Appendix A. Glossary and Acronyms

A.1 Glossary
A.2 Acronyms

A.1. Glossary

Below is a listing of terms used within this report. Many of these definitions were taken from FEMA's Federal Guidelines for Dam Safety, Glossary of Terms, April 2004.

Appurtenant structure. Ancillary features of a dam such as outlets, spillways, power plants, tunnels, etc.

Breach. An opening through a dam that allows the uncontrolled draining of a reservoir. A controlled breach is a constructed opening. An uncontrolled breach is an unintentional opening caused by discharge from the reservoir. A breach is generally associated with the partial or total failure of the dam.

Consequences. Potential loss of life or property damage downstream of a dam caused by floodwaters released at the dam or by waters released by partial or complete failure of dam. Also effects of landslides upstream of the dam on property located around the reservoir.

Dam. An artificial barrier that has the ability to impound water, wastewater, or any liquid-borne material, for the purpose of storage or control of water.

Dam failure. Catastrophic type of failure characterized by the sudden, rapid, and uncontrolled release of impounded water or the likelihood of such an uncontrolled release It is recognized that there are lesser degrees of failure and that any malfunction or abnormality outside the design assumptions and parameters that adversely affect a dam's primary function of impounding water is properly considered a failure. These lesser degrees of failure can progressively lead to or heighten the risk of a catastrophic failure. They are, however, normally amenable to corrective action.

Dam safety. Dam safety is the art and science of ensuring the integrity and viability of dams such that they do not present unacceptable risks to the public, property, and the environment. It requires the collective application of engineering principles and experience, and a philosophy of risk management that recognizes that a dam is a structure whose safe function is not explicitly determined by its original design and construction. It also includes all actions taken to identify or predict deficiencies and consequences related to failure, and to document, publicize, and reduce, eliminate, or remediate to the extent reasonably possible, any unacceptable risks.

Deterministic methodology. A method in which the chance of occurrence of the variable involved is ignored and the method or model used is considered to follow a definite law of certainty, and not probability.

Emergency Action Plan (EAP) Exercise. An activity designed to promote emergency preparedness; test or evaluate EAPs, procedures, or facilities; train personnel in emergency management duties; and demonstrate operational capability. Exercises consist of the performance of duties, tasks, or operations very similar to the way they would be performed in a real emergency. However, the exercise performance is in response to a simulated event.

Exceedance Probability. The likelihood that a random event will exceed a specified magnitude in a given time period, usually 1 year unless otherwise indicated.

Failure mode. A potential failure mode is a physically plausible process for dam failure resulting from an existing inadequacy or defect related to a natural foundation condition, the dam or appurtenant structures design, the construction, the materials incorporated, the operations and maintenance, or aging process, which can lead to an uncontrolled release of the reservoir.

Flood. A temporary rise in water surface elevation resulting in inundation of areas not normally covered by water. Hypothetical floods may be expressed in terms of average probability of exceedance per year such as one-percent-chance-flood, or expressed as a fraction of the probable maximum flood or other reference flood.

> **Flood, Inflow Design (IDF).** The flood flow above which the incremental increase in downstream water surface elevation due to failure of a dam or other water impounding structure is no longer considered to present an unacceptable threat to downstream life or property. The flood hydrograph used in the design of a dam and its appurtenant works particularly for sizing the spillway and outlet works and for determining maximum storage, height of dam, and freeboard requirements.
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> **Flood, Probable Maximum (PMF).** The flood that may be expected from the most severe combination of critical meteorologic and hydrologic conditions that are reasonably possible in the drainage basin under study.

Flood plain. An area adjoining a body of water or natural stream that may be covered by floodwater. Also, the downstream area that would be inundated or otherwise affected by the failure of a dam or by large flood flows. The area of the flood plain is generally delineated by a frequency (or size) of flood.

Hazard. A situation that creates the potential for adverse consequences such as loss of life, property damage, or other adverse impacts.

> **Hazard potential.** The possible adverse incremental consequences that result from the release of water or stored contents due to failure of the dam or misoperation of the dam or appurtenances. Impacts may be for a defined area downstream of a dam from flood waters released through spillways and outlet works of the dam or waters released by partial or complete failure of the dam. There may also be impacts for an area upstream of the dam from effects of backwater flooding or landslides around the reservoir perimeter.
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> **Hazard potential classification.** A system that categorizes dams according to the degree of adverse incremental consequences of a failure or misoperation of a dam. The hazard
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> potential classification does not reflect in any way on the current condition of the dam (i.e., safety, structural integrity, flood routing capacity).

Hydrograph, breach or dam failure. A flood hydrograph resulting from a dam breach.

Hydrograph, flood. A graph showing, for a given point on a stream, the discharge, height, or other characteristic of a flood with respect to time.

Hydrograph, unit. A hydrograph with a volume of one inch of runoff resulting from a storm of a specified duration and areal distribution. Hydrographs from other storms of the same duration and distribution are assumed to have the same time base but with ordinates of flow in proportion to the runoff volumes.

Hydrology. One of the earth sciences that encompasses the natural occurrence, distribution, movement, and properties of the waters of the earth and their environmental relationships.

Indemnification Cost. The present cost to provide sufficient security against all claims of loss or damage in the event of a future dam failure.

