Common Alternative Practices

Buffer Law Implementation

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UPDATED: May 5, 2017
BWSR Board Adopted: June 28, 2017

Purpose

This technical document provides an overview of the process and considerations conducted by Soil and Water Conservation Districts when assisting landowners in implementing the Alternative Practices provision in the Minnesota Buffer Law. Additionally, this document details a set of common alternative practices that may be a useful start for landowners interested in water quality protection options comparable to a buffer and to SWCDs in offering alternative practices implementation support and validation.

What Statute Says

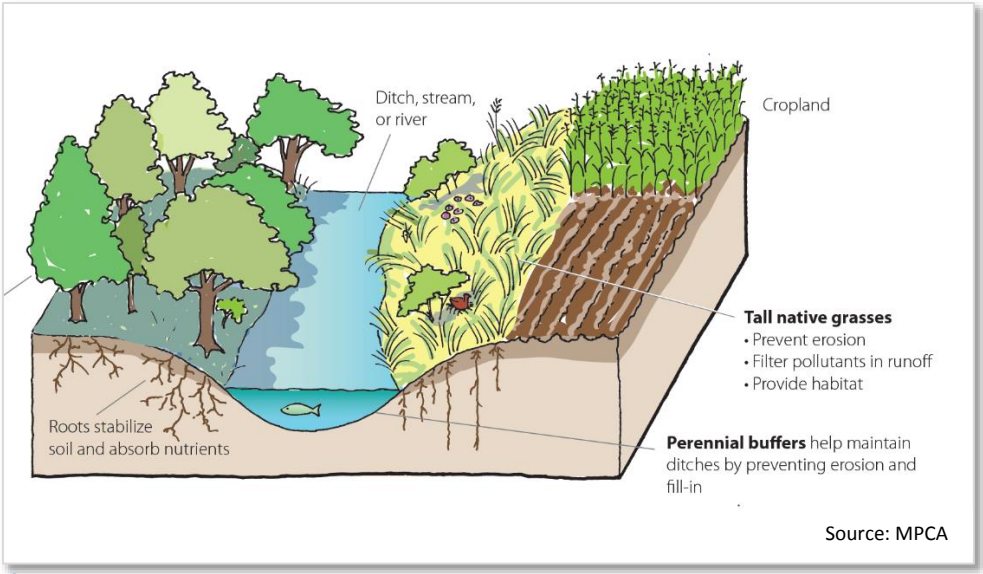
The Buffer Law was amended in 2017 to make several changes to the alternative practices provision, which are shown below. Significant changes are to codify the common alternative practices and to require they be adopted by the Board of Water and Soil Resources (BWSR).

"A landowner owning property adjacent to a water body identified in a buffer protection map and whose property is used for cultivation farming may meet the requirements… …by adopting an alternative riparian water quality practice, or combination of structural, vegetative, and management practices, based on the Natural Resources Conservation Service Field Office Technical Guide, common alternative practices adopted and published by the board, other practices approved by the board, or practices based on local conditions approved by the local soil and water conservation district that are consistent with the Field Office Technical Guide, that provide water quality protection comparable to the buffer protection for the water body that the property abuts." *See §103F.48, Subd. 3.*

Buffer and Alternative Practices Benefits

Buffers provide multiple benefits for water quality, including stabilizing the bank, absorbing nutrients, preventing erosion and sedimentation into ditches, streams, rivers and lakes, and filtering pollutants such as excess pesticides and fertilizers.

In some situations, alternative practices will provide comparable water quality benefits and may be more appropriate to fit site conditions and land management objectives.



Source: MPCA

Roles

Soil and Water Conservation Districts (SWCDs) have the authority and expertise to work with landowners to determine what alternative practices may best fit on their land and validate them if requested. Landowners may install alternative practices with or without SWCD assistance and may request a validation of compliance from the SWCD.

SWCDs have authority to validate alternative practices (and combination of practices) based on provisions of the USDA-NRCS Field Office Technical Guide (FOTG). In some situations, a SWCD may request additional input from other field staff or technical experts to ensure they are sufficiently informed when working with landowners. BWSR's role is to provide program information and support to ensure local staff are successful and consistent when working with landowners.

Local Process

To help ensure a consistent approach across the state, BWSR recommends that SWCDs:

1. Develop alternative practices based on FOTG:

The NRCS Field Office Technical Guide (FOTG) practices and design standards are identified on the BWSR website and standards are detailed on the NRCS website.

The BWSR Board has authority to approve practices and methodologies not currently found in the NRCS FOTG which may be used to attain compliance with the law. (*See Minn. Stat. §103F.48, Subd. 3(b)*)

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2. Ensure comparability:

Water quality benefits provided by an alternative practice must be comparable to that which a buffer would provide.

- In some instances, it is appropriate to run models such as RUSLE2 (a soil loss estimator), BWSR pollution reduction calculators, PTMApp, or other commonly accepted scientific methods.
- In many instances, SWCD best professional judgment should prevail, such as when determining that areas of significant concentrated flow are being treated by an alternative practice; or how and where runoff flowing into the water body occurs and how treatment is provided.

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3. Document:

Documenting alternative practices as proposed/as implemented with a diagram, aerial photos, topographic or soil survey maps, etc. is important so both the landowner and the SWCD have a record of sufficient detail to show how alternative practices will be used to achieve comparable water quality benefit.

General Implementation Considerations

- Protect and provide bank stability and water quality protection along the entire frontage of the water body and where possible, treat unstable banks.
- Note where field wind erosion susceptibility is an important resource concern and suggest wind erosion practices. See: https://infosys.ars.usda.gov/WindErosion/nrcs/wepsnrcs.html.
- If a project will alter the course, current or cross section of a Public Water it is suggested that landowners and/or SWCD staff contact the DNR Area Hydrologist before initiating the project.
- SWCD staff may work with landowners to develop routine maintenance plans to ensure the viability of practices which have been implemented. This allows the local SWCD and the landowner to ensure practice success.
- Alternative practices installed on public ditches per this document should be coordinated with the public drainage authority to ensure consistency with the acquisition and establishment of permanent strips of perennial vegetation in accordance with Chapter 103E.
- Alternative practices installed per this document within shoreland zoning districts should be coordinated with county or municipal officials responsible for shoreland ordinance provisions.

