

APPENDIX II

Photographs

PHOTOGRAPH 1

VIEW SHOWING UPSTREAM FACE OF DAM.
NOTE THE VARYING CREST ELEVATIONS OF
CONCRETE ARCHES AND PENSTOCK INTAKE
STRUCTURE.

PHOTOGRAPH 2

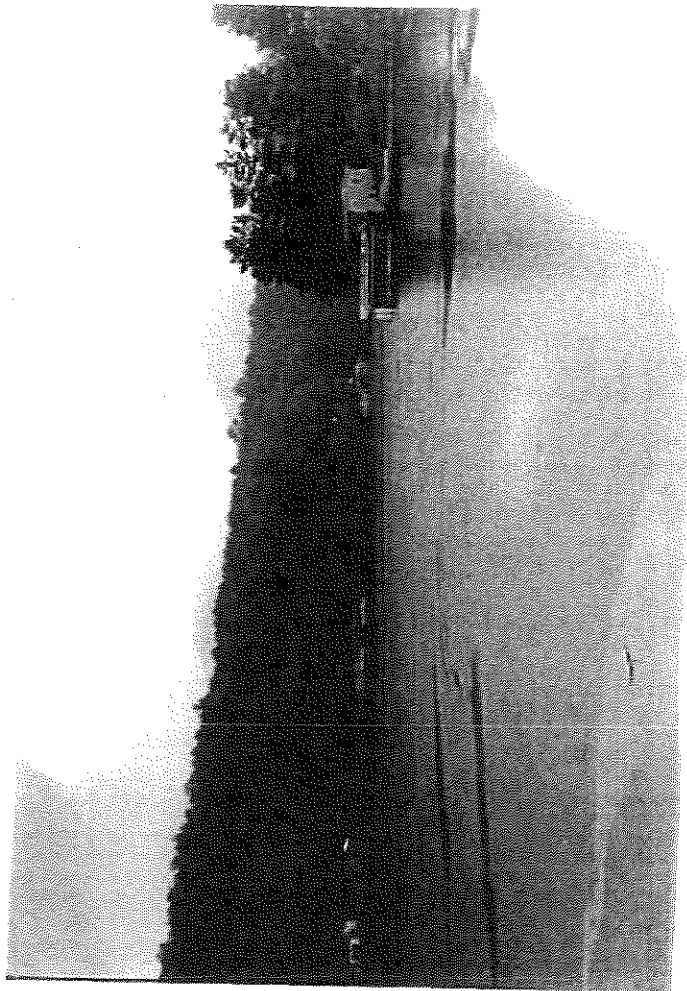
VIEW SHOWING DOWNSTREAM FACE OF DAM AS SEEN
FROM RIGHT ABUTMENT. THE BRICK BUILDING LOCATED
BETWEEN TWO BUTRESS WALLS IS THE POWERHOUSE.

PHOTOGRAPH 3

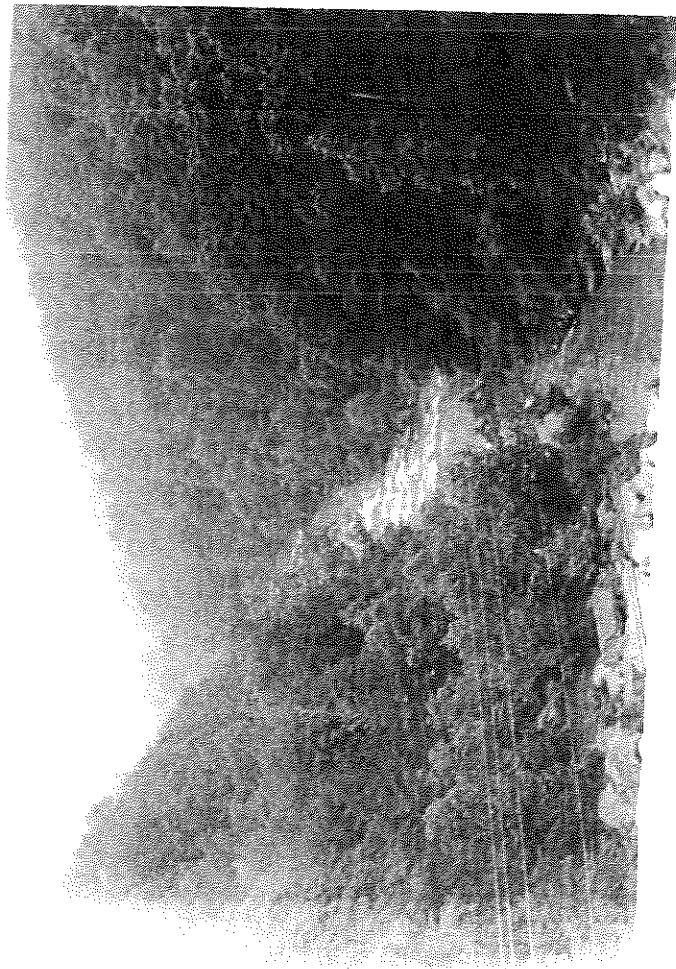
VIEW DOWNSTREAM OF DAM AS SEEN FROM
POWERHOUSE.

