BIG JOHNSON RESERVOIR/CREWS GULCH

DRAINAGE BASIN PLANNING STUDY

TECHNICAL ADDENDUM

Prepared for:

El Paso County
Department of Public Works
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KIOWA Project No. 88.05.09
D15/R26

September 1991

BIG JOHNSON RESERVOIR/CREWS GULCH

DRAINAGE BASIN PLANNING STUDY

TECHNICAL ADDENDUM

Section I

Hydrology Spreadsheets

Flow Summary Tables
"x" and "M" Calculations
Time of Concentration Spreadsheets

KIOWA ENGINEERING CORPORATION

BIG JOHNSON HYDROLOGY

DATE: 15-Dec-88

TIME: 10:52 AM

TABLE X
SUMMARY OF PEAK DISCHARGES (CFS)

DESIGN POINT	DRAINAGE AREA (SQ MI)	** EXISTING CONDITION ** 24 HOUR STORM 100 YR.	24 HOUR STORM 10 YR.	2 HOUR STORM 100 YR.	2 HOUR STORM 10 YR.	** FUTURE CONDITION ** 24 HOUR STORM 100 YR.	24 HOUR STORM 10 YR.	2 HOUR STORM 100 YR.	2 HOUR STORM 10 YR.
1	2.37	4398	1742	4881	1983	3676	1372	3989	1524
2	2.35	4400	1771	4866	1984	3656	1379	3971	1528
3	2.29	4374	1780	4814	1966	3554	1372	3853	1508
4	2.24	1503	464	1962	664	2471	842	2770	979
5	2.20	1456	444	1930	653	2412	834	2713	966
6	2.17	1428	433	1903	644	2379	827	2678	956
7	2.14	1391	428	1874	635	2331	818	2631	946
8	0.07	145	70	141	69	145	70	141	69
9	0.47	469	172	566	196	885	422	875	390
10	0.45	426	145	524	186	843	408	838	377
11	0.37	350	114	440	147	727	361	699	331
12	0.15	110	27	151	45	331	178	299	150
13	0.15	198	81	223	95	259	119	268	125
24	0.09	104	39	121	47	129	54	141	59
25	0.08	90	33	105	39	116	49	125	51
26	1.56	946	282	1324	450	1356	437	1692	577
27	0.87	557	177	754	262	880	318	1056	383
28	0.78	509	168	682	237	820	303	974	357
29	0.11	72	21	97	33	72	21	97	33
30	0.46	341	116	427	154	600	239	657	266
31	3.07	795	307	1351	503	4851	2786	4337	2510
32	0.79	85	5	295	73	269	160	261	157
34	1.33	146	14	483	122	1511	914	1397	836
36	1.66	200	27	604	151	2227	1281	2118	1215
61	0.07	N/A	N/A	N/A	N/A	36	21	34	19
62	0.08	N/A	N/A	N/A	N/A	48	28	44	24
63	0.61	221	71	349	98	1499	873	1404	799

TABLE X (Continued)

BASIN NUMBER	DRAINAGE AREA (SQ MI)	** EXISTING CONDITION ** 24 HOUR STORM 100 YR.	24 HOUR STORM 10 YR.	2 HOUR STORM 100 YR.	2 HOUR STORM 10 YR.	** FUTURE CONDITION ** 24 HOUR STORM 100 YR.	24 HOUR STORM 10 YR.	2 HOUR STORM 100 YR.	2 HOUR STORM 10 YR.
1	0.02	30	10	34	16	30	10	34	16
2	0.01	27	15	29	17	27	15	29	17
3	0.03	66	31	73	39	102	61	109	70
4	0.01	8	2	11	3	8	2	11	3
5	0.01	11	4	13	5	34	21	33	21
6	0.03	53	25	55	25	52	24	54	24
7	0.01	10	3	13	4	10	3	13	4
8	0.01	11	3	13	5	11	3	13	5
9	0.03	64	31	66	32	64	31	66	32
10	0.01	18	8	19	8	18	8	19	8
11	0.01	9	3	11	4	9	3	11	4
12	0.02	60	35	58	34	60	35	58	34
13	0.02	37	17	40	19	37	17	40	19
14	0.01	24	12	25	14	24	12	25	14
15	0.01	15	6	16	7	15	6	16	7
16	0.04	79	39	81	40	79	39	81	41
17	0.02	56	31	59	35	56	31	59	35
18	0.05	107	50	103	57	107	50	103	57
19	0.01	16	6	18	8	16	6	18	8
20	0.03	71	36	70	39	71	36	70	39
21	0.07	66	20	84	27	154	81	155	83
22	0.02	19	6	24	8	58	33	59	35
23	0.04	81	38	85	42	81	38	85	42
24	0.01	18	8	19	8	18	8	19	4
25	0.05	70	28	79	33	70	28	79	33
26	0.03	22	6	30	10	47	21	49	22
27	0.09	75	20	97	31	259	156	235	140
28	0.06	45	13	62	20	112	51	121	57
29	0.09	132	55	150	65	177	82	188	91
30	0.06	56	23	64	26	84	36	91	39
31	0.11	71	25	97	36	89	32	113	42
32	0.03	48	21	53	24	55	24	59	26
33	0.08	85	31	101	38	109	43	126	53
34	0.13	83	29	114	41	137	49	165	62
35	0.02	24	8	29	11	24	8	29	11

TABLE X (Continued)

BASIN NUMBER	DRAINAGE AREA (SQ MI)	** EXISTING CONDITION ** 24 HOUR STORM 100 YR.	24 HOUR STORM 10 YR.	2 HOUR STORM 100 YR.	2 HOUR STORM 10 YR.	** FUTURE CONDITION ** 24 HOUR STORM 100 YR.	24 HOUR STORM 10 YR.	2 HOUR STORM 100 YR.	2 HOUR STORM 10 YR.
36	0.02	21	6	27	10	21	6	27	10
37	0.07	44	14	62	21	44	14	62	21
38	0.08	61	20	80	28	61	20	80	28
39	0.03	27	7	35	11	21	6	26	10
40	0.03	28	8	36	12	28	8	36	12
41	0.02	18	5	24	8	18	5	24	8
42	0.01	11	3	14	5	11	3	14	6
43	0.05	44	13	57	19	44	13	57	19
44	0.02	56	37	46	28	56	37	46	28
45	0.01	24	12	26	14	24	12	26	14
46	0.03	57	25	60	30	62	28	67	35
47	0.05	59	18	70	24	176	110	180	116
48	0.13	144	48	179	67	406	230	439	273
49	0.04	63	25	70	29	108	57	112	64
50	0.04	78	35	81	39	132	79	136	84
51	0.03	63	29	62	33	106	66	108	69
52	0.11	156	68	167	72	361	220	359	223
53	0.31	78	8	166	40	914	553	836	510
54	0.12	9	0	42	8	234	111	249	122
55	0.26	26	1	97	19	606	329	605	334
56	0.22	32	1	94	20	699	427	661	397
57	0.07	25	4	44	11	220	134	209	125
58	0.18	24	2	73	18	505	305	445	256
59	0.17	29	3	75	19	467	281	416	237
60	0.44	52	2	176	37	1323	803	1238	740
61	0.08	22	1	48	9	270	166	252	162
62	0.24	92	13	159	39	753	460	716	430
63	0.07	64	18	82	25	130	63	136	66
64	0.11	50	13	80	25	188	87	195	88
65	0.17	128	36	175	56	292	127	321	146
66	0.08	50	13	70	22	75	22	97	33
67	0.43	252	66	370	114	252	66	370	114
68	0.03	72	35	74	40	72	35	74	40
69	0.01	13	5	15	6	13	5	15	6
70	0.40	401	268	356	215	401	268	356	215
71	0.01	29	16	31	19	29	16	31	19

KIOWA ENGINEERING CORPORATION

TR20 'X' AND 'M' VALUE CALCULATION SPREADSHEET
REACH CARDS

DATE: 13-Dec-88
TIME: 01:16 PM

PROJECT: BIG JOHNSON

REACH ID	CONDITION	SLOPE	MANNING'S N VALUE	BOTTOM WIDTH FT	SIDE SLOPE Z	DEPTH (FT)	LENGTH (FT)	AREA FT^2	X VALUE	M VALUE
1	EXISTING	0.009	0.045	60.0	1.5	8.0	1795.2	576.0	0.2	1.63
	FUTURE	0.005	0.035	60.0	4.0	8.0	1795.2	736.0	0.2	1.59
3	EXISTING	0.009	0.045	50.0	1.5	8.0	1372.8	496.0	0.2	1.62
	FUTURE	0.005	0.035	50.0	4.0	8.0	1372.8	656.0	0.2	1.58
6	EXISTING	0.032	0.030	25.0	1.5	5.0	600.0	162.5	1.0	1.60
	FUTURE	0.005	0.035	25.0	2.5	5.0	600.0	187.5	0.4	1.57
7	EXISTING	0.008	0.035	30.0	2.0	4.0	1200.0	152.0	0.4	1.60
	FUTURE	0.005	0.035	30.0	2.0	4.0	1200.0	152.0	0.3	1.60
8	EXISTING	0.009	0.035	10.0	15.0	6.0	1161.6	600.0	0.9	1.36
	FUTURE	0.009	0.035	10.0	15.0	6.0	1161.6	600.0	0.9	1.36
11	EXISTING	0.004	0.035	8.0	10.0	5.0	650.0	290.0	0.7	1.36
	FUTURE	0.004	0.035	8.0	10.0	5.0	650.0	290.0	0.7	1.36
13	EXISTING	0.014	0.035	10.0	20.0	6.0	1267.2	780.0	1.1	1.34
	FUTURE	0.014	0.035	10.0	20.0	6.0	1267.2	780.0	1.1	1.34
14	EXISTING	0.025	0.015	5.0	1.0	4.0	600.0	36.0	5.4	1.45
	FUTURE	0.025	0.015	5.0	1.0	4.0	600.0	36.0	5.4	1.45
15	EXISTING	0.009	0.035	4.0	30.0	3.0	540.0	282.0	1.6	1.21
	FUTURE	0.009	0.035	4.0	30.0	3.0	540.0	282.0	1.6	1.21
17	EXISTING	0.017	0.040	4.0	20.0	4.0	650.0	336.0	1.9	1.24
	FUTURE	0.017	0.040	4.0	20.0	4.0	650.0	336.0	1.9	1.24
18	EXISTING	0.026	0.040	4.0	15.0	4.0	1267.2	256.0	2.4	1.25
	FUTURE	0.026	0.040	4.0	15.0	4.0	1267.2	256.0	2.4	1.25
19	EXISTING	0.023	0.035	8.0	10.0	2.0	600.0	56.0	1.6	1.37
	FUTURE	0.023	0.035	8.0	10.0	2.0	600.0	56.0	1.6	1.37
20	EXISTING	0.035	0.020	2.0	12.0	2.0	1130.0	52.0	8.8	1.12
	FUTURE	0.035	0.020	2.0	12.0	2.0	1130.0	52.0	8.8	1.12
22	EXISTING	0.014	0.045	8.0	2.0	2.0	2250.0	24.0	1.0	1.51
	FUTURE	0.014	0.045	8.0	2.0	2.0	2250.0	24.0	1.0	1.51
23	EXISTING	0.039	0.045	8.0	2.0	3.0	800.0	42.0	1.6	1.49
	FUTURE	0.039	0.045	8.0	2.0	3.0	800.0	42.0	1.6	1.49
24	EXISTING	0.069	0.045	8.0	2.0	2.0	800.0	24.0	2.2	1.51
	FUTURE	0.069	0.045	8.0	2.0	2.0	800.0	24.0	2.2	1.51
28	EXISTING	0.022	0.040	15.0	4.0	5.0	1900.0	175.0	0.9	1.50
	FUTURE	0.005	0.035	20.0	5.0	4.0	1900.0	160.0	0.4	1.52
30	EXISTING	0.011	0.040	4.0	50.0	2.0	1500.0	208.0	1.6	1.18
	FUTURE	0.005	0.035	10.0	4.0	4.0	1500.0	104.0	0.6	1.46
31	EXISTING	0.018	0.040	2.0	50.0	2.0	2900.0	204.0	3.2	1.09
	FUTURE	0.005	0.035	10.0	4.0	4.0	2900.0	104.0	0.6	1.46
33	EXISTING	0.014	0.040	30.0	5.0	4.0	1050.0	200.0	0.5	1.56
	FUTURE	0.005	0.035	30.0	4.0	4.0	1050.0	184.0	0.3	1.57
34	EXISTING	0.022	0.040	20.0	20.0	3.0	3500.0	240.0	0.7	1.43
	FUTURE	0.022	0.035	20.0	4.0	4.0	3500.0	144.0	0.9	1.54
35	EXISTING	0.051	0.040	20.0	20.0	3.0	1350.0	240.0	1.1	1.43
	FUTURE	0.051	0.040	20.0	20.0	3.0	1350.0	240.0	1.1	1.43
38	EXISTING	0.033	0.040	20.0	20.0	2.0	1250.0	120.0	0.9	1.44
	FUTURE	0.033	0.040	20.0	20.0	2.0	1250.0	120.0	0.9	1.44

39	EXISTING	0.038	0.045	4.0	20.0	2.0	1003.2	88.0	2.6	1.21
	FUTURE	0.005	0.035	4.0	4.0	4.0	1003.2	80.0	1.2	1.33
41	EXISTING	0.035	0.040	20.0	20.0	3.0	1161.6	240.0	0.9	1.43
	FUTURE	0.035	0.040	20.0	20.0	3.0	1161.6	240.0	0.9	1.43
45	EXISTING	0.007	0.040	20.0	20.0	3.0	850.0	240.0	0.4	1.43
	FUTURE	0.007	0.040	20.0	20.0	3.0	850.0	240.0	0.4	1.43
53	EXISTING	0.030	0.040	20.0	20.0	3.0	5300.0	240.0	0.9	1.43
	FUTURE	0.005	0.035	20.0	4.0	4.0	5300.0	144.0	0.4	1.54
56	EXISTING	0.021	0.040	20.0	20.0	3.0	4200.0	240.0	0.7	1.43
	FUTURE	0.005	0.035	20.0	4.0	4.0	4200.0	144.0	0.4	1.54
58	EXISTING	0.039	0.040	20.0	20.0	3.0	2900.0	240.0	1.0	1.43
	FUTURE	0.005	0.035	20.0	4.0	4.0	2900.0	144.0	0.4	1.54
62	EXISTING	0.029	0.040	20.0	20.0	3.0	4500.0	240.0	0.9	1.43
	FUTURE	0.005	0.035	20.0	4.0	4.0	4500.0	144.0	0.4	1.54
67	EXISTING	0.004	0.040	15.0	1.0	5.0	1200.0	100.0	0.4	1.57
	FUTURE	0.004	0.040	15.0	1.0	5.0	1200.0	100.0	0.4	1.57

ATOMA ENGINEERING CORPORATION

TR20 TIME OF CONCENTRATION CALCULATION SPREADSHEET

DATE: 12-Dec-00
TIME: 10:32 AM

PROJECT: BIG JOHNSON HYDROLOGY

CURVE	DESCRIPTION	EQUATION	CONVEYANCE TYPE
E	GRASSED WATERWAY	VELOCITY = 10 ^ (0.5 * LOG(SLOPE%) + 0.18)	1
F	PAVED AREA (SHEET FLOW) & SHALLOW CONC. FLOW	VELOCITY = 10 ^ (0.5 * LOG(SLOPE%) + 0.30)	2
C	SHORT GRASS PASTURE & LAWNS	VELOCITY = 10 ^ (0.5 * LOG(SLOPE%) - 0.15)	3
A	FOREST WITH HEAVY GROUND LITTER & MEADOW	VELOCITY = 10 ^ (0.5 * LOG(SLOPE%) - 0.61)	4
B	FALLOW OR MINIMUM TILLAGE CULTIVATION	VELOCITY = 10 ^ (0.5 * LOG(SLOPE%) - 0.32)	5
D	NEARLY BARE GROUND	VELOCITY = 10 ^ (0.5 * LOG(SLOPE%))	6
N/A	DRAINAGEWAY	VELOCITY = 1.49 / n * R^(2/3) * S^(1/2)	7

