Part 520 – Soil and Water Resource Development

Subpart A – Erosion and Sediment Control

MN520.1 Minimizing Erosion and Sediment during Construction

L. Construction activity that disturbs one or more acres of land must have coverage under a Construction Stormwater Permit from the Minnesota Pollution Control Agency (MPCA). Construction of conservation practices associated with agricultural or silvicultural activities are exempt from this permit requirement. Examples of exempt conservation practices include:

- Grassed Waterways
- Terraces
- Water and Sediment Control Basins
- Diversions
- Grade Stabilization Structures

Although exempt from permitting requirements, construction activities associated with conservation practices must still be performed with appropriate erosion and sediment control measures to minimize the chance of a water quality standard violation.

The provisions listed in worksheet MN-ENG-142 shall be the minimum erosion and sediment control provisions included on all conservation practice projects which involve earth moving activities. This worksheet may be included in the plans or equivalent provisions provided as notes on drawings or details in the specifications.

(1) Projects not included under the agricultural and silvicultural exemption include:
   (i) Feedlot projects will include erosion and sediment control requirements in the feedlot permit. Plans prepared for the feedlot must include provisions to meet these permit requirements.
   (ii) Buildings and roofs may have stormwater permit requirements which could include runoff detention in some cases.
   (iii) Projects located in or adjacent to a stream, river or lake, which would have a high potential to violate state water quality standards, usually require a permit even if they support an agricultural or silvicultural conservation practice. MPCA should be consulted if there is a question on permit applicability for these projects.

(2) MPCA policy on the agricultural and silvicultural exemption for conservation practices is spelled out in the MPCA Fact Sheet entitled "Agricultural Conservation Practice Projects, Guidance Regarding Construction Stormwater Permit Requirements". Available at http://www.pca.state.mn.us (search for "wq-strm2-16").

Construction Site Erosion and Sediment Control

Job Name _____ Date: _____

Practice Standard (name & number) _____

By: _____

County _____ Township, Range, Section _____

Conservation projects with more than one acre of soil disturbance are operating under an exclusion from the National Pollution Discharge Elimination System (NPDES) permitting requirements for construction site storm water discharges. See the MPCA Fact Sheet regarding Conservation Practices for more details. The following provisions will be implemented to provide construction site erosion and sediment control for these projects regardless of size:

1. Locate topsoil or other temporary stockpiles of soil in locations where they will not be subject to erosion from concentrated flow.

2. When permanent vegetation must be disturbed, limit the area of disturbance to the minimum required for the project.

3. Seed, or otherwise stabilize, disturbed areas in accordance with the planting and erosion control specifications for the project. Stabilization must be done within 14 days in that portion of the site where the construction activity has temporarily or permanently ceased, unless work is completed after the fall seeding cutoff date:

4. If a grassed waterway or diversion will be completed after the fall seeding cutoff date, do not leave a loosened soil surface over winter. Track the finished grade to compact the soil surface for temporary erosion protection. Implement seeding and stabilization as soon as feasible in the spring.

5. Project Specific Requirements (describe or show N/A for not applicable).

   a) Mulching:
   b) Fabric barriers:
   c) Silt Fence:
   d) Other

Note: Excessive sediment discharges from any project that impact water quality may result in enforcement action under state water quality protection rules.

Part 520 – Soil and Water Resource Development

Subpart C – Dams

MN520.21 Definition and Classes

F. NRCS policy in Minnesota for maintaining an inventory of dams is those which meet any of the following criteria:

(1) All significant hazard and high hazard dams.
(2) All low hazard dams having more than six feet of overall height between the top of the settled dam and the lowest elevation at the downstream toe and a storage capacity of 50 acre/feet or more. Storage capacity is the capacity at the crest of the emergency spillway or the elevation of the top of dam if there is no emergency spillway.
(3) All low hazard dams with an overall height of 25 feet or more and a storage capacity of more than 15 acre/feet (height and storage capacity definitions are in (2) above).
(4) All dams with an overall height of 35 feet or more (height as in (2) above).

G. Inventory size dams will be included in the NRCS inventory if they meet all of the following:

(1) Dam was built with NRCS technical and/or financial assistance.
(2) The dam was built according to NRCS standards and specifications in effect at the time of construction.
(3) Alterations to the dam since the time of construction have been made in accordance with NRCS standards and specifications.

H. All information requested on worksheet MN-ENG-129, MN Dam Inventory Report, is to be included in the NRCS inventory. A copy of the worksheet and instructions for completing the worksheet is shown in Section MN520-40 Subpart E, Exhibits.

(1) Inventory of new dams. As new dams are constructed, the required data is to be added to the NRCS inventory on the basis of design and construction records. The individual approving the design shall, to the extent possible, complete worksheet MN-ENG-129. The individual making the final construction check will check worksheet MN-ENG-129, make any needed as-built corrections, and verify that all items are complete. One copy of MN-ENG-129 is to be forwarded through the area office to the SCE and one copy retained in the case file.
(2) MN Department of Natural Resources (MN-DNR) dam inventory. State inventory information will be sent to the MN-DNR at least annually, by the state office. All needed information will be available from worksheet MN-ENG-129. The MN-DNR will assign national dam inventory ID numbers.
(3) Entry, storage, and retrieval of data.
  (i) Automatic data processing procedures will be used to maintain the inventory. Data will be entered at the state office.
  (ii) Inventory data will be retrieved as needed by the state office and copies of the inventory furnished to respective area and field offices.
(4) Keeping the inventory current. Data on new dams, updated or corrected data on previously submitted dams can be submitted at any time. Data on all dams completed during a calendar year must be forwarded through the area office to the SCE by January 15 of the following year. This data will then be entered into the dam inventory database.
(5) Responsibility.
  (i) The SCE provides overall coordination for the inventory of dams.
  (ii) Each ASTC(FO) insures the inventory policy is carried out by the field offices.
  (iii) Each area office will review the MN-ENG-129 worksheets received from the field, for completeness and accuracy, before transmitting them to the state office.