PHOTOGRAPH 4

VIEW UPSTREAM FROM DAM AS SEEN FROM RIGHT ABUT-
MENT. NOTE HEAVILY WOODED SLOPES.

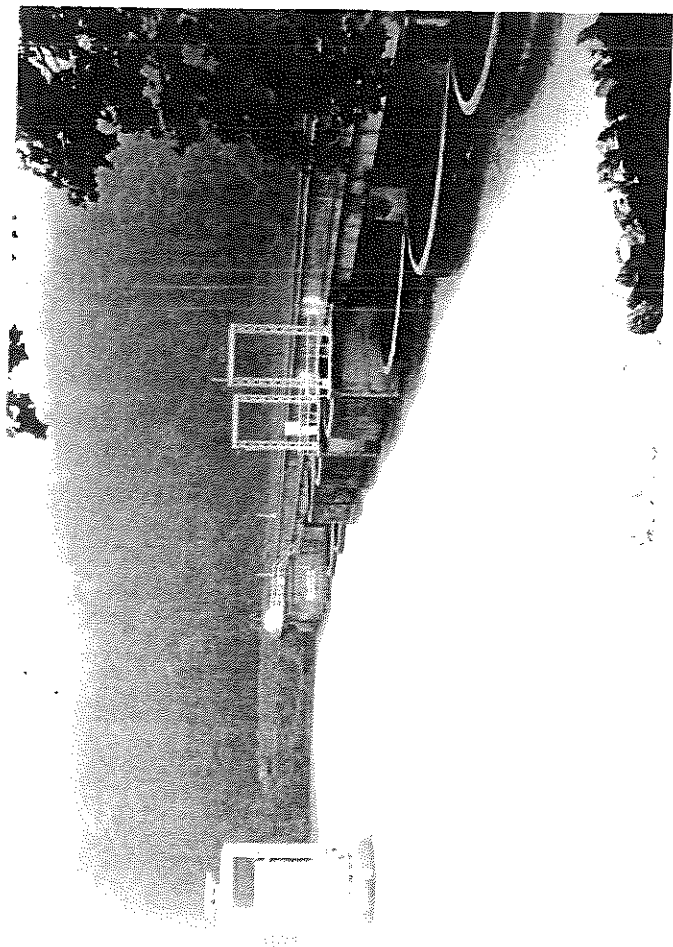
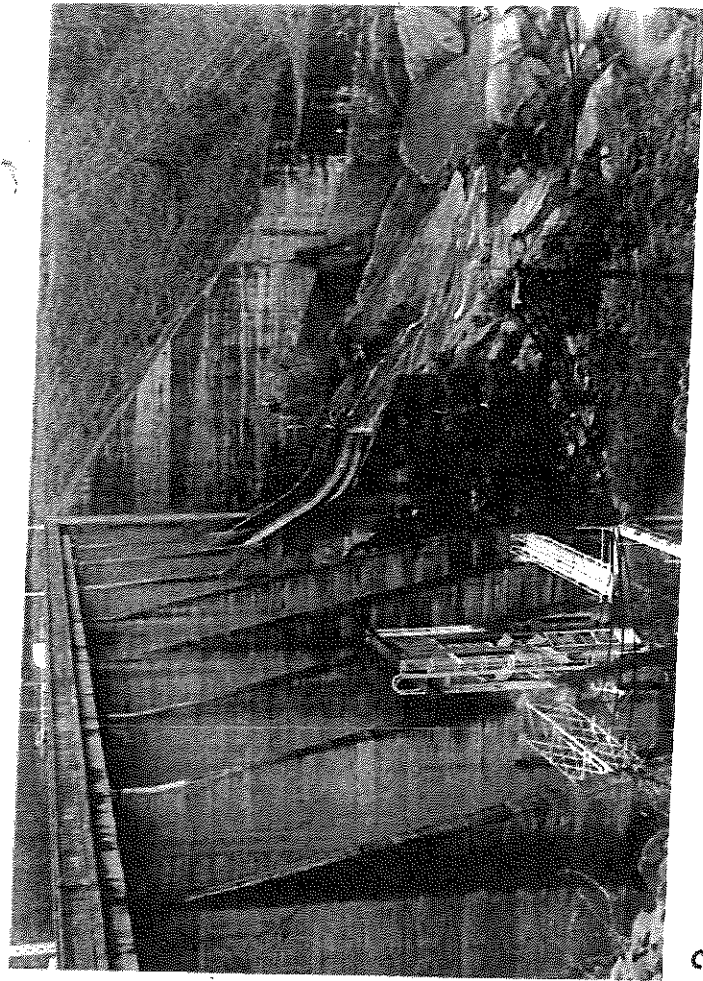