Development of common alternative practices

While the law doesn't direct BWSR to prescribe alternative practices, many (including local governments, interest groups, legislators, and landowners) have asked for examples of common alternative practices scenarios to increase the efficiency and consistency of landowner assistance provided by SWCDs.

These common alternative practices were developed in response to and with suggestions from SWCD staff from around the state. These combinations are not intended to be the only options for implementation, or to address all scenarios. The common alternative practice examples include:

1. Minnesota Agricultural Water Quality Certification Program
2. USDA-FOTG Practice Standards Filter Strip (393/391) - public waters w/50' buffer standard
3. Grassed Waterway/Cultivated Watercourses - public waters w/50' buffer standard

4A. Negative slopes or concentrated inflow - public ditches w/16.5' buffer standard

4B. Glacial Lake Plain Areas - public ditches w/16.5' buffer standard

5. Negative slopes or concentrated inflow - public waters w/50' buffer standard
6. Conservation Tillage/Cover Crops with Vegetated Filter Strip - public waters w/50' buffer standard

Minnesota Agricultural Water Quality Certification Program

Common Alternative Practice #1

Buffer Law Implementation

Purpose and Considerations

On May 25, 2016, the BWSR Board approved resolution #16-31 which allows the use of the Minnesota Agricultural Water Quality Certification Program (MAWQCP) as an "Other Alternative Practice." This means that if a landowner's parcel is certified under this program, it also qualifies to attain compliance with the Minnesota Buffer Law (Minnesota Statutes §103F.48).

Any landowner possessing a valid State of Minnesota Agricultural Water Quality Certification Agreement is in compliance under the alternative practices provision of the Buffer Law.

Implementation Guidance

Landowners interested in the Minnesota Agricultural Water Quality Certification Program can get more information by visiting the Minnesota Department of Agriculture website at: http://www.mda.state.mn.us/awqcp.

Comparable Benefits

The Minnesota Agricultural Water Quality Certification Program adoption as an "Other Alternative Practice" acknowledges a methodology in which a comprehensive review of an entire agricultural operation undergoes extensive review and is ranked on an individual basis. MAWQCP-certified status is defined and accorded by the State of Minnesota Agricultural Water Quality Certification Agreement (contract) between the MAWQCP-certified producer and the State of Minnesota. In Section D. Producer Certainty of the contract, it states: "As long as Producer is certified and maintains certification status, Producer is deemed in compliance with any new state water quality laws and rules that take effect during the agreement period."

By virtue of a producer being MAWQCP-certified and maintaining certification status, that producer is in compliance with §103F.48 Buffer Law.

NRCS Filter Strip Standard: MN 393/391 practice standards – Public Waters (with 50' avg. buffer standard)

Common Alternative Practice #2

Buffer Law Implementation

Purpose and Considerations

This document is for the use of MN NRCS 393 (Filter Strip) or 391 (Riparian Forest Buffer) Conservation Practice Standards to comply with the Minnesota Buffer Law. MN NRCS 393 & 391 Standards may be used as standalone conservation practices as long as practice criteria is being met for the defined purpose. For the purposes of this common alternative practice, the definition of a filter strip is: "A strip or area of herbaceous vegetation that removes contaminants from overland flow."

Note: Alternative practices installed per this document within shoreland zoning districts should be coordinated with county or municipal officials responsible for shoreland ordinance provisions.

Implementation Guidance

For information related to implementation of the NRCS 393 & 391 practice standards please use the following:

- https://efotg.sc.egov.usda.gov/references/public/MN/391_MN_Riparian_Forest_Buffer_2016.pdf
- https://efotg.sc.egov.usda.gov/references/public/MN/393_March_2017_MN_final2.pdf

Additional information on using RUSLE2 for Design and Predicted Effectiveness can be found at:

- https://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=18578.wba

NOTE: These standards are not directly related to the Conservation Reserve Program (CRP) criteria.

Comparable Benefits

The NRCS 393 Practice standard calls for overland flow entering the filter strip to be uniform sheet flow and any concentrated flow will be dispersed before it enters the filter strip or addressed by an additional conservation practice. It also calls for more specific seeding mixes and the maintenance standards are more prescriptive as it calls for a 10-year life expectancy and after up to 6" of sediment accumulation the strip is to be re-shaped, graded as needed and vegetation re-established. Therefore, implementation of a properly sited, designed and maintained filter strip following NRCS 393 or 391 practice standards will provide comparable water quality benefit.

Illustration Figure 1: Cross Section view, Alt Practice #2

(not to scale)

Grassed Waterway/Cultivated Watercourses – Public Waters (with 50' avg. buffer standard)

Common Alternative Practice #3

Buffer Law Implementation

Purpose and Considerations

This common alternative practice may be applicable in locations where a watercourse identified on the Buffer Protection Map has:

- no clearly defined bed or bank; and
- no normal water level; and
- a resource concern has been identified.

For the purposes of this common alternative practice, the definition of a grassed waterway is: "A shaped or graded channel that is established with suitable vegetation to convey surface water at a non-erosive velocity using a broad and shallow cross section to a stable outlet". The purposes of grassed waterways are to convey runoff from locations where runoff is concentrated, including terraces, diversions, or other concentrated flow, without causing erosion or flooding, to reduce gully erosion and to protect/improve water quality. This practice is applied in areas where added water conveyance capacity and vegetative protection are needed to prevent erosion and improve runoff water quality resulting from concentrated surface flow.

Note: Alternative practices installed per this document within shoreland zoning districts should be coordinated with county or municipal officials responsible for shoreland ordinance provisions.