MN520.23 Classification

B. Hazard classification of a dam shall be done early in the planning stage so that unnecessary delays and duplication of work can be avoided. The following procedure shall be followed when determining hazard class:

(1) Visually inspect the site and upstream and downstream conditions. If the hazard class is obvious, this will be documented and no further analysis is required.

(2) If the hazard class is not obvious from the visual inspection, a breach analysis may be required.

(i) A breach analysis, when warranted, shall be evaluated with non-storm conditions downstream of the dam and the reservoir water surface at the emergency spillway elevation, the principal spillway hydrograph peak elevation, or the emergency spillway hydrograph peak elevation, whichever is highest. MN DNR dam safety permit requirements may be more conservative and should be verified.

(ii) When the National Weather Service breach analysis procedures are used, an embankment decay time during breaching is deemed appropriate and should be based upon the actual embankment and foundation materials placed. The decay time will normally vary from an instantaneous breach up to about 3 hours, depending on the ability of the embankment and abutment materials to resist erosion.

(3) Hazard classification shall be documented on worksheet MN-ENG-027, Documentation for Hazard Classification. See Exhibit MN520.41.

(4) Guidelines used by NRCS in Minnesota to evaluate the hazard classification of a dam are based upon the potential losses that could result if a dam failure should occur. These guidelines are given in Exhibit MN520.42.

MN520.28 Potential Impact Area--Low Hazard Dams of Inventory Size and all Significant Hazard Dams

B. Requirements.

(1) Use breach routing procedures for all significant hazard dams. For low hazard dams, the individual exercising design approval authority will determine the need for a breach routing. A conservative estimate may be made in place of breach routing. A conservative estimate of the potential impacted area could be as follows: The area flooded from the dam downstream to a major receiving stream. Depth of the flood wave is to be two-thirds of the dam height at the upper end and decreasing uniformly to a depth which covers the flood plain at the lower end.

(2) A map will be used to show the impact area determined by breach routing.

(i) When a conservative estimate is made to determine the impact area, a written narrative (see Exhibit MN520.43) and/or a map will be used to describe the impact area.

(ii) Documentation of the method or thought process used to develop the potential impact area shall be included in the design file.

(iii) The engineer with design approval will prepare a narrative and/or a map indicating precautions to further development.

C. Distribution.

(1) For low hazard dams that are designed and approved by field engineers, the district conservationist is responsible for transmitting information on potential impact areas (see Exhibit MN 520.43). For all other dams, the State Conservationist will transmit the information.

Part 520 – Soil and Water Resource Development

Subpart E – Exhibits

MN520.40 MN Dam Inventory Report--Instructions

The data base field information is given as follows:

( ) official field name (field name used in database) (units, where applicable) (field type, field size) -- field description and/or entry options.

The first series of fields (#1 - #44) comprise the National Inventory of Dams (NID) data fields that are standardized by the U. S. Army Corps of Engineers (USACE) and are reported by all National Inventory of Dams participating agencies.

(1) DAM NAME (DAM_NAME) (alphanumeric, 65 var) -- Enter the official name of the dam. Do not abbreviate unless part of the official name. For dams that do not have an official name, use the popular name of dam. Do not insert meaningless information such as "No Name" or "Unknown" which only serve to increase the size of the file.

(2) OTHER DAM NAMES (OTHER_NAMES) (alphanumeric, 65 var) -- If there are names other than the official name (i.e., reservoir name) of the dam in common use, enter the names in this space. Separate names using a semi-colon. Leave blank if none.

(3) DAM FORMER NAMES (FORMER_NAMES) (alphanumeric, 65 var) -- Enter any previous reservoir or dam name(s), if changed. Separate the names using a semi-colon. Leave blank if none.

(4) STATE OR FEDERAL AGENCY ID (FED_ID) (alphanumeric, 15 var) -- Enter the Official State or Agency identification number for the dam. In Minnesota, the first two characters are MN for Minnesota. The next two characters are the NRCS administrative area (01 through 07) and the following three characters are the county code (see table). A dash is the next character, followed by a two digit numeric code which numbers the inventory dams in each county sequentially. Check with the person responsible for the MN NRCS dam inventory to agree on what the final two digits should be. This data field allows the dams to be sorted within the state quickly (see Table 1).

(5) NID ID (NID_ID) (alphanumeric, 7) -- Enter the official NID identification number for the dam. This is a required field and must have an entry to be included in the National Inventory of Dams. This field is used as the unique identifier for each dam in the Nation. This identifier is used to link the NID and NRCS databases with other databases for queries about NRCS dams. It is the same as the Corps of Engineers Identification Number assigned in the original 1981 USACE National Inventory of Dams. Once assigned, this NID ID will never be reused. If a dam is removed or decommissioned, the NID ID number for that dam is retired.

The first two characters are the appropriate two letter State abbreviation, based on the location of the dam. The last five characters will be a unique number for that State. Ranges of numbers have been assigned to each Agency participating in the National Inventory of Dams effort so that assigning Agency can be determined.