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1 2

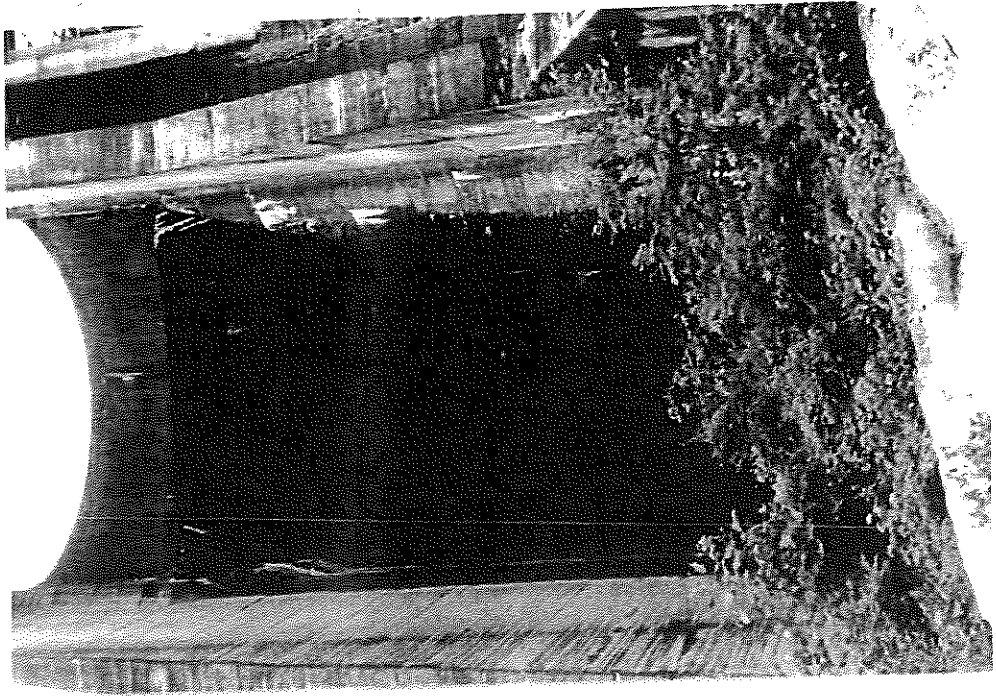


PHOTOGRAPH 5

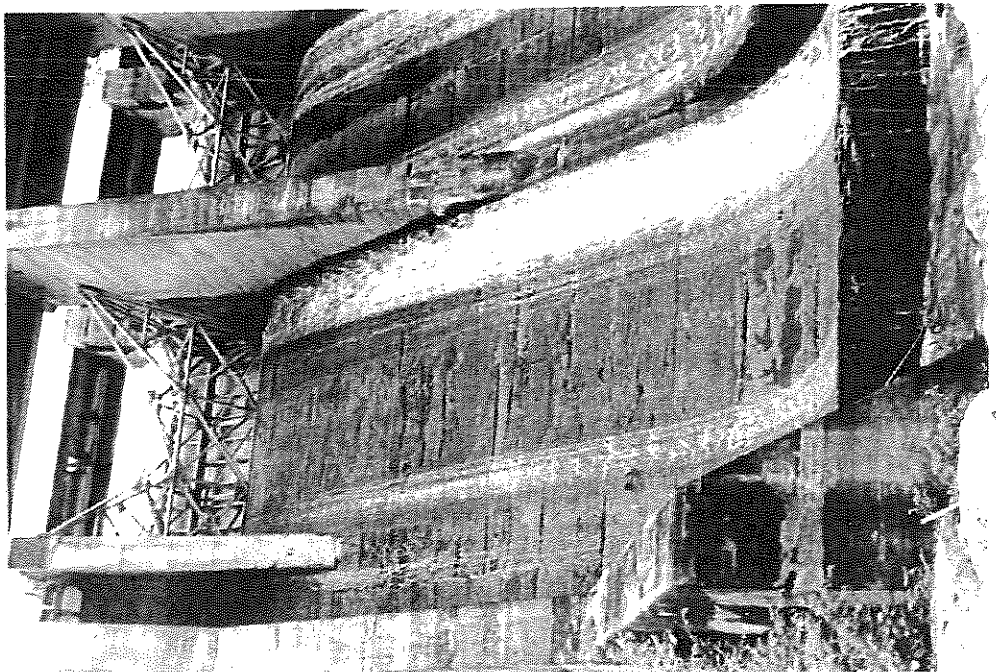
VIEW SHOWING EMERGENCY OGEE SPILLWAYS AND SMALL TRASH GATE. NOTE MINOR EROSION OF CONCRETE AND WATER LEAKAGE FROM GATE SEALS.

PHOTOGRAPH 6

VIEW OF DOWNSTREAM PORTION OF A TYPICAL CONCRETE ARCH. NOTE CALSINATION OF CONCRETE AROUND CONSTRUCTION JOINTS. THIS ARCH IS ADJACENT TO THE TRASH GATE.



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APPENDIX III

Hydrologic and Hydraulic

HYDROLOGIC AND HYDRAULIC

Inflow estimates for the reservoir were derived synthetically using a rainfall-runoff model developed using the Corps of Engineers Hydrologic Engineering Center HEC-1 Hydrograph Package Computer Program. The model routes runoff, which was determined from rainfall data and a routine that uses U.S. Soil Conservation Service (SCS) curve numbers, through the watershed. Physical characteristics of the watershed and routing criteria were also input to the model.

