No

HfB—Hartland very fine sandy loam, 3 to 8 percent slopes

Map Unit Composition

Hartland and similar soils: 85 percent Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hartland

Setting

Landform: Lakebeds Landform position (two-dimensional): Toeslope Landform position (three-dimensional): Tread Down-slope shape: Linear Across-slope shape: Linear Parent material: Coarse-silty glaciolacustrine deposits

Typical profile

H1 - 0 to 9 inches: very fine sandy loam H2 - 9 to 29 inches: silt loam H3 - 29 to 65 inches: silt loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: High (about 11.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 2e Hydrologic Soil Group: B Hydric soil rating: No

HfC2—Hartland very fine sandy loam, 8 to 15 percent slopes, eroded

Map Unit Composition

Hartland and similar soils: 85 percent Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hartland

Setting

Landform: Lakebeds Landform position (two-dimensional): Footslope Landform position (three-dimensional): Tread Down-slope shape: Linear Across-slope shape: Linear Parent material: Coarse-silty glaciolacustrine deposits

Typical profile

H1 - 0 to 9 inches: very fine sandy loam
H2 - 9 to 29 inches: silt loam
H3 - 29 to 65 inches: silt loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: High (about 11.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 3e Hydrologic Soil Group: B Hydric soil rating: No

HfD2—Hartland very fine sandy loam, 15 to 25 percent slopes, eroded

Map Unit Composition

Hartland and similar soils: 85 percent Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hartland

Setting

Landform: Lakebeds Landform position (two-dimensional): Backslope Landform position (three-dimensional): Riser Down-slope shape: Linear Across-slope shape: Linear Parent material: Coarse-silty glaciolacustrine deposits

Typical profile

H1 - 0 to 9 inches: very fine sandy loam H2 - 9 to 29 inches: silt loam H3 - 29 to 65 inches: silt loam

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: High (about 11.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 4e Hydrologic Soil Group: B Hydric soil rating: No

HnC—Hinckley-Suffield complex, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2svlx Elevation: 0 to 470 feet Mean annual precipitation: 36 to 71 inches Mean annual air temperature: 39 to 55 degrees F Frost-free period: 145 to 240 days Farmland classification: Not prime farmland

Map Unit Composition

Hinckley and similar soils: 60 percent *Suffield and similar soils:* 25 percent *Estimates are based on observations, descriptions, and transects of the mapunit.*

Description of Hinckley

Setting

Landform: Kame terraces, outwash plains, kames, eskers, moraines, outwash terraces, outwash deltas

Landform position (two-dimensional): Shoulder, backslope, footslope

Landform position (three-dimensional): Nose slope, side slope, crest, head slope, riser

Down-slope shape: Linear, convex, concave

Across-slope shape: Convex, linear, concave

Parent material: Sandy and gravelly glaciofluvial deposits derived from gneiss and/or granite and/or schist

Typical profile

A - 0 to 8 inches: loamy sand Bw1 - 8 to 11 inches: gravelly loamy sand Bw2 - 11 to 16 inches: gravelly loamy sand BC - 16 to 19 inches: very gravelly loamy sand C - 19 to 65 inches: very gravelly sand

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Very low (about 2.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 4e Hydrologic Soil Group: A Hydric soil rating: No

Description of Suffield

Setting

Landform: Marine terraces Landform position (three-dimensional): Riser Down-slope shape: Convex Across-slope shape: Convex Parent material: Silty glaciolacustrine deposits over clayey glaciolacustrine deposits

Typical profile

Ap - 0 to 6 inches: silt loam

Bw - 6 to 18 inches: silt loam 2*C - 18 to 65 inches:* silty clay loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 18 to 39 inches to strongly contrasting textural stratification
Natural drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 18 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 3e Hydrologic Soil Group: C Hydric soil rating: No

Ls—Limerick-Saco silt loams

Map Unit Setting

National map unit symbol: blj2 Elevation: 10 to 1,750 feet Mean annual precipitation: 34 to 48 inches Mean annual air temperature: 37 to 46 degrees F Frost-free period: 80 to 160 days Farmland classification: Not prime farmland

Map Unit Composition

Limerick and similar soils: 55 percent Saco and similar soils: 30 percent *Estimates are based on observations, descriptions, and transects of the mapunit.*

Description of Limerick

Setting

Landform: Flood plains Landform position (two-dimensional): Toeslope Landform position (three-dimensional): Talf Down-slope shape: Linear Across-slope shape: Linear Parent material: Coarse-silty alluvium derived from slate

Typical profile

H1 - 0 to 8 inches: silt loam *H2 - 8 to 16 inches:* silt loam *H3 - 16 to 65 inches:* silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Available water storage in profile: Very high (about 18.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 4w Hydrologic Soil Group: B/D Hydric soil rating: Yes

Description of Saco

Setting

Landform: Flood plains Landform position (two-dimensional): Toeslope Landform position (three-dimensional): Talf Down-slope shape: Concave Across-slope shape: Concave Parent material: Coarse-silty alluvium

Typical profile

H1 - 0 to 12 inches: silt loam *H2 - 12 to 24 inches:* silt loam *H3 - 24 to 65 inches:* silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Available water storage in profile: Very high (about 15.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 6w Hydrologic Soil Group: B/D Hydric soil rating: Yes

Sn—Scantic silt loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2slv3 Elevation: 10 to 900 feet Mean annual precipitation: 33 to 60 inches Mean annual air temperature: 39 to 45 degrees F Frost-free period: 90 to 160 days Farmland classification: Not prime farmland

Map Unit Composition

Scantic and similar soils: 85 percent Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Scantic

Setting

Landform: Marine terraces, river valleys Landform position (three-dimensional): Talf Down-slope shape: Linear Across-slope shape: Linear Parent material: Glaciomarine deposits

Typical profile

Ap - 0 to 9 inches: silt loam Bg1 - 9 to 16 inches: silty clay loam Bg2 - 16 to 29 inches: silty clay Cg - 29 to 65 inches: silty clay

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 6.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 4w Hydrologic Soil Group: D Hydric soil rating: Yes

SuC2—Suffield silt loam, 8 to 15 percent slopes, eroded

Map Unit Setting

National map unit symbol: blk1 Elevation: 10 to 900 feet Mean annual precipitation: 34 to 48 inches Mean annual air temperature: 43 to 46 degrees F Frost-free period: 90 to 160 days Farmland classification: Not prime farmland

Map Unit Composition

Suffield and similar soils: 85 percent *Estimates are based on observations, descriptions, and transects of the mapunit.*

Description of Suffield

Setting

Landform: Coastal plains Landform position (two-dimensional): Backslope Landform position (three-dimensional): Riser Down-slope shape: Linear Across-slope shape: Linear Parent material: Fine glaciolacustrine deposits

Typical profile

H1 - 0 to 6 inches: silt loam *H2 - 6 to 23 inches:* silt loam *H3 - 23 to 33 inches:* silty clay *H4 - 33 to 65 inches:* silty clay

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 18 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: High (about 9.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 4e Hydrologic Soil Group: C Hydric soil rating: No

SuD2—Suffield silt loam, 15 to 25 percent slopes, eroded

Map Unit Setting

National map unit symbol: blk2 Elevation: 10 to 900 feet Mean annual precipitation: 34 to 48 inches Mean annual air temperature: 43 to 46 degrees F Frost-free period: 90 to 160 days Farmland classification: Not prime farmland

Map Unit Composition

Suffield and similar soils: 85 percent *Estimates are based on observations, descriptions, and transects of the mapunit.*

Description of Suffield

Setting

Landform: Coastal plains Landform position (two-dimensional): Backslope Landform position (three-dimensional): Riser Down-slope shape: Linear Across-slope shape: Linear Parent material: Fine glaciolacustrine deposits

Typical profile

H1 - 0 to 6 inches: silt loam *H2 - 6 to 23 inches:* silt loam *H3 - 23 to 33 inches:* silty clay *H4 - 33 to 65 inches:* silty clay

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: High (about 9.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 6e Hydrologic Soil Group: C Hydric soil rating: No

SuE2—Suffield silt loam, 25 to 45 percent slopes, eroded

Map Unit Setting

National map unit symbol: blk3 Elevation: 10 to 900 feet Mean annual precipitation: 34 to 48 inches Mean annual air temperature: 43 to 46 degrees F Frost-free period: 90 to 160 days Farmland classification: Not prime farmland

Map Unit Composition

Suffield and similar soils: 85 percent *Estimates are based on observations, descriptions, and transects of the mapunit.*

Description of Suffield

Setting

Landform: Coastal plains Landform position (two-dimensional): Backslope Landform position (three-dimensional): Riser Down-slope shape: Linear Across-slope shape: Linear Parent material: Fine glaciolacustrine deposits

Typical profile

H1 - 0 to 6 inches: silt loam *H2 - 6 to 23 inches:* silt loam *H3 - 23 to 33 inches:* silty clay *H4 - 33 to 65 inches:* silty clay

Properties and qualities

Slope: 25 to 45 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: High (about 9.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 7e Hydrologic Soil Group: C Hydric soil rating: No

Sz—Swanton fine sandy loam

Map Unit Setting

National map unit symbol: blk4 Elevation: 10 to 900 feet Mean annual precipitation: 36 to 48 inches Mean annual air temperature: 39 to 46 degrees F Frost-free period: 90 to 160 days Farmland classification: Not prime farmland

Map Unit Composition

Swanton and similar soils: 85 percent Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Swanton

Setting

Landform: Outwash plains Landform position (two-dimensional): Toeslope Landform position (three-dimensional): Talf Down-slope shape: Linear Across-slope shape: Linear Parent material: Loamy glaciolacustrine deposits

Typical profile

H1 - 0 to 9 inches: fine sandy loam *H2 - 9 to 32 inches:* fine sandy loam *H3 - 32 to 65 inches:* silty clay

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 0 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: High (about 9.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 4w Hydrologic Soil Group: C/D Hydric soil rating: Yes

WmB—Windsor loamy sand, 0 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2w2x2 Elevation: 0 to 1,410 feet Mean annual precipitation: 36 to 71 inches Mean annual air temperature: 39 to 55 degrees F Frost-free period: 140 to 240 days Farmland classification: Farmland of statewide importance

Map Unit Composition

Windsor and similar soils: 85 percent Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Windsor

Setting

Landform: Outwash terraces, deltas, outwash plains, dunes Landform position (three-dimensional): Tread, riser Down-slope shape: Linear, convex Across-slope shape: Linear, convex

Parent material: Loose sandy glaciofluvial deposits derived from granite and/or loose sandy glaciofluvial deposits derived from schist and/or loose sandy glaciofluvial deposits derived from gneiss

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material *A - 1 to 3 inches:* loamy sand *Bw - 3 to 25 inches:* loamy sand *C - 25 to 65 inches:* sand

Properties and qualities

Slope: 0 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Low (about 4.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 2s Hydrologic Soil Group: A Hydric soil rating: No Custom Soil Resource Report

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APPENDIX B

PRE-DEVELOPMENT HYDROCAD CALCULATIONS





Existing 082719r Type III 24 Prepared by Sevee & Maher Engineers, Inc. HydroCAD® 10.00-22 s/n 01260 © 2018 HydroCAD Software Solutions LLC

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

Subcatchment SC-1A: Northeas	t Runoff Area=787,640 sf 0.00% Impervious Runoff Depth>1.09" Flow Length=1,159' Tc=45.2 min CN=78 Runoff=11.41 cfs 1.635 af
SubcatchmentSC-1B: Northwes	t Runoff Area=1,486,320 sf 0.00% Impervious Runoff Depth>1.03" Flow Length=1,985' Tc=44.5 min CN=77 Runoff=20.48 cfs 2.925 af
Subcatchment SC-1C: Town Hal	Runoff Area=1,513,369 sf 11.73% Impervious Runoff Depth>0.76" Flow Length=1,815' Tc=71.0 min CN=72 Runoff=11.34 cfs 2.203 af
SubcatchmentSC-2: NELMA	Runoff Area=1,007,352 sf 4.40% Impervious Runoff Depth>1.04" Flow Length=1,388' Tc=25.2 min CN=77 Runoff=18.22 cfs 2.000 af
Subcatchment SC-3: Southeast	Runoff Area=175,454 sf 0.00% Impervious Runoff Depth>1.15" Flow Length=783' Tc=24.5 min CN=79 Runoff=3.60 cfs 0.387 af
SubcatchmentSC-4: Southwest	Runoff Area=588,377 sf 0.00% Impervious Runoff Depth>1.06" Flow Length=1,423' Tc=92.8 min CN=78 Runoff=5.48 cfs 1.194 af
Reach 1BR: Wetland Reach n=0.0	Avg. Flow Depth=0.30' Max Vel=1.33 fps Inflow=23.10 cfs 5.082 af 35 L=543.0' S=0.0055 '/' Capacity=717.02 cfs Outflow=22.82 cfs 5.016 af
Reach 1CR: Stream n=0.1	Avg. Flow Depth=1.00' Max Vel=1.43 fps Inflow=11.34 cfs 2.203 af 00 L=961.0' S=0.0163 '/' Capacity=116.18 cfs Outflow=10.92 cfs 2.157 af
Reach 4R: Wetland Reach	Avg. Flow Depth=0.88' Max Vel=0.18 fps Inflow=5.44 cfs 1.187 af =0.800 L=196.0' S=0.0195 '/' Capacity=6.71 cfs Outflow=5.12 cfs 1.150 af
Pond 1BP: 3x3 Stone Box Culve Primary=2	rt Peak Elev=58.74' Storage=107 cf Inflow=23.09 cfs 5.082 af 23.10 cfs 5.082 af Secondary=0.00 cfs 0.000 af Outflow=23.10 cfs 5.082 af
Pond 4P: Culvert Primary	Peak Elev=54.96' Storage=1,220 cf Inflow=5.48 cfs 1.194 af v=5.44 cfs 1.187 af Secondary=0.00 cfs 0.000 af Outflow=5.44 cfs 1.187 af
Pond AP-1: AP-1 Primary=1	Peak Elev=55.71' Storage=79,721 cf Inflow=32.16 cfs 6.651 af 7.27 cfs 6.253 af Secondary=0.00 cfs 0.000 af Outflow=17.27 cfs 6.253 af
Pond AP-2: AP-2	Inflow=18.22 cfs 2.000 af Primary=18.22 cfs 2.000 af
Pond AP-3: AP-3 Primary	Peak Elev=49.95' Storage=1,489 cf Inflow=5.62 cfs 1.537 af r=5.60 cfs 1.530 af Secondary=0.00 cfs 0.000 af Outflow=5.60 cfs 1.530 af

Summary for Subcatchment SC-1A: Northeast

11.41 cfs @ 12.65 hrs, Volume= Runoff = 1.635 af, Depth> 1.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr 2-yr Storm Rainfall=3.10"

	A	rea (sf)	CN [Description		
		3,043	91 (Gravel road	ls, HSG D	
	7	84,597	78 N	Meadow, no	on-grazed,	HSG D
	7	87,640	78 V	Veighted A	verage	
	7	87,640	1	100.00% Pe	ervious Are	а
	Тс	Length	Slope	Velocity	Capacity	Description
_	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
	25.2	100	0.0050	0.07		Sheet Flow, A-B
						Grass: Dense n= 0.240 P2= 3.10"
	19.7	941	0.0130	0.80		Shallow Concentrated Flow, B-C
						Short Grass Pasture Kv= 7.0 fps
	0.3	118	0.0200	6.80	135.97	Channel Flow, C-D
						Area= 20.0 sf Perim= 16.6' r= 1.20'
_						n= 0.035 Earth, dense weeds
		4 4 5 0	T ()			

45.2 1,159 Total

Summary for Subcatchment SC-1B: Northwest

20.48 cfs @ 12.65 hrs, Volume= 2.925 af, Depth> 1.03" Runoff =

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr 2-yr Storm Rainfall=3.10"

	A	rea (sf)	CN E	Description				
451,869 78			78 N	Meadow, non-grazed, HSG D				
		6,595	96 C	Gravel surfa	ace, HSG C			
_	1,0	27,856	77 V	Voods, Go	od, HSG D			
	1,4	86,320	77 V	Veighted A	verage			
	1,4	86,320	1	00.00% Pe	ervious Are	а		
	Тс	Length	Slope	Velocity	Capacity	Description		
	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)			
	14.5	100	0.0200	0.11		Sheet Flow, A-B		
						Grass: Dense n= 0.240 P2= 3.10"		
	2.0	310	0.1400	2.62		Shallow Concentrated Flow, B-C		
						Short Grass Pasture Kv= 7.0 fps		
	23.3	796	0.0130	0.57		Shallow Concentrated Flow, C-D		
						Woodland Kv= 5.0 fps		
	4.7	779	0.0180	2.75	362.73	Channel Flow, D-E		
						Area= 132.0 sf Perim= 114.0' r= 1.16'		
						n= 0.080 Earth, long dense weeds		
	44.5	4 005	-					

1,985 Total 44.5

Summary for Subcatchment SC-1C: Town Hall

Runoff = 11.34 cfs @ 13.04 hrs, Volume= 2.203 af, Depth> 0.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr 2-yr Storm Rainfall=3.10"

A	rea (sf)	CN I	Description		
8	09,968	77 \	Noods, Go	od, HSG D	
	9,665	98 I	Paved park	ing, HSG D	
	55,432	30 I	Meadow, no	on-grazed,	HSG A
	53,363	30	Noods, Go	od, HSG A	
	45,721	98 I	Paved park	ing, HSG A	
	17,927	98 I	Roofs, HSC	βA	
1	91,094	55	Noods, Go	od, HSG B	
	74,486	58 I	Meadow, no	on-grazed,	HSG B
	70,436	98 I	Paved park	ing, HSG B	
	23,116	98 I	Roofs, HSG	βB	
1	24,650	70	Noods, Go	od, HSG C	
	26,882	71 I	Meadow, no	on-grazed,	HSG C
	4,662	98	Paved park	ing, HSG C	
	5,967	98	Roofs, HSC	G C	
1,5	13,369	72	Neighted A	verage	
1,3	35,875	8	38.27% Pei	vious Area	
1	77,494		11.73% Imp	pervious Ar	ea
-				o ::	
IC	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(CfS)	
38.0	100	0.0200	0.04		Sheet Flow, A-B
					Woods: Dense underbrush n= 0.800 P2= 3.10"
33.0	1,715	0.0300	0.87		Shallow Concentrated Flow, B-C
					Woodland Kv= 5.0 tps
71.0	1,815	Total			