BASIN ID	CONDITION	** SLOPE (FT./FT.) **			** LENGTH (FT.) **			** CONVEYANCE TYPE **			** VELOCITY (FT/SEC) **			** TIME OF CONCENTRATION (HR) **			Tc (HR)
NUMBER	FUT./EXIST.	SEGMENT-1	SEGMENT-2	SEGMENT-3	SEGMENT-1	SEGMENT-2	SEGMENT-3	SEGMENT-1	SEGMENT-2	SEGMENT-3	SEGMENT-1	SEGMENT-2	SEGMENT-3	SEGMENT-1	SEGMENT-2	SEGMENT-3	TOTAL
1	EXISTING	0.009			1795.2			7			10.92			0.05			0.05
	FUTURE	0.005			1795.2			7			9.77			0.05			0.05
2	EXISTING	0.023			1083.2			2			3.83			0.09			0.09
	FUTURE	0.023			1083.2			2			3.83			0.09			0.09
3	EXISTING	0.009			1372.8			7			10.70			0.04			0.04
	FUTURE	0.005			1372.8			7			9.56			0.04			0.04
4	EXISTING	0.013			950.4			3			0.81			0.33			0.33
	FUTURE	0.013			950.4			3			0.81			0.33			0.33
5	EXISTING	0.014			1161.6			6			1.18			0.27			0.27
	FUTURE	0.014			1161.6			2			2.36			0.14			0.14
6	EXISTING	0.007	0.032		1020.0	600.0		2	7		1.67	21.55		0.30	0.01		0.31
	FUTURE	0.007	0.005		1020.0	600.0		2	7		1.67	7.09		0.30	0.02		0.33
7	EXISTING	0.009	0.008		630.0	900.0		3	7		0.67	8.22		0.26	0.03		0.29
	FUTURE	0.009	0.005		630.0	900.0		3	7		0.67	6.15		0.26	0.04		0.30
8	EXISTING	0.009			1161.6			1			1.44			0.22			0.22
	FUTURE	0.009			1161.6			1			1.44			0.22			0.22
9	EXISTING	0.030			2006.4			2			3.46			0.16			0.16
	FUTURE	0.030			2006.4			2			3.46			0.16			0.16
10	EXISTING	0.010			1100.8			2			2.00			0.15			0.15
	FUTURE	0.010			1100.8			2			2.00			0.15			0.15
11	EXISTING	0.005	0.004		730.0	450.0		3	1		0.50	0.96		0.41	0.13		0.54
	FUTURE	0.005	0.004		730.0	450.0		3	1		0.50	0.96		0.41	0.13		0.54
12	EXISTING	0.032			950.4			3			1.27			0.21			0.21
	FUTURE	0.032			950.4			3			1.27			0.21			0.21
13	EXISTING	0.014			1267.2			1			1.79			0.20			0.20
	FUTURE	0.014			1267.2			1			1.79			0.20			0.20
14	EXISTING	0.019			792.0			1			2.09			0.11			0.11
	FUTURE	0.019			792.0			1			2.09			0.11			0.11
15	EXISTING	0.015			1140.8			3			0.87			0.36			0.36
	FUTURE	0.015			1140.8			3			0.87			0.36			0.36
16	EXISTING	0.027			3273.6			2			3.28			0.28			0.28
	FUTURE	0.027			3273.6			2			3.28			0.28			0.28

17	EXISTING	0.026			1003.2			2			3.22			0.09			0.09
	FUTURE	0.026			1003.2			2			3.22			0.09			0.09
18	EXISTING	0.060	0.024		200.0	850.0		3	2		1.73	3.09		0.04	0.08		0.12
	FUTURE	0.060	0.024		200.0	850.0		3	2		1.73	3.09		0.04	0.08		0.12
19	EXISTING	0.035			1795.2			1			2.83			0.18			0.18
	FUTURE	0.035			1795.2			1			2.83			0.18			0.18
20	EXISTING	0.040			2059.2			2			3.99			0.14			0.14
	FUTURE	0.040			2059.2			2			3.99			0.14			0.14
21	EXISTING	0.035			2745.6			1			2.83			0.27			0.27
	FUTURE	0.035			2745.6			1			2.83			0.27			0.27
22	EXISTING	0.041			1504.0			3			1.43			0.31			0.31
	FUTURE	0.041			1504.0			1			3.06			0.14			0.14
23	EXISTING	0.027			2376.0			2			3.28			0.20			0.20
	FUTURE	0.027			2376.0			2			3.28			0.20			0.20
24	EXISTING	0.024			1267.2			1			2.34			0.15			0.15
	FUTURE	0.024			1267.2			1			2.34			0.15			0.15
25	EXISTING	0.009			1795.2			2			1.09			0.26			0.26
	FUTURE	0.009			1795.2			2			1.09			0.26			0.26
26	EXISTING	0.008			2006.4			1			1.35			0.41			0.41
	FUTURE	0.008			2006.4			1			1.35			0.41			0.41
27	EXISTING	0.022			2534.4			1			2.24			0.31			0.31
	FUTURE	0.022			2534.4			1			2.24			0.31			0.31
28	EXISTING	0.043	0.022		1250.0	1980.0		6	1		2.07	2.24		0.17	0.24		0.40
	FUTURE	0.043	0.005		1250.0	1980.0		1	7		3.14	5.74		0.11	0.09		0.20
29	EXISTING	0.050	0.036		900.0	1350.0		6	1		2.24	2.87		0.11	0.13		0.24
	FUTURE	0.037			2600.0			2			3.84			0.19			0.19
30	EXISTING	0.073	0.011		1100.0	1700.0		6	3		2.70	0.74		0.11	0.64		0.75
	FUTURE	0.040	0.011		1265.0	1700.0		2	1		3.99	1.59		0.09	0.30		0.39
31	EXISTING	0.050	0.013		2300.0	2600.0		1	1		3.38	1.73		0.19	0.42		0.61
	FUTURE	0.050	0.013		2300.0	2600.0		1	1		3.38	1.73		0.19	0.42		0.61
32	EXISTING	0.053			2006.4			6			2.30			0.24			0.24
	FUTURE	0.053			2006.4			1			3.48			0.16			0.16
33	EXISTING	0.075	0.030		1100.0	1300.0		6	3		2.74	1.23		0.11	0.29		0.41
	FUTURE	0.040	0.030		1265.0	1300.0		2	1		3.99	2.62		0.09	0.14		0.23
34	EXISTING	0.023	0.022		2900.0	600.0		3	7		1.07	7.91		0.75	0.02		0.77
	FUTURE	0.023	0.005		2900.0	600.0		1	7		2.30	5.06		0.35	0.03		0.38
35	EXISTING	0.051			1350.0			3			1.60			0.23			0.23
	FUTURE	0.051			1350.0			3			1.60			0.23			0.23
36	EXISTING	0.060			1161.6			3			1.73			0.19			0.19
	FUTURE	0.060			1161.6			3			1.73			0.19			0.19
37	EXISTING	0.040			3220.8			3			1.42			0.63			0.63
	FUTURE	0.040			3220.8			3			1.42			0.63			0.63
38	EXISTING	0.052	0.030	0.012	1700.0	700.0	500.0	3	3	1	1.61	1.23	1.66	0.29	0.16	0.08	0.53
	FUTURE	0.052	0.030	0.012	1700.0	700.0	500.0	3	3	1	1.61	1.23	1.66	0.29	0.16	0.08	0.53
39	EXISTING	0.038			1003.2			3			1.38			0.20			0.20
	FUTURE	0.038			1003.2			3			1.38			0.20			0.20
40	EXISTING	0.050			1531.2			3			1.70			0.25			0.25
	FUTURE	0.050			1531.2			3			1.70			0.25			0.25
41	EXISTING	0.035			1161.6			3			1.32			0.24			0.24
	FUTURE	0.035			1161.6			3			1.32			0.24			0.24
42	EXISTING	0.066			1003.2			3			1.02			0.15			0.15
	FUTURE	0.066			1003.2			3			1.02			0.15			0.15
43	EXISTING	0.055	0.030		1350.0	800.0		3	1		1.66	2.62		0.23	0.08		0.31
	FUTURE	0.055	0.030		1350.0	800.0		3	1		1.66	2.62		0.23	0.08		0.31
44	EXISTING	0.001			1214.4			2			0.63			0.53			0.53
	FUTURE	0.001			1214.4			2			0.63			0.53			0.53

45	EXISTING	0.007		844.8		7		4.46		0.05		0.05
	FUTURE	0.007		844.8		7		4.46		0.05		0.05
46	EXISTING	0.060	0.008	500.0	500.0	3	7	1.73	7.26	0.08	0.02	0.10
	FUTURE	0.040	0.008	575.0	500.0	2	7	3.99	6.27	0.04	0.02	0.06
47	EXISTING	0.063		1100.0		6		2.51		0.12		0.12
	FUTURE	0.040		1265.0		2		3.99		0.09		0.09
48	EXISTING	0.025		2059.2		1		2.39		0.24		0.24
	FUTURE	0.025		2059.2		7		13.11		0.04		0.04
49	EXISTING	0.050		1214.4		6		2.24		0.15		0.15
	FUTURE	0.040		1400.0		2		3.99		0.10		0.10
50	EXISTING	0.042		1100.0		6		2.05		0.15		0.15
	FUTURE	0.030		1265.0		2		3.46		0.10		0.10
51	EXISTING	0.059		1100.0		6		2.43		0.13		0.13
	FUTURE	0.040		1265.0		2		3.99		0.09		0.09
52	EXISTING	0.017		2956.0		1		1.97		0.42		0.42
	FUTURE	0.005		2956.0		7		5.06		0.14		0.14
53	EXISTING	0.030		5913.6		1		2.62		0.63		0.63
	FUTURE	0.005		5913.6		7		5.06		0.28		0.28
54	EXISTING	0.043		2051.2		3		1.47		0.54		0.54
	FUTURE	0.043		3200.0		2		4.14		0.22		0.22
55	EXISTING	0.035		5300.0		1		2.03		0.52		0.52
	FUTURE	0.005		5966.4		7		5.06		0.28		0.28
56	EXISTING	0.021		4200.0		1		2.19		0.53		0.53
	FUTURE	0.005		4200.0		7		5.06		0.28		0.28
57	EXISTING	0.033		2420.0		3		1.29		0.52		0.52
	FUTURE	0.033		2760.0		2		3.62		0.21		0.21
58	EXISTING	0.039		4392.4		3		1.40		0.87		0.87
	FUTURE	0.039		5060.0		2		3.94		0.36		0.36
59	EXISTING	0.027		3740.0		3		1.16		0.90		0.90
	FUTURE	0.027		4312.0		2		3.28		0.37		0.37
60	EXISTING	0.034		5305.6		1		2.79		0.54		0.54
	FUTURE	0.005		5305.6		7		5.06		0.26		0.26
61	EXISTING	0.051		1953.6		3		1.60		0.34		0.34
	FUTURE	0.051		1953.6		1		3.42		0.16		0.16
62	EXISTING	0.029		4500.0		1		2.50		0.40		0.40
	FUTURE	0.005		4500.0		7		5.06		0.21		0.21
63	EXISTING	0.042		2051.2		1		3.10		0.26		0.26
	FUTURE	0.042		2051.2		1		3.10		0.26		0.26
64	EXISTING	0.013	0.052	1500.0	2700.0	3	1	0.81	3.45	0.52	0.22	0.73
	FUTURE	0.013	0.005	1725.0	2700.0	2	7	2.27	5.06	0.21	0.13	0.34
65	EXISTING	0.036		4171.2		1		2.07		0.40		0.40
	FUTURE	0.005		4171.2		7		5.06		0.20		0.20
66	EXISTING	0.050		2798.4		3		1.58		0.49		0.49
	FUTURE	0.050		2798.4		1		3.38		0.23		0.23
67	EXISTING	0.040	0.004	4500.0	3700.0	1	7	3.03	10.03	0.41	0.10	0.52
	FUTURE	0.040	0.004	4500.0	3700.0	1	7	3.03	10.03	0.41	0.10	0.52
68	EXISTING	0.033		1267.2		2		3.62		0.10		0.10
	FUTURE	0.033		1267.2		2		3.62		0.10		0.10
69	EXISTING	0.055	0.013	1100.0	500.0	3	2	1.66	2.27	0.18	0.07	0.25
	FUTURE	0.055	0.013	1100.0	500.0	3	2	1.66	2.27	0.18	0.07	0.25
70	EXISTING	0.001		5016.0		2		0.63		2.21		2.21
	FUTURE	0.001		5016.0		2		0.63		2.21		2.21
71	EXISTING	0.010		739.2		2		2.60		0.08		0.08
	FUTURE	0.010		739.2		2		2.60		0.08		0.08

BIG JOHNSON RESERVOIR/CREWS GULCH

DRAINAGE BASIN PLANNING STUDY

TECHNICAL ADDENDUM

Section II

TR-20 Hydrology Input and Output Printouts

Little Johnson Basin Existing and Future Conditions
2-Hour Storm Duration

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JOB TR-20                                                          NOPLOTS
TITLE 001 EXISTING CONDITION (LITTLE JOHNSON- 100 YR.)
TITLE     2 HR STORM
 5 RAINFL 1                    .167
 8                  0.000       0.030       0.150       .4800       0.680
 8                  0.750       0.840       0.890       0.920       0.940
 8                  0.960       0.980       1.000       1.000       1.000
 9 ENDTBL
 5 RAINFL 2                    .167
 8                  0.000       0.050       0.240       .5700       0.660
 8                  0.720       0.770       0.830       0.860       0.910
 8                  0.940       0.970       1.000       1.000       1.000
 9 ENDTBL
 6 RUNOFF 1   1        5          .087          46.          0.64
 6 REACH  3 152    5   6         1000.          7.4           1.5
 6 RUNOFF 1  86        7          .014          46.           .15
 6 ADDHYD 4    43 7 6 5
 6 REACH  3 146    5   6         2000.          7.4           1.5
 6 RUNOFF 1   4        7          .088          46.           .72
 6 ADDHYD 4    44 7 6 1
 6 RUNOFF 1   2        7          .083          82.           .31
 6 RUNOFF 1   3        6          .022          82.           .23
 6 ADDHYD 4     4 6 7 3
 6 REACH  3 102    3   5         1900.          1.2           1.5
 6 RUNOFF 1   5        6          .114          39.           .52
 6 ADDHYD 4     5 5 6 1
 6 RUNOFF 1   7        1          .046          81.          0.28
 6 RUNOFF 1   9        1          .062          39.          0.58
 6 RUNOFF 1  14        1          .122          39.           .26
 6 RUNOFF 1  10        5          .018          39.          0.26
 6 REACH  3 103    5   6         1450.          1.2           1.5
 6 RUNOFF 1  12        7          .096          39.          0.52
 6 ADDHYD 4     3 6 7 1
 6 RUNOFF 1  11        5          .127          39.          0.58
 6 REACH  3 104    5   6          800.          1.2           1.5
 6 RUNOFF 1  13        7          .021          39.          0.22
 6 ADDHYD 4     6 6 7 4
 6 REACH  3 105    4   5          600.          7.4           1.5
 6 RUNOFF 1  26        6          .037          85.          0.33
 6 ADDHYD 4     7 5 6 7
 6 REACH  3 106    7   4          800.          7.4           1.5
 6 RUNOFF 1  27        2          .057          81.          0.49
 6 ADDHYD 4     8 2 4 5
 6 RUNOFF 1   8        7          .028          39.          0.28
 6 REACH  3 107    7   4         1850.          4.3           1.5
 6 RUNOFF 1  24        6          0.07          42.           .5
 6 ADDHYD 4    11 6 4 7
 6 REACH  3 108    7   4         3174.          7.4           1.5
 6 ADDHYD 4     8 4 5 6
 6 REACH  3 109    6   7         2323.          7.4           1.5
 6 RUNOFF 1  29        5          .065          82.          1.36
 6 ADDHYD 4     9 7 5 3
 6 RUNOFF 1  28        2          .047          54.           .27
 6 RUNOFF 1  64        5          .09           53.          0.14
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6 REACH   3 141    5    7          3700.          2.1          1.5
6 RUNOFF  1  62         4           .137          54.         0.93
6 ADDHYD  4    37 7 4 5
6 RUNOFF  1  65         6           .021          81.         0.25
6 REACH   3 147    6    4          4700.          2.1          1.5
6 ADDHYD  4    37 4 5 6
6 RUNOFF  1  58         5           .018          39.         0.13
6 REACH   3 151    5    7          1000.          7.4          1.5
6 ADDHYD  4    37 6 7 4
6 REACH   3 142    4    7          1300.          2.1          1.5
6 ADDHYD  4    38 2 7 4
6 REACH   3 143    4    5          1800.          2.1          1.5
6 ADDHYD  4    39 3 5 6
6 REACH   3 144    6    7          4600.          2.1          1.5
6 RUNOFF  1  61         5           .085          85.          0.5
6 ADDHYD  4    40 7 5 2
6 RUNOFF  1  35         5           .037          77.         0.25
6 REACH   3 111    5    6          1100.          2.1          1.5
6 RUNOFF  1  36         7           .049          39.          .58
6 ADDHYD  4    19 6 7 5
6 REACH   3 112    5    6          1432.          2.4          1.5
6 RUNOFF  1  43         7           .048          73.         0.26
6 ADDHYD  4    20 6 7 5
6 REACH   3 113    5    6          1819.          7.4          1.5
6 RUNOFF  1  41         7           .051          92.         0.54
6 ADDHYD  4    22 6 7 3
6 RUNOFF  1  31         5           .009          40.         0.14
6 REACH   3 114    5    6          2550.          1.2          1.5
6 RUNOFF  1  25         7           .057          39.         0.71
6 ADDHYD  4    12 6 7 5
6 REACH   3 115    5    6           350.          7.4          1.5
6 RUNOFF  1  33         7           .083          80.         0.45
6 ADDHYD  4    13 6 7 5
6 REACH   3 116    5    6           750.          7.4          1.5
6 RUNOFF  1  32         7           .043          79.         0.14
6 ADDHYD  4    14 6 7 5
6 REACH   3 117    5    4          2900.          7.4          1.5
6 RUNOFF  1  40         5           .121          82.         0.92
6 ADDHYD  4    33 4 5 6
6 RUNOFF  1  30         7           .052          81.         0.78
6 REACH   3 118    7    4          3000.          7.4          1.5
6 ADDHYD  4    33 6 4 5
6 REACH   3 139    5    4           800.          7.4          1.5
6 RUNOFF  1  59         5           .094          77.         0.35
6 ADDHYD  4    34 4 5 6
6 REACH   3 140    6    7          1900.          7.4          1.5
6 RUNOFF  1  60         4           .031          82.         0.63
6 ADDHYD  4    15 7 4 6
6 REACH   3 119    6    7           930.          7.4          1.5
6 ADDHYD  4    22 3 7 5
6 RUNOFF  1  23         6           .025          85.         0.33
6 REACH   3 120    6    7           700.          1.2          1.5
6 RUNOFF  1  22         4           .043          40.         0.25
6 ADDHYD  4    16 7 4 6
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6 REACH   3 121    6    7          650.          7.4          1.5
6 RUNOFF  1  34         6          .039          80.         0.48
6 RUNOFF  1  21         4          .036          77.         0.12
6 ADDHYD  4    17 7 6 3
6 ADDHYD  4    17 3 4 6
6 REACH   3 122    6    7         2200.          7.4          1.5
6 RUNOFF  1  37         6          .087          77.         0.52
6 ADDHYD  4    18 6 7 4
6 REACH   3 123    4    6          900.          7.4          1.5
6 RUNOFF  1  39         7          .029          77.          .59
6 ADDHYD  4    21 6 7 3
6 RUNOFF  1  38         6          .018          73.         0.21
6 ADDHYD  4    21 6 3 4
6 REACH   3 124    4    6         1600.          7.4          1.5
6 ADDHYD  4    22 6 5 7
6 REACH   3 125    7    5          550.          7.4          1.5
6 RUNOFF  1  42         6          .024          92.         0.28
6 ADDHYD  4    23 5 6 7
6 REACH   3 126    7    5         1300.          7.4          1.5
6 RUNOFF  1  45         6          .082          77.         0.36
6 RUNOFF  1  44         7          .028          77.         0.24
6 REACH   3 127    7    4         1600.          7.4          1.5
6 ADDHYD  4    24 5 6 7
6 ADDHYD  4    24 7 4 5
6 REACH   3 128    5    6          550.          7.4          1.5
6 RUNOFF  1  46         7          .01           90.         0.13
6 ADDHYD  4    25 7 6 3
6 REACH   3 148    2    7         2500.          4.8          1.5
6 ADDHYD  4    25 3 7 2
6 RUNOFF  1   6         5          .179          54.         0.62
6 REACH   3 137    5    6         2000.          2.1          1.5
6 RUNOFF  1  15         7          .048          72.         0.45
6 ADDHYD  4    32 6 7 5
6 RUNOFF  1  16         6          .097          84.         0.55
6 REACH   3 129    6    7          700.          7.4          1.5
6 ADDHYD  4    32 7 5 6
6 RUNOFF  1  17         5          .078          77.         0.56
6 REACH   3 130    5    7         1600.          7.4          1.5
6 ADDHYD  4    32 7 6 1
6 RUNOFF  1  18         1         .077           77.         0.48
6 RUNOFF  1  19         1          .04           39.         0.29
6 RUNOFF  1  52         5          .273          61.         0.53
6 REACH   3 131    5    6         3900.          4.8          1.5
6 RUNOFF  1  53         7          .232          78.         0.45
6 ADDHYD  4    31 6 7 1
6 RUNOFF  1  54         5          .037          61.         0.26
6 REACH   3 132    5    6         1300.          7.4          1.5
6 RUNOFF  1  51         7          .109          85.          0.5
6 RUNOFF  1  55         5          .038          77.         0.37
6 ADDHYD  4    28 6 7 4
6 ADDHYD  4    28 5 4 6
6 REACH   3 133    6    7         3174.          7.4          1.5
6 RUNOFF  1  56         5          .096          90.         0.65
6 ADDHYD  4    29 5 7 6
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6 REACH   3 138    6    7          1000.          7.4          1.5
6 RUNOFF  1  57         6           .018          85.         0.64
6 ADDHYD  4     30 6 7 4
6 RUNOFF  1  47         5           .035          85.         1.01
6 REACH   3 134    5    6          1150.          7.4          1.5
6 RUNOFF  1  49         7           .125          85.         0.35
6 RUNOFF  1  48         5           .053          85.         0.17
6 REACH   3 135    5    3          3097.          7.4          1.5
6 ADDHYD  4     26 6 7 5
6 ADDHYD  4     26 5 3 6
6 REACH   3 136    6    7          1000.          7.4          1.5
6 RUNOFF  1  50         5           .057          83.         0.6
6 ADDHYD  4     27 7 5 3
6 RUNOFF  1  85         5           .031          90.         0.25
6 ADDHYD  4     41 5 3 6
6 REACH   3 149    2    7          4200.          4.8          1.5
6 ADDHYD  4     41 7 6 2
6 REACH   3 150    2    3          3300.          4.8          1.5
6 RUNOFF  1  87         2           .025          85.         0.22
6 ADDHYD  4     45 2 3 7
6 ADDHYD  4     45 7 4 1                                          1 1   1   1
6 RUNOFF  1  63         1           .019          51.         0.32
  ENDATA
7 LIST
7 INCREM  6                  0.1
7 COMPUT  7 001     63          0.0          3.1          1.01 3  01  01
  ENDCMP  1
7 COMPUT  7 001     63          0.0          2.0          1.02 3  01  02
  ENDCMP  1
  ENDJOB  2
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SUMMARY TABLE 3 - DISCHARGE (CFS) AT XSECTIONS AND STRUCTURES FOR ALL STORMS AND ALTERNATES

