

RESERVOIR SEDIMENTATION
DATA SUMMARY

Emma La Frontz

35-12

NAME OF RESERVOIR

DATA SHEET NO.

DAM	1. OWNER Emma La Frontz			2. RIVER Trib. of Boyer R.		3. STATE Iowa		
	4. SEC. 16 TWP. 83N RANGE 38W			5. NEAREST TOWN Denison		6. COUNTY Crawford		
	7. STREAM BED ELEV.			8. TOP OF DAM ELEV.		9. SPILLWAY CREST ELEV.		
RESERVOIR	10. STORAGE ALLOCATION	11. ELEVATION TOP OF POOL	12. SURFACE AREA ACRES	13. STORAGE ACRE- FEET	14. ACCUMULATED ACRE- FEET	15. DATE STORAGE BEGAN		
	d. FLOOD CONTROL		2.07	2.59	15.28	May 1942		
	b. POWER							
	c. WATER SUPPLY		1.71	12.69	12.69	16. DATE NORMAL OPER. BEGAN		
	d. IRRIGATION							
	e. CONSERVATION							
	f. INACTIVE					May 1942		
17. LENGTH OF RESERVOIR				MILES	AV. WIDTH OF RESERVOIR			
WATERSHED	18. TOTAL DRAINAGE AREA 0.155			SQ. MI.	22. MEAN ANNUAL PRECIPITATION 28 (40)			
	19. NET SEDIMENT CONTRIBUTING AREA 0.152			SQ. MI.	23. MEAN ANNUAL RUNOFF 5.0*			
	20. LENGTH		MILES	AV. WIDTH		MILES	24. MEAN ANNUAL RUNOFF	
							AC.-FT.	
	21. MAX. ELEV.		MIN. ELEV.		25. CLIMATIC CLASSIFICATION Sub-humid			
SURVEY DATA	26. DATE OF SURVEY	27. PERIOD YEARS	28. ACCL. YEARS	29. TYPE OF SURVEY	30. NO. OF RANGES OR CONTOUR INT.	31. SURFACE AREA ACRES	32. CAPACITY ACRE- FEET	33. C _w RATIO AC.-FT. PER SQ. MI.
	May 1942	-	-	-	-	1.71	12.69	81.9
	April 1949	6.9	6.9	Range Detailed	3	1.60	7.86	50.7
	26. DATE OF SURVEY	34. PERIOD ANNUAL PRECIPITATION		35. PERIOD WATER INFLOW			36. WATER INFL. TO DATE XXXX	
				d. MEAN ANNUAL	b. MAX. ANNUAL	c. PERIOD TOTAL	d. MEAN ANNUAL	b. TOTAL TO DATE
	April 1949			(inches)			(inches)	
				7.9*			7.9*	
	26. DATE OF SURVEY	37. PERIOD SEDIMENT DEPOSITS ACRE- FEET			38. TOTAL SED. DEPOSITS TO DATE ACRE- FEET.			
		a. PERIOD TOTAL	b. AV. ANNUAL	c. PER SQ. MI.-YEAR	d. TOTAL TO DATE	e. AV. ANNUAL	f. PER SQ. MI.-YEAR	
	April 1949	4.83 (4.94) <u>1/</u>	0.700 (0.716)	4.61 (4.71)	4.83 (4.94)	0.700 (0.716)	4.61 (4.71)	
26. DATE OF SURVEY	39. AV. DRY WGT. LBS. PER CU. FT.	40. SED. DEP. TONS PER SQ. MI.-YR.		41. STORAGE LOSS PCT.		42. SED. INFLOW PPM		
		a. PERIOD	b. TOTAL TO DATE	a. AV. ANNUAL	b. TOT. TO DATE	a. PERIOD	b. TOT. TO DATE	
April 1949	56.7 (3)	5,690 (5,820)	5,690 (5,820)	4.64 (5.52) ^{2/}	32.1 (38.1) ^{2/}	9,740 ^{2/} (9,960) ^{2/}	9,740 ^{2/} (9,960) ^{2/}	

* Estimated

1/ Above-crest deposits within original flow line at emergency spillway elevation; includes 0.04 acre-feet of sediment above emergency spillway crest elevation.

