Determining Regulatory Jurisdiction and Reporting Requirements for Ditching Activities

Is it a Ditch, Intermittent or Perennial Stream

Presentation Outline

- Jurisdiction and Reporting Requirements
- Methods for Identifying Ditches, Intermittent and Perennial Streams
- Meeting Non-Reporting Implementation Requirements

Jurisdiction and Reporting Categories Applicable to Ditching Activities

Non-Jurisdictional

Activities on intermittent streams

Jurisdictional

Activities on Perennial Streams

Non-Reporting

Maintenance of an existing channelized perennial stream with a drainage area of less than 0.5 square miles conducted in a manner that meets implementation requirements.

Reporting

All other activities on perennial streams

Determining Jurisdiction and Reporting Requirements

1. Is it a human constructed ditch or a naturally occurring stream?
2. Is it intermittent or perennial?
3. Is it an existing channelized perennial stream with a D.A. less than 0.5 mi^2?

Is it a human constructed ditch or a ditched stream?

1. Walk the entire feature looking for a natural origin.

2. Look for a natural valley on the topo-maps.

3. Review topo-maps for contour crenulations (V-shaped contour lines) with angles of 90$_{\circ}$ or less as indicators of the presence of a stream.

4. Review soil survey maps for the presence of linear soil mapping units indicative of alluvial deposits and the presence of a stream.

Is it intermittent or perennial?

Evaluative Parameters For Identification of Perennial Streams (from DEC Technical Guidance)

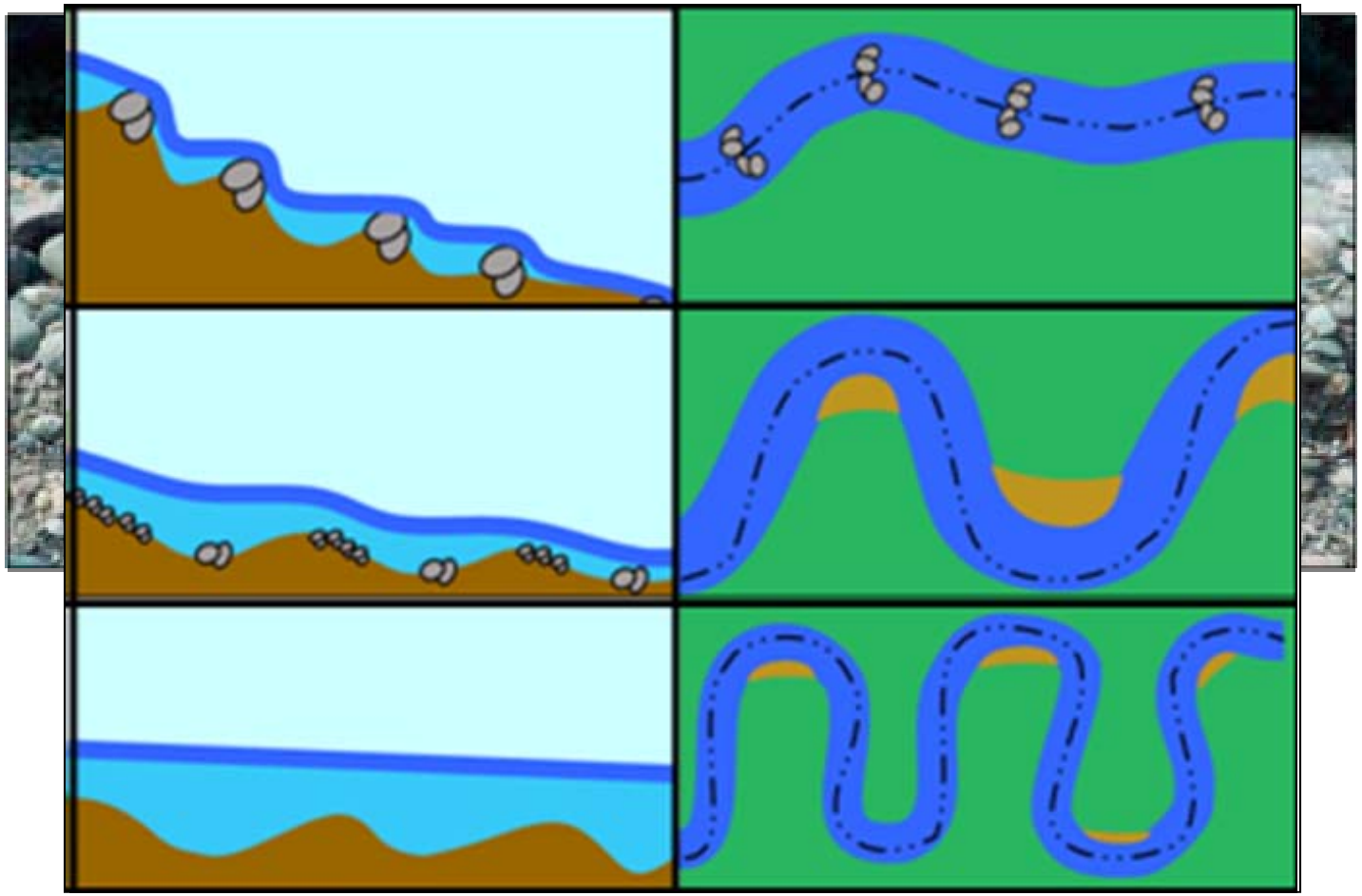
1. Direct observation or compelling evidence obtained that surface flow is uninterrupted.
2. Presence of one or more geomorphic characteristics typically associated with perennial streams.
3. Watershed size greater than 0.5 square miles
4. VHD data layer-derived application of USGS regression for intermittent stream flow probability
5. Presence of aquatic organisms requiring uninterrupted flow for survival
6. Base flows are primarily supported by groundwater recharge as indicated by bank seeps, springs or other indicators
7. Presence of highly permeable channel (particularly streambed) boundary conditions in conjunction with occasional to frequent decline of the groundwater table below the streambed elevation.
8. Surrounding topography exhibits characteristics of being formed by fluvial processes.

