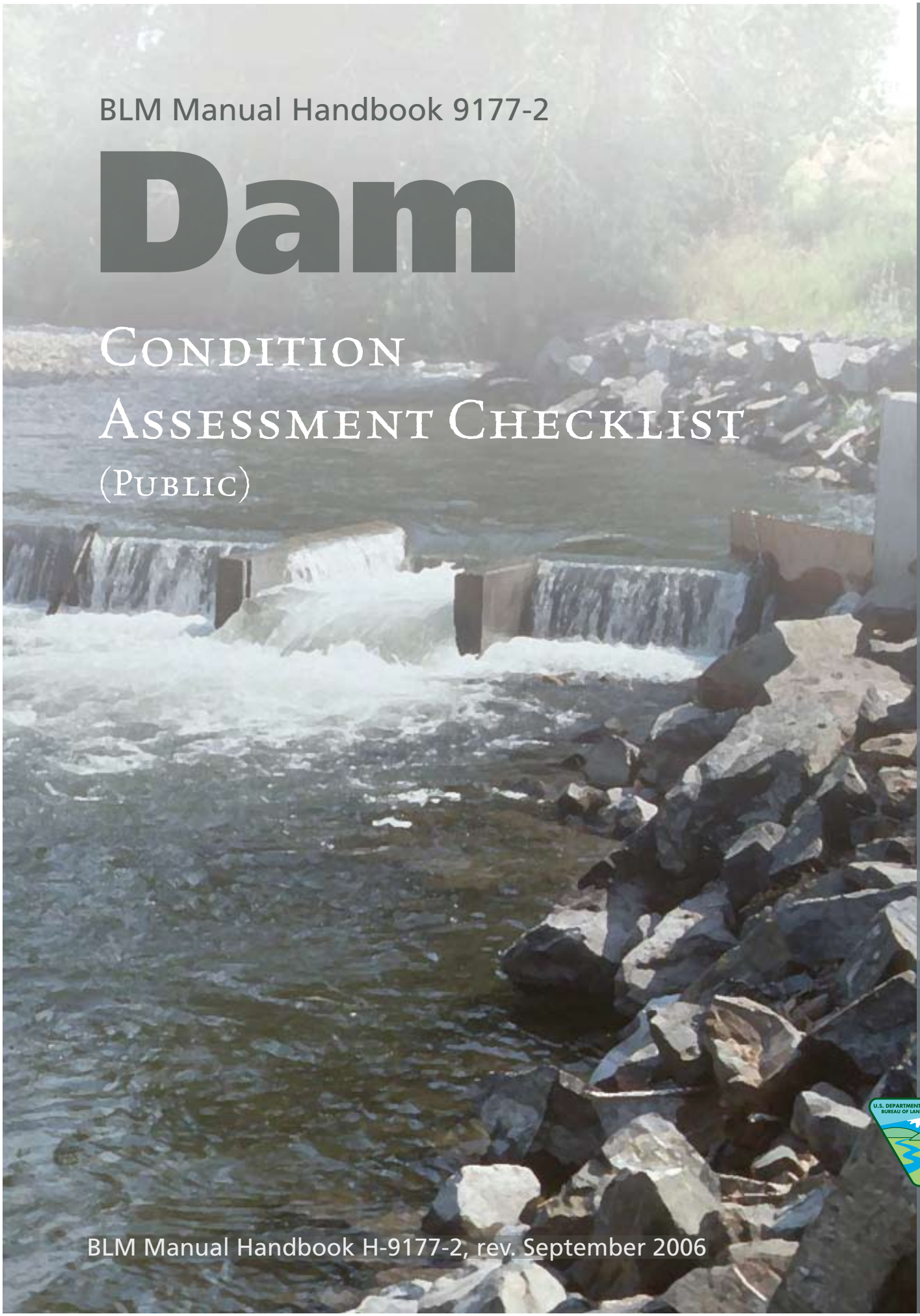
BLM Manual Handbook 9177-2

Dam

Condition Assessment Checklist (Public)