Implementation and Dimensions Guidance

Situation #1: Where a watercourse is functioning similar to a grassed waterway SWCD staff should validate the following;

- The watercourse has intermittent/temporary flow; and
- There are no signs of ephemeral erosion in the waterway or adjacent field; and
- The waterway is adequately vegetated.

Note: SWCDs can propose additional measures to address identified resource concerns.

Situation #2: Where a watercourse is cultivated and there is *not* a grassed waterway present, SWCD staff may consider the following options if they have determined there is a resource concern to be addressed;

Option #1: A flat bottom with 10:1 side slopes and vegetation establishment following the NRCS Critical Area Planting standard #342, or Conservation Cover standard #327.

Option #2: Designed and built according to the NRCS Grassed Waterway standard #412.

Notes:

- Occasional mowing and harvest of vegetation is encouraged, if funding sources allow such maintenance, so that accumulated nutrients can be removed.

- A DNR public waters work permit may be required for course, current or cross-section alterations below the Ordinary High Water Level of a Public Water. Landowners should contact the DNR Area Hydrologist before starting a project to determine if permitting requirements may apply.

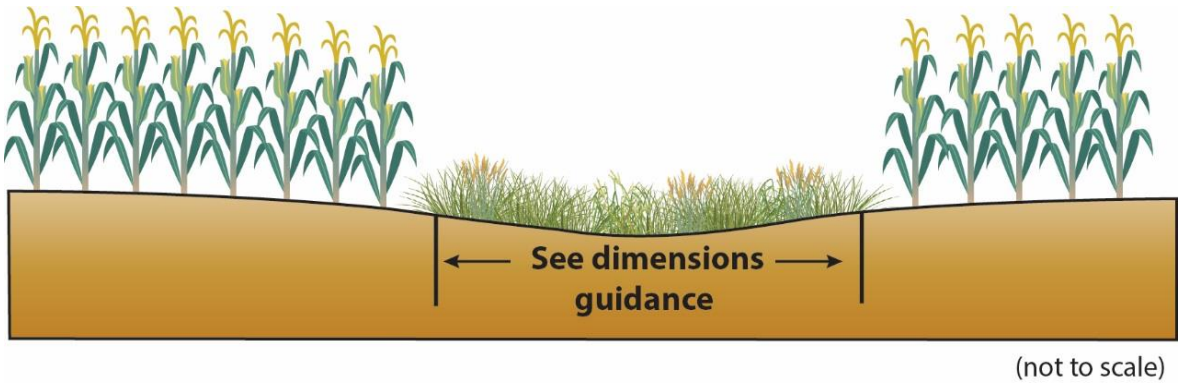
- Design considerations: when a perforated tile line(s) is required to stabilize the waterway and meet NRCS specifications, the tile should meet the following conditions, unless SWCD or NRCS staff otherwise confirm it is the minimum necessary to support a stable grassed waterway and outlet:
    1. The tile is not larger than 4" in diameter; and
    2. A single tile line is used without additional lateral tile lines connecting into it; and
    3. Conservation style tile intakes are used if any surface intakes are required to support the waterway; and
    4. The tile outlet does not create additional erosion.

Comparable Benefits

This procedure provides some treatment for overland flow entering the grassed waterway along the general location of the public watercourse with the grassed bottom and side slopes of the waterway. Further, it provides a stable flow path preventing gully formation in areas where intermittent concentrated flow and row crop agricultural production could otherwise lead to significant erosion. This stabilization also will provide protection which would not have been provided if a gully were allowed to re-form and continually move. Considering all of the above information, a stable grassed waterway implemented as listed in the information above will provide protection from erosion and sedimentation and additional comparable water quality benefits.

Illustration

Figure 2: Cross Section view, Alt Practice #3



Negative slopes or concentrated inflow –

Public Ditches (with 16.5' buffer standard)

Common Alternative Practice #4A

Buffer Law Implementation

Purpose and Considerations

This common alternative practice may be applicable in locations where:

- the primary land slope is away from the top of the channel of a public drainage ditch or there are existing high areas or berms next to the channel which prevent flow from uniformly entering the water body; and
- flow typically enters the public ditch through areas of open channel concentrated flows; or
- flow typically enters the public ditch through an installed pipe or conduit.

Note: Alternative practices installed per this document should be coordinated with the public drainage authority to ensure consistency with the acquisition and establishment of permanent strips of perennial vegetation in accordance with Chapter 103E.

Implementation Guidance

- SWCD should verify by site visit that perennial vegetation is installed from the top of the channel to the top of the constructed berm/spoil bank. This perennial vegetation helps provide bank stability and serves as a tillage setback to prevent sedimentation or direct application of fertilizer or pesticides below the top of bank or normal water level.
- In addition to the perennial vegetation, treatment of all discharge which flows into the waterbody via concentrated flow or other conduit may be treated using a combination of situations 1-3 below.
- Site-specific diagrams or pictures should be used to document validations.

Situation #1: Runoff approaches as concentrated flow and discharges via a conduit, structure or vegetated pathway that meets NRCS Design standards.

- SWCD staff should determine that the structure(s) will be/is functioning as specified to provide the as-designed water quality functions.

Situation #2: Runoff approaches as concentrated flow and discharges via a conduit, structure or vegetated pathway that does *not* meet NRCS Design standards.

- SWCD staff should confirm that outfall locations are stable and functioning as intended to prevent erosion, reduce flow and trap sediment.

- Develop a drainage area map(s) for all outfall locations to determine depth/length of a critical area planting where all areas of concentrated flow enter through a structure or channel which is not based on a NRCS design standard. For consistency and predictability purposes, some suggested dimensions have been provided in the table to the right for low slope sites. When using the table, SWCD staff should consider site specific factors such as topography, soil type and tillage management to assure comparable water quality benefit.

Area draining to site (acres)	Width (ft) Perennial Veg.	Length (ft) Perennial Veg.
<50	10-20	25-50
50-200	15-25	30-60
>200	20-30	60-120

- Use NRCS Code 342 (Critical Area Planting) or 327 (Conservation Cover) specifications to determine proper seed mixture. Seed tags and invoices to show that it was seeded to Critical Area Planting or Conservation Cover specifications may be needed for SWCD validation.