2/ Based on water supply pool.

26. DATE OF SURVEY	43. DEPTH DESIGNATION RANGE IN FEET ABOVE, AND BELOW, CREST ELEVATION													
	PERCENT OF TOTAL SEDIMENT LOCATED WITHIN DEPTH DESIGNATION													

26. DATE OF SURVEY	44. REACH DESIGNATION PERCENT OF TOTAL ORIGINAL LENGTH OF RESERVOIR														
	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	-105	-110	-115	-120	-125
	PERCENT OF TOTAL SEDIMENT LOCATED WITHIN REACH DESIGNATION														

45. RANGE IN RESERVOIR OPERATION							
WATER YEAR	MAX. ELEV.	MIN. ELEV.	INFLOW AC.-FT.	WATER YEAR	MAX. ELEV.	MIN. ELEV.	INFLOW AC.-FT.

46. ELEVATION-AREA-CAPACITY DATA								
ELEVATION	AREA	CAPACITY	ELEVATION	AREA	CAPACITY	ELEVATION	AREA	CAPACITY

47. REMARKS AND REFERENCES
 1. Gottschalk, L.C., and Brune, G.M. Sediment design criteria for the Missouri Basin Loess Hills. Soil Conserv. Serv. SCS-TP-97, 21 pp., illus., processed. Milwaukee, Wisconsin, 1950.
 2. U.S.D.A. Yearbook of Agriculture, Washington, D.C., 1941.
 For 270 feet downstream from dam, gradient was found to have decreased from 2.82 to 2.37%. From 270 to 970 feet downstream, gradient decreased from 1.45 to 1.29%.

3/ $42 = \frac{37b \times 39 \times 1,000,000}{35a \times 18 \times 640 \times 62.4}$

48. AGENCY SUPPLYING DATA 12
Region 3, Soil Conservation Service

49. DATE January 9, 1950

U. S. Dept. of Agriculture, Milwaukee, Wis.

RESERVOIR SEDIMENTATION
DATA SUMMARY

Emma La Frontz

NAME OF RESERVOIR

35-12a

DATA SHEET NO.