For the NRCS compiled inventory, this number likely has already been assigned by the State Dam Safety Agency or another Federal Agency, and NRCS should obtain the NID ID from their State Dam Safety Agency. Only in very rare cases, such as non-participating States, will NRCS need to assign a NID ID. In this situation, please contact NRCS NHQ for the range of assigned numbers.

(6) LONGITUDE (LONG_DEG) (number, 12 var) -- Longitude at the dam centerline as a single value in decimal degrees (Degrees + Minutes/60 + Seconds/3600). NOTE: Longitude in the US is always a minus number. This is the X-coordinate for geocoding. (We need to give them the accuracy that we want. For Example: -36.1252).

(7) LATITUDE (LAT_DEG) (number, 12 var) -- Latitude at the dam centerline as a single value in decimal degrees to four significant digits (Degrees + Minutes/60 + Seconds/3600). This is the Y-coordinate for geocoding. (We need to give them the accuracy that we want. For example: 24.2148)

(8) SECTION, TOWNSHIP, RANGE LOCATION (GEODETIC_LOC) (alphanumeric, 30 var) -- This is an optional field. States that track Section, Township and Range are requested to enter any information that is understandable and that clearly designates the individual values. For example, S.21, T.3N, R.69W. If the meridian location is needed to locate the dam, include it in the field. For example, S21 T3N R68W of 6PM (Sixth Principal Meridian).

(9) COUNTY (COUNTY) (alphanumeric, 30 var) -- Name of county (or parish) where dam is located.

(10) RIVER OR STREAM (STREAM) (alphanumeric, 30 var) -- Name of river or stream on which dam is built. If the stream is unnamed, identify it as a tributary to a named river, e.g., TR-Snake. If the dam is located offstream, enter the name of the river or stream and identify as offstream, e.g., Snake-OS.

(11) NEAREST CITY/TOWN (NEAREST_TOWN) (alphanumeric, 30 var) -- Name of nearest downstream city, town, or village that is most likely to be affected by floods resulting from failure of the dam.

(12) DISTANCE TO NEAREST CITY/TOWN (DIST_TOWN) (miles) (number, 3 var) -- Distance to nearest downstream city, town, or village, to the nearest mile (and tenth if appropriate).

(13) OWNER NAME (OWNER_NAME) (alphanumeric, 50 var) -- Name of owner of dam.

(14) OWNER TYPE (OWNER_TYPE) (alphanumeric, 1) -- Use the following codes to indicate the type of owner:

F for Federal	U for Public Utility	
P for Private owner	S for State	L for Local Government

Typically for NRCS, this Field would be L if Field #53 = WS, PT, RC, or FP.

(15) DAM DESIGNER (DAM_DSGNR) (alphanumeric, 65 var) -- Enter the name of the principal firm(s) or agency accomplishing design of the dam and major appurtenances operating features, and major modifications. List original designer, then modification designers (if applicable). Separate the names using a semi-colon. Typically for NRCS, if the design was prepared by an A&E and NRCS approved the plans, this Field would show the name of the A&E, and Field #46 would show NRCS involvement. If the design was prepared by NRCS in-house, this field would show USDA-NRCS.

(16) NON_FEDERAL DAM ON FEDERAL PROPERTY (NFDFP) (alphanumeric, 1) -- Indication whether the dam is a non-Federal dam on Federal property, such as in National Forests.

Y for Yes N for No

(17) DAM TYPE (DAM_TYPE) (alphanumeric, 6 var) -- Codes to indicate the type of dam. List in order of importance. Codes are concatenated if the dam is a combination of several types. For example, an entry of CNCB would indicate a concrete buttress dam type.

RE for Earth	VA for Arch	ER for Rockfill
MV for Multi-Arch	ST for Stone	PG for Gravity
CN for Concrete	TC for Timber Crib	CB for Buttress
MS for Masonry	OT for Other	

(18) CORE (CORE) (alphanumeric, 3) -- Enter code to indicate position, type of watertight member, and certainty. Typically for NRCS, most dams would be HEK.

Position: F for upstream facing;

H for homogenous dam;
I for core;
X for unlisted/unknown.

Type: A for bituminous concrete;
C for concrete;
E for earth;
M for metal;
P for plastic;
X for unlisted/unknown.

Certainty: K for known;
Z for estimated.

(19) FOUNDATION (FNDN) (alphanumeric, 3) -- Code for the material upon which dam is founded followed by the certainty; do not separate with a comma.

Material: R for rock;
RS for rock and soil;
S for soil;
U for unlisted/unknown.

Certainty: K for known;
Z for estimated.

(20) PURPOSES (PURPOSES) (alphanumeric, 8 var) -- Codes to indicate the purposes for which the reservoir is used: Can use up to four purposes, list in order of importance. Codes are concatenated when multiple codes are used, e.g. ICF for irrigation, flood control, and fish and wildlife.

I for Irrigation	N for Navigation	S for Water Supply
R for Recreation	H for Hydroelectric	F for Fish and Wildlife Pond
T for Tailings	D for Debris Control	O for Other
C for Flood Control and Storm Water Management		
P for Fire Protection, Stock, or Small Farm Pond		
G for Grade Stabilization		

(21) YEAR COMPLETED (YR_COMP) (alphanumeric, 5 var) -- Year in which original main dam structure was completed. The NID allows addition of an "E" to indicate an estimated date. Use four digits (Example: 2010). Entry date is not to be changed when modifications or rehabilitations are done; use Field #22 below.