Situation #3: Water flows overland to open tile intake(s).

- Establish perennial vegetation around all open tile intakes within the parcel adjacent to the waterbody, following the NRCS 393 practice standard. (Typically 15'-60' radius.)

Notes:

- A DNR public waters work permit may be required for course, current or cross-section alterations below the Ordinary High Water Level of a Public Water. Landowners should contact their DNR Area Hydrologist before starting a project to determine if permitting requirements may apply.
- In areas where perennial vegetation is established to treat runoff, occasional maintenance and re-shaping and re-seeding to maintain flow and remove and distribute vegetative mass may be useful. Side inlets or similar structural practices will also require occasional maintenance to function as designed.

Comparable Benefits

This common alternative practice provides treatment of runoff along the entire frontage of the waterbody. In instances where all land flows away from the top edge of the constructed channel, it provides a tillage setback. The perennial vegetation helps provide bank stability and serves as a tillage setback to prevent direct application of fertilizer or pesticides below the top of bank or normal water level. It also helps prevent direct disturbance of the banks so soil is not deposited directly onto the banks or into the water body due to tillage practices. The concentrated inflow measures treat the water before it enters the waterbody more than one-rod of perennial vegetation would, as the runoff would not flow through the buffer uniformly towards the water body. Use of the combination of perennial vegetation and discharge structures or other vegetated areas provide comparable or greater water quality benefit.

Illustrations

Figure 3: Cross Section view A, Alt Practice #4

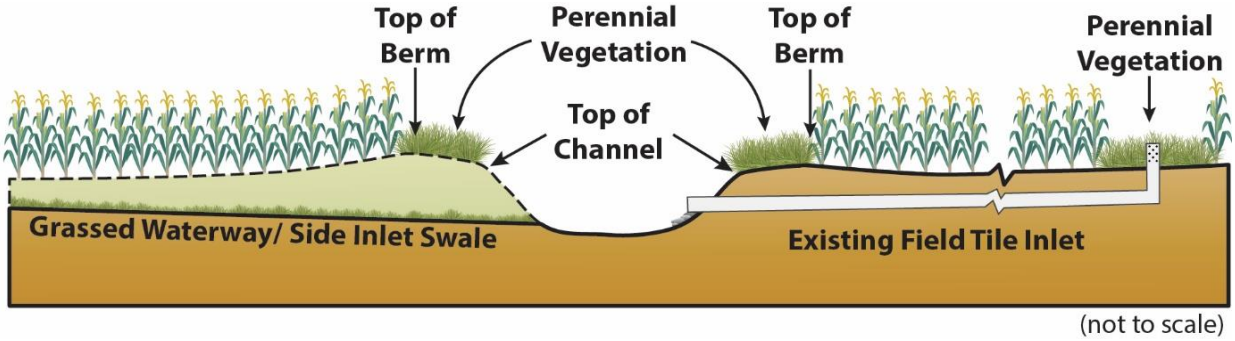


Figure 4: Cross Section view B, Alt Practice #4

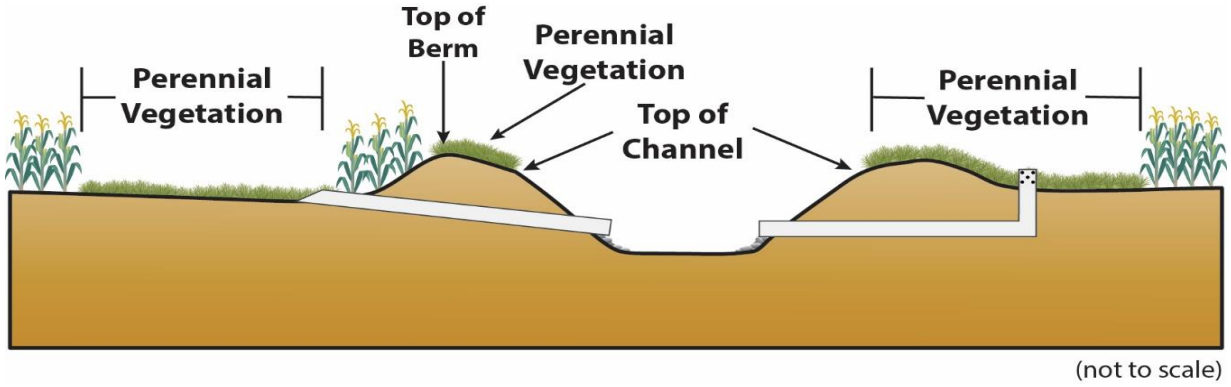
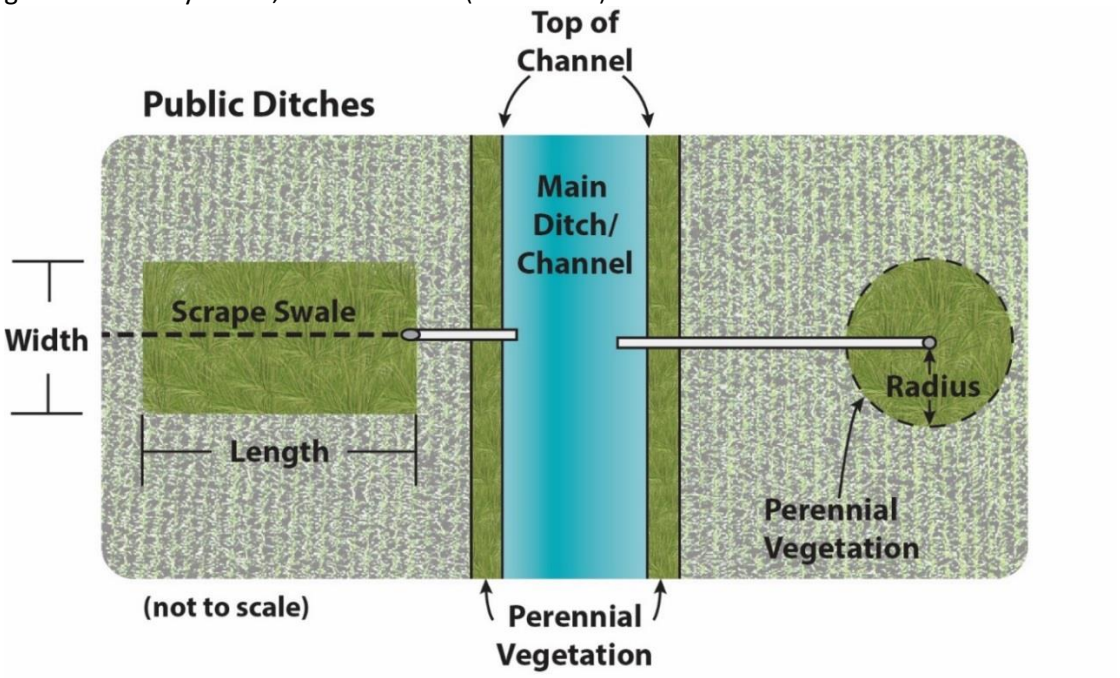