Summary for Subcatchment SC-2: NELMA

Runoff = 18.22 cfs @ 12.37 hrs, Volume= 2.000 af, Depth> 1.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr 2-yr Storm Rainfall=3.10"

	Area (sf)	CN	Description
*	44,300	98	Impervious
	12,000	91	Gravel roads, HSG D
	51,794	77	Woods, Good, HSG D
	635,982	78	Meadow, non-grazed, HSG D
	34,809	70	Woods, Good, HSG C
	228,467	71	Meadow, non-grazed, HSG C
	1,007,352	77	Weighted Average
	963,052		95.60% Pervious Area
	44,300		4.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.3	100	0.0300	0.14		Sheet Flow, A_B Grass: Dense n= 0.240 P2= 3.10"
11.3	645	0.0186	0.95		Shallow Concentrated Flow, B-C Short Grass Pasture Kv= 7.0 fps
1.6	643	0.0187	6.70	335.19	Channel Flow, C-D Area= 50.0 sf Perim= 40.3' r= 1.24' n= 0.035 Earth, dense weeds

25.2 1,388 Total

Summary for Subcatchment SC-3: Southeast

Runoff = 3.60 cfs @ 12.36 hrs, Volume= 0.387 af, Depth> 1.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr 2-yr Storm Rainfall=3.10"

	A	rea (sf)	CN [Description		
82,626 78 Meadow, non-graze						HSG D
		13,968	96 (Gravel surfa	ace, HSG D)
_		78,860	77 \	Noods, Go	od, HSG D	
	1	75,454	79 \	Neighted A	verage	
	1	75,454	-	100.00% P	ervious Are	а
	_				_	
	Tc	Length	Slope	Velocity	Capacity	Description
_	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
	19.1	100	0.0100	0.09		Sheet Flow, A-B
						Grass: Dense n= 0.240 P2= 3.10"
	4.5	262	0.0190	0.96		Shallow Concentrated Flow, B-C
						Short Grass Pasture Kv= 7.0 fps
	0.9	421	0.0260	7.71	369.85	Channel Flow, C-D
						Area= 48.0 sf Perim= 40.2' r= 1.19'
						n= 0.035 Earth, dense weeds
	04 E	702	Total			

24.5 783 Total

Summary for Subcatchment SC-4: Southwest

Runoff = 5.48 cfs @ 13.30 hrs, Volume= 1.194 af, Depth> 1.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr 2-yr Storm Rainfall=3.10"

Area (s	sf) CN	Description
272,28	87 80	Pasture/grassland/range, Good, HSG D
1,29	92 96	Gravel surface, HSG D
314,79	98 77	Woods, Good, HSG D
588,37	77 78	Weighted Average
588,37	77	100.00% Pervious Area

Existing 082719r

Type III 24-hr 2-yr Storm Rainfall=3.10" Printed 8/27/2019

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Тс	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
44.6	100	0.0134	0.04		Sheet Flow, A-B
					Woods: Dense underbrush n= 0.800 P2= 3.10"
41.3	849	0.0047	0.34		Shallow Concentrated Flow, B-C
					Woodland Kv= 5.0 fps
6.9	474	0.0270	1.15		Shallow Concentrated Flow, C-D
					Short Grass Pasture Kv= 7.0 fps

92.8 1,423 Total

Summary for Reach 1BR: Wetland Reach

Inflow A	rea =	68.863 ac,	5.92% Impervious,	Inflow Depth > 0 .	89" for 2-yr Storm event
Inflow	=	23.10 cfs @	12.77 hrs, Volume	= 5.082 af	-
Outflow	=	22.82 cfs @	12.97 hrs, Volume	= 5.016 af,	Atten= 1%, Lag= 12.1 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Max. Velocity= 1.33 fps, Min. Travel Time= 6.8 min Avg. Velocity = 0.73 fps, Avg. Travel Time= 12.4 min

Peak Storage= 9,325 cf @ 12.86 hrs Average Depth at Peak Storage= 0.30' Bank-Full Depth= 2.00' Flow Area= 184.0 sf, Capacity= 717.02 cfs

50.00' x 2.00' deep channel, n= 0.035 Earth, dense weeds Side Slope Z-value= 20.0 22.0 '/' Top Width= 134.00' Length= 543.0' Slope= 0.0055 '/' Inlet Invert= 57.00', Outlet Invert= 54.00'



Summary for Reach 1CR: Stream

Inflow Area	a =	34.742 ac, 1	1.73% Impervious,	Inflow Depth >	0.76"	for 2-yr Storm event
Inflow	=	11.34 cfs @	13.04 hrs, Volume	e= 2.203	af	-
Outflow	=	10.92 cfs @	13.38 hrs, Volume	e= 2.157	af, Atte	en= 4%, Lag= 20.4 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Max. Velocity= 1.43 fps, Min. Travel Time= 11.2 min Avg. Velocity = 0.86 fps, Avg. Travel Time= 18.7 min

Peak Storage= 7,361 cf @ 13.19 hrs Average Depth at Peak Storage= 1.00' Bank-Full Depth= 3.00' Flow Area= 40.0 sf, Capacity= 116.18 cfs

Existing 082719rType III 24-hr 2-yr Storm Rainfall=3.10"Prepared by Sevee & Maher Engineers, Inc.Printed 8/27/2019HydroCAD® 10.00-22 s/n 01260 © 2018 HydroCAD Software Solutions LLCPage 7

20.00' x 3.00' deep Parabolic Channel, n= 0.100 Earth, dense brush, high stage Length= 961.0' Slope= 0.0163 '/' Inlet Invert= 72.00', Outlet Invert= 56.31'



Summary for Reach 4R: Wetland Reach

Inflow A	Area	=	13.507 ac,	0.00% Impe	ervious,	Inflow Depth >	1.0)5" for 2-y	r Storn	n event
Inflow		=	5.44 cfs @	13.36 hrs,	Volume	= 1.187	' af			
Outflow	V	=	5.12 cfs @	13.91 hrs,	Volume	= 1.150	af,	Atten= 6%	Lag=	33.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Max. Velocity= 0.18 fps, Min. Travel Time= 18.3 min Avg. Velocity = 0.12 fps, Avg. Travel Time= 27.5 min

Peak Storage= 5,622 cf @ 13.61 hrs Average Depth at Peak Storage= 0.88' Bank-Full Depth= 1.00' Flow Area= 35.0 sf, Capacity= 6.71 cfs

15.00' x 1.00' deep channel, n= 0.800 Sheet flow: Woods+dense brush Side Slope Z-value= 20.0 '/' Top Width= 55.00' Length= 196.0' Slope= 0.0195 '/' Inlet Invert= 52.82', Outlet Invert= 49.00'



Summary for Pond 1BP: 3x3 Stone Box Culvert

Inflow Area =	•	68.863 ac,	5.92% Impervious, In	flow Depth > 0.8	39" for 2-yr Storm event
Inflow =		23.09 cfs @	12.77 hrs, Volume=	5.082 af	-
Outflow =		23.10 cfs @	12.77 hrs, Volume=	5.082 af,	Atten= 0%, Lag= 0.2 min
Primary =		23.10 cfs @	12.77 hrs, Volume=	5.082 af	
Secondary =		0.00 cfs @	5.00 hrs, Volume=	0.000 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Peak Elev= 58.74' @ 12.77 hrs Surf.Area= 282 sf Storage= 107 cf

Plug-Flow detention time= 0.0 min calculated for 5.065 af (100% of inflow) Center-of-Mass det. time= 0.0 min (863.4 - 863.4)

Existing	082719r			Ту	pe III 24-hr 2-yr Stol	rm Rainfall=3.10"
Prepared	by Sevee 8	& Maher En	gineers, Inc.	-		Printed 8/27/2019
HydroCAD	<u>® 10.00-22 s</u>	/n 01260 © 2	018 HydroCAD	Software Solution	s LLC	Page 8
Volume	Invert	Avail.Stor	rage Storage	Description		
#1	58.00'	379,78	30 cf Custom	n Stage Data (Pr	ismatic) Listed below	(Recalc)
Elevation	Sur	f.Area	Inc.Store	Cum.Store		
(feet)		(sq-ft)	(cubic-feet)	(cubic-feet)		
58.00	1	7	0	0		
59.00)	377	192	192		
60.00	1	2,198	1,288	1,480		
61.00		9,800	5,999	7,479		
62.00	2	9,558	19,679	27,158		
63.00	5	3,497	41,528	68,685		
64.00	7	6,964	65,231	133,916		
65.00	12	3,349	100,157	234,072		
66.00	16	8,066	145,708	379,780		
Device I	Routing	Invert	Outlet Device	S		
#1 F	Primary	56.31'	36.0" W x 36	.0" H Box Culv	ert	
			L= 54.0' Box	, headwall w/3 s	quare edges, Ke= 0.5	600
			Inlet / Outlet I	nvert= 56.13' / 5	6.31' S= -0.0033 '/' (Cc= 0.900
			n= 0.025 Rub	oble masonry, ce	emented, Flow Area=	9.00 sf
#2 \$	Secondary	65.00'	20.0' long x	5.0' breadth Bro	oad-Crested Rectang	ular Weir
			Head (feet) 0	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	n) 2.34 2.50 2.	70 2.68 2.68 2.66 2.	65 2.65 2.65
			2.65 2.67 2.0	66 2.68 2.70 2	.74 2.79 2.88	
Primary (DutFlow Ma	x=23.07.cfs	@ 12 77 hrs ⊦	IW=58 74' (Fre	e Discharge)	
1=Culv	vert (Barrel (Controls 23.0	07 cfs @ 3.93 f	ps)		

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=58.00' (Free Discharge) 2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 4P: Culvert

Inflow Area =	13.507 ac,	0.00% Impervious,	Inflow Depth > 1.	06" for 2-yr Storm event
Inflow =	5.48 cfs @	13.30 hrs, Volume	= 1.194 af	
Outflow =	5.44 cfs @	13.36 hrs, Volume	= 1.187 af,	Atten= 1%, Lag= 3.5 min
Primary =	5.44 cfs @	13.36 hrs, Volume	= 1.187 af	
Secondary =	0.00 cfs @	5.00 hrs, Volume	= 0.000 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Peak Elev= 54.96' @ 13.36 hrs Surf.Area= 1,389 sf Storage= 1,220 cf

Plug-Flow detention time= 5.0 min calculated for 1.187 af (99% of inflow) Center-of-Mass det. time= 3.2 min (879.4 - 876.2)

Volume	Invert	Avail.Storage	Storage Description
#1	52.00'	190,452 cf	Custom Stage Data (Prismatic)Listed below (Recalc)

Existing 082719r Prepared by Sevee & Maher Engineers, Inc.

Elevatio	on S	Surf.Area	Inc.Store	Cum.Store	
(fee	et)	(sq-ft)	(cubic-feet)	(cubic-feet)	
52.0	00	1	0	0	
53.0	00	7	4	4	
54.0	00	556	282	286	
55.0	00	1,423	990	1,275	
56.0	00	3,587	2,505	3,780	
57.0	00	6,301	4,944	8,724	
58.0	00	9,663	7,982	16,706	
59.0	00	14,490	12,077	28,783	
60.0	00	22,192	18,341	47,124	
61.0	00	34,805	28,499	75,622	
62.0	00	57,427	46,116	121,738	
63.0	00	80,000	68,714	190,452	
Device	Routing	Invert	Outlet Devices		
#1	Primary	53.82'	18.0" W x 24.0"	' H Box Culver	t
	,		L= 50.0' Box, h	neadwall w/3 sq	uare edges, Ke= 0.500
			Inlet / Outlet Inv	ert= 53.82' / 52.	82' S=0.0200 '/' Cc= 0.
			n= 0.025 Rubbl	le masonry, cen	ented, Flow Area= 3.00 s
#2	Secondary	y 62.50'	100.0' long x 1	0.0' breadth Br	oad-Crested Rectangula
			Head (feet) 0.2	0 0.40 0.60 0.	80 1.00 1.20 1.40 1.60
			Coef. (English)	2.49 2.56 2.70	2.69 2.68 2.69 2.67 2

Primary OutFlow Max=5.44 cfs @ 13.36 hrs HW=54.96' (Free Discharge) **1=Culvert** (Barrel Controls 5.44 cfs @ 4.24 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=52.00' (Free Discharge) 2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond AP-1: AP-1

Inflow Area	=	86.945 ac,	4.69% Impervious	, Inflow Depth >	0.92" f	or 2-yr Stori	m event
Inflow	=	32.16 cfs @	12.85 hrs, Volum	e= 6.651	af		
Outflow	=	17.27 cfs @	14.54 hrs, Volum	e= 6.253	af, Atten	= 46%, Lag	= 101.9 min
Primary	=	17.27 cfs @	14.54 hrs, Volum	e= 6.253	af	-	
Secondary	=	0.00 cfs @	5.00 hrs, Volum	e= 0.000	af		

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Peak Elev= 55.71' @ 13.98 hrs Surf.Area= 41,378 sf Storage= 79,721 cf

Plug-Flow detention time= 67.8 min calculated for 6.253 af (94% of inflow) Center-of-Mass det. time= 49.9 min (916.6 - 866.7)

Volume	Invert	Avail.Storage	Storage Description
#1	53.00'	580,540 cf	Custom Stage Data (Prismatic)Listed below (Recalc)

Existing 082719r

Prepared by Sevee & Maher Engineers, Inc.

Elevatio	on	Surf.Area	Inc.Store	Cum.Store	
(fee	et)	(sq-ft)	(cubic-feet)	(cubic-feet)	
53.0	00	18,129	0	0	
54.0	00	26,167	22,148	22,148	
55.0	00	34,797	30,482	52,630	
56.0	00	44,050	39,424	92,054	
57.0	00	54,092	49,071	141,125	
58.0	00	68,472	61,282	202,407	
59.0	00	85,610	77,041	279,448	
60.0	00	122,767	104,189	383,636	
61.0	00	271,041	196,904	580,540	
Device	Routing	Invert	Outlet Devices		
#1	Primary	53.00'	24.0" Round	Culvert	
			L= 75.0' CMP	, end-section c	onforming to fill, Ke= 0.500
			Inlet / Outlet In	vert= 53.00' / 5	1.50' S= 0.0200 '/' Cc= 0.900
			n= 0.025 Corr	ugated metal,	Flow Area= 3.14 sf
#2	Seconda	ry 60.00'	10.0' long x 5	.0' breadth Bro	oad-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 3.5	0 4.00 4.50 5	.00 5.50
			Coef. (English)	2.34 2.50 2.	70 2.68 2.68 2.66 2.65 2.65 2.65
			2.65 2.67 2.6	6 2.68 2.70 2	.74 2.79 2.88

Primary OutFlow Max=17.28 cfs @ 14.54 hrs HW=55.56' (Free Discharge) -1=Culvert (Barrel Controls 17.28 cfs @ 5.58 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=53.00' (Free Discharge) 2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond AP-2: AP-2

Inflow A	Area	=	23.126 ac,	4.40% Impervious,	Inflow Depth > 1.	04" for 2-yr Storm event
Inflow		=	18.22 cfs @	12.37 hrs, Volume	= 2.000 af	-
Primar	y	=	18.22 cfs @	12.37 hrs, Volume	= 2.000 af,	Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Pond AP-3: AP-3

Inflow Area	=	17.535 ac,	0.00% Impervious,	Inflow Depth >	1.05" for	2-yr Storm event
Inflow	=	5.62 cfs @	13.90 hrs, Volume	= 1.537 a	af	
Outflow	=	5.60 cfs @	13.96 hrs, Volume	= 1.530 a	af, Atten= 0	%, Lag= 3.7 min
Primary	=	5.60 cfs @	13.96 hrs, Volume	= 1.530 a	af	-
Secondary	=	0.00 cfs @	5.00 hrs, Volume	= 0.000 a	af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Peak Elev= 49.95' @ 13.96 hrs Surf.Area= 2,448 sf Storage= 1,489 cf

Plug-Flow detention time= 5.4 min calculated for 1.525 af (99% of inflow) Center-of-Mass det. time= 3.9 min (892.4 - 888.4)

Existing 082719r

Type III 24-hr 2-yr Storm Rainfall=3.10"Printed 8/27/2019tions LLCPage 11

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Volume	Inve	rt Avail.Sto	rage Storage	Description	
#1	49.00	0' 492,01	19 cf Custom	Stage Data (Pi	rismatic)Listed below (Recalc)
Elevatio	on S	Surf.Area	Inc.Store	Cum.Store	
100	0	695	0	0	
50.0		2 545	1 620	1 620	
51 0	0	4 335	3 440	5 060	
52 (00	6 672	5 504	10 564	
53.0	00	10.072	8.372	18,936	
54.0	00	16.185	13,129	32.064	
55.0	00	21,770	18,978	51,042	
56.0	00	27,163	24,467	75,508	
57.0	00	43,138	35,151	110,659	
58.0	00	56,033	49,586	160,244	
59.0	00	71,132	63,583	223,827	
60.0	00	97,106	84,119	307,946	
61.0	00	271,041	184,074	492,019	
Device	Routing	Invert	Outlet Device	S	
#1 #2	Primary Secondar	49.00' y 60.50'	36.0" Round L= 75.0' RCF Inlet / Outlet In n= 0.025 Cor 10.0' long x Head (feet) 0 2.50 3.00 3.5 Coef. (English 2.65 2.67 2.6	Culvert P, end-section c nvert= 49.00' / 4 rugated metal, 5.0' breadth Bro 20 0.40 0.60 50 4.00 4.50 5 n) 2.34 2.50 2. 56 2.68 2.70 2	onforming to fill, Ke= 0.500 7.50' S= 0.0200 '/' Cc= 0.900 Flow Area= 7.07 sf pad-Crested Rectangular Weir 0.80 1.00 1.20 1.40 1.60 1.80 2.00 .00 5.50 70 2.68 2.68 2.66 2.65 2.65 2.65 .74 2.79 2.88
Drimary	OutElow	Max=5 50 cfs (3 13 06 hrs HV	N=10.05' (Free	Discharge)