Evaluative Parameters (from DEC Technical Guidance)

1. Direct observation or compelling evidence obtained that surface flow is uninterrupted.
   - Observation of flow during low flow conditions
   - Testimony of local area residents

Evaluative Parameters (from DEC Technical Guidance)

2. Presence of geomorphic characteristics:
   a. Riffles, pools, runs, gravel bars, other depositional features, bed armor layer



Evaluative Parameters (from DEC Technical Guidance)

2. Presence of one or more geomorphic characteristics:
    a. Bed forms
    b. Bank erosion and/or bed scour
    c. Indications of waterborne debris and sediment transport
    d. Defined bed and banks

Evaluative Parameters (from DEC Technical Guidance)

Figure 6a. Ephemeral Stream Bed (NC DWQ)

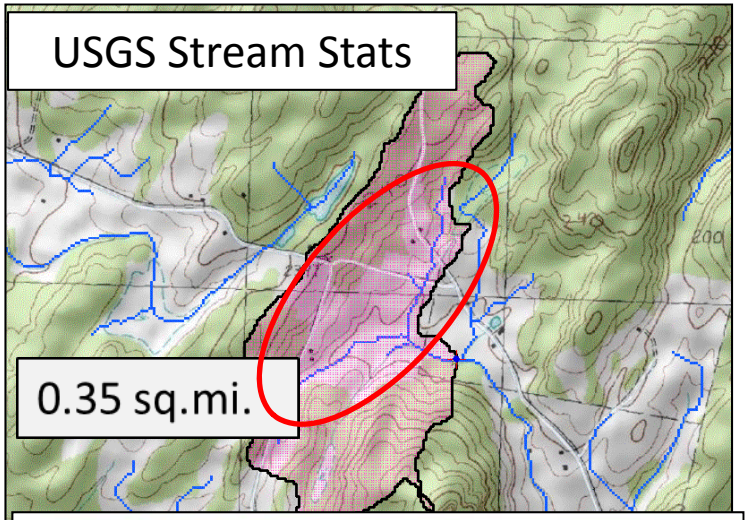
Ephemeral Stream

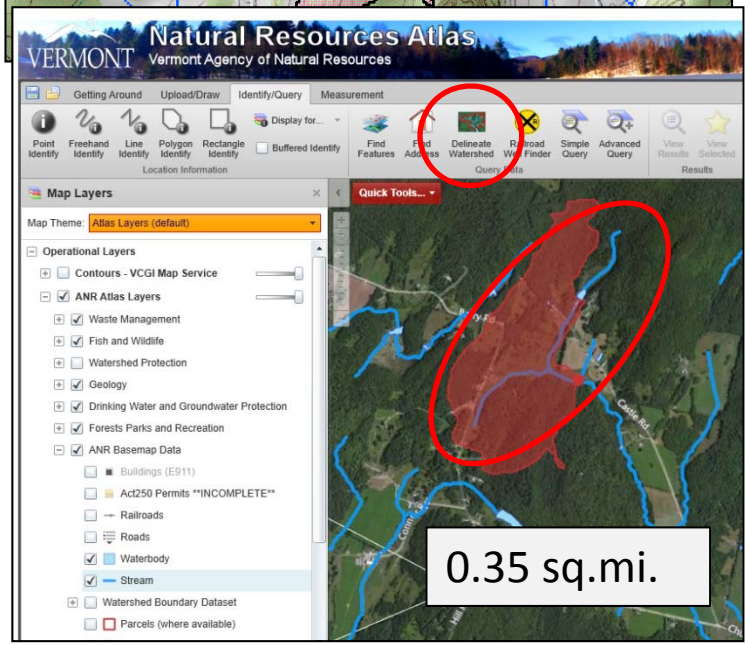
2. Presence of one or more geomorphic characteristics:
   a. Bed forms
   b. Bank erosion and/or bed scour
   c. Indications of waterborne debris and sediment transport
   d. Defined bed and banks

Figure 6b. Perennial Stream Bed (NC DWQ)

Evaluative Parameters (from DEC Technical Guidance)

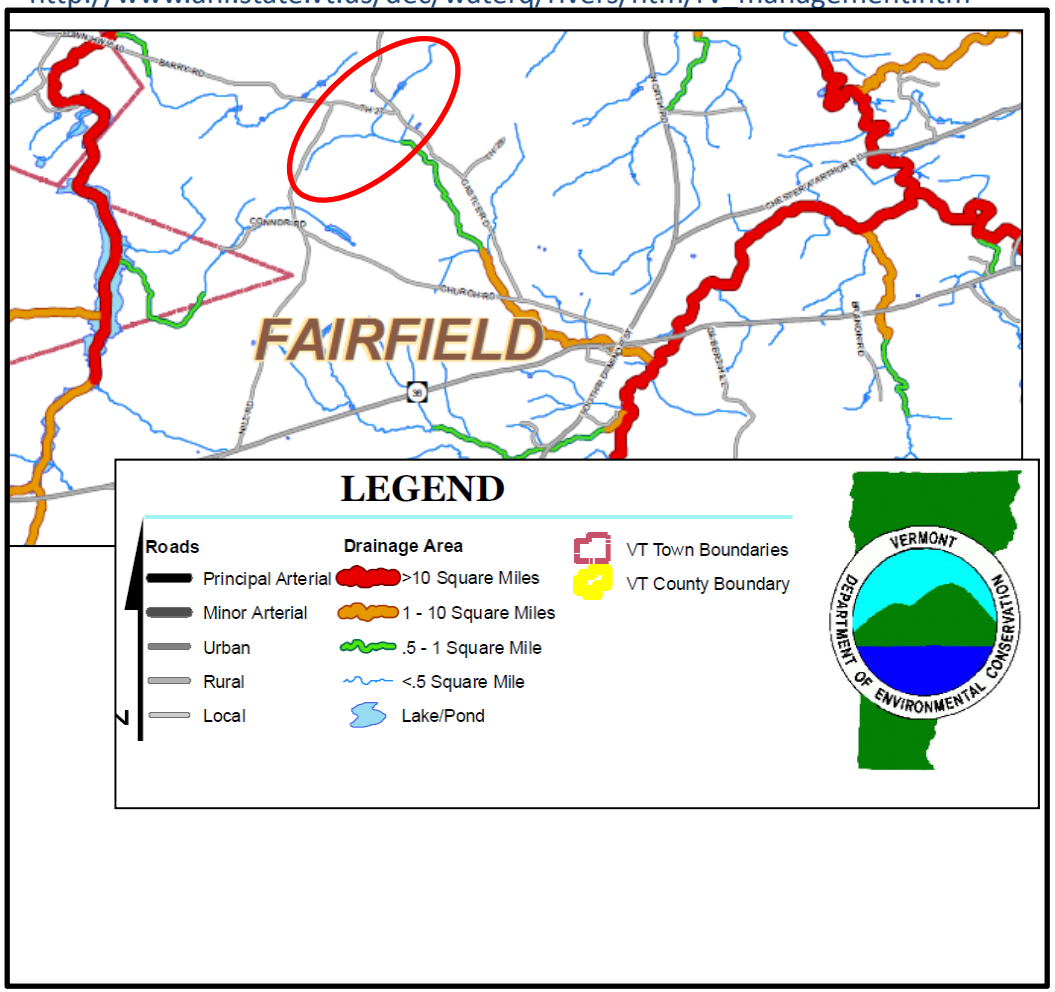
3. Watershed size greater than 0.5 square miles