Rainfall-duration data used in the model were obtained from Hydrometeorological Report (HMR) No. 33, prepared by the U.S. Weather Bureau, dated April 1956. The probable maximum precipitation (PMP) for the region in which this dam is located is 26.5 inches over a 24-hour period for a 200 square mile basin. Percentages applied to this drainage basin for 6, 12, and 24-hour rainfall durations were determined from HMR No. 33 and input to the computer program. Rainfall was critically arrayed by the program.

The physical characteristics of the basin were determined from field inspection, soil survey bulletins, and USGS topographic maps. The modified-Puls or storage routing method was used as the reservoir routing procedure. Storage-discharge data were also computed for the dam and reservoir and input to the computer model for routing.

Calculations for input data for the model and printouts of the hydrology and reservoir routing results are presented in the following pages. HEC-1 procedures, presently outlined, relate to the spillway capacity evaluation according to State criteria (using ratios of the PMP).

In addition, for this report, the hydrologic analysis was evaluated in light of the Corps of Engineers Recommended Guidelines Phase I screening criteria, in which the present spillway capacity is compared with the spillway design flood peak inflow. The SDF was computed using a regionalized equation furnished by the Wilmington District Corps of Engineers for use in Phase I reports.

(MAIN)

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Subject Lake Lure Dam By JPB Date 6/19/81
H & H Ckd. DHS Rev. _____

HYDROLOGIC DATA SUMMARY

The following calculations are used to derive rating curves for existing outlet works, hydrographs, and routine of floods.

Drainage area= 95 sm
Lake area= 746 ac

ELEVATION/AREA DATA

Elevation -----	Area(ac) -----
4	57
100	746
150	1280

SOILS DATA

The basin soils are the Pacolet-Madison-Medowee and Hayesville-Saluda-Ashe Associations.

Composite CN= 60

TIME OF CONCENTRATION

$$T_c = \left[\frac{11.9L^3}{H} \right]^{0.385}$$

Where: L=basin hydraulic length(mi)= 20.9
H =max el.-min.el= 2249 ft

Tc=time of concn.= 3.86 hrs

The method used for determining the time of concentration is the California Highway Equation method. This method was selected because of the large basin size. This equation yields conservative results in determining peak inflow rates.

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Rating of Outlet Works

A. Physical Data:

Discharge at Lake Lure Dam is controlled by three tainter gates (all three must be individually operated by one mobile motor). An additional 9.5 feet wide trash gate is located to the right of the tainter gates. For this report, it is assumed that only one gate would be fully opened during a major storm (gate on far left).

The dam consists of 10 arches:

- a) top elevation of arches 1 through 5 = 107.4
- b) top elevation of arches 6, 7, & 8 = 113.4
- c) top elevation of arches 9 & 10 = 105.4
- d) top of gates = elevation 105.7
- e) invert of gates = elevation 89.4

The three tainter gates are 28.5 feet, 29 feet, and 28.5 feet wide, respectively, and all three are 16.3 feet high. The trash gate is 4.5 feet high, overtopping elevation is 105.8, base elevation is 101.3. The base of the concrete girder (for highway across crest of dam) is at elevation 111.5. Assume that during a major storm the turbines would be shut down due to a high tailwater; therefore, no flow through the penstock was considered.

B. Rating:

Assume normal pool is at elevation 100.0 feet, and the tainter gate will be incrementally opened to elevation 105.7 feet. Full discharge will occur at 105.7 feet. Orifice flow occurs above elevation 105.7 feet.

$$Q = CA\sqrt{2gh}$$

$$A = 464.5 \text{ ft}^2$$

where:

C = 0.61
A = area of opening
h = head above
center of orifice
g = 32.2 fps²

The head datum (centerline) elevation for the gate is 97.5 feet. Free-fall orifice computations were made for

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all elevations (assume no submerged orifice conditions).

	<u>Elevation</u>	<u>H</u>	<u>Q (cfs)</u>
*	105.7	8.2	0
	106	8.5	6629
	107.4	9.9	7154
	108	10.5	7368
	109	11.5	7711
	111	13.5	8355
	113.4	15.9	9067
	115	17.5	9512
	117	19.5	10,041
	120	22.5	10,786
	125	27.5	11,924
	130	32.5	12,963
	135	37.5	13,924

* Gate closed, no flow.

At elevation 105.4 feet, arches 9 and 10 overtop.
Assume all arches have 45 feet of available weir length.
Assume sharp-crested weir flow for all arches:

$$Q = CLH^{3/2}$$

where:

L = 45 feet/arch

H = head
L = length
C = 3.3

<u>Elevation</u>	<u>H</u>	<u>Q (cfs)</u>	<u>2 x Q (cfs)</u>
105.4	0	0	0
105.7	0.3	24	48
106	0.6	69	138
107.4	2.0	420	840
108	2.6	622	1245
109	3.6	1014	2028
111	5.6	1968	3936
113.4	8.0	3360	6720
115	9.6	4417	8834
117	11.6	5867	11,734
120	14.6	8284	15,568
125	19.6	12,886	25,772
130	24.6	18,119	36,238
135	29.6	23,915	47,830

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At elevation 107.4, arches 1 through 5 overtop.

