

RESERVOIR SEDIMENTATION

Lake Brownwood

53-30

DATA SUMMARY

The Brown Co.

NAME OF RESERVOIR

DATA SHEET NO.

DAM	1. OWNER Water Impr. Dist. No. 1		2. RIVER Pecan Bayou (Colo.)		3. STATE Texas				
	4. SECT. & LONG. 31° 50' RANGE 99° 00'		5. NEAREST TOWN Brownwood		6. COUNTY Brown				
	7. STREAM BED ELEV. 1330 MSL		8. TOP OF DAM ELEV. 1449.5		9. SPILLWAY CREST ELEV. 1424.5				
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	1424.5	7,383	14,000	148,300	Flood of			
	b. POWER	None	-	-	134,300	July 1932			
	c. WATER SUPPLY	1422.5	No allocation made,		134,300	16. DATE NORMAL OPER. BEGAN			
	d. IRRIGATION	1422.5	included in conservation		134,300				
	e. CONSERVATION	1422.5	6,650	85,050	134,300	Spring of			
	f. INACTIVE	1405.5	3,490	49,250	49,250		1933		
17. LENGTH OF RESERVOIR 26.5 a. MILES			14. AV. WIDTH OF RESERVOIR 0.43 MILES						
WATERSHED	18. TOTAL DRAINAGE AREA 1,544 SQ. MI.		22. MEAN ANNUAL PRECIPITATION 26.0 INCHES						
	19. NET SEDIMENT CONTRIBUTING AREA 1,532 b. SQ. MI.		23. MEAN ANNUAL RUNOFF (25 yrs.) 1.84 INCHES						
	20. LENGTH 56 MILES	AV. WIDTH 27.6 MILES	24. MEAN ANNUAL RUNOFF 11: 151,634 AC.-FT.						
	21. MAX. ELEV. 2,350' MIN. ELEV. 1,330'		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.	
	July 1, 1932			Reconnaissance Range	12 Ranges	7,383	148,300	96	
	Aug. 1, 1934	2.1	2.1		72 Ranges	7,383	147,865	95	
	Feb. 1, 1940	5.5	7.6		72 Ranges	7,383	143,880	93	
	Aug. 1, 1948	8.5	16.1		72 Ranges	7,333	136,600	88	
	* Ranges Spud-sounded to original ground during 1940 survey and contour map for the original basin developed from these soundings and other data.								
	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	a. MEAN ANNUAL	b. TOTAL TO DATE		
	July 1, 1932								
	Aug. 1, 1934	25.72	207,030	*395,630	434,763	207,030	434,763		
Feb. 1, 1940	26.14	161,140	@297,288	886,284	173,820	1,321,047			
Aug. 1, 1948	27.83	144,020	@385,925	1,224,153	158,090	2,545,200			
* July 1932 thru June 1933.		@ Calendar Years.							
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.-YR.	a. TOTAL TO DATE	b. AV. ANNUAL	c. PER SQ. MI.-YR.			
July 1, 1932									
Aug. 1, 1934	435	207	0.135	435	207	0.135			
Feb. 1, 1940	3,985	725	0.473	4,420	582	0.380			
Aug. 1, 1948	7,280	856	0.559	11,700	727	0.475			
φ Sediment exposed to July sun and was thus compacted, lake nearly empty.									
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			
	Period Date	a. PERIOD	b. TOTAL TO DATE	a. AV. ANNUAL	b. TO DATE	a. PERIOD	b. TO DATE		
Aug. 1, 1934	90 est. 90	265	265	0.14	0.29	1,440	1,440		
Feb. 1, 1940	#55 est. 58	566	480	0.39	2.98	3,960	3,120		
Aug. 1, 1948	X53 est. 55	645	569	0.49	7.89	5,050	4,050		
φ Tons of sediment low in 1st period when conduits were open.									
# Ave. of 19 shallow samples, 41.9 lbs. * X Weighted ave. 23 samples, 40.0 lbs.									

From elev. 1424.5 20 10 1400 90 80 70 60 50 40
 To elev. 1420 10 00 1390 80 70 60 50 40 30

5330

26. DATE OF SURVEY	43. DEPTH DESIGNATION RANGE IN FEET ABOVE, AND BELOW, CREST ELEVATION										
	(Crest - 4.5 ft.)										
	PERCENT OF TOTAL SEDIMENT LOCATED WITHIN DEPTH DESIGNATION										
Aug. 1, 1934	(Date not available to show vertical distribution of sediment)										
Feb. 1, 1940	1	15	17	21	18	13	8	5.5	1.4	0.1	
Aug. 1, 1948	2	19	22	20	17	10	6	3	1.0	0.0	

