3431

BEFORE THE

FEDERAL ENERGY REGULATORY COMMISSION

APPLICATION FOR LICENSE FOR MAJOR PROJECT

SUSITNA HYDROELECTRIC PROJECT

VOLUME 7

DRAFT

EXHIBIT E

CHAPTER 2

TABLES AND FIGURES

HARZA-EBASCO
SUSITNA JOINT VENTURE

Alaska Power Authority

BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

APPLICATION FOR LICENSE FOR MAJOR PROJECT

SUSITNA HYDROELECTRIC PROJECT
DRAFT LICENSE APPLICATION

VOLUME 7

EXHIBIT E
CHAPTER 2 - WATER USE AND QUALITY
TABLES AND FIGURES

November 1985

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VOLUME NUMBER COMPARISON

LICENSE APPLICATION AMENDMENT VS. JULY 29, 1983 LICENSE APPLICATION

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River Mile	Average Slope	Predominant Channel Pattern
RM 149 to 144	0.00195	Single channel confined by valley walls. Frequent bedrock control points.
RM 144 to 139	0.00260	Split channel confined by valley wall and terraces.
RM 139 to 129.5	0.00210	Split channel confined occasionally by terraces and valley walls. Main channels, side channels and sloughs occupy valley bottom.
RM 129.5 to 119	0.00173	Split channel with occasional tendency to braid. Main channel frequently flows against west valley wall. Subchannels and sloughs occupy east floodplain.
RM 119 to 104	0.00153	Single channel frequently incised and occasional islands.
RM 104 to 95	0.00147	Transition from split channel to braided. Occasionally bounded by terraces. Braided through the confluence with Chulitna and Talkeetna Rivers.
RM 95 to 61	0.00105	Braided with occasional confinement by terraces.
RM 61 to 42	0.00073	Combined patterns; western floodplain braided, eastern floodplain split channel.
RM 42 to 0	0.00030	Split channel with occasional tendency to braid. Deltaic distributary channels begin forming at about RM 20.

Source: R&M 1982d

Table E.2.2.2: REPRESENTATIVE BED MATERIAL SIZE DISTRIBUTION FOR SELECTED SLOUGHS, SIDE CHANNEL AND MAINSTREAM SITES

	Particle Size, mm											Bed Material Sizes (mm) For Given Percentage		
	.062	.125	.250	.500	1.00	2.00	4.00	8.00	16.0	32.0	64.0	D_{16}	D_{50}	D_{90}
	Percent Finer Than													
Main Channel near Cross Section 4[1]	2	3	7	10	13	16	22	29	42	70	89	1.7	20	65
Main Channel between Cross Sections 12 and 13[2]	1	2	3	5	8	12	18	24	32	50	77	3.0	34	78
Main Channel upstream from Lane Creek[3]	2	3	5	7	9	10	14	21	32	48	77	5.0	35	84
Mainstem 2 Side Channels at Cross Section 18.2[4]	3	5	7	10	13	17	22	29	37	53	73	1.7	30	110
Slough 8A[5]	1	3	6	10	12	13	15	18	28	47	83	4.3	35	70
Slough 9[6]	1	2	7	15	18	20	23	30	41	63	93	0.5	22	58
Main Channel upstream from 4th of July Creek[7]	2	4	6	8	11	14	20	27	36	55	78	2.5	28	85
Side Channel 10[8]	1	3	6	12	17	20	25	34	44	62	82	0.8	20	80
Lower Side Channel 11, downstream from Slough 11[9]	1	2	5	7	10	14	19	30	41	58	84	2.6	25	72
Slough 11[10]	1	2	5	8	12	15	20	27	35	50	68	2.2	32	100
Upperside Channel 11, upstream from Slough 11[10]	1	2	5	8	12	15	20	27	35	50	68	2.2	32	100
Main Channel between Cross Section 46 and 48[11]	1	2	3	7	10	13	17	24	33	53	72	3.3	30	100
Side Channel 21, downstream from Slough 21[12]	0	0	1	4	6	8	12	17	23	40	62	7.5	46	96
Slough 21[12]	0	0	1	4	6	8	12	17	23	40	62	7.5	46	96

1/ Based on 6 samples taken at three locations near cross section 4.
2/ Based on 2 samples taken near river miles 109.3.
3/ Based on 2 samples taken in main channel upstream from Lane Creek.
4/ Based on 4 samples taken in the Mainstem 2 side channel, at four locations.
5/ Based on 6 samples taken near the slough in the main channel at RM 125.6.
6/ Based on 5 samples taken near the slough in the main channel at RM 128.7.
7/ Based on 3 samples taken in the main and side channels near 4th of July Creek.
8/ Based on 2 samples taken in Slough 10.
9/ Based on 2 samples taken in Side Channel 11, downstream from Slough 11.
10/ Based on one sample taken in Slough 11.
11/ Based on 2 samples taken between cross sections 46 and 48.
12/ Based on one sample taken near the upstream end of side channel.

Table E.2.2.3: TRANSPORTABLE BED MATERIAL SIZES IN SELECTED SLOUGHS, SIDE CHANNELS AND MAINSTREAM SITES

Location	Discharge at Gold Creek (cfs)										
	5,000	7,000	10,000	15,000	20,000	25,000	30,000	35,000	40,000	45,000	55,000
	Transportable Bed Material Size (mm)										
Main Channel near Cross Section 4	18	21	24	29	33	36	38	41	43	44	48
Main Channel between Cross Sections 12 & 13	21	25	28	37	44	48	53	57	60	65	76
Main Channel upstream from Lane Creek	25	28	32	37	44	48	52	56	60	64	72
Mainstem 2 Side Channel at Cross Section 18.2											
Main Channel				6	11	18	25	31	37	43	56
North-east Fork				5	9	13	16	18	21	24	29
North-west Fork				5	9	13	16	17	19	21	24
Slough 8A							4	6	8	9	12
Slough 9						9	13	17	20	24	31
Main Channel upstream from 4th of July Creek	27	31	35	40	45	50	54	57	61	64	71
Side Channel 10					5	13	22	29	37	45	60
Lower Side Channel 11		5	9	16	22	28	34	39	45	50	61
Slough 11										5	17
Upper Side Channel 11					7	13	20	30	44	57	84
Main Channel between Cross Sections 46 and 48	30	35	41	49	56	62	68	73	79	84	94
Side Channel 21			6	10	15	18	22	25	28	31	37
Slough 21					3	5	9	14	21	30	58

TABLE E.2.2.4: PERIODS OF RECORD FOR GAGING STATIONS

Station Name	USGS Gage Number	Susitna River Mile	Drainage Area (mi2/)	Periods of Record: Streamflow (Continuous)1/	Periods of Record: Water Quality2/	Agency
Susitna River nr. Denali	15291000	290.8	950	5/57-9/66, 11/68-Present	1957-66, 1968-69, 1974-Present (6/30/82)	USGS
Susitna River nr. Cantwell (Vee Canyon)	15291500	223.1	4,140	5/61-9/72, 5/80-Present	1962-72, 1980-Present(7/27/82)	USGS
Susitna River nr. Cantwell (Vee Canyon)	-	223.1	4,140	-	1980-81	R&M Consul
Susitna River nr. Watana Damsite	-	182.2 3/	5,180	6/80-Present	10/80-12/81	R&M Consul
Susitna River at Gold Creek	15292000	136.6	6,160	8/49-Present	1949-58, 1962, 1967-68, 1974-Present (9/16/82)	USGS
Susitna River at Gold Creek	-	136.6	6,160	-	1980-Present(10/14/82)	R&M
Susitna River at Sunshine	15292780	83.9	11,100	5/81-Present	1971, 1975, 1977, 1981-Present (10/13/82)	
Susitna River at Susitna Station	15294350	25.8	19,400	10/74-Present	1955, 1970, 1975-Present(10/5/82)	USGS
Maclaren River nr. Paxson	15291200	259.8 4/	280	6/58-Present	1958-61, 1967-68, 1975	USGS
Chulitna River nr. Talkeetna	15292400	98.0 4/	2,570	2/58-9/72, 5/80-Present	1958-59, 1967-72, 1980-Present (6/3/82)	USGS
Talkeetna River nr. Talkeetna	15291500	97.0 4/	2,006	6/64-Present	1954, 1966-Present(10/14/82)	USGS
Skwentna River nr. Skwentna	15294300	28.0 5/	2,250	10/59-Present	1959, 1961, 1967-68, 1974-75, 1980-81	USGS
Yentna River nr. Susitna Station	15294345	28.0 4/	6,180	10/80-Present	1981-Present (8/11/82)	USGS

Notes:

1/ All USGS streamflow gage stations except Skwentna River are currently active, however, flow data included in this document are through September 198
2/ "Present" in periods of record indicates station is active as of January 1983. A date after "Present" indicates the most recent data available.
3/ Watana continuous water quality monitor was installed at river mile 183.0.
4/ River mile at tributary's confluence with Susitna River.
5/ River mile at Yentna-Susitna confluence.

Source: USGS and R&M

TABLE E.2.2.5: USGS STREAMFLOW SUMMARY (cfs)

Station		Denali	Cantwell	Gold Creek	Susitna	Maclaren	Chulitna	Talkeetna	Skwentna
Yrs. of Record		22+	12+	32	7	23+	16+	17+	22
Oct	Max	2,165	5,472	8,212	58,640	734	8,062	4,438	7,254
	Mean	1,187	3,236	5,757	35,694	421	4,916	2,562	4,492
	Min	528	1,638	3,124	19,520	249	2,898	1,450	1,929
Nov	Max	878	2,487	4,192	31,590	370	3,213	1,718	4,195
	Mean	528	1,514	2,568	16,289	189	2,075	1,180	1,930
	Min	290	780	1,215	9,933	95	1,480	765	678
Dec	Max	575	1,658	3,264	14,690	246	2,100	1,103	2,871
	Mean	344	1,053	1,793	9,794	127	1,494	836	1,320
	Min	169	543	866	6,000	49	1,000	556	624
Jan	Max	444	1,694	2,452	10,120	162	1,623	851	2,829
	Mean	257	896	1,463	8,417	100	1,299	680	1,117
	Min	119	437	724	6,529	44	974	459	600
Feb	Max	330	1,200	2,028	9,017	140	1,414	777	1,821
	Mean	215	761	1,243	7,665	87	1,115	573	952
	Min	81	426	723	5,614	42	820	401	600
Mar	Max	290	1,200	1,900	8,906	121	1,300	743	1,352
	Mean	195	711	1,123	6,842	78	988	512	839
	Min	42	429	713	5,368	41	738	380	600
Apr	Max	415	1,223	2,650	12,030	145	1,600	1,038	2,138
	Mean	232	883	1,377	8,350	87	1,176	603	1,110
	Min	43	465	745	6,233	50	700	422	607
May	Max	3,468	12,150	21,890	83,580	2,131	13,890	8,840	22,370
	Mean	2,092	8,044	13,277	64,896	823	8,634	4,336	8,755
	Min	629	1,915	3,745	48,670	208	2,355	2,145	1,635
June	Max	12,210	34,630	50,580	165,900	4,297	40,330	19,040	36,670
	Mean	7,261	18,808	27,658	123,447	2,886	22,527	11,619	19,137
	Min	4,647	9,909	15,500	90,930	1,751	17,390	5,207	10,650
July	Max	12,110	22,790	34,400	181,400	4,649	35,570	15,410	28,620
	Mean	9,600	17,431	24,383	141,300	3,216	27,047	10,974	17,811
	Min	6,756	12,220	16,100	115,200	2,441	20,820	7,080	11,670
Aug	Max	12,010	22,760	38,538	159,600	4,122	33,670	16,770	20,160
	Mean	8,246	15,252	21,996	118,973	2,633	22,749	9,459	13,535
	Min	3,919	6,597	8,879	91,360	974	11,300	3,787	7,471
Sept	Max	5,452	12,910	21,240	91,200	2,439	22,260	10,610	13,090
	Mean	3,300	7,971	13,175	71,239	1,138	11,544	5,369	8,156
	Min	1,822	3,376	5,093	48,910	470	6,704	2,070	3,783

Notes: Susitna River at Sunshine and Yentna River streamflow data were not included due to the brief period of record (approximately 1 yr).

Data current as of Sept. 30, 1981.

Source: USGS

Table E.2.2.6: WATANA NATURAL MONTHLY FLOWS (CFS)

YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	ANNUAL
1951	3299	1107	906	808	673	620	1302	11650	18518	19787	16478	17206	7734
1952	4593	2170	1501	1275	841	735	804	4217	25773	22111	17356	11571	7777
1953	6286	2757	1281	819	612	671	1382	15037	21470	17355	16682	11514	8035
1954	4219	1600	1184	1088	803	638	943	11697	19477	16984	20421	9166	7401
1955	3859	2051	1550	1388	1051	886	941	6718	24881	23788	23537	13448	8719
1956	4102	1588	1039	817	755	694	718	12953	27172	25831	19153	13194	9051
1957	4208	2277	1707	1373	1189	935	945	10176	25275	19949	17318	14841	8381
1958	6035	2936	2259	1481	1042	974	1265	9958	22098	19753	18843	5979	7770
1959	3668	1730	1115	1081	949	694	886	10141	18330	20493	23940	12467	8011
1960	5166	2214	1672	1400	1139	961	1070	13044	13233	19506	19323	16086	7954
1961	6049	2328	1973	1780	1305	1331	1965	13638	22784	19840	19480	10146	8603
1962	4638	2263	1760	1609	1257	1177	1457	11334	36017	23444	19887	12746	9833
1963	5560	2509	1709	1309	1185	884	777	15299	20663	28767	21011	10800	9278
1964	5187	1789	1195	852	782	575	609	3579	42842	20083	14048	7524	8263
1965	4759	2368	1070	863	773	807	1232	10966	21213	23236	17394	16226	8451
1966	5221	1565	1204	1060	985	985	1338	7094	25940	16154	17391	9214	7374
1967	3270	1202	1122	1102	1031	890	850	12556	24712	21987	26105	13673	9096
1968	4019	1934	1704	1618	1560	1560	1577	12827	25704	22083	14148	7164	8032
1969	3135	1355	754	619	608	686	1262	9314	13962	14844	7772	4260	4912
1970	2403	1021	709	636	602	624	986	9536	14399	18410	16264	7224	6115
1971	3768	2496	1687	1097	777	717	814	2857	27613	21126	27447	12189	8589
1972	4979	2587	1957	1671	1491	1366	1305	15973	27429	19820	17510	10956	8963
1973	4301	1978	1247	1032	1000	874	914	7287	23859	16351	18017	8100	7112
1974	3057	1355	932	786	690	627	872	12889	14781	15972	13524	9786	6314
1975	3089	1474	1277	1216	1110	1041	1211	11672	26689	23430	15127	13075	8403
1976	5679	1601	876	758	743	691	1060	8939	19994	17015	18394	5712	6835
1977	2974	1927	1688	1349	1203	1111	1203	8569	31353	19707	16807	10613	8233
1978	5794	2645	1980	1578	1268	1257	1408	11232	17277	18385	13412	7133	6992
1979	3774	1945	1313	1137	1055	1101	1318	12369	22905	24912	16671	9097	8184
1980	6150	3525	2032	1470	1233	1177	1404	10140	23400	26740	18000	11000	8908
1981	6632	3044	1790	1858	1592	1262	1641	14416	16739	27601	30542	11669	9985
1982	5700	2650	1863	1700	1234	898	1196	10879	21444	20445	13206	13890	7968
1983	5154	2132	1893	1797	1610	1427	1565	11672	20401	18761	20862	11192	8253
MAX	6632	3525	2259	1858	1610	1560	1965	15973	42842	28767	30542	17206	9985
MIN	2403	1021	709	619	602	575	609	2857	13233	14843	7772	4260	4912
MEAN	4567	2064	1453	1225	1035	936	1158	10625	22980	20747	18366	10875	8046

Table E.2.2.7: DEVIL CANYON NATURAL MONTHLY FLOWS (CFS)

YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	ANNUAL
1951	3652	1231	1031	906	768	697	1505	13219	19979	21576	18530	19799	8616
1952	5222	2539	1758	1484	943	828	879	4990	30014	24862	19647	13441	8918
1953	7518	3233	1550	1000	746	767	1532	17758	25231	19184	19207	13928	9356
1954	5109	1921	1387	1224	930	729	1131	15286	23188	19154	24072	11579	8867
1955	4830	2507	1868	1649	1275	1024	1107	8390	28082	26213	24960	13989	9707
1956	4648	1789	1207	922	893	852	867	15979	31137	29212	22610	16496	10608
1957	5235	2774	1987	1583	1389	1105	1109	12474	28415	22110	19389	18029	9669
1958	7435	3590	2905	1792	1212	1086	1437	11849	24414	21763	21220	6989	8867
1959	4403	2000	1371	1317	1179	878	1120	13901	21538	23390	28594	15330	9650
1960	6061	2623	2012	1686	1340	1113	1218	14803	14710	21739	22066	18930	9084
1961	7171	2760	2437	2212	1594	1639	2405	16031	27069	22881	21164	12219	10021
1962	5459	2544	1979	1796	1413	1320	1613	12141	40680	24991	22242	14767	10947
1963	6308	2696	1896	1496	1387	958	811	17698	24094	32388	22721	11777	10432
1964	5998	2085	1387	978	900	664	697	4047	47816	21926	15586	8840	9251
1965	5744	2645	1161	925	829	867	1314	12267	24110	26196	19789	18234	9556
1966	6497	1908	1478	1279	1187	1187	1619	8734	30446	18536	20245	10844	8697
1967	3844	1458	1365	1358	1268	1089	1054	14436	27796	25081	30293	15728	10460
1968	4585	2204	1930	1851	1779	1779	1791	14982	29462	24871	16091	8226	9176
1969	3577	1532	836	687	682	770	1421	10430	14951	15651	8484	4796	5352
1970	2867	1146	810	757	709	722	1047	10722	17119	21142	18653	8444	7064
1971	4745	3082	2075	1319	944	867	986	3428	31031	22942	30316	13636	9657
1972	5537	2912	2313	2036	1836	1660	1566	19777	31930	21717	18654	11884	10199
1973	4639	2155	1387	1140	1129	955	987	7896	26393	17572	19478	8726	7739
1974	3491	1463	997	843	746	690	949	15005	16767	17790	15257	11370	7161
1975	3507	1619	1487	1409	1342	1272	1457	14037	30303	26188	17032	15155	9607
1976	7003	1853	1008	897	876	825	1261	11305	22814	18253	19298	6463	7706
1977	3552	2392	2148	1657	1470	1361	1510	11212	35607	21741	18371	11916	9439
1978	6936	3211	2371	1868	1525	1481	1597	11693	18417	20079	15327	8080	7765
1979	4502	2324	1549	1304	1204	1165	1403	13334	24052	27463	19107	10172	9023
1980	6900	3955	2279	1649	1383	1321	1575	11377	26255	30002	20196	12342	9994
1981	7335	3382	1841	1958	1839	1470	1898	15789	18387	31679	35256	13033	11254
1982	6384	3270	2207	2086	1559	1094	1574	12490	24439	22877	14536	16427	9115
1983	6272	2454	2192	2098	1858	1596	1781	13777	22789	20295	23203	12731	9307
MAX	7518	3955	2905	2212	1858	1779	2405	19777	47816	32388	35256	19799	11254
MIN	2867	1146	810	687	682	664	697	3428	14710	15651	8484	4796	5352
MEAN	5363	2402	1703	1429	1216	1086	1340	12462	26043	23075	20654	12555	9159

Table E.2.2.8: COMPUTED WEEKLY FLOWS FOR SUSITNA RIVER AT WATANA DAMSITE [1/]

1951	4521.	4029.	3518.	2007.	1248.	1176.	1103.	1042.	994.	903.
	903.	903.	903.	828.	812.	812.	812.	757.	667.	667.
	667.	641.	618.	618.	618.	618.	542.	700.	1071.	1861.
	4923.	14338.	15945.	7915.	13828.	26696.	19247.	12238.	17232.	18464.
	21682.	20740.	19074.	17891.	14413.	15312.	14985.	21048.	24531.	15237.
	15738.	13323.								
1952	7559.	5055.	3674.	2855.	2793.	2609.	1928.	1908.	1761.	1489.
	1489.	1489.	1489.	1329.	1299.	1299.	1299.	1069.	819.	819.
	819.	784.	730.	730.	730.	730.	796.	796.	796.	796.
	909.	1132.	1549.	3357.	16784.	19892.	28174.	30555.	27039.	23527.
	16714.	21361.	23150.	30727.	19888.	15618.	11855.	13935.	15561.	10522.
	9086.	10876.								
1953	8559.	7982.	5556.	4049.	3948.	3377.	2164.	2652.	1913.	1250.
	1250.	1250.	1250.	880.	820.	820.	820.	722.	598.	598.
	598.	606.	678.	678.	678.	678.	486.	486.	785.	1308.
	10007.	13666.	12435.	21448.	16652.	27821.	21482.	17488.	20466.	17377.
	15695.	17070.	17745.	20931.	17859.	14312.	14731.	17519.	14058.	12806.
	10679.	8137.								
1954	6126.	5080.	3728.	2971.	1821.	1738.	1608.	1497.	1361.	1174.
	1174.	1174.	1174.	1120.	1099.	1099.	1099.	982.	794.	794.
	794.	716.	630.	630.	630.	630.	506.	506.	870.	930.
	4308.	8521.	13802.	15823.	14807.	19799.	19022.	18245.	22178.	19307.
	15396.	14981.	14981.	24614.	20049.	20049.	20049.	18930.	11256.	9676.
	9025.	5793.								
1955	4746.	4461.	3359.	3359.	2716.	2156.	2032.	1796.	1756.	1657.
	1624.	1431.	1431.	1546.	1561.	1338.	1249.	1179.	1052.	1052.
	1052.	949.	879.	879.	879.	879.	828.	828.	828.	828.
	2519.	3321.	3882.	11626.	12771.	17007.	27727.	30081.	28168.	29660.
	24776.	19124.	22869.	20805.	19270.	19771.	24039.	34146.	17921.	13691.
	11128.	8763.								
1956	6059.	4461.	3633.	3129.	2062.	1721.	1581.	1393.	1306.	1027.
	1027.	1027.	1027.	848.	810.	810.	810.	809.	750.	750.
	750.	739.	689.	689.	689.	689.	641.	641.	641.	641.
	1798.	8483.	12106.	24085.	15966.	27294.	35522.	26081.	22994.	24335.
	26536.	26799.	26153.	24666.	22447.	20285.	16173.	13792.	11446.	16046.
	15637.	10015.								
1957	5279.	5279.	3583.	3300.	2789.	2342.	2247.	2123.	2035.	1908.
	1852.	1509.	1509.	1399.	1378.	1378.	1378.	1310.	1193.	1193.
	1193.	1079.	920.	920.	920.	920.	837.	837.	837.	837.
	2452.	4269.	6969.	15611.	23050.	31747.	28053.	24892.	17043.	19864.
	18252.	20463.	22198.	17659.	17664.	17568.	16111.	17804.	14143.	15435.
	15008.	14415.								

[1/] Weekly flows start from week 1 (Oct 1-7) to week 52 (Sept. 23-30), the flow for week 52 is the total flow between Sept. 23 and 30 divided by 8.

1958	7628.	6544.	5337.	5503.	3997.	3287.	2815.	2314.	2637.	2991.
	2551.	1902.	1544.	1839.	1614.	1408.	1332.	1101.	1152.	1038.
	959.	959.	1024.	1000.	939.	939.	950.	1063.	1153.	1398.
	3001.	5917.	8267.	15742.	16842.	24642.	24642.	21247.	19363.	18442.
	18442.	18442.	18082.	32829.	23946.	17783.	14415.	9969.	6605.	6605.
	5128.	5129.								
1959	4604.	4050.	3875.	2689.	2392.	2068.	1760.	1352.	1215.	797.
	879.	1375.	1375.	1150.	1109.	1056.	1035.	1051.	1027.	984.
	879.	797.	683.	683.	683.	683.	666.	666.	952.	999.
	1801.	2951.	12604.	17856.	14298.	20496.	15311.	18247.	20418.	21688.
	20819.	22556.	17816.	18373.	14392.	18474.	34121.	33290.	20953.	10824.
	8131.	7669.								
1960	8534.	5896.	3243.	4051.	2692.	2292.	2194.	2064.	1962.	1656.
	1656.	1656.	1656.	1541.	1523.	1360.	1295.	1227.	1175.	1152.
	1097.	1062.	1041.	996.	882.	882.	694.	694.	910.	945.
	4703.	6668.	12886.	20055.	20716.	11838.	12275.	12710.	13971.	19936.
	14780.	17003.	23312.	26487.	20467.	18086.	17477.	16811.	14281.	22570.
	15996.	11980.								
1961	9778.	7102.	5050.	3678.	2753.	2516.	2319.	2058.	2118.	2126.
	2085.	1833.	1833.	1776.	1773.	1825.	1846.	1601.	1317.	1297.
	1246.	1181.	1097.	1222.	1535.	1535.	1617.	1617.	1783.	1811.
	5580.	10306.	17834.	16989.	15795.	14578.	23810.	29749.	24996.	18341.
	19253.	19937.	20655.	22581.	23083.	19710.	18708.	13842.	9309.	10560.
	10059.	10131.								
1962	8304.	3663.	3663.	3663.	2910.	2187.	2187.	2187.	2067.	1742.
	1742.	1742.	1742.	1645.	1626.	1626.	1626.	1462.	1237.	1237.
	1237.	1207.	1174.	1174.	1174.	1174.	1335.	1335.	1335.	1335.
	3165.	3896.	10571.	15580.	25042.	25502.	49464.	42296.	29941.	24659.
	24076.	20979.	24659.	22051.	19487.	19487.	19487.	19844.	18961.	11972.
	9699.	9763.								
1963	7677.	5846.	5094.	4603.	3273.	2427.	2427.	2427.	2243.	1684.
	1684.	1684.	1684.	1346.	1303.	1303.	1303.	1284.	1203.	1203.
	1203.	1015.	870.	870.	870.	870.	680.	680.	680.	680.
	2138.	2871.	16185.	26173.	29395.	20039.	20039.	20039.	20039.	25591.
	33081.	31343.	26765.	24772.	22882.	19853.	20996.	17689.	13124.	11736.
	9384.	8325.								
1964	7204.	6067.	4963.	3760.	2277.	2037.	1803.	1489.	1454.	1358.
	1311.	1038.	1038.	913.	888.	830.	807.	816.	818.	802.
	760.	696.	612.	588.	524.	524.	588.	588.	637.	646.
	524.	521.	699.	1548.	17791.	66753.	45845.	38257.	27669.	22261.
	22938.	21646.	14854.	16893.	15985.	12889.	13741.	11603.	8901.	7255.
	7294.	6247.								

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1965	5814.	6506.	4258.	3387.	2593.	2408.	2383.	2656.	1708.	1175.
	1047.	952.	952.	880.	866.	866.	866.	821.	764.	764.
	764.	785.	809.	809.	809.	809.	1050.	1050.	1324.	1370.
	1702.	4582.	7973.	14365.	28598.	18020.	19249.	18396.	27076.	25264.
	25478.	23730.	20581.	18313.	16343.	25247.	16925.	9394.	14093.	17314.
	15844.	18328.								
1966	10948.	6087.	2852.	2359.	2043.	1676.	1481.	1412.	1361.	1265.
	1223.	1174.	1129.	1075.	1062.	1062.	1062.	1025.	980.	980.
	980.	983.	985.	985.	985.	985.	1091.	1091.	1432.	1490.
	2210.	2873.	5322.	10202.	16017.	37660.	26954.	22768.	19214.	15178.
	14458.	15132.	17122.	22511.	18320.	15064.	18252.	14606.	10023.	9733.
	9623.	7019.								
1967	5525.	3705.	2802.	1896.	1290.	1192.	1192.	1192.	1173.	1119.
	1119.	1119.	1119.	1105.	1106.	1106.	1106.	1077.	1037.	1037.
	1037.	965.	882.	882.	882.	882.	771.	771.	790.	910.
	1409.	4044.	14066.	19680.	23533.	22187.	29069.	24227.	23703.	17634.
	17564.	24423.	28466.	21665.	20177.	44209.	24653.	16555.	23511.	13875.
	10087.	7666.								
1968	5636.	4692.	3669.	2797.	2340.	1987.	1881.	1812.	1780.	1740.
	1740.	1669.	1657.	1633.	1634.	1634.	1611.	1552.	1561.	1561.
	1561.	1561.	1560.	1560.	1560.	1560.	1544.	1485.	1556.	1662.
	1787.	2353.	10464.	27061.	21911.	21507.	29938.	30356.	22099.	24724.
	22504.	21723.	20991.	18324.	16541.	13759.	12436.	11024.	9099.	9115.
	5821.	4456.								
1969	4162.	3593.	2768.	2457.	2109.	1631.	1241.	1087.	901.	809.
	767.	724.	687.	658.	640.	598.	598.	598.	587.	599.
	630.	630.	655.	673.	709.	732.	779.	919.	1196.	1696.
	2867.	5116.	9727.	17064.	10209.	11525.	14689.	16092.	14614.	13051.
	16518.	16974.	14188.	11668.	12201.	6318.	5126.	4792.	5256.	4595.
	3939.	3308.								
1970	3018.	2841.	2489.	1680.	1432.	1202.	950.	842.	787.	735.
	699.	694.	694.	656.	656.	628.	617.	618.	628.	589.
	589.	589.	605.	616.	645.	645.	769.	846.	969.	1176.
	1634.	3900.	13817.	12474.	15221.	12989.	12531.	11864.	19977.	20089.
	16855.	18059.	17267.	21606.	18880.	14586.	16486.	11350.	9396.	7477.
	7616.	4244.								
1971	4991.	4166.	3393.	2885.	2923.	2796.	2543.	2249.	2013.	1886.
	1761.	1614.	1446.	1328.	1188.	1080.	950.	880.	821.	746.
	746.	730.	716.	716.	716.	716.	717.	744.	808.	904.
	1098.	1415.	2087.	3683.	6558.	19251.	39740.	24136.	33340.	21395.
	21771.	25092.	16325.	20943.	38945.	34819.	21352.	16880.	19170.	12233.
	9251.	8027.								

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1972	6619.	5931.	4501.	3711.	3005.	2717.	2574.	2431.	2311.	2016.
	2016.	1860.	1860.	1790.	1642.	1642.	1642.	1643.	1528.	1465.
	1465.	1403.	1416.	1351.	1351.	1329.	1241.	1241.	1189.	1241.
	2386.	13753.	13553.	18894.	31966.	20142.	35772.	31327.	21178.	22096.
	22084.	19683.	16050.	18343.	19675.	18045.	18653.	12473.	11598.	15857.
	11686.	5278.								
1973	4296.	3976.	5515.	4090.	2727.	2210.	1887.	1738.	1519.	1356.
	1210.	1186.	1186.	1051.	1026.	1026.	1026.	1035.	1008.	1008.
	1008.	929.	868.	868.	868.	868.	879.	879.	879.	929.
	1227.	2355.	8066.	11109.	13811.	17385.	28985.	31344.	20593.	18980.
	18143.	13728.	14810.	15752.	18754.	14942.	19441.	20593.	11210.	7823.
	6605.	5366.								
1974	4607.	3710.	2558.	1938.	1693.	1459.	1344.	1230.	1129.	1028.
	926.	881.	854.	816.	811.	778.	765.	745.	707.	694.
	662.	663.	648.	636.	605.	605.	594.	620.	747.	1189.
	2059.	5341.	9964.	22246.	25280.	16013.	13675.	12785.	13651.	14383.
	17876.	16396.	15766.	14730.	15504.	13265.	10498.	14244.	13395.	7511.
	7590.	9984.								
1975	4537.	4509.	2402.	1602.	1468.	1478.	1478.	1478.	1461.	1264.
	1264.	1264.	1264.	1270.	1203.	1203.	1203.	1200.	1123.	1123.
	1081.	1051.	1040.	1040.	1040.	1040.	1036.	1047.	1142.	1354.
	2133.	5138.	11291.	17252.	23081.	30459.	22880.	28749.	25700.	23413.
	25455.	24131.	22076.	20265.	16199.	15474.	13658.	11762.	9359.	15849.
	14847.	12513.								
1976	7559.	6664.	6139.	3621.	2720.	1937.	1475.	1173.	1011.	925.
	890.	855.	809.	778.	778.	750.	739.	741.	746.	746.
	746.	726.	687.	687.	687.	687.	644.	675.	839.	1402.
	3440.	9778.	9397.	9828.	11375.	23100.	24887.	17525.	16928.	16991.
	16954.	16164.	16576.	20226.	26317.	19534.	15004.	10554.	6302.	5160.
	5190.	5530.								
1977	3729.	3045.	2903.	2576.	2139.	1963.	1839.	1736.	2097.	1902.
	1722.	1583.	1462.	1442.	1400.	1326.	1294.	1257.	1219.	1197.
	1197.	1156.	1106.	1106.	1106.	1106.	1149.	1149.	1211.	1272.
	1314.	2267.	8205.	12588.	19531.	29414.	38957.	31928.	28489.	18502.
	20572.	21740.	18089.	19531.	18939.	17328.	17519.	11066.	8643.	12235.
	11736.	9877.								
1978	6782.	6882.	6046.	4510.	3355.	2862.	2578.	2392.	2223.	2108.
	2015.	1955.	1808.	1741.	1641.	1557.	1496.	1403.	1285.	1247.
	1247.	1212.	1258.	1258.	1258.	1275.	1251.	1251.	1251.	1322.
	3355.	11862.	16195.	10959.	11660.	13979.	19417.	16614.	20703.	19608.
	18215.	18416.	18064.	16600.	15674.	14572.	12160.	8756.	9287.	8372.
	6293.	4696.								

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1979	4195.	4701.	3796.	2849.	2736.	2368.	1774.	1558.	1502.	1483.
	1349.	1214.	1170.	1185.	1138.	1138.	1138.	1059.	1067.	1067.
	1067.	989.	1113.	1113.	1113.	1113.	1064.	1113.	1228.	1545.
	2451.	4633.	10811.	17246.	28470.	25470.	21379.	19302.	23880.	22832.
	22584.	27495.	28100.	21732.	20346.	16431.	13993.	12415.	7911.	7704.
	11339.	8978.								
1980	6672.	8469.	5948.	4395.	4084.	3698.	4120.	2949.	2811.	2297.
	2069.	1890.	1711.	1607.	1535.	1451.	1379.	1345.	1285.	1224.
	1176.	1175.	1177.	1177.	1177.	1177.	1122.	1122.	1179.	1604.
	3462.	8212.	11764.	10518.	16714.	25823.	20349.	26351.	22988.	26281.
	26663.	28137.	25275.	28150.	19051.	18006.	16331.	11948.	8723.	9329.
	15679.	10243.								
1981	8532.	7605.	6326.	5214.	3950.	3534.	2637.	2685.	2707.	2175.
	1678.	1578.	1516.	1448.	1684.	1961.	2118.	2142.	1911.	1594.
	1265.	1190.	1194.	1274.	1297.	1314.	1238.	1291.	1373.	1779.
	4737.	17566.	17640.	11625.	19077.	16465.	14949.	16085.	18788.	14090.
	33261.	32516.	29007.	31168.	30077.	38871.	30803.	20647.	15158.	12220.
	10197.	8299.								
1982	5901.	5560.	5713.	6627.	3364.	2845.	2782.	2339.	2057.	1971.
	1860.	1794.	1794.	1697.	1695.	1695.	1695.	1729.	1662.	1213.
	881.	767.	826.	826.	874.	1123.	956.	956.	1057.	1403.
	2641.	6274.	11618.	15603.	17916.	21638.	18090.	23883.	23173.	16689.
	20637.	20979.	23533.	20306.	13970.	12157.	10610.	11835.	10670.	13360.
	21010.	11582.								
1983	7782.	6119.	4982.	2921.	2384.	2252.	2137.	1997.	1944.	1850.
	1850.	1850.	1965.	2201.	1906.	1690.	1588.	1553.	1535.	1650.
	1685.	1583.	1534.	1437.	1389.	1280.	1185.	1208.	1411.	1907.
	3484.	8419.	14537.	12909.	18671.	23758.	17019.	20754.	20568.	22463.
	19352.	16152.	17431.	17935.	22829.	21149.	18683.	22728.	15528.	9607.
	8465.	9728.								

Table E.2.2.9: COMPUTED WEEKLY FLOWS FOR SUSITNA RIVER AT DEVIL CANYON[1/]

1951	5002.	4460.	3893.	2221.	1390.	1308.	1227.	1159.	1105.	1029.
	1029.	1029.	1029.	928.	911.	911.	911.	849.	763.	763.
	763.	732.	693.	693.	693.	693.	632.	812.	1247.	2166.
	5578.	16270.	18094.	8982.	15694.	28723.	20708.	13168.	18542.	20078.
	23579.	22556.	20742.	20059.	16216.	17229.	16860.	23677.	28254.	17550.
	18128.	15345.								
1952	8578.	5735.	4169.	3240.	3275.	3051.	2256.	2231.	2060.	1744.
	1744.	1744.	1744.	1547.	1512.	1512.	1512.	1242.	913.	913.
	913.	876.	823.	823.	823.	823.	865.	865.	865.	865.
	1070.	1348.	1844.	3994.	19808.	23151.	32788.	35561.	31470.	26455.
	18796.	24021.	26032.	34530.	22572.	17722.	13454.	15784.	18093.	12236.
	10567.	12646.								
1953	10249.	9557.	6653.	4848.	4640.	3958.	2537.	3109.	2241.	1518.
	1518.	1518.	1518.	1076.	1001.	1001.	1001.	882.	728.	728.
	728.	737.	770.	770.	770.	770.	515.	515.	833.	1384.
	11682.	16151.	14696.	25346.	19715.	32683.	25237.	20543.	24040.	19114.
	17262.	18775.	19518.	24005.	20575.	16487.	16972.	20191.	17049.	15531.
	12951.	9867.								
1954	7420.	6152.	4514.	3597.	2199.	2085.	1928.	1796.	1633.	1374.
	1374.	1374.	1374.	1260.	1236.	1236.	1236.	1105.	923.	923.
	923.	834.	718.	718.	718.	718.	585.	585.	1006.	1076.
	5588.	11134.	18035.	20674.	19401.	23445.	22525.	21603.	26262.	21613.
	17237.	16771.	16771.	29010.	23623.	23623.	23623.	22350.	14288.	12282.
	11456.	7355.								
1955	5953.	5593.	4211.	4211.	3316.	2637.	2487.	2197.	2140.	1995.
	1956.	1723.	1723.	1838.	1855.	1589.	1483.	1401.	1280.	1280.
	1280.	1153.	1010.	1010.	1010.	1010.	962.	962.	962.	962.
	3137.	4150.	4849.	14520.	15954.	19123.	31175.	33822.	31673.	32794.
	27394.	21145.	25282.	22103.	20433.	20965.	25488.	36191.	18609.	14219.
	11555.	9100.								
1956	6868.	5055.	4117.	3547.	2325.	1938.	1781.	1570.	1470.	1197.
	1197.	1197.	1197.	958.	913.	913.	913.	914.	892.	892.
	892.	879.	849.	849.	849.	849.	770.	770.	770.	770.
	2220.	10455.	14922.	29687.	19760.	31174.	40573.	29790.	26263.	27406.
	29885.	30181.	29454.	29030.	26510.	23956.	19099.	16306.	14339.	20101.
	19588.	12547.								
1957	6577.	6577.	4462.	4110.	3399.	2855.	2740.	2587.	2471.	2213.
	2147.	1751.	1751.	1614.	1588.	1588.	1588.	1509.	1396.	1396.
	1396.	1263.	1088.	1088.	1088.	1088.	974.	974.	974.	974.
	2998.	5240.	8557.	19170.	28186.	35489.	31359.	27825.	19052.	21995.
	20209.	22658.	24581.	19770.	19771.	19663.	18031.	19953.	17237.	18813.
	18292.	17567.								

1/ Weekly flows start from week 1 (Oct 1-7) to week 52 (Sept. 23-30), the flow for week 52 is the total flow between Sept. 23 and 30 divided by 8.

1958	9403.	8067.	6579.	6784.	4885.	4021.	3443.	2831.	3221.	3868.
	3300.	2460.	1998.	2228.	1953.	1703.	1611.	1331.	1333.	1201.
	1109.	1111.	1138.	1110.	1042.	1042.	1071.	1198.	1299.	1575.
	3551.	7050.	9849.	18752.	20003.	27116.	27116.	23381.	21304.	20248.
	20248.	20248.	19851.	36827.	26997.	20048.	16251.	11239.	7737.	7737.
	6008.	6007.								
1959	5540.	4873.	4662.	3236.	2770.	2388.	2035.	1563.	1405.	985.
	1086.	1699.	1699.	1403.	1351.	1288.	1262.	1276.	1278.	1226.
	1096.	997.	865.	865.	865.	865.	831.	831.	1187.	1246.
	2471.	4043.	17261.	24455.	19652.	23860.	17822.	21239.	23769.	24645.
	23659.	25632.	20245.	21943.	17188.	22064.	40756.	39763.	25835.	13349.
	10026.	9459.								
1960	10007.	6913.	3803.	4751.	3192.	2716.	2599.	2444.	2322.	1995.
	1995.	1995.	1995.	1857.	1835.	1637.	1559.	1474.	1378.	1351.
	1286.	1247.	1205.	1152.	1019.	1019.	790.	790.	1035.	1077.
	5345.	7566.	14617.	22750.	23524.	13128.	13610.	14093.	15491.	22156.
	16426.	18898.	25911.	30054.	23404.	20681.	19984.	19226.	16823.	26586.
	18844.	14112.								
1961	11591.	8418.	5986.	4360.	3269.	2981.	2749.	2439.	2508.	2634.
	2583.	2271.	2271.	2211.	2203.	2268.	2294.	1988.	1604.	1578.
	1516.	1446.	1352.	1505.	1891.	1891.	1996.	1996.	2201.	2235.
	6581.	12101.	20940.	19947.	18628.	17325.	28298.	35357.	29708.	21299.
	22357.	23150.	23984.	24592.	25061.	21399.	20310.	15053.	11262.	12778.
	12169.	12256.								
1962	9801.	4324.	4324.	4324.	3274.	2458.	2458.	2458.	2321.	1960.
	1960.	1960.	1960.	1837.	1815.	1815.	1815.	1634.	1392.	1392.
	1392.	1359.	1316.	1316.	1316.	1316.	1486.	1486.	1486.	1486.
	3391.	4173.	11325.	16690.	26822.	28876.	56010.	47891.	33902.	26163.
	25543.	22258.	26163.	24614.	21799.	21799.	21799.	22209.	22008.	13899.
	11257.	11332.								
1963	8737.	6653.	5797.	5238.	3522.	2607.	2607.	2607.	2410.	1872.
	1872.	1872.	1872.	1540.	1490.	1490.	1490.	1465.	1414.	1414.
	1414.	1188.	933.	933.	933.	933.	693.	693.	693.	693.
	2460.	3320.	18714.	30261.	34055.	23383.	23383.	23383.	23383.	28908.
	37368.	35407.	30234.	26872.	24729.	21455.	22691.	19122.	14318.	12804.
	10239.	9083.								
1964	8327.	7011.	5737.	4347.	2658.	2374.	2100.	1736.	1690.	1576.
	1523.	1205.	1205.	1047.	1020.	954.	926.	934.	942.	922.
	876.	802.	707.	679.	606.	606.	674.	674.	730.	740.
	590.	604.	809.	1790.	20029.	74483.	51153.	42687.	30872.	24270.
	25009.	23601.	16194.	18729.	17736.	14300.	15247.	12880.	10489.	8548.
	8595.	7361.								

1965	7044.	7883.	5159.	4104.	2914.	2687.	2659.	2963.	1906.	1271.
	1133.	1030.	1030.	943.	928.	928.	928.	880.	820.	820.
	820.	841.	870.	870.	870.	870.	1115.	1115.	1406.	1454.
	1899.	5130.	8925.	16084.	31961.	20514.	21916.	20942.	30826.	28458.
	28698.	26730.	23181.	20872.	18586.	28711.	19247.	10693.	15833.	19452.
	17801.	20591.								
1966	13634.	7579.	3550.	2937.	2500.	2042.	1804.	1721.	1656.	1554.
	1503.	1442.	1388.	1298.	1281.	1281.	1281.	1238.	1180.	1180.
	1180.	1184.	1187.	1187.	1187.	1187.	1317.	1317.	1731.	1800.
	2714.	3540.	6557.	12569.	19703.	44111.	31569.	26668.	22505.	17390.
	16564.	17337.	19615.	26089.	21345.	17552.	21266.	17016.	11802.	11462.
	11331.	8267.								
1967	6487.	4350.	3288.	2227.	1568.	1446.	1446.	1446.	1422.	1361.
	1361.	1361.	1361.	1362.	1363.	1363.	1363.	1325.	1275.	1275.
	1275.	1188.	1078.	1078.	1078.	1078.	963.	963.	989.	1138.
	1624.	4649.	16169.	22624.	27061.	24918.	32648.	27209.	26620.	20076.
	19995.	27805.	32408.	25176.	23405.	51282.	28599.	19229.	27035.	15955.
	11597.	8813.								
1968	6430.	5353.	4187.	3191.	2670.	2265.	2145.	2064.	2026.	1969.
	1969.	1888.	1875.	1868.	1869.	1869.	1842.	1776.	1779.	1779.
	1779.	1779.	1779.	1779.	1779.	1779.	1750.	1684.	1764.	1883.
	2087.	2748.	12217.	31597.	25614.	24621.	34274.	34753.	25300.	27823.
	25325.	24447.	23623.	20824.	18816.	15653.	14145.	12539.	10453.	10471.
	6687.	5120.								
1969	4751.	4102.	3160.	2805.	2386.	1844.	1404.	1229.	1017.	896.
	849.	801.	761.	731.	711.	663.	663.	663.	660.	673.
	707.	707.	735.	755.	796.	822.	878.	1036.	1348.	1912.
	3208.	5727.	10892.	19104.	11446.	12312.	15692.	17191.	15610.	13725.
	17372.	17848.	14921.	12703.	13327.	6903.	5598.	5234.	5924.	5179.
	4441.	3729.								
1970	3613.	3401.	2979.	2011.	1615.	1349.	1065.	943.	883.	840.
	799.	793.	793.	780.	781.	748.	735.	735.	739.	693.
	693.	693.	698.	711.	745.	745.	811.	893.	1021.	1240.
	1833.	4383.	15525.	14018.	17146.	15505.	14957.	14162.	23845.	23076.
	19362.	20745.	19835.	24759.	21655.	16732.	18910.	13021.	10994.	8748.
	8910.	4967.								
1971	6293.	5253.	4279.	3638.	3621.	3449.	3138.	2775.	2486.	2321.
	2166.	1986.	1779.	1597.	1429.	1298.	1140.	1059.	999.	908.
	908.	889.	865.	865.	865.	865.	870.	903.	980.	1096.
	1312.	1700.	2506.	4424.	7861.	21610.	44612.	27094.	37428.	23189.
	23596.	27197.	17694.	23161.	43006.	38447.	23577.	18657.	21459.	13693.
	10354.	8985.								

1972	7354.	6590.	5002.	4124.	3386.	3056.	2896.	2735.	2602.	2389.
	2389.	2205.	2205.	2182.	2001.	2001.	2001.	2000.	1885.	1807.
	1807.	1730.	1718.	1639.	1639.	1613.	1483.	1483.	1422.	1483.
	2946.	17070.	16823.	23452.	39387.	23332.	41437.	36288.	24532.	24274.
	24261.	21623.	17632.	19568.	20953.	19219.	19865.	13290.	12589.	17212.
	12685.	5728.								
1973	4631.	4286.	5945.	4409.	2970.	2408.	2056.	1894.	1654.	1511.
	1349.	1321.	1321.	1162.	1134.	1134.	1134.	1142.	1142.	1142.
	1142.	1050.	945.	945.	945.	945.	949.	949.	949.	1003.
	1329.	2552.	8737.	12035.	14974.	19248.	32089.	34700.	22798.	20385.
	19488.	14744.	15905.	17030.	20275.	16155.	21018.	22260.	12074.	8425.
	7115.	5779.								
1974	5275.	4249.	2930.	2220.	1835.	1574.	1450.	1328.	1218.	1099.
	989.	941.	913.	876.	870.	835.	822.	798.	765.	751.
	717.	718.	714.	700.	666.	666.	639.	665.	802.	1279.
	2387.	6225.	11611.	25921.	29383.	18109.	15463.	14457.	15436.	16001.
	19887.	18241.	17539.	16605.	17493.	14966.	11844.	16072.	15586.	8738.
	8830.	11618.								
1975	5158.	5126.	2732.	1822.	1618.	1622.	1622.	1622.	1607.	1479.
	1479.	1479.	1479.	1473.	1394.	1394.	1394.	1393.	1365.	1365.
	1313.	1274.	1272.	1272.	1272.	1272.	1248.	1260.	1375.	1630.
	2559.	6184.	13592.	20770.	27708.	34462.	25886.	32527.	29079.	26155.
	28436.	26957.	24660.	22789.	18242.	17426.	15380.	13252.	10858.	18386.
	17223.	14515.								
1976	9346.	8243.	7593.	4478.	3159.	2241.	1707.	1356.	1167.	1063.
	1023.	983.	930.	920.	921.	888.	875.	876.	880.	880.
	880.	856.	822.	822.	822.	822.	756.	792.	983.	1643.
	4311.	12374.	11892.	12436.	14396.	26245.	28274.	19909.	19234.	18276.
	18235.	17385.	17831.	21250.	27600.	20486.	15736.	11079.	7164.	5867.
	5902.	6285.								
1977	4442.	3626.	3458.	3068.	2652.	2438.	2285.	2156.	2600.	2429.
	2200.	2020.	1867.	1772.	1720.	1629.	1590.	1543.	1487.	1461.
	1461.	1415.	1355.	1355.	1355.	1355.	1438.	1438.	1516.	1592.
	1712.	2974.	10764.	16515.	25448.	33191.	43962.	36028.	32148.	20430.
	22716.	24005.	19973.	21372.	20695.	18935.	19143.	12101.	9714.	13751.
	13190.	11099.								
1978	8112.	8229.	7232.	5395.	4079.	3474.	3131.	2904.	2692.	2523.
	2412.	2340.	2163.	2060.	1942.	1843.	1770.	1663.	1548.	1503.
	1503.	1460.	1478.	1478.	1478.	1498.	1441.	1441.	1441.	1522.
	3504.	12344.	16853.	11404.	12150.	14917.	20720.	17729.	22092.	21324.
	19810.	20028.	19646.	18935.	17917.	16659.	13901.	10010.	10516.	9480.
	7126.	5317.								

1979	5005.	5607.	4528.	3398.	3267.	2830.	2121.	1862.	1792.	1748.
	1591.	1433.	1381.	1359.	1306.	1306.	1306.	1213.	1218.	1218.
	1218.	1126.	1169.	1169.	1169.	1169.	1131.	1184.	1305.	1640.
	2638.	4998.	11662.	18604.	30663.	26683.	22397.	20220.	25018.	25082.
	24811.	30205.	30868.	24867.	23326.	18838.	16043.	14232.	8834.	8606.
	12663.	10027.								
1980	7486.	9501.	6673.	4930.	4588.	4148.	4621.	3309.	3151.	2576.
	2321.	2119.	1918.	1801.	1722.	1628.	1547.	1507.	1440.	1372.
	1319.	1320.	1321.	1321.	1321.	1321.	1260.	1260.	1324.	1800.
	3875.	9212.	13196.	11801.	18768.	28973.	22831.	29565.	25792.	29501.
	29933.	31585.	28372.	31440.	21402.	20230.	18346.	13413.	9786.	10465.
	17592.	11492.								
1981	9434.	8409.	6994.	5765.	4389.	3929.	2932.	2985.	2998.	2216.
	1710.	1608.	1546.	1524.	1775.	2066.	2232.	2262.	2240.	1868.
	1484.	1391.	1391.	1484.	1510.	1529.	1449.	1510.	1608.	2083.
	5196.	19239.	19321.	12733.	20884.	18091.	16425.	17674.	20644.	16157.
	38138.	37283.	33258.	36067.	34704.	44852.	35541.	23832.	16893.	13620.
	11366.	9251.								
1982	6569.	6190.	6361.	7376.	4141.	3513.	3436.	2889.	2534.	2328.
	2193.	2115.	2115.	2084.	2083.	2083.	2083.	2106.	2111.	1542.
	1119.	982.	1001.	1001.	1060.	1363.	1286.	1286.	1420.	1886.
	3035.	7207.	13345.	17920.	20543.	24650.	20609.	27209.	26402.	18710.
	23136.	23521.	26386.	22303.	15386.	13388.	11684.	13035.	12548.	15713.
	24712.	13620.								
1983	9491.	7464.	6077.	3562.	2760.	2590.	2458.	2297.	2235.	2142.
	2142.	2142.	2274.	2569.	2225.	1974.	1854.	1813.	1769.	1902.
	1942.	1821.	1710.	1602.	1548.	1427.	1341.	1366.	1596.	2158.
	4096.	9947.	17176.	15253.	21996.	26445.	18942.	23102.	22894.	24232.
	20875.	17423.	18801.	19944.	25388.	23520.	20778.	25284.	17691.	10946.
	9644.	11085.								

Table E.2.2.10: GOLD CREEK NATURAL MONTHLY FLOWS (CFS) 1/

YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	ANNUAL
1951	3848	1300	1100	960	820	740	1617	14090	20790	22570	19670	21240	9106
1952	5571	2744	1900	1600	1000	880	920	5419	32370	26390	20920	14480	9552
1953	8202	3497	1700	1100	820	820	1615	19270	27320	20200	20610	15270	10090
1954	5604	2100	1500	1300	1000	780	1235	17280	25250	20360	26100	12920	9682
1955	5370	2760	2045	1794	1400	1100	1200	9319	29860	27560	25750	14290	10256
1956	4951	1900	1300	980	970	940	950	17660	33340	31090	24530	18330	11473
1957	5806	3050	2142	1700	1500	1200	1200	13750	30160	23310	20540	19800	10384
1958	8212	3954	3264	1965	1307	1148	1533	12900	25700	22880	22540	7550	9476
1959	4811	2150	1513	1448	1307	980	1250	15990	23320	25000	31180	16920	10560
1960	6558	2850	2200	1845	1452	1197	1300	15780	15530	22980	23590	20510	9712
1961	7794	3000	2694	2452	1754	1810	2650	17360	29450	24570	22100	13370	10809
1962	5916	2700	2100	1900	1500	1400	1700	12590	43270	25850	23550	15890	11565
1963	6723	2800	2000	1600	1500	1000	830	19030	26000	34400	23670	12320	11073
1964	6449	2250	1494	1048	966	713	745	4307	50580	22950	16440	9571	9800
1965	6291	2799	1211	960	860	900	1360	12990	25720	27840	21120	19350	10169
1966	7205	2098	1631	1400	1300	1300	1775	9645	32950	19860	21830	11750	9432
1967	4163	1600	1500	1500	1400	1200	1167	15480	29510	26800	32620	16870	11219
1968	4900	2353	2055	1981	1900	1900	1910	16180	31550	26420	17170	8816	9811
1969	3822	1630	882	724	723	816	1510	11050	15500	16100	8879	5093	5596
1970	3124	1215	866	824	768	776	1080	11380	18630	22660	19980	9121	7591
1971	5288	3407	2290	1442	1036	950	1082	3745	32930	23950	31910	14440	10251
1972	5847	3093	2510	2239	2028	1823	1710	21890	34430	22770	19290	12400	10886
1973	4826	2253	1465	1200	1200	1000	1027	8235	27800	18250	20290	9074	8086
1974	3733	1523	1034	874	777	724	992	16180	17870	18800	16220	12250	7631
1975	3739	1700	1603	1516	1471	1400	1593	15350	32310	27720	18090	16310	10275
1976	7739	1993	1081	974	950	900	1373	12620	24380	18940	19800	6881	8189
1977	3874	2650	2403	1829	1618	1500	1680	12680	37970	22870	19240	12640	10109
1978	7571	3525	2589	2029	1668	1605	1702	11950	19050	21020	16390	8607	8195
1979	4907	2535	1681	1397	1286	1200	1450	13870	24690	28880	20460	10770	9489
1980	7311	4192	2416	1748	1466	1400	1670	12060	29080	32660	20960	13280	10748
1981	7725	3569	1915	2013	1975	1585	2040	16550	19300	33940	37870	13790	11961
1982 2/	7463	3613	2397	2300	1739	1203	1783	13380	26100	24120	15270	17780	9800
1983 2/	6892	2633	2358	2265	1996	1690	1900	14950	24510	21150	24500	13590	9926
MAX	8212	4192	3264	2452	2028	1900	2650	21890	50580	34400	37870	21240	11961
MIN	3124	1215	866	724	723	713	745	3745	15500	16100	8879	5093	5596
MEAN	5825	2589	1844	1543	1317	1169	1441	13483	27795	24390	21911	13493	9785

1/ The USGS gage at Gold Creek has been operational since October 1949. Reservoir operation simulations were made for the 34 calendar years beginning January 1950, and ending December 1983. Hydrologic statistics used in comparing natural and with-project conditions are based on the 33 complete water years (standard statistical year) beginning October 1, 1950 and ending September 30, 1983.

2/ Provisional data were used for water years 1982 and 1983. Final date published for these years are identical to provisional data except in the November 1981 to March 1982 period. The final published values (USGS 1983) for these months are: November, 3,260; December, 1,877; January, 1,681; February, 1,486; March, 1,347. These differences amount to approximately 1 percent of the yearly flow and do not affect the validity of the results.

Table E.2.2.11: NATURAL WEEKLY FLOWS FOR SUSITNA RIVER AT GOLD CREEK[1/]

1951	5257.	4686.	4091.	2334.	1471.	1386.	1300.	1229.	1171.	1100.
	1100.	1100.	1100.	980.	960.	960.	960.	900.	820.	820.
	820.	786.	740.	740.	740.	740.	774.	997.	1529.	2657.
	6157.	17329.	19271.	9567.	16671.	29543.	21300.	13543.	19071.	20729.
	24343.	23286.	21414.	21429.	17614.	18714.	18314.	25600.	30057.	18671.
	19286.	18657.								
1952	9229.	6171.	4486.	3486.	3500.	3204.	2369.	2343.	2186.	1900.
	1900.	1900.	1900.	1643.	1600.	1600.	1600.	1343.	1000.	1000.
	1000.	949.	880.	880.	880.	880.	920.	920.	920.	920.
	1191.	1514.	2071.	4486.	21929.	24814.	35143.	38114.	33729.	27629.
	19629.	25086.	27186.	37243.	25071.	19686.	14943.	17329.	18886.	12771.
	11029.	15086.								
1953	11143.	10390.	7233.	5271.	5000.	4257.	2729.	3343.	2429.	1700.
	1700.	1700.	1700.	1186.	1100.	1100.	1100.	980.	820.	820.
	820.	820.	820.	820.	820.	820.	930.	930.	1504.	2500.
	14129.	16814.	15300.	26386.	20743.	35114.	27114.	22071.	25829.	20229.
	18271.	19871.	20657.	25643.	21857.	17514.	18029.	21500.	18786.	17114.
	14271.	12426.								
1954	8119.	6733.	4940.	3937.	2401.	2271.	2100.	1957.	1786.	1500.
	1500.	1500.	1500.	1329.	1300.	1300.	1300.	1171.	1000.	1000.
	1000.	906.	780.	780.	780.	780.	870.	870.	1496.	1600.
	6743.	12286.	19900.	22814.	21571.	25457.	24457.	23457.	28514.	24486.
	19529.	19000.	19000.	31143.	24000.	24000.	24000.	23000.	16286.	14000.
	13057.	9581.								
1955	6500.	6109.	4600.	4600.	3686.	3000.	2829.	2500.	2414.	2200.
	2157.	1900.	1900.	1986.	2000.	1714.	1600.	1514.	1400.	1400.
	1400.	1271.	1100.	1100.	1100.	1100.	1200.	1200.	1200.	1200.
	3557.	4500.	5257.	15743.	17429.	20329.	33143.	35957.	33671.	34186.
	28557.	22043.	26357.	22614.	20900.	21443.	26071.	37243.	19671.	15029.
	12214.	10993.								
1956	7236.	5327.	4339.	3737.	2486.	2100.	1929.	1700.	1586.	1300.
	1300.	1300.	1300.	1026.	980.	980.	980.	976.	970.	970.
	970.	957.	940.	940.	940.	940.	950.	950.	950.	950.
	2514.	11400.	16271.	32371.	21686.	33457.	43543.	31971.	28186.	29057.
	31686.	32000.	31229.	31429.	28771.	26000.	20729.	17714.	16000.	22429.
	21857.	16000.								
1957	7200.	7200.	4886.	4500.	3757.	3200.	3071.	2900.	2757.	2400.
	2329.	1900.	1900.	1729.	1700.	1700.	1700.	1614.	1500.	1500.
	1500.	1371.	1200.	1200.	1200.	1200.	1200.	1200.	1200.	1200.
	3414.	5757.	9400.	21057.	30914.	37443.	33086.	29357.	20100.	23214.
	21329.	23914.	25943.	20957.	20943.	20829.	19100.	21143.	18914.	20643.
	20071.	22029.								

[1/] Weekly flows start from week 1 (Oct 1-7) to week 52 (Sept. 23-30), the flow for week 52 is the total flow between Sept. 23 and 30 divided by 7

1958	10333.	8864.	7230.	7454.	5429.	4521.	3870.	3181.	3586.	4314.
	3680.	2744.	2229.	2429.	2129.	1857.	1757.	1457.	1443.	1300.
	1200.	1200.	1200.	1171.	1100.	1100.	1200.	1343.	1457.	1766.
	3990.	7883.	11014.	20971.	22057.	28000.	28000.	24143.	22000.	22000.
	22000.	22000.	21571.	38686.	27529.	20443.	16571.	11557.	8500.	8500.
	6600.	7543.								
1959	5991.	5271.	5043.	3500.	2986.	2600.	2214.	1700.	1529.	1100.
	1214.	1900.	1900.	1557.	1500.	1429.	1400.	1400.	1400.	1343.
	1200.	1106.	980.	980.	980.	980.	1000.	1000.	1429.	1500.
	2857.	4543.	19400.	27486.	22329.	26029.	19443.	23171.	25929.	26400.
	25343.	27457.	21686.	23886.	18629.	23914.	44171.	43171.	28700.	14829.
	11137.	12007.								
1960	10714.	7400.	4071.	5086.	3486.	3000.	2871.	2700.	2557.	2200.
	2200.	2200.	2200.	2029.	2000.	1786.	1700.	1614.	1500.	1471.
	1400.	1357.	1300.	1243.	1100.	1100.	1100.	1100.	1443.	1500.
	5857.	7600.	14686.	22857.	24286.	14357.	14886.	15414.	16943.	22929.
	17000.	19557.	26814.	32043.	25429.	22471.	21714.	20857.	18314.	28943.
	20514.	17557.								
1961	12529.	9100.	6471.	4714.	3586.	3300.	3043.	2700.	2757.	2900.
	2843.	2500.	2500.	2414.	2400.	2471.	2500.	2200.	1800.	1771.
	1700.	1614.	1500.	1671.	2100.	2100.	2500.	2500.	2757.	2800.
	7229.	12714.	22000.	20957.	19814.	18971.	30986.	38714.	32529.	23000.
	24143.	25000.	25900.	25643.	26000.	22200.	21071.	15657.	12429.	14100.
	13429.	15457.								
1962	10429.	4600.	4600.	4600.	3514.	2700.	2700.	2700.	2529.	2100.
	2100.	2100.	2100.	1929.	1900.	1900.	1900.	1729.	1500.	1500.
	1500.	1457.	1400.	1400.	1400.	1400.	1700.	1700.	1700.	1700.
	3700.	4500.	12214.	18000.	28471.	30286.	58743.	50229.	35557.	27186.
	26543.	23129.	27186.	26057.	23000.	23000.	23000.	23429.	23571.	14886.
	12057.	13871.								
1963	9150.	6967.	6071.	5486.	3700.	2800.	2800.	2800.	2571.	2000.
	2000.	2000.	2000.	1657.	1600.	1600.	1600.	1557.	1500.	1500.
	1500.	1286.	1000.	1000.	1000.	1000.	830.	830.	830.	830.
	2666.	3400.	19171.	31000.	35686.	26000.	26000.	26000.	26000.	31143.
	40257.	38143.	32571.	27800.	25143.	21814.	23071.	19543.	15143.	13543.
	10829.	10979.								
1964	8897.	7491.	6129.	4643.	2886.	2600.	2300.	1900.	1843.	1700.
	1643.	1300.	1300.	1129.	1100.	1029.	1000.	1000.	1000.	980.
	930.	861.	770.	739.	660.	660.	710.	710.	770.	780.
	866.	1043.	1400.	3099.	28990.	75029.	51529.	43000.	31100.	25371.
	26143.	24671.	16929.	19757.	18729.	15100.	16100.	13600.	11354.	9253.
	9304.	9106.								

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1965	7677.	8591.	5623.	4473.	3080.	2836.	2807.	3129.	2033.	1370.
	1221.	1110.	1110.	981.	960.	960.	960.	917.	860.	860.
	860.	877.	900.	900.	900.	900.	1180.	1180.	1489.	1540.
	2011.	5386.	9371.	16886.	33643.	21971.	23471.	22429.	33014.	30357.
	30614.	28514.	24729.	22229.	19671.	30386.	20371.	11343.	16849.	20700.
	18943.	25043.								
1966	15086.	8387.	3929.	3250.	2764.	2264.	2000.	1907.	1829.	1714.
	1657.	1590.	1530.	1419.	1400.	1400.	1400.	1357.	1300.	1300.
	1300.	1300.	1300.	1300.	1300.	1300.	1500.	1500.	1971.	2050.
	3014.	3886.	7200.	13800.	21657.	47686.	34129.	28829.	24329.	18643.
	17757.	18586.	21029.	28014.	22914.	18843.	22829.	18300.	12886.	12514.
	12371.	10314.								
1967	6990.	4687.	3544.	2400.	1729.	1600.	1600.	1600.	1571.	1500.
	1500.	1500.	1500.	1500.	1500.	1500.	1500.	1457.	1400.	1400.
	1400.	1314.	1200.	1200.	1200.	1200.	1100.	1100.	1129.	1300.
	1743.	4929.	17143.	23986.	28829.	26571.	34814.	29014.	28386.	21557.
	21471.	29857.	34800.	27100.	25043.	54871.	30600.	20614.	29071.	17157.
	12471.	10831.								
1968	6851.	5703.	4460.	3400.	2857.	2429.	2300.	2214.	2171.	2100.
	2100.	2014.	2000.	2000.	2000.	2000.	1971.	1900.	1900.	1900.
	1900.	1900.	1900.	1900.	1900.	1900.	1871.	1800.	1886.	2014.
	2243.	2943.	13086.	33843.	27543.	26457.	36829.	37343.	27186.	29429.
	26786.	25857.	24986.	22214.	20143.	16757.	15143.	13429.	11271.	11291.
	7210.	6309.								
1969	5061.	4370.	3366.	2987.	2543.	1971.	1500.	1314.	1086.	950.
	900.	850.	807.	771.	750.	700.	700.	700.	700.	714.
	750.	750.	779.	800.	843.	871.	957.	1129.	1471.	2086.
	3400.	6013.	11434.	20057.	12069.	12800.	16314.	17871.	16229.	13929.
	17629.	18114.	15143.	13386.	14286.	7399.	6001.	5593.	6303.	5511.
	4726.	4536.								
1970	3940.	3709.	3249.	2193.	1714.	1429.	1129.	1000.	936.	900.
	857.	850.	850.	850.	850.	814.	800.	800.	800.	750.
	750.	750.	750.	764.	800.	800.	850.	936.	1071.	1300.
	1943.	4614.	16343.	14757.	18129.	16971.	16371.	15500.	26100.	25029.
	21000.	22500.	21514.	26429.	22871.	17671.	19971.	13786.	11897.	9466.
	9643.	6143.								
1971	7017.	5857.	4771.	4057.	4000.	3800.	3457.	3057.	2743.	2571.
	2400.	2200.	1971.	1743.	1557.	1414.	1243.	1157.	1100.	1000.
	1000.	979.	950.	950.	950.	950.	964.	1000.	1086.	1214.
	1457.	1900.	2800.	4943.	8714.	22857.	47186.	28657.	39586.	24471.
	24900.	28700.	18671.	24357.	44743.	40000.	24529.	19471.	22857.	14586.
	11029.	10939.								

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1972	7744.	6939.	5267.	4343.	3600.	3257.	3086.	2914.	2771.	2600.
	2600.	2400.	2400.	2400.	2200.	2200.	2200.	2200.	2086.	2000.
	2000.	1914.	1886.	1800.	1800.	1771.	1700.	1700.	1629.	1700.
	3386.	19571.	19286.	26886.	44243.	24471.	43457.	38057.	25729.	25371.
	25357.	22600.	18429.	20243.	21729.	19929.	20600.	13786.	13186.	18029.
	13286.	6857.								
1973	4786.	4429.	6143.	4557.	3114.	2543.	2171.	2000.	1743.	1600.
	1429.	1400.	1400.	1229.	1200.	1200.	1200.	1200.	1200.	1200.
	1200.	1114.	1000.	1000.	1000.	1000.	1000.	1000.	1000.	1057.
	1400.	2686.	9200.	12671.	15714.	20214.	33700.	36443.	23943.	21057.
	20129.	15229.	16429.	17657.	21029.	16757.	21800.	23171.	12814.	8942.
	7551.	7010.								
1974	5636.	4539.	3130.	2371.	1914.	1643.	1514.	1386.	1271.	1143.
	1029.	979.	950.	907.	900.	864.	850.	829.	800.	786.
	750.	750.	750.	736.	700.	700.	700.	729.	879.	1400.
	2571.	6586.	12286.	27429.	31357.	19557.	16700.	15614.	16671.	16943.
	21057.	19314.	18571.	17714.	18686.	15986.	12651.	17130.	16614.	9314.
	9413.	14154.								
1975	5503.	5469.	2914.	1943.	1700.	1700.	1700.	1700.	1686.	1600.
	1600.	1600.	1600.	1586.	1500.	1500.	1500.	1500.	1500.	1500.
	1443.	1400.	1400.	1400.	1400.	1400.	1400.	1414.	1543.	1829.
	2843.	6857.	15071.	23029.	30500.	36400.	27343.	34357.	30714.	27500.
	29900.	28343.	25929.	24200.	19486.	18614.	16429.	14157.	11743.	19886.
	18629.	17943.								
1976	10286.	9071.	8357.	4929.	3429.	2457.	1871.	1486.	1271.	1143.
	1100.	1057.	1000.	1000.	1000.	964.	950.	950.	950.	950.
	950.	929.	900.	900.	900.	900.	900.	943.	1171.	1957.
	4957.	13943.	13400.	14014.	16129.	27700.	29843.	21014.	20300.	19329.
	19286.	18386.	18857.	21714.	27714.	20571.	15800.	11183.	7729.	6330.
	6367.	7750.								
1977	4831.	3943.	3760.	3337.	2943.	2714.	2543.	2400.	2886.	2714.
	2457.	2257.	2086.	1957.	1900.	1800.	1757.	1700.	1629.	1600.
	1600.	1557.	1500.	1500.	1500.	1500.	1600.	1600.	1686.	1771.
	1971.	3457.	12514.	19200.	29200.	34957.	46300.	37943.	33857.	21714.
	24143.	25514.	21229.	22286.	21329.	19514.	19729.	12514.	10363.	14671.
	14071.	13534.								
1978	8829.	8957.	7871.	5871.	4486.	3829.	3450.	3200.	2964.	2757.
	2636.	2557.	2364.	2236.	2107.	2000.	1921.	1807.	1700.	1650.
	1650.	1600.	1600.	1600.	1600.	1621.	1650.	1650.	1650.	1743.
	3643.	12557.	17143.	11600.	12371.	15386.	21371.	18286.	22786.	22314.
	20729.	20957.	20557.	20214.	19114.	17771.	14829.	10686.	11214.	10109.
	7599.	6481.								

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1979	5416.	6069.	4901.	3679.	3577.	3126.	2343.	2057.	1971.	1900.
	1729.	1557.	1500.	1457.	1400.	1400.	1400.	1300.	1300.	1300.
	1300.	1200.	1200.	1200.	1200.	1200.	1200.	1257.	1386.	1743.
	2743.	5143.	12000.	19143.	31671.	27486.	23071.	20829.	25771.	26371.
	26086.	31757.	32457.	26514.	24800.	20029.	17057.	15171.	9447.	9203.
	13543.	12254.								
1980	7890.	10014.	7034.	5197.	4871.	4424.	4929.	3529.	3357.	2743.
	2471.	2257.	2043.	1914.	1829.	1729.	1643.	1600.	1529.	1457.
	1400.	1400.	1400.	1400.	1400.	1400.	1400.	1400.	1471.	2000.
	4143.	9714.	13914.	12443.	19843.	32143.	25329.	32800.	28614.	31343.
	31800.	33557.	30143.	33014.	23200.	21929.	19886.	14457.	10570.	11304.
	19000.	14186.								
1981	9849.	8779.	7303.	6019.	4657.	4211.	3143.	3200.	3200.	2314.
	1786.	1679.	1614.	1571.	1829.	2129.	2300.	2329.	2414.	2014.
	1600.	1500.	1500.	1600.	1629.	1650.	1700.	1771.	1886.	2443.
	5623.	20400.	20486.	13500.	21943.	18629.	16914.	18200.	21257.	17829.
	42086.	41143.	36700.	38600.	36157.	46729.	37029.	24971.	17986.	14500.
	12100.	11256.								
1982	7641.	7200.	7399.	8581.	4612.	3943.	3857.	3243.	2828.	2529.
	2385.	2300.	2300.	2300.	2300.	2300.	2300.	2314.	2357.	1721.
	1250.	1100.	1100.	1100.	1164.	1497.	1500.	1500.	1657.	2200.
	3386.	8100.	15000.	20143.	22714.	26143.	21857.	28857.	28000.	19500.
	24114.	24514.	27500.	23657.	16629.	14471.	12629.	14014.	13486.	16886.
	26557.	16729.								
1983	10429.	8201.	6677.	3914.	2971.	2786.	2643.	2471.	2400.	2300.
	2300.	2300.	2443.	2771.	2400.	2129.	2000.	1957.	1900.	2043.
	2086.	1957.	1814.	1700.	1643.	1514.	1500.	1529.	1786.	2414.
	4586.	11086.	19143.	17000.	24143.	27343.	19586.	23886.	23671.	25371.
	21857.	18243.	19686.	21014.	26586.	24629.	21757.	26529.	18957.	11729.
	10334.	11878.								

Table E.2.2.12: FILLED WEEKLY FLOWS FOR SUSITNA RIVER AT SUNSHINE[1/]

1951	17177.	14159.	11006.	7079.	5194.	4232.	3862.	3826.	3805.	3604.
	3390.	3113.	3054.	3185.	3053.	3289.	3353.	3084.	2955.	2755.
	2706.	2304.	2067.	2037.	2047.	2043.	2019.	2456.	3661.	5807.
	11605.	29453.	31619.	20670.	33347.	56558.	57725.	39376.	50229.	56252.
	67629.	65919.	57570.	55764.	51646.	45836.	40515.	53692.	59465.	37827.
	35510.	36824.								
1952	20305.	14637.	10937.	9606.	9849.	8386.	6569.	6138.	5588.	5231.
	5416.	5343.	5096.	4347.	4022.	4015.	3912.	3390.	2536.	2488.
	2309.	2238.	2260.	2306.	2417.	2594.	2645.	2436.	2473.	2940.
	3908.	5301.	7870.	13448.	54536.	64522.	89263.	85740.	83180.	73837.
	60181.	72666.	71262.	88726.	66940.	54633.	42482.	44512.	45732.	34331.
	27830.	45344.								
1953	29969.	27812.	18379.	11761.	10163.	8499.	6422.	7284.	5694.	4032.
	4039.	4113.	4065.	3341.	3090.	3012.	2867.	2613.	2308.	2306.
	2244.	2187.	2223.	2162.	2188.	2196.	2326.	2572.	3894.	6227.
	23819.	34890.	33229.	60778.	50770.	73245.	66876.	56154.	62575.	51400.
	48805.	50817.	52187.	59958.	53155.	42612.	45613.	49154.	50992.	45939.
	34251.	28171.								
1954	17168.	14581.	11221.	8475.	5119.	5012.	5065.	4797.	4217.	3803.
	3843.	3864.	3576.	3276.	3212.	3241.	3123.	2935.	2656.	2677.
	2526.	2484.	2266.	2259.	2171.	2143.	2249.	2146.	3068.	3127.
	11189.	18368.	34888.	37389.	39503.	48924.	54899.	57570.	64429.	57641.
	53541.	50558.	50722.	77526.	66404.	67140.	62214.	54533.	36463.	33742.
	31890.	23463.								
1955	14415.	13371.	11500.	10838.	9461.	7491.	6510.	5999.	5518.	4869.
	4834.	4555.	4425.	4688.	4493.	3845.	3688.	3269.	2961.	2847.
	2810.	2600.	2385.	2515.	2497.	2703.	3020.	2956.	2988.	3061.
	6978.	10133.	11551.	28802.	31442.	42692.	67856.	71981.	75069.	79208.
	79411.	71137.	68586.	61054.	57583.	53619.	52704.	64547.	45310.	44049.
	34541.	35544.								
1956	20668.	15730.	11828.	9421.	6187.	4841.	4936.	4761.	4486.	3629.
	3648.	3695.	3907.	3294.	3037.	2844.	2783.	2705.	2572.	2736.
	2550.	2605.	2569.	2587.	2540.	2530.	2449.	2405.	2510.	2336.
	5266.	21107.	28155.	53302.	46596.	70346.	93245.	73775.	68116.	64438.
	72291.	76125.	74569.	70713.	62095.	53762.	44261.	37631.	37748.	47085.
	51719.	39838.								
1957	17262.	15437.	10377.	9327.	8482.	7096.	6443.	5983.	5686.	4873.
	4965.	4637.	4739.	4239.	4378.	4300.	4294.	3976.	3578.	3351.
	3353.	3266.	3099.	3089.	3087.	3093.	2994.	2843.	3013.	3118.
	7285.	13024.	17909.	36791.	61104.	72993.	71225.	70391.	55057.	60841.
	61351.	64597.	64000.	56195.	55688.	61697.	53405.	45599.	35339.	37400.
	34408.	39522.								

1/ Weekly flows start from week 1 (Oct 1-7) to week 52 (Sept. 23-30). the flow for week 52 is the total flow between Sept. 23 and 30 divided by 7
Synthesized flows for the period Oct. 49 through Apr. 81

1958	21101.	17052.	13585.	13876.	10793.	10335.	8497.	7132.	7668.	8147.
	7112.	5822.	5018.	4930.	4444.	3861.	3739.	3363.	3245.	3032.
	3070.	3242.	3386.	3470.	3241.	3086.	3335.	3455.	4348.	5664.
	12052.	31445.	45444.	63572.	58652.	62743.	72743.	59986.	60064.	57164.
	54094.	57419.	61736.	94235.	78513.	74287.	53006.	39595.	27467.	31858.
	25497.	29445.								
1959	20071.	16994.	14250.	9792.	7710.	7039.	6007.	4625.	4186.	3159.
	3073.	4220.	4143.	3739.	3695.	3457.	3484.	3458.	3355.	2994.
	2834.	2693.	2476.	2545.	2692.	2742.	2798.	2908.	3889.	4892.
	7473.	13268.	43457.	49891.	44598.	50295.	39637.	51160.	63889.	60624.
	59914.	65486.	56443.	59048.	51234.	64813.	110999.	87636.	57222.	34460.
	23992.	23025.								
1960	23231.	16861.	9958.	11305.	8602.	7091.	6624.	6153.	5993.	5041.
	5038.	4884.	4847.	4192.	4408.	4021.	3819.	3598.	3383.	3277.
	3019.	2947.	2926.	2771.	2547.	2550.	2493.	2490.	3033.	3165.
	9834.	16856.	30515.	51986.	58311.	35099.	37580.	41703.	46768.	57159.
	45874.	50165.	67050.	77476.	68861.	58652.	50617.	43507.	32419.	56536.
	42558.	40220.								
1961	27277.	19379.	14352.	10553.	7723.	7194.	6725.	5801.	5867.	6177.
	6017.	5390.	5483.	5124.	4886.	5024.	5072.	4480.	3725.	3658.
	3592.	3469.	3177.	3406.	4001.	3900.	4723.	4855.	5251.	5571.
	11524.	23950.	39710.	38483.	38787.	38325.	63917.	76213.	68496.	57882.
	56695.	61448.	69583.	66684.	70624.	53452.	59133.	39921.	33492.	42348.
	33105.	35882.								
1962	25987.	13080.	12204.	11372.	8964.	7352.	6812.	6311.	5874.	4869.
	4836.	4817.	4810.	4293.	4155.	4159.	4172.	3758.	3292.	3223.
	3227.	3084.	2992.	2939.	2898.	2918.	3293.	3350.	3822.	3948.
	7535.	9228.	21998.	36813.	57048.	54598.	100907.	92899.	75088.	64799.
	64736.	62685.	72878.	72970.	55634.	51364.	49261.	56707.	53471.	30962.
	24002.	28609.								
1963	18542.	13624.	11294.	9763.	7033.	5800.	5593.	5377.	5286.	4735.
	4649.	4821.	4644.	4181.	4018.	3970.	3916.	3627.	3396.	3383.
	3363.	2955.	2358.	2319.	2172.	2236.	2002.	2006.	2056.	2030.
	5162.	6648.	34537.	56583.	73863.	51721.	50320.	51709.	58642.	73962.
	94118.	93556.	71752.	59421.	51527.	49426.	52148.	44959.	34182.	29882.
	23637.	25728.								
1964	22623.	19739.	16110.	10918.	7955.	6917.	5753.	4331.	4157.	3525.
	3449.	3031.	3031.	2936.	2925.	2694.	2580.	2496.	2419.	2387.
	2311.	2179.	2008.	1990.	1899.	1903.	2121.	2374.	2567.	2740.
	3135.	3938.	5265.	10766.	62954.	159391.	121320.	108536.	90560.	63985.
	70008.	68485.	49808.	57704.	48200.	44736.	46976.	35440.	28569.	22262.
	21446.	22168.								

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1965	17910.	22910.	13289.	10873.	8339.	7781.	7610.	7836.	6333.	4725.
	4571.	4456.	4456.	3542.	3391.	3391.	3391.	3213.	2978.	2978.
	2978.	2916.	2833.	2833.	2833.	2833.	3267.	3267.	3587.	3639.
	5293.	9335.	20057.	34217.	62024.	48845.	53801.	59666.	69345.	63857.
	73304.	69019.	59113.	58821.	55048.	81679.	53261.	30322.	47226.	52901.
	48390.	79050.								
1966	33187.	23394.	11735.	9202.	7284.	5791.	5218.	4886.	4568.	4150.
	4036.	3912.	3794.	3519.	3453.	3421.	3388.	3258.	3082.	3026.
	2975.	2926.	2894.	2885.	2885.	2888.	3308.	3308.	3810.	3929.
	5661.	7364.	13743.	23295.	35651.	92830.	73419.	64856.	56973.	45860.
	51061.	54992.	62768.	76553.	62697.	54136.	69943.	49930.	33434.	32806.
	31378.	26252.								
1967	19226.	13446.	9958.	6558.	4904.	4424.	4291.	4187.	4068.	3929.
	3884.	3863.	3825.	3818.	3774.	3729.	3619.	3544.	3390.	3330.
	3220.	3116.	2892.	2798.	2747.	2715.	2530.	2502.	2532.	2866.
	4600.	13174.	37642.	49382.	58062.	53555.	69789.	69404.	76686.	65240.
	62004.	96138.	90481.	71299.	63591.	134156.	82846.	53088.	60005.	52333.
	29173.	24348.								
1968	15186.	12355.	9763.	7519.	6387.	5702.	5405.	5140.	4926.	4793.
	4653.	4514.	4369.	4339.	4282.	4183.	4129.	4035.	4023.	4012.
	3991.	3991.	3976.	3940.	3867.	3867.	3922.	3940.	4312.	4970.
	6403.	9989.	29937.	71163.	66407.	64885.	92372.	88636.	67323.	75860.
	74899.	63970.	70111.	56424.	56206.	46980.	43272.	34676.	27331.	26008.
	17424.	15099.								
1969	11338.	9770.	7645.	6914.	5716.	4623.	3892.	3537.	3132.	2843.
	2717.	2585.	2473.	2345.	2296.	2182.	2161.	2130.	2088.	2082.
	2108.	2077.	2077.	2084.	2092.	2121.	2276.	2568.	3330.	4869.
	7525.	12463.	20021.	38337.	26353.	28300.	41006.	49429.	48172.	45426.
	51040.	46444.	41005.	38199.	38765.	20168.	16366.	16328.	18120.	15459.
	12986.	12475.								
1970	11740.	11348.	9474.	6758.	5790.	4595.	3744.	3375.	3087.	2939.
	2850.	2829.	2792.	2695.	2636.	2599.	2579.	2564.	2550.	2462.
	2377.	2368.	2368.	2382.	2419.	2419.	2501.	2719.	3124.	3870.
	5620.	12391.	31697.	34699.	42949.	39107.	51237.	42523.	60532.	60992.
	56330.	62455.	60586.	72477.	63724.	48233.	55810.	40138.	36036.	31765.
	26447.	17198.								
1971	16190.	13622.	11284.	9541.	9275.	8669.	7385.	6557.	5894.	5450.
	5111.	4800.	4401.	3981.	3626.	3279.	2932.	2725.	2619.	2498.
	2474.	2408.	2378.	2364.	2326.	2380.	2428.	2486.	2667.	2888.
	3581.	5450.	8499.	14261.	23880.	51272.	94115.	70113.	105724.	67869.
	73570.	75208.	48933.	58933.	111293.	88576.	56895.	44989.	50071.	34650.
	25264.	23696.								

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1972	16986.	19300.	13377.	10265.	8478.	7414.	6736.	6144.	5664.	5258.
	5073.	4741.	4615.	4556.	4291.	4269.	4136.	4136.	3981.	3789.
	3722.	3589.	3494.	3349.	3267.	3207.	3094.	3085.	3083.	3367.
	6890.	31208.	30604.	43564.	77716.	49249.	77141.	76258.	57752.	64368.
	73525.	58894.	55743.	58593.	56133.	52417.	54877.	35655.	38121.	51237.
	32120.	21045.								
1973	15112.	12043.	16499.	12065.	8322.	6791.	5982.	5255.	4896.	4783.
	4349.	4401.	4065.	3543.	3361.	3306.	3209.	3252.	3161.	3090.
	3057.	2855.	2601.	2616.	2488.	2427.	2301.	2476.	2524.	2995.
	4201.	8627.	28303.	32643.	35916.	45603.	74713.	82150.	61144.	54091.
	55013.	42076.	44824.	44994.	51591.	37825.	59742.	54057.	34150.	24306.
	17546.	13608.								
1974	12505.	9102.	6700.	5814.	4871.	4308.	4153.	3868.	3805.	3452.
	3182.	2895.	2896.	2723.	2672.	2599.	2541.	2519.	2542.	2502.
	2463.	2405.	2389.	2290.	2184.	2162.	2132.	2170.	2399.	3372.
	5845.	13273.	21516.	44503.	57360.	39156.	39336.	40758.	48381.	48939.
	55012.	53978.	51181.	47619.	50529.	44633.	33265.	49049.	42016.	24362.
	21924.	30550.								
1975	14144.	12886.	7589.	6290.	5445.	4691.	4373.	4145.	4260.	3996.
	3934.	3994.	3979.	3856.	3641.	3441.	3347.	3443.	3294.	3081.
	3012.	2998.	2856.	2902.	2928.	2845.	2916.	2927.	3038.	3601.
	5316.	10149.	27584.	42834.	63847.	71819.	60748.	74235.	72396.	69072.
	80847.	74257.	59965.	58069.	70989.	51926.	40080.	35119.	31860.	44500.
	41632.	36349.								
1976	21330.	19074.	15485.	9434.	6982.	5183.	4405.	3709.	3496.	3196.
	3096.	2946.	2893.	2848.	2806.	2677.	2688.	2667.	2682.	2967.
	2845.	2828.	2773.	2553.	2544.	2561.	2531.	2730.	3541.	5010.
	12263.	34395.	29057.	31116.	38560.	65694.	78734.	55537.	60624.	56025.
	60466.	62810.	58821.	59378.	63217.	56781.	62128.	34680.	23750.	20236.
	21055.	23935.								
1977	15213.	12668.	10437.	9972.	8122.	7087.	6333.	5823.	6915.	6246.
	5349.	5131.	4920.	4696.	4389.	4067.	3959.	3646.	3518.	3361.
	3475.	3358.	3276.	3219.	3172.	3170.	3426.	3295.	3376.	3489.
	4320.	7537.	21572.	34865.	61347.	87107.	111840.	92399.	89321.	61670.
	67293.	76319.	63978.	62349.	61984.	61972.	67468.	38423.	32239.	37610.
	36740.	35613.								
1978	21436.	20366.	16959.	12879.	10596.	8376.	7179.	6531.	6198.	5791.
	5579.	5376.	5270.	5201.	4739.	4585.	4296.	4039.	3719.	3532.
	3395.	3221.	3216.	3175.	3063.	3200.	3452.	3377.	3503.	3989.
	6769.	20739.	28688.	22552.	25198.	36637.	52575.	45217.	54310.	60360.
	57994.	62681.	63169.	62771.	58740.	53824.	41760.	31138.	35008.	28967.
	21936.	17876.								

Table E.2.2.12 (Page 5 of 5)

1979	13298.	12587.	10669.	8195.	7956.	7355.	5911.	5374.	5222.	5054.
	4810.	4395.	4262.	3911.	4000.	3782.	3710.	3405.	3325.	3158.
	3192.	3072.	2899.	2964.	2885.	2951.	2983.	3119.	3351.	4948.
	8793.	18449.	31505.	42264.	69722.	59100.	53485.	50688.	64893.	68273.
	71248.	93255.	83639.	75231.	67342.	61788.	50656.	38018.	22286.	22524.
	27205.	26030.								
1980	18773.	22775.	14605.	11352.	10306.	9631.	10190.	6813.	6890.	5471.
	4931.	4784.	4435.	4168.	4095.	3915.	3796.	3660.	3597.	3421.
	3344.	3401.	3269.	3230.	3097.	3193.	3207.	3362.	3569.	5062.
	8985.	15510.	21319.	22436.	37557.	57698.	52364.	64839.	68573.	69152.
	76877.	76930.	74906.	71178.	50916.	44331.	41509.	31392.	24977.	26452.
	41331.	30314.								
1981	21247.	18703.	15614.	12936.	10415.	9464.	7562.	7405.	7113.	5740.
	4662.	4300.	4085.	4133.	4272.	4538.	4707.	4621.	4599.	4078.
	3620.	3443.	3369.	3447.	3401.	3422.	3371.	3450.	3742.	5455.
	14600.	40714.	42857.	34114.	49114.	45257.	43229.	52300.	60214.	54143.
	115700.	97171.	87043.	92029.	82914.	103657.	77000.	60971.	44243.	33757.
	27857.	24857.								
1982	17214.	16000.	16214.	18571.	9929.	8414.	7271.	5771.	4914.	4429.
	4043.	3914.	3657.	3000.	3500.	3500.	3500.	3514.	3829.	3214.
	2814.	2700.	2700.	2700.	2800.	3386.	3357.	3300.	3514.	4529.
	6557.	15914.	31000.	35000.	46400.	65386.	55857.	63100.	69257.	51500.
	57886.	59386.	78257.	67214.	49800.	45043.	38500.	40171.	37829.	41971.
	76157.	46571.								
1983	26100.	19400.	14814.	12300.	10443.	9143.	8214.	7286.	6786.	6214.
	5929.	5500.	5729.	6514.	5443.	4843.	4671.	4600.	4514.	4943.
	4786.	4186.	3829.	3486.	3243.	3114.	3157.	3286.	3900.	5514.
	9829.	23214.	40200.	37000.	49700.	56386.	45271.	56800.	63300.	63443.
	58943.	47871.	48071.	52071.	75200.	64386.	49200.	53514.	45200.	27000.
	21571.	25057.								

Table E.2.2.13: FILLED WEEKLY FLOWS FOR SUSITNA RIVER AT SUSITNA STATION[1/]

1950	43908.	29117.	22339.	16780.	13790.	12745.	13566.	11247.	8263.	8486.
	9512.	7965.	7384.	6941.	8078.	8011.	7411.	7249.	7571.	6572.
	5959.	5974.	5500.	5089.	4808.	4829.	4956.	5264.	5968.	6501.
	10176.	52328.	74936.	74650.	87927.	102382.	88419.	117563.	112285.	105677.
	123061.	131695.	153538.	137306.	134312.	136557.	109387.	92125.	67084.	76127.
	92561.	97161.								
1951	67519.	66614.	51920.	35232.	21703.	16143.	17412.	12027.	10900.	11124.
	10884.	8560.	8026.	7242.	7042.	8017.	8225.	9091.	9128.	8281.
	8407.	7118.	6926.	6439.	6118.	6707.	5943.	7413.	8292.	12234.
	26871.	67040.	67810.	67049.	68214.	102416.	114406.	94715.	121856.	123157.
	147370.	128703.	106340.	113181.	118847.	100781.	101177.	90190.	100554.	77073.
	96463.	71611.								
1952	40531.	36647.	30195.	21763.	17999.	15165.	12798.	14454.	14597.	10704.
	11269.	10959.	9987.	7930.	7910.	8045.	7721.	6756.	6000.	5923.
	6114.	6000.	6059.	6021.	5683.	5090.	4742.	4220.	4007.	5117.
	5896.	13923.	32778.	48173.	72412.	92360.	94858.	102934.	116650.	113248.
	108657.	117456.	117715.	122851.	118012.	109236.	83115.	68168.	64785.	57035.
	57938.	86464.								
1953	49328.	49154.	34080.	24900.	23341.	23921.	18098.	16167.	15760.	11681.
	9569.	11434.	9717.	9564.	8249.	8558.	8561.	7557.	7490.	7371.
	6367.	6033.	6099.	5284.	5052.	5340.	5141.	5372.	6047.	8315.
	26008.	38575.	51333.	75645.	76106.	84102.	91417.	93951.	121038.	113785.
	121106.	123221.	111921.	136813.	137032.	123097.	103946.	94908.	85757.	101842.
	138830.	100932.								
1954	44768.	49035.	54159.	38408.	22362.	22500.	19675.	16371.	12492.	11094.
	12108.	10587.	8900.	9423.	9079.	8290.	7341.	6712.	6591.	7008.
	6609.	6627.	6982.	6657.	5982.	6058.	5843.	5589.	6973.	7508.
	33326.	44419.	59851.	64795.	61916.	76641.	76684.	83279.	110786.	103957.
	101063.	91740.	84833.	102666.	107222.	103076.	98938.	79086.	54075.	54336.
	72130.	49700.								
1955	30476.	35842.	28349.	27077.	22645.	18580.	13163.	11185.	12573.	9135.
	9012.	9947.	8719.	9319.	8374.	7684.	7621.	7655.	7601.	7054.
	6876.	6749.	6740.	6273.	5476.	6072.	6355.	6163.	6074.	7523.
	15327.	27019.	55208.	75376.	85170.	107583.	106433.	117490.	130427.	149490.
	163352.	158321.	154281.	125396.	130536.	134104.	107720.	84051.	75624.	83242.
	80872.	90884.								
1956	48071.	53300.	52957.	41096.	24436.	18382.	15316.	14069.	12410.	9802.
	10818.	9617.	10554.	9438.	9078.	8011.	8111.	8336.	7949.	7652.
	7301.	7156.	6236.	6186.	5313.	5447.	5933.	5262.	5482.	6637.
	12427.	46829.	54658.	72000.	93736.	150597.	165910.	145252.	138117.	129368.
	141350.	139364.	122908.	126408.	123754.	113928.	78886.	62031.	47315.	57219.
	78587.	57761.								

1/ Weekly flows start from Week 1 (Oct 1-7) to Week 52 (Sept. 23-30)

Table E.2.2.13 (Page 2 of 5)

1957	31847.	26644.	21520.	21679.	19788.	21126.	18736.	13097.	11604.	8081.
	7304.	6742.	7002.	7060.	7262.	7344.	7281.	7222.	7549.	6783.
	7519.	6286.	5879.	5858.	5630.	5703.	5205.	4824.	5595.	7579.
	14093.	30372.	56280.	72205.	109300.	142279.	128909.	135763.	112330.	103394.
	108496.	108911.	100897.	107220.	115034.	125555.	98941.	82600.	66069.	72590.
	65488.	66847.								
1958	34454.	34575.	24224.	25445.	29117.	29336.	22682.	14985.	17757.	14453.
	10406.	8362.	8636.	9478.	9102.	8298.	7979.	7512.	7017.	6449.
	6706.	6769.	6577.	7133.	5655.	5082.	5660.	5834.	6441.	6906.
	10662.	18636.	41789.	63809.	63654.	75399.	78308.	84072.	99058.	102785.
	103651.	94873.	90151.	120563.	111573.	105419.	82602.	65000.	44834.	45239.
	43506.	38815.								
1959	30324.	28468.	28666.	27216.	20259.	18445.	13355.	9513.	10001.	7323.
	7292.	7962.	8613.	7239.	7412.	7370.	7555.	7395.	7143.	6529.
	5969.	5176.	5094.	5159.	5448.	5423.	5640.	5436.	6227.	7617.
	10839.	23743.	62607.	80472.	77267.	102149.	81643.	100695.	125612.	119711.
	123872.	129333.	104259.	101079.	100347.	77839.	98052.	86150.	58722.	38338.
	35639.	28438.								
1960	29030.	29992.	22826.	20245.	18005.	19834.	13803.	11658.	12502.	8555.
	9890.	9129.	8985.	9366.	8706.	8118.	7998.	8041.	7917.	8103.
	8623.	9018.	8994.	7965.	7634.	7894.	7273.	6739.	8026.	9918.
	33264.	68046.	82120.	83644.	94576.	96641.	86741.	100916.	115642.	127103.
	119182.	123931.	170800.	199000.	176719.	189015.	134594.	102503.	72426.	97975.
	89392.	106901.								
1961	51705.	37725.	30760.	22525.	12674.	15537.	13448.	12813.	13506.	11712.
	11149.	9481.	9280.	9857.	8413.	8727.	8816.	8876.	9082.	9591.
	9900.	9229.	8255.	7767.	8185.	7838.	8906.	8146.	8667.	10228.
	28174.	64817.	84075.	80654.	82125.	97265.	115730.	122123.	128578.	113007.
	122769.	130393.	128479.	122641.	137169.	118560.	111599.	82123.	64822.	90463.
	77763.	79348.								
1962	64718.	40876.	31859.	33817.	24776.	21985.	18640.	16282.	16628.	12216.
	10534.	9057.	9337.	9211.	8405.	8587.	8484.	8293.	8437.	8368.
	7739.	7411.	7009.	6872.	6719.	7516.	7468.	7867.	9323.	9969.
	20540.	20943.	52888.	69509.	85063.	95796.	127575.	125847.	131419.	137590.
	152287.	161963.	180678.	156414.	118110.	116761.	107602.	107025.	81625.	66023.
	59088.	58142.								
1963	31178.	24348.	22517.	23222.	14519.	14850.	10152.	8855.	8775.	8723.
	9478.	9908.	9861.	9165.	8465.	8262.	7996.	7351.	7256.	7176.
	6739.	6876.	6402.	6401.	6153.	5955.	5799.	5160.	5016.	5639.
	8114.	20583.	68327.	80014.	104264.	109091.	85982.	106212.	116103.	129122.
	159300.	181969.	129193.	115417.	104871.	104118.	106673.	84471.	74285.	71029.
	65091.	62852.								

1964	45462.	35505.	29943.	20584.	16084.	13974.	11861.	7797.	7459.	6526.
	6482.	6298.	7156.	7779.	8184.	8181.	8309.	7391.	7015.	7044.
	6671.	6351.	5710.	5167.	5194.	4924.	5112.	5080.	5127.	6099.
	6234.	14734.	30130.	44551.	68378.	137927.	113154.	130444.	136860.	108425.
	128782.	127186.	108428.	112640.	107884.	99618.	102640.	71642.	48036.	39700.
	38225.	41221.								
1965	27938.	39213.	28555.	25368.	16716.	15455.	12096.	11869.	12270.	9531.
	9358.	8864.	8624.	7969.	7709.	7629.	6972.	6348.	6707.	6704.
	6468.	6072.	6017.	5961.	6140.	6182.	6492.	6418.	7708.	8732.
	21489.	28716.	64135.	77287.	106588.	117383.	95667.	111748.	144774.	141831.
	160970.	156289.	115332.	130948.	111939.	112918.	88214.	67337.	68851.	71238.
	87068.	116064.								
1966	57970.	40881.	39942.	41295.	31083.	22967.	19259.	17231.	13962.	10652.
	8190.	8980.	8175.	7800.	8050.	7971.	8213.	7994.	8129.	7653.
	7955.	6656.	6576.	6268.	6494.	6687.	6061.	6495.	6720.	6368.
	5864.	11178.	38232.	58985.	55947.	109891.	110815.	101072.	113252.	96537.
	112446.	115419.	139262.	132561.	150971.	135464.	134475.	109027.	86444.	95732.
	140034.	101196.								
1967	67409.	49468.	31774.	22638.	14014.	9155.	9216.	10456.	8270.	6577.
	6941.	5927.	5955.	5486.	6070.	6639.	6798.	6962.	7046.	6803.
	6488.	5990.	5783.	6142.	5706.	5750.	5864.	5467.	4789.	4999.
	3840.	10176.	33517.	47849.	46019.	63949.	64423.	78571.	96355.	93337.
	106370.	119743.	118396.	115583.	123717.	156327.	110053.	90987.	91006.	81832.
	61336.	64114.								
1968	43859.	46190.	31570.	23508.	19013.	16007.	10823.	13318.	12816.	10849.
	9223.	8552.	7997.	8672.	8650.	8700.	8864.	8581.	9108.	8985.
	8287.	8116.	7662.	7150.	7596.	7946.	7219.	7968.	10356.	17849.
	43558.	85592.	84823.	98473.	128513.	137609.	171711.	144743.	123692.	138546.
	147356.	121545.	130967.	111105.	109034.	89516.	93243.	70645.	51645.	44064.
	34763.	29829.								
1969	18546.	13933.	13199.	10256.	8739.	7845.	8127.	8710.	7957.	6723.
	5787.	5527.	6440.	7669.	7539.	7392.	7265.	7192.	6740.	6363.
	6501.	6367.	6163.	5856.	6065.	5738.	5601.	5558.	7898.	12362.
	28629.	80229.	90010.	96604.	118465.	111209.	115110.	129307.	125301.	118350.
	125735.	119527.	98684.	108171.	119823.	75329.	55311.	53616.	42702.	39700.
	36440.	34604.								
1970	27602.	39243.	32700.	16002.	15066.	10141.	9107.	7637.	7819.	5734.
	5730.	5460.	5422.	6288.	6716.	6967.	6679.	6880.	7034.	6579.
	6491.	6482.	6328.	6063.	6009.	5872.	6121.	6248.	7045.	9171.
	23597.	42622.	79017.	90576.	110752.	114644.	108046.	115467.	137293.	149123.
	133578.	138792.	148283.	147761.	124733.	118872.	109683.	85764.	73957.	61226.
	54377.	39042.								

1971	24958.	21122.	19282.	17057.	15726.	13688.	13383.	11047.	10605.	9120.
	8678.	8685.	8015.	8053.	8243.	8366.	7908.	7311.	6857.	6062.
	5833.	6029.	5569.	5240.	5138.	4865.	5200.	5524.	5344.	6230.
	6941.	16084.	38446.	63738.	73277.	105818.	117307.	119056.	182134.	161398.
	161463.	148971.	102895.	105224.	147290.	131674.	96995.	87347.	92284.	64742.
	58972.	53853.								
1972	29710.	33996.	22152.	17829.	12583.	12306.	10498.	8666.	8618.	7595.
	7079.	8362.	8265.	8424.	9466.	8379.	8446.	7971.	8571.	7594.
	7287.	6399.	6378.	5745.	6029.	6520.	6775.	6698.	6836.	6552.
	14483.	47584.	53202.	68593.	111795.	113148.	116944.	118835.	121664.	124905.
	147462.	118639.	115735.	123117.	115921.	102627.	99551.	75340.	68338.	71842.
	64769.	41482.								
1973	21506.	14672.	35958.	28931.	25442.	19223.	14392.	10877.	10650.	10434.
	9534.	8676.	7894.	7967.	7543.	7000.	6736.	6546.	6590.	6392.
	6105.	6013.	5194.	5320.	5142.	5247.	5535.	4801.	4586.	5932.
	5533.	17690.	58830.	63104.	61209.	78992.	87819.	135321.	129443.	115819.
	102725.	87018.	94787.	92223.	99601.	77736.	98525.	86027.	62687.	63975.
	61009.	56062.								
1974	39089.	31808.	23485.	17985.	16811.	13702.	10291.	10302.	10500.	8582.
	7611.	7869.	8513.	8881.	8300.	8188.	8087.	8005.	7654.	8176.
	8186.	7938.	8219.	7314.	6992.	6997.	6781.	6770.	7370.	11310.
	35106.	74190.	57603.	78285.	92780.	82818.	63457.	76000.	101992.	92659.
	91189.	89850.	96956.	91090.	96909.	89718.	76353.	86761.	75215.	55601.
	44260.	48981.								
1975	25571.	25571.	17143.	13286.	11143.	11000.	10143.	10000.	10000.	9786.
	9500.	9286.	9000.	9000.	8786.	8500.	8500.	8000.	8000.	8000.
	7500.	7500.	7000.	7000.	7000.	7000.	6786.	6500.	6500.	7286.
	9214.	14571.	34429.	78029.	112500.	129429.	110286.	135429.	140857.	142857.
	153429.	137857.	118429.	110143.	99571.	98300.	84614.	67986.	61700.	89157.
	94271.	80457.								
1976	45443.	33800.	31614.	21429.	16000.	12286.	9357.	7643.	6429.	6000.
	6000.	6000.	6000.	6343.	6571.	6800.	6400.	6229.	6000.	5600.
	5371.	5200.	5343.	5400.	5400.	5400.	5400.	5400.	5714.	9000.
	46143.	98086.	66514.	62714.	62729.	92829.	121529.	111571.	114057.	125857.
	120429.	116571.	106671.	111343.	118571.	102657.	90243.	67700.	42371.	38714.
	52857.	67943.								
1977	32900.	29857.	30000.	30429.	22000.	18857.	19286.	17143.	15571.	14571.
	13429.	12286.	11714.	11571.	10143.	9571.	9500.	9929.	9357.	8643.
	8786.	7786.	7143.	6643.	6500.	6500.	6143.	6000.	6000.	6571.
	8241.	18143.	56157.	88457.	118829.	158143.	173000.	172286.	168571.	149143.
	142286.	150143.	134857.	136143.	133429.	134000.	134429.	89100.	73657.	97629.
	84771.	92643.								