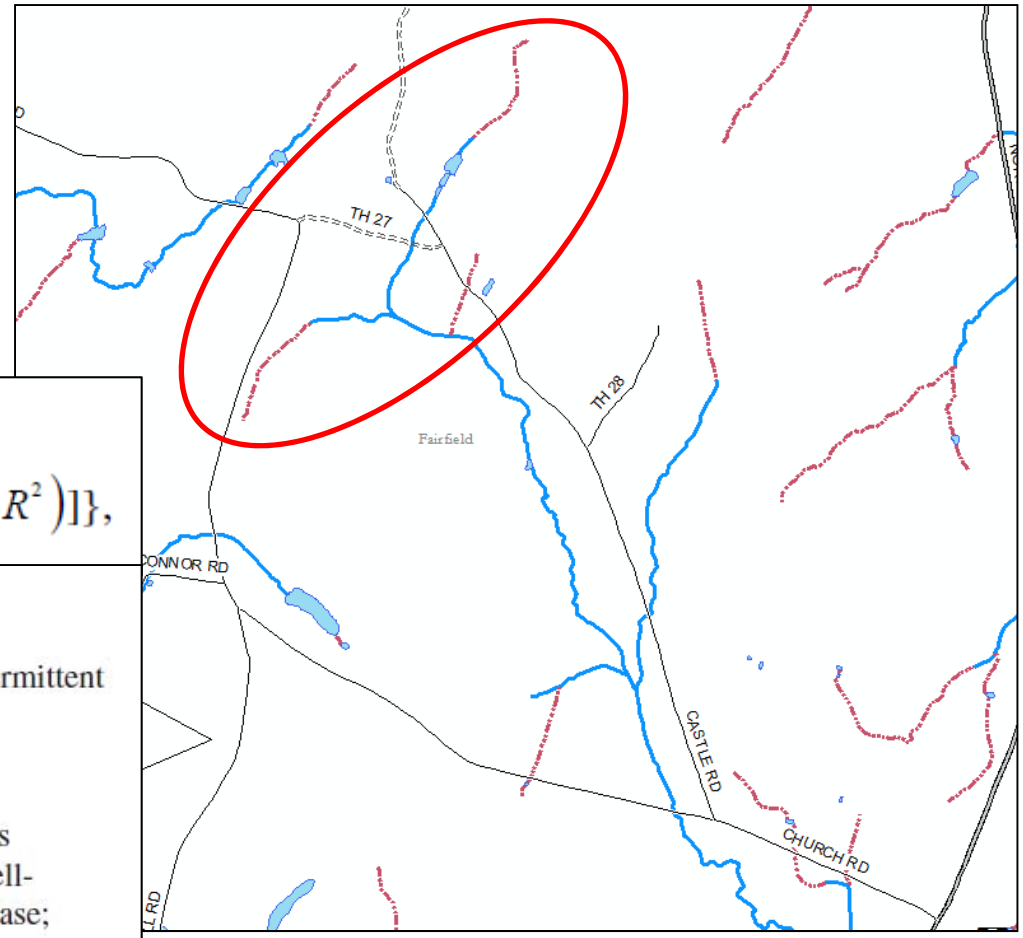
DEC Stream Watershed Size Maps by Town

http://www.anr.state.vt.us/dec/waterq/rivers/htm/rv_management.htm



Evaluative Parameters (from DEC Technical Guidance)

4. VHD data layer-derived application of USGS regression for intermittent stream flow probability



$$p = 1/\{1 + exp[-5.30 + 1.98(log_{10}(A)) + 2.38(log_{10}(E)) + 0.525(log_{10}(S+1)) - 165(R^2)]\},$$

where

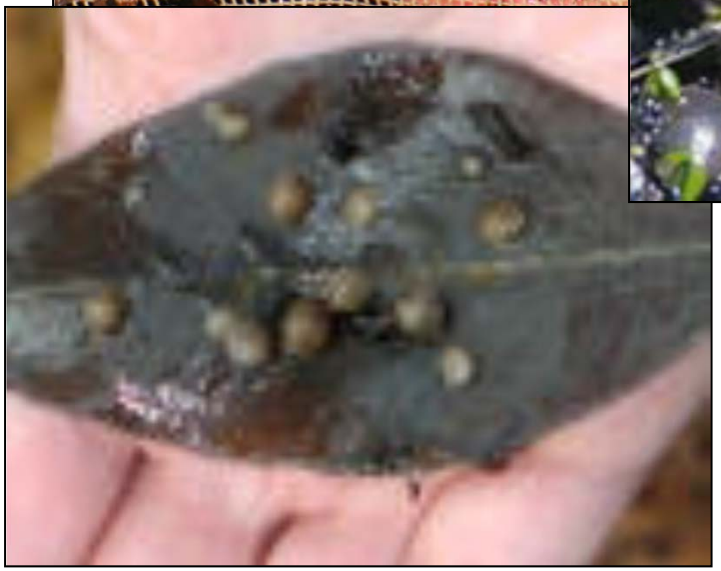
- p is the probability that a stream has intermittent flow;
- A is the drainage area, in square miles;
- E is the site elevation, in feet;
- S is the percentage of the basin with soils classified as well- or moderately well-drained soils in the SSURGO database;

and

- R is the relative relief, unitless (ratio of maximum relief to basin perimeter).

