



REMR TECHNICAL NOTE HY-FC-1.2  
GUIDANCE FOR EVALUATION OF EXISTING  
HIGH-LEVEL EMERGENCY SPILLWAYS

PURPOSE: To provide guidance for use in evaluating the potential for excessive scour downstream from high-level emergency spillways.

DEFINITION: The term "excessive scour" refers to scour that may threaten the safety of a spillway.

PERSONNEL REQUIREMENTS: To evaluate a spillway properly, a team having the following members is required:

- a. One engineer or scientist from the District Office with substantial knowledge of the project, preferably someone who was involved in the design and construction of the spillway.
- b. One hydraulic engineer.
- c. One geotechnical engineer.
- d. Any other individual(s) who may have special knowledge or experience that could contribute to a thorough and accurate evaluation of the project. These individuals may include project personnel or representatives from the Division Office, the Waterways Experiment Station, or Corps Headquarters.

EVALUATION PROCEDURE: The evaluation team should perform the following tasks:

- a. Collect historical and other pertinent data on the project, including:
  1. Information on the original design and construction of the spillway and on any subsequent modifications. Drawings should be obtained which show all spillway and exit channel characteristics.
  2. Current topography of the region downstream from the spillway to a stable reach of channel or river whose bottom slope is not expected to change. The map should have 1- to 2-ft contour intervals so that any surface features which might contribute to excessive scour can be identified. The spillway approach should not be overlooked.
  3. Borings and a soil analysis of the channel bed material. This information can be used to determine the susceptibility of the channel to scour and the depth to a stable stratum.

4. Current records or hydrographs of flow over the spillway. This information is valuable in relating various flow rates to scour patterns.
- b. Perform a thorough analysis of all the information listed in subpara a, giving particular attention to:
    1. Pinpointing potential problem areas so that further investigation can be made of these areas during a site inspection.
    2. Analyzing any additional information that might affect the results of the investigation.
  - c. Perform a site inspection and evaluation. This phase of the investigation is important, and several factors should be observed:
    1. Urbanization and land use changes. Many times at the beginning of a project the downstream area of the discharge channel may be undeveloped. However, with time the land use may change, causing the subsequent value of the land to rise dramatically. This change could be the single most important factor in determining how much scour protection will be required.
    2. Changes in soil composition. Any areas where there is an apparent change in soil composition should be noted and previously acquired information should be checked to be sure adequate data on these areas is available.
    3. Check for discrepancies. There should be no discrepancies in structural drawings, topographical maps, exit channel geometry, soil data, and any other information on which decisions will be based.
  - d. Identify the factors which are potential causes of excessive scour (see REMR Technical Note HY-FC-1.1 for a description of causes). Based upon these findings, a decision can be made as to whether any of the resulting factors are likely to cause excessive scour.
  - e. Report on the results of the evaluation, including a conclusion on the expected performance of the spillway and a recommendation on any remedial measures required:
    1. The structure does not appear to be endangered by the expected (normal) scour in the exit channel; thus, no action is required.
    2. The spillway is likely to experience excessive scour based upon the evaluation of available data and the previous flows. Operational solutions are recommended.
    3. The structure is endangered by excessive scour. This condition is due to flows which are likely to occur or have already been experienced. Structural solutions are recommended. (See

REMR Technical Note HY-FC-1.3 for information on structural modifications which can be made to prevent excessive scour.)