<u>Elevation</u>	<u>H</u>	<u>Q (cfs)</u>	<u>5 x Q (cfs)</u>
107.4	0	0	0
108	0.6	69	345
109	1.6	300	1500
111	3.6	1014	5070
113.4	6.0	2182	10,910
115	7.6	3111	15,555
117	9.6	4417	22,085
120	12.6	6642	33,210
125	17.6	10,965	54,825
130	22.6	15,955	79,775
135	27.6	21,532	107,660

At elevation 113.4, arches 6, 7, and 8 overtop:

<u>Elevation</u>	<u>H</u>	<u>Q (cfs)</u>	<u>3 x Q (cfs)</u>
113.4	0	0	0
115	1.6	300	900
117	3.6	1014	3042
120	6.6	2519	7554
125	11.6	5867	17,601
130	16.6	10,044	30,132
135	21.6	14,908	44,724

At elevation 105.7, the two remaining tainter gates overtop.
At elevation 105.8, the trash gate overtops.

Assume sharp-crested weir flow:

$$Q = CLH^{3/2}$$

where:

$$C = 3.3$$

$$L = 28.5, 29.0, 9.5$$

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<u>Elevation</u>	<u>H</u>	<u>Q (Gate 2)</u>	<u>Q (Gate 3)</u>	<u>Q (Trash Gate)</u>
105.7	0	0	0	0
106	0.3	15	16	30
107.4	1.7	208	212	63
108	2.3	328	334	102
109	3.3	564	574	179
111	5.3	1148	1168	372
113.4	7.7	2010	2045	657
115	9.3	2667	2714	875
117	11.3	3572	3635	1175
120	14.3	5086	5175	1677
125	19.3	7974	8114	2637
130	24.3	11,266	11,464	3526
135	29.3	14,916	15,178	4947

Outflow Summary For Dam
(doesn't include overtopping)

<u>Elevation</u>	<u>Q (cfs)</u>
105.4	0
105.7	48
106	6801
107.4	8477
108	9722
109	12,556
111	20,049
113.4	31,409
115	41,057
117	55,284
120	79,056
125	128,847
130	185,364
135	249,179

Minimum dam overtopping at abutments is 115.4 feet. Minimum top of handrail is elevation 119.2 feet.

A second analysis was also performed which included rating the outlet works with all 3 tainter gates open. The following outflow summary was calculated (Assume gates cannot overtop in fully opened position):

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<u>Elevation</u>	<u>Q (cfs)</u>
105.4	0
105.7	48
106	20,028
107.4	22,365
108	23,796
109	26,840
111	34,443
113.4	45,448
115	54,700
117	68,159
120	90,367
125	136,607
130	188,560
135	246,933

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Subject Lake Lure Dam

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Peak Reservoir Probable Maximum
Flood (PMF) inflows estimated
from COE equations.

$$q_p = 8800A^{-0.3}$$

where:

$$q_p = \text{cfs/sq.mi.}$$

$$A = \text{drainage area (sq.mi.)}$$

$$\text{Drainage area} = 95 \text{ sq.mi.}$$

$$q_p = 2245 \text{ cfs}$$

$$\text{Total est. inflow} = Q_t = q_p(A)$$

$$Q_t = 213250 \text{ cfs}$$

FLOW VELOCITIES OVER DAM

Assume $dc = 2/3 H$

$$q = CLH^{1.5} \quad \text{where } L=1$$

$$V = \frac{3q}{2H}$$

For Values of PMF

(using HEC-1)

%	Depth	Velocity (fps)
50	5.72	11.12
75	10.98	15.41
100	15.04	18.03

For Values of PMF

(using COE eqs.)

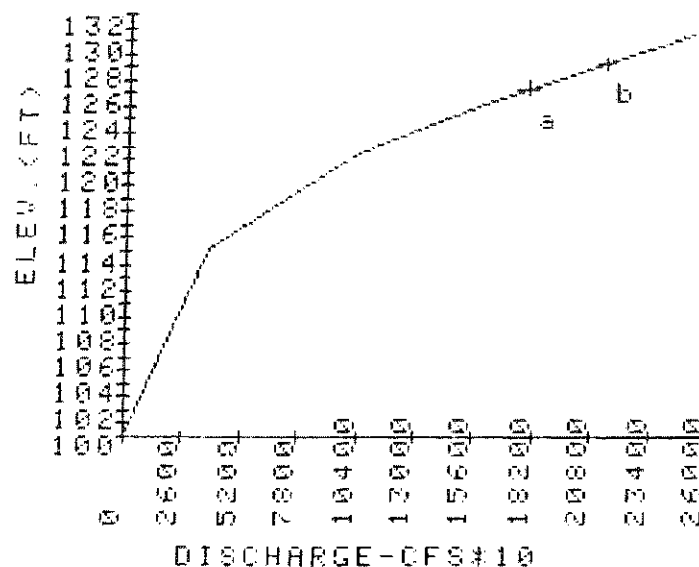
%	Depth	Velocity (fps)
50	6.27	11.64
75	9.85	14.59
100	12.92	16.71

The PMF overtopping depths listed above were interpolated from HEC-1 data

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ELEVATION-OUTFLOW CURVE
for
LAKE LURE DAM

(Total flow, including overflow.)