Evaluative Parameters (from DEC Technical Guidance)

5. Presence of aquatic organisms requiring uninterrupted flow for survival



Evaluative Parameters (from DEC Technical Guidance)

6. Base flows are primarily supported by groundwater recharge as indicated by bank seeps, springs or other indicators

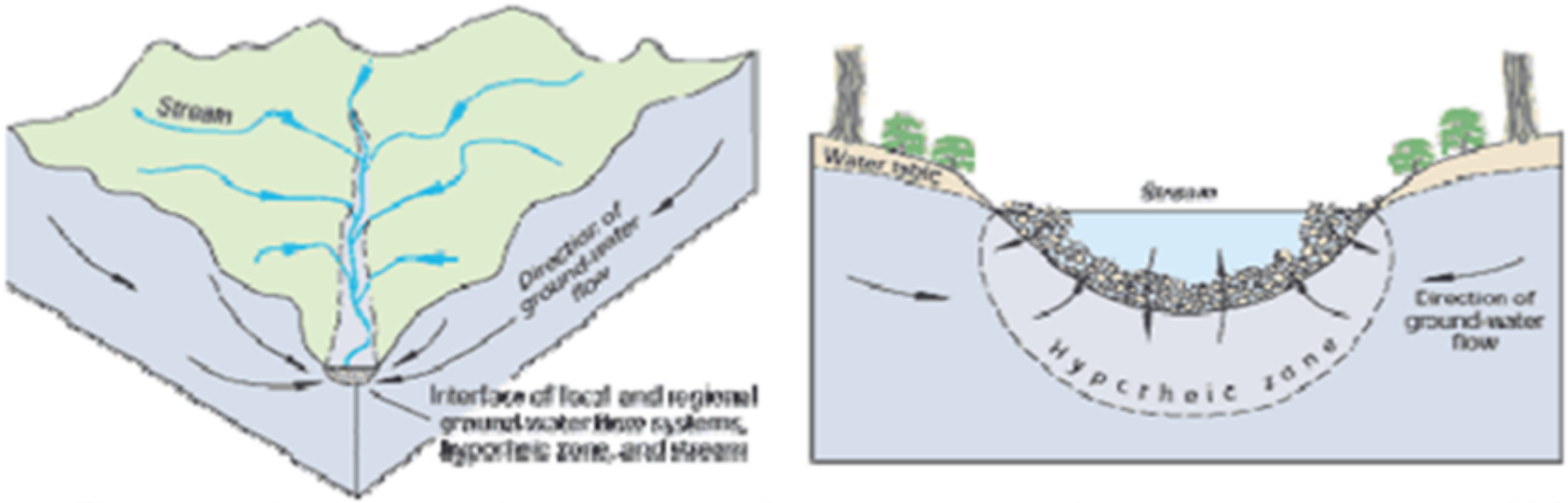


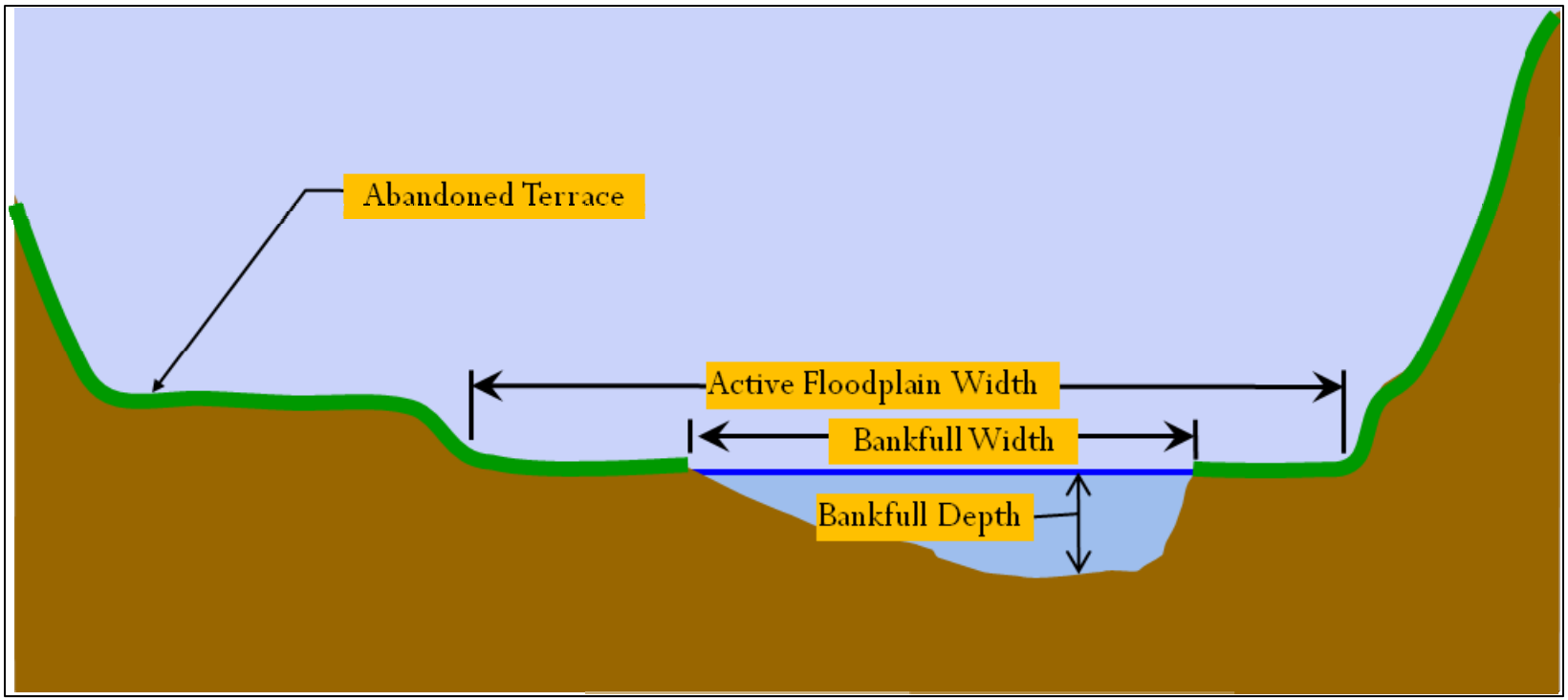
Figure 14: Illustration of groundwater flow and hyporheic zone (Winter et al.,1998).

Evaluative Parameters (from DEC Technical Guidance)

7. Presence of highly permeable channel boundary conditions in conjunction with occasional to frequent decline of the groundwater table below the streambed elevation.