XSECTION/ STRUCTURE ID	DRAINAGE AREA (SQ MI)	STORM NUMBERS..... 1	2
0 STRUCTURE 45	2.52		
+ ALTERNATE 1		2798.69	1285.58

1END OF 1 JOBS IN THIS RUN

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JOB TR-20                                                          NOPLOTS
TITLE 001 FUTURE CONDITION (LITTLE JOHNSON- 100YR.)
TITLE     2 HR STORM
 5 RAINFL 1                    .167
 8                  0.000       0.030       0.150       .4800       0.680
 8                  0.750       0.840       0.890       0.920       0.940
 8                  0.960       0.980       1.000       1.000       1.000
 9 ENDTBL
 5 RAINFL 2                    .167
 8                  0.000       0.050       0.240       .5700       0.660
 8                  0.720       0.770       0.830       0.860       0.910
 8                  0.940       0.970       1.000       1.000       1.000
 9 ENDTBL
 6 RUNOFF 1   1        5         .087         85.         0.13
 6 REACH  3 152    5   6        1000.         7.4          1.5
 6 RUNOFF 1  86        7         .014         92.          .15
 6 ADDHYD 4     43 7 6 5
 6 REACH  3 146    5   6        2000.         7.4          1.5
 6 RUNOFF 1   4        7         .088         88.          .2
 6 ADDHYD 4     44 7 6 1
 6 RUNOFF 1   2        7         .083         82.          .31
 6 RUNOFF 1   3        6         .022         82.          .23
 6 ADDHYD 4      4 6 7 3
 6 REACH  3 102    3   5        1900.         1.2          1.5
 6 RUNOFF 1   5        6         .114         86.          .25
 6 ADDHYD 4      5 5 6 1
 6 RUNOFF 1   7        1         .046         81.         0.04
 6 RUNOFF 1   9        1         .062         86.         0.23
 6 RUNOFF 1  14        1         .122         85.         0.56
 6 RUNOFF 1  10        5         .018         85.         0.23
 6 REACH  3 103    5   6        1450.         1.2          1.5
 6 RUNOFF 1  12        7         .096         86.         0.28
 6 ADDHYD 4      3 6 7 1
 6 RUNOFF 1  11        5         .127         85.         0.61
 6 REACH  3 104    5   6         800.         1.2          1.5
 6 RUNOFF 1  13        7         .021         88.         0.23
 6 ADDHYD 4      6 6 7 4
 6 REACH  3 105    4   5         600.         7.4          1.5
 6 RUNOFF 1  26        6         .037         85.         0.33
 6 ADDHYD 4      7 5 6 7
 6 REACH  3 106    7   4         800.         7.4          1.5
 6 RUNOFF 1  27        2         .057         85.         0.45
 6 ADDHYD 4      8 2 4 5
 6 RUNOFF 1   8        7         .028         92.         0.27
 6 REACH  3 107    7   4        1850.         4.3          1.5
 6 RUNOFF 1  24        6         0.07         92.          .9
 6 ADDHYD 4    11 6 4 7
 6 REACH  3 108    7   4        3174.         7.4          1.5
 6 ADDHYD 4      8 4 5 6
 6 REACH  3 109    6   7        2323.         7.4          1.5
 6 RUNOFF 1  29        5         .065         82.         1.36
 6 ADDHYD 4      9 7 5 3
 6 RUNOFF 1  28        2         .047         89.          .29
 6 RUNOFF 1  64        5         .09          88.         0.14
```

```
6 REACH   3 141    5    7          3700.          2.1          1.5
6 RUNOFF  1  62         4           .137          81.         0.62
6 ADDHYD  4     37 7 4 5
6 RUNOFF  1  65         6           .021          88.         0.33
6 REACH   3 147    6    4          4700.          2.1          1.5
6 ADDHYD  4     37 4 5 6
6 RUNOFF  1  58         5           .018          90.         0.13
6 REACH   3 151    5    7          1000.          7.4          1.5
6 ADDHYD  4     37 6 7 4
6 REACH   3 142    4    7          1300.          2.1          1.5
6 ADDHYD  4     38 2 7 4
6 REACH   3 143    4    5          1800. $0♦      2.1          1.5
6 ADDHYD  4     39 3 5 6
6 REACH   3 144    6    7          4600.          2.1          1.5
6 RUNOFF  1  61         5           .085          85.          0.5
6 ADDHYD  4     40 7 5 2
6 RUNOFF  1  35         5           .037          77.         0.25
6 REACH   3 111    5    6          1100.          2.1          1.5
6 RUNOFF  1  36         7           .049          83.          .58
6 ADDHYD  4     19 6 7 1
6 RUNOFF  1  43         5           .048          73.         0.26
6 REACH   3 113    5    6          1819.          7.4          1.5
6 RUNOFF  1  41         7           .051          92.         0.54
6 ADDHYD  4     22 6 7 3
6 RUNOFF  1  31         5           .009          85.         0.14
6 REACH   3 114    5    6          2550.          1.2          1.5
6 RUNOFF  1  25         7           .057          89.         1.22
6 ADDHYD  4     12 6 7 5
6 REACH   3 115    5    6           350.          7.4          1.5
6 RUNOFF  1  33         7           .083          80.         0.45
6 ADDHYD  4     13 6 7 5
6 REACH   3 116    5    6           750.          7.4          1.5
6 RUNOFF  1  32         7           .043          79.         0.14
6 ADDHYD  4     14 6 7 5
6 REACH   3 117    5    4          2900.          7.4          1.5
6 RUNOFF  1  40         5           .121          82.         0.92
6 ADDHYD  4     33 4 5 6
6 RUNOFF  1  30         7           .052          81.         0.78
6 REACH   3 118    7    4          3000.          7.4          1.5
6 ADDHYD  4     33 6 4 5
6 REACH   3 139    5    4           800.          7.4          1.5
6 RUNOFF  1  59         5           .094          77.         0.35
6 ADDHYD  4     34 4 5 6
6 REACH   3 140    6    7          1900.          7.4          1.5
6 RUNOFF  1  60         4           .031          82.         0.63
6 ADDHYD  4     15 7 4 6
6 REACH   3 119    6    7           930.          7.4          1.5
6 ADDHYD  4     22 3 7 5
6 RUNOFF  1  23         6           .025          92.          0.4
6 REACH   3 120    6    7           700.          1.2          1.5
6 RUNOFF  1  22         4           .043          85.         0.11
6 ADDHYD  4     16 7 4 6
6 REACH   3 121    6    7           650.          7.4          1.5
6 RUNOFF  1  34         6           .039          80.         0.48
```

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6 RUNOFF 1  21        4          .036          77.          0.12
6 ADDHYD 4     17 7 6 3
6 ADDHYD 4     17 3 4 6
6 REACH  3 122    6    7        2200.          7.4           1.5
6 RUNOFF 1  37        6          .087          77.          0.52
6 ADDHYD 4     18 6 7 4
6 REACH  3 123    4    6         900.          7.4           1.5
6 RUNOFF 1  39        7          .029          77.          0.59
6 ADDHYD 4     21 6 7 3
6 RUNOFF 1  38        6          .018          73.          0.21
6 ADDHYD 4     21 6 3 4
6 REACH  3 124    4    6        1600.          7.4           1.5
6 ADDHYD 4     22 6 5 7
6 REACH  3 125    7    5         550.          7.4           1.5
6 RUNOFF 1  42        6          .024          92.          0.28
6 ADDHYD 4     23 5 6 7
6 REACH  3 126    7    5        1300.          7.4           1.5
6 RUNOFF 1  45        6          .082          77.          0.36
6 RUNOFF 1  44        7          .028          77.          0.24
6 REACH  3 127    7    4        1600.          7.4           1.5
6 ADDHYD 4     24 5 6 7
6 ADDHYD 4     24 7 4 5
6 REACH  3 128    5    6         550.          7.4           1.5
6 RUNOFF 1  46        7          .01           90.          0.13
6 ADDHYD 4     25 7 6 3
6 REACH  3 148    2    7        2500.          4.8           1.5
6 ADDHYD 4     25 3 7 1
6 RUNOFF 1   6        5          .179          88.          0.62
6 REACH  3 137    5    6        2000.          2.1           1.5
6 RUNOFF 1  15        7          .048          88.          0.41
6 ADDHYD 4     32 6 7 5
6 RUNOFF 1  16        6          .097          84.          0.55
6 REACH  3 129    6    7         700.          7.4           1.5
6 ADDHYD 4     32 7 5 6
6 RUNOFF 1  17        5          .078          77.          0.56
6 REACH  3 130    5    7        1600.          7.4           1.5
6 ADDHYD 4     32 7 6 1
6 RUNOFF 1  18        1         .077           85.          0.48
6 RUNOFF 1  19        1          .04           85.          0.29
6 RUNOFF 1  52        5          .273          85.          0.26
6 REACH  3 131    5    6        3900.          4.8           1.5
6 RUNOFF 1  53        7          .232          85.          0.31
6 ADDHYD 4     31 6 7 1
6 RUNOFF 1  54        5          .037          81.          0.38
6 REACH  3 132    5    6        1300.          7.4           1.5
6 RUNOFF 1  51        7          .109          85.          0.5
6 RUNOFF 1  55        5          .038          77.          0.37
6 ADDHYD 4     28 6 7 4
6 ADDHYD 4     28 5 4 6
6 REACH  3 133    6    7        3174.          7.4           1.5
6 RUNOFF 1  56        5          .096          90.          0.65
6 ADDHYD 4     29 5 7 6
6 REACH  3 138    6    7        1000.          7.4           1.5
6 RUNOFF 1  57        6          .018          85.          0.64
```

```
6 ADDHYD 4     30 6 7 4
6 RUNOFF 1  47         5          .035          85.          1.01
6 REACH  3 134    5    6         1150.          7.4           1.5
6 RUNOFF 1  49         7          .125          85.          0.35
6 RUNOFF 1  48         5          .053          85.          0.17
6 REACH  3 135    5    3         3097.          7.4           1.5
6 ADDHYD 4     26 6 7 5
6 ADDHYD 4     26 5 3 6
6 REACH  3 136    6    7         1000.          7.4           1.5
6 RUNOFF 1  50         5          .057          83.          0.6
6 ADDHYD 4     27 7 5 3
6 RUNOFF 1  85         5          .031          90.          0.25
6 ADDHYD 4     41 5 3 6
6 REACH  3 150    3    3         3300.          4.8           1.5
6 RUNOFF 1  87         2          .025          85.          0.22
6 ADDHYD 4     45 2 3 7
6 ADDHYD 4     45 7 4 1                                                1 1   1   1
6 RUNOFF 1  63         1          .019          88.          0.22
  ENDATA
7 LIST
7 INCREM 6                  0.1
7 COMPUT 7 001     63          0.0           3.1           1.01 3  01  01
  ENDCMP 1
7 COMPUT 7 001     63          0.0           2.0           1.02 3  01  02
  ENDCMP 1
  ENDJOB 2
```