Primary OutFlow Max=5.59 cfs @ 13.96 hrs HW=49.95' (Free Discharge) -1=Culvert (Barrel Controls 5.59 cfs @ 4.37 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=49.00' (Free Discharge) 2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Existing 082719r	Type III 24-hr 10-yr Storm Rainfall=4.60
Prepared by Sevee & Maher Engineers, Inc.	Printed 8/27/2019
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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points Runoff by SCS TR-20 method, UH=SCS, Weighted-CN Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentSC-1A: Nor	Runoff Area=787,640 sf 0.00% Impervious Runoff Depth>2.18 Flow Length=1,159' Tc=45.2 min CN=78 Runoff=23.19 cfs 3.281 a
SubcatchmentSC-1B: Nor	Runoff Area=1,486,320 sf 0.00% Impervious Runoff Depth>2.10 Flow Length=1,985' Tc=44.5 min CN=77 Runoff=42.54 cfs 5.966 a
SubcatchmentSC-1C: Tow	rn Hall Runoff Area=1,513,369 sf 11.73% Impervious Runoff Depth>1.70 Flow Length=1,815' Tc=71.0 min CN=72 Runoff=26.71 cfs 4.916 a
SubcatchmentSC-2: NELM	IA Runoff Area=1,007,352 sf 4.40% Impervious Runoff Depth>2.11 Flow Length=1,388' Tc=25.2 min CN=77 Runoff=37.78 cfs 4.073 a
SubcatchmentSC-3: South	Runoff Area=175,454 sf 0.00% Impervious Runoff Depth>2.28 Flow Length=783' Tc=24.5 min CN=79 Runoff=7.17 cfs 0.764 a
SubcatchmentSC-4: South	Runoff Area=588,377 sf 0.00% Impervious Runoff Depth>2.14 Flow Length=1,423' Tc=92.8 min CN=78 Runoff=11.18 cfs 2.404 a
Reach 1BR: Wetland Reac	Avg. Flow Depth=0.49' Max Vel=1.77 fps Inflow=53.09 cfs 10.813 a n=0.035 L=543.0' S=0.0055 '/' Capacity=717.02 cfs Outflow=52.86 cfs 10.720 a
Reach 1CR: Stream	Avg. Flow Depth=1.49' Max Vel=1.86 fps Inflow=26.71 cfs 4.916 a n=0.100 L=961.0' S=0.0163 '/' Capacity=116.18 cfs Outflow=26.11 cfs 4.847 a
Reach 4R: Wetland Reach	Avg. Flow Depth=1.27' Max Vel=0.21 fps Inflow=11.00 cfs 2.396 a n=0.800 L=196.0' S=0.0195 '/' Capacity=6.71 cfs Outflow=10.52 cfs 2.342 a
Pond 1BP: 3x3 Stone Box Prima	Culvert Peak Elev=60.72' Storage=5,064 cf Inflow=54.11 cfs 10.813 a ry=53.09 cfs 10.813 af Secondary=0.00 cfs 0.000 af Outflow=53.09 cfs 10.813 a
Pond 4P: Culvert Prir	Peak Elev=55.77' Storage=3,025 cf Inflow=11.18 cfs 2.404 a nary=11.00 cfs 2.396 af Secondary=0.00 cfs 0.000 af Outflow=11.00 cfs 2.396 a
Pond AP-1: AP-1 Prima	Peak Elev=58.51' Storage=239,265 cf Inflow=70.30 cfs 14.001 a ry=25.34 cfs 13.209 af Secondary=0.00 cfs 0.000 af Outflow=25.34 cfs 13.209 a
Pond AP-2: AP-2	Inflow=37.78 cfs 4.073 a Primary=37.78 cfs 4.073 a
Pond AP-3: AP-3 Prir	Peak Elev=50.39' Storage=2,743 cf Inflow=11.44 cfs 3.106 a nary=11.40 cfs 3.096 af Secondary=0.00 cfs 0.000 af Outflow=11.40 cfs 3.096 a

Existing 082719r	Type III 24-hr 25-yr Storm Rainfall=5.80"
Prepared by Sevee & Maher Engineers, Inc.	Printed 8/27/2019
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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points Runoff by SCS TR-20 method, UH=SCS, Weighted-CN Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment SC-1A: Northeast	Runoff Area=787,640 sf 0.00% Impervious Runoff Depth>3.14" Flow Length=1,159' Tc=45.2 min CN=78 Runoff=33.34 cfs 4.729 af
SubcatchmentSC-1B: Northwest	Runoff Area=1,486,320 sf 0.00% Impervious Runoff Depth>3.04" Flow Length=1,985' Tc=44.5 min CN=77 Runoff=61.62 cfs 8.658 af
Subcatchment SC-1C: Town Hall	Runoff Area=1,513,369 sf 11.73% Impervious Runoff Depth>2.56" Flow Length=1,815' Tc=71.0 min CN=72 Runoff=40.59 cfs 7.413 af
SubcatchmentSC-2: NELMA	Runoff Area=1,007,352 sf 4.40% Impervious Runoff Depth>3.07" Flow Length=1,388' Tc=25.2 min CN=77 Runoff=54.69 cfs 5.908 af
Subcatchment SC-3: Southeast	Runoff Area=175,454 sf 0.00% Impervious Runoff Depth>3.26" Flow Length=783' Tc=24.5 min CN=79 Runoff=10.20 cfs 1.093 af
SubcatchmentSC-4: Southwest	Runoff Area=588,377 sf 0.00% Impervious Runoff Depth>3.08" Flow Length=1,423' Tc=92.8 min CN=78 Runoff=16.06 cfs 3.470 af
Reach 1BR: Wetland Reach n=0.035 L:	Avg. Flow Depth=0.59' Max Vel=1.97 fps Inflow=72.40 cfs 15.986 af =543.0' S=0.0055 '/' Capacity=717.02 cfs Outflow=72.30 cfs 15.874 af
Reach 1CR: Stream n=0.100	Avg. Flow Depth=1.82' Max Vel=2.11 fps Inflow=40.59 cfs 7.413 af _=961.0' S=0.0163 '/' Capacity=116.18 cfs Outflow=39.88 cfs 7.328 af
Reach 4R: Wetland Reach n=0.800	Avg. Flow Depth=1.59' Max Vel=0.22 fps Inflow=15.67 cfs 3.461 af L=196.0' S=0.0195 '/' Capacity=6.71 cfs Outflow=15.04 cfs 3.394 af
Pond 1BP: 3x3 Stone Box Culvert Primary=72.40 cf	Peak Elev=62.09' Storage=30,048 cf Inflow=82.11 cfs 15.986 af s 15.986 af Secondary=0.00 cfs 0.000 af Outflow=72.40 cfs 15.986 af
Pond 4P: Culvert Primary=15.67	Peak Elev=56.38' Storage=5,361 cf Inflow=16.06 cfs 3.470 af cfs 3.461 af Secondary=0.00 cfs 0.000 af Outflow=15.67 cfs 3.461 af
Pond AP-1: AP-1 Primary=29.23 cf	Peak Elev=60.16' Storage=405,309 cf Inflow=95.19 cfs 20.603 af s 17.380 af Secondary=1.55 cfs 0.121 af Outflow=30.77 cfs 17.501 af
Pond AP-2: AP-2	Inflow=54.69 cfs 5.908 af Primary=54.69 cfs 5.908 af
Pond AP-3: AP-3 Primary=16.34	Peak Elev=50.70' Storage=3,854 cf Inflow=16.40 cfs 4.608 af cfs 4.596 af Secondary=0.00 cfs 0.000 af Outflow=16.34 cfs 4.596 af

APPENDIX C

POST-DEVELOPMENT HYDROCAD CALCULATIONS




Proposed 082719r Type III 24 Prepared by Sevee & Maher Engineers, Inc. HydroCAD® 10.00-22 s/n 01260 © 2018 HydroCAD Software Solutions LLC

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

Subcatchment SC-1A: Northea	Runoff Area=798,350 sf 0.00% Impervious Runoff Depth>1.14" Flow Length=1,159' Tc=45.2 min CN=79 Runoff=12.24 cfs 1.747 af
SubcatchmentSC-1B: Northw	est Runoff Area=1,424,359 sf 0.72% Impervious Runoff Depth>1.03" Flow Length=1,985' Tc=44.5 min CN=77 Runoff=19.63 cfs 2.803 af
Subcatchment SC-1C: Town H	all Runoff Area=1,513,369 sf 11.73% Impervious Runoff Depth>0.76" Flow Length=1,815' Tc=71.0 min CN=72 Runoff=11.34 cfs 2.203 af
SubcatchmentSC-2: NELMA	Runoff Area=1,007,352 sf 4.52% Impervious Runoff Depth>1.04" Flow Length=1,388' Tc=25.2 min CN=77 Runoff=18.22 cfs 2.000 af
Subcatchment SC-3: Southeas	Runoff Area=194,599 sf 2.16% Impervious Runoff Depth>1.34" Flow Length=596' Tc=18.3 min CN=82 Runoff=5.28 cfs 0.501 af
Subcatchment SC-4: Southwe	stRunoff Area=620,476 sf0.90% ImperviousRunoff Depth>1.12"Flow Length=1,423'Tc=93.1 minCN=79Runoff=6.07 cfs1.328 af
Reach 1BR: Wetland Reach n=0	Avg. Flow Depth=0.27' Max Vel=1.45 fps Inflow=22.26 cfs 4.960 af 0.030 L=543.0' S=0.0055 '/' Capacity=836.52 cfs Outflow=22.06 cfs 4.901 af
Reach 1CR: Stream	Avg. Flow Depth=1.00' Max Vel=1.42 fps Inflow=11.34 cfs 2.203 af 0.100 L=961.0' S=0.0161 '/' Capacity=115.44 cfs Outflow=10.92 cfs 2.157 af
Reach 4R: Wetland Reach	Avg. Flow Depth=0.93' Max Vel=0.18 fps Inflow=6.04 cfs 1.320 af n=0.800 L=196.0' S=0.0195 '/' Capacity=6.71 cfs Outflow=5.71 cfs 1.281 af
Pond 1BP: 36-in HDPE Culver Primary	Peak Elev=58.74' Storage=106 cf Inflow=22.26 cfs 4.960 af =22.26 cfs 4.960 af Secondary=0.00 cfs 0.000 af Outflow=22.26 cfs 4.960 af
Pond 4P: Culvert Prima	Peak Elev=55.06' Storage=1,357 cf Inflow=6.07 cfs 1.328 af ary=6.04 cfs 1.320 af Secondary=0.00 cfs 0.000 af Outflow=6.04 cfs 1.320 af
Pond AP-1: AP-1 Primary	Peak Elev=55.71' Storage=79,806 cf Inflow=32.31 cfs 6.647 af =17.28 cfs 6.252 af Secondary=0.00 cfs 0.000 af Outflow=17.28 cfs 6.252 af
Pond AP-2: AP-2	Inflow=18.22 cfs 2.000 af Primary=18.22 cfs 2.000 af
Pond AP-3: AP-3 Prima	Peak Elev=50.01' Storage=1,638 cf Inflow=6.31 cfs 1.782 af ary=6.28 cfs 1.774 af Secondary=0.00 cfs 0.000 af Outflow=6.28 cfs 1.774 af

Summary for Subcatchment SC-1A: Northeast

Runoff = 12.24 cfs @ 12.65 hrs, Volume= 1.747 af, Depth> 1.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr 2-yr Storm Rainfall=3.10"

	A	rea (sf)	CN E	Description		
		37,018	91 (Gravel road	ls, HSG D	
	7	61,332	78 N	Aeadow, no	on-grazed,	HSG D
	7	98,350	79 V	Veighted A	verage	
	7	98,350	1	00.00% Pe	ervious Are	а
	Тс	Length	Slope	Velocity	Capacity	Description
_	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
	25.2	100	0.0050	0.07		Sheet Flow, A-B
						Grass: Dense n= 0.240 P2= 3.10"
	19.7	941	0.0130	0.80		Shallow Concentrated Flow, B-C
						Short Grass Pasture Kv= 7.0 fps
	0.3	118	0.0200	6.80	135.97	Channel Flow, C-D
						Area= 20.0 sf Perim= 16.6' r= 1.20'
_						n= 0.035 Earth, dense weeds
		4 4 5 0				

45.2 1,159 Total

Summary for Subcatchment SC-1B: Northwest

Runoff = 19.63 cfs @ 12.65 hrs, Volume= 2.803 af, Depth> 1.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr 2-yr Storm Rainfall=3.10"

A	rea (sf)	CN E	Description		
3	86,242	78 N	leadow, no	on-grazed,	HSG D
1,0	27,856	77 V	Voods, Go	od, HSG D	
	5,200	98 F	Roofs, HSG	G C	
	5,061	98 F	aved park	ing, HSG C	
1,4	24,359	77 V	Veighted A	verage	
1,4	14,098	9	9.28% Per	vious Area	
,	10,261	0	.72% Impe	ervious Area	а
			·		
Тс	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
14.5	100	0.0200	0.11		Sheet Flow, A-B
					Grass: Dense n= 0.240 P2= 3.10"
2.0	310	0.1400	2.62		Shallow Concentrated Flow, B-C
					Short Grass Pasture Kv= 7.0 fps
23.3	796 0.0130		0.57		Shallow Concentrated Flow, C-D
					Woodland Kv= 5.0 fps
4.7	779	0.0180	2.75	362.73	Channel Flow, D-E
					Area= 132.0 sf Perim= 114.0' r= 1.16'
					n= 0.080 Earth, long dense weeds

44.5 1,985 Total

Summary for Subcatchment SC-1C: Town Hall

Runoff = 11.34 cfs @ 13.04 hrs, Volume= 2.203 af, Depth> 0.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr 2-yr Storm Rainfall=3.10"

Ar	rea (sf)	CN I	Description		
8	09,968	77 \	Noods, Go	od, HSG D	
	9,665	98 I	Paved park	ing, HSG D	
;	55,432	30 I	Meadow, no	on-grazed,	HSG A
	53,363	30 \	Noods, Go	od, HSG A	
4	45,721	98 I	Paved park	ing, HSG A	
	17,927	98 I	Roofs, HSC	βA	
19	91,094	55 \	Noods, Go	od, HSG B	
	74,486	58 I	Meadow, no	on-grazed,	HSG B
	70,436	98 I	Paved park	ing, HSG B	
	23,116	98 I	Roofs, HSG	βB	
1:	24,650	70 \	Noods, Go	od, HSG C	
	26,882	71 I	Meadow, no	on-grazed,	HSG C
	4,662	98 I	Paved park	ing, HSG C	
	5,967	98 I	Roofs, HSC	S C	
1,5	13,369	72 \	Neighted A	verage	
1,3	35,875	8	38.27% Pei	vious Area	
1	77,494		11.73% Imp	pervious Are	ea
_					
TC	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
38.0	100	0.0200	0.04		Sheet Flow, A-B
					Woods: Dense underbrush n= 0.800 P2= 3.10"
33.0	1,715	0.0300	0.87		Shallow Concentrated Flow, B-C
					Woodland Kv= 5.0 fps
71.0	1,815	Total			

Summary for Subcatchment SC-2: NELMA

Runoff = 18.22 cfs @ 12.37 hrs, Volume=

2.000 af, Depth> 1.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr 2-yr Storm Rainfall=3.10"

Proposed 082719r

Type III 24-hr 2-yr Storm Rainfall=3.10" Printed 8/27/2019

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	Α	rea (sf)	CN [Description					
*		45,542	98 I	mpervious					
		21,643	91 (Gravel road	ls, HSG D				
		51,673	77 V	Voods, Go	od, HSG D				
	2	17,703	71 N	/leadow, no	on-grazed,	HSG C			
		34,809	70 V	Voods, Go	od, HSG C				
	6	35,982	78 N	/leadow, no	on-grazed,	HSG D			
	1,0	07,352	77 V	Veighted A	verage				
	9	61,810	ç	95.48% Pei	vious Area				
		45,542	4	4.52% Impervious Area					
	TC	Length	Slope	Velocity	Capacity	Description			
_	(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)				
	12.3	100	0.0300	0.14		Sheet Flow, A_B			
						Grass: Dense n= 0.240 P2= 3.10"			
	11.3	645	0.0186	0.95		Shallow Concentrated Flow, B-C			
						Short Grass Pasture Kv= 7.0 fps			
	1.6	643	0.0187	6.70	335.19	Channel Flow, C-D			
						Area= 50.0 sf Perim= 40.3' r= 1.24'			
						n= 0.035 Earth, dense weeds			
	25.2	1,388	Total						

Summary for Subcatchment SC-3: Southeast

Runoff	=	5.28 cfs @	12.26 hrs.	Volume=	0.501 af. Depth	> 1.34"
1 tunion		0.20 013 @	12.201113,	volume-		1 1.04

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr 2-yr Storm Rainfall=3.10"

_	A	rea (sf)	CN [Description		
		67,722	78 N	Meadow, no	on-grazed,	HSG D
		43,812	96 (Gravel surfa	ace, HSG D)
		78,860	77 V	Noods, Go	od, HSG D	
_		4,205	98 F	Paved park	ing, HSG D	
	1	94,599	82 V	Neighted A	verage	
	1	90,394	ç	97.84% Pei	rvious Area	
		4,205	2	2.16% Impe	ervious Area	a
	_		<u> </u>			
	IC	Length	Slope	Velocity	Capacity	Description
_	(min)	(feet)	(ft/ft)	(ft/sec)	(CfS)	
	16.3	100	0.0150	0.10		Sheet Flow, A-B
						Grass: Dense n= 0.240 P2= 3.10"
	1.1	75	0.0267	1.14		Shallow Concentrated Flow, B-C
				/		Short Grass Pasture Kv= 7.0 fps
	0.9	421	0.0260	7.71	369.85	Channel Flow, C-D
						Area= 48.0 sf Perim= 40.2' r= 1.19'
_						n= 0.035 Earth, dense weeds
	18.3	596	Total			

Summary for Subcatchment SC-4: Southwest

Runoff = 6.07 cfs @ 13.31 hrs, Volume= 1.328 af, Depth> 1.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr 2-yr Storm Rainfall=3.10"

/	Area (sf)	CN E	Description		
	269,993	78 N	Meadow, no	on-grazed,	HSG D
	30,080	96 (Gravel surfa	ace, HSG D)
	314,798	77 V	Voods, Go	od, HSG D	
	2,800	98 F	Roofs, HSG	G D	
	2,805	98 F	Paved park	ing, HSG D	
	620,476	79 V	Veighted A	verage	
	614,871	ç	9.10% Pei	vious Area	
	5,605	().90% Impe	ervious Area	а
Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
44.6	100	0.0134	0.04		Sheet Flow, A-B
					Woods: Dense underbrush n= 0.800 P2= 3.10"
41.3	849	0.0047	0.34		Shallow Concentrated Flow, B-C
					Woodland Kv= 5.0 fps
7.2	474	0.0248	1.10		Shallow Concentrated Flow, C-D
					Short Grass Pasture Kv= 7.0 fps
93.1	1,423	Total			