Evaluative Parameters (from DEC Technical Guidance)

8. Surrounding topography exhibits characteristics of being formed by fluvial processes



North Carolina Guidance

Geomorphic Indicators

1. Continuity of Channel Bed and Bank
2. Sinuosity of Channel Along Thalweg
3. Riffle-Pool, Step-Pool, Ripple-Pool sequence
4. Particle Size in Stream Substrate
5. Active/Relict Floodplain
6. Depositional Bars or Benches
7. Recent Alluvial Deposits
8. Headcuts
9. Grade Control
10. Natural Valley
11. Second (or Greater) Order Channel

B. Hydrologic Indicators

1. Presence of Baseflow
2. Iron Oxidizing Bacteria
3. Leaf litter
4. Sediment on Plants or Debris
5. Organic Drift Lines
6. Soil-based Evidence of a Seasonal High Water Table

C. Biological Indicators

1. Fibrous Roots in Streambed
2. Rooted Upland Plants in Streambed
3. Benthic Macroinverts
4. Aquatic Mollusks
5. Fish
6. Crayfish
7. Amphibians
8. Algae

Basic Methods For Making Stream Determinations (from NC guidance)

- **Do not evaluate a stream within 48 hours of rainfall that results in surface runoff.**
  - It generally takes 48 hours for increased streamflow resulting from precipitation to attenuate.
  - Delaying a stream determination following rainfall helps to eliminate visual bias associated with observing water in a stream that may not currently have baseflow.
  - Stormflow may obscure many of the channel features that need to be observed and evaluated.

Basic Methods For Making Stream Determinations

- **Become familiar with the characteristics of headwaters streams**
  - Visit a variety of headwater streams look for the geomorphic, hydrologic and biological features discussed here, and gain experience observing the magnitude and variability of these features.

- **Review information on stream to be evaluated.**
  - (USGS) topographic maps
  - (NRCS) soil survey maps, geology maps and/or high resolution topographic data (e.g., LiDAR-based)
  - aerial photography
  - land use/land cover
  - current streamflow at nearby gauges, recent rainfall compared to normal
  - drought status information

Basic Methods For Making Stream Determinations

- **Walk to the upstream extent of the feature to the drainage divide where possible.**
  - Evaluating the degree of development of stream indicators requires comparison of the stream reach of interest to upstream portions of the stream.
  - Headwater streams are often discontinuous with segments with very poorly developed channels where baseflow flows under the surface. Therefore, an apparent perennial or intermittent stream origin may not be the actual origin.

- **Evaluate at least 100 ft of stream to determine average conditions.**
  - Determinations must not be made by observing one location in a stream, but rather should be made by observing a reach of stream.
  - Examine and study the nature of the channel, noting the presence or absence and magnitude of evaluative parameters

Maintenance of Previously Channelized Perennial Streams Less Than 0.5 mi^2

Implementation Requirements for Non-Reporting Eligibility

1. The project must be conducted between July1 and October 1
2. Turbidity associated with the activity is avoided
3. Vegetated buffers as required under applicable (AAPs), MFO, LFO Permits, and/or other applicable rules are maintained
4. Erosional channels are appropriately stabilized with vegetative and/or structural treatments
5. Excavated sediments to maintain channel capacity are disposed appropriately
6. The work does not result in existing surface waters being converted to subsurface flows
7. Project improvements that move toward attainment of the Stream Alterations Performance Standards are implemented wherever feasible

Implementation Requirements for Non-Reporting Eligibility

Avoiding turbidity

FACT SHEET:

Maintaining Surface Water Drainage Ditches

Save yourself time & money, stabilize the raw earth in your ditches the right way, the first time!

This fact sheet is designed to provide helpful do's and dont's when you are maintaining existing ditches. Allowing dirty water with sediment & excess nutrients to enter streams, rivers, lakes, ponds or wetlands is considered a violation of state regulations! Following these guidelines will help keep the State's waterways (streams, rivers, lakes, ponds and wetlands) clean for you and your neighbors.

The information presented here is not intended as guidance for building new ditches or to compensate for other regulatory requirements and/or exemptions. If you're planning new ditch construction, please contact the Center for Clean & Clear for appropriate technical assistance.

TECHNICAL ASSISTANCE
For help designing or maintaining ditches, please contact the Center for Clean & Clear at 802-527-5730.

Stone check dams slow the

Below are things to review before you clean out your ditches.

How close are waterways or wetlands?

Do ✓
- Check resource maps for **Waters of the State** (streams, rivers, wetlands, ponds, etc.)
- Contact technical assistance if you are unsure of local resources.

Don't ⊘
- Don't begin work until you know where the Waters of the State are located on your land.

Will a contractor do the work?

Do ✓
- Meet with your contractor to explain the details of the job.
- Explain to the contractor what is and isn't allowed and provide a copy of this fact sheet.

Don't ⊘
- Don't allow the contractor to begin work before you discuss the details of the work.

Are the fields and d

Do ✓
- Work between June a September to allow v regrow.
- Always check the wea forecast to operate in

Don't ⊘
- Don't work if water is your fields or in your
- Don't work if rain is pr

Where will the dirty water go?

Do ✓
- Take responsibility for your runoff.
- Construct check dams in your ditch to slow water flow and allow settling before it leaves the ditch (see photo on this page).

Don't ⊘
- Don't flood your neighbors by altering your ditch's capacity or outlet location.
- Don't let dirty drainage water enter Waters of the State.

Where will the excavated dirt

Do ✓
- Spread the excavated soil from the ditch o least 50 feet from ditches, other waterway wetlands.
- Clean out and stabilize ditches by the end

Don't ⊘
- Don't place remaining debris or sediment i
- Don't allow soil to erode back into the ditch
- Don't build berms or stockpiles alongside y

What shape should the ditch be?

Do ✓
- Slope the sides gently— 2:1 (h:v) or flatter.

Are the fields and ditches dry?

Do ✓
- Work between June and September to allow vegetation to regrow.
- Always check the weather forecast to operate in dry weather.

Don't ⊘
- Don't work if water is standing in your fields or in your ditches.
- Don't work if rain is predicted.

