From:	James Seymour
To:	Hediger, David; Carr, Tim; Owens McCullough; Remi McDonald
Cc:	Godsoe, Benjamin
Subject:	RE: [External] LUPC SP4103 Review Request
Date:	Friday, October 30, 2026 4:31:18 PM
Attachments:	image001.png image002.png 2026-10-30_260393 Loaf Land Subdivision (SP4103) Final Comment Response Memorandum STI.pdf

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David and Tim,
Remi and I reviewed questions associated with the Loaf Subdivision, and tried to answer as precisely and in as short form as possible.
I think we understood the situation and explanations you were looking for as you proceeded to the next level of public discussion. Without getting deeply technical I think we have achieved that.

Please understand that the HydroCad model is just that, a model, and as with any model it is based on best engineering estimations and assumptions. Within the model there are conservative factors that are applied, and we find that these models are very good and usually produce results which actually exceed rates or conditions that are normally witnessed in real time conditions.

As with any model they are dependent on the data input, and engineer's measurements of flow length soil conditions , slopes and land areas. While there can be minor differences with any engineering design, we agree with the assumptions, and strategy applied, and can also agree with the results as presented. HydroCad is a well respected Stormwater model based on TR-55 and TR-20 methodology as was historically used for to assess peak flow rates for small watersheds by the US Government, and the HydroCad model has expanded on many Best Management Practices (BMP's) and utilize precipitation data as periodically updated and required by State and Federal agencies.

Please see the attached memo for your consideration.
Should you need additional inputs or explanation please reach back, and we will define or refine, as necessary .

TY

James Seymour, PE Western and Lakes Region/Sr. Manager

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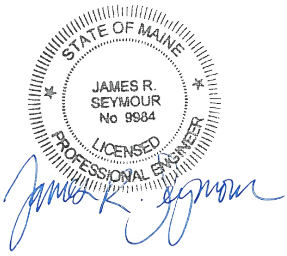
Review Memorandum

To: **Tim Carr – Acting Chief Planner**
David Hediger – Senior Planner
Land Use Planning Commission
22 State House Station
Augusta, Maine 04333-0022

From: **James R. Seymour, P.E. - Sebago Technics, Inc.**

Date: **October 30, 2026**

Subject: **LUPC Stormwater Review (Application #: SP 4103)**



Project: **Loaf Land Subdivision (STI # 260393)**
Mountain Road and Hedgehog Trail
Coplin Plantation, Tax Map 7 Lots 2 and 12 (D-RS)

Applicant: **Loaf Land Development, LLC.**

I. Project Description & Background

On October 28, Sebago Technics, Inc. (Sebago) received revised application materials for a 24.5 -acre subdivision located in Coplin Plantation in Franklin County, Maine by Maine-Land Development Consultants (MLDC), Inc. The revised materials include the following:

- A comment response memorandum dated October 7, 2026, prepared by Emily Hastings of MLDC.
- A revised HydroCAD report analyzing peak flows from the proposed project to Lot 7-12 (Fish/Burch property) as well as the capacity of the culverts that cross the proposed road.
- Nine revised plan sheets dated October 10, 2026, prepared by MLDC.

In addition to the above materials, Sebago also received a document by email from Tim Carr on October 20, 2026, containing questions related to the review of the stormwater modeling and the overall methodology of HydroCAD and TR-55 used in small watershed analysis.

II. Technical Review

The following sections outline compliance with the Maine Department of Environmental Protection (MDEP) Best Management Practices (BMP) Manual and LUPC Chapter 10 regulations. The most recent review memorandum from Sebago Technics, Inc. dated September 30, 2026, found that MLDC had generally addressed the comments on the project related to phosphorus management and the general plans/engineering of the

project and, as such, this comment letter shall focus on the few outstanding comments from Sebago and the modeling question document from the LUPC.

III. Assessment and Recommendations for Improvements to reduce Phosphorus Export:

We offer the following comments on the revised phosphorus treatment plan and MDEP worksheet calculations:

2. Since the applicant is proposing to use structural BMPs to meet the phosphorus standards, the BMPs should also meet the design requirements of the BMP manual in general. We offer the following comments on the underdrained soil filters design:

    c. Filter Ponds 2 & 3 do not show sediment forebays for the secondary swales entering the pond. The sediment forebay for the secondary swale entering Filter Pond 4 appears to be missing the callout on Plan Sheet C6.4

    MLDC Response: Provided updated plans sheets C6.1 through C6.4

    Sebago Response: No further comment.

