

Runoff Treatment Systems

Vegetative Filter Strips, Treatment Wetlands, Biofilters, Dispersion Sandwiches

Grant Rate	Maximum Grant
50%	\$5,000

Rationale:

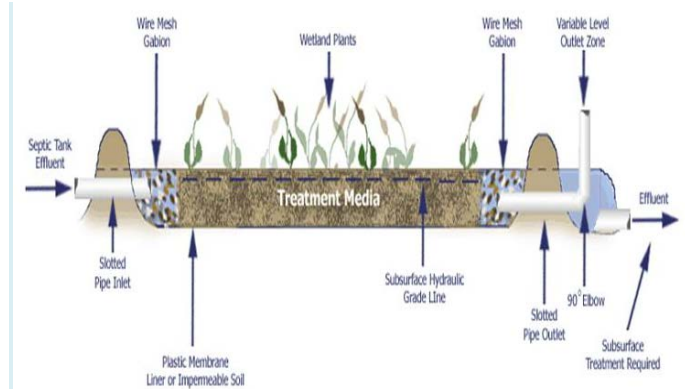
To treat manure effluent water to reduce bacteria, nutrient and biochemical oxygen demand in order to protect ground & surface water. This is done using a variety of engineered treatment technologies.

Manure Runoff Treatment Systems, such as:

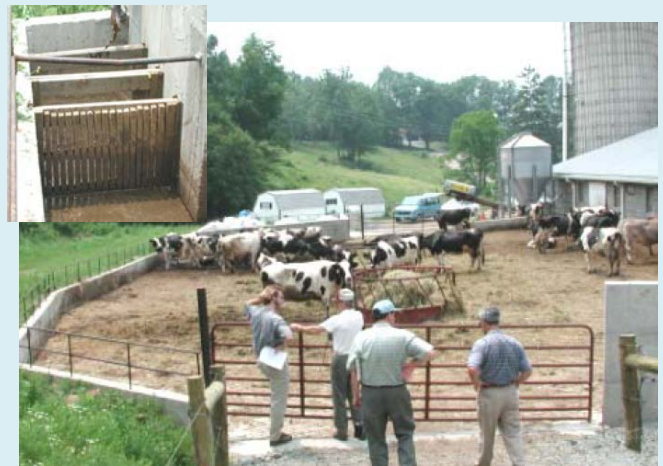
- Vegetated Filter Strips (VFS)
- Treatment Wetlands
- Biofilters/ Dispersion Sandwiches / Carbon-based bioreactors for nitrate reduction
- Treatment systems need to be designed to reduce concentrations of total phosphorus, fecal bacteria, total nitrogen, and biological oxygen demand.
- *Note: treatment systems require provincial approval under the Ont. Water Resources Act*

Conditions:

- The project must be maintained in good condition for its intended purpose for at least 10 years.
- Must meet or exceed legal requirements
- Design must be done by a qualified professional
- The design must specify percent phosphorus reduction expected.
- The design must have MOE approval, and any other permits required.
- Appropriate manure runoff reduction systems (eaves, berms, storage) should be in place to reduce the volume of runoff to be treated
- Projects need to be designed to improve water quality and overall stream health.
- Written permission of the landowner(s) must be given on the grant application and the agreement.



This sub-surface flow wetland can treat runoff from livestock yards or tile drains. Treatment wetlands for manure runoff can reduce Suspended Sediment, Biological Oxygen Demand, Phosphorus, Nitrogen and fecal bacteria by 80-90%



A vegetative filter strip treats manure runoff. First clean water is diverted. Then a paved curbed yard channels runoff through a screen system to remove course material. This then flows to a spreader pipe or bar that lets the runoff enter the vegetative filter evenly for treatment. This can reduce phosphorus runoff by 68%, and bacteria by 77%.

Eligible Costs

- Purchased materials and supplies
- Clean water diversion structures to minimize runoff
- Paving of livestock yards needed for runoff collection into manure runoff treatment system
- Contract labour (from registered company)
- Profession fees (consulting/engineering) for design, construction and supervision.
- Pumping equipment
- Disconnection or plugging of existing tile-drain outlets near manure treatment system.

Ineligible Costs:

- Work done before grant approval is ineligible
- If the work is under order by any regulatory agency, it does not qualify for grant funding.
- Grants will not be provided for costs of in-kind labour and machine time, equipment and personal expenses of the applicant(s), the applicant(s) business, or family members
- Repair and maintenance of treatment systems and equipment
- Manure storage additives and feed additives to improve absorption and reduce nutrient content
- Incineration units
- Generators, primary hydro wiring
- Manure spreading equipment

*Work that proceeds prior to funding approval does not qualify for funding assistance.
If the work is under order by any regulatory agency, it does not qualify for funding assistance.*

Ministry of Environment Approval

Of the various treatment systems, vegetated filter strips (VFS) have the most streamlined approval process.

Under Section 53 of the *Ontario Water Resources Act* (OWRA), farmers require approval for the installation of a VFS system. Farmers must apply for and comply with the Certificate of Approval issued under the OWRA by the Ministry of the Environment (MOE). The MOE issues the Certificate of Approval.

There is no fee for applying for this Certificate of Approval.

Apply well in advance, as approval can take a long time. Your application will also be submitted to OMAFRA for technical review, which should streamline approvals.