DAM	1. OWNER Emma La Frontz			2. RIVER Trib. of Boyer River		3. STATE Iowa		
	4. SEC. 16 TWP. 83N RANGE 38W			5. NEAREST TOWN Denison		6. COUNTY Crawford		
	7. STREAM BED ELEV.			8. TOP OF DAM ELEV.		9. SPILLWAY CREST ELEV.		
RESERVOIR	10. STORAGE ALLOCATION	11. ELEVATION TOP OF POOL	12. SURFACE AREA ACRES	13. STORAGE ACRE- FEET	14. ACCUMULATED ACRE- FEET	15. DATE STORAGE BEGAN		
	a. FLOOD CONTROL		2.07	2.59	15.28	May 1942		
	b. POWER							
	c. WATER SUPPLY		1.71	12.69	12.69	16. DATE NORMAL OPER. BEGAN		
	d. IRRIGATION					May 1942		
	e. CONSERVATION							
	f. INACTIVE							
17. LENGTH OF RESERVOIR			MILES		AV. WIDTH OF RESERVOIR MILES			
WATERSHED	18. TOTAL DRAINAGE AREA 0.155			SQ. MI.	22. MEAN ANNUAL PRECIPITATION 28 (40)		INCHES	
	19. NET SEDIMENT CONTRIBUTING AREA 0.152			SQ. MI.	23. MEAN ANNUAL RUNOFF 3.2 est.		INCHES	
	20. LENGTH MILES		AV. WIDTH MILES		24. MEAN ANNUAL RUNOFF 171 A.F./sq.mi. AC.-FT.			
	21. MAX. ELEV.		MIN. ELEV.		25. CLIMATIC CLASSIFICATION Sub-humid			
SURVEY DATA	26. DATE OF SURVEY	27. PERIOD YEARS	28. ACCL. YEARS	29. TYPE OF SURVEY	30. NO. OF RANGES OR CONTOUR INT.	31. SURFACE AREA ACRES	32. CAPACITY ACRE- FEET	33. C/I RATIO AC.-FT. PER SQ. MI.
	5/42	-	-	-	-	2.07	15.28	98.6
	4/18/49	6.9	6.9	Detailed Range	3 Ranges	1.96	10.38	67.0
	7/13/53	4.23	11.1	"	"	1.91	9.47	61.1
	26. DATE OF SURVEY	34. PERIOD ANNUAL PRECIPITATION	35. PERIOD WATER INFLOW ACRE- FEET			36. WATER INFL. TO DATE AC.-FT.		
			a. MEAN ANNUAL	b. MAX. ANNUAL	c. PERIOD TOTAL	d. MEAN ANNUAL	e. TOTAL TO DATE	
	26. DATE OF SURVEY	37. PERIOD SEDIMENT DEPOSITS ACRE- FEET			38. TOTAL SED. DEPOSITS TO DATE ACRE- FEET.			
		a. PERIOD TOTAL	b. AV. ANNUAL	c. PER SQ. MI.-YEAR	d. TOTAL TO DATE	e. AV. ANNUAL	f. PER SQ. MI.-YEAR	
		4/18/49	4.90 (4.94)	0.710 (0.716)	4.67 (4.71)	4.90 (4.94)	0.710 (0.716)	4.67 (4.71)
	7/13/53	0.91 (0.93)	0.215 (0.220)	1.41 (1.45)	5.81 (5.87)	0.523 (0.529)	3.44 (3.48)	
26. DATE OF SURVEY	39. AV. DRY WGT. LBS. PER CU. FT.	40. SED. DEP. TONS PER SQ. MI.-YR.		41. STORAGE LOSS PCT.		42. SED. INFLOW PPM		
		a. PERIOD	b. TOTAL TO DATE	c. AV. ANNUAL	d. TOT. TO DATE	e. PERIOD	f. TOT. TO DATE	
4/18/49	56.7 (3)	5,767 (5,817)	5,767 (5,817)	4.64	32.1	-	-	
7/13/53	62.0 (3)	1,904 (1,958)	4,645 (4,699)	3.42	38.0			

1/ At crest elevation. 2/ C/I ratio 0.59 in 1942, 0.40 in 1949, and 0.36 in 1953. Trap efficiency estimated at 96 percent in 1942 and 1949, and 95 percent in 1953.

26. DATE OF SURVEY	43. DEPTH DESIGNATION RANGE IN FEET ABOVE, AND BELOW, CREST ELEVATION													
PERCENT OF TOTAL SEDIMENT LOCATED WITHIN DEPTH DESIGNATION														

26. DATE OF SURVEY	44. REACH DESIGNATION PERCENT OF TOTAL ORIGINAL LENGTH OF RESERVOIR														
	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	-105	-110	-115	-120	-125
PERCENT OF TOTAL SEDIMENT LOCATED WITHIN REACH DESIGNATION															

45. RANGE IN RESERVOIR OPERATION							
WATER YEAR	MAX. ELEV.	MIN. ELEV.	INFLOW AC.-FT.	WATER YEAR	MAX. ELEV.	MIN. ELEV.	INFLOW AC.-FT.

46. ELEVATION-AREA-CAPACITY DATA								
ELEVATION	AREA	CAPACITY	ELEVATION	AREA	CAPACITY	ELEVATION	AREA	CAPACITY

47. REMARKS AND REFERENCES (1) Gottschalk, L.C., and G.M.Brune, Sediment Design Criteria for the Missouri Basin Loess Hills, SCS-TP-97, Soil Conservation Service, Milwaukee, Wis., 1950. (2) U.S.D.A. Yearbook of Agriculture, Washington, D. C., 1942. For 270 feet downstream from dam, gradient was found to have decreased from 2.82 to 2.37 %. From 270 to 970 feet downstream, gradient decreased from 1.45 to 1.29% (1942-1949).
 Total rate of sediment production, adjusted for trap efficiency, 4,820 tons/sq.mi.

48. AGENCY SUPPLYING DATA S.C.S., Milwaukee, Wisconsin 49. DATE August 10, 1953