Table E.2.2.13 (Page 5 of 5)

1978	56729.	46714.	33429.	24000.	18429.	15286.	12571.	10057.	20171.	7914.
	7486.	7343.	7200.	7029.	7000.	7000.	7000.	6800.	6800.	6800.
	6800.	6600.	6600.	6600.	6600.	6557.	6429.	6457.	6800.	7714.
	13029.	44286.	59714.	56871.	63029.	69714.	95271.	93529.	112571.	115143.
	118857.	117857.	117286.	124000.	120143.	105014.	93371.	70643.	72129.	66700.
	51814.	37700.								
1979	31000.	45143.	42000.	32000.	26571.	19714.	13429.	10286.	9857.	9500.
	9500.	9214.	9000.	9000.	9000.	9000.	8500.	8500.	8143.	8000.
	7714.	7429.	7000.	7000.	7000.	7000.	6500.	6786.	8143.	11357.
	22714.	67143.	88214.	94371.	125571.	125000.	116286.	104857.	133000.	129143.
	136143.	151286.	155429.	137571.	138286.	143714.	124143.	94457.	58329.	55400.
	92114.	114229.								
1980	65943.	83900.	55914.	38229.	39214.	38829.	36929.	22286.	19286.	17357.
	15286.	13186.	12071.	11286.	10429.	9929.	9500.	9357.	9186.	9043.
	8871.	8800.	8857.	9129.	8700.	8986.	9629.	10357.	12000.	14571.
	23714.	55629.	67929.	77014.	109586.	138143.	141571.	151286.	147429.	161143.
	189857.	190571.	174857.	172143.	137714.	131571.	118714.	99286.	84429.	83571.
	107714.	102143.								
1981	42571.	40143.	33543.	27486.	22557.	19714.	14143.	14143.	13714.	10429.
	8429.	7286.	6929.	6857.	7429.	8071.	8143.	8571.	8857.	7571.
	6714.	6071.	6000.	6000.	6214.	6571.	7214.	8000.	9143.	13429.
	39857.	85714.	92857.	86171.	105971.	99400.	94129.	116714.	120857.	102600.
	152900.	188857.	171286.	165714.	162714.	206714.	133857.	115571.	97457.	69414.
	56100.	48186.								
1982	30457.	27586.	31114.	48527.	25657.	21286.	17571.	14343.	13000.	12286.
	12000.	11429.	11000.	10286.	9286.	8857.	8500.	8071.	7571.	7071.
	7000.	6500.	5857.	5500.	5000.	5000.	5000.	5071.	5714.	6786.
	9714.	27000.	55100.	61329.	70271.	103457.	103629.	108257.	126000.	101486.
	102729.	107000.	138143.	131000.	104571.	93929.	81286.	80857.	82857.	94143.
	174571.	104857.								
1983	54957.	36271.	28829.	22286.	18857.	16857.	15143.	13714.	12286.	11000.
	9943.	9086.	8914.	10000.	8486.	7857.	7800.	7600.	7686.	8600.
	9229.	8429.	7600.	7057.	6771.	6600.	6543.	6443.	6886.	9257.
	19786.	54829.	80286.	68714.	87286.	107857.	77143.	106571.	122143.	117714.
	111714.	99271.	90614.	95200.	145143.	113457.	89814.	84929.	73629.	49714.
	42171.	46829.								

TABLE E.2.2.14: FILLED STREAMFLOW SUMMARY (cfs) (Page 1 of 2)

Station		Denali	Cantwell	Watana	Devil Canyon	Gold Creek	Sunshine	Susitna	Maclaren	Chulitna	Talkeetna	Skwentna
Oct	Max	2,165	5,472	6,632	7,518	8,212	20,837	58,640	734	8,062	4,891	7,254
	Min	528	1,638	2,403	2,867	3,124	8,176	13,476	249	2,380	1,451	1,929
	Mean	1,165	3,149	4,567	5,363	5,825	13,799	32,777	418	4,850	2,683	4,329
Nov	Max	878	2,487	3,525	3,955	4,192	8,795	31,590	370	3,213	1,721	4,195
	Min	192	780	1,021	1,146	1,215	4,020	8,251	95	1,480	765	678
	Mean	500	1,460	2,064	2,402	2,589	6,185	15,063	182	2,155	1,223	1,867
Dec	Max	575	1,658	2,259	2,905	3,264	6,547	14,690	246	2,100	1,203	2,871
	Min	146	543	709	810	866	2,675	5,753	49	1,000	556	624
	Mean	315	951	1,453	1,703	1,844	4,426	9,267	117	1,564	871	1,295
Jan	Max	651	1,694	1,858	2,212	2,452	5,216	10,120	162	1,681	940	2,829
	Min	85	437	619	687	724	2,228	6,365	44	974	459	600
	Mean	248	850	1,125	1,429	1,543	3,674	8,112	99	1,330	693	1,068
Feb	Max	422	1,200	1,610	1,858	2,028	4,664	9,413	140	1,414	777	1,821
	Min	64	426	602	682	723	2,095	5,614	42	820	392	490
	Mean	206	706	1,035	1,216	1,317	3,115	7,383	81	1,115	548	911
Mar	Max	290	1,273	1,560	1,779	1,900	3,920	8,906	121	1,354	743	1,352
	Min	42	408	575	644	713	1,972	5,271	36	770	285	522
	Mean	192	659	936	1,085	1,169	2,786	6,412	74	1,017	485	826
Apr	Max	415	1,702	1,965	2,405	2,650	5,228	13,029	145	1,883	1,075	2,138
	Min	43	465	609	697	745	2,233	4,613	50	700	385	607
	Mean	231	835	1,158	1,340	1,441	3,585	7,684	86	1,264	605	1,088
May	Max	4,259	13,751	15,973	19,777	21,890	43,121	88,470	2,131	21,902	8,840	22,370
	Min	629	1,915	2,857	3,428	3,745	10,799	28,713	208	2,355	2,140	1,635
	Mean	2,306	7,473	10,625	12,462	13,483	27,674	56,770	832	8,862	4,294	8,555
June	Max	12,210	34,630	42,842	47,814	50,580	116,152	165,900	4,297	40,330	19,040	40,356
	Min	4,647	9,909	13,233	14,710	15,500	40,702	73,838	1,751	15,297	5,207	10,650
	Mean	7,532	17,567	22,980	26,043	27,795	63,268	112,256	2,888	22,173	11,085	18,462
July	Max	12,110	22,790	28,767	32,388	34,400	85,600	181,400	4,649	35,570	17,079	28,620
	Min	6,756	12,220	14,843	15,651	16,100	45,226	92,511	2,441	20,781	7,080	11,670
	Mean	9,688	16,873	20,747	23,075	24,390	64,143	126,590	3,241	26,875	10,748	16,997

TABLE E.2.2.14 (Page 2 of 2)

Station		Denali	Cantwell	Watana	Devil Canyon	Gold Creek	Sunshine	Susitna	Maclaren	Chulitna	Talkeetna	Skwentna
Aug	Max	12,010	22,760	30,542	35,256	37,870	84,940	159,600	4,122	33,670	16,770	20,590
	Min	3,919	6,597	7,772	8,484	8,879	25,092	80,891	974	11,300	3,787	7,471
	Mean	8,431	14,614	18,366	20,654	21,911	56,148	109,084	2,644	22,896	9,596	13,335
Sep	Max	6,955	12,910	17,206	19,799	21,240	54,110	107,700	2,439	22,260	10,610	13,371
	Min	1,194	3,376	4,260	4,796	5,093	14,320	37,592	470	6,704	2,070	3,783
	Mean	3,334	7,969	10,878	12,555	13,493	32,867	67,721	1,167	12,391	5,779	8,371
Ann	Max	3,651	7,962	9,985	11,254	11,961	28,262	63,159	1,276	11,419	5,400	10,024
	Min	2,127	4,159	4,912	5,352	5,596	14,431	38,030	693	6,110	2,249	4,939
	Mean	2,885	6,184	8,046	9,159	9,785	23,607	46,891	998	8,931	4,073	6,622

Notes: 1. Based on 33 full water years (1951-1983) used in reservoir operation simulations.

2. Gold Creek data are not filled since records are available for complete period.

3. For manner of computing discharges see the report "Weekly Flow Duration Curves and Observed and Filled Weekly Flows (H-E 1984b).

TABLE E.2.2.15: CHULITNA NATURAL MONTHLY FLOWS (CFS)

YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	ANNUAL
1951	11662	4108	3320	3204	2764	2073	4027	25708	49797	61254	48748	41369	21620
1952	13482	7166	5262	3977	2516	2379	2709	15437	78934	71348	57108	37239	24906
1953	20837	7485	4144	3009	2307	2192	5992	41136	63783	51688	49175	38821	24268
1954	12112	4856	3784	3175	2635	2236	3217	28644	55325	55478	64762	31897	22489
1955	12234	6848	4726	4045	2876	2532	3271	17597	62202	73276	57382	39366	23990
1956	13616	4967	3755	2943	2626	2561	2614	31524	74386	71745	52663	42412	25602
1957	12654	6634	4842	5263	3463	3109	3278	26323	66996	62068	54642	35743	23785
1958	15861	8775	6547	4108	3160	3291	4724	43121	63535	61148	66295	27982	25892
1959	14545	5849	3686	3572	3051	2621	3878	32473	50801	60465	75849	35284	24519
1960	14687	6782	4995	4041	3226	2723	3265	33427	41489	57231	58641	41521	22822
1961	16906	6609	5753	4953	3719	3606	5528	31179	60208	61913	57701	35124	24577
1962	15013	6952	4883	4135	3279	2951	3865	25780	79285	66923	55675	33867	25334
1963	12699	5732	4732	3965	3346	2337	2233	34823	54482	81032	50940	28823	23940
1964	16439	5720	3307	2742	2358	1972	2496	15169	116152	62552	45898	23957	24949
1965	15480	7587	4634	3397	2994	2341	3564	25221	58188	65597	56359	54110	25114
1966	18209	5441	3997	3419	3038	2892	3727	16690	69595	55885	61717	30568	23047
1967	11582	4342	3886	3708	3310	2829	2740	32732	66739	77772	82835	40470	27936
1968	10739	5464	4597	4204	4009	3920	4427	36838	77511	69779	47063	21190	24277
1969	8607	4096	2675	2228	2095	2092	3545	21456	40702	45226	25092	14320	14431
1970	9439	4020	2863	2617	2460	2394	3225	25624	47990	61289	55003	27342	20499
1971	12332	7495	4971	3343	2534	2367	2682	10799	76544	65673	74291	32756	24773
1972	14353	6810	4958	4282	3829	3354	3406	37441	65941	62693	51364	34371	24534
1973	13387	6132	4404	3335	3083	2564	2683	22181	63903	48613	49949	22711	20347
1974	8176	4160	3139	2615	2490	2271	2740	28099	42938	51827	44637	29364	18656
1975	9764	4518	3990	3546	3144	2894	3267	29348	69403	69781	51095	37183	24115
1976	15426	4516	3057	2740	2813	2629	4040	29551	63375	59516	55499	21917	22242
1977	11690	6726	5485	4183	3459	3224	3458	25037	92912	66834	58707	34461	26448
1978	17202	7599	5539	4503	3554	3169	3793	21409	45719	61217	48974	25255	20811
1979	10875	6280	4645	3791	3222	2939	3946	33487	57887	78729	57662	24144	24148
1980	15240	8737	5010	3945	3469	3217	4146	20889	59314	74148	46141	29764	23050
1981	16476	8275	4834	4449	4061	3413	4711	36160	50890	85600	84940	32460	28262
1982	16450	7030	4035	3500	3229	2877	3803	26560	62820	63030	45590	48830	24077
1983	16180	6300	5613	5216	4664	3481	4197	31390	58100	55380	60580	30010	23567
MAX	20837	8775	6547	5216	4664	3920	5528	43121	116152	85600	84940	54110	28262
MIN	8176	4020	2675	2228	2095	1972	2233	10799	40702	45226	25092	14320	14431
MEAN	13799	6185	4426	3674	3115	2786	3585	27674	63268	54143	56148	32867	23607

TABLE E.2.2.16: SUSITNA STATION NATURAL MONTHLY FLOWS (CFS)

YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	ANNUAL
1951	52068	15346	9652	7832	8445	6603	9697	60926	105673	125114	104500	83670	49413
1952	30902	14730	10889	7753	6090	5741	4613	34054	99748	115100	99128	64391	41330
1953	37815	19316	10900	8555	6979	5501	7538	53853	96192	119376	118233	102881	49190
1954	44248	18724	10749	8270	6718	6440	8268	53538	85185	96102	98382	56359	41353
1955	29682	15131	9424	8138	7167	6197	7115	51797	113462	153364	116529	79947	50136
1956	46493	16472	10316	8593	7641	5927	6268	56298	146220	132586	99800	58274	49839
1957	24877	16930	7554	7241	7135	5818	6354	55773	128452	105598	106490	65985	45055
1958	29621	22476	10903	8535	6815	6175	6507	40039	82839	100062	94788	43686	38030
1959	27855	14008	7922	7399	6442	5271	6537	51880	100841	117531	92093	40470	40122
1960	24836	15053	9364	8455	8311	8209	9674	73415	99624	141423	158494	92542	54492
1961	33453	13694	10588	8914	9413	8129	10266	69623	113671	123563	114665	78275	49802
1962	41072	19353	10660	8606	8083	7066	9449	49400	117820	157964	118230	65372	51422
1963	24271	11298	9436	8296	7063	6291	5584	56270	104341	146559	102520	66576	46013
1964	31249	11235	6707	8031	6882	5356	5413	32225	125517	117667	98432	41397	41066
1965	28957	13472	9263	7399	6517	6075	8281	59076	116673	142381	100623	82329	48691
1966	43743	20441	9281	8014	7742	6521	6363	34417	105237	117527	133251	102429	49825
1967	40034	9973	6446	6365	6686	5859	5184	29713	73838	110054	120611	72634	40813
1968	34611	14039	9376	8705	8674	7640	13029	88470	143377	132330	93898	39758	49794
1969	13476	8251	6288	7437	7581	5995	9240	83980	120114	114858	80891	37592	41482
1970	27549	9585	5753	6703	6689	6108	8243	69589	118322	142959	115440	56199	48096
1971	20133	12759	8734	8038	6333	5283	5666	39644	127225	139960	115377	65877	46508
1972	24631	10457	7896	8596	7631	6190	7233	58614	117258	126346	102305	60012	45026
1973	25284	15549	9195	7194	6334	5302	5235	42293	104781	99326	90842	59739	39449
1974	27000	11997	8321	8301	7996	7434	9861	68225	81914	92511	87929	55172	39133
1975	19520	10400	9419	8597	7804	7048	6867	47540	128800	135700	91360	77740	46103
1976	31550	9933	6000	6529	5614	5368	7253	70460	107000	115200	99650	48910	43089
1977	30140	18270	13100	10100	8911	6774	6233	56180	165900	143900	125500	83810	55979
1978	38230	12630	7529	6974	6771	6590	7033	48670	90930	117600	102100	55500	42002
1979	36810	15000	9306	8823	7946	7032	8683	81260	119900	142500	128200	74340	53677
1980	58640	31590	14690	10120	9017	8906	12030	66580	142900	181400	126400	91200	63159
1981	34970	16200	8416	7774	7589	6177	10350	83580	108700	152800	159600	67170	55729
1982	33900	17570	11740	9032	7214	5435	5817	44940	108100	114800	94630	109700	47086
1983	34010	15200	9890	8368	8421	7123	7681	62090	103900	103300	107900	54870	43831
MAX	58640	31590	14690	10120	9413	8906	13029	88470	165900	181400	1596700	109700	63159
MIN	13476	8251	5753	6365	5614	5271	4613	28713	73838	92511	80981	37592	38030
MEAN	32777	15063	9267	8112	7383	6412	7684	56770	112256	126590	109084	67721	46871

TABLE E.2.2.17: CHULITNA NATURAL MONTHLY FLOWS (CFS)

YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	ANNUAL
1951	5520	1845	1442	1525	1347	907	1637	8618	21811	28456	18755	13272	8813
1952	4585	2653	2048	1531	946	1048	1297	6149	25778	25851	22187	16003	9216
1953	7093	2182	1252	1153	998	945	1790	12915	21957	29781	18815	14033	8701
1954	3647	1780	1488	1234	1151	1027	1037	8024	21882	24996	24776	9129	8272
1955	3726	2456	1790	1504	900	877	1291	5220	19686	30087	19946	15713	8643
1956	5797	1962	1672	1305	1110	1080	962	8792	26033	27694	19801	18904	9637
1957	4520	2168	1553	1524	11298	1258	1225	6532	24058	27901	23028	9451	8765
1958	4279	2745	1892	1271	1179	1354	1883	21902	23842	27603	33321	14680	11419
1959	5495	1885	1217	1248	1040	1005	1612	10637	16829	23308	26434	9836	8448
1960	4723	2283	1700	1448	1103	933	1000	13890	17390	23650	19320	12420	8382
1961	5135	1950	1745	1452	1100	1079	1600	10100	20490	27420	24580	16030	9451
1962	5777	2400	1500	1300	1000	930	1170	7743	20620	27220	21980	13490	8817
1963	3506	1500	1550	1600	1300	846	700	11060	17750	28950	18390	11330	8268
1964	8062	2300	1000	1007	820	770	1133	2355	40330	24430	20250	9235	9334
1965	5642	2900	2100	1600	1400	1300	1400	7452	20070	23230	22550	22260	9365
1966	6071	1620	1350	1200	1100	1100	1300	4104	21740	23750	27720	12200	8660
1967	4682	1680	1500	1458	1257	1045	972	12400	25520	35570	33670	12510	11112
1968	3483	1550	1397	1235	1200	1148	1367	10940	29000	30140	20710	7375	9195
1969	2898	1480	1139	974	900	824	1333	6001	18560	20820	11300	6704	6110
1970	4578	1887	1316	1200	1154	1100	1437	9643	19670	26100	24660	11330	8736
1971	3826	2210	1403	1113	950	934	982	4468	22180	27280	23810	11080	8406
1972	5439	2156	1432	1174	1041	939	893	9765	17900	25770	29070	12120	8360
1973	4532	2272	1903	1272	1142	894	970	9281	21892	21193	18204	8889	7749
1974	2380	1535	1250	1012	1070	989	1065	5700	15297	23513	19221	11821	7117
1975	3730	1681	1480	1218	984	891	1002	8634	22002	27826	19767	11907	8480
1976	4344	1544	1313	1154	1293	1170	1766	12304	26702	29225	23718	11419	9733
1977	5588	2732	1840	1518	1183	1107	1098	6680	34262	32175	29877	15098	11154
1978	5829	2680	1905	1681	1189	975	1326	5833	17829	27427	23962	12499	8656
1979	3985	2371	1878	1506	1179	1065	1580	19012	19176	32677	27338	8777	9453
1980	5068	2513	1539	1256	1138	1011	1215	9142	22490	34950	20780	8240	9183
1981	5771	3213	2016	1623	1414	1171	1440	9972	22420	29860	33170	11960	10415
1982	4328	2253	1219	1031	873	789	1072	6289	18360	25610	20360	18240	8455
1983	5499	2513	1853	1573	1039	1050	1248	8968	18890	22320	22190	10960	8231
MAX	8062	3213	2100	1681	1414	1354	1883	21902	40330	35570	33670	22260	11419
MIN	2380	1480	1000	974	820	770	700	2355	15297	20781	11300	6704	6110
MEAN	4850	2155	1564	1330	1115	1017	1264	8862	22173	26875	22896	12391	8931

TABLE E.2.2.18: TALKEETNA NATURAL MONTHLY FLOWS (CFS)

YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	ANNUAL
1951	1922	823	669	617	502	354	458	2140	5768	8445	8336	6229	3039
1952	2839	1601	1132	740	459	366	385	3230	18352	17079	11408	6916	5400
1953	4891	1576	1026	656	396	355	906	8037	12656	8886	8316	8686	4721
1954	2477	823	659	548	392	344	497	2695	7228	8029	13134	8287	3773
1955	2825	1330	800	629	489	456	516	2657	10591	13501	9979	8378	4368
1956	2471	908	651	553	461	455	512	4237	12465	10663	6506	4478	3713
1957	1984	1148	971	904	558	533	598	5214	10683	8788	9281	5902	3900
1958	2886	1721	1203	747	565	681	1075	6601	12306	8022	8998	5430	4206
1959	3812	1599	819	747	617	539	799	5096	8752	10082	15910	7638	4734
1960	3019	1369	911	673	542	497	460	3958	6255	9476	13289	7205	4001
1961	3488	1361	1147	940	698	580	722	3243	8097	7837	9280	4525	3522
1962	2958	1541	1083	827	639	515	650	4223	13398	11553	8434	3454	4128
1963	2180	1146	1005	647	463	369	443	4417	8282	15033	7479	3193	3753
1964	1520	881	675	599	500	413	525	4364	17080	9820	8395	3815	4061
1965	3115	1568	1100	720	620	540	580	3474	11090	12180	11150	10610	4749
1966	4438	1460	876	711	526	395	422	2410	12970	10100	10730	5370	4222
1967	2388	897	750	637	546	471	427	4112	9286	12600	14160	6971	4470
1968	2029	1253	987	851	777	743	983	8840	14100	11230	7546	4120	4478
1969	1637	827	556	459	401	380	519	3869	5207	7080	3787	2070	2249
1970	1450	765	587	504	458	440	545	3950	7979	10320	8752	5993	3500
1971	2817	1647	1103	679	458	402	503	2145	19040	11760	16770	5990	5299
1972	2632	1310	845	727	628	481	519	3516	12700	12030	9576	8709	4490
1973	3630	1373	889	748	654	574	577	3860	12210	7676	9927	3861	3850
1974	1807	960	745	645	559	482	535	4578	8030	7755	7704	4763	3325
1975	1967	1002	774	694	586	508	522	4084	13180	12070	8484	7960	4335
1976	2884	773	558	524	480	470	613	3439	10580	9026	8088	3205	3406
1977	1857	1105	1069	700	549	506	548	4244	18280	9344	8005	5963	4355
1978	3268	1121	860	746	576	485	534	2950	7429	10790	7001	3567	3301
1979	1660	1138	932	762	652	577	710	7790	12010	14440	8274	4039	4449
1980	3379	1718	868	808	741	700	1038	4823	11380	13900	7224	5402	4355
1981	2600	1144	717	652	535	545	671	4529	6589	15410	14680	4384	4416
1982	2346	1236	708	650	467	285	480	3313	12940	11070	7271	9555	4204
1983	3351	1243	1082	836	580	565	669	4551	9013	8703	8803	3944	3635
MAX	4891	1721	1203	940	777	743	1075	8840	19040	17079	16770	10610	5400
MIN	1450	765	556	459	392	285	385	2140	5207	7080	3787	2070	2249
MEAN	2683	1223	871	693	548	485	605	4294	11085	10748	9596	5779	4073

TABLE E.2.2.19: INSTANTANEOUS PEAK FLOWS OF RECORD

Maclaren		Denali		Cantwell		Gold Creek	
Date	Flows (cfs)	Date	Flows (cfs)	Date	Flows (cfs)	Date	Flows (cfs)
8/11/71	9,260	8/10/71	38,200	8/10/71	55,000[2]	6/7/64	90,700
9/13/60	8,920	8/14-15/67	28,200	6/8/64	51,200	8/10/71	87,400
8/14/67	7,460	7/28/80	24,300	6/15/62[3]	46,800	6/17/72	82,600
7/18/63	7,300	8/4/76	22,100	6/17/72	44,700	6/15/62	80,600
6/16/72	7,070	8/9/81	23,200	8/14/67	38,800	8/15/67	80,200
8/10/81	6,650	7/12/75	21,700	7/18/63	32,000[4]	7/12/81	64,900
6/14/62	6,540	7/27/68	19,000	8/14/81	30,900	6/6/66	63,600
8/5/61	6,540					8/25/59	62,300

Notes: 1 Maximum daily flow from preliminary USGS data.
2 Estimated maximum daily flow based on discharge records at Denali and Gold Creek.
3 Approximate date.
4 Maximum daily flow.

Source: USGS

TABLE E.2.2.20: FLOOD PEAKS FREQUENCY AT WATANA AND DEVIL CANYON

Return Period	Flood Peaks (cfs) Watana Annual		Watana May-June	Watana July-Sept	Devil Canyon Annual		Devil Canyon May-June	Devil Canyon July-Sept
(Year)	(1)	(2)			(1)	(2)		
2	47,600	43,500	39,000	34,200	50,400	46,000	41,300	36,300
5	64,200	57,400	51,500	45,700	68,000	60,800	54,500	48,300
10	77,500	67,000	60,800	54,500	82,100	71,000	64,400	57,700
25	95,400	79,800	73,800	67,200	101,000	84,500	78,200	71,100
50	110,000	89,500	84,400	77,800	117,000	94,800	89,400	82,400

1/ Corresponding to 95 percent one-sided upper confidence limit.

2/ Mean estimate from the flood frequency curve, the flood frequency relationships are not extended over the return period of 50 years.

TABLE E.2.2.21: FLOOD VOLUME[1/] FREQUENCY AT WATANA AND DEVIL CANYON

Return Period (Year)	Watana Annual 3-day	Watana Annual 7-day	Watana Annual 15-day	Watana May-June 3-day	Watana May-June 7-day	Watana May-June 15-day	Watana July-September 3-day	Watana July-September 7-day	Watana July-September 15-day
	(mean discharge cfs)								
2	36,028	32,297	28,529	32,188	29,114	26,036	28,013	25,766	23,840
5	47,062	41,182	35,004	42,242	37,701	32,968	36,783	32,521	28,728
10	54,485	46,910	39,049	49,592	43,813	37,432	43,547	37,379	31,795
25	64,027	54,015	43,950	59,732	52,043	42,969	53,233	43,970	35,530
50	71,251	59,233	47,478	67,900	58,553	47,034	61,341	49,210	38,227

Return Period (Year)	Devil Canyon Annual 3-day	Devil Canyon Annual 7-day	Devil Canyon Annual 15-day	Devil Canyon May-June 3-day	Devil Canyon May-June 7-day	Devil Canyon May-June 15-day	Devil Canyon July-September 3-day	Devil Canyon July-September 7-day	Devil Canyon July-September 15-day
	(mean discharge cfs)								
2	40,410	36,225	31,998	36,103	32,655	29,202	31,420	28,900	26,740
5	52,786	46,191	39,261	47,380	42,287	36,978	41,257	36,476	32,222
10	61,112	52,616	43,798	55,624	49,142	41,985	48,843	41,925	35,662
25	71,814	60,584	49,295	66,996	58,373	48,195	59,707	49,318	39,852
50	79,917	66,437	53,252	76,158	65,674	52,754	68,802	55,195	42,876

[1/] Volume = mean discharge in the table times the respective duration.

TABLE E.2.2.22: COMPARISON OF SUSITNA REGIONAL FLOOD PEAK ESTIMATES WITH USGS METHODS FOR GOLD CREEK

Station Location	Return Period (Yrs.)	Single[1/] Station Estimate (cfs)	Susitna Regional Estimate (cfs)	USGS[2/] Area II Regional Estimate (cfs)	USGS[3/] Cook Inlet Regional Estimate (cfs)
Susitna River at Gold Creek	1.25	37,500	37,700	48,700	-
	2	48,000	49,000	59,200	43,800
	5	63,300	64,200	73,000	53,400
	10	73,700	74,500	83,400	55,300
	50	97,700	100,000	104,000	71,600
	100	108,000	110,000	115,000	

1/ Based on Log Pearson Type III distribution (USWRC 1981)

2/ Lamke, R.D., 1970.

3/ Freethey, G.W., and D.R. Scully, 1980.

Source: R&M 1981f

TABLE E.2.2.23: HEC 2 WATER SURFACE ELEVATIONS (feet)
Deadman Creek to Devil Creek for Select Watana Flows

River Mile	8100 cfs	17200 cfs	26700 cfs	30700 cfs	42200 cfs	46400 cfs
162.1	1211.2	1213.5	1215.7	1216.5	1218.4	1219.3
167.0	1276.3	1278.7	1279.9	1280.6	1281.4	1281.3
173.1	1330.8	1333.0	1334.9	1335.7	1337.3	1337.9
174.0	1340.0	1342.8	1344.2	1345.0	1346.0	1346.2
176.0	1363.9	1366.5	1367.9	1368.5	1369.5	1369.8
176.7	1370.8	1373.5	1375.1	1375.9	1377.3	1377.6
178.8	1391.6	1394.3	1396.3	1397.2	1398.8	1399.2
180.1	1410.6	1412.1	1412.9	1413.4	1414.2	1414.6
181.0	1414.4	1416.5	1417.8	1418.3	1419.2	1419.4
181.8	1428.8	1432.0	1434.2	1435.1	1436.6	1436.8
182.1	1435.3	1437.9	1439.8	1440.7	1442.4	1442.8
182.5	1440.7	1442.4	1443.8	1444.5	1445.7	1446.0
182.8	1443.7	1445.6	1446.8	1447.4	1448.3	1448.5
183.5	1449.8	1452.2	1453.8	1454.5	1455.7	1456.0
183.8	1451.6	1454.1	1455.8	1456.5	1457.8	1458.0
184.0	1453.5	1456.3	1458.1	1458.9	1460.3	1460.6
184.2	1454.6	1457.5	1459.4	1460.2	1461.6	1461.8
184.4	1456.2	1459.3	1461.3	1462.3	1464.0	1464.4
184.8	1462.9	1465.9	1467.4	1468.1	1469.1	1469.2
185.4	1473.0	1475.8	1477.4	1478.1	1479.4	1479.7
185.9	1497.3	1497.9	1498.3	1498.5	1498.3	1499.0
186.5	1505.3	1509.0	1510.9	1511.6	1513.5	1513.1
186.8	1510.1	1513.0	1515.0	1515.9	1517.8	1518.2

Source: R&M 1982b

TABLE E.2.2.24: WATER SURFACE ELEVATIONS

Cross Section	River Mileage	Water Surface Elevations (ft,msl) for Indicated Discharge (cfs) 3,000	5,000	7,000	9,700	13,400	17,000	23,400	34,500	52,000
0.001	83.90	272.1	272.7	273.3	274.1	275.1	275.9	277.2	279.3	282.2
0.01	84.83	276.6	278.2	279.0	281.4	281.6	282.3	284.8	291.7	292.4
0.02	86.93	281.7	282.8	283.5	285.5	285.7	286.4	288.5	294.1	295.3
0.03	88.13	285.1	286.0	286.4	288.0	288.1	288.6	290.4	294.9	296.3
0.04	89.83	291.4	292.2	292.7	294.0	294.1	294.5	295.9	298.8	300.3
0.05	91.63	298.7	299.4	299.7	300.9	301.0	301.3	302.5	304.7	305.9
0.3	94.23	314.3	315.3	315.7	316.7	316.7	317.1	318.2	318.7	319.7
0.4	94.55	316.1	317.0	317.5	318.7	318.8	319.2	320.3	321.6	322.7
0.5	94.92	317.3	318.5	319.1	320.7	320.8	321.2	322.4	323.9	325.0
0.6	95.37	319.2	320.8	321.5	323.4	323.6	324.2	325.5	327.0	327.8
0.7	95.76	323.5	324.3	324.8	326.3	326.5	326.9	328.2	329.6	330.4
0.8	96.13	326.5	327.2	327.6	328.8	328.9	329.3	330.4	331.9	332.6
0.9	96.61	330.5	331.1	331.4	332.4	332.5	332.8	333.6	334.8	335.4
1.0	97.02	332.0	332.9	333.4	334.6	334.7	335.0	335.9	336.9	337.7
1.1	97.31	332.9	333.9	334.5	335.7	335.8	336.2	337.2	338.4	339.2
1.2	97.62	335.0	335.7	336.1	337.3	337.4	337.7	339.0	340.3	341.0
2.0	97.93	336.7	338.0	338.3	339.3	339.4	339.7	340.9	342.1	342.9
2.1	98.03	337.1	338.3	338.7	339.7	339.8	340.1	341.3	342.7	343.6
2.2	98.23	337.7	338.9	339.3	340.5	340.5	340.9	342.3	344.1	345.0
2.3	98.42	338.5	340.0	340.5	342.5	342.7	343.5	345.4	347.1	347.9
3.0	98.59	339.7	341.2	341.8	334.1	344.5	345.3	346.9	348.4	349.1
3.1	98.75	340.9	342.1	342.7	344.6	345.1	346.0	347.5	348.9	350.0
3.2	98.93	343.4	344.1	344.6	345.2	345.8	346.8	348.0	349.4	350.8
3.3	99.10	344.8	345.5	346.0	346.1	346.8	347.7	348.6	350.0	351.6
3.4	99.31	345.9	346.4	346.9	347.2	348.0	348.8	349.8	351.1	352.8
4.0	99.58	347.1	347.5	348.0	348.6	349.5	350.3	351.7	352.9	354.6
4.1	99.75	351.0	351.4	351.7	351.9	352.6	353.2	354.3	355.3	356.7
4.2	99.94	351.9	352.5	352.8	353.0	353.8	354.4	355.5	356.6	358.0
4.3	100.17	352.5	353.1	353.5	353.8	354.7	355.5	357.0	358.2	359.7
4.4	100.28	353.1	353.9	354.2	354.5	355.5	356.3	357.9	359.0	360.3
5.0	100.36	356.5	356.9	357.2	357.4	358.0	358.5	359.6	360.8	362.1

TABLE E.2.2.24 (Page 2 of 4)

Cross Section	River Mileage	3,000	5,000	7,000	9,700	13,400	17,000	23,400	34,500	52,000
			Water Surface Elevations (ft,msl) for Indicated Discharge (cfs)							
6.0	100.96	360.2	360.9	361.3	361.9	362.7	363.3	364.4	365.6	367.3
7.0	101.52	363.1	364.0	364.6	365.3	366.5	366.6	368.2	369.5	371.0
8.0	102.38	370.2	371.2	371.7	372.4	373.4	374.0	375.1	376.6	378.4
9.0	103.22	374.9	376.2	376.9	378.0	378.6	379.8	381.2	383.3	385.8
9.1	104.12	381.9	383.0	383.7	384.9	385.8	386.6	387.7	389.7	391.8
10.0	104.75	391.1	391.6	391.8	392.2	392.2	392.8	393.6	395.0	396.7
10.1	105.01	393.5	394.2	394.6	395.1	395.3	395.8	396.6	397.9	399.4
10.2	105.81	399.7	400.2	400.8	401.4	401.7	402.2	403.0	404.2	405.6
10.3	106.34	403.8	404.9	405.4	406.0	406.3	406.8	407.7	409.0	410.8
11.0	106.68	406.3	407.4	407.8	408.3	408.7	409.3	410.2	411.5	413.2
12.0	108.41	419.0	419.7	420.4	420.8	421.7	422.6	423.7	425.6	428.0
13.0	110.36	433.2	434.3	435.6	436.2	437.6	438.1	439.6	441.5	444.9
14.0	110.89	441.3	442.0	442.4	42.9	443.4	443.9	445.0	446.7	449.3
15.0	111.83	450.2	451.2	451.6	452.1	452.6	452.9	453.7	454.9	456.3
16.0	112.34	453.4	454.2	454.8	455.4	456.3	456.6	457.7	459.0	460.8
17.0	112.69	457.6	458.1	458.6	459.0	459.9	460.4	461.1	462.4	463.9
18.0	113.02	459.1	459.7	460.2	460.7	461.8	462.4	463.2	464.9	466.6
18.1	114.11	471.9	472.8	473.4	474.2	474.5	475.3	476.0	477.0	478.9
18.2	115.08	477.0	478.1	479.1	480.2	481.2	481.8	482.9	484.2	486.1
18.3	115.86	480.4	481.6	482.5	483.9	484.7	485.5	487.0	488.6	490.9
19.0	116.44	484.3	485.1	485.7	486.8	487.6	488.5	490.1	491.6	494.2
19.1	116.89	490.7	491.4	492.1	492.7	493.5	494.0	495.5	496.8	499.0
20.0	117.19	492.0	493.0	493.9	494.8	495.8	496.4	497.9	499.0	501.0
20.1	117.61	497.8	498.7	499.4	500.1	501.0	501.5	502.5	503.5	504.9
20.2	118.31	502.1	503.3	504.1	504.8	505.5	506.1	507.2	508.2	509.8
21.0	119.15	506.0	507.3	508.3	509.2	510.2	510.9	512.2	513.5	515.7
22.0	119.32	508.9	509.8	510.5	511.5	512.3	512.9	514.0	515.3	517.3
23.0	120.26	518.1	518.3	519.3	519.7	520.4	520.9	521.8	522.9	524.6
24.0	120.66	519.2	520.1	520.7	521.2	522.2	523.0	524.1	525.4	527.2
24.1	120.85	520.0	521.2	522.0	522.7	524.0	524.4	525.4	526.8	529.8
25.0	121.63	530.9	531.4	532.0	533.2	533.8	533.9	534.6	537.8	539.6
25.1	122.05	532.5	533.1	533.7	534.8	535.5	535.6	536.7	539.6	541.7
26.0	122.57	535.6	536.4	536.9	537.6	538.2	538.9	540.1	542.0	544.2

TABLE E.2.2.24 (Page 3 of 4)

Cross Section	River Mileage	Water Surface Elevations (ft,msl) for Indicated Discharge (cfs) 3,000	5,000	7,000	9,700	13,400	17,000	23,400	34,500	52,000
27.0	123.31	540.2	541.3	542.0	542.8	543.3	544.4	545.5	547.2	549.4
28.0	124.41	551.6	552.7	553.6	554.4	555.2	556.1	556.8	558.1	560.1
28.1	125.54	563.6	564.3	564.9	565.3	566.0	566.8	567.6	568.3	570.1
29.0	126.11	567.5	568.4	568.8	569.4	570.4	571.2	572.0	573.1	574.9
30.0	127.50	584.7	585.6	586.0	586.7	587.3	587.7	588.0	589.2	590.8
31.0	128.66	592.0	593.3	594.3	595.3	596.2	597.1	598.2	599.6	601.4
32.0	129.67	604.0	604.6	605.2	606.1	607.1	607.7	608.4	610.0	611.8
33.0	130.12	610.6	611.3	611.7	612.2	613.0	613.5	613.8	614.6	615.9
34.0	130.47	614.1	614.7	615.2	615.7	616.6	617.2	617.9	619.1	620.4
35.0	130.87	615.0	616.0	616.6	617.4	618.4	619.1	620.1	621.7	623.6
36.0	131.19	616.4	617.1	617.8	618.9	620.2	621.0	622.4	624.2	626.6
37.0	131.80	625.1	626.0	626.5	627.1	627.8	628.1	628.9	629.4	630.4
38.0	132.90	637.0	637.7	638.2	638.9	640.0	640.7	641.8	643.4	645.6
39.0	133.33	644.5	645.1	645.4	645.9	646.4	646.7	647.4	648.2	649.7
40.0	134.28	653.1	653.8	654.4	655.2	655.9	656.5	657.5	658.6	660.4
41.0	134.72	657.9	658.6	659.2	659.9	660.6	661.2	662.3	663.6	665.8
42.0	135.36	667.4	668.0	668.4	668.8	669.4	669.8	670.4	671.5	672.8
43.0	135.72	668.4	669.4	670.2	671.2	672.1	672.7	673.8	675.3	676.9
44.0	136.40	678.8	679.6	680.2	681.2	682.2	683.0	684.2	685.4	687.4
45.0	136.68	681.1	682.2	683.0	684.0	685.1	686.0	687.2	688.4	690.5
46.0	136.96	684.1	685.1	685.9	686.9	687.9	688.8	690.2	691.7	694.1
47.0	137.15	687.5	688.6	689.3	690.4	691.3	691.9	692.9	694.2	696.3
48.0	137.41	689.8	690.9	691.7	692.9	693.9	694.6	695.5	697.0	699.1
49.0	138.23	698.6	699.6	700.2	700.9	702.7	703.4	704.3	705.2	706.6
50.0	138.48	700.2	701.3	702.0	702.7	704.3	705.1	706.2	707.3	708.6
51.0	138.89	705.4	706.0	706.5	706.9	707.6	708.5	709.7	711.4	711.7
52.0	139.44	713.0	714.4	715.8	717.1	717.8	718.2	718.6	719.5	720.1
53.0	140.15	719.9	720.8	722.1	722.7	723.7	724.4	725.4	726.5	728.8
54.0	140.83	730.2	730.8	731.3	731.8	732.3	733.1	734.1	735.8	737.6
55.0	141.59	740.7	741.6	742.2	742.9	743.4	743.9	744.3	745.3	746.8
56.0	142.13	749.5	750.2	750.5	751.4	751.4	752.1	753.2	755.0	756.9

TABLE E.2.2.24 (Page 4 of 4)

Cross Section	River Mileage	3,000	Water Surface Elevations (ft,msl) for Indicated Discharge (cfs) 5,000	7,000	9,700	13,400	17,000	23,400	34,500	52,000
57.0	142.34	751.7	752.7	753.1	754.2	754.4	755.0	756.0	757.8	759.9
58.0	143.18	762.4	763.5	764.1	764.8	765.7	766.2	766.2	767.9	769.2
59.0	144.83	783.0	784.3	785.4	786.8	787.8	789.2	790.4	791.2	792.3
60.0	147.56	816.4	817.5	818.5	819.5	820.6	821.6	823.4	823.8	825.8
61.0	148.73	828.7	830.3	831.3	833.1	834.3	834.8	836.4	838.7	840.5
62.0	148.94	831.4	832.9	833.7	835.4	836.6	837.1	838.5	841.0	843.0
63.0	149.15	834.4	835.6	836.4	837.9	839.0	839.7	841.0	843.2	845.2
64.0	149.35	836.2	837.6	838.5	839.9	841.1	841.9	843.2	845.4	848.0
65.0	149.46	839.0	840.0	840.6	841.9	842.9	843.5	844.7	847.0	850.0
66.0	149.51	842.3	843.0	843.6	844.5	845.2	845.8	846.8	848.5	850.9
67.0	149.81	845.7	846.8	847.5	848.7	849.6	850.2	851.1	852.4	854.7
68.0	150.19	847.3	848.6	849.5	851.0	852.1	852.8	854.0	855.8	858.8

TABLE E.2.2.25: DETECTION LIMITS AND CRITERIA FOR WATER QUALITY PARAMETERS

Parameters[1]	R&M Detection Limit	USGS Detection Limit[4]	Criteria Levels
Temperature, °C	0.1	--	20,15(M),13(Sp)
Total Suspended Sediments[2]	1	1	no measurable increase
Turbidity (NTU)	0.05	1	25 NTU increase
Dissolved Oxygen	0.1	--	7 and 17
D.O. Percent Saturation	1	--	110
Nitrate Nitrogen	0.1	0.01	10
Total Phosphorus	0.01	0.01	0.01
Ortho-Phosphate	0.01	0.01	--
Total Dissolved Solids[3]	1	1	1,500
Conductivity, umhos/cm @ 25°C	1	--	--
<u>Significant Ions</u>			
Sulfate	1	0.05	200
Chloride	0.2	0.01	200
Ca, Calcium	0.05	0.01	--
Mg, Magnesium	0.05	0.1	--
Na, Sodium	0.05	0.1	--
K, Potassium	0.05	0.1	--
Total Hardness	1	--	--
pH, pH Units	± 0.01	--	6.5 - 9.0
Total Alkalinity, as $CaCO_3$	2	--	20
Free Carbon Dioxide	1	--	--
Chemical Oxygen Demand	1	--	--
Total Organic Carbon	1.0	--	3.0 (S)
True Color, Platinum Cobalt Units	1	1	50
<u>Metals</u>			
Ag, Silver	0.05	0.001	0.05
Al, Aluminum	0.05	0.01	0.073 (S)
As, Arsenic	0.10	0.001	0.440
Au, Gold	0.05	--	--
B, Boron	0.05	0.01	0.043
Ba, Barium	0.05	0.1	1.0
Bi, Bismuth	0.05	--	0.0035 (S)
Cd, Cadmium	0.01	0.001	0.0012, 0.0004
Co, Cobalt	0.05	0.001	--
Cr, Chromium	0.05	0.001	0.1
Cu, Copper	0.05	0.001	0.01
Fe, Iron	0.05	0.01	1.0
Hg, Mercury	0.1	0.0001	0.00005
Mn, Manganese	0.05	0.001	0.05
Mo, Molybdenum	0.05	0.001	0.07
Ni, Nickel	0.05	0.001	0.025
Pb, Lead	0.05	0.001	0.03
Pt, Platinum	0.05	--	--
Sb, Antimony	0.10	0.001	9
Se, Selenium	0.10	0.001	0.01
Si, Silicon	0.05	--	--
Sn, Tin	0.10	0.1	--
Sr, Strontium	0.05	0.01	--
Ti, Titanium	0.05	--	--
W, Tungsten	1.0	--	--
V, Vanadium	0.05	--	0.007 (S)
Zn, Zinc	0.05	0.01	0.03
Zr, Zirconium	0.05	--	--
<u>Organic Chemicals</u> (ug/l)			
- Endrin	0.0002	0.00001	0.004
- Lindane	0.004	0.00001	0.01
- Methoxychlor	0.1	0.00001	0.03
- Toxaphene	0.005	0.001	0.013
- 2, 4-D	0.1	0.00001	100
- 2, 4, 5-TP Silvex	0.01	0.00001	10
Gross Alpha (Picocurie/liter)	3	--	15

TABLE E.2.2.25 (Page 2 of 2)

Parameters[1]	R&M Detection Limit	USGS Detection Limit[4]	Criteria Levels
Others			
Settleable Solids, ml/l	0.1	---	--
Ammonia Nitrogen	0.05	0.01	0.02
Organic Nitrogen	0.1	--	--
Kheldahl Nitrogen	0.1	0.1	--
Nitrite Nitrogen	0.01	0.01	--
Total Nitrogen	0.1	0.01	--
Total Inorganic Carbon	1.0	--	--

(1) All parameters and values are expressed in mg/l unless otherwise noted.

(2) TSS - (nonfilterable) material on a standard fiber filter after filtration of a well-mixed sample.

(3) TDS - (filterable) material that passes through a standard glass fiber filter and remains after evaporation.

(4) USGS detection limits are taken from "1982 Water Quality Laboratory Services Catalog" USGS Open-File Report 81-1016. The limits used are the limits for the most precise test available.

(M) - Migration Routes

(Sp) - Spawning Areas

(S) - Suggested Criteria

Source: USGS 1984, RM 1981h, 1981i, 19821 and RM and L.A. Peterson & Associates 1982

TABLE E.2.2.26: PARAMETERS EXCEEDING CRITERIA BY STATION AND SEASON

Parameter	Station	Season	Criteria
D.O. % Saturation	G	S	L
Phosphorus, Total (d)	V, G, T, S, SS	S, W, B	E
pH	T V, S G, T	S W B	L
Total Organic Carbon	G, SS V, G, SS SS	S W B	S
True Color	V, G, T, S	S	L
Aluminum (d)	V, G	S, W	S
Aluminum (t)	G, T, S	S	S
Bismuth (d)	V, G G	S W	S
Cadmium (d)	G, T, SS	S	E
Cadmium (t)	G, T, S, SS T, SS	S W	E
Copper (d)	SS T T, SS	S W B	A
Copper (t)	G, T, S, SS T, SS	S W, B	A
Iron (t)	G, T, S, SS T, SS	S B	E
Lead (t)	G, T, S, SS SS	S B	A
Manganese (d)	G,	S	E
Manganese (t)	G, T, S, SS T, SS	S B	E
Mercury (d)	G, T, S, SS T, S	S W	E
Mercury (t)	G, T, S, SS T, S, SS T, SS	S W B	E
Nickel (t)	G, S, SS	S	A
Zinc (d)	S T	W B	A
Zinc (t)	G, T, S, SS T, SS	S W, B	A

Notes:

<u>Parameter</u>

(d) dissolved
(t) total recoverable

<u>Stations</u>

D - Denali
V - Vee Canyon
G - Gold Creek
C - Chulitna
T - Talkeetna
S - Sunshine
SS - Susitna Station

<u>Seasons</u>

S - Summer
W - Winter
B - Breakup

<u>Criteria</u>

L - Established by law as per Alaska <u>Water Quality Standards</u>, 1979.

E - Established by law as per EPA <u>Quality Criteria for Water</u>, 1976.

S - Criteria that have been suggested but are not law, or levels which natural waters usually do not exceed.

A - Alternate level to 0.01 of the 96-hour LC_{50} determined through bioassay (EPA 1976).

Source: USGS AND R&M

TABLE E.2.2.27: SUSITNA RIVER BETWEEN THE CHULITNA CONFLUENCE (RM 98.5) AND GOLD CREEK (RM 136.5) WATER SURFACE ELEVATIONS IN FEET (MSL) 1983 FREEZEUP STAGING (Page 1 of 2)

Location		Date of Survey				
		10/6	10/17	10/21	11/4	11/18
LRX-45 Gold Creek	RM 136.5	683.59	683.35	683.06	681.84	681.24
LRX-40	RM 134.2		653.86	657.21	655.23	654.24
Near LRX-35	RM 130.9					592.85
Near LRX-31	RM 128.7					592.86
LRX-29	RM 126.1			569.44		567.55
LRX-27	RM 123.3					541.11
LRX-24	RM 120.5			520.93		520.05
LRX-18	RM 113.0			460.18		457.74
Near LRX-10.3	RM 106.2 2/			2.25		
LRX-9	RM 103.3			377.52		375.67
LRX-3	RM 98.6	342.55	341.51	341.30	339.65	339.40
LRX-2.3	RM 98.4	341.24			339.23	
LRX-2.2	RM 98.2	340.86			339.36	
Location of Leading Edge		No Cover	No Cover	No Cover	42.0	82.5
Discharge (USGS Gold Creek)			8800	7800	6900	

1/ A maximum stage of 344.63 feet was reached at 1530 on December 9, 1983 coincident with the leading edge of ice cover passing this cross section.

2/ Surveyed from Arbitrary Reference Datum of 10 feet.

TABLE E.2.2.27 (Page 2 of 2)

Location		Date of Survey 12/13	12/22	12/28	1/5	1/27
LRX-45 Gold Creek	RM 136.5	681.59	681.96	682.73	683.49	684.64
LRX-40	RM 134.2		653.86	654.55	655.23	657.58
Near LRX-35	RM 130.9			617.55	617.05	618.16
Near LRX-31	RM 128.7		593.95	596.54	595.58	594.99
LRX-29	RM 126.1	573.49	573.53	572.59	571.53	571.08
LRX-27	RM 123.3		545.31		544.35	544.43
LRX-24	RM 120.5	520.82	522.26		523.58	523.89
LRX-18	RM 113.0	461.87			461.36	461.13
Near LRX-10.3	RM 106.2 2/	7.65				
LRX-9	RM 103.3	383.57	381.32			381.41
LRX-3 1/	RM 98.6	342.80	343.07	343.00		341.34
LRX-2.3	RM 98.4					
LRX-2.2	RM 98.2					
Location of Leading Edge		108	116.2 127.0	129.5	130.2 136.3	130.2 136.8
Discharge (USGS Gold Creek)		3400	BACKWATER			

1/ A maximum stage of 344.63 feet was reached at 1530 on December 9, 1983 coincident with the leading edge of ice cover passing this cross section—

2/ Surveyed from Arbitrary Reference Datum of 10 feet.

TABLE E.2.2.28: MAJOR ANNUALLY RECURRING OPEN LEADS BETWEEN SUNSHINE RM 83 AND DEVIL CANYON RM 151 LOCATIONS AND DIMENSIONS ON MARCH 2, 1983

Location of Upstream End 1 River Mile #	Channel Type	Type of Lead(1)	Approx. Length (Ft.)	Widest Point (Ft.)	Continuous or Discontinuous
85.0	Mainstem	Velocity	550	80	Continuous
87.1	Slough	Velocity	4,500	50	Discontinuous
87.6	Mainstem	Velocity	700	100	Continuous
89.0	Mainstem	Velocity	1,200	100	Continuous
	Side Channel	Velocity	2,500	40	Continuous
89.5	Mainstem	Velocity	1,400	60	Discontinuous
91.0	Mainstem	Velocity	1,700	80	Discontinuous
92.3	Mainstem	Velocity	1,300	110	Discontinuous
93.7	Mainstem	Velocity	3,500	110	Continuous
94.0	Mainstem	Velocity	3,500	20	Discontinuous
95.2	Side Channel	Velocity	2,400	100	Continuous
96.9	Side Channel	Velocity	5,600	150	Discontinuous
97.0	Mainstem	Velocity	1,100	30	Continuous
102.0	Mainstem	Velocity	2,400	100	Discontinuous
102.9	Mainstem	Velocity	600	100	Continuous
103.5	Mainstem	Velocity	1,850	100	Discontinuous
104.1	Mainstem	Velocity	280	70	Continuous
104.5	Mainstem	Velocity	1,700	110	Continuous
104.9	Mainstem	Velocity	900	150	Continuous
105.9	Mainstem	Velocity	1,050	100	Continuous
106.1	Mainstem	Velocity	200	60	Continuous
106.4	Mainstem	Velocity	370	50	Continuous
106.6	Mainstem	Velocity	350	50	Discontinuous
107.4	Mainstem	Velocity	200	50	Continuous
109.1	Mainstem	Velocity	550	100	Discontinuous
110.3	Mainstem	Velocity	150	100	Discontinuous
110.5	Mainstem	Velocity	290	50	Continuous
110.9	Mainstem	Velocity	450	50	Discontinuous
111.5	Mainstem	Velocity	1,600	100	Continuous
111.7	Mainstem	Velocity	500	90	Continuous
111.9	Mainstem	Velocity	900	150	Continuous
112.5	Mainstem	Velocity	700	100	Discontinuous
112.9	Mainstem	Velocity	500	110	Continuous
113.8	Mainstem	Velocity	600	110	Continuous
117.4	Mainstem	Thermal	780	60	Continuous
117.9	Side Channel	Thermal	1,260	120	Discontinuous
119.6	Side Channel	Thermal	550	50	Continuous
119.7	Mainstem	Velocity	350	50	Continuous

Location of Upstream End 1 River Mile#	Channel Type	Type of Lead(1)	Approx. Length (Ft.)	Widest Point (Ft.)	Continuous or Discontinuous
120.3	Mainstem	Velocity	800	100	Continuous
121.1	Mainstem	Velocity	550	100	Continuous
121.8	Side Channel	Thermal	1,450	30	Discontinuous
122.4	Slough (7)	Thermal	1,850	60	Discontinuous
122.5	Slough (7)	Thermal	380	50	Continuous
122.9	Slough (7)	Thermal	1,950	80	Discontinuous
123.1	Mainstem	Velocity	1,000	80	Continuous
123.9	Side Channel	Thermal	200	50	Continuous
124.4	Side Channel	Velocity	270	40	Continuous
124.9	Mainstem	Thermal	600	90	Continuous
125.3	Slough (8)	Thermal	3,500	50	Discontinuous
125.5	Mainstem	Velocity	2,140	100	Continuous
125.5	Slough (8)	Thermal	800	500	Continuous
125.6	Mainstem	Velocity	350	60	Continuous
125.9	Slough (8)	Thermal	580	50	Continuous
126.1	Slough (8)	Thermal	500	30	Continuous
126.3	Slough (8)	Thermal	250	50	Continuous
126.8	Slough (8)	Thermal	1,500	80	Discontinuous
127.2	Side Channel	Thermal	2,450	50	Continuous
127.5	Mainstem	Velocity	700	80	Continuous
128.9	Slough (9)	Thermal	5,060	100	Continuous
128.5	Side Channel	Thermal	1,210	30	Discontinuous
128.8	Side Channel	Thermal	380	20	Continuous
129.2	Slough	Thermal	4,000	30	Discontinuous
130.0	Mainstem	Velocity	600	90	Continuous
130.8	Side Channel	Thermal	5,000	50	Discontinuous
130.7	Mainstem	Velocity	150	50	Continuous
131.1	Mainstem	Velocity	490	90	Continuous
131.3	Mainstem	Velocity	800	100	Continuous
131.5	Side Channel	Thermal	5,000	80	Discontinuous
131.3	Side Channel	Thermal	900	90	Discontinuous
132.0	Mainstem	Velocity	150	20	Continuous
132.1	Mainstem	Velocity	500	20	Discontinuous
132.3	Mainstem	Velocity	400	80	Continuous
132.6	Mainstem	Velocity	1,350	80	Continuous
133.7	Slough	Thermal	6,000	60	Continuous
133.7	Mainstem	Velocity	1,110	100	Continuous
134.3	Slough (10)	Thermal	4,500	40	Continuous
134.0	Side Channel	Thermal	1,200	50	Continuous
134.5	Side Channel	Thermal	850	100	Continuous
135.2	Mainstem	Velocity	1,580	90	Discontinuous

TABLE E.2.2.28 (Page 3 of 3)

Location of Upstream End 1 River Mile#	Channel Type	Type of Lead(1)	Approx. Length (Ft.)	Widest Point (Ft.)	Continuous or Discontinuous
135.7	Slough (11)	Thermal	5,500	80	Continuous
136.0	Mainstem	Velocity	230	80	Continuous
136.3	Side Channel	Thermal	2,050	40	Continuous
136.7	Mainstem	Thermal	1,620	80	Continuous
137.1	Mainstem	Velocity	750	60	Continuous
137.4	Side Channel	Thermal	2,500	20	Discontinuous
137.8	Slough (16)	Thermal	1,400	30	Discontinuous
138.2	Mainstem	Velocity	2,000	150	Continuous
138.9	Mainstem	Thermal	2,100	150	Continuous
139.0	Mainstem	Velocity	780	20	Continuous
139.1	Mainstem	Velocity	500	30	Continuous
138.4	Mainstem	Velocity	600	30	Continuous
140.6	Side Channel	Thermal	1,900	100	Discontinuous
	Slough (20)	Thermal	1,100	20	Continuous
142.0	Slough (21)	Thermal	3,850	40	Discontinuous
141.5	Mainstem	Velocity	850	40	Continuous
142.0	Mainstem	Velocity	950	50	Continuous
142.6	Mainstem	Velocity	1,600	150	Discontinuous
142.8	Mainstem	Velocity	850	150	Continuous
143.6	Mainstem	Velocity	550	20	Discontinuous
	Mainstem	Velocity	280	20	Continuous
143.8	Mainstem	Velocity	780	100	Continuous
143.9	Mainstem	Velocity	500	30	Continuous
144.5	Mainstem	Velocity	900	100	Discontinuous
	Slough (22)	Thermal	250	20	Continuous
144.6	Slough (22)	Thermal	300	20	Continuous
145.5	Mainstem	Velocity	1,150	100	Continuous
146.9	Mainstem	Velocity	700	100	Continuous
147.1	Mainstem	Velocity	850	80	Discontinuous
147.7	Mainstem	Velocity	150	40	Continuous
148.1	Mainstem	Velocity	420	50	Discontinuous
148.5	Mainstem	Velocity	680	140	Continuous
149.0	Mainstem	Velocity	400	60	Continuous
149.5	Mainstem	Velocity	500	80	Continuous
150.0	Mainstem	Velocity	350	20	Discontinuous
150.2	Mainstem	Velocity	750	100	Continuous
151.2	Mainstem	Velocity	2,800	100	Discontinuous

(1) Velocity indicates lead kept open by high-velocity flows. Thermal indicates lead kept by groundwater seepage.

TABLE E.2.2.29: NUMBER OF BEDLOAD SAMPLES COLLECTED UP TO FEBRUARY 1984

GAGING STATION	YEAR	NUMBER OF SAMPLES Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Susitna R. at Gold Creek (15292000)	1981							1	1	1			
Susitna R. near Talkeetna (15292100)	1982						5	4	5	1			
	1983			1		2	3	2	3	1	1		
	1984		1										
Chulitna R. near Talkeetna (15292400)	1981							1	1	1			
	1982						5	4	4	2			
Chulitna R. Below Canyon near Talkeetna (15292410)	1983			1		3	3	2	3	1	1		
	1984		1										
Susitna R. Right Channel below Chulitna R. (15292439)	1983			1		1	1	1	1		1		
	1984		1										
Susitna R. Left Channel below Chulitna R. (15292440)	1983			1		1	1	1	1		1		
	1984		1										
Talkeetna R. near Talkeetna (15292700)	1981							1	1	1			
	1982						5	4	5	1			
	1983			1		2	3	2	2	3	1		
	1984		1										
Susitna R. at Sunshine (15292780)	1981						1	1	1				
	1982						5	4	5	1			
	1983			1		2	3	2	5	1	1		
	1984		1										

Source: Knott and Lipscomb, 1983 and 1985

TABLE E.2.2.30: WATER DISCHARGE AND ESTIMATED SEDIMENT TRANSPORT AT SELECTED SITES ON SUSITNA RIVER MAY 1982 THROUGH SEPTEMBER 1983

Gaging Station	Year	Month	Water Discharge (acre-ft)	Suspended Load (tons)	Bedload (tons)	Total Load (tons)
Susitna River near Talkeetna (15292100)	1982	May	920,000	300,000	3,900	304,000
		June	1,700,000	800,000	17,400	817,000
		July	1,500,000	880,000	12,900	893,000
		Aug.	1,000,000	359,000	3,900	363,000
		Sep.	1,100,000	470,000	5,400	475,000
		Oct.	450,000	9,300	388	9,690
		Nov.	160,000	780	17	797
		Dec.	150,000	720	15	735
	1983	Jan.	150,000	740	16	756
		Feb.	140,000	620	13	633
		Mar.	110,000	340	6	346
		Apr.	120,000	500	10	510
		May	1,000,000	350,000	8,400	358,000
		June	1,600,000	920,000	27,200	947,000
		July	1,400,000	1,080,000	15,600	1,100,000
		Aug.	1,600,000	980,000	16,900	997,000
		Sep.	850,000	121,000	3,800	125,000
Chulitna River near Talkeetna (15292400)	1982	May	386,700	130,000	80,000	210,000
		June	1,092,000	1,280,000	430,000	1,710,000
		July	1,575,000	2,650,000	330,000	2,980,000
		Aug.	1,252,000	1,400,000	260,000	1,660,000
		Sep.	1,085,000	1,690,000	127,000	1,820,000
Chulitna River below canyon Near Talkeetna (15292410)	1982	Oct.	338,100	37,000	4,400	41,400
		Nov.	149,600	5,100	127	5,230
		Dec.	114,000	2,600	40	2,640
		Jan.	96,700	1,900	26	1,930
		Feb.	57,500	630	4	634
		Mar.	64,600	720	5	725
		Apr.	74,300	1,100	13	1,110
		May	546,100	250,000	87,000	337,000
		June	1,124,000	1,660,000	190,000	1,850,000

TABLE E.2.2.30 (Page 2 of 3)

Gaging Station	Year	Month	Water Discharge (acre-ft)	Suspended Load (tons)	Bedload (tons)	Total Load (tons)
		July	1,372,000	2,760,000	230,000	2,990,000
		Aug.	1,364,000	3,200,000	179,000	3,380,000
		Sep.	652,500	630,000	148,000	778,000
Talkeetna River near Talkeetna (15292700)	1982	May	203,700	60,000	4,000	64,000
		June	770,200	400,000	81,000	481,000
		July	680,900	510,000	40,000	550,000
		Aug.	447,100	138,000	58,700	197,000
		Sep.	568,000	242,000	39,000	281,000
		Oct.	206,100	10,000	1,350	11,400
		Nov.	73,980	850	66	916
		Dec.	66,550	630	47	677
	1983	Jan.	51,410	380	26	406
		Feb.	32,210	140	8	148
		Mar.	34,770	150	9	158
		Apr.	39,790	230	15	245
		May	279,800	46,000	4,630	50,600
		June	536,300	220,000	19,100	239,000
		July	353,100	430,000	24,000	454,000
		Aug.	541,300	350,000	26,300	376,000
		Sep.	234,700	23,800	3,720	27,500
Susitna River at Sunshine (15292780)	1982	May	1,633,000	600,000	16,000	616,000
		June	3,738,000	2,700,000	175,000	2,880,000
		July	3,876,000	4,200,000	142,000	4,340,000
		Aug.	2,083,000	2,400,000	74,000	2,470,000
		Sep.	2,906,000	2,270,000	95,000	2,820,000
		Oct.	994,900	110,000	16,800	127,000
		Nov.	374,900	4,500	6,600	11,100
		Dec.	345,100	3,200	6,100	9,300
	1983	Jan.	320,700	2,700	5,750	8,450
		Feb.	259,000	1,700	4,630	6,330
		Mar.	214,000	780	3,940	4,720
		Apr.	249,700	1,700	4,500	6,200
		May	1,930,000	930,000	46,000	976,000

TABLE E.2.2.30 (Page 3 of 3)

Gaging Station	Year	Month	Water Discharge (acre-ft)	Suspended Load (tons)	Bedload (tons)	Total Load (tons)
		June	3,457,000	3,400,000	184,000	3,580,000
		July	3,405,000	3,900,000	101,000	4,000,000
		Aug.	3,725,000	4,700,000	82,000	4,780,000
		Sep.	1,786,000	690,000	128,000	818,000

Source: Knott and Lipscomb, 1983 and 1985

TABLE E.2.2.31: BEDLOAD SIZE DISTRIBUTION

Gaging Station	Month	.125	.25	.50	1.0	2.0	4.0	8.0	16	32	64	76
		PARTICLE SIZE (mm)										
		Percent Finer Than										
Susitna R. at Gold Creek (15292000)	Jul. 1981		2	20	28	33	36	38	44	61	89	100
	Aug. 1981		5	41	51	55	58	59	66	72	82	100
	Sep. 1981		15	78	88	97	100					
Susitna R. near Talkeetna (15292100)	Jun. 1982		2	39	48	50	51	53	56	67	83	100
	Jul. 1982		1	63	85	87	88	90	92	98	100	
	Aug. 1982		1	71	96	98	98	99	99	100		
	Sep. 1982		2	63	78	80	80	82	84	91	100	
	Mar. 1983		3	75	100							
	May 1983		1	70	93	94	95	95	95	96	100	
	Jun. 1983		1	47	60	62	62	64	67	69	100	
	Jul. 1983		1	76	91	93	93	94	95	98	100	
	Aug. 1983		5	62	91	92	93	94	95	96	100	
	Sep. 1983			76	88	92	93	93	93	100		
	Oct. 1983			84	89	99	99	99	100			
Chulitna R. near Talkeetna (15292400)	Jul. 1981		2	15	22	26	30	45	70	93	96	100
	Aug. 1981		1	12	19	27	40	56	73	89	97	100
	Sep. 1981			15	29	44	55	77	91	99	100	
	Jun. 1982		1	19	39	47	58	72	84	95	100	
	Jul. 1982		1	14	33	38	45	57	70	88	100	
	Aug. 1982		1	13	33	39	46	58	73	91	100	
	Sep. 1982		1	20	38	49	55	64	75	89	100	

TABLE E.2.2.31 (Page 2 of 3)

Gaging Station	Month	.125	.25	.50	1.0	2.0	4.0	8.0	16	32	64	76
		PARTICLE SIZE (mm) Percent Finer Than										
Chulitna R. below Canyon	May 1983		1	20	49	66	68	78	88	97	100	
near Talkeetna	Jun. 1983		1	23	44	57	58	69	80	91	100	
(15292410)	Jul. 1983		1	23	48	58	60	69	78	91	100	
	Aug. 1983		1	17	30	35	38	49	66	83	98	100
	Sep. 1983			31	50	71	77	87	94	100		
	Oct. 1983		1	30	52	61	68	81	90	98	100	
	Feb. 1984	1	2	49	73	79	79	84	100			
Susitna R. Righ Channel	Mar. 1983			90	100							
below Chulitna R.	May 1983			20	34	39	39	43	51	64	100	
(15292439)	Jun. 1983		1	28	45	53	54	60	69	79	100	
	Jul. 1983			36	54	58	63	70	80	93	100	
	Aug. 1983			16	22	24	26	36	58	82	100	
	Oct. 1983			53	77	82	82	83	86	94	100	
	Feb. 1984			50	99	100						
Susitna R. Left Channel	May 1983		2	85	95	100						
below Chulitna R.	Jun. 1983		2	43	60	62	63	67	73	84	100	
(15292440)	Jul. 1983		1	67	81	81	62	83	86	90	100	
	Aug. 1983		3	52	66	70	70	72	75	84	100	
	Oct. 1983			78	95	96	97	98	98	100		
Talkeetna R. near Talkeetna												
(15292700)	Jul. 1981	1	12	46	54	56	57	59	64	78	97	100
	Aug. 1981		5	68	85	87	88	89	91	93	100	
	Sep. 1981		6	86	99	100						
	Jun. 1982		1	27	57	61	63	65	73	85	95	100
	Jul. 1982		6	50	81	84	85	85	87	89	100	

TABLE E.2.2.31 (Page 3 of 3)

Gaging Station	Month	PARTICLE SIZE (mm) .125	.25	.50	1.0	2.0	4.0	8.0	16	32	64	76
		Percent Finer Than										
	Aug. 1982		1	30	82	88	90	91	92	95	97	100
	Sep. 1982		1	12	26	27	28	33	49	82	100	
	Mar. 1983			60	100							
	May 1983		1	64	96	100						
	Jun. 1983		1	38	67	72	72	76	83	96	100	
	Jul. 1983		2	46	80	83	83	84	85	90	100	
	Aug. 1983	1	3	44	75	80	81	84	88	97	100	
	Sep. 1983			59	95	99	100					
	Oct. 1983			79	98	100						
	Feb. 1984	1	3	48	97	100						
Susitna R. at Sunshine (15292780)	Jul. 1981											
	Aug. 1981											
	Sep. 1981											
	Jun. 1982											
	Jul. 1982											
	Aug. 1982											
	Sep. 1982											
	Mar. 1983		1	47	93	95	95	97	100			
	May. 1983		1	26	43	47	47	51	61	79	99	100
	Jun. 1983		1	24	34	39	26	47	62	83	99	100
	Jul. 1983		5	30	42	44	50	65	77	93	100	
	Aug. 1983		1	39	51	54	58	64	73	88	99	100
	Sep. 1983		0	31	44	49	52	63	78	93	100	
	Oct. 1983		1	40	66	71	72	77	85	96	100	
	Feb. 1984		1	30	58	61	64	69	77	93	100	

Source: Knott and Lipscomb 1983, 1985

TABLE E.2.2.32: BED MATERIAL SIZE DISTRIBUTION OF SUSITNA RIVER

Location	Particle Size (mm)											Bed Material Sizes (mm) for given Percentages		
	.062	.125	250	500	1.00	2.00	4.00	8.00	16.0	32.0	64.0			
	Percent Finer Than											D_{16}	D_{50}	D_{90}
Main Channel at RM 99.6	2	3	7	10	13	16	22	29	42	70	89	1.7	20	65
Main Channel at RM 109.3	1	2	3	5	8	12	18	24	32	50	77	3.0	34	78
Main Channel at RM 113.6	2	3	5	7	9	10	14	21	32	48	77	5.0	35	84
Side Channel at RM 115.1	3	5	7	10	13	17	22	29	37	53	73	1.7	30	110
Near Slough 8A, RM 125.6	1	3	6	10	12	13	15	18	28	47	83	4.3	35	70
Near Slough 9, RM 128.7	1	2	7	15	18	20	23	30	41	63	93	0.5	22	58
Main Channel at RM 131.2	2	4	6	8	11	14	20	27	36	55	78	2.5	28	85
Side Slough 9, RM 133.5	1	3	6	12	17	20	25	34	44	62	82	0.8	20	80
Side Channel at RM 135.0	1	2	5	7	10	14	19	30	41	58	84	2.6	25	72
Side Slough 11, RM 135.4	1	2	5	8	12	15	20	27	35	50	68	2.2	32	100
Main Channel near RM 137-2	1	2	3	7	10	13	17	24	33	53	72	3.3	30	100
Side Channel near RM 142.0	0	0	1	4	6	8	12	17	23	40	62	7.5	46	96

TABLE E.2.2.33: SUSPENDED SEDIMENT CONCENTRATION (mg/l)

Station	MONTHS											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Susitna R. near Denali												
Max.	-	-	-	-	1190	1600	2770	5690	3600	1400	-	-
Min.	-	-	-	-	102	302	886	350	124	85	-	-
Median	-	-	-	-	570	840	1350	890	293	104	-	-
Susitna R. near Cantwell												
Max.		-	-	-	726	1860	2790	1040	770	140	-	-
Min.	-	-	-	-	132	172	632	380	34	6	-	-
Median	-	-	-	-	661	417	1090	755	138	84	-	-
Susitna R. at Gold Creek												
Max.	8	-	3	-	1110	1400	1300	938	812	22	-	-
Min.	<1	-	1	-	65	151	100	158	23	7	-	-
Median	2	-	2	-	498	574	394	420	68	10	-	-
Susitna R. near Talkeetna												
Max.	-	-	-	-	-	769	768	341	-	-	-	-
Min.	-	-	-	-	-	181	145	219	-	-	-	-
Median	-	-	-	-	-	438	422	285	-	-	-	-
Chulitna R. near Talkeetna												
Max.	-	-	21	-	1040	1600	2200	1260	1680	-	-	-
Min.	-	-	4	-	500	90	717	694	129	-	-	-
Median	-	-	12	-	675	820	1165	817	396	-	-	-
Talkeetna R. near Talkeetna												
Max.	15	-	11	48	503	1340	1160	3530	310	29	-	-
Min.	2	-	1	2	21	171	90	38	13	8	-	-
Median	8	-	3	8	123	309	359	466	80	16	-	-
Susitna R. at Sunshine												
Max.	-	-	-	-	-	1630	1430	3510	-	-	-	-
Min.		-	-	-	-	360	503	424	-	-	-	-
Median	-	-	-	-	-	702	713	715	?	-	-	-
Susitna R. at Susitna Station												
Max.	-	-	5	-	572	918	1490	1490	-	-	-	-
Min.	-	-	3	-	378	326	561	483	-	-	-	-
Median	-	-	3	-	417	503	852	943	-	-	-	-

TABLE E.2.2.34: PARTICLE SIZE DISTRIBUTION OF SUSPENDED SEDIMENT

Stream Gaging Station	Number of 1/ Sample	PARTICLE SIZE (mm)									
		.002	.004	.008	.016	.031	.062	.125	.250	.500	1.000
		Percent Finer Than 2/									
Susitna River near Denali	34	12	16	23	31	41	53	64	81	96	100
Susitna River near Cantwell	27	12	18	25	33	43	54	67	86	97	100
Susitna River at Gold Creek	24	15	19	27	35	47	61	75	86	98	100
Susitna River near Talkeetna	13	29	35		53		72	79	90	100	
Chulitna River near Talkeetna	36	21	31	37	46	55	62	72	85	99	100
Talkeetna River near Talkeetna	16	9	16	22	31	41	53	65	85	99	100
Susitna River at Sunshine	17	22	33	43	53	62	67	79	90	100	
Susitna River at Susitna Station	9	16	23	33	43	52	60	82	94	100	

1/ Samples for which full range of size distributions were analyzed.

2/ The percentages given are the median values from a range of observed percentages for various sizes.

Table E.2.2.35: 1982 TURBIDITY AND SUSPENDED SEDIMENT ANALYSIS

Location	Date Sampled	Date Analyzed	Turbidity[2] (NTU)	Suspended[3] Sediment Concentration (mg/l)	Discharge (cfs)
Susitna River at Vee Canyon (RM 223)	6/4/82	6/11/82	82	--	--
	6/30/82	8/3/82	384	--	--
	7/27/82	8/18/82	720	--	--
	8/26/82	9/14/82	320	--	--
Susitna River near Chase[4] (RM 103)	6/3/82	6/11/82	140	769	35,800
	6/8/82	6/24/82	130	547	44,400
	6/15/82	6/24/82	94	170	24,200
	6/22/82	8/3/82	74	426	37,000
	6/30/82	8/18/82	376	392	30,200
	7/8/82	8/18/82	132	156	20,700
	7/14/82	8/3/82	728	729	30,800
	7/21/82	8/18/82	316	232	24,900
	7/28/82	8/18/82	300	464	30,800
	8/4/82	8/18/82	352	377	22,700
	8/10/82	8/26/82	364	282	20,000
	8/18/82	8/26/82	304	275	17,700
	8/25/82	9/14/82	244	221	16,800
	8/31/82	9/14/82	188	252	19,300
	9/19/82	10/12/82	328	439	28,700
Susitna River at Cross Section LRX-4[1,4] (RM 99)	5/26/82	5/29/82	81	--	--
Susitna River below Talkeetna[1,5] (approximately RM 91)	5/26/82	5/29/82	98	--	--
	5/28/82	6/2/82	256	--	43,600
	5/29/82	6/2/82	140	--	42,900
	5/30/82	6/2/82	65	--	38,400
	5/31/82	6/2/82	130	--	39,200
	6/1/82	6/2/82	130	--	47,000
Susitna River at Sunshine-Parks Highway Bridge[5] (RM83)	6/3/82	6/11/82	164	847	71,000
	6/10/82	6/24/82	200	414	64,500
	6/17/82	6/24/82	136	322	50,800
	6/21/82	8/3/82	360	755	78,300
	6/28/82	8/18/82	1,056	668	75,700
	7/6/82	8/3/82	352	507	46,600
	7/12/82	8/3/82	912	867	59,800
	7/19/82	8/18/82	552	576	60,800
	7/26/82	8/18/82	696	1180	96,800
	8/2/82	8/18/82	544	704	62,400
	8/9/82	8/26/82	720	746	54,000
	8/16/82	8/26/82	784	728	47,800
	8/23/82	9/14/82	552	496	38,600
	8/30/82	9/14/82	292	439	39,800
	9/17/82	10/12/82	784	1290	86,500
Chulitna River[1] (approximately 1 mile above Chulitna-Susitna Confluence)	5/26/82	5/29/82	194	--	--
	5/28/82	6/2/82	272	--	--
	5/29/82	6/2/82	308	--	--
	5/30/82	6/2/82	120	--	--
	5/31/82	6/2/82	360	--	--
	6/1/82	6/2/82	324	--	--

Location	Date Sampled	Date Analyzed	Turbidity[2] (NTU)	Suspended[3] Sediment Concentration (mg/l)	Discharge[4] (cfs)
Chulitna River (Canyon)[6] (18 miles above the Chulitna-Susitna Confluence)	6/4/82	6/11/82	272	424	11,500
	6/22/82	8/3/82	680	813	19,500
	6/29/82	8/18/82	1,424	1600	29,000
	7/7/82	8/3/82	976	1030	20,700
	7/13/82	8/18/82	1,136	1200	22,700
	7/20/82	8/18/82	1,392	1250	23,100
	7/27/82	8/18/82	664	1010	31,900
	8/3/82	8/18/82	704	960	23,300
	8/11/82	8/26/82	592	753	21,300
	8/17/82	8/26/82	1,296	1250	21,900
	8/24/82	9/14/82	632	843	18,200
	9/1/82	9/14/82	316	523	17,300
	9/18/82	10/12/82	1,920	1550	29,200
Talkeetna River at Railroad Bridge[1,7] (0.5 miles above Susitna-Talkeetna Confluence)	5/26/82	5/29/82	17	--	5,680
	5/28/82	6/2/82	39	--	6,250
	5/29/82	6/2/82	21	--	5,860
	5/30/82	6/2/82	20	--	5,660
	5/31/82	6/2/82	44	--	7,400
	6/1/82	6/2/82	55	--	9,560
Talkeetna River at USGS Cable[7] (6 miles above Susitna-Talkeetna Confluence)	6/2/82	6/11/82	146	340	17,900
	6/9/82	6/24/82	49	311	14,700
	6/17/82	6/24/82	28	216	11,400
	6/23/82	8/3/82	26	164	12,400
	6/29/82	8/18/82	41	321	10,700
	7/7/82	8/3/82	20	100	6,750
	7/13/82	8/3/82	132	226	8,880
	7/20/82	8/18/82	148	226	8,400
	7/28/82	8/18/82	272	--	14,200
	8/3/82	8/18/82	49	180	8,980
	8/10/82	8/26/82	53	212	6,980
	8/17/82	8/26/82	82	198	6,230
	8/24/82	9/14/82	68	263	5,920
	8/31/82	9/14/82	37	276	9,120
	9/20/82	10/12/82	34	301	14,800

Notes: [1] Samples collected by R&M Consultants. All other samples were collected by USGS.

[2] R&M Consultants conducted all turbidity analysis.

[3] Suspended sediment concentrations are preliminary unpublished data provided by the U.S. Geological Survey (USGS).

[4] Discharges for "Susitna near Chase" and "Susitna at LRX-4" are from provisional USGS stream gage data at the Alaska Railroad Bridge at Gold Creek.

[5] Discharges for "Susitna Below Talkeetna" and "Susitna at Sunshine" are from provisional USGS stream gage data at the Parks Highway Bridge at Sunshine.

[6] Discharges for "Chulitna River (Canyon)" are from provisional USGS stream gage data at the Parks Highway Bridge at Chulitna.

[7] Discharges for "Talkeetna at R.R. Bridge" and "Talkeetna at USGS Cable" are from provisional USGS stream gage data near Talkeetna.

TABLE E.2.2.36: Summary statistics for habitat variables recorded on the Susitna River between the Chulitna River confluence and Devil Canyon, May 18 to September 25, 1983.

	Min	Max	Mean	Std. Dev	n	Auto-Correl-ation	n
Discharge (ft^3/sec)[a]	10,500	36,000	21,964	4965.4	106	0.87	104
Water temperature (°C)[b]	0.0	14.5	10.2	2.8	106	0.92	104
Turbidity (NTU)	13	560	167	119.6	105	0.93	104

a/ USGS provisional data on Susitna River at Gold Creek, 1983, Gage No. 15292000.
b/ ADF&G data at Talkeetna Station downstream migrant traps, 1983.

SOURCE: (ADF&G 1984g)

TABLE E.2.2.37: Summary statistics for habitat variables recorded on the Susitna River between the Chulitna River confluence and Devil Canyon, May 14 through October 6, 1984.

	Min	Max	Mean	Std. Dev	n
Discharge (ft^3/sec)[a/]	6,780	52,000	19,405	8,160.0	146
Water Temperature (°C)[b/]	2.0	13.5	8.8	3.0	145
Turbidity (NTU)	13	400	115	92.0	145

a/ USGS provisional data at Gold Creek, 1984.
b/ ADF&G data at Talkeetna Station outmigrant traps, 1984.

SOURCE: (ADF&G 1985a)

TABLE E.2.2.38: SIGNIFICANT ION CONCENTRATIONS

	Ranges of Concentrations (mg/l)			
	Upstream of Project[1]		Downstream of Project[2]	
	Summer	Winter	Summer	Winter
Bicarbonate (alkalinity)	39 - 81	57 - 161	23 - 87	46 - 88
Chloride	1.5 - 11	16 - 30	1.2 - 15	5.7 - 35
Sulfate	2 - 31	11 - 39	1 - 31	10 - 38
Calcium (dissolved)	13 - 29	25 - 51	10 - 37	18 - 39
Magnesium (dissolved)	1.1 - 6.4	3.8 - 16.0	1.2 - 7.8	3.2 - 10.0
Sodium (dissolved)	2.1 - 10.0	6.3 - 23.0	1.8 - 10	4.9 - 21.1
Potassium (dissolved)	1.3 - 7.3	2.0 - 9.0	0.9 - 4.4	1.2 - 5

Notes: 1 = Denali and Vee Canyon

2 = Gold Creek, Sunshine and Susitna Station

Source: USGS & R&M

TABLE E.2.2.39: LAKES POTENTIALLY IMPACTED BY ACCESS ROADS AND/OR TRANSMISSION LINES

Lake	Location	Impacts
Deadman Lake	Sec. 13 & 14, T22S, R4W, Fairbanks, Meridian	Increased access from Watana access road near MP 27
Big Lake	Sec. 19 &20, T22S, R4W; Sec. 25, T22S, R4W; Fairbanks Meridian	Increased access from Watana access road near MP 28; Location of proposed campground (see Chapter 7 of Exhibit E)
Unnamed Lake, NW of Deadman Creek	Sec. 25, T22S, R5W Fairbanks, Meridian	Increased access from Watana access road near MP 27
Unnamed Lake east of Tsusena Butte	Sec. 21, T33N, R5E, Seward Meridian	Increased access from Watana access road near MP 32
Lake complex near Watana camp at MP 41	Sec. 15, 16, & 21, T32N, R5E, Seward Meridian	Impact from location of camp; water quality
Fog Lakes	T31N, R5E & R6E, Seward Meridian	Increased access by road across to Watana Dam; potential development by Native Corporation
Swimming Bear Lake	Sec. 4, T32N, R3E, Seward Meridian	Increased access from Devil Canyon access road near MP 18
High Lake	Sec. 20, T32N, R2E, Seward Meridian	Increased access from Devil Canyon access road near MP 28
Mermaid Lake	Sec. 25, T32N, R1E, Seward Meridian	Increased access from Devil Canyon access road near MP 29; Location of proposed campground (see Chapter 7 of Exhibit E)
Unnamed Lake complex	Sec. 15, 16, 21, 22 & 28, T32N, R1E, Seward Meridian	Increased access from Devil Canyon access road near MP 31

TABLE E.2.2.40: STREAMS AND SLOUGHS TO BE PARTIALLY OR COMPLETELY INUNDATED BY STAGE I WATANA RESERVOIR (EL 2,000)[1/]

Stream	Susitna River Mile at Mouth	Approximate[2/] Elevation at Mouth (ft. msl)	Length of Stream to be Inundated (miles)
1. unnamed	236.0	2,140	0.0
2. unnamed	233.8	2,055	0.0
3. Oshetna River	233.5	2,050	0.0
4. unnamed	232.7	2,040	0.0
5. Goose Creek	231.2	2,030	0.0
6. unnamed	230.8	2,025	0.0
7. unnamed	229.8	2,015	0.0
8. unnamed	229.7	2,015	0.2
9. unnamed	229.1	2,010	0.0
10. unnamed	228.5	2,000	0.0
11. unnamed	228.4	2,000	0.0
12. unnamed	227.4	1,980	0.0
13. unnamed	226.8	1,970	0.2
14. unnamed	225.0	1,930	0.1
15. unnamed	224.4	1,920	0.1
16. unnamed	221.5	1,875	0.5
17. unnamed	220.9	1,865	0.2
18. unnamed	219.2	1,845	0.6
19. unnamed	217.6	1,830	0.3
20. unnamed	215.1	1,785	0.2
21. unnamed	213.2	1,760	0.2
22. unnamed	213.0	1,755	0.3
23. unnamed slough	212.2	1,750	0.3 (entire length
24. unnamed	212.1	1,750	0.2
25. unnamed slough	212.0	1,750	0.5 (entire length)
26. unnamed	211.7	1,745	0.2
27. unnamed	210.2	1,720	0.4
28. unnamed slough	208.7	1,705	0.3 (entire length)
29. Jay Creek	208.6	1,700	2.0
30. unnamed slough	208.0	1,695	0.4 (entire length)
31. unnamed	207.3	1,690	0.6 (entire length)
32. unnamed	207.0	1,685	0.6
33. Kosina Creek	206.9	1,685	2.5
34. unnamed slough	205.7	1,670	0.5 (entire length)
35. unnamed	205.0	1,665	0.3 (entire length)
36. unnamed	204.9	1,665	0.4 (entire length)
37. unnamed	203.9	1,655	0.4
38. unnamed	203.4	1,650	0.5 (entire length)
39. unnamed	201.8	1,635	0.5
40. unnamed slough	200.9	1,630	0.2 (entire length)
41. unnamed	200.7	1,625	0.5
42. unnamed	198.7	1,610	0.5
43. unnamed	198.6	1,605	0.4
44. unnamed	197.9	1,600	0.4
45. unnamed	197.1	1,595	0.5
46. unnamed	196.7	1,590	0.4
47. unnamed	196.2	1,585	1.7
48. unnamed	195.8	1,580	1.7

TABLE E.2.2.40 (Page 2 of 2)[1/]

Stream Name	Susitna River Mile at Mouth	Approximate[2/] Elevation at Mouth (ft. msl)	Length of Stream to be Inundated (miles)
49. unnamed	195.2	1,575	0.9
50. unnamed	194.9	1,560	1.2
51. Watana Creek	194.1	1,560	6.6 (longest fork)
51A. Delusion Creek (tributary to Watana Creek)	--	1,700	1.2
52. unnamed slough	193.6	1,565	0.4 (entire length)
53. unnamed	192.7	1,550	1.1
54. unnamed	192.0	1,545	2.6
55. unnamed	190.0	1,530	0.2
56. unnamed	187.0	1,505	0.4
57. unnamed	186.9	1,505	1.4
58. Deadman Creek	186.7	1,500	1.4

1/ See Figure E.2.2.144 for locations of affected water bodies

2/ The elevations at the mouths were approximated from USGS 1:63,360 topographic quadrangle maps. A control survey, conducted by R&M Consultants (1981a, 1982c), identified several possible inaccuracies in the USGS contours along the length of the reservoir. Thus, there are four unnamed streams on the USGS maps which would appear to be inundated at their mouths but may actually be above the upper end of the reservoir as surveyed.

TABLE E.2.2.41: STREAMS AND SLOUGHS TO BE PARTIALLY OR COMPLETELY INUNDATED BY STAGE II DEVIL CANYON RESERVOIR (EL 1,455)1/

Stream Name	Susitna River Mile at Mouth	Approximate Elevation at Mouth (ft. msl)	Length of Stream to be Inundated (miles)
1. Tsusena Creek	181.9	1,450	0.2
2. unnamed (Bear Creek)	181.2	1,440	0.2
3. unnamed slough	180.1	1,430	0.6 (entire length)
4. unnamed	179.3	1,420	0.1
5. unnamed slough	179.1	1,420	0.2
6. unnamed slough	177.0	1,385	0.1
7. Fog Creek	176.7	1,380	1.0
8. unnamed	175.3	1,370	0.6
9. unnamed	175.1	1,365	0.1
10. unnamed	174.9	1,360	0.1
11. unnamed	174.3	1,350	0.3
12. unnamed slough	173.9	1,345	0.1 (entire length)
13. unnamed	173.9	1,345	0.4
14. unnamed	173.0	1,335	0.1
15. unnamed	173.0	1,335	0.2
16. unnamed	172.9	1,330	0.2
17. unnamed slough	172.2	1,350	2.0 (entire length)
17A. unnamed (tributary to slough)	--	1,350	0.2
17B. unnamed (tributary to slough)	--	1,350	0.1
18. unnamed slough	172.0	1,320	0.5 (entire length)
19. unnamed slough	171.5	1,315	0.8 (entire length)
19A. unnamed (tributary to slough)	--	1,320	0.1
19B. unnamed (tributary to slough)	--	1,320	0.1
20. unnamed slough	171.5	1,315	0.2 (entire length)
21. unnamed	171.4	1,315	0.1
22. unnamed	171.0	1,310	0.6
23. unnamed slough	169.5	1,290	0.7 (entire length)
24. unnamed	168.8	1,280	0.2
25. unnamed slough	168.0	1,265	0.2 (entire length)
26. unnamed	166.5	1,235	0.6
27. unnamed	166.0	1,230	0.2
28. unnamed	164.0	1,200	0.2
29. unnamed	163.7	1,180	0.2
30. Devil Creek	161.4	1,120	1.4
31. unnamed	157.0	1,030	1.3
32. unnamed	154.5	985	0.4
33. unnamed (Cheechako Creek)	152.4	950	1.6

1/ See Figure E.2.145 for locations of affected water bodies.

TABLE E.2.2.42: STREAMS AND SLOUGHS TO BE PARTIALLY OR COMPLETELY INUNDATED BY STAGE III WATANA RESERVOIR (EL. 2,185)[2/]

Stream	Susitna River Mile at Mouth	Approximate[1/] Elevation at Mouth (ft. msl)	Total Length of Stream to be Inundated by Stage III (miles)	Total Length of Stream to be Inundated by Stages I and III (miles)
1. unnamed	236.0	2,140	0.1	0.1
2. unnamed	233.8	2,055	0.3	0.3
3. Oshetna River	233.5	2,050	2.0	2.0
4. unnamed	232.7	2,040	0.2	0.2
5. Goose Creek	231.2	2,030	1.2	1.2
6. unnamed	230.8	2,025	0.2	1.2
7. unnamed	229.8	2,015	0.3	0.2
8. unnamed	229.7	2,015	0.2	0.3
9. unnamed	229.1	2,010	0.1	0.2
10. unnamed	228.5	2,000	0.1	0.1
11. unnamed	228.4	2,000	0.1	0.1
12. unnamed	227.4	1,980	0.1	0.2
13. unnamed	226.8	1,970	0.4	0.1
14. unnamed	225.0	1,930	0.3	0.6
15. unnamed	224.4	1,920	0.1	0.4
16. unnamed	221.5	1,875	0.5	0.2
17. unnamed	220.9	1,865	0.1	1.0
18. unnamed	219.2	1,845	0.6	0.5
19. unnamed	217.6	1,830	0.2	0.3
20. unnamed	215.1	1,785	0.1	0.4
21. unnamed	213.2	1,760	0.2	0.6
22. unnamed	213.0	1,755	0.3	0.3
23. unnamed slough	212.2	1,750		0.3 (entire length
24. unnamed	212.1	1,750	0.1	0.3
25. unnamed slough	212.0	1,750		0.5 (entire length)
26. unnamed	211.7	1,745	0.1	0.3
27. unnamed	210.2	1,720	0.3	0.7
28. unnamed slough	208.7	1,705		0.3 (entire length)
29. Jay Creek	208.6	1,700	1.2	3.2
30. unnamed slough	208.0	1,695		0.4 (entire length)
31. unnamed	207.3	1,690		0.9 (entire length)
32. unnamed	207.0	1,685	0.4	1.0
33. Kosina Creek	206.9	1,685	1.7	4.2
34. unnamed slough	205.7	1,670		0.5 (entire length
35. unnamed	205.0	1,665	0.2	0.5 (entire length)
36. unnamed	204.9	1,665		0.4 (entire length)
37. unnamed	203.9	1,655	0.3	0.7
38. unnamed	203.4	1,650		0.5 (entire length)
39. unnamed	201.8	1,635	0.3	0.8
40. unnamed slough	200.9	1,630		0.2 (entire length)
41. unnamed	200.7	1,625	0.5	1.0
42. unnamed	198.7	1,610	0.2	0.7
43. unnamed	198.6	1,605	0.2	0.6
44. unnamed	197.9	1,600	0.2	0.6
45. unnamed	197.1	1,595	0.2	0.7
46. unnamed	196.7	1,590	0.3	0.7
47. unnamed	196.2	1,585	1.3	1.0
48. unnamed	195.8	1,580	1.4	1.1

TABLE E.2.2.42 (Page 2 of 2)[2/]

Stream Name	Susitna River Mile at Mouth	Approximate[1/] Elevation at Mouth (ft. msl)	Length of Stream to be Inundated by Stage III (miles)	Total Length of Stream to be Inundated by Stages I and III (miles)
49. unnamed	195.2	1,575	0.4	1.3 (entire length)
50. unnamed	194.9	1,560	0.5	1.7
51. Watana Creek	194.1	1,560	3.4 (longest fork)	10.0 (longest fork)
51A. Delusion Creek (tributary to Watana Creek)	--	1,700	0.7	1.9
52. unnamed slough	193.6	1,565	0.0	0.4 (entire length)
53. unnamed	192.7	1,550	0.4	1.5 (entire length)
54. unnamed	192.0	1,545	1.3 (longest fork)	3.9 (longest forK)
55. unnamed	190.0	1,530	0.3	0.5
56. unnamed	187.0	1,505	0.3	0.7
57. unnamed	186.9	1,505	1.3	1.7
58. Deadman Creek	186.7	1,500	0.9	2.3

1/ The elevations at the mouths were approximated from USGS 1:63,360 topographic quadrangle maps. A control survey, conducted by R&M Consultants (1981a, 1982c), identified several possible inaccuracies in the USGS contours along the length of the reservoir. Thus, there are four unnamed streams on the USGS maps which would appear to be inundated at their mouths but may actually be above the upper end of the reservoir as surveyed.

2/ See Figure E.2.2.146 for locations of affected water bodies

TABLE E.2.2.43: DOWNSTREAM TRIBUTARIES POTENTIALLY IMPACTED BY PROJECT OPERATION[1/]

Name	River Mile	Bank of Susitna[2/]	Reason for Concern	Type of Assessment[3/]	Potential Impact Forecasted[4/]
Portage Creek	148.9	RB	fish access	2	1
Jack Long Creek	144.8	LB	fish access	1	3
Indian River	138.5	RB	fish access	2	2
Gold Creek	136.7	LB	fish access	2	1
unnamed	132.0	LB	Railroad (RR)	1	6
4th of July Creek	131.0	RB	fish access	2	1
Sherman Creek	130.9	LB	RR/fish access	2	2
unnamed	128.5	LB	Railroad	1	6
unnamed	127.3	LB	Railroad	1	5
Skull Creek	124.7	LB	Railroad	2	7
unnamed	123.9	RB	fish access	1	3
Deadhorse Creek	121.0	LB	fish access	2	1
Little Portage Creek	117.8	LB	Railroad	2	6
Gash Creek	111.7	LB	RR/fish access	1	6.4
unnamed	110.1	LB	Railroad	1	5
Whiskers Creek	101.2	RB	fish access	1	4

1/ See Sections 2.5.2 and 4.1.3 (f). Mitigation measures are discussed in Chapter 3.

2/ Referenced by facing downstream (LB = left bank, RB = right bank).

3/ Type of Assessment: 1) Visual - bed material size not available
2) Comparison of transportable size vs. bed material size.

4/ Potential Impact
1. Potential fish access problems less likely than for category 2 since tributary bed material smaller than size transportable by mainstem.
2. Potential fish access problems more likely than for category 1 until tributary adjusts. Tributary bed material larger than size transportable by mainstem.
3. No data on tributary bed material. Visual assessment indicates potential for fish access problem for a period until tributary adjusts.
4. No data on tributary bed material. Visual assessment indicates no potential fo fish excess problem.
5. Visual asssessment indicates potential for limited scour at RR bridge, potentially limited by geologic features. Depth of RR foundation may exceed scour depth.
6. Visual assessment indicates no potential for scour endangering RR bridge.
7. Comparison of tributary bed material size to transportable size by mainstem indicates potential for limited scour at bridge.

Table E.2.2.44: SUMMARY OF SURFACE WATER AND GROUND WATER APPROPRIATIONS

Township Grid	Surface Water Appropriation		Ground Water Appropriation	
	Equivalent Flow Rates		Equivalent Flow Rates	
	cfs	ac-ft/yr	cfs	ac-ft/yr
Susitna	0.153	50.0	0.0498	16.3
Fish Creek	0.000116	0.02100	0.00300	2.24
Willow Creek	18.3	5,660	0.153	128
Little Willow Creek	0.00613	1.42	0.00190	1.37
Montana Creek	0.0196	7.85	0.366	264
Chunlina	0.00322	0.797	0.000831	0.601
Susitna Reservoir	0.00465	3.36	--	--
Chulina (Chunlina)	--	--	0.00329	2.38
Kroto-Trapper Creek	0.0564	10.7	--	--
Kahiltna	125	37,000	--	--
Yentna	0.00155	0.565	--	--
Skwentna	0.00551	1.90	0.000775	0.560

Source: Dwight 1981

Table E.2.2.45: WATER RIGHT APPROPRIATIONS ADJACENT TO THE SUSITNA RIVER

ADL Number	Type	Source (Depth)	Amount	Days Of Use
	Certificate			
45156	single family dwelling	well (unknown)	650 gpd	365
	general crops	" "	0.5 ac-ft/yr	91
	Certificate			
43981	single family dwelling	well (90 ft)	500 gpd	365
	Certificate			
78895	single family dwelling	well (20 ft)	500 gpd	365
200540	grade school	well (27 ft)	990 gpd	334
209233	fire station	well (34 ft)	500 gpd	365
	Certificate			
200180	single family dwelling	unnamed stream	200 gpd	365
	lawn & garden irrigation	" "	100 gpd	153
200515	single family dwelling	unnamed stream	500 gpd	365
206633	single family dwelling	unnamed lake	75 gpd	365
206930	single family dwelling	unnamed lake	250 gpd	365
206931	single family dwelling	unnamed lake	250 gpd	365
	Permit			
206929	general crops	unnamed creek	1 ac-ft/yr	153
	Permit			
206735	single family dwelling	unnamed stream	250 gpd	365
	Pending			
209866	single family dwelling	Sherman Creek	75 gpd	365
	lawn and garden irrigation	" "	50 gpd	183

Source: Dwight 1981

TABLE E.2.2.46: SUSITNA HYDROELECTRIC PROJECT PRIMARY ACTIVITIES FOR BOATS EXITING THE SUSITNA RIVER AT THREE LOCATIONS[1]

Main Activity	Susitna Landing Boats	Susitna Landing Percent[2]	Willow Creek Boats	Willow Creek Percent[2]	Talkeetna Boats	Talkeetna Percent[2]
Sport Fishing	1585	60	342	60	159	39
Trapping	2	0	1	0	0	0
Hunting	39	2	32	6	1	0
Commercial Fishing	3	0	1	0	0	0
Commercial Supply	27	1	2	0	0	0
Private Supply	293	12	32	6	14	4
Transportation	228	10	56	10	59	15
Camping	17	1	3	1	1	0
Sight Seeing	44	2	16	3	27	7
Susitna Study	24	1	2	0	54	14
Other Activity	72	3	26	5	0	0
TOTALS	2334	92	513	91	315	79

1/ The numbers presented are estimates of total boating use projected an ADF&G survey of boat operators departing the Susitna River during the months of May through September, 1984.

2/ Percentages adding up to less than 100 reflect no response from some operators and the result of rounding off percentages to the nearest digit

Source: ADF&G 1985c.

TABLE E.2.2.47: BOATS WITH NAVIGATIONAL PROBLEMS BY EXIT LOCATION, 1984[a]

Exit Location	Month/ Season	Debris			Bars			Rocks			Velocity		
		Total Boats	Boats With Prob	% With Prob	Total Boats	Boats With Prob	% With Prob	Total Boats	Boats With Prob	% With Prob	Total Boats	Boats With Prob	% With Prob
Susitna	May	406	63	16	406	17	4	407	8	2	407	47	12
	Jun	898	149	17	898	83	9	898	103	11	890	16	2
	Jul	427	16	4	429	40	9	427	19	4	427	3	1
	Aug	352	19	5	348	44	13	348	11	3	347	0	0
	Sep	499	12	2	502	96	19	500	54	11	496	4	1
	Overall	2,582	259	10	2,583	280	11	2,580	195	8	2,567	70	3
	Kings	1,400	214	15	1,401	105	7	1,401	114	8	1,393	63	5
	Other Fish	1,181	44	4	1,181	174	15	1,178	80	7	1,172	6	1
Talkeetna	Jul	188	1	1	188	13	7	189	27	14	188	13	7
	Aug	146	0	0	146	0	0	146	0	0	146	0	0
	Sep	64	1	2	64	2	3	64	2	3	64	1	2
	Overall	398	2	1	398	15	4	399	29	7	398	14	4
	Other Fish	397	2	1	397	15	4	398	29	7	397	14	4
Willow	Jul	224	4	2	233	7	3	223	6	3	244	1	1
	Aug	224	28	12	222	63	28	219	51	23	217	0	0
	Sep	122	7	6	122	20	16	124	17	14	122	2	2
	Overall	470	39	7	567	90	16	566	74	13	563	3	1
	Other Fish	555	39	7	552	89	16	551	72	13	548	3	1

[a] The numbers presented are estimates. Since a single boat may have had several different navigational problems during a trip, the sum of boats with problems over all problem groups may not represent the number of unique boats with problems.

Source: ADEC 1985

TABLE E.2.2.48: TEMPORAL SALINITY ESTIMATES FOR SELECT COOK INLET LOCATIONS

Location	Conditions	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept
Cook Inlet near the Susitna River Mouth (Node #27)	Pre-Project	9,949	12,856	15,153	16,937	18,543	19,942	20,976	15,699	9,729	6,592	5,792	7,231
	Stage III Watana Filling (WY 2008)	10,330	13,151	15,411	17,159	18,734	20,107	21,133	16,439	11,071	7,588	6,508	7,836
	Stage III Watana Operation (WY 2008)	10,080	12,539	14,374	15,930	17,355	18,617	19,612	15,475	10,393	7,206	6,252	7,616
	Stage III Watana/Devil Canyon Operation	10,093	12,498	14,313	15,825	17,188	18,451	19,500	15,570	10,484	7,248	6,290	7,609
Center of Cook Inlet near East Foreland (Node #12)	Pre-Project	21,868	22,911	23,921	24,813	25,591	26,263	26,824	26,788	25,388	22,912	21,174	21,072
	Stage III Watana Filling (WY 2008)	22,100	23,102	24,077	24,942	25,698	26,352	26,900	26,910	25,742	23,476	21,738	21,545
	Stage III Watana Operation (WY 2008)	22,048	22,995	23,900	24,704	25,411	26,028	26,548	26,537	25,345	23,107	21,442	21,315
	Stage III Watana/Devil Canyon Operation	22,050	22,992	23,891	24,688	25,385	25,995	26,514	26,519	25,354	23,128	21,465	21,326
Mouth of Cook Inlet (Node #1)	Pre-Project	29,109	29,496	29,727	29,893	30,037	30,158	30,239	29,816	29,000	28,270	28,112	28,567
	Stage III Watana Filling (WY 2008)	29,160	29,529	29,754	29,916	30,056	30,173	30,253	29,878	29,164	28,435	28,254	28,676
	Stage III Watana Operation (WY 2008)	29,127	29,472	29,673	29,828	29,965	30,080	30,161	29,798	29,076	28,359	28,190	28,625
	Stage III Watana/Devil Canyon Operation	29,128	29,468	29,667	29,821	29,954	30,070	30,155	29,806	29,085	28,364	28,196	28,624
Center of Turnagain Arm (Node # 55)	Pre-Project	8,916	10,616	12,659	14,681	16,522	18,158	19,551	19,442	16,083	12,100	9,263	8,301
	Stage III Watana Filling (WY 2008)	9,262	10,951	12,963	14,951	16,760	18,365	19,732	19,677	16,541	12,752	9,931	8,928
	Stage III Watana Operation (WY 2008)	9,212	10,810	12,665	14,466	16,108	17,573	18,834	18,772	15,782	12,171	9,508	8,601
	Stage III Watana/Devil Canyon Operation	9,216	10,809	12,652	14,436	16,054	17,495	18,745	18,712	15,776	12,192	9,534	8,623
Center of Knik Arm (Node # 46)	Pre-Project	3,675	6,538	9,252	11,610	13,657	15,446	16,550	11,970	1,923	325	400	1,248
	Stage III Watana Filling (WY 2008)	3,834	6,754	9,482	11,832	13,862	15,630	16,710	12,119	2,008	350	437	1,355
	Stage III Watana Operation (WY 2008)	3,807	6,658	9,260	11,445	13,318	14,950	15,939	11,540	1,913	335	421	1,312
	Stage III Watana/Devil Canyon Operation	3,809	6,658	9,249	11,422	13,276	14,885	15,862	11,502	1,916	337	422	1,315

Notes:
1. All concentrations are reported in mg/l and represent end of the month salinity estimates.
2. Nodes correspond to computer simulation locations.
3. Modeling undertaken for 2-Stage Project is applicable to 3-Stage Project.

Source: RMA 1983

TABLE E.2.2.49: ESTIMATED LOW AND HIGH FLOWS AT ACCESS ROUTE STREAM CROSSINGS

Drainage Basin	Road Mile Location	A Area (mi^2)	30-Day Minimum Flow (cfs)[1] Recurrence Interval (yrs)			Peak Flows (cfs)[2] Recurrence Interval (yrs)			
			2	10	20	2	10	25	50
Denali Highway to Watana Camp Segment									
Lily Creek	3	3.7	0.8	0.6	0.5	25	54	78	96
Seattle Creek	6	11.1	2.4	1.8	1.5	74	147	205	248
Seattle Creek Tributary	8	1.5	0.3	0.2	0.2	10	24	35	44
Seattle Creek Tributary	9	2.7	0.8	0.5	0.4	13	29	42	51
Brushkana Creek	12	22.0	5.5	3.8	3.4	115	217	299	354
Brushkana Creek Site	14	21.0	4.9	3.5	3.1	121	228	315	374
Upper Deadman Creek	20	12.1	3.0	2.1	1.9	64	127	177	211
Deadman Creek Tributary	28	54.5	13.2	9.3	8.2	276	488	661	767
Watana to Devil Canyon Segment									
Tsusena Creek	2.5	126.6	26	19	17	780	1309	1744	2000
Devil Creek	22	31.0	6.7	4.8	4.2	199	369	506	597
Devil Canyon to Gold Creek Railroad Segment									
Gold Creek	0.2[3]	25.0	5.4	3.9	3.4	162	304	418	497

1/ Minimum flows estimated from the following USGS regression equation (Freethey and Scully 1980).

$$M_{d,rt} = aA^b (LP + 1)^c (J + 10)^d$$

where: M = minimum flow (cfs)
d = number of days
rt = recurrence interval (yrs)
A = drainage area (mi^2)
LP = area of lakes and ponds (percent)
J = mean minimum January air temperature (°F)
a,b,c = coefficients

2/ Peak flows estimated from the following USGS regression equation (Freethey and Scully 1980).

$$Q_t = aA^b (LP + 1)^c P^d$$

where: Q = annual peak discharge (cfs)
t = recurrence interval (yrs)
A = drainage area (mi^2)
LP = areas of lakes and ponds (percent)
P = mean annual precipitation (in)
a,b,c,d = coefficients

3/ Railroad mile location.