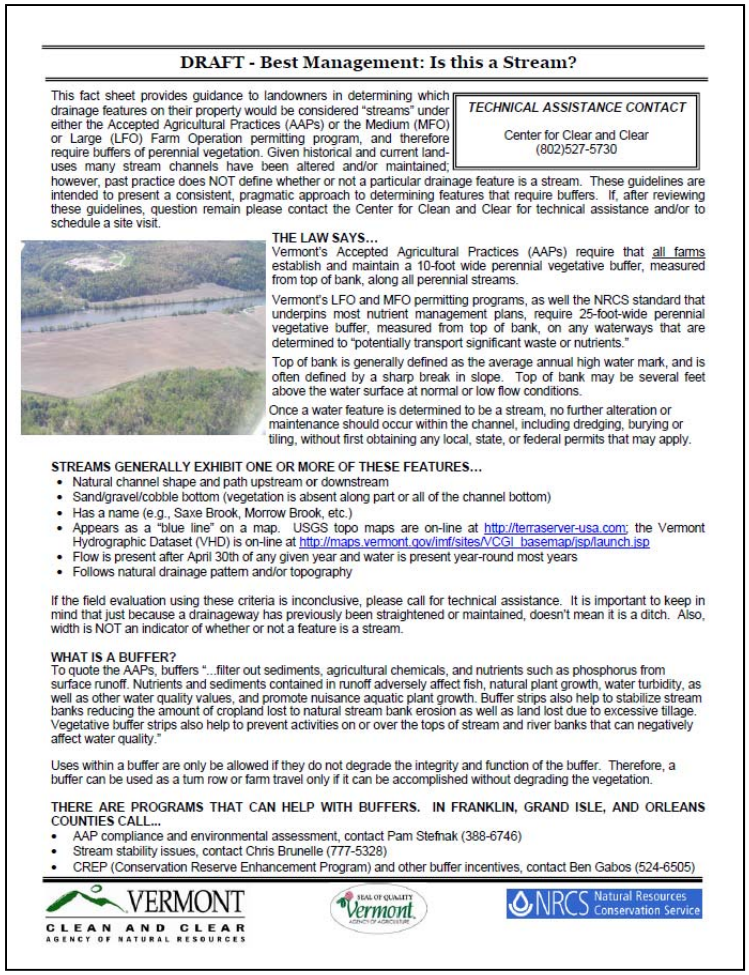
Where will the dirty water go?

Do ✓
- Take responsibility for your runoff.
- Construct check dams in your ditch to slow water flow and allow settling before it leaves the ditch (see photo on this page).

Don't ⊘
- Don't flood your neighbors by altering your ditch's capacity or outlet location.
- Don't let dirty drainage water enter Waters of the State.

Implementation Requirements for Non-Reporting Eligibility

Maintain required vegetated buffers as per applicable (AAPs), MFO, LFO Permits, and/or other applicable rules.



DRAFT - Best Management: Is this a Stream?

This fact sheet provides guidance to landowners in determining which drainage features on their property would be considered "streams" under either the Accepted Agricultural Practices (AAPs) or the Medium (MFO) or Large (LFO) Farm Operation permitting program, and therefore require buffers of perennial vegetation. Given historical and current land-uses many stream channels have been altered and/or maintained; however, past practice does NOT define whether or not a particular drainage feature is a stream. These guidelines are intended to present a consistent, pragmatic approach to determining features that require buffers. If, after reviewing these guidelines, question remain please contact the Center for Clean and Clear for technical assistance and/or to schedule a site visit.

TECHNICAL ASSISTANCE CONTACT
Center for Clear and Clear
(802)527-5730

THE LAW SAYS...
Vermont's Accepted Agricultural Practices (AAPs) require that all farms establish and maintain a 10-foot wide perennial vegetative buffer, measured from top of bank, along all perennial streams.

Vermont's LFO and MFO permitting programs, as well the NRCS standard that underpins most nutrient management plans, require 25-foot-wide perennial vegetative buffer, measured from top of bank, on any waterways that are determined to "potentially transport significant waste or nutrients."

Top of bank is generally defined as the average annual high water mark, and is often defined by a sharp break in slope. Top of bank may be several feet above the water surface at normal or low flow conditions.

Once a water feature is determined to be a stream, no further alteration or maintenance should occur within the channel, including dredging, burying or tiling, without first obtaining any local, state, or federal permits that may apply.

STREAMS GENERALLY EXHIBIT ONE OR MORE OF THESE FEATURES...
- Natural channel shape and path upstream or downstream
- Sand/gravel/cobble bottom (vegetation is absent along part or all of the channel bottom)
- Has a name (e.g., Saxe Brook, Morrow Brook, etc.)
- Appears as a "blue line" on a map. USGS topo maps are on-line at http://terraserver-usa.com; the Vermont Hydrographic Dataset (VHD) is on-line at http://maps.vermont.gov/imf/sites/VCGI_basemap/jsp/launch.jsp
- Flow is present after April 30th of any given year and water is present year-round most years
- Follows natural drainage pattern and/or topography

If the field evaluation using these criteria is inconclusive, please call for technical assistance. It is important to keep in mind that just because a drainageway has previously been straightened or maintained, doesn't mean it is a ditch. Also, width is NOT an indicator of whether or not a feature is a stream.

WHAT IS A BUFFER?
To quote the AAPs, buffers "...filter out sediments, agricultural chemicals, and nutrients such as phosphorus from surface runoff. Nutrients and sediments contained in runoff adversely affect fish, natural plant growth, water turbidity, as well as other water quality values, and promote nuisance aquatic plant growth. Buffer strips also help to stabilize stream banks reducing the amount of cropland lost to natural stream bank erosion as well as land lost due to excessive tillage. Vegetative buffer strips also help to prevent activities on or over the tops of stream and river banks that can negatively affect water quality."

Uses within a buffer are only be allowed if they do not degrade the integrity and function of the buffer. Therefore, a buffer can be used as a turn row or farm travel only if it can be accomplished without degrading the vegetation.