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BLM Manual Handbook H-9177-2, rev. September 2006

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Dam

Condition Assessment Checklist (Public)

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NAME OF DAM:		
Geographical Data	**Classification Data**	**Inspector Data**
	Current Hazard Class (L/S/H):	Date of Inspection:
Administrative State:	Population at Risk (High Hazard Only):	Inspector Name:
Geographic State (if diff):		Weather:
County:		
Field Office:	Size Class (Minor/Small/Inter/Large):	Date of Last Inspection:
Section: T: R:	Type of Dam (if not earth):	Safety issues and warnings for inspectors:
Aliquot Part:	Condition Rating Code: [1]	
Latitude at Benchmark (nearest 10th)	River/Stream Crossed:	Driving Directions to Dam:
Longitude at Benchmark (nearest 10th):	Seismic PGA (high haz only):	
Meridian:	Date Dam Constructed:	
BLM ID No.:	Date Dam Modified:	
Equip. No.:	Plan/Section Dwg No.:	

Notes:

For High Hazard dams, note any low water crossings, private land crossings, locked gates, poor roads, etc:

Describe any development within 3 miles downstream since the last inspection. If none, write "None":

Describe any active County, State, or Federal roads, active railroads, or utilities within 3 miles downstream. If none, write "None." For County roads, list the number of vehicles per day:

[1] Condition Rating Code (See Appendix). Give numeral (0–9) and discriptive term (good, poor,etc.).

Dimensional Data							
Benchmark Elevation:	Station _____	A		Slope of Upstream Face (H:V):		O	
Dam Crest Elevation (max):	Station _____	B		Principal Spillway Outlet Invert Elevation:	Station _____	P	
Dam Crest Elevation (minimum):	Station _____	C		Principal Spillway Outlet Diameter:		Q	
Emergency Spillway Crest Elevation:	Station _____	D		Low-Level Gated Outlet Outlet Invert Elevation:	Station _____	R	
Principal Spillway Inlet Invert Elevation:	Station _____	E		Lowest Point on the Downstream Toe Elevation:	Station _____	S	
Principal Spillway Inlet (Riser) Diameter:		F		Distance From Centerline of Dam to Outlet of Principal Spillway:		T	
Principal Spillway Material: (m/c/p)				Distance From Centerline of Dam to Outlet of Low-Level Gated Outlet:		U	
Principal Spillway Drop Inlet Height (Riser):		G		Distance From Centerline of Dam to Lowest Point on Downstream Face:		V	
Water Level at Survey Date Elevation:	Station _____	H		Slope of Downstream Face (H:V):		W	
Lowest Point on the Upstream Toe Elevation:		I		Crest Width:	Station _____	X	
Low-Level Gated Outlet Inlet Invert Elevation:	Station _____	J		Dam Crest Length Along Centerline of the Dam:		Y	
Low-Level Gated Outlet Diameter:		K		Emergency Spillway Width at the Crest:		Z	
Low-Level Gated Outlet Material: (m/c/p)				Emergency Spillway Length at the Crest:		AA	
Distance From Centerline of Dam to Inlet of Low-Level Gated Outlet:		L		Emergency Spillway Sideslope on Left (H:V):		BB	
Distance From Centerline of Dam to Lowest Point on Upstream Face:		M		Emergency Spillway Sideslope on Right (H:V):		CC	
Distance From Centerline of Dam to Inlet of Principal Spillway:		N		Reservoir Surface Area (Acres) at Emergency Spillway Crest:		DD	

Calculated Data			
Calc1. Hydraulic Height (D-S):		Calc7. Principal Spillway Outlet Pipe Length (T+N):	
Calc2. Structural Height (B-S):		Calc8. Low-Level Gated Outlet Pipe Length (U+L):	
Calc3. Minimum Freeboard (C-D):		Calc9. Estimated Max Reservoir Storage ((DD • Calc6.) / 3) :	
Calc4. Normal Storage Depth (E-I):		Calc10. Volume of Embankment: (((Calc2. • Y) • (X + ((Calc2. • O)/2] + ((Calc2. • W)/2))) / 54)	
Calc5. Actual Storage Depth (H-I):		Other:	
Calc6. Maximum Storage Depth (D-I):		Other:	

Notes:

See Figure for definition of dimensions.