TABLE E.2.2.50: AVAILABLE STREAMFLOW RECORDS FOR MAJOR STREAMS CROSSED BY TRANSMISSION CORRIDOR

Stream Name	USGS Gage Description	USGS Number	Period of Continuous Record	Drainage Area[1/] (mi^2)	Transmission Line Crossing from Gage[2/] (approx.)	Mean Annual Streamflow[3/] (cfs)
Anchorage-Willow Segment						
Little Susitna River	Near Palmer	15290000	1948-present	61.9	35 mi. d/s	206
Willow Creek	Near Willow	15294005	1978-present	166	7 mi. d/s	472
Fairbanks-Healy Segment						
Nenana River #1	Near Healy	15518000	1950-1979	1,910	2 mi. d/s	3,506
Nenana River #2	Near Healy	15518000	1950-1979	1,910	20 mi. d/s	3,506
Tanana River	At Nenana	15515500	1962-present	15,600	5 mi. u/s	23,460
Willow-Healy Intertie						
Talkeetna River	Near Talkeetna	15292700	1964-present	2,006	5 mi. d/s	4,050
Susitna River	At Gold Creek	15292000	1949-present	6,160	5 mi. u/s	9,647
Indian River	--	--	--	82	15 mi. u/s	--
E.F. Chulitna River	Chulitna River near Talkeetna	15292400	1958-72,1980-present	2,570	40 mi. u/s	8,748
M.F. Chulitna River	Chulitna River near Talkeetna	15292400	1958-72,1980-present	2,570	50 mi. u/s	8,748
Nenana River	Near Windy	15516000	1950-56,1958-73	710	5 mi. u/s	--
Yanert Fork	--	--	--	N/A	1 mi. u/s	--
Healy Creek	--	--	--	N/A	1 mi. u/s	--
Watana-Gold Creek Segment						
Tsusena Creek	--	--	--	149	3 mi. u/s	--
Devil Creek	--	--	--	71	9 mi. u/s	--
Susitna River	At Gold Creek	15292000	1949-present	6,160	13 mi. u/s	9,647

1/ Areas for ungaged streams are at the mouth.
2/ d/s = downstream, u/s = upstream. Distances for ungaged streams are from the mouth.
3/ Averages determined through the 1980 water year at gage sites.

TABLE E.2.3.1: RESERVOIR OPERATION LEVEL CONSTRAINTS

Reservoir	Normal Minimum Water Surface Elevation (ft, msl)	Normal Maximum Water Surface Elevation (ft, msl)	50-year Flood Surcharge Elevation (ft, msl)
Watana Stage I	1,850	2,000	2,014
Devil Canyon Stage II	1,405	1,455	1,456
Watana Stage III	2,065	2,185	2,193

TABLE E.2.3.2: INFLUENCE OF MAINSTEM FLOW AND WATER QUALITY ON CHARACTERISTICS OF AQUATIC HABITAT TYPES

	Physical Characteristics					
Habitat Type	Hydraulic1/	Hydrologic	Temp.	Turbidity	Ice	Total
Mainstem (MS)	4	4	4	4	4	20
Side Channel (SC)	3	4	4	3	4	18
Tributary Mouth (TM)	3	3	2	2	3	13
Side Slough (SS)	2	2	2	2	2	10
Upland Slough (US)	~~1~~ 2	~~1~~ 2	~~0~~ 1	~~0~~ 1	0	~~2~~ 6
Tributary (T)	0	0	0	0	0	0
Lake (L)	0	0	0	0	0	0

0 - no influence
1 - small, limited influence
2 - moderate, occasional influence
3 - moderate, frequent influence
4 - direct, extensive influence

1/ Depth, velocity, wetted area, etc.

TABLE E.2.3.3: IMPORTANT USES OF HABITAT TYPES BY EVALUATION SPECIES

Evaluation Species	Habitat Type					
	MS[1]	SC	TM	SS	US	T
Chinook Salmon						X
Migrate	X		X			X
Spawn-incubate						X
Rear		X		X		
Coho Salmon						
Migrate	X		X			X
Spawn-incubate						X
Rear					X	X
Chum Salmon						
Migrate	X	X	X	X		X
Spawn-incubate		X		X		X
Rear	X			X		X
Sockeye Salmon						
Migrate	X			X		
Spawn-incubate				X		
Rear				X	X	
Pink Salmon						
Migrate	X		X			X
Spawn-incubate						X
Rear						
Arctic Grayling						
Migrate	X		X			X
Spawn-incubate						X
Rear	X		X			X
Rainbow Trout						
Migrate	X		X			X
Spawn-incubate						X
Rear	X		X			X
Burbot						
Migrate	X		X			
Spawn-incubate						
Rear	X					
Dolly Varden						
Migrate	X	X				X
Spawn-incubate						X
Rear	X					

1/ MS=Mainstem, SC=Side Channel, TM=Tributary Mouth, SS=Side Sloughs, US=Upland Sloughs, T=Tributary

Source: HE 1985

TABLE E.2.3.4: PRIMARY UTILIZATION OF SENSITIVE HABITAT TYPES BY EVALUATION SPECIES

Evaluation Species	Habitat Types: Mainstem	Side Channel	Side Slough	Tributary Mouth
Chinook Salmon		R	R	
Chum Salmon	R	S	S,R	
Coho Salmon				
Sockeye Salmon			S,R	
Pink Salmon				
Arctic Grayling	R			R
Rainbow Trout	R			R
Dolly Varden	R			R
Burbot	S,R			

S - spawning/incubation
R - rearing

TABLE E.2.3.5: STANDARD WATER WEEKS FOR ANY WATER YEAR N

WEEK NUMBER	FROM day	FROM month	FROM year	TO day	TO month	TO year	WEEK NUMBER	FROM day	FROM month	FROM year	TO day	TO month	TO year
1	1	Oct	n-1	7	Oct	n-1	27	1	Apr	n	7	Apr	n
2	8	Oct	n-1	14	Oct	n-1	28	8	Apr	n	14	Apr	n
3	15	Oct	n-1	21	Oct	n-1	29	15	Apr	n	21	Apr	n
4	22	Oct	n-1	28	Oct	n-1	30	22	Apr	n	28	Apr	n
5	29	Oct	n-1	4	Nov	n-1	31	29	Apr	n	5	May	n
6	5	Nov	n-1	11	Nov	n-1	32	6	May	n	12	May	n
7	12	Nov	n-1	18	Nov	n-1	33	13	May	n	19	May	n
8	19	Nov	n-1	25	Nov	n-1	34	20	May	n	26	May	n
9	26	Nov	n-1	2	Dec	n-1	35	27	May	n	2	Jun	n
10	3	Dec	n-1	9	Dec	n-1	36	3	Jun	n	9	Jun	n
11	10	Dec	n-1	16	Dec	n-1	37	10	Jun	n	16	Jun	n
12	17	Dec	n-1	23	Dec	n-1	38	17	Jun	n	23	Jun	n
13	24	Dec	n-1	30	Dec	n-1	39	24	Jun	n	30	Jun	n
14	31	Dec	n-1	6	Jan	n	40	1	Jul	n	7	Jul	n
15	7	Jan	n	13	Jan	n	41	8	Jul	n	14	Jul	n
16	14	Jan	n	20	Jan	n	42	15	Jul	n	21	Jul	n
17	21	Jan	n	27	Jan	n	43	22	Jul	n	28	Jul	n
18	28	Jan	n	3	Feb	n	44	29	Jul	n	4	Aug	n
19	4	Feb	n	10	Feb	n	45	5	Aug	n	11	Aug	n
20	11	Feb	n	17	Feb	n	46	12	Aug	n	18	Aug	n
21	18	Feb	n	24	Feb	n	47	19	Aug	n	25	Aug	n
22	25	Feb	n	3	Mar	n	48	26	Aug	n	1	Sep	n
23	4	Mar	n	10	Mar	n	49	2	Sep	n	8	Sep	n
24	11	Mar	n	17	Mar	n	50	9	Sep	n	15	Sep	n
25	18	Mar	n	24	Mar	n	51	16	Sep	n	22	Sep	n
26	25	Mar	n	31	Mar	n	52	23	Sep	n	30	Sep	n

TABLE E.2.3.6: FLOW CONSTRAINTS FOR ENVIRONMENTAL FLOW REQUIREMENT CASE E-I

Water Week	Gold Creek Flow (cfs) Minimum	Gold Creek Flow (cfs) Maximum	Water Week	Gold Creek Flow (cfs) Minimum	Gold Creek Flow (cfs) Maximum
14	2,000	14,000	40	14,000	
15	2,000	14,000	41	14,000	
16	2,000	14,000	42	14,000	
17	2,000	14,000	43	14,000	
18	2,000	14,000	44	14,000	40,000
19	2,000	14,000	45	14,000	40,000
20	2,000	14,000	46	(2)	40,000
21	2,000	14,000	47	(3)	40,000
22	2,000	14,000	48	14,000	40,000
23	2,000	14,000	49	12,000	14,000
24	2,000	14,000	50	10,000	14,000
25	2,000	14,000	51	8,000	14,000
26	2,000	14,000	52	6,000	14,000
27	2,000	14,000	1	6,000	14,000
28	2,000	14,000	2	6,000	14,000
29	2,000	14,000	3	5,000	14,000
30	2,000	14,000	4	4,000	14,000
31	2,000	14,000	5	3,000	14,000
32	2,000	14,000	6	3,000	14,000
33	2,000	14,000	7	3,000	14,000
34	2,000	14,000	8	3,000	14,000
35	2,000	14,000	9	2,000	14,000
36	10,000		10	2,000	14,000
37	(1)		11	2,000	14,000
38	14,000		12	2,000	14,000
39	14,000		13	2,000	14,000

(1) Base minimum flow of 10,000 cfs. 45,000 cfs spike; 3 days up, 3 days down.

(2) Base minimum flow of 14,000 cfs. 23,000 cfs spike; 1 day up, 1 day down.

(3) Base minimum flow of 14,000 cfs. 18,000 cfs spike; 1 day up, 1 day down.

TABLE E.2.3.7: FLOW CONSTRAINTS FOR ENVIRONMENTAL FLOW REQUIREMENT CASE E-II

Water Week	Gold Creek Flow (cfs) Minimum	Gold Creek Flow (cfs) Maximum	Water Week	Gold Creek Flow (cfs) Minimum	Gold Creek Flow (cfs) Maximum
14	2,000	16,000	40	6,000	
15	2,000	16,000	41	6,000	
16	2,000	16,000	42	6,000	
17	2,000	16,000	43	6,000	
18	2,000	16,000	44	11,000	
19	2,000	16,000	45	12,000	30,000
20	2,000	16,000	46	12,000	30,000
21	2,000	16,000	47	12,000	30,000
22	2,000	16,000	48	12,000	30,000
23	2,000	16,000	49	(2)	30,000
24	2,000	16,000	50	9,000	16,000
25	2,000	16,000	51	9,000	16,000
26	2,000	16,000	52	8,000	16,000
27	2,000		1	6,000	16,000
28	2,000		2	6,000	16,000
29	2,000		3	6,000	16,000
30	2,000		4	6,000	16,000
31	2,000		5	3,000	16,000
32	4,000		6	3,000	16,000
33	6,000		7	3,000	16,000
34	8,000		8	3,000	16,000
35	8,000		9	3,000	16,000
36	10,000		10	2,000	16,000
37	10,000		11	2,000	16,000
38	(1)		12	2,000	16,000
39	6,000		13	2,000	16,000

(1) Base minimum flow of 6,000 cfs. 35,000 cfs spike; 3 days up, 3 days down.

(2) Base minimum flow of 12,000 cfs. 18,000 cfs spike; 1 day up, 1 day down.

TABLE E.2.3.8: FLOW CONSTRAINTS FOR ENVIRONMENTAL FLOW REQUIREMENT CASE E-III

Water Week	Gold Creek Flow (cfs) Minimum	Gold Creek Flow (cfs) Maximum	Water Week	Gold Creek Flow (cfs) Minimum	Gold Creek Flow (cfs) Maximum
14	5,000	14,000	40	14,000	
15	5,000	14,000	41	14,000	
16	5,000	14,000	42	14,000	
17	5,000	14,000	43	14,000	
18	5,000	14,000	44	14,000	
19	5,000	14,000	45	14,000	
20	5,000	14,000	46	14,000	
21	5,000	14,000	47	14,000	
22	5,000	14,000	48	14,000	
23	5,000	14,000	49	12,000	
24	5,000	14,000	50	10,000	
25	5,000	14,000	51	8,000	
26	5,000	14,000	52	6,000	
27	5,000	14,000	1	6,000	14,000
28	5,000	14,000	2	6,000	14,000
29	5,000	14,000	3	6,000	14,000
30	5,000	14,000	4	6,000	14,000
31	5,000	14,000	5	5,000	14,000
32	5,000	14,000	6	5,000	14,000
33	6,000	14,000	7	5,000	14,000
34	7,000	14,000	8	5,000	14,000
35	8,000	14,000	9	5,000	14,000
36	10,000		10	5,000	14,000
37	10,000		11	5,000	14,000
38	14,000		12	5,000	14,000
39	14,000		13	5,000	14,000

TABLE E.2.3.9: FLOW CONSTRAINTS FOR ENVIRONMENTAL FLOW REQUIREMENT CASE E-IV

Water Week	Gold Creek Flow (cfs) Minimum	Gold Creek Flow (cfs) Maximum	Water Week	Gold Creek Flow (cfs) Minimum	Gold Creek Flow (cfs) Maximum
14	2,000	16,000	40	9,000	35,000
15	2,000	16,000	41	9,000	35,000
16	2,000	16,000	42	9,000	35,000
17	2,000	16,000	43	9,000	35,000
18	2,000	16,000	44	9,000	35,000
19	2,000	16,000	45	9,000	35,000
20	2,000	16,000	46	9,000	35,000
21	2,000	16,000	47	9,000	35,000
22	2,000	16,000	48	9,000	35,000
23	2,000	16,000	49	8,000	35,000
24	2,000	16,000	50	7,000	35,000
25	2,000	16,000	51	6,000	35,000
26	2,000	16,000	52	6,000	35,000
27	2,000	16,000	1	6,000	18,000
28	2,000	16,000	2	6,000	17,000
29	2,000	16,000	3	5,000	16,000
30	2,000	16,000	4	4,000	16,000
31	2,000	16,000	5	3,000	16,000
32	4,000	16,000	6	3,000	16,000
33	6,000	16,000	7	3,000	16,000
34	6,000	16,000	8	3,000	16,000
35	6,000	16,000	9	3,000	16,000
36	9,000	35,000	10	2,000	16,000
37	9,000	35,000	11	2,000	16,000
38	9,000	35,000	12	2,000	16,000
39	9,000	35,000	13	2,000	16,000

TABLE E.2.3.10: FLOW CONSTRAINTS FOR ENVIRONMENTAL FLOW REQUIREMENT CASE E-IVa

Water Week	Gold Creek Flow (cfs)		Water Week	Gold Creek Flow (cfs)	
	Minimum	Maximum		Minimum	Maximum
14	2,000	16,000	40	9,000	35,000
15	2,000	16,000	41	9,000	35,000
16	2,000	16,000	42	9,000	35,000
17	2,000	16,000	43	9,000	35,000
18	2,000	16,000	44	9,000	35,000
19	2,000	16,000	45	9,000	35,000
20	2,000	16,000	46	9,000	35,000
21	2,000	16,000	47	9,000	35,000
22	2,000	16,000	48	(2)	35,000
23	2,000	16,000	49	(3)	35,000
24	2,000	16,000	50	(3)	35,000
25	2,000	16,000	51	7,000	35,000
26	2,000	16,000	52	6,000	35,000
27	2,000	16,000	1	6,000	18,000
28	2,000	16,000	2	6,000	17,000
29	2,000	16,000	3	5,000	16,000
30	2,000	16,000	4	4,000	16,000
31	2,000	16,000	5	3,000	16,000
32	4,000	16,000	6	3,000	16,000
33	6,000	16,000	7	3,000	16,000
34	6,000	16,000	8	3,000	16,000
35	6,000	16,000	9	3,000	16,000
36	9,000	35,000	10	2,000	16,000
37	9,000	35,000	11	2,000	16,000
38	(1)	35,000	12	2,000	16,000
39	9,000	35,000	13	2,000	16,000

(1) Base minimum flow of 9,000 cfs. 30,000 cfs spike; 1 day up, 1 day hold, 1 day down.

(2) Base minimum flow of 9,000 cfs. 18,000 cfs spike; 1 day up, 1 day hold, 1 day down.

(3) Base minimum flow of 8,000 cfs 18,000 cfs. spike; 1 day up, 1 day hold, 1 day down.

TABLE E.2.3.11: FLOW CONSTRAINTS FOR ENVIRONMENTAL FLOW REQUIREMENT CASE E-IVb

Water Week	Gold Creek Flow (cfs)		Water Week	Gold Creek Flow (cfs)	
	Minimum	Maximum		Minimum	Maximum
14	2,000	16,000	40	9,000	35,000
15	2,000	16,000	41	9,000	35,000
16	2,000	16,000	42	9,000	35,000
17	2,000	16,000	43	9,000	35,000
18	2,000	16,000	44	9,000	35,000
19	2,000	16,000	45	9,000	35,000
20	2,000	16,000	46	9,000	35,000
21	2,000	16,000	47	9,000	35,000
22	2,000	16,000	48	(2)	35,000
23	2,000	16,000	49	(2)	35,000
24	2,000	16,000	50	(3)	35,000
25	2,000	16,000	51	7,000	35,000
26	2,000	16,000	52	6,000	35,000
27	2,000	16,000	1	6,000	18,000
28	2,000	16,000	2	6,000	17,000
29	2,000	16,000	3	5,000	16,000
30	2,000	16,000	4	4,000	16,000
31	2,000	16,000	5	3,000	16,000
32	4,000	16,000	6	3,000	16,000
33	6,000	16,000	7	3,000	16,000
34	6,000	16,000	8	3,000	16,000
35	6,000	16,000	9	3,000	16,000
36	9,000	35,000	10	2,000	16,000
37	9,000	35,000	11	2,000	16,000
38	(1)	35,000	12	2,000	16,000
39	9,000	35,000	13	2,000	16,000

(1) Base minimum flow of 9,000 cfs. 25,000 cfs spike; 1 day up, 1 day hold, 1 day down.

(2) Base minimum flow of 9,000 cfs. 14,000 cfs spike; 1 day up, 1 day hold, 1 day down.

(3) Base minimum flow of 8,000 cfs. 14,000 cfs spike; 1 day up, 1 day hold, 1 day down.

TABLE E.2.3.12: FLOW CONSTRAINTS FOR ENVIRONMENTAL FLOW REQUIREMENT CASE E-V

Water Week	Gold Creek Flow (cfs) Minimum	Gold Creek Flow (cfs) Maximum	Water Week	Gold Creek Flow (cfs) Minimum	Gold Creek Flow (cfs) Maximum
14	2,000	16,000	40	9,000	35,000
15	2,000	16,000	41	9,000	35,000
16	2,000	16,000	42	9,000	35,000
17	2,000	16,000	43	9,000	35,000
18	2,000	16,000	44	11,000	35,000
19	2,000	16,000	45	12,000	30,000
20	2,000	16,000	46	12,000	30,000
21	2,000	16,000	47	12,000	30,000
22	2,000	16,000	48	12,000	30,000
23	2,000	16,000	49	(2)	30,000
24	2,000	16,000	50	9,000	16,000
25	2,000	16,000	51	9,000	16,000
26	2,000	16,000	52	8,000	16,000
27	2,000	16,000	1	6,000	16,000
28	2,000	16,000	2	6,000	16,000
29	2,000	16,000	3	5,000	16,000
30	2,000	16,000	4	4,000	16,000
31	2,000	16,000	5	3,000	16,000
32	4,000	16,000	6	3,000	16,000
33	6,000	16,000	7	3,000	16,000
34	6,000	16,000	8	3,000	16,000
35	6,000	16,000	9	3,000	16,000
36	9,000	35,000	10	2,000	16,000
37	9,000	35,000	11	2,000	16,000
38	(1)	35,000	12	2,000	16,000
39	9,000	35,000	13	2,000	16,000

(1) Base minimum flow of 9,000 cfs. 35,000 cfs spike; 3 days up, 3 days down.

(2) Base minimum flow of 12,000 cfs. 18,000 cfs spike; 1 day up, 1 day down.

TABLE E.2.3.13 FLOW CONSTRAINTS FOR ENVIRONMENTAL FLOW REQUIREMENT CASE E-VI.

Water Week	Gold Creek Flow (cfs) Minimum	Maximum	Water Week	Gold Creek Flow (cfs) Minimum	Maximum
14	2,000	16,000	40	9,000 *	35,000
15	2,000	16,000	41	9,000 *	35,000
16	2,000	16,000	42	9,000 *	35,000
17	2,000	16,000	43	9,000 *	35,000
18	2,000	16,000	44	9,000 *	35,000
19	2,000	16,000	45	9,000 *	35,000
20	2,000	16,000	46	9,000 *	35,000
21	2,000	16,000	47	9,000 *	35,000
22	2,000	16,000	48	9,000 *	35,000
23	2,000	16,000	49	8,000	35,000
24	2,000	16,000	50	7,000	35,000
25	2,000	16,000	51	6,000	35,000
26	2,000	16,000	52	6,000	35,000
27	2,000	16,000	1	6,000	18,000
28	2,000	16,000	2	6,000	17,000
29	2,000	16,000	3	5,000	16,000
30	2,000	16,000	4	4,000	16,000
31	2,000	16,000	5	3,000	16,000
32	4,000	16,000	6	3,000	16,000
33	6,000	16,000	7	3,000	16,000
34	6,000	16,000	8	3,000	16,000
35	6,000	16,000	9	3,000	16,000
36	9,000 *	35,000	10	2,000	16,000
37	9,000 *	35,000	11	2,000	16,000
38	9,000 *	35,000	12	2,000	16,000
39	9,000 *	35,000	13	2,000	16,000

* Minimum summer flows are 9,000 cfs except in dry years when the minimum will be 8,000 cfs. A dry year is defined by the one-in-ten year low flow.

TABLE E.2.3.14: ECONOMIC ANALYSIS OF ENVIRONMENTAL FLOW CASES COMPOSITE FORECAST

Case	Cumulative Present Worth of System Costs 1/ (1996-2054) (million 1985$)	Cumulative Present Worth of Differential Mitigation Costs (1996-2054) 2/ (million 1985$)	Cumulative Present Worth of Net System Costs (1996-2054) (million 1985$)	Total Railbelt Installed n Capacity i 2025 (MW)
P-1	4,811	25	4,836	2,105
A	4,813	25	4,838	2,105
E-VI	4,823	0	4,823	2,192
E-IV	4,830	0	4,830	2,192
C	5,120	11	5,131	2,279
E-V	5,490	-4	5,486	2,453
E-I	6,570	-7	6,563	2,855

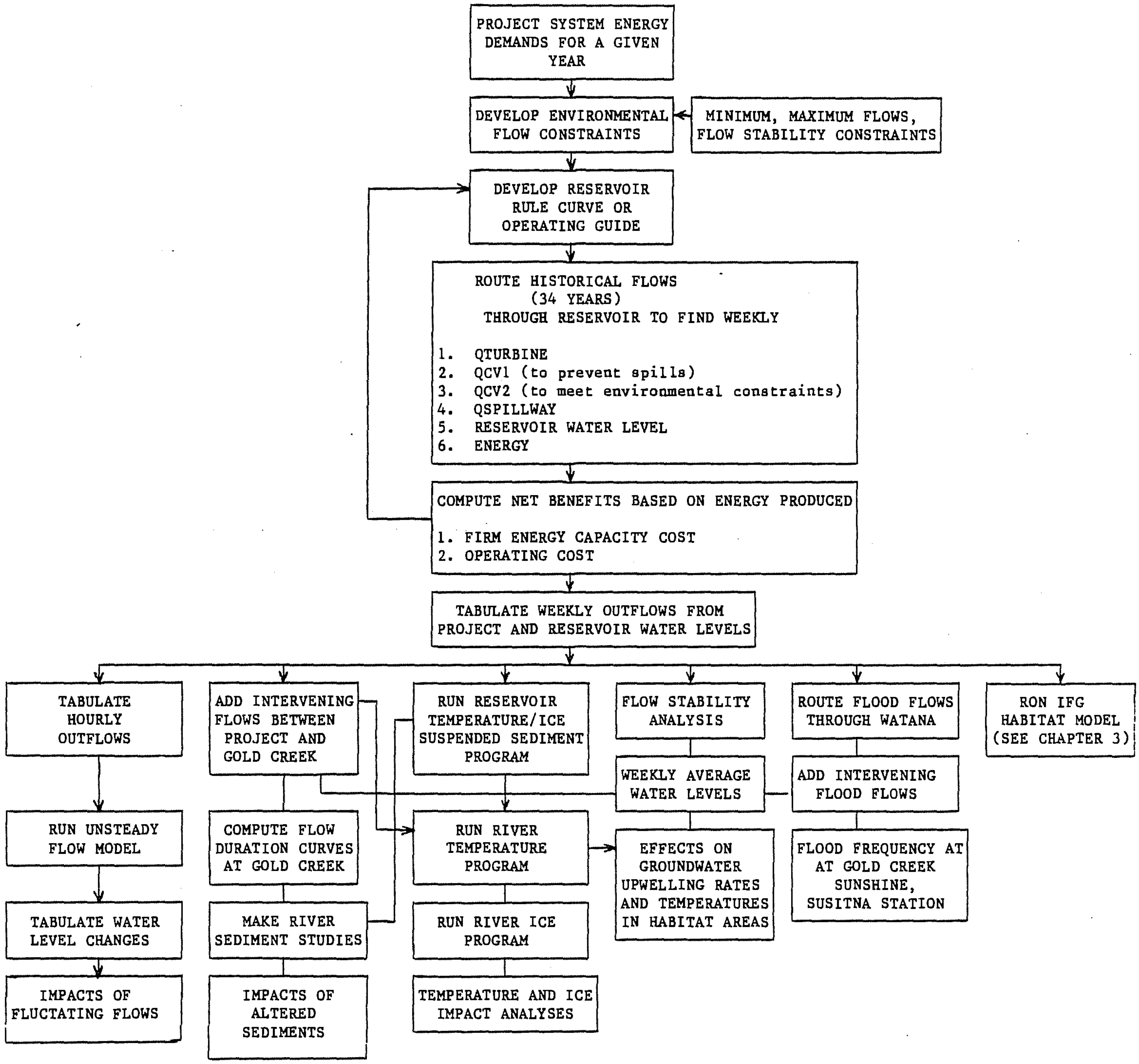
1/ Costs include production costs and costs for mitigation measures for E-VI flow requirements.

2/ Costs represent the differences in mitigation costs between those required for E-VI and those required for the specific flow requirement.

TABLE E.2.3.15: SUSITNA DEPENDABLE CAPACITY AND ENERGY PRODUCTION COMPOSITE FORECAST

	Watana Stage I	Watana I and Devil Canyon II		Watana III and Devil Canyon II		Ultimate Project, Not Limited by Load
	1999 - 2004	2005	2011	2012	2025	
Average Energy (GWh)	2390	4200	4750	5130	6690	6900
Firm Energy (GWh)	1990	4200	4500	5130	5720	5720
Dependable Capacity (MW)	300	790	805	1500	1520	1620

TABLE E.2.4.1: LINKED SYSTEM FOR ESTIMATING IMPACTS OF SUSITNA HYDROELECTRIC PROJECT ON WATER USE AND QUALITY



Notes: 1. QTURBINE = discharge through turbines
2. QCV1 and QCV2 = discharge through cone values
3. QSPILLWAY = discharge over spillway

TABLE E.2.4.2: SUSITNA HYDROELECTRIC PROJECT PROJECT CHARACTERISTICS USED IN PROJECT FLOW AND TEMPERATURE SIMULATIONS

Stage	Project		Average Project Energy Generation (GWH/YR)	Flow Require-ments	Simulations Flow	Simulations Temperature
I.	Watana-el. 2,000		2,400	E-VI	YES	YES
			2,200 1/	E-I	YES	YES
II.	Watana-el. 2,000		4,400	E-VI	YES	YES
	Devil Canyon el. 1,455		4,100 1/	E-I	YES	YES
III.	Watana-el. 2185	Early	4,700	E-VI	NO	YES
	Devil Canyon-el. 1,455	Early	5,500	E-VI	YES	NO
		Late	6,900	E-VI	YES	YES
		Late	6,000 1/	E-I	YES	YES

1/ Differences between energy production for Case E-I and Case E-VI for late Stage III are the result of restricted energy production due to the E-I flow requirements

TABLE E.2.4.3: SIMULATION OF WATANA STAGE I FILLING

Natural Flows at Watana and Gold Creek

Month	Dry Sequence Watana	Dry Sequence Gold Creek	Average Sequence Watana	Average Sequence Gold Creek	Wet Sequence Watana	Wet Sequence Gold Creek
May	8100	13000	10600	13500	12000	15000
June	18100	21800	23000	27800	26600	31600
July	16400	19100	20700	24400	24100	27800
August	14700	17400	18400	21900	21500	25200
September	8500	10400	10900	13500	12500	15100
October	3600	4500	4600	5800	5200	6500
November	1700	2100	2100	2600	2400	3000
December	1200	1500	1500	1800	1700	2000
January	900	1200	1200	1500	1400	1700
February	800	1100	1000	1300	1200	1500
March	700	1000	900	1200	1000	1400
April	900	1100	1200	1400	1400	1600

Simulated Flow During Stage I Filling

Case E-VI Month	Case E-VI Min. Required[1/]	Dry Sequence Gold Creek	Dry Sequence Watana	Average Sequence Gold Creek	Average Sequence Watana	Wet Sequence Gold Creek	Wet Sequence Watana
May	4903	3903	1700	4903	2000	4903	1800
June	8800	7800	4200	8800	4000	10800	3800
July	9000	8000	52000	12700	5400	20500	5300
August	9000	8000	5300	12400	5400	15500	5300
September	6800	5800	3900	6800	4300	6800	4200
October	5032	4032	2600	5032	3800	5032	3700
November	Natural						
December	Natural						
January	Natural			See Note			
February	Natural						
March	Natural						
April	Natural						
End of October Reservoir Water Level		1920		1960		1970	

1/ Would be reduced by 1000 cfs for dry sequence.

Note: The winter flows following the summer of filling were not simulated as they will depend on operations of the first two units which are scheduled to come on-line in October and January. Minimum flows will not be less than the natural flows shown in the table.

TABLE E.2.4.4: WATER LEVEL AND DISCHARGE VARIATIONS AT RIVER MILE 130 FOR VARIOUS DAILY AVERAGE DISCHARGES AND DISCHARGE FLUCTUATIONS AT WATANA POWERHOUSE

Average Daily Watana Discharge	Total Daily Powerhouse Discharge Fluctuation	Fluctuation as a Percent of Daily Discharge	Total Daily Fluctuation in Discharge River Mile 130	Total Daily Fluctuation in Water Level at River Mile 130	Intervenin Flow Betweer Watana and River Mile 1
cfs	cfs	%	cfs	ft	cfs
6,370	170	3	60	0.0	3,330
13,300	220	2	220	0.1	440
13,510	800	6	720	0.2	360
31,480	3,040	10	2,830	0.8	6,210
6,410	650	10	340	0.1	5,250
13,630	1,280	9	1,180	0.3	380
6,350	1,000	16	630	0.2	690
6,900	1,000	14	620	0.2	3,750
3,820	1,000	26	370	0.3	590
6,380	1,770	28	1,250	0.4	690
6,420	1,630	25	1,180	0.4	5,250
6,920	2,000	29	1,500	0.4	3,750
13,700	3,800	28	3,610	0.4	420
3,850	1,820	47	1,140	1.1	330
6,500	3,070	47	2,520	0.8	5,240
6,970	3,050	44	2,410	0.7	3,740

TABLE E.2.4.5: FLUCTUATING WATER LEVEL - CASES ILLUSTRATED ON FIGURES E.2.4.19 THROUGH E.2.4.30

Case	Average Weekly Flow		Maximum Weekly Change in Flow		Average Daily Discharge-Day 4		Maximum Daily Change in Discharge-Day 4		Maximum Weekly Change in Water Level	Maximum Daily Change in Water Level-Day 4
	Watana (cfs)	Site[1] (cfs)	Watana (cfs)	Site[1] (cfs)	Watana (cfs)	Site[1] (cfs)	Watana (cfs)	Site[1] (cfs)	Site[1] (cfs)	Site[1] (cfs)
ACB	13150	13440	1990	2010	13510	13860	800	690	0.6	0.1
ACC	13150	13500	2960	2460	13630	14010	1280	1130	0.9	0.3
ACD	13160	13380	4990	5180	13700	14140	3800	3460	1.5	0.9
CBA	6410	10620	990	1010	6410	10670	650	360	0.3	0.1
CCB	6410	10570	2000	2030	6420	10670	1630	1220	0.5	0.3
CCD	6420	10570	3120	2850	6500	10740	3070	2580	0.7	0.7

[1] For cases ACB, ACC and ACD the site shown in Figures E.2.4.19 through E.2.4.24 is RM 120.3. For Cases CBA, CCB and CCD the site shown in Figures E.2.4.25 through E.2.4.30 is RM 132.9.

TABLE E.2.4.6: SURFACE AREA AT GIVEN DISCHARGE FOR VARIOUS SUSITNA RIVER DISCHARGES

Discharge (cfs)	Mainstem Habitat Surface Area (acres)	Change in Surface Area for a 20% (10% (+)) Change in Flow %	Side Channel Habitat Surface Area (acres)	Change in Surface Area For a 20% (10% (+)) Change in Flow %
5,100	2,460	2.5	730	2.4
7,400	2,600	3.6	770	7.7
10,600	2,810	3.0	970	14.3
12,500	2,850	4.8	1,100	11.7
16,000	3,160	8.7	1,220	4.9
23,000	3,740	10.1	1,240	1.0

Discharge (cfs)	Side Slough Habitat Surface Area (acres)	Change in Surface Area for a 20% (10% (+)) Change in Flow %	Upland Slough Habitat Surface Area (acres)	Change in Surface Area For a 20% (10% (+)) Change in Flow %
5,100	121	8.4	15.3	22.0
7,400	144	5.1	22.9	10.7
10,600	134	10.2	19.6	11.3
12,500	118	18.6	23.6	11.1
16,000	86	25.7	22.6	2.0
23,000	53	40.9	24.4	4.8

Discharge (cfs)	Tributary Mouth Habitat Area (acres)	Change in Surface Area for a 20% (10% (+)) Change in Flow %	Total Habitat Surface Area[1/] (acres)
5,100	15.9	2.2	3,340
7,400	15.1	5.4	3,550
10,600	18.6	29.0	3,950
12,500	26.2	19.1	4,120
16,000	25.3	13.6	4,510
23,000	12.1	NA	5,070

1/ Total of mainstem, side channel, side slough, upland slough and tributary mouth habitat surface areas.

TABLE E.2.4.6 (Page 2 of 2)

Discharge (cfs)	Gravel Bar Area (acres)	Vegetated Bar Area (acres)	Total of Gravel Bar & Vegetated Bar Area (acres)
5100	2520	1950	4470
7400	2300	2130	4430
10,600	1850	2080	3930
12,500	1730	1920	3650
16,000	1420	2010	3430
2300	820	1720	2540

Discharge (cfs)	Change in Gravel & Vegetated Bar Area for 20% (10%±) Change in Flow: % of Bar Area	% of Total Habitat Surface Area
5100	2.9	0.1
7400	8.2	3.6
10,600	7.2	6.4
12,500	7.2	6.4
16,000	8.9	6.8
23,000	11.5	5.8

Source of Habitat Surface Areas: E. W. Trihey & Associates, 1985

TABLE E.2.4.7 WITH-PROJECT WATANA MONTHLY FLOWS (CFS), STAGE I

YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	ANNUAL
1951	4884	5705	7318	6339	6360	4950	3450	3755	10118	9410	9382	16157	7310
1952	7468	7587	9198	8230	7950	5408	3450	4073	6944	9326	12084	11708	7788
1953	7816	8735	9198	8587	7950	5100	3450	3123	9362	9085	12395	12118	8074
1954	7021	7587	8285	7924	7950	5100	3450	2768	9036	9428	10639	10669	7482
1955	6587	7131	8728	7924	7950	5408	3450	3433	7078	9331	22314	14000	8624
1956	7251	7286	8728	7360	6360	4950	3450	2939	9224	17936	19153	13293	9023
1957	7251	7587	9198	8230	7950	5947	3450	3124	8114	8991	15769	14841	8373
1958	7816	8433	10442	8893	7950	5691	3450	2979	8302	9224	13937	10209	8117
1959	5583	6161	7318	7618	7950	5408	3450	2819	8028	9421	15748	13694	7764
1960	7021	7587	9198	8230	7950	5947	3450	3428	9205	9418	9347	13544	7853
1961	7816	8073	9633	8893	7950	6188	4312	3631	9919	9024	17524	10251	8611
1962	7468	7587	9198	8587	7950	6188	4312	3940	8652	21004	19887	13035	9848
1963	7704	7918	9582	8587	7950	5691	3450	3387	9432	15236	21011	11552	9316
1964	7021	7918	9147	7719	6360	4950	3450	3906	7788	18206	14048	10209	8422
1965	5904	7131	9147	7719	6360	4950	3450	3611	8984	9031	16182	16212	8231
1966	7931	7587	9147	7719	6360	4950	3450	3356	8142	9174	11330	10321	7466
1967	6908	6852	7369	7924	6531	4950	3450	3286	9358	11329	26021	14522	9068
1968	7021	7286	9147	7924	7950	6188	4312	3722	9401	11254	14148	10183	8218
1969	5932	6161	7318	6339	6360	4950	3450	3421	6878	6956	6961	6183	5908
1970	4405	4492	5762	4993	5009	3898	2716	3350	6559	6827	8013	7449	5292
1971	4518	6395	8177	7924	7950	5408	3450	4059	6541	9083	22165	13053	8239
1972	7021	7918	9198	8587	7950	6188	4312	3631	9531	13725	17510	12329	9005
1973	6700	7286	9147	7360	6360	4950	3450	3994	7752	9284	9788	10542	7224
1974	5920	6492	7318	6339	6360	4950	3450	3375	9709	9682	7661	7390	6553
1975	4830	5705	7318	6339	6979	6188	4312	3460	9420	12442	15127	13075	7939
1976	7816	8073	9147	7360	6360	4950	3450	2768	8297	9437	9327	9782	7236
1977	4766	5705	7753	7924	7950	5947	3450	2910	8030	12023	16807	10748	7843
1978	7816	8073	9633	8893	7950	6188	4312	4428	8199	9371	8883	7390	7598
1979	4604	5705	7318	6339	6360	4950	4312	4132	9458	11684	16671	10214	7659
1980	7021	8278	10500	8893	7950	6188	4312	3737	9074	10794	17881	11038	8819
1981	7816	8735	10442	8893	7950	6188	4312	4031	10195	10242	28843	12346	10028
1982	7021	8278	9633	8893	7950	6188	4312	3460	8724	9310	9270	12083	7922
1983	7704	7918	9198	8587	7950	6188	4312	3460	9654	9283	13565	11878	8309
MAX	7931	8735	10500	8893	7950	6188	4312	4428	10195	21004	28843	16212	10028
MIN	4405	4492	5762	4993	5009	3898	2716	2768	6541	6827	6961	6183	5292
MEAN	6678	7254	8722	7820	7307	5493	3715	3500	8640	10787	14830	11576	8035

TABLE E.2.4.8 WITH-PROJECT GOLD CREEK MONTHLY FLOWS (CFS)
STAGE I,WATANA (LOW) OPERATION,1996 LOAD CONDITIONS

YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	ANNUAL
1951	5424	5903	7512	6487	6511	5075	3948	6212	12184	11968	12962	20028	8682
1952	8491	8096	9606	8530	8139	5560	3584	5408	13386	13293	16368	14195	9563
1953	9700	9460	9647	8869	8175	5249	4377	6921	14971	12057	16144	15926	10129
1954	8392	8082	8614	8125	8152	5254	4084	8058	14770	13978	14946	14618	9762
1955	8010	7917	9239	8316	8293	5639	3866	5858	12083	12828	24351	15306	10161
1956	8050	7630	8998	7531	6574	5198	3786	7447	15501	23140	24532	18489	11447
1957	8777	8411	9650	8551	8255	6228	3852	6663	12897	12387	18992	19758	10376
1958	9958	9519	11420	9366	8221	5865	3796	6225	11508	12989	16897	11882	9824
1959	6676	6604	7732	7997	8295	5706	3904	8353	13253	14021	22826	18224	10314
1960	8350	8264	9743	8670	8271	6188	3970	5440	11965	12500	13914	18063	9612
1961	9524	8792	10342	9529	8429	6677	5292	6926	16736	13804	20025	13557	10819
1962	8641	8104	9560	8862	8212	6416	4688	5633	15323	23575	23478	16094	11582
1963	8751	8291	9899	8884	8241	5834	3625	6370	15415	21250	23182	13185	11111
1964	8246	8407	9449	7921	6536	5097	3592	6394	13699	21061	16456	12242	9958
1965	7396	7559	9326	7815	6456	5041	3609	5541	13554	13737	19754	19390	9948
1966	9899	8135	9572	8057	6681	5265	3950	5861	15140	12896	15680	12937	9523
1967	7784	7263	7751	8317	6894	5271	3795	6061	14284	16281	32357	17759	11190
1968	7888	7715	9502	8287	8290	6527	4651	6960	15357	15495	17217	11885	9996
1969	6607	6443	7451	6445	6476	5080	3731	5071	8470	8045	8251	7027	6594
1970	5124	4686	5922	5181	5175	4050	2830	5116	10855	11307	11492	9353	6769
1971	6038	7297	8787	8265	8212	5644	3728	5019	11776	12159	26303	15375	9901
1972	7875	8432	9755	9155	8490	6646	4802	10186	15785	16584	19339	13816	10927
1973	7198	7580	9368	7534	6549	5087	3576	5012	11610	11090	11989	11689	8199
1974	6588	6664	7423	6426	6450	5047	3614	6413	13011	12559	10424	9723	7869
1975	5480	5929	7646	6640	7340	6546	4734	7318	14821	16570	18176	16385	9812
1976	9841	8498	9356	7576	6565	5162	3880	6569	12444	11652	10370	11017	8590
1977	5661	6438	8463	8406	8359	6342	3931	7310	14337	15383	18975	12835	9718
1978	9576	8965	10245	9342	8354	6535	4708	5105	9907	12036	11825	8874	8800
1979	5707	6321	7689	6600	6591	5049	4479	5507	11334	15683	20332	11993	8964
1980	8147	8968	10894	9174	8185	6411	4647	5611	14737	15891	21620	13366	10660
1981	8850	9308	10578	9052	8329	6511	4865	6342	12419	17484	35192	14539	12004
1982	8726	9291	10175	9495	8454	6493	4941	6555	13261	12748	11703	15745	9799
1983	9435	8425	9658	9053	8337	6457	4739	7087	12909	11784	17026	14309	9946
MAX	9958	9519	11420	9529	8490	6677	5292	10186	16736	23575	35192	20028	12004
MIN	5124	4686	5922	5181	5175	4050	2830	5012	8470	8045	8251	7027	6594
MEAN	7903	7800	9120	8135	7591	5732	4108	6380	13324	14492	18276	14230	9774

TABLE E.2.4.9 WITH-PROJECT SUNSHINE MONTHLY FLOWS (CFS)
STAGE I,WATANA (LOW) OPERATION,1996 LOAD CONDITIONS

YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	ANNUAL
1951	13248	8706	9731	8735	8451	6403	6174	17814	41397	50877	41652	40320	21197
1952	16357	12584	12958	10932	9626	7052	5355	15293	60104	58563	51836	37376	24917
1953	22367	13463	12061	10777	9645	6621	7160	29223	51675	43418	44887	39425	24306
1954	14913	10844	10885	10011	9781	6698	5723	19716	44884	47922	54979	33400	22571
1955	14962	11927	11903	10581	9776	7055	5780	14312	44400	58819	56158	39908	23895
1956	16765	10663	11444	9486	8232	6818	5346	21511	56438	63850	52563	42511	25575
1957	15696	11944	12333	11119	10224	8120	5783	19271	49835	51110	53092	35743	23777
1958	17642	14272	14730	11519	10068	8007	6908	36142	49739	50619	61389	32212	26239
1959	16460	10280	9889	10109	10052	7336	6442	25151	40500	49393	67657	36512	24272
1960	16541	12155	12521	10871	10037	7709	5644	23811	37461	47143	48664	38980	22721
1961	18674	12353	13413	12066	10364	8463	7875	21172	47343	51097	55745	35228	24585
1962	17842	12276	12321	11114	9972	7961	6720	18386	51919	64482	55675	34157	25350
1963	14843	11140	12605	11243	10112	7144	4905	22910	43251	67501	50940	29575	23978
1964	18272	11849	11258	9609	7937	6347	5337	15496	81098	60675	45898	26642	25107
1965	16625	12350	12711	10253	8582	6985	5781	17866	45960	51393	55146	54096	24894
1966	20919	11463	11939	10078	8413	6857	5838	12952	51797	48905	55656	31675	23138
1967	15220	9993	10132	10530	8810	6880	5339	23462	51384	67114	82750	41319	27908
1968	13741	10816	12039	10510	10399	8548	7162	27723	61208	58950	47063	24209	24462
1969	11404	8903	9239	7948	7847	6356	5732	15563	33618	37340	24281	16243	15426
1970	11441	7491	7916	6973	6867	5668	4955	19438	40150	49706	46753	27567	19677
1971	13082	11395	11461	10170	9707	7057	5317	12001	55472	53630	69008	33619	24424
1972	16394	12140	12198	11199	10288	8176	6413	25099	48043	56599	51364	35744	24576
1973	15786	11440	12304	9664	8444	6641	5218	18888	47796	41546	41720	25153	20459
1974	11039	9297	9524	8170	8160	6594	5317	18585	37866	45537	38775	26970	18896
1975	11505	8749	10031	8669	9013	8040	6368	21136	52133	58793	51095	37183	23651
1976	17564	11088	11327	9342	8431	6889	6430	23381	51677	51937	46432	25987	22643
1977	13482	10503	11551	10758	10206	8060	5704	19378	69590	59151	58707	34597	26058
1978	19225	13027	13192	11918	10237	8099	6697	14605	36641	52203	44444	25512	21417
1979	11704	10040	10650	8994	8528	6788	6940	25250	44440	65501	57662	25261	23622
1980	17111	13490	13477	11367	10186	8228	7054	14486	44988	58202	46022	29801	22961
1981	17660	13965	13486	11483	10420	8338	7381	26466	43630	71496	81492	33209	28439
1982	17636	12777	11807	10598	9943	8167	6983	19619	49547	51150	42621	46687	24021
1983	19957	14059	13230	12022	10992	8253	7102	24064	44309	44861	52408	30196	23552
MAX	22367	14272	14730	12066	10992	8548	7875	36142	81098	71496	82750	54096	28439
MIN	11039	7491	7916	6973	6867	5668	4905	12001	33618	37340	24281	16243	15426
MEAN	15942	11438	11705	10267	9386	7344	6148	20611	48797	54227	52562	33546	23597

TABLE E.2.4.10 WITH-PROJECT SUSITNA STATION MONTHLY FLOWS (CFS)
STAGE I,WATANA (LOW) OPERATION,1996 LOAD CONDITIONS

YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	ANNUAL
1951	53653	19944	16063	13364	14132	10933	11845	53032	97272	114737	97404	82621	48989
1952	33776	20148	18585	14708	13200	10414	7259	33910	80919	102314	93855	64528	41341
1953	39345	25294	18817	16323	14316	9930	9605	41939	84084	111106	113945	103485	49229
1954	47049	24712	17850	15106	13865	10901	10774	44609	74744	88546	88600	57862	41434
1955	32410	20211	16602	14675	14067	10720	9624	48512	95660	138907	115306	80499	50040
1956	49642	22170	18004	15136	13247	10184	9000	46284	128272	124691	99800	58372	49812
1957	27920	22240	15045	14097	13896	10829	8858	48721	111291	94641	104940	65985	45047
1958	31402	27973	19086	15946	13723	10892	8692	33060	69043	89533	90881	47916	38377
1959	29770	18439	14124	13937	13443	9985	9101	44558	90539	106460	83901	41698	39875
1960	26691	20426	16890	15285	15122	13194	12053	63799	95597	131335	148517	90000	54391
1961	35220	19438	18248	16027	16058	12985	12612	59616	100806	112747	112708	78379	49810
1962	43901	24677	18098	15584	14777	12076	12304	42005	90454	155523	118230	65662	51437
1963	26415	16707	17309	15574	13828	11097	8257	44357	93110	133029	102520	67327	46051
1964	33082	17364	14659	14898	12460	9731	8254	32552	90464	115790	98433	44082	41225
1965	30102	18235	17339	14255	12105	10218	10498	51721	104444	128176	99410	82316	48470
1966	46453	26463	17223	14673	13117	10486	8474	30680	87439	110547	127190	103536	49916
1967	43672	15623	12692	13187	12186	9920	7783	19442	58483	99396	120526	73482	40784
1968	37612	19391	16818	15011	15064	12267	15764	79365	127074	121501	93898	42777	49980
1969	16273	13057	12852	13157	12334	10259	11427	78087	113030	106971	80080	39515	42477
1970	29552	13057	10806	11059	11096	9382	9973	63402	110482	131375	107189	56424	47273
1971	20883	16658	15224	14865	13506	9974	8302	40846	106153	127917	110095	66740	46158
1972	26672	15787	15136	15512	14091	11012	10240	46273	99359	120251	102305	61385	45067
1973	27683	20856	17094	13522	11695	9378	7770	39000	88674	92259	82613	62181	39561
1974	29863	17134	14706	13855	13666	11757	12438	58711	76842	86221	82066	52775	39372
1975	21239	14650	15460	13720	13672	12195	10032	40103	110631	124445	91158	78236	45636
1976	33557	16510	14310	13098	11271	9627	11419	62719	95148	109219	88735	53433	43507
1977	31737	22206	19185	16693	15620	11638	8561	51583	141399	135653	125554	84469	55588
1978	40132	20093	15942	14295	13454	11520	10166	41789	81711	108921	97069	55892	42828
1979	37304	19079	15334	14025	13242	10891	12158	72231	106791	129247	127743	78948	53397
1980	59759	36073	23150	17556	15752	13917	15352	60387	127946	162487	128923	91513	63066
1981	35826	22184	17226	14807	13929	11110	14144	72917	101111	137695	155696	67800	55755
1982	34832	23582	19489	16241	13920	10741	9030	37869	94945	103010	91794	107286	47037
1983	36516	21014	17213	15158	14738	11905	10863	55084	91605	94418	100098	53064	43702
MAX	59759	36073	23150	17556	16058	13917	15764	79365	141399	162487	155696	107286	63066
MIN	16273	13057	10806	11059	11096	9378	7259	19442	58483	86221	80080	39515	38377
MEAN	34847	20345	16563	14707	13654	10972	10383	49672	97743	116638	105490	68491	46868

TABLE E.2.4.11 MONTHLY MAXIMUM,MINIMUM AND MEAN FLOWS AT WATANA (CFS)

STAGE I - WATANA (LOW) OPERATION

MONTH	NATURAL CONDITIONS			WITH PROJECT CONDITIONS		
	MAX	MIN	MEAN	MAX	MIN	MEAN
OCT	6632	2403	4567	7931	4405	6678
NOV	3525	1021	2064	8735	4492	7254
DEC	2259	709	1453	10500	5762	8722
JAN	1858	619	1225	8893	4993	7820
FEB	1610	602	1035	7950	5009	7307
MAR	1560	575	936	6188	3898	5493
APR	1965	609	1158	4312	2716	3715
MAY	15973	2857	10625	4428	2768	3500
JUN	42842	13233	22980	10195	6541	8640
JUL	28767	14843	20747	21004	6827	10787
AUG	30542	7772	18366	28843	6961	14830
SEP	17206	4260	10878	16212	6183	11576
ANNUAL	9985	4912	8046	10028	5292	8035

TABLE E.2.4.12 MONTHLY MAXIMUM,MINIMUM AND MEAN FLOWS AT GOLD CREEK (CFS)

STAGE I - WATANA (LOW) OPERATION

MONTH	NATURAL CONDITIONS			WITH PROJECT CONDITIONS		
	MAX	MIN	MEAN	MAX	MIN	MEAN
OCT	8212	3124	5825	9958	5124	7903
NOV	4192	1215	2589	9519	4686	7800
DEC	3264	866	1844	11420	5922	9120
JAN	2452	724	1543	9529	5181	8135
FEB	2028	723	1317	8490	5175	7591
MAR	1900	713	1169	6677	4050	5732
APR	2650	745	1441	5292	2830	4108
MAY	21890	3745	13483	10186	5012	6380
JUN	50580	15500	27795	16736	8470	13324
JUL	34400	16100	24390	23575	8045	14492
AUG	37870	8879	21911	35192	8251	18276
SEP	21240	5093	13493	20028	7027	14230
ANNUAL	11961	5596	9785	12004	6594	9774

TABLE E.2.4.13 MONTHLY MAXIMUM, MINIMUM AND MEAN FLOWS AT SUNSHINE (CFS)

STAGE I - WATANA (LOW) OPERATION

MONTH	NATURAL CONDITIONS			WITH PROJECT CONDITIONS		
	MAX	MIN	MEAN	MAX	MIN	MEAN
OCT	20837	8176	13799	22367	11039	15942
NOV	8775	4020	6185	14272	7491	11438
DEC	6547	2675	4426	14730	7916	11705
JAN	5216	2228	3674	12066	6973	10267
FEB	4664	2095	3115	10992	6867	9386
MAR	3920	1972	2786	8548	5668	7344
APR	5528	2233	3585	7875	4905	6148
MAY	43121	10799	27674	36142	12001	20611
JUN	116152	40702	63268	81098	33618	48797
JUL	85600	45226	64143	71496	37340	54227
AUG	84940	25092	56148	82750	24281	52562
SEP	54110	14320	32867	54096	16243	33546
ANNUAL	28262	14431	23607	28439	15426	23597

TABLE E.2.4.14 MONTHLY MAXIMUM,MINIMUM AND MEAN FLOWS AT SUSITNA STATION (CFS)

STAGE I - WATANA (LOW) OPERATION

MONTH	NATURAL CONDITIONS			WITH PROJECT CONDITIONS		
	MAX	MIN	MEAN	MAX	MIN	MEAN
OCT	58640	13476	32777	59759	16273	34847
NOV	31590	8251	15063	36073	13057	20345
DEC	14690	5753	9267	23150	10806	16563
JAN	10120	6365	8112	17556	11059	14707
FEB	9413	5614	7383	16058	11096	13654
MAR	8906	5271	6412	13917	9378	10972
APR	13029	4613	7684	15764	7259	10383
MAY	88470	28713	56770	79365	19442	49672
JUN	165900	73838	112256	141399	58483	97743
JUL	181400	92511	126590	162487	86221	116638
AUG	159600	80891	109084	155696	80080	105490
SEP	109700	37592	67721	107286	39515	68491
ANNUAL	63159	38030	46871	63066	38377	46868

TABLE E.2.4.15: FLOOD PEAK FREQUENCY DATA FOR INTERVENING AREAS

		Recurrence Interval, (Year)				
		2	5	10	25	50
		Flood Peaks (cfs)				
1. Between Cantwell and Gold Creek						
	Annual	24,000	35,000	41,300	46,900	53,600
	May-June	20,000	30,000	35,400	40,200	45,900
	July-September	14,200	22,200	26,200	29,700	34,000
2. Between Watana and Gold Creek						
	Annual	16,700	24,400	28,800	32,700	37,300
	May-June	13,900	20,900	24,700	28,000	32,000
	July-September	9,890	15,500	18,200	20,700	23,700
3. Between Gold Creek and Susitna Station						
	Annual	149,000	173,000	192,000	212,000	230,000
	May-June	115,000	131,000	146,000	161,000	174,000
	July-September	147,000	172,200	191,000	211,000	229,000
4. Between Watana and Sunshine						
	Annual	99,700	116,000	128,000	142,000	154,000
	May-June	76,900	87,600	97,700	108,000	116,000
	July-September	98,300	115,000	128,000	141,000	153,000
5. Between Watana and Susitna Station						
	Annual	154,000	180,000	199,000	220,000	239,000
	May-June	119,000	136,000	151,000	167,000	180,000
	July-September	152,000	178,000	198,000	219,000	237,000

TABLE E.2.4.16: SUSITNA HYDROELECTRIC PROJECT WATANA OUTLET WORKS OPERATION THREE STAGE PROJECT, STAGE I

Year	Week of First Release	Week of Maximum Release	Duration of Release	Maximum Release	Powerhouse Flow	Total Release
			Weeks	cfs	cfs	ac-ft
1951	Sept 2	Sept 2	4	11,842	9,832	355,000
1952	Aug 12	Aug 12	5	6,521	9,040	278,000
1953	Aug 12	Aug 26	6	8,022	9,497	321,000
1954	Aug 26	Aug 26	2	6,696	9,510	114,000
1955	July 29	Aug 26	8	24,000	9,561	1,065,000
1956	July 15	July 22	10	17,582	8,571	1,378,000
1957	Aug 5	Aug 12	8	8,520	9,048	685,000
1958	Aug 5	Aug 12	4	8,734	9,049	297,000
1959	Aug 19	Aug 26	4	23,726	9,564	608,000
1960	Sept 9	Sept 9	3	7,056	10,058	201,000
1961	Aug 5	Aug 5	5	13,291	8,923	528,000
1962	July 1	July 22	11	16,094	8,565	1,603,000
1963	July 15	July 22	9	18,192	8,573	1,212,000
1964	July 1	July 8	9	14,343	8,595	901,000
1965	Aug 5	Aug 12	7	16,165	9,082	785,000
1966	Aug 19	Aug 26	3	5,122	9,484	145,000
1967	July 22	Aug 12	8	24,000	9,049	1,456,000
1968	July 22	July 29	6	9,442	8,882	465,000
1969	--	--	-	--	--	--
1970	--	--	-	--	--	--
1971	Aug 5	Aug 12	6	24,000	9,101	976,000
1972	July 15	July 15	10	10,863	8,537	964,000
1973	Aug 22	Aug 22	3	2,188	9,532	1,584,000
1974	--	--	-	--	--	--
1975	July 22	July 29	9	11,375	8,890	769,000
1976	--	--	-	--	--	--
1977	July 15	July 29	9	10,644	8,887	717,000
1978	--	--	-	--	--	--
1979	July 22	July 29	6	12,836	8,896	641,000
1980	July 29	July 29	6	18,303	8,926	707,000
1981	July 29	Aug 12	7	24,000	9,078	1,408,000
1982	Sept 16	Sept 16	2	6,979	10,275	114,000
1983	Aug 19	Aug 26	3	13,207	9,521	373,000

TABLE E.2.4.17: SUSITNA HYDROELECTRIC PROJECT
SIMULATED STREAM TEMPERATURES
STAGE I
WEATHER PERIOD: SUMMER 1981
CASE E-VI
FLOW REQUIREMENTS
STAGED CONSTRUCTION

RIVER		MAY					JUNE				JULY			
MILE	31	32	33	34	35	36	37	38	39	40	41	42	43	44
184 1/	2.2	2.8	3.8	4.8	6.6	8.1	8.8	10.3	9.5	8.4	8.4	10.2	10.5	10.5
173	2.5	2.8	3.5	4.7	6.4	7.7	8.8	10.3	9.4	8.4	8.4	9.9	10.4	10.4
162	2.8	3.6	4.2	5.3	7.0	7.9	9.1	10.6	9.6	8.7	8.6	10.1	10.6	10.5
150	3.1	3.7	4.2	5.4	7.1	7.9	9.3	10.8	9.7	8.9	8.7	10.1	10.7	10.7
140	3.3	3.9	4.3	5.5	7.2	7.9	9.4	10.9	9.8	9.0	8.8	10.1	10.7	10.7
130	3.6	4.3	4.6	5.8	7.3	7.8	9.4	10.9	9.6	9.0	8.6	9.8	10.4	10.5
120	4.0	4.9	5.3	6.4	7.9	8.1	9.8	11.3	9.9	9.3	8.9	10.1	10.7	10.7
110	4.3	5.5	5.8	6.9	8.4	8.3	10.2	11.6	10.1	9.5	9.1	10.3	11.0	10.9
99 2/	4.7	6.0	6.4	7.4	8.8	8.6	10.5	11.9	10.4	9.7	9.3	10.6	11.2	11.2
98 3/	4.4	5.7	6.2	6.7	7.7	7.0	8.5	9.4	8.5	8.5	8.2	8.6	9.0	9.3
84 4/	4.8	6.4	7.1	7.4	8.5	7.5	9.2	10.1	9.0	9.0	8.7	9.1	9.5	9.8

RIVER		AUGUST				SEPTEMBER				OCTOBER			
MILE	45	46	47	48	49	50	51	52	1	2	3	4	5
184 1/	9.7	9.1	8.3	9.2	8.8	7.9	8.0	7.1	6.1	5.1	4.8	4.3	3.7
173	9.8	9.1	8.4	9.2	8.8	7.8	7.9	6.9	5.7	4.7	4.1	3.6	3.0
162	9.9	9.1	8.5	9.4	8.9	7.9	7.9	6.7	5.4	4.5	3.8	3.3	2.5
150	10.1	9.3	8.7	9.5	9.0	8.0	8.0	6.7	5.3	4.4	3.6	3.1	2.2
140	10.2	9.3	8.8	9.6	9.1	8.0	8.0	6.5	5.1	4.2	3.4	2.9	1.8
130	10.2	9.2	8.8	9.6	9.0	7.9	7.9	6.3	4.9	4.0	3.2	2.6	1.4
120	10.4	9.3	8.9	9.8	9.2	8.0	7.9	6.2	4.7	3.9	3.1	2.5	.9
110	10.5	9.3	9.0	10.0	9.3	8.1	8.0	6.1	4.7	3.8	3.0	2.4	.5
99 2/	10.7	9.4	9.2	10.2	9.5	8.2	8.0	5.9	4.4	3.7	2.9	2.3	.1
98 3/	9.3	8.2	8.3	8.7	7.9	7.2	6.7	4.7	3.6	3.2	2.7	2.1	.1
84 4/	9.7	8.2	8.6	9.3	8.2	7.3	6.8	4.3	3.4	3.1	2.6	2.0	0.0

1/ Downstream of Watana Damsite

2/ Upstream of Chulitna-Susitna confluence

3/ Downstream of Chulitna-Susitna confluence

4/ At Sunshine stream gaging station

TABLE E.2.4.18: SUSITNA HYDROELECTRIC PROJECT
SIMULATED STREAM TEMPERATURES
WEATHER PERIOD: SUMMER 1982
2001 ENERGY DEMANDS
CASE E-VI FLOW REQUIREMENTS
STAGED CONSTRUCTION
STAGE I

RIVER	MAY						JUNE				JULY			
MILE	31	32	33	34	35	36	37	38	39	40	41	42	43	44
184 1/	2.6	2.7	2.9	3.2	3.7	5.2	6.3	6.6	8.7	10.9	10.6	9.9	9.9	9.4
173	2.9	2.5	2.6	2.9	3.7	5.1	6.2	6.7	8.7	10.8	10.6	10.1	9.8	9.6
162	3.4	2.9	3.3	3.4	4.3	5.5	6.4	7.1	9.1	11.0	10.8	10.4	10.0	9.9
150	3.6	3.0	3.4	3.5	4.5	5.6	6.5	7.3	9.3	11.0	10.9	10.6	10.2	10.1
140	3.8	3.0	3.5	3.6	4.7	5.7	6.6	7.4	9.4	11.1	11.0	10.8	10.2	10.3
130	4.2	3.3	3.7	3.8	4.9	5.8	6.6	7.5	9.4	10.9	10.8	10.7	9.9	10.1
120	4.7	3.7	4.3	4.3	5.4	6.2	6.9	7.9	9.8	11.2	11.2	11.1	10.1	10.5
110	5.2	4.0	4.8	4.8	5.9	6.5	7.1	8.2	10.2	11.5	11.4	11.4	10.4	10.8
99 2/	5.7	4.4	5.3	5.2	6.4	6.8	7.3	8.5	10.6	11.8	11.7	11.7	10.6	11.2
98 3/	5.2	4.3	5.2	5.3	6.2	6.7	6.5	7.2	9.1	9.2	9.0	9.3	8.3	9.0
84 3/	5.6	4.7	5.9	6.0	7.2	7.7	7.0	8.0	10.1	9.7	9.6	10.0	9.0	9.8

RIVER	AUGUST				SEPTEMBER			
MILE	45	46	47	48	49	50	51	52
184 1/	9.8	9.4	9.9	9.2	9.3	9.6	8.4	7.3
173	10.0	9.6	10.0	9.3	9.1	9.2	7.9	6.9
162	10.2	9.8	10.2	9.4	9.2	9.2	7.9	6.8
150	10.5	10.0	10.4	9.6	9.2	9.2	7.8	6.8
140	10.7	10.2	10.6	9.7	9.2	9.1	7.8	6.7
130	10.6	10.2	10.6	9.6	9.1	8.9	7.5	6.5
120	11.0	10.5	10.9	9.9	9.2	9.0	7.6	6.4
110	11.3	10.7	11.1	10.1	9.3	9.0	7.6	6.4
99 2/	11.7	11.0	11.4	10.3	9.4	9.1	7.7	6.4
98 3/	9.2	8.7	9.2	7.9	7.8	7.2	5.7	5.3
84 4/	9.8	9.3	9.8	8.5	8.0	7.2	5.9	5.1

1/ Downstream of Watana Damsite
2/ Upstream of Chulitna-Susitna confluence
3/ Downstream of Chulitna-Susitna confluence
4/ At Sunshine stream gaging station

TABLE E.2.4.19: SUSITNA HYDROELECTRIC PROJECT
SIMULATED STREAM TEMPERATURES
STAGE I
WEATHER PERIOD: SUMMER 1981
CASE E-I FLOW REQUIREMENTS
STAGED CONSTRUCTION

RIVER		MAY					JUNE					JULY		
MILE	31	32	33	34	35	36	37	38	39	40	41	42	43	44
184 1/	1.8	2.8	3.8	5.0	6.8	7.8	8.7	10.0	9.1	8.4	8.2	9.6	10.6	10.3
173	2.1	2.7	3.1	4.6	6.3	7.5	8.8	10.0	9.0	8.5	8.2	9.3	10.6	10.3
162	2.7	3.8	4.3	5.5	7.1	7.7	9.0	10.3	9.2	8.7	8.4	9.6	10.7	10.4
150	3.0	3.8	4.2	5.5	7.1	7.7	9.2	10.5	9.4	8.9	8.6	9.7	10.9	10.6
140	3.3	4.0	4.2	5.6	7.2	7.7	9.3	10.7	9.5	9.0	8.7	9.7	11.0	10.7
130	3.6	4.3	4.5	5.8	7.2	7.6	9.4	10.7	9.4	9.0	8.5	9.3	10.8	10.6
120	4.1	5.1	5.3	6.5	8.0	7.9	9.7	11.0	9.7	9.3	8.8	9.7	11.1	10.8
110	4.6	5.7	6.0	7.2	8.6	8.2	10.0	11.4	9.9	9.5	9.0	9.9	11.2	11.0
99 2/	5.0	6.3	6.6	7.8	9.2	8.4	10.2	11.7	10.2	9.8	9.3	10.3	11.4	11.1
98 3/	4.5	5.7	6.2	6.7	7.6	7.0	8.9	9.4	8.4	8.5	8.1	8.3	9.6	9.6
84 4/	4.8	6.5	7.1	7.4	8.5	7.4	9.5	10.1	9.0	9.0	8.6	8.9	9.9	10.0

RIVER			AUGUST			SEPTEMBER							
MILE	45	46	47	48	49	50	51	52	1	2	3	4	5
184 1/	9.6	8.6	7.9	9.0	8.8	8.1	7.8	6.8	5.8	5.0	4.6	4.2	3.5
173	9.7	8.6	8.0	9.0	8.8	8.0	7.6	6.5	5.3	4.4	3.8	3.4	2.8
162	9.8	8.6	8.1	9.2	8.9	8.0	7.6	6.3	5.1	4.2	3.5	3.2	2.2
150	10.0	8.9	8.4	9.4	9.1	8.1	7.7	6.3	4.9	4.1	3.2	3.0	2.0
140	10.1	8.9	8.4	9.5	9.1	8.1	7.7	6.1	4.7	3.9	3.0	2.8	1.6
130	10.1	8.8	8.5	9.5	9.1	8.0	7.7	5.9	4.5	3.7	2.8	2.5	1.2
120	10.3	8.9	8.6	9.7	9.2	8.1	7.7	5.8	4.3	3.6	2.7	2.4	.7
110	10.4	9.0	8.8	9.9	9.3	8.2	7.7	5.6	4.2	3.5	2.6	2.3	.4
99 2/	10.6	9.1	8.9	10.1	9.5	8.3	7.8	5.5	4.0	3.4	2.5	2.2	0.0
98 3/	9.2	8.0	8.1	8.6	7.9	7.3	6.5	4.3	3.3	3.0	2.4	2.0	0.0
84 4/	9.6	8.1	8.5	9.2	8.2	7.4	6.6	3.9	3.1	2.9	2.4	1.9	0.0

1/ Downstream of Watana Damsite

2/ Upstream of Chulitna-Susitna confluence

3/ Downstream of Chulitna-Susitna confluence

4/ At Sunshine stream gaging station

TABLE E.2.4.20: SUSITNA HYDROELECTRIC PROJECT
SIMULATED STREAM TEMPERATURES
WEATHER PERIOD: SUMMER 1982
CASE E-I FLOW REQUIREMENTS
STAGED CONSTRUCTION STAGE I

RIVER MILE	MAY 31	32	33	34	35	JUNE 36	37	38	39	40	JULY 41	42	43	44
184 1/	2.3	2.7	2.9	3.3	3.9	5.0	6.2	6.2	9.2	10.4	10.1	9.4	9.4	9.2
173	2.6	2.4	2.5	2.8	3.8	5.0	6.2	6.5	9.1	10.3	10.2	9.6	9.4	9.4
162	3.3	2.9	3.3	3.5	4.5	5.4	6.4	6.9	9.5	10.6	10.4	9.9	9.6	9.7
150	3.5	2.9	3.3	3.5	4.6	5.5	6.6	7.1	9.6	10.7	10.6	10.2	9.9	10.0
140	3.8	3.0	3.4	3.6	4.8	5.6	6.6	7.2	9.7	10.7	10.7	10.4	9.9	10.1
130	4.2	3.2	3.7	3.8	5.0	5.7	6.7	7.3	9.6	10.6	10.6	10.4	9.6	10.0
120	4.8	3.7	4.3	4.3	5.6	6.1	6.9	7.7	10.1	11.0	10.9	10.8	9.9	10.4
110	5.4	4.1	4.9	4.8	6.0	6.4	7.1	8.1	10.5	11.2	11.1	11.1	10.1	10.7
99 2/	5.9	4.5	5.4	5.3	6.6	6.8	7.3	8.4	10.9	11.5	11.4	11.4	10.4	11.0
98 3/	5.3	4.3	5.3	5.3	6.3	6.7	6.7	7.1	9.2	9.1	9.0	9.2	8.3	9.0
84 4/	5.7	4.8	6.0	6.0	7.3	7.7	7.1	8.0	10.1	9.7	9.5	9.9	8.9	9.8

RIVER MILE	AUGUST 45	46	47	48	SEPTEMBER 49	50	51	52
184 1/	9.6	9.3	9.8	9.0	9.3	9.2	8.9	7.4
173	9.8	9.5	10.0	9.1	9.0	8.8	8.6	7.0
162	10.0	9.6	10.2	9.2	9.1	8.8	8.6	7.0
150	10.3	9.9	10.4	9.4	9.1	8.8	8.6	6.9
140	10.5	10.1	10.5	9.5	9.1	8.7	8.6	6.8
130	10.5	10.1	10.6	9.5	9.0	8.5	8.4	6.6
120	10.9	10.3	10.9	9.7	9.1	8.5	8.4	6.6
110	11.2	10.6	11.1	9.9	9.2	8.6	8.4	6.6
99 2/	11.5	10.8	11.4	10.1	9.3	8.7	8.4	6.6
98 3/	9.2	8.8	9.3	8.0	7.6	6.9	6.4	5.4
84 4/	9.8	9.4	9.8	8.5	7.8	7.0	6.4	5.2

1/ Downstream of Watana Damsite

2/ Upstream of Chulitna-Susitna confluence

3/ Downstream of Chulitna-Susitna confluence

4/ At Sunshine stream gaging station

TABLE E.2.4.21: STREAM TEMPERATURES WEATHER PERIOD: SUMMER 1981 NATURAL CONDITIONS

WATER WEEK NO.

River Mile	May					June				July				
	31	32	33	34	35	36	37	38	39	40	41	42	43	44
184[1/]	4.8	7.6	8.6	8.2	9.2	8.9	11.6	12.2	8.5	8.4	9.2	9.5	9.8	9.4
173	4.8	7.4	8.2	7.9	9.1	8.7	11.4	12.1	8.6	8.5	9.2	9.5	9.9	9.5
162	4.9	7.5	8.4	8.1	9.3	8.8	11.6	12.3	8.7	8.7	9.3	9.6	10.0	9.6
150[3/]	5.0	7.6	8.3	8.1	9.3	8.9	11.6	12.4	9.0	8.9	9.5	9.9	10.2	9.9
140	5.1	7.6	8.3	8.1	9.4	8.9	11.6	12.5	9.1	9.0	9.5	9.9	10.3	10.3
130	5.1	7.5	8.2	8.1	9.4	8.8	11.5	12.3	9.1	9.0	9.4	9.9	10.3	10.0
120	5.3	7.7	8.4	8.4	9.7	9.0	11.7	12.6	9.3	9.3	9.6	10.1	10.5	10.2
110	5.5	7.9	8.6	8.6	9.9	9.1	11.9	12.8	9.6	9.5	9.7	10.2	10.7	10.4
99[3/]	5.7	8.0	8.8	8.9	10.1	9.3	12.1	13.1	9.8	9.7	9.9	10.4	10.9	10.6
98[4/]	5.0	7.2	7.9	7.8	8.8	7.7	9.5	10.2	8.5	8.6	8.8	9.1	9.5	9.3
84[5/]	5.2	7.5	8.3	8.2	9.4	8.0	10.0	10.7	9.0	9.1	9.1	9.5	9.9	9.8

River Mile	August				September				October				
	45	46	47	48	49	50	51	52	1	2	3	4	5
184[1/]	9.4	6.8	7.5	9.9	7.2	7.0	6.2	1.6	0.3	0.3	1.2	0.5	0.0
173	9.5	7.0	7.6	9.9	7.3	7.0	6.2	1.8	0.5	0.4	1.2	0.4	0.0
162	9.6	7.1	7.7	10.0	7.5	7.1	6.2	1.7	0.5	0.4	1.2	0.4	0.0
150[2/]	9.9	7.5	8.0	10.1	7.7	7.2	6.4	2.0	0.7	0.6	1.3	0.5	0.0
140	10.0	7.6	8.1	10.2	7.8	7.3	6.5	2.1	0.8	0.7	1.3	0.5	0.0
130	10.0	7.6	8.1	10.1	7.9	7.3	6.5	2.2	1.0	0.9	1.4	0.5	0.0
120	10.1	7.7	8.3	10.3	8.1	7.4	6.6	2.2	1.0	0.9	1.4	0.5	0.0
110	10.3	7.8	8.5	10.5	8.2	7.5	6.7	2.2	1.0	1.0	1.4	0.5	0.0
99[3/]	10.5	8.0	8.6	10.7	8.4	7.6	6.8	2.2	1.0	1.0	1.4	0.5	0.0
98[4/]	9.2	7.4	7.9	8.9	7.4	6.9	5.9	2.3	1.5	1.6	1.7	1.0	0.0
84[5/]	9.6	7.7	8.3	9.4	7.8	7.1	6.1	2.3	1.7	1.8	1.9	1.1	0.0

1/ Downstream of Watana Dam Site
2/ Downstream of Devil Canyon Dam Site
3/ Upstream of Susitna - Chulitna confluence
4/ Downstream of Susitna - Chulitna confluence (full mixing assumed)
5/ At Sunshine stream gaging station at Parks Highway Bridge

TABLE E.2.4.22: STREAM TEMPERATURES WEATHER PERIOD:
SUMMER 1982 NATURAL CONDITIONS

WATER WEEK NO.

River	May					June				July				
Mile	31	32	33	34	35	36	37	38	39	40	41	42	43	44
184[1]	5.5	4.9	7.2	7.1	8.8	9.2	8.0	9.6	11.9	10.2	10.6	10.6	9.7	10.5
173	5.2	4.6	6.8	6.7	8.5	8.9	7.9	9.5	11.7	10.2	10.7	10.7	9.7	10.6
162	5.5	4.7	6.9	6.9	8.6	9.0	8.0	9.6	11.8	10.4	10.8	10.9	9.8	10.7
150[3]	5.4	4.7	6.8	6.8	8.6	9.0	8.1	9.7	11.9	10.5	11.0	11.1	10.1	10.9
140	5.4	4.7	6.8	6.7	8.5	9.0	8.1	9.7	11.9	10.6	11.1	11.2	10.1	11.0
130	5.5	4.7	6.7	6.6	8.4	8.9	8.0	9.6	11.8	10.6	11.1	11.2	10.0	11.0
120	5.9	4.9	6.9	6.8	8.6	9.1	8.2	9.9	12.0	10.9	11.3	11.5	10.2	11.2
110	6.2	5.1	7.1	7.0	8.8	9.2	8.3	10.0	12.2	11.1	11.5	11.7	10.4	11.4
99[3]	6.6	5.3	7.3	7.2	9.0	9.3	8.5	10.2	12.5	11.4	11.7	12.0	10.6	11.7
98[4]	5.8	4.9	6.7	6.6	8.1	8.3	7.4	8.6	10.5	9.3	9.6	10.0	8.8	9.7
84[5]	6.1	5.2	7.0	6.9	8.4	8.6	7.6	7.0	11.0	9.8	10.1	10.5	9.3	10.2

River	August				September				October				
Mile	45	46	47	48	49	50	51	52	1	2	3	4	5
184[1]	10.5	10.5	10.5	9.0	7.6	6.1	6.4	4.1	2.0	0.0	0.0	0.0	0.0
173	10.6	10.6	10.6	9.1	7.6	6.2	6.3	4.1	2.1	0.0	0.0	0.0	0.0
162	10.8	10.8	10.7	9.2	7.7	6.3	6.4	4.1	2.1	0.0	0.0	0.0	0.0
150[2]	11.1	11.0	10.9	9.4	7.9	6.5	6.6	4.3	2.2	0.2	0.0	0.0	0.0
140	11.2	11.1	11.0	9.5	8.0	6.6	6.6	4.4	2.3	0.2	0.0	0.0	0.0
130	11.2	11.0	11.0	9.5	8.0	6.7	6.6	4.4	2.3	0.3	0.0	0.0	0.0
120	11.5	11.2	11.3	9.7	8.1	6.8	6.7	4.5	2.3	0.2	0.0	0.0	0.0
110	11.7	11.4	11.5	9.9	8.3	6.9	6.7	4.5	2.3	0.2	0.0	0.0	0.0
99[3]	12.0	11.6	11.8	10.1	8.4	7.1	6.8	4.6	2.3	0.1	0.0	0.0	0.0
98[4]	9.6	9.1	9.4	8.0	7.3	6.3	5.6	4.4	2.5	0.8	0.2	0.0	0.0
84[5]	10.1	9.7	9.9	8.5	7.6	6.6	5.8	4.5	2.6	0.8	0.0	0.0	0.0

1/ Downstream of Watana Dam Site
2/ Downstream of Devil Canyon Dam Site
3/ Upstream of Susitna - Chulitna confluence
4/ Downstream of Susitna - Chulitna confluence (full mixing assumed)
5/ At Sunshine stream gaging station at Parks Highway Bridge

TABLE E.2.4.23: SUSITNA HYDROELECTRIC PROJECT MAXIMUM SIMULATED RIVER STAGES
WINTER 1981-82 FLOW CASE E-VI, INFLOW-MATCHING

Slough or Side Channel	River Mile	Threshold Elevation	Simulated Natural Conditions	Stage I	Stage II	Stage III Early	Stage III Late	
Whiskers	101.5	367	$\boxed{368}$	$\boxed{370}$	$\boxed{370}$	$\boxed{369}$	$\boxed{370}$	
Gash Creek	112.0	453	$\boxed{455}$	$\boxed{457}$	$\boxed{459}$	$\boxed{456}$	$\boxed{457}$	
6A	112.3	(Upland)	457	459	461	459	459	
8	114.1	476	472	475	$\boxed{476}$	$\boxed{476}$	474	
MSII	115.5	482	$\boxed{484}$	$\boxed{487}$	$\boxed{487}$	$\boxed{485}$	$\boxed{485}$	
MSII	115.9	487	486	$\boxed{489}$	$\boxed{490}$	$\boxed{488}$	$\boxed{487}$	
Curry	120.0	(Upland)	523	526	521	520	518	Maximum
Moose	123.5	548	$\boxed{549}$	$\boxed{555}$	$\boxed{551}$	$\boxed{548}$	545	upstream
8A West	126.1	573	571	$\boxed{575}$	$\boxed{573}$	571	569	extent of
8A East	127.1	582	$\boxed{583}$	$\boxed{585}$	$\boxed{584}$	581	581	ice front
9	129.3	604	$\boxed{606}$	$\boxed{607}$	$\boxed{605}$	601	603	
9 u/s	130.6	617	$\boxed{620}$	$\boxed{620}$	$\boxed{619}$	616	$\boxed{617}$	
4th July	131.8	626	$\boxed{629}$	$\boxed{633}$	$\boxed{630}$	$\boxed{627}$	$\boxed{628}$	
9A	133.7	651	$\boxed{651}$	$\boxed{656}$	649	649	650	
10 u/s	134.3	657	$\boxed{657}$	$\boxed{664}$	655	655	656	
11 d/s	135.3	667	$\boxed{670}$	$\boxed{675}$	$\boxed{667}$	$\boxed{667}$	$\boxed{668}$	
11	136.5	687	683	$\boxed{688}$	682	682	684	
17	139.3	(Upland)	-	715	714	714	715	
20	140.5	730	-	729	728	728	729	
21 (A6)	141.8	747	-	747	746	746	747	
21	142.2	755	-	753	752	752	753	
22	144.8	788	-	787	785	785	787	
LRX-3 ICE FRONT STARTING DATE				12-10	12-29	12-30	1-2	
MAX. ICE FRONT EXTENT (RIVER MILE)				139	133	126	114	
MELT-OUT DATE				4-28	3-26	3-19	3-5	

Notes:

1. $\boxed{}$ Indicates locations where maximum river stage equals or exceeds a known slough threshold elevation.

2. All river stages in feet.

TABLE E.2.4.24: SUSITNA HYDROELECTRIC PROJECT MAXIMUM SIMULATED RIVER STAGES WINTER 1981-82 FLOW CASE E-I,

Slough or Side Channel	River Mile	Threshold Elevation	Simulated Natural Conditions	Stage I 2001 Demand	Stage II 2002 Demand	Stage III 2020 Demand
Whiskers	101.5	367	$\boxed{368}$	$\boxed{370}$	$\boxed{370}$	$\boxed{370}$
Gash Creek	112.0	453	$\boxed{455}$	$\boxed{458}$	$\boxed{458}$	$\boxed{457}$
6A	112.3	(Upland)	457	461	461	460
8	114.1	476	472	$\boxed{478}$	$\boxed{476}$	475
MSII	115.5	482	$\boxed{484}$	$\boxed{490}$	$\boxed{487}$	$\boxed{486}$
MSII	115.9	487	486	$\boxed{493}$	$\boxed{490}$	$\boxed{488}$
Curry	120.0	(Upland)	523	526	520	522
Moose	123.5	548	$\boxed{549}$	$\boxed{555}$	$\boxed{551}$	545
8A West	126.1	573	571	$\boxed{574}$	$\boxed{573}$	569
8A East	127.1	582	$\boxed{583}$	$\boxed{585}$	$\boxed{584}$	582
9	129.3	604	$\boxed{606}$	$\boxed{607}$	$\boxed{605}$	603
9 u/s	130.6	617	$\boxed{620}$	$\boxed{621}$	$\boxed{619}$	$\boxed{617}$
4th July	131.8	626	$\boxed{629}$	$\boxed{632}$	$\boxed{630}$	$\boxed{628}$
9A	133.7	651	$\boxed{651}$	$\boxed{656}$	649	650
10 u/s	134.3	657	$\boxed{657}$	$\boxed{663}$	655	656
11 d/s	135.3	667	$\boxed{670}$	$\boxed{674}$	$\boxed{667}$	$\boxed{668}$
11	136.5	687	683	$\boxed{687}$	682	684
17	139.3	(Upland)	-	715	714	715
20	140.5	730	-	729	728	729
21 (A6)	141.8	747	-	747	746	747
21	142.2	755	-	753	752	753
22	144.8	788	-	786	785	787
LRX-3 ICE FRONT STARTING DATE				12-10	12-29	1-1
MAX. ICE FRONT EXTENT (RIVER MILE)				139	133	120
MELT-OUT DATE				4-29	3-28	3-6

max. upstream extent of ice front

Notes:

1. ☐ Indicates locations where maximum river stage equals or exceeds a known slough threshold elevation.

2. All river stages in feet.

TABLE E.2.4.25: SEDIMENT CONCENTRATION (mg/l) STAGE 1

Month	Range of Observed Natural Conditions 1/	Estimated Range of Conditions for Period 1970, 1982, 1982 2/	Average Concentrations 3/ in Outflow			Range of Simulated Outflow Concentration		
			Minimum (1970)	Average (1982)	Maximum (1981)	Minimum (1970)	Average (1982)	Maximum (1981)
January	<1-8	1-55	60-70	60-70	80-90	40-90	45-85	50-120
February	-	1-93	30-50	50-60	60-70	20-70	35-70	30-95
March	1-6	1-20	20-35	35-50	35-50	10-50	20-60	20-75
April	-	2-183	20-30	20-40	40-60	10-40	10-50	20-75
May	65-1,110	5-1,480	15-20	30-40	40-50	5-50	10-65	10-70
June	151-1,860	620-1,705	70-80	80-90	80-90	35-90	45-145	70-95
July	100-2,790	506-2,062	100-110	120-140	100-110	85-115	120-145	70-190
August	158-1,040	198-2,150	100-110	100-120	150-180	90-115	85-125	130-200
September	23-812	5-1,530	90-100	85-95	120-140	85-105	85-100	100-170
October	6-140	1-144	80-100	90-110	120-130	80-100	90-110	100-140
November	-	1-71	80-100	90-100	110-120	75-100	85-110	90-130
December	-	1-47	70-90	75-90	90-100	60-90	70-95	70-110

1/ Range of observed suspended sediment concentrations measured by US Geological Survey on Susitna River at gaging stations near Cantwell (period of observations 1962-1972, 1980-1982) and at Gold Creek(period of observations 1962, 1974-1982).

2/ Based on computations of daily average suspended sediment concentrations using flows at Susitna River near Cantwell Station and sediment-flow rating curve (Figure E.2.4.110) for 1970, 1981 and 1982. Represents range of inflows to project during these years.

3/ Based on monthly outflow suspended sediment concentration for 2-3 years of simulations for each of the three years.

TABLE E.2.4.26: SETTLING COLUMN RUN#1
TOTAL SUSPENDED SOLIDS AND TURBIDITY

	TSS (mg/l)	Avg TSS	Average[1/] Percent Remaining	Turbidity (NTU)	Avg Turbidity
Susitna River (8/6/84)	181	--	--	--	--
0 Hours					
Top	117			172	
Middle	146	124	100	174	165
Bottom	108			148	
3 Hours					
Top	120			134	
Middle	115	119	96	154	141
Bottom	122			136	
6 Hours					
Top	63			144	
Middle	105	93	75	125	138
Bottom	111			126	
12 Hours					
Top	49			100	
Middle	85	78	63	118	115
Bottom	100			126	
24 Hours					
Top	34			90	
Middle	64	57	46	108	101
Bottom	74			104	
48 Hours					
Top	32			90	
Middle	59	52	42	108	104
Bottom	66			112	
72 Hours					
Top	34			76	
Middle	48	50	41	112	103
Bottom	69			120	
96 Hours					
Top	38			90	
Middle	49	48	39	94	96
Bottom	56			104	

1/ Average Percent Remaining = $\frac{\text{Average TSS at Time (T)}}{\text{Average TSS at Time 0}} \times 100$

Note: Top refers to upper 1/3 of settling column.
Middle refers to middle 1/3 of settling column.
Bottom refers to lower 1/3 of settling column.

TABLE E.2.4.27: SETTLING COLUMN RUN#2
TOTAL SUSPENDED SOLIDS AND TURBIDITY

	TSS (mg/l)	Avg TSS	Average[1/] Percent Remaining	Turbidity (NTU)	Avg Turbidity
Susitna River (8/6/84)	410	--	--	--	--
0 Hours					
Top [2/]	320			308	
Middle	355	342	100	308	304
Bottom	350			296	
3 Hours					
Top	230			304	
Middle	300	283	83	280	300
Bottom	320			316	
6 Hours					
Top	190			280	
Middle	260	243	71	316	291
Bottom	280			276	
12 Hours					
Top	160			232	
Middle	245	215	63	240	228
Bottom	240			212	
24 Hours					
Top	145			244	
Middle	220	190	55	280	268
Bottom	205			280	
48 Hours					
Top	155			240	
Middle	175	167	49	244	241
Bottom	170			240	
72 Hours					
Top	93			220	
Middle	122	112	33	268	247
Bottom	120			252	
96 Hours					
Top	78			204	
Middle	106	101	30	208	
Bottom	119			220	

1/ Average Percent Remaining = $\frac{\text{Average TSS at Time (T)}}{\text{Average TSS at Time 0}} \times 100$

2/ Top refers to upper 1/3 of settling column.
Middle refers to middle 1/3 of settling column.
Bottom refers to lower 1/3 of settling column.

TABLE E.2.4.28: AVERAGE TOTAL SUSPENDED SOLIDS AND TURBIDITY VALUES SETTLING COLUMN TESTS

	0 HOUR		6 HOUR		12 HOUR		24 HOUR		48 HOUR		72 HOUR		
MINE SITE	TSS mg/l	Turb NTU	TSS mg/l	Turb NTU	TSS mg/l	Turb NTU	TSS mg/l	Turb NTU	TSS mg/l	Turb NTU	TSS mg/l	Turb NTU	$\frac{NTU}{TSS}$ Ratio
1	6,280	3,200	2,310	2,900	2,060	2,200	1,260	1,900	1,240	1,500	780	1,500	1.94
2	53,800	14,200	5,300	7,100	14,100	5,400	1,800	2,900	800	1,700	620	1,200	1.94
3	11,200	6,700	3,410	6,500	4,080	5,300	3,600	5,200	3,400	4,700	2,800	3,700	1.32
4	33,500	10,700	5,310	6,800	2,690	4,000	1,430	2,300	540	1,300	190	1,400	7.37
5	5,480	5,300	3,990	4,200	3,260	2,900	1,840	2,900	1,280	2,300	1,000	1,700	1.70
6	8,100	3,100	4,250	2,300	1,850	1,600	1,410	1,300	1,130	1,100	810	1,200	1.48
7	17,200	6,300	2,760	2,800	1,730	2,200	1,320	2,000	1,030	1,600	1,160	1,980	1.71
8	13,700	6,100	2,900	3,600	2,290	2,500	1,850	2,500	1,590	1,900	1,130	1,200	1.06
9	12,700	7,900	2,710	4,800	1,130	2,100	700	1,280	330	600	180	420	2.33
10	18,100	7,400	4,950	5,600	3,700	5,100	3,480	5,100	2,430	3,600	2,290	3,000	1.31
11	3,030	2,700	1,780	2,400	1,470	1,700	1,280	2,000	1,350	2,600	1,170	2,000	1.77
12	20,700	8,500	6,550	6,800	4,180	5,300	2,180	4,300	1,840	3,100	1,110	2,400	2.16
13	27,900	10,200	1,470	1,800	490	680	200	330	52.3	180	42.9	110	2.56
14	25,600	11,100	0,400	6,800	1 534	630	232	370	68.8	130	35.2	45	1.28
Porcupine	8,610	4,300	2,830	2,800	1,630	2,300	873	1,500	740	1,400	651	1,300	2.0

Note: The values listed above are average values of the column ports sampled.
Average values for Porcupine Creek listed under 6 hour and 12 hour were sampled at 4 and 7 hours, respectively.
Total Suspended Solids and Turbidity values for Porcupine Creek after 528 hours (22 days) are 120 mg/l and 390 NTU, respectively.

TAB E E.2.4.29: TROPHIC STATUS AND RATES OF ANNUAL PRIMARY PRODUCTIVITY OBSERVED IN VARIOUS LAKES, LAKE-RESERVOIRS AND RESERVOIRS IN TEMPERATE, SUBARCTIC AND ARCTIC REGIONS OF THE NORTHERN HEMISPHERE

Water Body	Trophic Classification	Annual Primary Productivity gCm^{-2} yr^{-1} Approximate Estimates	Latitude
Waldo (Oregon)	Ultra-Oligotrophic	<1	44
Experimental Lakes Area	Ultra-Oligotrophic[1/]	<2	50
Char (N.W.T. Canada)	Ultra-Oligotrophic[1/]	4	74
Meretta (NW.T. - Canada)	Ultra-Oligotrophic	11	
Great Bear (N.W.T. Canada)	Ultra-Oligotrophic[1/]	5-20	66
Great Slave (N.W.T. Canada)	Ultra-Oligotrophic[1/]	5-20	62
Winnipeg (Manitoba, Canada)	Ultra-Oligotrophic[1/]	5-20	53
Smallwood Res. (Labrador Plateau, Canada)	Ultra-Oligotrophic[1/]	5-20	53
Watana - Devil Canyon Reservoir (Alaska)	Ultra-Oligotrophic[1/]	1-20	63
Gabbro Lake (Labrador Plateau, Canada)	Ultra-Oligotrophic[1/]	5-20	54
Lobstick Lake (Labrador Plateau, Canada)	Ultra-Oligotrophic[1/]	5-20	54
Tustumena lake (Alaska)	Ultra-Oligotrophic[1/]	5-20	60
LaGrande Lake-Reservoirs Quebec, Canada)	Ultra-Oligotrophic	<30	53
Southern Indian LK Reservoirs (Manitoba, Canada)	Ultra-Oligotrophic[1/]		
Koocanusa Reservoir (Montana-British Columbia)	Ultra-Oligotrophic	29	49
Kamloops (British Columbia, Canada)	Ultra-Oligotrophic	32	50
Castle (California)	Ultra-Oligotrophic	36	40
Lawrence (Michigan)	Oligotrophic	41	42
Lunzar Untersee (Austria)	Oligotrophic	45	48
Superior (USA-Canada)	Oligotrophic	50	48
Tahoe (Nevada-California)	Oligotrophic	70	39
Cresent Lake (Alaska)	Oligotrophic[1/]	<90	61
George (New York)	Oligo-Mesotrophic	72	48
Huron (USA-Canada)	Oligotrohpic	100	48
Flathead (Montana)	Oligo-Mesotrophic	123	48
Michigan (USA)	Mesotrophic	130-150	45

1/ Estimated

Source: (MODIFIED AFTER STUART, 1983)

TABLE E.2.4.29 (Page 2 of 2)

Water Body	Trophic Classification	Annual Primary Productivity gCm^{-2} yr^{-1} Approximate Estimates	Latitude
Clear (Calfornia)	Mesotrophic	160	42
Crooked (Indiana)	Mesotrophic	171	40
Ontario (USA-Canada)	Mesotrophic	180	44
Erie (USA-Canada) (East Basin)	Mesotrophic	180	42
Belwood Reservoir (Ontario)	Mesotrophic	<200	43
Cayuga (New York)	Mesotrophic	200	43
North Lake Reservoir (Texas)	Mesotrophic	200	33
Sammamish (Washington)	Mesotrophic	238	48
Esrom (Denmark-1959)	Mesotrophic	260	55
Lac Leman (Switzerland-1975)	Eutrophic	300	46
Minnetonka (Minnesota)	Eutrophic	300	46
Erie (USA-Canada) (West Basin)	Eutrophic	310	42
Waco Reservoir (Texas)	Eutrophic	310	31
Washington (Washington-1971)	Mesotrophic	354	48
Frederiksborg Slotssø(Denmark)	Europhic	376	56
Wintergreen (Michigan)	Europhic	369	43
Sollerød So (Denmark)	Eutrophic	522	56
Sylvan (Indiana)	Eutrophic	570	40
Lanao (Philippines)	Eutrophic	620	15
Victoria (Africa)	Eutrophic	640	0
Washington (Washington 1963-64 Pre Diversion of Sewage)	Eutrophic	766	48
Mendota (Wisconsin 1965-1966)	Eutrophic	1100	43

E.2.4.30: PERCENT OF TIME NAVIGATION FLOWS EXCEEDED DURING STAGE I OPERATION

	Gold Creek[1]		Sunshine[2]		Susitna Station[3]	
	Natural	Stage I Load	Natural	Stage I Load	Natural	Stage I Load
27 May 2 Jun	100	100	94	83	88	70
3 Jun 9 Jun	100	100	100	97	100	91
10 Jun 16 Jun	100	100	100	100	100	90
17 Jun 23 Jun	100	100	100	100	100	100
24 Jun 30 Jun	100	100	100	100	100	100
1 Jul 7 Jul	100	100	100	100	100	100
8 Jul 14 Jul	100	100	100	100	100	100
15 Jul 21 Jul	100	100	100	100	100	100
22 Jul 28 Jul	100	100	100	100	100	100
29 Jul 4 Aug	100	100	100	100	100	100
5 Aug 11 Aug	100	100	100	100	100	100
12 Aug 18 Aug	100	100	97	96	97	97
19 Aug 25 Aug	100	100	96	96	97	97
26 Aug 1 Sep	98	100	93	94	96	95
2 Sep 8 Sep	100	100	91	94	75	75
9 Sep 15 Sep	97	100	82	86	63	63
16 Sep 22 Sep	94	100	67	71	62	59
23 Sep 30 Sep	84	100	43	56	42	43

1/ Estimated Navigable flow = 6,000 cfs at Gold Creek Portage Creek to Chulitna.

2/ Estimated navigable flow = 25,000 cfs at Sunshine for navigable channels to a tributaries Chulitna River to Yentna River, Jetboats observed operating on mall channel at 17,800 cfs.

3/ Estimated flow for jetboat to navigate Alexander Slough = 60,000 at Susitna Station. Estimate based on aerial photography. Flow value dependent on recent changes to channel morphology of Alexander Slough.