(22) YEAR MODIFIED (YR_MOD) (alphanumeric, 60 var) -- Year of major modification or rehabilitation of dam or major control structure is completed. Use four digits (Example 2010). Major changes are defined as structural, foundation, or mechanical construction activity which significantly restores the project to original condition; changes the project's operation, capacity or structural characteristics (e.g., spillway or seismic modification); or increases the longevity, stability, or safety of the dam. Use the codes to indicate the type of modification; up to ten may be entered, separated by semi-colons.

S for structural	F for foundation	M for mechanical
E for seismic	H for hydraulic	O for other.

(23) DAM LENGTH (DAM_LEN) (feet) (number, 7 var) -- Length of dam defined as length along top of dam. Also includes spillway, power plant, navigation lock, fish pass, etc., where these form part of the length of the dam. If detached from the dam, these structures should not be included.

(24) DAM HEIGHT (DAM_HT) (feet) (number, 6 var) -- Height of the dam to nearest foot, defined as the vertical distance between the lowest point along the crest of the dam and the lowest point at the downstream toe which usually occurs in the natural bed of the stream or water course.

(25) STRUCTURAL HEIGHT (STR_HT) (feet) (number, 6 var) -- Height of the dam to the nearest foot, defined as the vertical distance from the lowest point of the excavated foundation to the top of the dam.

(26) HYDRAULIC HEIGHT (HYDR_HT) (feet) (number, 6 var) -- Height of the dam to the nearest foot, defined as the vertical distance between the maximum design water level (freeboard design flood) and the lowest point at the downstream toe. Typically for NRCS, this is the same as Field #24.

(27) MAXIMUM DISCHARGE (MAX_DISC) (cfs) (number, 7 var) -- The discharge in cubic feet per second (cfs) that the spillway will discharge when the pool is at the maximum designed water surface elevation.

(28) MAXIMUM STORAGE (MAX_STOR) (acre-feet) (number, 10 var) – The total storage space in a reservoir below the maximum attainable water surface elevation. Typically for NRCS, this is the sum of #65, #66, and #67, and #68.

(29) NORMAL STORAGE (NORM_STOR) (acre-feet) (number, 10 var) – The total storage space in a reservoir below the normal retention level, excluding any flood or surcharge storage. Typically for NRCS, this is the sum of #65 and #68.

(30) SURFACE AREA (SURF_A) (acres) (number, 8 var) -- Surface area of the impoundment at normal pool level to the crest of the lowest ungated outlet.

(31) DRAINAGE AREA (DA) (square miles) (number, 10 var) -- Drainage area to the nearest hundredth, which is defined as the area that drains to the dam.

(32) DOWNSTREAM HAZARD POTENTIAL (CUR_HAZ) (alphanumeric, 1) -- Code to indicate the most current potential hazard classification as defined in the NEM. Use L for NRCS Class a, S for NRCS Class b, and H for NRCS Class c. Use best and latest available information. Qualify how current the data is in Field #63. Do not use any other Codes since this Field is a critical filter for inclusion in the NID.

L for low S for significant H for high

(33) EMERGENCY ACTION PLAN (EAP) (alphanumeric, 2) -- Code indicating whether or not the dam has an Emergency Action Plan developed by the dam owner.

Y for Yes N for No
NR for Not Required by submitting agency

Typically for NRCS, if Field #32 is L or S, this Field is NR.

(34) INSPECTION DATE (LAST_INSP_D) (date, 10 var) -- Date of the most recent inspection of the dam prior to submission of data. Typically for NRCS, this means formal inspection led by a qualified engineer (can be NRCS or non-NRCS) as defined in NRCS National Operation & Maintenance Manual (NO&MM). The date should be entered as mm/dd/yyyy (06/30/1982).

(35) INSPECTION FREQUENCY (INSP_FREQ) (number, 1) -- Scheduled frequency interval for periodic inspections, in years. Typically for NRCS, this is the frequency of formal inspections required by the State dam regulatory authority.

(36) STATE REGULATED DAM (STATE_REG) (alphanumeric, 1) -- Code to indicate whether the dam is considered “State Regulated” by the National Dam Safety Program Act. A “State Regulated Dam” is defined in the Act as a dam for which the State executes one or more of the following general responsibilities: (a) Inspection; (b) Enforcement; (c) Permitting.

Y for Yes, N for No

(37) STATE REGULATORY AGENCY (STATE_REG_AGENCY) (alphanumeric, 30 var) -- Name of the primary state agency with regulatory or approval authority over the dam.

(38) SPILLWAY TYPE (SPWY_TYPE) (alphanumeric, 1) -- Letter code that describes the type of spillway:

C for Controlled U for Uncontrolled N for None

Typically for NRCS; if Field #20 includes I, leave this field blank; if Field #70 is NO, use N for this field; if Field #70 is not NO, use U for this field.

(39) SPILLWAY WIDTH (SPWY_W) (feet) (number, 4) -- The width to the nearest foot, of the spillway that is available for discharge when the reservoir is at its maximum designed water surface elevation. Typically for NRCS, this is the bottom width on an open channel spillway.

(40) OUTLET GATES (OUT_GATES) (alphanumeric, 15 var) -- Use one or more of the following codes to describe the type of spillway and controlled outlet gates, if any.

Use up to five types in decreasing size order, separated by semi-colons, followed by number of gates. Typically for NRCS, if Field #38 is U, this field is U; if Field #38 is N, this field is X.