Summary for Reach 1BR: Wetland Reach

Inflow /	Area	a =	67.441 ac,	6.39% Impervious,	Inflow Depth > 0.	88" for 2-yr Storm event
Inflow		=	22.26 cfs @	12.78 hrs, Volume	= 4.960 af	-
Outflov	v	=	22.06 cfs @	12.96 hrs, Volume	= 4.901 af,	Atten= 1%, Lag= 11.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Max. Velocity= 1.45 fps, Min. Travel Time= 6.2 min Avg. Velocity = 0.80 fps, Avg. Travel Time= 11.4 min

Peak Storage= 8,256 cf @ 12.86 hrs Average Depth at Peak Storage= 0.27' Bank-Full Depth= 2.00' Flow Area= 184.0 sf, Capacity= 836.52 cfs

50.00' x 2.00' deep channel, n= 0.030 Earth, grassed & winding Side Slope Z-value= 20.0 22.0 '/' Top Width= 134.00' Length= 543.0' Slope= 0.0055 '/' Inlet Invert= 57.00', Outlet Invert= 54.00'



Avg. Velocity = 0.12 fps, Avg. Travel Time= 27.0 min

Peak Storage= 6,093 cf @ 13.60 hrs Average Depth at Peak Storage= 0.93' Bank-Full Depth= 1.00' Flow Area= 35.0 sf, Capacity= 6.71 cfs

15.00' x 1.00' deep channel, n= 0.800 Sheet flow: Woods+dense brush Side Slope Z-value= 20.0 '/' Top Width= 55.00' Length= 196.0' Slope= 0.0195 '/' Inlet Invert= 52.82', Outlet Invert= 49.00'

Proposed 082719rType III 24-hr 2-yr Storm Rainfall=3.10"Prepared by Sevee & Maher Engineers, Inc.Printed 8/27/2019HydroCAD® 10.00-22 s/n 01260 © 2018 HydroCAD Software Solutions LLCPage 8



Summary for Pond 1BP: 36-in HDPE Culvert

Inflow Area	=	67.441 ac,	6.39% Impervious, In	flow Depth > 0.8	8" for 2-yr Storm event
Inflow	=	22.26 cfs @	12.78 hrs, Volume=	4.960 af	
Outflow :	=	22.26 cfs @	12.78 hrs, Volume=	4.960 af,	Atten= 0%, Lag= 0.0 min
Primary :	=	22.26 cfs @	12.78 hrs, Volume=	4.960 af	-
Secondary	=	0.00 cfs @	5.00 hrs, Volume=	0.000 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Peak Elev= 58.74' @ 12.78 hrs Surf.Area= 281 sf Storage= 106 cf

Plug-Flow detention time= 0.0 min calculated for 4.960 af (100% of inflow) Center-of-Mass det. time= 0.0 min (864.0 - 864.0)

Volume	Inver	t Avail.Stor	rage Storage	Description	
#1	58.00	645,09	95 cf Custom	Stage Data (Pr	rismatic)Listed below (Recalc)
Elevatio (fee	on S	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
58 (00	7	0	0	
59.0	00	377	192	192	
60.0	00	2,198	1,288	1,480	
61.0	00	9,800	5,999	7,479	
62.0	00	24,409	17,105	24,583	
63.0	00	49,900	37,155	61,738	
64.0	00	67,484	58,692	120,430	
65.0	00	96,865	82,175	202,604	
66.0	00	129,107	112,986	315,590	
67.0	00	165,716	147,412	463,002	
68.0	00	198,471	182,094	645,095	
Device	Routing	Invert	Outlet Devices	5	
#1	Primary	56.51'	36.0" Round L= 75.0' CPF Inlet / Outlet Ir	Culvert P, end-section convert= 56.51' / 5	onforming to fill, Ke= 0.500 6.13' S= 0.0051 '/' Cc= 0.900
#2	Secondary	y 67.00'	20.0' long x 5 Head (feet) 0. 2.50 3.00 3.5 Coef. (English 2.65 2.67 2.6	5.0' breadth Bro 20 0.40 0.60 0 4.00 4.50 5) 2.34 2.50 2. 6 2.68 2.70 2	both interior, Flow Area = 7.07 st bad-Crested Rectangular Weir 0.80 1.00 1.20 1.40 1.60 1.80 2.00 .00 5.50 70 2.68 2.66 2.65 2.65 2.65 .74 2.79 2.88

Primary OutFlow Max=22.23 cfs @ 12.78 hrs HW=58.74' (Free Discharge) **1=Culvert** (Barrel Controls 22.23 cfs @ 5.49 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=58.00' (Free Discharge) 2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 4P: Culvert

Inflow Area =	=	14.244 ac,	0.90% Impervious,	Inflow Depth > 1.	12" for 2-yr Storm event
Inflow =		6.07 cfs @	13.31 hrs, Volume	= 1.328 af	
Outflow =		6.04 cfs @	13.36 hrs, Volume	= 1.320 af,	Atten= 0%, Lag= 3.1 min
Primary =		6.04 cfs @	13.36 hrs, Volume	= 1.320 af	-
Secondary =		0.00 cfs @	5.00 hrs, Volume	= 0.000 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Peak Elev= 55.06' @ 13.36 hrs Surf.Area= 1,543 sf Storage= 1,357 cf

Plug-Flow detention time= 4.9 min calculated for 1.320 af (99% of inflow) Center-of-Mass det. time= 3.2 min (877.3 - 874.0)

Inver	: Avail.Sto	rage Storag	e Description	
52.00	190,4	52 cf Custo	om Stage Data (P	rismatic)Listed below (Recalc)
on S	urf Area	Inc Store	Cum Store	
et)	(sq-ft)	(cubic-feet)	(cubic-feet)	
00	1	0	0	
00	7	4	4	
00	556	282	286	
00	1,423	990	1,275	
00	3,587	2,505	3,780	
00	6,301	4,944	8,724	
00	9,663	7,982	16,706	
00	14,490	12,077	28,783	
00	22,192	18,341	47,124	
00	34,805	28,499	75,622	
00	57,427	46,116	121,738	
00	80,000	68,714	190,452	
Routing	Invert	Outlet Devic	ces	
Primary	53.82'	18.0" W x 2	4.0" H Box Culv	rert
5		L= 50.0' Be	ox, headwall w/3 s	square edges, Ke= 0.500
		Inlet / Outlet	t Invert= 53.82' / 5	52.82' S= 0.0200 '/' Cc= 0.900
		n= 0.025 R	ubble masonry, ce	emented, Flow Area= 3.00 sf
Secondary	62.50'	100.0' long	x 10.0' breadth	Broad-Crested Rectangular Weir
		Head (feet)	0.20 0.40 0.60	0.80 1.00 1.20 1.40 1.60
		Coef. (Engli	sh) 2.49 2.56 2.	70 2.69 2.68 2.69 2.67 2.64
	Invert 52.00 on S on S on 00 00 00 00 00 00 00 00 00 00 00 00 00	Invert Avail.Stor 52.00' 190,45 on Surf.Area et) (sq-ft) 00 1 00 7 00 556 00 1,423 00 3,587 00 6,301 00 9,663 00 14,490 00 22,192 00 34,805 00 57,427 00 80,000 Routing Invert Primary 53.82' Secondary 62.50'	Invert Avail.Storage Storage 52.00' 190,452 cf Custo on Surf.Area Inc.Store et) (sq-ft) (cubic-feet) 00 1 0 00 7 4 00 556 282 00 1,423 990 00 3,587 2,505 00 6,301 4,944 00 9,663 7,982 00 14,490 12,077 00 34,805 28,499 00 57,427 46,116 00 80,000 68,714 Reouting Primary 53.82' 18.0" W x 2 L= 50.0' B Inlet / Outlet Inlet / Outlet n= 0.025 R Secondary 62.50' 100.0' long Head (feet) Coef. (Engli	InvertAvail.StorageStorage Description $52.00'$ 190,452 cfCustom Stage Data (PonSurf.AreaInc.StoreCum.Store $(sq-ft)$ (cubic-feet)(cubic-feet) 00 100 00 744 00 556282286 00 1,4239901,275 00 3,5872,5053,780 00 6,3014,9448,724 00 9,6637,98216,706 00 14,49012,07728,783 00 22,19218,34147,124 00 34,80528,49975,622 00 57,42746,116121,738 00 80,00068,714190,452RoutingInvertOutlet DevicesPrimary53.82'18.0" W x 24.0" H Box CulvL= 50.0' Box, headwall w/3 stInlet / Outlet Invert= 53.82' / 5 $n= 0.025$ Rubble masonry, c $n= 0.025$ Rubble masonry, cSecondary62.50'100.0' long x 10.0' breadthHead (feet)0.200.400.60Coef. (English)2.492.562

Primary OutFlow Max=6.04 cfs @ 13.36 hrs HW=55.05' (Free Discharge) **1=Culvert** (Barrel Controls 6.04 cfs @ 4.35 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=52.00' (Free Discharge) 2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond AP-1: AP-1

Inflow Area	=	85.769 ac,	5.03% Impervious,	Inflow Depth > 0.9	93" for 2-yr Storm event
Inflow :	=	32.31 cfs @	12.82 hrs, Volume	= 6.647 af	-
Outflow :	=	17.28 cfs @	13.45 hrs, Volume	= 6.252 af,	Atten= 47%, Lag= 37.7 min
Primary :	=	17.28 cfs @	13.45 hrs, Volume	= 6.252 af	-
Secondary :	=	0.00 cfs @	5.00 hrs, Volume	= 0.000 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Peak Elev= 55.71' @ 13.96 hrs Surf.Area= 41,397 sf Storage= 79,806 cf

Plug-Flow detention time= 68.0 min calculated for 6.252 af (94% of inflow) Center-of-Mass det. time= 50.1 min (915.2 - 865.2)

Volume	Inver	t Avail.Stor	rage Storage	Description	
#1	53.00	580,54	0 cf Custom	Stage Data (Pr	rismatic)Listed below (Recalc)
Elevatio	n S	Surf.Area	Inc.Store	Cum.Store	
(fee	t)	(sq-ft)	(cubic-feet)	(cubic-feet)	
53.0	0	18,129	0	0	
54.0	0	26,167	22,148	22,148	
55.0	0	34,797	30,482	52,630	
56.0	0	44,050	39,424	92,054	
57.0	0	54,092	49,071	141,125	
58.0	0	68,472	61,282	202,407	
59.0	0	85,610	77,041	279,448	
60.0	0	122,767	104,189	383,636	
61.0	0	271,041	196,904	580,540	
Device	Routing	Invert	Outlet Device	S	
#1	Primary	53.00'	24.0" Round	l Culvert	
#2	Secondary	y 60.00'	L= 75.0' CM Inlet / Outlet I n= 0.025 Cor 10.0' long x Head (feet) 0 2.50 3.00 3.9 Coef. (English 2.65 2.67 2.6	P, end-section c nvert= 53.00' / 5 rugated metal, 5.0' breadth Bro 0.20 0.40 0.60 50 4.00 4.50 5 n) 2.34 2.50 2. 66 2.68 2.70 2	conforming to fill, Ke= 0.500 1.50' S= 0.0200 '/' Cc= 0.900 Flow Area= 3.14 sf Dad-Crested Rectangular Weir 0.80 1.00 1.20 1.40 1.60 1.80 2.00 .00 5.50 70 2.68 2.68 2.66 2.65 2.65 2.65 .74 2.79 2.88

Primary OutFlow Max=17.28 cfs @ 13.45 hrs HW=55.56' (Free Discharge) -1=Culvert (Barrel Controls 17.28 cfs @ 5.58 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=53.00' (Free Discharge)

Summary for Pond AP-2: AP-2

Inflow /	Area	I =	23.126 ac,	4.52% Impervious,	Inflow Depth > 1.0	04" for 2-yr Storm event
Inflow		=	18.22 cfs @	12.37 hrs, Volume	= 2.000 af	-
Primar	у	=	18.22 cfs @	12.37 hrs, Volume	= 2.000 af,	Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Pond AP-3: AP-3

Inflow Area	=	18.712 ac,	1.20% Impervious,	Inflow Depth > 1.7	14" for 2-yr Storm event
Inflow	=	6.31 cfs @	13.88 hrs, Volume	= 1.782 af	
Outflow	=	6.28 cfs @	13.94 hrs, Volume	= 1.774 af,	Atten= 0%, Lag= 3.7 min
Primary	=	6.28 cfs @	13.94 hrs, Volume	= 1.774 af	-
Secondary	=	0.00 cfs @	5.00 hrs, Volume	= 0.000 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Peak Elev= 50.01' @ 13.94 hrs Surf.Area= 2,557 sf Storage= 1,638 cf

Plug-Flow detention time= 5.3 min calculated for 1.768 af (99% of inflow) Center-of-Mass det. time= 3.9 min (884.2 - 880.4)

Volume	Inve	ert Avail.Sto	orage Storage I	Description	
#1	49.0	0' 492,0	19 cf Custom	Stage Data (Pi	rismatic)Listed below (Recalc)
Elevatio (fee	on et)	Surf.Area (sg-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
49.0	00	695	0		
50.0	00	2,545	1,620	1,620	
51.0	00	4,335	3,440	5,060	
52.0	00	6,672	5,504	10,564	
53.0	00	10,072	8,372	18,936	
54.0	00	16,185	13,129	32,064	
55.0	00	21,770	18,978	51,042	
56.0	00	27,163	24,467	75,508	
57.0	00	43,138	35,151	110,659	
58.0	00	56,033	49,586	160,244	
59.0	00	71,132	63,583	223,827	
60.0	00	97,106	84,119	307,946	
61.0	00	271,041	184,074	492,019	
Device	Routing	Invert	Outlet Devices		
#1	Primary	49.00'	36.0" Round	Culvert	
	-		L= 75.0' RCP	, end-section c	onforming to fill, Ke= 0.500
			Inlet / Outlet In	vert= 49.00' / 4	7.50' S= 0.0200 '/' Cc= 0.900
			n= 0.025 Corr	ugated metal,	Flow Area= 7.07 sf
#2	Seconda	ry 60.50'	10.0' long x 5 Head (feet) 0.1 2.50 3.00 3.50 Coef. (English) 2.65 2.67 2.60	.0' breadth Brown 20 0.40 0.60 0 4.00 4.50 5 0 2.34 2.50 2. 6 2.68 2.70 2	oad-Crested Rectangular Weir 0.80 1.00 1.20 1.40 1.60 1.80 2.00 0.00 5.50 70 2.68 2.66 2.65 2.65 2.65 74 2.79 2.88

Primary OutFlow Max=6.28 cfs @ 13.94 hrs HW=50.01' (Free Discharge) **1=Culvert** (Barrel Controls 6.28 cfs @ 4.50 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=49.00' (Free Discharge) 2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Proposed 082719r	Type III 24-hr 10-yr Storm Rainfall=4.60
Prepared by Sevee & Maher Engineers, Inc.	Printed 8/27/2019
HydroCAD® 10.00-22 s/n 01260 © 2018 HydroCAD Software	Solutions LLC Page 2

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

Subcatchment SC-1A: Northeas	t Runoff Area=798,350 sf 0.00% Impervious Runoff Depth>2.26" Flow Length=1,159' Tc=45.2 min CN=79 Runoff=24.40 cfs 3.451 af
Subcatchment SC-1B: Northwes	Runoff Area=1,424,359 sf 0.72% Impervious Runoff Depth>2.10" Flow Length=1,985' Tc=44.5 min CN=77 Runoff=40.77 cfs 5.717 af
Subcatchment SC-1C: Town Ha	Runoff Area=1,513,369 sf 11.73% Impervious Runoff Depth>1.70" Flow Length=1,815' Tc=71.0 min CN=72 Runoff=26.71 cfs 4.916 af
Subcatchment SC-2: NELMA	Runoff Area=1,007,352 sf 4.52% Impervious Runoff Depth>2.11" Flow Length=1,388' Tc=25.2 min CN=77 Runoff=37.78 cfs 4.073 af
Subcatchment SC-3: Southeast	Runoff Area=194,599 sf 2.16% Impervious Runoff Depth>2.54" Flow Length=596' Tc=18.3 min CN=82 Runoff=9.94 cfs 0.944 af
Subcatchment SC-4: Southwest	Runoff Area=620,476 sf 0.90% Impervious Runoff Depth>2.22" Flow Length=1,423' Tc=93.1 min CN=79 Runoff=12.15 cfs 2.631 af
Reach 1BR: Wetland Reach n=0.03	Avg. Flow Depth=0.44' Max Vel=1.94 fps Inflow=51.05 cfs 10.564 af 80 L=543.0' S=0.0055 '/' Capacity=836.52 cfs Outflow=50.88 cfs 10.481 af
Reach 1CR: Stream n=0.7	Avg. Flow Depth=1.50' Max Vel=1.85 fps Inflow=26.71 cfs 4.916 af 100 L=961.0' S=0.0161 '/' Capacity=115.44 cfs Outflow=26.11 cfs 4.847 af
Reach 4R: Wetland Reach n=	Avg. Flow Depth=1.33' Max Vel=0.22 fps Inflow=11.96 cfs 2.623 af 0.800 L=196.0' S=0.0195 '/' Capacity=6.71 cfs Outflow=11.46 cfs 2.566 af
Pond 1BP: 36-in HDPE Culvert Primary=51	Peak Elev=60.79' Storage=5,557 cf Inflow=52.44 cfs 10.564 af .05 cfs 10.564 af Secondary=0.00 cfs 0.000 af Outflow=51.05 cfs 10.564 af
Pond 4P: Culvert Primary=	Peak Elev=55.90' Storage=3,446 cf Inflow=12.15 cfs 2.631 af 11.96 cfs 2.623 af Secondary=0.00 cfs 0.000 af Outflow=11.96 cfs 2.623 af
Pond AP-1: AP-1 Primary=25	Peak Elev=58.48' Storage=237,584 cf Inflow=68.90 cfs 13.932 af .28 cfs 13.159 af Secondary=0.00 cfs 0.000 af Outflow=25.28 cfs 13.159 af
Pond AP-2: AP-2	Inflow=37.78 cfs 4.073 af Primary=37.78 cfs 4.073 af
Pond AP-3: AP-3 Primary=	Peak Elev=50.46' Storage=2,976 cf Inflow=12.49 cfs 3.511 af 12.45 cfs 3.500 af Secondary=0.00 cfs 0.000 af Outflow=12.45 cfs 3.500 af

