

# AQUACULTURE PONDS

(Acre)  
Code 397

Natural Resources Conservation Service  
Conservation Practice Standard

## I. Definition

A water impoundment constructed and managed for farming of freshwater and saltwater organisms including fish, mollusks, crustaceans and aquatic plants.

## II. Purpose

Provide a favorable aquatic environment for producing, growing, and harvesting aquaculture crops.

## III. Conditions Where Practice Applies

This practice applies to all impoundments that store water and are managed for aquaculture purposes.

## IV. Federal, Tribal, State, and Local Laws

Users of this standard should be aware of potentially applicable federal, tribal, state and local laws, rules, regulations or permit requirements governing aquaculture ponds. This standard does not contain the text of federal, tribal, state, or local laws.

## V. Criteria

### A. General Criteria

Aquaculture ponds may be: (1) embankment ponds that intercept and store surface runoff water, or (2) off-channel impoundments or excavated ponds that are filled by pumping ground water, or diverting spring or stream flows.

The site must be protected from flooding, sedimentation, and non-sediment contamination.

The pond shall be constructed to the recommended size and depth for the species to be grown.

The soils within the pond area, as well as those in the contributing drainage area, must be checked for residues of pesticides and other harmful chemicals if there is any possibility of

contamination.

Acid soils shall be limed to achieve a neutral condition or the desired pH level for best production.

The pond shall be located in soils with an acceptable permeability to limit water losses due to seepage or it shall be lined.

When multiple ponds are installed, each pond shall be arranged so that it can be managed independently of the others to facilitate harvesting and the control of parasites and disease.

All ponds shall be designed to prevent the escape of non-native or otherwise harmful species to adjacent surface water bodies especially downstream and upstream of streams and rivers.

A protective cover of vegetation shall be established on all exposed soil surfaces that have been disturbed. If soil or climatic conditions preclude the use of vegetation, other protection methods shall be used.

Any available water source may be used if the quality and quantity are adequate. If water is pumped from rivers and streams or other sources where undesirable fish, pesticide residue, fish disease, and parasites may be introduced, filters must be installed in the pumping system.

Evaporation rates, stocking densities, and cultured species requirements shall be used in establishing specific incoming flow rates.

Water entering the pond shall be aerated to increase dissolved oxygen and dissipate harmful gases, if needed. The minimum dissolved oxygen level in ponds is 3 to 5 parts per million. Supplemental aeration within the aquaculture pond shall be included, as necessary to maintain desired dissolved oxygen.

Water temperature and water chemistry shall be suitable to meet the species requirements and the planned production level.

Incoming water shall be introduced as far away from outlet drain as practicable to prevent the rapid removal of fresh water from the pond.

Provide for the collection, harvest and utilization of wastes from the cultured organisms.

Provisions shall be made for any needed treatment of water released downstream to ensure that the designated use of the receiving waters is not degraded from the aquaculture impoundment structure.

#### **B. Embankment Ponds**

Earthfill dams and embankments that intercept and store runoff water shall meet or exceed the requirements for embankments as specified in Wisconsin NRCS Field Office Technical Guide (FOTG), Section IV, Standard 378, Pond.

The minimum top width of the embankment shall be 14 feet, where it is to be used as a road for harvesting, feeding, and management purposes and is nonpublic.

#### **C. Excavated Ponds**

Ponds established by excavating and constructing an embankment around their outer perimeter that excludes outside runoff shall have either an auxiliary spillway, a principal spillway pipe, or a pumping system installed with sufficient capacity to remove a 10-year/24-hour direct rainfall amount in 48 hours or less. A minimum 8-inch diameter pipe shall be used for a principal spillway.

The minimum design elevation of the top of the embankment shall include 6 inches of freeboard above the highest potential water elevation in the pond. The highest potential water elevation will be the top elevation of the outlet weir or principal spillway, plus the head needed to discharge the maximum pond inflow, plus the depth of the 10-year, 24-hour rainfall.

Perimeter embankment construction shall include the required settlement to maintain freeboard requirements. A minimum width of 10 feet shall be provided between the outside toe of the embankment and the top of the bank of any adjacent stream or ditch.

#### **D. Pipes and Conduits**

Pump discharge through embankments shall be installed above expected high water level, and provisions shall be made to prevent pump and motor vibrations from being transmitted to discharge conduits.

Interior embankments constructed for division of water or to direct water flow for circulation shall have adequate cross section to ensure stability and function for its intended purpose.

Adequate provisions must be made to protect earth surfaces from turbulent water at pipe inlets and outlets.

#### **E. Drains**

All ponds shall have facilities for complete as well as partial drawdown. Turn-down pipes, quick-release valves, bottom-water release sleeves, pumps or other devices for water level control and pond management are to be included in the design and construction of the impoundment. Conduit design and seepage control shall meet or exceed the requirements specified in Wisconsin NRCS FOTG, Section IV, Standard 378, Pond.

#### **F. Pond Bottom**

Where organisms are harvested by seining, the pond bottom shall be smooth and free of all stumps, trees, roots, and other debris. Existing channels and depressions in the pond area shall be filled and smoothed. The edges of the pond shall be deepened to provide at least 3 feet of water.

Where crawfish are harvested by trapping, complete clearing and removal of trees, stumps, and other vegetation is not required.

The pond bottom shall be sloped to the outlet at a gradient of at least 0.2 foot per 100 feet.

#### **G. Access and Safety**

Provisions shall be made for access to the site as well as access for operation and maintenance. Ramps for equipment access shall have a grade of 4 horizontal to 1 vertical or flatter.

Appropriate safety features shall be made available nearby to aid people who may fall into the pond and devices installed to prevent such accidents.

Fences shall be installed as necessary to exclude livestock and unwanted traffic.

## VI. Considerations

Considerations include additional design recommendations that are not required criteria, but may be used to enhance or avoid problems with the design and function of this practice.

- A. The state fishery agency or appropriate state university or research institution should be contacted for recommendation on pond size, water depths, and adapted commercial aquatic species.
- B. Consider any adverse impact to cultural resources when planning for aquaculture ponds.
- C. Consider the visual design of ponds should be carefully considered in areas of high public visibility and those associated with recreational fishing.
- D. Consider the effects on the volume of downstream flow or aquifers that might cause undesirable environmental, social, or economic effects and contribute to water table decline from heavy pumping.
- E. Consider measures to avoid depredation by birds and/or other animals.

## VII. Plans and Specifications

Plans and specifications for constructing aquaculture ponds shall be in keeping with this standard and shall describe the site-specific requirements for applying the practice to achieve its intended purpose.

As a minimum the plans shall include:

- a site location map with topographic information,
- typical cross sections of the pond(s) showing the elevations and dimensions,
- structure size, location, material type, and elevations,
- disposal of any excess excavated material,
- location and type of fence, if required, and
- areas to be vegetated and vegetative specification.

## VIII. Operation and Maintenance

A written site specific operation and maintenance plan shall be prepared and provided for use by those responsible for the system. The O&M plan shall provide for inspection, operation, and maintenance of vegetation, pipes, valves, spillways, roads, and other parts of the system

## IX. References

USDA, NRCS Wisconsin Field Office Technical Guide (FOTG), Section IV, Practice Standards and Specifications.