For design factsheets and manuals check the OMAFRA website or contact an OMAFRA resource centre. www.omafra.gov.on.ca

Helpful Links:

Vegetated Filter Strip System Design Manual:

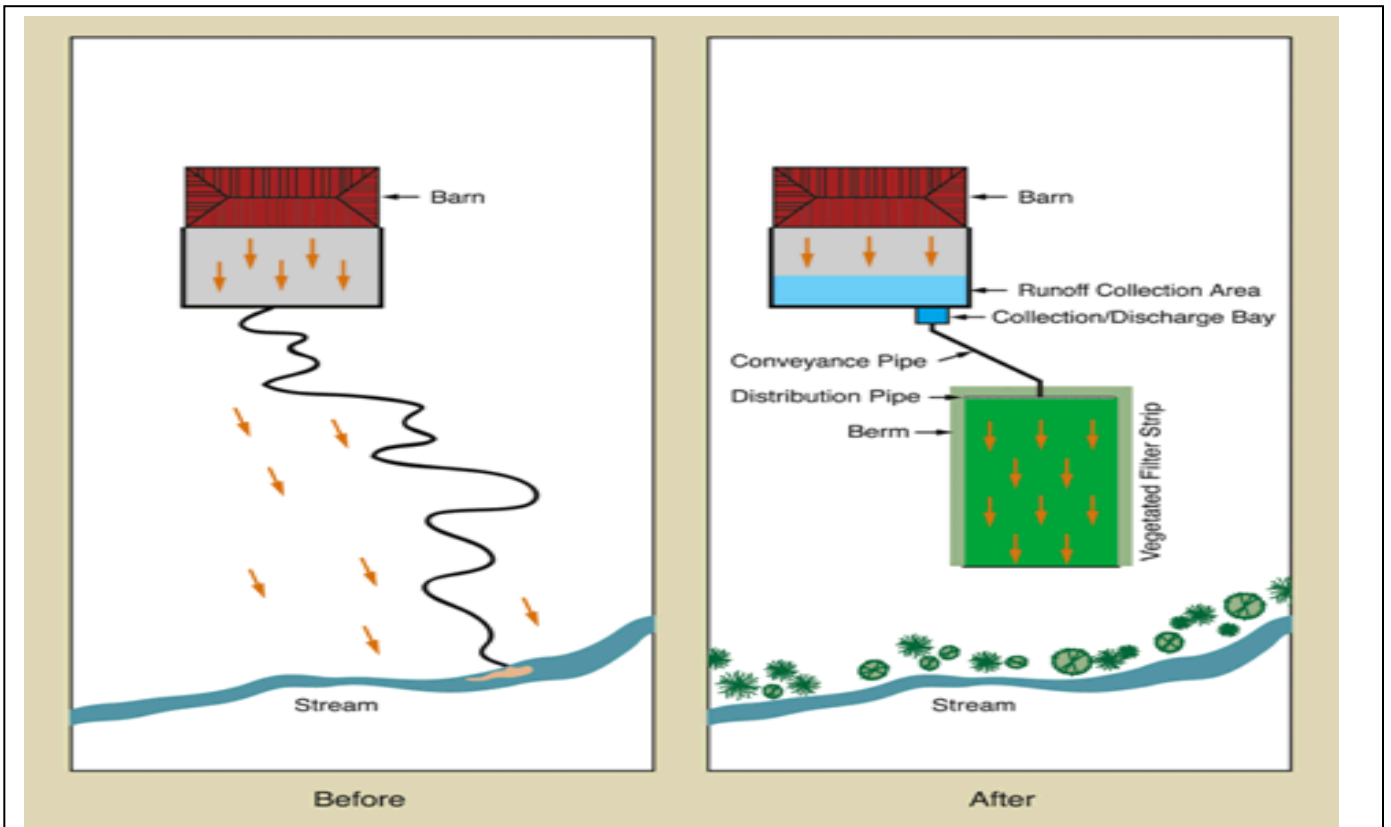
http://www.omafra.gov.on.ca/english/engineer/facts/vfss_manual/vfssman1.htm

Guidance Manual for the Design, Construction and Operation of Constructed Wetlands for Application in Ontario:

http://agrienvarchive.ca/bioenergy/download/wetlands_manual.pdf

MOE, 2008. Design Guidelines for Sewage Works: (constructed treatment wetlands)

http://www.ene.gov.on.ca/stdprodconsume/groups/lr/@ene/@resources/documents/resource/std01_079496.pdf



A manure runoff treatment system can significantly reduce the concentrations of bacteria, nitrogen, phosphorus and biochemical oxygen demand. Treatment systems consist of the following parts: runoff/contaminant reduction, runoff collection, delivery, and treatment area.
 (source: OMAF)

**Design of Vegetated Filter Strip Systems –
Engineering Consultants
DRAFT***

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<p>Conestoga-Rovers Mike Muffels, M. Sc. 651 Colby Drive, Waterloo, Ontario N2V 1C2 Tel: 519-884-0510 Fax: 519-884-0525 Email: mmuffels@CRAworld.com</p>	<p>Triton Engineering Dale Murray, P. Eng. 105 Queen Street West, Fergus, Ontario N1M 1S6 Tel: 519-843-3920 Fax: 519-843-1943 Email: dmurray@tritoneng.on.ca</p>
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<p>Johnson Engineering Consultants David Johnson, P. Eng. 368 Huron Street Stratford, Ontario N5A 5T5 Tel: 519-271-9923 Fax: 519-271-5353 Email: jecinc@jeninc.on.ca</p>	<p>WESA – Carp David Harding, P. Eng. 3108 Carp Road, PO Box 430, Carp, Ontario K0A 1L0 Tel: 613-839-3053 Fax: 613-839-5376 Email: dharding@wesa.ca</p>

**The NVCA is providing this list of contractors to ease the difficulties in locating contractors with experience in designing treatment systems. The NVCA does not recommend or endorse the contractors, and recommends the applicant obtain multiple guaranteed quotes with full costs broken-down.*

*The NVCA encourages applicants to search out other qualified contractors
(and let us know about them!)*

If you are a contractor that would like to be added to this list, contact the NVCA.