Proposed 082719r	Type III 24-hr 25-yr Storm Rainfall=5.80"
Prepared by Sevee & Maher Engineers, Inc.	Printed 8/27/2019
HydroCAD® 10.00-22 s/n 01260 © 2018 HydroCAD Soft	ware Solutions LLC Page 2

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

Subcatchment SC-1A: N	ortheast	Runoff Are Flow Length=1,1	ea=798,350 sf 59' Tc=45.2 m	0.00% Imperv nin CN=79 I	vious Runoff De Runoff=34.76 cf	epth>3.23" s 4.940 af
Subcatchment SC-1B: N	orthwest	Runoff Area Flow Length=1,9	=1,424,359 sf 985' Tc=44.5 m	0.72% Imperv nin CN=77 I	vious Runoff De Runoff=59.05 cf	epth>3.04" s 8.297 af
Subcatchment SC-1C: T	own Hall	Runoff Area= Flow Length=1,8	1,513,369 sf 1 315' Tc=71.0 m	1.73% Imperv nin CN=72 I	vious Runoff De Runoff=40.59 cf	epth>2.56" s 7.413 af
SubcatchmentSC-2: NE	LMA	Runoff Area Flow Length=1,3	=1,007,352 sf 888' Tc=25.2 m	4.52% Imperv nin CN=77 I	vious Runoff De Runoff=54.69 cf	epth>3.07" s 5.908 af
Subcatchment SC-3: So	utheast	Runoff Are Flow Length=5	ea=194,599 sf 96' Tc=18.3 m	2.16% Imperv nin CN=82 I	vious Runoff De Runoff=13.82 cf	epth>3.56" s 1.325 af
Subcatchment SC-4: So	uthwest	Runoff Are Flow Length=1,4	ea=620,476 sf 23' Tc=93.1 m	0.90% Imperv nin CN=79 I	vious Runoff De Runoff=17.35 cf	epth>3.18" s 3.771 af
Reach 1BR: Wetland Re	ach n=0.030 L=54	Avg. Flow Deptl 43.0' S=0.0055	1=0.53' Max Vo '/' Capacity=8	el=2.16 fps li 36.52 cfs Ou	nflow=69.96 cfs utflow=69.89 cfs	15.625 af 15.524 af
Reach 1CR: Stream	n=0.100 L=	Avg. Flow Dep 961.0' S=0.016	th=1.83' Max \ 1 '/' Capacity=	√el=2.10 fps 115.44 cfs C	Inflow=40.59 cf Outflow=39.87 cf	s 7.413 af s 7.328 af
Reach 4R: Wetland Read	c h n=0.800 I	Avg. Flow Dep _=196.0' S=0.0	th=1.63' Max \ 195 '/' Capacit	√el=0.23 fps y=6.71 cfs C	Inflow=16.06 cf Outflow=15.67 cf	s 3.762 af s 3.692 af
Pond 1BP: 36-in HDPE C Pri	Culvert mary=69.96 cfs	Peak Elev= 15.625 af Seco	62.25' Storage ndary=0.00 cfs	e=31,347 cf li 0.000 af Ou	nflow=79.71 cfs utflow=69.96 cfs	15.625 af 15.625 af
Pond 4P: Culvert	Primary=16.06 cf	Peak Ele s 3.762 af Sec	ev=56.75' Stora ondary=0.00 cfs	nge=7,222 cf s 0.000 af O	Inflow=17.35 cf Outflow=16.06 cfs	s 3.771 af s 3.762 af
Pond AP-1: AP-1 Pri	mary=29.18 cfs	Peak Elev=6 17.358 af Seco	0.14' Storage= ndary=1.23 cfs	402,093 cf li 0.089 af Ou	nflow=93.89 cfs utflow=30.41 cfs	20.464 af 17.446 af
Pond AP-2: AP-2				Р	Inflow=54.69 cf rimary=54.69 cf	s 5.908 af s 5.908 af
Pond AP-3: AP-3	Primary=17.42 cf	Peak Ele s 5.092 af Sec	ev=50.77' Stora ondary=0.00 cfs	ge=4,105 cf s_0.000 af_0	Inflow=17.51 cf Outflow=17.42 cf	s 5.105 af s 5.092 af

ATTACHMENT E

OUTSIDE AGENCY REVIEW LETTERS





4 Blanchard Road, P.O. Box 85A Cumberland, ME 04021 Tel: 207.829.5016 • Fax: 207.829.5692 info@smemaine.com smemaine.com

August 16, 2019

John Perry, Environmental Review Coordinator Maine Department of Inland Fisheries and Wildlife 284 State Street, 41 SHS Augusta, Maine 04333-0041

Subject: Compost Gravel Pad and Salt Shed Cumberland, Maine Site Plan Review

Dear John:

The Town of Cumberland is seeking approval from the Cumberland Planning Board for a new compost and salt shed facility in Cumberland. As shown on the attached Figure 1 - Site Location Map, the property is located off Tuttle Road. The property is a 31.67-acre parcel bordered to the north, south and west by existing residential properties, to the west by the Town of Cumberland and to the east by the Maine Central Railroad Company and Guilford Trans Industries, Inc.

We would appreciate receiving any information relative to rare, threatened, or endangered species or the presence of important wildlife or fisheries habitat at or in the immediate vicinity of our project.

Should you have any questions or require additional information, please contact me. Thank you in advance for your consideration.

Sincerely,

SEVEE & MAHER ENGINEERS, INC.

Daniel P. Diffin, P.E., LEED AP BD+C Vice President/Senior Civil Engineer

Attachment





MAINE HISTORIC PRESERVATION COMMISSION 55 CAPITOL STREET 65 STATE HOUSE STATION AUGUSTA, MAINE 04333

JANET T. MILLS GOVERNOR KIRK F. MOHNEY DIRECTOR

August 21, 2019

Mr. Daniel P. Diffin Sevee & Maher Engineers PO Box 85A Cumberland, ME 04021

Project:	MHPC# 1169-19	Town of Cumberland; 290 Tuttle Road
		Relocation of Municipal Compost Facility
Town:	Cumberland, ME	

Dear Mr. Diffin:

In response to your recent request, I have reviewed the information received August 19, 2019 to initiate consultation on the above referenced project.

Based on the information provided, I have concluded that there are no National Register eligible properties on or adjacent to the parcels. In addition, the project area is not considered sensitive for archaeological resources.

Please contact Megan M. Rideout of our staff, at <u>megan.m.rideout@maine.gov</u> or 207-287-2992, if we can be of further assistance in this matter.

Sincerely,

Kieft. Mohney

Kirk F. Mohney State Historic Preservation Officer



4 Blanchard Road, P.O. Box 85A Cumberland, ME 04021 Tel: 207 829.5016 + Fax: 207.829.5692 Info@smemaine.com smemaine.com

August 16, 2019

Mr. Kirk F. Mohney, Director Maine Historic Preservation Commission 55 Capitol Street 65 State House Station Augusta, Maine 04333-0065

Subject: Town of Cumberland Compost Gravel Pad and Salt Shed 290 Tuttle Road, Cumberland, Maine

Dear Mr. Mohney:

On behalf of the Town of Cumberland, Sevee & Maher Engineers, Inc. (SME) is requesting a letter of review from the Maine Historic Preservation Commission in regard to the proposed relocation of the municipal compost facility to a site off Tuttle Road in Cumberland.

Proposed construction includes a 2-acre gravel compost pad and associated site improvements. Access to the site will be an old railroad corridor that has been decommissioned and left as gravel. Additional site development will include a gravel access drive from Tuttle Road.

A search of the National Register of Historic Places online maps showed no known historic properties or districts near the property. In addition to searching the National Register of Historic Places, records of the neighboring properties were searched for any buildings over fifty (50) years old. All properties with such buildings are listed below with photos attached and their location keyed to Figure 1, attached for your reference.

79 Corey Road (1820)

This structure is located approximately 0.44 miles from the proposed construction, across the railroad right of way from the proposed development. A picture of the property, a copy of the municipal tax card and the MHPC Historic Building/Structure Survey form are also included in the attachment.



Please feel free to contact me at 207.829.5016 or <u>dpd@smemaine.com</u> if you have any questions or need additional information.

Sincerely,

SEVEE & MAHER ENGINEERS, INC.

In

Daniel P. Diffin, P.E., LEED AP BD+C Vice President/Senior Civil Engineer

Attachments

19125 20190816mhpc.docx August 16, 2019 Page 2 of 2



MHPC USE ONLY		SURVEY MAP NAME
I D D D D D D I D I D D D D D D D D D D		
INVENTORY NO.		house a false fast becauted
	MAINE HISTORIC P Historic Buildi	PRESERVATION COMMISSION
1. PROPERTY NAME (H	STORIC):	ing on acture our cy round
2. PROPERTY NAME (O	THER):	
3. STREET ADDRESS:7	9 Corey Road	
I. TOWN: Cumberla	and	5. COUNTY: Cumberland
. DATE RECORDED:		7. SURVEYOR:
OWNER NAME:		ADDRESS:
SINGLE FA MULTI-FAM TRANSPOI RECREATI	MILY AGRICULTU IILY GOVERNME TATION DEFENSE DN/CULTURE UNKNOWN	URECOMMERCIAL/TRADEFUNERARY ENTALEDUCATIONHEALTH CARE HOTELLANDSCAPE SUMMER COTTAGE/CAMPSOCIAL
1. PRIMARY STYLISTIC COLONIAL FEDERAL GREEK RE GOTHIC RE ITALIANAT SECOND E	CATEGORY: CATEGORY: QUEEN ANNE VIVAL SHINGLE STYLE VIVAL R. ROMANESQUE E ROMANESQUE MPIRE HIGH VIC. GOTHIC	MEO-CLASSICAL REVFOUR SQUARE RENAISSANCE REVART DECO 1977/2077 C. REVIVALINTERNATIONAL ARTS & CRAFTSRANCH BUNGALOWVERNACULAR OTHER
2. OTHER STYLISTIC C. COLONIAL FEDERAL	ATEGORY: 	NEO-CLASSICAL REVFOUR SQUARE RENAISSANCE REVART DECO 19 <u>TH/20TH</u> C. REVIVALINTERNATIONAL
GREEK RE GOTHIC RE ITALIANATI SECOND E	VIVAL	ARTS & CRAFTSRANCH BUNGALOWVERNACULAR OTHER
GREEK RE GOTHIC RE ITALIANATI SECOND E 3. HEIGHT: 5 STORY	MPIRE R. ROMANESQUE ROMANESQUE MPIRE HIGH VIC. GOTHIC 11/2 STORY OVER 5 () 2 STORY	ARTS & CRAFTSRANCH BUNGALOWVERNACULAR OTHER 21/2 STORY3 STORY4 STORY
3. HEIGHT: 	Implies R. ROMANESQUE ROMANESQUE ROMANESQUE MPIRE HIGH VIC. GOTHIC Implies 11/2 STORY OVER 5 () 2 STORY IDTH (MAIN BLOCK; USE GROUND FLOCK) 3 BAY	ARTS & CRAFTSRANCH BUNGALOWVERNACULAR OTHER 21/2 STORY3 STORY4 STORY 4 STORY5 BAY MORE THAN 5 ()
4. PRIMARY FACADE W 4. APPENDAGES:	EVIVAL R. ROMANESQUE E ROMANESQUE MPIRE HIGH VIC. GOTHIC 11/2 STORY 2 STORY OVER 5 () 2 STORY IDTH (MAIN BLOCK: USE GROUND FLC 3 BAY SIDE ELL REAR ELL SIDE ELL REAR ELL DORMERS PORCH	ARTS & CRAFTSRANCH BUNGALOWVERNACULAR OTHER 21/2 STORY3 STORY4 STORY 4 STORY3 STORY4 STORY 4 STORY3 STORY4 STORY 4 STORY5 BAYMORE THAN 5 () 5 BAY5 BAYMORE THAN 5 () FRONTADDED STORIESSHED BAY WINDOW



16. PORCH: ATTACHEDENGAGEDONE STORYMORE THAN ONE STORY FULL WIDTHWRAPAROUNDSLEEPING PORCHSECONDARY PORCH
17. PLAN: HALL AND PARLOR1/2 CAPECENTRAL HALLSIDE HALL BACK HALLIRREGULAR OTHER
18. PRIMARY STRUCTURAL SYSTEM: TIMBER FRAME BRACED FRAME BRICK STONE BALLOON FRAME CONCRETE STEEL LOG PLANK WALL PLATFORM FRAME FRAME CONSTRUCTION - TYPE UNKNOWN OTHER
19. CHIMNEY PLACEMENT: INTERIORINTERIOR FRONT/REARCENTERINTERIOR ENDEXTERIOR OTHER
20. ROOF CONFIGURATION: GABLE SIDEGABLE FRONTHIPMANSARDFLAT GAMBRELPARAPET GABLESHEDCROSSGABLE COMPOUND OTHERSHEDCROSSGABLE
21. ROOF MATERIAL: WOOD METAL TILE SLATE ASPHALT ASBESTOS
22. EXTERIOR WALL MATERIALS: CLAPBOARDBRICKFLUSH SHEATHINGWOOD SHINGLESTONE LOGPRESSED METALCONCRETESTUCCOASPHALT GRANITEASBESTOSTERRA COTTABOARD AND BATTENALUMINUM/VINYL OTHER
23. FOUNDATION MATERIAL: FIELDSTONEBRICKWOODCONCRETEGRANITEORNAMENTAL CONC. BLOCK OTHER
A. OUTBUILDINGS/FEATURES: CARRIAGE HOUSE FENCE OR WALL CEMETERY BARN (DETACHED) FORMAL GARDEN LANDSCAPE/PLANT MAT. ARCHAEOLOGICAL SITE GARAGE OTHER
HISTORICAL DATA
5. DOCUMENTED DATE OF CONSTRUCTION: 26. ESTIMATED DATE OF CONSTRUCTION:
7. DATE MAJOR ADDITIONS/ALTERATIONS:
8. ARCHITECT: 29. CONTRACTOR:
8. ARCHITECT: 29. CONTRACTOR: 10. ORIGINAL OWNER:
8. ARCHITECT:
8. ARCHITECT: 29. CONTRACTOR: 10. ORIGINAL OWNER:
29. CONTRACTOR:
8. ARCHITECT: 29. CONTRACTOR: 0. ORIGINAL OWNER:
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FORM G:\KIRK\ARCH-SVY.FRM\HBSSFHD3.FRM

79 COREY ROAD

Location	79 COREY ROAD	Mblu	R03/9///
Acct#	W1880R	Owner	WORMELL LEROY C JR
Assessment	\$307,500	PID	1030

Building Count 1

Current Value

Assessment				
Valuation Year	Improvements	Land	Total	
2015	\$185,300	\$122,200	\$307,500	

Owner of Record

Owner	WORMELL LEROY C JR	Sale Price	\$240,000
Co-Owner	WORMELL CAROLE A	Certificate	
Address	184 BROOK STREET	Book & Page	19103/ 289
	WESTBROOK, ME 04092	Sale Date	03/31/2003
		Instrument	1A

Ownership History

Ownership History					
Owner	Sale Price	Certificate	Book & Page	Instrument	Sale Date
WORMELL LEROY C JR	\$240,000		19103/ 289	1A	03/31/2003
WORMELL LEROY C	\$0		3619/ 300		-

.

Building Information

Building 1 : Section 1

Year Built:	1820		
Living Area:	1,777		
Replacement Cost:	\$196,311		
Building Percent	68		
Good:			
Replacement Cost			
Less Depreciation:	\$133,500		
B	Building Attributes		
Field	Description		
Style	Conventional		
Model	Residential		
- A second se	on an and the second		

Grade:	Average
Stories:	1 Story
Occupancy	1
Exterior Wall 1	Clapboard
Exterior Wall 2	
Roof Structure:	Gable/Hip
Roof Cover	Asph/F Gls/Cmp
Interior Wall 1	Plastered
Interior Wall 2	
Interior Flr 1	Pine/Soft Wood
Interior Flr 2	Carpet
Heat Fuel	Oil
Heat Type:	Forced Air-Duc
АС Туре:	None
Total Bedrooms:	5 Bedrooms
Total Bthrms:	1
Total Half Baths:	0
Total Xtra Fixtrs:	
Total Rooms:	8 Rooms
Bath Style:	Average
Kitchen Style:	Average

Building Photo



⁽http://images.vgsi.com/photos/CumberlandMEPhotos//\00\00\

Building Layout



Building Sub-Areas (sq ft)			Legend
Code	Description	Gross Area	Living Area
BAS	First Floor	1,316	1,316
EAF	Attic, Expansion, Finished	1,316	461
FEP	Porch, Enclosed, Finished	119	0
FOP	Porch, Open, Finished	84	0
UBM	Basement, Unfinished	1,316	0
		4,151	1,777

Extra Features

Extra Features

Legend

No Data for Extra Features

Land

Land Use

Land Line Valuation

Use Code	1010	Size (Acres)	55.5
Description	Single Fam MDL-01	Frontage	0
Zone	RR1	Depth	0
Neighborhood	70	Assessed Value	\$122,200
Alt Land Appr	No		

Outbuildings

Category

Outbuildings					Legend	
Code	Description	Sub Code	Sub Description	Size	Value	Bidg #
BRN3	1 STORY W/LOFT			4000 S.F.	\$18,200	1
SHD1	SHED FRAME		an a	500 S.F.	\$1,400	1
PAT2	PATIO-GOOD			3600 S.F.	\$3,600	1
BRN1	BARN - 1 STORY			4450 S.F.	\$15,600	1
SHD1	SHED FRAME			336 S.F.	\$900	1
BRN8	POLE BARN			2880 S.F.	\$7,100	1
SHD1	SHED FRAME			1800 S.F.	\$5,000	1

Valuation History

Assessment						
Valuation Year Improvements Land Total						
2014	\$185,300	\$122,200	\$307,500			
2013	\$185,300	\$122,200	\$307,500			
2012	\$185,300	\$122,200	\$307,500			

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ATTACHMENT F

SITE PHOTOS





Site Access Facing North



Site Area Facing South

ATTACHMENT F - SITE PHOTOS Sevee & Maher Engineers, Inc. (19125) August 2019



Site Area Facing West



Site Area Facing East



Wetlands Facing Northwest of the Access Road



Wetlands Facing Northeast of the Access Road



Site Entrance Facing Southwest from Tuttle Road



Site Entrance Facing Tuttle Road

ATTACHMENT F - SITE PHOTOS Sevee & Maher Engineers, Inc. (19125) August 2019

ATTACHMENT G

MEDOT DRIVEWAY ENTRANCE PERMIT APPLICATION





4 Blanchard Road, P.O. Box 85A Cumberland, ME 04021 Tel: 207.829.5016 • Fax: 207.829.5692 info@smemaine.com smemaine.com

August 22, 2019

Mr. Anthony Fontaine, MEDOT Permit Field Specialist Maine Department of Transportation P.O. Box 358 Scarborough, ME 04074

Subject:Town of Cumberland, Compost and Sand/Salt Facility RelocationMaine DOT Driveway/Entrance Permit Application

Dear Mr. Fontaine:

On behalf of the Town of Cumberland (Town), Sevee & Maher Engineers (SME) is pleased to submit the attached Maine Department of Transportation (MEDOT) Application for a Driveway/Entrance Permit for the compost facility relocation in Cumberland. The proposed entrance to the facility from Tuttle Road is shown in Figure 1. The property is located off Tuttle Road in Cumberland on a Town owned 31.67-acre parcel. Existing residential properties border the parcel to the north and south, Town property exists to the west, respectively and to the east by the Maine Central Railroad Company Guilford Trans Industries, Inc.