Figure 5: Bird's Eye view, Alt Practice #4 (not to scale)



Glacial Lake Plain Areas

Public Ditches (with 16.5' buffer standard)

Common Alternative Practice #4B

Buffer Law Implementation

Purpose and Considerations

This common alternative practice may be applicable on Public Ditches in locations where:

- the primary surface runoff contributing area is approximately 0.1% slope; and
- the channel and banks are fully vegetated and stable; and
- surface water typically enters the public ditch through open channel concentrated flows; or
- surface flow directly discharging over the channel bank into the public ditch is minimal and infrequent.

Note: Alternative practices installed per this document should be coordinated with the public drainage authority to ensure consistency with the acquisition and establishment of permanent strips of perennial vegetation in accordance with Chapter 103E.

Implementation Guidance

- SWCD staff should verify that perennial vegetation is clearly established outward beyond the top of the channel to provide a sufficient setback to protect the top of the bank from tillage disturbance, direct deposition of sediment, and direct as well as indirect application of fertilizer, pesticides & herbicides into the channel.
- In addition to the perennial vegetative setback, treatment of all runoff water into the ditch via concentrated flow or other conduit may be treated using a combination of situations 1-4 below.
- Site-specific diagrams or pictures should be used to document validation of compliance.

Situation #1: Surface runoff approaches as concentrated flow and discharges via a conduit, structure or vegetated pathway that meets NRCS design standards.

- SWCD staff should determine that the structure(s) are functioning as specified to provide the as- designed water quality functions.

Situation #2: Surface runoff approaches the ditch as concentrated flow and discharges via a conduit, structure or vegetated pathway that does not meet NRCS design standards.

- SWCD staff should confirm that conduit outlets or graded outfalls are stable and not causing bank erosion.

- Develop a drainage area map(s) for all outfall locations to determine depth/length and width of a critical area planting where all areas of concentrated flow enter through a structure or channel which is not based on a NRCS design standard. For consistency and predictability purposes, some suggested dimensions have been provided in the table to the right for low slope sites. When using the

Area draining to site (acres)	Width (ft) Perennial Veg.	Length (ft) Perennial Veg.
<50	10-20	25-50
50-200	15-25	30-60
>200	20-30	60-120

table, SWCD staff should consider site specific factors such as topography, soil type and tillage management to assure comparable water quality benefit.

- Use NRCS Code 342 (Critical Area Planting) or 327 (Conservation Cover) specifications to determine proper seed mixture. Seed tags and invoices to show that it was seeded to Critical Area Planting or Conservation Cover specifications may be needed for SWCD validation.

Situation #3: Surface runoff flows overland to open tile intake.

- Establish perennial vegetation around all open tile intakes within the parcel adjacent to the ditch, following the NRCS 393 practice standard. (Typically 15'-60' radius.)

Situation #4: Surface runoff does not directly discharge to the ditch via concentrated flow.

- Provide a minimum 16.5'-50' strip of no-till/strip till (NRCS 329 standard) or cover crops (NRCS 340 standard) in addition to the vegetated tillage setback.

Notes:

- A DNR public waters work permit may be required for course, current or cross-section alterations below the Ordinary High Water Level of a Public Water. Landowners should contact their DNR Area Hydrologist before starting a project to determine if permitting requirements may apply.
- In areas where perennial vegetation is established to treat runoff, occasional maintenance and re-shaping and re-seeding to maintain flow and remove and distribute vegetative mass may be useful. Side inlets or similar structural practices will also require occasional maintenance to function as designed.

Comparable Benefits

This common alternative practice provides treatment of runoff where it enters the ditch. In instances where there is minimal flow over the top edge of the constructed channel, this alternative practice provides bank stability and serves as a tillage setback to prevent direct deposition of soil into the channel associated with tillage practices or application of fertilizer or pesticides below the top of bank or normal water level. The concentrated inflow measures treat the water before it enters the ditch more than one-rod of perennial vegetation would, as the runoff would not typically flow through the buffer towards the ditch. Use of the combination of perennial vegetation and discharge structures or other vegetated areas provide comparable or greater water quality benefit.