LEGEND FOR GRAPH

a = 75% PMF
b = 100% PMF

4 1 2 4 4

5 5 5 5 5

((

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PROVIDE OF SERVICE OF STEADY STATE CALCULATIONS

RUNOFF HYDROGRAPH AT	1
ROUTE HYDROGRAPH TO	2
RUNOFF HYDROGRAPH AT	3
ROUTE HYDROGRAPH TO	4
END OF VOLUME	

 FLOOD HYDROGRAPH PACKAGE (HEC-1)
 DAM SAFETY VERSTORY JULY 1978
 LAST MODIFICATION 24 FEB 79

ANALYSIS OF DAM OVERTOPPING USING RATIOS OF PMF
 LAKE LURE DAM
 RUTHERFORD COUNTY, NORTH CAROLINA

NO	DHR	NMIN	IDAY	JOB SPECIFICATION				IPRT	NSTAN
				IMR	IMIN	MTBC	IPRT		
300	0	30	81023	0	0	0	0	-4	0
			JOPER	WT	LRPT	TRAC			
			1	0	0	0			

MULTI-PLAN ANALYSES TO BE PERFORMED

RTIOS= 0.30 0.35 0.40 0.45 0.50 0.55 0.60 0.75 1.00
 VOLAN= 1 NRTIO= 9 LRATIO= 0

SUB-AREA RUNOFF COMPUTATION

HYDROGRAPH COMPUTATION FOR LAKE LUKE

ISTAG	ICOM	ITCON	ITAPE	JPLI	JPRT	INAME	ISTAGE	IAUTO
1	0	0	0	0	0	1	0	0

HYDROGRAPH DATA

INUDG	ITARE	SNAP	IRSDA	IRSDC	RATIO	ISNOW	ISAME	LOCAL
1	45.00	0.0	95.00	1.00	0.0	0	0	0

PRECIP DATA

SPFI	PMS	R6	R24	R48	R72	R96
0.0	24.90	90.00	104.00	123.00	0.0	0.0

LOSS DATA

LPROI	STAKE	ULTR	RITOL	URAIN	STIRK	RTION	STRTL	CNSTL	ALSMX	RTIMP
1	0.0	0.0	1.00	0.0	0.0	1.00	-1.00	-60.00	0.0	0.0

CURVE NO = -60.00 VELOCITY = -1.00 EFFECT CN = 60.00

UNIT HYDROGRAPH DATA

TC= 3.90 LAG= 2.14

RECESSION DATA

START= -1.00 ORCSN= -0.10 RTIOR= 1.50

END-OF-PERIOD FLOW

MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP	MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP
-------	-------	--------	------	------	------	------	-------	-------	--------	------	------	------	------

SUM 33.09 26.24 6.84 3759423.
(848.1) (667.2) (174.1) (*****)

TOTAL RAIN	9.93	TOTAL RAINFALL EXCESS	4.84	TOTAL FLOW	709590.
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TOTAL RAIN	11.56	TOTAL RAINFALL EXCESS	6.21	TOTAL FLOW	906553.
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TOTAL RAIN	13.23	TOTAL RAINFALL EXCESS	7.63	TOTAL FLOW	1110242.
------------	-------	-----------------------	------	------------	----------

TOTAL RAIN	14.69	TOTAL RAINFALL EXCESS	9.09	TOTAL FLOW	1319153.
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TOTAL RAIN	16.54	TOTAL RAINFALL EXCESS	10.48	TOTAL FLOW	1532225.
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TOTAL RAIN	18.23	TOTAL RAINFALL EXCESS	12.09	TOTAL FLOW	1748244.
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TOTAL RAIN	19.88	TOTAL RAINFALL EXCESS	13.62	TOTAL FLOW	1966590.
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TOTAL RAIN	20.40	TOTAL RAINFALL EXCESS	14.29	TOTAL FLOW	2631571.
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TOTAL RAIN	21.00	TOTAL RAINFALL EXCESS	26.24	TOTAL FLOW	3759423.
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HYDROGRAPH ROUTING

ROUTING COMPUTATION OVER DAM (M19) OVERTOPPING EL.=115.4; 1 GATE OPEN ;

STAGE	15.40	125.00	105.70	105.00	135.00	45.00	6881.00	24817.00	0.0	746.	1280.	0.	32285.	82348.	4.	155.	150.
FLOW	125.00	105.70	105.00	135.00	45.00	6881.00	24817.00	0.0	746.	1280.	0.	32285.	82348.	4.	155.	150.	
SURFACE AREA	57.	746.	1280.	0.	32285.	82348.	4.	155.	150.								
CAPACITY	0.	32285.	82348.	4.	155.	150.											
ELEVATION	4.	155.	150.														

CRCL	SPWD	CDW	EXPV	CLVL	COOL	CAREA	EXPL
100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

TOPCL	COND	EXPD	DAMWID
115.4	6.1	1.5	700.

