Inspection Checklist Guidelines

Dams should be periodically inspected looking for problems or potential problems. The following is a partial list of items that should considered during an inspection. It is important to make a written record of your observations. The use of sketches and photos is encouraged. Take measurements as needed to help describe a situation.

Embankment

- **Embankment stability.** The embankment should be checked for any signs of instability, e.g., sloughing, sliding, cracking or bulging. Also check for any signs of unusual settlement.
- **Slumping or sliding**. Embankment instability may show in the form of embankment slumps or slides. This instability may be caused by excessive seepage, poor compaction, foundation problems or too steep of side slopes. Shallow slides are usually the result of localized problems and may be corrected by refilling and re-vegetating the affected area. A deep slide has the potential to cause problems with the spillway conduit and the embankment drainage system. These structures should be checked for damage if sliding has occurred.
- **Cracking**. Deep longitudinal cracks (parallel to the length of the dam) are usually a precursor to embankment slumps or slides. Transverse cracking (perpendicular to the length of the dam) is typically caused by poor compaction effort during construction mostly in the vicinity of the spillway conduit installation trench. It may also be the result of differential settlement in areas where there are sharp changes in grade in the foundation such as a deep stream channel. Noticeable settlement of the embankment surface will also be associated with this type of cracking. Desiccation cracking as the result of the soil surface drying out usually occurs as random cracks and is typically not a concern.
- **Trees and brush**. The dam embankment and groins should be kept free of all woody growth. The tree and brush free zone should extend at least 20 feet beyond the embankment toe and groins.
- **Burrowing animals (muskrats, gopher, snapping turtles, etc.)**. The embankment should be inspected for signs of burrowing animals.
- **Wave erosion**. The upstream face should be checked for wave erosion, beaching and for the loss of riprap or other erosion control material.
- **Gully erosion**. Check the embankment for rills and gullies. Pay particular attention to the groins and areas alongside spillway walls.
- **Sinkholes**. Watch for sinkholes on the embankment, particularly in line with the principal spillway conduit. Sinkholes are likely a sign of internal erosion within the embankment, typically along a conduit.
- **Seepage**. All embankment dams will have some seepage. Springs, boils or simply a wet area with or without wetland vegetation are an indication of uncontrolled seepage. Concern with seepage occurs primarily when it breaks out on the embankment or in the downstream area in the form of a spring or a boil. Seepage areas should be watched for an increase the size of the wet area, a significant change in the amount of water flowing from the seep, muddy or cloudy discharges or a build up of sediment below or around the point source of seepage.
- **Embankment/ foundation drains**. The drain outlets should be checked for sediment and other debris or obstructions. Outflow should be checked for cloudy or muddy discharges and for accumulated sediment in the pipe and immediately below the outlet. Drain outflow rates should be measured if possible. It is advisable to check the captured water for signs of sediment. The impoundment level will need to be recorded at the time of the measurement. The flow rate should be recorded and compared to previous measured or estimated rates. A significant change in the flow rate (either an increase or decrease) may be an indication of a problem and a more detailed investigation may need to be undertaken.

Rodent pins or other guards to prevent rodents from entering the pipe should be checked to assure they are in place and secure.

Principal Spillway

- **Inlet**. The spillway inlet, trash rack and riser, if so equipped, should be observed for debris or other obstructions. Check to assure that the anti-vortex plate or device is in place and secure. Metal items should be checked for corrosion and for broken or missing parts. Check concrete for general deterioration, cracking, joint spalls, misaligned joints, loss of joint filler and missing or damaged water-stops. Risers should be checked to assure they are plumb.
- **Outlet**. The outlet area (stilling basin) should be checked for erosion problems and signs of instability. An unstable outlet could cause embankment instability in addition to problems with the spillway conduit such as joint separation or misalignment.
- **Conduit alignment, deformation and corrosion**. An inspection of the entire conduit interior should be made provided there's reasonable access to the conduit (including flow conditions), it's large enough to pass through and, if needed, appropriate air handing equipment is employed. Otherwise, the conduit should be observed from both the upstream and downstream ends for horizontal and vertical alignment. The water in the flow line or the stained area in the bottom of a conduit is a good way to observe the alignment. Many misaligned conduits are generally the result of poor or improper installation. It's important to watch for changes in alignment from the previous inspections (reports). Metal conduits should also be watched for deformation and corrosion. Concrete conduits should be watched for cracks and general concrete deterioration. Any of these conditions may lead to serious problems such as seepage along the exterior of the conduit resulting in internal erosion (piping). Check the area under and around the exterior of the conduit or stilling basin for cavities, holes, flowing water, sediment deposits and other signs of piping along the conduit.
  A comparison the amount of water entering a spillway conduit with that flowing out of the conduit should be made.

Emergency Spillway

- **Vegetative Cover**. The condition of the vegetative cover in the emergency spillway should be assessed. Trees and brush should not be allowed to grow in the spillway. The spillway should be checked for erosion.
- **Obstructions**. The emergency spillway should be maintained clear of obstructions to assure that the spillway design discharge capacity is maintained. Obstructions also cause discontinuities in the flow, from which scour and erosion are likely to occur. Fences in emergency spillways are not recommended because of reduced capacity should the fence become clogged with debris. If a fence must be used, barbed wire is recommended because it's more likely to pass debris than other types of fence. It should be located in the spillway inlet section, typically upstream of the embankment centerline.

Low-Level Outlets or Lake Drains

- The condition and the operability of the low-level outlet should be assessed. Typically, a gate controller wheel or handle is stored off-site. Make sure the dam owner/ operator knows the whereabouts of the controller. If the controller is left on-site, it should be locked to reduce the chance of an unauthorized opening and drawdown of the pool. Check the outlet area for erosion and scour and for any signs of piping along the conduit.

Downstream Area

- The area downstream of a dam should be checked for changes in land use that may affect the hazard classification of the dam.