Indicate all dimensions in feet unless otherwise noted.

If reservoir is dry at time of inspection, actual storage depth is 0.

Datum for permanent benchmark shall be elevation 100'.

For Calc10. dimensions O and W are slope ratios and all other parameters are in feet. The answer is in cubic yards.

Inspector Signature _____ Date _____

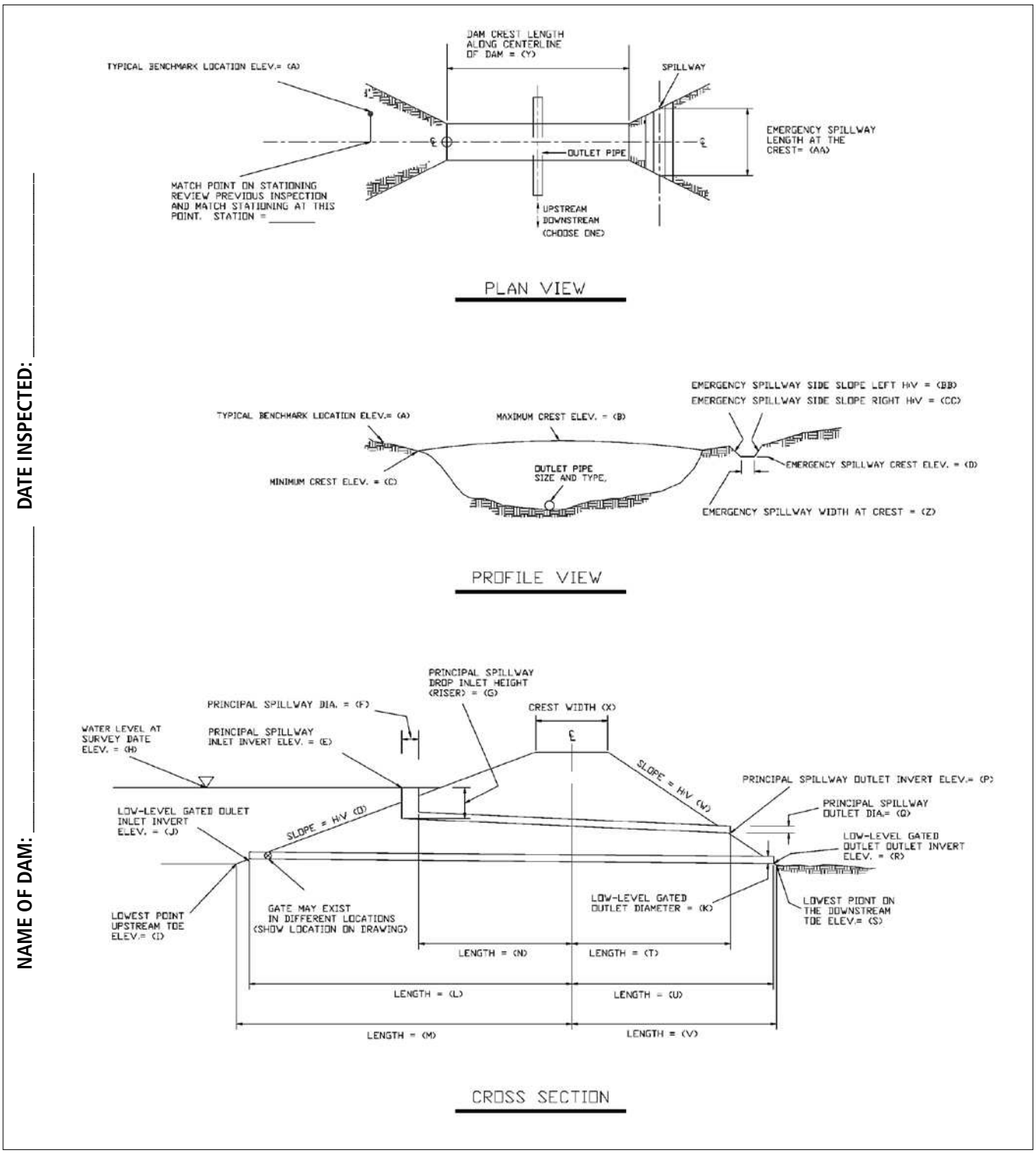

Figure. Definition of Dimensions.

Notes:

Show location on the Plan View of Station 0+00.

Use the back of this page to draw a plan view sketch of the reservoir and dam (DD).

DAM CONDITION ASSESSMENT CHECKLIST

NAME OF DAM: _____ DATE INSPECTED: _____ Directions:

1 Check the N/A, YES/NO, or Corrective Action Recommended (CAR[1]) columns as required.

2 Use the same flag number if quantities for similar items will be calculated and grouped together in the Recommended Work Summary.

3 Use item numbers to identify items on the Recommended Work Summary.

Item No.	Item	N/A	Y	N	CAR[1] RIM	Flag No.	Remarks
	EMBANKMENT						
1.	CREST						
a.	Any visual settlements						
b.	Cracking						
c.	Lateral movement						
d.	Visible sinkhole						
e.	Erosion						
f.	Trees & brush						
g.	FAMS road on crest						
h.	Rodent holes						
2.	UPSTREAM SLOPE						
a.	Erosion						
b.	Trees & brush						
c.	Longitudinal cracks						
d.	Transverse cracks						
e.	Visual depression or bulges						
f.	Visual settlements						
