

3.0 Rest Area Pond Subwatershed

3.1 Location and General Description

The Rest Area Pond Subwatershed is within the Lower St. Croix Valley Watershed District (formerly Valley Branch Watershed District). Rest Area Pond, located in subwatershed RAP-1, and Barton Pit, located in subwatershed BRT-1, were part of a single dry depression located in the west half of Section 33, T29N, R20W in West Lakeland Township.

The area tributary to Rest Area Pond is 1,789 acres, and is comprised of subwatersheds RAP-1 through RAP-6 and RAP-8 through RAP-13. Since flows from West Lakeland Storage Site enter Rest Area Pond, the total tributary area to Rest Area Pond is 15,844 acres. The majority of the Rest Area Pond subwatershed is located outside of Afton, with only very small portions of subwatersheds RAP-4, RAP-5, RAP-6, RAP-8, and RAP-9 located within Afton (paralleling I-94).

At its outlet elevation of 834.0, the Rest Area Pond has a surface area of 11 acres. The 100-year flood elevation of the pond is 857.5. A pipe carries outflows from the Rest Area Pond to the St. Croix River, paralleling the north side of I-94. See **Figure 1**

3.2 Landscape Units

Landscape units were determined only for those portions of the subwatershed located in Afton and includes small portions of Landscape Units 3,4, and 5. In general, the land cover is related to adjacent highway land use, and includes pavement and grassed highway right-of-way areas.

3.3 Water Quantity Management Goals

The LSCVWD collected water quality samples from the Rest Area Pond during 1986 and is collecting data in 2001. The Minnesota Department of Transportation (MNDOT) collected samples from the pond during 1990 and 1991. The historic available data indicate the water quality of the pond is relatively poor, but consistent with the pond's use as a detention basin. The data indicates the pond would be assigned a trophic status of eutrophic to hypereutrophic, which means the pond is rich to extremely rich in nutrients, and has poor to very poor water transparency.

Rest Area Pond and the land surrounding it are owned by MNDOT. There is no public boat access to the pond and its use is limited to passive viewing by Rest Area visitors and detaining and treating stormwater runoff. Use of the pond is not expected to change. Because the water quality of the pond is consistent with its use, the LSCVWD will continue to manage the pond as a detention basin.

The LSCVWD Plan classifies the Rest Area Pond as a Category IV water body, based on its existing water quality and its existing and desired recreational uses. This gives the Rest Area Pond a low water quality ranking. See **Figure 2** Further discussion of this classification is included in Appendix A.

3.4 Groundwater Recharge/Infiltration/Permeability

The portion of the Rest Area Pond subwatershed located within Afton has a high total infiltration potential and a high groundwater sensitivity (see **Figure 3**). (Section 1.4 describes the methodology used to determine the ranking levels.) Although the Afton portion of the subwatershed cluster is small compared with the entire Rest Area Pond subwatershed cluster, the high infiltration capacity means that the creation of additional impervious area could have a water quantity impact downstream in other communities.

3.5 Erosion Index Ranking

The Rest Area Pond subwatershed cluster receives a low soil erosion index (EI) ranking of 3.39, the lowest value of any subwatershed within Afton. (See **figure 6**) The majority of the Rest Area Pond watershed is outside of Afton, and flow out of Afton, therefore limited evaluation was done for this subwatershed cluster.

4.0 Fahlstrom Pond Subwatershed

4.1 Location and General Description

The Fahlstrom Pond Subwatershed is within the Lower St. Croix Valley Watershed District (formerly Valley Branch Watershed District). Fahlstrom Pond (DNR #82-5W) is located in subwatershed FAL-1, south of I-94, between Neal Avenue South (CSAH 71) and Indian Trail South. (See **Figure 1**) During near normal water level conditions (approximately Elevation 838), the pond is split into two basins with a combined surface area of approximately 10 acres. At higher water levels, the two ponds act as one and a third pond to the north (in subwatershed FAL-2) combines with Fahlstrom Pond. The DNR's hydrographic survey report for Fahlstrom Pond found the Ordinary High Water (OHW) to be Elevation 848.1. The highest recorded water level was reached in November, 1986, when it reached Elevation 844.4.

The tributary area of Fahlstrom Pond is 763 acres and is comprised of subwatersheds FAL-1, FAL-4, FAL-6, and FAL-7. Should subwatersheds FAL-5, FAL-8 and FAL-9 overflow, the tributary area increases by 1,788 acres to 2,551 acres. This could occur during stormwater runoff events of longer duration than the 100-year 10-day snowmelt. Construction of I-94 diverted approximately 1,000 acres of the Fahlstrom Pond tributary area into the I-94 drainage system. Currently, most of the tributary area is undeveloped. The Landuse planed for Afton calls for rural residential development, with lot sizes ranging from 2.5 acres to 5 acres, or agricultural use. Some of Afton's planned industrial development along I-94 is within the Fahlstrom Pond tributary area. The area of Woodbury that is tributary to Fahlstrom Pond is planned to be used for industrial, commercial, and high and medium density residential purposes.

