

# Technical Memo



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**To:** Minnehaha Creek Board of Managers

**From:** Chris Meehan, PE, CFM

**Date:** October 21, 2015

**Subject:** Mooney Lake Preserve

The attached memorandum provides further information concerning the review of the Mooney Lake Preserve Development and addresses specific concerns with stormwater management and wetland protection raised by an October 15 memo filed in the litigation related to the permit. (The memo, developed on behalf of the plaintiffs, is by Cecilio Olivier of Emmons & Olivier Resources (EOR) and is included with the Board of Managers packet for the October 22, 2015, meeting.) The project is an 11 home development on an 89 acre parcel located in Orono Minnesota. Stormwater from the site will be routed to Mooney and Hadley Lakes as it is currently. Mooney Lake currently is impaired for nutrients (Total Phosphorus) along with being a landlocked basin with a managed outlet.

The permit review has been an iterative process to ensure the applicant is in compliance with the District's regulations. As such there has been several design iterations and computations associated with this project, which have resulted in improvements to the water-resources protections incorporated into the plans for the project. This process is typical of any proposed multi-acre land-disturbing work. While it is often not possible to discern from the EOR memo how the underlying review was conducted, the memo contains numerous inaccuracies and speculates as to impacts from *possible* development of the property – not the development that is actually proposed.

The supporting permit report analyzes the proposed project against the regulatory thresholds and specific criteria in MCWD's rules. This memo supplements that report, and elaborates on a general determination that the October 15 EOR memo conveys an inaccurate impression of the proposed project and the performance of the stormwater-management and wetland-protection plans. The principal outcomes of the application of the MCWD's water-resource and wetlands protection rules are:

- Decreased runoff volumes from the project property compared to existing conditions (under which runoff from 1.38 acres of impervious area is untreated);
- Treatment of runoff from all impervious surfaces on the project site, resulting in a reduction of loading of phosphorus and other pollutants to downstream waterbodies, including Mooney Lake;
- A technical review that applied the correct soil conditions, infiltration rates and runoff coefficients, and fully accounted for planned modifications to the topography (including tree cover/canopy) in analyzing the proposed work;
- Buffers compliant with MCWD regulatory requirements on all wetlands onsite downgradient from proposed land-disturbing work.

## **PROJECT OVERVIEW**

Based on the final iteration of the site plans for the project, the development of the 11 parcels will result in an additional 3.7 acres of impervious area associated with driveways and proposed home footprints. The site currently contains 1.4 acres of impervious area, some of which will be left in place, and some of which will be restored to natural vegetation. Overall the project will result in 5.1 acres of impervious area. As the project has gone through design iterations there have been minor adjustments to the impervious area. However the plan included in MCWD staff's permit review report reflects the impervious numbers stated above accurately.

To ensure protection and improvement in water quality of downstream water bodies the new, and currently untreated, existing impervious will be treated by a suite of Best Management Practices (BMPs) which have been designed to protect the receiving downstream water bodies. BMPs for the site include two infiltration basins, a water quality pond with a filtration bench, water quality ponds and nine rain gardens. The associated BMPs are shown in the plans. The plans also provide that "Houses, impervious surfaces and individual driveways need to direct all runoff to the proposed rain gardens. Curbs will be required on all driveways to accomplish this." These provisions ensure that, as new structures are added, impervious areas throughout the development are appropriately addressed.

Currently the runoff volumes from the impervious areas on site are not collected or retained and drain directly to the downstream waterbody. Stormwater volumes and loading associated with the development will all be eliminated through infiltration and filtration practices in accordance with the District's stormwater requirements through the types of BMPs noted above. All impervious areas will be routed to a prescribed BMP to abstract stormwater volumes to less-than-existing levels. The District's 1-inch abstraction requirement for this development will result in 8.0 ac-ft of volume annually being infiltrated and not running off into the downstream lakes. The overall decrease in annual runoff compared to existing conditions will be 2.2 ac-ft. Given that stormwater runoff rates will not increase as a result of the proposed development, there is no clear basis for the EOR memo's conclusion that the potential for flooding in the Mooney Lake subwatershed will be exacerbated.

The change in land-use on the site (Agricultural, Turf Grass, Woods) has been adequately accounted for in the stormwater volumes that need to be addressed on-site. The project will also mitigate changes in land use associated with tree canopy adjustments through the implementation of rain gardens, downstream infiltration basins and additional tree planting throughout the development. The stormwater-management plan also provides an additional 10% capacity on top of necessary volume mitigation measures to ensure long-term protection.

Soil boring information submitted by the permit applicant demonstrates adequately accounting for appropriate infiltration and filtration rates associated with the underlying soils. The project site consists of loams and sandy clay loams. The associated infiltration and filtration basins have been designed to ensure the first inch of runoff can be infiltrated within 48-hrs. Infiltration rates used to complete this calculation are consistent with the 0.2 - 0.3 in/hr rates recommended for the circumstances by the MPCA Stormwater Management Manual. The filtration bench proposed for the southeast water quality pond uses a filtration

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rate of 0.8 in/hr, which is due to new non-native filtration media being used for the facility and is appropriate based on the manual.

In addition to reductions in stormwater volumes reaching the lake, the project will also address reduction of phosphorus, metals and sediment loading from the site associated with the existing and new additional impervious areas. All of the BMPs noted above contribute to the removal of these constituents. The associated concentrations of runoff used to predict loading from the site are in compliance with the MPCA Stormwater Management Manual. The project will result in at a minimum 5%, but more likely a 10%, decrease in loading of these constituents to the lake from existing conditions.

The planned routing of all impervious areas to a BMP throughout the development of the parcel will result in the removal of these constituents prior to entering wetlands and downstream lakes. This is of importance as Mooney Lake is an impaired waterbody in accordance with the Minnesota Pollution Control Agency's Impaired Waters List.

It should also be noted that buffers were not considered to contribute to the reduction and would only provide additional enhancement to natural health of the parcel. The addition of buffers along all wetlands will be established to provide additional habitat and while also providing additional interception of overland flow, in accordance with the MCWD wetland rule.

Stormwater BMPs on-site will also treat and provide volume reduction prior to stormwater reaching any of the wetlands on-site. The ability to treat this water and limit stormwater volumes will ensure that wetland bounce and phosphorus concentrations are maintained to predevelopment conditions in accordance with the City of Orono's Surface Water Management Plan.

No wetland impacts are proposed. Wetlands down gradient of the new homes will be protected by buffers as required by MCWD rules. Each specific plan for lot development will be reviewed for compliance.

The classifications of wetlands on-site, combination of Manage 2 and 3, are characterized correctly and are in accordance with MCWD's function and values assessment of wetlands throughout the watershed. They are not all Manage 2 wetlands as was stated in the EOR letter.

In summary the proposed development will implement strategies required by MCWD rules. Stormwater volumes and loading to Mooney Lake and Hadley Lake will be reduced.