TABLE E.2.4.31 WITH-PROJECT WATANA MONTHLY FLOWS (CFS), STAGE II

YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	ANNUAL
1951	6242	7522	8333	7601	6283	5725	4981	3793	1716	6887	16394	17206	7734
1952	6585	7485	8333	7803	7238	5725	5052	4406	2811	8770	17356	11571	7777
1953	7158	7440	8338	7962	7741	5725	6216	4264	2615	10601	16682	11514	8035
1954	6156	7508	8333	7803	6845	5725	4981	3484	3047	5129	20422	9166	7401
1955	5909	7457	8333	7803	7238	5725	6226	4638	3083	10942	23537	13448	8719
1956	6267	7550	8333	7803	6845	5725	4981	3557	2810	21933	19153	13194	9051
1957	5891	7442	8333	7889	7719	6030	6226	4336	2516	11889	17318	14841	8381
1958	6537	7355	8230	7827	7916	7276	6559	4673	1903	9853	18843	5979	7770
1959	6036	7521	8333	7803	6845	5725	4981	3130	3030	6079	23074	13362	8011
1960	6772	7471	8333	7870	7717	6030	6226	4659	2565	4405	17311	16086	7954
1961	7278	7483	8334	7808	7891	7156	6418	4443	2854	13635	19480	10146	8603
1962	6712	7523	8333	7824	7689	6030	6359	4741	6293	23444	19887	12746	9833
1963	6566	7588	8338	7953	7704	6343	6307	4214	3303	20760	21011	10800	9278
1964	6501	7501	8333	7803	7238	5725	4981	3643	5429	20083	14048	7524	8263
1965	6260	7517	8333	7803	7238	5725	5326	4684	2809	11923	17394	16226	8451
1966	7363	7502	8333	7803	6845	5725	5052	4657	2546	5847	17391	9214	7375
1967	6155	7496	8333	7803	6451	5725	4981	3793	2869	15275	25980	13803	9096
1968	6158	7528	8333	7803	7631	6030	6559	4428	2933	17378	14148	7371	8049
1969	6202	7504	8333	7601	6283	5725	4981	3793	2964	4558	6711	6055	5895
1970	4995	5400	5250	4916	4948	4508	3922	3272	3048	3141	10713	7480	5136
1971	5910	7414	8333	7803	7238	5725	5052	4406	2894	8054	27447	12189	8568
1972	6392	7533	8335	7848	7866	7184	6398	3544	3839	19820	17510	10974	8965
1973	6244	7553	8333	7803	7238	5725	4981	3793	2574	5022	17806	8100	7111
1974	6201	7525	8333	7601	6283	5725	4981	3793	2414	3623	9482	9786	6314
1975	6208	7521	8333	7803	6451	5725	4981	3743	2624	18878	15127	13075	8403
1976	6692	7558	8333	7803	7238	5725	4981	3793	2383	4038	17587	5718	6835
1977	6128	7453	8333	7803	6845	5725	5616	4141	2644	16331	16807	10613	8232
1978	6526	7404	8349	7866	7893	7211	6565	5199	2953	3743	13026	7282	7005
1979	6042	7483	8333	7803	6845	5725	5616	4741	1876	17422	16671	9097	8172
1980	6926	7474	8449	7910	7938	7261	6557	4835	3658	16570	18000	11000	8908
1981	7201	7525	8455	7967	7880	7213	6481	5013	1712	17554	30401	11815	9985
1982	6131	7375	8372	7805	7838	7238	6452	4823	2619	9710	13206	13992	7968
1983	6599	7500	8333	7877	7926	6865	6429	4558	1858	8811	20862	11192	8253
MAX	7363	7588	8455	7967	7938	7276	6565	5199	6293	23444	30401	17206	9985
MIN	4995	5400	5250	4916	4948	4508	3922	3130	1712	3141	6711	5718	5136
MEAN	6392	7428	8245	7727	7205	6095	5649	4212	2885	11579	17903	10987	8046

TABLE E.2.4.32 WITH-PROJECT DEVIL CANYON MONTHLY FLOWS (CFS), STAGE II

YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	ANNUAL
1951	6594	7646	8457	7699	6378	5801	5184	5511	8195	8231	13887	19799	8616
1952	7214	7854	8589	8012	7340	5817	5127	5305	6921	11521	19647	13441	8918
1953	8390	7916	8608	8143	7874	5820	6370	6980	7299	11538	19207	13928	9356
1954	7046	7829	8535	7939	6972	5815	5169	7073	7040	8019	23078	11579	8867
1955	6880	7913	8650	8064	7462	5863	6392	6310	7168	12512	24960	13989	9707
1956	6813	7751	8500	7908	6983	5883	5130	6583	7136	24964	22610	16496	10608
1957	6918	7939	8612	8098	7919	6199	6390	6634	7474	12291	19389	18029	9669
1958	7937	8009	8876	8138	8085	7388	6731	6565	8114	9251	20064	6989	8867
1959	6771	7792	8589	8040	7075	5908	5215	6890	7118	8476	27377	16226	9650
1960	7667	7880	8672	8155	7917	6182	6374	6418	7623	8151	15076	18930	9084
1961	8400	7914	8798	8241	8179	7464	6858	6836	7139	16676	21164	12219	10021
1962	7533	7804	8552	8011	7845	6173	6515	5548	10956	24991	22242	14767	10947
1963	7314	7775	8525	8140	7907	6416	6341	6613	6735	24381	22721	11777	10432
1964	7312	7797	8525	7929	7355	5814	5069	4305	10203	21926	15586	8840	9251
1965	7245	7794	8424	7865	7294	5785	5408	5985	7312	13330	19789	18234	9556
1966	8638	7845	8606	8022	7047	5926	5333	6296	7406	8808	19322	10844	8697
1967	6729	7752	8576	8059	6688	5923	5185	5673	7128	17231	30168	15857	10460
1968	6725	7799	8558	8036	7850	6249	6774	6583	7055	19813	16091	8433	9193
1969	6644	7681	8415	7669	6357	5809	5140	5052	7263	7720	7423	6458	6808
1970	4777	2931	2973	5037	5055	4606	3983	4591	6291	6252	12083	8700	5613
1971	6887	8000	8721	8025	7405	5875	5224	5440	6983	9026	30048	13636	9636
1972	6950	7857	8690	8213	8211	7478	6659	7348	8340	21717	18654	11902	10201
1973	6583	7730	8472	7912	7367	5806	5054	4959	7476	8415	14247	8726	7737
1974	6635	7633	8397	7659	6339	5787	5058	5909	7706	7941	7970	8834	7161
1975	6626	7666	8543	7997	6682	5956	5227	6109	7334	20576	17032	15155	9607
1976	8017	7810	8465	7942	7371	5859	5182	6159	7606	8022	13417	6469	7706
1977	6706	7918	8793	8112	7112	5975	5923	6783	7313	17964	18371	11916	9438
1978	7668	7970	8740	8156	8150	7435	6755	5772	7299	7030	10134	8229	7777
1979	6770	7862	8568	7971	6994	5788	5700	5706	8155	15006	19107	10172	9011
1980	7676	7904	8696	8089	8087	7405	6729	6072	6513	19832	20196	12342	9994
1981	7904	7863	8506	8067	8127	7421	6738	6386	8316	16835	35114	13180	11254
1982	6814	7995	8716	8191	8163	7434	6830	6434	7450	10366	14536	16427	9115
1983	7717	7822	8631	8178	8174	7035	6644	6663	8145	8071	21703	12731	9307
MAX	8638	8009	8876	8241	8211	7478	6858	7348	10956	24991	35114	19799	11254
MIN	4777	2931	2973	5037	5055	4606	3983	4305	6291	6252	7423	6458	5613
MEAN	7167	7686	8424	7931	7387	6245	5831	6106	7582	13542	19164	12583	9160

TABLE E.2.4.33 WITH-PROJECT GOLD CREEK MONTHLY FLOWS (CFS), STAGE II

YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	ANNUAL
1951	6781	7719	8527	7749	6434	5849	5479	6399	8800	9000	15415	21077	9106
1952	7608	7993	8741	8103	7426	5876	5187	5866	9123	12738	21640	14058	9552
1953	9041	8165	8788	8244	7966	5874	7144	8061	9146	12681	20431	15323	10091
1954	7527	8002	8661	8004	7047	5878	5616	8774	9063	10398	23735	13116	9681
1955	7331	8244	8844	8195	7581	5955	6643	7063	8971	13584	25575	14753	10256
1956	7066	7895	8603	7975	7059	5972	5317	8065	9448	26787	24532	18391	11474
1957	7418	8265	8785	8210	8023	6311	6629	7874	9117	13525	20542	19758	10384
1958	8678	8440	9209	8301	8187	7450	6906	7919	9003	11006	20647	7652	9476
1959	7129	7964	8747	8182	7190	6023	5436	8664	9136	10178	29801	17891	10560
1960	8101	8148	8878	8309	8037	6271	6746	6671	8905	9000	16900	20605	9713
1961	8986	8202	9043	8444	8369	7645	7398	7737	9671	18415	21981	13452	10810
1962	7885	8040	8695	8099	7951	6258	6735	6434	12965	26016	23478	15804	11566
1963	7613	7961	8655	8250	7995	6486	6482	7197	9286	26774	23182	12434	11073
1964	7726	7991	8635	8005	7413	5872	5123	6323	11141	22938	16456	9557	9799
1965	7752	7945	8511	7899	7333	5816	5486	6614	8984	15076	20967	19403	10169
1966	9331	8050	8758	8142	7166	6040	5553	7161	9898	10148	20818	11830	9432
1967	7031	7906	8715	8196	6814	6046	5327	6568	8970	19088	32316	17040	11219
1968	7026	7957	8688	8166	7971	6370	6899	7666	9253	21266	17217	9073	9827
1969	6877	7785	8466	7707	6398	5855	5262	5585	7867	8000	8000	6767	7054
1970	5032	3000	3031	5104	5114	4660	4036	5171	7867	8000	13173	9383	6140
1971	7430	8316	8943	8144	7500	5960	5331	5830	8800	10285	31318	14512	10230
1972	7247	8047	8892	8416	8406	7642	6889	10099	10093	22678	19339	12461	10887
1973	6742	7847	8554	7977	7426	5862	5107	5368	8800	9000	14987	9246	8085
1974	6869	7697	8438	7688	6373	5822	5145	6832	9022	9000	9000	9584	7630
1975	6858	7744	8661	8104	6812	6084	5403	7601	9121	21946	18176	16385	10276
1976	8716	7983	8542	8019	7442	5937	5412	7594	8934	9000	13556	6953	8189
1977	7023	8186	9043	8285	7254	6119	6097	8541	9367	19289	18975	12700	10107
1978	8286	8296	8962	8315	8297	7559	6962	5988	7867	8000	11161	8766	8207
1979	7145	8099	8704	8065	7076	5824	5783	6117	8885	16453	20332	10877	9477
1980	8052	8164	8844	8191	8172	7484	6893	6709	9320	21667	21739	13329	10749
1981	8234	8098	8592	8126	8259	7537	7034	7325	8892	19998	36750	14009	11961
1982	7837	8388	8915	8407	8341	7544	7082	7918	8991	11372	15639	17654	9845
1983	8331	8007	8793	8343	8313	7134	6856	8185	9012	9038	22825	13623	9890
MAX	9331	8440	9209	8444	8406	7645	7398	10099	12965	26787	36750	21077	11961
MIN	5032	3000	3031	5104	5114	4660	4036	5171	7867	8000	8000	6767	6140
MEAN	7597	7895	8571	8041	7489	6334	6042	7149	9204	14919	20321	13560	9785

TABLE E.2.4.34 WITH-PROJECT SUNSHINE MONTHLY FLOWS (CFS), STAGE II

YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	ANNUAL
1951	14605	10523	10746	9997	8374	7178	7706	18001	38012	47909	44104	41369	21620
1952	15474	12481	12093	10505	8913	7368	6958	15752	55841	58008	57108	37239	24906
1953	21708	12169	11202	10152	9435	7245	9926	30363	45850	44043	49175	38821	24268
1954	14049	10764	10933	9891	8676	7323	7255	20432	39177	44342	63768	31897	22489
1955	14284	12254	11508	10460	9063	7371	8557	15517	41288	59574	57382	39355	23990
1956	15781	10927	11049	9929	8717	7592	6877	22128	50384	67497	52563	42412	25602
1957	14337	11799	11468	10778	9993	8203	8560	20483	46055	52249	54642	35743	23785
1958	16363	13194	12518	10453	10034	9593	10018	37836	47235	48636	65139	27982	25892
1959	16913	11640	10904	10294	8947	7652	7974	25462	36383	45550	74632	36180	24519
1960	16292	12039	11656	10511	9804	7791	8420	25042	34402	43643	51650	41521	22822
1961	18135	11763	12114	10982	10305	9431	9981	21984	40278	55708	57701	35124	24577
1962	17087	12212	11455	10351	9711	7803	8767	19187	49561	66923	55675	33867	25334
1963	13705	10811	11361	10609	9866	7796	7762	23737	37123	73025	50940	28823	23940
1964	17753	11432	10444	9693	8814	7122	6869	15425	78540	62552	45898	23957	24949
1965	16981	12736	11897	10338	9459	7759	7658	18939	41390	52731	56359	54110	25114
1966	20351	11378	11125	10162	8898	7631	7441	14252	46555	46157	60794	30568	23047
1967	14467	10636	11096	10409	8730	7654	6871	23969	46071	69922	82710	40600	27936
1968	12879	11058	11225	10390	10080	8390	9410	28429	55104	64721	47063	21397	24294
1969	11674	10245	10254	9210	7769	7130	7264	16078	33014	37295	24031	15983	15886
1970	11349	5805	5025	6897	6806	6278	6161	19494	37161	46400	48434	27597	19048
1971	14474	12414	11616	10050	8995	7374	6920	12811	52497	51756	74023	32756	24752
1972	15766	11755	11335	10459	10204	9173	8499	25012	42352	62693	51364	34388	24535
1973	15331	11707	11490	10107	9321	7415	6750	19243	44986	39456	44718	22711	20346
1974	11320	10330	10539	9432	8083	7368	6849	19003	33877	41977	37350	26832	18656
1975	12883	10565	11046	10133	8484	7577	7037	21419	46433	64168	51095	37183	24115
1976	16439	10573	10513	9786	9308	7663	7961	24406	48167	49285	49619	21923	22242
1977	14845	12252	12130	10637	9101	7837	7870	20609	64619	63057	58707	34461	26447
1978	17935	12358	11908	10891	10180	9123	8950	15489	34601	48168	43780	25404	20823
1979	13142	11818	11665	10458	9013	7563	8244	25860	41990	66272	57662	24144	24136
1980	17017	12686	11426	10385	10173	9301	9299	15584	39572	63978	46141	29764	23050
1981	17045	12755	11500	10557	10349	9364	9550	27448	40104	74011	83050	32679	28396
1982	16746	11874	10546	9510	9830	9217	9123	20982	45277	49775	46558	48596	24068
1983	18852	13641	12365	11312	10968	8931	9219	25162	40412	42115	58206	29510	23495
MAX	21708	13641	12518	11312	10968	9593	10018	37836	78540	74011	83050	54110	28396
MIN	11320	5805	5025	6897	6806	6278	6161	12811	33014	37295	24031	15983	15886
MEAN	15636	11533	11156	10173	9285	7946	8082	21380	44676	54654	54607	32876	23609

TABLE E.2.4.35 WITH-PROJECT SUSITNA STATION MONTHLY FLOWS (CFS), STAGE II

YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	ANNUAL
1951	55011	21761	17078	14626	14055	11707	13376	53219	93888	111769	99856	83670	49413
1952	32894	20045	17720	14281	12487	10730	8862	34368	76656	101759	99128	64391	41330
1953	38686	23999	17957	15697	14107	10554	12372	43080	78259	111731	118233	102881	49190
1954	46185	24632	17898	14985	12760	11526	12306	45325	69037	84966	97388	56359	41353
1955	31732	20538	16207	14554	13354	11036	12401	49717	92548	139663	116529	79947	50136
1956	48658	22434	17609	15579	13731	10958	10531	46901	122219	128338	99800	58274	49839
1957	26561	22095	14180	13756	13664	10912	11635	49933	107511	95779	106490	65985	45056
1958	30123	26894	16874	14880	13688	12478	11801	34755	66538	87549	94631	43686	38030
1959	30223	19799	15139	14122	12338	10301	10632	44869	86421	102616	90876	41366	40122
1960	26442	20310	16024	14925	14888	13277	14830	65031	92537	127835	151503	92542	54492
1961	34681	18848	16949	14943	15998	13954	14719	60428	93741	117358	114665	78275	49802
1962	43145	24613	17233	14821	14515	11918	14351	42807	88096	157964	118230	65372	51422
1963	25277	16377	16065	14940	13582	11749	11114	45184	86982	138553	102520	66576	46013
1964	32563	16947	13845	14982	13337	10505	9786	32481	87906	117667	98433	41397	41066
1965	30458	18620	16525	14340	12982	10993	12375	52794	99874	129515	100623	82330	48691
1966	45884	26378	16409	14758	13602	11261	10076	31980	82197	107799	132328	102429	49825
1967	42920	16267	13657	13066	12106	10694	9314	19949	53169	102204	120486	72763	40813
1968	36750	19633	16004	14890	14745	12109	18011	80071	120970	127272	93898	39965	49811
1969	16543	14399	13867	14419	12256	11034	12959	78601	112426	106927	79830	39255	42937
1970	29460	11370	7915	10983	11035	9992	11179	63458	107493	128069	108870	56455	46644
1971	22275	17677	15379	14744	12793	10290	9904	41656	103178	126043	115109	65877	46487
1972	26044	15402	14273	14773	14006	12008	12326	46186	93668	126346	102305	60030	45027
1973	27228	21123	16280	13965	12572	10153	9302	39356	85864	90169	85611	59739	39448
1974	30144	18167	15721	15117	13588	12532	13970	59129	72853	82662	80642	52636	39133
1975	22617	16466	16475	15185	13144	11732	10702	40386	104931	129821	91158	78236	46100
1976	32433	15995	13495	13541	12148	10402	12951	63743	91638	106567	91922	49369	43107
1977	33100	23955	19765	16572	14515	11416	10727	52814	136429	139559	125554	84333	55978
1978	38842	19425	14659	13268	13397	12544	12419	42673	79670	104886	96405	55784	42234
1979	38742	20857	16349	15489	13726	11665	13462	72841	104342	130017	127743	77832	53910
1980	59665	35269	21099	16574	15739	14990	17598	61485	122530	168263	129041	91476	63155
1981	35210	20974	15239	13881	13859	12135	16313	73899	97584	140209	157254	67269	55712
1982	33943	22679	18229	15154	13808	11791	11170	39232	90675	101635	95731	109195	47083
1983	35412	20596	16348	14448	14714	12583	12980	56182	87708	91672	105897	52378	43645
MAX	59665	35269	21099	16574	15998	14990	18011	80071	136429	168263	157254	109195	63155
MIN	16543	11370	7915	10983	11035	9992	8862	19949	53169	82662	79830	39255	38030
MEAN	34541	20441	16014	14614	13553	11574	12317	50440	93622	117066	107536	67820	46879

TABLE E.2.4.36 MONTHLY MAXIMUM, MINIMUM AND MEAN FLOWS AT DEVIL CANYON (CFS)

STAGE II - WATANA (LOW) - DEVIL CANYON OPERATIONS

MONTH	NATURAL CONDITIONS			WITH PROJECT CONDITIONS		
	MAX	MIN	MEAN	MAX	MIN	MEAN
OCT	7518	2867	5363	8638	4777	7167
NOV	3955	1146	2402	8009	2931	7686
DEC	2905	810	1703	8876	2973	8424
JAN	2212	687	1429	8241	5037	7931
FEB	1858	682	1216	8211	5055	7387
MAR	1779	664	1086	7478	4606	6245
APR	2405	697	1340	6858	3983	5831
MAY	19777	3428	12462	7348	4305	6106
JUN	47814	14710	26043	10956	6291	7582
JUL	32388	15651	23075	24991	6252	13542
AUG	35256	8484	20654	35114	7423	19164
SEP	19799	4796	12555	19799	6458	12583
ANNUAL	11254	5352	9159	11254	5613	9160

TABLE E.2.4.37 MONTHLY MAXIMUM,MINIMUM AND MEAN FLOWS AT GOLD CREEK (CFS)

STAGE II - WATANA (LOW) - DEVIL CANYON OPERATIONS

MONTH	NATURAL CONDITIONS			WITH PROJECT CONDITIONS		
	MAX	MIN	MEAN	MAX	MIN	MEAN
OCT	8212	3124	5825	9331	5032	7597
NOV	4192	1215	2589	8440	3000	7895
DEC	3264	866	1844	9209	3031	8571
JAN	2452	724	1543	8444	5104	8041
FEB	2028	723	1317	8406	5114	7489
MAR	1900	713	1169	7645	4660	6334
APR	2650	745	1441	7398	4036	6042
MAY	21890	3745	13483	10099	5171	7149
JUN	50580	15500	27795	12965	7867	9204
JUL	34400	16100	24390	26787	8000	14919
AUG	37870	8879	21911	36750	8000	20321
SEP	21240	5093	13493	21077	6767	13560
ANNUAL	11961	5596	9785	11961	6140	9785

TABLE E.2.4.38 MONTHLY MAXIMUM, MINIMUM AND MEAN FLOWS AT SUNSHINE (CFS)

STAGE II - WATANA (LOW) - DEVIL CANYON OPERATIONS

MONTH	NATURAL CONDITIONS			WITH PROJECT CONDITIONS		
	MAX	MIN	MEAN	MAX	MIN	MEAN
OCT	20837	8176	13799	21708	11320	15636
NOV	8775	4020	6185	13641	5805	11533
DEC	6547	2675	4426	12518	5025	11156
JAN	5216	2228	3674	11312	6897	10173
FEB	4664	2095	3115	10968	6806	9285
MAR	3920	1972	2786	9593	6278	7946
APR	5528	2233	3585	10018	6161	8082
MAY	43121	10799	27674	37836	12811	21380
JUN	116152	40702	63268	78540	33014	44676
JUL	85600	45226	64143	74011	37295	54654
AUG	84940	25092	56148	83050	24031	54607
SEP	54110	14320	32867	54110	15983	32876
ANNUAL	28262	14431	23607	28396	15886	23609

TABLE E.2.4.39 MONTHLY MAXIMUM,MINIMUM AND MEAN FLOWS AT SUSITNA STATION (CFS)

STAGE II - WATANA (LOW) - DEVIL CANYON OPERATIONS

MONTH	NATURAL CONDITIONS			WITH PROJECT CONDITIONS		
	MAX	MIN	MEAN	MAX	MIN	MEAN
OCT	58640	13476	32777	59665	16543	34541
NOV	31590	8251	15063	35269	11370	20441
DEC	14690	5753	9267	21099	7915	16014
JAN	10120	6365	8112	16574	10983	14614
FEB	9413	5614	7383	15998	11035	13553
MAR	8906	5271	6412	14990	9992	11574
APR	13029	4613	7684	18011	8862	12317
MAY	88470	28713	56770	80071	19949	50440
JUN	165900	73838	112256	136429	53169	93622
JUL	181400	92511	126590	168263	82662	117066
AUG	159600	80891	109084	157254	79830	107536
SEP	109700	37592	67721	109195	39255	67820
ANNUAL	63159	38030	46871	63155	38030	46879

TABLE E.2.4.40: SUSITNA HYDROELECTRIC PROJECT DEVIL CANYON
CONE VALVE OPERATION THREE STAGE PROJECT, STAGE II

Year	Week of First Release	Week of Maximum Release	Duration of Release	Maximum Release	Power-house Flow	Total Release	Maximum Watana Release During Period
			Weeks	cfs	cfs	ac-ft	cfs
1950	Aug 12	Aug 19	3	7,224	9,438	192,000	16,096
1951	Aug 5	Sept 2	8	18,670	9,584	991,000	24,000
1952	July 22	July 29	10	31,395	3,135	1,142,000	24,000
1953	July 15	July 29	10	14,870	9,135	1,146,000	20,931
1954	July 29	Aug 5	8	14,462	9,161	1,062,000	23,280
1955	July 15	Aug 26	10	35,491	700	1,736,000	24,000
1956	July 1	July 15	13	23,898	6,283	2,327,000	24,000
1957	July 15	July 22	11	15,793	8,788	1,444,000	22,198
1958	July 29	July 29	5	26,020	3,371	876,000	24,000
1959	July 29	Aug 19	7	38,000	430	1,841,000	24,000
1960	Aug 5	Sept 9	9	16,303	10,283	1,039,000	22,570
1961	July 8	Aug 5	12	15,895	9,166	1,402,000	23,083
1962	June 24	June 24	14	20,975	8,161	2,362,000	24,000
1963	July 8	July 15	10	33,185	2,222	2,288,000	24,000
1964	June 24	July 8	11	16,189	8,820	1,318,000	22,938
1965	July 15	Aug 12	12	20,500	8,211	1,558,000	24,000
1966	July 29	July 29	8	15,626	9,153	823,000	22,511
1967	July 15	Aug 12	10	38,000	0	2,636,000	24,000
1968	July 1	July 8	11	16,504	8,821	1,172,000	22,504
1969	--	--	--	--	--	--	5,751
1970	Aug 12	Aug 19	4	9,464	9,446	237,000	16,486
1971	July 29	Aug 5	7	38,000	0	1,891,000	24,000
1972	June 24	July 8	13	15,443	8,818	1,619,000	22,096
1973	Aug 12	Aug 26	4	12,510	9,750	415,000	20,593
1974	Sept 2	Sept 2	2	5,574	10,012	91,000	13,395
1975	July 8	July 8	12	20,910	7,526	1,602,000	24,000
1976	Aug 5	Aug 12	4	11,185	9,301	277,000	19,534
1977	July 1	July 15	12	15,230	8,775	1,338,000	21,740
1978	Aug 12	Aug 12	4	6,412	9,295	164,000	14,572
1979	July 15	July 22	8	25,737	5,131	1,204,000	24,000
1980	July 8	July 15	11	26,498	5,087	1,641,000	24,000
1981	July 15	Aug 12	10	38,000	0	2,876,000	24,000
1982	July 22	Sept 16	10	14,207	10,505	875,000	21,010
1983	July 29	Aug 5	8	16,221	9,167	980,000	22,829

TABLE E.2.4.41: SUSITNA HYDROELECTRIC PROJECT
SIMULATED STREAM TEMPERATURES
STAGE II
WEATHER PERIOD: SUMMER 1981
CASE E-VI FLOW REQUIREMENTS
STAGED CONSTRUCTION
50 FT DRAWDOWN AT DEVIL CANYON
2 LEVEL INTAKE
PROPOSED PROJECT

RIVER MILE	31	32	33 (MAY)	34	35	36	37	38 (JUNE)	39	40	41	42 (JULY)	43	44
150 1/	2.4	3.0	3.9	4.4	4.9	6.0	5.6	4.8	6.5	8.4	7.7	5.9	5.1	9.1
140	2.7	3.4	4.3	4.8	5.4	6.3	6.1	5.4	6.9	8.7	8.1	6.3	5.4	9.3
130	3.0	3.9	4.7	5.3	6.0	6.4	6.6	6.1	7.2	8.6	7.7	6.6	5.7	9.3
120	3.3	4.5	5.3	5.9	6.7	6.8	7.2	6.8	7.7	9.0	8.2	7.0	6.0	9.6
110	3.6	5.0	5.9	6.4	7.4	7.2	7.8	7.5	8.1	9.4	8.7	7.4	6.3	9.8
99 2/	3.9	5.5	6.4	7.0	8.1	7.5	8.4	8.2	8.6	9.7	9.1	7.8	6.7	10.0
98 3/	4.0	5.5	6.2	6.5	7.3	6.6	7.7	8.0	7.7	8.2	7.8	7.7	6.2	8.9
84 4/	4.4	6.3	7.1	7.3	8.3	7.2	8.6	9.0	8.5	8.8	8.4	8.5	8.2	9.5

RIVER MILE	45	46	47 (AUGUST)	48	49	50 (SEPTEMBER)	51	52	1	2	3	4	5
150 1/	9.9	9.5	8.7	9.0	9.7	9.7	9.6	9.0	8.3	7.8	7.3	6.7	5.9
140	10.0	9.5	8.8	9.2	9.7	9.7	9.6	8.8	7.9	7.5	7.0	6.4	5.3
130	10.0	9.4	8.8	9.2	9.7	9.5	9.4	8.3	7.3	7.0	6.5	5.9	4.6
120	10.2	9.5	9.0	9.4	9.8	9.5	9.3	8.0	6.9	6.7	6.2	5.5	4.0
110	10.4	9.5	9.1	9.6	9.9	9.5	9.3	7.8	6.6	6.5	5.9	5.3	3.4
99 2/	10.6	9.6	9.3	9.8	10.0	9.5	9.3	7.5	6.2	6.1	5.6	4.9	2.7
98 3/	9.2	8.2	8.3	8.6	8.2	7.9	7.3	5.3	4.5	4.6	4.3	3.6	1.9
84 4/	9.6	8.3	8.6	9.1	8.4	7.9	7.2	4.7	4.0	4.1	3.8	3.1	1.1

1/ Downstream of Devil Canyon Dam Site
2/ Upstream of Chulitna-Susitna confluence
3/ Downstream of Chulitna-Susitna confluence
4/ At Sunshine stream gaging station

TABLE E.2.4.42: SUSITNA HYDROELECTRIC PROJECT
SIMULATED STREAM TEMPERATURES
STAGE II
WEATHER PERIOD: SUMMER 1982
CASE E-VI FLOW REQUIREMENTS
STAGED CONSTRUCTION
50 FT DRAWDOWN AT DEVIL CANYON
2 LEVEL INTAKE
PROPOSED PROJECT

RIVER	MAY						JUNE					JULY		
MILE	31	32	33	34	35	36	37	38	39	40	41	42	43	44
150 1/	3.1	3.2	3.5	3.9	4.1	4.3	4.9	6.4	7.9	5.7	5.1	7.3	8.3	6.9
140	3.3	3.4	3.8	4.1	4.5	4.7	5.2	6.7	8.4	6.3	5.6	7.8	8.5	7.1
130	3.7	3.6	4.1	4.4	4.9	5.0	5.4	7.0	8.6	6.8	6.2	8.1	8.5	7.4
120	4.1	3.9	4.6	4.9	5.5	5.5	5.8	7.5	9.2	7.4	6.8	8.7	8.9	7.8
110	4.4	4.2	5.0	5.3	6.0	5.9	6.2	8.0	9.8	7.9	7.4	9.2	9.2	8.1
99 2/	4.8	4.5	5.4	5.7	6.5	6.4	6.5	8.5	10.4	8.6	8.1	9.8	9.6	8.5
98 3/	4.7	4.4	5.3	5.5	6.3	6.5	6.1	6.8	8.7	7.8	7.6	8.4	7.9	8.2
84 4/	5.2	4.8	6.0	6.1	7.2	7.6	6.7	7.8	9.8	8.7	8.6	9.4	8.7	9.1

RIVER	AUGUST				SEPTEMBER			
MILE	45	46	47	48	49	50	51	52
150 1/	8.2	8.8	9.7	9.1	9.8	9.5	9.9	9.9
140	8.5	9.0	9.9	9.2	9.8	9.5	9.8	9.7
130	8.7	9.1	10.0	9.3	9.6	9.3	9.6	9.3
120	9.1	9.4	10.3	9.5	9.7	9.4	9.6	9.2
110	9.5	9.7	10.6	9.7	9.8	9.4	9.6	9.1
99 2/	9.9	10.0	10.9	9.9	9.8	9.5	9.5	8.9
98 3/	8.6	8.4	9.0	7.8	8.0	7.5	6.8	6.5
84 4/	9.4	9.1	9.6	8.4	8.1	7.5	6.7	6.0

1/ Downstream of Devil Canyon Dam Site
2/ Upstream of Chulitna-Susitna confluence
3/ Downstream of Chulitna-Susitna confluence
4/ At Sunshine stream gaging station

TABLE E.2.4.43: SUSITNA HYDROELECTRIC PROJECT
SIMULATED STREAM TEMPERATURES
STAGE II
WEATHER PERIOD: SUMMER 1981
CASE E-V1 FLOW REQUIREMENTS
STAGED CONSTRUCTION
50 FT DRAWDOWN AT DEVIL CANYON
3 LEVEL INTAKE5/

River	May					June				July				
Mile	31	32	33	34	35	36	37	38	39	40	41	42	43	44
150 1/	2.4	3.0	3.9	4.4	5.1	6.3	6.0	6.6	7.0	7.3	7.3	6.1	5.0	9.0
140	2.7	3.4	4.3	4.8	5.6	6.5	6.5	7.1	7.4	7.7	7.7	6.4	5.3	9.1
130	3.0	3.9	4.7	5.3	6.1	6.6	6.9	7.5	7.5	7.8	7.5	6.7	5.6	9.2
120	3.3	4.5	5.3	5.9	6.9	7.0	7.5	8.2	8.0	8.3	8.0	7.1	6.0	9.4
110	3.6	5.0	5.9	6.4	7.5	7.3	8.1	8.8	8.4	8.7	8.4	7.5	6.2	9.6
99 2/	3.9	5.5	6.4	7.0	8.2	7.7	8.7	9.4	8.9	9.1	8.9	7.9	6.6	9.9
98 3/	4.0	5.5	6.2	6.5	7.4	6.7	7.8	8.3	7.8	8.0	7.8	7.7	7.2	8.9
84 4/	4.4	6.3	7.1	7.3	8.3	7.2	8.6	9.3	8.5	8.7	8.4	8.5	8.1	9.5

River	August				September				October				
Mile	45	46	47	48	49	50	51	52	1	2	3	4	5
150 1/	9.9	9.5	8.7	9.0	9.7	9.7	9.6	9.0	8.3	7.8	7.3	6.7	5.9
140	10.0	9.5	8.8	9.1	9.8	9.7	9.6	8.8	7.9	7.5	7.0	6.4	5.4
130	10.0	9.4	8.8	9.2	9.7	9.5	9.4	8.3	7.4	7.1	6.6	6.0	4.7
120	10.2	9.5	9.0	9.4	9.8	9.5	9.3	8.0	7.0	6.8	6.3	5.6	4.0
110	10.4	9.5	9.1	9.6	9.9	9.5	9.3	7.8	6.6	6.6	6.0	5.4	3.5
99 2/	10.5	9.6	9.3	9.8	10.1	9.5	9.3	7.5	6.2	6.2	5.6	5.0	2.7
98 3/	9.2	8.2	8.3	8.6	8.2	7.9	7.3	5.3	4.5	4.6	4.3	3.7	1.9
84 4/	9.6	8.3	8.6	9.1	8.4	7.9	7.2	4.7	4.0	4.2	3.9	3.2	1.1

1/ Downstream of Devil Canyon Dam Site
2/ Upstream of Chulitna - Susitna confluence
3/ Downstream of Chulitna - Susitna confluence
4/ At Sunshine Stream gaging station
5/ For comparison with proposed project (See Table E.2.4.52)

TABLE E.2.4.44: SUSITNA HYDROELECTRIC PROJECT
SIMULATED STREAM TEMPERATURES
WEATHER PERIOD: SUMMER 1982
CASE E-V1 FLOW REQUIREMENTS
STAGED CONSTRUCTION
STAGE II
50 FT DRAWDOWN AT DEVIL CANYON
3 LEVEL INTAKE 5/

River	May					June				July				
Mile	31	32	33	34	35	36	37	38	39	40	41	42	43	44
150 1/	3.0	3.2	3.5	3.9	4.1	4.3	4.9	6.3	8.0	6.4	7.4	8.6	8.6	6.8
140	3.3	3.4	3.7	4.1	4.5	4.7	5.2	6.7	8.4	6.9	7.8	9.9	8.8	7.1
130	3.7	3.6	4.1	4.4	4.9	5.0	5.4	6.9	8.6	7.3	8.1	9.9	8.7	7.4
120	4.1	3.9	4.5	4.9	5.5	5.5	5.8	7.5	9.2	7.9	8.6	10.4	9.1	7.8
110	4.4	4.2	5.0	5.2	6.0	5.9	6.2	8.0	9.8	8.4	9.1	10.8	9.4	8.1
99 2/	4.8	4.5	5.4	5.6	6.5	6.3	6.5	8.5	10.4	9.0	9.6	11.3	9.8	8.5
98 3/	4.7	4.4	5.3	5.4	6.3	6.5	6.1	6.8	8.7	7.9	8.1	8.8	8.0	8.1
84 4/	5.2	4.7	5.9	6.1	7.2	7.6	6.7	7.8	9.8	8.8	8.9	9.7	8.7	9.1

River	August				September			
Mile	45	46	47	48	49	50	51	52
150 1/	8.2	8.7	9.6	9.0	9.5	8.8	9.2	9.8
140	8.5	8.9	9.8	9.2	9.6	8.8	9.2	9.6
130	8.7	9.1	9.9	9.2	9.4	8.7	9.0	9.2
120	9.1	9.4	10.2	9.4	9.5	8.8	9.0	9.1
110	9.4	9.7	10.5	9.6	9.6	8.8	9.0	9.0
99 2/	9.9	10.0	10.9	9.9	9.7	8.9	9.0	8.8
98 3/	8.6	8.4	8.9	7.8	7.9	7.2	6.6	6.5
84 4/	9.4	9.1	9.6	8.4	8.0	7.2	6.6	6.0

1/ Downstream of Devil Canyon Dam Site
2/ Upstream of Chulitna - Susitna confluence
3/ Downstream of Chulitna - Susitna confluence
4/ At Sunshine Stream gaging station
5/ For comparison with proposed project (Table E.2.4.53)

TABLE E.2.4.45: SUSITNA HYDROELECTRIC PROJECT
SIMULATED STREAM TEMPERATURES
STAGE II
WEATHER PERIOD: SUMMER 1981
CASE E-VI FLOW REQUIREMENTS
STAGED CONSTRUCTION
9 FT DRAWDOWN AT DEVIL CANYON
2 LEVEL INTAKE5/

RIVER		MAY					JUNE				JULY			
MILE	31	32	33	34	35	36	37	38	39	40	41	42	43	44
1501/	2.4	3.0	3.9	4.4	4.8	5.9	7.9	9.8	7.0	5.4	6.3	7.4	4.9	8.7
140	2.7	3.4	4.3	4.8	5.4	6.1	8.2	10.1	7.4	5.9	7.0	7.6	5.2	8.9
130	3.0	3.9	4.7	5.3	6.0	6.3	8.4	10.1	7.6	6.3	7.0	7.7	5.5	9.0
120	3.3	4.5	5.3	6.0	6.8	6.7	9.0	10.7	8.1	6.9	7.5	8.1	5.8	9.2
110	3.6	5.0	5.9	6.5	7.5	7.1	9.4	11.1	8.5	7.4	8.0	8.4	6.1	9.4
992/	3.9	5.5	6.4	7.1	8.2	7.4	9.9	11.6	8.9	7.9	8.5	8.8	6.5	9.7
983/	4.1	5.5	6.2	6.5	7.3	6.6	8.2	8.9	7.8	7.6	7.7	8.0	7.1	8.8
844/	4.5	6.3	7.1	7.3	8.3	7.1	8.9	9.7	8.5	8.4	8.3	8.7	8.1	9.4

RIVER		AUGUST				SEPTEMBER				OCTOBER			
MILE	45	46	47	48	49	50	51	52	1	2	3	4	5
1501/	9.9	9.5	8.7	9.1	9.7	9.7	9.6	9.0	8.3	7.8	7.3	6.8	5.9
140	10.1	9.5	8.8	9.2	9.8	9.7	9.6	8.8	7.9	7.5	7.0	6.4	5.4
130	10.1	9.4	8.9	9.3	9.7	9.5	9.4	8.3	7.3	7.0	6.5	5.9	4.7
120	10.3	9.5	9.0	9.5	9.8	9.5	9.3	8.0	6.9	6.7	6.2	5.5	4.0
110	10.4	9.6	9.1	9.6	9.9	9.5	9.3	7.8	6.6	6.5	5.9	5.3	3.4
992/	10.6	9.7	9.3	9.9	10.1	9.5	9.3	7.5	6.2	6.2	5.6	4.9	2.7
983/	9.2	8.2	8.3	8.6	8.2	7.9	7.3	5.3	4.5	4.6	4.3	3.6	1.9
844/	9.6	8.3	8.6	9.2	8.4	7.9	7.2	4.7	4.0	4.1	3.8	3.2	1.1

1/ Downstream of Devil Canyon Dam Site
2/ Upstream of Susitna - Chulitna confluence
3/ Downstream of Susitna - Chulitna confluence
4/ At Sunshine stream gaging station
5/ For comparison with proposed project (see Table E.2.4.52)

TABLE E.2.4.46: SUSITNA HYDROELECTRIC PROJECT
SIMULATED STREAM TEMPERATURES
STAGE II
WEATHER PERIOD: SUMMER 1982
CASE E-VI FLOW REQUIREMENTS
STAGED CONSTRUCTION
9 FT DRAWDOWN AT DEVIL CANYON
2 LEVEL INTAKE 5/

RIVER	MAY				JUNE					JULY				
MILE	31	32	33	34	35	36	37	38	39	40	41	42	43	44
150 1/	3.1	3.3	3.6	4.0	4.2	4.3	4.9	6.3	7.5	8.8	9.8	10.4	7.4	6.7
140	3.4	3.5	3.8	4.2	4.5	4.7	5.2	6.7	8.0	9.1	10.1	10.7	7.6	7.0
130	3.8	3.7	4.2	4.5	4.9	5.0	5.4	6.9	8.3	9.2	9.9	10.6	7.7	7.3
120	4.2	4.0	4.6	4.9	5.5	5.5	5.8	7.5	9.0	9.7	10.4	11.0	8.1	7.7
110	4.5	4.3	5.0	5.3	6.0	5.9	6.2	8.0	9.5	10.1	10.7	11.4	8.4	8.0
99 2/	5.0	4.5	5.5	5.7	6.5	6.4	6.6	8.5	10.2	10.5	11.1	11.9	8.7	8.4
98 3/	4.8	4.4	5.3	5.5	6.3	6.5	6.1	6.8	8.6	8.4	8.5	9.0	7.8	8.1
84 4/	5.3	4.8	6.0	6.1	7.2	7.6	6.7	7.8	9.8	9.1	9.2	9.8	8.6	9.1

RIVER	AUGUST				SEPTEMBER			
MILE	45	46	47	48	49	50	51	52
150 1/	8.1	8.6	9.5	9.0	9.4	8.7	8.7	9.7
140	8.4	8.8	9.7	9.1	9.4	8.7	8.7	9.5
130	8.6	8.9	9.8	9.2	9.3	8.6	8.5	9.1
120	9.1	9.3	10.2	9.4	9.4	8.7	8.5	9.0
110	9.4	9.5	10.4	9.6	9.5	8.7	8.6	8.9
99 2/	9.8	9.9	10.8	9.8	9.5	8.8	8.6	8.7
98 3/	8.6	8.4	8.9	7.8	7.8	7.2	6.4	6.4
84 4/	9.4	9.1	9.6	8.4	8.0	7.2	6.4	6.0

1/ Downstream of Devil Canyon Dam Site
2/ Upstream of Susitna - Chulitna confluence
3/ Downstream of Susitna - Chulitna confluence
4/ At Sunshine stream gaging station
5/ For comparison with proposed project (see Table E.2.4.53)

TABLE E.2.4.47: SUSITNA HYDROELECTRIC PROJECT
SIMULATED STREAM TEMPERATURES
STAGE II
WEATHER PERIOD: SUMMER 1981
CASE E-I FLOW REQUIREMENTS
STAGED CONSTRUCTION
50 FT DRAWDOWN AT DEVIL CANYON
2 LEVELS OF PORTS 5/

RIVER	MAY					JUNE					JULY			
MILE	31	32	33	34	35	36	37	38	39	40	41	42	43	44
150 1/	2.2	2.9	3.8	4.3	4.7	5.9	4.7	8.6	9.5	9.5	10.2	8.9	5.4	8.2
140	2.5	3.3	4.2	4.8	5.3	6.1	5.0	8.9	9.7	9.6	10.2	9.1	5.7	8.3
130	2.9	3.9	4.7	5.3	5.9	6.3	5.4	9.2	9.6	9.6	9.7	8.9	6.1	8.5
120	3.3	4.5	5.4	6.0	6.8	6.7	5.8	9.6	9.9	9.8	9.9	9.3	6.5	8.7
110	3.6	5.0	6.0	6.6	7.5	7.0	6.2	10.0	10.1	10.0	10.2	9.6	6.8	8.9
99 2/	4.0	5.6	6.5	7.2	8.2	7.4	6.6	10.4	10.4	10.3	10.4	9.9	7.2	9.2
98 3/	4.1	5.5	6.2	6.6	7.3	6.6	7.0	8.9	8.4	8.7	8.3	8.2	7.5	8.5
84 4/	4.5	6.3	7.1	7.3	8.3	7.2	7.9	9.7	9.0	9.1	8.7	8.9	8.5	9.2

RIVER	AUGUST				SEPTEMBER							
MILE	45	46	47	48	49	50	51	52	1	2	3	4	5
150 1/	9.7	9.1	8.4	8.8	9.5	9.6	9.5	8.9	8.1	7.7	7.2	6.6	5.8
140	9.8	9.2	8.6	9.0	9.6	9.6	9.5	8.7	7.8	7.4	6.9	6.3	5.3
130	9.8	9.1	8.6	9.0	9.5	9.4	9.3	8.2	7.2	6.9	6.4	5.8	4.6
120	10.0	9.2	8.7	9.2	9.7	9.4	9.2	7.9	6.8	6.6	6.1	5.4	3.9
110	10.2	9.2	8.9	9.4	9.8	9.4	9.2	7.7	6.5	6.4	5.8	5.2	3.3
99 2/	10.4	9.3	9.0	9.6	9.9	9.4	9.2	7.4	6.1	6.1	5.5	4.8	2.6
98 3/	9.1	8.1	8.2	8.5	8.1	7.9	7.3	5.3	4.5	4.5	4.2	3.6	1.8
84 4/	9.5	8.2	8.5	9.1	8.3	7.8	7.2	4.7	4.0	4.1	3.8	3.1	1.1

1/ Downstream of Devil Canyon Dam Site
2/ Upstream of Susitna - Chulitna confluence
3/ Downstream of Susitna - Chulitna confluence
4/ At Sunshine stream gaging station
5/ For comparison with proposed project see Table E.2.4.52

TABLE E.2.4.48: SUSITNA HYDROELECTRIC PROJECT
SIMULATED STREAM TEMPERATURES
STAGE II
WEATHER PERIOD: SUMMER 1982
CASE E-I FLOW REQUIREMENTS
STAGED CONSTRUCTION
50 FT DRAWDOWN AT DEVIL CANYON
q LEVELS OF PORTS5/

RIVER			MAY				JUNE					JULY		
MILE	31	32	33	34	35	36	37	38	39	40	41	42	43	44
150 1/	3.0	3.2	3.5	4.0	4.2	4.4	4.3	6.1	7.0	7.6	8.5	9.1	9.0	8.8
140	3.3	3.4	3.8	4.2	4.6	4.7	4.5	6.4	7.4	7.9	8.8	9.4	9.2	9.1
130	3.8	3.7	4.2	4.5	5.0	5.0	4.7	6.7	7.7	8.2	8.9	9.5	9.1	9.2
120	4.2	4.1	4.8	5.0	5.6	5.5	5.0	7.1	8.3	8.6	9.3	9.9	9.4	9.6
110	4.6	4.4	5.2	5.5	6.2	5.9	5.2	7.5	8.8	9.0	9.7	10.3	9.7	9.9
99 2/	5.1	4.7	5.7	5.9	6.7	6.3	5.5	7.9	9.3	9.4	10.0	10.7	10.0	10.4
98 3/	4.9	4.4	5.4	5.5	6.4	6.5	5.6	6.9	8.5	8.2	8.4	8.9	8.1	8.7
84 4/	5.3	4.8	6.1	6.2	7.3	7.6	6.3	7.8	9.7	9.0	9.1	9.7	8.8	9.6

RIVER			AUGUST			SEPTEMBER		
MILE	45	46	47	48	49	50	51	52
150 1/	8.9	8.7	9.1	9.4	10.5	10.5	9.0	9.5
140	9.2	9.0	9.3	9.5	10.5	10.4	9.0	9.4
130	9.3	9.1	9.4	9.5	10.2	9.9	8.7	9.0
120	9.8	9.4	9.8	9.7	10.3	9.9	8.8	8.9
110	10.1	9.6	10.0	9.9	10.3	9.9	8.8	8.8
99 2/	10.5	10.0	10.4	10.1	10.3	9.9	8.8	8.6
98 3/	8.8	8.4	8.8	7.9	8.1	7.2	6.4	6.4
84 4/	9.5	9.1	9.5	8.5	8.2	7.2	6.4	5.9

1/ Downstream of Devil Canyon Dam Site
2/ Upstream of Susitna - Chulitna confluence
3/ Downstream of Susitna - Chulitna confluence
4/ At Sunshine Stream gaging station
5/ For comparison with proposed project (see Table E.2.4.53)

TABLE E.2.4.49: SEDIMENT CONCENTRATION (MG/L)
STAGE II

Month	Range of Observed Natural Conditions 1/	Estimated Range of Natural Conditions (1982) 2/	Range of Monthly Average Concentration Average Year (1982) 3/	Range of Extreme Concentrations Average Year (1982)
January	4-8	1-20	50-70	50-75
February	N/A	1-30	40-50	30-60
March	1-6	1-20	35-45	30-50
April	N/A	30-170	25-35	25-35
May	65-1110	130-1270	25-30	10-35
June	151-1860	930-1470	50-60	20-100
July	100-2790	600-1600	100-120	70-140
August	158-1040	200-1070	100-120	80-130
September	23-812	200-1530	80-100	70-130
October	6-140	1-30	80	75-85
November	N/A	1-30	80	75-80
December	N/A	1-30	70-75	60-80

1/ Based on observations by the U.S. Geological Survey on the Susitna River near Cantwell (1962-1972, 1980-1982) and on the Susitna River at Gold Creek (1974-To present).

2/ Based on suspended sediment concentration vs. flow relationship on Susitna River near Cantwell.

3/ Based on simulations of 3 years.

TABLE E.2.4.50: PERCENT OF TIME NAVIGATION FLOWS EXCEEDED DURING STAGE II OPERATION

	Gold Creek 1/		Sunshine 2/		Susitna Station 3	
	Nautural	Stage II 2002 Load	Natural	Stage II 2002 Load	Natural	Stage II 2002 Load
27 May - 2 Jun	100	100	94	80	88	68
3 Jun - 9 Jun	100	100	100	97	100	90
10 Jun - 16 Jun	100	100	100	100	100	92
17 Jun - 23 Jun	100	100	100	100	100	98
24 Jun - 30 Jun	100	100	100	100	100	100
1 Jul - 7 Jul	100	100	100	100	100	100
8 Jul - 14 Jul	100	100	100	100	100	100
15 Jul - 21 Jul	100	100	100	100	100	100
22 Jul - 28 Jul	100	100	100	100	100	100
29 Jul - 4 Aug	100	100	100	100	100	100
5 Aug - 11 Aug	100	100	100	100	100	100
12 Aug - 18 Aug	100	100	97	96	100	100
19 Aug - 25 Aug	100	100	96	96	97	97
26 Aug - 1 Sep	98	100	93	94	96	96
2 Sep - 8 Sep	100	100	91	88	75	73
9 Sep - 15 Sep	97	100	82	81	63	62
16 Sep - 22 Sep	94	100	67	65	62	60
23 Sep - 30 Sep	84	100	43	48	42	43

1/ Estimated navigable flow = 6,000 cfs at Gold Creek, for Portage Creek to Chulitna River.

2/ Estimated navigable flow = 25,000 cfs at Sunshine, for navigable channels to all tributaries, Chulitna River to Yentna River. Jet boats observed operating on main channel at 17,800 cfs.

3/ Estimated flow for jet boat to navigate Alexander Slough = 60,000 cfs at Susitna Station. Estimate based on aerial photography. Flow value dependent on channel morphology of Alexander Slough.

TABLE E.2.4.51 WITH-PROJECT WATANA MONTHLY FLOWS (CFS), EARLY STAGE III

YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	ANNUAL
1951	7148	7916	8722	8043	7927	7134	6281	4897	3130	4324	10068	17206	7721
1952	6804	7784	8631	7956	7882	7086	6304	5286	3321	4521	16118	11571	7777
1953	7330	7724	8610	7957	7857	7076	6259	4304	3289	7695	16682	11514	8035
1954	6387	7809	8662	7999	7881	7098	6260	3910	3517	3393	16682	9166	7401
1955	6214	7744	8604	7931	7823	7062	6256	4839	3623	7342	22795	14214	8719
1956	6464	7844	8671	8018	7883	7072	6285	4267	3354	16115	19153	13194	9051
1957	6186	7722	8615	7950	7827	7039	6250	4549	3289	8889	17318	14841	8381
1958	6719	7638	8422	7878	7815	7042	6223	4699	3038	8354	19169	6077	7778
1959	6303	7813	8632	7955	7835	7055	6239	4065	3604	2888	19837	13776	8003
1960	6928	7739	8571	7912	7825	7045	6257	4774	3285	3029	16036	16086	7954
1961	7445	7749	8522	7835	7770	6957	6098	4445	3309	13170	19480	10146	8603
1962	6933	7826	8648	7963	7850	7052	6251	5237	3683	23444	19887	12746	9833
1963	6777	7863	8652	7954	7819	7079	6309	4467	3615	18572	21011	10800	9278
1964	6663	7815	8659	7997	7879	7093	6304	5443	3076	16345	14048	7524	8263
1965	6424	7824	8705	8026	7907	7105	6302	5015	3487	6952	17394	16226	8451
1966	7520	7799	8630	7960	7846	7042	6209	4859	3252	2966	15145	9214	7374
1967	6401	7847	8656	7954	7841	7055	6259	4746	3587	8744	25849	13938	9096
1968	6380	7810	8633	7945	7822	7015	6220	4586	3399	15003	14148	7441	8055
1969	6466	7887	8737	8053	7935	7128	6299	5129	3631	3821	6711	6479	6516
1970	6926	7673	7915	7268	7192	6424	5497	4735	4132	3711	3716	5478	5880
1971	6434	7811	8727	8110	8020	7226	6425	5539	3779	2845	9374	12189	7196
1972	6593	7800	8574	7867	7745	6964	6186	3970	3210	19820	17510	11041	8970
1973	6512	7876	8690	8010	7878	7098	6310	5360	3385	3119	12910	8165	7111
1974	6468	7919	8743	8055	7939	7134	6336	4643	3204	2997	6116	6257	6309
1975	7735	8113	8684	7996	7856	7050	6247	4518	3343	10946	15127	13075	8403
1976	6790	7834	8688	7993	7875	7074	6250	4500	3263	2955	13048	5939	6853
1977	6402	7749	8548	7920	7815	7017	6194	4457	3250	11596	16807	10613	8214
1978	6660	7682	8549	7896	7780	6993	6216	5356	3561	3726	12325	7351	7010
1979	6329	7784	8648	7984	7870	7107	6302	5174	3083	11707	16671	9097	8166
1980	7090	7744	8610	7943	7826	7027	6222	5009	3897	16205	18000	11000	8908
1981	7322	7787	8706	7985	7780	6995	6179	4924	3069	16122	30349	12039	9985
1982	6345	7629	8548	7848	7744	7004	6127	4833	3334	8961	13206	13992	7968
1983	6766	7803	8605	7901	7795	7026	6210	4595	3033	7050	20862	11192	8253
MAX	7735	8113	8743	8110	8020	7226	6425	5539	4132	23444	30349	17206	9985
MIN	6186	7629	7915	7268	7192	6424	5497	3910	3033	2845	3716	5478	5880
MEAN	6723	7799	8613	7941	7828	7042	6229	4761	3395	9010	16168	10897	8046

TABLE E.2.4.52 WITH-PROJECT DEVIL CANYON MONTHLY FLOWS (CFS), EARLY STAGE III

YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	ANNUAL
1951	6122	8040	8846	8141	8022	7210	6484	6466	8291	8231	7472	18713	8487
1952	7433	8153	8888	8164	7984	7179	6379	6059	7562	8595	17085	13441	8918
1953	8562	8200	8879	8139	7991	7172	6413	7020	7440	9331	19024	13928	9356
1954	7276	8130	8865	8134	8008	7189	6448	7499	7227	6621	19275	11579	8867
1955	7185	8200	8921	8192	8047	7200	6423	6511	7172	9431	24218	14756	9707
1956	7010	8045	8839	8123	8021	7230	6433	7293	7433	19386	22610	16496	10608
1957	7213	8219	8895	8159	8027	7208	6414	6847	7564	9951	19389	18029	9669
1958	8120	8292	9068	8189	7984	7153	6395	6590	8121	8889	20342	7087	8875
1959	7038	8083	8887	8191	8066	7239	6473	7825	7210	7298	22592	16639	9642
1960	7823	8148	8910	8198	8026	7197	6404	6532	7630	8151	13116	18930	9084
1961	8566	8181	8986	8267	8059	7265	6538	6838	7603	16203	21164	12219	10021
1962	7754	8107	8867	8150	8006	7195	6407	6044	8346	24991	22242	14767	10947
1963	7525	8050	8839	8141	8022	7152	6342	6866	7047	22193	22721	11777	10432
1964	7474	8111	8851	8123	7997	7182	6392	5912	9068	17202	15586	8840	9251
1965	7409	8101	8796	8088	7964	7165	6384	6316	7322	9005	19789	18234	9556
1966	8796	8142	8904	8179	8048	7244	6490	6499	7902	7660	15547	10844	8697
1967	6975	8104	8899	8210	8078	7254	6463	6626	7164	11361	30037	15993	10460
1968	6947	8080	8859	8177	8041	7234	6435	6741	7307	17647	16091	8503	9198
1969	6908	8064	8819	8121	8009	7212	6458	6245	7315	7720	7423	6458	7394
1970	4777	5166	8016	7389	7299	6521	5558	5921	6853	6445	6969	6083	6415
1971	7141	8397	9115	8331	8188	7376	6597	6110	7211	7740	9236	13546	8242
1972	7151	8125	8929	8233	8090	7258	6447	7774	7923	21513	18654	11968	10206
1973	6850	8053	8830	8119	8007	7180	6383	5969	7532	8415	9059	8457	7737
1974	6902	8027	8808	8113	7995	7196	6412	6760	7724	7941	7970	6050	7492
1975	4871	7551	8894	8190	8088	7281	6493	6883	7429	13246	17032	15155	9270
1976	8115	8086	8820	8132	8009	7208	6451	6866	7659	8022	8861	6417	7724
1977	6980	8215	9008	8228	8081	7267	6501	7100	7621	13517	18371	11916	9420
1978	7802	8248	8940	8185	8037	7216	6406	5864	7299	7030	10070	8298	7783
1979	7057	8163	8884	8152	8019	7171	6387	6139	8179	10436	19107	10172	9005
1980	7840	8173	8857	8122	7976	7171	6394	6245	6752	19467	20196	12342	9994
1981	8025	8125	8757	8085	8027	7203	6436	6297	8319	16715	35063	13403	11254
1982	7029	8249	8892	8234	8069	7200	6505	6444	7458	10300	14536	16427	9115
1983	7884	8125	8903	8202	8042	7195	6426	6700	8155	8033	21108	12731	9307
MAX	8796	8397	9115	8331	8188	7376	6597	7825	9068	24991	35063	18930	11254
MIN	4777	5166	8016	7389	7299	6521	5558	5864	6752	6445	6969	6050	6415
MEAN	7290	8035	8863	8145	8010	7192	6411	6600	7601	11778	17332	12430	9156

TABLE E.2.4.53 WITH-PROJECT GOLD CREEK MONTHLY FLOWS (CFS), EARLY STAGE III

YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	ANNUAL
1951	6309	8114	8916	8191	8078	7258	6779	7354	8897	9000	9000	19991	8977
1952	7827	8292	9040	8256	8071	7238	6438	6621	9763	9812	19079	14058	9552
1953	9214	8449	9059	8240	8082	7225	7187	8101	9288	10473	20248	15323	10091
1954	7758	8303	8991	8200	8083	7252	6895	9200	9250	9000	19932	13116	9681
1955	7636	8531	9115	8323	8166	7293	6673	7264	8975	10502	24833	15520	10256
1956	7263	8188	8941	8189	8097	7319	6621	8775	9744	21209	24532	18391	11474
1957	7713	8545	9068	8271	8132	7320	6653	8087	9206	11186	20542	19758	10384
1958	8861	8724	9401	8352	8086	7216	6570	7945	9011	10644	20925	7750	9484
1959	7396	8256	9046	8334	8180	7353	6693	9600	9228	9000	25017	18305	10552
1960	8257	8415	9116	8352	8145	7287	6777	6785	8912	9000	14940	20605	9713
1961	9152	8469	9231	8471	8249	7447	7078	7740	10135	17942	21981	13452	10810
1962	8106	8343	9010	8238	8111	7281	6628	6930	10354	26016	23478	15804	11566
1963	7824	8236	8969	8250	8110	7222	6484	7451	9598	24586	23182	12434	11073
1964	7889	8305	8962	8199	8055	7240	6446	7930	10006	18214	16456	9557	9799
1965	7916	8252	8883	8121	8003	7196	6461	6945	8995	10750	20967	19403	10169
1966	9488	8347	9055	8298	8167	7357	6709	7364	10394	9000	17043	11830	9432
1967	7277	8258	9038	8347	8204	7376	6605	7521	9006	13218	32185	17176	11219
1968	7248	8239	8988	8307	8162	7355	6559	7824	9504	19100	17217	9143	9833
1969	7141	8168	8870	8159	8050	7258	6580	6779	7919	8000	8000	6767	7641
1970	5032	5235	8074	7456	7358	6575	5610	6501	8429	8193	8059	6767	6942
1971	7683	8713	9337	8451	8282	7462	6704	6500	9028	9000	10506	14422	8836
1972	7448	8315	9131	8435	8284	7422	6676	10524	9676	22474	19339	12528	10892
1973	7009	8170	8912	8184	8066	7236	6437	6378	8857	9000	9799	8977	8085
1974	7136	8091	8849	8142	8028	7231	6500	7682	9040	9000	9000	6800	7962
1975	5103	7630	9012	8297	8217	7409	6669	8375	9216	14616	18176	16385	9939
1976	8814	8259	8897	8209	8079	7286	6680	8301	8987	9000	9000	6901	8208
1977	7297	8483	9258	8401	8223	7412	6675	8857	9675	14842	18975	12700	10089
1978	8420	8574	9161	8345	8184	7340	6613	6080	7867	8000	11097	8835	8212
1979	7432	8400	9019	8245	8101	7206	6470	6549	8909	11883	20332	10877	9472
1980	8216	8433	9005	8224	8061	7250	6558	6883	9560	21302	21739	13329	10749
1981	8355	8359	8842	8144	8158	7318	6733	7235	8895	19878	36698	14232	11961
1982	8051	8642	9091	8450	8247	7310	6757	7928	9000	11306	15639	17654	9845
1983	8498	8311	9066	8367	8181	7295	6638	8222	9022	9000	22229	13623	9890
MAX	9488	8724	9401	8471	8284	7462	7187	10524	10394	26016	36698	20605	11961
MIN	5032	5235	8074	7456	7358	6575	5610	6080	7867	8000	8000	6767	6942
MEAN	7720	8244	9011	8256	8112	7280	6623	7643	9223	13156	18489	13406	9781

TABLE E.2.4.54 WITH-PROJECT SUNSHINE MONTHLY FLOWS (CFS), EARLY STAGE III

YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	ANNUAL
1951	14133	10917	11136	10438	10018	8587	9005	18955	38109	47909	37690	40284	21491
1952	15693	12780	12392	10657	9558	8730	8209	16506	56482	55082	54547	37239	24906
1953	21881	12452	11473	10148	9552	8597	9969	30404	45991	41835	48992	38821	24267
1954	14279	11065	11262	10086	9712	8696	8534	20858	39364	42945	59965	31897	22489
1955	14589	12541	11779	10588	9649	8709	8587	15718	41293	56493	56640	40122	23990
1956	15978	11220	11387	10144	9755	8939	8181	22839	50681	61919	52563	42412	25602
1957	14632	12079	11750	10839	10101	9212	8584	20696	46144	49909	54642	35743	23785
1958	16545	13477	12710	10505	9933	9358	9682	37862	47242	48275	65417	28080	25900
1959	17180	11932	11203	10446	9937	8983	9231	26397	36474	44373	69848	36594	24511
1960	16449	12306	11894	10554	9912	8807	8451	25156	34409	43643	49690	41521	22822
1961	18302	12030	12302	11008	10184	9232	9661	21986	40741	55235	57701	35124	24577
1962	17308	12515	11771	10489	9871	8826	8660	19683	46951	66923	55675	33867	25334
1963	13916	11086	11675	10610	9981	8532	7764	23991	37434	70837	50940	28823	23940
1964	17915	11747	10771	9887	9455	8490	8191	17032	77405	57828	45898	23957	24949
1965	17145	13043	12269	10560	10129	9139	8633	19270	41400	48406	56359	54110	25114
1966	20508	11675	11422	10319	9899	8949	8597	14455	47051	45009	57019	30568	23047
1967	14712	10988	11420	10560	10120	8985	8149	24922	46106	64052	82578	40735	27936
1968	13101	11339	11526	10531	10271	9375	9070	28587	55355	62555	47063	21467	24300
1969	11938	10628	10658	9662	9421	8533	8581	17271	33066	37295	24031	15983	16473
1970	11349	8040	10069	9249	9051	8194	7736	20824	37723	46592	43320	24981	19850
1971	14727	12811	12011	10356	9777	8875	8293	13481	52725	50471	53211	32666	23358
1972	15967	12022	11574	10479	10083	8952	8287	25438	41934	62489	51364	34456	24541
1973	15598	12030	11847	10314	9962	8789	8079	20253	45043	39456	39530	22442	20345
1974	11587	10724	10950	9886	9739	8777	8203	19854	33894	41977	37350	24047	18988
1975	11129	10450	11397	10326	9890	8903	8303	22193	46529	56839	51095	37183	23779
1976	16538	10849	10869	9975	9946	9012	9230	25113	48219	49285	45062	21871	22260
1977	15118	12548	12345	10753	10070	9130	8449	20925	64927	58610	58707	34461	26429
1978	18069	12636	12107	10921	10066	8904	8601	15580	34601	48168	43717	25473	20829
1979	13430	12119	11980	10639	10038	8945	8930	26292	42014	61701	57662	24144	24130
1980	17181	12955	11588	10418	10061	9067	8964	15758	39811	63613	46141	29764	23050
1981	17165	13017	11750	10575	10249	9146	9249	27359	40107	73890	82999	32902	28396
1982	16961	12129	10722	9553	9737	8984	8798	20992	45285	49709	46558	48596	24068
1983	19019	13944	12637	11336	10836	9092	9000	25199	40423	42076	57611	29510	23495
MAX	21881	13944	12710	11336	10836	9375	9969	37862	77405	73890	82999	54110	28396
MIN	11129	8040	10069	9249	9051	8194	7736	13481	33066	37295	24031	15983	16473
MEAN	15759	11882	11595	10388	9908	8892	8662	21874	44695	52891	52775	32722	23605

TABLE E.2.4.55 WITH-PROJECT SUSITNA STATION MONTHLY FLOWS (CFS), EARLY STAGE III

YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	ANNUAL
1951	54538	22155	17467	15067	15699	13116	14676	54174	93984	111769	93442	82585	49283
1952	33112	20344	18018	14433	13132	12092	10113	35123	77296	98833	96566	64391	41330
1953	38859	24283	18229	15693	14223	11906	12414	43120	78401	109523	118050	102881	49190
1954	46415	24933	18227	15180	13796	12899	13585	45751	69225	83568	93585	56359	41353
1955	32037	20825	16478	14682	13940	12373	12431	49918	92553	136582	115788	80714	50136
1956	48855	22728	17948	15794	14769	12305	11835	47612	122516	122759	99800	58274	49839
1957	26855	22374	14462	13817	13773	11921	11659	50146	107601	93440	106490	65985	45056
1958	30305	27178	17066	14931	13587	12243	11465	34780	66546	87188	94910	43784	38038
1959	30490	20091	15438	14273	13329	11632	11890	45804	86513	101439	86092	41779	40114
1960	26598	20578	16263	14968	14996	14293	14861	65145	92544	127835	149543	92542	54492
1961	34848	19115	17137	14969	15877	13755	14399	60430	94204	116885	114665	78275	49802
1962	43367	24916	17548	14960	14676	12941	14243	43302	85485	157964	118230	65372	51422
1963	25489	16652	16379	14941	13697	12485	11116	45438	87294	136364	102520	66576	46013
1964	32725	17261	14172	15176	13979	11873	11108	34088	86771	112943	98433	41397	41066
1965	30622	18927	16897	14562	13652	12373	13350	53125	99884	125189	100623	82330	48691
1966	46042	26675	16706	14914	14603	12578	11233	32182	82693	106651	128553	102429	49825
1967	43165	16619	13980	13217	13496	12024	10592	20902	53205	96334	120354	72898	40813
1968	36972	19915	16305	15032	14936	13094	17672	80229	121222	125105	93898	40035	49817
1969	16807	14782	14271	14871	13908	12437	14276	79795	112478	106927	79830	39255	43524
1970	29460	13605	12959	13335	13279	11908	12754	64788	108055	128261	103756	53838	47446
1971	22528	18074	15774	15051	13576	11792	11278	42326	103406	124758	94297	65787	45092
1972	26245	15670	14512	14792	13885	11788	12114	46611	93250	126141	102305	60097	45033
1973	27495	21446	16638	14172	13212	11526	10631	40365	85921	90169	80423	59469	39448
1974	30411	18561	16132	15571	15244	13941	15324	59980	72871	82662	80642	49852	39464
1975	20862	16351	16827	15377	14549	13057	11967	41161	105027	122492	91158	78236	45764
1976	32531	16271	13851	13730	12785	11751	14219	64450	91690	106567	87365	49317	43125
1977	33374	24251	19980	16688	15484	12708	11305	53130	136737	135112	125554	84333	55960
1978	38976	19702	14858	13298	13283	12326	12070	42764	79670	104886	96341	55853	42240
1979	39030	21158	16664	15670	14751	13048	14148	73274	104365	125447	127743	77832	53905
1980	59829	35538	21261	16607	15628	14756	17263	61659	122770	167898	129041	91476	63155
1981	35331	21236	15490	13898	13759	11917	16012	73810	97587	140089	157203	67492	55712
1982	34157	22934	18405	15197	13714	11558	10845	39242	90684	101569	95731	109195	47083
1983	35579	20900	16620	14472	14582	12744	12761	56219	87718	91634	105301	52378	43645
MAX	59829	35538	21261	16688	15877	14756	17672	80229	136737	167898	157203	109195	63155
MIN	16807	13605	12959	13217	12785	11526	10113	20902	53205	82662	79830	39255	38038
MEAN	34664	20789	16453	14828	14176	12520	12897	50935	93641	115302	105704	67667	46875

TABLE E.2.4.56 WITH-PROJECT WATANA MONTHLY FLOWS (CFS), LATE STAGE III

YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	ANNUAL
1951	6281	7815	8795	8075	7991	7137	6108	5058	4296	5096	5842	7062	6622
1952	7852	9768	10993	10094	9989	8921	7635	6323	5362	5096	6208	7019	7927
1953	7852	9768	10993	10094	9989	8921	7635	6292	5716	6024	6140	6767	8006
1954	7852	9768	10993	10094	9989	8921	7635	6066	5354	5064	5609	6781	7831
1955	6281	7815	8860	10094	9989	8921	7635	6323	5369	5644	6728	12618	8003
1956	8319	9768	10993	10094	9989	8921	7635	6112	5582	5318	12775	13194	9051
1957	8445	9768	11030	11225	11151	10126	9001	6744	5338	5850	6312	6414	8437
1958	7852	10158	11879	11143	11129	10120	8976	7179	6365	5096	5842	6670	8518
1959	6281	7815	8795	8075	9773	8921	7635	5765	5329	5096	5068	8180	7207
1960	8640	9946	12049	11198	11160	10145	9019	6535	5369	4529	4674	5650	8227
1961	7185	9768	11249	11116	11097	10044	8894	6968	5538	5531	6368	6990	8380
1962	8242	9768	11030	11232	11164	10130	8986	7583	5330	5907	15339	12746	9783
1963	8791	9960	12112	11237	11151	10176	9048	5768	5329	5236	11842	10800	9278
1964	8770	9768	12052	11296	10429	8921	7635	5393	4616	5851	7044	7830	8292
1965	8442	9768	12097	11327	10441	8921	7635	6323	5369	5358	6113	9418	8422
1966	9122	9768	10993	10094	9989	8921	7635	6323	5391	5731	5831	7042	8061
1967	6281	7815	8795	8335	9989	8921	7635	6323	5752	5501	12087	13673	8409
1968	8314	9768	10993	10094	9989	8921	7635	6223	5716	5583	6289	8266	8137
1969	8087	9768	10993	9379	7991	7137	6108	5058	4296	4077	5801	5922	7050
1970	5153	6154	6926	6359	6293	5620	4810	4146	4296	4077	4674	5650	5340
1971	6281	7815	8795	8075	7991	7137	6108	5058	4296	5096	6936	12001	7121
1972	8605	9951	12036	11149	11071	10048	8947	6303	5393	5819	7467	11644	9020
1973	8112	9768	10993	10094	9989	8921	7635	6323	5369	5096	5842	6670	7890
1974	6281	7815	8795	8075	7991	7137	6108	5058	6022	5096	5327	5650	6604
1975	6281	7815	8795	8075	7991	7137	6108	5058	5255	5610	6449	12932	7278
1976	8535	9962	12152	11291	10118	8921	7635	6323	5369	5096	5842	5692	8071
1977	6281	7815	8795	8075	7991	7137	6108	5058	4866	5947	6194	9802	6996
1978	8632	10171	12010	11172	11104	10078	8962	7586	6204	5096	5067	5650	8464
1979	6281	7815	8795	8075	7991	7137	6108	5058	5267	6115	6359	7358	6856
1980	7852	10196	12073	11221	11154	10117	8980	7474	6238	5217	6200	8641	8764
1981	9027	10894	12167	11265	11106	10081	8947	7413	6436	4893	15967	11669	9985
1982	8600	10166	12034	11130	11071	10095	8916	7285	6181	5096	5842	5692	8496
1983	6281	8645	10993	10094	9989	8921	7635	6323	6101	5975	6425	7149	7866
MAX	9122	10894	12167	11327	11164	10176	9048	7586	6436	6115	15967	13673	9985
MIN	5153	6154	6926	6359	6293	5620	4810	4146	4296	4077	4674	5650	5340
MEAN	7609	9198	10638	9953	9856	8838	7670	6146	5415	5328	7167	8462	8012

TABLE E.2.4.57 WITH-PROJECT DEVIL CANYON MONTHLY FLOWS (CFS), LATE STAGE III

YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	ANNUAL
1951	4846	6400	8919	8174	8086	7214	6311	6627	8301	8231	7472	6156	7226
1952	8481	10138	11250	10303	10091	9014	7710	7096	9603	7987	8359	8889	9068
1953	9084	10245	11263	10275	10122	9017	7789	9008	9477	7953	8564	9182	9327
1954	8741	10090	11196	10230	10115	9012	7823	9654	9065	7234	9259	9195	9297
1955	7252	8271	9177	10355	10213	9060	7801	7995	8571	8192	8385	12791	8991
1956	8865	9969	11161	10199	10126	9080	7783	9139	9547	8700	16232	16496	10608
1957	9471	10265	11310	11435	11350	10296	9165	9042	8665	7830	8383	9602	9725
1958	9252	10812	12525	11454	11298	10232	9148	9071	8726	7295	8522	7126	9615
1959	7016	8085	9051	8312	10003	9105	7869	9525	8537	7994	9722	11043	8845
1960	9535	10355	12389	11483	11360	10297	9167	8294	7752	8151	7176	6402	9357
1961	8307	10200	11713	11549	11386	10351	9334	9361	9823	8572	8238	8869	9798
1962	9063	10049	11250	11419	11321	10273	9142	8390	9993	7976	17172	14767	10897
1963	9539	10147	12299	11424	11354	10250	9081	8167	8761	8857	13552	11777	10432
1964	9581	10064	12244	11422	10547	9011	7723	5863	9588	8028	8316	9075	9280
1965	9427	10045	12189	11389	10497	8982	7717	7624	8267	8318	8572	11359	9526
1966	10398	10111	11267	10313	10190	9123	7916	7963	9896	8113	8685	8672	9383
1967	6856	8071	9038	8591	10226	9120	7838	8203	8836	8595	16275	15728	9774
1968	8880	10039	11219	10327	10207	9140	7849	8378	9474	8371	8232	9328	9281
1969	8529	9946	11075	9447	8065	7221	6267	6175	7304	7720	7423	6458	7974
1970	4777	2931	5408	6480	6400	5718	4871	5332	7016	6809	7169	6760	5806
1971	7258	8401	9183	8297	8158	7287	6280	5629	7714	7740	8977	13448	8190
1972	9163	10276	12392	11514	11416	10342	9208	10107	9894	8112	8362	12420	10256
1973	8450	9945	11133	10203	10118	9003	7708	6932	8022	8415	8260	6280	8702
1974	4919	7521	8859	8133	8047	7200	6184	7174	8008	7941	7970	6050	7332
1975	5908	7960	9005	8269	8222	7368	6354	7423	8869	8368	8354	15011	8415
1976	9860	10214	12284	11431	10252	9056	7836	8689	8377	8022	8861	6316	9270
1977	4716	6504	9255	8384	8258	7387	6415	7701	9120	7987	8396	10440	7874
1978	9774	10737	12401	11462	11361	10301	9151	8047	7547	7030	6973	6230	9243
1979	6937	8194	9031	8243	8140	7201	6193	6023	8201	7552	8180	8433	7690
1980	8602	10626	12319	11400	11304	10261	9152	8711	9093	8479	8396	9982	9850
1981	9730	11232	12218	11366	11353	10289	9204	8786	8483	8585	20680	13033	11254
1982	9284	10786	12378	11516	11396	10291	9294	8896	9176	7994	7897	6896	9643
1983	7399	8968	11292	10395	10236	9091	7851	8428	8489	8033	8242	8689	8920
MAX	10398	11232	12525	11549	11416	10351	9334	10107	9993	8857	20680	16496	11254
MIN	4716	2931	5408	6480	6400	5718	4871	5332	7016	6809	6973	6050	5806
MEAN	8179	9321	10839	10157	10037	8988	7852	7983	8733	8036	9553	9785	9117

TABLE E.2.4.58 WITH-PROJECT GOLD CREEK MONTHLY FLOWS (CFS), LATE STAGE III

YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	ANNUAL
1951	5032	6473	8989	8223	8142	7262	6606	7515	8906	9000	9000	7434	7716
1952	8875	10277	11402	10394	10177	9073	7769	7657	11805	9204	10352	9506	9702
1953	9735	10493	11443	10376	10213	9070	8563	10090	11325	9096	9789	10576	10061
1954	9223	10263	11322	10295	10191	9075	8269	11355	11088	9614	9916	10731	10111
1955	7704	8601	9371	10486	10332	9152	8051	8748	10374	9264	9000	13555	9540
1956	9118	10113	11264	10265	10203	9169	7971	10621	11858	10523	18154	18391	11474
1957	9971	10592	11483	11546	11455	10408	9404	10282	10308	9065	9535	11331	10440
1958	9993	11244	12857	11617	11400	10295	9322	10425	9616	9050	9105	7789	10224
1959	7375	8258	9209	8454	10118	9220	8089	11299	10554	9696	12147	12709	9756
1960	9969	10623	12595	11638	11480	10386	9540	8547	9034	9000	9000	8077	9986
1961	8893	10488	11958	11752	11576	10533	9874	10263	12355	10311	9055	10102	10587
1962	9415	10285	11393	11507	11426	10358	9362	9276	12001	9000	18408	15804	11517
1963	9838	10333	12429	11533	11442	10320	9223	8752	11312	11250	14014	12434	11073
1964	9995	10258	12355	11498	10605	9069	7777	7881	10527	9040	9186	9793	9828
1965	9934	10197	12276	11423	10536	9013	7794	8253	9939	10064	9750	12528	10139
1966	11090	10316	11418	10433	10310	9237	8136	8828	12388	9453	10180	9658	10119
1967	7158	8225	9177	8727	10351	9242	7981	9098	10679	10453	18423	16911	10532
1968	9181	10197	11348	10457	10329	9261	7974	9462	11672	9824	9358	9968	9916
1969	8762	10050	11126	9485	8106	7267	6389	6708	7907	8000	8000	6767	8220
1970	5032	3000	5466	6547	6459	5772	4923	5912	8592	8557	8258	7444	6333
1971	7801	8716	9405	8416	8253	7373	6386	6019	9530	9000	10246	14324	8783
1972	9460	10466	12593	11717	11611	10506	9438	12857	11647	9073	9046	12980	10942
1973	8610	10062	11215	10268	10177	9059	7761	7341	9347	9000	9000	6800	9050
1974	5153	7585	8900	8162	8081	7234	6272	8097	9324	9000	9000	6800	7802
1975	6140	8039	9123	8376	8352	7496	6530	8916	10656	9738	9497	16242	9084
1976	10559	10387	12361	11508	10322	9133	8065	10124	9705	9000	9000	6800	9753
1977	5032	6772	9505	8557	8400	7532	6589	9459	11174	9312	9000	11224	8543
1978	10391	11063	12622	11622	11508	10425	9358	8263	8115	8000	8000	6767	9672
1979	7312	8431	9166	8336	8222	7236	6276	6434	8930	9000	9405	9138	8156
1980	8978	10885	12467	11502	11389	10340	9316	9348	11901	10314	9939	10970	10604
1981	10060	11466	12304	11425	11484	10404	9501	9725	9059	11748	22316	13862	11961
1982	10306	11179	12576	11732	11574	10401	9546	10380	10718	9000	9000	8123	10373
1983	8013	9153	11454	10560	10375	9190	8062	9949	9356	9000	9363	9580	9503
MAX	11090	11466	12857	11752	11611	10533	9874	12857	12388	11748	22316	18391	11961
MIN	5032	3000	5466	6547	6459	5772	4923	5912	7907	8000	8000	6767	6333
MEAN	8609	9530	10987	10268	10139	9076	8064	9027	10355	9414	10710	10761	9742

TABLE E.2.4.59 WITH-PROJECT SUNSHINE MONTHLY FLOWS (CFS), LATE STAGE III

YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	ANNUAL
1951	12856	9277	11208	10471	10082	8590	8833	19117	38119	47909	37690	27727	20230
1952	16741	14765	14754	12796	11664	10565	9540	17543	58523	54474	45820	32687	25056
1953	22402	14497	13857	12284	11683	10442	11345	32392	48029	40458	38532	34074	24238
1954	15744	13025	13593	12181	11820	10519	9908	23013	41202	43558	49949	29512	22920
1955	14656	12611	12036	12751	11814	10568	9965	17202	42691	55255	40807	38157	23274
1956	17833	13145	13710	12220	11860	10789	9531	24684	52795	51233	46185	42412	25602
1957	16890	14125	14165	14114	13424	12300	11335	22891	47246	47788	43636	27315	23841
1958	17677	15997	16167	13770	13247	12437	12435	40342	47847	46681	53597	28119	26640
1959	17158	11934	11366	10566	11875	10849	10627	28097	37801	45068	56978	30997	23715
1960	18161	14514	15372	13839	13247	11906	11214	26918	34531	43643	43750	28994	23095
1961	18043	14049	15029	14289	13511	12319	12457	24509	42961	47604	44775	31774	24354
1962	18617	14457	14153	13758	13186	11904	11394	22029	48598	49907	50606	33867	25285
1963	15930	13183	15135	13893	13313	11629	10503	25292	39148	57501	41772	28823	23940
1964	20022	13699	14164	13185	12005	10319	9522	16983	77926	48654	38628	24193	24978
1965	19163	14987	15662	13861	12662	10956	9966	20578	42345	47719	45142	47235	25085
1966	22110	13644	13786	12453	12041	10828	10023	15918	49045	45462	50157	28396	23733
1967	14593	10955	11558	10940	12268	10851	9525	26499	47779	61286	68817	40470	27250
1968	15035	13298	13886	12680	12438	11281	10485	30224	57523	53279	39204	22292	24382
1969	13559	12510	12915	10988	9477	8543	8391	17200	33055	37295	24031	15983	17052
1970	11349	5805	7460	8340	8151	7391	7048	20235	37886	46957	43519	25658	19241
1971	14845	12814	12078	10321	9748	8786	7976	13000	53227	50471	52951	32568	23306
1972	17978	14174	15037	13760	13409	12037	11048	27771	43905	49088	41072	34907	24590
1973	17198	13922	14150	12398	12072	10612	9403	21216	45533	39456	38731	20265	21310
1974	9604	10218	11001	9906	9791	8781	7975	20269	34179	41977	37350	24047	18828
1975	12165	10859	11508	10405	10024	8990	8164	22734	47969	51960	42417	37040	22924
1976	18282	12977	14332	13274	12189	10860	10615	26936	48938	49285	45062	21770	23806
1977	12854	10837	12592	10909	10247	9250	8363	21526	66426	53080	48731	32986	24883
1978	20040	15124	15569	14198	13391	11989	11347	17763	34849	48168	40620	23405	22289
1979	13310	12150	12127	10730	10158	8975	8736	26177	42036	58818	46735	22405	22814
1980	17942	15408	15050	13696	13389	12157	11722	18224	42152	52625	34340	27404	22906
1981	18870	16124	15211	13856	13575	12232	12017	29848	40270	65761	68616	32532	28396
1982	19216	14665	14208	12835	13064	12075	11587	23444	47003	47403	39918	39065	24596
1983	18535	14787	15025	13529	13030	10987	10425	26927	40756	42076	44745	25468	23108
MAX	22402	16124	16167	14289	13575	12437	12457	40342	77926	65761	68817	47235	28396
MIN	9604	5805	7460	8340	8151	7391	7048	13000	33055	37295	24031	15983	17052
MEAN	16648	13168	13572	12400	11935	10688	10104	23258	45827	49148	44996	30077	23566

TABLE E.2.4.60 WITH-PROJECT SUSITNA STATION MONTHLY FLOWS (CFS), LATE STAGE III

YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	ANNUAL
1951	53262	20515	17540	15100	15763	13120	14503	54335	93994	111769	93442	70028	48022
1952	34160	22329	20381	16572	15238	13927	11444	36159	79337	98225	87839	59839	41480
1953	39380	26327	20612	17830	16355	13751	13790	45109	80438	108146	107590	98135	49161
1954	47880	26893	20558	17276	15904	14723	14959	47906	71062	84182	83569	53975	41783
1955	32105	20895	16734	16844	16105	14233	13809	51402	93951	135343	99955	78749	49420
1956	50710	24652	20270	17870	16875	14155	13185	49457	124629	112073	93422	58274	49839
1957	29114	24421	16877	17092	17096	15009	14410	52341	108702	91319	95484	57558	45111
1958	31437	29698	20523	18196	16901	15322	14218	37261	67151	85594	83090	43823	38778
1959	30468	20092	15601	14394	15266	13498	13286	47504	87840	102135	73221	36183	39318
1960	28310	22785	19741	18253	18331	17392	17623	66907	92666	127835	143603	80014	54765
1961	34589	21134	19864	18250	19204	16842	17194	62953	96424	109254	101739	74925	49579
1962	44676	26858	19931	18229	17991	16019	16978	45648	87133	140948	113160	65372	51372
1963	27503	18749	19839	18224	17029	15583	13855	46739	89008	123028	93352	66576	46013
1964	34832	19214	17565	18474	16529	13702	12439	34039	87292	103769	91162	41632	41096
1965	32640	20872	20290	17863	16185	14189	14684	54433	100829	124503	89406	75455	48661
1966	47644	28644	19070	17048	16745	14457	12659	33646	84687	107104	121691	100258	50512
1967	43046	16586	14119	13598	15644	13891	11968	22479	54878	93568	106593	72634	40126
1968	38906	21873	18665	17181	17102	15001	19087	81866	123389	115830	86039	40860	49899
1969	18428	16664	16527	16197	13964	12446	14085	79724	112467	106927	79830	39255	44103
1970	29460	11370	10351	12426	12380	11105	12067	64199	108218	128626	103956	54515	46837
1971	22646	18077	15841	15016	13547	11703	10960	41845	103908	124758	94038	65689	45040
1972	28257	17821	17975	18074	17211	14873	14875	48944	95222	112740	92012	60548	45082
1973	29095	23339	18941	16256	15323	13349	11956	41329	86411	90169	79624	57292	40413
1974	28428	18055	16183	15591	15296	13944	15096	60395	73155	82662	80642	49852	39305
1975	21898	16760	16937	15456	14684	13145	11828	41701	106466	117613	82479	78093	44909
1976	34276	18399	17314	17029	15028	13598	15604	66273	92408	106567	87365	49216	44670
1977	31109	22541	20227	16844	15660	12828	11219	53732	138236	129582	115579	82858	54414
1978	40947	22191	18319	16574	16608	15411	14816	44947	79918	104886	93245	53785	43700
1979	38910	21189	16811	15761	14872	13078	13954	73158	104387	122564	116816	76093	52589
1980	60590	37990	24723	19885	18956	17847	20021	64125	125110	156910	117241	89117	63011
1981	37036	24343	18951	17179	17085	15003	18780	76299	97751	131959	142820	67122	55712
1982	36412	25470	21890	18478	17041	14649	13634	41694	92402	99263	89091	99664	47611
1983	35094	21742	19009	16665	16776	14639	14186	57947	88052	91634	92435	48335	43258
MAX	60590	37990	24723	19885	19204	17847	20021	81866	138236	156910	143603	100258	63011
MIN	18428	11370	10351	12426	12380	11105	10960	22479	54878	82662	73221	36183	38778
MEAN	35553	22075	18430	16840	16203	14316	14338	52318	94773	111560	97925	65022	46836

TABLE E.2.4.61 MONTHLY MAXIMUM,MINIMUM AND MEAN FLOWS AT DEVIL CANYON (CFS)

STAGE III - WATANA (HIGH) - DEVIL CANYON OPERATIONS

MONTH	NATURAL CONDITIONS			WITH PROJECT CONDITIONS					
				EARLY STAGE III			LATE STAGE III		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCT	7518	2867	5363	8796	4777	7290	10398	4716	8179
NOV	3955	1146	2402	8397	5166	8035	11232	2931	9321
DEC	2905	810	1703	9115	8016	8863	12525	5408	10839
JAN	2212	687	1429	8331	7389	8145	11549	6480	10157
FEB	1858	682	1216	8188	7299	8010	11416	6400	10037
MAR	1779	664	1086	7376	6521	7192	10351	5718	8988
APR	2405	697	1340	6597	5558	6411	9334	4871	7852
MAY	19777	3428	12462	7825	5864	6600	10107	5332	7983
JUN	47814	14710	26043	9068	6752	7601	9993	7016	8733
JUL	32388	15651	23075	24991	6445	11778	8857	6809	8036
AUG	35256	8484	20654	35063	6969	17332	20680	6973	9553
SEP	19799	4796	12555	18930	6050	12430	16496	6050	9785
ANNUAL	11254	5352	9159	11254	6415	9156	11254	5806	9117

TABLE E.2.4.62 MONTHLY MAXIMUM, MINIMUM AND MEAN FLOWS AT GOLD CREEK (CFS)

STAGE III - WATANA (HIGH) - DEVIL CANYON OPERATIONS

MONTH	NATURAL CONDITIONS			WITH PROJECT CONDITIONS					
				EARLY STAGE III			LATE STAGE III		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCT	8212	3124	5825	9488	5032	7720	11090	5032	8609
NOV	4192	1215	2589	8724	5235	8244	11466	3000	9530
DEC	3264	866	1844	9401	8074	9011	12857	5466	10987
JAN	2452	724	1543	8471	7456	8256	11752	6547	10268
FEB	2028	723	1317	8284	7358	8112	11611	6459	10139
MAR	1900	713	1169	7462	6575	7280	10533	5772	9076
APR	2650	745	1441	7187	5610	6623	9874	4923	8064
MAY	21890	3745	13483	10524	6080	7643	12857	5912	9027
JUN	50580	15500	27795	10394	7867	9223	12388	7907	10355
JUL	34400	16100	24390	26016	8000	13156	11748	8000	9414
AUG	37870	8879	21911	36698	8000	18489	22316	8000	10710
SEP	21240	5093	13493	20605	6767	13406	18391	6767	10761
ANNUAL	11961	5596	9785	11961	6942	9781	11961	6333	9742

TABLE E.2.4.63 MONTHLY MAXIMUM,MINIMUM AND MEAN FLOWS AT SUNSHINE (CFS)

STAGE III - WATANA (HIGH) - DEVIL CANYON OPERATIONS

MONTH	NATURAL CONDITIONS			WITH PROJECT CONDITIONS					
				EARLY STAGE III			LATE STAGE III		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCT	20837	8176	13799	21881	11129	15759	22402	9604	16648
NOV	8775	4020	6185	13944	8040	11882	16124	5805	13168
DEC	6547	2675	4426	12710	10069	11595	16167	7460	13572
JAN	5216	2228	3674	11336	9249	10388	14289	8340	12400
FEB	4664	2095	3115	10836	9051	9908	13575	8151	11935
MAR	3920	1972	2786	9375	8194	8892	12437	7391	10688
APR	5528	2233	3585	9969	7736	8662	12457	7048	10104
MAY	43121	10799	27674	37862	13481	21874	40342	13000	23258
JUN	116152	40702	63268	77405	33066	44695	77926	33055	45827
JUL	85600	45226	64143	73890	37295	52891	65761	37295	49148
AUG	84940	25092	56148	82999	24031	52775	68817	24031	44996
SEP	54110	14320	32867	54110	15983	32722	47235	15983	30077
ANNUAL	28262	14431	23607	28396	16473	23605	28396	17052	23566

TABLE E.2.4.64 MONTHLY MAXIMUM, MINIMUM AND MEAN FLOWS AT SUSITNA STATION (CFS)

STAGE III - WATANA (HIGH) - DEVIL CANYON OPERATIONS

MONTH	NATURAL CONDITIONS			WITH PROJECT CONDITIONS					
				EARLY STAGE III			LATE STAGE III		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCT	58640	13476	32777	59829	16807	34664	60590	18428	35553
NOV	31590	8251	15063	35538	13605	20789	37990	11370	22075
DEC	14690	5753	9267	21261	12959	16453	24723	10351	18430
JAN	10120	6365	8112	16688	13217	14828	19885	12426	16840
FEB	9413	5614	7383	15877	12785	14176	19204	12380	16203
MAR	8906	5271	6412	14756	11526	12520	17847	11105	14316
APR	13029	4613	7684	17672	10113	12897	20021	10960	14338
MAY	88470	28713	56770	80229	20902	50935	81866	22479	52318
JUN	165900	73838	112256	136737	53205	93641	138236	54878	94773
JUL	181400	92511	126590	167898	82662	115302	156910	82662	111560
AUG	159600	80891	109084	157203	79830	105704	143603	73221	97925
SEP	109700	37592	67721	109195	39255	67667	100258	36183	65022
ANNUAL	63159	38030	46871	63155	38038	46875	63011	38778	46836

TABLE E.2.4.65: SUSITNA HYDROELECTRIC PROJECT
DEVIL CANYON OUTLET WORKS OPERATION
THREE STAGE PROJECT
EARLY STAGE III

Year	Week of First Release	Week of Maximum Release	Duration of Release	Maximum Release	Power-house Flow	Total Release	Maximum Watana Release During Period
			Weeks	cfs	cfs	ac-ft	cfs
1950	June 10	Aug 26	11	8,375	0	447,000	4,953
1951	June 3	Sept 2	18	21,714	4,260	1,301,000	17,911
1952	June 17	Aug 5	16	18,134	4,438	1,554,000	15,663
1953	July 1	July 29	14	18,041	4,545	1,671,000	15,465
1954	Aug 5	Aug 19	8	19,299	4,324	1,316,000	14,290
1955	July 1	Aug 26	14	28,063	4,295	2,131,000	24,000
1956	May 20	July 22	15	24,950	4,504	2,735,000	21,734
1957	May 27	Aug 26	17	15,694	4,259	2,058,000	17,043
1958	June 3	Aug 5	12	27,210	3,154	1,402,000	24,000
1959	May 20	Aug 26	12	35,217	2,828	2,048,000	24,000
1960	July 1	Sept 9	14	22,578	4,008	1,616,000	15,518
1961	June 17	Aug 5	14	20,616	4,445	2,263,000	17,497
1962	June 10	July 22	17	21,665	4,498	3,115,000	19,669
1963	July 8	July 15	14	28,525	4,602	2,684,000	24,000
1964	June 3	July 15	19	19,024	4,577	1,847,000	17,922
1965	July 22	Aug 12	12	24,283	4,428	2,060,000	19,488
1966	June 3	Aug 19	14	16,948	4,318	1,125,000	12,734
1967	July 1	Aug 12	12	32,359	4,455	2,702,000	24,000
1968	July 1	July 15	12	19,869	4,578	1,699,000	16,658
1969	July 1	Aug 19	10	4,154	3,443	355,000	--
1970	--	--	--	--	--	--	--
1971	July 1	Sept 2	11	17,226	4,233	787,000	12,550
1972	May 27	July 8	15	19,582	4,679	2,413,000	17,106
1973	June 3	Aug 12	14	8,398	0	725,000	14,275
1974	July 1	Aug 19	11	4,557	3,636	277,000	--
1975	July 1	July 22	16	20,167	4,493	1,970,000	16,921
1976	June 17	Aug 12	13	8,915	0	482,000	9,979
1977	May 27	July 29	17	16,838	4,534	1,878,000	14,384
1978	July 29	Aug 19	8	9,603	4,298	651,000	8,813
1979	June 3	July 29	17	20,325	4,542	1,697,000	22,945
1980	July 8	July 29	14	26,881	4,559	2,417,000	23,072
1981	June 3	Aug 16	16	32,951	2,956	3,290,000	24,000
1982	July 1	Sep 16	15	20,718	3,994	1,647,000	17,654
1983	June 3	Aug 26	20	21,011	4,273	1,832,000	17,243

TABLE E.2.4.66: SUSITNA HYDROELECTRIC PROJECT
DEVIL CANYON CONE VALVE OPERATION
THREE STAGE PROJECT
LATE STAGE III

Year	Week of First Release	Week of Maximum Release	Duration of Release	Maximum Release	Power-house Flow	Total Release	Maximum Watana Release During Period
			Weeks	cfs	cfs	ac-ft	cfs
1950	--	--	--	--	--	--	--
1951	--	--	--	--	--	--	--
1952	--	--	--	--	--	--	--
1953	--	--	--	--	--	--	--
1954	--	--	--	--	--	--	--
1955	Aug 26	Sept 2	5	11,857	5,653	420,000	8,653
1956	Aug 5	Aug 12	8	17,910	6,046	1,210,000	12,222
1957	--	--	--	--	--	--	--
1958	--	--	--	--	--	--	--
1959	Sept 2	Sept 9	5	6,411	6,938	195,000	2,362
1960	--	--	--	--	--	--	--
1961	--	--	--	--	--	--	--
1962	Aug 5	Aug 26	8	16,449	5,760	1,210,000	11,424
1963	Aug 12	Aug 19	7	15,820	5,905	728,000	12,613
1964	Aug 26	Sept 9	3	4,455	6,034	114,000	1,238
1965	Sept 23	Sept 23	2	11,276	7,213	230,000	7,403
1966	--	--	--	--	--	--	--
1967	Aug 12	Aug 19	7	22,674	5,925	1,103,000	16,270
1968	Sept 2	Sept 9	2	4,335	6,136	121,000	--
1969	--	--	--	--	--	--	--
1970	--	--	--	--	--	--	--
1971	Aug 26	Sept 2	5	15,801	5,658	508,000	9,902
1972	May 27	Sept 9	6	11,943	5,269	422,000	5,984
1973	--	--	--	--	--	--	--
1974	--	--	--	--	--	--	--
1975	Aug 26	Sept 9	5	13,114	5,272	572,000	5,976
1976	--	--	--	--	--	--	--
1977	Sept 9	Sept 16	3	7,984	5,206	254,000	1,533
1978	--	--	--	--	--	--	--
1979	--	--	--	--	--	--	--
1980	Sept 16	Sept 16	3	4,933	6,962	142,000	1,419
1981	Aug 12	Aug 19	7	29,582	5,959	1,244,000	22,420
1982	--	--	--	--	--	--	--
1983	--	--	--	--	--	--	--

TABLE E.2.4.67: SUSITNA HYDROELECTRIC PROJECT
SIMULATED STREAM TEMPERATURES
LATE STAGE III
WEATHER PERIOD: SUMMER 1981
CASE E-VI FLOW REQUIREMENTS
STAGED CONSTRUCTION
50 FT DRAWDOWN AT DEVIL CANYON
2 LEVELS OF PORTS

RIVER		MAY					JUNE					JULY		
MILE	31	32	33	34	35	36	37	38	39	40	41	42	43	44
150[1/]	2.7	3.2	4.0	4.5	5.2	6.2	7.3	8.5	8.2	7.3	7.0	8.5	9.8	10.4
140	2.9	3.5	4.3	4.8	5.6	6.4	7.6	8.8	8.5	7.6	7.4	8.8	10.0	10.6
130	3.1	3.9	4.7	5.2	6.1	6.6	7.9	9.1	8.5	7.8	7.4	8.6	9.7	10.1
120	3.4	4.4	5.2	5.7	6.7	7.0	8.5	9.7	8.9	8.2	7.8	9.0	10.1	10.5
110	3.6	4.8	5.7	6.2	7.3	7.3	9.0	10.2	9.3	8.6	8.2	9.3	10.5	10.8
99[2/]	3.9	5.3	6.1	6.7	7.8	7.6	9.5	10.7	9.6	9.0	8.6	9.7	10.8	11.1
98[3/]	4.0	5.4	6.1	6.4	7.3	6.7	8.0	8.7	8.0	8.0	7.8	8.1	8.6	8.6
84[4/]	4.4	6.2	7.0	7.2	8.3	7.2	8.8	9.5	8.7	8.7	8.4	8.8	9.2	9.3

RIVER		AUGUST				SEPTEMBER							
MILE	45	46	47	48	49	50	51	52	1	2	3	4	5
150[1/]	9.9	5.3	5.0	6.6	7.3	7.3	7.6	8.1	7.5	7.0	6.6	6.1	5.4
140	10.1	5.6	5.2	6.8	7.4	7.4	7.6	7.9	7.3	6.9	6.4	5.9	5.0
130	9.8	5.7	5.4	7.0	7.5	7.4	7.6	7.5	6.9	6.6	6.1	5.5	4.5
120	10.1	5.9	5.7	7.3	7.7	7.5	7.6	7.3	6.6	6.4	5.9	5.2	3.9
110	10.4	6.1	5.9	7.6	7.9	7.6	7.7	7.1	6.4	6.2	5.7	5.0	3.4
99[2/]	10.7	6.4	6.1	7.9	8.1	7.7	7.7	6.8	7.1	6.0	5.5	4.7	2.9
98[3/]	8.5	6.7	6.4	7.5	7.2	6.9	6.4	4.9	4.7	4.8	4.4	3.7	2.1
84[4/]	9.1	7.1	7.1	8.3	7.6	7.1	6.6	4.4	4.2	4.3	4.0	3.2	1.3

1/ Downstream of Devil Canyon Dam Site
2/ Upstream of Chulitna - Susitna confluence
3/ Downstream of Chulitna - Susitna confluence
4/ At Sunshine Stream gaging station

TABLE E.2.4.68: SUSITNA HYDROELECTRIC PROJECT
SIMULATED STREAM TEMPERATURES
LATE STAGE III
WEATHER PERIOD: SUMMER 1982
CASE E-VI FLOW REQUIREMENTS
STAGED CONSTRUCTION
50 FT DRAWDOWN AT DEVIL CANYON
2 LEVELS OF PORTS

RIVER		MAY					JUNE					JULY		
MILE	31	32	33	34	35	36	37	38	39	40	41	42	43	44
150 1/	3.6	3.8	4.0	4.3	4.6	4.9	5.4	6.1	6.6	7.3	8.6	9.6	9.8	9.9
140	3.8	3.9	4.2	4.5	4.9	5.1	5.6	6.4	7.1	7.8	8.9	9.9	10.0	10.2
130	4.1	4.1	4.5	4.8	5.2	5.4	5.8	6.7	7.5	8.0	9.0	9.9	9.6	10.0
120	4.4	4.3	4.8	5.1	5.7	5.8	6.1	7.2	8.2	8.6	9.5	10.4	9.9	10.5
110	4.7	4.5	5.2	5.4	6.1	6.2	6.4	7.7	8.7	9.1	9.9	10.8	10.3	10.9
99 2/	5.0	4.7	5.5	5.8	6.5	6.5	6.8	8.2	9.4	9.6	10.3	11.3	10.6	11.4
98 3/	4.9	4.5	5.4	5.5	6.3	6.6	6.2	6.8	8.5	8.1	8.3	8.8	8.0	8.7
84 4/	5.3	4.9	6.0	6.1	7.2	7.7	6.8	7.8	9.7	8.9	9.0	9.7	8.8	9.6

RIVER		AUGUST				SEPTEMBER		
MILE	45	46	47	48	49	50	51	52
150 1/	9.9	9.7	9.9	8.5	7.3	7.6	7.8	8.0
140	10.2	9.9	10.1	8.7	7.5	7.6	7.7	7.8
130	10.2	9.9	10.1	8.7	7.5	7.4	7.2	7.4
120	10.7	10.2	10.5	9.1	7.7	7.6	7.3	7.3
110	11.1	10.6	10.9	9.3	7.8	7.7	7.3	7.2
99 2/	11.6	10.9	11.2	9.6	8.1	7.8	7.4	7.1
98 3/	8.8	8.4	8.8	7.3	6.8	6.2	5.1	5.3
84 4/	9.5	9.1	9.5	8.1	7.3	6.5	5.5	5.1

1/ Downstream of Devil Canyon Dam Site
2/ Upstream of Chulitna - Susitna confluence
3/ Downstream of Chulitna - Susitna confluence
4/ At Sunshine Stream gaging station

TABLE E.2.4.69: SUSITNA HYDROELECTRIC PROJECT
STREAM TEMPERATURES
EARLY STAGE III
WEATHER PERIOD: SUMMER 1981
CASE E-VI FLOW REQUIREMENTS
STAGED CONSTRUCTION

River Mile	May					June				July				
	31	32	33	34	35	36	37	38	39	40	41	42	43	44
150 1/	2.1	2.9	3.8	4.2	4.7	5.3	5.9	6.5	6.8	6.7	5.2	4.3	6.2	7.3
140	2.4	3.3	4.2	4.6	5.3	5.6	6.4	7.0	7.2	7.1	5.5	4.6	6.5	7.5
130	2.8	3.8	4.7	5.2	5.9	5.9	6.8	7.5	7.4	7.3	5.8	4.9	6.7	7.7
120	3.1	4.5	5.3	5.9	6.7	6.3	7.4	8.2	7.9	7.8	6.2	5.2	7.0	8.0
110	3.5	5.0	5.9	6.4	7.5	6.7	8.0	8.7	8.3	8.2	6.4	5.5	7.2	8.2
99 2/	3.8	5.6	6.5	7.1	8.2	7.1	8.6	9.4	8.8	8.7	6.8	5.8	7.6	8.5

River Mile	August				September				October				
	45	46	47	48	49	50	51	52	1	2	3	4	5
150 1/	7.6	7.7	7.3	7.7	8.4	8.4	8.6	8.1	7.4	7.0	6.6	6.2	5.5
140	7.8	7.8	7.4	7.9	8 5	8.4	8.6	7.9	7.1	6.8	6.4	5.9	4.9
130	8.0	7.7	7.5	8.0	8.5	8.4	8.5	7.5	6.6	6.4	5.9	5.5	4.2
120	8.2	7.9	7.7	8.2	8.7	8.4	8.5	7.3	6.3	6.1	5.6	5.2	3.5
110	8.4	8.0	7.8	8.4	8.8	8.5	8.5	7.1	6.0	5.9	5.4	5.0	2.9
99 2/	8.7	8.1	8.0	8.7	9.0	8.5	8.5	6.8	5.6	5.6	5.1	4.6	2.2

1/ Downstream of Devil Canyon Dam Site
2/ Upstream of Chulitna-Susitna Confluence

TABLE E.2.4.70: SUSITNA HYDROELECTRIC PROJECT
STREAM TEMPERATURES
EARLY STAGE III
WEATHER PERIOD: SUMMER 1982
CASE E-VI FLOW REQUIREMENTS
STAGED CONSTRUCTION

River Mile	May 31	32	33	34	35	June 36	37	38	39	July 40	41	42	43	44
150 1/	3.6	3.7	4.0	4.3	4.4	4.6	5.1	6.1	6.7	7.0	5.5	5.2	5.4	6.3
140	3.8	3.9	4.2	4.5	4.8	4.9	5.4	6.5	7.3	7.5	5.8	5.5	5.7	6.6
130	4.2	4.1	4.6	4.7	5.2	5.2	5.6	6.8	7.6	7.8	6.2	5.9	6.0	6.9
120	4.6	4.4	5.0	5.2	5.8	5.7	6.0	7.3	8.4	8.4	6.7	6.3	6.3	7.3
110	5.0	4.6	5.4	5.6	6.3	6.1	6.3	7.8	9.0	8.9	7.0	6.7	6.6	7.6
99 2/	5.4	4.9	5.8	6.0	6.8	6.5	6.7	8.4	9.7	9.4	7.5	7.1	7.0	8.0

River Mile	August 45	46	47	48	September 49	50	51	52
150 1/	7.6	7.7	8.0	7.9	7.9	7.9	7.8	8.3
140	7.9	8.0	8.3	8.1	8.0	7.9	7.8	8.2
130	8.2	8.2	8.5	8.2	8.0	7.9	7.7	7.9
120	8.6	8.5	8.9	8.5	8.1	8.0	7.8	7.8
110	8.9	8.8	9.2	8.7	8.3	8.1	7.8	7.8
99 2/	9.1	9.2	9.6	9.0	8.4	8.1	7.9	7.7

1/ Downstream of Devil Canyon Dam Site
2/ Upstream Susitna-Chulitna Confluence

TABLE E.2.4.71: SUSITNA HYDROELECTRIC PROJECT
SIMULATED STREAM TEMPERATURES
LATE STAGE III
WEATHER PERIOD: SUMMER 1981
CASE E-I FLOW REQUIREMENTS
STAGED CONSTRUCTION
50 FT DRAWDOWN AT DEVIL CANYON
2 LEVELS OF PORTS

RIVER		MAY					JUNE					JULY		
MILE	31	32	33	34	35	36	37	38	39	40	41	42	43	44
150 1/	2.0	2.6	3.6	4.1	4.7	5.3	4.8	5.9	5.5	5.9	9.3	8.9	9.0	9.1
140	2.3	3.1	4.1	4.6	5.3	5.6	5.1	6.3	5.9	6.3	9.4	9.1	9.3	9.4
130	2.7	3.7	4.6	5.2	5.9	5.9	5.4	6.8	6.2	6.6	9.0	8.9	9.1	9.2
120	3.1	4.3	5.3	5.9	6.8	6.3	5.9	7.4	6.7	7.0	9.3	9.2	9.5	9.6
110	3.4	4.8	5.8	6.5	7.5	6.6	6.2	7.8	7.1	7.4	9.6	9.6	9.9	9.9
99 2/	3.8	5.4	6.4	7.1	8.2	7.0	6.6	8.4	7.5	7.8	9.9	9.9	10.3	10.3
98 3/	4.0	5.5	6.2	6.5	7.3	6.5	7.0	8.1	7.4	7.6	8.1	8.2	8.5	8.5
84 4/	4.5	6.3	7.1	7.3	8.3	7.1	7.9	9.0	8.2	8.4	8.6	8.9	9.2	9.2

RIVER		AUGUST			SEPTEMBER								
MILE	45	46	47	48	49	50	51	52	1	2	3	4	5
150 1/	7.0	7.4	6.4	6.9	7.7	7.8	8.2	8.4	7.7	7.3	6.8	6.3	5.5
140	7.4	7.5	6.5	7.1	7.9	7.9	8.2	8.1	7.5	7.1	6.6	6.1	5.1
130	7.5	7.4	6.7	7.3	7.9	7.8	8.1	7.7	7.0	6.8	6.3	5.7	4.6
120	7.9	7.6	6.9	7.6	8.1	7.9	8.1	7.5	6.8	6.6	6.0	5.5	4.1
110	8.2	7.7	7.0	7.8	8.3	8.0	8.2	7.3	6.5	6.4	5.9	5.3	3.6
99 2/	8.7	7.9	7.3	8.1	8.5	8.1	8.2	7.0	6.2	6.1	5.6	5.0	3.1
98 3/	8.0	7.2	7.1	7.6	7.4	7.1	6.7	5.0	4.8	4.9	4.5	3.9	2.3
84 4/	8.7	7.5	7.7	8.4	7.8	7.3	6.8	4.5	4.3	4.4	4.1	3.4	1.5

1/ Downstream of Devil Canyon Dam Site
2/ Upstream of Chulitna - Susitna confluence
3/ Downstream of Chulitna - Susitna confluence
4/ At Sunshine Stream gaging station

TABLE E.2.4.72: SUSITNA HYDROELECTRIC PROJECT
SIMULATED STREAM TEMPERATURES
LATE STAGE III
WEATHER PERIOD: SUMMER 1982
CASE E-I FLOW REQUIREMENTS
STAGED CONSTRUCTION
50 FT DRAWDOWN AT DEVIL CANYON
2 LEVELS OF PORTS

RIVER	MAY				JUNE					JULY				
MILE	31	32	33	34	35	36	37	38	39	40	41	42	43	44
150 1/	3.6	3.8	4.0	4.4	4.6	4.7	4.5	6.2	5.7	5.3	6.2	6.4	8.3	9.8
140	3.9	3.9	4.3	4.6	4.9	5.0	4.7	6.5	6.1	5.8	6.5	6.8	8.5	10.0
130	4.3	4.1	4.6	4.8	5.3	5.3	4.9	6.8	6.6	6.2	6.9	7.2	8.5	10.0
120	4.7	4.4	5.1	5.3	5.9	5.7	5.2	7.2	7.2	6.7	7.4	7.7	8.9	10.4
110	5.0	4.7	5.5	5.7	6.4	6.1	5.4	7.6	7.7	7.2	7.8	8.2	9.2	10.7
99 2/	5.5	4.9	5.9	6.0	6.9	6.5	5.6	8.0	8.3	7.7	8.3	8.7	9.5	11.1
98 3/	5.2	4.6	5.5	5.6	6.4	6.6	5.7	6.9	8.2	7.5	7.8	8.2	7.9	8.9
84 4/	5.6	4.9	6.1	6.2	7.3	7.6	6.4	7.8	9.4	8.5	8.7	9.1	8.7	9.7

RIVER	AUGUST				SEPTEMBER			
MILE	45	46	47	48	49	50	51	52
150 1/	9.9	9.7	9.8	9.8	10.3	10.7	10.1	9.4
140	10.1	9.9	10.0	9.9	10.3	10.5	9.8	9.0
130	10.2	9.9	10.1	9.9	10.0	10.1	8.8	8.2
120	10.6	10.2	10.4	10.1	10.1	10.1	8.8	8.0
110	10.9	10.4	10.6	10.2	10.1	10.1	8.8	7.8
99 2/	11.3	10.7	10.9	10.4	10.2	10.0	8.6	7.5
98 3/	9.0	8.7	9.1	8.1	8.0	7.2	5.4	5.2
84 4/	9.7	9.4	9.7	8.6	8.1	7.2	5.7	5.0

1/ Downstream of Devil Canyon Dam Site
2/ Upstream of Chulitna - Susitna confluence
3/ Downstream of Chulitna - Susitna confluence
4/ At Sunshine Stream gaging station

TABLE E.2.4.73: SEDIMENT CONCENTRATION mg/l
STAGE III

Month	Range of Observed Natural Conditions 1/	Simulated Range of Natural Condition (1982) 2/	Range of Monthly Mean Outflow Concentrations	Range of Outflow Concentrations
			Average Year (1982)	Average Year (1982)
January	<1-8	1-20	50-60	40-70
February	-	1-30	50	30-65
March	1-6	1-20	20-30	14-40
April	-	30-170	20-30	15-40
May	65-1110	130-1270	12-22	10-30
June	151-1860	930-1470	30-40	15-60
July	100-2790	600-1600	70-80	60-100
August	158-1040	200-1070	70-80	55-100
September	23-812	200-1530	50-60	40-70
October	6-140	1-30	50	40-65
November	-	1-30	70	65-70
December	-	1-30	65-70	55-70

1/ Based on observations by the U.S. Geological Survey on the Susitna River near Cantwell (1962-1972, 1980-1983) and the Susitna River at Gold Creek (1974-1983).

2/ Estimated range of daily suspended sediment concentrations influent to the reservoir based on flow vs. concentration rating curve at USGS gauge on Susitna River near Cantwell.

3/ Based on simulations of 3 years 1982 represents a year with an average sediment load.