Illustrations

Figure 6: Cross Section view A, Alt Practice #4B

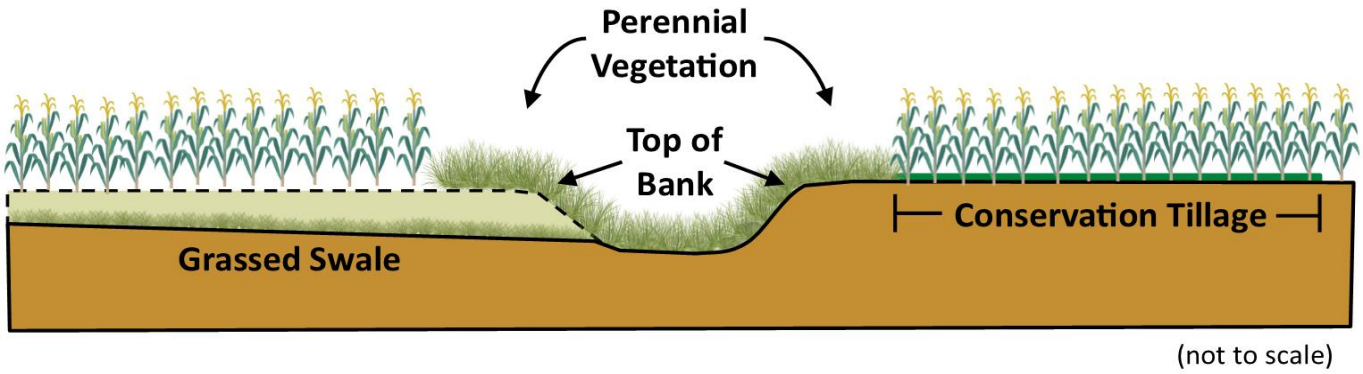


Figure 7: Cross Section view B, Alt Practice #4B

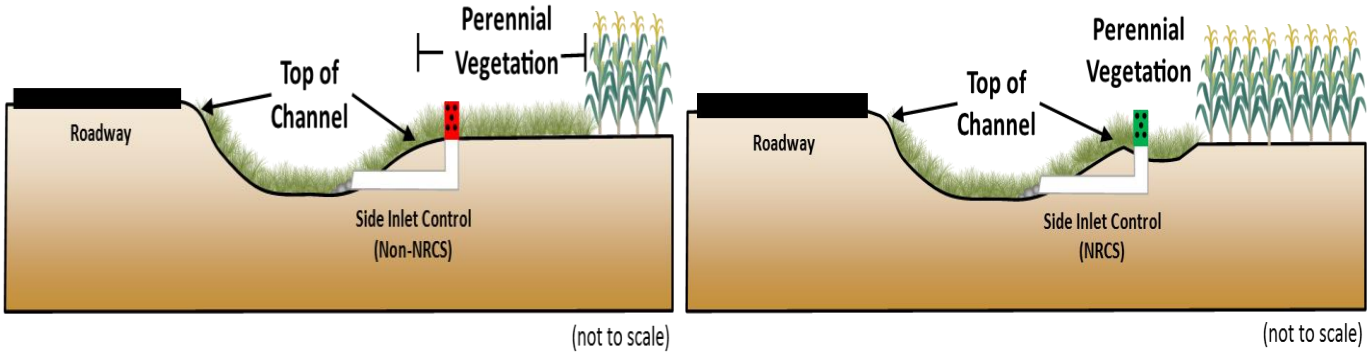
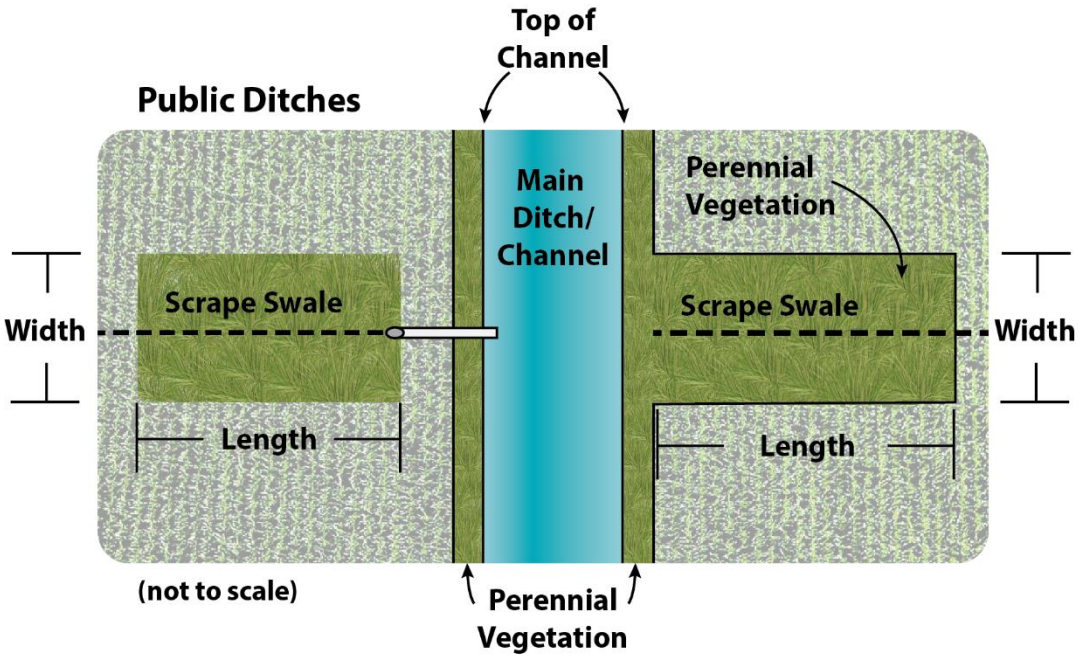


Figure 8: Bird's Eye view, Alt Practice #4B (not to scale)



Negative slopes or concentrated inflow – Public Waters (with 50' avg. buffer standard)

Common Alternative Practice #5

Buffer Law Implementation

Purpose and Considerations

This common alternative practice may be applicable in locations where:

- the land slope is away from the top of the bank of a water body, or there are existing high areas next to the bank which prevent flow from uniformly entering the water body;
- runoff typically enters the water body through open channel concentrated flows;
- runoff typically enters the water body through an installed pipe or conduit;

Note: Alternative practices installed per this document within shoreland zoning districts should be coordinated with county or municipal officials responsible for shoreland ordinance provisions.