THERE ARE PROGRAMS THAT CAN HELP WITH BUFFERS. IN FRANKLIN, GRAND ISLE, AND ORLEANS COUNTIES CALL...
- AAP compliance and environmental assessment, contact Pam Stefnak (388-6746)
- Stream stability issues, contact Chris Brunelle (777-5328)
- CREP (Conservation Reserve Enhancement Program) and other buffer incentives, contact Ben Gabos (524-6505)

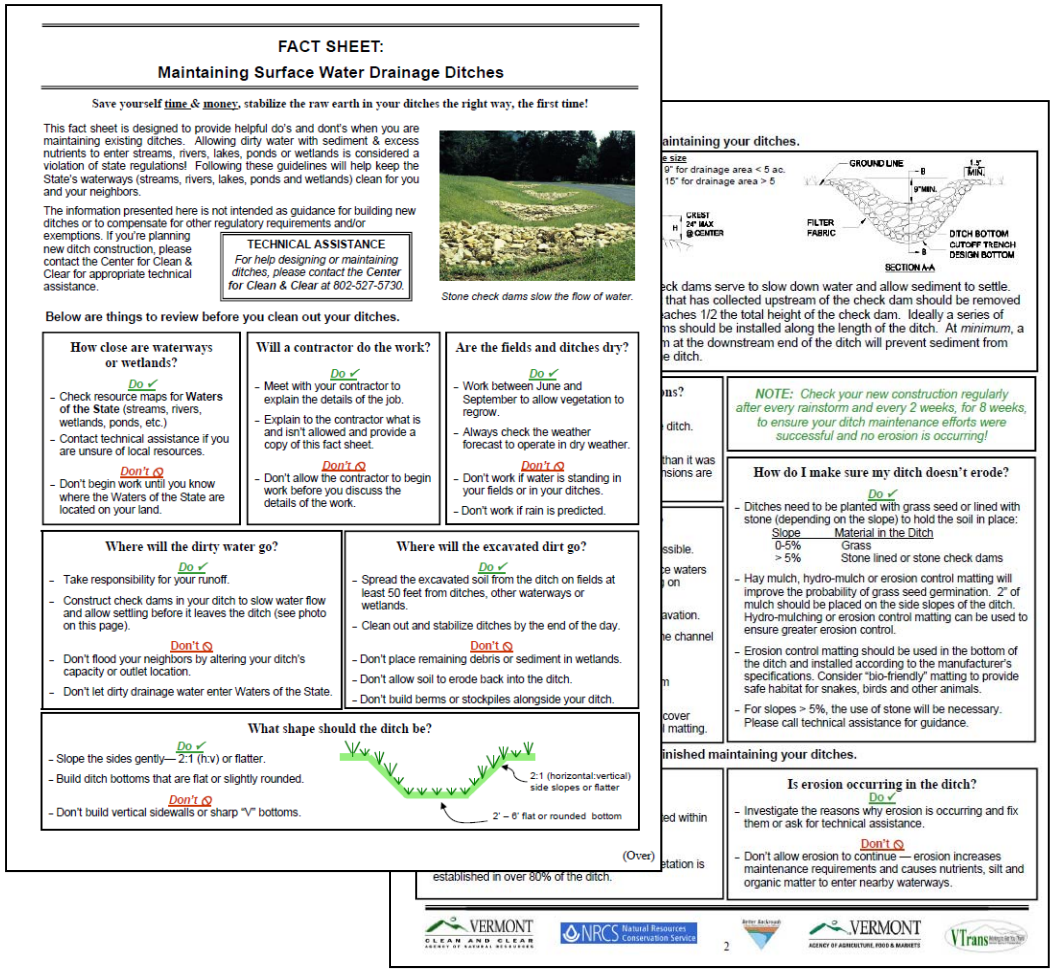
VERMONT CLEAN AND CLEAR AGENCY OF NATURAL RESOURCES
Vermont
NRCS Natural Resources Conservation Service

AAP Requirement
10-foot perennial vegetative buffer along perennial streams: All Farms

LFO/MFO programs and NRCS standard
25-foot perennial vegetative buffer

Implementation Requirements for Non-Reporting Eligibility

Stabilize erosional channels with vegetative and/or structural treatments



FACT SHEET:

Maintaining Surface Water Drainage Ditches

Save yourself time & money, stabilize the raw earth in your ditches the right way, the first time!

This fact sheet is designed to provide helpful do's and dont's when you are maintaining existing ditches. Allowing dirty water with sediment & excess nutrients to enter streams, rivers, lakes, ponds or wetlands is considered a violation of state regulations! Following these guidelines will help keep the State's waterways (streams, rivers, lakes, ponds and wetlands) clean for you and your neighbors.

The information presented here is not intended as guidance for building new ditches or to compensate for other regulatory requirements and/or exemptions. If you're planning new ditch construction, please contact the Center for Clean & Clear for appropriate technical assistance.

TECHNICAL ASSISTANCE
For help designing or maintaining ditches, please contact the Center for Clean & Clear at 802-527-5730.

Stone check dams slow the flow of water.

Below are things to review before you clean out your ditches.

How close are waterways or wetlands?

Do ✓
- Check resource maps for **Waters of the State** (streams, rivers, wetlands, ponds, etc.)
- Contact technical assistance if you are unsure of local resources.

Don't ✗
- Don't begin work until you know where the Waters of the State are located on your land.

Will a contractor do the work?

Do ✓
- Meet with your contractor to explain the details of the job.
- Explain to the contractor what is and isn't allowed and provide a copy of this fact sheet.

Don't ✗
- Don't allow the contractor to begin work before you discuss the details of the work.

Are the fields and ditches dry?

Do ✓
- Work between June and September to allow vegetation to regrow.
- Always check the weather forecast to operate in dry weather.

Don't ✗
- Don't work if water is standing in your fields or in your ditches.
- Don't work if rain is predicted.

Where will the dirty water go?

Do ✓
- Take responsibility for your runoff.
- Construct check dams in your ditch to slow water flow and allow settling before it leaves the ditch (see photo on this page).

Don't ✗
- Don't flood your neighbors by altering your ditch's capacity or outlet location.
- Don't let dirty drainage water enter Waters of the State.

Where will the excavated dirt go?

Do ✓
- Spread the excavated soil from the ditch on fields at least 50 feet from ditches, other waterways or wetlands.
- Clean out and stabilize ditches by the end of the day.

Don't ✗
- Don't place remaining debris or sediment in wetlands.
- Don't allow soil to erode back into the ditch.
- Don't build berms or stockpiles alongside your ditch.

What shape should the ditch be?

Do ✓
- Slope the sides gently— 2:1 (h:v) or flatter.
- Build ditch bottoms that are flat or slightly rounded.

Don't ✗
- Don't build vertical sidewalls or sharp "V" bottoms.

2:1 (horizontal:vertical) side slopes or flatter

2' – 6' flat or rounded bottom

(Over)

aintaining your ditches.

e size
9" for drainage area < 5 ac.
15" for drainage area > 5

GROUND LINE
FILTER FABRIC
DITCH BOTTOM CUTOFF TRENCH DESIGN BOTTOM
SECTION A-A

ck dams serve to slow down water and allow sediment to settle. that has collected upstream of the check dam should be removed aches 1/2 the total height of the check dam. Ideally a series of ms should be installed along the length of the ditch. At *minimum*, a n at the downstream end of the ditch will prevent sediment from e ditch.