X for none	U for uncontrolled	T for tainter (radial)
L for vertical lift	R for roller	B for bascule
D for drum	N for needle	F for flap
S for slide	V for valve	O for other controlled

(41) VOLUME OF DAM (VOL_DAM) (cubic yards) (number, 10 var) -- Total number of cubic yards of materials used in the dam structure. Include portions of the powerhouse, locks, and spillways only if they are an integral part of the dam and are required for structural stability.

(42) NUMBER OF LOCKS (N_LOCKS) (number, 1) -- Number of existing navigation locks for the project. Typically for NRCS, this is 0.

(43) LENGTH OF LOCKS (L_LOCKS) (feet) (number, 4 var) -- Length of primary navigation lock to the nearest foot. Typically for NRCS, this field is blank.

(44) LOCK WIDTH (LOC_W) (feet) (number, 3 var) -- Width of the primary navigation lock to the nearest foot. Typically for NRCS, this field is blank.

The following eight fields (#45 - #52) comprise additional data fields that are only provided by participating Federal Agencies submitting data to the NID. Typically NRCS should enter data for only NRCS or other USDA Agencies involved with NRCS assisted dams. Use the following codes as applicable for each field:

USDA NRCS (Natural Resources Conservation Service)
USDA FS (Forest Service)
USDA RHS (Rural Housing Service)
USDA RUS (Rural Utilities Service)
USDA FSA (Farm Services Agency
USDA ARS (Agricultural Research Service)

(45) FEDERAL AGENCY INVOLVEMENT IN FUNDING (FED_FUND) (alphanumeric, 20 var) – Federal Agency involved in funding of the dam. Codes are concatenated if several agencies were involved. Typically for NRCS, this should be USDA NRCS if Field #53 = WS, PT, RC, FP.

(46) FEDERAL AGENCY INVOLVEMENT IN DESIGN (FED_DESIGN) (alphanumeric, 20 var) -- Federal Agency involved in the design of the dam. Codes are concatenated if several agencies were involved.

(47) FEDERAL AGENCY INVOLVEMENT IN CONSTRUCTION (FED_CONST) (alphanumeric, 20 var) -- Federal Agency involved in construction of the dam. Codes are concatenated if several agencies were involved.

(48) FEDERAL AGENCY INVOLVEMENT IN REGULATORY (FED_REG) (Alphanumeric, 20 var) -- Federal Agency involved in regulating the dam. Codes are concatenated if several agencies are involved. Typically for NRCS, this field should be blank.

(49) FEDERAL AGENCY INVOLVEMENT IN INSPECTION (alphanumeric, 20 var) (FED_INSP) -- Federal Agency involved in inspecting the dam. Codes are concatenated if several agencies are involved. Typically for NRCS, this field should be blank. USDA NRCS involvement means formal inspection by an NRCS engineer as defined in NRCS National Operation & Maintenance Manual (NO&MM).

(50) FEDERAL AGENCY INVOLVEMENT IN OPERATION (FED_OP) (alphanumeric, 20 var) -- Federal Agency involved in operating the dam. Codes are concatenated if several agencies were involved. Typically for NRCS, this field should be blank.

(51) FEDERAL AGENCY OWNER (FED_OWN) (alphanumeric, 20 var) -- Federal Agency which partly or wholly owns the dam. Codes are concatenated if several agencies were involved. Typically for NRCS, this field should be blank.

(52) FEDERAL AGENCY INVOLVEMENT - OTHER (FED_OTHER) (alphanumeric, 20 var) -- Federal Agency involved in other aspects of the dam. Codes are concatenated if several agencies were involved. Typically for NRCS, this field should be blank.

The following sixteen fields (#53 - #76) comprise additional data fields that should be provided for NRCS assisted dams.

(53) PROGRAM AUTHORIZATION (AUTH) (alphanumeric, var 2) -- Code for authorization.

CO for CO-01	GP for GPCP	OT for Other
WS for PL-566	RC for RC&D	PT for PILOT
FP for WF-03		

Dams authorized under WS, PT, RC, or FP are considered as “project” dams.

(54) WATERSHED NUMBER (WSHED_NO) (number, 4) -- Contains the 4-digit watershed number for PL-566 dams. Typically the range is 2001 to 2800 for dams included in watershed plans developed within the state or 2801 to 2999 for dams included in plans developed by an adjoining state.

(55) WATERSHED NAME (WSHED_NAME) (alphanumeric, var 40) -- Name of watershed project for PL-566 dams.

(56) PLANNED SERVICE LIFE (SERV_LIFE) (alphanumeric, 3 var) – Number of years used to amortize the benefits of a project dam and/or determine the volume of sediment storage provided in the sediment pool.

(57) O&M INSPECTION RESPONSIBILITY (O&M_INSP_RES) (alphanumeric, 5 var) – Code to indicate the party assigned operation and maintenance inspection responsibility by an O&M Agreement or supplemental legal document for a project dam. Leave blank for non-project dams.

OWNER for owner in Field #13	NRCS for NRCS
JOINT for OWNER & NRCS	OTHER for other party
NONE for no existing or non-enforceable O&M Agreement	

(58) O&M INSPECTION CURRENT (O&M_IN_CURR) (alphanumeric, 1) – Code to indicate if an O&M Inspection and written report were completed on a project dam during the current or past calendar year by the responsible party in Field #57. Leave blank for non-project dams.

Y for Yes N for No

(59) O&M COMPLETED (O&M_COMP) (alphanumeric, 1) – Code to indicate if O&M needs reported in prior O&M Inspection Report(s) for project dams have been completed. Leave blank for non-project dams.