Implementation Guidance

- SWCD should verify that undisturbed perennial vegetation is installed from the top of the bank to the top of the constructed or natural berm, if one exists, but not less than 16.5 ft landward from the top of the bank. This perennial vegetation helps provide bank stability, serves as a tillage setback to prevent sedimentation and direct application of fertilizer or pesticides below the waterbody.
- In addition to the perennial vegetation, treatment of all discharge which flows into the waterbody via concentrated flow or other conduit may be treated using a combination of situations 1-3 below.
- Site-specific diagrams or pictures should be used to document validations.

Situation #1: Runoff approaches as concentrated flow and discharges via a conduit, structure or vegetated pathway that meets NRCS Design standards.

- SWCD staff should confirm that outfall locations are stable and functioning as intended to prevent erosion, reduce flow or trap sediment.
- SWCD staff should determine that the practice or structure(s) will be/is functioning as intended to provide the as-designed water quality functions.

Situation #2: Runoff approaches as concentrated flow and discharges via a conduit or structure or vegetated pathway that does *not* meet NRCS Design standards.

- SWCD staff should confirm that outfall locations are stable and functioning as intended to prevent erosion, reduce flow or trap sediment.

- Develop a drainage area map(s) for all outfall locations to determine depth/length of a critical area planting where all areas of concentrated flow enter through a structure or channel which is not based on a NRCS design standard. For consistency and predictability purposes, some suggested dimensions have been provided in the table to the right for low slope sites. When using the table, SWCD staff should consider site specific factors such as topography, soil types and tillage management to assure comparable water quality benefit.

Area draining to site (acres)	Width (ft) Perennial Veg.	Length (ft) Perennial Veg.
<50	10-20	25-50
50-200	15-25	30-60
>200	20-30	60-120

- Use NRCS Code 342 (Critical Area Planting) or 327 (Conservation Cover) specifications to determine proper seed mixture. Seed tags and invoices to show that it was seeded to Critical Area Planting or Conservation Cover specifications may be needed for SWCD validation.

Situation #3: Water flows overland to open tile intake(s).

- Establish perennial vegetation around all open tile intakes within the parcel adjacent to the waterbody, following the NRCS 393 practice standard. (Typically 15'-60' radius.)

Notes:

- In any areas where perennial vegetation is established to treat runoff occasional maintenance and re-shaping and re-seeding to maintain flow and remove and distribute vegetative mass may be useful. Side inlets or similar structural practices will also require occasional maintenance to function as designed.

- A DNR public waters work permit may be required for course, current or cross-section alterations below the Ordinary High Water Level of a Public Water. Landowners should contact their DNR Area Hydrologist before starting a project to determine if permitting requirements may apply.

Comparable Benefits

This common alternative practice provides treatment of runoff along the entire frontage of the waterbody. In instances where all land flows away from the top edge of the constructed channel, it provides a tillage setback. The perennial vegetation helps provide bank stability and serves as a tillage setback to prevent direct application of fertilizer or pesticides below the top of bank or normal water level. It also helps prevent direct disturbance of the banks so soil is not deposited directly onto the banks or into the water body due to tillage practices. The concentrated inflow measures provide for stable outfalls and retention areas where establishing fifty feet of perennial vegetation would provide minimal treatment or prevention of sediment and sediment associated constituents. Use of the combination of perennial vegetation and discharge structures or other vegetated areas will provide comparable or greater water quality benefit.