TABLE E.2.4.74: PERCENT OF TIME NAVIGATION FLOWS EXCEEDED DURING STAGE III OPERATION

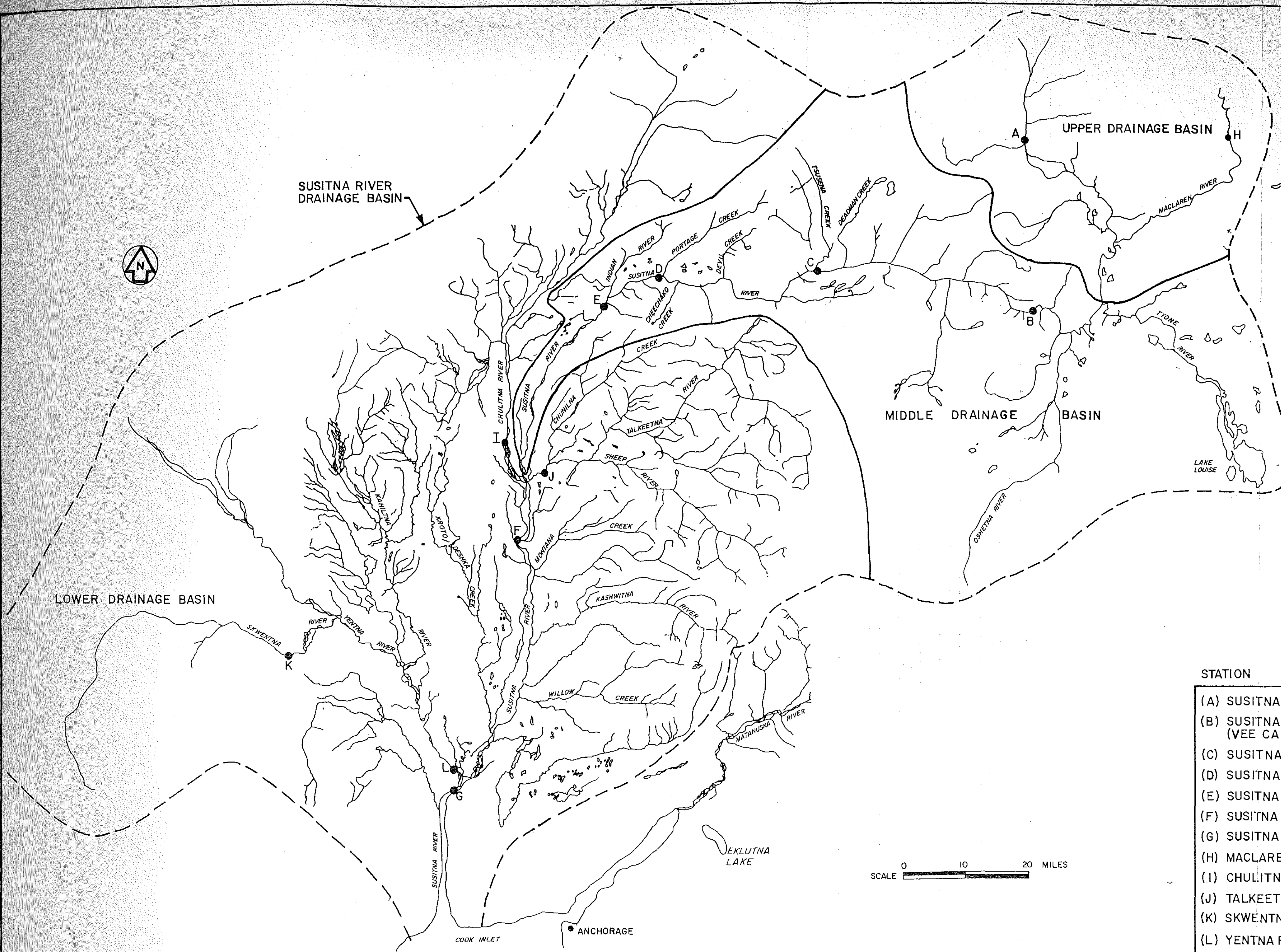
	Gold Creek 1/		Sunshine 2/		Susitna Station 3/	
	Natural	Stage 3 2008 Load	Natural	Stage 3 2008 Load	Natural	Stage 3 2008 Load
27 May 2 Jun	100	100	94	80	88	68
3 Jun 9 Jun	100	100	100	97	100	90
10 Jun 16 Jun	100	100	100	100	100	92
17 Jun 23 Jun	100	100	100	100	100	98
24 Jun 30 Jun	100	100	100	100	100	100
1 Jul 7 Jul	100	100	100	100	100	100
8 Jul 14 Jul	100	100	100	100	100	100
15 Jul 21 Jul	100	100	100	100	100	100
22 Jul 28 Jul	100	100	100	100	100	100
29 Jul 4 Aug	100	100	100	100	100	100
5 Aug 11 Aug	100	100	100	100	100	100
12 Aug 18 Aug	100	100	97	96	100	100
19 Aug 25 Aug	100	100	96	95	97	97
26 Aug 1 Sep	98	100	93	92	96	96
2 Sep 8 Sep	100	100	91	88	75	76
9 Sep 15 Sep	97	100	82	81	63	61
16 Sep 22 Sep	94	100	67	61	62	60
23 Sep 30 Sep	84	100	43	44	42	43

1/ Estimated navigable flow = 6,000 cfs at Gold Creek, for Portage Creek to Chulitna River.

2/ Estimated navigable flow = 25,000 cfs at Sunshine, for navigable channels to all tributaries, Chulitna River at Yentna River. Jet boats observed operating on main channel at 17,800 cfs.

3/ Estimated flow for jet boat to navigate Alexander Slough = 60,000 cfs at Susitna Station. Estimate based on aerial photography. Flow valve dependent on channel morphology of Alexander Slough.

FIGURES



NOTES:

1. CONTINUOUS WATER QUALITY MONITOR INSTALLED.
2. DATA COLLECTION 1981-85
3. THE LETTER BEFORE EACH STATION NAME IN THE TABLE IS USED ON THE MAP TO MARK THE APPROXIMATE LOCATION OF THE STATIONS.

STATION	STREAMFLOW GAGING	CREST STAGE GAGE	STAFF GAGE	WATER QUALITY	WATER TEMPERATURE	SEDIMENT DISCHARGE	BEDLOAD SAMPLING[2]	CLIMATE
(A) SUSITNA RIVER NEAR DENALI	X		X		X	X		X
(B) SUSITNA RIVER NEAR CANTWELL (VEE CANYON)	X		X	X	X	X		
(C) SUSITNA RIVER NEAR WATANA DAMSITE	X	X		X[1]	X			X
(D) SUSITNA RIVER NEAR DEVIL CANYON		X	X					X
(E) SUSITNA RIVER AT GOLD CREEK	X			X	X	X	X	
(F) SUSITNA RIVER NEAR SUNSHINE	X				X	X	X	
(G) SUSITNA RIVER AT SUSITNA STATION	X			X	X	X		
(H) MACLAREN RIVER NEAR PAXSON	X							
(I) CHULITNA RIVER NEAR TALKEETNA	X				X	X	X	
(J) TALKEETNA RIVER NEAR TALKEETNA	X			X	X	X	X	
(K) SKWENTNA RIVER NEAR SKWENTNA	X			X	X	X		X
(L) YENTNA RIVER NEAR SUSITNA STATION	X				X	X		

STREAMFLOW GAGING AND WATER QUALITY MONITORING STATIONS

FIGURE E.2.2.1

RIVER MILE 103.2

SINGLE CHANNEL:

- STABLE
- NON-ERODIBLE BANKS; CONTROLLED BY VALLEY WALLS, BEDROCK OR ARMOR LAYER CONSISTING OF GRAVEL/COBBLES.
- CHANNEL MAY BE EITHER STRAIGHT OR MEANDERING; IN STRAIGHT CHANNELS, THALWEG OFTEN MEANDERS ACROSS CHANNEL.
- OCCASIONAL FRAGMENTARY ALLUVIAL DEPOSITS IN FLOODPLAIN.

SINGLE-CHANNEL RIVER PATTERN

SOURCE: R & M 1982d

FIGURE E.2.2.2

RIVER MILE 124.4

SPLIT CHANNEL:

- MAIN CHANNEL BEHAVES SIMILAR TO SINGLE CHANNEL AT LOW FLOW.
- SIDE CHANNELS PROVIDE FLOOD RELIEF AT HIGH FLOWS (GREATER THAN 20,000 CFS).
- ISLANDS WELL ESTABLISHED WITH VEGETATION.
- GRAVEL/COBBLE BED MATERIAL.
- MEAN ANNUAL FLOOD CORRELATES WITH BANKFULL FLOW.
- CHANNELS ARE MODERATELY STABLE.

SPLIT-CHANNEL RIVER PATTERN

SOURCE: R&M 1982d

FIGURE E.2.2.3

CHULITNA RIVER NEAR CONFLUENCE WITH SUSITNA RIVER

BRAIDED CHANNEL:

- FLOODPLAIN IS VERY WIDE AND SHALLOW EVEN AT FLOOD FLOW.
- MULTIPLE AND INTERLACING CHANNELS IN UNVEGETATED GRAVEL FLOODPLAIN
- MOVE LARGE QUANTITIES OF BED MATERIAL DURING FLOWS GREATER THAN BANKFULL
- RESULTS FROM COMBINATION OF HIGH RATES OF BEDLOAD TRANSPORT, LOW CHANNEL STABILITY, HIGH SEDIMENT SUPPLY, HIGH GRADIENTS AND LOW UPSTREAM FLOW REGULATION.

BRAIDED-CHANNEL RIVER PATTERN

SOURCE: R & M 1982d

FIGURE E.2.2.4

DELTA ISLANDS

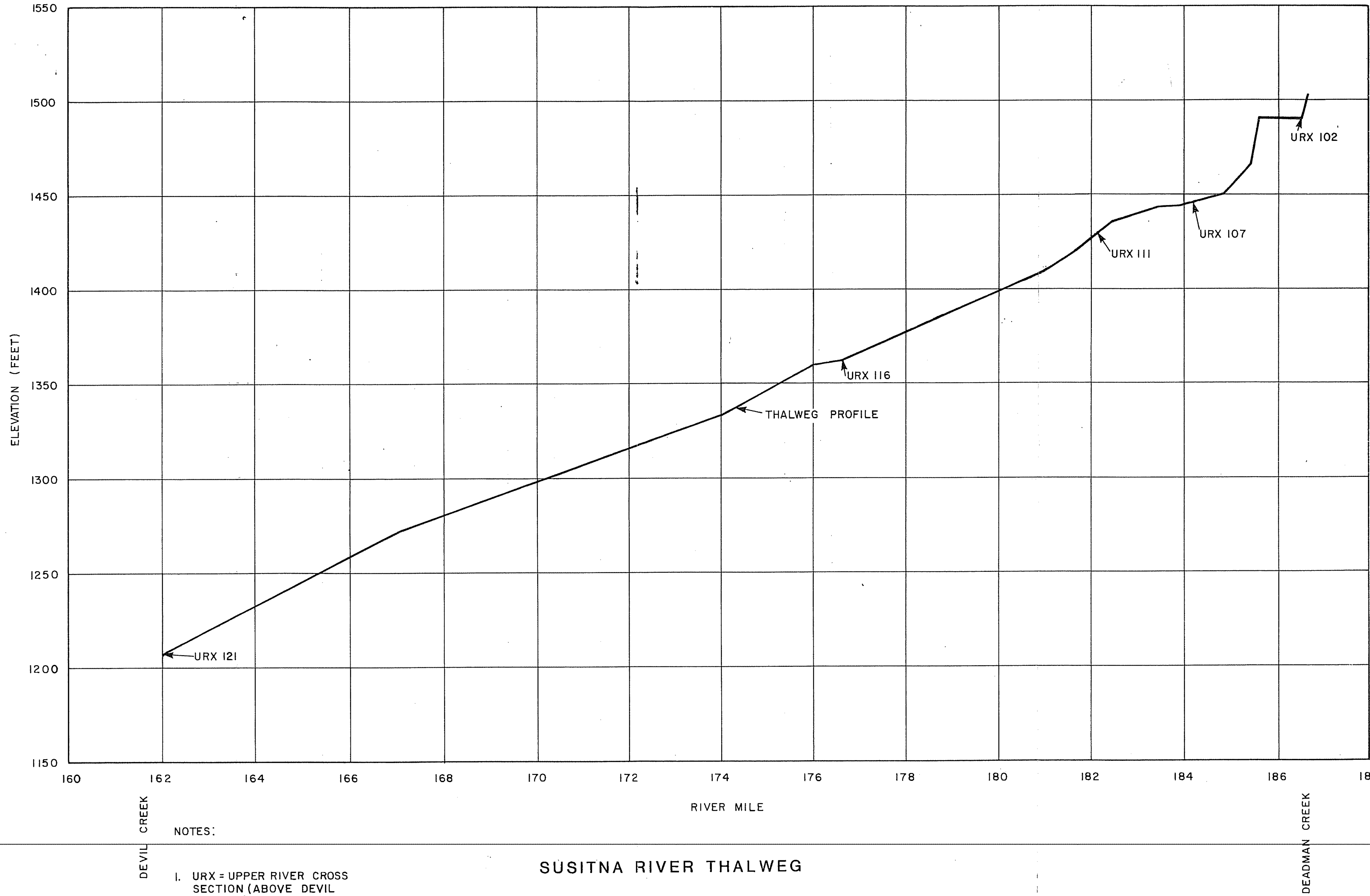
MULTI-CHANNEL (DELTA ISLANDS):

- VERY BROAD FLOODPLAIN WITH LITTLE LATERAL CONTROL.
- MULTIPLE CHANNELS CONSIST OF A MIX OF BRAIDED, SPLIT CHANNEL AND SINGLE CHANNELS WITHIN FLOODPLAIN.
- RELATIVELY UNSTABLE, SUBJECT TO MAJOR LOCAL CHANGES DURING SINGLE FLOOD EVENTS.
- LARGE AMOUNT OF FINE SUSPENDED SEDIMENT HELPS STABILIZE BANKS; DENSE VEGETATION EFFECTIVE IN TRAPPING SEDIMENT.
- BED MATERIAL CONSISTS OF GRAVEL/SAND WITH POCKETS OF SILT.

MULTI-CHANNEL RIVER PATTERN

SOURCE: R & M 1982d

FIGURE E.2.2.5



NOTES:

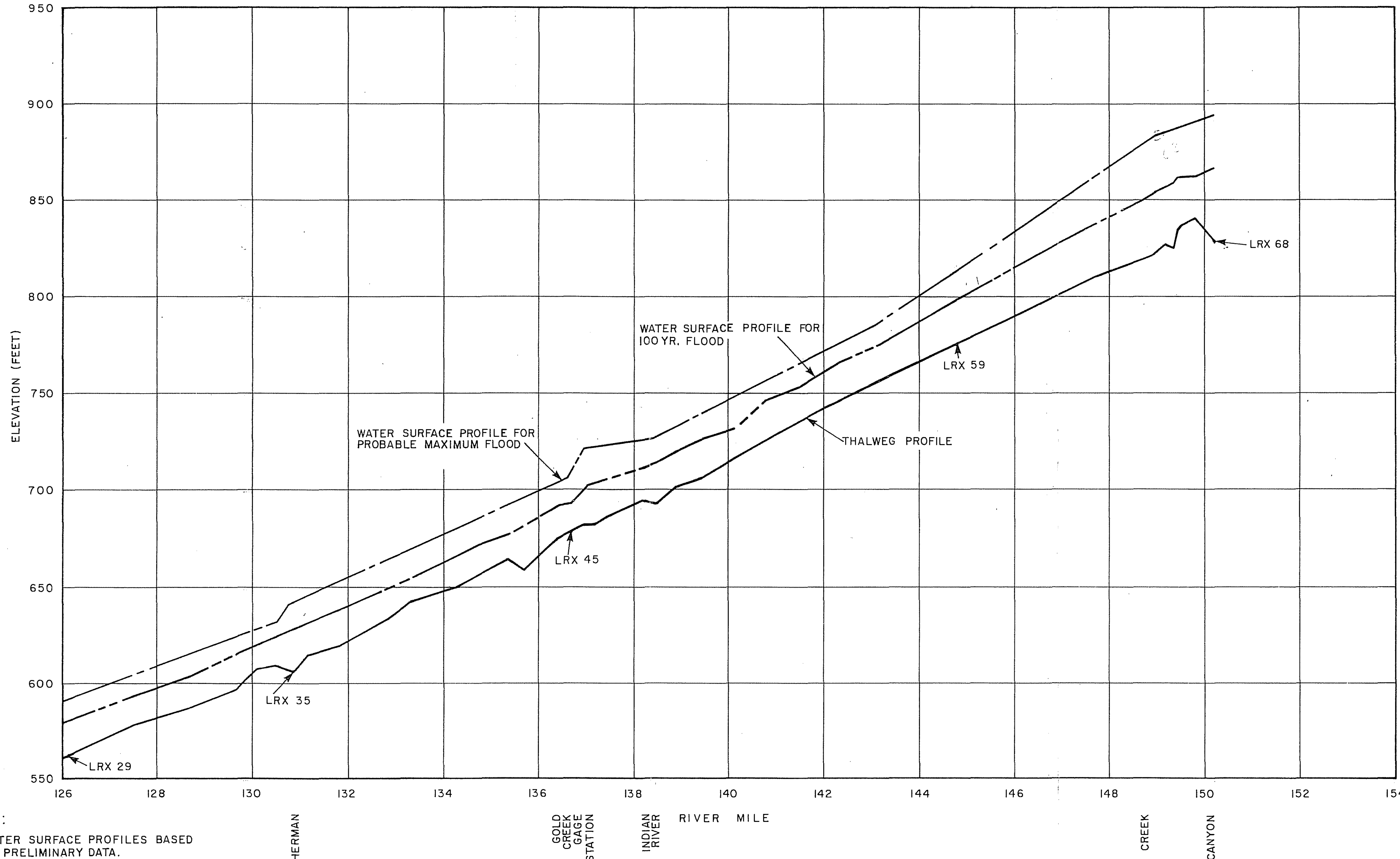
1. URX = UPPER RIVER CROSS SECTION (ABOVE DEVIL CANYON).

SUSITNA RIVER THALWEG

DEADMAN CREEK TO DEVIL CREEK

SOURCE: R & M 1982h

FIGURE E.2.2.6



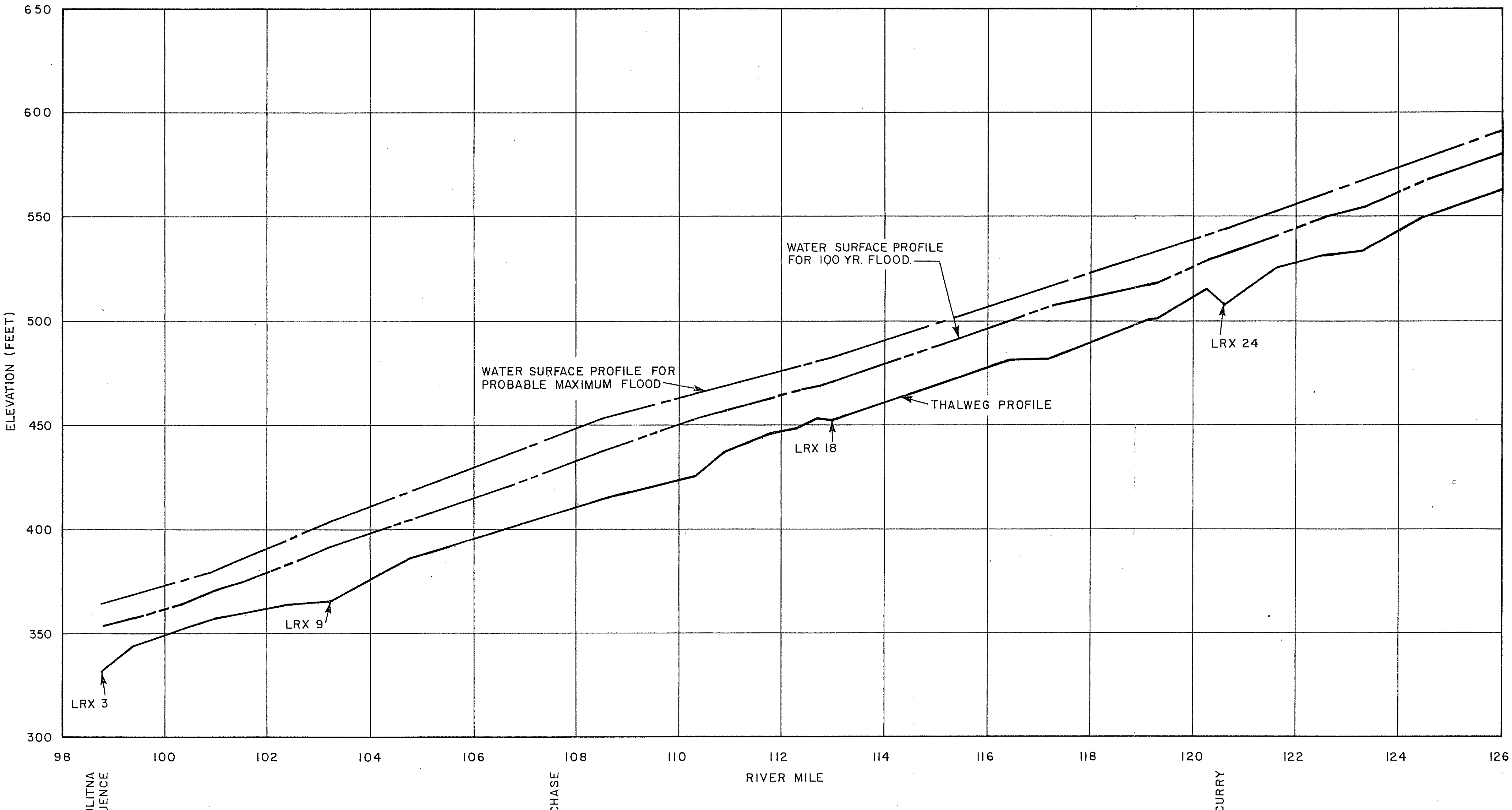
NOTES:

1. WATER SURFACE PROFILES BASED ON PRELIMINARY DATA.
2. LRX = LOWER RIVER CROSS SECTION (BELOW DEVIL CANYON).

SUSITNA RIVER THALWEG AND WATER SURFACE PROFILES
DEVIL CANYON TO RM 126

SOURCE: R & M 1982h

FIGURE E.2.2.7



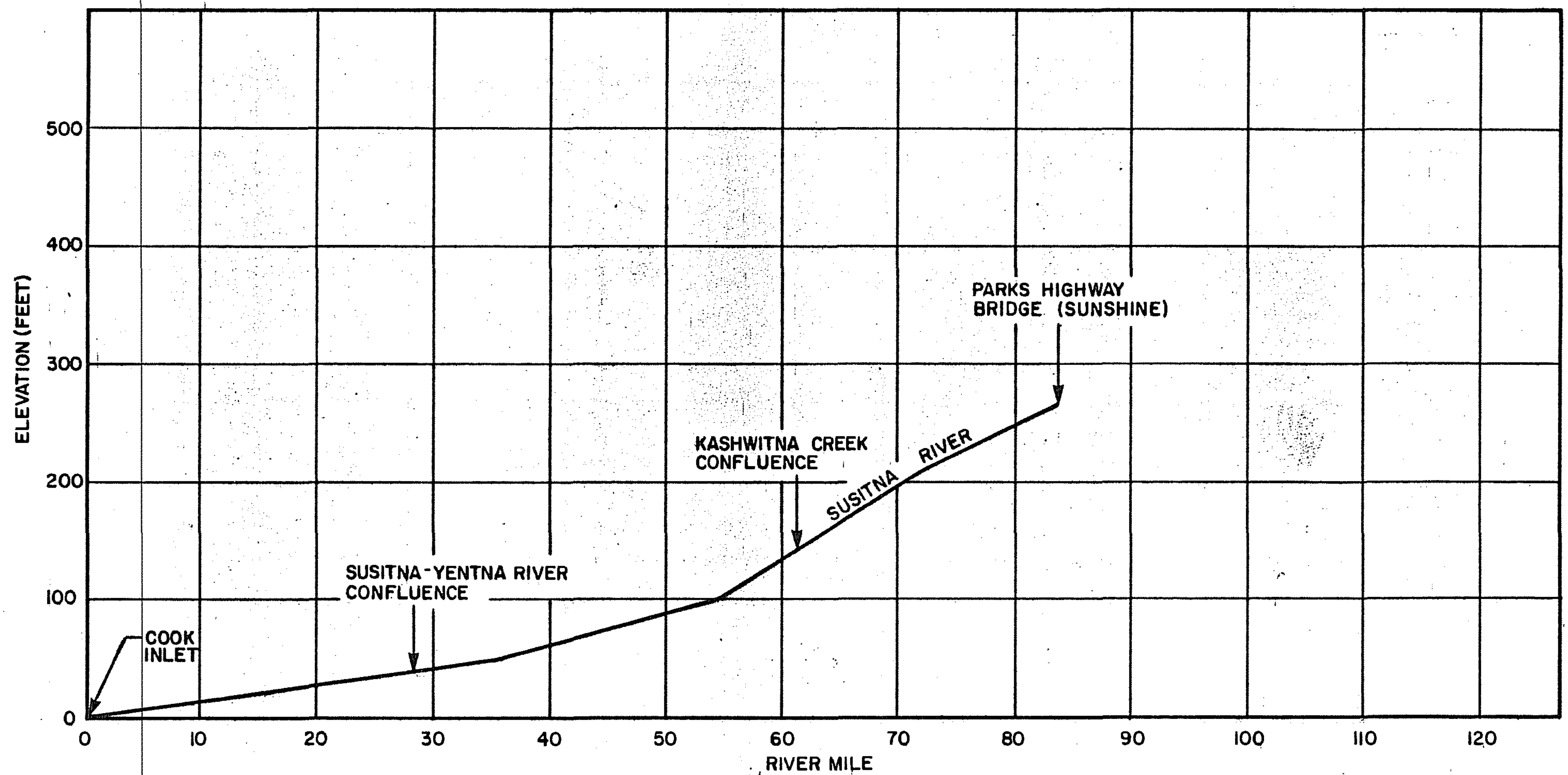
NOTES:

1. WATER SURFACE PROFILES BASED ON PRELIMINARY DATA.
2. LRX = LOWER RIVER CROSS SECTION (BELOW DEVIL CANYON).

SUSITNA RIVER THALWEG AND WATER SURFACE PROFILES
RM 126 TO TALKEETNA

SOURCE: R&M 1982h

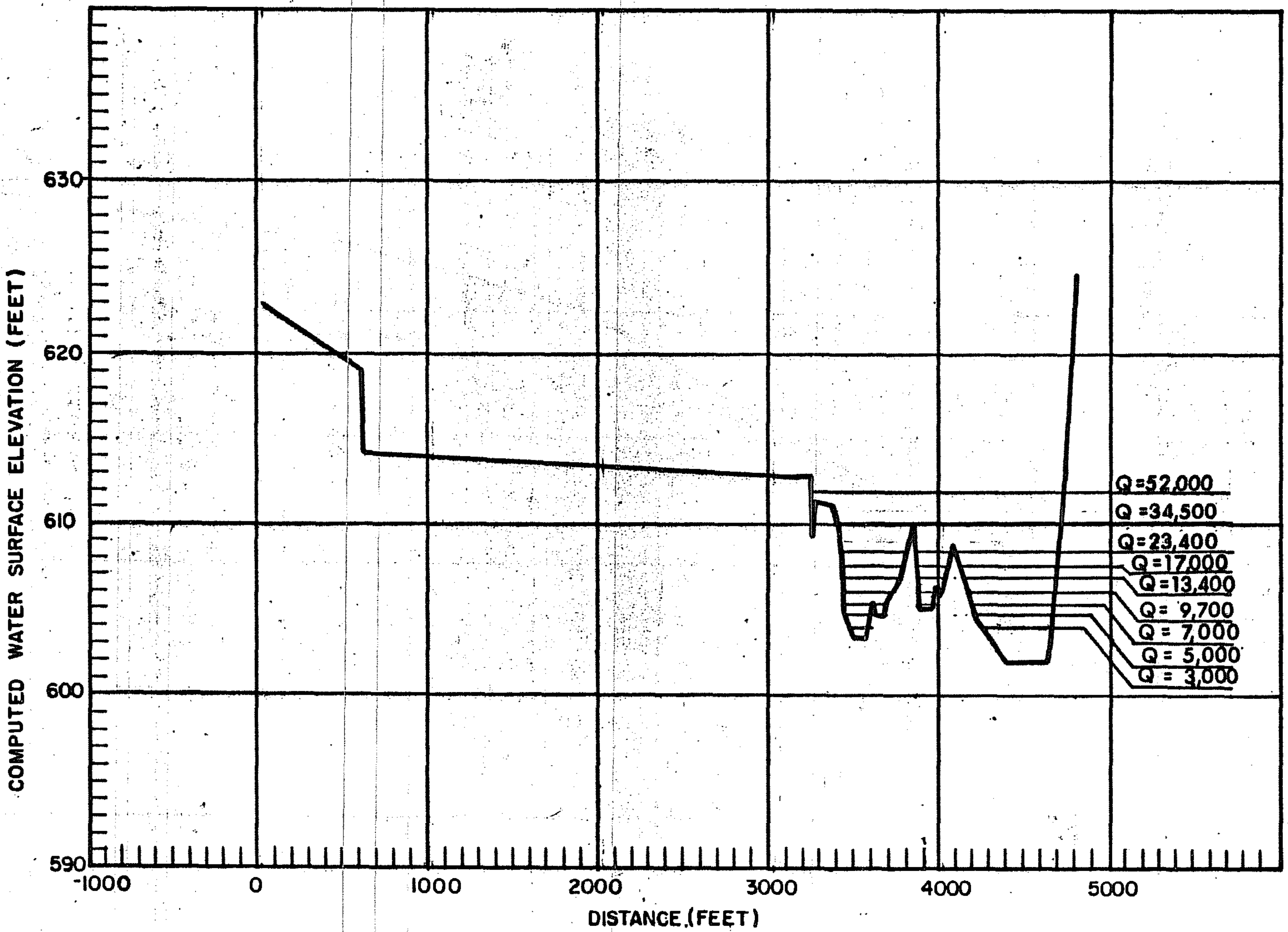
FIGURE E.2.2.8



SUSITNA RIVER THALWEG PROFILE
SUNSHINE TO COOK INLET

SOURCE: R&M 1982b

FIGURE E.2.2.9



NOTES:

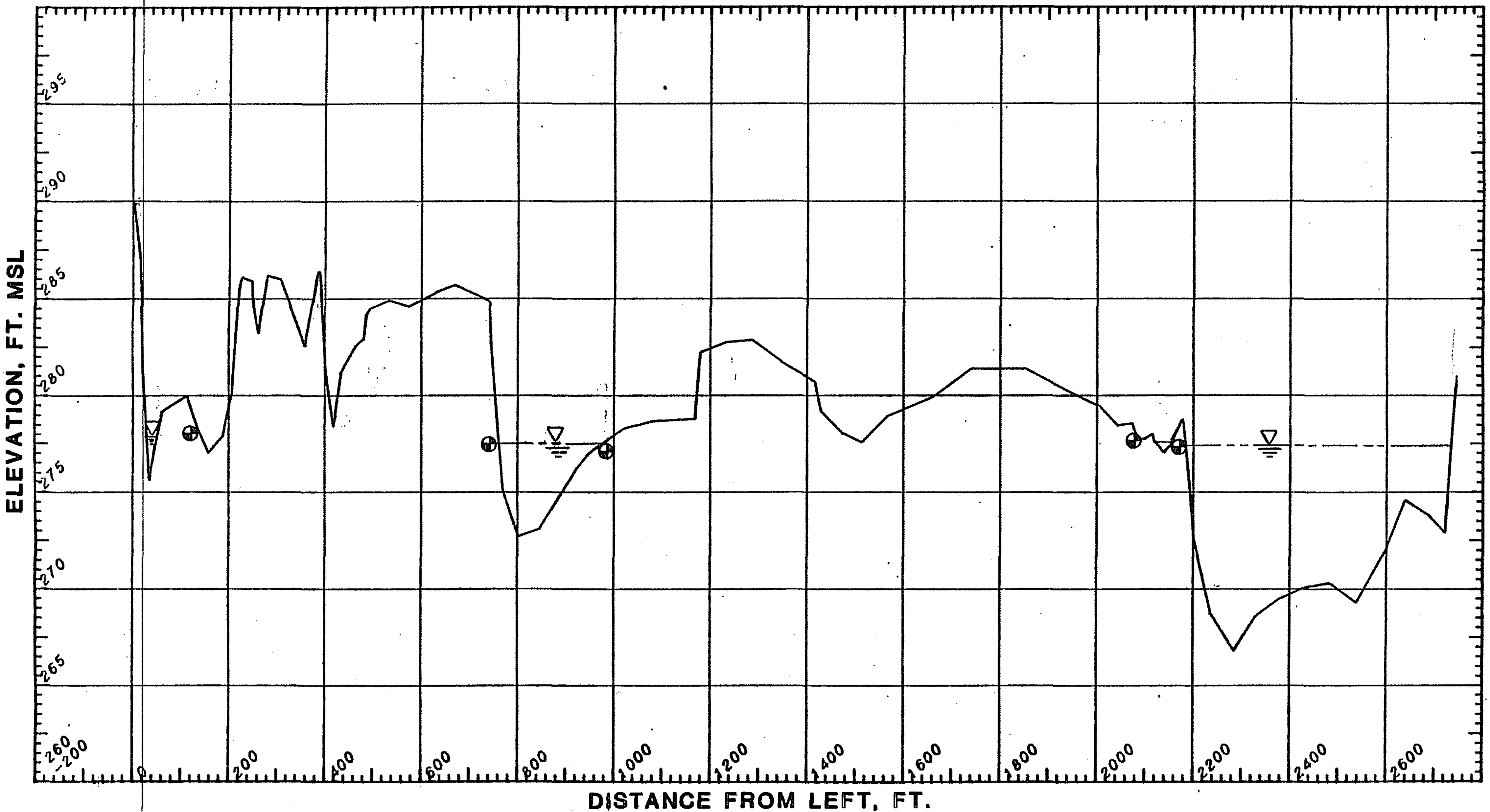
Q = FLOW (CFS)

(e) = ESTIMATED

CROSS-SECTION NUMBER 32
NEAR SHERMAN (RIVER MILE 129.7)

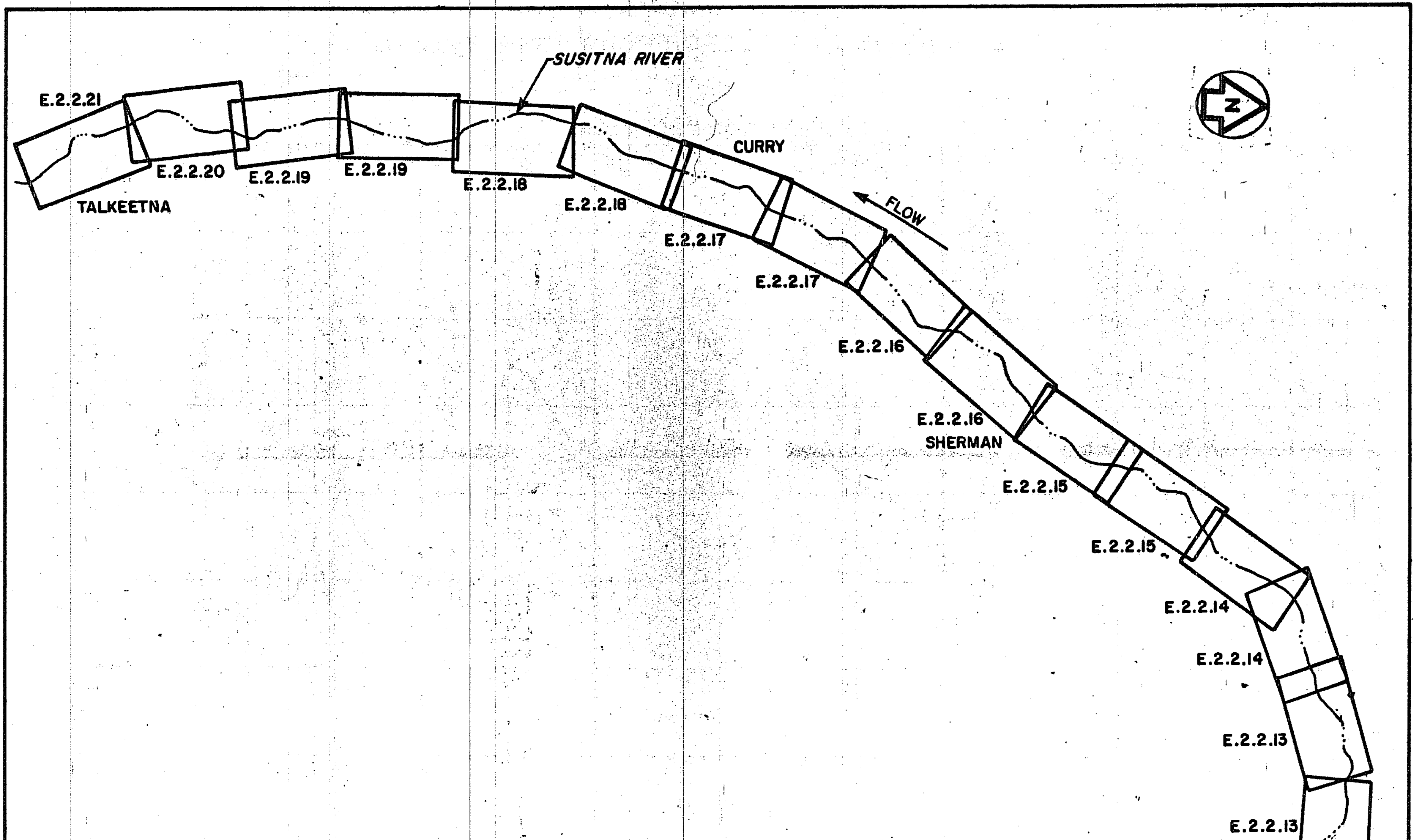
SOURCE: HE 1984a

FIGURE E.2.2.10



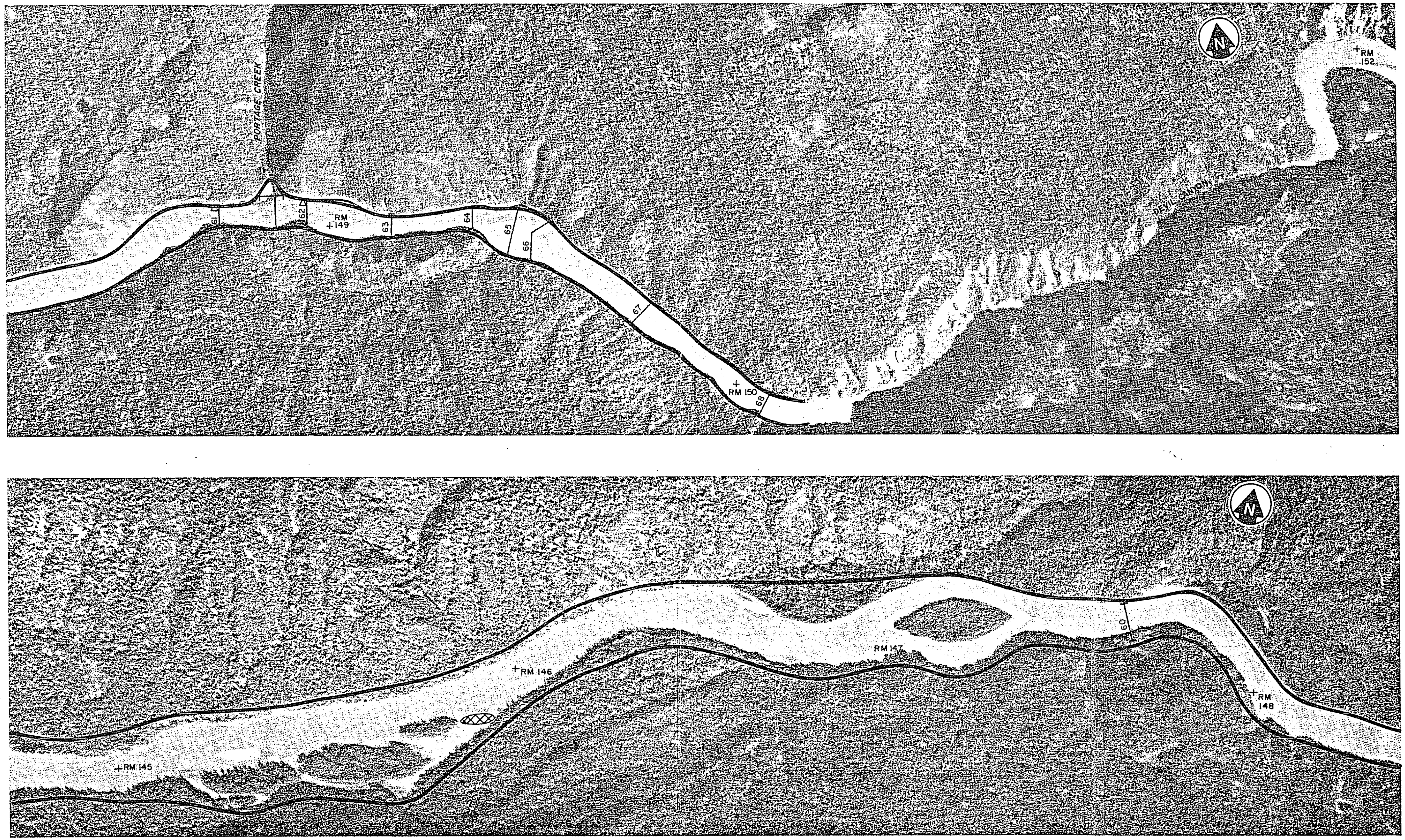
SUSITNA RIVER CROSS SECTION AT RIVER MILE 87.7
IN LOWER RIVER

FIGURE E.2.2.11



SUSITNA RIVER PLAN INDEX MAP

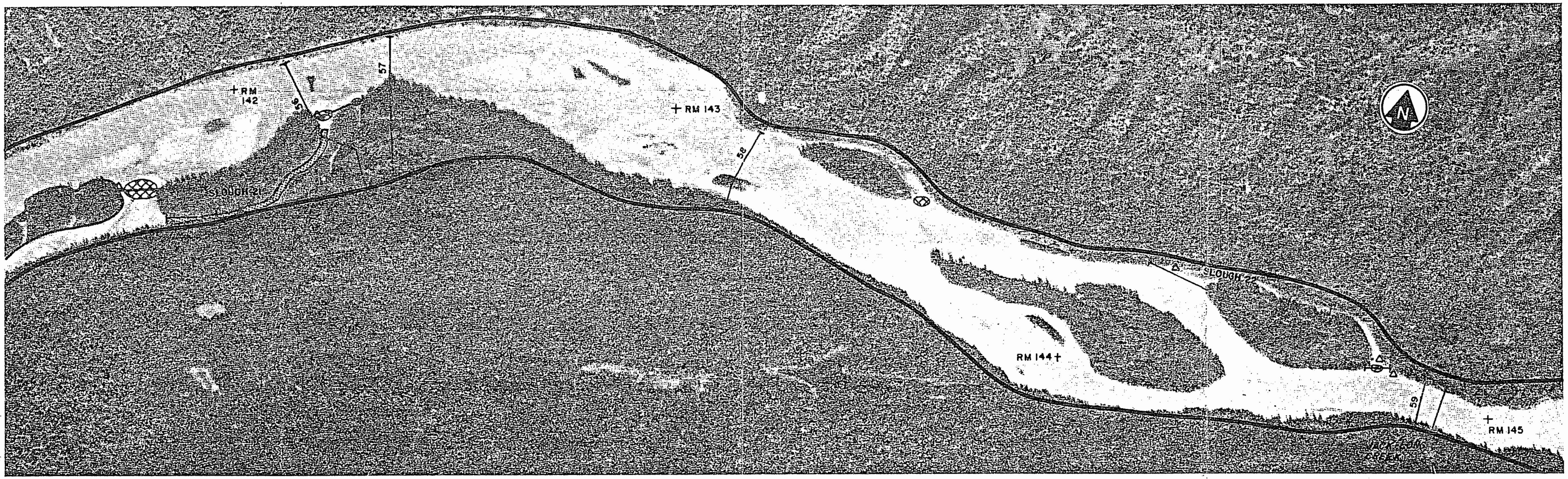
FIGURE E.2.2.12

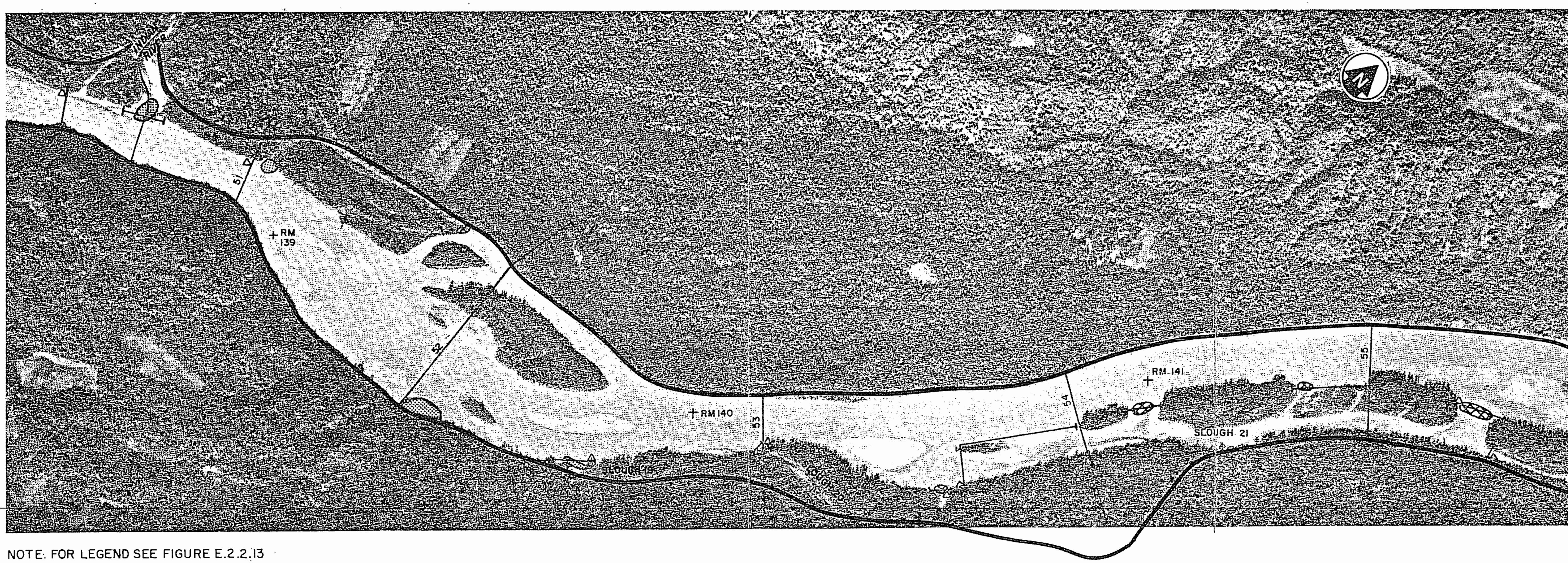


LEGEND:
+ RIVER MILE
62 LRX CROSS SECTION
100 YEAR FLOOD PLAIN BOUNDARY
THERMALLY INDUCED OPEN LEAD DURING WINTER
BERM
△ STAFF GAGE SITE

SUSITNA RIVER PLAN
RM 152 TO RM 145

FIGURE E.2.2.13

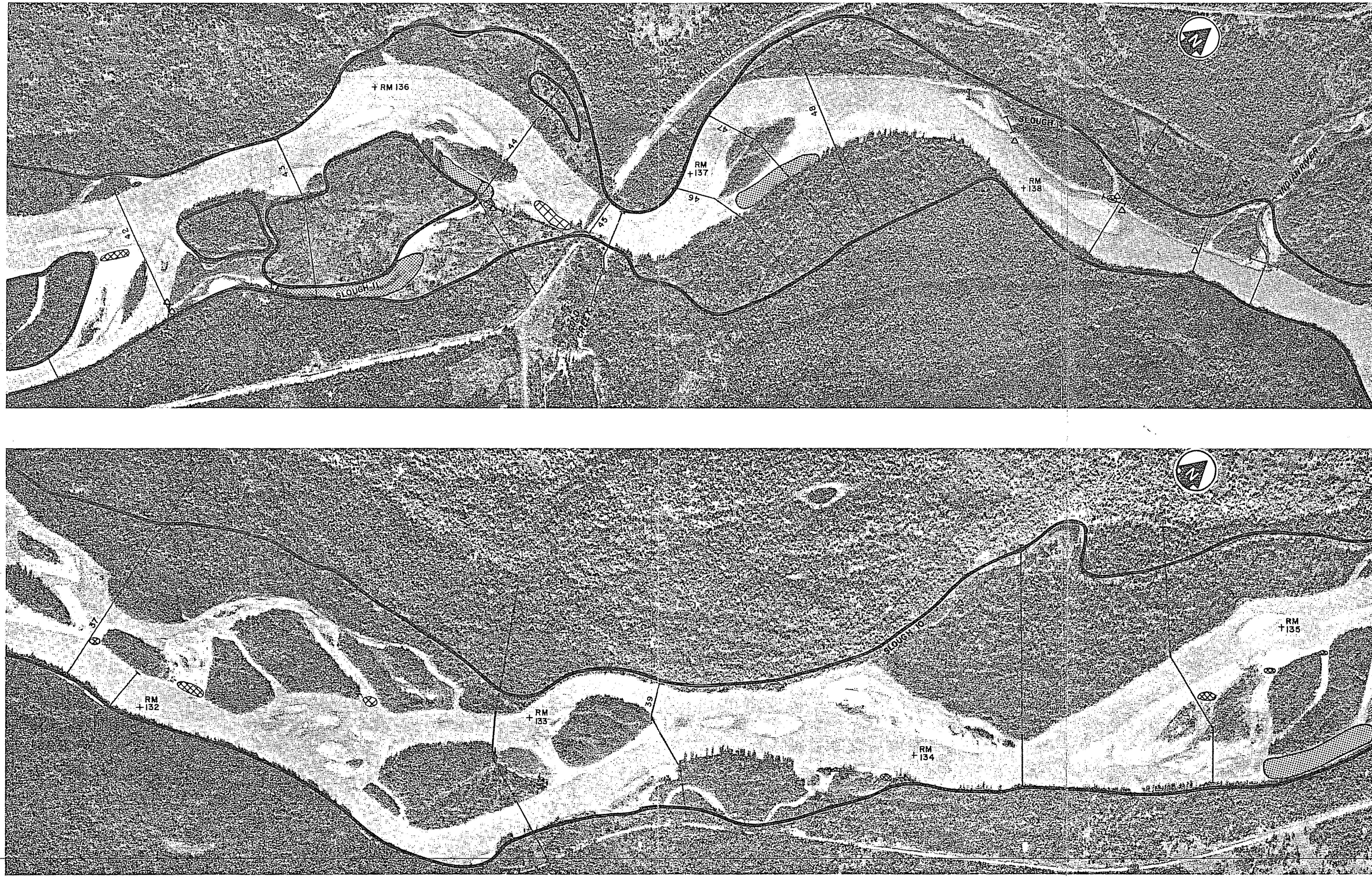




NOTE: FOR LEGEND SEE FIGURE E.2.2.13

SUSITNA RIVER PLAN
RM 145 TO RM 139

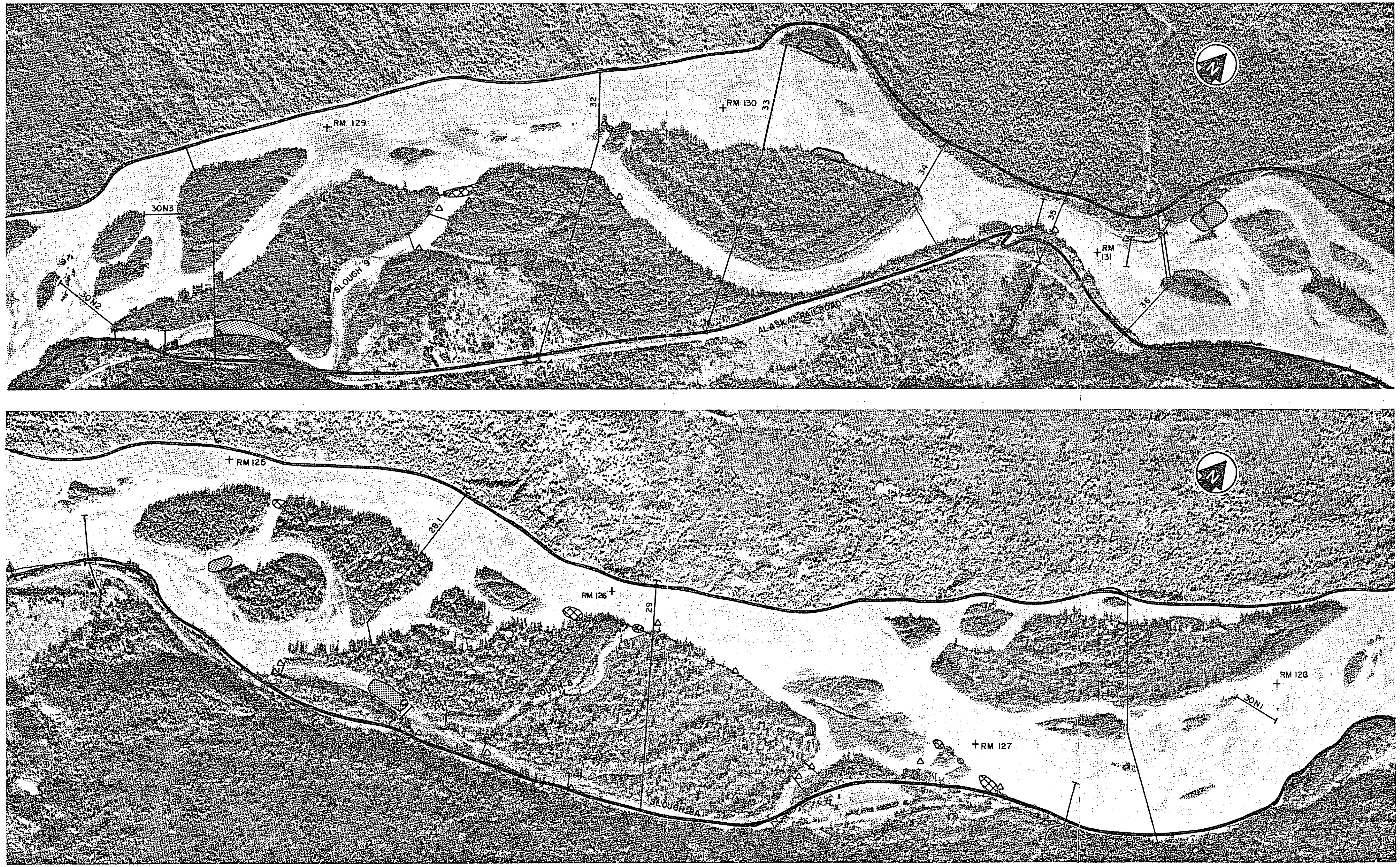
FIGURE E.2.2.14



NOTE: FOR LEGEND SEE FIGURE E.2.2.13

SUSITNA RIVER PLAN
RM 138 TO RM 132

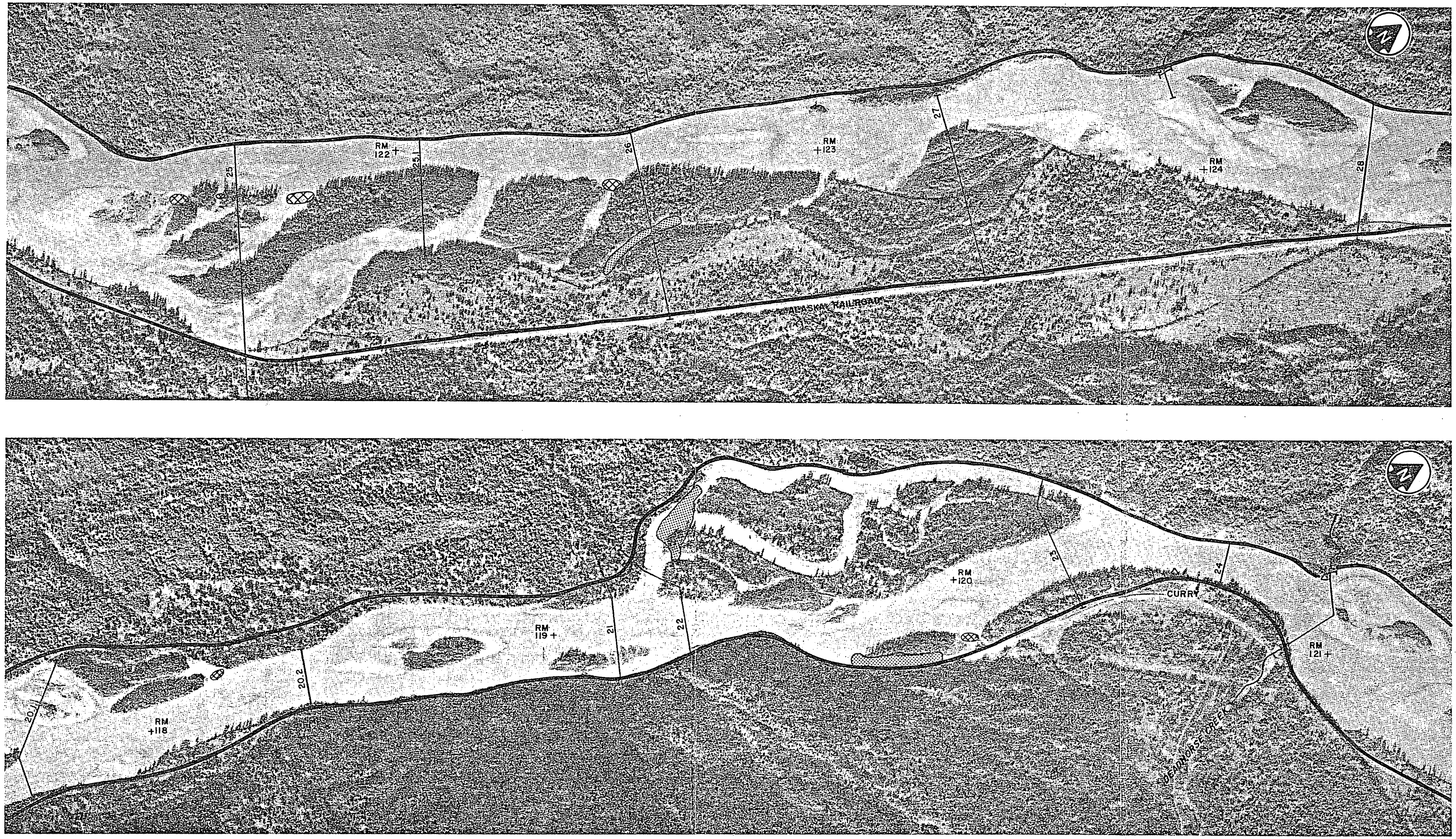
FIGURE E.2.2.15



NOTE: FOR LEGEND SEE FIGURE E.2.2.13

SUSITNA RIVER PLAN
RM 131 TO RM 125

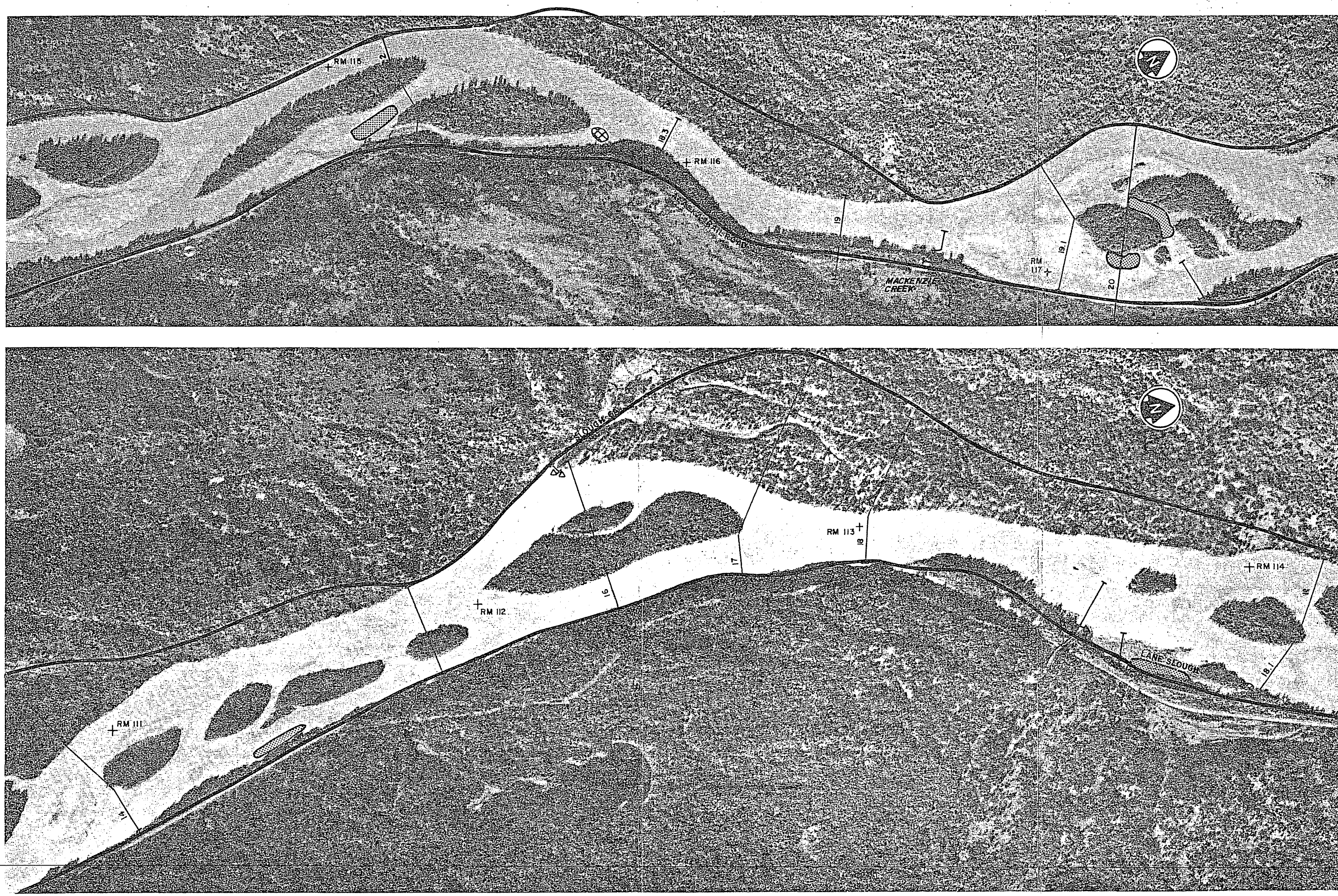
FIGURE E.2.2.16



NOTE: FOR LEGEND SEE FIGURE E.2.2.13

SUSITNA RIVER PLAN
RM 124 TO RM 118

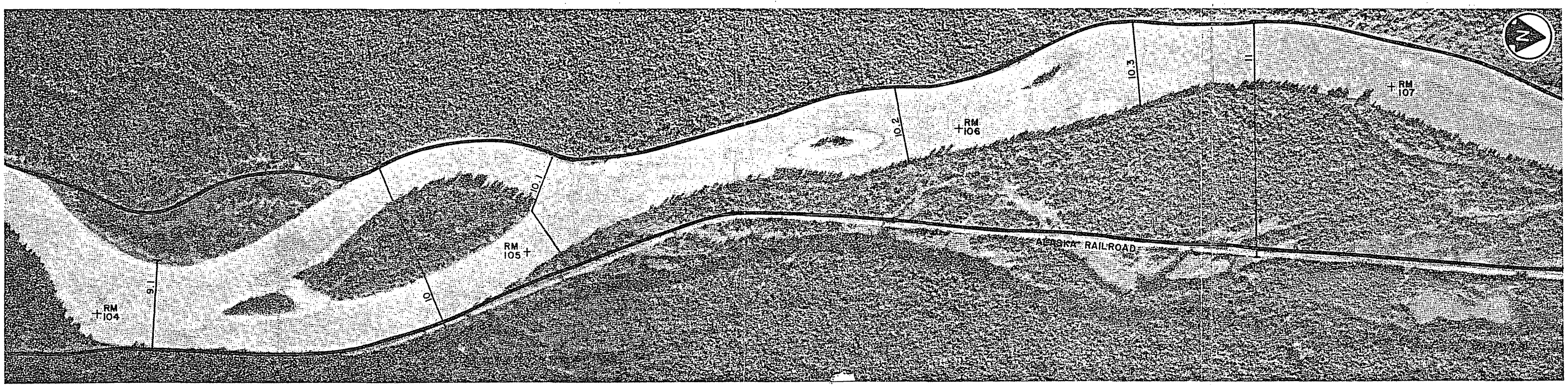
FIGURE E.2.2.17



NOTE: FOR LEGEND SEE FIGURE E.2.2.13

SUSITNA RIVER PLAN
RM 117 TO RM 111

FIGURE E.2.2.18



NOTE: FOR LEGEND SEE FIGURE E.2.2.13

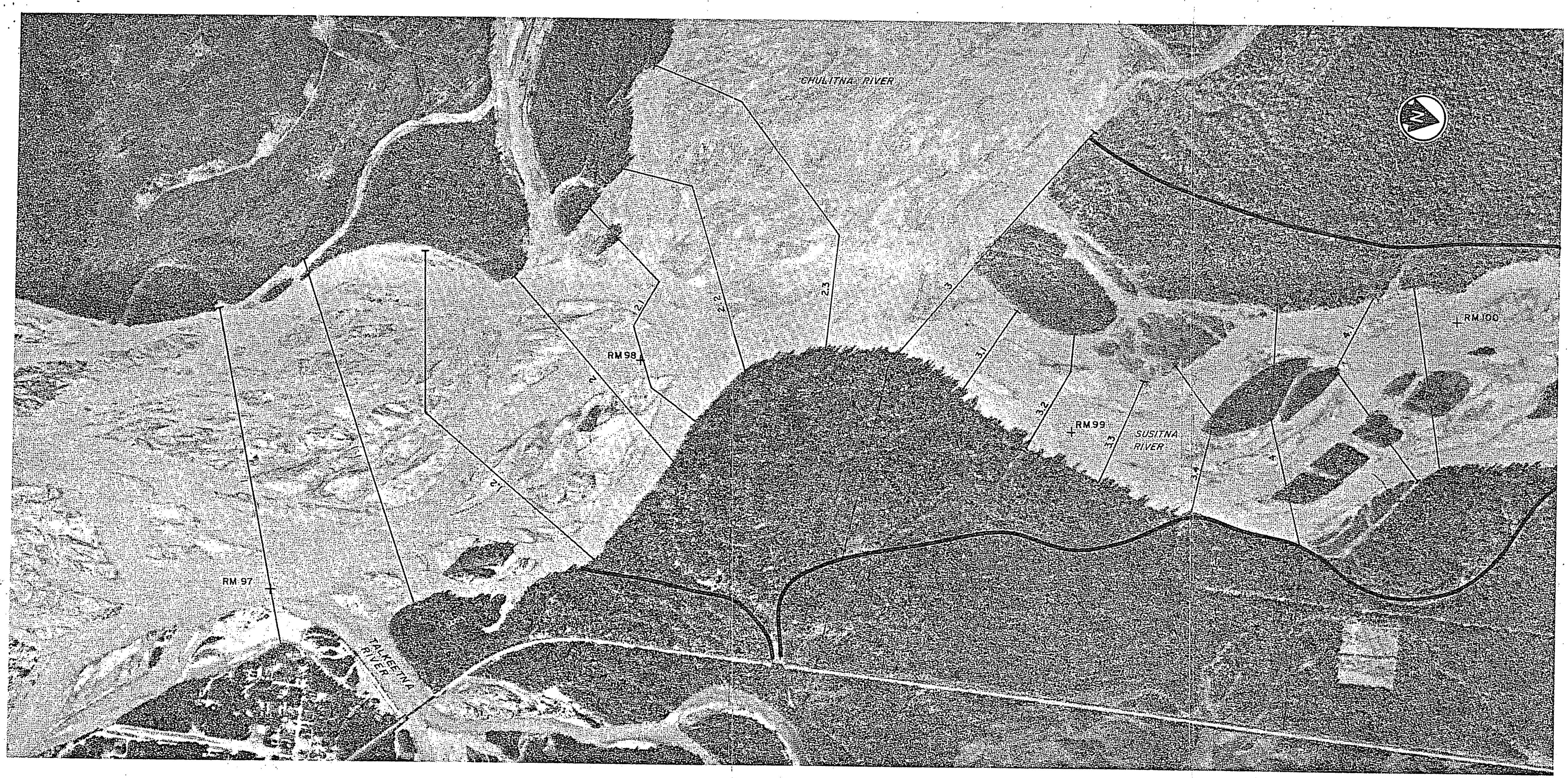
SUSITNA RIVER PLAN
RM 110 TO RM 104

FIGURE E.2.2.19

NOTE: FOR LEGEND SEE FIGURE E.2.2.13

SUSITNA RIVER PLAN
RM 103 TO RM 101

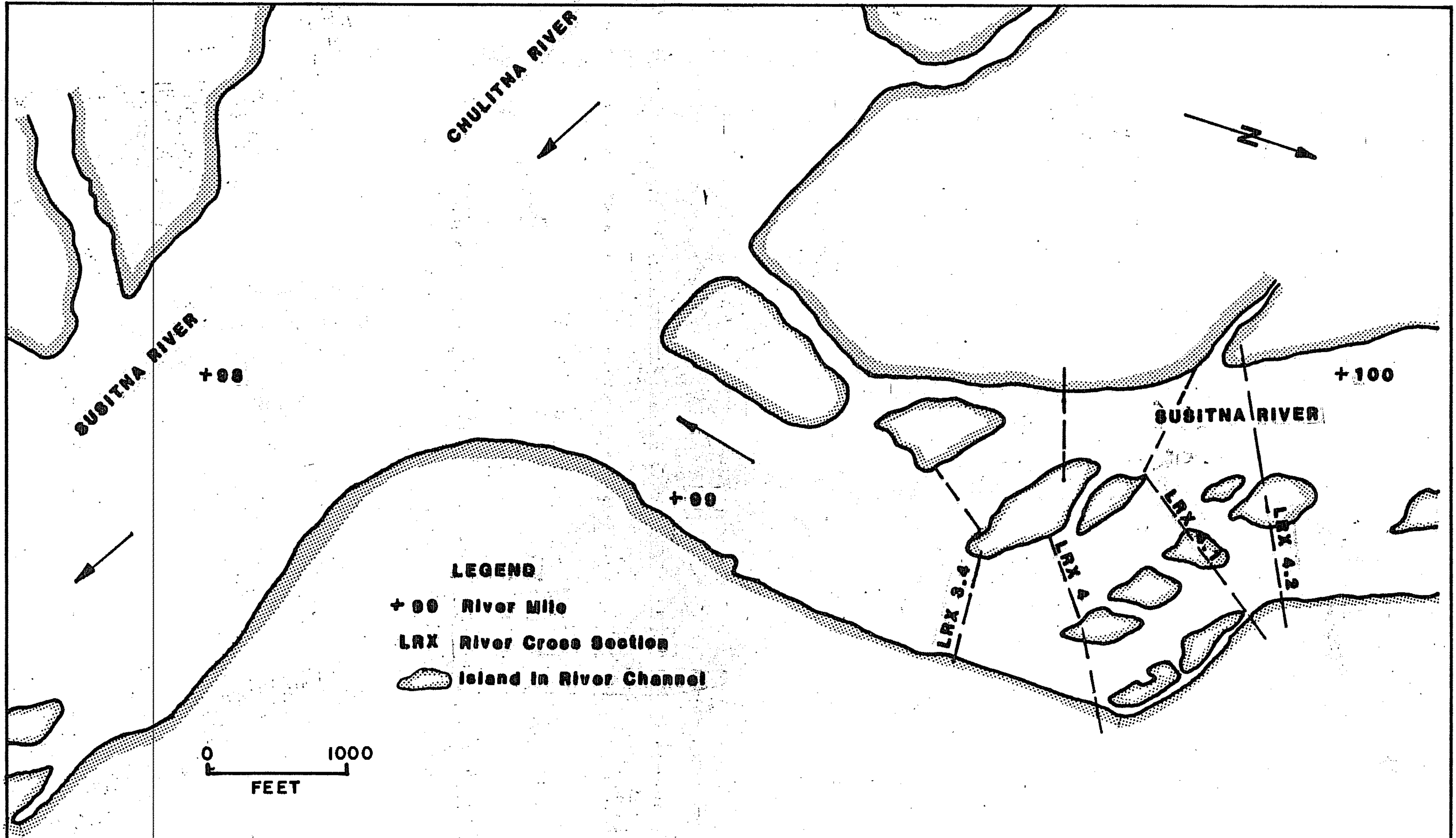
FIGURE E.2.2.20



NOTE: FOR LEGEND SEE FIGURE E.2.2.13

SUSITNA RIVER PLAN
RM 100 TO RM 97

FIGURE E.2.2.21

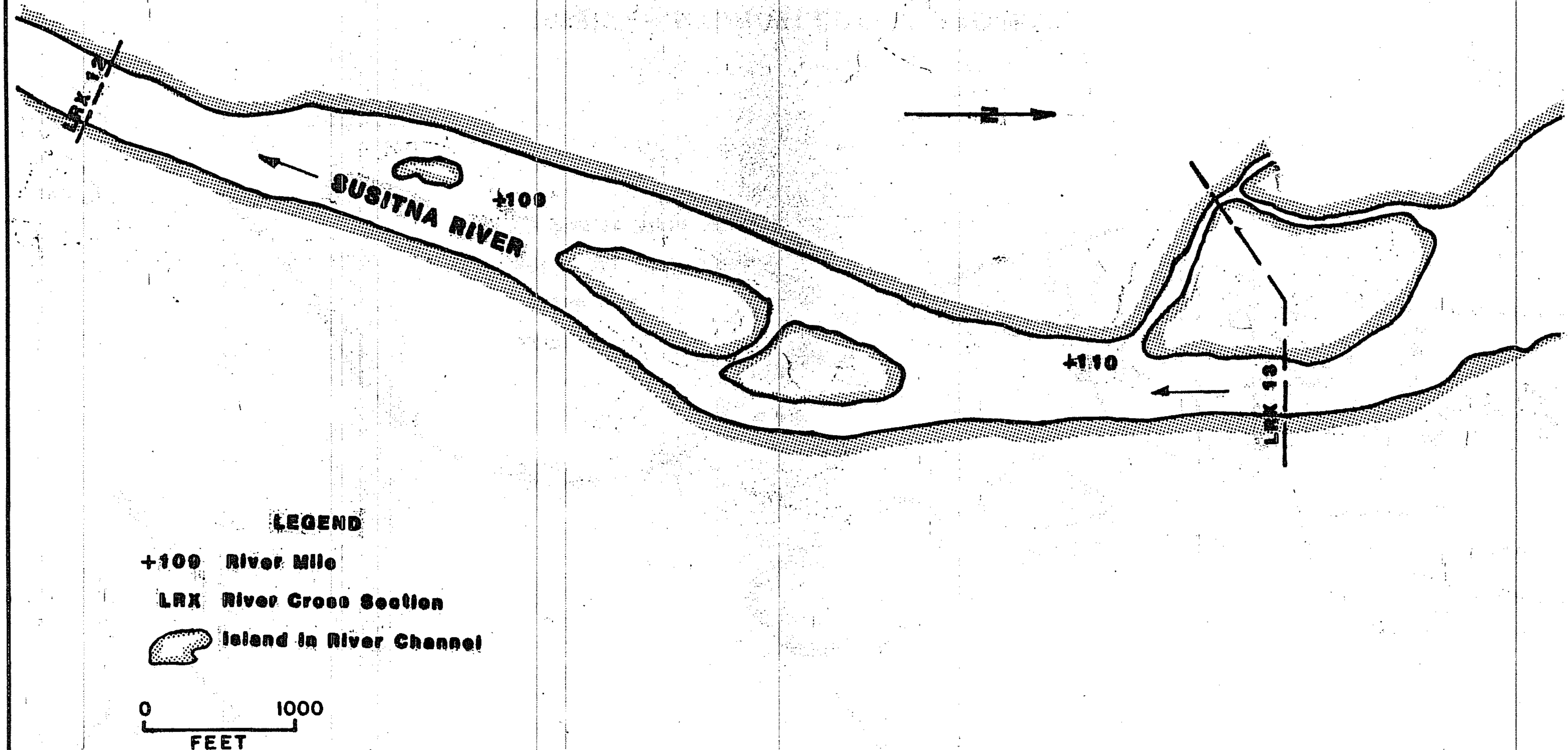


SUSITNA HYDROELECTRIC PROJECT

MAIN RIVER CHANNEL NEAR RIVER CROSS SECTION LRX 4

BED STABILITY ANALYSIS SITES

FIGURE E.2.2.22

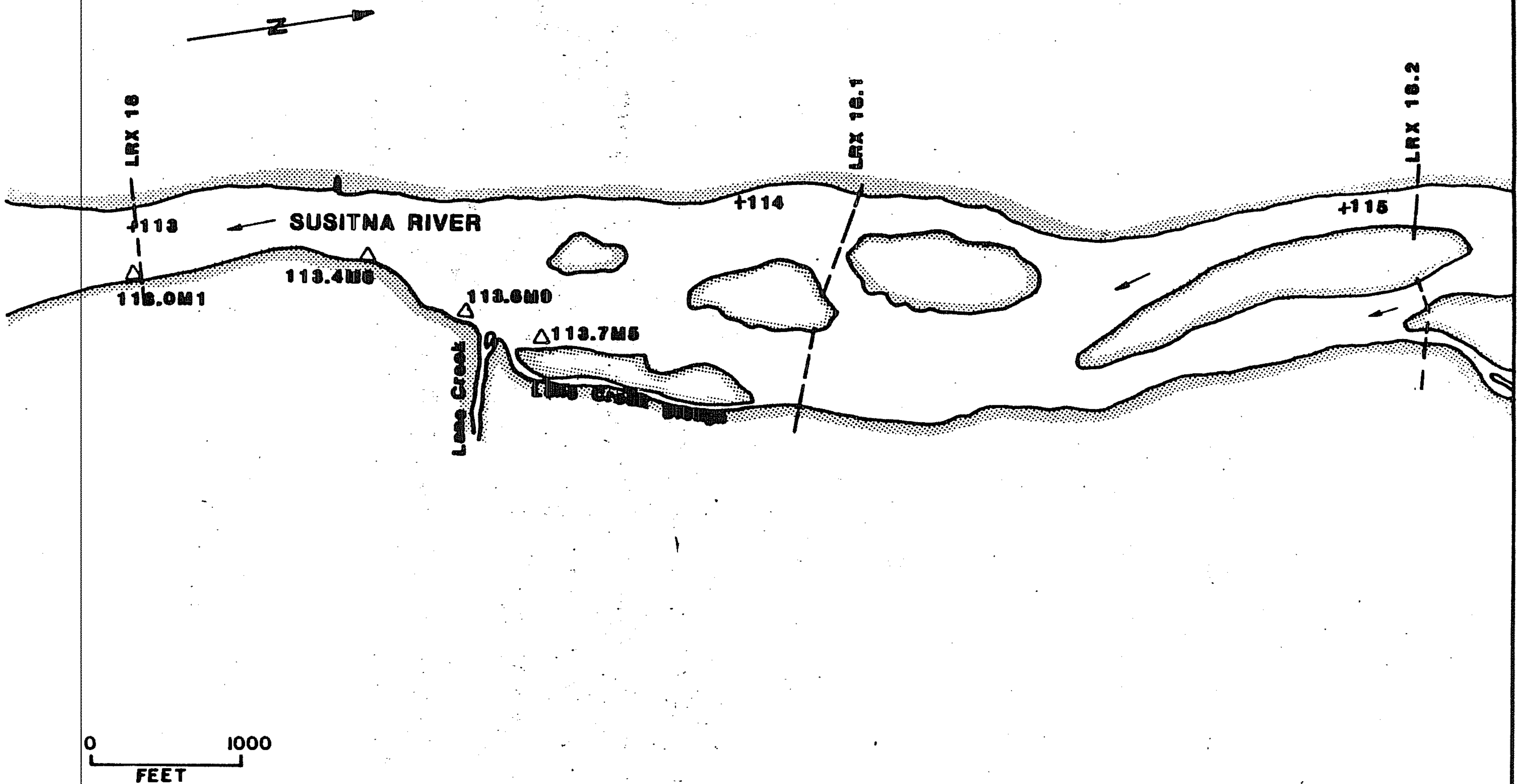


SUSITNA HYDROELECTRIC PROJECT

MAIN CHANNEL BETWEEN RIVER CROSS SECTIONS LRX12 AND LRX 13

BED STABILITY ANALYSIS SITES

FIGURE E.2.2.23

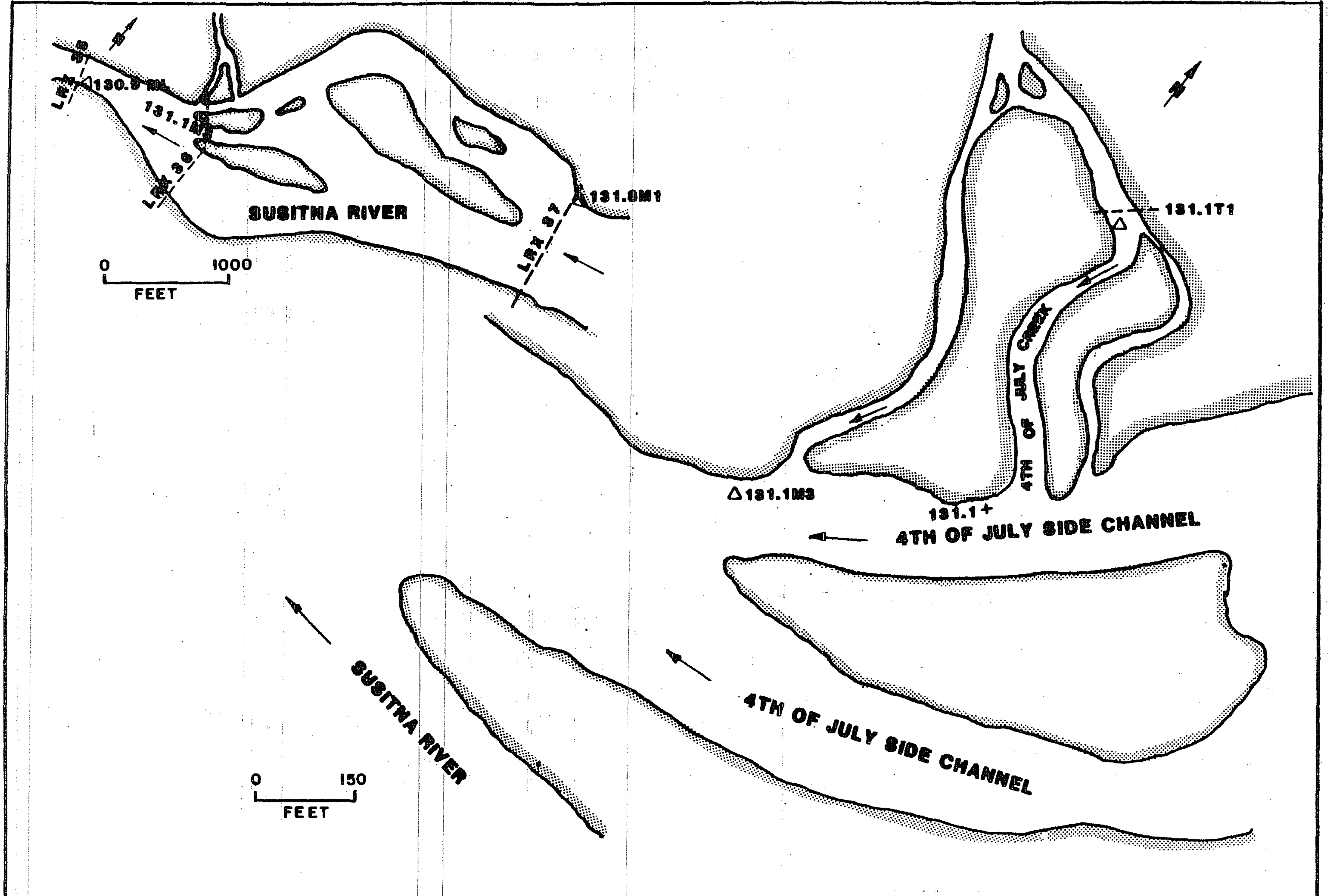


SUSITNA HYDROELECTRIC PROJECT

MAIN CHANNEL UPSTREAM FROM LANE CREEK

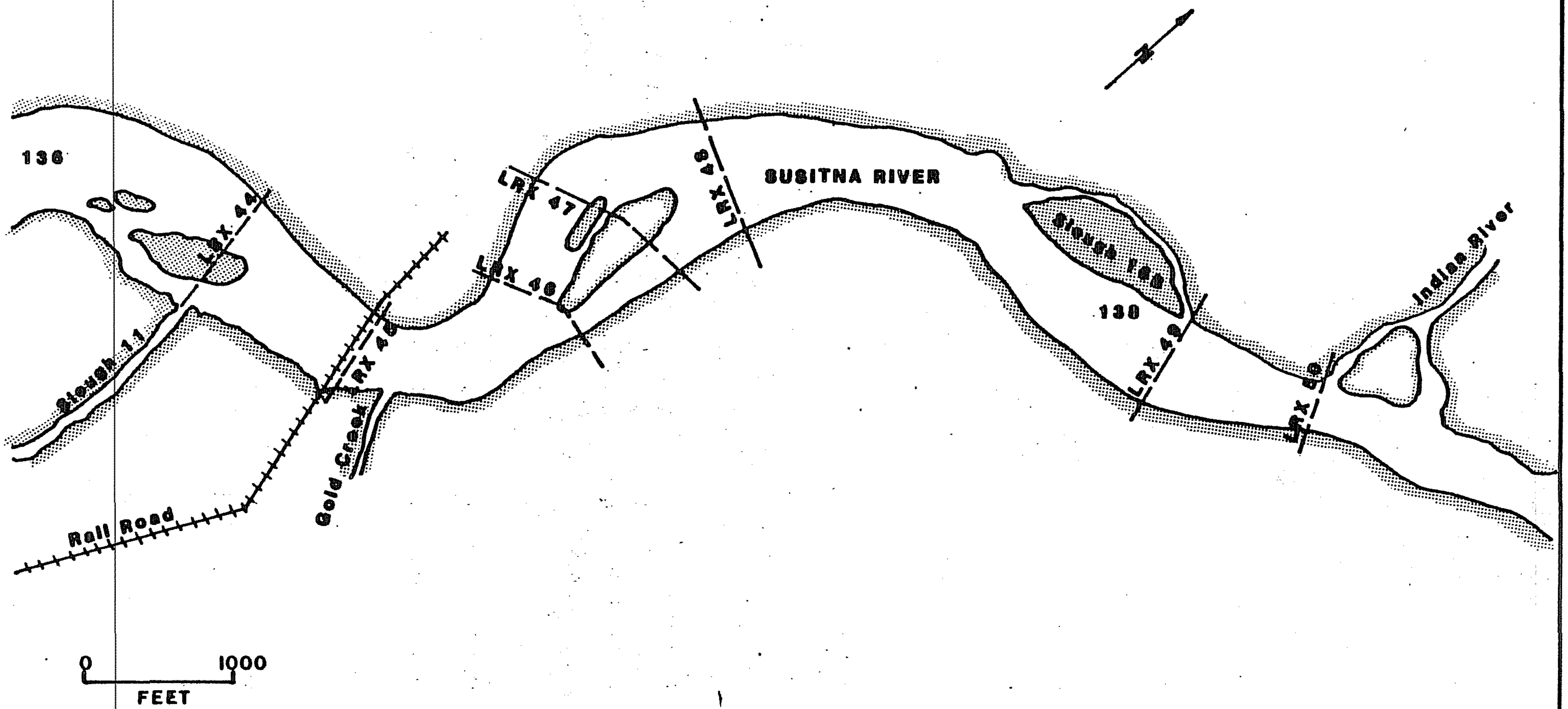
BED STABILITY ANALYSIS SITES

FIGURE E.2.2.24



SUSITNA HYDROELECTRIC PROJECT
MAIN CHANNEL NEAR AND UPSTREAM FROM 4th OF JULY CREEK
BED STABILITY ANALYSIS SITES

FIGURE E.2.2.25

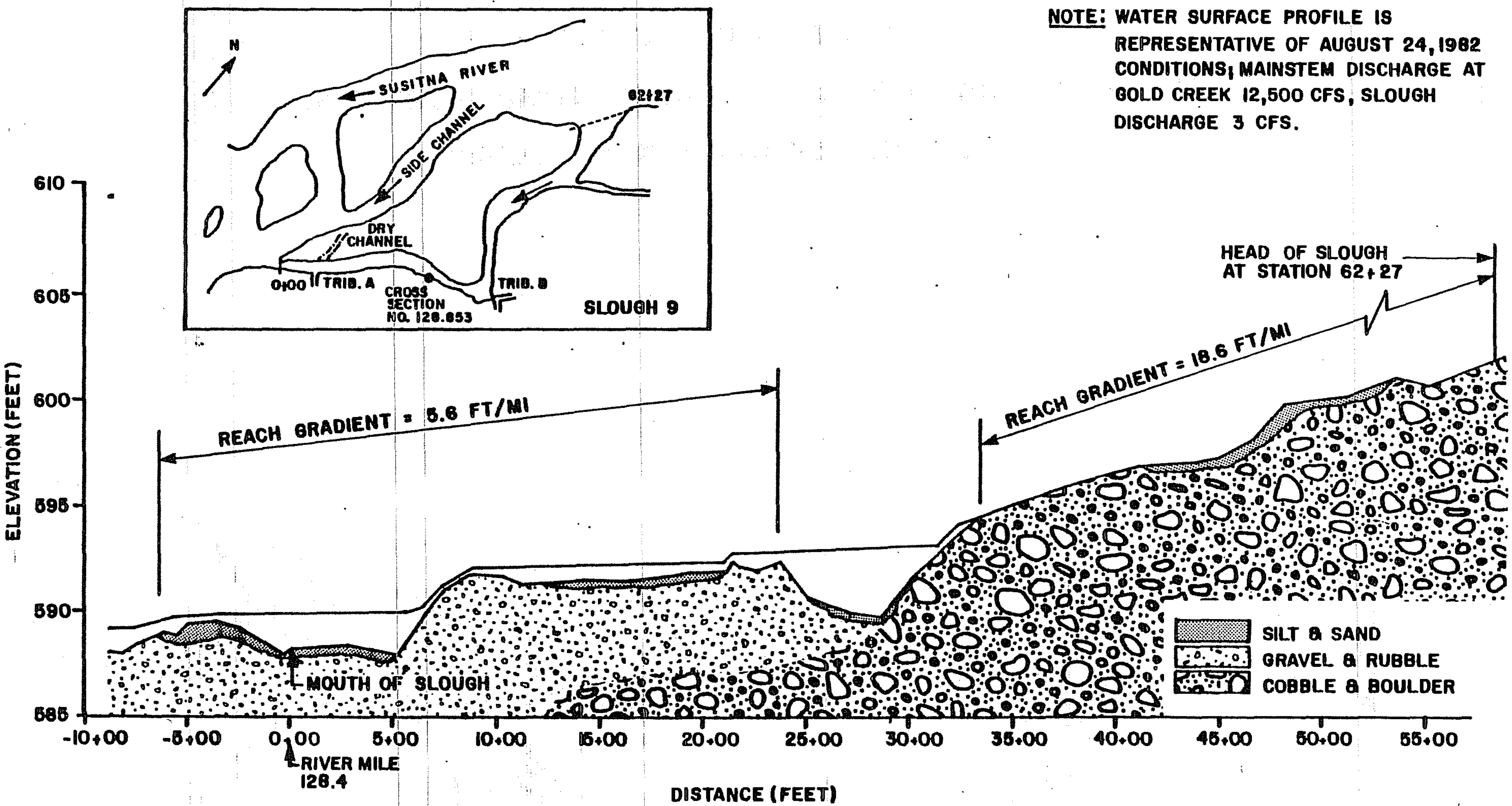


SUSITNA HYDROELECTRIC PROJECT

MAIN CHANNEL BETWEEN RIVER CROSS SECTIONS 46 AND 48

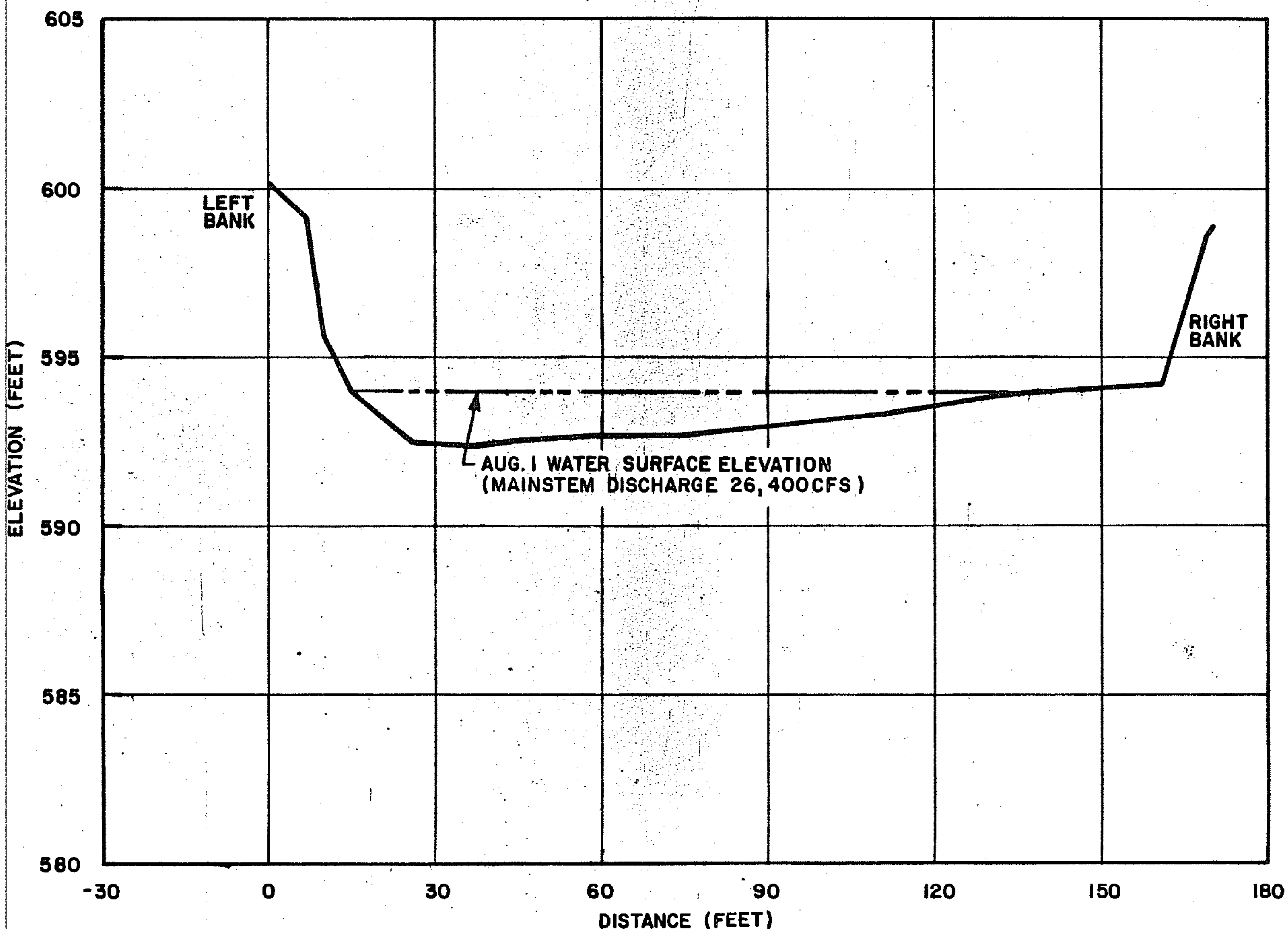
BED STABILITY ANALYSIS SITES

FIGURE E.2.2.26



SLOUGH 9 THALWEG PROFILE

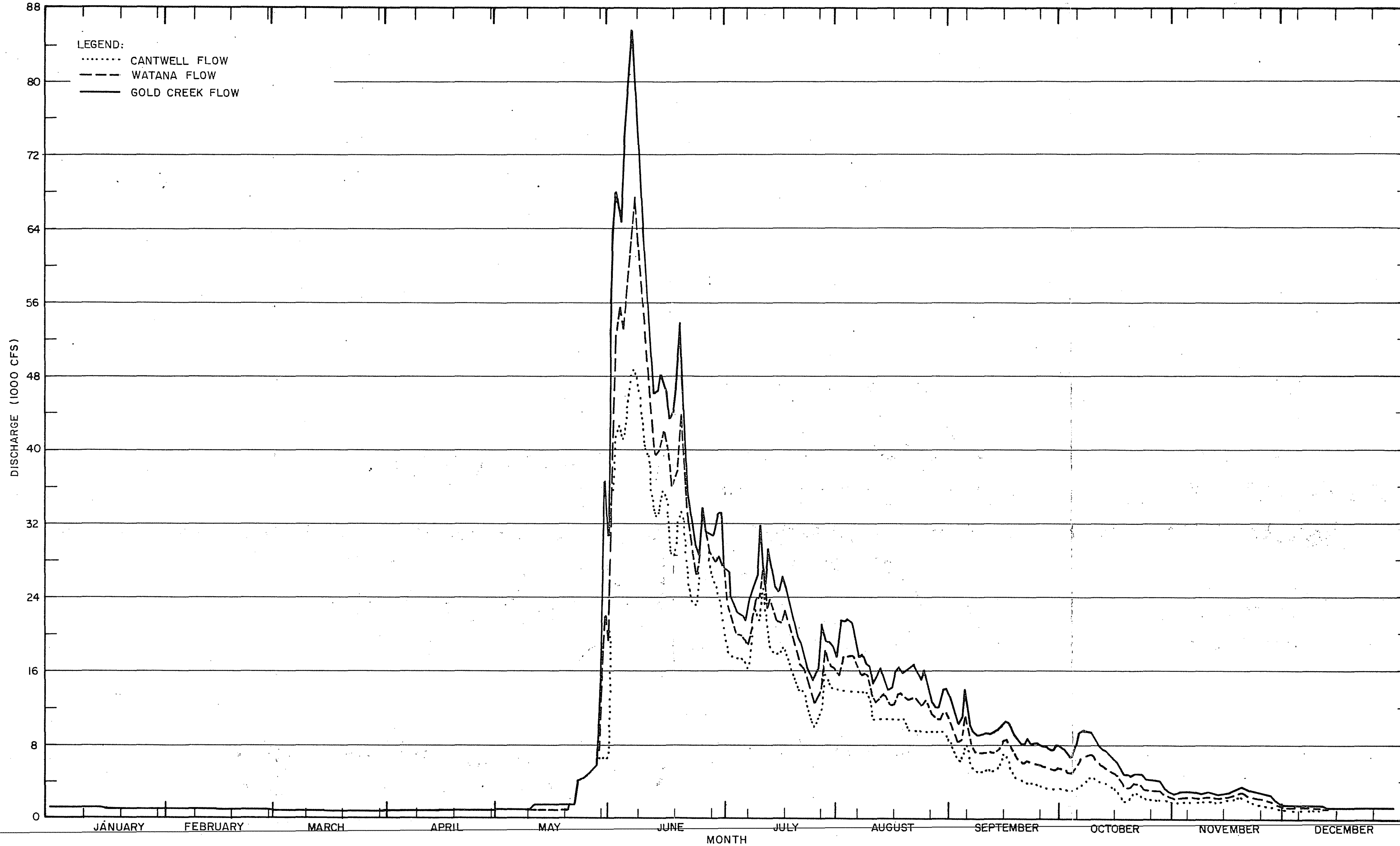
FIGURE E2.2.27



NOTES:
1. CROSS SECTION # 128.8S3 APPROXIMATELY 2400 FEET UPSTREAM OF SLOUGH MOUTH.
2. CROSS SECTION REPRESENTS VIEW LOOKING DOWNSTREAM.
3. MAINSTREAM DISCHARGE MEASURED AT GOLD CREEK.

SLOUGH 9 CROSS SECTION

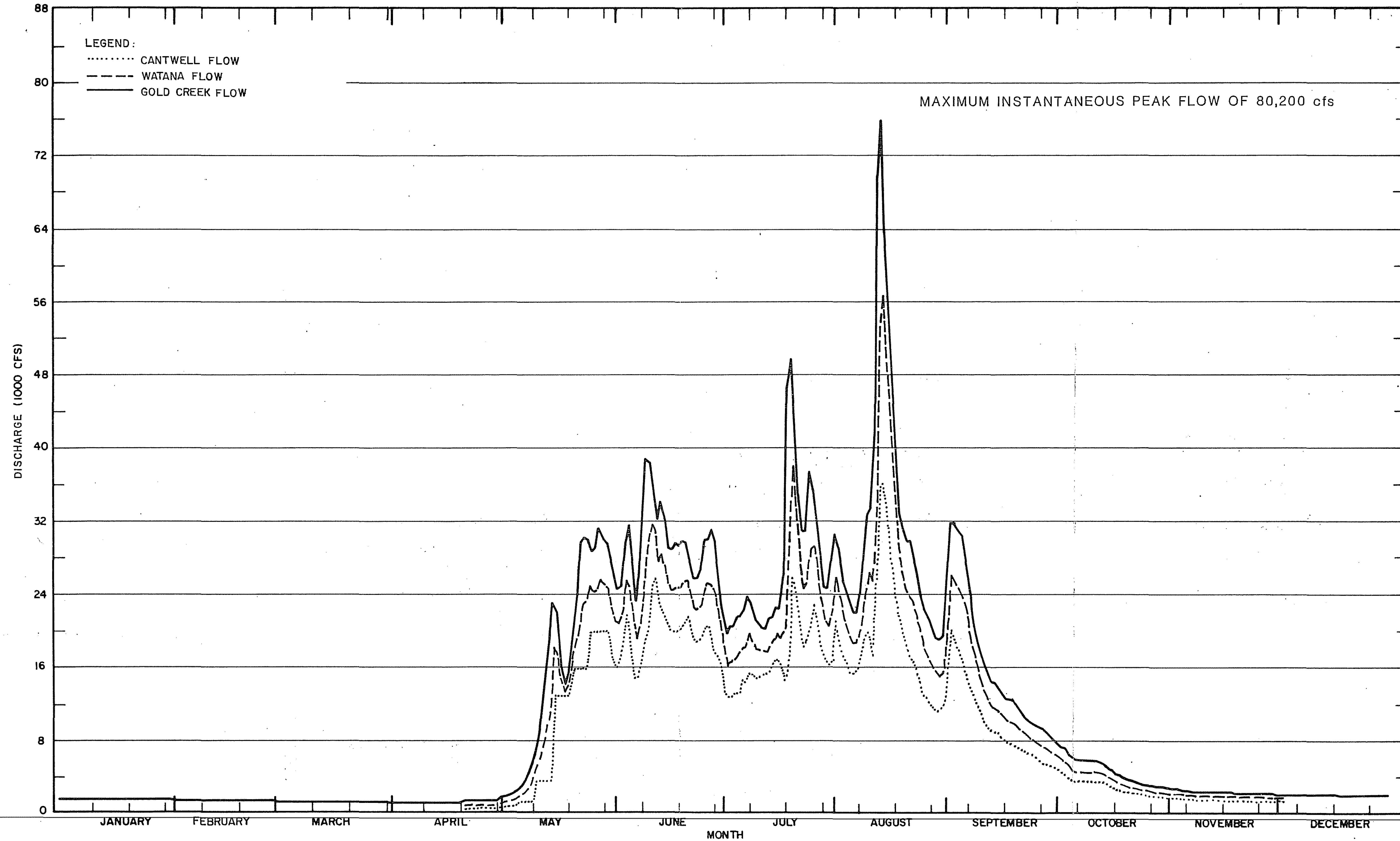
FIGURE E.2.2.28



NOTE:
TIME SCALE IS IN INCREMENTS OF 10 DAYS.

1964 NATURAL FLOWS
CANTWELL, WATANA AND GOLD CREEK

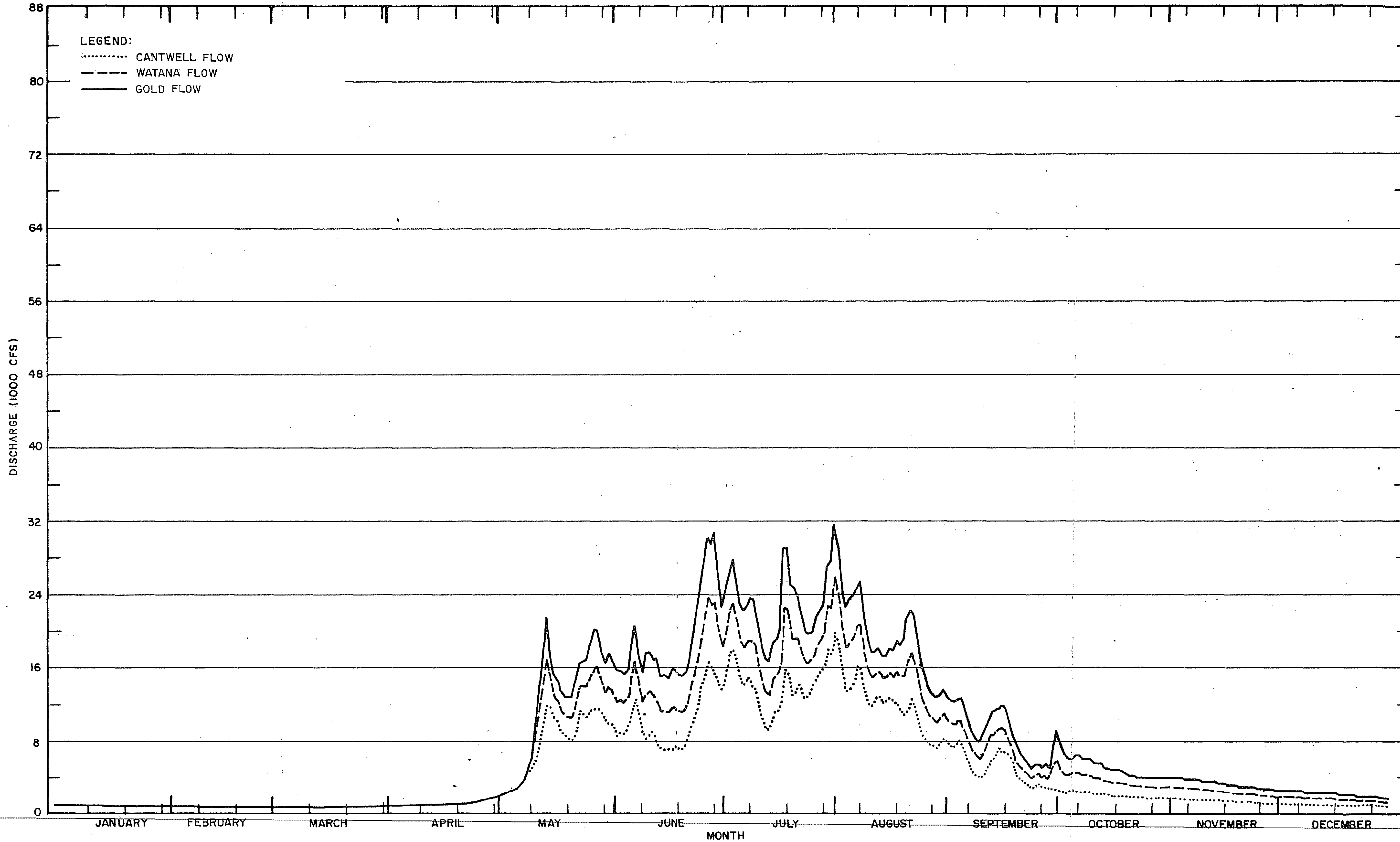
FIGURE E.2.2.29



NOTE:
TIME SCALE IS IN INCREMENTS OF 10 DAYS.