g.	Visible sinkhole						
h.	Debris						
i.	Rodent holes						
3.	DOWNSTREAM SLOPE						
a.	Erosion						
b.	Trees & brush						
c.	Longitudinal cracks						
d.	Transverse cracks						
e.	Visual depressions or bulges						
f.	Visual settlements						
g.	Visible sinkhole						
h.	Boils present at toe						

Item No.	Item	N/A	Y	N	CAR RIM	Flag No.	Remarks
i.	Seepage present						
j.	Rodent holes						
k.	Is toe drain dry						
4.	ABUTMENT CONTACTS						
a.	Erosion						
b.	Visual differential movement						
c.	Cracks						
d.	Seepage present						
e.	Trees & brush						
5.	GROIN						
a.	Erosion						
b.	Visual differential movement						
c.	Cracks						
d.	Seepage present						
e.	Trees & brush						
6.	RESERVOIR CONTROL						
a.	Recent downstream development						
b.	Slides in reservoir area						
c.	Change in reservoir operation						
d.	Other large impoundments u/s						
e.	Evidence or recreational use						
7.	INSTRUMENTATION						
a.	List any instrumentation present						
b.	Is instrumentation functional						
c.	Record measurements						
(see page 58 of ***Dam Condition Assessment Guidelines for Embankment Dams***)—EMBANKMENT SAFETY RATING:							
PRINCIPAL SPILLWAY OR OUTLET							
8.	INTAKE STRUCTURE						
a.	Debris present						
b.	Concrete surface condition						
(1)	Spalling						
(2)	Cracking						
(3)	Erosion						
(4)	Scaling						
(5)	Exposed reinforcement						
(6)	Other, list						