The property is currently a mix of open meadow and woods within the Rural Residential 1 Zone. Proposed construction includes a 2-acre Compost Pad, an 80- by 100-foot Salt Shed, a 12,000-square-foot gravel area for brush pile storage and associated site improvements. A Site Overview Plan is attached for your reference. Proposed use of this facility is for the Town to operate a compost facility and store road salt and sand for winter operations.

Residents of the Town will be able to drop-off and pick-up compost as needed from the Compost Pad area. Proposed hours of operation of the facility to the public are Tuesday from 1 to 4 pm and Saturday from 9 am to 4 pm. Approximately one (1) employee will occupy the facility during public hours. The Town expects a maximum of 50 to 60 customers during operation hours on Saturdays. Approximately 15 users are anticipated on Tuesdays. The Compost Pad will be open from May to December.

Traffic to the salt and sand building will occur during snowstorms for loading of snowplows. The Town currently operates with nine (9) snowplows.

Proposed access to the site from Tuttle Road will be a driveway approximately 2,000 linear feet long. The gravel drive will be 22 feet wide with a 50-foot-long paved apron at the entrance to Tuttle Road. Turning radii of 25 feet are proposed at the entrance to provide safe access to the site. Existing sight distance from the entrance is in excess of 1,000 feet in each direction.



Please feel free to contact me at 207.829.5016 or <u>dpd@smemaine.com</u> if you have any questions or need additional information.

Very truly yours,

SEVEE & MAHER ENGINEERS, INC.

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Daniel Diffin, P.E., LEED AP BD+C Vice President/Senior Civil Engineer

Attachments

cc: Figure 1 – Maine Department of Transportation, Tuttle Road Site Overview Plan – Sand and Salt Buildings Application for Driveway/Entrance Permit Cumberland Tax Map R03




	DPD	8/2019	ISSUED TO CLIENT FOR REVIEW
REV.	BY	DATE	STATUS

Date Received	APPLICATION FOR DRIVEWAY/ENTRANCE PERMIT MAINE DEPARTMENT OF TRANSPORTATION					
Application No	Scarborough, ME 04070 Phone: (207)-885-7000 FAX: (207)-883-3806					
Application with Title 23 M	is hereby made to construct, change location, grade or use served by a driveway or entrance to property in accordance .R.S.A. § 704 and §705.					
	1. Land Owner's Name: Town of Cumberland Phone# 207-829-5559					
Section A Property Owner Information	2. Land Owner's Mailing Address: 290 Tuttle Road, Cumberland, ME 04021 Address Town/City State Zip Code 3. Applicant or Agent's Name: Dan Diffin, Sevee & Maher Engineers, Inc Phone # 207-829-5016 4. Applicant/Agent Mailing Address: 4 Blanchard Road, Cumberland, ME 04021 Address Town/City State Zip Code					
	5. Other contact information: N/A Work Cell N/A 6. Directions to property: From I-295 N, take Exit 10. Turn right off the exit. Turn at the second light onto Route 9 N for 9.8 miles. Turn right onto Tuttle Road. In about 0.9 mile, the site is on the right, directly across from Cumberland Crossing.					
Section B Property Location Information	7. Route No. N/A Road Name: Tuttle Road 8. North South East IWest - side of highway 9. City/Town: Cumberland County: Cumberland 10. Distance from nearest intersection: 0.1 mile Name of Intersection: Maurice Way and Tuttle (estimated in tenths of a mile) Itach Survey Data (if available) Attach Survey Data (if available) 12. Map and Lot number R3/53 (MUST provide copy of tax map) Lot prior to May 25,2002? Yes No Proposed Location of Driveway/Entrance shall be staked and flagged by applicant.					
Section C Driveway/ Entrance Information	 13. Desired width of Driveway/Entrance: 22 (feet) Type of Surface: 50 ft pavement apron, then gravel (gravel, pavement, etc.) 14. Will the development associated with this driveway/entrance have more than 10,000 square feet of impervious surface draining towards the highway? YES NO × "Impervious surfaces" are the footprint of buildings, pavement, gravel, or other low-permeability or compacted surfaces, not including natural or man-made water bodies. 15. Does your property have an existing access? X yes no (If no go to line 18) 16. If this is an existing access and you are changing its use, please describe Former railroad bed converted to a site access drive Go to Section D. 17. If this is an existing access and you are physically modifying, please describe: Adding a paved apron with 25-foot radii to provide safe access gravel = Single Family Residence = Home Business = Commercial/Industrial = Subdivision or Development = Multi-family with 5 or less units = Multifamily with more than 5 units Retail = Office = School = Business Park = Mall ✓ Dther (explain) Municipal - Town Salt Shed/Compost # employees/day # customers/day					
Section D Construction Information	19. Construction expected to begin on October 2019 and be completed on April 2020 20. Person/Company constructing entrance (date) 21. Construction contacts name To be determined					

Region 1

Cita Cleatala au	
Site Sketch or	rattach Site Plan
SFF ATTA	CHEDPLANSET
ferman in from the set of the set	

THE OWNER HEREBY AGREES

- 1) Provide, erect and maintain all necessary barricades, lights, warning signs and other devices to direct traffic safely while the work is in progress.
- 2) At no time cause the highway to be closed to traffic.
- 3) Where the drive/entrance is located within a curb, curb and gutter, and/or sidewalk section, completely remove the existing curb, curb and gutter, and/or sidewalk as may be required to create the drive/entrance and restore drainage. All driveways/entrances abutting sidewalk sections shall meet the requirements set forth in the Americans with Disabilities Act of 1990, 42 U.S.C. §§ 12132 et seq.
- 4) Obtain, deliver to site and install any culverts and/or drainage structures necessary for drainage; the size, type and length of such culverts or structures shall be as specified in the permit pursuant to 23 M.R.S.A. § 705. All culverts and/or drainage structures shall be new.
- 5) Complete construction of proposed driveway/entrance within twelve months of commencement of construction.



- 7) Not alter, without the express written consent of the MDOT, any culverts, drainage patterns or swales within MDOT right-ofway.
- 8) File a copy of the approved driveway/entrance permit with the affected municipality or LURC, as appropriate, within 5 business days of receiving the MDOT approval.
- 9) Shall construct and maintain the entrance side slopes to be no steeper than the adjacent roadway side slopes, but in no case to be steeper than 3 horizontal to 1 vertical, unless the side slope is behind existing roadway guardrail, in which case it shall be no steeper than 2 horizontal to 1 vertical.
- 10) Notify the MeDOT(in writing) of a proposed change to use served by driveway/entrance when increase in traffic flow is expected to occur. This does not exempt the need for obtaining a Traffic Movement Permit (TMP) if trip generation meets or exceeds 100 passenger car equivalents (pce) during the peak hour of the day.

FURTHER CONDITION OF THE PERMIT:

The owner shall assume the defense of, and pay all damages, fines, and penalties for which he/she shall become liable, and shall indemnify and safe harmless said Department, its representatives, agents and employees from liability, actions against all suite, claims, damages for wrongful death, personal injuries or property damage suffered by any person or association which results from the willful or negligent action or inaction of the owner/applicant/agent and in proceedings of every kind arising out of the construction and maintenance of said entrance(s), including snow removal. Nothing herein shall, nor is intended to, waive and defense, immunity or limitation of liability which may be available to the MDOT, their officers, agents or employees under the Maine Tort Claims Act or any other privileges and/or immunities provided by law.

The submission of false or misleading statements on or with this application, or the omission of information necessary to prevent statements submitted herein or herewith from being misleading, is a crime punishable under Chapter 19 of the Maine Criminal Code, and any permit issued in reliance thereon will be considered null and void without notice or further action by the Department.

Date	Filed:	August 22, 2019
		the state of the s

Signature of Applicant

werd-Signature of Owner

By signing and checking this box I hereby certify that I have been granted permission from the property owner to act in their behalf.



show "North"



ATTACHMENT H

DRAFT LANDSCAPE AGREEMENTS WITH ABUTTERS





Town of Cumberland, Maine 290 Tuttle Road Cumberland, Maine 04021 Telephone (207) 829-5559 • Fax (207) 829-2214

August 26, 2019

Tom Simmons & Zoe Gordon 135 Longwoods Road Cumberland, ME 04021

Re: Landscaping Commitment Letter

Dear Tom and Zoe,

Pursuant to our meeting at your home on Friday, August 23, 2019, the Town of Cumberland will commit to the following landscaping plan as part of the new compost, brush and sand/salt facility:

- The Town will commit \$18,000 in landscaping toward buffering your project from the new facility.
- The Town will prepare a planting of mixed hardwood and softwood trees along the two ridges identified in our August 23rd visit.
- The Town will visit the buffering site by May 15th of 2020 to look at a buffering plan and decide with you if plantings should occur in 2020 or wait until the sand/salt shed operation is built and active.
- The Town will commit to have installed, no later than June 15, 2021, the agreed upon buffer.

As we discussed, the taller the trees are, the more expensive they will be and are typically equal in purchase price to installation. For example, a \$200 tree typically requires \$200 in labor to install. The plants will all have a one year warranty and will all be installed on your property to gain the most effective buffer.

We will have a preliminary plan to you by October 1, 2019. The plan, plantings and location will require your final approval and may be altered by you up until the time of planting.

Please let me know if there is additional information that you would like to add to this commitment letter.

Sincerely,

William R. Shane Town Manager

Cc: Town Council Planning Board Chris Bolduc, Assistant Town Manager Bill Longley, Code Enforcement Officer Carla Nixon, Town Planner



TOWN OF CUMBERLAND, MAINE 290 Tuttle Road

Cumberland, Maine 04021

Telephone (207) 829-5559 • Fax (207) 829-2214

August 26, 2019

Rob and Sarah Verrier 276 Tuttle Road Cumberland, ME 04021

Re: Landscaping Commitment Letter

Dear Rob and Sarah,

Pursuant to our meeting in my office on July 25, 2019, the Town will commit to the following landscaping plan:

- Install landscaped berm per the attached diagram. Berm will be a mixture of hard and softwood plantings.
- Additional softwood (white pine) trees will be installed to complete the buffering across the rear of your property.
- Photos of the existing buffer along the access drive will be taken prior to tree removal. Should
 tree removal negatively impact the screening along your property line, additional trees will be
 planted to "fill in" any holes in the buffer created by the new construction.
- All trees will be planted on your property and will be warrantied for a period of one year.

Please review this plan and let me know if there is anything that was missed in this outline.

Thank you for you cooperation and assistance in the development of this plan.

Sincerely,

William R. Shane Town Manager

Cc: Town Council Planning Board Chris Bolduc, Assistant Town Manager Bill Longley, Code Enforcement Officer Carla Nixon, Town Planner



eventds11CU/CompositTutte Road RelocationAcadPlansBASE dwg_821001914227 PM, sim

From:	<u>Carla Nixon</u>
To:	Denny Gallaudet
Cc:	William Shane; William Longley; Christina Silberman
Subject:	RE: [External] [Cumberland ME] Compost and Salt Shed Application (Sent by Denny Gallaudet, denny.gallaudet@gmail.com)
Date:	Monday, September 9, 2019 9:48:21 AM

Thank you Denny. I will pass this along to the Planning Board. Carla

Carla Nixon, AICP Director of Planning Town of Cumberland 290 Tuttle Road Cumberland, ME 04021 (207) 829-2206 cnixon@cumberlandmaine.com

-----Original Message-----From: cmsmailer@civicplus.com [mailto:cmsmailer@civicplus.com] Sent: Saturday, September 07, 2019 10:07 AM To: Carla Nixon <cnixon@cumberlandmaine.com> Subject: [External] [Cumberland ME] Compost and Salt Shed Application (Sent by Denny Gallaudet, denny.gallaudet@gmail.com)

Hello cnixon,

Denny Gallaudet (denny.gallaudet@gmail.com) has sent you a message via your contact form (<u>https://www.cumberlandmaine.com/user/21/contact</u>) at Cumberland ME.

If you don't want to receive such e-mails, you can change your settings at <u>https://www.cumberlandmaine.com/user/21/edit</u>.

Message:

The Lands and Conservation Commission writes in opposition to the plan to relocate the Compost Operation and Salt Shed to the town owned property adjacent to the Town Forest.

This opposition is consistent with the stance the Commission took in regard to the recent plan to develop this property for senior housing and other related purposes.

The property in question is now an open meadow with significant wetlands and is the site of the butterfly garden. This use complements the use of the adjacent town forest and will be compromised severely by proposed relocations.

While we recognize the Town is operating under a tight deadline due to its agreement with the Maine Department of Environmental Protection, we lament the fact that the Commission was only allowed the briefest of opportunities to provide comment prior to the vote of the Town Council to move forward with this proposal.

If the project is to go forward, we urge that the Planning Board consider reversing the proposed positions of the Salt Shed and Compost, thus reducing the visual and other impacts of the more intrusive Salt Shed.

This email has been scanned for spam and viruses by Proofpoint Essentials. Visit the following link to report this

TOWN OF CUMBERLAND COMPOST PAD AND SAND/SALT SHED RELOCATION TUTTLE ROAD CUMBERLAND, MAINE LOCATION MAP TE LOCATION SME SEVEE & MAHER ENGINEERS ENVIRONMENTAL • CIVIL • GEOTECHNICAL • WATER • COMPLIANCE 4 Blanchard Road, PO Box 85A, Cumberland Center, Maine 04021 Phone 207.829.5016 • Fax 207.829.5692 • smemaine.com

TITLE	DWG NO
COVER SHEET	
GENERAL NOTES, LEGEND, AND ABBREVIATIONS	C-100
EXISTING CONDITIONS AND DEMOLITION PLAN	C-101
SITE OVERVIEW PLAN	C-102
SITE LAYOUT PLAN	C-103
SITE GRADING AND DRAINAGE PLAN	C-104
EROSION CONTROL PLAN	C-105
LANDSCAPE BERM GRADING AND EROSION CONTROL	C-106
GRAVEL ACCESS DRIVE PLAN AND PROFILE (SHEET 1 OF 3)	C-200
GRAVEL ACCESS DRIVE PLAN AND PROFILE (SHEET 2 OF 3)	C-201
GRAVEL ACCESS DRIVE PLAN AND PROFILE (SHEET 3 OF 3)	C-202
EROSION CONTROL NOTES AND DETAILS	C-300
SECTIONS AND DETAILS	C-301
STORMWATER MANAGEMENT PLAN - PRE-DEVELOPMENT CONDITIONS	D-100
STORMWATER MANAGEMENT PLAN - POST DEVELOPMENT CONDITIONS	D-101
BUFFER PLANTING PLAN	L-101
TOPOGRAPHIC LAND SURVEY FOR TOWN OF CUMBERLAND PROPERTY OFF TUTTLE ROAD CUMBERLAND MAINE	1





GENERAL SITE NOTES:

- 1. EXCAVATE AND STOCKPILE ON-SITE TOPSOIL. TOPSOIL IS TO REMAIN THE PROPERTY OF THE OWNER DURING CONSTRUCTION, AND SHALL NOT BE REMOVED FROM THE SITE.
- 2. PAVEMENT EDGES SHALL BE TRUE TO LINE. SAWCUT EXISTING PAVEMENT IN SMOOTH STRAIGHT LINE WHERE NEW PAVEMENT JOINS, PROVIDE TACK COAT LAYER AS SPECIFIED.
- 3. PROVIDE TRAFFIC CONTROL SIGNAGE AND STRIPING AS SHOWN AND IN ACCORDANCE WITH U.S.D.O.T. MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MDOT MOST RECENT VERSION).
- 4. EXISTING TOPOGRAPHIC INFORMATION AND SITE FEATURES FROM SURVEY PERFORMED BY BOUNDARY POINTS PROFESSIONAL LAND SURVEYING, LLC OF CUMBERLAND, MAINE, DATED 8-1-2019. TOPOGRAPHY OUTSIDE OF SURVEY LIMIT IS LIDAR FROM MAINE GIS DATA CATALOG.
- 5. WETLANDS DELINEATED BY AL FRICK ASSOCIATES, INC., DATED 6/13/16.
- 6. HORIZONTAL DATUM: MAINE NAD 83, WEST. VERTICAL DATUM: NGVD 1929.

GRADING NOTES:

- 1. ADD 4" LOAM, SEED AND MULCH TO DISTURBED AREAS UNLESS OTHERWISE NOTED. PROVIDE EROSION CONTROL MESH ON ALL SLOPES STEEPER THAN 3:1, AND ALONG DITCH CHANNELS.
- MAINTAIN TEMPORARY EROSION CONTROL MEASURES FOR THE FULL DURATION OF CONSTRUCTION. INSPECT WEEKLY 2. AND AFTER EACH STORM AND REPAIR AS NEEDED. REMOVE SEDIMENTS FROM THE SITE. PLACE IN AREA OF LOW EROSION POTENTIAL, AND STABILIZE WITH SEED AND MULCH.
- 3. PLACE TEMPORARY SOIL STABILIZATION WITHIN 7 DAYS OF INITIAL DISTURBANCE. PLACE PERMANENT SOIL STABILIZATION WITHIN 7 DAYS OF FINAL GRADING.

UTILITY NOTES:

- 1. THE ACCURACY AND COMPLETENESS OF SUBSURFACE INFORMATION IS NOT GUARANTEED. VERIFY SITE CONDITIONS INCLUDING TEST PITS FOR LOCATIONS AND INVERTS OF UTILITIES AND REPORT ANY DISCREPANCIES TO THE ENGINEER PRIOR TO PROCEEDING WITH THAT PORTION OF THE WORK.
- 2. COORDINATE WORK ON UTILITY LINES OR WITHIN ROAD RIGHT-OF-WAY WITH THE UTILITY COMPANIES AND TOWN ROAD DEPARTMENT AND STATE MDOT.
- 3. ALL PIPING AND DRAINAGE STRUCTURES SHALL BE INSTALLED IN ACCORDANCE WITH THE TOWN OF CUMBERLAND MUNICIPAL STANDARDS.