1967 NATURAL FLOWS
CANTWELL, WATANA AND GOLD CREEK

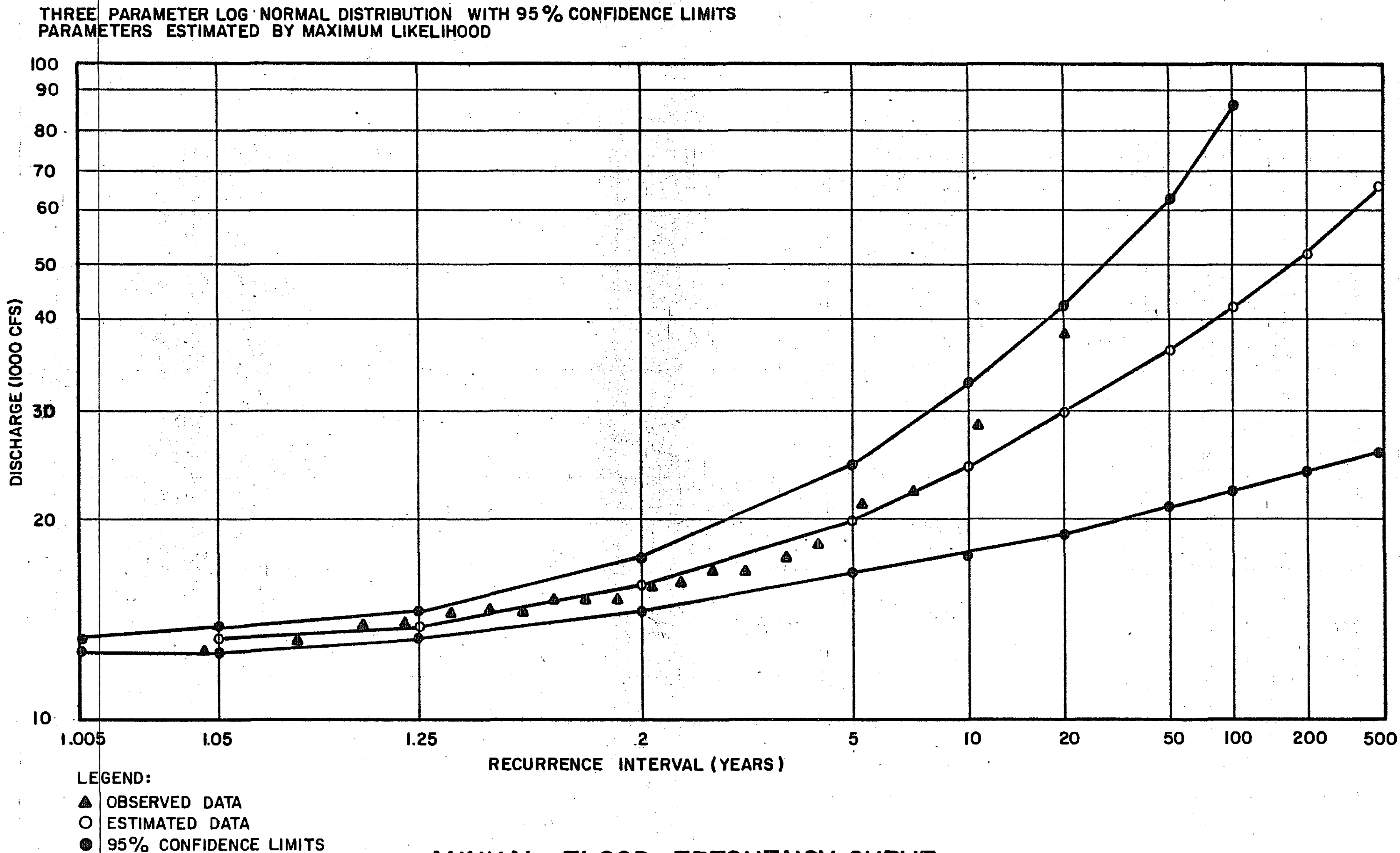
FIGURE E.2.2.30



NOTE:
TIME SCALE IS IN INCREMENTS OF 10 DAYS.

1970 NATURAL FLOWS
CANTWELL, WATANA AND GOLD CREEK

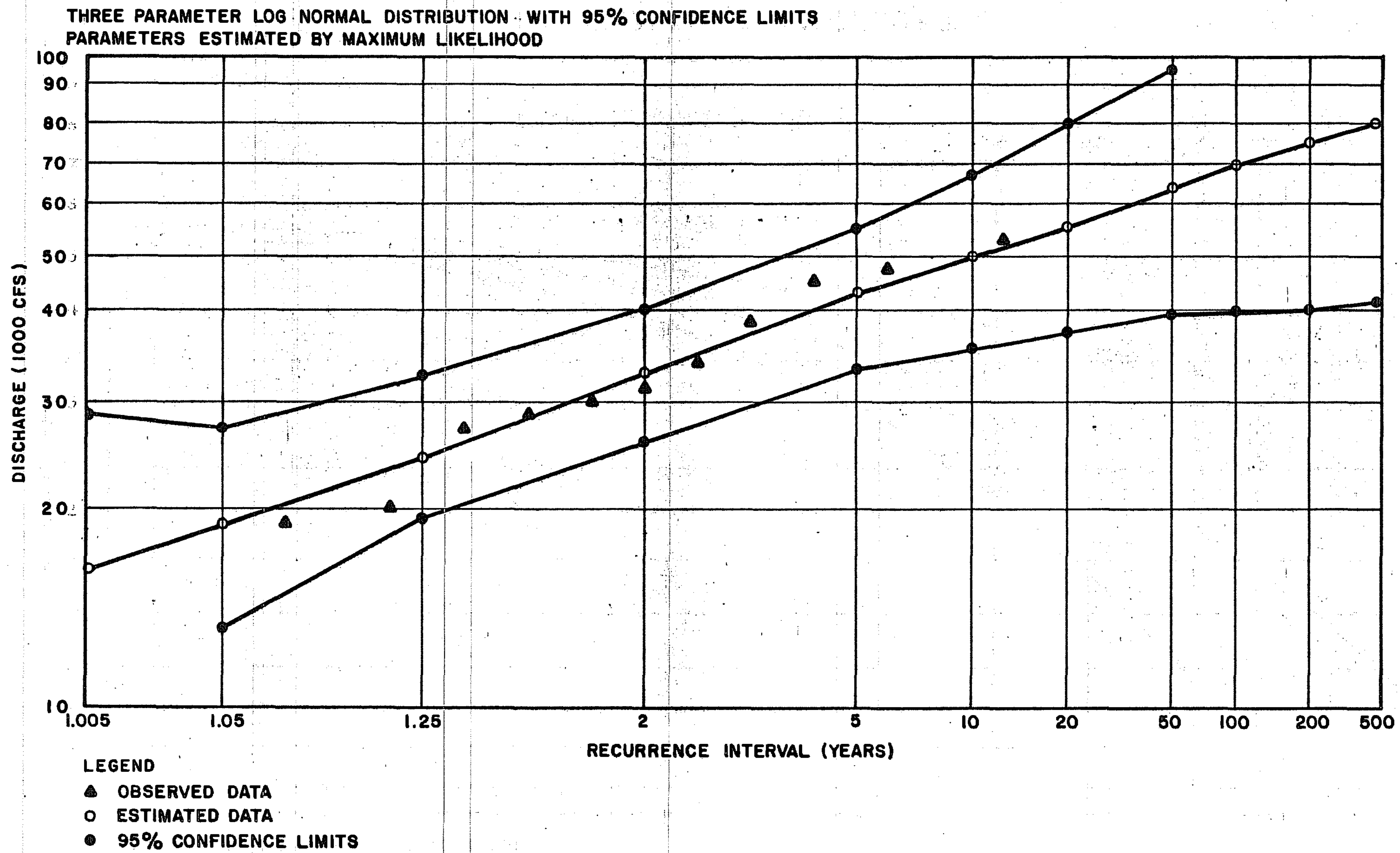
FIGURE E.2.2.31



ANNUAL FLOOD FREQUENCY CURVE
SUSITNA RIVER NEAR DENALI

SOURCE: R&M 1981

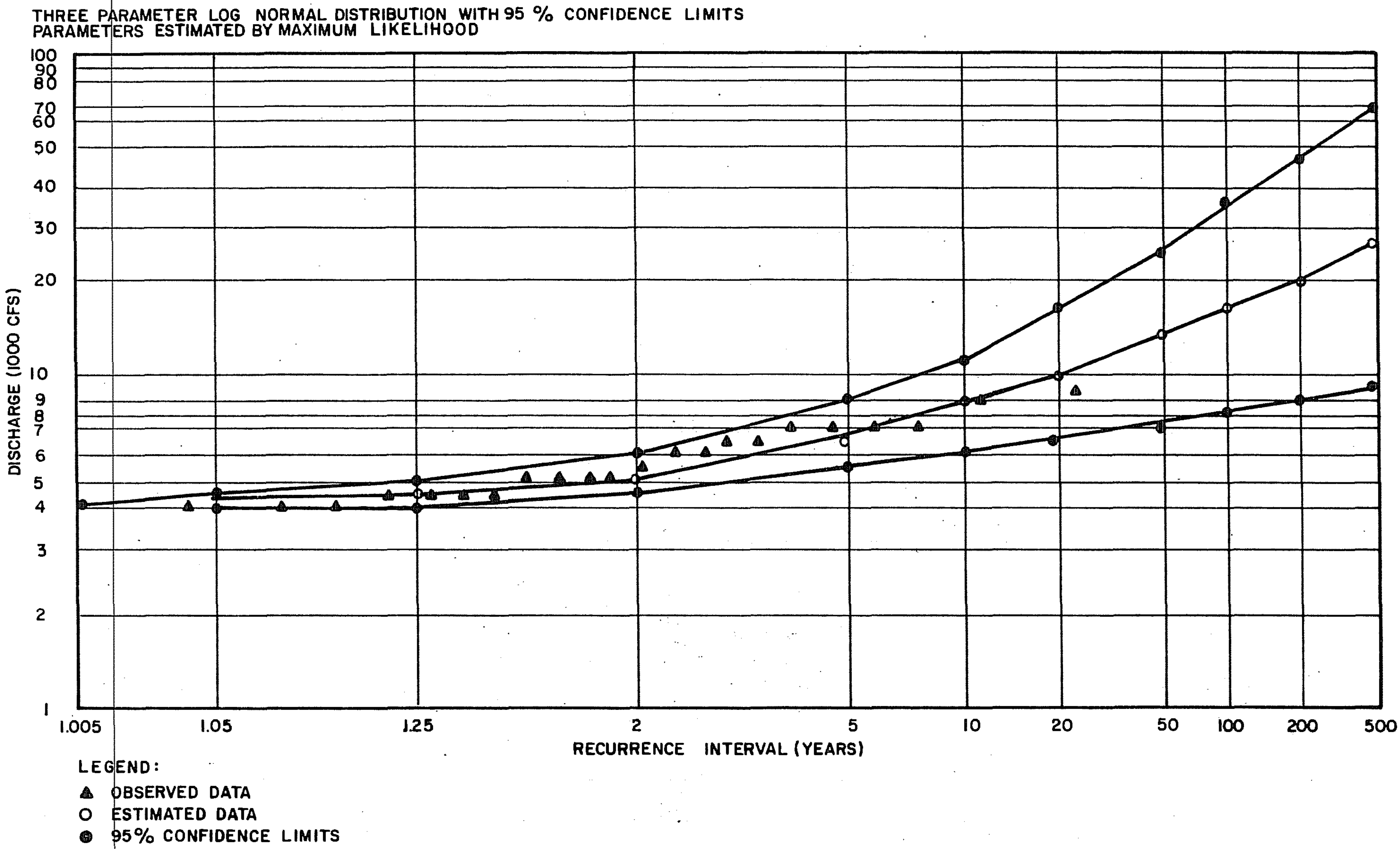
FIGURE E.2.2.32



ANNUAL FLOOD FREQUENCY CURVE
SUSITNA RIVER NEAR CANTWELL

SOURCE: R & M 1981

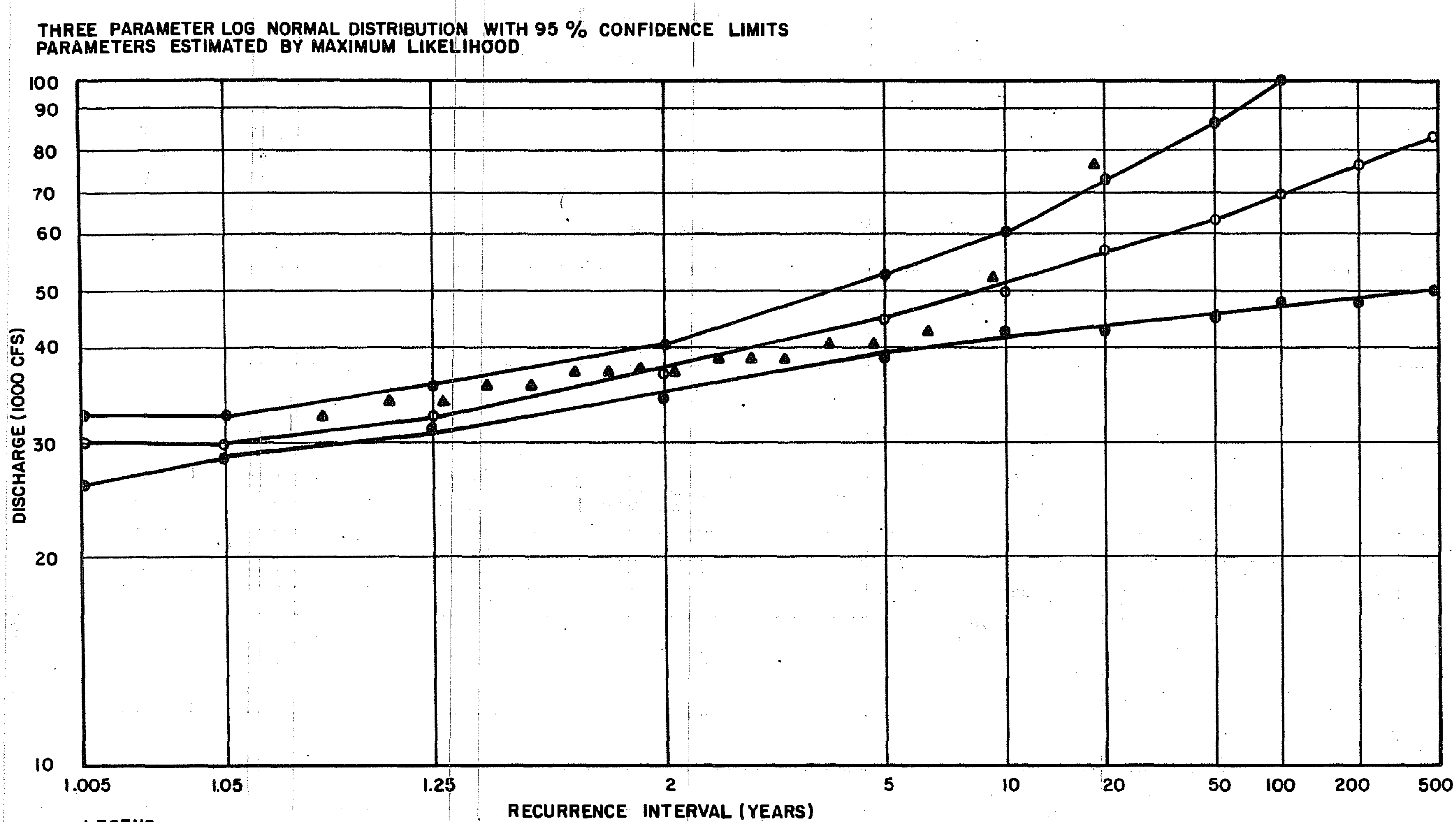
FIGURE E.2.2.33



ANNUAL FLOOD FREQUENCY CURVE
MACLAREN RIVER NEAR PAXSON

SOURCE: R & M 1981f

FIGURE E.2.2.34

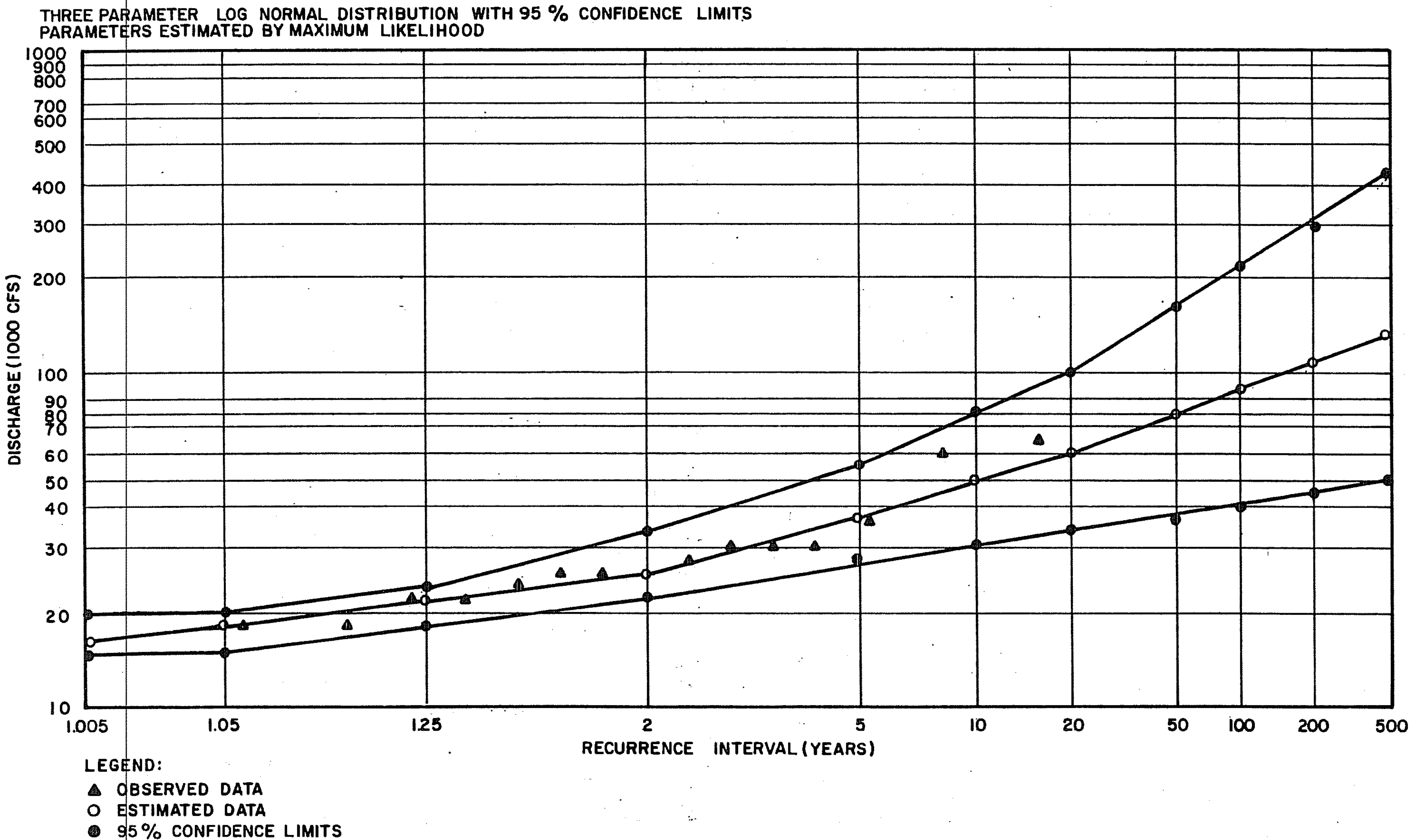


LEGEND:
▲ OBSERVED DATA
○ ESTIMATED DATA
● 95% CONFIDENCE LIMITS

ANNUAL FLOOD FREQUENCY CURVE
CHULITNA RIVER NEAR TALKEETNA

SOURCE: R & M 1981f

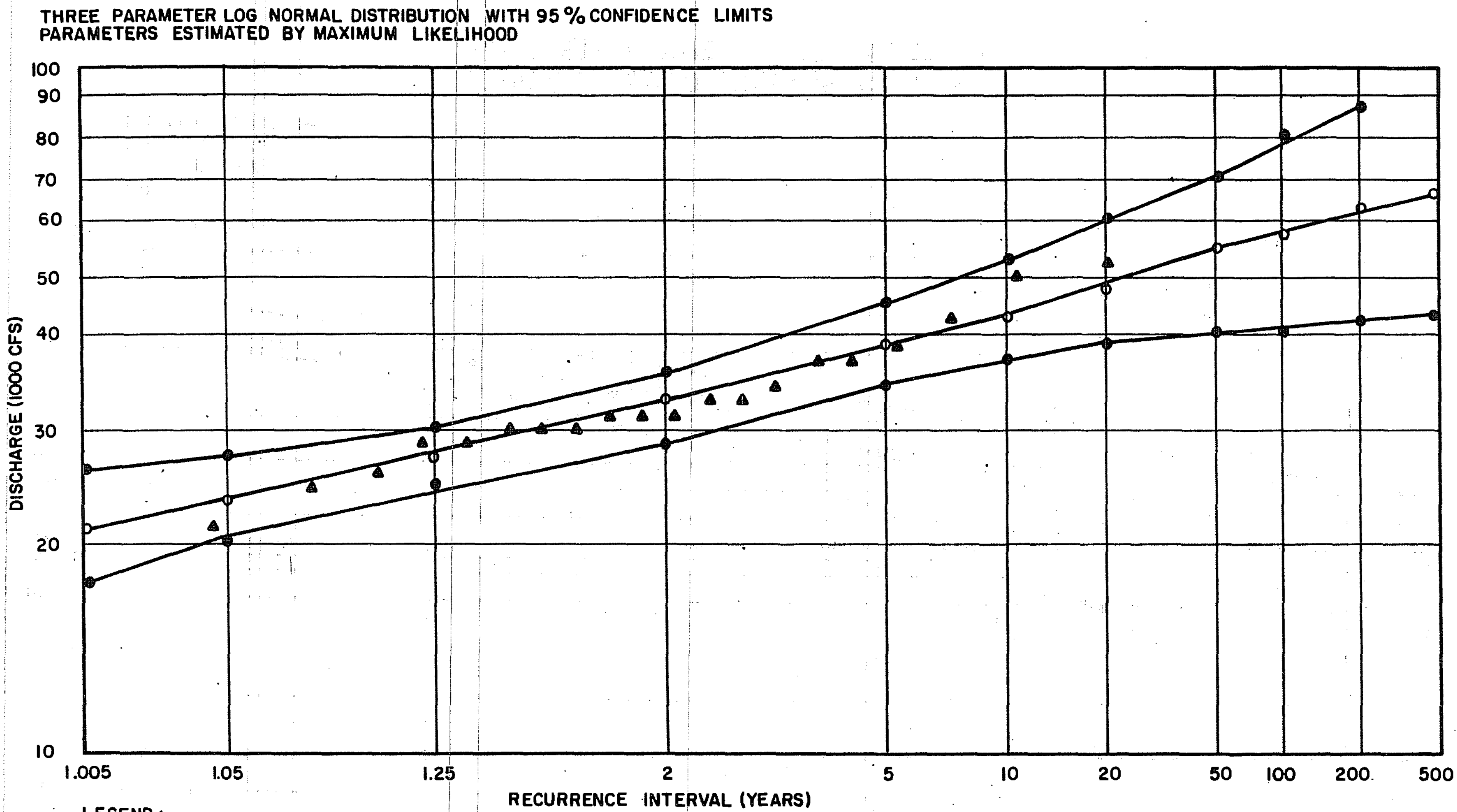
FIGURE E.2.2.35



ANNUAL FLOOD FREQUENCY CURVE
TALKEETNA RIVER NEAR TALKEETNA

SOURCE: R & M 1981f

FIGURE E.2.2.36

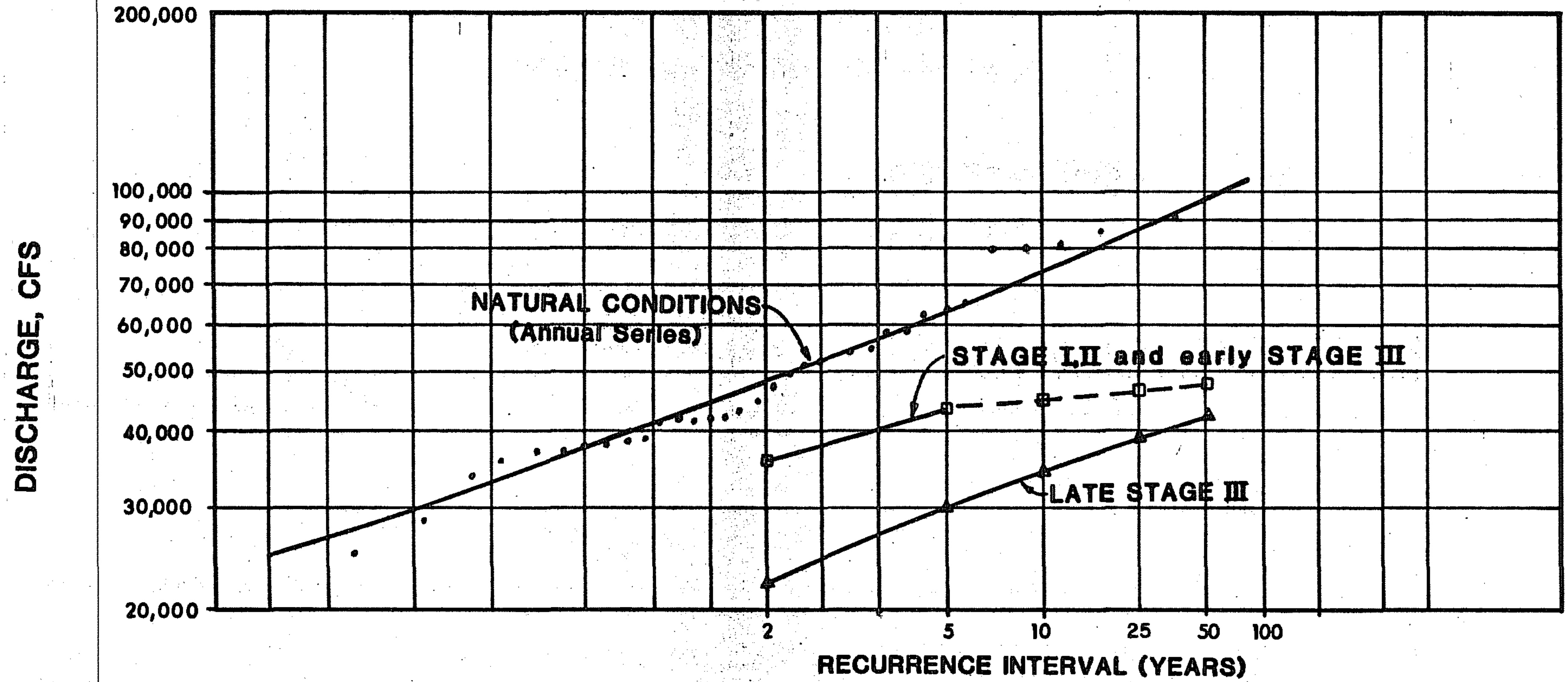


LEGEND:
▲ OBSERVED DATA
○ ESTIMATED DATA
● 95% CONFIDENCE LIMITS

ANNUAL FLOOD FREQUENCY CURVE
SKWENTNA RIVER NEAR SKWENTNA

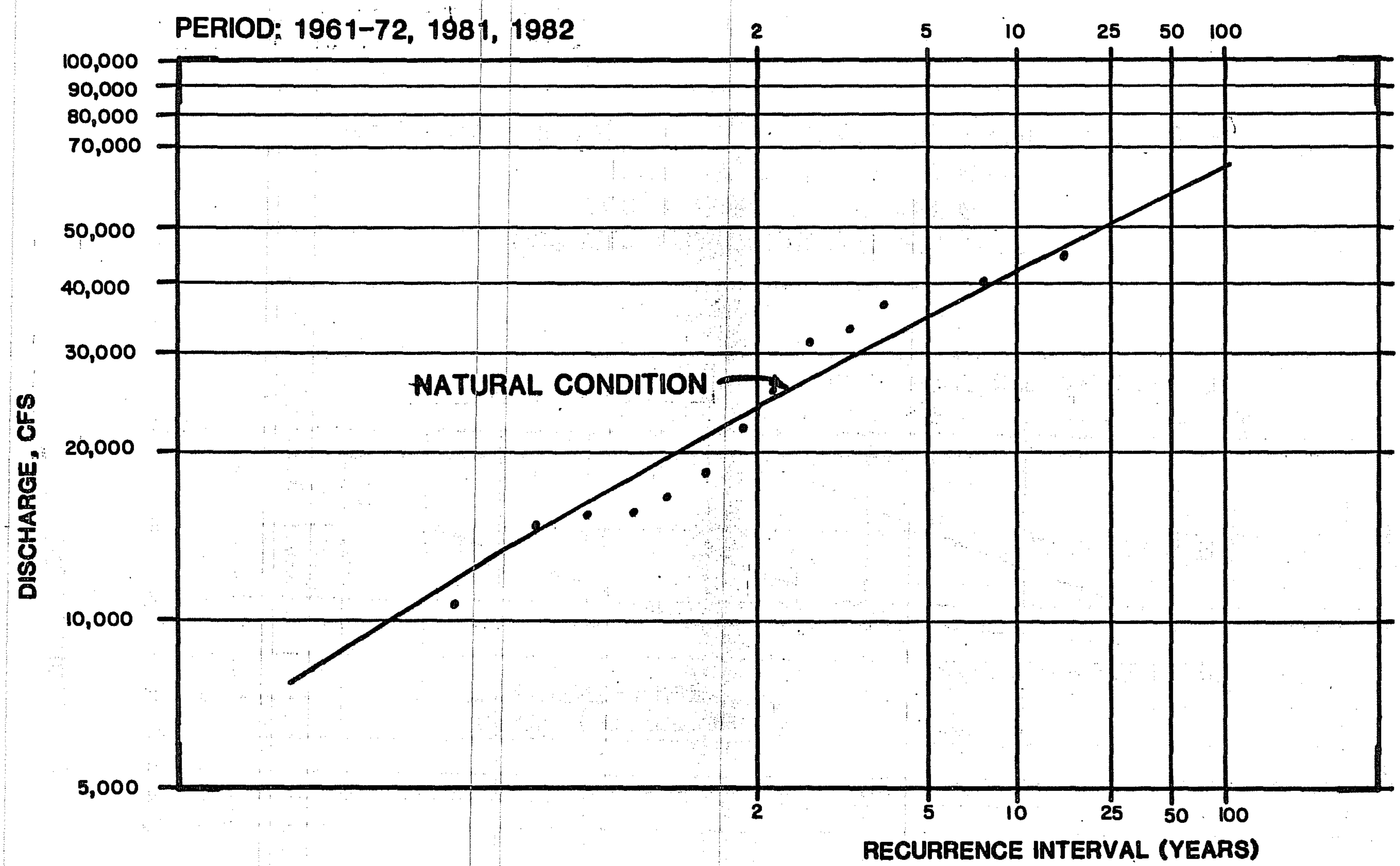
SOURCE: R&M 1981f

FIGURE E.2.2.37



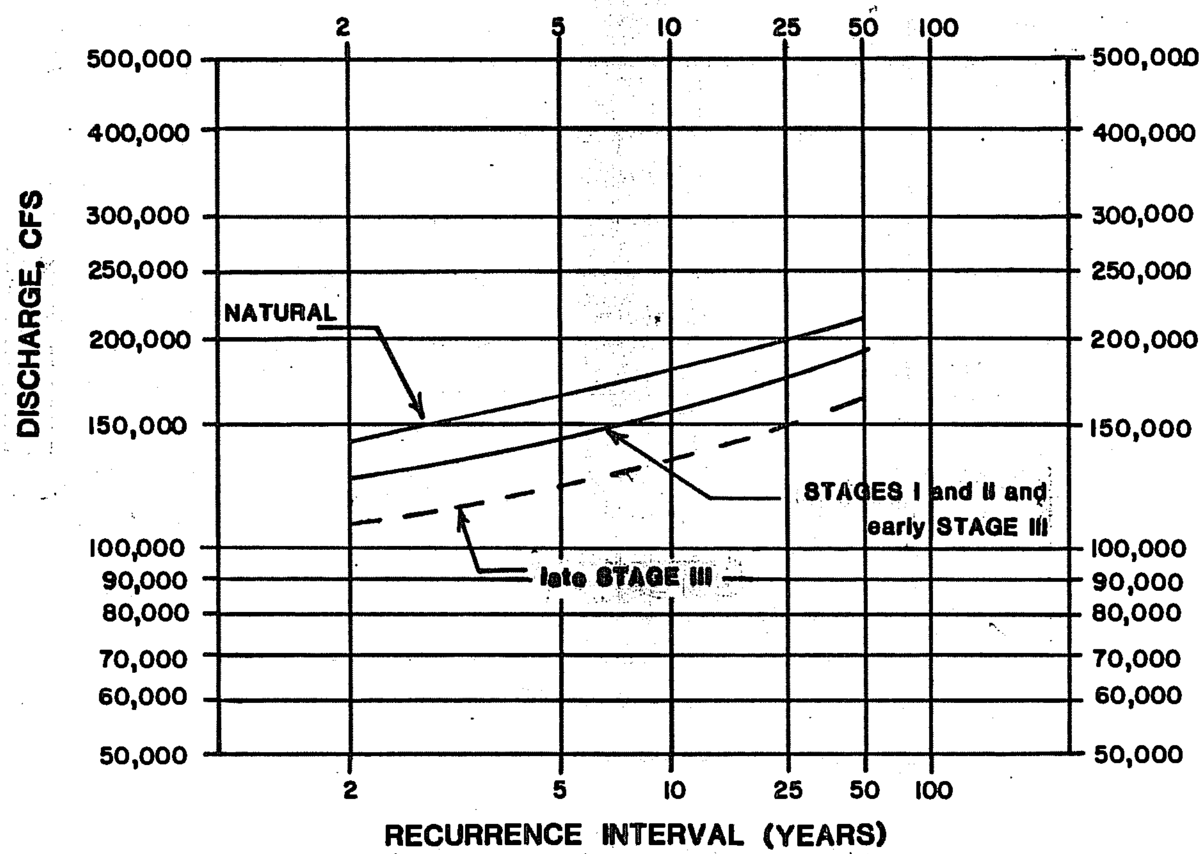
SUSITNA HYDROELECTRIC PROJECT
FLOOD FREQUENCY CURVE
SUSITNA RIVER AT GOLD CREEK
MAXIMUM OF ANNUAL AND JULY SEPTEMBER SERIES

FIGURE E.2.2.38



SUSITNA HYDROELECTRIC PROJECT
FLOOD FREQUENCY CURVE
FOR INTERVENING AREA BETWEEN CANTWELL
AND GOLD CREEK
ANNUAL SERIES

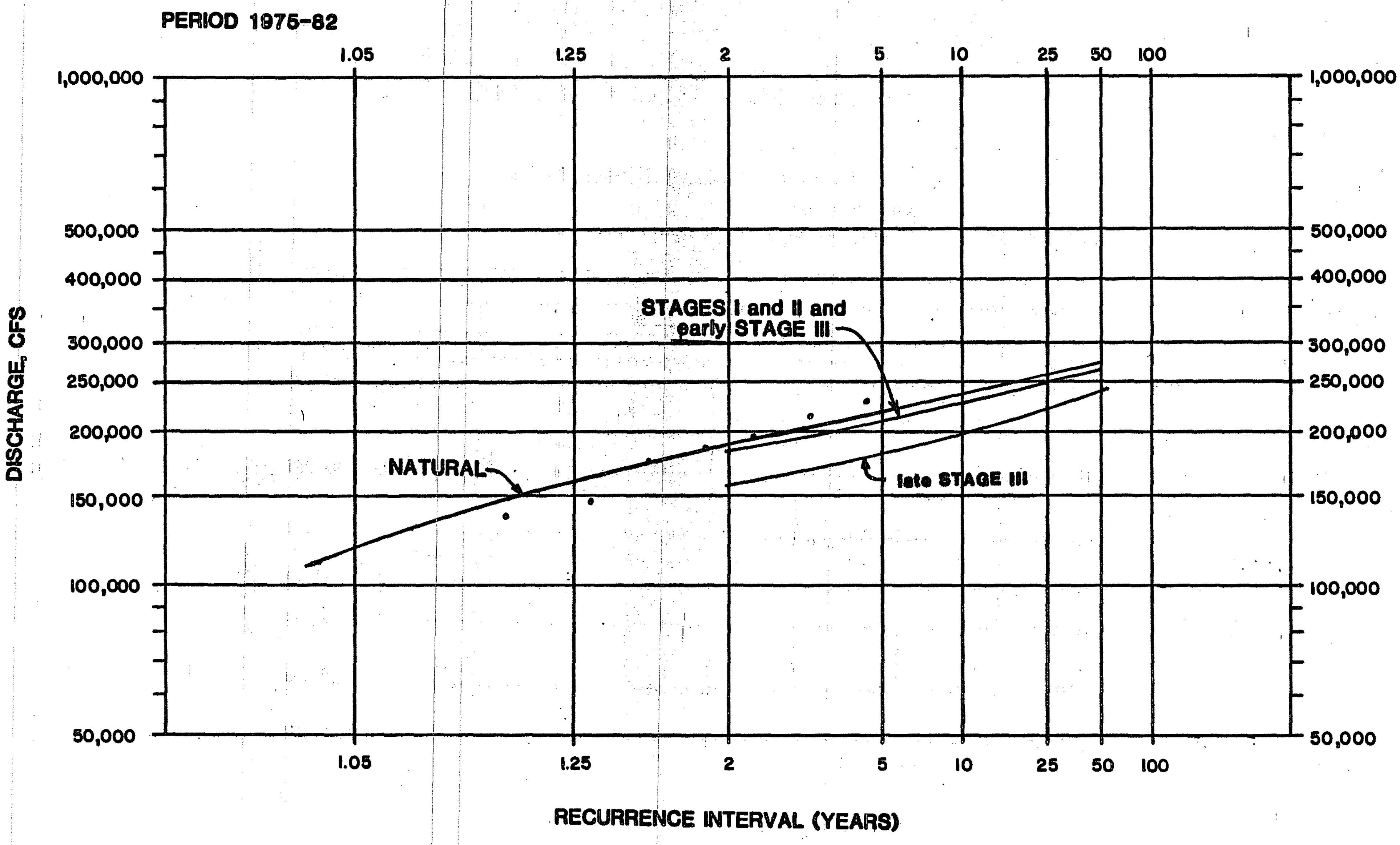
FIG[illegible] E.2.[illegible]



SUSITNA HYDROELECTRIC PROJECT

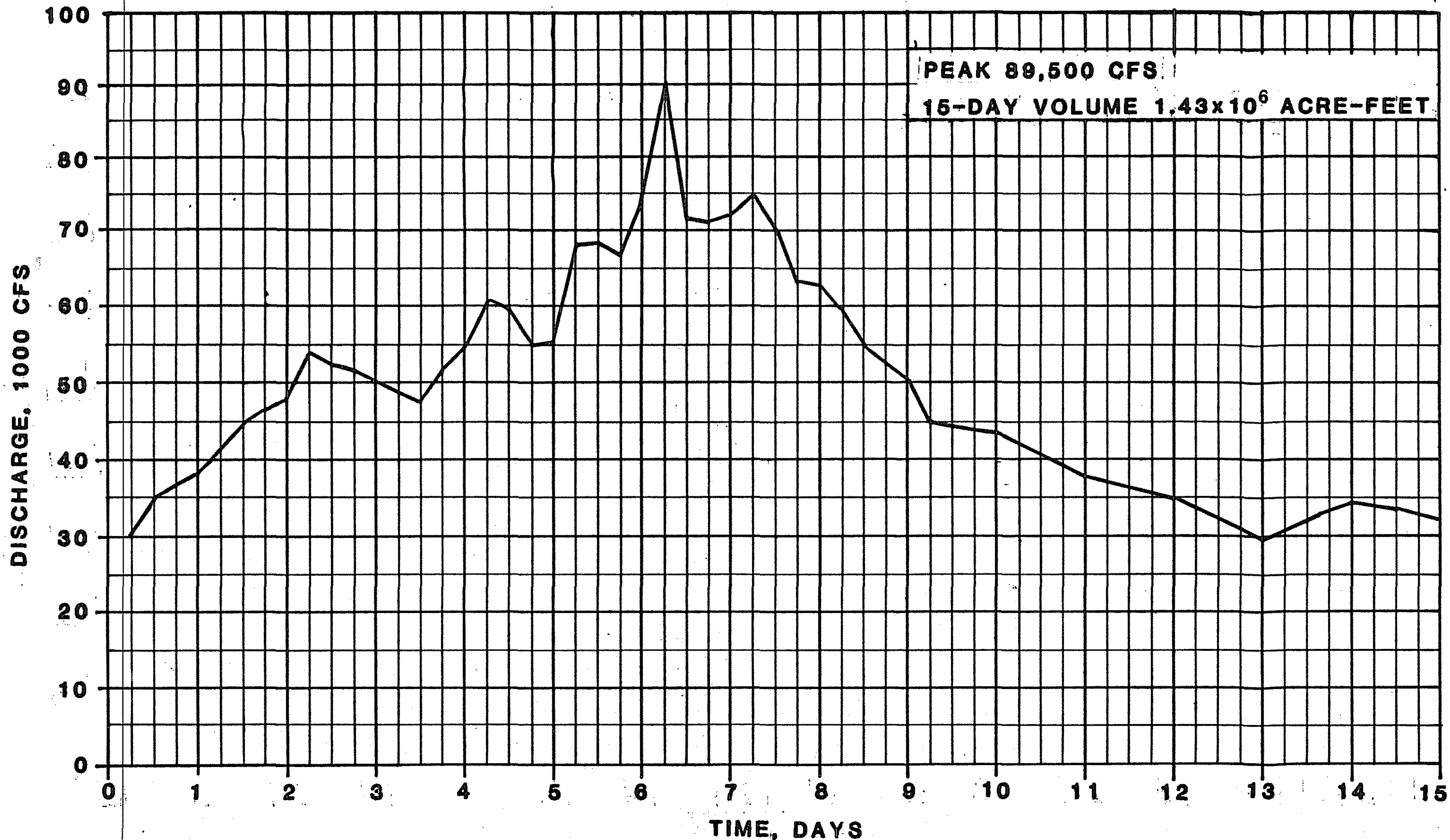
FLOOD PEAK FREQUENCY CURVES FOR NATURAL AND WITH-PROJECT CONDITIONS AT SUNSHINE MAXIMUM OF ANNUAL AND JULY-SEPTEMBER SERIES

FIGURE E.2.2.40



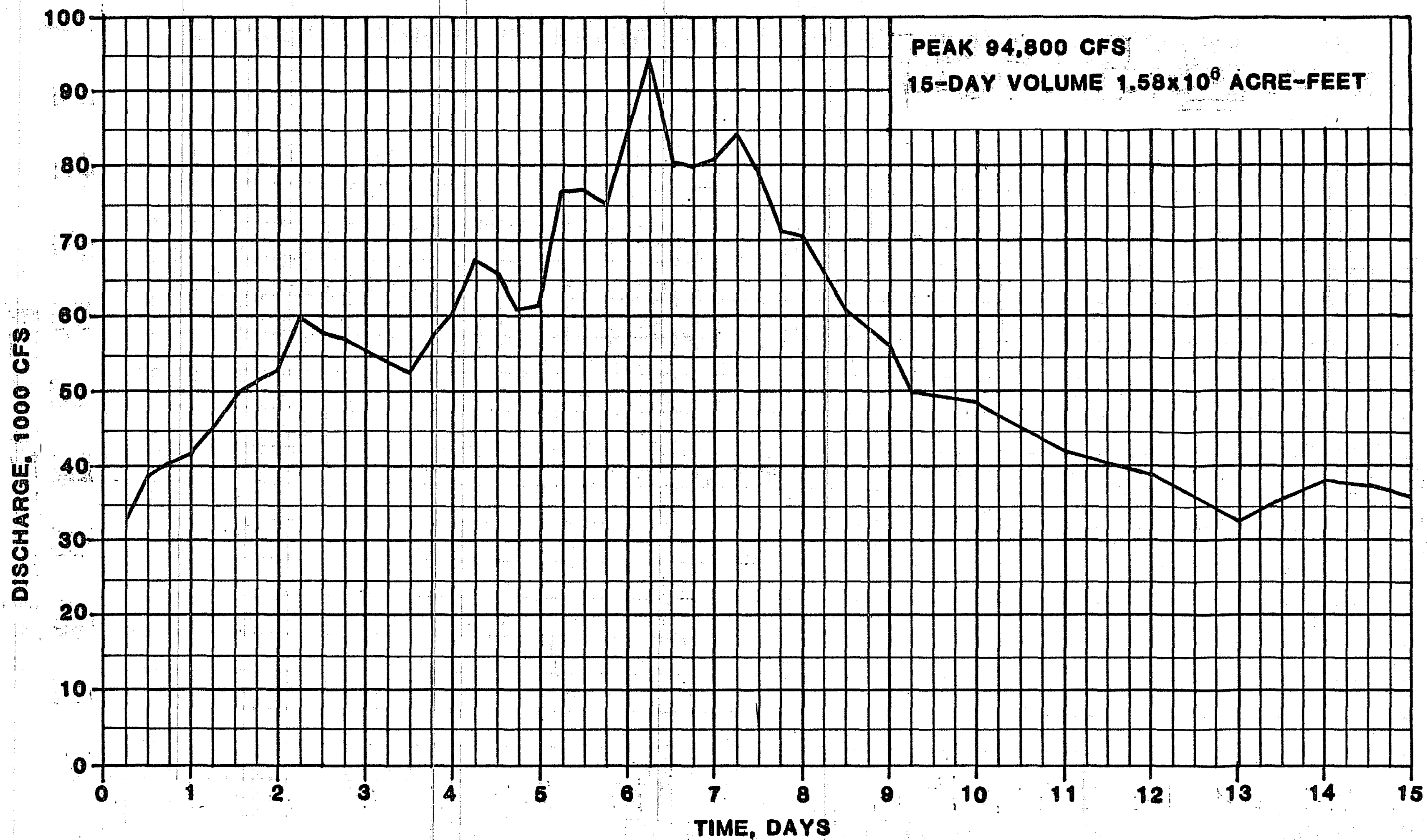
SUSITNA HYDROELECTRIC PROJECT
FLOOD FREQUENCY CURVES
AT SUSITNA STATION
MAXIMUM OF ANNUAL AND JULY-SEPTEMBER SERIES

FIGURE E.2.2.41



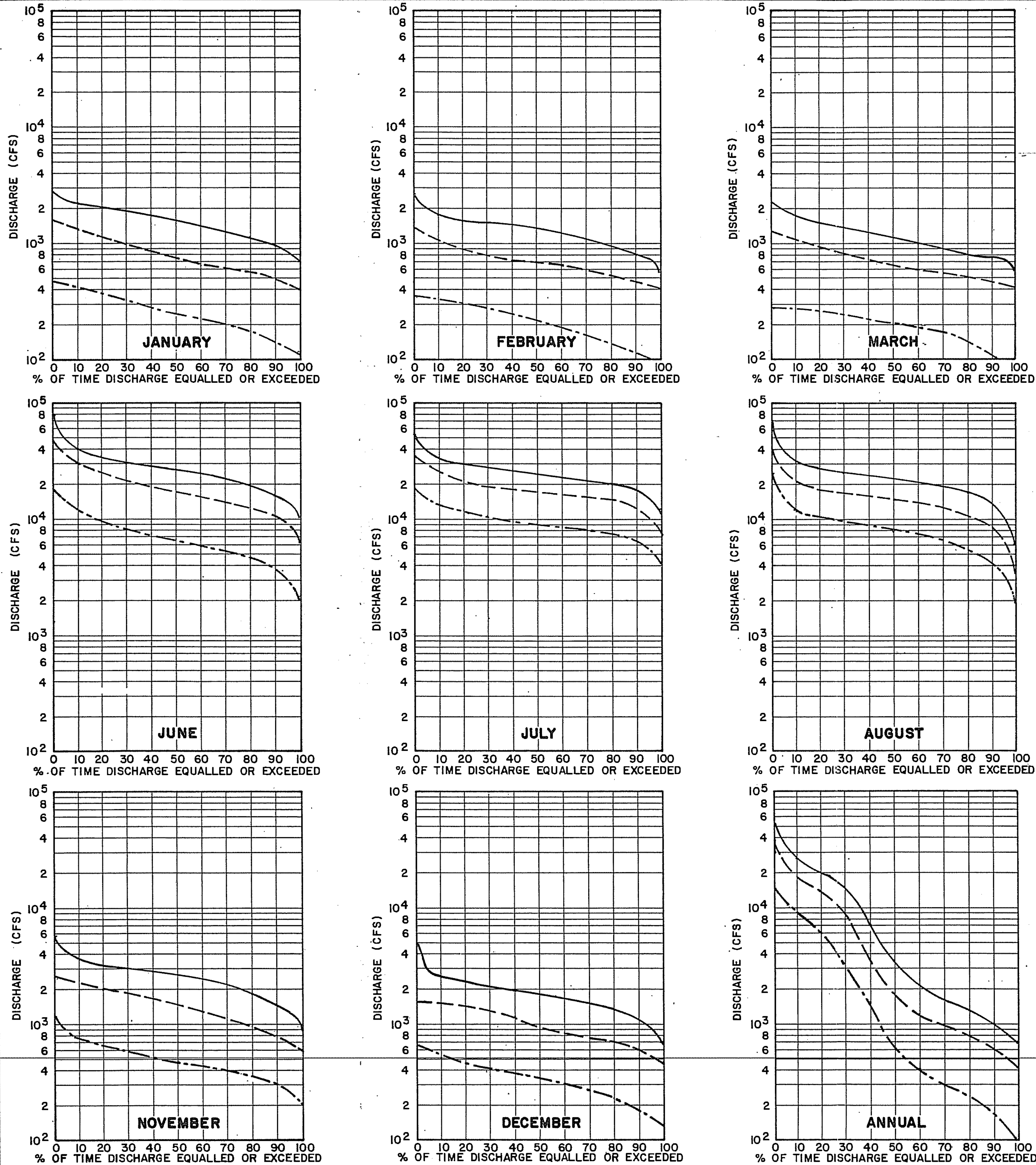
50-YEAR ANNUAL MAXIMUM FLOOD HYDROGRAPH AT WATANA

FIGURE E.2.2.42



50-YEAR ANNUAL MAXUMUM FLOOD HYDROGRAPH AT DEVIL CANYON

FIGURE E.2.2.43



NOTES:

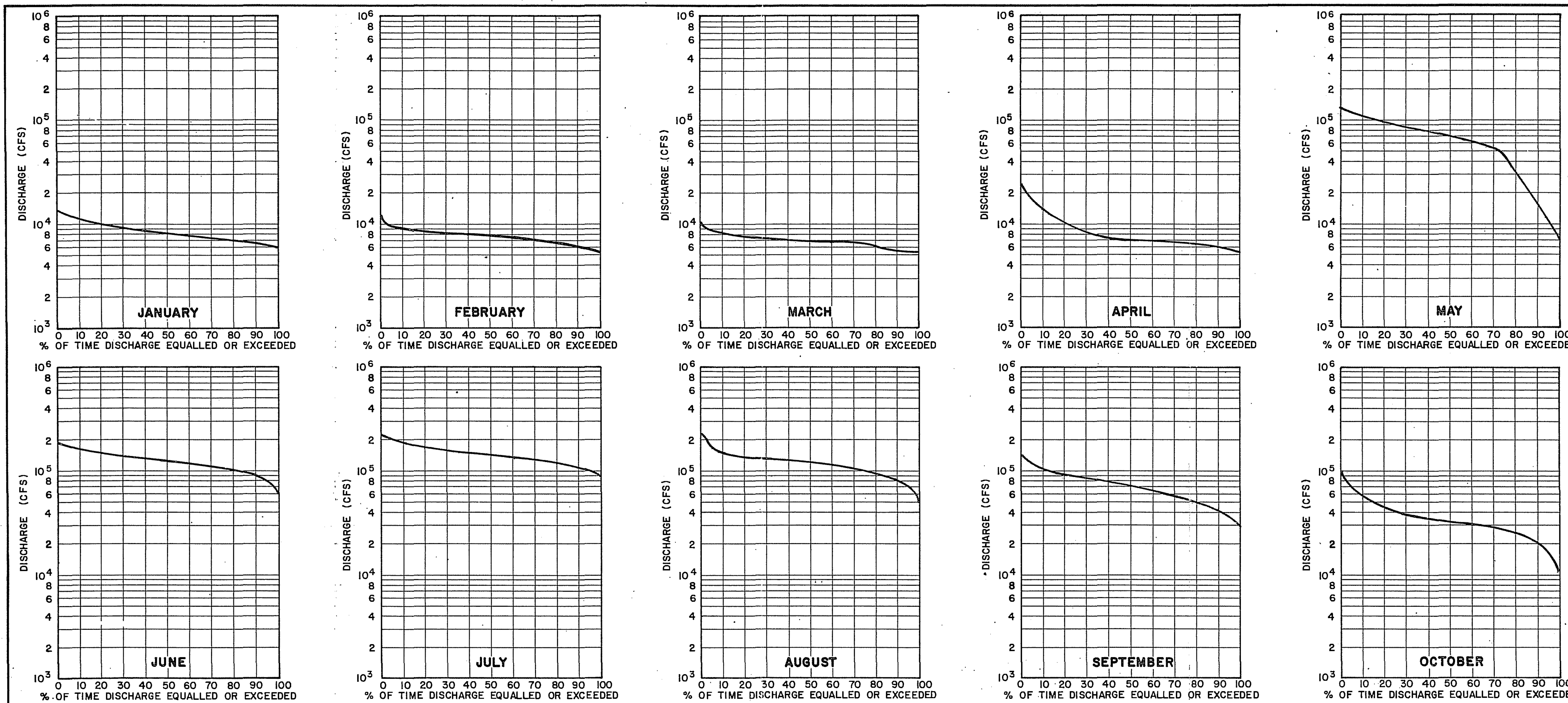
1. FLOW DURATION CURVES BASED ON MEAN DAILY FLOWS.
2. PERIODS OF RECORD:
   DENALI: MAY 1957 - SEP 1966, NOV 1968 - SEP 1981
   CANTWELL: MAY 1961 - SEP 1972, MAY 1980 - SEP 1981
   GOLD CREEK: AUG 1949 - SEP 1981

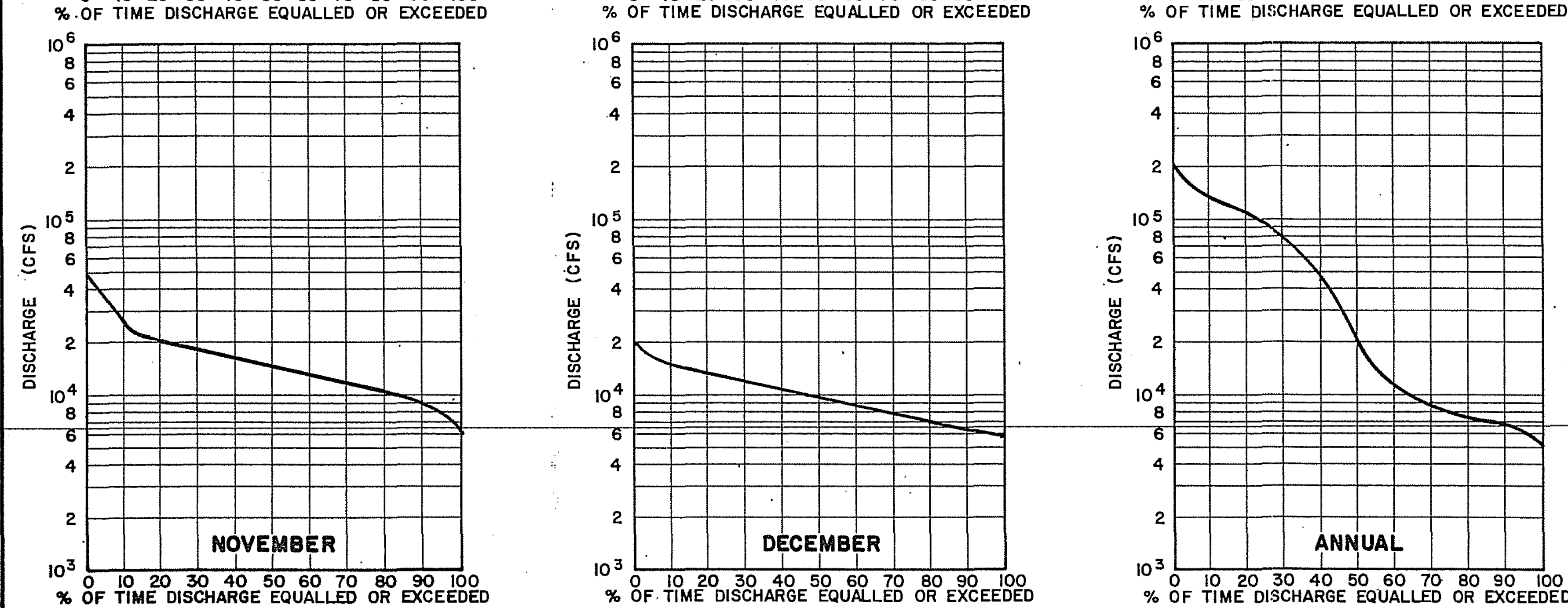
LEGEND:

——— (solid line)	GOLD CREEK
– – – (dashed line)	CANTWELL
–·–·– (dash-dot line)	DENALI

MONTHLY AND ANNUAL FLOW DURATION CURVES SUSITNA RIVER NEAR DENALI SUSITNA RIVER NEAR CANTWELL SUSITNA RIVER AT GOLD CREEK

FIGURE E.2.2.44



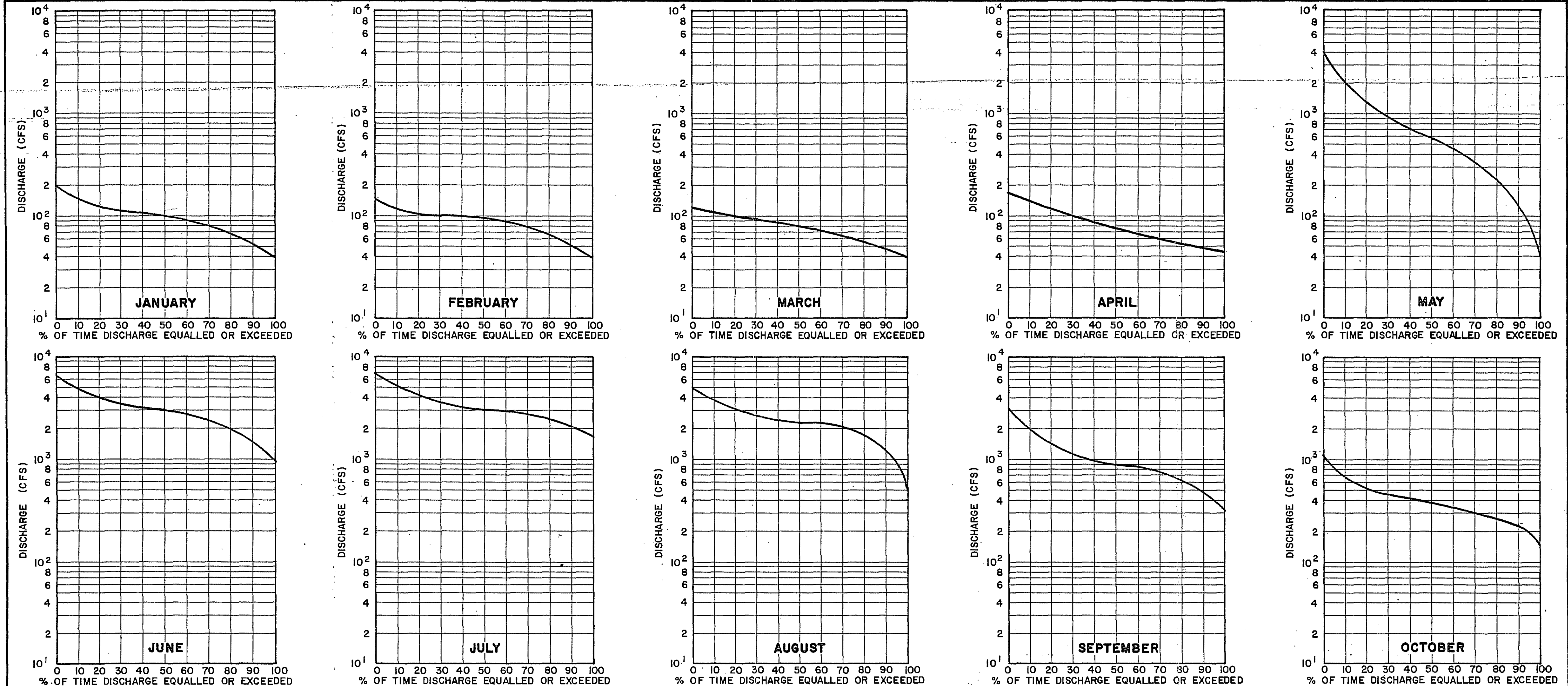


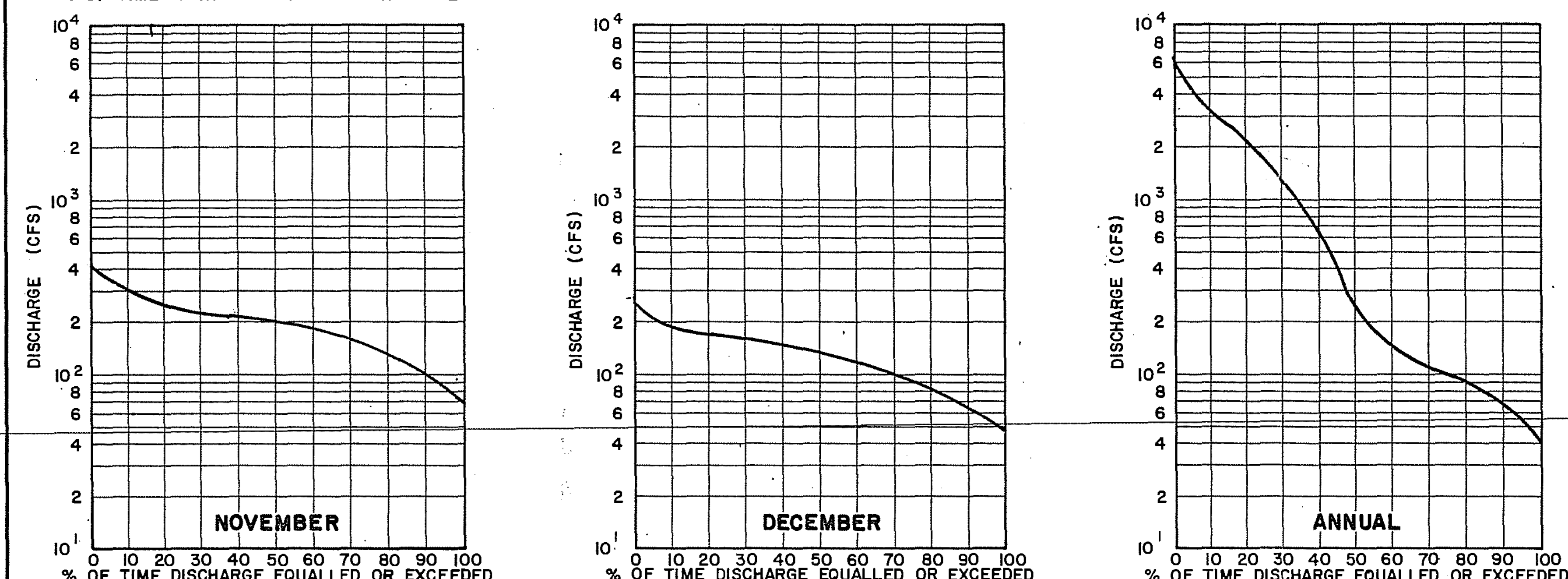
NOTES:

1. FLOW DURATION CURVES BASED ON MEAN DAILY FLOWS.
2. PERIOD OF RECORD: OCTOBER 1974 - SEPTEMBER 1981.

MONTHLY AND ANNUAL
FLOW DURATION CURVES
SUSITNA RIVER AT SUSITNA STATION

FIGURE E.2.2.45



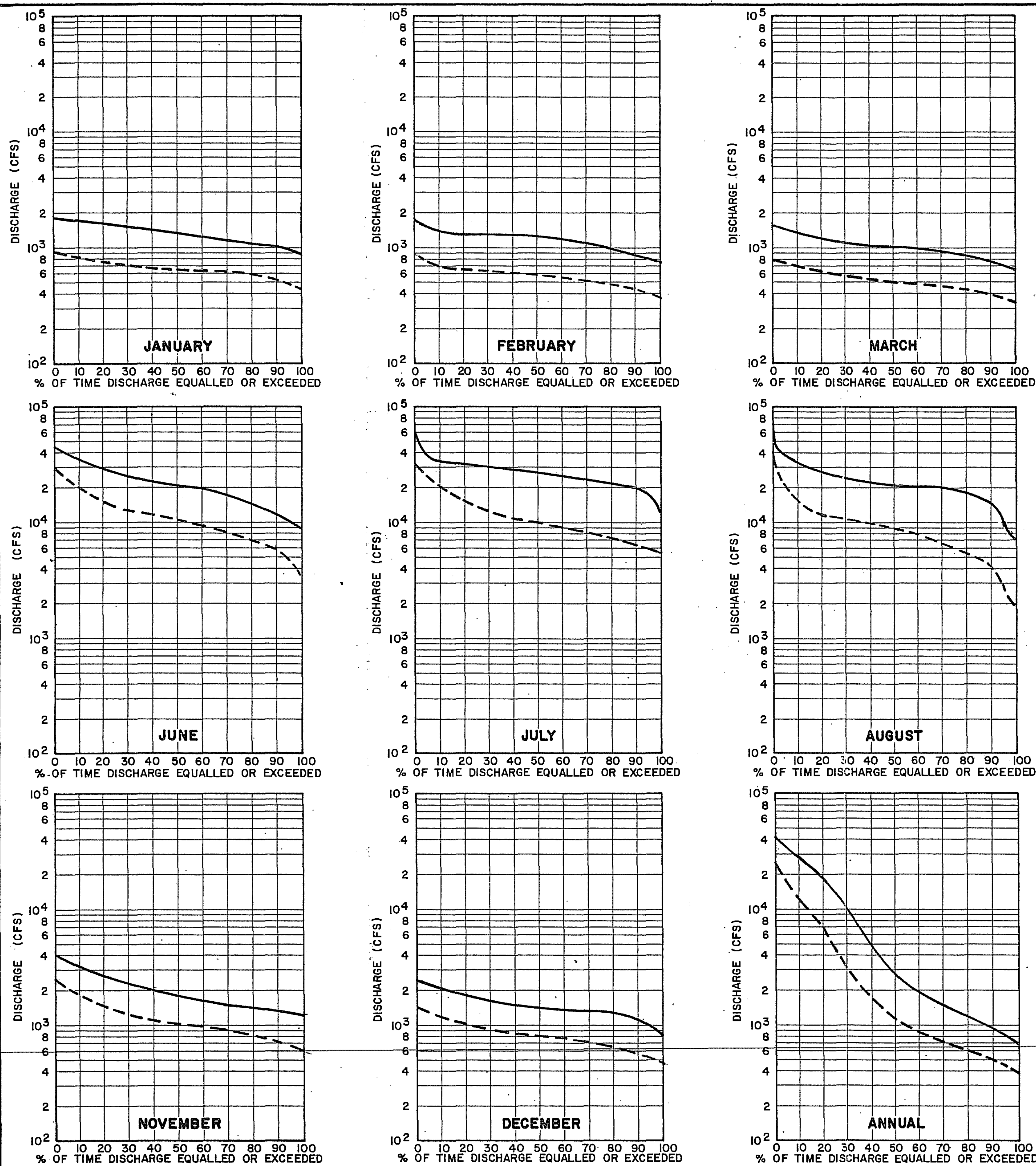


NOTES:

1. FLOW DURATION CURVES BASED ON MEAN DAILY FLOWS.
2. PERIOD OF RECORD: JUNE 1958-SEPTEMBER 1981.

MONTHLY AND ANNUAL
FLOW DURATION CURVES
MACLAREN RIVER AT PAXSON

FIGURE E.2.2.46



NOTES:

1. FLOW DURATION CURVES BASED ON MEAN DAILY FLOWS.
2. PERIODS OF RECORD:
   CHULITNA RIVER NEAR TALKEETNA:
   FEBRUARY 1958 - SEPTEMBER 1972
   MAY 1980 - SEPTEMBER 1981
   TALKEETNA RIVER NEAR TALKEETNA:
   JUNE 1964 - SEPTEMBER 1981

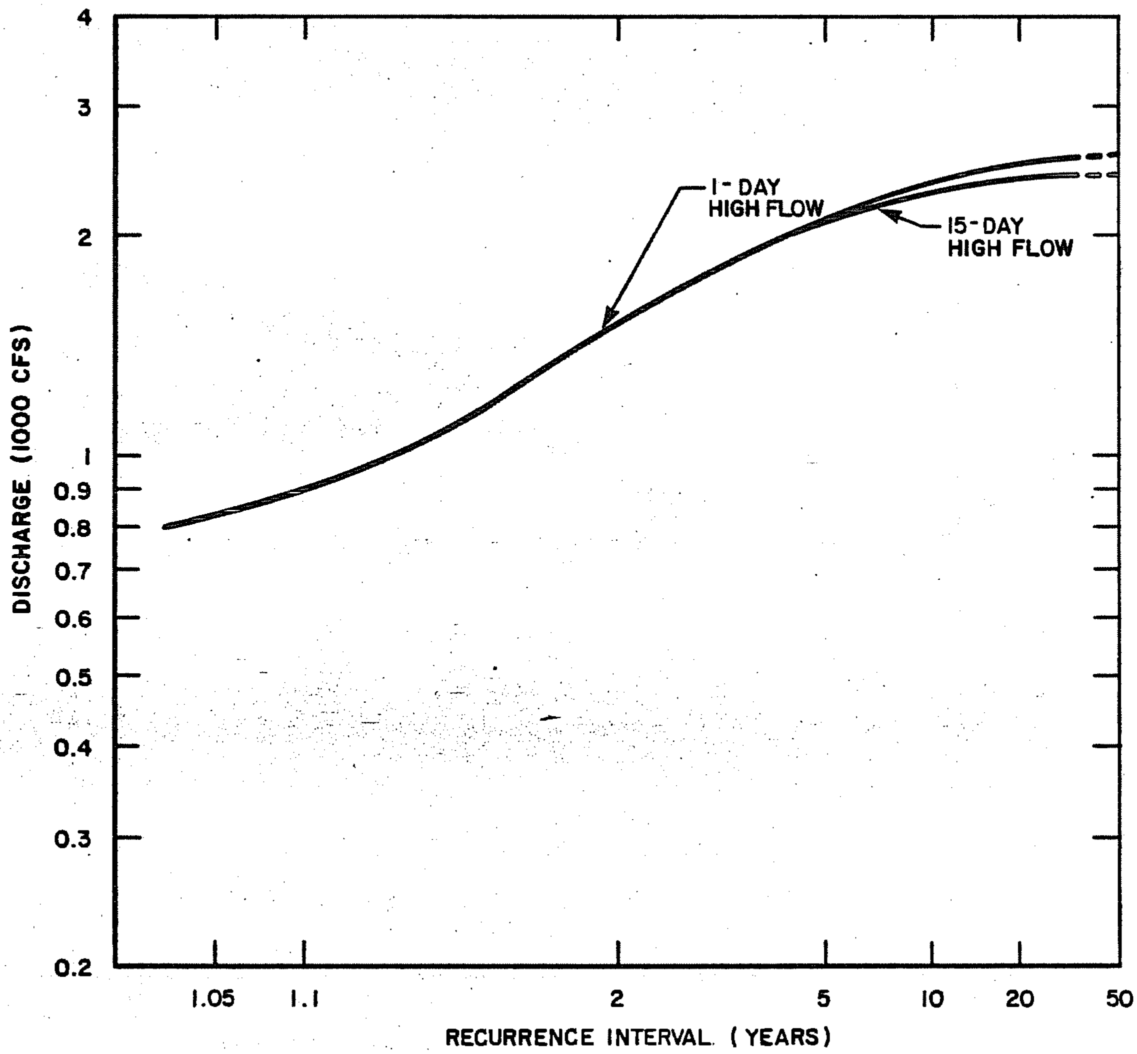
LEGEND:

—— CHULITNA RIVER

- - - TALKEETNA RIVER

MONTHLY AND ANNUAL FLOW DURATION CURVES CHULITNA RIVER NEAR TALKEETNA TALKEETNA RIVER NEAR TALKEETNA

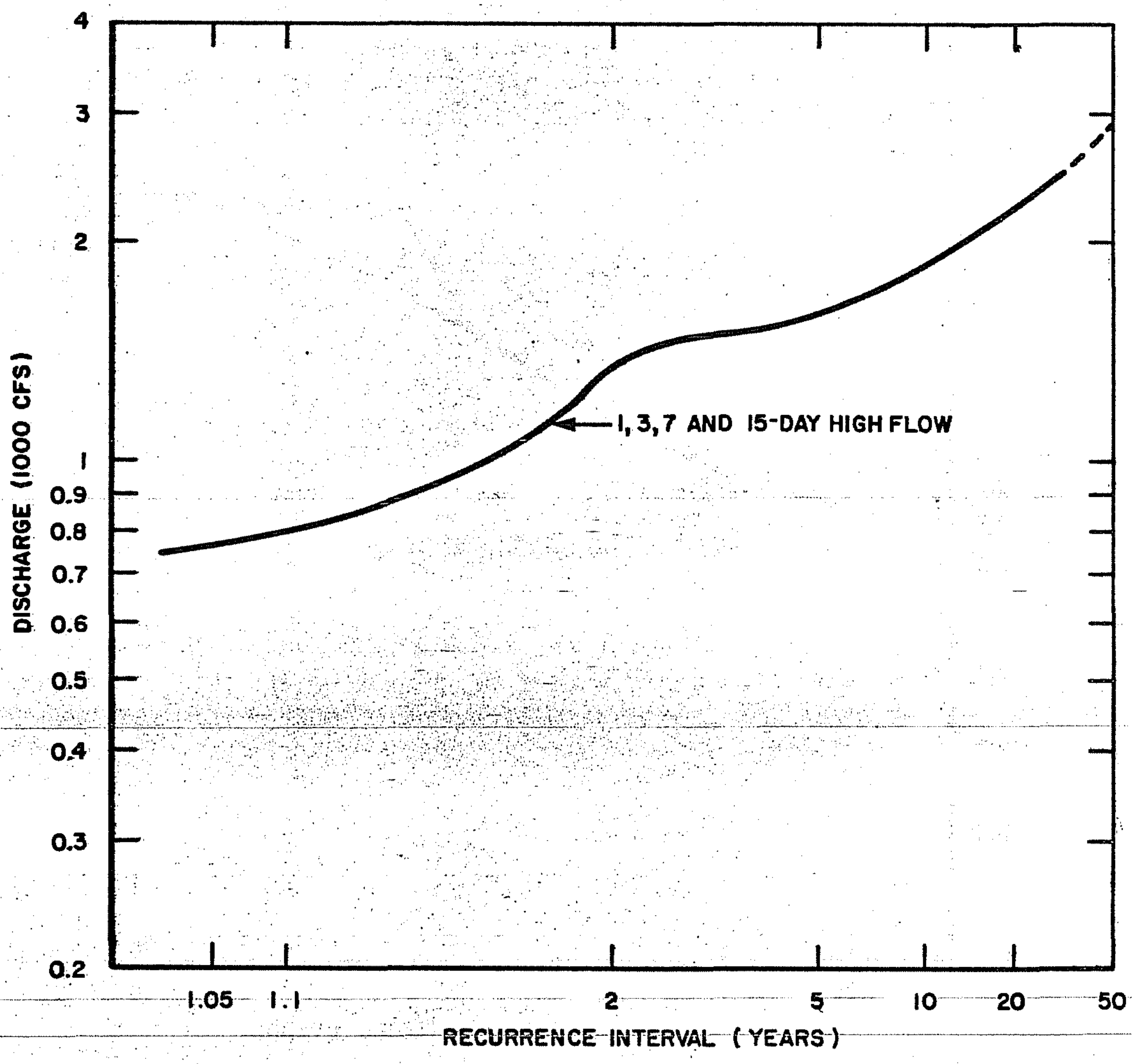
FIGURE E.2.2.47



NOTE: PERIOD OF RECORD WY 1950 - WY 1981.

SUSITNA RIVER AT GOLD CREEK
HIGH-FLOW FREQUENCY CURVES
JANUARY

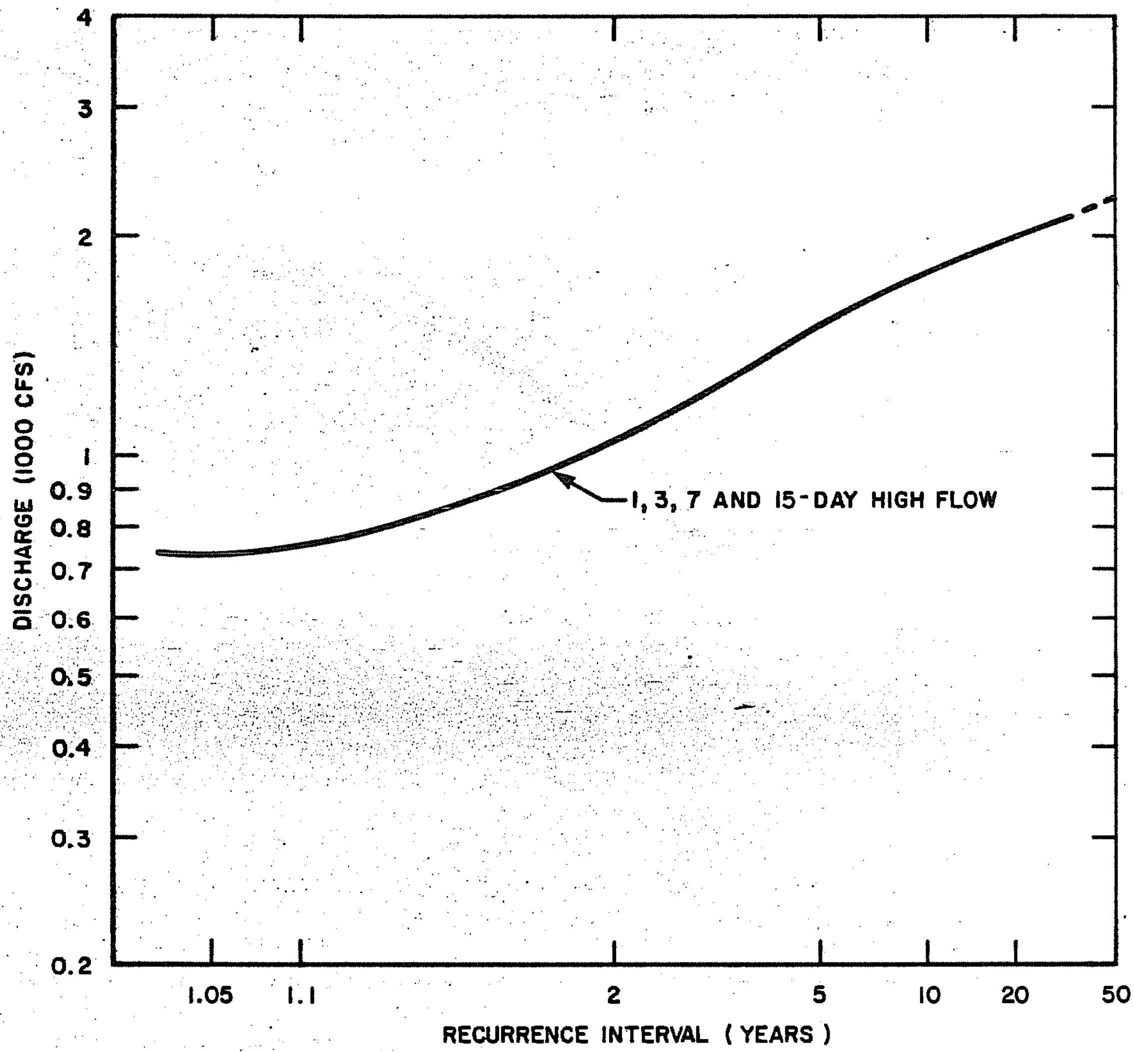
FIGURE E.2.2.48



NOTE: PERIOD OF RECORD WY 1950 - WY 1981.

SUSITNA RIVER AT GOLD CREEK
HIGH-FLOW FREQUENCY CURVES
FEBRUARY

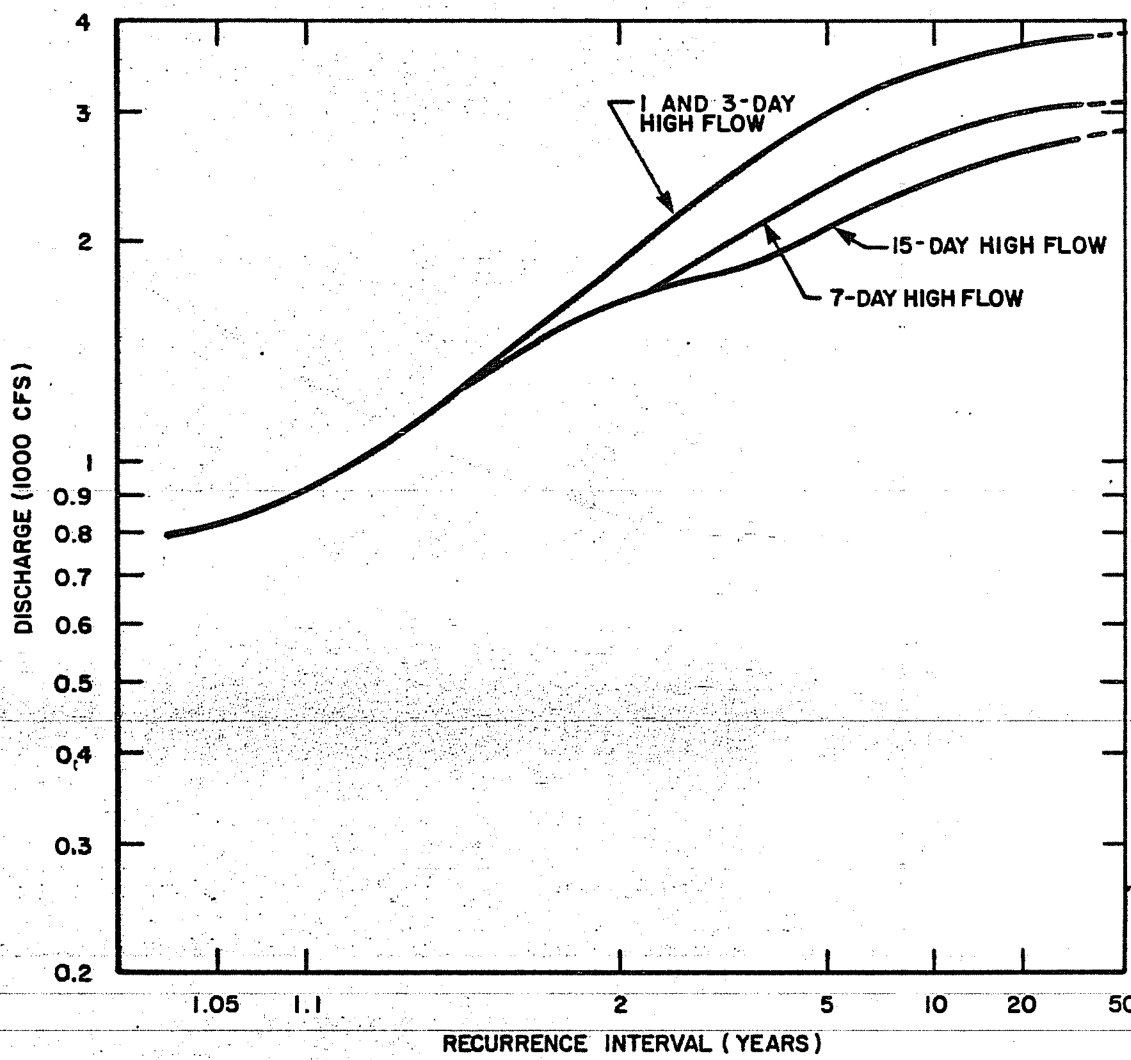
FIGURE E.2.2.49



NOTE: PERIOD OF RECORD WY 1950 - WY 1981.

SUSITNA RIVER AT GOLD CREEK
HIGH-FLOW FREQUENCY CURVES
MARCH

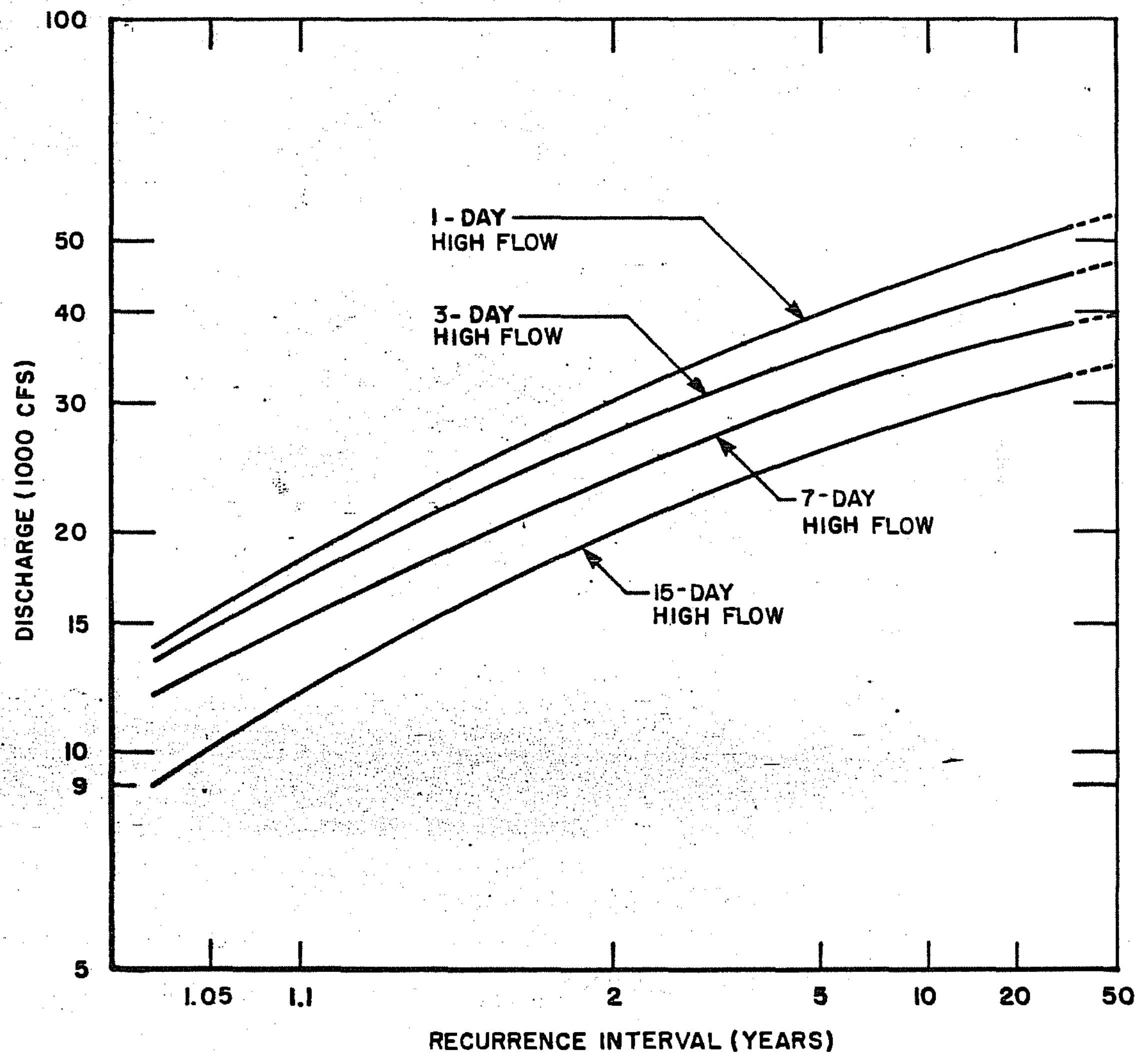
FIGURE E.2.2.50



NOTE: PERIOD OF RECORD WY 1950 - WY 1981

SUSITNA RIVER AT GOLD CREEK
HIGH-FLOW FREQUENCY CURVES
APRIL

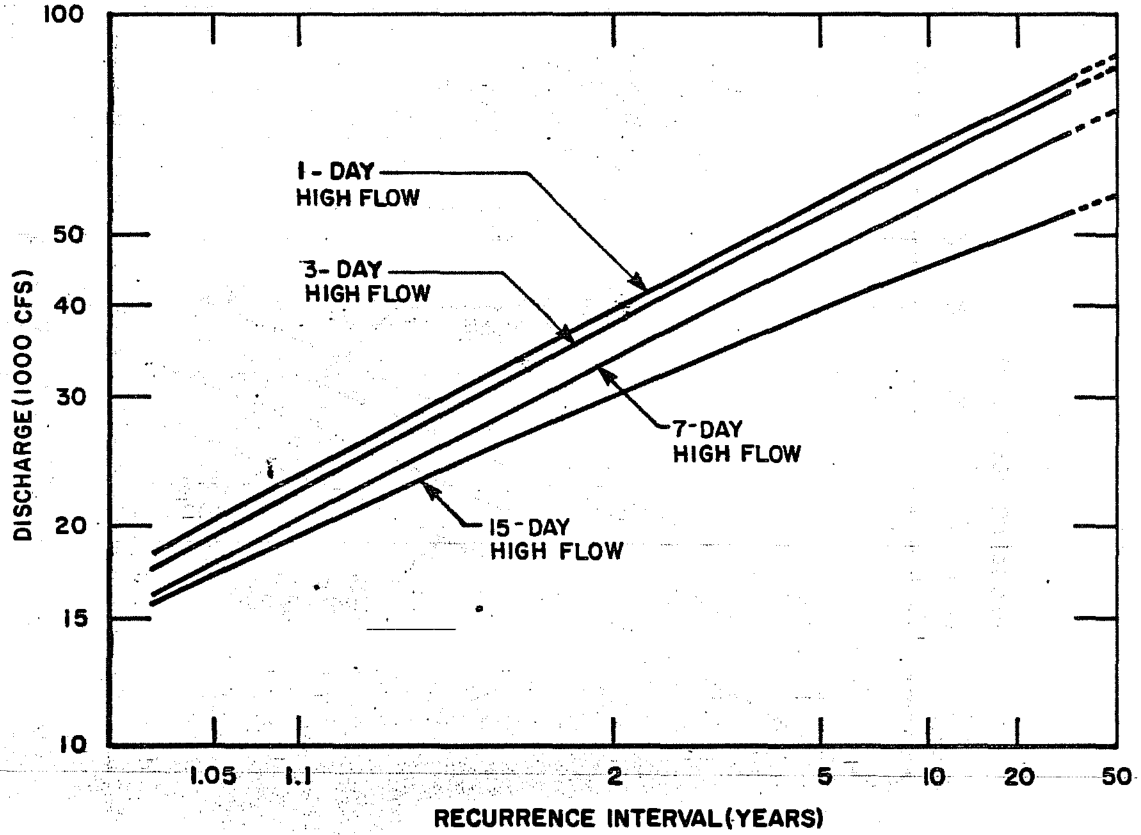
FIGURE E.2.2.51



NOTE: PERIOD OF RECORD WY 1950 - WY 1981.

SUSITNA RIVER AT GOLD CREEK HIGH-FLOW FREQUENCY CURVES MAY

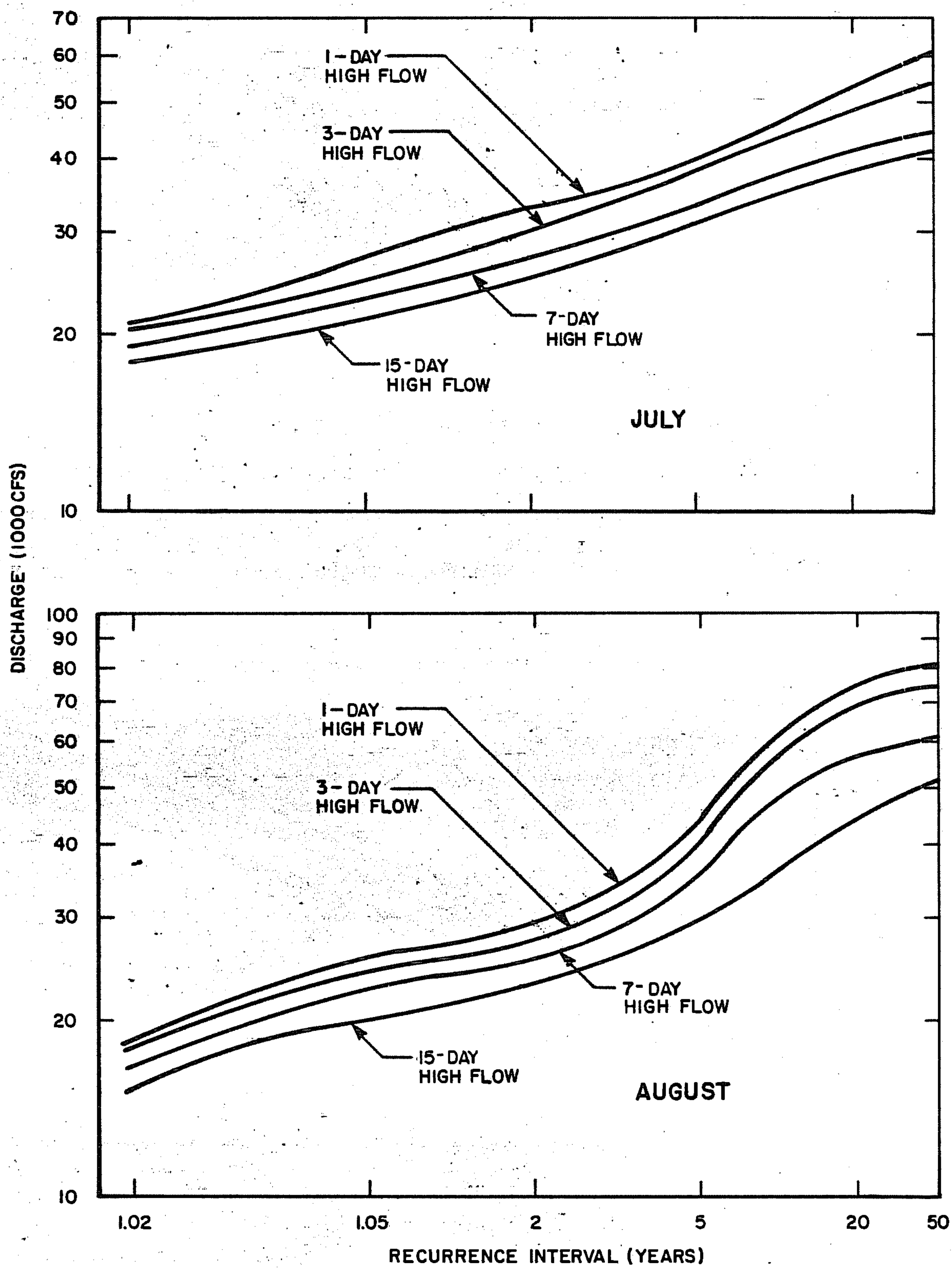
FIGURE E.2.2.52



NOTE: PERIOD OF RECORD WY 1950 - WY 1981.

SUSITNA RIVER AT GOLD CREEK HIGH-FLOW FREQUENCY CURVES JUNE

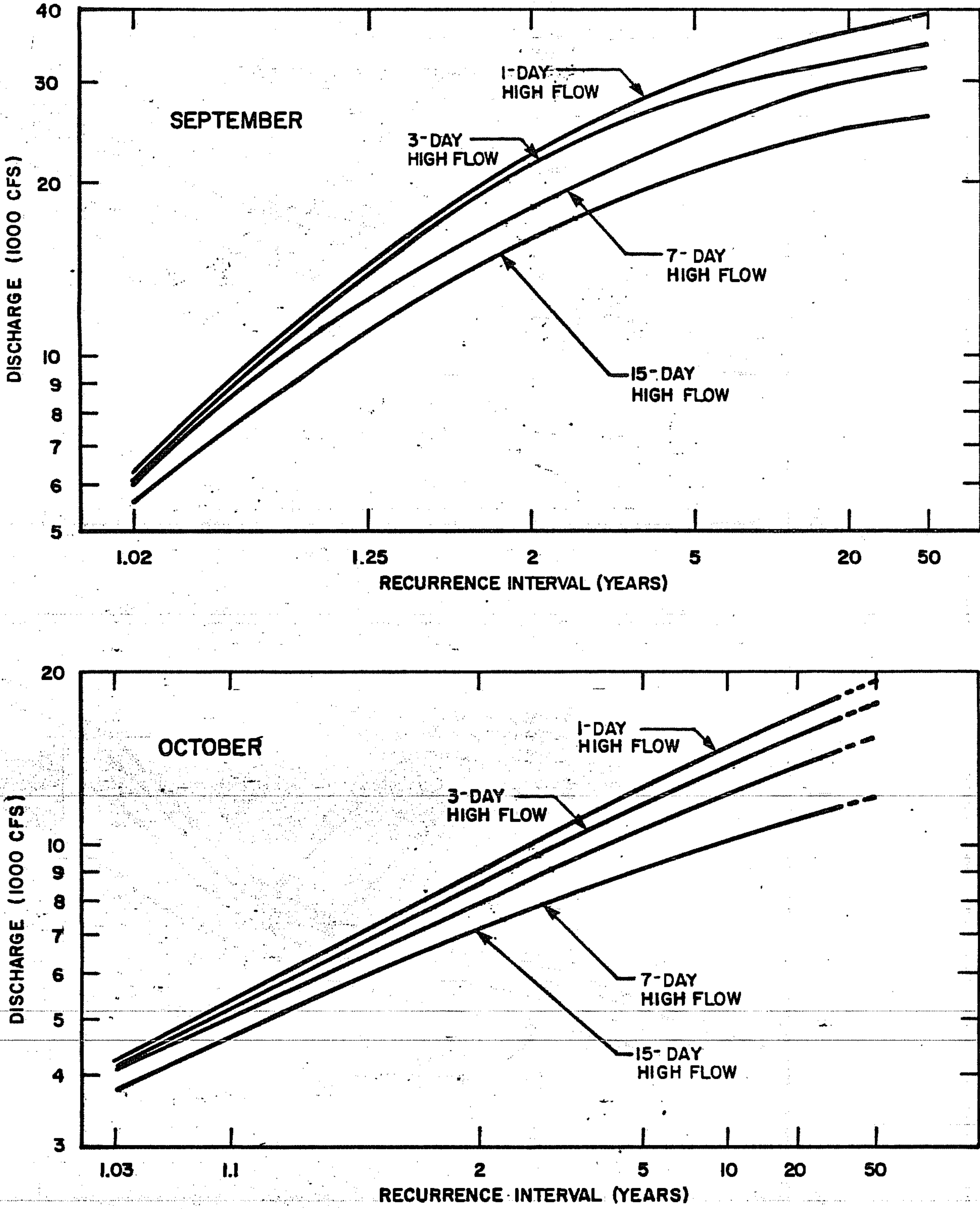
FIGURE E.2.2.53



NOTE: PERIOD OF RECORD WY 1950 - WY 1981

SUSITNA RIVER AT GOLD CREEK
HIGH-FLOW FREQUENCY CURVES
JULY AND AUGUST

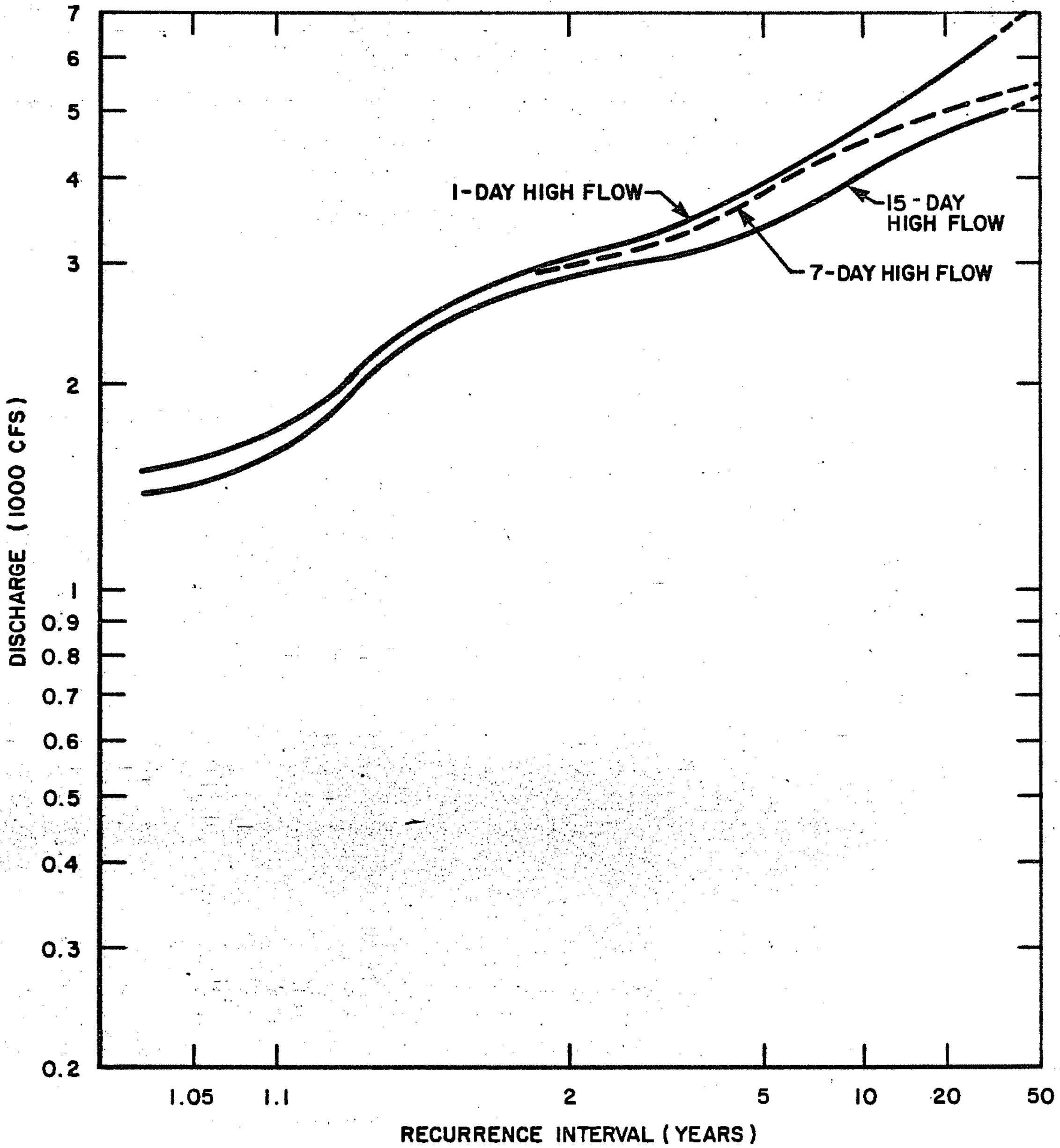
FIGURE E.2.2.54



NOTE: PERIOD OF RECORD WY 1950 - WY 1981.

SUSITNA RIVER AT GOLD CREEK
HIGH-FLOW FREQUENCY CURVES
SEPTEMBER AND OCTOBER

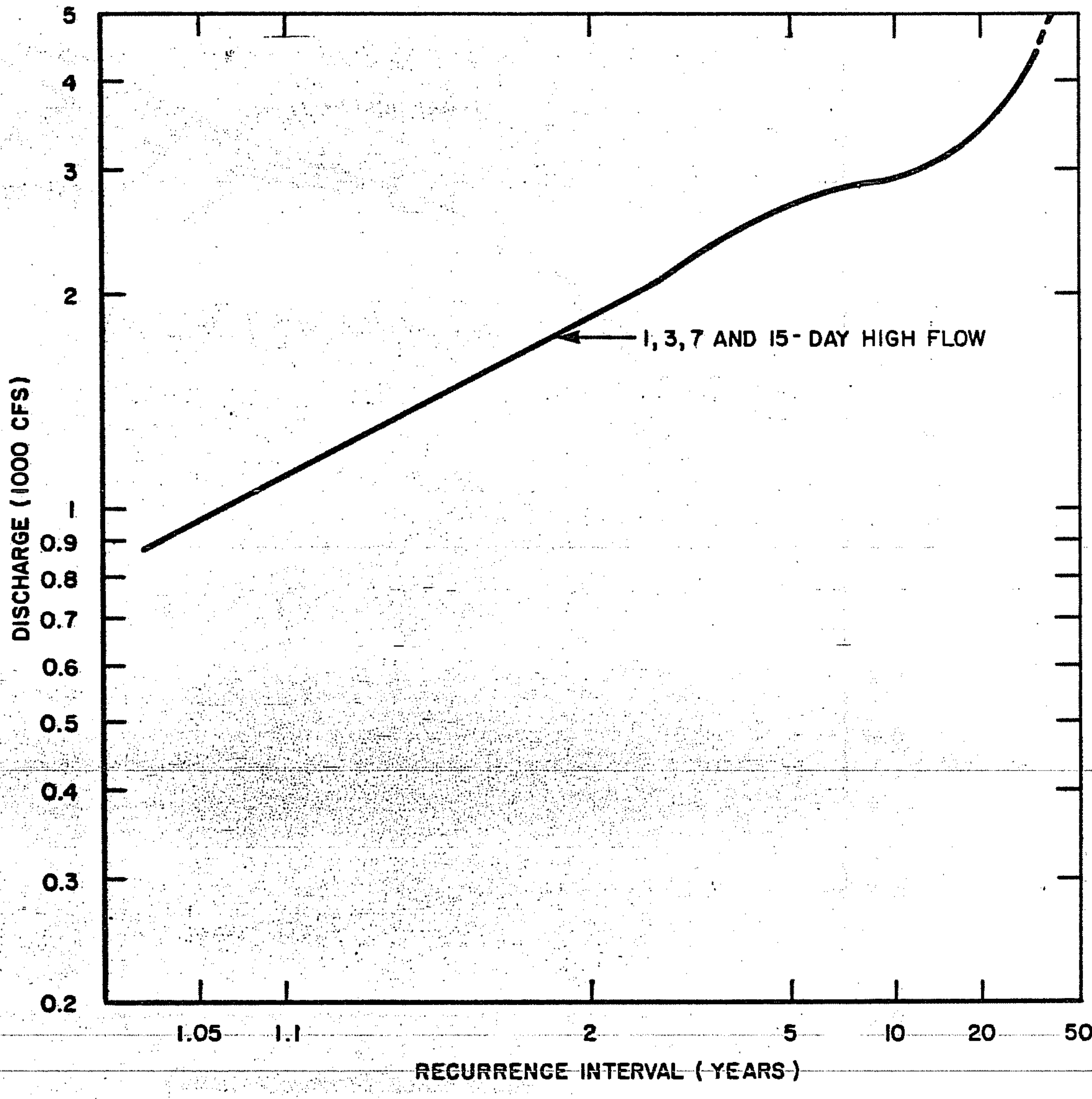
FIGURE E.2.2.55



NOTE: PERIOD OF RECORD WY 1950 - WY 1981.

SUSITNA RIVER AT GOLD CREEK HIGH-FLOW FREQUENCY CURVES NOVEMBER

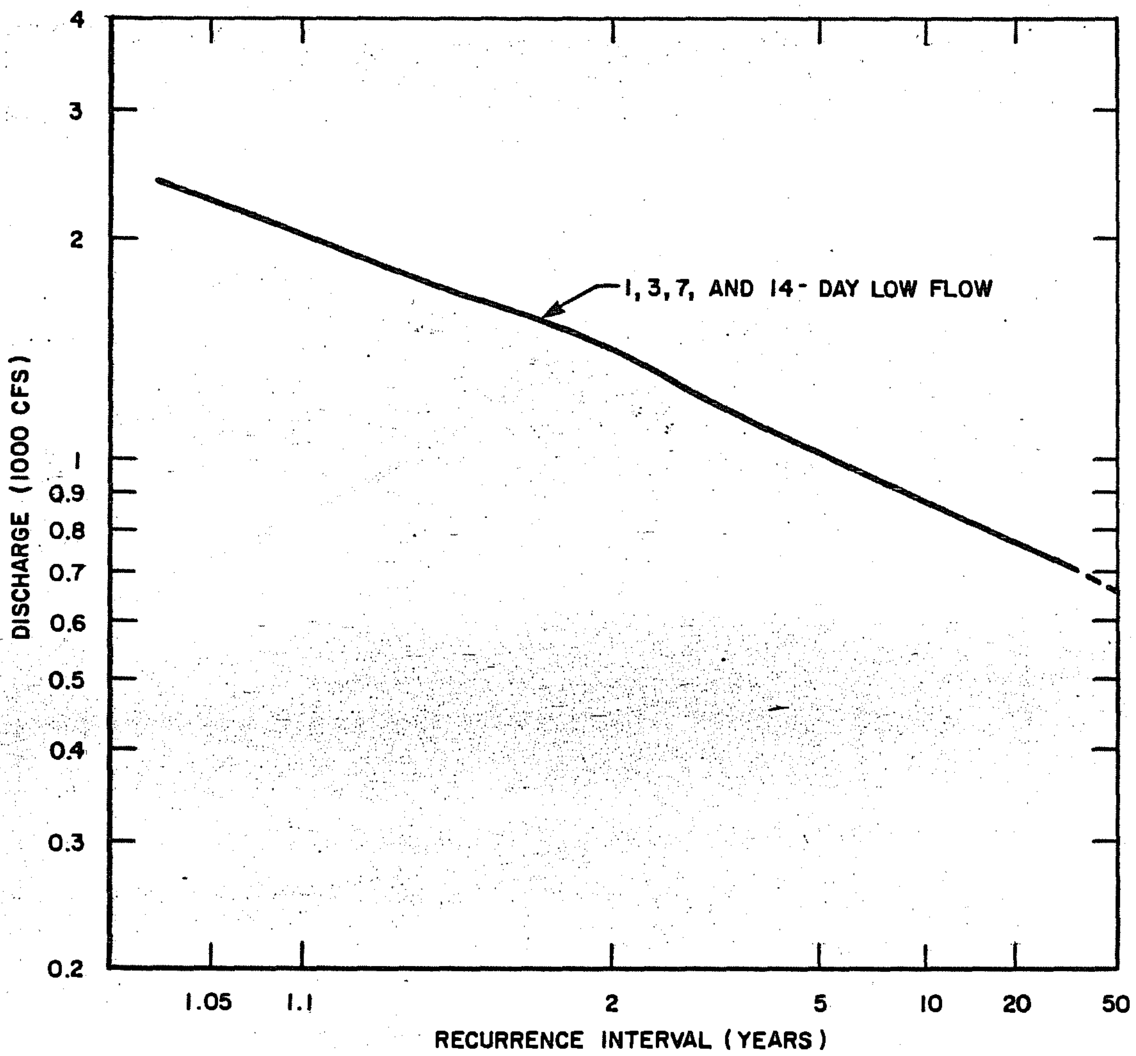
FIGURE E.2.2.56



NOTE:
PERIOD OF RECORD WY 1950 - WY 1981.

