

## **SECTION 2: 2008 ENGINEER'S ANNUAL REPORT**

### **Introduction and Summary**

Engineering activities of the Board of Managers of the Valley Branch Watershed District (VBWD) during 2008 are summarized in different parts of this annual report. Part I of the Engineer's Annual Report and Part III of the Managers' Annual Report include investigations by the Managers. As engineering advisors for the Managers, we assisted the Managers with these studies or projects. Also during 2008, the Board of Managers responded to activities of others within the VBWD. As engineering advisors, we reviewed these actions and made recommendations to the Managers concerning conformance with the policies, objectives, rules, and regulations of the VBWD. Many of these activities are summarized in Part IV of the Managers' Annual Report. Part II of the Engineer's Annual Report summarizes the types of technical assistance we provided the Managers.

## **PART I**

### **VBWD INVESTIGATIONS AND STUDIES**

#### **Lake Level Program**

Managing the quantity of water and minimizing the negative impact from floods, high flows, and droughts is a mission of the VBWD Managers. Collecting water level data helps the Managers make decisions in managing the water levels and floodplains of the VBWD's water resources.

In 2008, the VBWD collected water level data from 27 basins. Volunteers and the Washington Conservation District collected the water levels for the VBWD. Ramsey County Public Works read the water levels every two weeks during the ice-out months at Silver Lake in 2008. A volunteer for the Minnesota Department of Natural Resources (MDNR) reads and reports the water levels of Sunnybrook Lake. Some basins were unusually dry in 2008 and accurate readings could not be made.

The lake level graphs presented in Appendix B were prepared by the VBWD using the volunteers' and contractor's data, and in some cases, additional data from the MDNR's database is included. The data for the water bodies monitored by Mr. Charles Taylor, a volunteer for the VBWD, are also presented in tabular format in the appendix.

#### **Water Quality Monitoring Program**

The VBWD Managers routinely assess whether water bodies are meeting the VBWD's water quality goals. The type of monitoring conducted for a water body varies according to the classification the VBWD has assigned to it. The VBWD monitors the water quality and habitat of the major basins within the VBWD to detect changes in the water quality and habitat over time, thereby determining the effect of changing land use patterns in the watershed and the effectiveness of the VBWD's efforts to preserve/improve water quality. The water quality monitoring program and results are discussed in detail in Appendix C.

##### **Basin Water Quality**

In 2008, the VBWD monitored the water quality of 32 basins. Ramsey County Public Works monitored the water quality of Silver Lake and shared the data with the VBWD.

##### **Stream Quality**

In addition to the basin water quality monitoring, the VBWD collected data on its streams. Invertebrate samples were collected from Valley Creek in 2008. The VBWD continued to participate in the Metropolitan Council's Watershed Outlet Monitoring Program (WOMP) by collecting discrete and continuous water quality and quantity data from the creek in 2008. The VBWD also collected discrete and continuous water quality and quantity data from stations on the South Fork and North Fork of Valley Creek. The VBWD continued to fund a program in 2008 in which students from the Stillwater Area High School collected stream macroinvertebrate and physical habitat data from Valley Branch Creek.

## **Habitat**

In 2008, the VBWD monitored the habitat of and habitat at the six high priority VBWD water bodies: Lake Jane, Lake DeMontreville, Lake Elmo, Lake Olson, Lake Edith, and Silver Lake.

## **Lake DeMontreville, Eagle Point Lake, and Horseshoe Lake Water Quality Assessments**

In 2006, the Managers identified lakes that might eventually be listed as impaired by the Minnesota Pollution Control Agency (MPCA) due to excessive nutrients, and ordered studies of these lakes. The primary intent of these studies was to identify what steps could be taken, if any, to prevent the lakes from being listed as nutrient impaired in the future by the MPCA, and if listed as impaired, what could be done to remove the impairment. Monitoring of stormwater quality and flow, and lake monitoring (water quality and biota) were conducted in 2007 to evaluate the potential causes of observed levels of phosphorus, chlorophyll *a*. and Secchi disc depth in Acorn (Mud) Lake, Long Lake, Sunfish Lake, Eagle Point Lake, and Horseshoe Lake. Barr Engineering published a report on the water quality assessment and recommendations in December 2007. After reviewing the recommendations and holding public meetings with stakeholder, the Managers implemented water quality improvement projects at Long Lake and Sunfish Lake in 2008. Part III of this annual report discussed these projects.