SUMMARY TABLE 3 - DISCHARGE (CFS) AT XSECTIONS AND STRUCTURES FOR ALL STORMS AND ALTERNATES

XSECTION/ STRUCTURE ID	DRAINAGE AREA (SQ MI)	STORM NUMBERS..... 1	2
0 STRUCTURE 45	.59		
+ ALTERNATE 1		1002.77	505.60

1END OF 1 JOBS IN THIS RUN

BIG JOHNSON RESERVOIR/CREWS GULCH

DRAINAGE BASIN PLANNING STUDY

TECHNICAL ADDENDUM

Section III

TR-20 Hydrology Input and Output Printouts

Big Johnson/Crews Gulch Basin Existing Condition
2-Hour Storm Duration
(See Map Pocket for Hydrology Map)

```
JOB TR-20                                                          NOPLOTS
TITLE 001 EXISTING CONDITION
TITLE     2 HR STORM
 5 RAINFL 1                    .167
 8                  0.000       0.030       0.150       .4800       0.680
 8                  0.750       0.840       0.890       0.920       0.940
 8                  0.960       0.980       1.000       1.000       1.000
 9 ENDTBL
 5 RAINFL 2                    .167
 8                  0.000       0.050       0.240       .5700       0.660
 8                  0.720       0.770       0.830       0.860       0.910
 8                  0.940       0.970       1.000       1.000       1.000
 9 ENDTBL
 6 RUNOFF 1  59        2         0.17        53.0        0.90           1
 6 REACH  3  58   2    3       2900.0         1.0         1.4
 6 RUNOFF 1  58        1         0.18        51.0        0.87           1
 6 ADDHYD 4    32 1 3 4
 6 RUNOFF 1  60        5         0.44        48.0        0.54           1
 6 ADDHYD 4    32 4 5 3                                                 1
 6 REACH  3  56   3    1       4200.0         0.7         1.4
 6 RUNOFF 1  56        6         0.22        49.0        0.53           1
 6 ADDHYD 4    34 1 6 5
 6 RUNOFF 1  61        1        0.082        51.0        0.34           1
 6 REACH  3  62   1    2       4500.0         0.9         1.4
 6 ADDHYD 4    34 5 2 4
 6 RUNOFF 1  62        6         0.24        56.0        0.48           1
 6 ADDHYD 4    34 4 6 5                                                 1
 6 RUNOFF 1  55        4         0.26        46.0        0.40           1
 6 ADDHYD 4    36 4 5 1
 6 RUNOFF 1  63        2         0.07        62.0        0.26           1
 6 ADDHYD 4    36 1 2 7                                                 1
 6 RUNOFF 1  57        1         0.07        56.0        0.52           1
 6 REACH  3  53   1    3       5300.0         0.9         1.4
 6 RUNOFF 1  53        2         0.31        54.0        0.63           1
 6 ADDHYD 4    63 2 3 4
 6 RUNOFF 1  54        2         0.12        46.0        0.54           1
 6 ADDHYD 4    63 2 4 3
 6 RUNOFF 1  52        2         0.11        75.0        0.42           1
 6 ADDHYD 4    63 2 3 4                                                 1
 6 RUNOFF 1  47        1         0.05        62.0        0.12           1
 6 ADDHYD 4    31 7 1 5
 6 RUNOFF 1  48        2         0.13        65.0        0.24           1
 6 ADDHYD 4    31 5 2 3
 6 RUNOFF 1  49        2         0.04        69.0        0.15           1
 6 ADDHYD 4    31 2 3 5
 6 RUNOFF 1  50        6         0.04        74.0        0.15           1
 6 ADDHYD 4    31 5 6 7
 6 RUNOFF 1  51        6         0.03        75.0        0.13           1
 6 ADDHYD 4    31 6 7 3
 6 RUNOFF 1  64        2         0.11        62.0        0.73           1
 6 ADDHYD 4    31 3 2 6
 6 RUNOFF 1  70        1          0.4       100.0        2.21           1
 6 ADDHYD 4    31 1 6 7                                                 1
 6 ADDHYD 4    31 4 7 6                                    1 1    1     1
```

```
6 RUNOFF 1  29        1        0.09        71.0        0.24          1
6 REACH  3  30   1    2     1500.0         1.6        1.18
6 RUNOFF 1  31        3        0.11        69.0         .82          1
6 ADDHYD 4    30 2 3 4
6 RUNOFF 1  30        5        0.06        74.0        0.75          1
6 ADDHYD 4    30 4 5 7
6 RUNOFF 1  32        1        0.03        73.0        0.24          1
6 ADDHYD 4    30 1 7 2
6 RUNOFF 1  65        7        0.17        63.0        0.40          1
6 REACH  3  31   7    5     2900.0         3.2         1.1
6 ADDHYD 4    30 5 2 3                                              1
6 REACH  3  33   3    4     1050.0         0.5        1.56
6 RUNOFF 1  36        1        0.02        63.0        0.19          1
6 REACH  3  35   1    2     1350.0         1.1         1.4
6 RUNOFF 1  35        3        0.02        66.0        0.23          1
6 ADDHYD 4    29 2 3 5
6 RUNOFF 1  37        7        0.07        65.0        0.63          1
6 ADDHYD 4    29 5 7 1                                              1
6 REACH  3  38   1    2     1250.0         0.9         1.4
6 ADDHYD 4    28 2 4 5
6 RUNOFF 1  66        2        0.08        62.0        0.49          1
6 REACH  3  34   2    1     3500.0         0.7         1.4
6 ADDHYD 4    28 5 1 2
6 RUNOFF 1  34        3        0.13        68.0        0.77          1
6 ADDHYD 4    28 2 3 4                                              1
6 REACH  3  45   4    5      850.0         0.4         1.4
6 RUNOFF 1  45        7        0.01        75.0        0.05          1
6 ADDHYD 4    27 5 7 4
6 RUNOFF 1  38        1        0.08        66.0        0.53          1
6 ADDHYD 4    27 1 4 2                                              1
6 RUNOFF 1  33        3        0.08        69.0        0.41          1
6 ADDHYD 4    26 2 3 4
6 RUNOFF 1  46        5        0.03        71.0        0.10          1
6 ADDHYD 4    26 5 4 7
6 RUNOFF 1  43        1        0.05        63.0        0.31          1
6 ADDHYD 4    26 1 7 5
6 RUNOFF 1  41        2        0.02        62.0        0.24          1
6 ADDHYD 4    26 2 5 7
6 RUNOFF 1  39        3        0.02        63.0        0.20          1
6 ADDHYD 4    26 3 7 5
6 RUNOFF 1  44        1        0.02       100.0        0.53          1
6 ADDHYD 4    26 1 5 7
6 RUNOFF 1  40        4        0.03        62.0        0.25          1
6 REACH  3  39   4 0  5     1003.0         2.6         1.2           1
6 ADDHYD 4    26 5 7 4
6 RUNOFF 1  67        1        0.43        62.0         .52          1
6 REACH  3  67   1    2     1200.0         0.4         1.6
6 ADDHYD 4    26 4 2 3
6 RUNOFF 1  42        1        0.01        62.0        0.15          1
6 REACH  3  41   1    2     1162.0         0.9         1.4
6 ADDHYD 4    26 2 3 4                                  1 1   1     1
6 RUNOFF 1  25        7        0.05        70.0        0.26          1
6 RUNOFF 1  26        3        0.03        63.0        0.41          1
6 ADDHYD 4    25 3 7 1                                              1
```

```
6 REACH   3   24    1    2          800.0          2.2          1.5
6 RUNOFF  1   24         3            0.01         72.0         0.15          1
6 ADDHYD  4     24 2 3 5                                                      1
6 REACH   3   23    5    7          800.0          1.6          1.5
6 RUNOFF  1   23         1            0.04         77.0         0.20          1
6 REACH   3   23    1    2          800.0          1.6          1.5
6 ADDHYD  4     13 2 7 5
6 RUNOFF  1   22         1            0.02         64.0         0.31          1
6 ADDHYD  4     13 1 5 7                                                      1
6 REACH   3   22    7    5         2250.0          1.0          1.5
6 RUNOFF  1   21         1            0.07         63.0         0.27          1
6 ADDHYD  4     11 5 1 2
6 RUNOFF  1   27         3            0.09         62.0         0.31          1
6 REACH   3   28    3    5         1900.0          0.9          1.5
6 RUNOFF  1   28         7            0.06         63.0         0.40          1
6 ADDHYD  4     12 5 7 3                                                      1
6 ADDHYD  4     11 3 2 5                                                      1
6 REACH   3   18    5    7         1267.2          2.4          1.3
6 RUNOFF  1   18         1            0.05         75.0         0.12          1
6 ADDHYD  4     10 1 7 2
6 RUNOFF  1   20         3            0.03         79.0         0.14          1
6 REACH   3   20    3    5         1130.0          8.8          1.1
6 ADDHYD  4     10 5 2 1                                             1        1
6 REACH   3   17    1    2          650.0          1.9          1.2
6 RUNOFF  1   17         3            0.02         82.0        0.091          1
6 ADDHYD  4      9 2 3 5                                             1        1
6 REACH   3   14    5    7          600.0          5.4          1.4
6 RUNOFF  1   19         1            0.01         70.0         0.18          1
6 REACH   3   19    1    2          600.0          1.6          1.4
6 ADDHYD  4      7 2 7 5
6 RUNOFF  1   14         1            0.01         78.0         0.11          1
6 ADDHYD  4      7 1 5 7
6 RUNOFF  1   12         2            0.02         90.0         0.21          1
6 ADDHYD  4      7 2 7 5
6 RUNOFF  1   16         1            0.04         79.0         0.28          1
6 RUNOFF  1   68         2            0.03         77.0         0.10          1
6 ADDHYD  4      8 1 2 3                                                      1
6 REACH   3   15    3    7          540.0          1.6          1.2
6 ADDHYD  4      7 7 5 3
6 ADDHYD  4      7 3 4 7                                                      1
6 REACH   3   13    7    5         1267.2          1.1          1.3
6 RUNOFF  1   15         1            0.01         74.0         0.36          1
6 ADDHYD  4      6 5 1 2
6 RUNOFF  1   13         3            0.02         75.0         0.20          1
6 ADDHYD  4      6 2 3 4                                                      1
6 REACH   3   11    4    5          650.0          0.7          1.4
6 RUNOFF  1   10         7            0.01         72.0         0.15          1
6 ADDHYD  4      5 5 7 4
6 RUNOFF  1   11         1            0.01         69.0         0.54          1
6 ADDHYD  4      5 1 4 5
6 RUNOFF  1   69         2            0.01         68.0         0.25          1
6 ADDHYD  4      5 2 5 7                                                      1
6 REACH   3    8    7    5         1161.6          0.9          1.4
6 RUNOFF  1    8         1            0.01         64.0         0.22          1
```

```
6 ADDHYD 4      4 5 1 2
6 RUNOFF 1   9         3        0.03        77.0        0.16          1
6 ADDHYD 4      4 2 3 4                                              1
6 REACH  3   7    4    5     1200.0         0.4         1.6
6 RUNOFF 1   5         7        0.01        65.0        0.27          1
6 ADDHYD 4      3 5 7 4
6 RUNOFF 1   6         1        0.03        77.0        0.31          1
6 ADDHYD 4      3 1 4 2
6 RUNOFF 1   7         3        0.01        65.0        0.29          1
6 REACH  3   6    3    4      600.0         1.0         1.6
6 ADDHYD 4      3 2 4 5                                        1 1   1   1
6 REACH  3   3    5    7     1372.8         0.2         1.6
6 RUNOFF 1   4         1        0.01        62.0        0.33          1
6 REACH  3   3    1    2     1372.8         0.2         1.6
6 ADDHYD 4      2 2 7 5
6 RUNOFF 1   2         1        0.01        81.0        0.09          1
6 ADDHYD 4      2 1 5 7
6 RUNOFF 1   3         1        0.03        72.0        0.04          1
6 ADDHYD 4      2 1 7 2
6 RUNOFF 1  71         3        0.01        83.0        0.08          1
6 ADDHYD 4      2 2 3 4                                              1
6 REACH  3   1    4    5     1795.2         0.2         1.6
6 RUNOFF 1   1         2        0.02        63.0        0.05          1
6 ADDHYD 4      1 2 5 7                                              1
  ENDATA
7 LIST
7 INCREM 6                  0.1
7 COMPUT 7  59         1        0.0         3.1        1.01 3   01   01
  ENDCMP 1
7 COMPUT 7  59         1        0.0         2.0        1.02 3   01   02
  ENDCMP 1
  ENDJOB 2
```

SUMMARY TABLE 3 - DISCHARGE (CFS) AT XSECTIONS AND STRUCTURES FOR ALL STORMS AND ALTERNATES

XSECTION/ STRUCTURE ID	DRAINAGE AREA (SQ MI)	STORM NUMBERS..... 1	2
0 STRUCTURE 63	.61		
ALTERNATE 1		348.91	97.85
0 STRUCTURE 36	1.66		
ALTERNATE 1		604.49	150.53
0 STRUCTURE 34	1.33		
ALTERNATE 1		483.40	122.05
0 STRUCTURE 32	.79		
ALTERNATE 1		294.55	72.85
0 STRUCTURE 31	3.07		
ALTERNATE 1		1351.48	503.42
0 STRUCTURE 30	.46		
ALTERNATE 1		427.38	154.20
0 STRUCTURE 29	.11		
ALTERNATE 1		96.99	32.56
0 STRUCTURE 28	.78		
ALTERNATE 1		682.05	236.79
0 STRUCTURE 27	.87		
ALTERNATE 1		754.48	261.54
0 STRUCTURE 26	1.56		
ALTERNATE 1		1323.85	450.13
0 STRUCTURE 25	.08		
ALTERNATE 1		104.76	38.60
0 STRUCTURE 24	.09		
ALTERNATE 1		121.04	47.19
0 STRUCTURE 13	.15		
ALTERNATE 1		223.04	94.87
0 STRUCTURE 12	.15		
ALTERNATE 1		150.62	45.45

SUMMARY TABLE 3 - DISCHARGE (CFS) AT XSECTIONS AND STRUCTURES FOR ALL STORMS AND ALTERNATES

XSECTION/ STRUCTURE ID		DRAINAGE AREA (SQ MI)	STORM NUMBERS..... 1	2
0 STRUCTURE 11		.37		
ALTERNATE	1		439.91	146.62
0 STRUCTURE 10		.45		
ALTERNATE	1		523.67	185.95
0 STRUCTURE 9		.47		
ALTERNATE	1		566.03	196.45
0 STRUCTURE 8		.07		
ALTERNATE	1		140.99	68.58
0 STRUCTURE 7		2.14		
ALTERNATE	1		1873.85	635.37
0 STRUCTURE 6		2.17		
ALTERNATE	1		1902.94	643.82
0 STRUCTURE 5		2.20		
ALTERNATE	1		1929.93	652.60
0 STRUCTURE 4		2.24		
ALTERNATE	1		1962.22	663.93
0 STRUCTURE 3		2.29		
ALTERNATE	1		2015.20	680.40
0 STRUCTURE 2		2.35		
ALTERNATE	1		2067.00	698.44
0 STRUCTURE 1		2.37		
ALTERNATE	1		2081.83	697.16
0 XSECTION 1		.02		
ALTERNATE	1		33.94	15.59
0 XSECTION 2		.01		
ALTERNATE	1		28.57	16.57
0 XSECTION 3		.03		
ALTERNATE	1		72.58	39.23

SUMMARY TABLE 3 - DISCHARGE (CFS) AT XSECTIONS AND STRUCTURES FOR ALL STORMS AND ALTERNATES

XSECTION/ STRUCTURE ID		DRAINAGE AREA (SQ MI)	STORM NUMBERS..... 1	2
0 XSECTION	4	.01		
ALTERNATE	1		10.59	3.36
0 XSECTION	5	.01		
ALTERNATE	1		13.19	4.80
0 XSECTION	6	.03		
ALTERNATE	1		55.44	25.02
0 XSECTION	7	.01		
ALTERNATE	1		12.90	4.48
0 XSECTION	8	.01		
ALTERNATE	1		13.43	4.97
XSECTION	9	.03		
ALTERNATE	1		66.09	32.21
0 XSECTION	10	.01		
ALTERNATE	1		19.08	8.42
0 XSECTION	11	.01		
ALTERNATE	1		10.90	4.05
0 XSECTION	12	.02		
ALTERNATE	1		57.85	34.02
0 XSECTION	13	.02		
ALTERNATE	1		40.18	18.99
0 XSECTION	14	.01		
ALTERNATE	1		24.78	13.61
0 XSECTION	15	.01		
ALTERNATE	1		15.66	6.71
0 XSECTION	16	.04		
ALTERNATE	1		80.90	40.49
0 XSECTION	17	.02		
ALTERNATE	1		58.90	34.56

SUMMARY TABLE 3 - DISCHARGE (CFS) AT XSECTIONS AND STRUCTURES FOR ALL STORMS AND ALTERNATES

XSECTION/ STRUCTURE ID	DRAINAGE AREA (SQ MI)	STORM NUMBERS..... 1	2
0 XSECTION 18	.05		
ALTERNATE 1		102.98	56.66
0 XSECTION 19	.01		
ALTERNATE 1		17.63	7.56
0 XSECTION 20	.03		
ALTERNATE 1		69.85	38.94
0 XSECTION 21	.07		
ALTERNATE 1		84.33	27.25
0 XSECTION 22	.02		
ALTERNATE 1		23.68	8.11
0 XSECTION 23	.04		
ALTERNATE 1		85.39	41.78
0 XSECTION 24	.01		
ALTERNATE 1		19.08	8.42
0 XSECTION 25	.05		
ALTERNATE 1		78.78	32.85
0 XSECTION 26	.03		
ALTERNATE 1		30.30	9.64
0 XSECTION 27	.09		
ALTERNATE 1		97.15	30.97
0 XSECTION 28	.06		
ALTERNATE 1		61.86	19.63
0 XSECTION 29	.09		
ALTERNATE 1		149.75	65.36
0 XSECTION 30	.06		
ALTERNATE 1		64.41	26.19
0 XSECTION 31	.11		
ALTERNATE 1		97.34	36.02

SUMMARY TABLE 3 - DISCHARGE (CFS) AT XSECTIONS AND STRUCTURES FOR ALL STORMS AND ALTERNATES

XSECTION/ STRUCTURE ID	DRAINAGE AREA (SQ MI)	STORM NUMBERS..... 1	2
0 XSECTION 32	.03		
ALTERNATE 1		53.07	24.21
0 XSECTION 33	.08		
ALTERNATE 1		101.13	37.68
0 XSECTION 34	.13		
ALTERNATE 1		114.39	41.35
0 XSECTION 35	.02		
ALTERNATE 1		28.70	11.17
0 XSECTION 36	.02		
ALTERNATE 1		26.73	9.68
0 XSECTION 37	.07		
ALTERNATE 1		62.24	21.09
0 XSECTION 38	.08		
ALTERNATE 1		80.02	27.81
0 XSECTION 39	.03		
ALTERNATE 1		35.12	10.57
0 XSECTION 40	.03		
ALTERNATE 1		35.62	11.77
0 XSECTION 41	.02		
ALTERNATE 1		24.02	7.96
0 XSECTION 42	.01		
ALTERNATE 1		13.58	4.55
0 XSECTION 43	.05		
ALTERNATE 1		56.54	18.70
0 XSECTION 44	.02		
ALTERNATE 1		45.39	28.22
0 XSECTION 45	.01		
ALTERNATE 1		25.94	14.46

