7.0 Shoreline and Streambank Improvements

7.1 Policy

It is the policy of the Board of Managers to prevent erosion of shorelines and streambanks, and to foster the use of natural materials and bioengineering for the maintenance and restoration of shorelines.

7.2 Regulation

No person may install a shoreline or streambank improvement, including but not limited to riprap, a bioengineered installation or a retaining wall, on a public water without first securing a permit from the District. Except that no NMCWD permit under this rule is required for:

7.2.1 Activities conducted pursuant to a project-specific permit from the state Department of Natural Resources, but the NMCWD buffer requirements apply to activity that would otherwise require a NMCWD permit;

7.2.2 activities in incidental wetlands or for utility improvements or repairs that are the subject of a no-loss determination or utility exemption from the relevant LGU;

7.2.3 removing accumulated sediment from a water basin; or

7.2.4 planting of vegetation not intended to provide deep soil structure stability.

7.3 Criteria

7.3.1 An applicant for a shoreline alteration permit must demonstrate a need to prevent shoreline erosion or restore eroded shoreline or streambank.

a Placement of riprap for merely cosmetic purposes is prohibited.

7.3.2 An applicant must first consider maintenance or restoration of shoreline or streambank using bioengineering. If bioengineering cannot provide stabilization, a combination of riprap and bioengineering may be used to restore or maintain shoreline or streambank. If a combination of riprap and bioengineering cannot provide stabilization within a reasonable period, riprap may be used to restore or maintain shoreline or streambank.

a A retaining wall may not extend below the OHWL, except where:

1 there is a demonstrable need for a retaining wall in a public improvement project, and

2 the design of the retaining wall has been certified by a licensed professional engineer.

7.3.3 **Riprap**.

a Riprap to be used in shoreline erosion protection must be sized appropriately in relation to the erosion potential of the wave or current

action of the particular water body, but in no case may the riprap rock average less than six inches in diameter or more than 30 inches in diameter. Riprap must be durable, natural stone and of a gradation that will result in a stable shoreline embankment. Stone, granular filter and geotextile material must conform to standard Minnesota Department of Transportation specifications, except that neither limestone nor dolomite may be used for shoreline or stream bank riprap, but may be used at stormwater outfalls. All materials used must be free from organic material, soil, clay, debris, trash or any other material that may cause siltation or pollution.

b Riprap must be placed to conform to the natural alignment of the shoreline.

c A transitional layer consisting of graded gravel, at least six inches deep, and, where appropriate, a geotextile filter fabric must be placed between the existing shoreline and any riprap. The thickness of riprap layers should be at least 1.25 times the maximum stone diameter. Toe boulders, if used, must be at least 50 percent buried.

d Riprap must not cover emergent vegetation, unless authorized by a Department of Natural Resources permit.

e Riprap may extend no higher than the top of bank or two feet above the 100-year high water elevation, whichever is lower.

7.3.4 **All shorelines and streambanks.**

a The finished slope of any shoreline must not be steeper than 3:1 (horizontal to vertical), unless approved by the NMCWD engineer based on specific site conditions.

b Horizontal encroachment from a shoreline must be the minimal amount necessary to permanently stabilize the shoreline and must not unduly interfere with water flow or navigation. No riprap or filter material may be placed more than six feet waterward of the OHWL. Streambank riprap may not reduce the cross-sectional area of the channel or result in a stage increase of more than 0.01 feet at or upstream of the treatment.

c The design of any shoreline erosion protection must reflect the engineering properties of the underlying soils and any soil corrections or reinforcements necessary. The design must conform to engineering principles for dispersion of wave energy and resistance to deformation from ice pressures and movement, considering prevailing winds, fetch and other factors that induce wave energy.

7.4 Required information and exhibits

The following exhibits must accompany the permit application. Exhibits must be submitted in an electronic format acceptable to the District:

7.4.1 A site plan, showing:

a Conditions establishing, to the satisfaction of the District, existing erosion or the potential for erosion;

b the existing OHWL contour, existing shoreline or streambank, floodplain elevation and location of property lines;

c elevation contours of the upland within 15 feet of the OHWL and referenced to accepted datum; and

d plan view of locations and lineal footage of the proposed riprap.

The plan must show the location of an upland baseline parallel to the shoreline with stationing. The baseline must be staked in the field by the applicant and maintained in place until project completion. Baseline origin and terminus each must be referenced to three fixed features measured to the closest 0.05 foot, with measurements shown and described on the plan. Perpendicular offsets from the baseline to the OHWL must be measured and distances shown on the plan at 20-foot stations. The plan must be certified by a licensed professional engineer or licensed surveyor.

7.4.2 A construction plan and specifications, showing:

a A sequencing analysis in compliance with section 7.3.2;

b materials to be used, including the size(s) of any riprap to be used;

c cross section detailing the proposed riprap, if any, drawn to scale, with the horizontal and vertical scales noted on the drawing. The detail should show the finished riprap slope, transitional layer design and placement, distance lake-ward of the riprap placement and OHWL;

d description of the underlying soil materials; and

e material specifications for stone, filter material and geotextile fabric.

7.4.3 An erosion control and site restoration plan.