Item No.	Item	N/A	Y	N	CAR RIM	Flag No.	Remarks
c.	Joint condition						
(1)	Displacement or offset						
(2)	Loss of joint material						
(3)	Leakage						
d.	Metal appurtenances						
(1)	Corrosion present						
(2)	Breakage present						
(3)	Anchor system secure						
9.	CONDUIT						
a.	Is conduit concrete						
b.	Concrete surface condition						
(1)	Spalling						
(2)	Cracking						
(3)	Erosion						
(4)	Scaling						
(5)	Exposed reinforcement						
(6)	Displacement or offset						
(7)	Leakage						
(8)	Other, list						
c.	Metal conduit condition						
(1)	Corrosion present						
(2)	Protection coating adequacy						
(3)	Conduit misalignment						
(4)	Leakage						
d.	Plastic conduit condition						
(1)	Displacement or offset						
(2)	Leakage						
(3)	Crushed or broken						
e.	Conduit trashrack condition						
(1)	Operational						
(2)	Plugged						
(3)	Corrosion or damage present						
10.	GATES						
a.	Flood gate condition						
(1)	Broken or bent						
(2)	Corroded or rusted						

Item No.	Item	N/A	Y	N	CAR RIM	Flag No.	Remarks
(3)	Regularly maintained						
(4)	Gates operational						
c.	Is there a low-level gate						
d.	Is low-level gate operational						
(see page 54 of *Dam Condition Assessment Guidelines for Embankment Dams*)—PRINCIPAL SPILLWAY or OUTLET WORKS SAFETY RATING:							
EMERGENCY SPILLWAY or OUTLET WORKS							
11.	STILLING BASIN						
a.	Concrete surface condition						
(1)	Spalling						
(2)	Cracking						
(3)	Erosion						
(4)	Scaling						
(5)	Exposed reinforcement						
(6)	Other, list						
b.	Joint condition						
(1)	Displacement or offset						
(2)	Loss of joint material						
(3)	Leakage						
c.	Energy dissipater condition						
(1)	Deterioration						
(2)	Covered with debris						
(3)	Other, list						
d.	Channel condition						
(1)	Eroding or backcutting						
(2)	Sloughing						
(3)	Obstructed						
(4)	Undercut by released water						
(5)	Embankment erosion by water						
e.	Gabion condition						
(1)	Corroded						
(2)	Basket misaligned						
(3)	Basket settlement						
(4)	Brush growing in gabions						
f.	Riprap condition						
(1)	Erosion undercut or settlement						

Item No.	Item	N/A	Y	N	CAR RIM	Flag No.	Remarks
(2)	Vegetation						
(3)	Extent of riprap adequacy						
(4)	Migration of riprap						
12.	SPILLWAY or OUTLET WORKS						
a.	Spillway concrete condition						
(1)	Spalling						
(2)	Cracking						
(3)	Erosion						
(4)	Scaling						
(5)	Exposed reinforcement						
(6)	Concrete undercut						
(7)	Settlement						
(8)	Other, list						
(9)	Trees and brush—obstructed						
b.	Joint condition						
(1)	Displacement or offset						
(2)	Loss of joint material						
(3)	Leakage						
c.	Energy dissipater condition						
(1)	Signs of deterioration						
(2)	Covered with debris						
(3)	Riprap dissipater						
(4)	Missing						
d.	Excavated earth spillway condition						
(1)	Slopes eroding						
(2)	Slopes sloughing						
(3)	Headcutting						
(4)	Trees and brush—obstructed						
e.	Natural earth spillway condition						
(1)	Slopes eroding						
(2)	Slopes sloughing						
(3)	Headcutting						
(4)	Trees and brush—obstructed						

Item No.	Item	N/A	Y	N	CAR RIM	Flag No.	Remarks
f.	Damage from released water						
(1)	Eroded embankment						
(2)	Undercutting of outlet						
(3)	Recent discharge						
(4)	Other damage, list						
g.	Is weir in good condition						
h.	Is control at weir						
(see page 56 of *Dam Condition Assessment Guidelines for Embankment Dams*—EMERGENCY SPILLWAY or OUTLET WORKS SAFETY RATING:							
OVERALL SAFETY RATING:		See page 60 of *Dam Safety Inspection Report Guidelines for Embankment Dams*					