DIG SAFE NOTES:

REQUIREMENTS.

PRIOR TO EXCAVATION, VERIFY THE UNDERGROUND UTILITIES, PIPES, STRUCTURES AND FACILITIES. PROVIDE THE FOLLOWING MINIMUM MEASURES:

- 1. PRE-MARK THE BOUNDARIES OF PLANNED EXCAVATION WITH WHITE PAINT, FLAGS OR STAKES, SO UTILITY CREWS KNOW WHERE TO MARK THEIR LINES.
- 2. CALL DIG SAFE, AT 811, AT LEAST THREE BUSINESS DAYS BUT NO MORE THAN 30 CALENDAR DAYS BEFORE STARTING WORK. DO NOT ASSUME SOMEONE ELSE WILL MAKE THE CALL.
- 3. IF BLASTING, NOTIFY DIG SAFE AT LEAST ONE BUSINESS DAY IN ADVANCE.
- 4. WAIT THREE BUSINESS DAYS FOR LINES TO BE LOCATED AND MARKED WITH COLOR-CODED PAINT, FLAGS OR STAKES. NOTE THE COLOR OF THE MARKS AND THE TYPE OF UTILITIES THEY INDICATE. TRANSFER THESE MARKS TO THE AS-BUILT DRAWINGS.
- 5. CONTACT THE LANDOWNER AND OTHER "NON-MEMBER" UTILITIES (WATER, SEWER, GAS, ETC.). FOR THEM TO MARK THE LOCATIONS OF THEIR UNDERGROUND FACILITIES. TRANSFER THESE MARKS TO THE AS-BUILT DRAWINGS.
- 6. RE-NOTIFY DIG SAFE AND THE NON-MEMBER UTILITIES IF THE DIGGING, DRILLING OR BLASTING DOES NOT OCCUR WITHIN 30 CALENDAR DAYS, OR IF THE MARKS ARE LOST DUE TO WEATHER CONDITIONS, SITE WORK ACTIVITY OR ANY OTHER REASON
- 7. HAND DIG WITHIN 18 INCHES IN ANY DIRECTION OF ANY UNDERGROUND LINE UNTIL THE LINE IS EXPOSED. MECHANICAL METHODS MAY BE USED FOR INITIAL SITE PENETRATION, SUCH AS REMOVAL OF PAVEMENT OR ROCK.
- 8. DIG SAFE REQUIREMENTS ARE IN ADDITION TO TOWN, CITY, AND/OR STATE DOT STREET OPENING PERMIT
- 9. FOR COMPLETE DIG SAFE REQUIREMENTS, CALL THE PUC OR VISIT THEIR WEBSITE.
- 10. IF YOU DAMAGE, DISLOCATE OR DISTURB ANY UNDERGROUND UTILITY LINE, IMMEDIATELY NOTIFY THE AFFECTED UTILITY. IF DAMAGE CREATES SAFETY CONCERNS, CALL THE FIRE DEPARTMENT AND TAKE IMMEDIATE STEPS TO SAFEGUARD HEALTH AND PROPERTY.
- 11. ANY TIME AN UNDERGROUND LINE IS DAMAGED OR DISTURBED OR IF LINES ARE IMPROPERLY MARKED, YOU MUST FILE AN INCIDENT REPORT WITH THE P.U.C. FOR AN INCIDENT REPORT FORM VISIT WWW.STATE.ME.US/MPUC OR CALL THE PUC AT 1-800-452-4699.

TYPICAL ABBREVIATIONS:

ACCMP	ASPHALT COATED CMP	EA	EACH	NITC	NOT IN THIS CONTRACT
ACP	ASBESTOS CEMENT PIPE	EG	EXISTING GROUND OR GRADE	NTS	NOT TO SCALE
AC	ACRE	ELEC	ELECTRIC	N/F	NOW OR FORMERLY
AGG	AGGREGATE	EL	ELEVATION	NO OR #	NUMBER
ALUM	ALUMINUM	ELB	ELBOW		
APPD	APPROVED	EOP	EDGE OF PAVEMENT	OC	ON CENTER
APPROX	APPROXIMATE	EQUIP	EQUIPMENT	OD	OUTSIDE DIAMETER
ARMH	AIR RELEASE MANHOLE	EST	ESTIMATED		
ASB	ASBESTOS	EXC	EXCAVATE	PC	POINT OF CURVE
ASP	ASPHALT	EXIST	EXISTING	PD	PERIMETER DRAIN
AUTO	AUTOMATIC			PI	
AUX	AUXTITARY	FI	FIFI D INI FT	PIV	
AVE		FG	FINISH GRADE	DI	
Δ7	ΔΖΙΜΙΤΗ	FBRGI	FIBERGLASS		
		FDN	FOUNDATION		
DCCMD	DITUNINOUS CONTED CMD			PERF	
BCCMP	BITUMINOUS COATED CMP			PP	POWER POLE
BM	BENCH MARK			PSI	POUNDS PER SQUARE INCH
BIT	BITUMINOUS	FLR	FLOUR	PVC	POLYVINYL CHLORIDE
BLDG	BUILDING	FPS	FEET PER SECOND	PVMT	PAVEMENT
BOT	BOTTOM	FT OR '	FEET		
BRG	BEARING	FTG	FOOTING	OTY	OUANTITY
BV	BALL VALVE			L	20/11/11
		GA	GAUGE	RCP	REINFORCED CONCRETE PIPE
CB	CATCH BASIN	GAL	GALLON	ROW	
CEN	CENTER	GALV	GALVANIZED		
CEM LIN	CEMENT LINED	GPD	GALLONS PER DAY		
CMP	CORRUGATED METAL PIPE	GPM	GALLONS PER MINUTE	REQU	REQUIRED
CO	CLEAN OUT				RIGHT
CF	CUBIC FEET	HDPE	HIGH DENSITY POLYETHYLENE	RIE	ROUTE
CFS	CUBIC FEET PER SECOND	HORIZ	HORIZONTAL	c	
CI	CAST IRON	HP	HORSEPOWER	S S	
CL	CLASS	HYD	HYDRANT	SCH	
CONC	CONCRETE			SF	
CONST	CONSTRUCTION	ID	INSIDE DIAMETER	SHI	
CONTR	CONTRACTOR	IN OR "	INCHES		SANITARY MANHOLE
CS	CURB STOP	INV	INVERT	51	STREET
CTR	CENTER	INV EL	INVERT ELEVATION	SIA	STATION
CTS				SY	SQUARE YARD
	COPPER	LB	POUND	TAN	TANGENT
CU CV		LC	LEACHATE COLLECTION	TDH	TOTAL DYNAMIC HEAD
CI	CODIC TARD	ID	I FAK DETECTION	TEMP	TEMPORARY
D	DEGREE OF CURVE	I F		TYP	TYPICAL
DBL	DOUBLE	LOC	LOCATION		TH ICKE
DEG OR °	DEGREE	IT		UD	UNDERDRAIN
DEPT	DEPARTMENT	LI		V	
DI		мн			
	DIAMETER	MI			
		маті		VEKI	VERTICAL
				WG	WATER GATE
		MER		W/	WITH
DK	DRAIN	MIN		₩/O	WITHOUT
DWG	DRAWING	MIP	MALE IRON PIPE		WITHOUT
		MISC	MISCELLANEOUS	VD	VARD
		MON	MONUMENT	υ	IARD

SURVEYOR'S NOTES:

- TITLE. PRIOR TO EXCAVATION.
- 03'17" WEST.

- PAGE 395.

1. THIS SURVEY PLAN IS ONLY VALID IF AUTHENTIC EMBOSSED SEAL AND SIGNATURE OF CERTIFYING PROFESSIONAL APPEAR ON THE FACE OF THIS SURVEY PLAN.

2. REFERENCE IS MADE TO THE CONTRACTUAL AGREEMENT BETWEEN THE PROFESSIONAL LAND SURVEYOR AND THE CLIENT.

3. THIS SURVEY PLAN IS SUBJECT TO POSSIBLE REVISION UPON RECEIPT OF A CERTIFIED TITLE OPINION.

4. ON THE BASIS OF MY KNOWLEDGE, INFORMATION AND BELIEF I CERTIFY EXCLUSIVELY TO THE CLIENT THAT THIS SURVEY PLAN, MADE TO THE NORMAL STANDARD OF CARE, SUBSTANTIALLY CONFORMS TO THE MAINE BOARD OF LICENSURE FOR LAND SURVEYOR STANDARDS.

5. NO CERTIFICATION IS MADE TO THE EXISTENCE OR NONEXISTENCE OF HAZARDOUS SUBSTANCES, ENVIRONMENTALLY SENSITIVE AREAS, UNDERGROUND UTILITIES, UNDERGROUND STRUCTURES, ZONING REGULATIONS OR REAL ESTATE

6. DIG SAFE MUST BE CONTACTED AND CONTRACTOR SHALL FIELD VERIFY LOCATIONS AND DIMENSIONS OF ALL UTILITIES

7. THE SOURCE OF BEARINGS FOR THIS LAND SURVEY WAS MAINE STATE PLANE GRID COORDINATE SYSTEM NORTH AMERICAN DATUM OF 1983 LOCATED IN THE WEST ZONE. AREA CONVERGENCE ANGLE BETWEEN TRUE NORTH AND GRID

8. TUTTLE ROAD ORIGINALLY A 66 FOOT WIDE ROAD. CUMBERLAND COUNTY COMMISSIONER'S OFFICE IN 1926 REDEFINED THE ROAD WIDTH TO 49.5 FEET.

9. REFERENCE IS MADE TO THE PLAN ON PUBLIC RECORD AT THE C.C.C.O. IN PLAN BOOK 5, PAGE 2 AND RECORD BOOK 19,

10. THE PROPERTY SURVEYED IS DESCRIBED IN A DEED TO MAINE CENTRAL RAILROAD COMPANY FROM NANCY WYMAN DATED 11-2-1870 RECORDED IN THE CUMBERLAND COUNTY REGISTRY OF DEEDS IN BOOK 381 PAGE 301.

11. REFERENCE IS MADE TO RIGHT OF WAY AND TRACK MAP MAINE CENTRAL R.R. OPERATED BY THE MAINE CENTRAL RAILROAD COMPANY STATION 211+20 TO STATION 264+00 DATED JUNE 30, 1916 FILE V.I./5.

12. REFERENCE IS MADE TO RIGHT OF WAY AND TRACK MAP MAINE CENTRAL R.R. OPERATED BY THE MAINE CENTRAL RAILROAD COMPANY STATION 264+20 TO STATION 316+80 DATED JUNE 30, 1916 FILE V.I./6.

13. REFERENCE IS MADE TO STANDARD BOUNDARY SURVEY PLAN OF LAND ON LONGWOODS ROAD (ROUTE 9) IN CUMBERLAND, MAINE FOR HUGH & PAMELA HARWOOD DATED 9-24-1988 BY DANIEL LAPOINTE RLS 1183.

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		DPD	8/2019	ISSUED FOR PLANNING BOARD REVIEW
	REV.	BY	DATE	STATUS

LEGEND PROPOSED EXISTING PROPERTY LINE SETBACK LINE ____ ___ ___ ___ MONUMENT • IRON PIPE IRON ROD DRILL HOLE BUILDING EDGE OF PAVEMENT _____ _____100 _____ EDGE OF GRAVEL CONTOUR _____100 _____ 114.23 SPOT GRADE FENCE _____X _____ _____X _____ STORM DRAIN ______SD_____ _____ CULVERT 1 CATCH BASIN UTILITY POLE \mathcal{O} OVERHEAD UTILITY _____ OHU — RIPRAP _____ · ____ · ____ · ____ · ____ WETLAND LIMIT علاد علاد علاد علاد علاد WETLAND AREA علاد علاد علاد علاد علاد STREAM ____ · · · ____ · · · ____ · · · ____ TREELINE \sim TREES EROSION CONTROL LEGEND _____SF _____ SILT FENCE STONE CHECK DAM STABILIZED ENTRANCE





50	o o			100		200 FEI

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REV.	BY	DATE	STATUS



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REV.	BY	DATE	STATUS



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REV.	BY	DATE	STATUS



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REV.	BY	DATE	STATUS





AND COMPACT EXISTING SUBGRADE (TYP)



	DPD	8/2019	ISSUED FOR PLANNING BOARD REVIEW
REV.	BY	DATE	STATUS



- 1. EXISTING PROPERTY BOUNDARY FROM PLAN ENTITLED "EXISTING CONDITIONS SURVEY FOR TOWN OF CUMBERLAND OF LAND PROCURED OFF TUTTLE ROAD CUMBERLAND MAINE" PREPARED BY BOUNDARY POINTS PROFESSIONAL LAND SURVEYING, LLC, DATED 12-7-2015. SEE DWG C-100 FOR SURVEYOR'S NOTES.
- 2. SEE DWG C-100 FOR GENERAL NOTES, LEGENDS AND ABBREVIATIONS.
- 3. ALL SITE AND CONSTRUCTION ACTIVITIES SHALL BE IN COMPLIANCE WITH MEDEP BEST MANAGEMENT PRACTICES AND EXISTING FEDERAL, STATE, AND LOCAL PERMITS AND PERMITTING REQUIREMENTS FOR THE SITE.

LANDSCAPE BERM SECTION

	WITE OF MILLA	TOWN OF CUMBERLAN	D
	DANIEL T	COMPOST PAD AND SAND/SALT SHEI	D RELOCATION
	P. DIFFIN 11841	TUTTLE ROAD	
		CUMBERLAND, MAINE	
	ENGENGED WELLIN	LANDSCAPE BERM GRAD	ING
		AND EROSION CONTRO) DL
		SME -	DESIGN BY: JTR
			DRAWN BY: SJM
			DATE: 8/2019
		ENVIRONMENTAL • CIVIL • GEOTECHNICAL • WATER • COMPLIANCE	CHECKED BY: BDP
		4 Blanchard Road, PO Box 85A, Cumberland, Maine 04021	LMN: BERM
		Phone 207.829.5016 • Fax 207.829.5692 • smemaine.com	CTB: SME-STD
		JOB NO. 19125.00 DWG FILE BASE	C-106



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REV.	BY	DATE	STATUS









	DPD	8/2019	ISSUED FOR PLANNING BOARD REVIEW
REV.	BY	DATE	STATUS





GRAVEL ACCESS DRIVE CENTERLINE LAYOUT TABLES

NG	DISTANCE	CURVE	ARC LENGTH	RADIUS	DELTA ANGLE	CHORD BEARING	CHORD LENGTH
)5" W	543.55'	C1	7.90'	500.00'	0°54'19"	S 21°24'14" W	7.90'
24" W	292.91'	C2	23.44'	500.00'	2°41'09"	S 20°30'49" W	23.44'
.5" W	373.28'	C3	25.29'	500.00'	2°53'52"	S 20°37'11" W	25.29'
)7" W	650.78'	C4	68.63'	300.00'	13°06'26"	S 28°37'20" W	68.48'
21 14/	112 40'						

	DPD	8/2019	ISSUED FOR PLANNING BOARD REVIEW
REV.	BY	DATE	STATUS

TE OF MARA	TOWN OF CUMBERLAN	
DANIEL T	COMPOST PAD AND SAND/SALT SHE	J RELOCATION
	TUTTLE ROAD	
Pp [1841	CUMBERLAND, MAINE	
EL CENSED INCLUT	GRAVEL ACCESS DRIVE PLAN AND) PROFILE
MAL L'INT	(SHEET 3 OF 3)	
	SME -	DESIGN BY: JTR
		DRAWN BY: SJM
	ENGINEERS	DATE: 7/2019
	ENVIRONMENTAL • CIVIL • GEOTECHNICAL • WATER • COMPLIANCE	CHECKED BY: BDP
	4 Blanchard Road, PO Box 85A, Cumberland, Maine 04021	LMN: PLANPROF
	Phone 207.829.5016 • Fax 207.829.5692 • smemaine.com	CTB: SME-STD
	JOB NO. 19125.00.00 DWG FILE BASE	C-202

EROSION CONTROL NOTES:

A. GENERAL

- 1. All soil erosion and sediment control will be done in accordance with: (1) the Maine Erosion and Sediment Control Handbook: Best Management Practices, Maine Department of Environmental Protection (MEDEP), October 2016.
- 2. The site Contractor (to be determined) will be responsible for the inspection and repair/replacement/maintenance of all erosion control measures, disturbed areas, material storage areas, and vehicle access points until all disturbed areas are stabilized.
- 3. Disturbed areas will be permanently stabilized within 7 days of final grading. Disturbed areas not to be worked upon within 14 days of disturbance will be temporarily stabilized within 7 days of the disturbance.
- 4. In all areas, removal of trees, bushes and other vegetation, as well as disturbance of topsoil will be kept to a minimum while allowing proper site operations.
- 5. Any suitable topsoil will be stripped and stockpiled for reuse as directed by the Owner. Topsoil will be stockpiled in a manner such that natural drainage is not obstructed and no off-site sediment damage will result. In any event, stockpiles will not be located within 100 feet of wetlands and will be at least 50 feet upgradient of the stockpile's perimeter silt fence. The sideslopes of the topsoil stockpile will not exceed 2:1. Silt fence will be installed around the perimeter of all topsoil stockpiles. Topsoil stockpiles will be surrounded with siltation fencing and will be temporarily seeded with Aroostook rye, annual or perennial ryegrass within 7 days of formation, or temporarily mulched.
- 6. Winter excavation and earthwork will be completed so as to minimize exposed areas while satisfactorily completing the project. Limit exposed areas to those areas in which work is to occur during the following 15 days and that can be mulched in one day. All areas will be considered denuded until the subbase gravel is installed in roadway areas or the areas of future loam and seed have been loamed, seeded, and mulched.

Install any added measures necessary to control erosion/sedimentation. The particular measure used will be dependent upon site conditions, the size of the area to be protected, and weather conditions.

To minimize areas without erosion control protection, continuation of earthwork operations on additional areas will not begin until the exposed soil surface on the area being worked has been stabilized.

B. TEMPORARY MEASURES

1. STABILIZED CONSTRUCTION ENTRANCE/EXIT

A crushed stone stabilized construction entrance/exit will be placed at any point of vehicular access to the site, in accordance with the detail shown on this sheet.