SUMMARY TABLE 3 - DISCHARGE (CFS) AT XSECTIONS AND STRUCTURES FOR ALL STORMS AND ALTERNATES

XSECTION/ STRUCTURE ID	DRAINAGE AREA (SQ MI)	STORM NUMBERS..... 1	2
0 XSECTION 46	.03		
+ ALTERNATE 1		59.52	29.75
0 XSECTION 47	.05		
+ ALTERNATE 1		69.62	24.13
0 XSECTION 48	.13		
+ ALTERNATE 1		178.70	66.97
0 XSECTION 49	.04		
+ ALTERNATE 1		69.74	28.74
0 XSECTION 50	.04		
+ ALTERNATE 1		80.90	39.12
XSECTION 51	.03		
ALTERNATE 1		62.05	32.88
0 XSECTION 52	.11		
+ ALTERNATE 1		166.78	71.57
0 XSECTION 53	.31		
+ ALTERNATE 1		165.52	40.11
0 XSECTION 54	.12		
+ ALTERNATE 1		41.64	8.44
0 XSECTION 55	.26		
+ ALTERNATE 1		96.79	19.02
0 XSECTION 56	.22		
+ ALTERNATE 1		94.49	20.18
0 XSECTION 57	.07		
+ ALTERNATE 1		44.30	11.00
0 XSECTION 58	.18		
+ ALTERNATE 1		72.50	18.13
0 XSECTION 59	.17		
+ ALTERNATE 1		75.03	19.47

SUMMARY TABLE 3 - DISCHARGE (CFS) AT XSECTIONS AND STRUCTURES FOR ALL STORMS AND ALTERNATES

XSECTION/ STRUCTURE ID	DRAINAGE AREA (SQ MI)	STORM NUMBERS..... 1	2
0 XSECTION 60	.44		
+ ALTERNATE 1		175.66	37.05
0 XSECTION 61	.08		
+ ALTERNATE 1		48.26	9.44
0 XSECTION 62	.24		
+ ALTERNATE 1		159.25	39.21
0 XSECTION 63	.07		
+ ALTERNATE 1		81.87	25.38
0 XSECTION 64	.11		
+ ALTERNATE 1		79.94	24.86
0 XSECTION 65	.17		
+ ALTERNATE 1		175.26	55.61
0 XSECTION 66	.08		
+ ALTERNATE 1		70.17	21.67
0 XSECTION 67	.43		
+ ALTERNATE 1		369.50	114.21
0 XSECTION 68	.03		
+ ALTERNATE 1		73.56	40.19
0 XSECTION 69	.01		
+ ALTERNATE 1		15.00	6.09
0 XSECTION 70	.40		
+ ALTERNATE 1		355.52	215.44
0 XSECTION 71	.01		
+ ALTERNATE 1		30.94	18.53

1END OF 1 JOBS IN THIS RUN

BIG JOHNSON RESERVOIR/CREWS GULCH

DRAINAGE BASIN PLANNING STUDY

TECHNICAL ADDENDUM

Section IV

TR-20 Hydrology Input and Output Printouts

Big Johnson/Crews Gulch Basin Existing Condition
24-Hour Storm Duration
(See Map Pocket for Hydrology Map)

```
JOB TR-20                                                          NOPLOTS
TITLE 001 EXISTING CONDITION BIG JOHNSON
TITLE     24 HR TYPE IIA CURVE
 5 RAINFL 1                    .50
 8                  0.000       .0025       0.005       .0075       0.010
 8                  0.015       0.020       0.025       0.030       0.050
 8                  0.060       0.100       0.700       0.750       0.780
 8                  0.798       0.820       0.830       0.840       0.850
 8                  0.860       0.865       0.870       0.885       0.890
 8                  0.900       0.905       0.910       0.915       0.921
 8                  0.927       0.933       0.940       0.945       0.950
 8                  0.955       0.960       0.965       0.970       0.975
 8                  0.980       0.983       0.985       0.988       0.990
 8                  0.993       0.995       0.998       1.000       1.000
 9 ENDTBL
 6 RUNOFF 1  59        2         0.17        53.0        0.90           1
 6 REACH  3  58   2    3       2900.0         1.0         1.4
 6 RUNOFF 1  58        1         0.18        51.0        0.87           1
 6 ADDHYD 4    32 1 3 4
 6 RUNOFF 1  60        5         0.44        48.0        0.54           1
 6 ADDHYD 4    32 4 5 3                                                 1
 6 REACH  3  56   3    1       4200.0         0.7         1.4
 6 RUNOFF 1  56        6         0.22        49.0        0.53           1
 6 ADDHYD 4    34 1 6 5
 6 RUNOFF 1  61        1        0.082        51.0        0.34           1
 6 REACH  3  62   1    2       4500.0         0.9         1.4
 6 ADDHYD 4    34 5 2 4
 6 RUNOFF 1  62        6         0.24        56.0        0.48           1
 6 ADDHYD 4    34 4 6 5                                                 1
 6 RUNOFF 1  55        4         0.26        46.0        0.40           1
 6 ADDHYD 4    36 4 5 1
 6 RUNOFF 1  63        2         0.07        62.0        0.26           1
 6 ADDHYD 4    36 1 2 7                                                 1
 6 RUNOFF 1  57        1         0.07        56.0        0.52           1
 6 REACH  3  53   1    3       5300.0         0.9         1.4
 6 RUNOFF 1  53        2         0.31        54.0        0.63           1
 6 ADDHYD 4    63 2 3 4
 6 RUNOFF 1  54        2         0.12        46.0        0.54           1
 6 ADDHYD 4    63 2 4 3
 6 RUNOFF 1  52        2         0.11        75.0        0.42           1
 6 ADDHYD 4    63 2 3 4                                                 1
 6 RUNOFF 1  47        1         0.05        62.0        0.12           1
 6 ADDHYD 4    31 7 1 5
 6 RUNOFF 1  48        2         0.13        65.0        0.24           1
 6 ADDHYD 4    31 5 2 3
 6 RUNOFF 1  49        2         0.04        69.0        0.15           1
 6 ADDHYD 4    31 2 3 5
 6 RUNOFF 1  50        6         0.04        74.0        0.15           1
 6 ADDHYD 4    31 5 6 7
 6 RUNOFF 1  51        6         0.03        75.0        0.13           1
 6 ADDHYD 4    31 6 7 3
 6 RUNOFF 1  64        2         0.11        62.0        0.73           1
 6 ADDHYD 4    31 3 2 6
 6 RUNOFF 1  70        1          0.4       100.0        2.21           1
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6 ADDHYD 4     31 1 6 7                                                    1
6 ADDHYD 4     31 4 7 6                                          1 1    1   1
6 RUNOFF 1  29         1        0.09          71.0          0.24           1
6 REACH  3  30    1    2      1500.0           1.6          1.18
6 RUNOFF 1  31         3        0.11          69.0           .82           1
6 ADDHYD 4     30 2 3 4
6 RUNOFF 1  30         5        0.06          74.0          0.75           1
6 ADDHYD 4     30 4 5 7
6 RUNOFF 1  32         1        0.03          73.0          0.24           1
6 ADDHYD 4     30 1 7 2
6 RUNOFF 1  65         7        0.17          63.0          0.40           1
6 REACH  3  31    7    5      2900.0           3.2           1.1
6 ADDHYD 4     30 5 2 3                                                    1
6 REACH  3  33    3    4      1050.0           0.5          1.56
6 RUNOFF 1  36         1        0.02          63.0          0.19           1
6 REACH  3  35    1    2      1350.0           1.1           1.4
6 RUNOFF 1  35         3        0.02          66.0          0.23           1
6 ADDHYD 4     29 2 3 5
6 RUNOFF 1  37         7        0.07          65.0          0.63           1
6 ADDHYD 4     29 5 7 1                                                    1
6 REACH  3  38    1    2      1250.0           0.9           1.4
6 ADDHYD 4     28 2 4 5
6 RUNOFF 1  66         2        0.08          62.0          0.49           1
6 REACH  3  34    2    1      3500.0           0.7           1.4
6 ADDHYD 4     28 5 1 2
6 RUNOFF 1  34         3        0.13          68.0          0.77           1
6 ADDHYD 4     28 2 3 4                                                    1
6 REACH  3  45    4    5       850.0           0.4           1.4
6 RUNOFF 1  45         7        0.01          75.0          0.05           1
6 ADDHYD 4     27 5 7 4
6 RUNOFF 1  38         1        0.08          66.0          0.53           1
6 ADDHYD 4     27 1 4 2                                                    1
6 RUNOFF 1  33         3        0.08          69.0          0.41           1
6 ADDHYD 4     26 2 3 4
6 RUNOFF 1  46         5        0.03          71.0          0.10           1
6 ADDHYD 4     26 5 4 7
6 RUNOFF 1  43         1        0.05          63.0          0.31           1
6 ADDHYD 4     26 1 7 5
6 RUNOFF 1  41         2        0.02          62.0          0.24           1
6 ADDHYD 4     26 2 5 7
6 RUNOFF 1  39         3        0.02          63.0          0.20           1
6 ADDHYD 4     26 3 7 5
6 RUNOFF 1  44         1        0.02         100.0          0.53           1
6 ADDHYD 4     26 1 5 7
6 RUNOFF 1  40         4        0.03          62.0          0.25           1
6 REACH  3  39    4 0  5      1003.0           2.6           1.2           1
6 ADDHYD 4     26 5 7 4
6 RUNOFF 1  67         1        0.43          62.0           .52           1
6 REACH  3  67    1    2      1200.0           0.4           1.6
6 ADDHYD 4     26 4 2 3
6 RUNOFF 1  42         1        0.01          62.0          0.15           1
6 REACH  3  41    1    2      1162.0           0.9           1.4
6 ADDHYD 4     26 2 3 4                                          1 1    1   1
6 RUNOFF 1  25         7        0.05          70.0          0.26           1
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6 RUNOFF 1  26        3        0.03        63.0        0.41        1
6 ADDHYD 4    25 3 7 1                                            1
6 REACH  3  24    1    2      800.0         2.2         1.5
6 RUNOFF 1  24         3        0.01        72.0        0.15        1
6 ADDHYD 4    24 2 3 5                                            1
6 REACH  3  23    5    7      800.0         1.6         1.5
6 RUNOFF 1  23         1        0.04        77.0        0.20        1
6 REACH  3  23    1    2      800.0         1.6         1.5
6 ADDHYD 4    13 2 7 5
6 RUNOFF 1  22         1        0.02        64.0        0.31        1
6 ADDHYD 4    13 1 5 7                                            1
6 REACH  3  22    7    5     2250.0         1.0         1.5
6 RUNOFF 1  21         1        0.07        63.0        0.27        1
6 ADDHYD 4    11 5 1 2
6 RUNOFF 1  27         3        0.09        62.0        0.31        1
6 REACH  3  28    3    5     1900.0         0.9         1.5
6 RUNOFF 1  28         7        0.06        63.0        0.40        1
6 ADDHYD 4    12 5 7 3                                            1
6 ADDHYD 4    11 3 2 5                                            1
6 REACH  3  18    5    7     1267.2         2.4         1.3
6 RUNOFF 1  18         1        0.05        75.0        0.12        1
6 ADDHYD 4    10 1 7 2
6 RUNOFF 1  20         3        0.03        79.0        0.14        1
6 REACH  3  20    3    5     1130.0         8.8         1.1
6 ADDHYD 4    10 5 2 1                                  1           1
6 REACH  3  17    1    2      650.0         1.9         1.2
6 RUNOFF 1  17         3        0.02        82.0       0.091        1
6 ADDHYD 4     9 2 3 5                                  1           1
6 REACH  3  14    5    7      600.0         5.4         1.4
6 RUNOFF 1  19         1        0.01        70.0        0.18        1
6 REACH  3  19    1    2      600.0         1.6         1.4
6 ADDHYD 4     7 2 7 5
6 RUNOFF 1  14         1        0.01        78.0        0.11        1
6 ADDHYD 4     7 1 5 7
6 RUNOFF 1  12         2        0.02        90.0        0.21        1
6 ADDHYD 4     7 2 7 5
6 RUNOFF 1  16         1        0.04        79.0        0.28        1
6 RUNOFF 1  68         2        0.03        77.0        0.10        1
6 ADDHYD 4     8 1 2 3                                             1
6 REACH  3  15    3    7      540.0         1.6         1.2
6 ADDHYD 4     7 7 5 3
6 ADDHYD 4     7 3 4 7                                             1
6 REACH  3  13    7    5     1267.2         1.1         1.3
6 RUNOFF 1  15         1        0.01        74.0        0.36        1
6 ADDHYD 4     6 5 1 2
6 RUNOFF 1  13         3        0.02        75.0        0.20        1
6 ADDHYD 4     6 2 3 4                                             1
6 REACH  3  11    4    5      650.0         0.7         1.4
6 RUNOFF 1  10         7        0.01        72.0        0.15        1
6 ADDHYD 4     5 5 7 4
6 RUNOFF 1  11         1        0.01        69.0        0.54        1
6 ADDHYD 4     5 1 4 5
6 RUNOFF 1  69         2        0.01        68.0        0.25        1
6 ADDHYD 4     5 2 5 7                                             1
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6 REACH   3    8     7     5        1161.6          0.9          1.4
6 RUNOFF  1    8           1          0.01         64.0         0.22                1
6 ADDHYD  4       4  5  1  2
6 RUNOFF  1    9           3          0.03         77.0         0.16                1
6 ADDHYD  4       4  2  3  4                                                       1
6 REACH   3    7     4     5        1200.0          0.4          1.6
6 RUNOFF  1    5           7          0.01         65.0         0.27                1
6 ADDHYD  4       3  5  7  4
6 RUNOFF  1    6           1          0.03         77.0         0.31                1
6 ADDHYD  4       3  1  4  2
6 RUNOFF  1    7           3          0.01         65.0         0.29                1
6 REACH   3    6     3     4         600.0          1.0          1.6
6 ADDHYD  4       3  2  4  5                                              1  1    1    1
6 REACH   3    3     5     7        1372.8          0.2          1.6
6 RUNOFF  1    4           1          0.01         62.0         0.33                1
6 REACH   3    3     1     2        1372.8          0.2          1.6
6 ADDHYD  4       2  2  7  5
6 RUNOFF  1    2           1          0.01         81.0         0.09                1
6 ADDHYD  4       2  1  5  7
6 RUNOFF  1    3           1          0.03         72.0         0.04                1
6 ADDHYD  4       2  1  7  2
6 RUNOFF  1   71           3          0.01         83.0         0.08                1
6 ADDHYD  4       2  2  3  4                                                       1
6 REACH   3    1     4     5        1795.2          0.2          1.6
6 RUNOFF  1    1           2          0.02         63.0         0.05                1
6 ADDHYD  4       1  2  5  7                                                       1
  ENDATA
7 LIST
7 INCREM  6                      0.1
7 COMPUT  7   59           1          0.0          4.5         1.01 2   01   01
  ENDCMP  1
7 COMPUT  7   59           1          0.0          3.0         1.01 2   01   02
  ENDCMP  1
  ENDJOB  2
```

SUMMARY TABLE 3 - DISCHARGE (CFS) AT XSECTIONS AND STRUCTURES FOR ALL STORMS AND ALTERNATES

XSECTION/ STRUCTURE ID	DRAINAGE AREA (SQ MI)	STORM NUMBERS..... 1	2
0 STRUCTURE 63	.61		
ALTERNATE 1		220.53	71.01
0 STRUCTURE 36	1.66		
ALTERNATE 1		199.82	26.80
0 STRUCTURE 34	1.33		
ALTERNATE 1		145.85	13.71
0 STRUCTURE 32	.79		
ALTERNATE 1		85.39	5.01
0 STRUCTURE 31	3.07		
ALTERNATE 1		795.29	306.91
0 STRUCTURE 30	.46		
ALTERNATE 1		340.72	116.03
0 STRUCTURE 29	.11		
ALTERNATE 1		72.19	20.66
0 STRUCTURE 28	.78		
ALTERNATE 1		508.74	167.88
0 STRUCTURE 27	.87		
ALTERNATE 1		556.66	177.18
0 STRUCTURE 26	1.56		
ALTERNATE 1		945.86	281.95
0 STRUCTURE 25	.08		
ALTERNATE 1		90.35	33.29
0 STRUCTURE 24	.09		
ALTERNATE 1		103.99	39.04
0 STRUCTURE 13	.15		
ALTERNATE 1		197.60	81.03
0 STRUCTURE 12	.15		
ALTERNATE 1		109.93	27.31

SUMMARY TABLE 3 - DISCHARGE (CFS) AT XSECTIONS AND STRUCTURES FOR ALL STORMS AND ALTERNATES

XSECTION/ STRUCTURE ID	DRAINAGE AREA (SQ MI)	STORM NUMBERS..... 1	2
0 STRUCTURE 11	.37		
ALTERNATE 1		350.45	113.94
0 STRUCTURE 10	.45		
ALTERNATE 1		425.98	145.45
0 STRUCTURE 9	.47		
ALTERNATE 1		468.68	172.07
0 STRUCTURE 8	.07		
ALTERNATE 1		144.50	69.57
0 STRUCTURE 7	2.14		
ALTERNATE 1		1390.50	427.59
0 STRUCTURE 6	2.17		
ALTERNATE 1		1427.57	433.45
0 STRUCTURE 5	2.20		
ALTERNATE 1		1456.06	444.34
0 STRUCTURE 4	2.24		
ALTERNATE 1		1503.34	464.22
0 STRUCTURE 3	2.29		
ALTERNATE 1		1575.87	493.90
0 STRUCTURE 2	2.35		
ALTERNATE 1		1601.39	485.02
0 STRUCTURE 1	2.37		
ALTERNATE 1		1599.13	456.43
0 XSECTION 1	.02		
ALTERNATE 1		29.77	10.47
0 XSECTION 2	.01		
ALTERNATE 1		27.42	14.59
0 XSECTION 3	.03		
ALTERNATE 1		66.15	30.59