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														
	<u>Pecan Bayou, North Arm of Lake</u>														
Feb. 1, 1940	7	5.5	7	5.5	4.5	4	2	1.5	1.0	0	T =	38.0			
Aug. 1, 1948	7	7	10	6	5	5.5	2.5	1.5	0.5	0	T =	45.0			
	<u>Jim Ned Creek, West Arm of Lake</u>														
Feb. 1, 1940	6	10	8	8	9	12.5	8.5	0	0	0	T =	62.0			
Aug. 1, 1948	6.5	10	6	5.5	6.3	11	9	0.2	0.3	0.2	T =	55.0			

45. RANGE IN RESERVOIR OPERATION							
WATER YEAR	MAX. ELEV.	MIN. ELEV.	INFLOW AC.-FT.	WATER YEAR	MAX. ELEV.	MIN. ELEV.	INFLOW AC.-FT.
July-Sept. 32	1426.5d	d	293,435	1941 f	1429.9	1420.7	350,476
1933 f	1407.8	e	105,816	1942 f	1428.0	1420.6	292,227
1934 f	1412.0	g	36,126	1943 f	1428.5	1421.5	110,945
1935 f	1428.9	g	299,855	1944	(no record)		47,838
1936	1430.7	1416.9	257,378	1945 f	1427.8	1421.6	147,054
1937	1426.3	1416.8	61,557	1946 f	1421.9	1420.6	58,198
1938	1427.0	1417.3	100,128	1947 f	1424.8	1421.5	35,753
1939	1427.7	1419.4	162,773	Oct. '47-July '48	1422.6	1418.0	44,773
1940 f	1426.9	1417.7	140,868	Incl. f			

46. ELEVATION-AREA-CAPACITY DATA								
ELEVATION	AREA	CAPACITY	ELEVATION	AREA	CAPACITY	ELEVATION	AREA	CAPACITY
1358	0	0	1420	6,050	107,000			
1360	20	30	1424.5	7,333	136,600 (crest)			
1370	120	700	1430	9,512	183,100			
1380	282	2,400	1440	14,194	301,400			
1390	960	8,600	1449.5	19,274	459,950			
1400	2,490	25,800						
1410	3,845	57,500						

47. REMARKS AND REFERENCES a. Pecan Bayou Arm, 13.5 mi., Jim Ned Cr. Arm, 13.0 mi.
 b. Area reduced 12 sq.mi., surface area lake at Elev. 1325. Hords Creek Dam, controlling 48 sq.mi., closed June 1948, a month before starting latest survey.
 c. Estimated flow at dam from Brownwood gaging station records.
 d. Maximum flood of record occurred in July 1932, reservoir was initially empty.
 e. Reservoir drained nearly empty, two 12-foot conduits were not closed until 1933.
 f. Records incomplete. Elevations from available gage heights and hydrographs.
 g. Gate failed to close, permitting reservoir to empty. Storage began about Nov. '35.

48. AGENCY SUPPLYING DATA Dept. of the Army, Corps of Engrs. Ft Worth District, Ft Worth, Texas, Lake Brownwood
 49. DATE 2-2-51

RESERVOIR SEDIMENTATION
DATA SUMMARY

LAKE BROWNWOOD
NAME OF RESERVOIR

53 - 30a

DATA SHEET NO.

DAM	1. OWNER Brown Co. Water Impr.		2. RIVER Pecan Bayou (Colorado)		3. STATE Texas			
	4. SEC. TWP. RANGE Dist. 1		5. NEAREST TOWN Brownwood		6. COUNTY Brown			
	7. STREAM BED ELEV. 1330' m.s.l.		8. TOP OF DAM ELEV. 1449.5		9. SPILLWAY CREST ELEV. 1424.5			
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	1424.5	7,298	---	149,925 1/	July 1932		
	b. POWER							
	c. WATER SUPPLY					16. DATE NORMAL OPER. BEGAN		
	d. IRRIGATION							
	e. CONSERVATION							
	f. INACTIVE					Spring 1933		
17. LENGTH OF RESERVOIR		26.5	MILES	AV. WIDTH OF RESERVOIR		0.43 MILES		
WATERSHED	18. TOTAL DRAINAGE AREA		1,544	SQ. MI.	22. MEAN ANNUAL PRECIPITATION (54)		25.7 INCHES	
	19. NET SEDIMENT CONTRIBUTING AREA		1,533	SQ. MI.	23. MEAN ANNUAL RUNOFF		1.8 INCHES	
	20. LENGTH		56	MILES	AV. WIDTH		27.6 MILES	
	21. MAX. ELEV.		2350'		24. MEAN ANNUAL RUNOFF		96 Ac. Ft./Sq. Mi. AC-Ft.	
	21. MIN. ELEV.		1,330		25. CLIMATIC CLASSIFICATION		Subhumid	
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.
	July 1, 1932						149,925	97
	Feb. 6, 1940	7.6	7.6	Range	72	7,298	145,720	94
	Sept. 7, 1959	19.6	27.2	Detail	72	7,298	135,963	88
				Range				
				Detail				
	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		
Feb. 6, 1940	4,205	553	0.361	4,205	553	0.361		
Sept. 7, 1959	9,757	498	0.325	13,962	513	0.335		
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	
Feb. 6, 1940	41.9	329	329	0.37	2.80			
Sept. 7, 1959	42.2 *	421	308	0.34	9.31			

* - Weighted average of 20 samples.