Because 2007 was an abnormally dry year (with respect to the summer season), an additional year of monitoring was conducted in 2008 for Eagle Point Lake and Horseshoe Lake to better evaluate the effects of external stormwater flow and phosphorus inputs during normal to wet climactic conditions. In addition, recent water quality data showed possible early signs of degrading water quality in Lake DeMontreville so VBWD Managers ordered a study of Lake DeMontreville's water quality in 2008. Barr Engineering published a report on the Lake DeMontreville, Eagle Point Lake, and Horseshoe Lake water quality assessments in January 2009. The Managers will review the conclusions of the report and expect to make management decisions in the spring of 2009.

## **Groundwater Level Observation Program**

Understanding the effects of community growth and other activities on groundwater and the groundwater-surface water interface is a mission of the VBWD Managers. Groundwater level monitoring during 2008 was conducted for the VBWD's 15 operational observation piezometers. Groundwater level data are summarized in Appendix D. Locations of all observation piezometers and generalized groundwater contours based on groundwater and lake level data are shown on Figure D-1.

## **Precipitation Data**

Collecting precipitation data helps the Managers make decisions in managing the water levels and floodplains of the VBWD's water resources. The VBWD recorded precipitation amounts in 2008 as in previous years. The precipitation gage is located at 4677 Birchbark Trail North, near Lake Jane. Charles Taylor of the Citizens Advisory Committee reads daily the precipitation amounts. Those amounts are summarized in graphs presented in Appendix E. Precipitation readings from the St. Paul airport and the Minneapolis-St. Paul International Airport are shown for comparison.

### **Project 1007, Olson Lake Estates Outlet, and Dam Inspections**

The VBWD owns, operates, and maintains various stormwater management systems. In the fall of 2008, the VBWD completed its annual inspection of Project 1007 and the Olson Lake Estates Outlet Project. The investigation included dam inspections at Rest Area Pond and Eagle Point Lake. Some general maintenance items were found and will be corrected in 2009.

## **PART II**

### **REVIEW OF ACTIONS INITIATED BY OTHERS**

During 2008, the Managers issued 26 permits. These permits are listed in Part III of the Managers Report. As engineering advisors, we provided technical assistance to the Managers in review of these projects.

Some of the types of assistance that we provided include the following:

#### **Flood Levels**

Technical activities grouped under this heading include computing flood levels and reviewing flood levels computed by others. In general, flood levels throughout the VBWD are computed assuming ultimate development of the tributary watershed and using the existing drainage system or drainage features proposed to be constructed in the near future. Computations included hydrologic analysis of the watershed and hydraulic analysis of storm drain systems. The information was used by the Managers to set minimum elevations and outline easements.

#### **Wetland Impacts**

Permit applications were reviewed to determine if the proposed work impacted wetlands. Wetland impacts were reviewed according for conformance with the VBWD's Rules and Regulations and the Wetland Conservation Act. Technical activities included review of the applicant's wetland delineation, and review of any necessary wetland mitigation. The purpose of the reviews was to determine if the proposed work complied with the VBWD's and the State's wetlands regulations.

#### **Erosion and Sediment Control and Water Quality Effects**

Permit applications were reviewed to ensure that the proposed activities would not result in erosion problems and to determine the effectiveness of proposed temporary and permanent erosion control measures. The effect of the development on the water quality leaving the site was analyzed and the suitability of ponds, infiltration facilities, and skimmers was assessed.

#### **Effect of Development on Downstream Property**

Technical activities in this category include quantifying flow rate changes and flood level changes and reviewing flow path alterations resulting for proposed development. This information was considered by the Managers before approving permit applications, particularly when the proposed activity could impact more than one community.

#### **Development Compatibility with Water Management Plan and Rules and Regulations**

At the direction of the Managers, we reviewed and informed the Managers of the compatibility of the proposed developments with the VBWD's Watershed Management Plan and the VBWD Rules and Regulations.

#### **Inspections**

Inspections of permitted activities in the VBWD were undertaken to ensure compliance with VBWD regulations and permit conditions. The VBWD's inspector, Mr. Ray Roemmich, handled the day-to-day inspections of permitted activities. At the direction of the Managers and/or inspector, we inspected projects which could impact wetlands and performed other inspections as needed.

**Administrative Services**

In addition to providing technical advice to the Managers, we continued to provide administrative services for the Managers in 2008. These activities included drafting correspondence, printing and publishing documents such as sections of the Annual Report, providing typing and word processing services, maintaining mailing lists, reviewing reports and planning documents, and representing the Managers by attending Washington County Water Consortium meetings, and other meetings regarding activities within the VBWD.

Respectfully submitted,  
BARR ENGINEERING COMPANY

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