

CHOOSING A SITE

The pond site selection needs to consider adequate water supply, type of watershed, topography and soils.

There should be adequate water supply to handle all of your needs. Factors that influence water supply include base flow of the stream/spring, rainfall, evaporation and watershed size and characteristics.

The watershed can determine the quality of your water supply. An urban watershed may have more impacts on water quality than a predominantly rural or forested watershed.

Topography determines the length of the permanent pool and height of the dam. Steep side slopes and high grade changes can affect construction and use of the pond.

Good soil quality is needed for an adequate embankment. The soil needs to be 20 percent clay to provide proper compaction and prevent seepage through the embankment. Consult a soil scientist or geotechnical engineer for more information.

WATER NEEDS

The amount of designated water storage is determined by the intended use of the pond.

Livestock watering:

Beef cattle/horses	15 gal/head/day
Dairy cows (drinking)	15 gal/head/day
Dairy Operations	35 gal/head/day
Hogs	4 gal/head/day
Sheep	2 gal/head/day

Irrigation:

This amount needed depends on effective rainfall, evaporation, crop usage, growing season and efficiency of irrigation method. **Contact your local Extension Office.**

Fire Suppression:

The amount needed is at least 1/4 acre-feet of storage.

Estimating Pond Capacity in Acre-Feet

1. Establish normal pool elevation and stake the waterline at this elevation (average depth 6 feet minimum)
2. Measure width of valley at this elevation and compute the surface area in acres (43,560 square feet per acre).
3. Multiply surface area by 0.4 times maximum water depth in feet (325,900 gallons in one acre-foot).

Determining Watershed Size for Storage

Ponds supplied with surface runoff require adequate watershed size to meet the desired depth and storage capacity. Generally, in our region every acre-foot of pond storage needs 2 to 2.5 acres of watershed area.

A larger watershed area is needed for ponds built in shallow or flat valleys and smaller watersheds for steeper valleys.

Are You Still Thinking about Constructing a Pond?

If you intend to build a pond, always consult a **licensed Engineer** for embankment and spillway design.

For technical advice or questions regarding planning and maintenance contact:

Culpeper SWCD 540-825-8591
Natural Resources Conservation Service
(NRCS) 540-825-4200

Pond Planning, Management and Water Quality



Thursday September 9, 2010
8am to 12:30pm
Town of Orange Public Works
Community Room

To Register: To register, contact
Janet Jones at 540-672-4347 or
jjones@orangecountyva.gov



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Pond Planning, Management and Water Quality

Agenda

8-8:30am	Registration with breakfast
8:30am	Welcome by Orange County and the York Watershed Roundtable
8:30-9:15am	Pond planning: site criteria, soils inventory, drainage area issues, water use, design components (Richard Jacobs, Culpeper Soil and Water Conservation District)
9:15-10am	Permitting: county planning, erosion and sediment control, stream/wetland impacts and dam safety (Orange County and U.S. Army Corps of Engineers)
10-10:15am	Break
10:15-11:15	Management issues: aquatic vegetation, fisheries, water quality management, buffers and shoreline management
11:15-11:30	Nuisances such as rodents, beavers, invasive vegetation; and structural issues such as leaking, erosion, degraded spillways, etc. (Culpeper Soil and Water Conservation District)
11:30-12:30	Pond ecology and Water Quality (Mike Hayslett, Virginia Vernal Pools Program, Sweet Briar College)

A pond may be constructed for a variety of uses such as recreation, fire suppression and agricultural/fish production. Ponds should always be designed by a **licensed engineer** to insure safety and longevity. This brochure is intended as a guide to landowners for pond planning and permitting needs.

Permits

There are five primary permits when building a pond.

1. Land-Disturbing Permits

Agricultural ponds used for watering crops and livestock are exempt from land-disturbing permits issued by the County

Residential or commercial ponds used for recreation or stormwater management that disturb more than 10,000 square feet require a Land-Disturbing Permit from the County.

2. Virginia Stormwater Management Permit (VSMP)

In addition to the County permit, non-agricultural ponds disturbing more than one acre require a VSMP from the Commonwealth. Disturbance includes pond access roads, stockpiles, borrow pits, clearing and grading.

3. Wetland and Stream Impacts

Please contact the Army Corps of Engineers (ACOE) and the Virginia Department of Environmental Quality (DEQ) on the back panel.

4. Dam Safety (Call 804-371-6095)

Ponds with dams of 25 feet or greater in height and with an impoundment capacity of more than 15 acre-feet and ponds with dams of 6 feet or greater in height and with an impoundment capacity of more than 50 acre-feet are regulated by the Department of Conservation & Recreation, Division of Dam Safety. Under these regulations,

ponds require an operating permit, annual inspections & development of an action plan.

5. Wildlife Impacts (Call 434-296-4731)

Ponds in watersheds known to support anadromous fish (shad, herring) spawning require construction of a fishway over the dam by Virginia Department of Game and Inland Fisheries (VGIF).

UNDERSTANDING PONDS

There are two types of pond construction:

1. Embankment ponds: A pond formed by the construction of a dam across a stream or watercourse.

2. Excavated Ponds: A hole dug out of nearly level ground. These ponds are more expensive and can only accommodate a small supply of water.

Both designs require a source of water, usually from a spring, live water source or surface runoff.



This is a typical earthen pond at Cedar Springs Dairy in Madison County