1/ Original capacity

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
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						
1358.5	5	5	1382.5	630	5,536	1406.5	3,376	47,419						
1364.5	73	190	1388.5	1,084	10,378	1412.5	4,413	69,620						
1370.5	218	985	1394.5	1,731	18,353	1418.5	5,778	98,666						
1376.5	381	2,675	1400.5	2,553	30,524	1424.5	7,298	135,963						
47. REMARKS AND REFERENCES														
Average Land Use: Rangeland - 69%; Cropland - 27.8%; Miscellaneous - 3.2%														
Average C/I Ratio = 0.977														
Estimated Trap Efficiency = 95%														
Total Annual Sediment Load, Adjusted for Trap Efficiency = 0.353 Ac.Ft./Sq.Mi.														
Soil Conservation Service														
48. AGENCY SUPPLYING DATA				Temple, Texas				49. DATE January 27, 1960						

RESERVOIR SEDIMENTATION
DATA SUMMARY

LAKE BROWNWOOD

53 - 30b

NAME OF RESERVOIR

DATA SHEET NO.

DAM	1. OWNER Brown Co. Water Impr.				2. RIVER Pecan Bayou (Colorado)		3. STATE Texas									
	4. SEC. TWP.		RANGE Dist. 1		5. NEAREST TOWN Brownwood		6. COUNTY Brown									
	7. STREAM BED ELEV. 1330' m.s.l.			8. TOP OF DAM ELEV. 1449.5			9. SPILLWAY CREST ELEV. 1424.5									
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		1424.5		7,298		---		149,925 1/		July 1932					
	b. POWER										16. DATE NORMAL OPER. BEGAN Spring 1933					
	c. WATER SUPPLY															
	d. IRRIGATION															
	e. CONSERVATION															
	f. INACTIVE															
17. LENGTH OF RESERVOIR 26.5 MILES					AV. WIDTH OF RESERVOIR 0.43 MILES											
WATERSHED	18. TOTAL DRAINAGE AREA 1,544 SQ. MI.				22. MEAN ANNUAL PRECIPITATION (54) 25.7 INCHES											
	19. NET SEDIMENT CONTRIBUTING AREA 1,533 SQ. MI.				23. MEAN ANNUAL RUNOFF 1.8 INCHES											
	20. LENGTH 56 MILES		AV. WIDTH 27.6 MILES		24. MEAN ANNUAL RUNOFF 96 Ac. Ft./Sq. Mi. AC-FT.											
	21. MAX. ELEV. 2350'		MIN. ELEV. 1,330		25. CLIMATIC CLASSIFICATION Subhumid											
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.	
	July 1, 1932															
	Feb. 6, 1940		7.6		7.6		Range Detail		72		7,298		149,925		97	
	Sept. 7, 1959		19.6		27.2		Range Detail		72		7,298		135,963		88	
	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			
Feb. 6, 1940		4,205		553		0.361		4,205		553		0.361				
Sept. 7, 1959		9,757		498		0.325		13,962		513		0.335				
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		
Feb. 6, 1940		41.9		329		329		0.37		2.80						
Sept. 7, 1959		42.2 *		299		308		0.34		9.31						

* - Weighted average of 20 samples.
1/ Original capacity

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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							
1358.5	5	5	1382.5	630	5,536	1406.5	3,376	47,419							
1364.5	73	190	1388.5	1,084	10,378	1412.5	4,413	69,620							
1370.5	218	985	1394.5	1,731	18,353	1418.5	5,778	98,666							
1376.5	381	2,675	1400.5	2,553	30,524	1424.5	7,298	135,963							
47. REMARKS AND REFERENCES															
Average Land Use: Rangeland - 69%; Cropland - 27.8%; Miscellaneous - 3.2%															
Average C/I Ratio = 0.977															
Estimated Trap Efficiency = 95%															
Total Annual Sediment Load, Adjusted for Trap Efficiency = 0.353 Ac.Ft./Sq.Mi.															
48. AGENCY SUPPLYING DATA				Soil Conservation Service Temple, Texas				49. DATE	January 27, 1960						

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