

# APPENDIX A: INFORMATION TO BE GATHERED (OWNER)

The following information is desirable for a complete record of the history and condition of a dam. Some items (see Appendix B) are needed before the Dam Safety Review begins, so that the scope, schedule and cost can be estimated, and the appropriate expertise determined.

	<i>Available? Give report reference</i>	<i>Date last calculated or assessed</i>	<i>Review assessment/ calculation in DSR?</i>	<i>Reassess or update calculation in DSR?</i>
<b>GENERAL INFORMATION</b>				
General description of each structure under review: height, length, dam material, foundation material, how the reservoir is controlled (type, size and number of gates, tunnels, conduits, spillways, etc.)	✓			
Purpose of structures	✓			
Physical location of dam: GPS co-ordinates, address and location map	✓			
Current dam classification	✓		✓	
Information to support dam classification:	✓		✓	
• Inundation maps, including basic assumptions	✓		✓	
• Breach calculations, including basic assumptions	✓		✓	
Regulatory information: water licences, orders, permits, approvals, conditions placed on dam by Regulator(s)	✓		✓	
Access to site information: access modes, restrictions, training requirements, personal protective equipment	✓		✓	
How the site is operated: locally, remotely	✓		✓	
Previous Dam Safety Review reports	✓		✓	
List of previously identified deficiencies that have been addressed	✓		✓	
List of outstanding identified deficiencies	✓		✓	
History of dam: remedial works, alterations to site, hydrologic changes, operational changes, unusual events, changes to surrounding environment (developments, upstream or downstream of site)	✓		✓	
<b>EXTERNAL HAZARDS/ LOADS</b>				
<b>METEOROLOGICAL</b>				
Safety Flood Level or Inflow Design Flood (See Tables 6.1A and 6.1B of 2013 CDA <i>Dam Safety Guidelines</i> )				✓
Information on extreme temperatures, ice, lightning strikes, windstorms or other meteorological events that could contribute to failure of the dam	✓			

		Available? Give report reference	Date last calculated or assessed	Review assessment/ calculation in DSR?	Reassess or update calculation in DSR?
<b>SEISMIC / EARTHQUAKE</b>					
Maximum Design Earthquake (See Tables 6.1A and 6.1B of 2013 CDA <i>Dam Safety Guidelines</i> )					✓
Other induced seismic activity that could contribute to failure of the dam					✓
<b>RESERVOIR ENVIRONMENT</b>					
Upstream dams, potential debris sources, landslides or other hazards within the reservoir environment (ice, wildfire, vegetation, etc.) that could contribute to failure of the dam		✓		✓	
<b>HUMAN AGENCY</b>					
Public usage in area, potential threats by the public to safety of the dam, etc.		✓		✓	
<b>DESIGN AND PERFORMANCE INFORMATION</b>					
<b>WATER OR TAILINGS BARRIER DESIGN</b>					
Detailed description of dam structures: type of structure, components, dimensions, volume, foundation, etc.		✓			
Design information for dam or information used in available safety assessments. For example:		✓		✓	
• Site geology		✓		✓	
• Working Design Basis or Design Report		✓		✓	
• Gradation curves					
• Material testing results					✓
• Foundation treatment details		✓		✓	
• Liquefaction, internal erosion, AAR, fatigue or other durability and strength considerations					✓
• Condition or performance of filters, drains, pumps, waterstops or other measures to control seepage through and around dam system		✓		✓	
• Condition or performance of containment systems for contaminated materials					
• Other (List here)					
As-built drawings		✓		✓	
Stability under Inflow Design Flood, other meteorological hazards					✓
Wind set-up and wave run-up calculations					✓
Stability under Maximum Design Earthquake and other induced seismic hazards					✓
Stability under landslide-induced waves					