SUSITNA RIVER AT GOLD CREEK
HIGH-FLOW FREQUENCY CURVES
DECEMBER

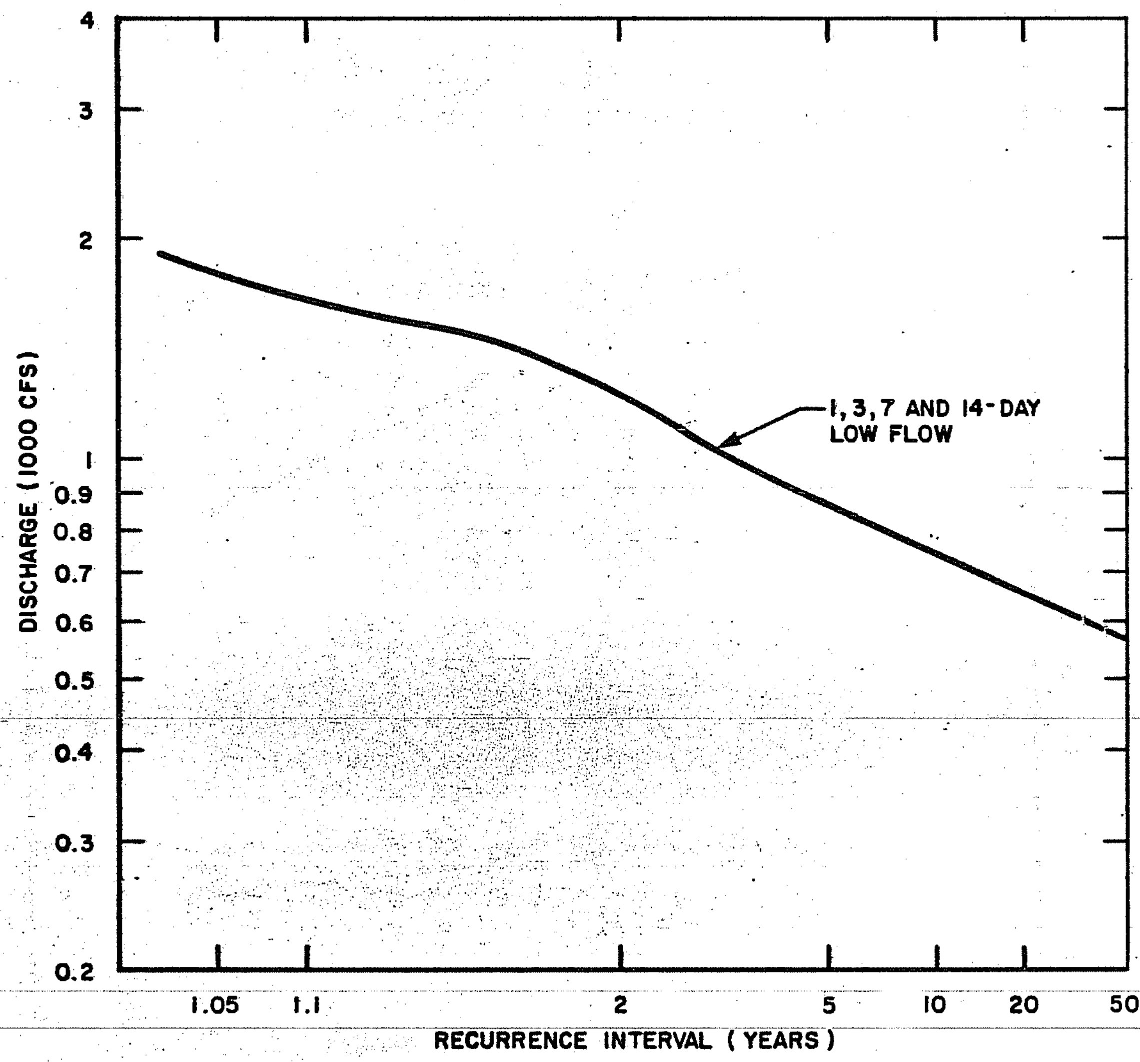
FIGURE E.2.2.57



NOTE: PERIOD OF RECORD WY 1950 - WY 1981.

SUSITNA RIVER AT GOLD CREEK
LOW-FLOW FREQUENCY CURVES
JANUARY

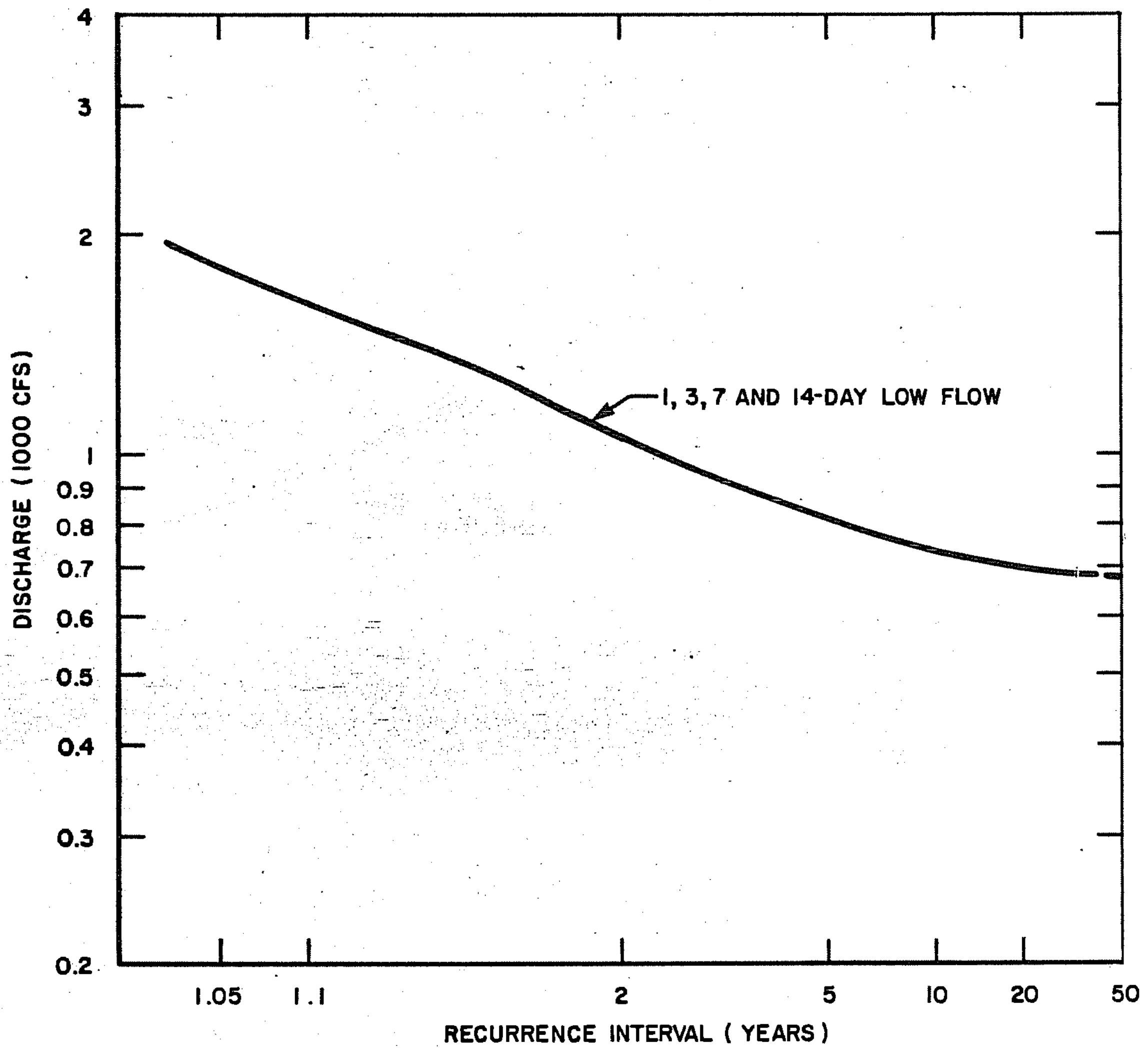
FIGURE E.2.2.58



NOTE: PERIOD OF RECORD WY 1950 - WY 1981.

SUSITNA RIVER AT GOLD CREEK
LOW-FLOW FREQUENCY CURVES
FEBRUARY

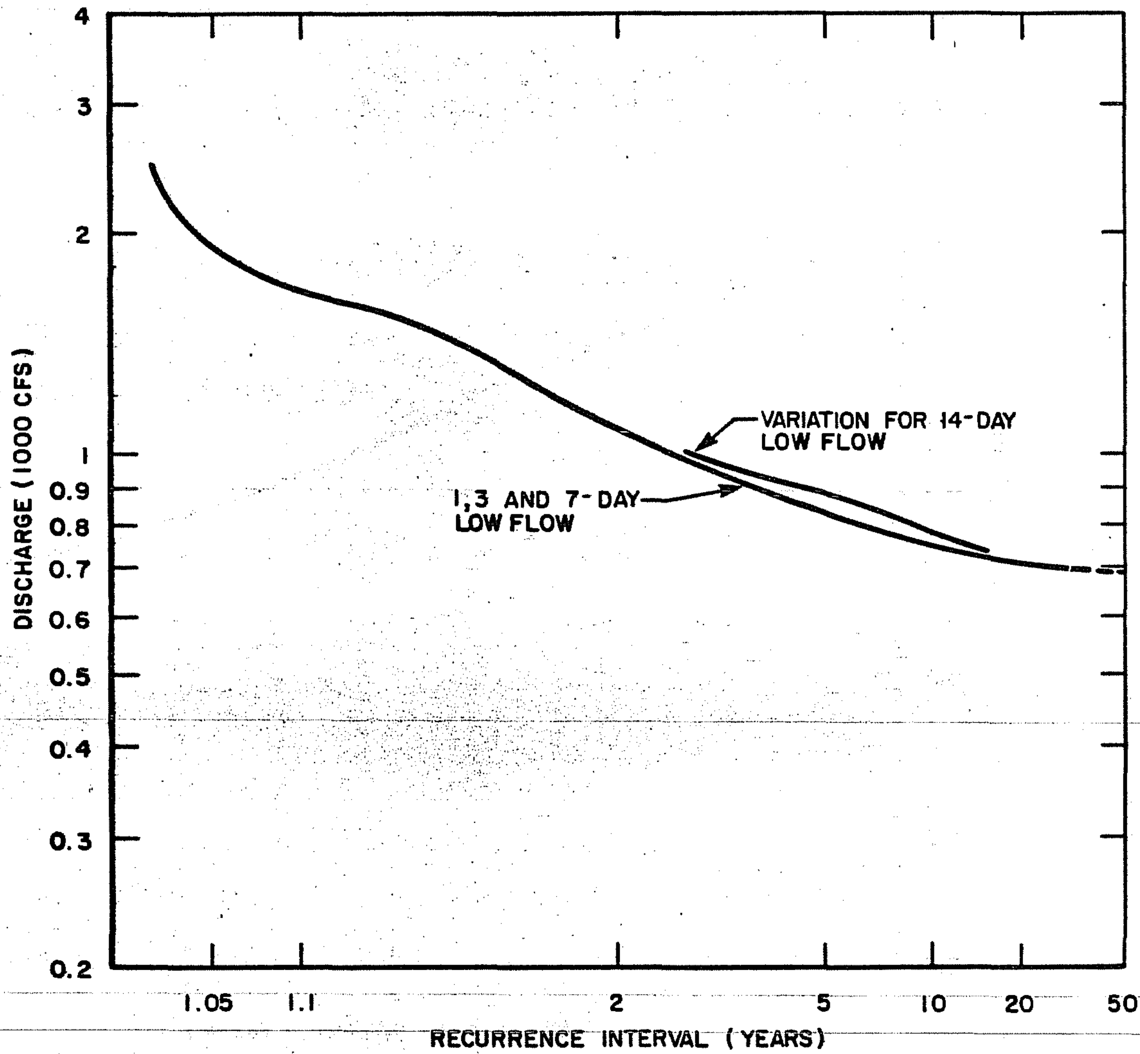
FIGURE E.2.2.59



NOTE: PERIOD OF RECORD WY 1950 - WY 1981.

SUSITNA RIVER AT GOLD CREEK
LOW-FLOW FREQUENCY CURVES
MARCH

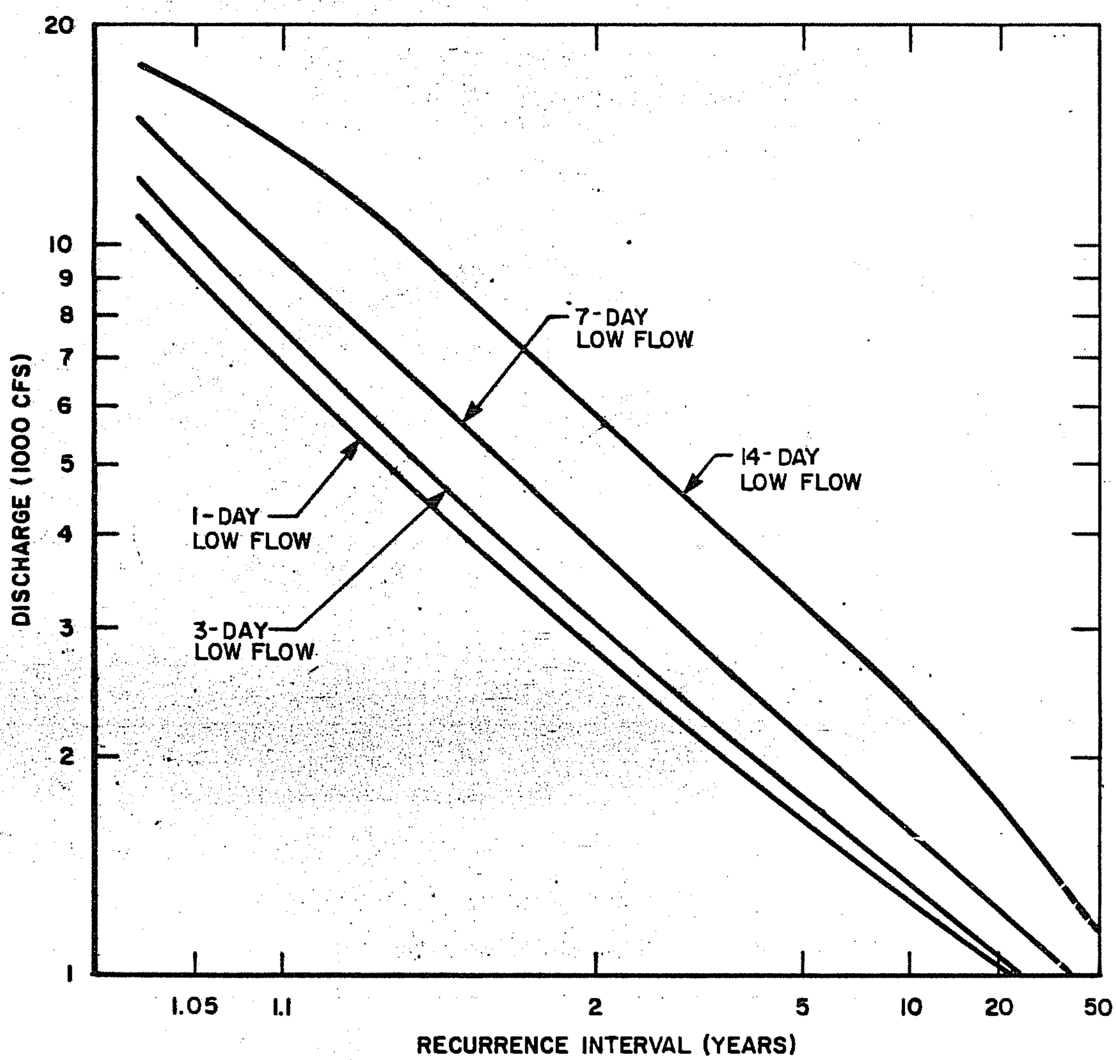
FIGURE E.2.2.60



NOTE: PERIOD OF RECORD WY 1950 - WY 1981.

SUSITNA RIVER AT GOLD CREEK LOW-FLOW FREQUENCY CURVES APRIL

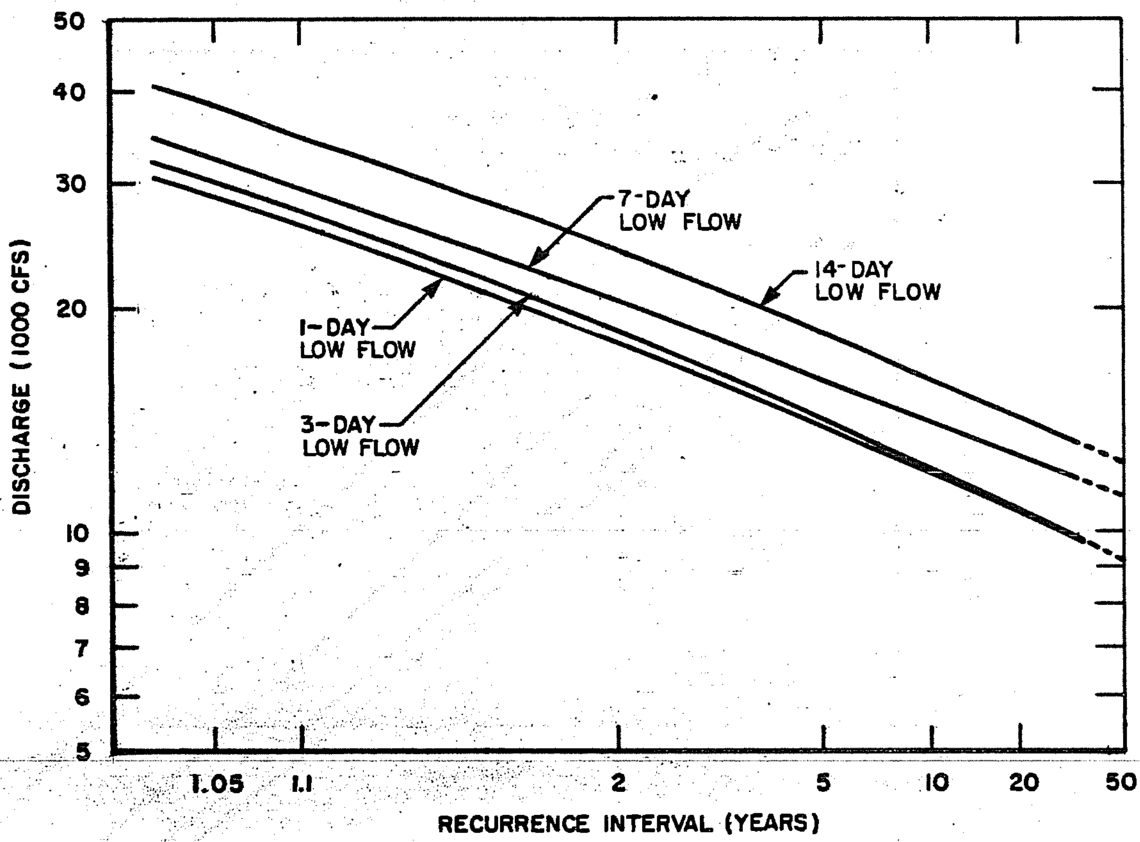
FIGURE E.2.2.61



NOTE: PERIOD OF RECORD WY 1950 - WY 1981.

SUSITNA RIVER AT GOLD CREEK
LOW-FLOW FREQUENCY CURVES
MAY

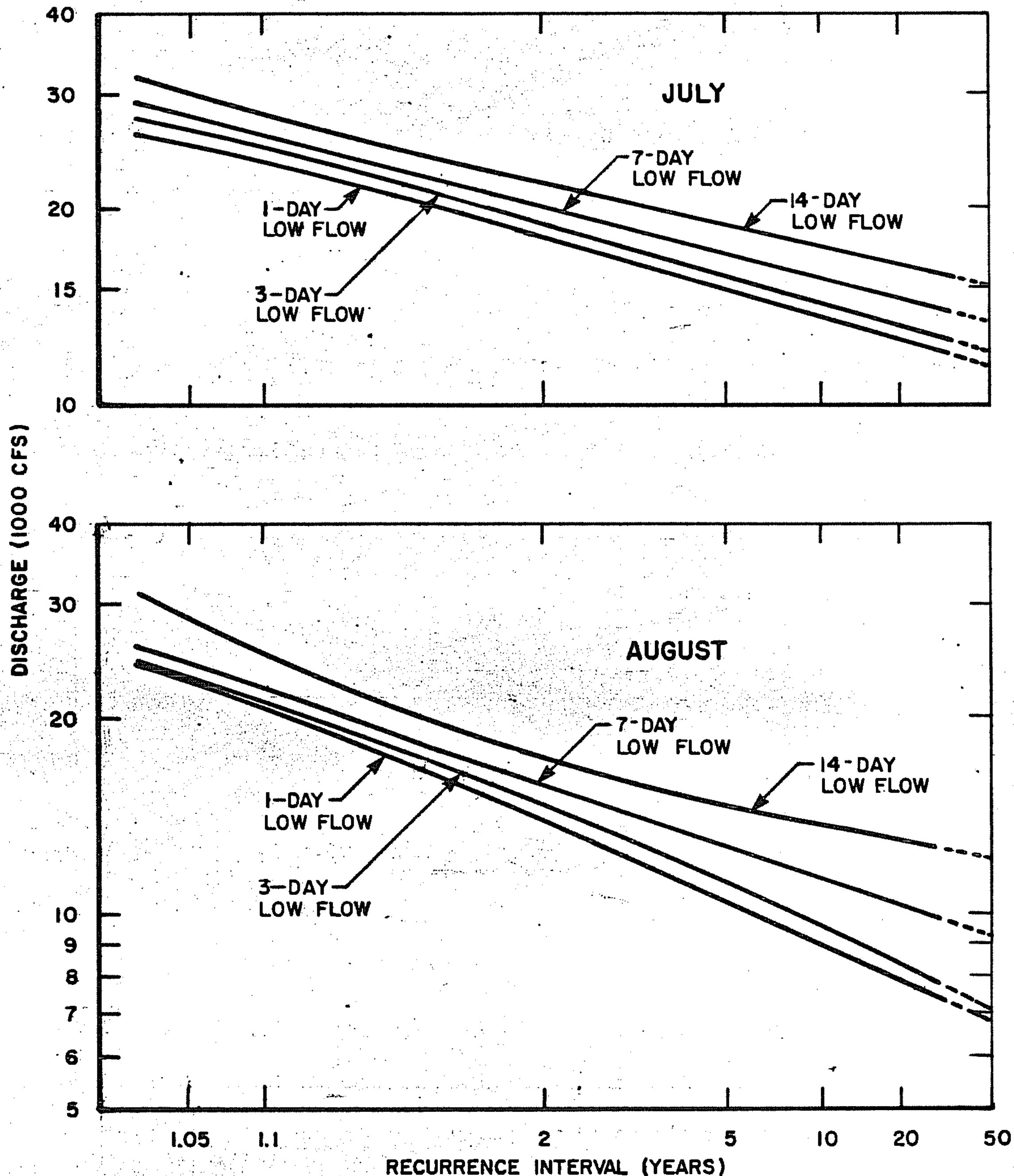
FIGURE E.2.2.62



NOTE: PERIOD OF RECORD WY 1950 - WY 1981.

SUSITNA RIVER AT GOLD CREEK
LOW-FLOW FREQUENCY CURVES
JUNE

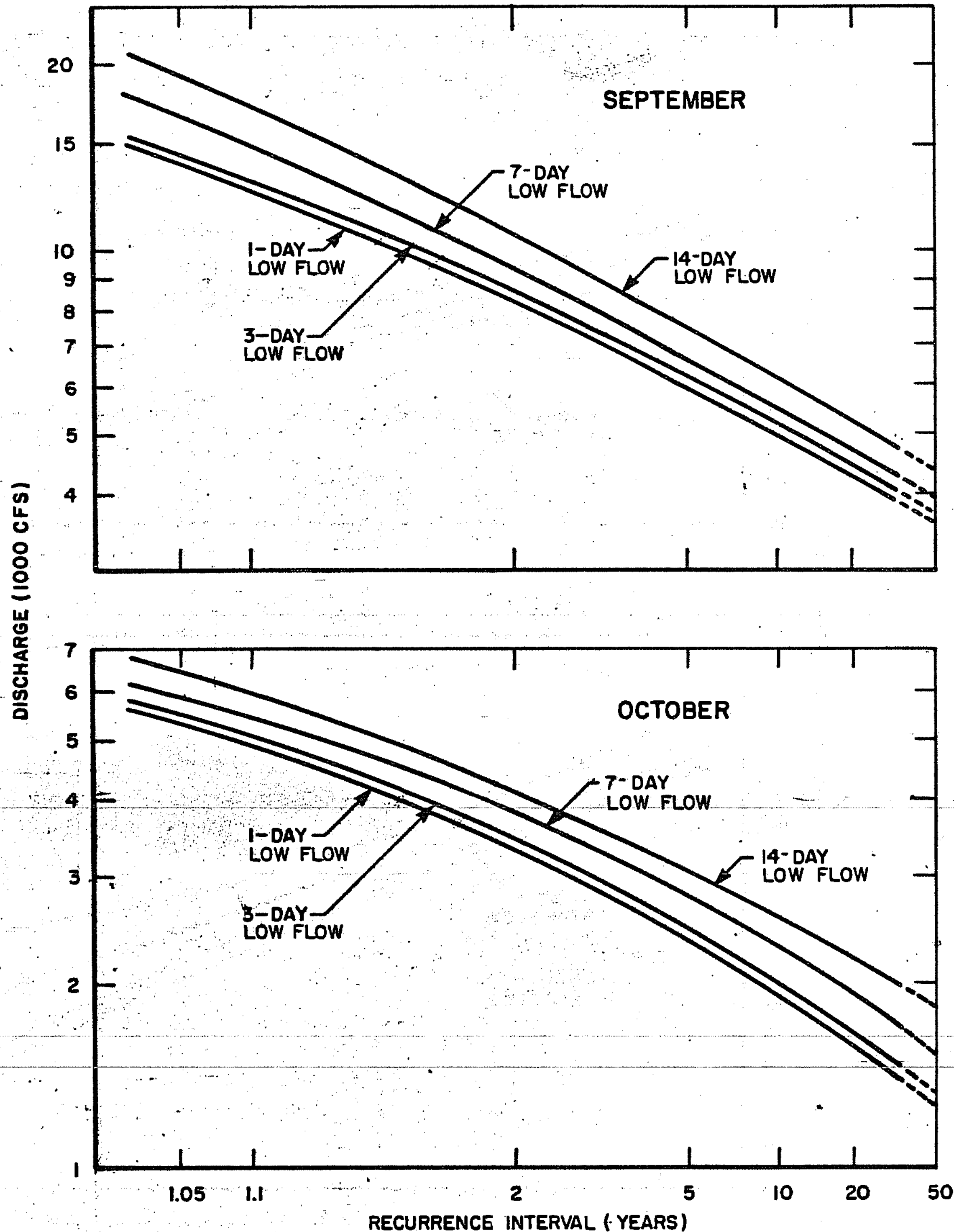
FIGURE E.2.2.63



NOTE: PERIOD OF RECORD WY 1950 - WY 1981.

SUSITNA RIVER AT GOLD CREEK
LOW-FLOW FREQUENCY CURVES
JULY AND AUGUST

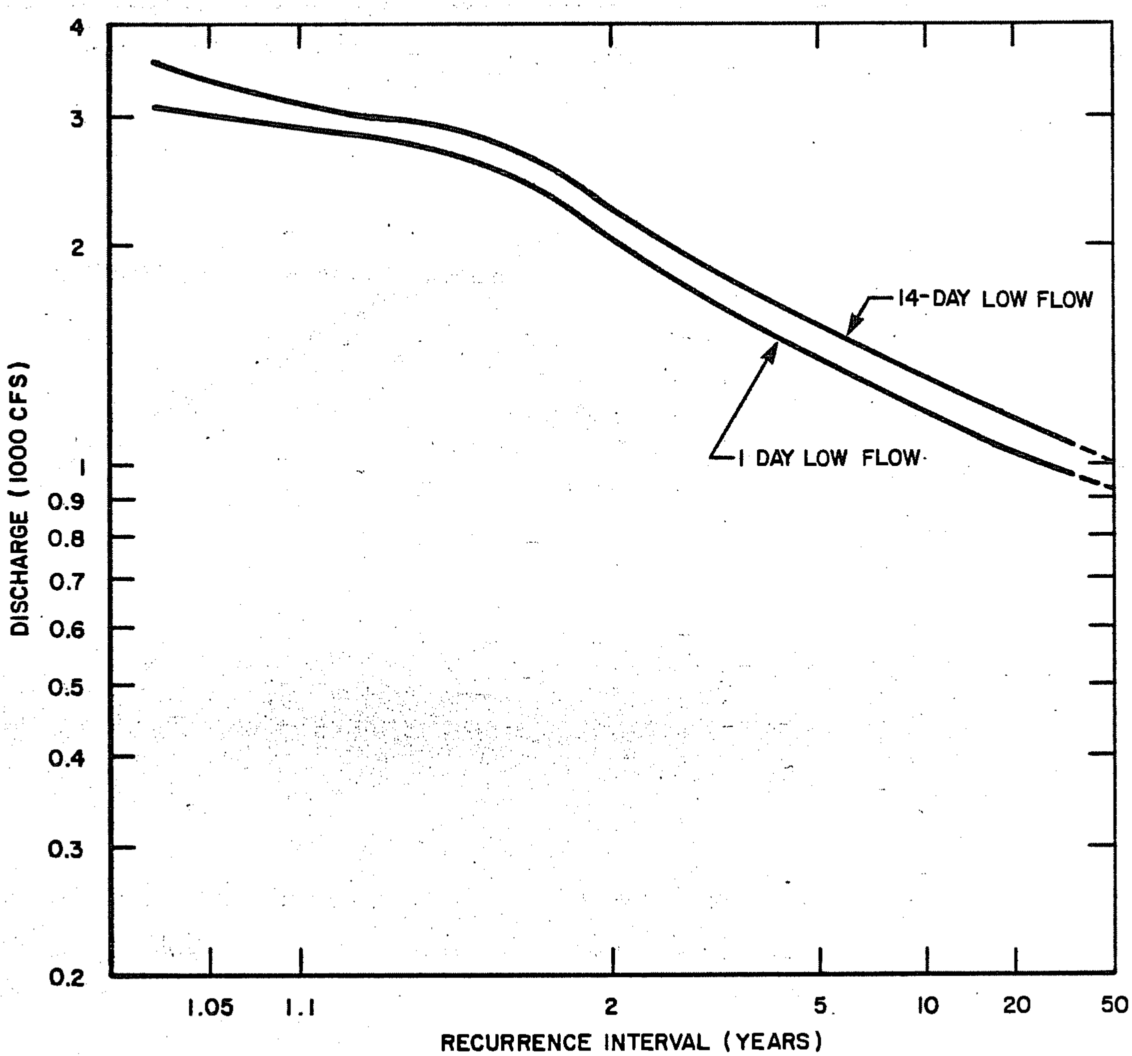
FIGURE E.2.2.64



NOTE: PERIOD OF RECORD WY 1950- WY 1981

SUSITNA RIVER AT GOLD CREEK
LOW-FLOW FREQUENCY CURVES
SEPTEMBER AND OCTOBER

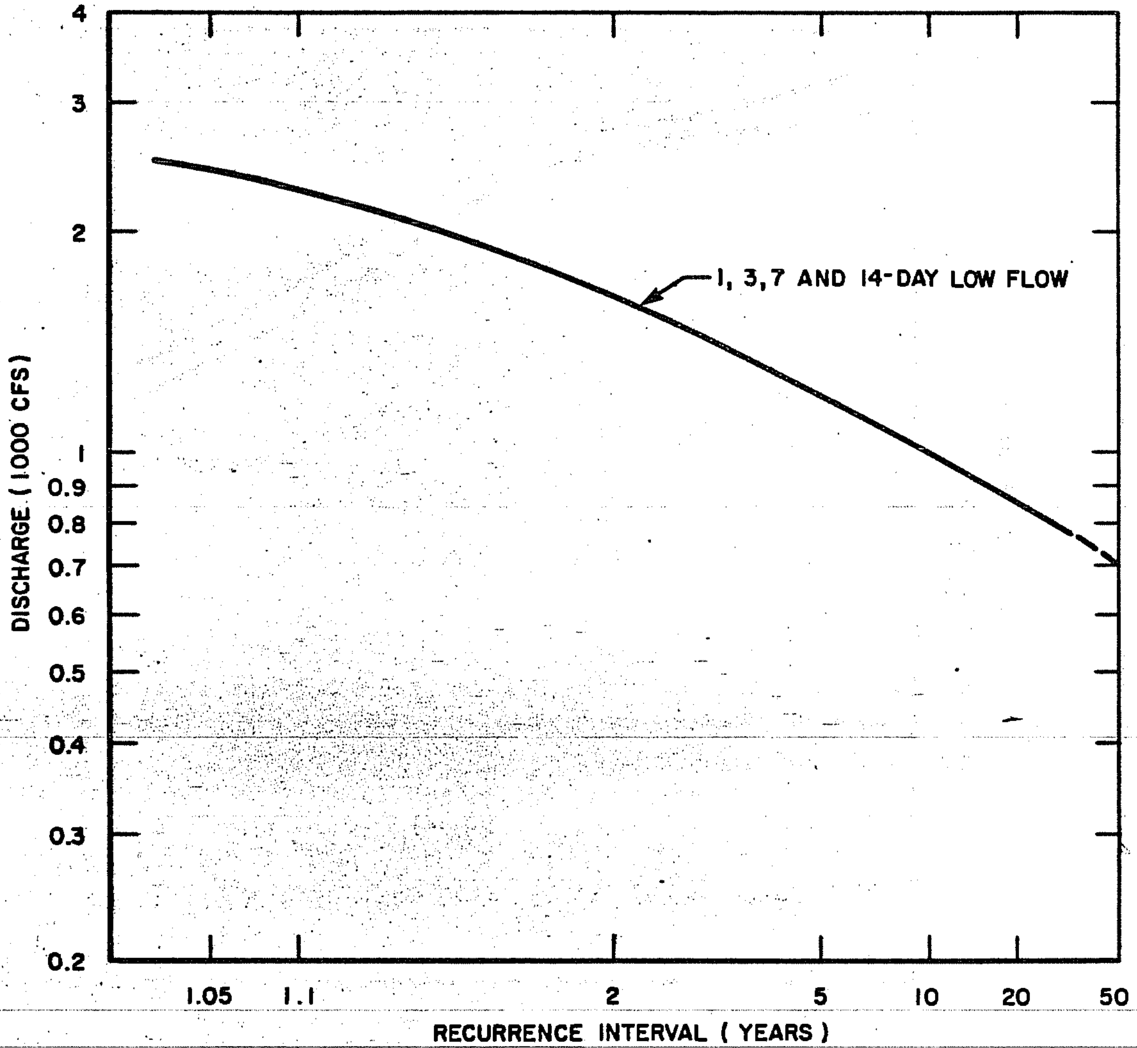
FIGURE E.2.2.65



NOTE: PERIOD OF RECORD WY 1950 - WY 1981.

SUSITNA RIVER AT GOLD CREEK
LOW-FLOW FREQUENCY CURVES
NOVEMBER

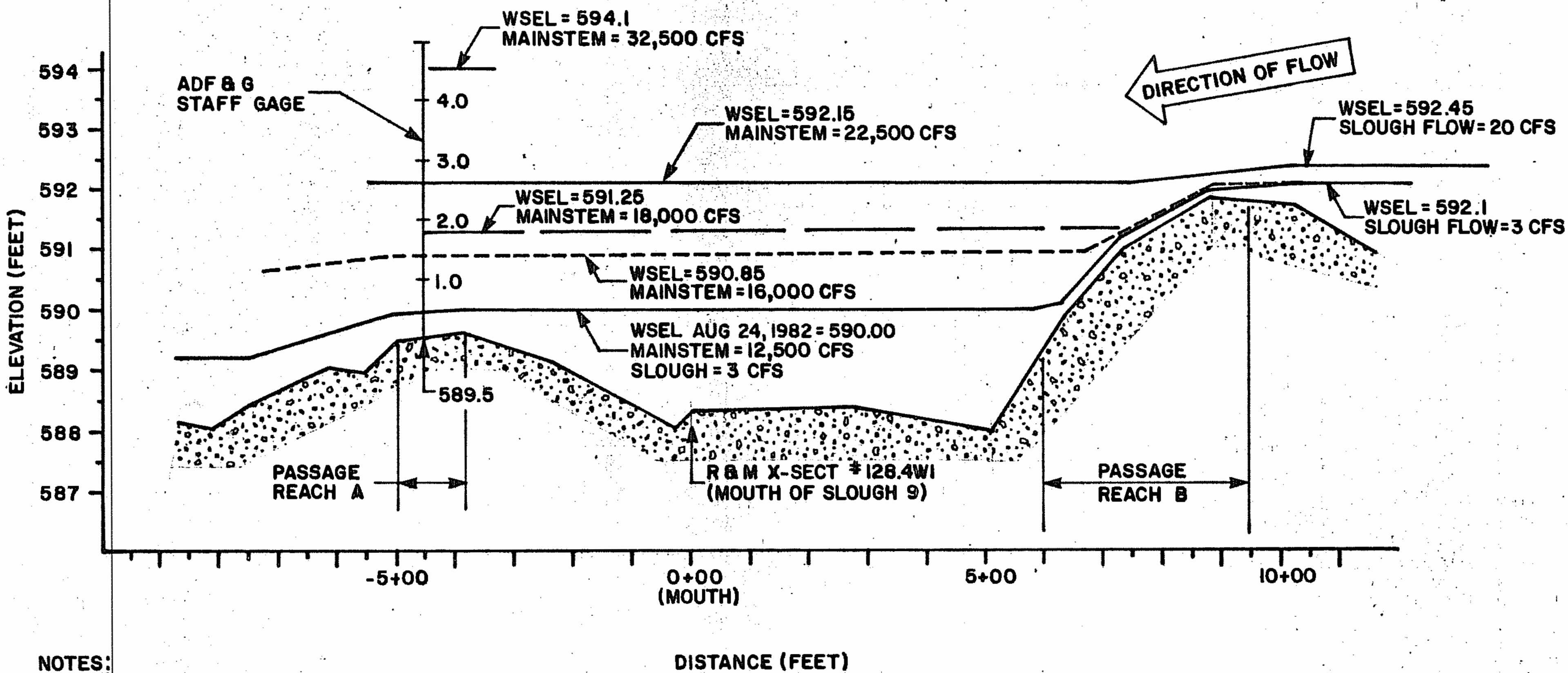
FIGURE E.2.2.66



NOTE: PERIOD OF RECORD WY 1950- WY 1981.

SUSITNA RIVER AT GOLD CREEK
LOW-FLOW FREQUENCY CURVES
DECEMBER

FIGURE E.2.2.67

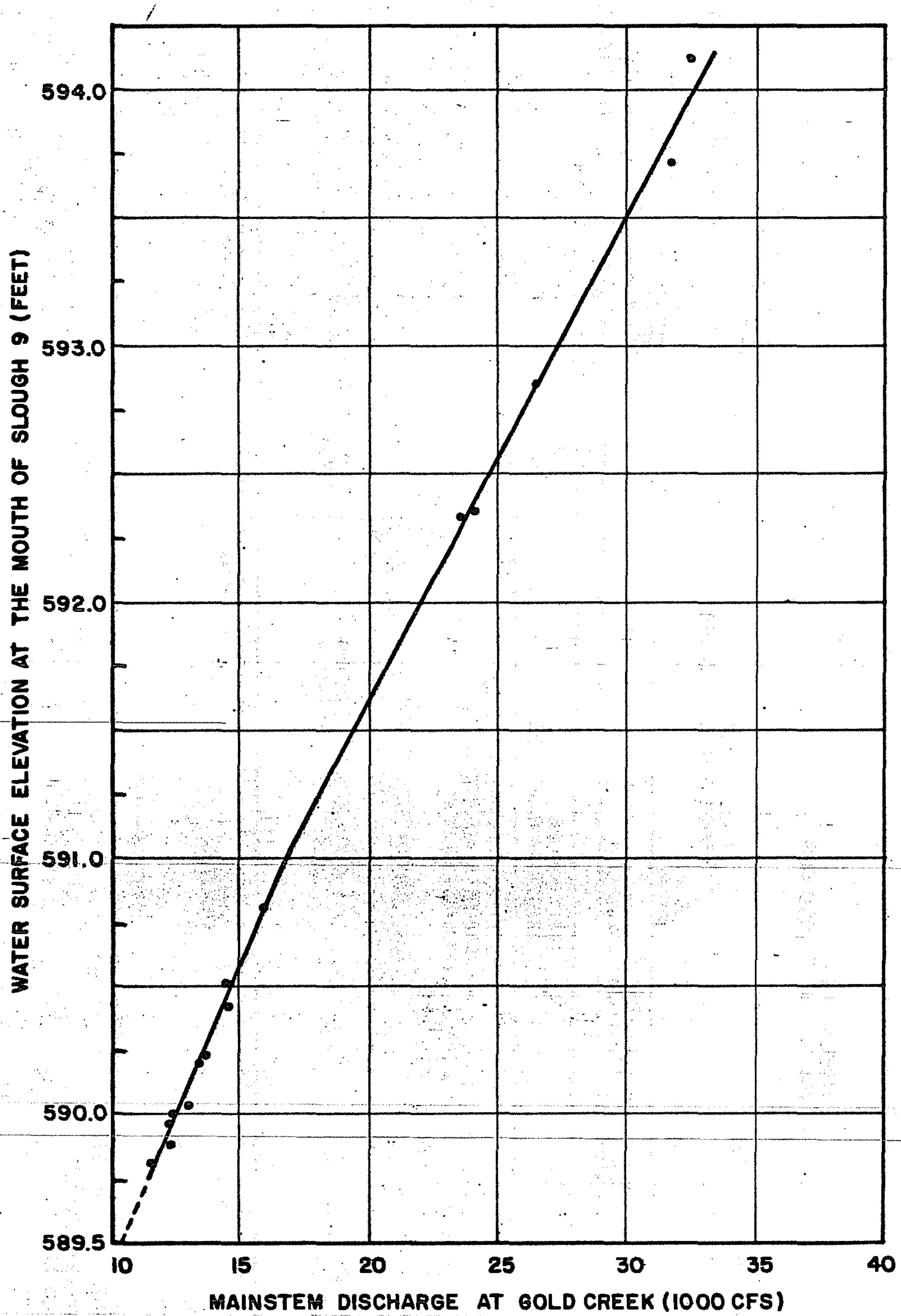


NOTES:

1. MOUTH OF SLOUGH AT STATION 0+00.
2. SELECT MAINSTEM DISCHARGES MEASURED AT GOLD CREEK.

BACKWATER PROFILES AT THE MOUTH OF SLOUGH 9

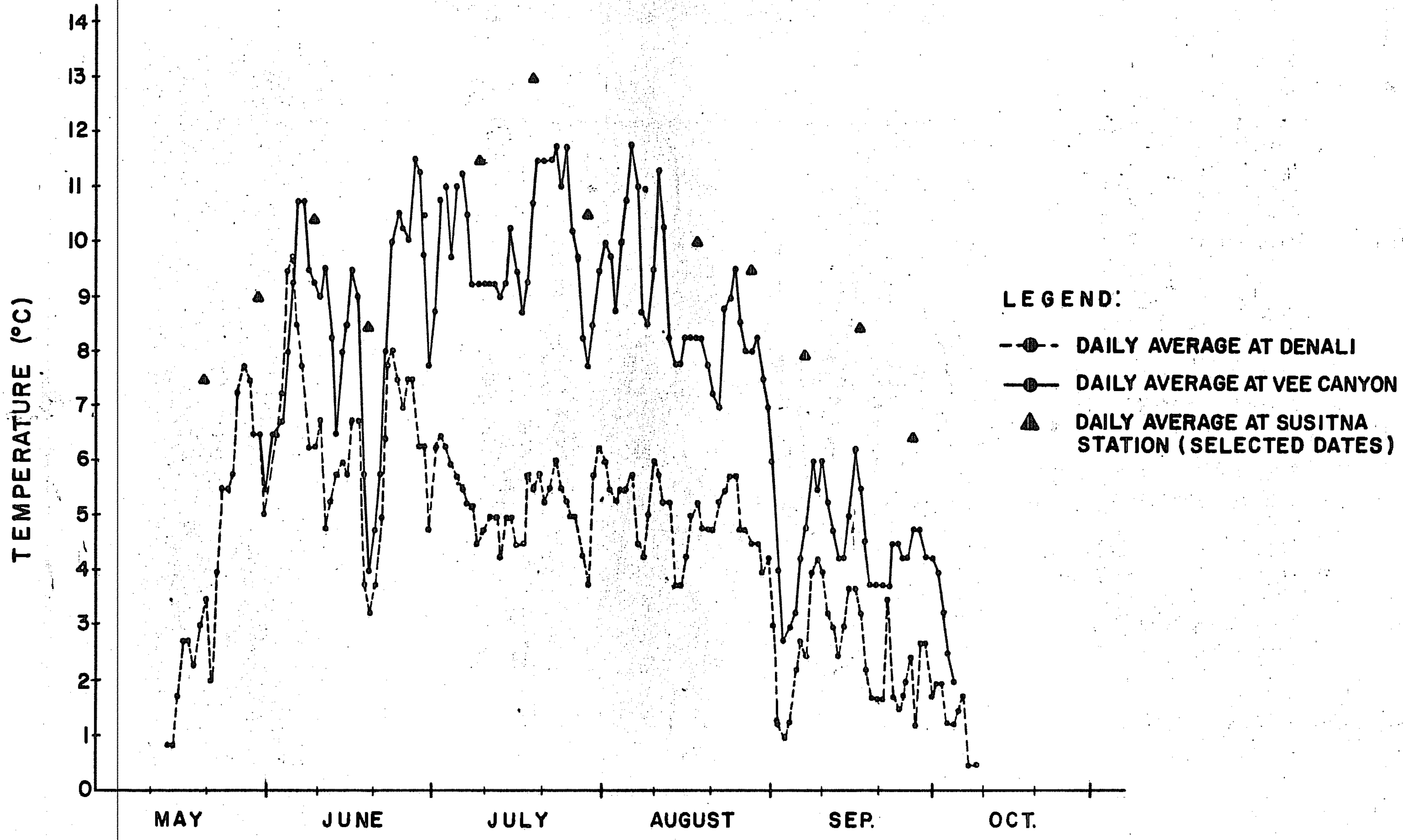
FIGURE E.2.2.68



OBSERVED WATER SURFACE ELEVATIONS AT MOUTH OF SLOUGH 9 FOR ASSOCIATED MAINSTEM DISCHARGES AT GOLD CREEK

DATA SOURCE : ADF & G 1982 a

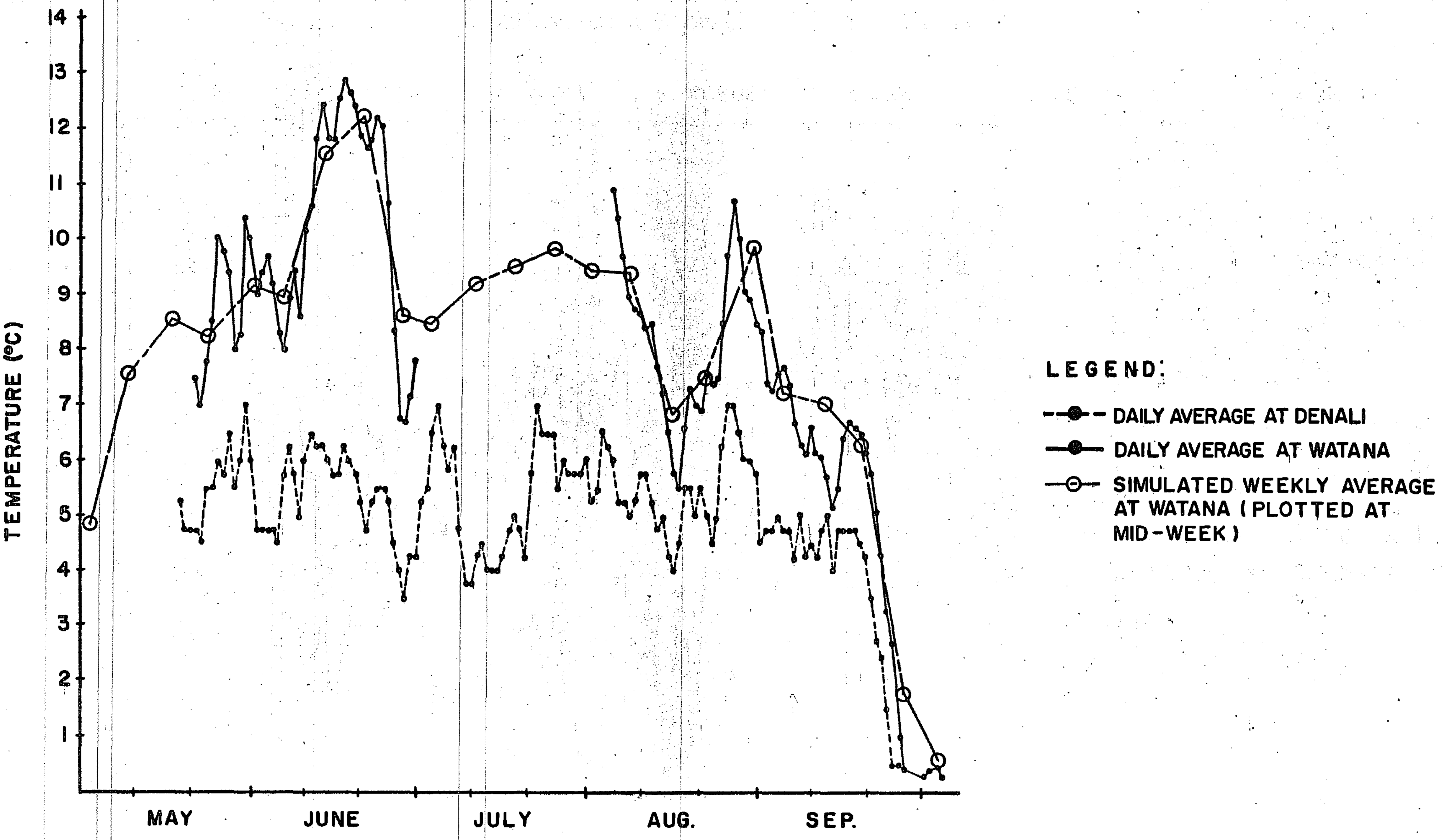
FIGURE E.2.2.69



SUSITNA RIVER WATER TEMPERATURES
SUMMER 1980

DATA SOURCE : USGS

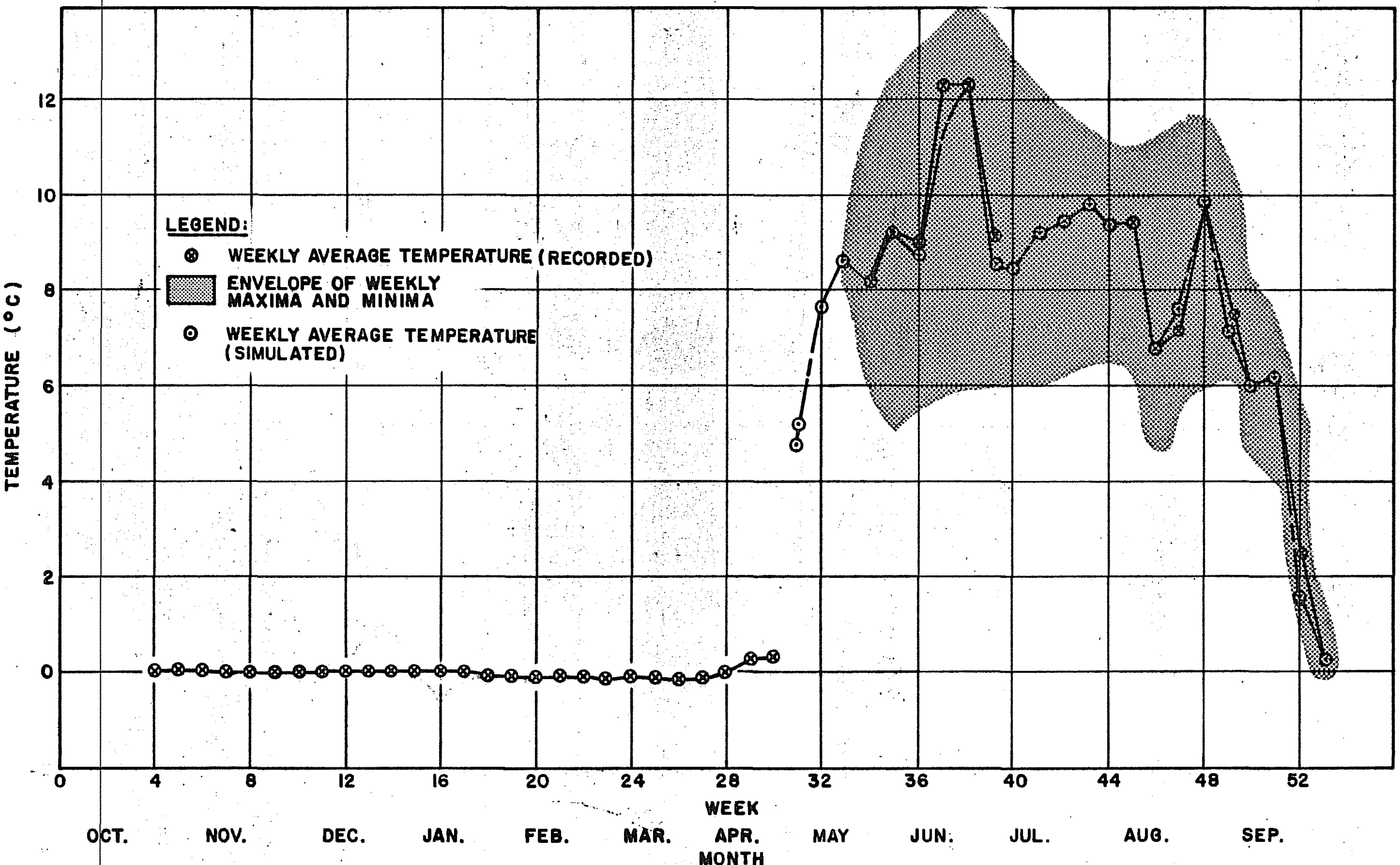
FIGURE E.2.2.70



SUSITNA RIVER WATER TEMPERATURES
SUMMER 1981

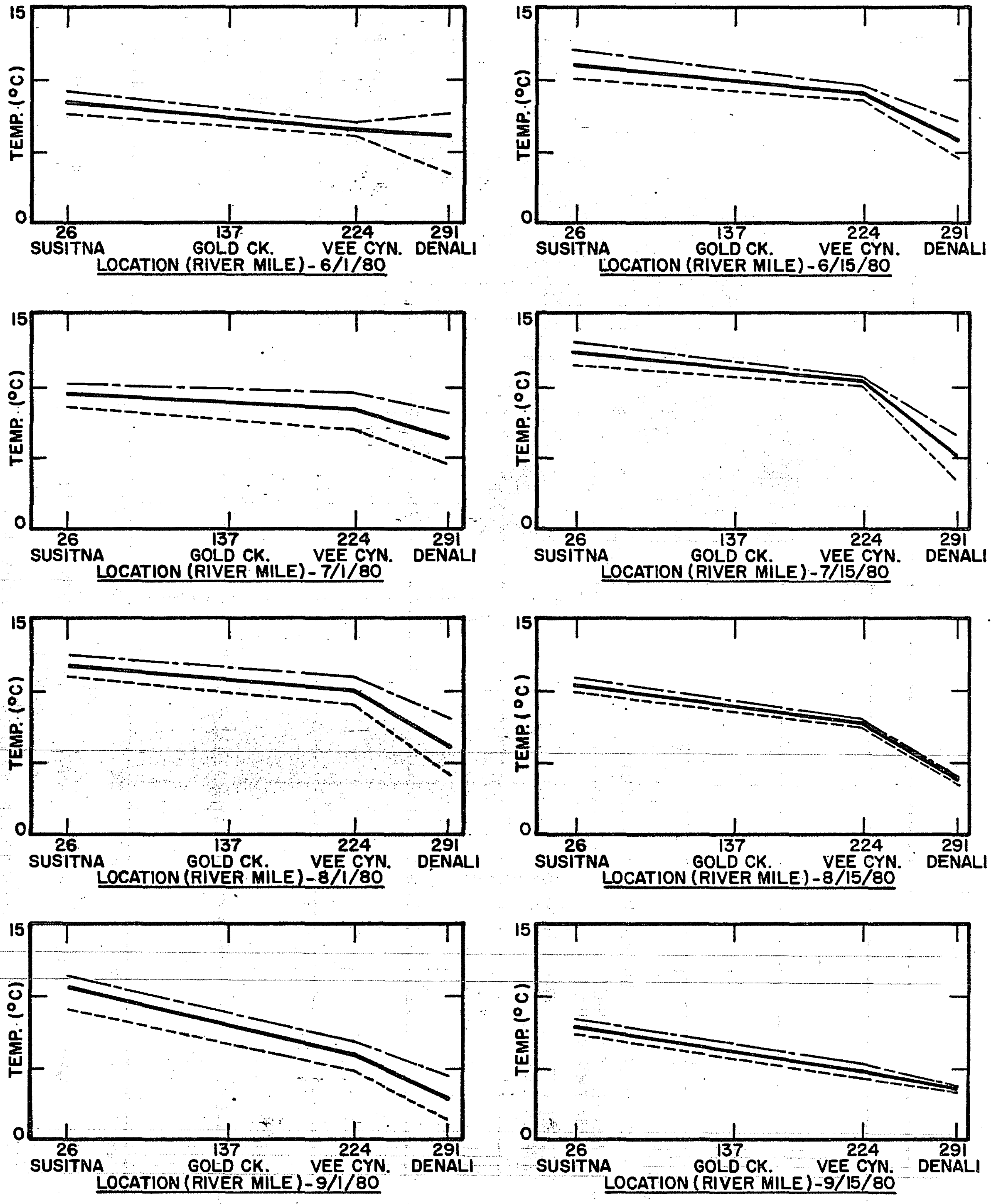
DATA SOURCE: USGS, R&M, APA 1984 G

FIGURE E.2.2.71



SUSITNA RIVER AT WATANA
WEEKLY AVERAGE WATER TEMPERATURE
1981 WATER YEAR

FIGURE E.2.2.72



LEGEND

- —·—·— MAXIMUM
- ━━━ MEAN
- - - - - MINIMUM

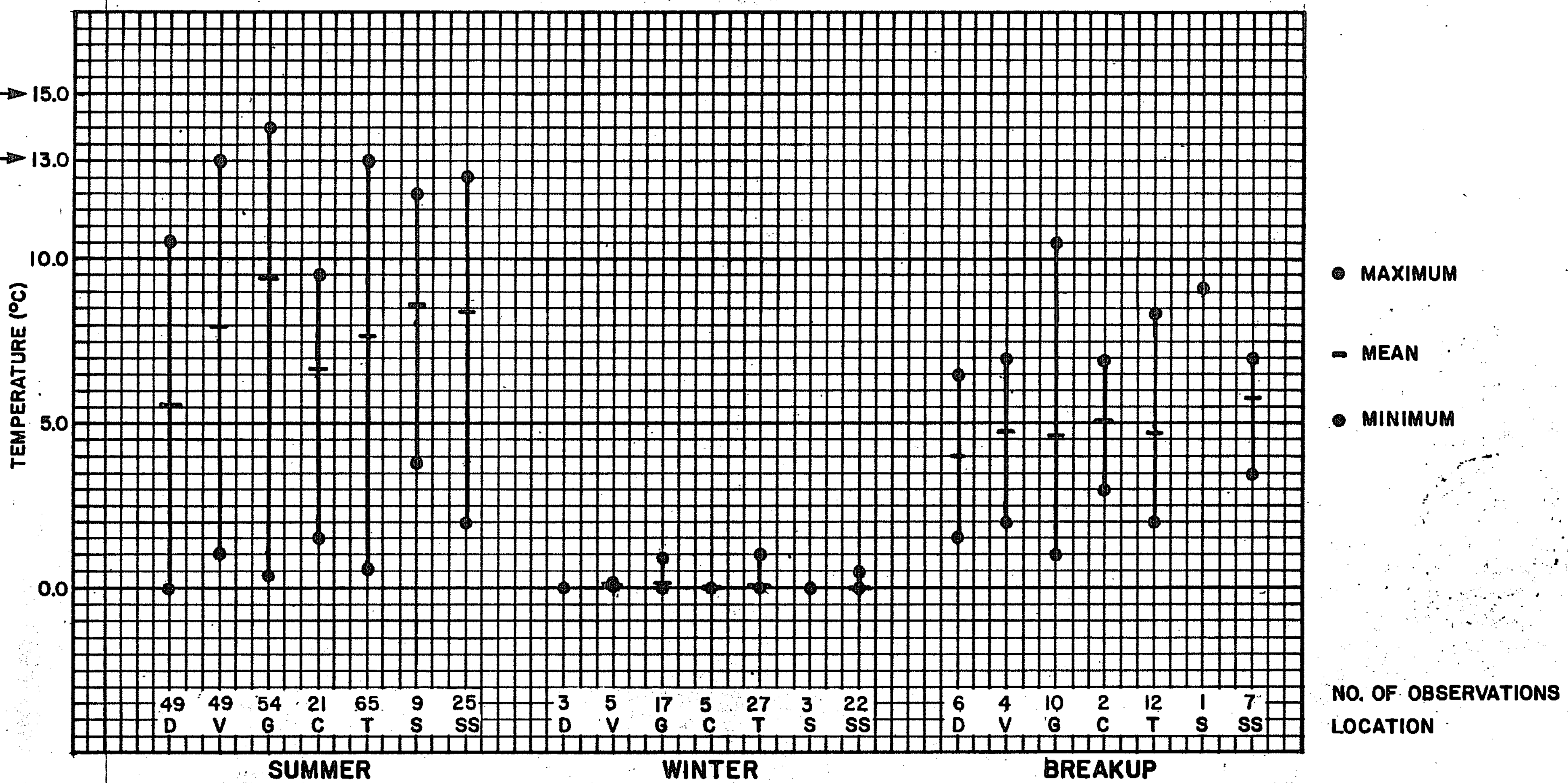
NOTES

1.) ALL TEMPERATURES WERE RECORDED BY THE USGS WITH SINGLE THERMOGRAPHS AT EACH SITE.
2.) GOLD CREEK'S TEMPERATURES WERE INFLUENCED BY TRIBUTARY INFLOW AT THE SITE AND THEREFORE WERE NOT INCLUDED.
3.) DAILY MEAN TEMPERATURES COMPUTED AS AVERAGE OF MINIMUM AND MAXIMUM FOR THE DAY.

SUSITNA RIVER - WATER TEMPERATURE GRADIENT

SOURCE: USGS

FIGURE E.2.2.73



D-DENALI V-VEE CANYON G-GOLD CREEK C-CHULITNA T-TALKEETNA S-SUNSHINE SS-SUSITNA STATION

NOTES:

I. A. CRITERIA: SHALL NOT EXCEED 20°C AT ANY TIME. THE FOLLOWING MAXIMUM TEMPERATURE SHALL NOT BE EXCEEDED WHERE APPLICABLE: MIGRATION ROUTES AND REARING AREAS--15°C, SPAWNING AREAS AND EGG AND FRY INCUBATION--13°C (ADEC, 1979).

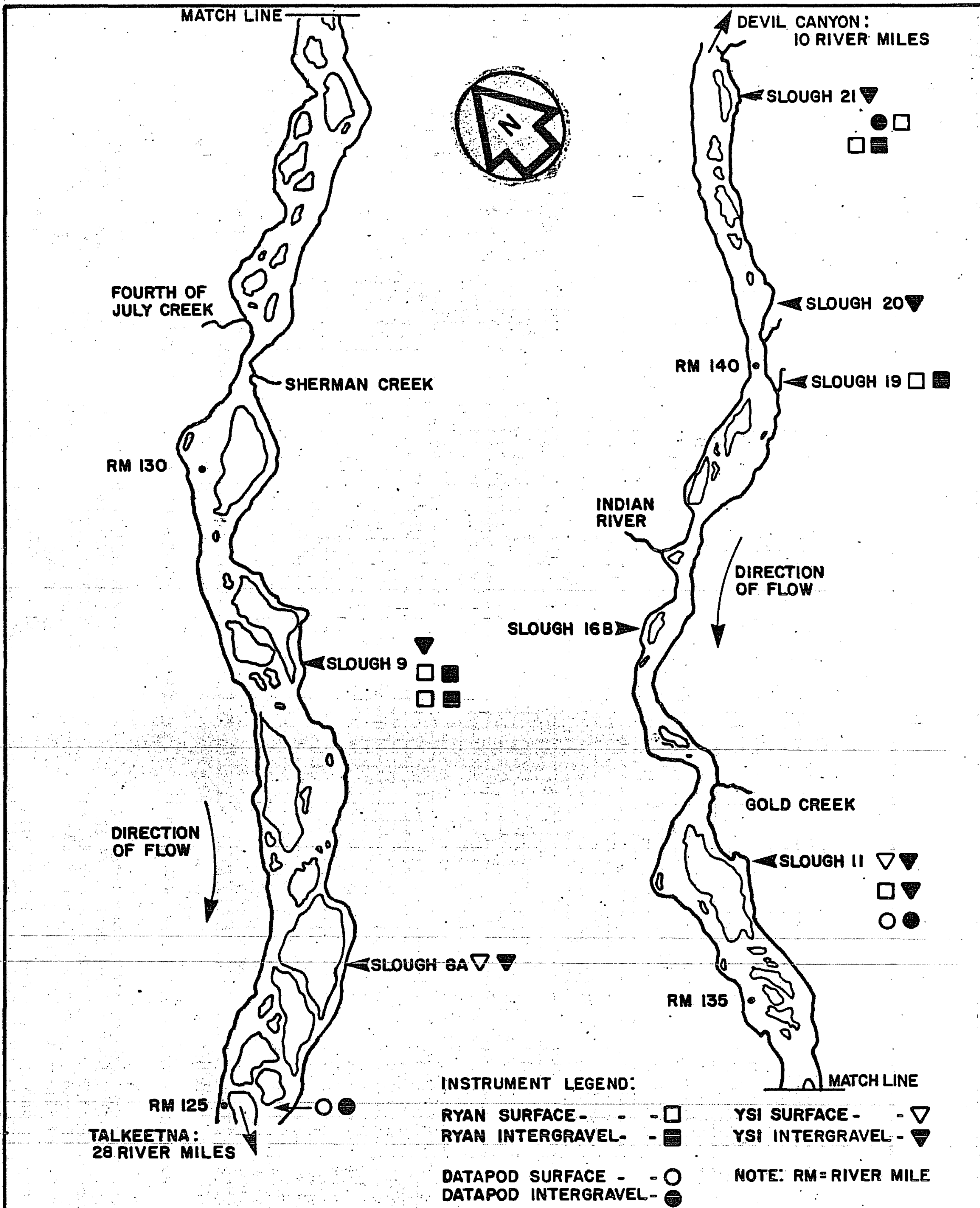
I. B. ESTABLISHED TO PROTECT SENSITIVE IMPORTANT FISH SPECIES, AND FOR THE SUCCESSFUL MIGRATION, SPAWNING, EGG-INCUBATION, FRY-REARING, AND OTHER REPRODUCTIVE FUNCTIONS OF IMPORTANT SPECIES.

2. MAXIMUM VALUES OF 12°C AT DENALI ON JUNE 4 AND 5, 1980; 15.0°C AT GOLD CREEK ON JULY 3 AND 4, 1979; AND 16.5°C AT SUSITNA STATION ON JULY 9, 1976 HAVE BEEN RECORDED BY USGS CONTINUOUS RECORDING EQUIPMENT, HOWEVER THESE WERE NOT INCLUDED IN THE ABOVE COMPILATION, ONLY DISCRETE OBSERVATIONS WERE UTILIZED SINCE CONTINUOUS RECORDERS ARE NOT PRESENT AT EACH STATION THROUGHOUT THE BASIN.

SOURCE: USGS

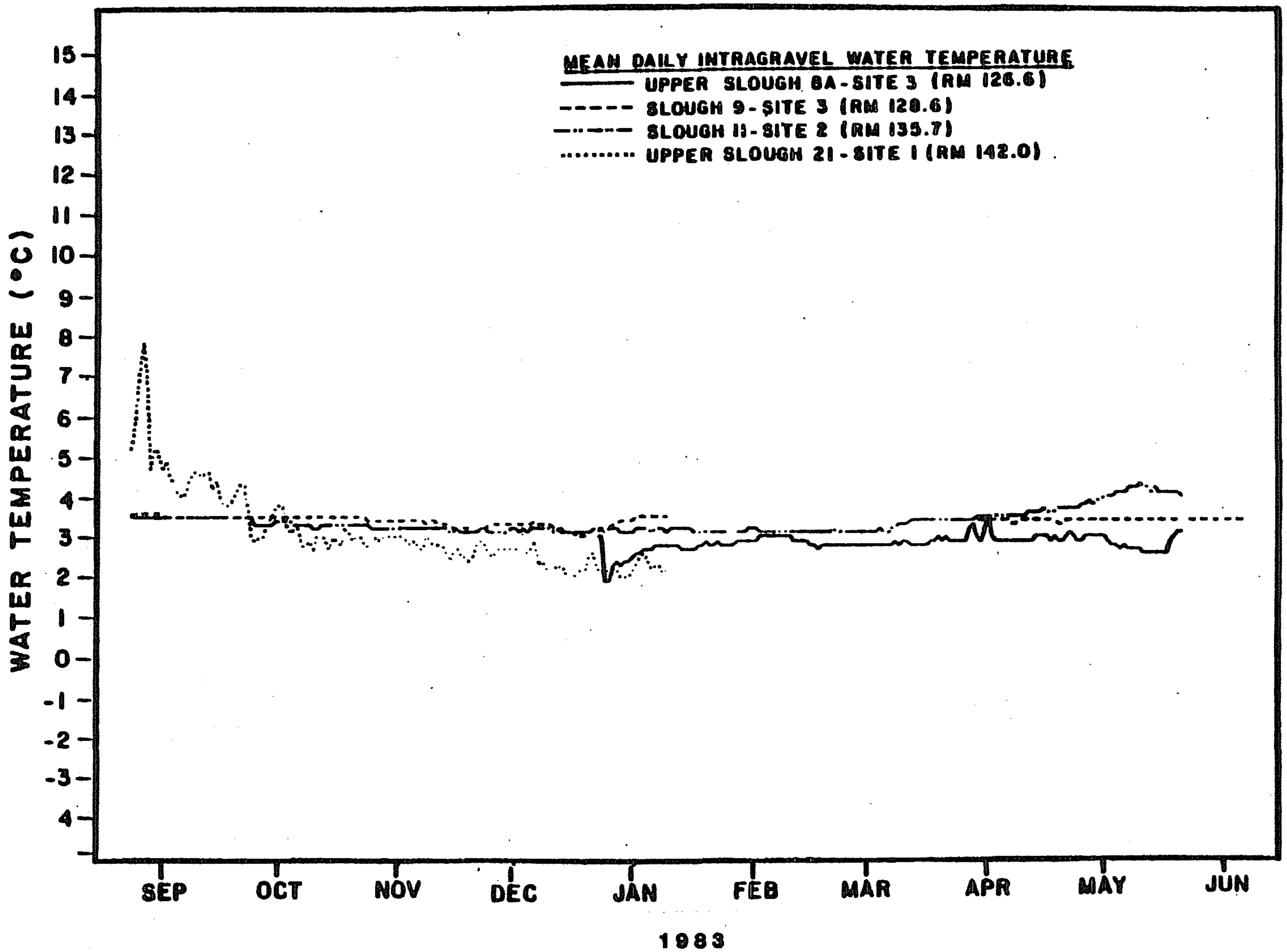
DATA SUMMARY - TEMPERATURE

FIGURE E.2.2.74



LOCATION MAP FOR 1982
MIDWINTER TEMPERATURE STUDY SITES

FIGURE E.2.2.75

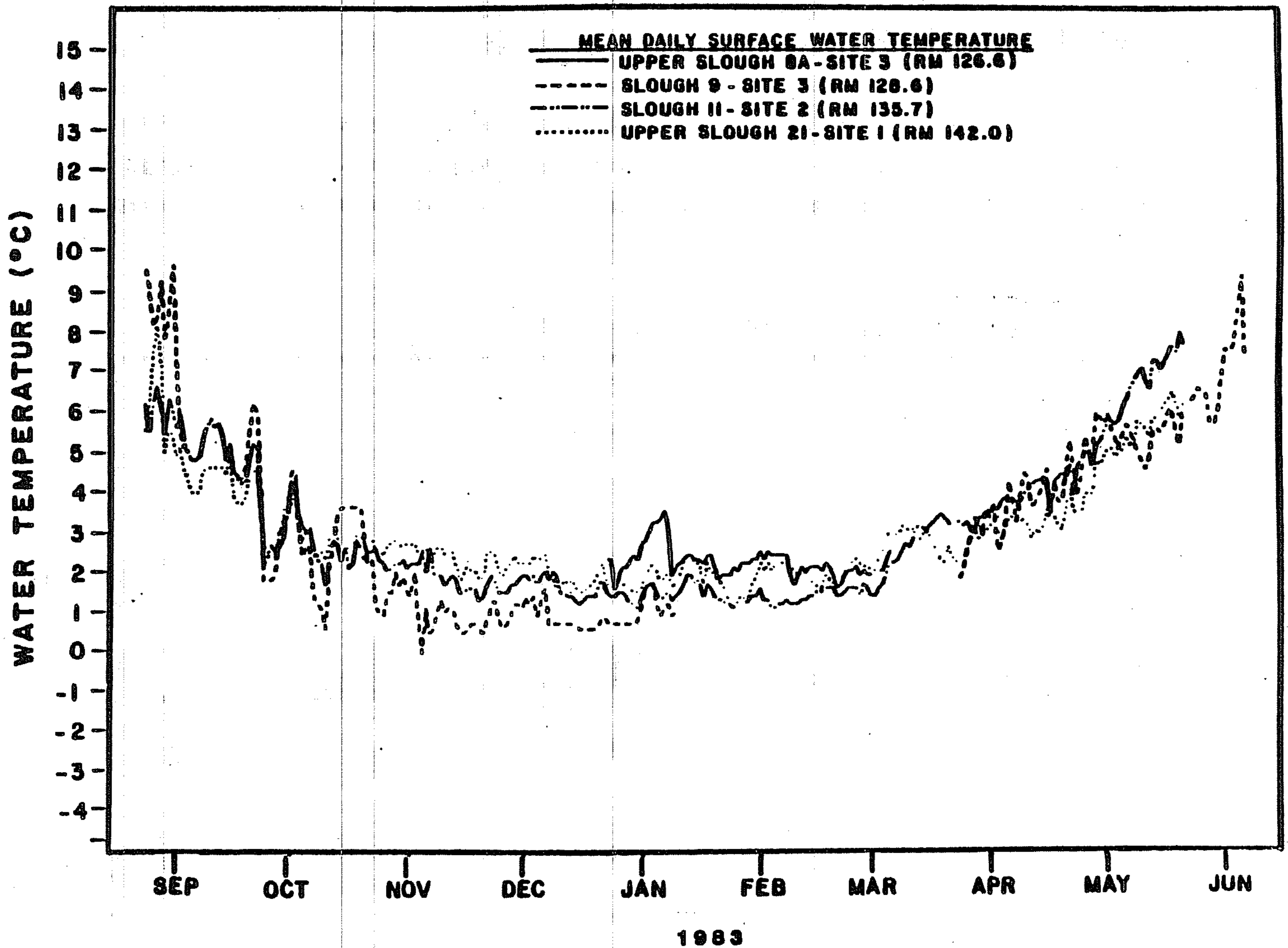


Mean daily intragravel water temperatures recorded at Upper Slough 8A - Site 3 (RM 126.6), Slough 9 - Site 3 (RM 128.6), Slough 11 - Site 2 (RM 135.7), and Upper Slough 21 - Site 1 (RM 142.0), during the 1983-84 winter season.

WINTER INTERGRAVEL WATER TEMPERATURES SIDE SLOUGH HABITATS

SOURCE: ADF & G 1984i

FIGURE E.2.2.76

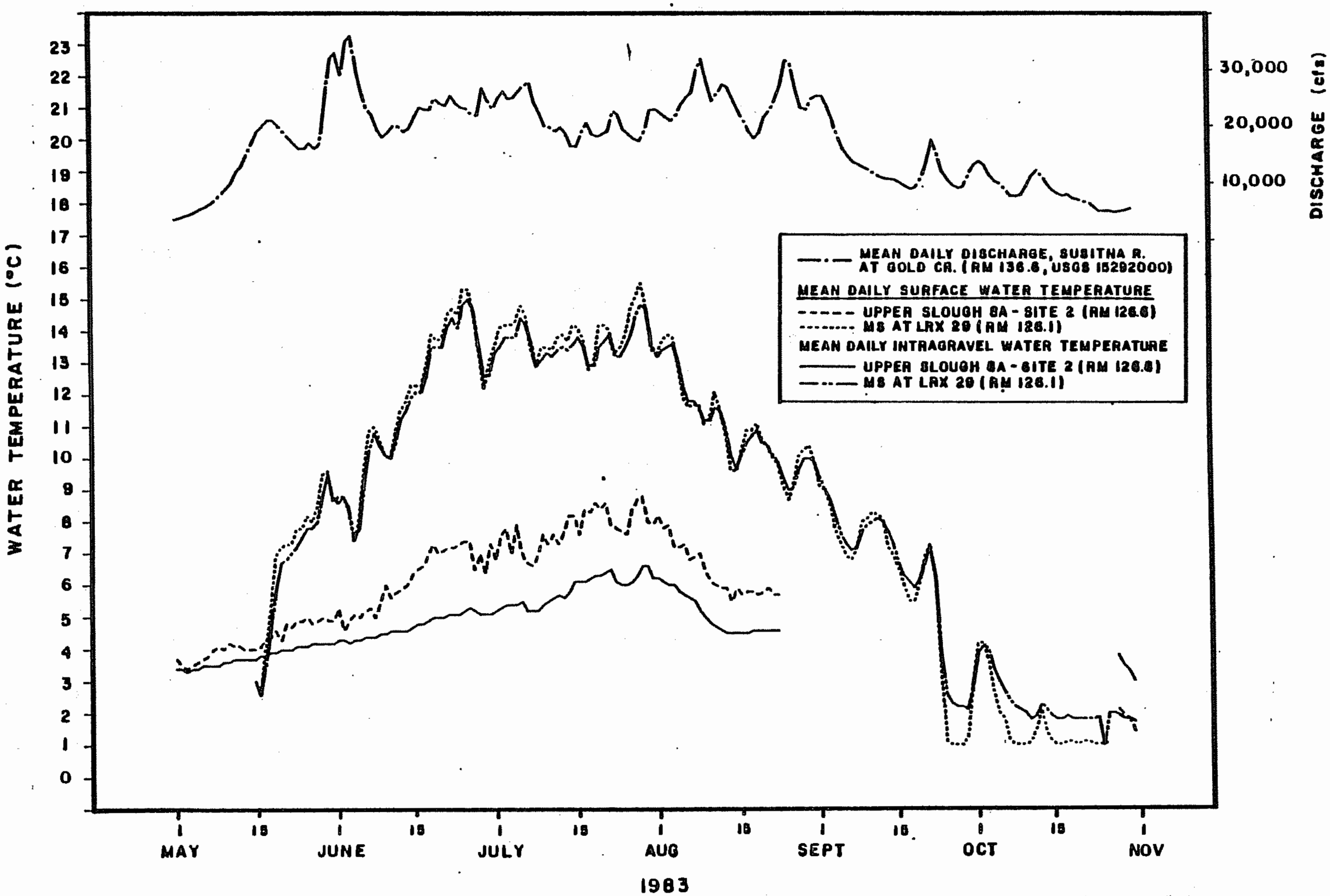


Mean daily surface water temperatures recorded at Upper Slough 8A - Site 3 (RM 126.6), Slough 9 - Site 3 (RM 128.6), Slough 11 - Site 2 (RM 135.7), and Upper Slough 21 - Site 1 (RM 142.0), during the 1983-84 winter season.

WINTER SURFACE WATER TEMPERATURES
SIDE SLOUGH HABITATS

SOURCE: ADF & G 1984l

FIGURE E.2.2.77

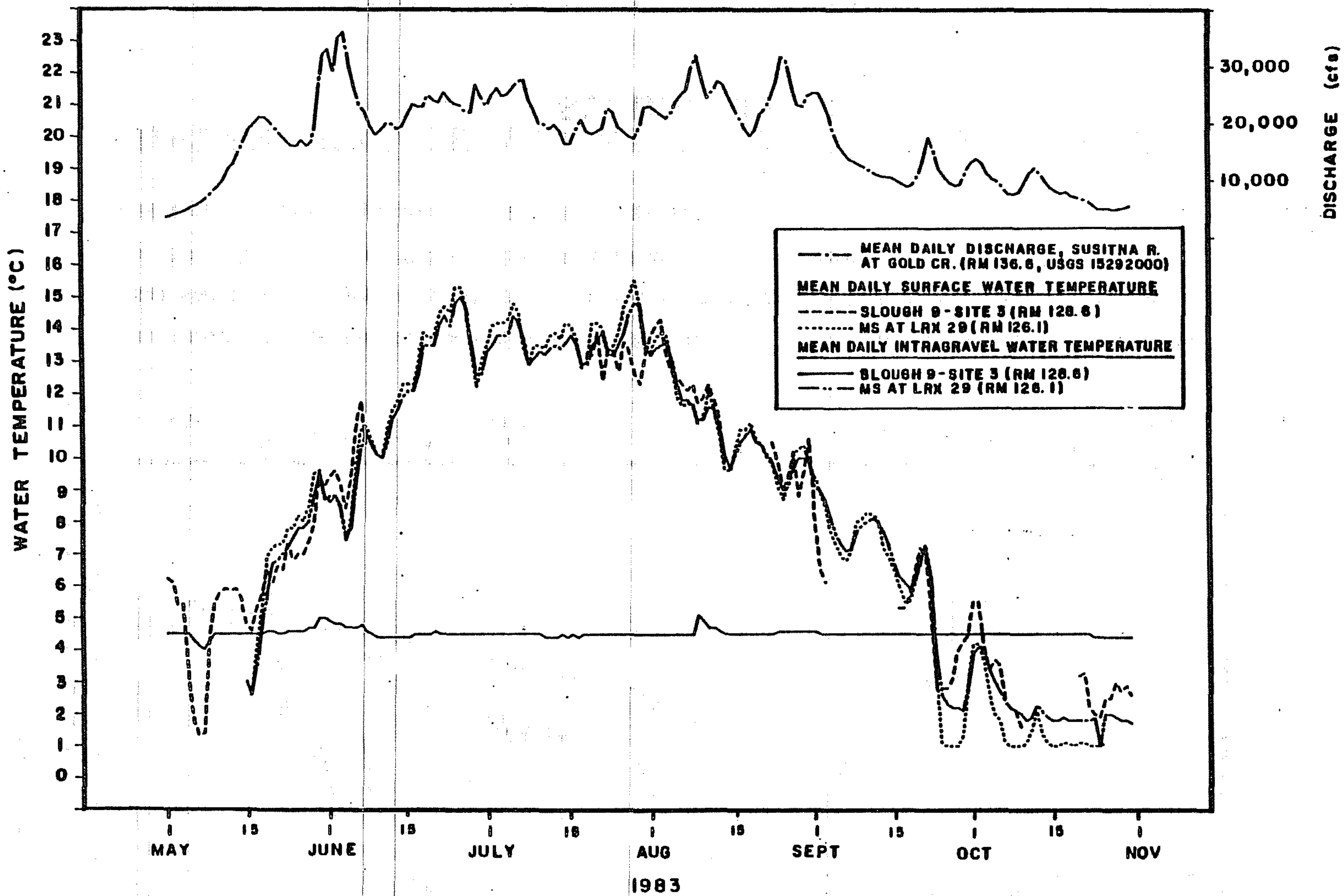


Mean daily intragravel and surface water temperature collected during the 1983 open water season at Upper Slough 8A - Site 2 (RM 126.6), Mainstem Susitna River at LRX 29 - Sites 1 and 2 (rm 126.1), and mean daily Susitna River discharge at Gold Creek (USGS gaging station 15292000).

SUMMER SURFACE AND INTERGRAVEL TEMPERATURES SLOUGH 8A

SOURCE: ADF&G 1984I

FIGURE E.2.2.78

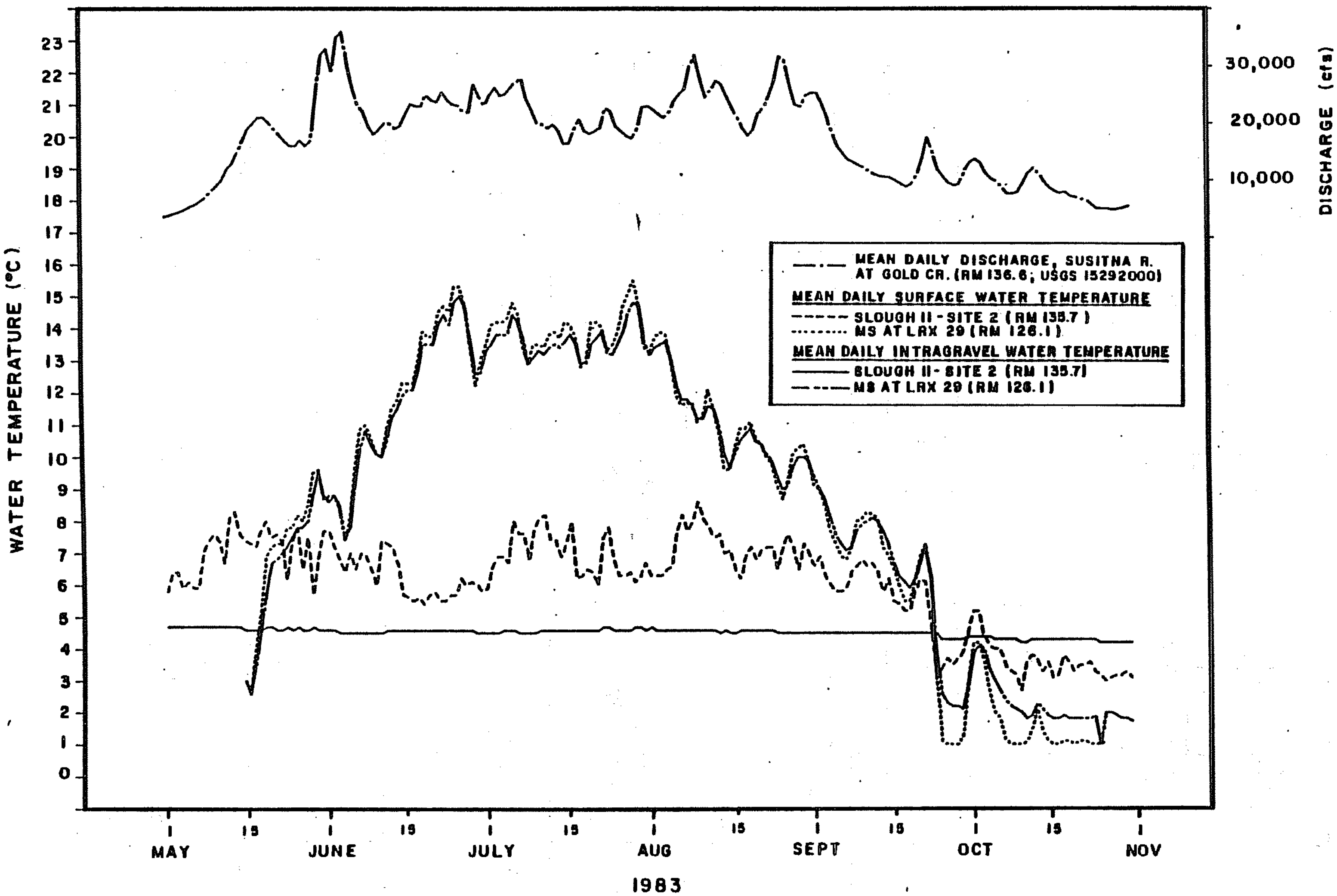


Mean daily intragravel and surface water temperature collected during the 1983 open water season at Slough 9 - Site 3 (RM 128.6), LRX 29 - Site 1 (RM 126.1), and mean daily Susitna River discharge at Gold Creek (USGS gaging station 15292000).

SUMMER SURFACE AND INTERGRAVEL TEMPERATURES SLOUGH 9

SOURCE: ADF & G 1984b

FIGURE E.2.2.79

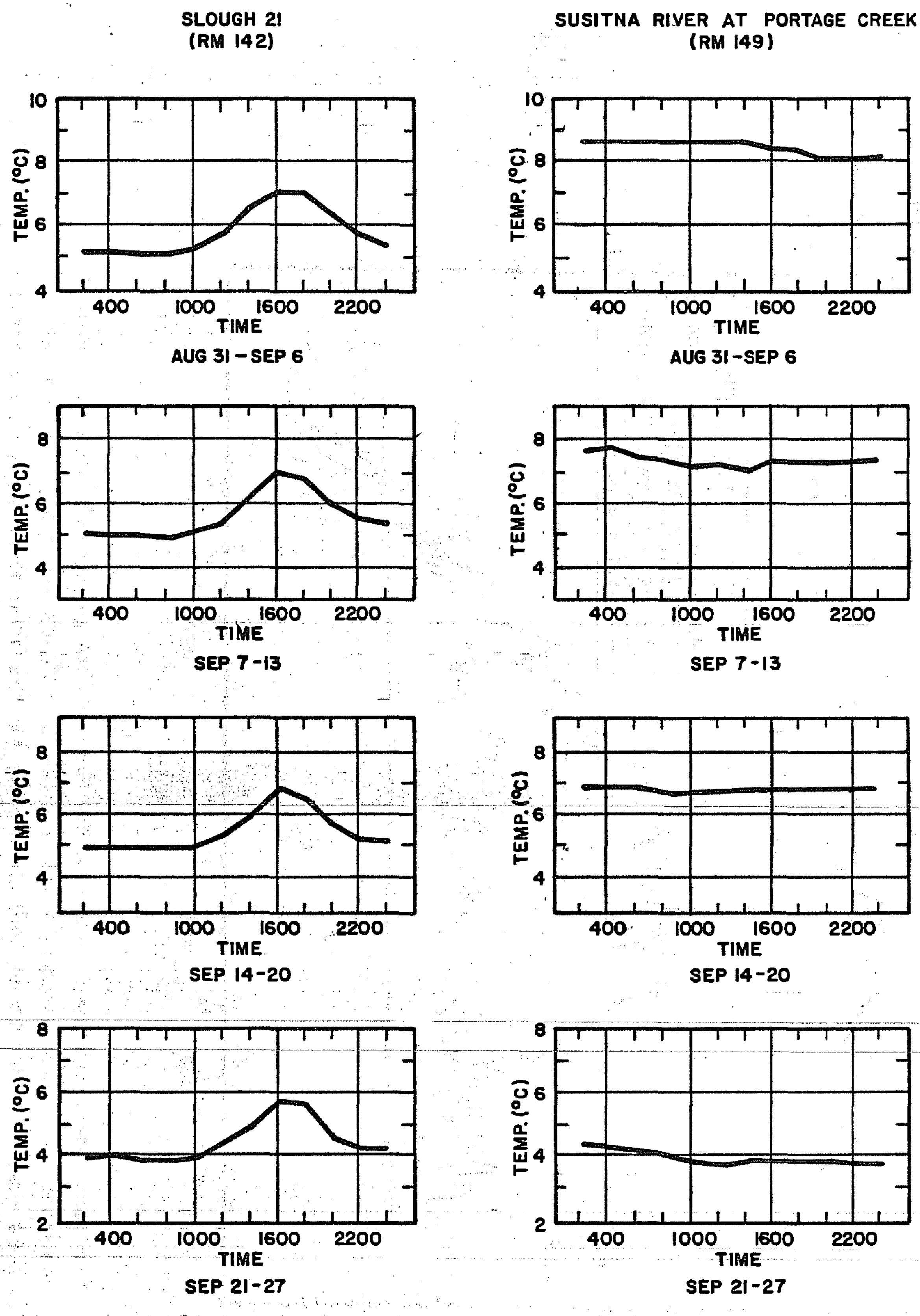


Mean daily intragravel and surface water temperature collected during the 1983 open water season at Slough 11 - Site 2 (RM 135.7), Mainstem Susitna River at LRX 29 - Site 1 (RM 126.1), and mean daily Susitna River discharge at Gold Creek (USGS gaging station 15292000).

SUMMER SURFACE AND INTERGRAVEL TEMPERATURES SLOUGH 11

SOURCE: ADF&G 1984b

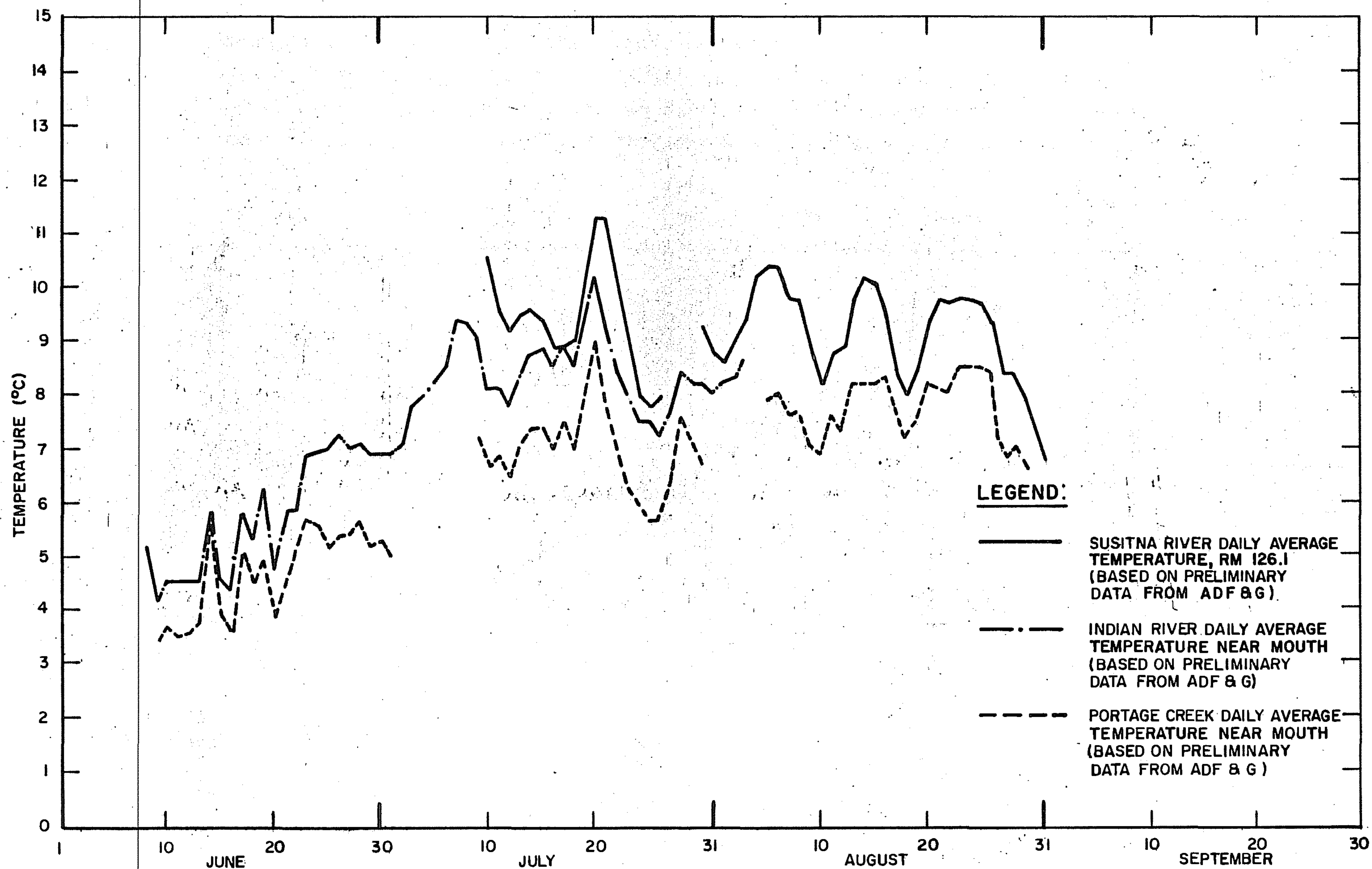
FIGURE E.2.2.80



COMPARISON OF WEEKLY DIEL SURFACE WATER TEMPERATURE VARIATIONS IN SLOUGH 21 AND THE MAINSTREAM SUSITNA RIVER AT PORTAGE CREEK 1981

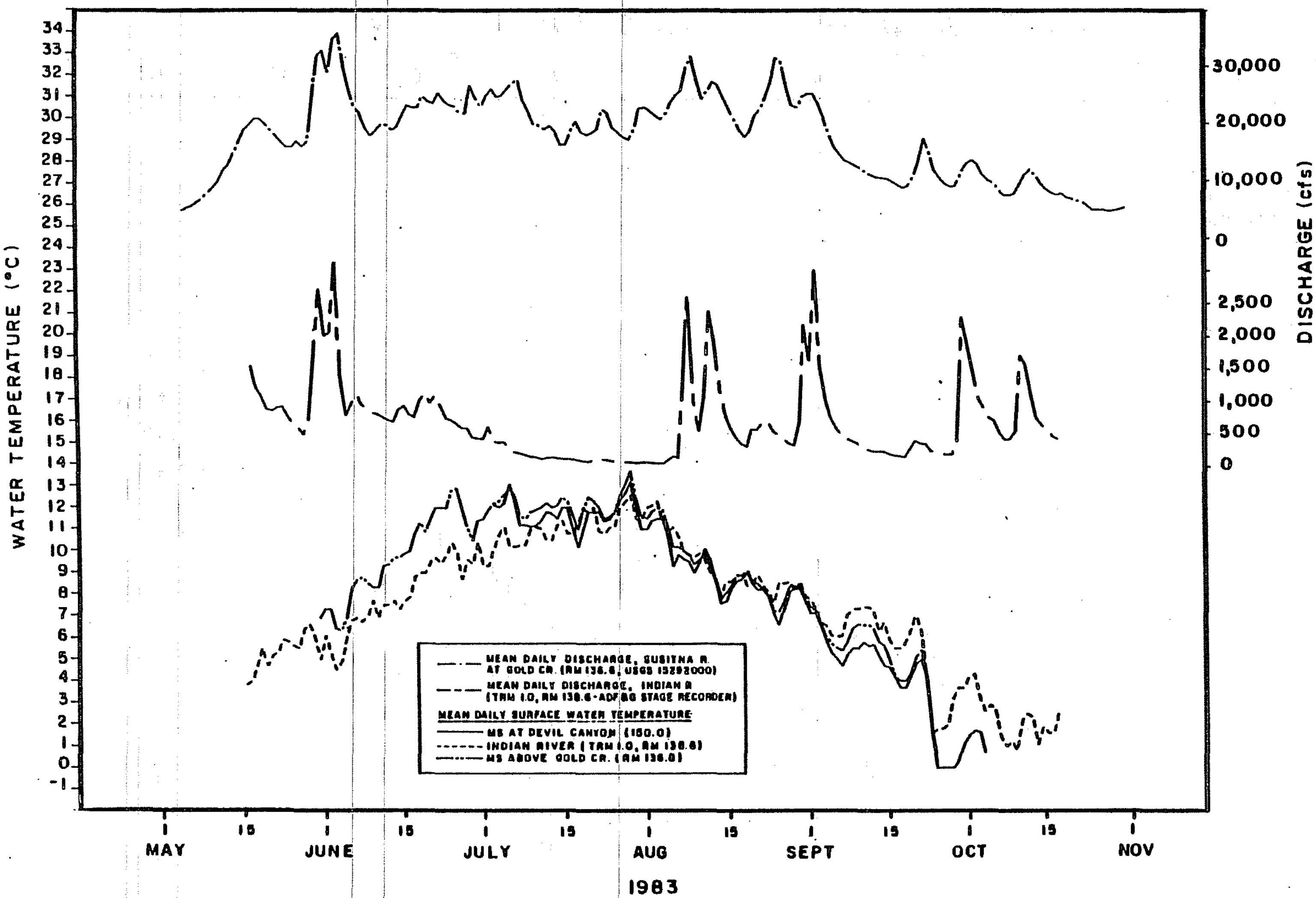
SOURCE: ADAPTED FROM ADF & G 1981

FIGURE E.2.2.81



SUSITNA RIVER, PORTAGE CREEK AND INDIAN RIVER WATER TEMPERATURES SUMMER 1982

FIGURE E.2.2.82

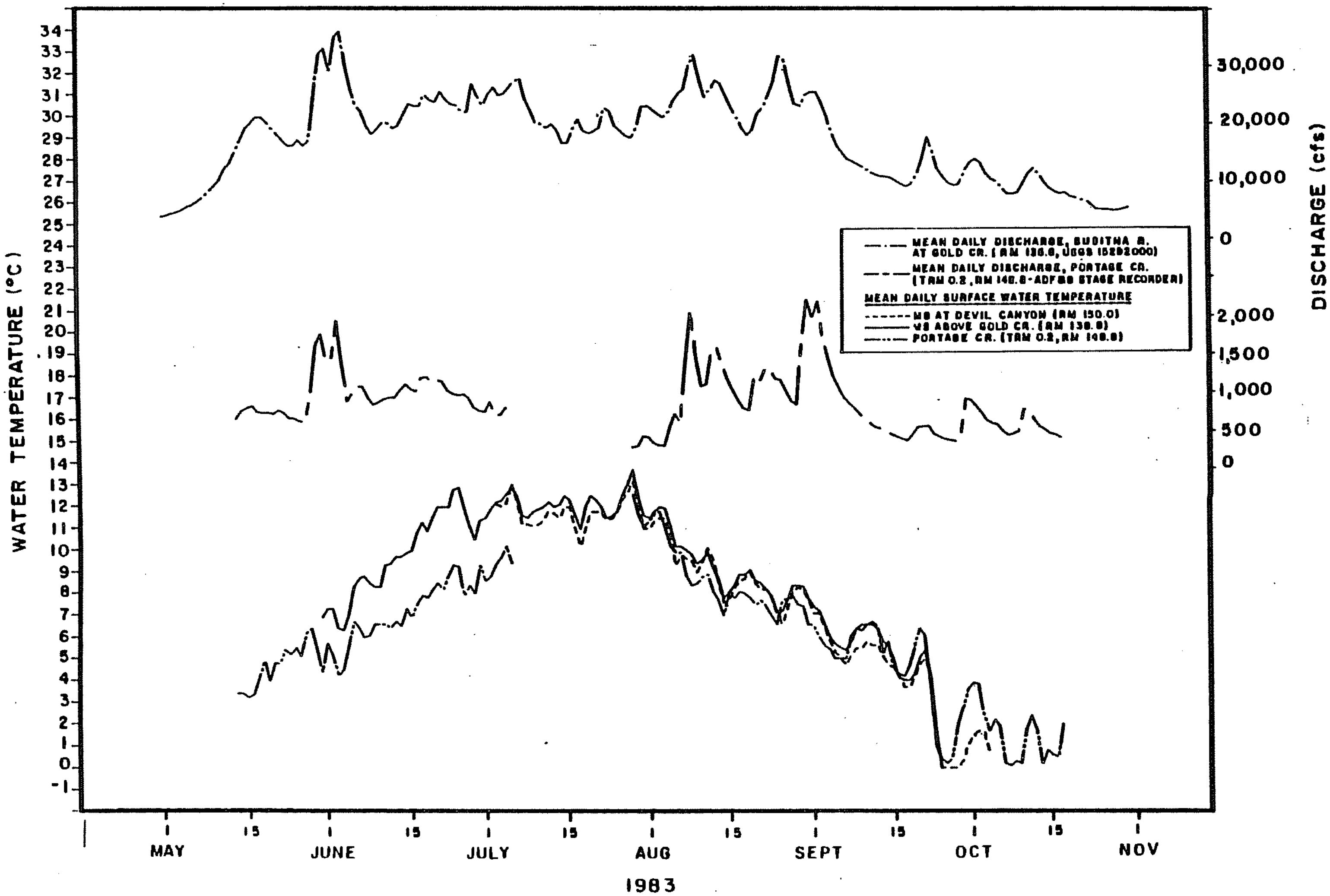


Mean daily surface water temperatures collected during the 1983 open water season at Mainstem Susitna River at Devil Canyon (RM 150.1), Mainstem Susitna River above Gold Creek (RM136.8), at Indian River - Site 2 (RM 138.6, TRM 1.0), and mean daily Susitna River discharge at Gold Creek (USGS gaging station 15292000).

DAILY WATER TEMPERATURES OF SUSITNA RIVER MAINSTEM AND INDIAN RIVER

SOURCE: ADF & G 1984 b

FIGURE E.2.2.83

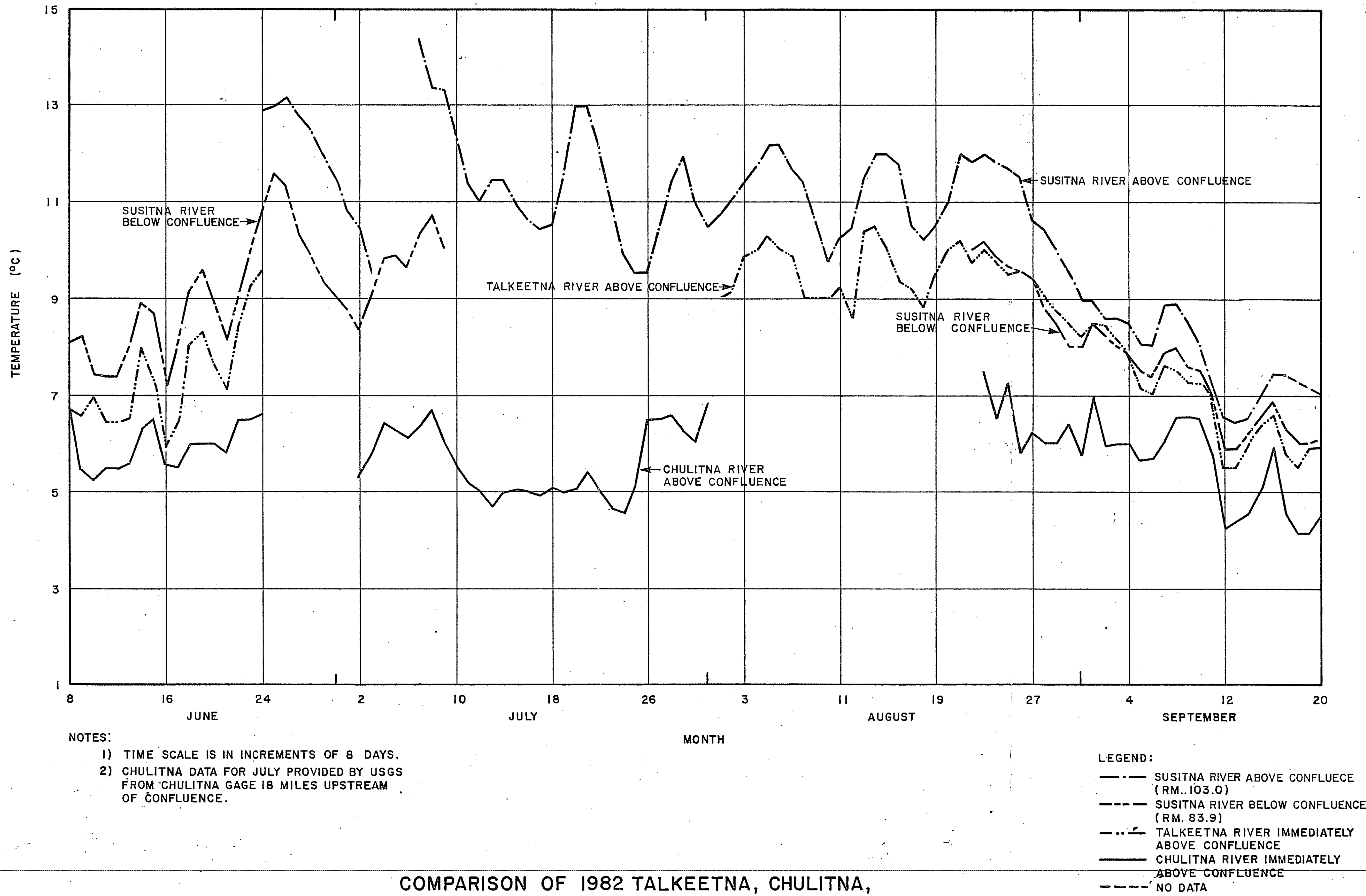


Mean daily surface water temperatures collected during the 1983 open water season at Mainstem Susitna River at Devil Canyon (RM 150.0), Mainstem Susitna River above Gold Creek (RM 136.8), at Portage Creek - Site 2 (RM 148.8, TRM 0.2), and mean daily Susitna River discharge at Gold Creek (USGS gaging station 152920000).

