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| DATE : | August 4, 2016 |
| TO : | Carol Sinden, Miranda Nichols, and Douglas Hansen  Water Assessment Section  Environmental Analysis and Outcomes Division |
| FROM : | Pam Anderson  Water Quality Monitoring Unit  Surface Water Monitoring Section  Environmental Analysis and Outcomes Division |
| PHONE : | (651) 757-2190 |
| SUBJECT : | Request to remove Otter Lake (43-0085-01, 43-0085-02, and 43-0085-03) from the 303(d) Impaired Waters list for Mercury in Fish Tissue |

Otter Lake was listed as impaired for aquatic consumption use during the 2008 listing cycle. During the 2014 assessment of the lake, it was determined that the residence time of the basin was too short for application of the aquatic recreation use standards. Minnesota Rules Chapter 7050.0150(4)states that in order to be considered a lake/reservoir, a water body must have a hydraulic residence time of at least 14 days which is to be determined using a flow equal to the 122-day ten-year low flow (122Q10) measured June 1st through September 30th.In June 2015, during TMDL development, bathymetry was determined (Figure 1) and residence time calculated. The calculations are attached (Table 1).  It looks like the 122Q10 residence time for the main basin is under 14 days (9.97 days). If we sort the minimum flows for the 10 year period (10 data points, one for each year) the highest low flow in any year had a residence time of 1.2 days and the mean of the 10 years is 3 days. It is well below the 14 days needed to be classified as a reservoir.

The reach is completely overlaid by a river reach, 07010205-659, which extends upstream into the South Fork Crow River and through the reservoir to the Hutchinson Dam (Figure 2). For assessment purposes, MPCA will no longer recognize Otter Lake as a lake, and will instead rely on the stream coverage. As a result, the mercury in fish tissue impairment should removed from Otter Lake and it should be included on 07010205-659.

Table 1. Otter Lake Residence Time

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|  | Res Time (days) |
| 122Q10 | 9.97 |
| Maximum 122Q | 1.22 |
| Mean 122Q | 3.03 |
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Figure 1. Bathymetry for Otter Lake



Figure 2. Lake extent and the stream reach overlap.