CREST LENGTH	45.	350.	700.
AT OR BELOW			
ELEVATION	115.4	117.0	141.0

PEAK OUTFLOW IS	34790.	AT TIME	44.00 HOURS
PEAK OUTFLOW IS <td>51224.</td> <td>AT TIME <td>44.00 HOURS</td> </td>	51224.	AT TIME <td>44.00 HOURS</td>	44.00 HOURS
PEAK OUTFLOW IS <td>65843.</td> <td>AT TIME <td>43.50 HOURS</td> </td>	65843.	AT TIME <td>43.50 HOURS</td>	43.50 HOURS
PEAK OUTFLOW IS <td>82797.</td> <td>AT TIME <td>43.50 HOURS</td> </td>	82797.	AT TIME <td>43.50 HOURS</td>	43.50 HOURS
PEAK OUTFLOW IS <td>99138.</td> <td>AT TIME <td>43.50 HOURS</td> </td>	99138.	AT TIME <td>43.50 HOURS</td>	43.50 HOURS
PEAK OUTFLOW IS <td>115400.</td> <td>AT TIME <td>43.00 HOURS</td> </td>	115400.	AT TIME <td>43.00 HOURS</td>	43.00 HOURS
PEAK OUTFLOW IS <td>131825.</td> <td>AT TIME <td>42.50 HOURS</td> </td>	131825.	AT TIME <td>42.50 HOURS</td>	42.50 HOURS
PEAK OUTFLOW IS <td>147551.</td> <td>AT TIME <td>42.00 HOURS</td> </td>	147551.	AT TIME <td>42.00 HOURS</td>	42.00 HOURS

SUB-AREA RUNOFF COMPUTATION

HYDROGRAPH COMPUTATION FOR LAKE LUPE

ISTAG ICOMP IECON ITAPE JPLY JPRT INAME ISTAGE IAUTO
 1 0 0 0 0 0 1 0 0

HYDROGRAPH DATA

IHYNG IUNG TARGA SNAP TRSDA TRSPE RATIO ISNOW ISAME LOCAL
 1 2 25.00 0.6 95.00 1.00 0.0 0 0 0

PRECIP DATA

SPEE PMS RC R12 R24 R48 R72 R96
 0.0 26.00 90.00 108.00 123.00 0.0 0.0 0.0

LOSS DATA

LROPI STXPR ULTRP RTIOL CHAIN STOKS RIIOK STRTL CNSTL ALSMX RTIMP
 1 0.0 0.0 1.00 0.0 0.0 1.00 -1.00 -60.00 0.0 0.0

CURVE NO = -40.00 WETNESS = -1.00 EFFECT CN = 60.00

UNIT HYDROGRAPH DATA

TC= 3.90 LAG= 2.24

RECESSION DATA

SIRTO= -1.00 GRCSN= -0.10 RTIOR= 1.50

END-OF-PERIOD FLOW

NO.04 HR.MN PERIOD RAIN EXCS LOSS COMP A HR.MN PERIOD RAIN EXCS LOSS COMP B

SUM 33.09 26.24 6.84 3759423.
 (840.)(667.)(174.)(.....)

TOTAL RAIN	%	TOTAL RAINFALL EXCESS	4.84%	TOTAL FLOW	709590.
TOTAL RAIN	11.58%	TOTAL RAINFALL EXCESS	6.21%	TOTAL FLOW	906553.
TOTAL RAIN	13.23%	TOTAL RAINFALL EXCESS	7.63%	TOTAL FLOW	1110242.
TOTAL RAIN	14.84%	TOTAL RAINFALL EXCESS	9.09%	TOTAL FLOW	1319153.
TOTAL RAIN	16.54%	TOTAL RAINFALL EXCESS	10.54%	TOTAL FLOW	1532225.
TOTAL RAIN	18.20%	TOTAL RAINFALL EXCESS	12.09%	TOTAL FLOW	1748244.
TOTAL RAIN	19.85%	TOTAL RAINFALL EXCESS	13.62%	TOTAL FLOW	1966590.
TOTAL RAIN	21.49%	TOTAL RAINFALL EXCESS	15.29%	TOTAL FLOW	2631571.
TOTAL RAIN	33.09%	TOTAL RAINFALL EXCESS	26.24%	TOTAL FLOW	3759423.

HYDROGRAPH ROUTING

ROUTING COMPUTATION OVER DAM (ASSUME 3 TAILRATER GATES ARE OPEN)

STAGE	105.40	105.70	106.00	107.40	108.00	109.00	111.00	113.40	115.00	117.00
FLO	903.7.00	136607.00	188560.00	246933.00	23796.00	26890.00	34443.00	45448.00	54700.00	68159.00
SURFACE AREA=	57.	746.	1280.							
CAPACITY=	0.	32295.	82598.							
ELEVATION=	4.	100.	150.							

CRFL SPWD COG EXPV ELEV COOL CAREA EXPL
100.0 0.0 0.0 0.0 0.0 0.0 0.0

DAM DATA
TOPEL COOD EXPD DAMWID
115.4 3.1 1.5 700.