Population at Risk. All those persons who could be in the flooded area below a dam attributable to the failure of the dam at the time of failure.

Probable Maximum Flood (PMF). See Flood. **Probable Maximum Precipitation (PMP).** Theoretically, the greatest depth of precipitation for a given duration that is physically possible over a given size storm area at a particular geographical location during a certain time of the year.

Reservoir. A body of water impounded by a dam and in which water can be stored.

Risk. A measure of the likelihood and severity of adverse consequences (National Research Council 1983). Risk is estimated by the mathematical expectation of the consequences of an adverse event occurring, i.e., the product of the probability of occurrence and the consequence, or alternatively, by the triplet of scenario, probability of occurrence, and the consequence.

Risk analysis. A procedure to identify and quantify risks by establishing potential failure modes, providing numerical estimates of the likelihood of an event in a specified time period, and estimating the magnitude of the consequences. The risk analysis should include all potential events that would cause unintentional release of stored water from the reservoir.

Risk assessment. The process of deciding whether existing risks are tolerable and present risk control measures are adequate and, if not, whether alternative risk control measures are justified. Risk assessment incorporates the risk analysis and risk evaluation phases.

Spillway. A structure over or through which flow is discharged from a reservoir. If the rate of flow is controlled by mechanical means, such as gates, it is considered a controlled spillway. If the geometry of the spillway is the only control, it is considered an uncontrolled spillway.

Spillway, auxiliary. Any secondary spillway that is designed to be operated infrequently, possibly in anticipation of some degree of structural damage or erosion to the spillway that would occur during operation.

Spillway, emergency. See Spillway, auxiliary.

Spillway, service. A spillway that is designed to provide continuous or frequent regulated or unregulated releases from a reservoir, without significant damage to either the dam or its appurtenant structures. This is also referred to as principal spillway.

Spillway capacity. The maximum spillway outflow that a dam can safely pass with the reservoir at its maximum level.

Spillway channel. An open channel or closed conduit conveying water from the spillway inlet downstream.

Spillway chute. A steeply sloping spillway channel that conveys discharges at super-critical velocities.

Spillway crest. The lowest level at which water can flow over or through the spillway.

Spillway Design Flood (SDF). The flood flow above which the incremental increase in downstream water surface elevation due to failure of a dam or other water impounding structure is no longer considered to present an unacceptable threat to downstream life or property. The flood hydrograph used in the design of a dam and its appurtenant works particularly for sizing the spillway and outlet works and for determining maximum storage, height of dam, and freeboard requirements.

Storage. The retention of water or delay of runoff either by planned operation, as in a reservoir, or by temporary filling of overflow areas, as in the progression of a flood wave through a natural stream channel.

Surcharge. The volume or space in a reservoir between the controlled retention water level and the maximum water level. Flood surcharge cannot be retained in the reservoir but will flow out of the reservoir until the controlled retention water level is reached.

Watershed. The area drained by a river or river system or portion thereof. The watershed for a dam is the drainage area upstream of the dam.

A.2. Acronyms

ACT. Australian Capital Territory

AEP. Annual Exceedance Probability

ALARP. As Low As Reasonably Practicable

ALL. Annualized Life Loss

AMC. Antecedent Moisture Condition

ANCOLD. Australian National Committee on Large Dams

APF. Annual Probability of Failure

ASCE. American Society of Civil Engineers

ASDSO. Association of State Dam Safety Officials

AWWA. American Waterworks Association

BC. British Columbia

BSC. Base Safety Conditions

CDA. Canadian Dam Safety Association

DOD. Department of Defense

DOI. Department of Interior

FEMA. Federal Emergency Management Agency

FERC. Federal Energy Regulatory Commission

FPC. Federal Power Commission

GIS. Geographic Information Systems

HMR. Hydrometeorological Report

ICODS. Interagency Committee on Dam Safety

ICOLD. International Commission on Large Dams

IDF. Inflow Design Flood

LOL. Loss of Life

MPF. Maximum Possible Flood.

MPP. Maximum Possible Precipitation

MRC. Mississippi River Commission

MCD. Miami Conservancy District

MSHA. Mine Safety and Health Administration

NOAA. National Oceanic and Atmospheric Administration

NWS. National Weather Service, formerly USWB

NID. National Inventory of Dams

NRC. National Research Council of the National Academy of Sciences

NRCS. Natural Resources Conservation Service, formerly SCS

NSW DSC. New South Wales Government Dam Safety Committee

O&M. Operation and Maintenance

PAR. Population at Risk

PMF. Probable Maximum Flood

PMP. Probable Maximum Precipitation

SCS. Soil Conservation Service, currently known as the NRCS

SDF. Spillway Design Flood

TCW. Total Class Weight

TF. Threshold Flood

TVA. Tennessee Valley Authority

USCOLD. United States Committee on Large Dams, currently known as USSD

USBR. United States Bureau of Reclamation

USFS. United States Forest Service

USFWS. United States Fish and Wildlife Service

USGS. United States Geological Survey

USSD. United States Society on Dams, formerly USCOLD

USACE. United States Army Corps of Engineers

USDA. United States Department of Agriculture

USWB. United States Weather Bureau, currently the National Weather Service

WES. U.S. Army Corps of Engineers Waterways Experiment Station

Appendix B. Bibliography

B.1 Bibliography

B.1. Bibliography

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