NOTE: Check your new construction regularly after every rainstorm and every 2 weeks, for 8 weeks, to ensure your ditch maintenance efforts were successful and no erosion is occurring!

How do I make sure my ditch doesn't erode?

Do ✓
- Ditches need to be planted with grass seed or lined with stone (depending on the slope) to hold the soil in place:

Slope	Material in the Ditch
0-5%	Grass
> 5%	Stone lined or stone check dams

- Hay mulch, hydro-mulch or erosion control matting will improve the probability of grass seed germination. 2" of mulch should be placed on the side slopes of the ditch. Hydro-mulching or erosion control matting can be used to ensure greater erosion control.
- Erosion control matting should be used in the bottom of the ditch and installed according to the manufacturer's specifications. Consider "bio-friendly" matting to provide safe habitat for snakes, birds and other animals.
- For slopes > 5%, the use of stone will be necessary. Please call technical assistance for guidance.

inished maintaining your ditches.

Is erosion occurring in the ditch?

Do ✓
- Investigate the reasons why erosion is occurring and fix them or ask for technical assistance.

Don't ✗
- Don't allow erosion to continue — erosion increases maintenance requirements and causes nutrients, silt and organic matter to enter nearby waterways.

ed within

tation is established in over 80% of the ditch.

VERMONT CLEAN AND CLEAR AGENCY OF NATURAL RESOURCES · NRCS Natural Resources Conservation Service · 2 · VERMONT AGENCY OF AGRICULTURE, FOOD & MARKETS · VTrans

Implementation Requirements for Non-Reporting Eligibility

Conversion of Surface to Sub-Surface Flows

Channels cannot be filled
Channels cannot be culverted for extensive length

Implementation Requirements for Non-Reporting Eligibility

Proper Disposal of Excavated Sediments

FACT SHEET:

Maintaining Surface Water Drainage Ditches

Save yourself time & money, stabilize the raw earth in your ditches the right way, the first time!

This fact sheet is designed to provide helpful do's and dont's when you are maintaining existing ditches. Allowing dirty water with sediment & excess nutrients to enter streams, rivers, lakes, ponds or wetlands is considered a violation of state regulations! Following these guidelines will help keep the State's waterways (streams, rivers, lakes, ponds and wetlands) clean for you and your neighbors.

The information presented here is not intended as guidance for building new ditches or to compensate for other regulatory requirements and/or exemptions. If you're planning new ditch construction, please contact the Center for Clean & Clear for appropriate technical assistance.

TECHNICAL ASSISTANCE
For help designing or maintaining ditches, please contact the Center for Clean & Clear at 802-527-5730.

Stone check dams slow the flow of wa

Below are things to review before you clean out your ditches.

How close are waterways or wetlands?

Do ✓
- Check resource maps for **Waters of the State** (streams, rivers, wetlands, ponds, etc.)
- Contact technical assistance if you are unsure of local resources.

Don't ⊘
- Don't begin work until you know where the Waters of the State are located on your land.

Will a contractor do the work?

Do ✓
- Meet with your contractor to explain the details of the job.
- Explain to the contractor what is and isn't allowed and provide a copy of this fact sheet.

Don't ⊘
- Don't allow the contractor to begin work before you discuss the details of the work.

Are the fields and ditches dr

Do ✓
- Work between June and September to allow vegetation to regrow.
- Always check the weather forecast to operate in dry weather.

Don't ⊘
- Don't work if water is standing in your fields or in your ditches.
- Don't work if rain is predicted.

Where will the dirty water go?

Do ✓
- Take responsibility for your runoff.
- Construct check dams in your ditch to slow water flow and allow settling before it leaves the ditch (see photo on this page).

Don't ⊘
- Don't flood your neighbors by altering your ditch's capacity or outlet location.
- Don't let dirty drainage water enter Waters of the State.

Where will the excavated dirt go?

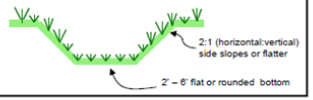
Do ✓
- Spread the excavated soil from the ditch on fields at least 50 feet from ditches, other waterways or wetlands.
- Clean out and stabilize ditches by the end of the day.

Don't ⊘
- Don't place remaining debris or sediment in wetlands.
- Don't allow soil to erode back into the ditch.
- Don't build berms or stockpiles alongside your ditch.

What shape should the ditch be?

Do ✓
- Slope the sides gently— 2:1 (h:v) or flatter.
- Build ditch bottoms that are flat or slightly rounded.

Don't ⊘
- Don't build vertical sidewalls or sharp "V" bottoms.



(Over)

Where will the excavated dirt go?

Do ✓
- Spread the excavated soil from the ditch on fields at least 50 feet from ditches, other waterways or wetlands.
- Clean out and stabilize ditches by the end of the day.

Don't ⊘
- Don't place remaining debris or sediment in wetlands.
- Don't allow soil to erode back into the ditch.
- Don't build berms or stockpiles alongside your ditch.

Implementation Requirements for Non-Reporting Eligibility

Make improvements that move the watercourse toward attainment of Stream Alterations Performance Standards where feasible

Equilibrium Standard

a. An activity shall not cause a stream to depart from, further depart from, or impede its attainment of the channel width, depth, meander pattern, and slope associated with the stream processes and the equilibrium conditions.

b. Following the stream alteration, the water flow, sediment, and woody debris produced by the watershed will be trans-ported by the stream channel in such a manner that the stream maintains its dimension, general pattern, and slope with no unnatural aggrading or degrading of the channel bed.

Implementation Requirements for Non-Reporting Eligibility

Make improvements that move the watercourse toward attainment of Stream Alterations Performance Standards where feasible

Connectivity Standard

a) An activity shall not result in changes in the erosion or deposition of instream materials that results in localized, abrupt changes to or disconnects within the horizontal alignment of streambanks or the vertical profile of the stream bed.

b) A person shall not change the course, current, or cross-section of a watercourse so as to create a physical obstruction or velocity barrier to the movement of aquatic organisms.

c) A person shall not establish, construct, or maintain a berm in a flood hazard area or river corridor.

End