This Factsheet discusses ways to assist you, the landowner, in planning and maintaining an erosion control system. The process starts with the selection of a system and does not end until the system is deemed necessary or is replaced by another.

CHOOSING A TYPE OF EROSION CONTROL SYSTEM

To choose an erosion control system, you should determine the best method to control the problem and where the control system is to be installed. In some cases, work will be required right at the erosion site, however, in other cases the solution needs to be located elsewhere in the watershed.

Frequently at this point any assistance is very valuable. Often information and technical assistance can be obtained from the field office of the Ontario Ministry of Agriculture, Food and Rural Affairs or the Conservation Authority. You may find that the solution to the sheet erosion occurring on your farm may be as simple as eliminating fall plowing or incorporating more rotations into your farming operation.

On the other hand, the solution to a rill or gully erosion problem may require the construction of a complex control system such as terraces and may involve the co-operation of other landowners.

COMPLETING NECESSARY LEGAL AND FINANCIAL STEPS

Once you have chosen the best type of control system, you should look at the legal and financial aspects. This should be completed before the final planning of the particular control system takes place.

Often the control system involves the neighbouring landowners. When neighbours may be impacted by the erosion control system they should be invited to participate in a written agreement. A Mutual Agreement under The Drainage Act is a means to complete the written agreement. If an agreement is not reached, then an alternative control system or method of approach should be considered.

Legal aspects such as a proper outlet for tile drains or grassed waterways should also be considered. Refer to the OMAFRA Factsheets, "Drainage Legislation" and "Common Law Aspects of Water" for further information.

At this stage, any grants or other incentives should be investigated. With most incentives, it is necessary to submit a proposal before construction commences. Often the incentive will specify the type of structure and professional assistance required.

PLANNING THE SYSTEM

Once the above steps are completed, the final planning can proceed. On a project requiring a change as basic as a cropping practice, a visit to a demonstration site or the reading of background information may be all that you will require to undertake the project.
However, a more complex project may require information such as the accurate determination of the surface waterflows and the complete design of an erosion control structure. Assistance by a consultant or knowledgeable contractor familiar with hydrology and the planning of erosion control structures will be required.

CONSTRUCTING THE PROJECT

Once plans are completed, the actual work can start. Sometimes a project can be completed by the landowner, however, most often specialized equipment, materials and expertise are required. A qualified contractor is hired using a combination of economics, experience, timeliness and reliability as the hiring criteria.

Once the work is initiated, you and other personnel involved with the planning of the project should frequently inspect the on-going work to ensure that construction is being completed according to plan. Also, unforeseen problems encountered during construction can be tackled.

The construction of the project is not complete until all the steps are finished. This includes the seeding of erosion-prone areas and the installation of emergency spillways. Visible markers should be installed if the project is a potential hazard to the operation of farm equipment.

MAINTENANCE OF A PROJECT

Erosion control projects are very vulnerable to poor maintenance. A continuing maintenance program should be instituted for every project. Maintenance requirements depend on the type of project.

1. **Systems With Permanent Vegetated Areas**
   All bare or eroded areas should be repaired and reseeded as soon as possible. Undesirable species of vegetation should be removed or controlled to prevent damage to the primary vegetation. Most vegetated areas designed to carry water should be mowed at least twice a year. The mowing prevents the channel from restricting water flow and it encourages a thick erosion resistant stand.

   Accidental spray application either by direct contact or runoff can destroy a vegetated area especially in the establishment stages. All spray operators should be cautious of this vulnerability.

2. **Systems Utilizing Drop Pipe Inlet Spillways**
   Excessive shifting, settlement or heaving of the structures should be monitored. It is an indication of potential problems. Inspection for pipe separation, breakage or crushing should take place after every major runoff event. A small internal hole can initiate water channelling along the pipe.

   Watch for erosion at the outlet of the spillway. This erosion can eventually undermine the outlet pipe. It should be repaired and an erosion resistant lining installed if the problem persists.

   Erosion at the inlet to the drop pipe structure may also be troublesome. It is caused by swirling and excessive velocities of water at the inlet. The swirling can be reduced by installing an anti-vortex device in the drop pipe and the velocity problem can be alleviated by reducing the slope in front of the inlet or by building an erosion resistant lining around the inlet. Plugging at the inlet must be avoided. After each usage any debris should be removed. If the debris presents a continual problem, the inlet grate should be changed to increase the entrance area, reduce the restriction or decrease the velocity of the water across the grate.

3. **Systems Which Incorporate Berms**
   Any movement or shifting of the berm must be stopped. Normally, the movement is caused by an unstable back slope. The stability of the back slope must be improved by reducing the slope, etc. The movement can also be caused by improper cultivation of a tilled berm. Any rodent damage to the berm should be repaired. A hole through the berm at ground level can result in immediate failure. In extreme cases, a rodent proof screen or barrier will have to be installed in the berm. Mowing of the grass cover may be required to maintain a good stand and keep weeds under control.

4. **Systems Which Use Emergency Spillways**
   Always make sure that the lowest point in the emergency spillway is below the top elevation of the berm. A level instrument is needed to verify this. Many spillways have adequate protection only at the inlet area with erosion occurring in the main section of the spillway if under heavy usage. This erosion will have to be repaired to prevent further washouts during the next usage period. If repair is frequently necessary, an improved emergency spillway system will be required or the main spillway system will need to be increased in capacity.

   Some systems such as terraces, use the vegetated flat top of the earthen berm as the spillway. With this system, it is essential that the berm top be level to spread out the overflow water and keep the velocities and eroding effects of the water to a minimum.

5. **Systems Utilizing Chute Spillways or Other Linings**
   Failure of this type of system is often caused by water finding a path around or under the structure. Look for base erosion caused by this water. Uneven settlement of blocks or riprap will indicate a problem. If found in an early stage, a cutoff wall can be installed at
the inlet to the structure. The addition of a grout material between the rocks will also help stabilize them, preventing further movement.

Figure 2 – Watch For Water Tracking Around Or Under Rock Chute Spillways

6. Silting Problems

Many erosion projects such as water and sediment control basin systems and grassed waterways can fill up with eroded silt. This silt will reduce the capacity of the structure. Removal of the silt or an increase of the structure size will then be necessary.

The more desirable solution is to reduce the movement of silt into the structure. This is done by improving conditions upstream which may involve a change of tillage practices or installation of a terrace system.

ASSISTANCE

Qualified erosion control contractors and consulting engineers are available for the design and construction of erosion control structures. In some areas of the province, Conservation Authorities may offer technical assistance and construction supervision. Also, information and other erosion control Factsheets are available at the local offices of the Ontario Ministry of Agriculture, Food and Rural Affairs.

All erosion control projects must comply with existing legislation, i.e., Lakes and Rivers Improvement Act, Fisheries Act, etc. Investigate all applicable legislation in the project planning stages.

RELEVANT OMAFRA FACTSHEETS
74-058, Common Law Aspects of Water.
89-166, Drainage Legislation.

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