- 2. SILT FENCE
- a. Silt fence will be installed prior to all construction activity, where soil disturbance may result in erosion. Silt fence will be erected at locations shown on the plans and/or downgradient of all construction activity.
- b. Silt fences will be removed when they have served their useful purpose, but not before the upgradient areas have been permanently stabilized.
- c. Silt fences will be inspected immediately after each rainfall and at least daily during prolonged rainfall. They will be inspected if there are any signs of erosion or sedimentation below them. Any required repairs will be made immediately. If there are signs of undercutting at the center or the edges, or impounding of large volumes of water behind them, they will be replaced with a temporary crushed stone check dam.
- d. Sediment deposits will be removed after each storm event if significant build-up has occurred or if deposits exceed half the height of the barrier
- 3. STONE CHECK DAMS

Stone check dams will be installed in grass-lined swales and ditches during construction. Remove stone check dams when they have served their useful purpose, but not before upgradient areas have been permanently stabilized.

- 4. EROSION CONTROL MIX SEDIMENT BARRIER
- a. Where approved, erosion control mix sediment barriers may be used as a substitute for silt fence. See the details in this drawing set for specifications.
- b. Rock Filter Berms: To provide more filtering capacity or to act as a velocity check dam, a berm's center can be composed of clean crushed rock ranging in size from the french drain stone to riprap.
- 5. TEMPORARY SEEDING

Stabilize disturbed areas that will not be brought to final grade and reduce problems associated with mud and dust production from exposed soil surface during construction with temporary vegetation.

6. TEMPORARY MULCHING

Use temporary mulch in the following locations and/or circumstances:

- In sensitive areas (within 100 feet of streams, wetlands and in lake watersheds) temporary mulch will be applied within 7 days of exposing spill or prior to any storm event.
- Apply temporary mulch within 14 days of disturbance or prior to any storm event in all other areas.
- Areas which have been temporarily or permanently seeded will be mulched immediately following seeding.
- Areas which cannot be seeded within the growing season will be mulched for over-winter protection and the area will be seeded at the beginning of the growing season.
- Mulch can be used in conjunction with tree, shrub, vine, and ground cover plantings.
- Mulch anchoring will be used on slopes greater than 5 percent in late fall (past October 15), and over-winter (October 15 - April 15).

The following materials may be used for temporary mulch:

- a. Hay or Straw material shall be air-dried, free of seeds and coarse material. Apply 2 bales/1,000 sf or 1.5 to 2 tons/acre to cover 90% of ground surface.
- b. Erosion Control Mix: It can be used as a stand-alone reinforcement:
- on slopes 2 horizontal to 1 vertical or less; on frozen ground or forested areas; and
- at the edge of gravel parking areas and areas under construction.
- c. Erosion control mix alone is not suitable:
- on slopes with groundwater seepage; • at low points with concentrated flows and in gullies;
- at the bottom of steep perimeter slopes exceeding 100 feet in INMTth;
- below culvert outlet aprons; and around catch basins and closed storm systems.
- d. Chemical Mulches and Soil Binders: Wide ranges of synthetic spray-on materials are marketed to protect the soil surface. These are emulsions that are mixed with water and applied to the soil. They may be used alone, but most often are used to hold wood fiber, hydro-mulches or straw to the soil surface.

- e. Erosion Control Blankets and Mats: Mats are manufactured combinations of mulch and netting designed to retain soil moisture and modify soil temperature. Dur growing season (April 15 to October 15) use mats indicated on drawings or N
- American Green (NAG) S75 (or mulch and netting) on: the base of grassed waterways;
- steep slopes (15 percent or greater); and
- any disturbed soil within 100 feet of lakes, streams, or wetlands.

During the late fall and winter (October 15 to April 15) use heavy grade mats indic drawings for NAG SC250 on all areas noted above plus use lighter grade mats NAG (or mulch and netting) on:

 sideslopes of grassed waterways; and moderate slopes (between 8 and 15 percent).

C. TEMPORARY DUST CONTROL

To prevent the blowing and movement of dust from exposed soil surfaces, and redu presence of dust, use water or calcium chloride to control dusting by preserving the moisture level in the road surface materials.

D. CONSTRUCTION DE-WATERING

- 1. Water from construction de-watering operations shall be cleaned of sediment be reaching wetlands, water bodies, streams or site boundaries. Utilize temporary se basins, erosion control soil filter berms backed by staked hay bales, A Dirt Bag 55 sediment filter bag by ACF Environmental, or other approved Best Management Practices (BMP's).
- 2. In sensitive areas near streams or ponds, discharge the water from the de-water operation into a temporary sediment basin created by a surrounding filter berm uncompacted erosion control mix immediately backed by staked hay bales (see the details). Locate the temporary sediment basin at lease 100 feet from the nearest body, such that the filtered water will flow through undisturbed vegetated soil and prior to reaching the water body or property line.

E. PERMANENT MEASURES

- 1. Riprapped Aprons: All storm drain pipe outlets and the inlet and outlet of culvert have riprap aprons to protect against scour and deterioration.
- 2. Topsoil, Seed, and Mulch: All areas disturbed during construction, but not subject other restoration (paving, riprap, etc.) will be loamed, limed, fertilized, seeded, a mulched.

Seeded Preparation: Use stockpiled materials spread to the depths shown on the available. Approved topsoil substitutes may be used. Grade the site as needed.

a. Seeding will be completed by August 15 of each year. Late season seeding m done between August 15 and October 15. Areas not seeded or which do not satisfactory growth by October 15, will be seeded with Aroostook Rye or mulc After November 1, or the first killing frost, disturbed areas will be seeded at de the specified application rates, mulched, and anchored.

PERMANENT SEEDING SPECIFICATIONS

Mixture:	Roadside (lbs/acre)	Lawn (lbs/acre)
Kentucky Bluegrass	20	55
White Clover	5	0
Creeping Red Fescue	20	55
Perennial Ryegrass	5	15

b. Mulch in accordance with specifications for temporary mulching.

- c. If permanent vegetated stabilization cannot be established due to the season year, all exposed and disturbed areas not to undergo further disturbance are t dormant seeding applied and be temporarily mulched to protect the site.
- 3. Ditches and Channels: All ditches on-site will be lined with North American Gree erosion control mesh (or an approved equal) upon installation of loam and seed.
- F. WINTER CONSTRUCTION AND STABILIZATION
- 1. Natural Resource Protection: During winter construction, a double-row of sedime barriers (i.e., silt fence backed with hay bales or erosion control mix) will be place between any natural resource and the disturbed area. Projects crossing the natu resource will be protected a minimum distance of 100 feet on either side from the resource.
- 2. Sediment Barriers: During frozen conditions, sediment barriers may consist of en control mix berms or any other recognized sediment barriers as frozen soil preve proper installation of hay bales or silt fences.
- 3. Mulching:
 - All areas will be considered to be denuded until seeded and mulched. Have straw mulch will be applied at a rate of twice the normal accepted rate.
 - Mulch will not be spread on top of snow.
 - After each day of final grading, the area will be properly stabilized with an hay or straw or erosion control matting.
 - Between the dates of November 1 and April 15, all mulch will be anchored either mulch netting, emulsion chemical, tracking or wood cellulose fiber.
- 5. Soil Stockpiling: Stockpiles of soil or subsoil will be mulched for over-winter prot with hay or straw at twice the normal rate or with a 4-inch layer of erosion control This will be done within 24 hours of stocking and re-established prior to any rain snowfall. Any soil stockpiles shall not be placed (even covered with mulch) withi feet from any natural resources.
- 6. Seeding: Dormant seeding may be placed prior to the placement of mulch or erc control blankets. If dormant seeding is used for the site, all disturbed areas will 4 inches of loam and seed at an application rate of three times the rate for perma seeding. All areas seeded during the winter will be inspected in the spring for ad catch. All areas insufficiently vegetated (less than 75 percent catch) will be rever by replacing loam, seed, and mulch.

If dormant seeding is not used for the site, all disturbed areas will be revegetated in the spring.

- 7. Maintenance: Maintenance measures will be applied as needed during the entire construction season. After each rainfall, snow storm, or period of thawing and ru and at least once a week, the site Contractor will perform a visual inspection of a installed erosion control measures and perform repairs as needed to ensure their continuous function.
- 8. Identified repairs will be started no later than the end of the net work day and be completed within seven (7) calendar days.

Following the temporary and/or final seeding and mulching, the Contractor will, in spring, inspect and repair any damages and/or bare spots. An established vegetat cover means a minimum of 85 to 90 percent of areas vegetated with vigorous grow

G. OVER-WINTER CONSTRUCTION EROSION CONTROL MEASURES

1. Stabilization of Disturbed Soil: By October 15, all disturbed soils on areas having a slope less than 15 percent will be seeded and mulched. If the Contractor fails to stabilize these soils by this date, then the Contractor shall stabilize the soil for late fall and winter, by using either temporary seeding or mulching.

ıring the Iorth	 Stabilization of Disturbed Slopes: All slopes to be vegetated will be completed by October 15. The Owner will consider any area having a grade greater than 15 percent (6.5H:1V) to be a slope. Slopes not vegetated by October 15 will receive one of the following actions to stabilize the slope for late fall and winter: 	
cated on G S75	a. Stabilize the soil with temporary vegetation and erosion control mesh.b. Stabilize the slope with erosion control mix.c. Stabilize the slope with stone riprap.	
5	 Stabilization of Ditches and Channels: All stone-lined ditches and channels to be used to convey runoff through the winter will be constructed and stabilized by November 15. Grass-lined ditches and channels will be complete by September 15. Grass-lined ditches not stabilized by September 15 shall be lined with either sod or riprap. 	ELEVATION
uce the	H. MAINTENANCE PLAN	
fore	 Routine Maintenance: Inspection will be performed as outlined in the project's Erosion Control Plan. Inspection will be by a qualified person during wet weather to ensure that the facility performs as intended. Inspection priorities will include checking erosion controls for accumulation of sediments. 	ANCHOR BOTTOM OF FENCE IN TRENCH WITH EXCAVATED MATERIAL.
ediment	I. Housekeeping	Man I have a Marken har
ring	1. Spill prevention. Controls must be used to prevent pollutants from being discharged from materials on site, including storage practices to minimize exposure of the materials to stormwater, and appropriate spill prevention, containment, and response planning and implementation.	
he site t water reas	2. 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 an 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.	SECTION OVER <u>NOTE:</u> CONTRACTORS OPTION TO USE SEDIMENT BARRIER OR SILT FENCE FOR SLOPE PROTECTION.
ts will ect to and	3. 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. If off-site tracking occurs roadways should be swept immediately and no loss once a week and prior to significant storm events.	1' MIN FLOW
plans, if	4. Debris and other materials. Litter, construction debris, and chemicals exposed to stormwater must be prevented from becoming a pollutant source.	EROSION CONTROL MIX SEDIMENT BARR
nay be obtain ched. double	5. Trench or foundation de-watering. Trench 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 must be removed from the ponded area, either through gravity or pumping, and 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.	NOTES: 1. EROSION CONTROL MIX CAN BE MANUFACTURED ON OR OFF THE SITE. IT MUST CONSIST PRIMA POINT OF GENERATION, AND MAY INCLUDE: SHREDDED BARK, STUMP GRINDINGS, COMPOSTED E GENERATED FROM WATER-FLUME LOG HANDLING SYSTEMS. WOOD CHIPS, GROUND CONSTRUCTION DEBRIS, REPROCESSED WOOD PRODUCTS OR BARK CHIP COMPONENT OF THE MIX. EROSION CONTROL MIX SHALL CONTAIN A WELL-GRADED MIXTURE OF PARTICLE SIZES AND MAY EROSION CONTROL MIX SHALL CONTAIN A WELL-GRADED MIXTURE OF PARTICLE SIZES AND MAY EROSION CONTROL MIX MUST BE FREE OF REFUSE, PHYSICAL CONTAMINANTS, AND MATERIAL TO THE MIX COMPOSITION SHALL MEET THE FOLLOWING STANDARDS: A. ORGANIC MATERIAL: BETWEEN 20% - 100% (DRY WEIGHT BASIS) B. PARTICLE SIZE: BY WEIGHT, 100% PASSING 6" SCREEN, 70-85% PASSING 0.75" SCREEN
	 6. 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: (a) Discharges from firefighting activity: 	 C. THE ORGANIC PORTION NEEDS TO BE FIBROUS AND ELONGATED. D. LARGE PORTIONS OF SILTS, CLAYS OR FINE SANDS ARE NOT ACCEPTABLE IN THE MIX. E. SOLUBLE SALTS CONTENT SHALL BE LESS THAN 4.0 MMHOS/CM. F. PH: 5.0 - 8.0 2. ON SLOPES LESS THAN 5% OR AT THE BOTTOM OF SLOPES 2:1 OR LESS UP TO 20 FEET LONG, TH DIMENSIONS. ON THE LONGER OR STEEPER SLOPES, THE BARRIER SHOULD BE WIDER TO ACCOM 3. THE BARRIER MUST BE PLACED ALONG A RELATIVELY LEVEL ELEVATION. IT MAY BE NECESSARY TO A VOID CREATING VOIDS AND PRIOSES THAT WOULD FINANCE TO WASH UNDER THE BARRIER FOR STATUST IN THE PRIOSE AND PRIOSES.
of the	(a) Discharges from firefighting activity;(b) Fire bydrant fluchings;	TO AVOID CREATING VOIDS AND BRIDGES THAT WOULD ENABLE FINES TO WASH UNDER THE BA STEMS.
to have n S75	 (c) Vehicle washwater if detergents are not used and washing is limited to the exterior of vehicles (engine, undercarriage and transmission washing is prohibited); (d) Dust control runoff in accordance with permit conditions and Appendix (C)(2); 	 4. LOCATIONS WHERE OTHER BMP'S SHOULD BE USED: A. AT LOW POINTS OF CONCENTRATED FLOW r B. BELOW CULVERT OUTLET APRONS C. WHERE A PREVIOUS STAND-ALONE EROSION CONTROL MIX APPLICATION HAS FAILED D. AT THE BOTTOM OF STEEP PERIMETER SLOPES THAT ARE MORE THAN 50 FEET FROM TOP UPGRADIENT WATERSHED)
	 (e) Routine external building washdown, not including surface paint removal, that doe not involve detergents; 	 E. AROUND CATCH BASINS AND CLOSED STORM DRAIN SYSTEMS. 5. THE EROSION CONTROL MIX BARRIERS SHOULD BE INSPECTED REGULARLY AND AFTER EACH LAF OF BERM IMMEDIATELY BY REPLACING OR ADDING ADDITIONAL MATERIAL PLACED ON THE BERM
ent æd ural	(f) Pavement washwater (where spills/leaks of toxic or hazardous materials have no occurred, unless all spilled material had been removed) if detergents are not used;	 6. IT MAY BE NECESSARY TO REINFORCE THE BARRIER WITH SILT FENCE OR STONE CHECK DAMS IF IMPOUNDMENT OF LARGE VOLUMES OF WATER. 2. SEDIMENT DEPOSITE CHOILE DEPOSITE CHOILE DEPOSITE THE ADDRED VIEW A
	(g) Uncontaminated air conditioning or compressor condensate;	 SEDIMENT DEPOSITS SHOULD BE REMOVED WHEN THEY REACH APPROXIMATELY ONE-HALF THEY REPLACE SECTIONS OF BERM THAT DECOMPOSE, BECOME CLOGGED WITH SEDIMENT OR OTHERV
rosion ents the	(h) Uncontaminated groundwater or spring water;	SHOULD BE RESHAPED AS NEEDED. 9 FROSION CONTROL MIX BARRIERS CAN BE LEFT IN PLACE AFTER CONSTRUCTION ANY SEDIMENT
	(i) Foundation or footer drain-water where flows are not contaminated;	IS NO LONGER REQUIRED SHOULD BE SPREAD TO CONFORM TO THE EXISTING GRADE AND BE SE BE PLANTED INTO THE BARRIERS, OR THEY CAN BE OVER-SEEDED WITH LEGUMES. IF THE BARRIED
	(j) Uncontaminated excavation dewatering (see requirements in Appendix C(5));	
y and	(k) Potable water sources including waterline flushings; and	NTS
chored	(I) Landscape irrigation.	
l by	7. Unauthorized non-stormwater discharges . The Department's approval under this Chapter does not authorize a discharge that is mixed with a source of non_stormwater, other than those discharges in compliance with Appendix C (6). Specifically, the Department's approval does not authorize discharges of the following:	
ection ol mix. fall or	(a) Wastewater from the washout or cleanout of concrete, stucco, paint, form releas oils, curing compounds or other construction materials;	e
in 100	(b) Fuels, oils or other pollutants used in vehicle and equipment operation an maintenance;	d data and the second data and
osion receive	(c) Soaps, solvents, or detergents used in vehicle and equipment washing; and	
	(d) Toxic or hazardous substances from a spill or other release.	
getated	8. Additional requirements. Additional requirements may be applied on a site-specific basis	
	J. CONSTRUCTION SEQUENCE	
e unoff <i>.</i>	In general, the expected sequence of construction for each phase is provided below. Construction is proposed to start in and end in 2019.	
, r	 Install temporary erosion control measures Clearing and grubbing Site Grading Site stabilization, pavement, loam and seed, and landscaping 	
e	Remove erosion control measures	
the tive wth.		

	DPD	8/2019	ISSUED FOR PLANNING BOARD REVIEW
REV.	BY	DATE	STATUS



JOB NO. 19125.00 DWG FILE DETAILS



	DANIEL P. DANIEL TTI P. DIFFIN 11841 DS/ONAL ENOMAL	TOWN OF CUMBERLAND COMPOST PAD AND SAND/SALT SHED RELOCATION TUTTLE ROAD CUMBERLAND, MAINE	
		SECTIONS AND DETAILS	
		SME -	DESIGN BY: JTR
			DRAWN BY: SJM
		ENGINEERS	DATE: 7/2019
		ENVIRONMENTAL • CIVIL • GEOTECHNICAL • WATER • COMPLIANCE	CHECKED BY: BDP
		4 Blanchard Road, PO Box 85A, Cumberland, Maine 04021	LMN: NONE
		Phone 207.829.5016 • Fax 207.829.5692 • smemaine.com	CTB: SME-STD
		10B NO. 19125 00 DWG FILE DETAILS	C-301

	DAT	8/2019	ISSUED FOR PLANNING BOARD REVIEW
REV.	BY	DATE	STATUS