Y for Yes N for No

(60) POPULATION AT RISK (POP_RISK) (number, 5 var) -- All those persons that would be exposed to flood waters if they took no action to evacuate. It should be the maximum combination of people reasonably expected in the dam breach inundation zone simultaneously at any time of the day or night, including permanent residents, seasonal transients (campers, recreationists, etc), and daily transients (workers, students, shoppers, commuters, etc). Accuracy of the data should be qualified by Field #61.

(61) POPULATION AT RISK ACCURACY (POP_ACC) (alphanumeric, 1) -- Code indicating if the Population at Risk number in Field #60 is based on a visual estimate or breach inundation map analysis.

E for Estimated visually
A for Analyzed with breach inundation map

(62) HAZARD CLASSIFICATION AS DESIGNED OR MODIFIED (DSGN_HAZ) (alphanumeric, 1) -- Code to indicate the potential hazard to the downstream area at the time the dam was built or modified. Use L for NRCS Class a, S for NRCS Class b, and H for NRCS Class c. If an existing dam was modified to reflect a change in classification, enter the most recent classification for which the dam was designed and modified. Leave blank for unknown.

L for low S for significant H for high

(63) HAZARD POTENTIAL CLASSIFICATION YEAR (HAZ_CLASS_YEAR) (number, 4) -- Year of most recent verification of Hazard Potential Classification in Field #32 by qualified NRCS personnel. Use four digits for year (Example 2010).

(64) EAP YEAR (EAP_YEAR) (number 4) – Year of most recent review and verification of existing or implementation of new Emergency Action Plan in Field #33. Use four digits for the year (Example: 2010).

(65) SEDIMENT STORAGE (SED_STOR) (acre-feet) (number, 10 var) – The planned sediment storage capacity of the reservoir as designed.

(66) FLOOD STORAGE (FLD_STOR) (acre-feet) (number, 10 var) -- The flood storage capacity of the reservoir. Typically, this is the capacity of the reservoir between the elevation of the permanent pool and the crest of the auxiliary (emergency) spillway.

(67) SURCHARGE STORAGE (SUR_STOR) (acre-feet) (number, 10 var) -- The surcharge capacity of the reservoir. Typically, this is the capacity of the reservoir between the elevations of the auxiliary (emergency) spillway crest and the top of dam.

(68) OTHER STORAGE (OTH_STOR) (acre-feet) (number, 10 var) -- The other beneficial capacity of the reservoir.

(69) PRINCIPAL SPILLWAY TYPE (PS_TYPE) (alphanumeric, 2) -- Code identifying the type of principal spillway as follows:

CP for Concrete Pipe CM for Corrugated Metal

PL for Plastic	WS for Welded Steel
CB for Concrete Box	OT for Other
OC for Open Pipe	NO for None

(70) PRIMARY AUXILIARY SPILLWAY TYPE (AS1_TYPE) (alphanumeric, 2) -- Code identifying the spillway type of the first auxiliary (emergency) spillway.

VE for Vegetated	RK for Rock	ST for Structural
EA for Earth	OT for Other	NO for None
HR for Hard Rock	SR for Soft Rock	

(71) SECONDARY AUXILIARY SPILLWAY TYPE (AS2_TYPE) (alphanumeric, 2) -- Code identifying the spillway type of the second auxiliary (emergency) spillway. Use the codes under Field #70 above.

(72) TERTIARY AUXILIARY SPILLWAY TYPE (AS3_TYPE) (alphanumeric, 2) -- Code identifying the spillway type of the third auxiliary (emergency) spillway. Use the codes under Field #70 above.

(73) CONDUIT HEIGHT (COND_HT) (feet) (number, 4 var) -- Height for rectangular or diameter for round conduit for the largest conduit through the dam, to nearest tenth of a foot.

(74) CONDUIT WIDTH (COND_W) (feet) (number, 4 var) -- Width (size) of the largest conduit through the dam to the nearest tenth of a foot. Leave blank if conduit is round.

(75) NUMBER OF CONDUITS (NO_COND) (number, 2 var) -- Number of conduits through dam.

(76) COOL WATER RELEASE (COOL_WATER) (alphanumeric, 1) -- Code indicating if a cold water release exists.

Y for Yes	N for No

Table 1. COUNTY CODES FOR MINNESOTA BY NRCS ADMINISTRATIVE AREAS
January 2011

Area 1	Area 2	Area 3	Area 4	Area 5	Area 6	Area 7
Beltrami 007	Becker 005	Aitkin 001	Anoka 003	Big Stone 011	Blue Earth 013	Dodge 039
Clearwater 029	Cass 021	Carlton 017	Benton 009	Chippewa 023	Brown 015	Fillmore 045
Hubbard 057	Clay 027	Chisago 025	Carver 019	Cottonwood 033	Faribault 043	Freeborn 047
Kittson 069	Crow Wing 035	Cook 031	Dakota 037	Jackson 063	Kandiyohi 067	Goodhue 049
Lake of the Woods 077	Douglas 041	Isanti 059	Hennepin 053	Lac Qui Parle 073	LeSueur 079	Houston 055
Mahnomen 087	Grant 051	Itasca 061	Ramsey 123	Lincoln 081	McLeod 085	Mower 099
Marshall 089	Morrison 097	Kanabec 065	Scott 139	Lyon 083	Martin 091	Olmsted 109
Norman 107	Otter Tail 111	Koochiching 071	Sherburne 141	Murray 101	Meeker 093	Rice 131
Pennington 113	Pope 121	Lake 075	Stearns 145	Nobles 105	Nicollet 103	Steele 147
Polk 119	Stevens 149	Mille Lacs 095	Washington 163	Pipestone 117	Renville 129	Wabasha 157
Red Lake 125	Todd 153	Pine 115	Wright 171	Redwood 127	Sibley 143	Winona 169
Roseau 135	Traverse 155	St. Louis 137		Rock 133	Waseca 161	
	Wadena 159			Swift 151	Watonwan 165	
	Wilkin 167			Yellow Medicine 173		