Illustrations

Figure 9: Cross Section view A, Alt Practice #5

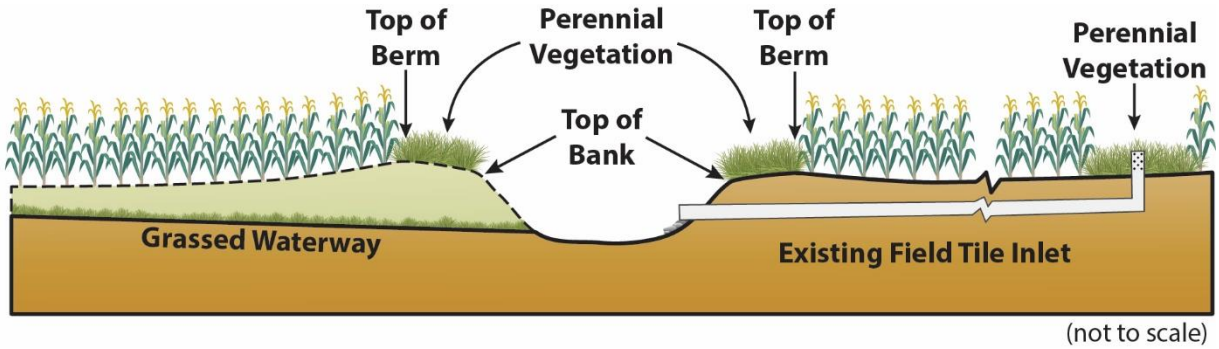


Figure10: Cross Section view B, Alt Practice #5

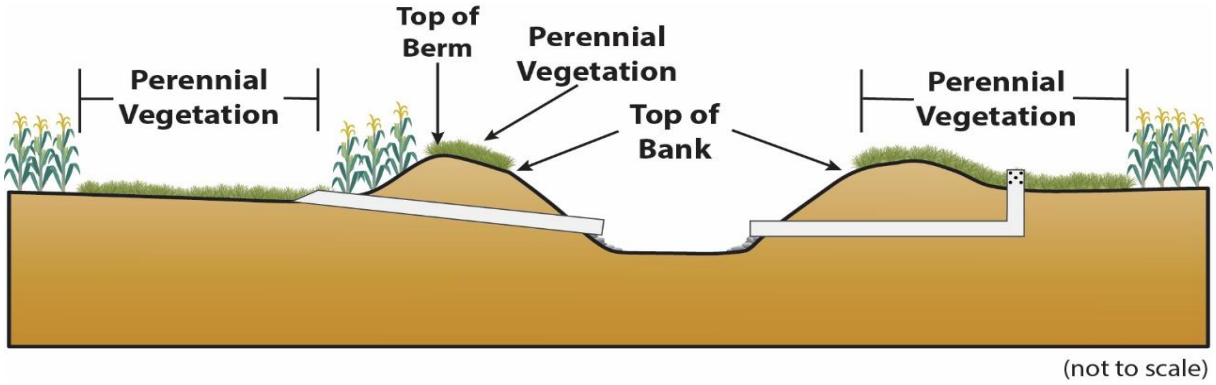
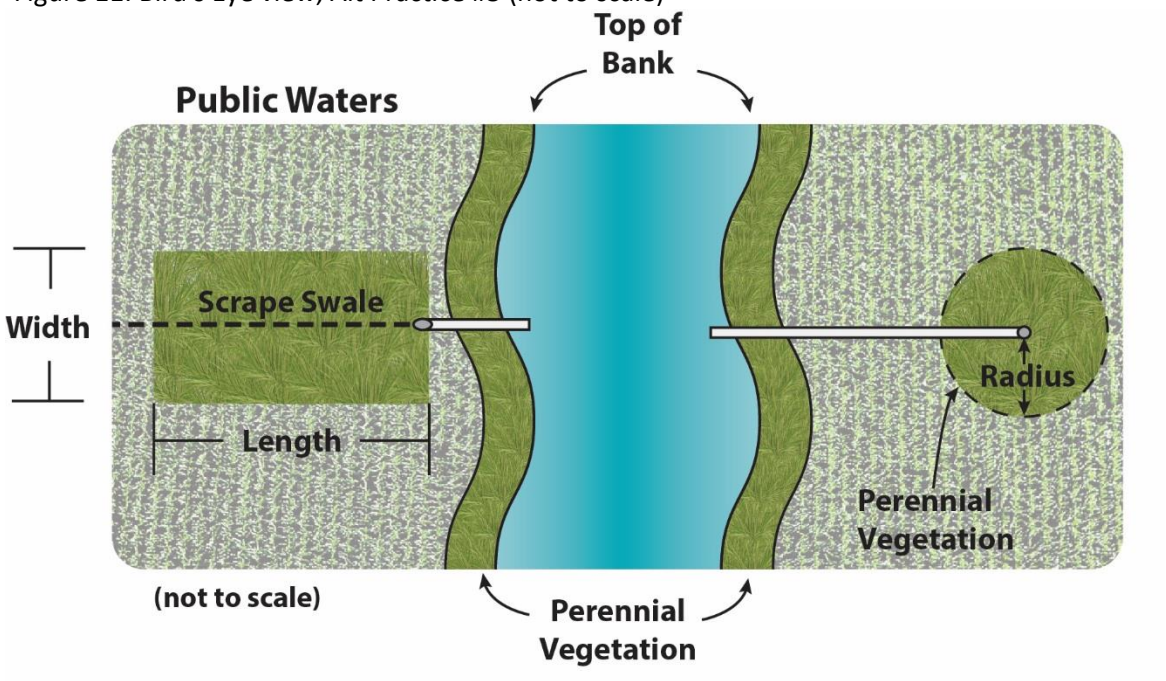


Figure 11: Bird's Eye view, Alt Practice #5 (not to scale)



Conservation Tillage/Cover Crops with Vegetated Filter Strip – Public Waters (with 50' avg. buffer standard)

Common Alternative Practice #6

Buffer Law Implementation

Purpose and Considerations

This common alternative practice document is for implementation of tillage management and/or cover crops in combination with a perennially vegetated filter strip as an alternative practice to achieve water quality protection comparable to the prescribed buffer under the Minnesota Buffer Law. Sufficient perennial vegetation or other measures should be considered in all instances to protect and provide bank stability.

USDA Agronomy Technical Note #2 or its equivalent "Using RUSLE2 for the Design and Predicted Effectiveness of Vegetative Filter Strips (VFS) for Sediment" may be used for determining benefits and sizing of installed perennially vegetated filter strips.

> **Note: Alternative practices installed per this document within shoreland zoning districts should be coordinated with county or municipal officials responsible for shoreland ordinance provisions.**

Implementation Guidance

- In all situations below, perennial vegetation may be installed following NRCS 342 or 327 practice standards.
- Use the most current erosion prediction system supported by NRCS.
- Site-specific diagrams or pictures should be used to document validations.

Situation #1: Landowner is interested in implementing no-till/strip-till following NRCS 329 practice standard on their entire parcel and using a standardized vegetated filter strip.

Step 1) SWCD validates that the no-till/strip-till 329 practice standard(s) are being met for all adjacent tillable land on the parcel.

Step 2) SWCD validates the presence of at least 25 ft of adjacent perennial vegetation.

Situation #2: Landowner is interested in implementing no-till/strip-till NRCS 329 practice standard and wants to calculate the size of the vegetated filter strip.

Step 1) Run RUSLE2, following Tech note #2, for the parcel with a baseline condition without tillage management and a 50' vegetative buffer strip.

Step 2) Run RUSLE2, following Tech note #2, and convert tillage to NRCS 329 No-Till/Strip-Till practice standard and reduce the vegetated filter strip width such that it reduces sediment delivery to the water body as identified in Step 1.

A minimum width of perennial vegetation of 16.5’ should also be established to provide bank stability and serve as a tillage setback to prevent sedimentation or direct application of fertilizer or pesticides below the top of bank or normal water level.

Additional information on using RUSLE2 for Design and Predicted Effectiveness can be found at: https://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=18578.wba

Situation #3: Landowner is interested in using situation #2 above AND adding a cover crop.

Follow steps for Situation #2 adding implementation of NRCS practice standard 340 Cover Crop when running RUSLE2.

Comparable Benefits

The no-till/strip-till and cover crop practice standards commonly reduce runoff and associated pollutants to the perennially vegetated filter strip by more than fifty percent as compared to full tillage. For example, conservation tillage can reduce soil loss up to 90% when compared to conventional tillage (MDA Ag BMP Handbook). Demonstration of benefits is accomplished using RUSLE2 following the standard accepted methodology provided by USDA/NRCS Agronomy Technical Note #2.

Illustration

Figure 12: Cross Section view, Alt Practice #6