SUMMARY TABLE 3 - DISCHARGE (CFS) AT XSECTIONS AND STRUCTURES FOR ALL STORMS AND ALTERNATES

XSECTION/ STRUCTURE ID	DRAINAGE AREA (SQ MI)	STORM NUMBERS..... 1	2
0 XSECTION 4	.01		
+ ALTERNATE 1		7.96	2.16
0 XSECTION 5	.01		
+ ALTERNATE 1		10.61	3.51
0 XSECTION 6	.03		
+ ALTERNATE 1		53.38	24.92
0 XSECTION 7	.01		
+ ALTERNATE 1		10.34	3.39
0 XSECTION 8	.01		
+ ALTERNATE 1		10.72	3.48
0 XSECTION 9	.03		
ALTERNATE 1		64.15	30.81
0 XSECTION 10	.01		
+ ALTERNATE 1		17.97	7.75
0 XSECTION 11	.01		
+ ALTERNATE 1		8.95	3.23
0 XSECTION 12	.02		
+ ALTERNATE 1		59.82	35.42
0 XSECTION 13	.02		
+ ALTERNATE 1		37.25	16.95
0 XSECTION 14	.01		
+ ALTERNATE 1		24.21	12.12
0 XSECTION 15	.01		
+ ALTERNATE 1		14.83	6.39
0 XSECTION 16	.04		
+ ALTERNATE 1		79.48	38.91
0 XSECTION 17	.02		
+ ALTERNATE 1		56.40	30.50

SUMMARY TABLE 3 - DISCHARGE (CFS) AT XSECTIONS AND STRUCTURES FOR ALL STORMS AND ALTERNATES

XSECTION/ STRUCTURE ID	DRAINAGE AREA (SQ MI)	STORM NUMBERS..... 1	2
0 XSECTION 18	.05		
ALTERNATE 1		107.24	50.35
0 XSECTION 19	.01		
ALTERNATE 1		15.54	6.25
0 XSECTION 20	.03		
ALTERNATE 1		71.08	35.76
0 XSECTION 21	.07		
ALTERNATE 1		65.97	19.76
0 XSECTION 22	.02		
ALTERNATE 1		18.82	5.80
0 XSECTION 23	.04		
ALTERNATE 1		80.54	38.25
0 XSECTION 24	.01		
ALTERNATE 1		17.97	7.75
0 XSECTION 25	.05		
ALTERNATE 1		70.46	28.15
0 XSECTION 26	.03		
ALTERNATE 1		22.03	6.28
0 XSECTION 27	.09		
ALTERNATE 1		74.52	20.47
0 XSECTION 28	.06		
ALTERNATE 1		45.04	12.76
0 XSECTION 29	.09		
ALTERNATE 1		132.36	55.44
0 XSECTION 30	.06		
ALTERNATE 1		55.72	22.99
0 XSECTION 31	.11		
ALTERNATE 1		71.44	25.48

SUMMARY TABLE 3 - DISCHARGE (CFS) AT XSECTIONS AND STRUCTURES FOR ALL STORMS AND ALTERNATES

XSECTION/ STRUCTURE ID	DRAINAGE AREA (SQ MI)	STORM NUMBERS..... 1	2
0 XSECTION 32	.03		
ALTERNATE 1		48.25	21.25
0 XSECTION 33	.08		
ALTERNATE 1		84.85	30.99
0 XSECTION 34	.13		
ALTERNATE 1		83.25	28.71
0 XSECTION 35	.02		
ALTERNATE 1		23.72	8.36
0 XSECTION 36	.02		
ALTERNATE 1		21.00	6.46
0 XSECTION 37	.07		
ALTERNATE 1		44.05	13.50
0 XSECTION 38	.08		
ALTERNATE 1		60.99	19.65
0 XSECTION 39	.03		
ALTERNATE 1		27.12	7.34
0 XSECTION 40	.03		
ALTERNATE 1		27.78	8.00
0 XSECTION 41	.02		
ALTERNATE 1		18.47	5.33
0 XSECTION 42	.01		
ALTERNATE 1		10.84	3.15
0 XSECTION 43	.05		
ALTERNATE 1		44.19	12.90
0 XSECTION 44	.02		
ALTERNATE 1		55.54	37.03
0 XSECTION 45	.01		
ALTERNATE 1		24.11	11.77

SUMMARY TABLE 3 - DISCHARGE (CFS) AT XSECTIONS AND STRUCTURES FOR ALL STORMS AND ALTERNATES

XSECTION/ STRUCTURE ID	DRAINAGE AREA (SQ MI)	STORM NUMBERS..... 1	2
0 XSECTION 46	.03		
ALTERNATE 1		57.49	24.92
0 XSECTION 47	.05		
ALTERNATE 1		58.79	17.69
0 XSECTION 48	.13		
ALTERNATE 1		143.56	48.25
0 XSECTION 49	.04		
ALTERNATE 1		62.98	24.93
0 XSECTION 50	.04		
ALTERNATE 1		77.98	35.28
0 XSECTION 51	.03		
ALTERNATE 1		62.99	29.41
0 XSECTION 52	.11		
ALTERNATE 1		156.06	67.83
0 XSECTION 53	.31		
ALTERNATE 1		77.83	8.42
0 XSECTION 54	.12		
ALTERNATE 1		9.46	.28
0 XSECTION 55	.26		
ALTERNATE 1		25.97	.65
0 XSECTION 56	.22		
ALTERNATE 1		31.89	1.10
0 XSECTION 57	.07		
ALTERNATE 1		24.87	3.72
0 XSECTION 58	.18		
ALTERNATE 1		24.14	1.57
0 XSECTION 59	.17		
ALTERNATE 1		28.81	2.84

SUMMARY TABLE 3 - DISCHARGE (CFS) AT XSECTIONS AND STRUCTURES FOR ALL STORMS AND ALTERNATES

XSECTION/ STRUCTURE ID	DRAINAGE AREA (SQ MI)	STORM NUMBERS..... 1	2
0 XSECTION 60	.44		
+ ALTERNATE 1		52.39	1.75
0 XSECTION 61	.08		
+ ALTERNATE 1		21.94	.86
0 XSECTION 62	.24		
+ ALTERNATE 1		91.79	13.41
0 XSECTION 63	.07		
+ ALTERNATE 1		63.69	18.20
0 XSECTION 64	.11		
+ ALTERNATE 1		49.67	12.95
0 XSECTION 65	.17		
ALTERNATE 1		127.60	36.16
0 XSECTION 66	.08		
+ ALTERNATE 1		49.67	13.04
0 XSECTION 67	.43		
+ ALTERNATE 1		252.23	65.65
0 XSECTION 68	.03		
+ ALTERNATE 1		71.59	35.35
0 XSECTION 69	.01		
+ ALTERNATE 1		12.98	4.89
0 XSECTION 70	.40		
+ ALTERNATE 1		401.37	267.58
0 XSECTION 71	.01		
+ ALTERNATE 1		29.26	16.13

1END OF 1 JOBS IN THIS RUN

BIG JOHNSON RESERVOIR/CREWS GULCH

DRAINAGE BASIN PLANNING STUDY

TECHNICAL ADDENDUM

Section V

TR-20 Hydrology Input and Output Printouts

Big Johnson/Crews Gulch Basin
Selected Plan Hydrology
Reaches 1 through 4

```
JOB TR-20                                                       NOPLOTS
TITLE 001 FUTURE CONDITION - DETENTION AT MCRAE (ALTERNATIVE 3)
TITLE     2 HR STORM
 5 RAINFL 1                .167
 8                0.000      0.030      0.150      .4800      0.680
 8                0.750      0.840      0.890      0.920      0.940
 8                0.960      0.980      1.000      1.000      1.000
 9 ENDTBL
 5 RAINFL 2                .167
 8                0.000      0.050      0.240      .5700      0.660
 8                0.720      0.770      0.830      0.860      0.910
 8                0.940      0.970      1.000      1.000      1.000
 9 ENDTBL
 3 STRUCT      61
 8                      00.        0.         0.
 8                       5.        24.        5.0
 8                      10.        48.        10.0
 9 ENDTBL
 3 STRUCT      32
 8                      00.        0.         0.
 8                       5.        73.        20.
 8                      10.       146.        45.0
 8                      15.       220.        75.0
 8                      20.       295.        95.
 9 ENDTBL
 3 STRUCT      62
 8                      00.        0.         0.
 8                       5.        22.        4.0
 8                      10.        44.        8.00
 9 ENDTBL
 3 STRUCT      98
 8                     13.8        0.         0.
 8                     14.0       20.         .7
 8                     16.0       200.       9.36
 8                     18.4       580.       23.36
 8                     20.0        900.      25.02
 8                     22.0       1200.      42.22
 8                     24.0       1500.      62.64
 8                     26.0       1700.      86.36
 9 ENDTBL
 6 RUNOFF 1  59       2          0.17        92.0       0.37
 6 REACH  3  58   2   3        2900.0         0.4       1.54
 6 RUNOFF 1  58       1          0.18        92.0       0.36
 6 ADDHYD 4    32 1 3 4
 6 RUNOFF 1  60       5          0.44        92.0       0.26
 6 ADDHYD 4    32 4 5 3
 6 RESVOR 2    32 3   4            0.
 6 REACH  3  56   4   1        4200.0         0.4       1.54
 6 RUNOFF 1  56       6          0.22        92.0       0.20
 6 ADDHYD 4    34 1 6 5
 6 RUNOFF 1  61       1         0.082        92.0       0.16
 6 RESVOR 2    62 1   3            0.
 6 REACH  3  62   3   2        4500.0         0.4       1.54
 6 ADDHYD 4    34 5 2 4
```

NOTE:

SELECTED PLAN HYDROLOGY FOR AREAS BELOW BIG JOHNSON DES.

```
6 RUNOFF 1  62        6        0.24        92.0        0.21
6 ADDHYD 4    34 4 6 5
6 RUNOFF 1  55        4        0.26        84.0        0.28
6 ADDHYD 4    36 4 5 1
6 RUNOFF 1  63        2        0.07        77.0        0.26
6 ADDHYD 4    36 1 2 7
6 RUNOFF 1  57        1        0.07        92.0        0.21
6 RESVOR 2    61 1    2          0.
6 REACH  3  53    2    3      5300.0         0.4        1.54
6 RUNOFF 1  53        2        0.31        92.0        0.28
6 ADDHYD 4    63 2 3 4
6 RUNOFF 1  54        2        0.12        77.0        0.22
6 ADDHYD 4    63 2 4 3
6 RUNOFF 1  52        2        0.11        91.0        0.14
6 ADDHYD 4    63 2 3 4
6 RUNOFF 1  47        1        0.05        92.0        0.09
6 ADDHYD 4    31 7 1 5
6 RUNOFF 1  48        2        0.13        84.0        0.04
6 ADDHYD 4    31 5 2 3
6 RUNOFF 1  49        2        0.04        81.0        0.10
6 ADDHYD 4    31 2 3 5
6 RUNOFF 1  50        6        0.04        89.0        0.10
6 ADDHYD 4    31 5 6 7
6 RUNOFF 1  51        6        0.03        92.0        0.09
6 ADDHYD 4    31 6 7 3
6 RUNOFF 1  64        2        0.11        77.0        0.34
6 ADDHYD 4    31 3 2 6
6 RUNOFF 1  70        1         0.4       100.0        2.21
6 ADDHYD 4    31 1 6 7
6 ADDHYD 4    31 4 7 6
6 RUNOFF 1  29        1        0.09        76.0        0.19
6 REACH  3  30    1    2      1500.0          .6        1.46
6 RUNOFF 1  31        3        0.11        69.0         .61
6 ADDHYD 4    30 2 3 4
6 RUNOFF 1  30        5        0.06        74.0        0.39
6 ADDHYD 4    30 4 5 7
6 RUNOFF 1  32        1        0.03        73.0        0.16
6 ADDHYD 4    30 1 7 2
6 RUNOFF 1  65        7        0.17        73.0        0.20
6 REACH  3  31    7    5      2900.0          0.6        1.46
6 ADDHYD 4    30 5 2 3                                          1
6 REACH  3  33    3    4      1050.0          0.5         1.6
6 RUNOFF 1  36        1        0.02        63.0        0.19
6 REACH  3  35    1    2      1350.0          1.1         1.4
6 RUNOFF 1  35        3        0.02        66.0        0.23
6 ADDHYD 4    29 2 3 5
6 RUNOFF 1  37        7        0.07        65.0        0.63
6 ADDHYD 4    29 5 7 1
6 REACH  3  38    1    2      1250.0          0.9         1.4
6 ADDHYD 4    28 2 4 5
6 RUNOFF 1  66        2        0.08        62.0        0.23
6 REACH  3  34    2    1      3500.0          0.9        1.54
6 ADDHYD 4    28 5 1 2
6 RUNOFF 1  34        3        0.13        68.0        0.38
```

```
6 ADDHYD 4    28 2 3 4                                                  1
6 REACH  3  45   4   5       850.0        0.4        1.4
6 RUNOFF 1  45       7         0.01       75.0       0.05
6 ADDHYD 4    27 5 7 4
6 RUNOFF 1  38       1         0.08       66.0       0.53
6 ADDHYD 4    27 1 4 2                                                  1
6 RUNOFF 1  33       3         0.08       69.0       0.23
6 ADDHYD 4    26 2 3 4
6 RUNOFF 1  46       5         0.03       71.0       0.06
6 ADDHYD 4    26 5 4 7
6 RUNOFF 1  43       1         0.05       63.0       0.31
6 ADDHYD 4    26 1 7 5
6 RUNOFF 1  41       2         0.02       62.0       0.24
6 ADDHYD 4    26 2 5 7
6 RUNOFF 1  39       3         0.02       63.0       0.20
6 ADDHYD 4    26 3 7 5
6 RUNOFF 1  44       1         0.02      100.0       0.53
6 ADDHYD 4    26 1 5 7
6 RUNOFF 1  40       4         0.03       62.0       0.25
6 REACH  3  39   4 0 5      1003.0        1.2        1.3
6 ADDHYD 4    26 5 7 4
6 RUNOFF 1  67       1         0.43       62.0       .52
6 REACH  3  67   1   2      1200.0        0.4        1.6
6 ADDHYD 4    26 4 2 3
6 RUNOFF 1  42       1         0.01       62.0       0.15
6 REACH  3  41   1   2      1162.0        0.9        1.4
6 ADDHYD 4    26 2 3 1                                    1 1   1   1
6 RESVOR 2    98 1   4        13.8                        1 1   1   1
6 RUNOFF 1  25       7         0.05       70.0       0.26
6 RUNOFF 1  26       3         0.03       77.0       0.41
6 ADDHYD 4    25 3 7 1
6 REACH  3  24   1   2       800.0        2.2        1.5
6 RUNOFF 1  24       3         0.01       72.0       0.15
6 ADDHYD 4    24 2 3 5
6 REACH  3  23   5   7       800.0        1.6        1.5
6 RUNOFF 1  23       1         0.04       77.0       0.20
6 REACH  3  23   1   2       800.0        1.6        1.5
6 ADDHYD 4    13 2 7 5
6 RUNOFF 1  22       1         0.02       86.0       0.14
6 ADDHYD 4    13 1 5 7
6 REACH  3  22   7   5      2250.0        1.0        1.5
6 RUNOFF 1  21       1         0.07       82.0       0.27
6 ADDHYD 4    11 5 1 2
6 RUNOFF 1  27       3         0.09       92.0       0.31
6 REACH  3  28   3   5      1900.0        0.4        1.5
6 RUNOFF 1  28       7         0.06       75.0       0.20
6 ADDHYD 4    12 5 7 3
6 ADDHYD 4    11 3 2 5
6 REACH  3  18   5   7      1267.2        2.4        1.3
6 RUNOFF 1  18       1         0.05       75.0       0.12
6 ADDHYD 4    10 1 7 2
6 RUNOFF 1  20       3         0.03       79.0       0.14
6 REACH  3  20   3   5      1130.0        8.8        1.1
6 ADDHYD 4    10 5 2 1
```

```
6 REACH  3 17   1   2       650.0        1.9        1.2
6 RUNOFF 1 17       3         0.02       82.0       0.09
6 ADDHYD 4    9 2 3 5
6 REACH  3 14   5   7       600.0        5.4        1.5
6 RUNOFF 1 19       1         0.01       70.0       0.18
6 REACH  3 19   1   2       600.0        1.6        1.4
6 ADDHYD 4    7 2 7 5
6 RUNOFF 1 14       1         0.01       78.0       0.11
6 ADDHYD 4    7 1 5 7
6 RUNOFF 1 12       2         0.02       90.0       0.21
6 ADDHYD 4    7 2 7 5
6 RUNOFF 1 16       1         0.04       79.0       0.28
6 RUNOFF 1 68       2         0.03       77.0       0.10
6 ADDHYD 4    8 1 2 3
6 REACH  3 15   3   7       540.0        1.6        1.2
6 ADDHYD 4    7 7 5 3
6 ADDHYD 4    7 3 4 7                                          1
6 REACH  3 13   7   5      1267.2        1.1        1.3
6 RUNOFF 1 15       1         0.01       74.0       0.36
6 ADDHYD 4    6 5 1 2
6 RUNOFF 1 13       3         0.02       75.0       0.20
6 ADDHYD 4    6 2 3 4                                          1
6 REACH  3 11   4   5       650.0        0.7        1.4
6 RUNOFF 1 10       7         0.01       72.0       0.15
6 ADDHYD 4    5 5 7 4
6 RUNOFF 1 11       1         0.01       69.0       0.54
6 ADDHYD 4    5 1 4 5
6 RUNOFF 1 69       2         0.01       68.0       0.25
6 ADDHYD 4    5 2 5 7                                          1
6 REACH  3  8   7   5      1161.6        0.9        1.4
6 RUNOFF 1  8       1         0.01       64.0       0.22
6 ADDHYD 4    4 5 1 2
6 RUNOFF 1  9       3         0.03       77.0       0.16
6 ADDHYD 4    4 2 3 4                                          1
6 REACH  3  7   4   5      1200.0        0.3        1.6
6 RUNOFF 1  5       7         0.01       92.0       0.14
6 ADDHYD 4    3 5 7 4
6 RUNOFF 1  6       1         0.03       77.0       0.33
6 ADDHYD 4    3 1 4 2
6 RUNOFF 1  7       3         0.01       65.0       0.30
6 REACH  3  6   3   4       600.0        0.4        1.6
6 ADDHYD 4    3 2 4 5                                    1 1   1   1
6 REACH  3  3   5   7      1372.8        0.2        1.6
6 RUNOFF 1  4       1         0.01       62.0       0.33
6 REACH  3  3   1   2      1372.8        0.2        1.6
6 ADDHYD 4    2 2 7 5
6 RUNOFF 1  2       1         0.01       81.0       0.09
6 ADDHYD 4    2 1 5 7
6 RUNOFF 1  3       1         0.03       88.0       0.04
6 ADDHYD 4    2 1 7 2
6 RUNOFF 1 71       3         0.01       83.0       0.08
6 ADDHYD 4    2 2 3 4                                          1
6 REACH  3  1   4   5      1795.2        0.2        1.6
6 RUNOFF 1  1       2         0.02       63.0       0.05
```

```
6 ADDHYD 4     1 2 5 7                                          1
  ENDATA
7 LIST
7 INCREM 6                  0.1
7 COMPUT 7  59       1        0.0         3.1          1.01 3  01  01
  ENDCMP 1
7 COMPUT 7  59       1        0.0         2.0          1.02 3  01  02
  ENDCMP 1
  ENDJOB 2
```