CREST LENGTH 40. 350. 700.
AT OR BELOW
ELEVATION 115.4 119.2 140.0

PEAK OUTFLOW IS 34909. AT TIME 44.00 HOURS

PEAK OUTFLOW IS 51180. AT TIME 44.00 HOURS

PEAK OUTFLOW IS 64402. AT TIME 43.50 HOURS

PEAK OUTFLOW IS 79974. AT TIME 43.50 HOURS

PEAK OUTFLOW IS 96247. AT TIME 43.50 HOURS

PEAK OUTFLOW IS 111042. AT TIME 41.50 HOURS

PEAK OUTFLOW IS 121190. AT TIME 43.00 HOURS

PEAK OUTFLOW IS 174607. AT TIME 43.00 HOURS

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PEAK FLOW AND STORAGE (END OF PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
 FLOWS IN CUBIC FEET PER SECOND (CUBIC METERS PER SECOND)
 AREA IN SQUARE MILES (SQUARE KILOMETERS)

OPERATION	STATION	AREA	PLAN	RATIOS APPLIED TO PRECIPITATION								
				RATIO 1	RATIO 2	RATIO 3	RATIO 4	RATIO 5	RATIO 6	RATIO 7	RATIO 8	RATIO 9
				0.50	0.75	1.00	1.25	1.50	1.75	2.00	2.25	2.50
HYDROGRAPH AT	1	95.70	1	55051.	70564.	85080.	100225.	115462.	130748.	146059.	161980.	178145.
	(	246.69)	(	1587.18)	1908.15)	(2415.16)	(2838.06)	(3269.51)	(3702.39)	(4135.93)	(4536.28)	(4933.05)
ROUTED TO	2	95.70	1	36790.	51224.	65943.	82797.	99138.	115400.	131425.	147831.	161886.
	(	246.69)	(	1991.79)	(1450.52)	(1899.62)	(2384.55)	(2807.27)	(3267.76)	(3721.56)	(4035.63)	(4321.62)
HYDROGRAPH AT	3	95.70	1	56951.	70564.	85080.	100225.	115462.	130748.	146059.	161980.	178145.
	(	246.69)	(	1587.18)	(1908.15)	(2415.16)	(2838.06)	(3269.51)	(3702.39)	(4135.93)	(4536.28)	(4933.05)
ROUTED TO	4	95.70	1	38909.	51090.	64802.	79094.	95247.	111442.	127198.	14507.	164840.
	(	246.69)	(	1101.78)	(1446.42)	(1834.99)	(2245.19)	(2697.11)	(3155.69)	(3601.05)	(4041.49)	(4474.68)

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1

RATIO OF PMF	ELEVATION OF RESERVOIR U.S. FEET	INITIAL VALUE 100.00 32295. 0.	SPILLWAY CREST 120.00 32295. 0.	TOP OF DAM 115.40 49914. 43902.	DURATION OVER TOP HOURS	MAXIMUM OUTFLOW CFS	MAXIMUM STORAGE AC-FT	MAXIMUM DEPTH OVER DAM	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
0.20	114.20				0.0	36790.	4529.	0.0	44.00	0.0
0.30	116.40				1.50	51224.	45814.	2.50	44.00	0.0
0.40	118.24				2.80	66945.	47495.	3.50	43.50	0.0
0.50	119.40				4.44	82797.	48986.	4.50	43.50	0.0
0.60	121.10				5.72	99138.	52002.	5.50	43.50	0.0
0.75	122.51				6.91	115400.	5347.	6.00	43.00	0.0
0.80	123.40				8.04	131425.	52445.	6.50	43.00	0.0
0.90	126.24				10.94	177831.	55168.	7.50	43.00	0.0
1.00	130.44				15.04	251886.	55552.	9.00	43.00	0.0

(Above Summary is with 1 tainter gate open only)

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1

RATIO OF PMF	MAXIMUM RECEIVOR W.S.-ELEV	ELEVATION STORAGE OUTFLOW	INITIAL VALUE 100.00 32295. 0.	SPILLWAY CREST 100.00 32295. 0.	TOP OF DAM 115.40 44914. 57392.	DURATION OVER TOP HOURS	MAXIMUM OUTFLOW CFS	MAXIMUM STORAGE AC-FT	MAXIMUM DEPTH OVER DAM	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
0.25	111.97					0.0	38909.	91967.	0.0	44.00	0.0
0.50	114.37					0.0	51680.	44001.	0.0	44.00	0.0
0.75	116.46					2.00	64802.	45873.	2.00	43.50	0.0
1.00	118.37					3.00	79994.	47580.	3.00	43.50	0.0
1.25	119.96					4.00	95247.	49085.	4.00	43.50	0.0
1.50	121.25					5.00	111442.	50337.	5.00	43.50	0.0
1.75	122.47					5.00	127198.	51503.	5.00	43.00	0.0
2.00	125.77					6.50	174507.	54755.	6.50	43.00	0.0
2.25	130.19					8.00	249440.	59292.	8.00	43.00	0.0

(Above Summary assumes 3 tainter gates fully opened.)

APPENDIX IV

Inventory Data

STATE	IDENTITY NUMBER
1	2
3	4
5	6
7	100

143

115 116 117

213

28

REFERENCES

1	2	3	4	5	6	7
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001 22

10TH	BLANK
(11)	
174175	76177
	76177
	76177

[illegible]

74	75	76	77	78	79	80
						7

74	75	76	77	78	79	80
						8

4	75	76	77	78	79	DM
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