

SUPPLEMENTAL WATERSHED AGREEMENT NO. II
 FOR ELM CREEK (CEN-TEX) WATERSHED, TEXAS
 BY
 EXCHANGE OF CORRESPONDENCE

Since the original Watershed Agreement was signed on the 24th day of June 1976 and subsequent supplements since, it has become necessary to modify that agreement in order to carry out the installation of the plan.

Floodwater Retarding Structure No. 5 will be moved from its original location approximately 3 miles upstream and have a drainage area of 1.28 square miles. Site 5 will now be identified as site 5A. The movement of site 5 upstream will increase the drainage area of site 6 from 3.08 square miles to 5.93 square miles. Site 6 was replanned to accommodate this increased drainage area and designated as site 6R2. Site 7 will have one end of the dam abutment moved upstream slightly to avoid the involvement of a barn and other appurtenant structures and will be designated as site 7REV. The hazard classification of sites 5 and 6 was changed from class B to class C structures at the new locations as sites 5A and 6R2. The hazard classification of site 7REV. will remain a class B structure. Tables 2 and 3 are attached. Supporting data is shown below:

	Structures <u>5, 6, 7</u>	Structures <u>5A, 6R2, 7REV.</u>
Drainage Area Controlled (Sq. Mi.)	13.06	12.69
Total Estimated Installation Cost	3,639,800	2,940,900
Estimated Federal Installation Cost	3,092,100	2,700,800
Average Annual Cost	214,570	173,370
Average Annual Benefits	203,390	197,640
Benefit - Cost Ratio	0.9 : 1.0	1.2 : 1.0

A biological evaluation of site 5A indicated that no federally listed threatened or endangered plants or animals would be affected and no critical habitat is present. No fishery resources will be affected. The installation of site 5A will affect approximately the same amount of Riverine - Intermittent wetlands as was at the original site. A cultural resource review will be made prior to construction. The installation of sites 5A, 6R2, and 7REV will not create any significant adverse impacts compared to those that would have occurred at the original locations.

All other terms, conditions and stipulations of the watershed agreement not modified here remain the same and are agreed to:

Signed:

Stanley J. Glass
Chairman

Central Texas Soil and Water Conservation District 2-14-93
Date

B. P. Engelhardt
Chairman

McLennan County Soil and Water Conservation District 2-9-93
Date

[Signature]
Chairman

Elm Creek Watershed Authority 2-11-93
Date

Approved by:

Henry W. [Signature]
State Conservationist

FEB 17 1993
Date

TABLE 3: STRUCTURAL DATA - DAMS WITH PLANNED STORAGE CAPACITY
ELM CREEK (GEN-TEX)

ITEM	UNIT	STRUCTURE NUMBERS		
		5 A	6 R2	T Rsv
		Cottowd Cr / Leona Cr		
Class of Structures		C	C	D
Seismic Zone		0.00	0	0.00
Drainage Area (Total)	SQ. MI.	1.28	1.21	12.69
Drainage Area (Controlled)	SQ. MI.	1.28	5.93	5.48
Runoff Curve No. (1 Day) Avg. AMC		73.00	72	69.00
Time of Concentration (Tc)	HR.	1.0	3.2	2.70
Elevation Top of Dam	FT.	720.4	567.1	516.20
Elevation Crest Emergency Spillway	FT.	713.5	557.8	510.70
Elevation Crest High Stage Inlet	FT.	704.8	546.0 / 542.0	499.60
Elevation Crest (Lowest Ungated Outlet)	FT.	704.8	541.0 / 542.0	495.70
Emergency Spillway Type		Veg.	Veg.	Veg.
Emergency Spillway Bottom Width	FT.	80.00	200	200.00
Emergency Spillway Exit Slope	X	3.4	2.5	4.10
Maximum Height of Dam	FT.	39.00	45	38.00
Volume of Fill	CU. YD.	91,090	437,000	161,960
Total Capacity 1/	AC. FT.	514.00	2492	2045.00
Sediment Submerged (Lowest Ungated Outlet) 2/	AC. FT.	129.00	200 / 179	200.00
Sediment Submerged	AC. FT.	129.00	116 / 179	213.00
Sediment Aerated	AC. FT.	9.00	28 / 16	35.00
Floodwater Retarding	AC. FT.	376.00	1953	1597.00
Surface Area				
Lowest Ungated Outlet	AC.	25.30	17 / 17	42.00
Sediment Pool	AC.	25.30	33 / 17	89.00
Floodwater Retarding Pool	AC.	64.5	237	211.00
Principal Spillway Design				
Reinfll Volume (1 Day)	IN.	9.90	9.90	8.73
Reinfll Volume (10 Day)	IN.	16.20	16.20	14.70
Runoff Volume (10 Day)	IN.	9.52	9.13	7.29
Capacity of High Stage (Maximum)	CFS	103.40	258	268.00
Dimensions of Conduit	IN.	30.00	36 / 30	49.00
Frequency Operation (Emergency Spillway)	X CHANCE	1.0	1.0	< 2.0
Emergency Spillway Hydrograph				
Reinfll Volume	IN.	13.18	13.18	9.70
Runoff Volume	IN.	9.59	9.44	5.83
Storm Duration	HR.	6.00	6	6.00
Velocity of Flow (Vc)	FT./SEC.	4.50	6.4	2.40
Maximum Reservoir Water Surface Elevation	FT.	715.40	560.4	511.0
Freeboard Hydrograph				
Reinfll Volume	IN.	30.50	30.50	17.55
Runoff Volume	IN.	26.47	26.28	13.11
Storm Duration	HR.	6.00	6	6.00
Maximum Reservoir Water Surface Elevation	FT.	720.40	567.1	516.20
Discharge Per Foot of Width (Qe/b)	AC. FT.	16.60	36.1	22.70
Bulk Length	FT.	400.00	700	390.00
Capacity Equivalents				
Sediment Volume	IN.	2.02	1.69	1.48
Floodwater Retarding Volume	IN.	5.52	6.18	5.46

1/ Storage Emergency Spillway Crest

2/ Included in Sediment Submerged (100 Years)

3/ Site 6 R2 has two Principal Spillways with separate Sediment Pools with a common Detention Pool.