SUMMARY TABLE 3 - DISCHARGE (CFS) AT XSECTIONS AND STRUCTURES FOR ALL STORMS AND ALTERNATES

XSECTION/ STRUCTURE ID	DRAINAGE AREA (SQ MI)	STORM NUMBERS..... 1	2
0 STRUCTURE 98	1.56		
+ ALTERNATE 1		1127.62	381.44
0 STRUCTURE 30	.46		
+ ALTERNATE 1		657.35	266.00
0 STRUCTURE 28	.78		
+ ALTERNATE 1		974.15	356.85
0 STRUCTURE 27	.87		
+ ALTERNATE 1		1055.61	382.97
0 STRUCTURE 26	1.56		
+ ALTERNATE 1		1692.44	576.67
0 STRUCTURE 7	2.14		
+ ALTERNATE 1		1775.46	582.13
0 STRUCTURE 6	2.17		
+ ALTERNATE 1		1804.88	589.42
0 STRUCTURE 5	2.20		
+ ALTERNATE 1		1831.96	596.99
0 STRUCTURE 4	2.24		
+ ALTERNATE 1		1864.32	607.03
0 STRUCTURE 3	2.29		
+ ALTERNATE 1		1922.67	625.94
0 STRUCTURE 2	2.35		
+ ALTERNATE 1		1979.59	643.32
0 STRUCTURE 1	2.37		
+ ALTERNATE 1		1994.41	640.55

1END OF 1 JOBS IN THIS RUN

BIG JOHNSON RESERVOIR/CREWS GULCH

DRAINAGE BASIN PLANNING STUDY

TECHNICAL ADDENDUM

Section VI

TR-20 Hydrology Input and Output Printouts

Big Johnson/Crews Gulch Basin
Selected Plan Hydrology
Reach 5

Selected Hydrology
ABOVE BJR

WQ Ponds @ BJR

```
Opqpur@ype0wrgty^w0tuvvsu0?? [illegible]
Abort, Retry, Ignore, Fail? [illegible]

...> type

******************80-80 LIST OF INPUT DATA [illegible]

JOB TR-20                                              SUMMARY   NOPLOTS
TITLE 001 FUTURE CONDITION - SELECTED PLAN AT BIG JOHNSON
TITLE     2 HR TYPE STORM FN: BJSEL2.DAT    (ALT 1-1)
 5 RAINFL 1                  .167
 8               0.000      .0300      0.150      .4900      0.650
 8               0.750      0.840      0.890      0.920      0.940
 8               0.960      0.980      1.000      1.000      1.000
 9 ENDTBL
 5 RAINFL 2                  .167
 8               0.000      0.050      0.240      .5700      0.650
 8               0.720      0.770      [illegible] [illegible] 0.910
 8               0.940      0.970      1.000      1.000      1.000
 9 ENDTBL
 3 STRUCT      61
 8                     00.        0.         0.
 8                      5.        24.        5.0
 8                     10.        48.        10.0
 9 ENDTBL
 3 STRUCT      32
 8                     00.        0.         0.
 8                      .5        20.        10.0
                       1.5        40.        25.0
 8                     2.5        60.        30.0
 8                     3.5        80.        35.0
 8                     4.5        81.        45.0
 8                     5.5        82.        55.0
 8                     6.5        83.        80.0
 8                     7.5        84.        100.0
 8                     8.5        95.        120.0
 8                     9.5        95.        150.0
 8                     10.5       100.       175.0
 9 ENDTBL
 3 STRUCT      62
 8                     00.        0.         0.
 8                      5.        22.        4.9
 8                     10.        44.        [illegible]
 9 ENDTBL
 3 STRUCT      77
 8                     [illegible] 0.        [illegible]
 8                     [illegible] [illegible] [illegible]
 8                     [illegible] [illegible] [illegible]
 9 ENDTBL
 3 STRUCT      88
 8                     0.0        0.         0.
 8                     4.0          50.      14.
 8                     9.0        1400.       30.


***********************80-80 LIST OF INPUT DATA CONTINUED [illegible]

 9 ENDTBL
 3 STRUCT      65
```

```
 8                    0.0          0.          0.
 8                    4.0         30.         11.
 8                    8.0        900.         36.
 9 ENDTBL
 6 RUNOFF 1  59       2          0.17        92.0        0.37
 6 REACH  3  58   2   3        2900.0         0.4        1.54
 6 RUNOFF 1  58       1          0.18        92.0        0.36
   ADDHYD 4    32 1 3 4
 6 RUNOFF 1  60       5          0.44        92.0        0.26
 6 ADDHYD 4    32 4 5 3
 6 RESVOR 2    32 3   4           0.
 6 REACH  3  56   4   1        4200.0         0.4        1.54
 6 RUNOFF 1  56       6          0.22        92.0        0.20
 6 ADDHYD 4    34 1 6 5
 6 RUNOFF 1  61       1         0.082        92.0        0.16
 6 RESVOR 2    62 1   3           0.
 6 REACH  3  62   3   2        4500.0         0.4        1.54
 6 ADDHYD 4    34 5 2 4
 6 RUNOFF 1  62       6          0.24        92.0        0.21
 6 ADDHYD 4    34 4 6 5
 6 RUNOFF 1  55       4          0.26        84.0        0.28
 6 ADDHYD 4    34 4 5 6
 6 RUNOFF 1  63       2          0.07        77.0        0.26
 6 ADDHYD 4    34 6 2 4                                     1 1   1   1
 6 RESVOR 2    77 4   7           0.                         1 1   1   1
 6 RUNOFF 1  57       1          0.07        92.0        0.21
 6 RESVOR 2    61 1   2           0.
 6 REACH  3  53   2   3        5300.0         0.4        1.54
 6 RUNOFF 1  53       2          0.31        92.0        0.28
 6 ADDHYD 4    63 2 3 4
 6 RUNOFF 1  54       2          0.12        77.0        0.22
 6 ADDHYD 4    63 2 4 3
 6 RUNOFF 1  52       2          0.11        91.0        0.14
   ADDHYD 4    63 3 2 1                                     1 1   1   1
 6 RESVOR 2    88 1   5           0.                         1 1   1   1
 6 RUNOFF 1  48       2          0.13        84.0        0.04
 6 RUNOFF 1  49       3          0.04        81.0        0.10
 6 ADDHYD 4    65 2 3 1
 6 RUNOFF 1  50       2          0.04        89.0        0.10
 6 ADDHYD 4    65 1 2 3
 6 RUNOFF 1  51       2          0.03        92.0        0.09
 6 ADDHYD 4    65 2 3 1                                     1 1   1
 6 RESVOR 2    66 1   2           0.                         1 1   1   1
 6 RUNOFF 1  70       1           0.4       100.0        2.31
1
```

```
**********80-80 LIST OF INPUT DATA (CONTINUED)**********

 6 ADDHYD 4    31 1 2 4
 6 ADDHYD 4    31 4 7 6
 6 RUNOFF 1  64       1          0.11        77.0        0.34
 6 RUNOFF 1  47       2           .05        77.0        0.09
 6 ADDHYD 4    31 1 2 3                                     1 1   1   1
 6 ADDHYD 4    31 6 3 4
 6 ADDHYD 4    99 4 5 1                                     1 1   1   1
   ENDATA
   LIST
 6 INCREM 6                 0.1
 7 COMPUT 7  59      99         0.0         3.1          1.01 3  01  01
   ENDCMP 1
 7 COMPUT 7  59      99         0.0         2.0          1.02 3  01  02
   ENDCMP 1
   ENDJOB 2
0**********END OF 80-80 LIST**********
```

EXECUTIVE CONTROL OPERATION ENDJOB RECORD ID

TR20 XEQ 6/ 1/91 15:10 FUTURE CONDITION - SELECTED PLAN AT BIG JOHNSON JOB 1 SUMMARY
REV PC/09/83 2 HR TYPE STORM FN: BJSEL1.DAT (ALT 1-1) PAGE 1

SUMMARY TABLE 1 - SELECTED RESULTS OF STANDARD AND EXECUTIVE CONTROL INSTRUCTIONS IN THE ORDER PERFORMED
(A STAR(*) AFTER THE PEAK DISCHARGE TIME AND RATE (CFS) VALUES INDICATES A FLAT TOP HYDROGRAPH
A QUESTION MARK(?) INDICATES A HYDROGRAPH WITH PEAK AS LAST POINT.)

SECTION/ STRUCTURE ID	STANDARD CONTROL OPERATION	DRAINAGE AREA (SQ MI)	RAIN TABLE #	ANTEC MOIST COND	MAIN TIME INCREM (HR)	PRECIPITATION BEGIN (HR)	PRECIPITATION AMOUNT (IN)	PRECIPITATION DURATION (HR)	RUNOFF AMOUNT (IN)	PEAK DISCHARGE ELEVATION (FT)	PEAK DISCHARGE TIME (HR)	PEAK DISCHARGE RATE (CFS)	PEAK DISCHARGE RATE (CFSM)
ALTERNATE 1 STORM 1													
XSECTION 59	RUNOFF	.17	1	3	.10	.0	3.10	2.00	2.73	---	.72	415.64	2445.0
XSECTION 58	REACH	.17	1	3	.10	.0	3.10	2.00	2.73	---	.88	373.90	2199.4
XSECTION 58	RUNOFF	.18	1	3	.10	.0	3.10	2.00	2.73	---	.72	445.33	2474.1
STRUCTURE 32	ADDHYD	.35	1	3	.10	.0	3.10	2.00	2.73	142.95	.79	762.23	2177.8
XSECTION 60	RUNOFF	.44	1	3	.10	.0	3.10	2.00	2.73	---	.64	1238.42	2814.6
STRUCTURE 32	ADDHYD	.79	1	3	.10	.0	3.10	2.00	2.73	363.84	.69	1946.70	2462.9
JCTURE 32	RESVOR	.79	1	3	.10	.0	3.10	2.00	2.68	7.62	2.27	94.12	119.5
XSECTION 56	REACH	.79	1	3	.10	.0	3.10	2.00	2.68	---	2.83	84.00	106.3
XSECTION 56	RUNOFF	.22	1	3	.10	.0	3.10	2.00	2.74	---	.60	680.80	3093.6
STRUCTURE 34	ADDHYD	1.01	1	3	.10	.0	3.10	2.00	2.69	---	.61	657.26	660.7
XSECTION 61	RUNOFF	.08	1	3	.10	.0	3.10	2.00	2.76	---	.58	252.15	3075.0
STRUCTURE 62	RESVOR	.08	1	3	.10	.0	3.10	2.00	2.73	10.00	1.26	43.98	536.3
XSECTION 62	REACH	.08	1	3	.10	.0	3.10	2.00	2.73	---	1.85	39.94	486.9
STRUCTURE 34	ADDHYD	1.09	1	3	.10	.0	3.10	2.00	2.69	---	.61	670.91	614.6
XSECTION 62	RUNOFF	.24	1	3	.10	.0	3.10	2.00	2.74	---	.61	716.12	2983.8
STRUCTURE 34	ADDHYD	1.33	1	3	.10	.0	3.10	2.00	2.70	---	.61	1387.02	1041.3
XSECTION 55	RUNOFF	.26	1	3	.10	.0	3.10	2.00	2.39	---	.65	605.28	2328.0
STRUCTURE 34	ADDHYD	1.59	1	3	.10	.0	3.10	2.00	2.65	---	.63	1973.42	1239.9
XSECTION 63	RUNOFF	.07	1	3	.10	.0	3.10	2.00	2.00	---	.69	136.36	1948.0
STRUCTURE 34	ADDHYD	1.66	1	3	.10	.0	3.10	2.00	2.62	---	.63	2105.07	1266.8
STRUCTURE 77	RESVOR	1.44	1	3	.10	.0	3.10	2.00	2.41	5.45	1.13	793.59	877.8
XSECTION 57	RUNOFF	.07	1	3	.10	.0	3.10	2.00	2.74	---	.61	268.87	2963.8
STRUCTURE 61	RESVOR	.07	1	3	.10	.0	3.10	2.00	2.72	7.03	1.34	33.78	372.3
XSECTION 53	REACH	.97	1	3	.10	.0	3.10	2.00	2.72	---	2.18	29.85	329.4
XSECTION 53	RUNOFF	.31	1	3	.10	.0	3.10	2.00	2.73	---	.65	836.46	2698.2
STRUCTURE 63	ADDHYD	.38	1	3	.10	.0	3.10	2.00	2.73	---	.65	838.99	2207.4
XSECTION 54	RUNOFF	.12	1	3	.10	.0	3.10	2.00	2.01	---	.65	245.49	3079.7
UCTURE 63	ADDHYD	.50	1	3	.10	.0	3.10	2.00	2.56	---	.65	1083.44	2166.9
XSECTION 52	RUNOFF	.11	1	3	.10	.0	3.10	2.00	2.72	---	.54	259.41	3367.4
STRUCTURE 63	ADDHYD	.61	1	3	.10	.0	3.10	2.00	2.59	---	.64	1403.51	2301.3
STRUCTURE 88	RESVOR	.61	1	3	.10	.0	3.10	2.00	2.58	6.91	.82	499.09	1634.3
XSECTION 48	RUNOFF	.13	1	3	.10	.0	3.10	2.00	2.45	---	.59	179.11	2211.2

MARY TABLE 1 - SELECTED RESULTS OF STANDARD AND EXECUTIVE CONTROL INSTRUCTIONS IN THE ORDER PERFORMED
(A STAR(*) AFTER THE PEAK DISCHARGE TIME AND RATE (CFS) VALUES INDICATES A FLAT TOP HYDROGRAPH
A QUESTION MARK(?) INDICATES A HYDROGRAPH WITH PEAK AS LAST POINT.)

SECTION/ STRUCTURE ID	STANDARD CONTROL OPERATION	DRAINAGE AREA (SQ MI)	RAIN TABLE #	ANISEC MOIST COND	MAIN TIME INCREM (HR)	PRECIPITATION BEGIN (HR)	PRECIPITATION AMOUNT (IN)	PRECIPITATION DURATION (HR)	RUNOFF AMOUNT (IN)	PEAK DISCHARGE ELEVATION (FT)	PEAK DISCHARGE TIME (HR)	PEAK DISCHARGE RATE (CFS)	PEAK DISCHARGE (CSM)
ALTERNATE 1 STORM 1													
XSECTION 49	RUNOFF	.04	1	3	.10	.0	3.10	2.00	2.26	---	.53	111.79	2794.9
STRUCTURE 65	ADDHYD	.17	1	3	.10	.0	3.10	2.00	2.40	---	.50	546.36	3213.6
XSECTION 50	RUNOFF	.04	1	3	.10	.0	3.10	2.00	2.26	---	.52	135.56	3389.0
STRUCTURE 65	ADDHYD	.21	1	3	.10	.0	3.10	2.00	2.45	---	.50	680.66	3241.2
XSECTION 51	RUNOFF	.03	1	3	.10	.0	3.10	2.00	2.29	---	.51	108.20	3606.6
STRUCTURE 65	ADDHYD	.24	1	3	.10	.0	3.10	2.00	2.49	---	.50	789.79	3291.6
STRUCTURE 66	RESVOR	.24	1	3	.10	.0	3.10	2.00	2.48	5.09	.82	253.60	1056.7
XSECTION 70	RUNOFF	.40	1	3	.10	.0	3.10	2.00	3.10	---	2.06	355.52	888.8
STRUCTURE 31	ADDHYD	.64	1	3	.10	.0	3.10	2.00	2.86	---	1.95	424.15	662.7
STRUCTURE 31	ADDHYD	2.30	1	3	.10	.0	3.10	2.00	2.53	---	1.16	1164.95	506.1
XSECTION 64	RUNOFF	.11	1	3	.10	.0	3.10	2.00	2.00	---	.74	194.73	1770.3
XSECTION 47	RUNOFF	.09	1	3	.10	.0	3.10	2.00	2.02	---	.53	126.73	2514.6
STRUCTURE 31	ADDHYD	.16	1	3	.10	.0	3.10	2.00	2.02	---	.69	282.22	1763.9
STRUCTURE 31	ADDHYD	2.46	1	3	.10	.0	3.10	2.00	2.50	---	1.10	1295.95	526.4
STRUCTURE 99	ADDHYD	3.07	1	3	.10	.0	3.10	2.00	2.52	---	.91	2115.24	688.6
ALTERNATE 1 STORM 2													
SECTION 59	RUNOFF	.17	2	3	.10	.0	2.00	2.00	1.65	---	.66	236.66	1392.1
SECTION 58	REACH	.17	2	3	.10	.0	2.00	2.00	1.65	---	.83	202.43	1190.8
SECTION 58	RUNOFF	.18	2	3	.10	.0	2.00	2.00	1.65	---	.65	256.36	1424.2
STRUCTURE 32	ADDHYD	.35	2	3	.10	.0	2.00	2.00	1.65	73.59	.73	415.47	1187.1
SECTION 60	RUNOFF	.44	2	3	.10	.0	2.00	2.00	1.65	---	.59	740.44	1682.8
STRUCTURE 32	ADDHYD	.79	2	3	.10	.0	2.00	2.00	1.65	285.79	.62	1091.47	1381.3
STRUCTURE 32	RESVOR	.79	2	3	.10	.0	2.00	2.00	1.63	5.60	2.27	62.16	78.7
SECTION 56	REACH	.79	2	3	.10	.0	2.00	2.00	1.63	---	2.92	81.98	103.8
SECTION 56	RUNOFF	.22	2	3	.10	.0	2.00	2.00	1.65	---	.55	397.05	1804.8
STRUCTURE 34	ADDHYD	1.01	2	3	.10	.0	2.00	2.00	1.63	---	.56	400.37	396.4
SECTION 61	RUNOFF	.08	2	3	.10	.0	2.00	2.00	1.65	---	.52	162.21	1976.2
STRUCTURE 62	RESVOR	.08	2	3	.10	.0	2.00	2.00	1.65	5.43	1.63	23.91	291.5
SECTION 62	REACH	.08	2	3	.10	.0	2.00	2.00	1.65	---	2.21	22.46	273.9
STRUCTURE 34	ADDHYD	1.09	2	3	.10	.0	2.00	2.00	1.64	---	.56	401.97	369.1
SECTION 62	RUNOFF	.24	2	3	.10	.0	2.00	2.00	1.65	---	.56	429.93	1791.4
STRUCTURE 34	ADDHYD	1.33	2	3	.10	.0	2.00	2.00	1.64	---	.56	831.78	624.5
SECTION 55	RUNOFF	.26	2	3	.10	.0	2.00	2.00	1.64	---	.62	333.79	1283.8
STRUCTURE 34	ADDHYD	1.59	2	3	.10	.0	2.00	2.00	1.59	---	.58	1167.06	734.5
SECTION 63	RUNOFF	.07	2	3	.10	.0	2.00	2.00	1.64	---	.62	86.41	948.7
STRUCTURE 34	ADDHYD	1.66	2	3	.10	.0	2.00	2.00	1.57	---	.59	1210.49	729.3