IV. General Plan/Engineering comments:

1. We have reviewed the HydroCAD analysis performed by the applicant and we agree with the general methodology and findings of the analysis. Below are comments to address minor inconsistencies in the model:

    a. The total areas printed on pages 2 and 3 of the HydroCAD report are roughly double the size of the study area. We believe this is likely due to including in the pre- and post- development in the same report printout. These should be printed independently to be able to properly compare the area and land coverage in the pre- and post-development state.

    MLDC Response: Provided revised Entrance Analysis Pre- & Post Development HydroCAD.

    Sebago Response: No further comment.

    b. The culverts should be labeled on the on Sheet D3.2 “Entrance Drainage Analysis Post-Development” to match the node names in HydroCAD for clarity.

    MLDC Response: Provided revised Plan Sheet D3.2

    Sebago Response: No further comment.

c. The defined storage for the inlet of The Mountain Road cross culvert starts at elevation 1,309 which is a foot above the invert of the culvert at elevation 1,308. The designer should verify that this is the intended inlet condition.

Sebago Response: It appears that the Mountain Road cross culvert has been removed in the revised plans therefore this comment no longer applies.

d. The cross culverts for Mountain Village Road at STA 2+75 and 8+80 are depicted on the plans as 15" culverts but are modeled as 18" culverts in HydroCAD. The designer should confirm which is correct and that there is adequate cover over the pipes. Additionally, the culvert at STA 2+75 would likely be flowing full in the 25-year event if the intended size is 15".

MLDC Response: Provided revised culvert modeling at the 25-year storm for Mountain Village Road station 2+75, 7+45, and 8+80.

Sebago Response: No further comment

e. The cross culverts for Mountain Village Road at STA 7+45 and STA 8+80 do not have their secondary overflow spillway modeled like the rest of the culverts.

MLDC Response: Provided revised culvert modeling at the 25-year storm for Mountain Village Road station 2+75, 7+45, and 8+80.

Sebago Response: No further comment.

V. LUPC Stormwater Modeling Questions:

- Does the analysis capture all the drainage from Lot 7-12 going to the Fish/Burch property?

Sebago Response: Yes, the watersheds depicted on Plan Sheets D3.1 and D3.2 appear to have been delineated by dividing ridge lines in the existing topography and capturing the area that is proposed to be altered due to the development.

- Does the analysis sufficiently address this comment from Sebago:

"We can decipher from the pond discharge in Hydrocad sheets included, that the larger flooding flows exit on the westerly side of the pond and discharge into an offsite wet area on the abutting property (Fish Jr and Jenny Burch land) which does by the ACME Land Surveying, LLC plan indicates by the topography provided. In principle we agree with the improvements but need calculations, evidence, and engineering statement that the discharge point does not negatively impact downstream landowners, then currently in the existing condition."

Sebago Response: The HydroCAD analysis shows that the runoff onto the abutting property will be less in the proposed condition for the 25-year storm event. It is up to the determination of the LUPC if the 25-year event is adequate for proving flooding control measures as some municipalities require up to the 50-year event with the Maine DOT using the 50-year event for open systems. Additionally, the location of the emergency spillway should be verified to be directed away from the existing downstream structure on the Fish/Burch Lot as it is not depicted on the plans.

- Does the text below accurately summarize the Applicant's analysis of stormwater drainage to Lot 7-10 (the Entrance Analysis)? The intent of this text is to provide a summary for the LUPC Commissioners because the Commissioners (instead of staff) will be making the decision on this permit.

Purpose: To model the pre-development (current) stormwater runoff going to Lot 7-10 (Fish and Burch property) from the Applicant's lot (Lot 7-12) and the predicted post-development runoff in order to compare the pre- and post-development conditions.

Model Used: HydroCAD

- Stormwater modeling software is used to simulate runoff, to design drainage systems, and to analyze how water moves and behaves. It supports standard industry calculation methods and is often used to help determine compliance with regulations.
- A HydroCAD model may include:
    - Rainfall and Climate Variables (for example: amount of rainfall, variation in intensity and duration of rainfall over time)
    - Catchment and Land Use Variables (for example: drainage area, hydrologic soil group, ground cover type, land use)
    - Hydraulic Components (for example: storage and filter ponds, culverts, weirs, swales)

  Sebago Response: HydroCAD models use rainfall intensities, SCS curve numbers from the soil and land cover types, Time of Concentration calculations, and watershed size to analyze runoff as a flow rate over time (hydrograph).
- The results from a HydroCAD model may include:
    - Peak flow rate and peak time
    - Hydrographs showing flow rate over time
    - Flow velocities

Scenario: A 25-Yr Storm event is modeled. This event involves 4.90 inches of rain falling over a 24-hr period with the large majority falling in an intense peak near the middle of the 24-hour period. This pattern of rainfall in the model is based on observed patterns of rainfall for the northeastern U.S.