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Internal erosion assessment				✓
Seepage analyses				✓
Performance expectations for dam, based on dam design assumptions				✓
Instrumentation alarm limits based on performance expectations or historical performance				✓
Records of dam inspections, repair, operations, maintenance, surveillance and performance reviews	✓		✓	
<b>HYDRAULIC STRUCTURES DESIGN</b>				
Design information for hydraulic structures. For example:	✓		✓	
• Site geology	✓			
• Working Design Basis or design report	✓			
• Model tests of capacity				
• As-built drawings	✓		✓	
• Material testing results	✓		✓	✓
• Foundation treatment details	✓		✓	✓
• Other (list here)				
Stability under Inflow Design Flood, other meteorological hazards				✓
Stability under Maximum Design Earthquake and other induced seismic hazards				✓
Stability under landslide-induced waves				
Rating/discharge curves for all hydraulic structures	✓		✓	
Capacity of hydraulic structures	✓		✓	
Verification of flow capacity of hydraulic structures through flow tests				
Routing studies for passing Inflow Design Flood				✓
Records of hydraulic structure inspections, repair, operations, maintenance, surveillance and performance reviews	✓		✓	
<b>MECHANICAL / ELECTRICAL DESIGN</b>				
Design information for dam safety critical equipment. For example:				
• Working Design Basis or design report				
• Material testing results				
• Maintenance expectations				
• Other (list here)				

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As-built drawings		✓		✓	
Functional assessment under seismic loading					
Functional assessment under flood loading					
Stability under Maximum Design Earthquake and other induced seismic hazards					
Functionality under landslide-induced waves					
Records of mechanical/electrical equipment inspections, repair, operations, testing maintenance, surveillance and performance reviews		✓		✓	
<b>DAM SAFETY CONTROLS</b>					
<b>MANAGEMENT SYSTEM</b>					
Documented Dam Safety Management System, including elements such as:		✓		✓	
• Policy statement for dam safety		✓		✓	
• Documented responsibility for dam safety assigned in the organization		✓		✓	
• Documented program of gate testing and maintenance, including back-up power, protection and control system					
• Qualifications and training requirements for staff with dam safety responsibilities		✓		✓	
• Information management for dam safety records		✓		✓	
Operations, Maintenance and Surveillance (OMS) Manual					
<b>OPERATIONS</b>					
Operating rules and orders for operating the reservoir		✓			
Operating procedures for normal operations		✓			
Operating procedures for unusual operations: flood, earthquake, ice, landslide, etc.		✓			
Evidence that operating rules and procedures are followed		✓		✓	
Information on how inflows are forecast		✓		✓	
Records of historical operations (up to past DSR typically)		✓			
Debris, sediment and ice management plans		✓		✓	
Flow regulation upstream or downstream of project with implications on dam safety and emergency management					
Communications with site for operations: powerlines, satellite, fibre optic lines, etc.					

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<b>MAINTENANCE AND TESTING</b>				
Maintenance plans for debris, vegetation, concrete repairs, rip rap replacement, coatings, etc.	✓		✓	
Records of maintenance for site	✓			
Records of testing and maintenance of critical equipment				
Operation & Maintenance (O&M) Manuals for critical equipment				
<b>SURVEILLANCE</b>				
Description of surveillance program including inspection of dam, instrumentation readings, reporting	✓			
Types of instruments and instrument data records	✓		✓	
Inspection records (routine and non-routine)	✓		✓	
Instrument data management (collection, QA/QC, analysis, reporting, calibration)	✓		✓	
Communication systems for transmittal of instrument data (backup, reliability)	✓		✓	
Power supplies for instrument data collection, storage and transmission (reliability, redundancy & alarm upon failure)	✓		✓	
Evaluations of dam performance based on monitoring data and visual observations	✓		✓	
<b>EMERGENCY MANAGEMENT</b>				
Emergency plans	✓			
Training of staff with responsibilities for emergency response	✓			
Testing of emergency plans				
Procedures for dam safety incident reporting				
Communications available at site during emergency				
Historical log of dam safety incidents (since the last DSR, typically)	✓			
<b>PUBLIC SAFETY / SECURITY INFORMATION</b>				
Public safety measures for site: fencing, signage, warning systems (sirens), protocols in case of dangerous or unusual conditions	✓		✓	
Security measures for site: protocols, security systems	✓		✓	