DAM SAFETY PROGRAM

DEPARTMENT OF CONSERVATION & HISTORIC RESOURCES
Division of Soil & Water Conservation
203 Governor Street, Suite 206
Richmond, Virginia 23219-2094

# DESIGN REPORT FOR THE CONSTRUCTION/ALTERATION OF IMPOUNDING STRUCTURES

Reference: Impounding Structure Regulations, Chapters 2 and 5, Virginia Soil & Water Conservation Board

1. Project Information:

   a. Proposed Construction New Construction Alteration _____

   b. Name of Impounding Structure Wood's End

   c. Inventory Number _____ (Leave blank if new Construction)

   d. Name of Reservoir N/A - Dry Facility

   e. Purpose of Reservoir Stormwater Quality & Quantity Management

2. Impounding Structure Classification:

   a. Size Classification From Table I Impounding Structure Regulations

      Large Medium (Small) (Circle One)

   b. Hazard Potential Classification From Table I Impounding Structure Regulations

      (Class I) Class II Class III (Circle One)

3. Location of Impounding Structure:

   a. (City/County) Roanoke Magisterial District Windsor Hills

   b. Located 1100 (feet/miles) upstream/downstream of Highway Number Rt. 1652

   c. Name of River or Stream Mud Lick Creek

   d. Latitude N 37°13'24" Longitude W 80°01'14"

4. Ownership:

   a. Owner's Name Roanoke County (Attn: George Simpson)

   b. Mailing Address 5204 Brambleton Avenue, P.O. Box 29800
      Roanoke, Virginia 24018-0798

   c. Telephone ( 540 ) 772-2080

5. Owner's Engineer:

a. Design Firm/Design Engineer Engineering Concepts / Robert H. Wampler Jr.

b. Virginia Number 0405000744 / 0402034713

c. Mailing Address 20 South Roanoke Street, P.O. Box 619

Fincastle, Virginia 24090

d. Telephone (540 ) 473-1253

6. Impounding Structure Data

a. Type of material X earth ___ concrete ___ masonry ___ other _____

Note: All elevations NGVD unless noted
For new construction complete only the design configuration column
For alteration complete both the existing and design configuration column

| | | Existing Configuration | Design Configuration | |
|---|---|---|---|---|
| b. | Top of Dam | | 1124.6 | Elev. |
| c. | Downstream Toe (Lowest) | | 1091.6 | Elev. |
| d. | Height of Dam | | 33.0 | Feet |
| e. | Crest Length (Exclusive of Spillway) | | 325 | Feet |
| f. | Crest Width | | 60 | Feet |
| g. | Upstream Slope | ___ H: ___ V | 2 H: 1 V | |
| h. | Downstream Slope | ___ H: ___ V | 3 H: 1 V | |

7. Reservoir Data:

| | | Existing Configuration | Design Configuration | |
|---|---|---|---|---|
| a. | Maximum Capacity | | 112.9 | Acre-Feet |
| b. | Maximum Pool | | 1125.7 | Elev. |
| c. | Maximum Pool Surface Area | | 12.9 | Acres |
| d. | Normal Capacity | | 0 | Acre-Feet |
| e. | Normal Pool | | 0 | Elev. |
| f. | Normal Pool Surface Area | | 0 | Acres |
| g. | Freeboard (Normal Pool to Top) | | N/A | Feet |

8. Spillway Data:

| | | Type | Construction Material | Design Configuration |
|---|---|---|---|---|
| a. | Low Level Drain | Orifice | Ductile Iron | 24" Base Flow Pipe |
| b. | Principal Spillway | Culvert | Structural Steel Plate | (3) - 12-1/2' Circular Pipe |
| c. | Emergency Spillway | Culvert | Structural Steel Plate | (3) - 12-1/2' Circular Pipe |

| | | Existing Configuration | Design Configuration | |
|---|---|---|---|---|
| d. | Low Level Drain (low inlet) | | 1095.5 | Elev. |
| e. | Principal Spillway (high inlet) | | 1110.5 | Elev. |
| f. | Emergency Spillway (crest) | | 1124.6 (Crest) | Elev. |

9. Watershed Data:

a. Drainage area 1218.8 (acres)/Sq. Miles.

b. Type and extent of Watershed Development Agricultural & Residentaial Mixed.
Design based on future build-out of the watersheed (year 2020).

c. Time of Concentration 1.26 Hours Method Overland, Shallow Concentrated, Channel Flow

d. Spillway Design Flood used (check and state source)
___ PMF, source
X 1/2 PMF, source Hydrometeorological Report No. 51 (USDC, NOAA, USDACOE)
___ 100 Year, source
___ 50 Year, source
___ Other, source

e. Design inflow hydrograph: Volume 2504.5 acre-feet; Peak inflow 5013 C.F.S.;
Rainfall duration of design inflow hydrograph 6 hours

f. Freeboard during passage of spillway design flood 0 feet.

10. Additional Information:

Provide as attachments to the Design Report the following information. Note for alteration permits the detail of this information is to be in accordance with the scope of the proposed alteration:

a. A description of properties located in the inundation zone downstream from the site of the impounding structure, including the location and number of residential structures, buildings, roads, utilities and other property that would be endangered should the impounding structure fail.

b. A statement from the governing body of the local political subdivision or other evidence confirming that body is aware of the proposal to build or alter an impounding structure and of the land use classifications applicable to the inundation zone.

c. Maps showing the location of the impounding structure that include: the county or city in which the impounding structure is located, the location of roads, access to the site and the outline of the impoundment.

d. A report of the geotechnical investigations of the foundation soils or bedrock and of the materials to be used to construct the impounding structure.

e. Design assumptions and analyses sufficient to indicate that the impounding structure will be stable during its construction and during the life of the impounding structure under all conditions of reservoir operations, including rapid filling and rapid drawdown o the impoundment.

f. Confirmation of the stability of the reservoir rim area in order to safeguard against reservoir rim slides of such magnitude as to create waves capable of overtopping the impounding structure and confirmation of rim stability during seismic activity.

g. Design assumptions and analyses sufficient to indicate that seepage in, around, through, or under the impounding structure, foundation, and abutments will be reasonably and practically controlled so that internal or external forces or results thereof will not endanger the stability of the impounding structure.

h. Calculations and assumptions relative to design of the spillway(s).

i. A description of provisions to ensure that the impounding structure and appurtenances will be protected against deterioration or erosion due to freezing and thawing, wind and rain, or any combination thereof.

j. List and provide any other pertinent design data, assumptions, and analyses commensurate with the nature of the impounding structure and specific site conditions:
Design Report Attached

k. A proposed schedule indicating construction sequence and time to completion.

l. A proposed impoundment and impounding structure operating schedule.

m. A proposed impoundment and impounding structure maintenance schedule.

n. A proposed inspection schedule to be utilized in making periodic safety inspections during the life of the project.

## CERTIFICATION BY OWNER'S ENGINEER

I hereby certify that the information provided in this form and the attachments to this form have been examined by me and found to be true and correct in my professional judgment.

Signed Robert N. Wampler P. Virginia Number 034713 this 31 day of August, 2000
Professional Engineer

DCHR/DSWC; DS-IDR
199-072; (2/1/89)