Sebago Response: correct, the model uses a simulated rainfall distribution that is typical for most of the interior and central United States (Type II) for Franklin County as directed by the MDEP Chapter 500 Rules.

Analysis: The Applicant identified two locations where concentrated runoff leaves its property and flows on to Lot 7-10:

- An area in the ROW along Mountain Rd at the entrance to the proposed subdivision, upslope from, and near the property boundary of the Fish/Burch property = Watershed Analysis Point A (WAP A)

- A wetland area near proposed Filter Pond 1 and near the property boundary of the Fish/Burch property = Watershed Analysis Point B (WAP B)

  Sebago Response: WAP A and WAP B represent the point where runoff leaves the subject parcel and enters the abutting parcel. WAP A represents runoff from Filter Pond 1's underdrain as well as the proposed driveway culvert for Mountain Village Road. WAP B represents runoff that exits the parcel by means of the emergency spill way of Filter Pond 1. A small amount of area is also tributary to WAP B that is not associated with Filter Pond 1.

  Analysis of Current Conditions:

- Based on topography, the Applicant identified two areas currently draining to WAP A or WAP B (see Plan D3.1, Entrance Drainage Analysis Pre-Development)
    - Subcatchment 1.1 drains to WAP A
    - Subcatchment 1.2 drains to WAP B
    - There is no cross-flow between the subcatchments

- The three points above are shown in the figure labeled "Routing Diagram for Entrance Analysis – Pre Development." The Routing Diagram indicates that:
    - Each subcatchment drains to a Watershed Analysis Point with no intervening development (such as culverts or filter ponds)
    - The modeled factors determining the timing and amount of runoff reaching WAP A or WAP B are the current environmental conditions (such as

subcatchment area, topography, soil types and extents, ground cover types, and extents)

Post-Development Analysis

- The proposed development that would affect the drainage area is:
    - A portion of the main subdivision road (Mountain Village Road)
    - A culvert at the entrance to the proposed subdivision (Culvert C2)
    - A culvert under the main subdivision road for an existing stream (Culvert C1)
    - Filter Pond 1 (Pond 1)
    - Drainage swales and ditches used to direct stormwater

- The proposed development would result in more complex routing of drainage, shown in the figure labeled ““Routing Diagram for Entrance Analysis – Post Development:”
    - It would change the topography of the drainage area, resulting in 5 subcatchments (see Plan D3.2): Subcatchments 1, 1.1, 1.2, 1.3, and 1.4
    - It would add development features to the drainage paths, such as culverts, swales, a road, and a filter pond
    - Under the post-development drainage pattern:
        - Subcatchments 1, 1.1, 1.2, and 1.3 drain to WAP A
        - Subcatchments 1, 1.1, and 1.4 drain to WAP B
            - The reason that Subcatchments 1 and 1.1 drain to both WAP A and WAP B has to do with Filter Pond 1
                - Both subcatchments drain to Filter Pond 1
                - During a 25-Yr storm, water arriving in Filter Pond 1 would exit the pond in two ways (see Plan C6.1):
                    - Filtering through the bottom of the pond and out to WAP A
                    - Leaving through a spillway outlet to WAP B (shown as the dashed red arrow labeled FP1 in the routing diagram)

Sebago Response: In general, this is correct. However, only Subcatchment 1.4 and the emergency spillway overflow of Filter

Pond 1 drain to WAP B as shown in the Post Development model diagram.

Modeling Results:

Peak Flows

Comparison of Peak Flows between Current and Proposed Conditions during a 25-Yr Storm Event

	WAP A	WAP B
Current Conditions	2.10 cfs	5.72 cfs
Post Development	2.01 cfs	4.83 cfs

Sebago Response: it should be noted that in addition to the reduction in peak flows above, level spreaders were sized downstream of the overflows for each Filter Pond according to the MDEP BMP manual. These level spreaders act to dissipate the energy from the flow returning it to sheet flow.

VI. Summary:

Our review of the project finds that in general the strategies to address Phosphorus are acceptable, as stated in the previous review memo dated September 30, 2026. We also find that the general engineering practices used to control stormwater runoff because of the proposed development to be acceptable provided the LUPC agrees with the methodology used to analyze the flow onto adjacent Lot 7-12.

All comments provided by Sebago Technics are to be for LUPC use and not meant as final determinations but merely offer guidance. Final decisions, if appropriate, are left with the LUPC at their discretion.

Respectfully Submitted,
SEBAGO TECHNICS, INC.



James R. Seymour, P. E.
Western and Lakes Region/Sr. Manager