MN DAM INVENTORY REPORT

Date	
Name of person completing report	
(1) Dam name	
(2) Other dam names	
(3) Former dam names	
(4) Federal Agency ID (NRCS-MN)	
(5) National ID (NID)	
(6) Longitude: deg: min: sec:	degrees + minutes/60 + seconds/3600 =
(7) Latitude: deg: min: sec:	degrees + minutes/60 + seconds/3600 =
(8) Location	section: township: range:
(9) County Name	
(10) River or Stream	
(11) Nearest City or Town	
(12) Distance to nearest city/town	
(13) Owner Name	
(14) Owner Type (F,P,U,S,L)	
(15) Dam designer	
(16) Non Federal Dam on Federal Property?	Y N
(17) Dam Type	
(18) Core	
(19) Foundation	
(20) Purposes	
(21) Year Completed	
(22) Year Modified	
(23) Dam Length, feet	
(24) Dam Height, feet	
(25) Structural Height, feet	
(26) Hydraulic Height, feet	
(27) Maximum Discharge, cfs	
(28) Maximum Storage, acre-feet	
(29) Normal Storage, acre-feet	
(30) Surface area, acres	
(31) Drainage area, square miles	
(32) Downstream hazard potential	
(33) Emergency Action Plan?	Y N
(34) Last Inspection Date (mmddyyyy)	
(35) Inspection frequency	
(36) State regulated dam?	Y N
(37) State Regulatory Agency	MN DNR
(38) Spillway Type (C, U or N)	
(39) Spillway Width, feet	

(40) Outlet Gates (x = none)	
(41) Volume of dam, cubic yards	
(42) Number of locks	0
(43) Length of locks, feet	
(44) Width of locks, feet	
Federal agency involvement in:	
(45) funding?	
(46) designing?	
(47) construction?	
(48) regulating dam?	
(49) inspection?	
(50) operation of dam?	
(51) ownership?	
(52) other?	
(53) Program authorization (i.e. CO, WS, RC)	
(54) Watershed number	
(55) Watershed name	
(56) Planned service life, years	
(57) O&M Inspection responsibility?	
(58) O&M Inspection current?	Y N
(59) O&M Completed?	Y N
(60) Population at risk	
(61) Population at risk accuracy?	E A
(62) Hazard Classification (L, S, H)	
(63) Year hazard class assigned	
(64) Year Emergency Action Plan	
(65) Sediment storage, acre-feet	
(66) Flood storage, acre-feet	
(67) Surcharge storage, acre-feet	
(68) Other storage, acre-feet	
(69) Principal spillway type	
(70) Primary Aux. Spwy. Type	
(71) Secondary Aux. Spwy. type	
(72) Tertiary Aux. Spwy. Type	
(73) Conduit height, feet	
(74) Conduit width, feet	
(75) Number of conduits	
(76) Cool water release?	Y N

MN520.41 MN-ENG-027
USDA-NRCS 3/01

DOCUMENTATION FOR HAZARD CLASSIFICATION

STRUCTURE NAME _____

OWNER(S) OR SPONSOR(‘S) NAME_____
_____
_____
_____

STRUCTURE LOCATION

STATE_____ COUNTY_____
SECTION NO._____ T._____ R. _____
LATITUDE_____LONGITUDE _____

DAM IN SERIES _____Yes _____No
If yes, explain:_____
_____
_____
_____

DAM AND RESERVOIR DATA

WATERSHED AREA _____sq. mi., or _____ acres
ELEVATIONS
Channel Bottom at centerline _____Channel Bottom downstream _____
Floodplain downstream _____Top of Dam _____
Emergency Spillway Crest _____Permanent Reservoir _____
STORAGE (Acre-feet)
Top of Dam _____Emergency Spillway_____
Permanent Reservoir
Including sediment _____Sediment Storage Only _____
HEIGHT-STORAGE PRODUCT _____

DOWNSTREAM CONDITIONS

STREAM NAME (IF ONE EXISTS)_____
Tributary to: _____

VALLEY CONDITIONS
Convergent _____
Divergent _____
Parallel _____
Slope_____

STREAM CHANNEL SIZE _____

ROUGHNESS OR RETARDANCE ESTIMATE “N” _____

BUILDING AND UTILITIES. Describe kind, distance downstream from dam, distance from stream channel and height above stream channel.

_____
_____
_____

ROADS AND RAILROADS. Describe kind and class of road or railroad, distance downstream of dam, height of road bed above stream bed, and type and size of bridge culvert.

_____
_____
_____

BRIDGES AND CULVERTS. Describe kind, area of opening(s), height from stream channel to bridge deck, culvert type and size, bridge opening, etc.

_____
_____
_____

DESCRIBE POTENTIAL DEVELOPMENT.