SUMMARY TABLE 1 - SELECTED RESULTS OF STANDARD AND EXECUTIVE CONTROL INSTRUCTIONS IN THE ORDER PERFORMED
(A STAR(*) AFTER THE PEAK DISCHARGE TIME AND RATE (CFS) VALUES INDICATES A FLAT TOP HYDROGRAPH
A QUESTION MARK(?) INDICATES A HYDROGRAPH WITH PEAK AS LAST POINT.)

SECTION/ STRUCTURE ID	STANDARD CONTROL OPERATION	DRAINAGE AREA (SQ MI)	RAIN TABLE #	ANTEC MOIST COND	RAIN TIME INCREM (HR)	PRECIPITATION BEGIN (HR)	PRECIPITATION AMOUNT (IN)	PRECIPITATION DURATION (HR)	RUNOFF AMOUNT (IN)	PEAK DISCHARGE ELEVATION (FT)	PEAK DISCHARGE TIME (HR)	PEAK DISCHARGE RATE (CFS)	PEAK DISCHARGE RATE (CSM)
ALTERNATE 1 STORM 2													
STRUCTURE 77	RESVOR	1.66	2	3	.10	.0	2.00	2.00	1.44	4.48	1.78	293.95	176.9
XSECTION 57	RUNOFF	.07	2	3	.10	.0	2.00	2.00	1.65	---	.56	125.40	1791.4
STRUCTURE 61	RESVOR	.07	2	3	.10	.0	2.00	2.00	1.65	3.89	1.72	18.68	266.9
XSECTION 53	REACH	.07	2	3	.10	.0	2.00	2.00	1.65	---	2.41	16.97	242.5
XSECTION 53	RUNOFF	.31	2	3	.10	.0	2.00	2.00	1.65	---	.60	509.59	1643.8
STRUCTURE 63	ADDHYD	.38	2	3	.10	.0	2.00	2.00	1.65	---	.60	510.72	1344.0*
XSECTION 54	RUNOFF	.12	2	3	.10	.0	2.00	2.00	1.04	---	.60	122.39	1019.9
STRUCTURE 63	ADDHYD	.50	2	3	.10	.0	2.00	2.00	1.50	---	.60	633.06	1266.1
XSECTION 52	RUNOFF	.11	2	3	.10	.0	2.00	2.00	1.52	---	.51	222.49	2022.6
STRUCTURE 63	ADDHYD	.61	2	3	.10	.0	2.00	2.00	1.52	---	.58	799.09	1310.0
STRUCTURE 68	RESVOR	.61	2	3	.10	.0	2.00	2.00	1.53	5.02	.83	395.80	648.9
XSECTION 48	RUNOFF	.13	2	3	.10	.0	2.00	2.00	1.43	---	.47	272.90	2099.3
XSECTION 49	RUNOFF	.04	2	3	.10	.0	2.00	2.00	1.22	---	.50	84.29	4684.2
STRUCTURE 65	ADDHYD	.17	2	3	.10	.0	2.00	2.00	1.38	---	.48	335.27	1972.2
CTION 50	RUNOFF	.04	2	3	.10	.0	2.00	2.00	1.56	---	.49	84.26	2106.5
STRUCTURE 65	ADDHYD	.21	2	3	.10	.0	2.00	2.00	1.42	---	.48	419.05	1995.5
XSECTION 51	RUNOFF	.03	2	3	.10	.0	2.00	2.00	1.69	---	.49	69.17	2305.6
STRUCTURE 65	ADDHYD	.24	2	3	.10	.0	2.00	2.00	1.45	---	.48	488.20	2034.2
STRUCTURE 66	RESVOR	.24	2	3	.10	.0	2.00	2.00	1.42	4.09	1.57	66.88	278.7
XSECTION 70	RUNOFF	.40	2	3	.10	.0	2.00	2.00	2.00	---	2.06	215.44	538.6
STRUCTURE 31	ADDHYD	.64	2	3	.10	.0	2.00	2.00	1.78	---	1.97	271.35	424.0
STRUCTURE 31	ADDHYD	2.30	2	3	.10	.0	2.00	2.00	1.54	---	1.86	561.10	243.7
XSECTION 64	RUNOFF	.11	2	3	.10	.0	2.00	2.00	1.04	---	.68	87.97	799.7
XSECTION 47	RUNOFF	.05	2	3	.10	.0	2.00	2.00	1.04	---	.50	49.36	1597.1
STRUCTURE 31	ADDHYD	.16	2	3	.10	.0	2.00	2.00	1.04	---	.61	115.14	719.6
STRUCTURE 31	ADDHYD	2.46	2	3	.10	.0	2.00	2.00	1.51	---	1.81	594.81	241.7
STRUCTURE 99	ADDHYD	3.07	2	3	.10	.0	2.00	2.00	1.51	---	1.69	768.92	250.5

1

MMARY TABLE 2 - SELECTED MODIFIED ATT-KIN REACH ROUTINGS IN ORDER OF STANDARD EXECUTIVE CONTROL INSTRUCTIONS
(A STAR(*) AFTER VOLUME ABOVE BASE(IN) INDICATES A HYDROGRAPH TRUNCATED AT A VALUE EXCEEDING BASE + 10% OF PEA
A QUESTION MARK(?) AFTER COEFF.(C) INDICATES PARAMETERS OUTSIDE ACCEPTABLE LIMITS, SEE PREVIOUS WARNINGS)

	HYDROGRAPH INFORMATION		ROUTING PARAMETERS				PEAK		
	OUTFLOW+	VOLUME ABOVE BASE(IN)	MAIN CHAN NO.	ITER- ATIONS	X	COEFF. (C)	PEAK OUTFLOW	S/C RATIO	ATT- KIN

XSEC ID	REACH LENGTH (FT)	INFLOW PEAK (CFS)	INFLOW TIME (HR)	OUTFLOW PEAK (CFS)	OUTFLOW TIME (HR)	INTERV.AREA PEAK (CFS)	INTERV.AREA TIME (HR)	BASE-FLOW (CFS)	ABOVE BASE (IN)	TIME INCR (HR)	ATION #	EXPONENT COEFF (X)	EXPONENT POWER (N)	LAG/STORAGE FACTOR (k*)	LAG/STORAGE Q/I RATIO (Q*)	PEAK (K) (SEC)	PEAK COEFF (C)	STORAGE AGE (HR)	STORAGE RATIO (KR)
ALTERNATE 1 STORM 1																			
58	2900	413	.7	373	.9			0	2.73	.10	1	.400	1.54	.114	.902	413	.61	.23	.12
56	4200	84	2.3	84	2.8			0	2.68	.10	1	.400	1.54	.004	.999	1045	.29	.59	.29
62	4500	44	1.3	40	1.8			0	2.73	.10	1	.400	1.54	.073	.906	1406	.23	.59	.40
53	5300	34	1.3	30	2.2			0	2.73	.10	1	.400	1.54	.092	.885	1817	.18	.90	.52
ALTERNATE 1 STORM 2																			
58	2900	232	.7	201	.9			0	1.65	.10	1	.400	1.54	.139	.866	506	.52	.16	.14
56	4200	82	2.3	82	2.9			0	1.63	.10	1	.400	1.54	.008	.999	1054	.29	.60	.29
62	4500	24	1.6	22	2.2			0	1.65	.10	1	.400	1.54	.086	.940	1741	.19	.60	.49
	5300	19	1.7	17	2.4			0	1.65	.10	1	.400	1.54	.111	.909	2236	.15	.79	.63

SUMMARY TABLE 3 - DISCHARGE (CFS) AT XSECTIONS AND STRUCTURES FOR ALL STORMS AND ALTERNATES

XSECTION/ STRUCTURE ID	DRAINAGE AREA (SQ MI)	STORM NUMBERS..... 1	2
STRUCTURE 99	3.07		
ALTERNATE 1		2115.24	769.82
STRUCTURE 88	.61		
ALTERNATE 1		999.99	395.80
STRUCTURE 77	1.66		
ALTERNATE 1		793.59	293.95
STRUCTURE 66	.24		
ALTERNATE 1		253.49	66.96
STRUCTURE 65	.24		
ALTERNATE 1		796.79	498.20
STRUCTURE 63	4		

	ALTERNATE 1	1403.81	799.09
0 STRUCTURE 62	.08		
	ALTERNATE 1	43.98	33.91
0 STRUCTURE 61	.07		
	ALTERNATE 1	33.75	18.68
0 STRUCTURE 34	1.66		
	ALTERNATE 1	2105.07	1210.40
0 STRUCTURE 32	.79		
	ALTERNATE 1	84.12	82.10
0 STRUCTURE 31	2.46		
	ALTERNATE 1	1295.95	594.81
0 XSECTION 47	.05		
	ALTERNATE 1	125.73	69.36
0 XSECTION 48	.13		
	ALTERNATE 1	439.14	272.90
0 XSECTION 49	.04		
	ALTERNATE 1	111.79	64.29

SUMMARY TABLE 3 - DISCHARGE (CFS) AT XSECTIONS AND STRUCTURES FOR ALL STORMS AND ALTERNATES

XSECTION/ STRUCTURE ID	DRAINAGE AREA (SQ MI)	STORM NUMBERS..... 1	2
0 XSECTION 50	.04		
ALTERNATE 1		135.56	84.26
0 XSECTION 51	.03		
ALTERNATE 1		108.20	69.17
0 XSECTION 52	.11		
ALTERNATE 1		359.41	222.49
0 XSECTION 53	.31		
ALTERNATE 1		836.48	504.59
0 XSECTION 54	.12		
ALTERNATE 1		249.49	122.39
0 XSECTION 55	.26		
ALTERNATE 1		605.28	333.79
0 XSECTION 56	.22		
ALTERNATE 1		660.80	397.05
0 XSECTION 57	.07		
ALTERNATE 1		209.87	125.40

ALTERNATE	1	445.33	256.36
XSECTION	59	.17	
ALTERNATE	1	415.64	236.66
XSECTION	60	.44	
ALTERNATE	1	1238.42	740.44
XSECTION	61	.08	
ALTERNATE	1	252.15	143.21
XSECTION	62	.24	
ALTERNATE	1	716.12	429.93
XSECTION	63	.07	
ALTERNATE	1	136.36	66.41

SUMMARY TABLE 3 - DISCHARGE (CFS) AT XSECTIONS AND STRUCTURES FOR ALL STORMS AND ALTERNATES

XSECTION/ STRUCTURE ID		DRAINAGE AREA (SQ MI)	STORM NUMBERS..... 1	2
XSECTION	64	.11		
ALTERNATE	1		194.73	87.97
XSECTION	70	.40		
ALTERNATE	1		355.52	215.44

END OF 1 JOBS IN THIS RUN

BIG JOHNSON RESERVOIR/CREWS GULCH

DRAINAGE BASIN PLANNING STUDY

TECHNICAL ADDENDUM

Section VII

HEC-2 Water Surface Profile Program Printouts

Crews Gulch
Existing and Improved Channel Conditions
100-year Frequency
&
100-year Floodway, Existing Channel Conditions

(for floodplain mapping information refer to the drawings included in the rear of the Technical Addendum)

```
1*********************************************************
 *  WATER SURFACE PROFILES                               *
 *  VERSION OF SEPTEMBER 1988                            *
 *  ERROR: 01,02                                         *
 *  UPDATED:  4 APRIL    1989                            *
 *  RUN DATE     9/30/91   TIME    2:57:58               *
 *********************************************************
```

```
*****************************************
*  U.S. ARMY CORPS OF ENGINEERS         *
*  THE HYDROLOGIC ENGINEERING CENTER    *
*  609 SECOND STREET, SUITE D           *
*  DAVIS, CALIFORNIA 95616-4687         *
*  (916) 756-1104, (916) 551-1748       *
*****************************************
```

```
X     X  XXXXXXX   XXXXX             XXXXX
X     X  X        X     X           X     X
X     X  X        X                       X
XXXXXXX  XXXX     X         XXXXX    XXXXX
X     X  X        X                  X
X     X  X        X     X            X
X     X  XXXXXXX   XXXXX             XXXXXXX
```

END OF BANNER

1

9/30/91 2:57:59 PAGE 1

THIS RUN EXECUTED 9/30/91 2:57:59

```
*****************************************************
  HEC2 RELEASE DATED SEP 88 UPDATED APR  1989


  ERROR CORR -  01,02
  MODIFICATION -
*****************************************************
```

```
T1      HEC2 WATER SURFACE PROFILES SUBCRITICAL FLOW
T2      100 YEAR FLOOD   DBPS EXISTING HYDROLOGY
T3      CREWS GULCH EXISTING CHANNEL CONDITIONS

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

      -10         2         0         0         0         0         0         0    5626.7

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

       1         0        -1
```

1

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```
   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     BANK ELEV
   0         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
```

```
 *PROF 1
0

 CCHV=     .300 CEHV=     .500
 *SECNO 3002.000
 3280 CROSS SECTION   3002.00 EXTENDED      4.56 FEET

 3720 CRITICAL DEPTH ASSUMED
   3002.00    10.56  5630.76  5630.76  5626.70  5632.63     1.87      .00      .00  5622.00
     4880.     1328.    2704.     848.     321.     193.     133.       0.       0.   5622.00
       .00     4.14    13.99     6.36     .045     .030     .045     .000  5620.20  1055.41
   .003983       0.       0.       0.        0       13        0      .00   184.59  1240.00
0
 *SECNO 3008.000

 3301 HV CHANGED MORE THAN HVINS


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  4.98

   3008.00    10.26  5633.26      .00      .00  5633.38      .12      .22      .52  5641.90
     4880.       0.    4880.       0.       0.    1765.       0.      14.       2.   5641.90
       .05      .00     2.76      .00     .000     .030     .000     .000  5623.00  1469.60
   .000161     500.     500.     500.        2        0        0      .00   183.25  1652.85
0

 SPECIAL BRIDGE

 SB  XK        XKOR      CDFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
      1.25      1.50      2.50       .00    160.00      4.50   2524.40      1.47   5623.00   5623.00

 *SECNO 3012.000
 CLASS A LOW FLOW

 3420 BRIDGE W.S.=    5633.26 BRIDGE VELOCITY=       2.79     CALCULATED CHANNEL AREA=      1749.

  EGPRS      EGLNC       H3       QWEIR      QLOW      BAREA   TRAPEZOID      ELLC      ELTRD     WEIRLN
                                                                 AREA
        .00   5633.38       .01        0.     4880.     2524.     2584.     5637.60   5641.90        0.


   3012.00    10.26  5633.26      .00      .00  5633.38      .12      .01      .00  5641.90
     4880.       0.    4880.       0.       0.    1767.       0.      16.       2.   5641.90
       .06      .00     2.76      .00     .000     .030     .000     .000  5623.00  1469.60
   .000160       50.      50.      50.        0        0        0      .00   183.27  1652.86
0
1
     9/30/91       2:57:59                                                                  PAGE    3


    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        QLOSS   BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA   LEFT/RIGHT
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN      SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID     ENDST


 *SECNO 3016.000

 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .59


 3470 ENCROACHMENT STATIONS=     1400.0     1610.0  TYPE=       1  TARGET=      210.000
```