Fahlstrom Pond has no surface water outlet (landlocked). Prior to construction of the I-94 drainage system, the pond overflow was at Elevation 874.3, the low point in Indian Trail South, to subwatershed EDI-4 and the large wetland west of Lake Edith (Metcalf Marsh). Construction of the I-94 drainage system changed the Fahlstrom Pond overflow. Fahlstrom Pond will now overflow to the MNDOT drainage system when the pond reaches approximately Elevation 869, with the water eventually reaching MNDOT's Rest Area Pond. Under extreme events, Fahlstrom Pond might also overflow to Metcalf Marsh.

The seepage rate from the pond was measured to be approximately 1.5 cfs (3 acre-feet per day) in the fall of 1986, when water levels were between 840 and 845. Based on this seepage rate and the total drainage area of 2,551 acres, the 100-year flood elevation of Fahlstrom Pond would be approximately 858.0. Without seepage, the 100-year flood elevation would be approximately 864.0.

However, the cooperative agreement between LSCVWD and MNDOT allows MNDOT to redirect the entire West Lakeland Storage Site tributary area (14,055 acres) to Fahlstrom Pond by closing a gate in Structure 2B (outlet control structure for West Lakeland Storage Site). If the gate were closed for a long enough period of time, the West Lakeland Storage Site would overflow to Fahlstrom Pond. If the gate were closed under 100-year flooding conditions, Fahlstrom Pond could reach its overflow elevation of 869, and back up into the MNDOT I-94 drainage system. Since MNDOT can operate the Structure 2B gate at any time, LSCVWD set the 100-year flood elevation for Fahlstrom Pond at Elevation 870. Although LSCVWD recognizes the possibility of a flooding problem, LSCVWD believes the likelihood to be remote.

4.2 Landscape Units

The Fahlstrom Pond Subwatershed contains several landscape units. These Landscape Units all or significant portions of 4-9. Further description and analysis of these landscape units are contained in the landscape portion of the NRI report.

4.3 Water Quality Management Goals

The LSCVWD Plan classifies Fahlstrom Pond as a Category V water body, based on its existing and desired recreational uses. This designation results in a Surface Water Quality Ranking of Low. (See **Figure 2**) Further description of this classification is included in *Appendix A*.

Water quality samples were collected from Fahlstrom Pond in 2000. The data show very high concentrations of total phosphorus and chlorophyll-a, and low Secchi disc transparencies. The water quality data are all in the hypereutrophic range (very nutrient rich). If an outlet is to be constructed from the pond to Lake Edith, water quality samples will be collected to help determine the water quality impact of a Fahlstrom Pond discharge on Metcalf Marsh, other downstream wetlands, and Lake Edith.

4.4 Groundwater Recharge/Infiltration/Permeability

The majority of the Fahlstrom pond subwatershed within Afton has a high groundwater recharge/infiltration ranking, with moderate and low rankings in the west portion of the subwatershed within Afton and Fahlstrom Pond itself (see **Figure 3**). (Section 1.4 describes the methodology used to determine the ranking levels.) Nearly all of subwatersheds FAL-1, FAL-2, FAL-3, FAL-6, and FAL-8 have a high groundwater recharge/infiltration ranking. The portions of subwatersheds FAL-5 and FAL-9 within Afton contain a mixture of low, moderate and high groundwater recharge/infiltration rankings.

Generally, the groundwater recharge/infiltration increases as you move further east and lower in the landscape. This may result in a greater accumulation of runoff from the lower (moderate) groundwater recharge/infiltration areas to the west, leading to greater infiltration as this water heads downhill to the east. Possible implications include: 1) surface water runoff from the west could negatively impact the groundwater to the east due to increase runoff, and 2) an increase in impervious cover along the eastern Fahlstrom Pond subwatershed could result in increased volumes of surface water moving east through this subwatershed (and potentially exiting this system).

4.5 Erosion Index Ranking

The Fahlstrom Pond subwatershed receives a moderate soil erosion index (EI) ranking of 5.92. The EI ranking varies throughout the subwatershed cluster, from a low EI ranking of 2.67 in FAL-6, to a moderate EI ranking of 7.51 in FAL-8. Subwatersheds FAL-6 and FAL-7, located north of I-94, received low EI rankings, with the balance of the Fahlstrom Pond subwatersheds receiving a moderate EI ranking. (See **Figure 6d1 –6d7**) See also, **table 2**, which itemized the EI values by subwatersheds.