[1] UNDER THE CAR/RIM COLUMN—DETERMINE WHAT IS THE CORRECTED ACTION RECOMMENDED (CAR)—REPAIR (R), INVESTIGATE (I),MONITOR (M) OR "NO" IF NO CORRECT ACTION IS NECESSARY

DO YOU RECOMMEND A HAZARD CLASSIFICATION REASSESSMENT? EXPLAIN:

_____

_____

_____

_____

_____

_____

OTHER REMARKS / NOTES FOR PHOTOS:

_____

_____

_____

_____

_____

_____

_____

_____

_____

DAM CONDITION ASSESSMENT CHECKLIST

NAME OF DAM: _____

DATE INSPECTED: _____

CALCULATIONS

List Flag Numbers from checklist and comment as needed. Group similar items, calculate estimated quantities, and enter totals on Summary.

NOTE: Recommended work items listed below were discovered during the field inspection.

Inspector Signature _____ Date _____

DAM CONDITION ASSESSMENT CHECKLIST

NAME OF DAM: _____ DATE INSPECTED: _____

RECOMMENDED WORK SUMMARY

ITEM NO.	ITEM[1]	WORK TYPE[2]	EST QTY	UOM[3]	REMARKS

[1] Include only work items for which a FAMS unit cost has been approved and developed.

[2] Work Types are to be classified as: A = Annual Maintenance, D = Deferred Maintenance, CI = Capital Improvement.

[3] UOM = Unit of Measure.

DAM CONDITION ASSESSMENT CHECKLIST

NAME OF DAM: _____ DATE INSPECTED: _____

REMARKS:

DAM CONDITION ASSESSMENT CHECKLIST

Coordinator, Safety of Dams Signature _____ Date_____

NAME OF DAM: _____ Date Inspected:_____

Photos:

Insert description of photographs on this page. Identify the feature, item, or deficiency that is captured by the photograph, and identify the direction in which the photograph is taken; i.e., “Main embankment from the west abutment looking east.” Add a text box for each photograph included. Provide additional photographs, as needed.

DAM CONDITION ASSESSMENT CHECKLIST

Coordinator, Safety of Dams Signature _____ Date_____

NAME OF DAM: _____ Date Inspected:_____

Photos:

Insert description of photographs on this page. Identify the feature, item, or deficiency that is captured by the photograph, and identify the direction in which the photograph is taken; i.e., “Main embankment from the west abutment looking east.” Add a text box for each photograph included. Provide additional photographs, as needed.

Appendix. Condition Rating Code:

Numeral (0–9) and Descriptive Term (GOOD, POOR, etc.)[1]

N Not applicable.

9 EXCELLENT—No deficiencies.

8 VERY GOOD—No noticeable or noteworthy deficiencies that affect the condition or operation.

7 GOOD—Concrete surfaces have shrink cracks, light scaling, and insignificant spalling that does not expose reinforcing steel.

6 SATISFACTORY—Minor deterioration or initial disintegration, minor chloride contamination, cracking with some leaching, or spalling on concrete.

5 FAIR—Moderate deterioration or disintegration, extensive cracking and leaching, or spalling on concrete.

4 POOR—Major spalling, heavy scaling, wide cracks, or exposed rebar in concrete.

3 SERIOUS—Any condition described in code 4 that is excessive in scope.

2 CRITICAL—Advanced deterioration of primary structural elements.

1 "PARTIAL FAILURE"—Dam is out of service; or
"IMMINENT FAILURE"—Dam will fail if not taken out of service.

0 FAILED—Dam has failed. Replacement of the entire structure is necessary.

Good (codes 7–9)	Fair (codes 5–6)
Poor (codes 2–4)	Unsatisfactory (codes 0–1)

[1] Condition Rating Codes are from Manual Handbook H-9177-1, Dam Condition Assessment Guidelines for Embankment Dams.

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