_____
_____
_____

ACTUAL HAZARD CLASS. _____
Rationale for determining Hazard Class. _____
_____
_____

INVENTORY SIZE DAM _____ YES _____NO

FINAL JOB CLASS _____

Hazard Analysis By:_____date _____
(signature)

Approved By:_____date _____
Classes I to VI (signature)

Approved By: _____date _____
Class VII (signature)

ATTACH:
Breach Routings
Map(s)

MN520.42 Guidelines for Evaluating Potential Hazards for Dam Classification

DAMAGE TO:	Low	Significant	High
LOCATION			
Area in which the dam will be installed	Rural or Agricultural—Areas of mostly farming or ranching. Urban housing developments do not exist and none expected during structure design life. Agricultural land used for agricultural production	Predominantly rural or agricultural	Developing or urban
ROADS			
Township and county—All rural area rounds without concrete or bituminous surfacing	May Damage— Damage may occur when road surface acts as weir and d>2 ft.		
Main Highways— U.S., interstate, turnpike highways and any concrete or bituminous surfaced township, county or state road that serves as the only access to a community	No significant damage. No overflow of the road or overflow at d<1 ft. for only a short time (less than 1 hour)	May Damage— Damage may occur when road surface acts as weir and d>2 ft.	Serious Damage— Interruption of service for more than 1 day.
RAILROADS			
Minor— Interstate railroads used as frequently as one time per day. Materials carried are relatively nonperishable, agricultural products, or products if disrupted would not adversely affect local economy, safety, or general well-being of the area.	No significant damage. Overflow of the bed for short periods at depths of less than 1 ft.	May Damage— Damage may occur when road surface acts as weir and d>2 ft.	
Main— Intrastate or interstate railroads used more frequently than one time per day. Disruption would adversely affect economy, safety, and general well-being of the area.	No overflow of bed and no significant damage to embankment or culvert system.	May damage— No interruption of services. Minor damages may occur (overflow of less than 1 ft. for very short periods)	Serious Damage— Interruption of service for more than 1 day.
BUILDINGS			
Farm— On farm buildings no occupied by people or having potential for occupancy.	May Damage— Damage may occur when D>3 ft. and depth x velocity is > 15.		
Homes— Single family residence, apartments, nursing homes, motels, hotels, and hospitals.	May Damage— Damages limited to flooding basements used primarily for storage and heating units.	May Damage— Any flooding above ground floor level.	Serious Damage— Damage may occur when D > 3 ft. and depth x velocity is > 15.

Buildings (cont)

Isolated— Single family dwellings on farms and ranches. Does not include homes in developing areas.	Same as above	Same as above	Same as above
Industrial/Commercial	No Damages— Generally no significant loss of property or structural	May Damage— Kind, construction and contents of building must be evaluated.	Serious Damage— Kind, construction and contents of building must be evaluated. General serious damage can occur at a depth of 3 ft. or more and at a velocity of 5 ft/sec or more.
Public— Schools, churches, libraries, etc.	No Damages— Generally no significant loss of property or structural damage and velocity 3 fps). Escape routes are out of direct flow and easily negotiated	May Damage— Kind, construction and contents of building must be evaluated. Evaluate escape routes for handicap and children	Serious Damage— Kind, construction, and contents of building must be evaluated. General serious damage can occur at a depth of 3 ft. or more and at a velocity of 5 ft/sec or more.

UTILITIES

Relatively important	No Damage— To public utilities expected	May Damage— Damage may occur when buried lines can be exposed by erosion and when towers, poles, and above ground lines can be damaged by undermining or be debris produced from the floodplain.	Serious Damage— Damage can be expected and interruption of services for 3 to 4 days.
Important— Interstate and intrastate power and communication lines serving towns, communities, and significant military and commercial facilities in which disruption of power and communication would adversely affect the economy, safety and general well-being of the area.	No damages	No interruption of services and no damages would threaten interruption of services	

POTENTIAL FOR LOSS OF LIFE

Flood depths greater than 1 ft in living quarters; such as residences, apartments, nursing homes, motels, hotels, and hospitals and on escape routes from such living quarters. Potential of loss of life should be considered for schools and recreational areas where adequate warning systems are not available.	No	No	Yes

MN520.43 Example of written narrative describing impact area

United States Department of Agriculture

NRCS
Natural Resources Conservation Service
600 First St, NE
Central, MN 55540 Phone: 651-202-7900 Fax: 651-202-7914

Date

Mr. O. J. Olson
Rural Route 1
Lake Wobegon, Minnesota

Dear Mr. Olson:

The USDA-Natural Resources Conservation Service (NRCS) is designing a livestock dam for you in the SE ¼ sec. 37, T115N, R39W on Lonely Creek, a tributary of the Minnesota River. Due to the dam's height (28 ft.) and storage capacity (51 ac/ft) it falls within the size category in which potential downstream damage should be considered in the event the dam should fail.

An evaluation was made of the area below your dam that could be flooded if a sudden failure should occur. The estimated flooded or impact area is 250 ft wide and 1 mile long. The evaluation indicated that the flooded area would affect only fences, trails, a county road and the valley crops. For this reason, the dam has been assigned a class (a) or low hazard rating. The design of the dam and emergency spillway will be based on this classification. If future development should occur downstream of the dam or should another dam be built upstream, hazard classification could change abruptly. You need to be aware of this so that you might alert future developers to the hazards that could occur. This is your responsibility.

This information is being provided to you so that you are aware of your responsibilities in connection with the proposed dam. You will need to provide this information to the Minnesota Department of Natural Resources and the county zoning officer when you apply for a permit for the dam.

Please let me know as soon as possible if you want NRCS to complete the final design of your dam. We will wait for your reply before we proceed. If you have any questions please do not hesitate to contact me.

Sincerely,

John J. Johnson
District Conservationist

cc:
Central County Soil and Water Conservation District, Central, MN