DAILY TEMPERATURES OF MAINSTEM SUSITNA RIVER AND PORTAGE CREEK

SOURCE: ADF & G 1984b

FIGURE E.2.2.84



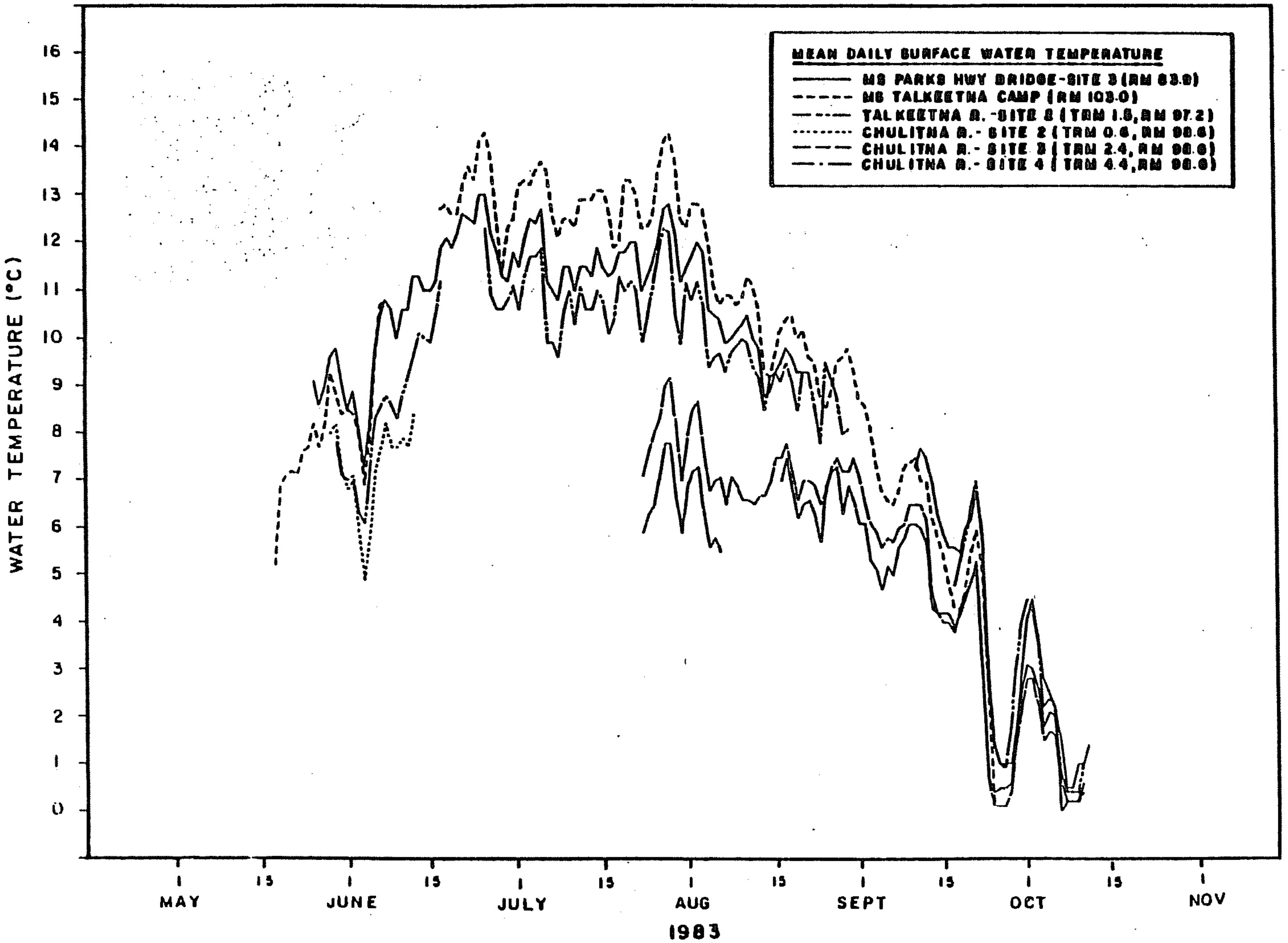
NOTES:

1) TIME SCALE IS IN INCREMENTS OF 8 DAYS.
2) CHULITNA DATA FOR JULY PROVIDED BY USGS FROM CHULITNA GAGE 18 MILES UPSTREAM OF CONFLUENCE.

COMPARISON OF 1982 TALKEETNA, CHULITNA, AND SUSITNA RIVER WATER TEMPERATURES

SOURCE: ADF & G 1982a

FIGURE E.2.2.85

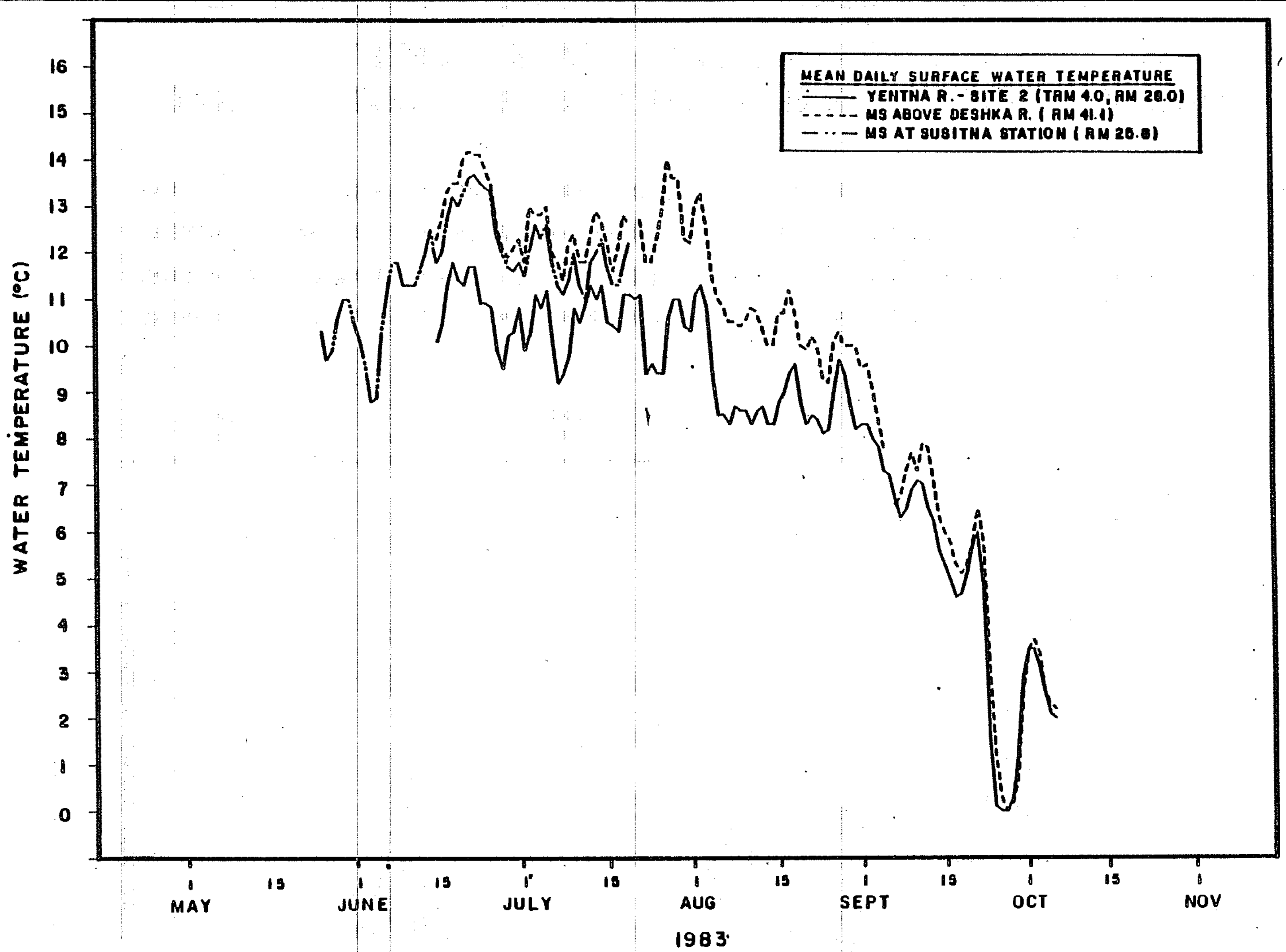


Mean daily surface water temperatures collected during the 1983 open water season at Mainstem Susitna River at Parks Highway Bridge - Site 3 (RM 83.9), Mainstem Susitna River at Talkeetna Fishwheel Camp (RM 103.0), Talkeetna River - Site 2 (RM 97.2, TRM 1.5), and the Chulitna River - Site 2 (RM98.6, TRM 0.6), Site 3 (RM 98.6, TRM 2.4), Site 4 (RM 98.6, TRM 4.4).

DAILY TEMPERATURES OF MAINSTEM SUSITNA RIVER, CHULITNA RIVER AND TALKEETNA RIVER

SOURCE: ADF & G 1984b

FIGURE E.2.2.86

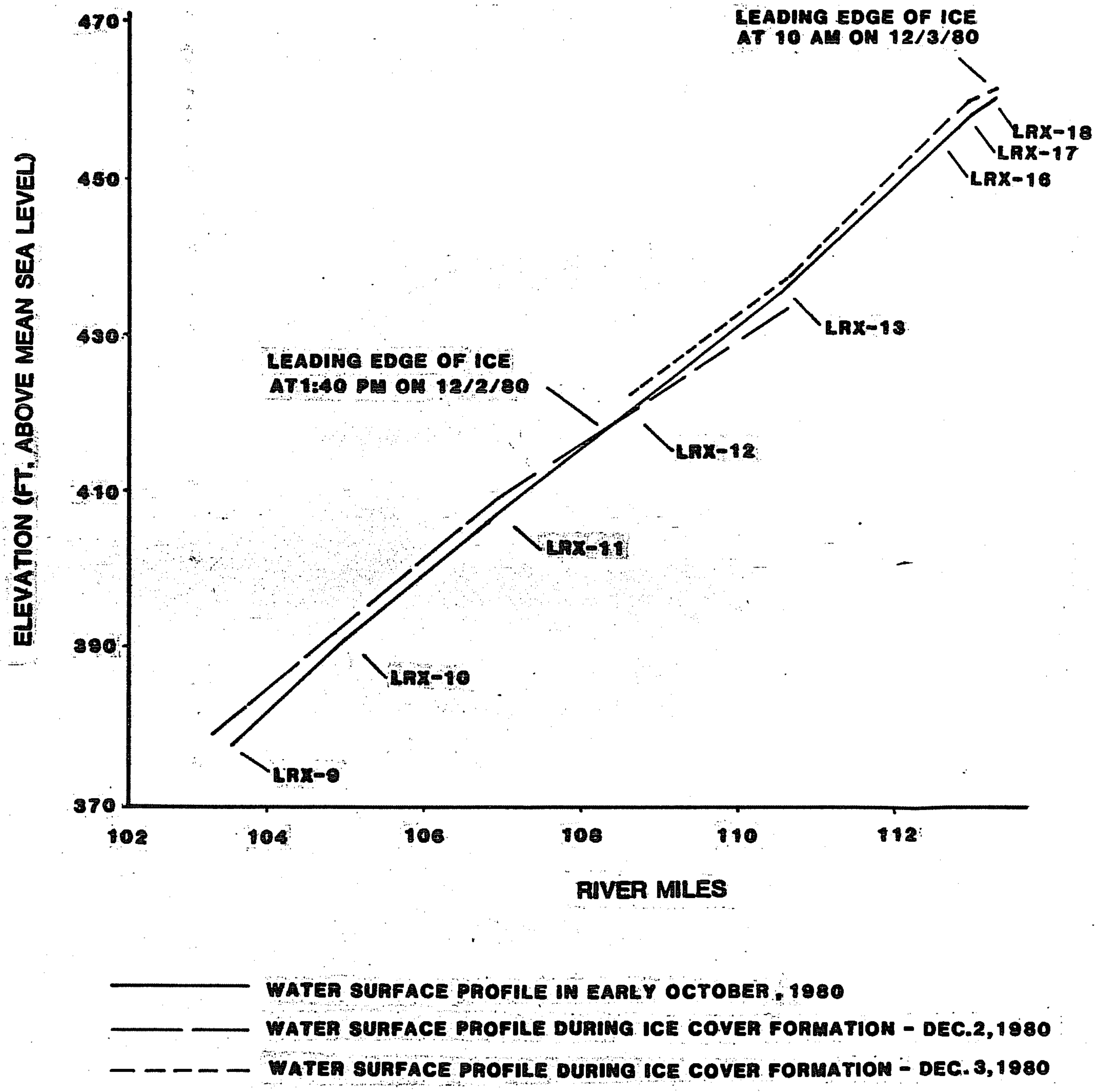


Mean daily surface water temperatures collected during the 1983 open water season at the Yentna River - Site 2 (RM 28.0,TRM 4.0), Mainstem Susitna River above the Deshka River (RM 41.1), and Mainstem Susitna River at Susitna Station (RM 25.8).

TEMPERATURE OF MAINSTEM SUSITNA RIVER AND YENTNA RIVER

SOURCE: 1984 b

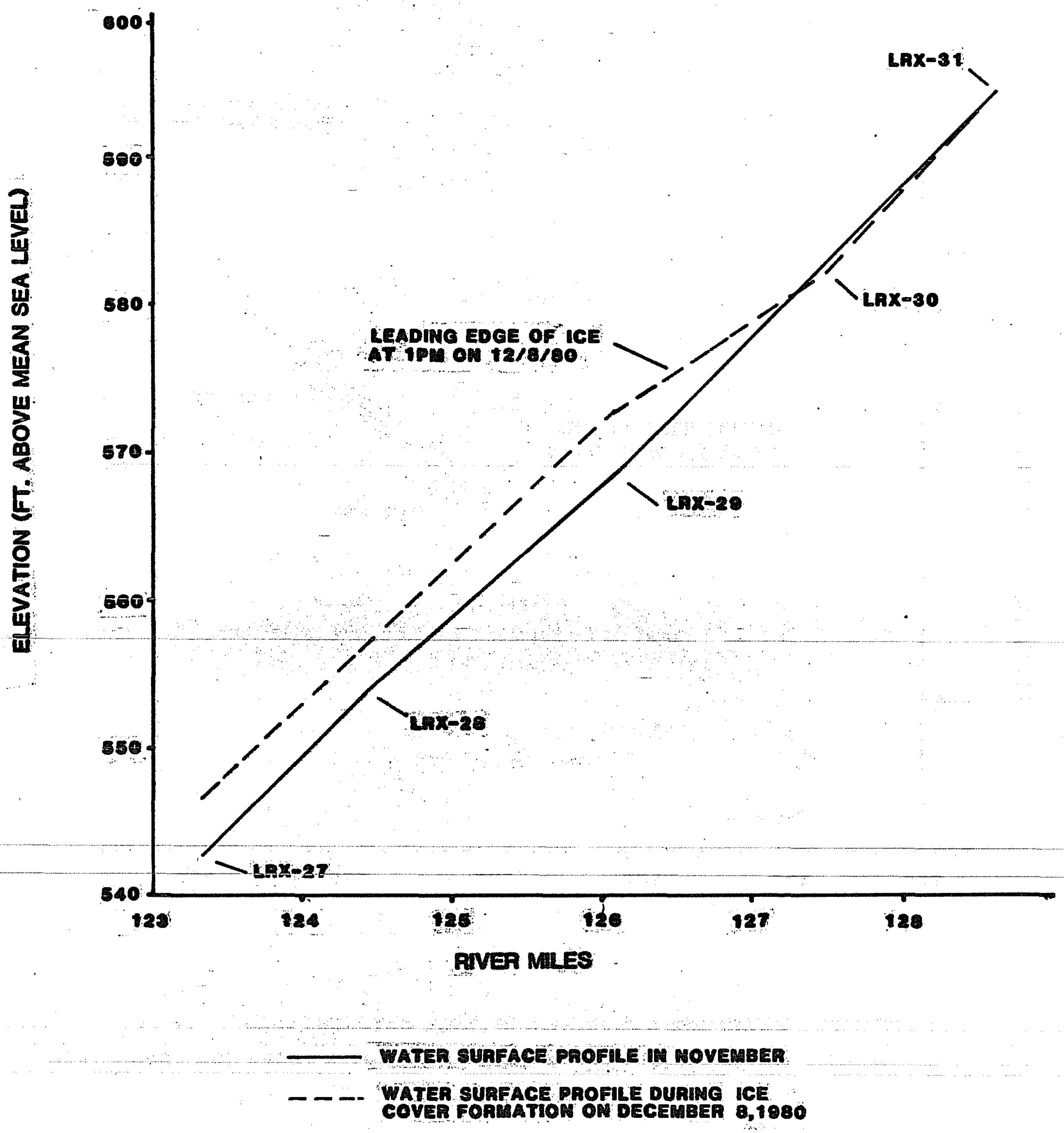
FIGURE E.2.2.87



WATER SURFACE PROFILES ON SUSITNA RIVER AT CHASE

SOURCE: R & M 1981 6

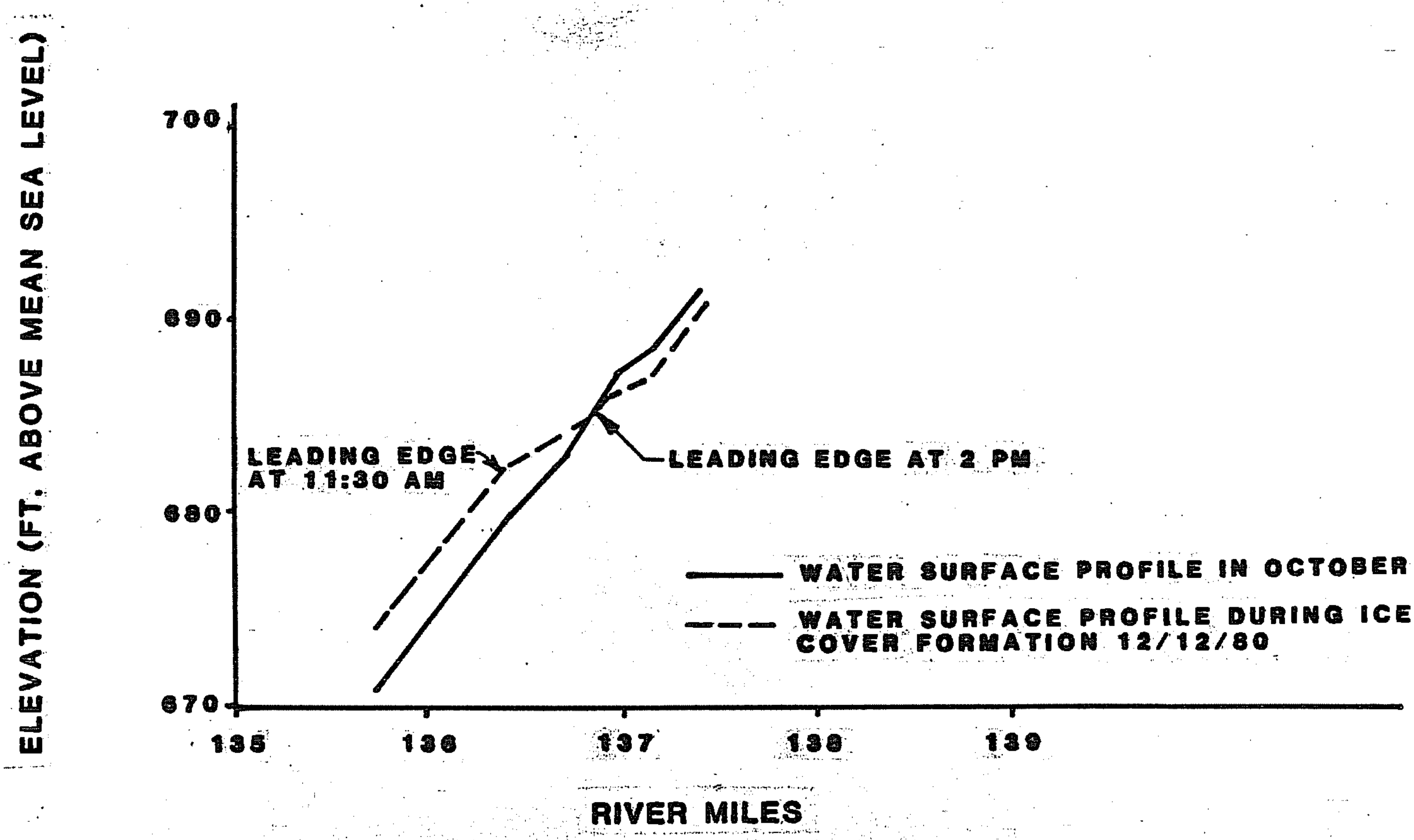
FIGURE E.2.2.88
(PAGE 1 OF 3)



WATER SURFACE PROFILES ON THE SUSITNA RIVER NEAR LRX-29

SOURCE: R&M 1981 e

FIGURE E.2.2.88
(PAGE 2 OF 3)



WATER SURFACE ELEVATION

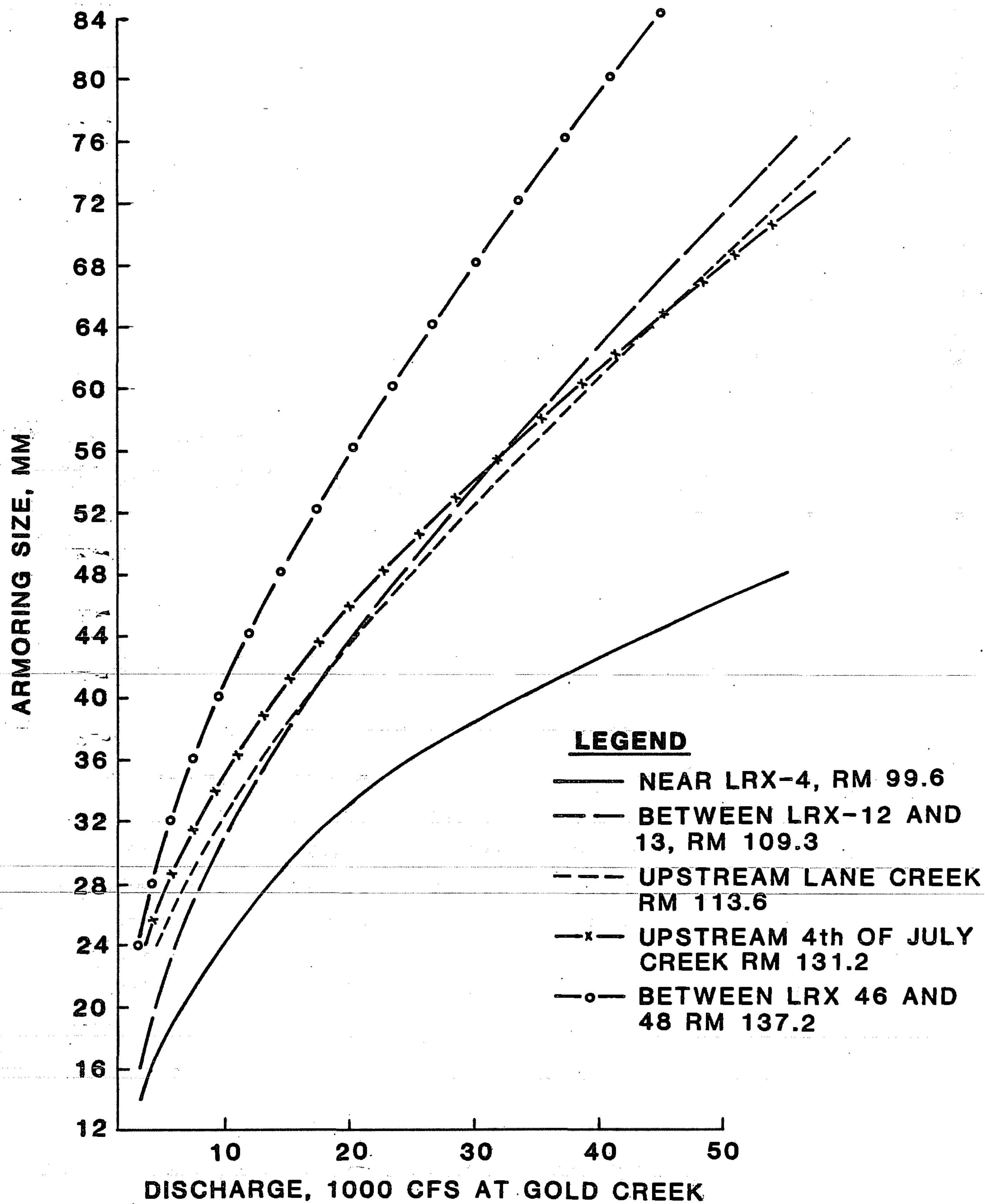
Cross Section	River Mile	October	Dec. 12	(Time)
LRX-43	135.72	670.90	674.32	(2:PM)
LRX-44	136.40	679.92	682.57	(11:20AM)
LRX-45	136.68	683.25	684.86	(11:45AM) (685.67 1:40 PM)
LRX-46	136.96	687.17	686.31	(12:20PM)
LRX-47	137.15	688.47	687.05	(12:35PM)
LRX-48	137.41	691.70	690.63	(1:05PM)

WATER SURFACE PROFILES ON THE SUSITNA RIVER

NEAR GOLD CREEK

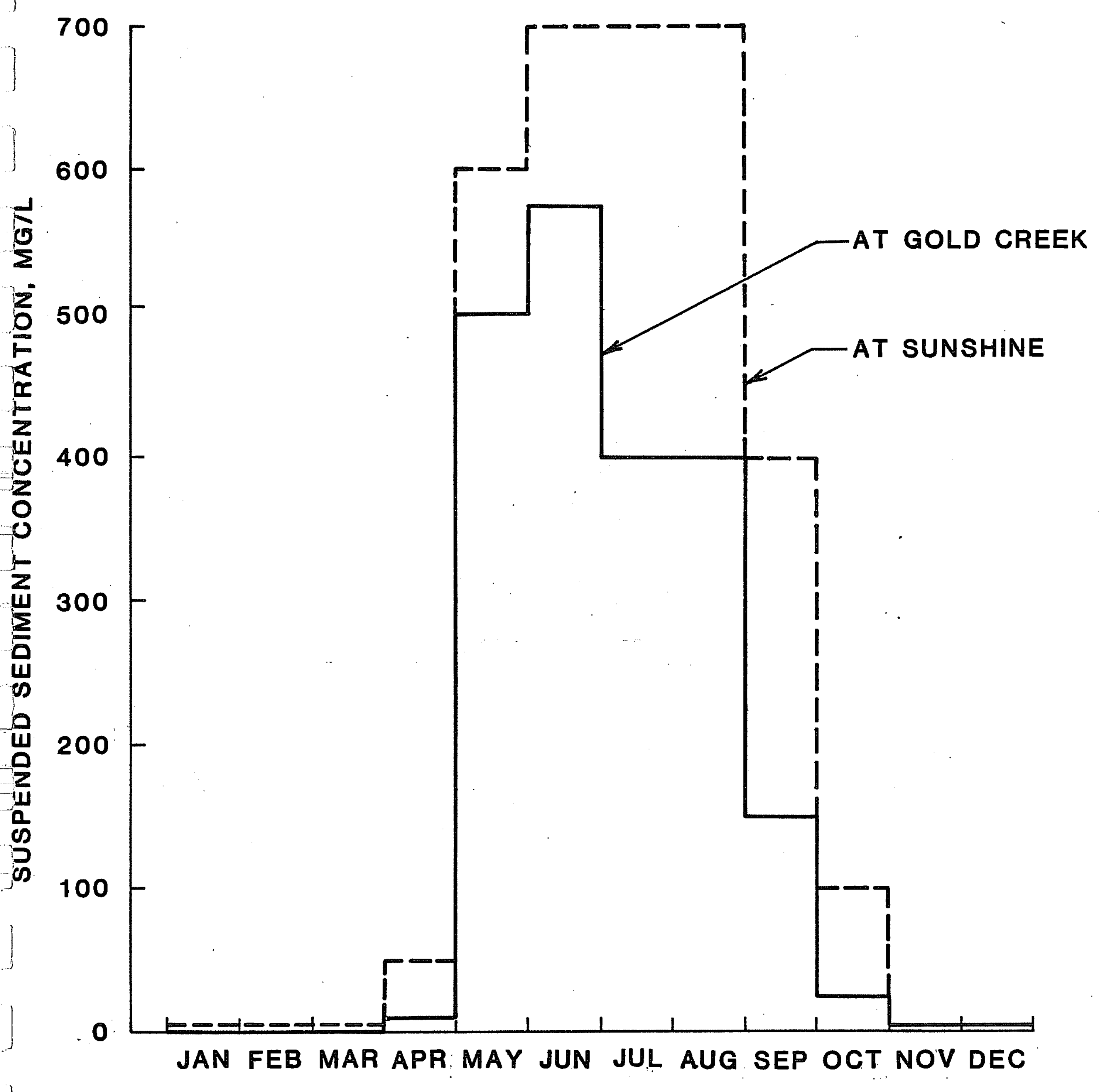
SOURCE: R&M 1981 B

FIGURE E.2.2.88
(PAGE 3 OF 3)



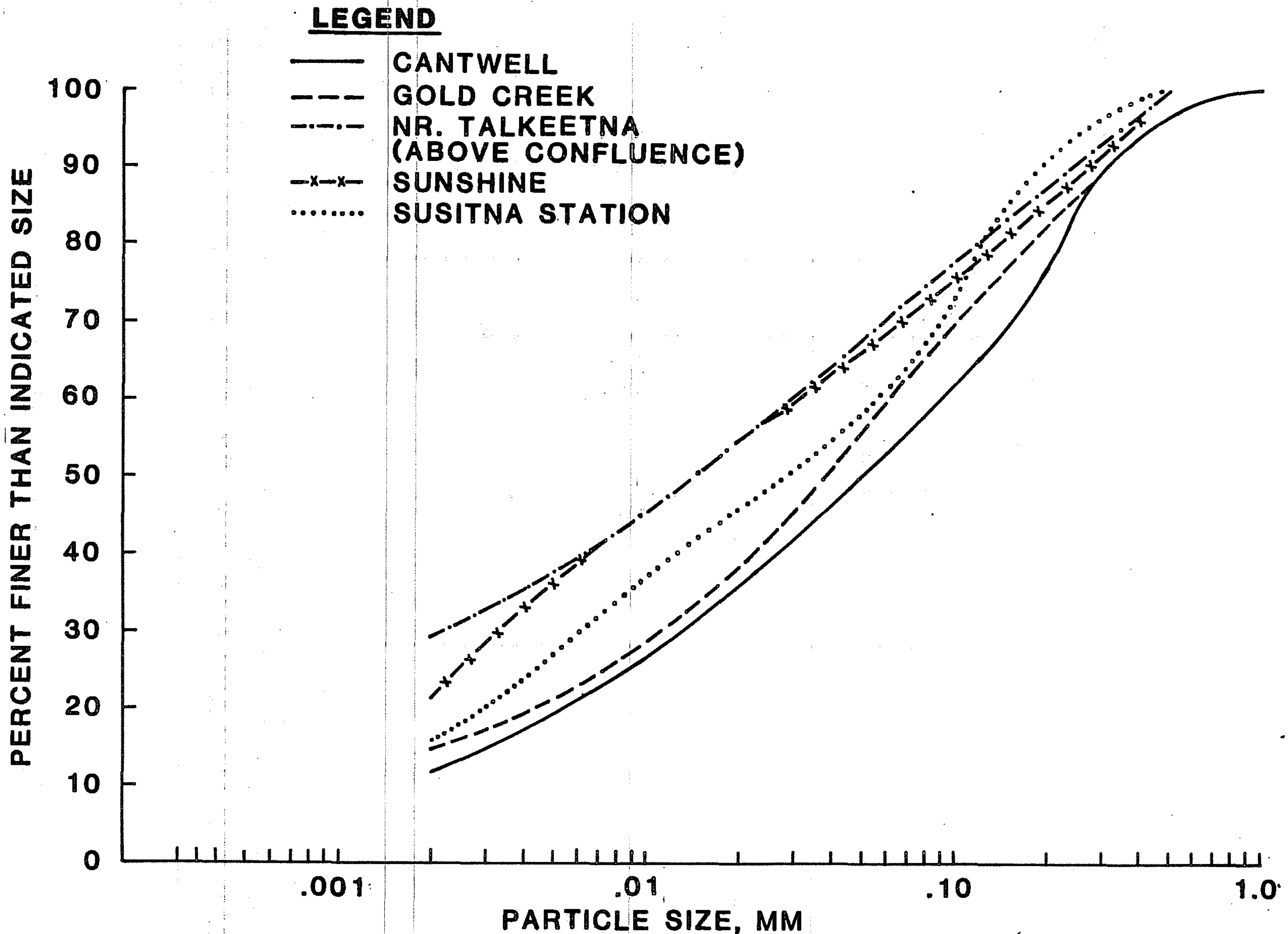
RELATIONSHIP BETWEEN ARMORING SIZE AND RIVER DISCHARGE

FIGURE E.2.2.89



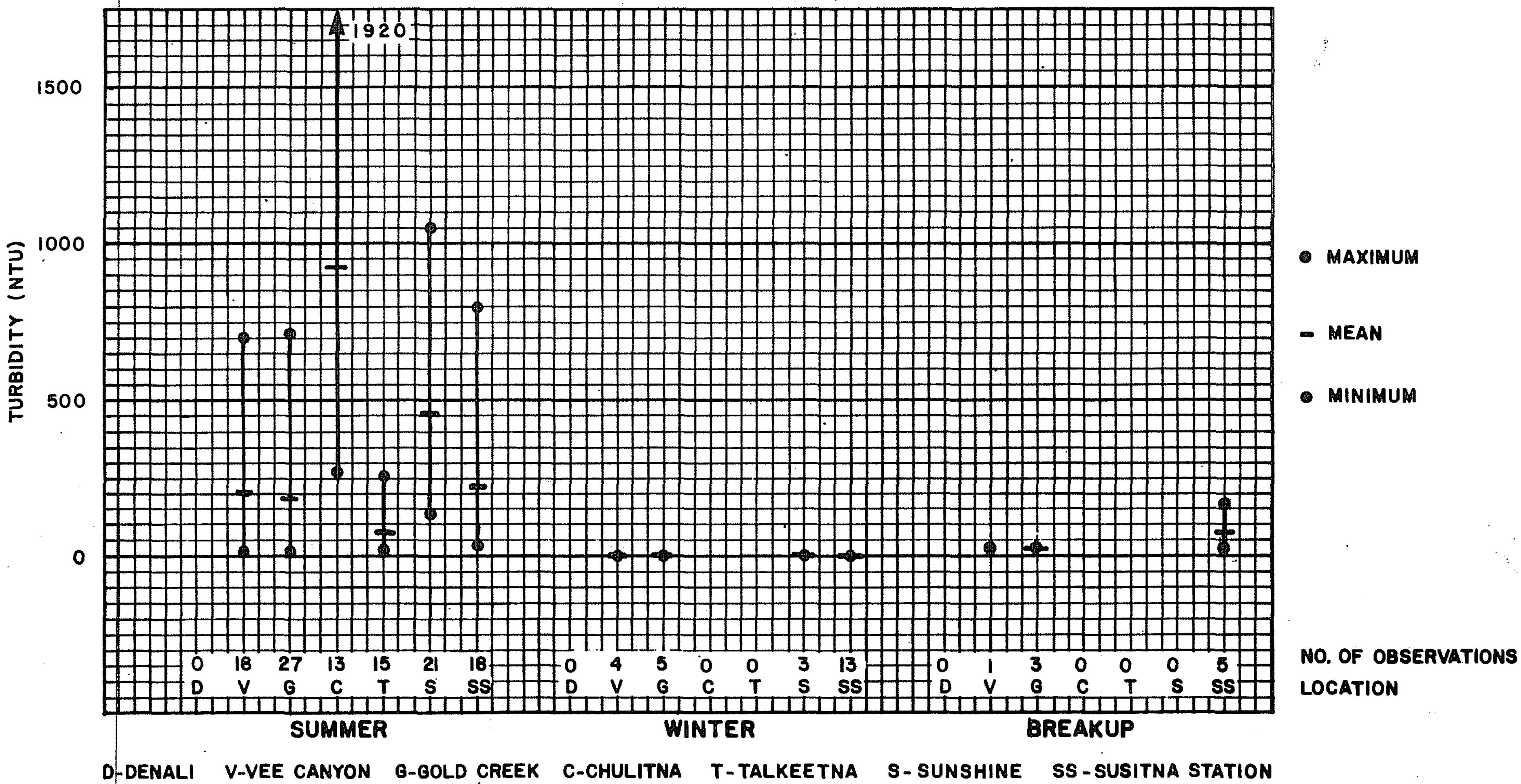
SUSITNA RIVER SUSPENDED SEDIMENT CONCENTRATIONS

FIGURE E.2.2.90



SUSPENDED SEDIMENT SIZE DISTRIBUTION SUSITNA RIVER

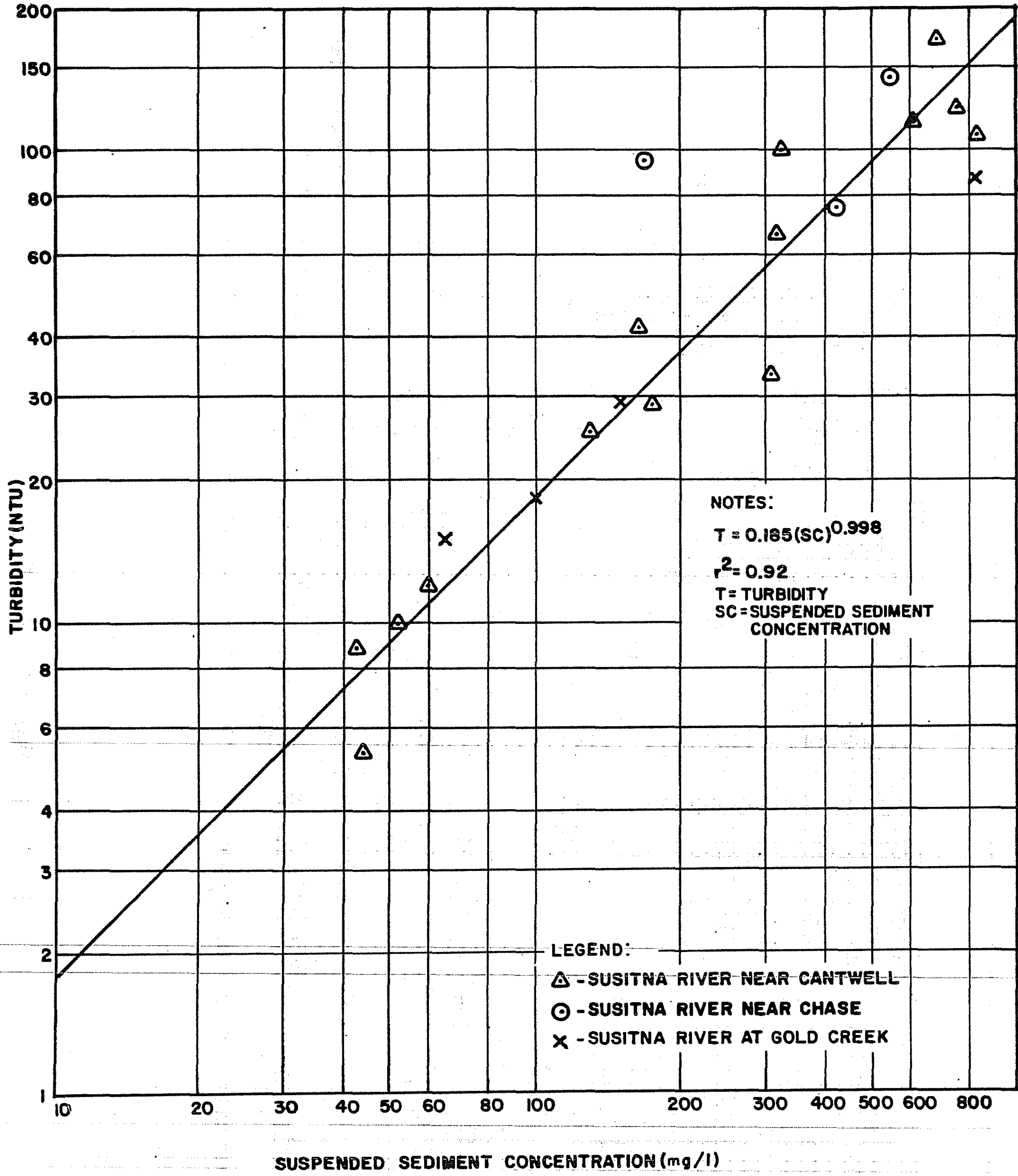
FIGURE E.2.2.91



DATA SUMMARY - TURBIDITY

SOURCE: USGS AND R&M

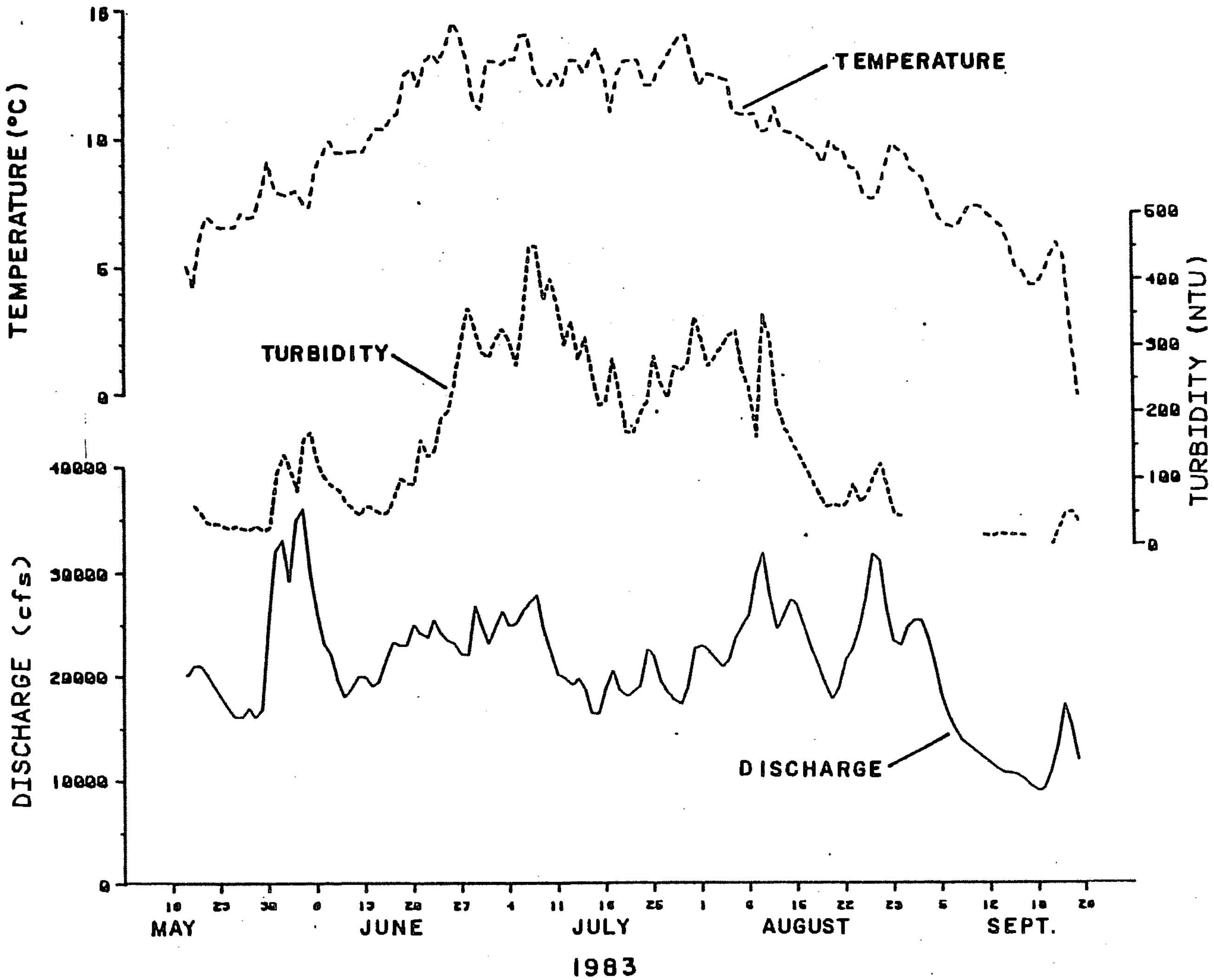
FIGURE E.2.2.92



TURBIDITY VS. SUSPENDED SEDIMENT CONCENTRATION

SOURCE: PERATROVICH, NOTTINGHAM AND DRAGE 1982

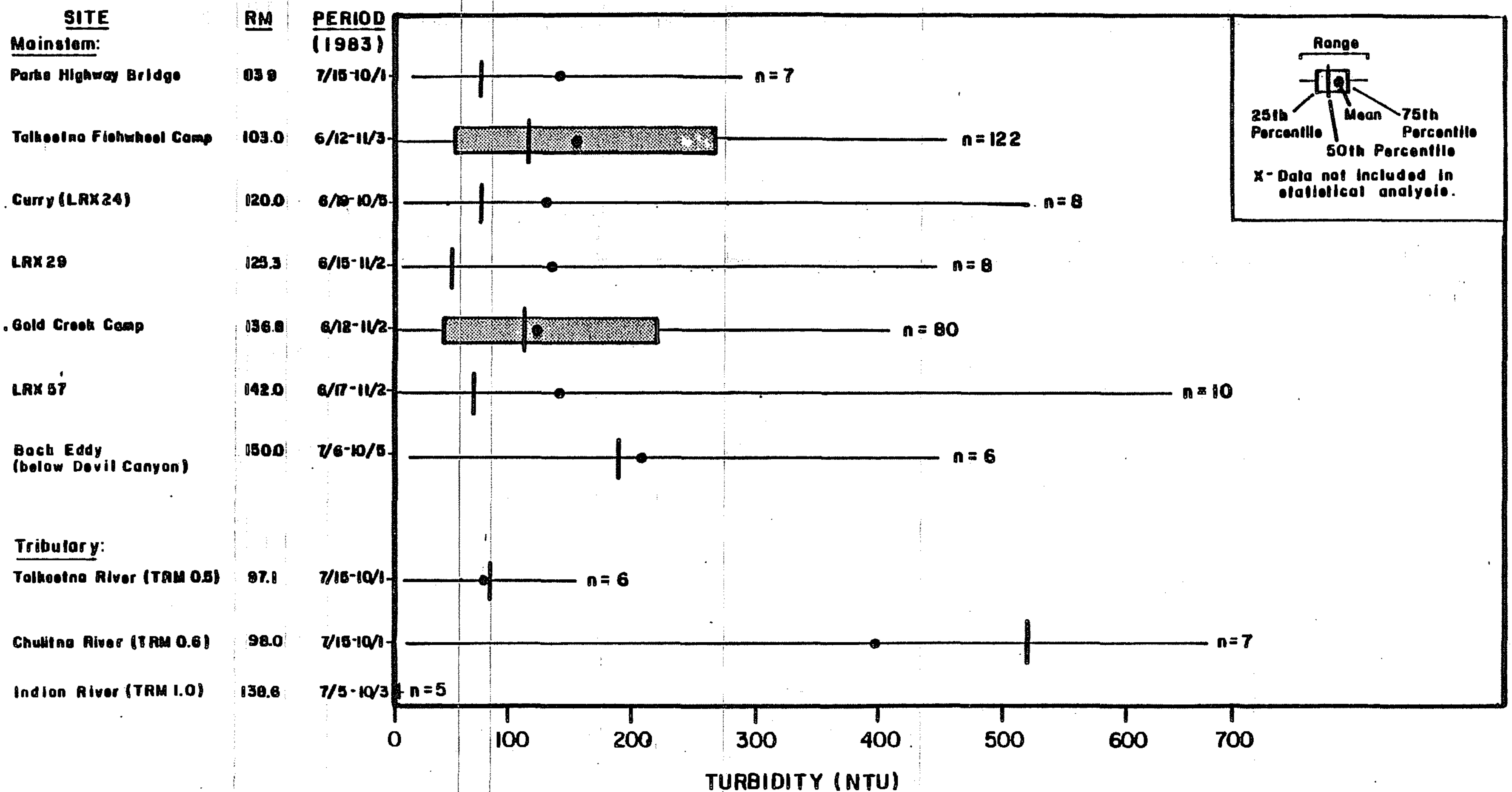
FIGURE E.2.2.93



MAINSTEM DISCHARGE, WATER TEMPERATURE, AND TURBIDITY RECORDED AT THE GOLD CREEK STATION, SUSITNA RIVER

SOURCE: ADF & G 1984c

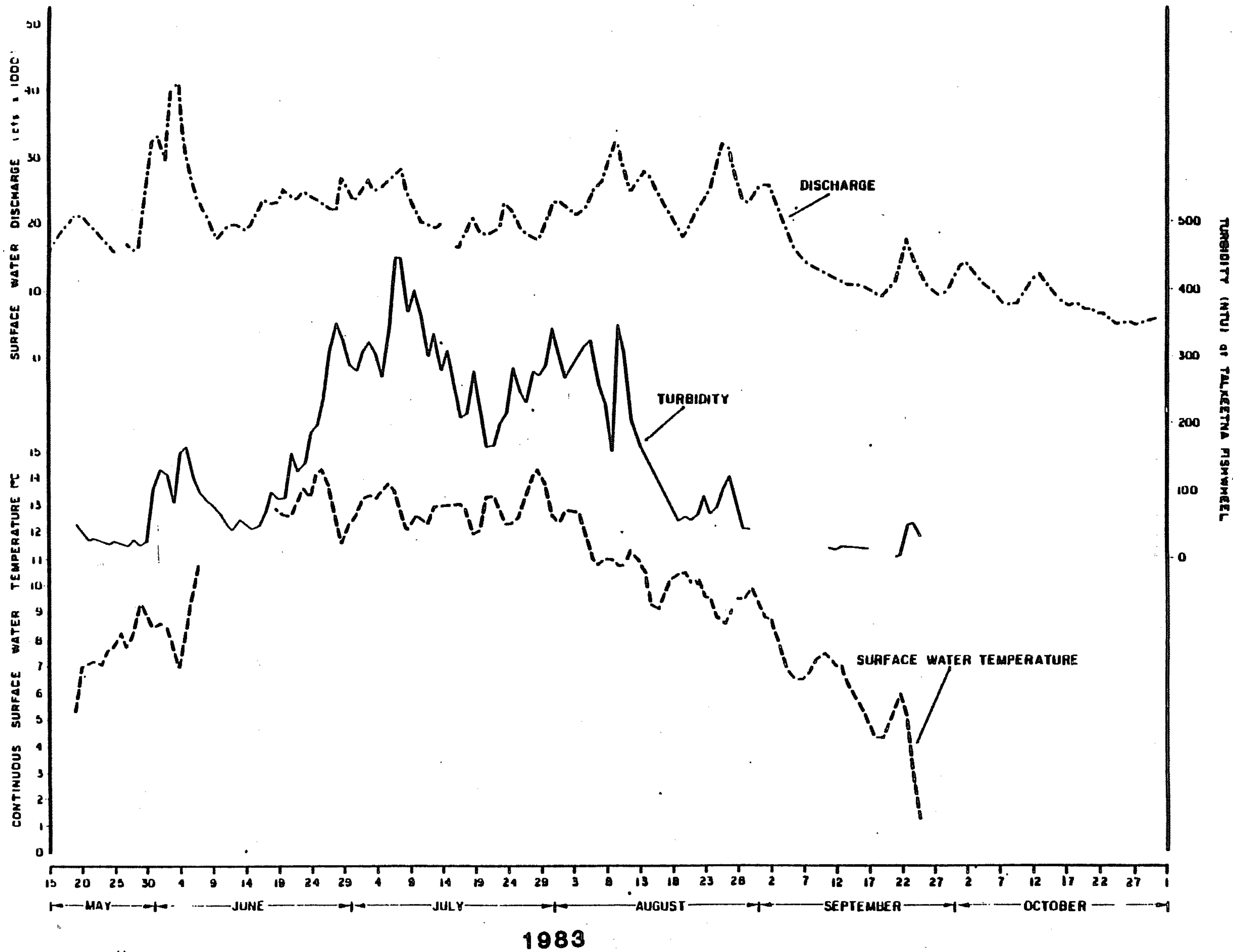
FIGURE E.2.2.94



TURBIDITY DATA SUMMARY SHOWING RANGE, 25th, 50th (MEDIAN), AND 75th PERCENTILE FOR MAINSTEM AND TRIBUTARY STUDY SITES.

SOURCE: ADF & G 1984c

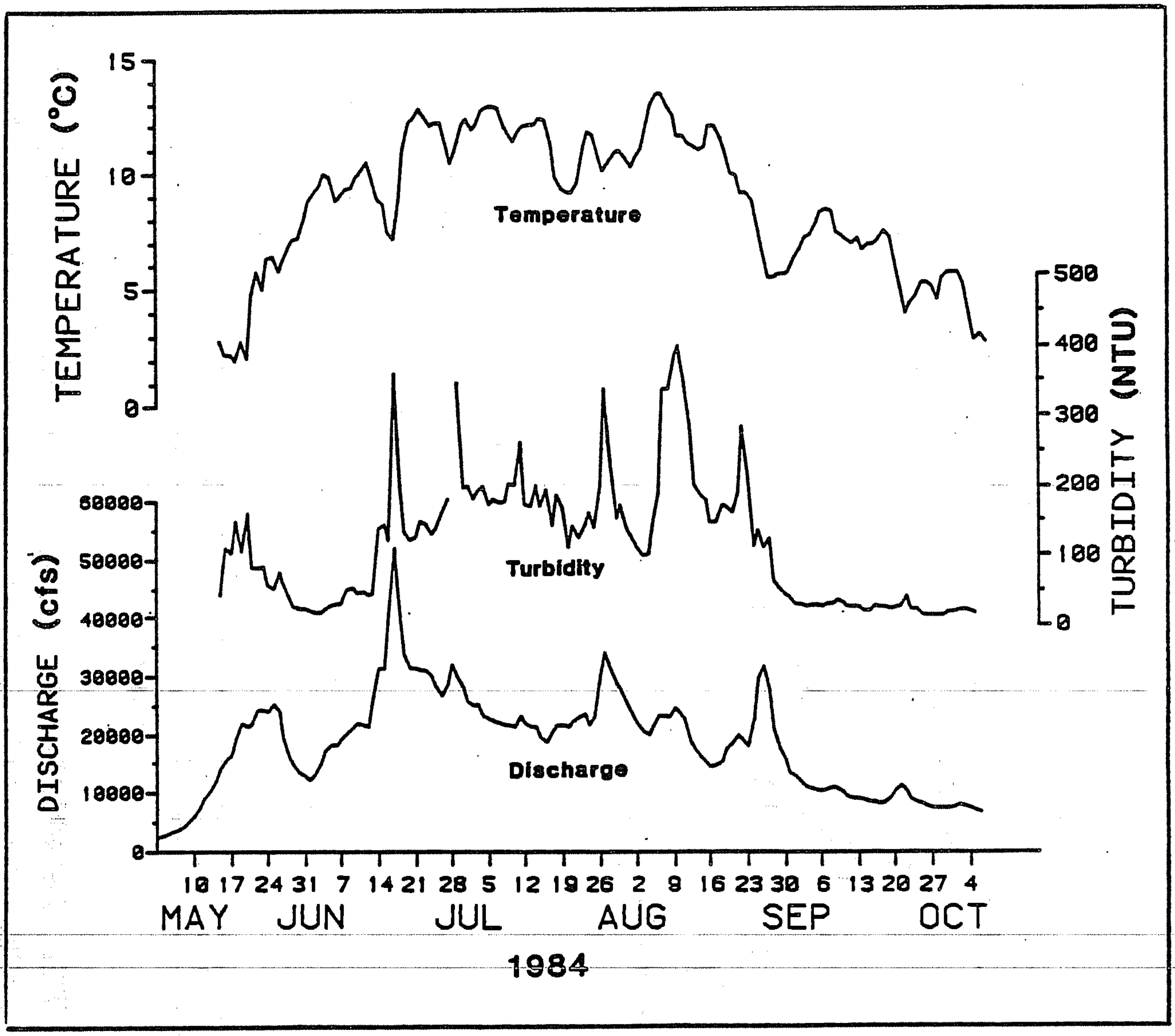
FIGURE E.2.2.95



TURBIDITY, WATER TEMPERATURE, AND SUSITNA RIVER DISCHARGE VERSUS TIME AT THE TALKEETNA FISHWHEEL CAMP.

SOURCE: ADF & G 1984c

FIGURE E.2.2.96



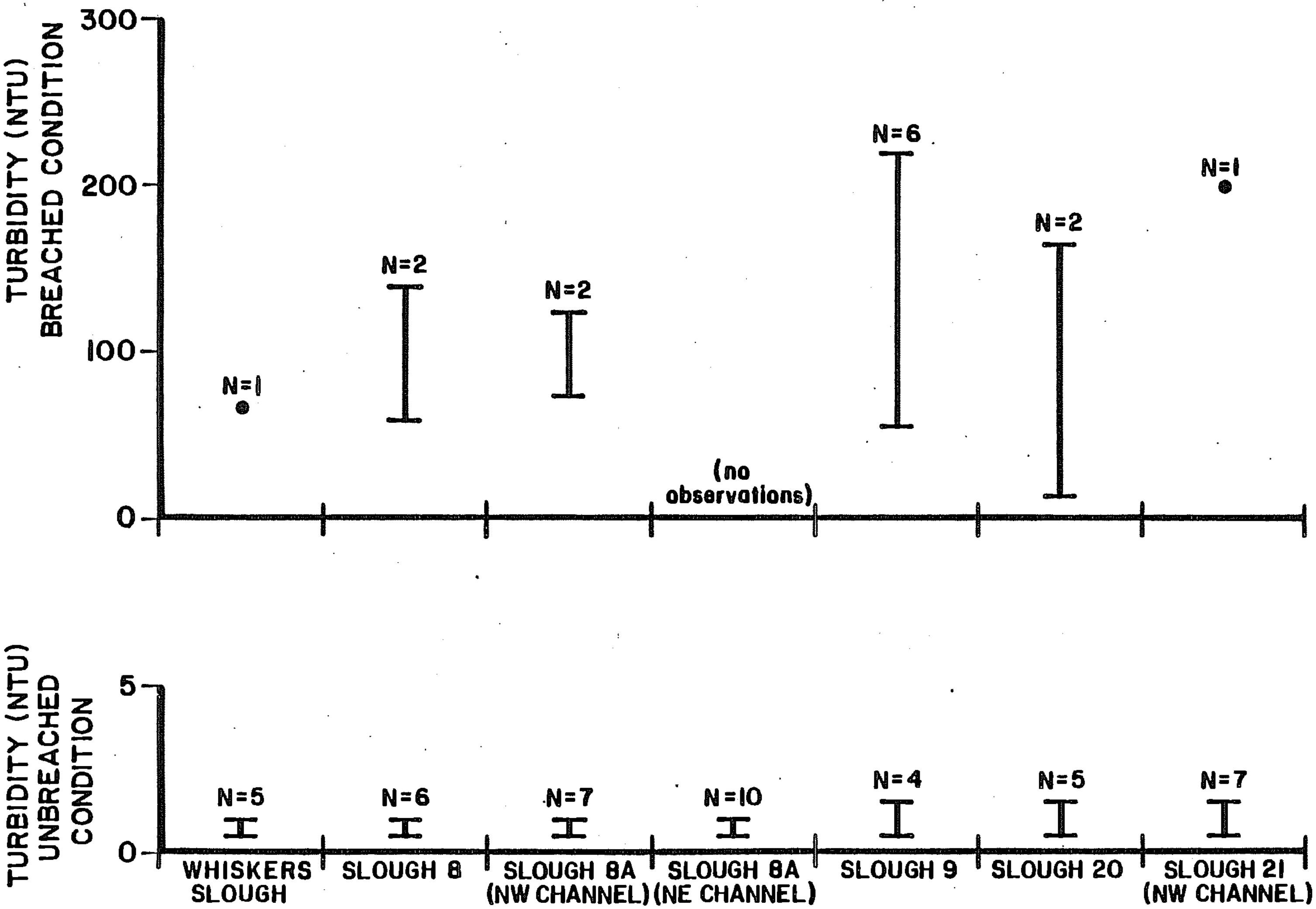
NOTES:

1. DISCHARGE WAS MEASURED AT THE USGS GAGING STATION AT GOLD CREEK
2. WATER TEMPERATURE AND TURBIDITY WERE MEASURED AT TALKEETNA STATION

MAINSTEM DISCHARGE, WATER TEMPERATURE, AND TURBIDITY IN THE MIDDLE REACH OF THE SUSITNA RIVER, 1984.

SOURCE: ADF&G 1984c

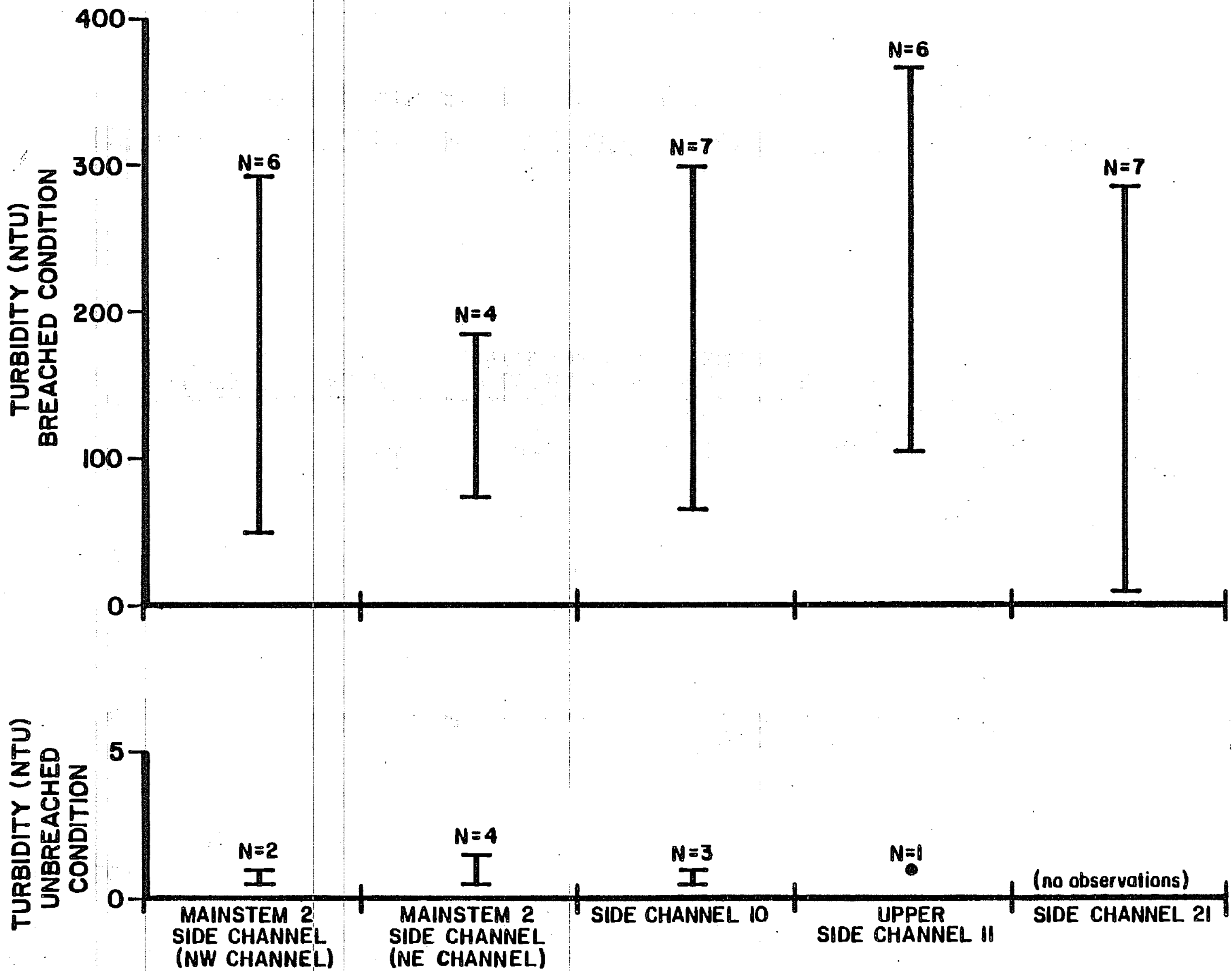
FIGURE E.2.2.97



RANGE OF TURBIDITY DURING UNBREACHED AND BREACHED CONDITIONS FOR SIDE SLOUGH HABITATS.

SOURCE: ADF & G 1984c

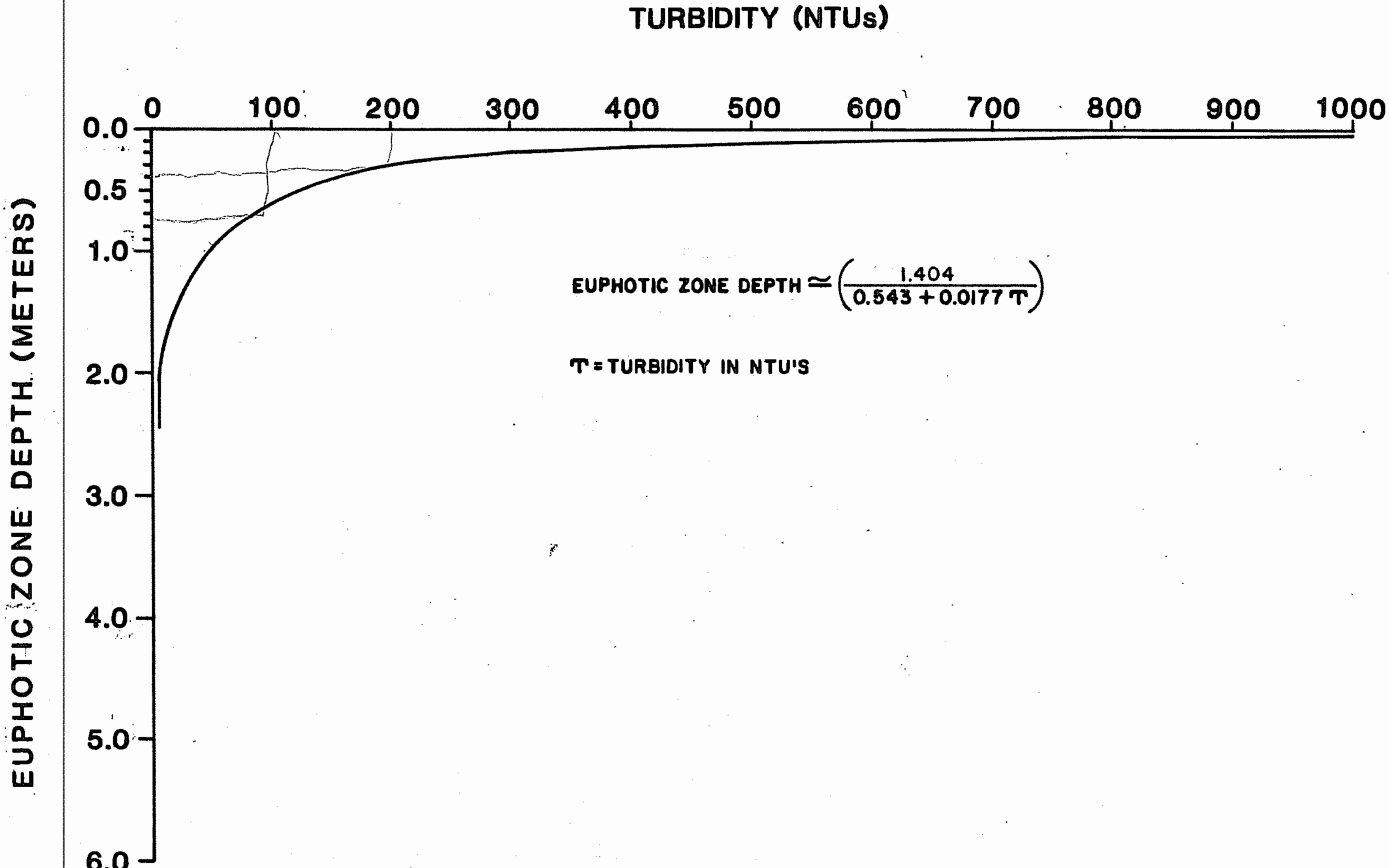
FIGURE E.2.2.98



RANGE OF TURBIDITY DURING UNBREACHED AND BREACHED CONDITIONS FOR SIDE SLOUGH HABITATS.

SOURCE: ADF&G 1984c

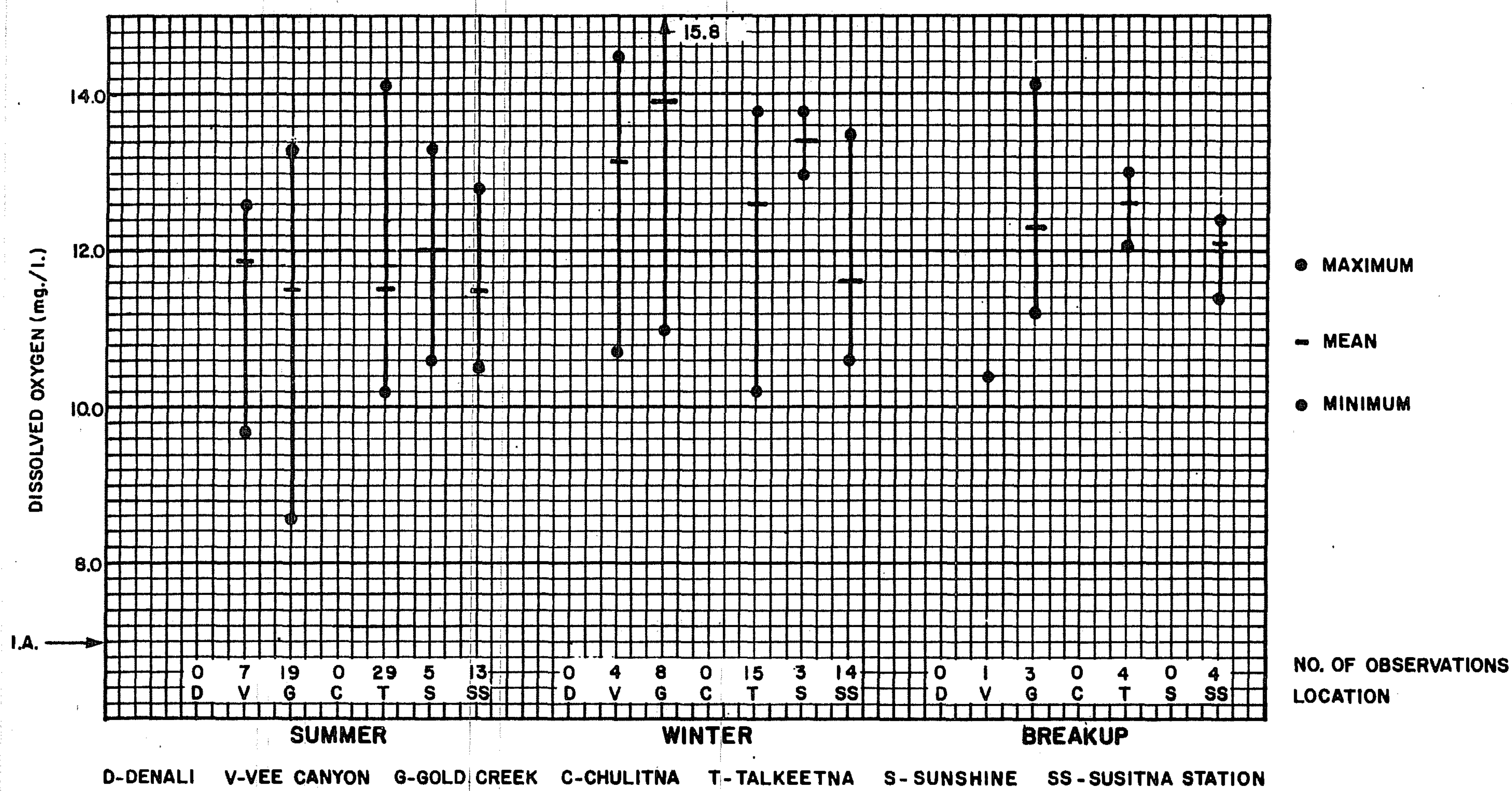
FIGURE E.2.2.99



AN EMPIRICALLY DERIVED, GENERALIZED RELATIONSHIP BETWEEN TURBIDITY AND THE MAXIMUM EUPHOTIC ZONE DEPTH (1.0 % P.A.R)

SOURCE: E.WOODY TRIHEY AND ASSOCIATES 1984 b

FIGURE E.2.2.100



NOTES:

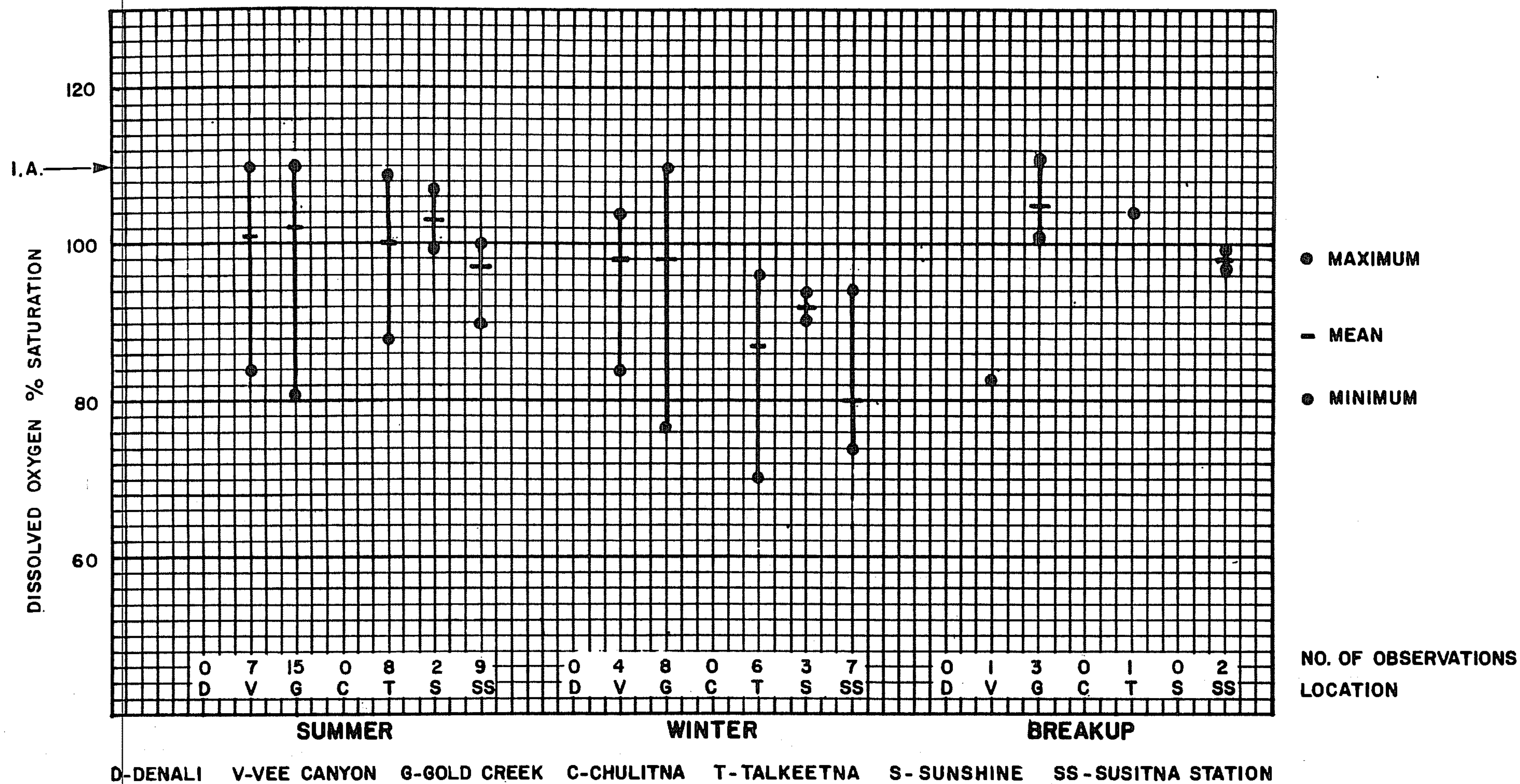
I. A. CRITERIA: GREATER THAN 7mg./l. BUT IN NO CASE SHALL DISSOLVED OXYGEN EXCEED 17 mg./l. (ADEC 1979).

I. B. ESTABLISHED FOR THE PROTECTION OF ANADROMOUS AND RESIDENT FISH.

DATA SUMMARY - DISSOLVED OXYGEN

SOURCE: USGS AND R & M

FIGURE E.2.2.101



NOTES:

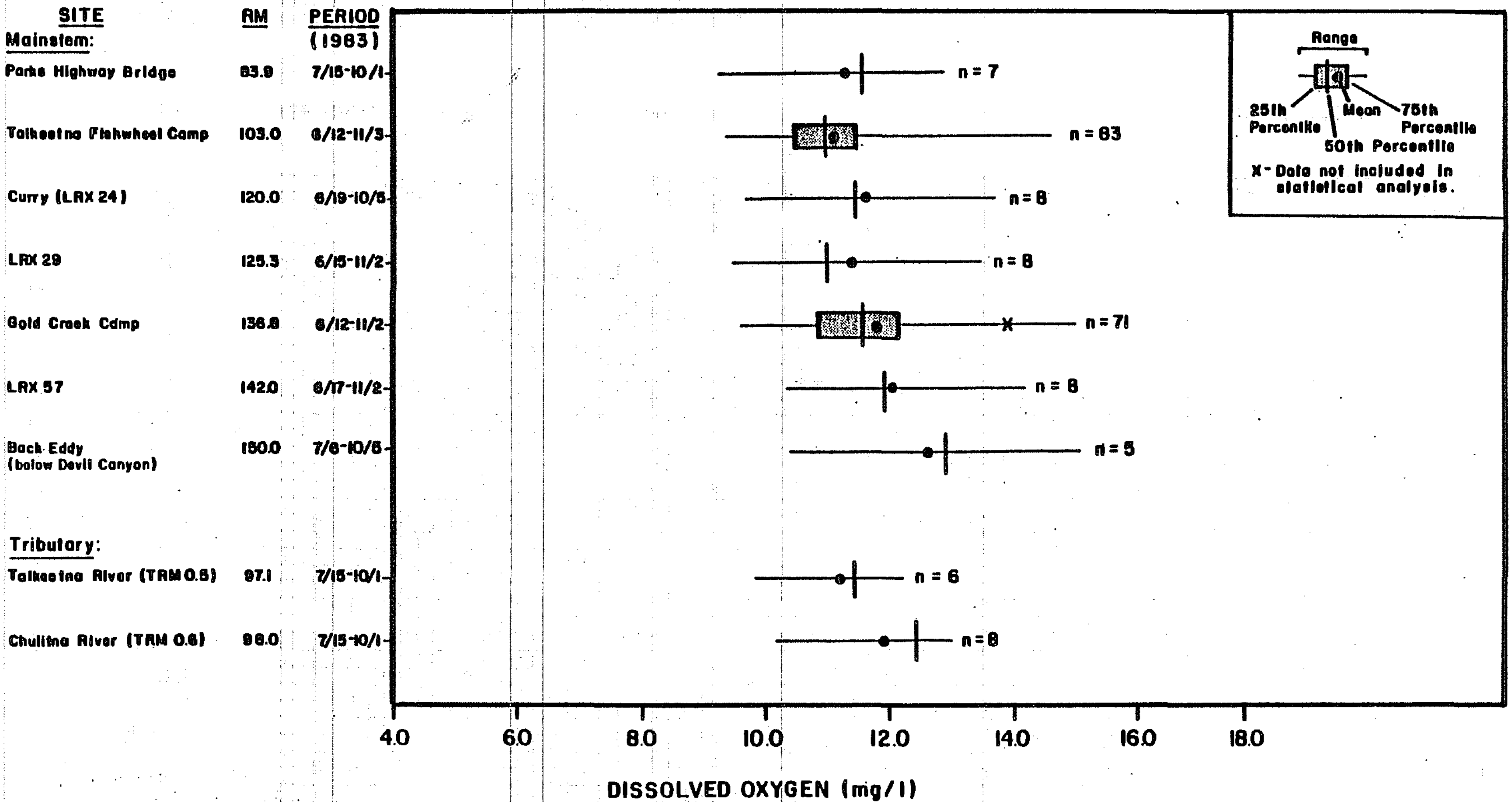
I. A. CRITERION: THE CONCENTRATION OF TOTAL DISSOLVED GAS SHALL NOT EXCEED 110 % SATURATION AT ANY POINT. (ADEC, 1979).

I. B. ESTABLISHED FOR THE PROTECTION OF ANADROMOUS AND RESIDENT FISH.

DATA SUMMARY – DISSOLVED OXYGEN % SATURATION

SOURCE: USGS AND R&M

FIGURE E.2.2.102

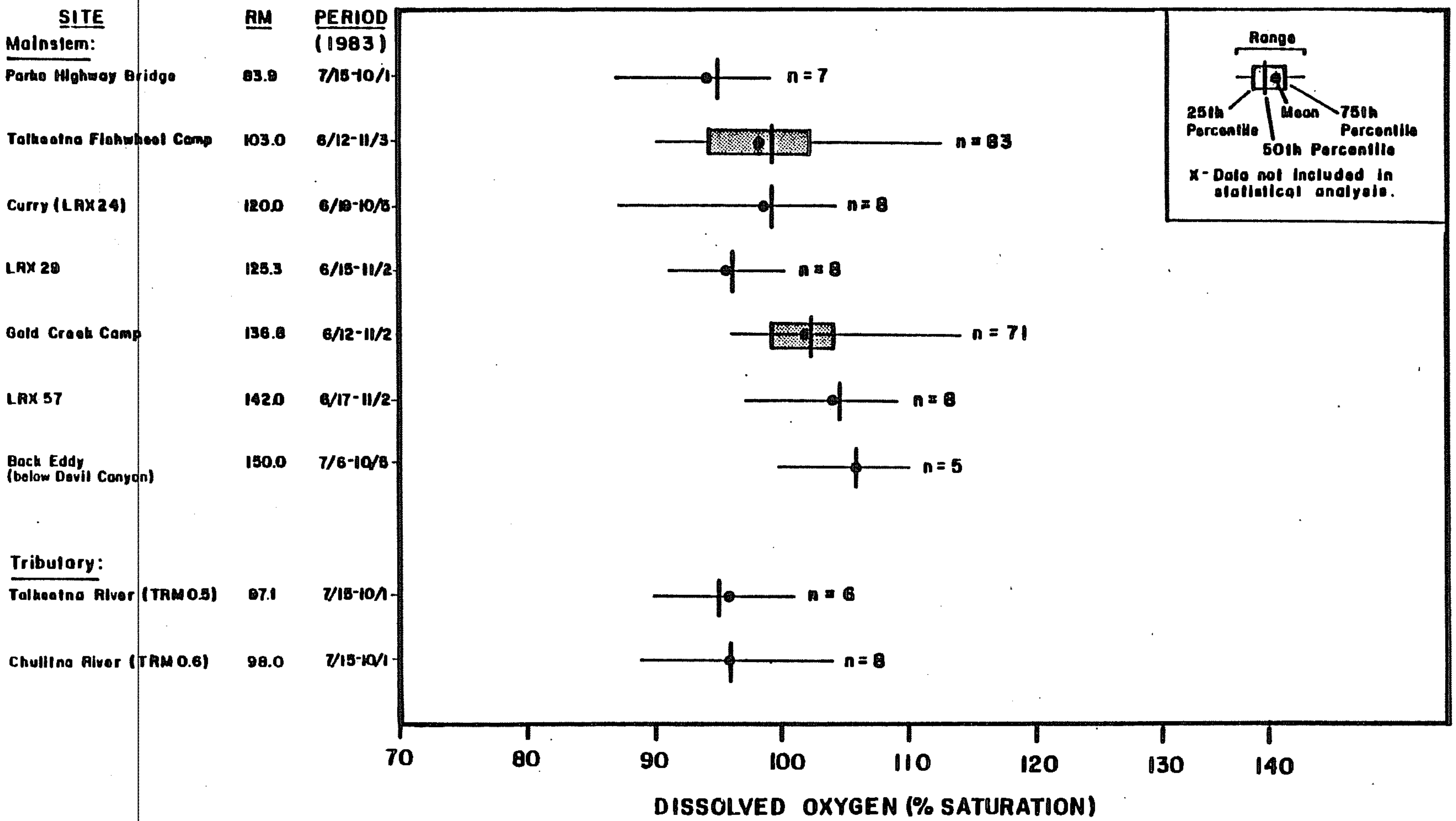


Dissolved oxygen data summary showing range, 25th, 50th (median), and 75th percentile for mainstem and tributary water quality study sites

DISSOLVED OXYGEN DATA SUMMARY

SOURCE: ADF & G 1984c

FIGURE E.2.2.103

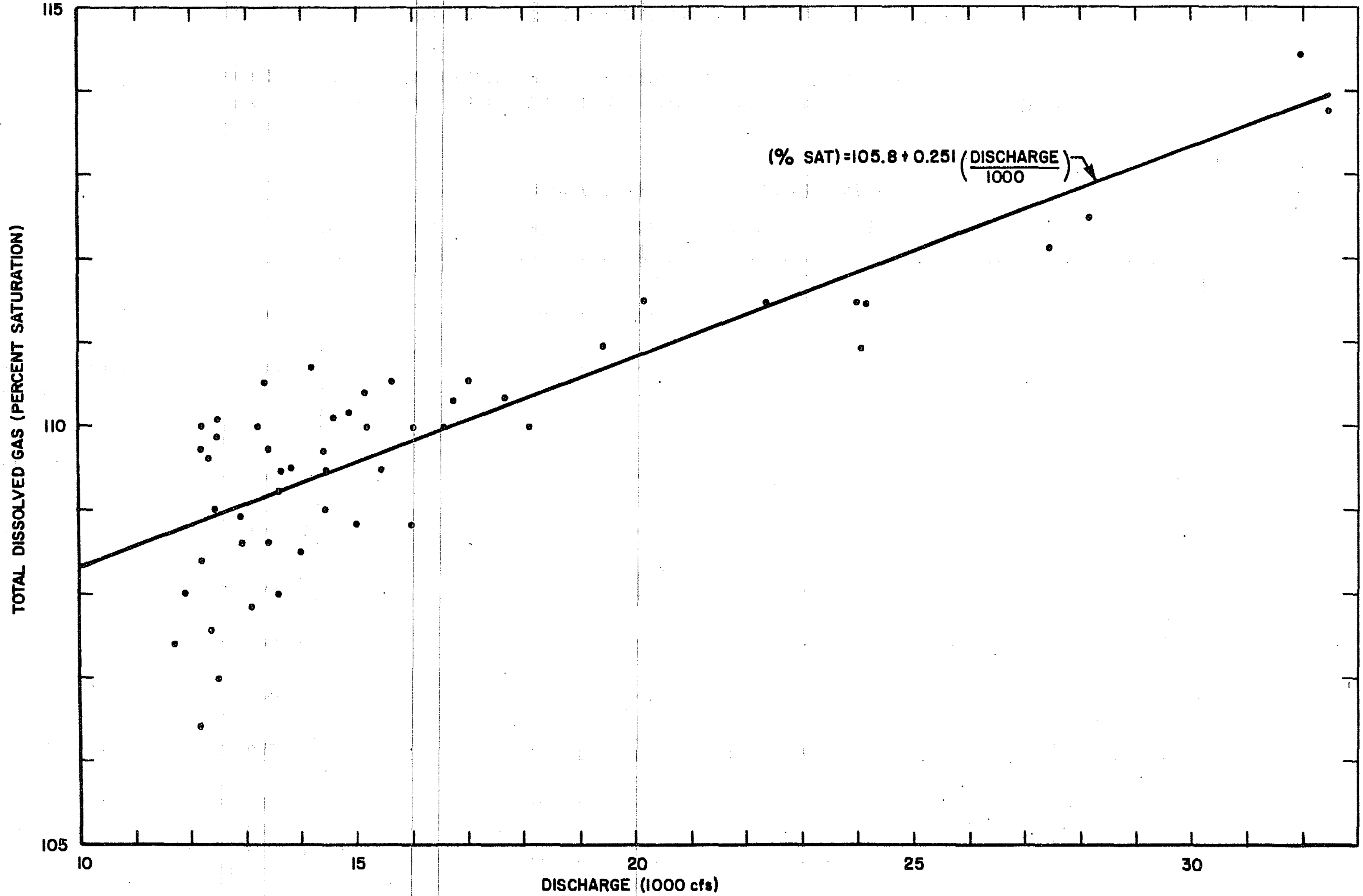


Dissolved oxygen percent saturation data summary showing range, 25th, 50th (median), and 75th percentile for mainstem and tributary water quality study sites.

DISSOLVED OXYGEN DATA SUMMARY

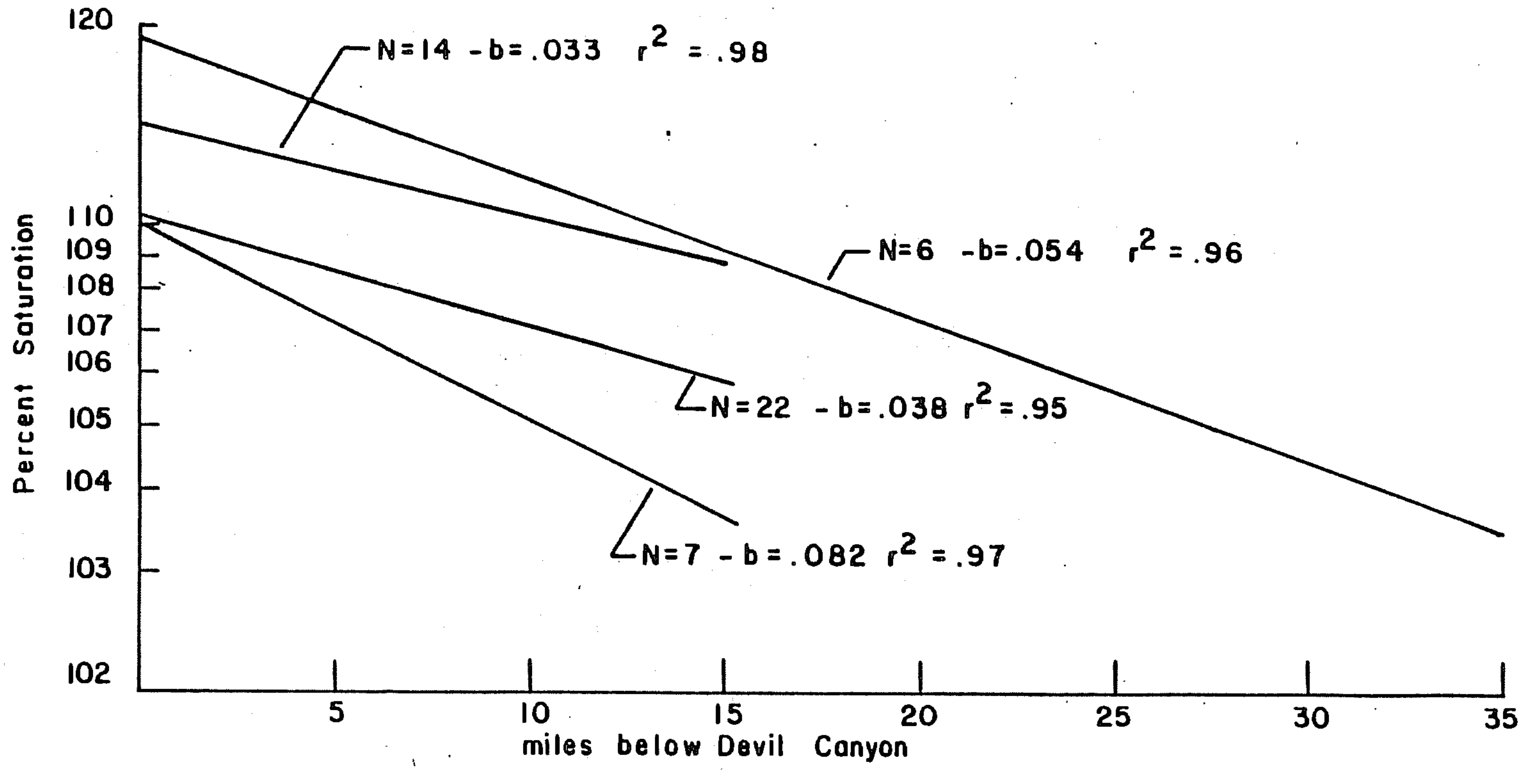
SOURCE: ADF & G 1984c

FIGURE E.2.2.104



TOTAL DISSOLVED GAS (PERCENT SATURATION) VS. DISCHARGE

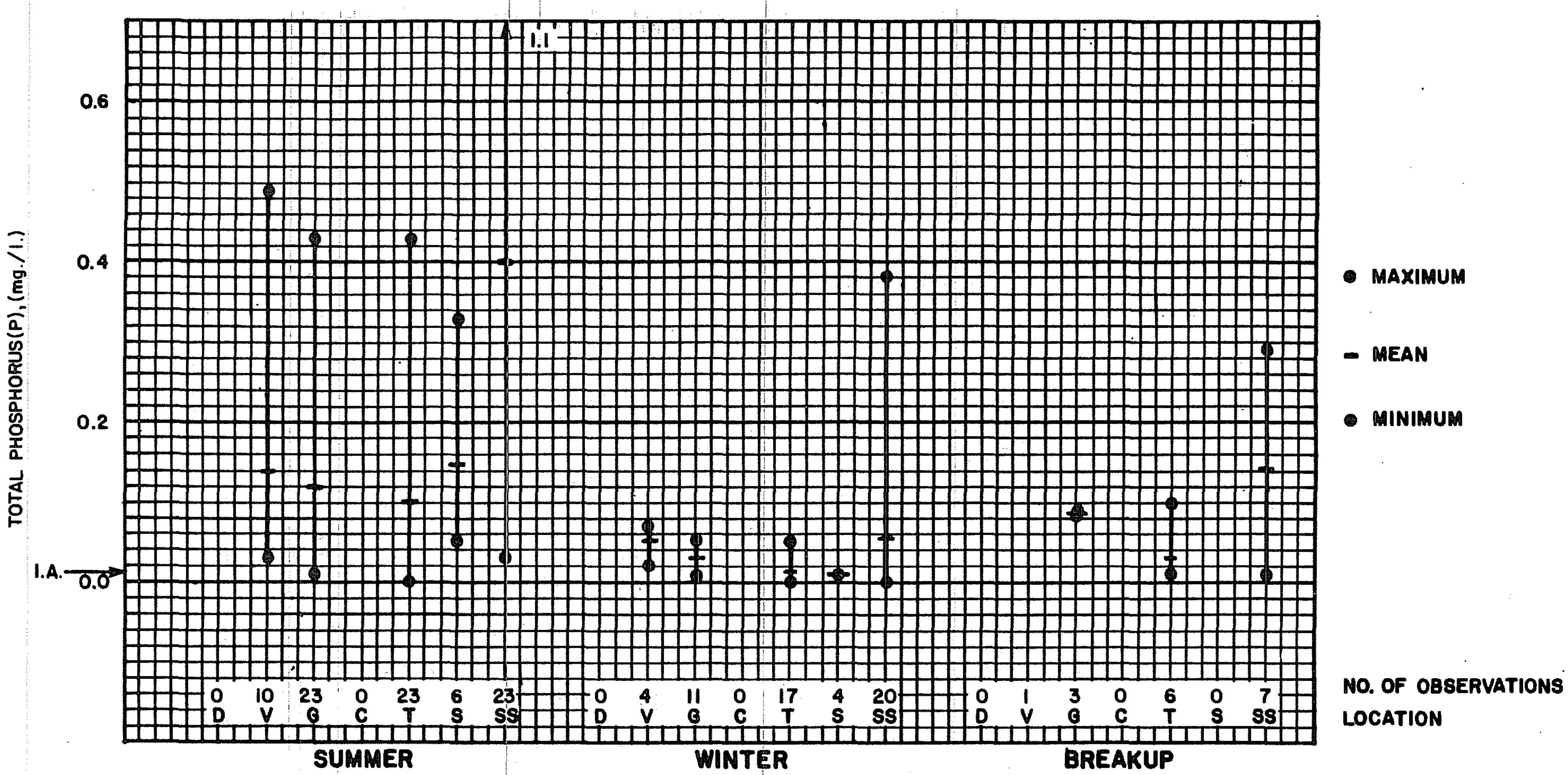
FIGURE E.2.2.105



RELATIONSHIP BETWEEN GAS CONCENTRATION AND DISTANCE DOWNSTREAM OF PROPOSED DEVIL CANYON DAM SITE

SOURCE: ADF & G 1983c.

FIGURE E.2.2.106



D-DENALI V-VEE CANYON G-GOLD CREEK C-CHULITNA T-TALKEETNA S-SUNSHINE SS-SUSITNA STATION

NOTES:

1.A. CRITERION: LESS THAN 0.01 mg./l. FOR ELEMENTAL PHOSPHORUS (EPA 1976).

1.B. ESTABLISHED TO PROTECT FRESHWATER AQUATIC ORGANISMS.

2. AT VEE CANYON, 4 SUMMER OBSERVATIONS, 2 WINTER OBSERVATIONS, AND THE 1 BREAKUP OBSERVATION WERE LESS THAN 0.05 mg./l.

3. AT GOLD CREEK, 6 SUMMER OBSERVATIONS, 3 WINTER OBSERVATIONS, AND 1 BREAKUP OBSERVATION WERE LESS THAN 0.05 mg./l.

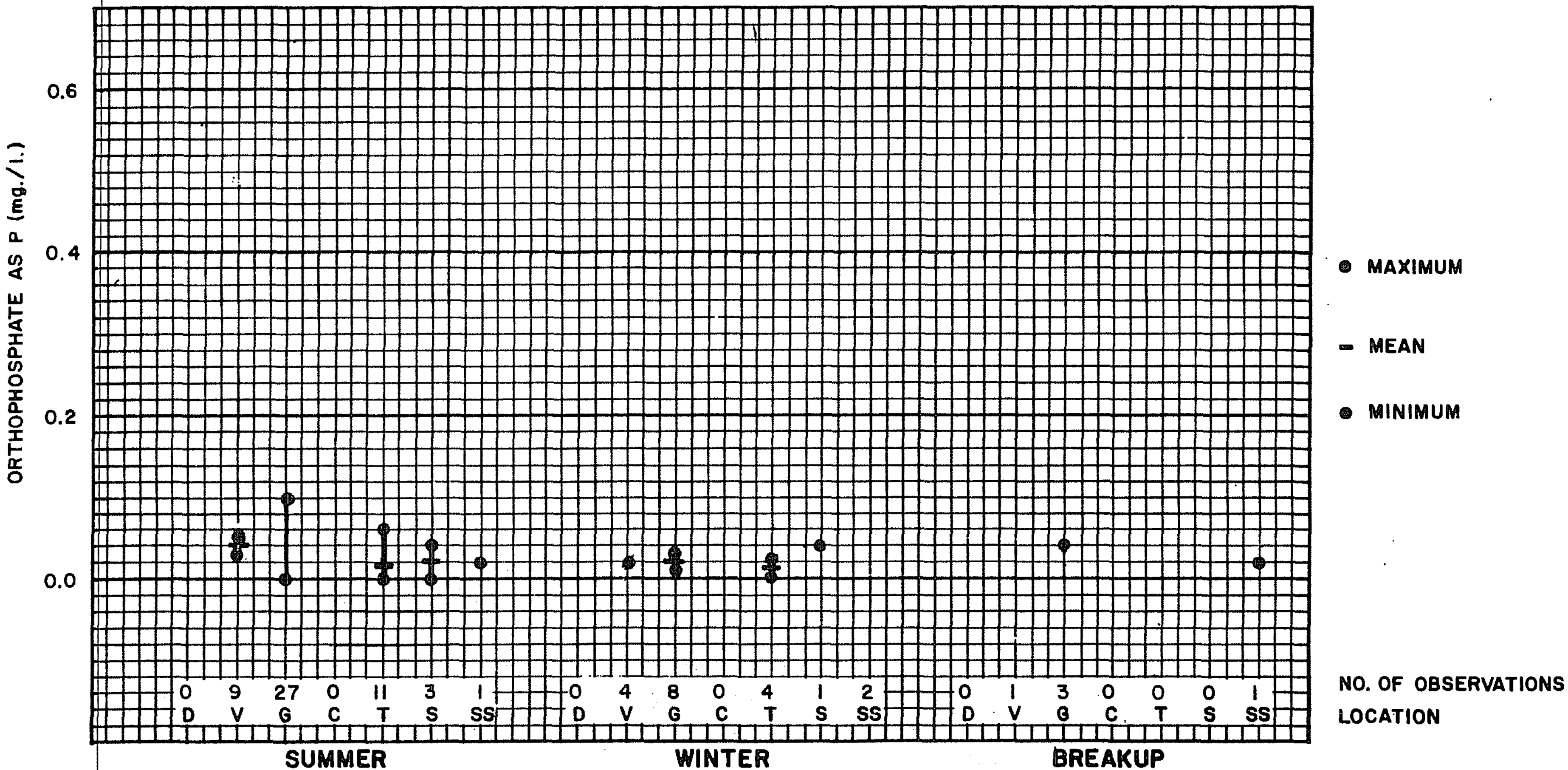
4. AT SUNSHINE, 2 WINTER OBSERVATIONS WERE LESS THAN 0.01 mg./l.

5. AT SUSITNA STATION, 2 WINTER OBSERVATIONS WERE LESS THAN 0.01 mg./l.

DATA SUMMARY - TOTAL PHOSPHORUS

SOURCE: USGS AND R & M

FIGURE E.2.2.107



D-DENALI V-VEE CANYON G-GOLD CREEK C-CHULITNA T-TALKEETNA S-SUNSHINE SS-SUSITNA STATION

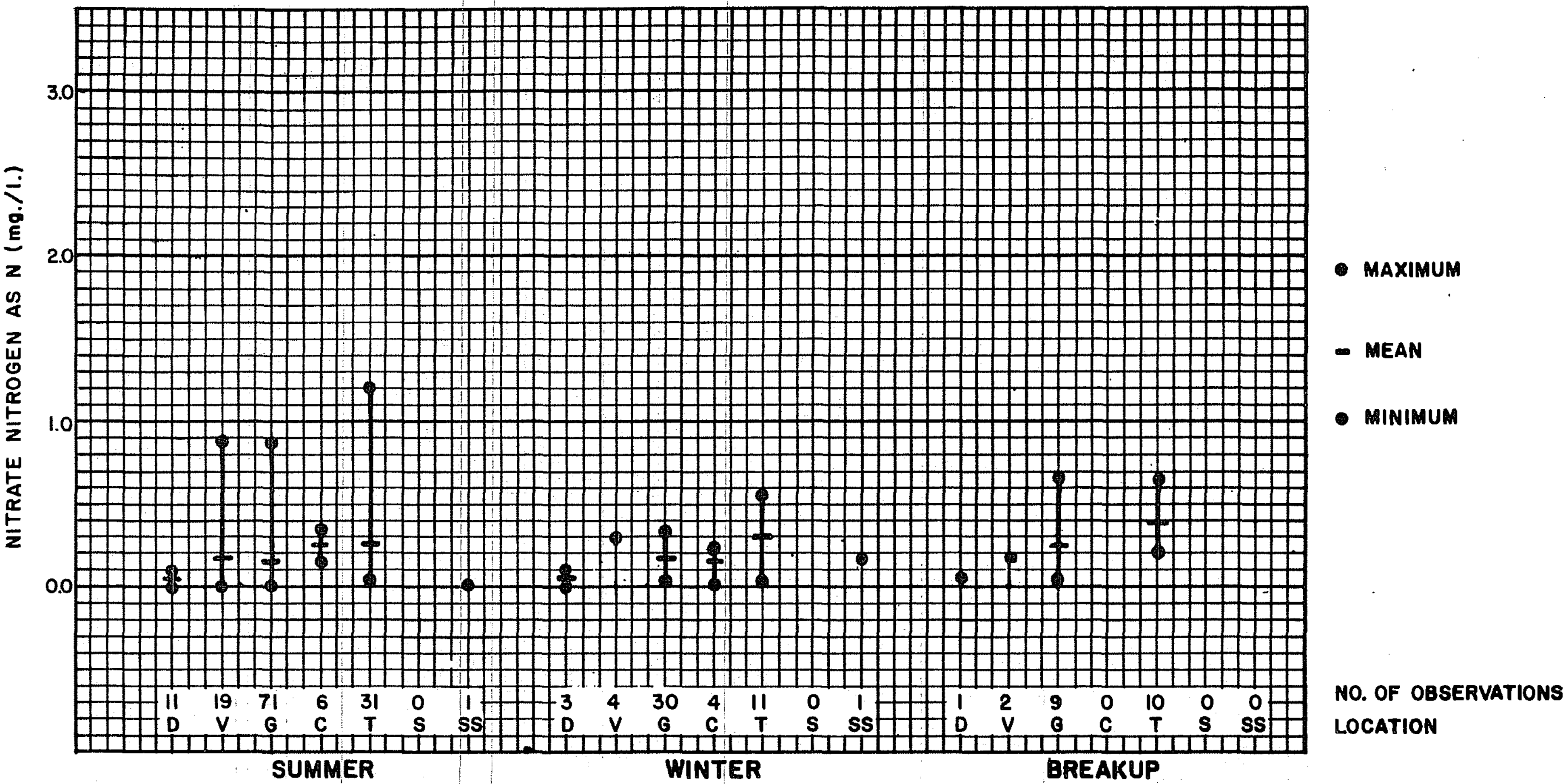
NOTES:

1. NO CRITERION ESTABLISHED.
2. AT VEE CANYON, 7 SUMMER OBSERVATIONS WERE LESS THAN 0.05 mg./l. 2 WINTER OBSERVATIONS AND THE 1 BREAKUP OBSERVATION WERE LESS THAN THE DETECTION LIMIT OF 0.01 mg./l.
3. AT GOLD CREEK, 13 SUMMER OBSERVATIONS WERE LESS THAN 0.02 mg./l. 2 WINTER OBSERVATIONS AND 2 BREAKUP OBSERVATIONS WERE LESS THAN THE DETECTION LIMIT OF 0.01 mg./l.
4. AT SUSITNA STATION, THE 2 WINTER OBSERVATIONS WERE LESS THAN 0.02 mg./l.

DATA SUMMARY-ORTHOPHOSPHATE

SOURCE: USGS AND R&M.

FIGURE E.2.2.108



D-DENALI V-VEE CANYON G-GOLD CREEK C-CHULITNA T-TALKEETNA S-SUNSHINE SS-SUSITNA STATION

NOTES:

1.A. CRITERION: LESS THAN 10 mg./l. (EPA 1976).

1.B. ESTABLISHED TO PROTECT WATER SUPPLIES.

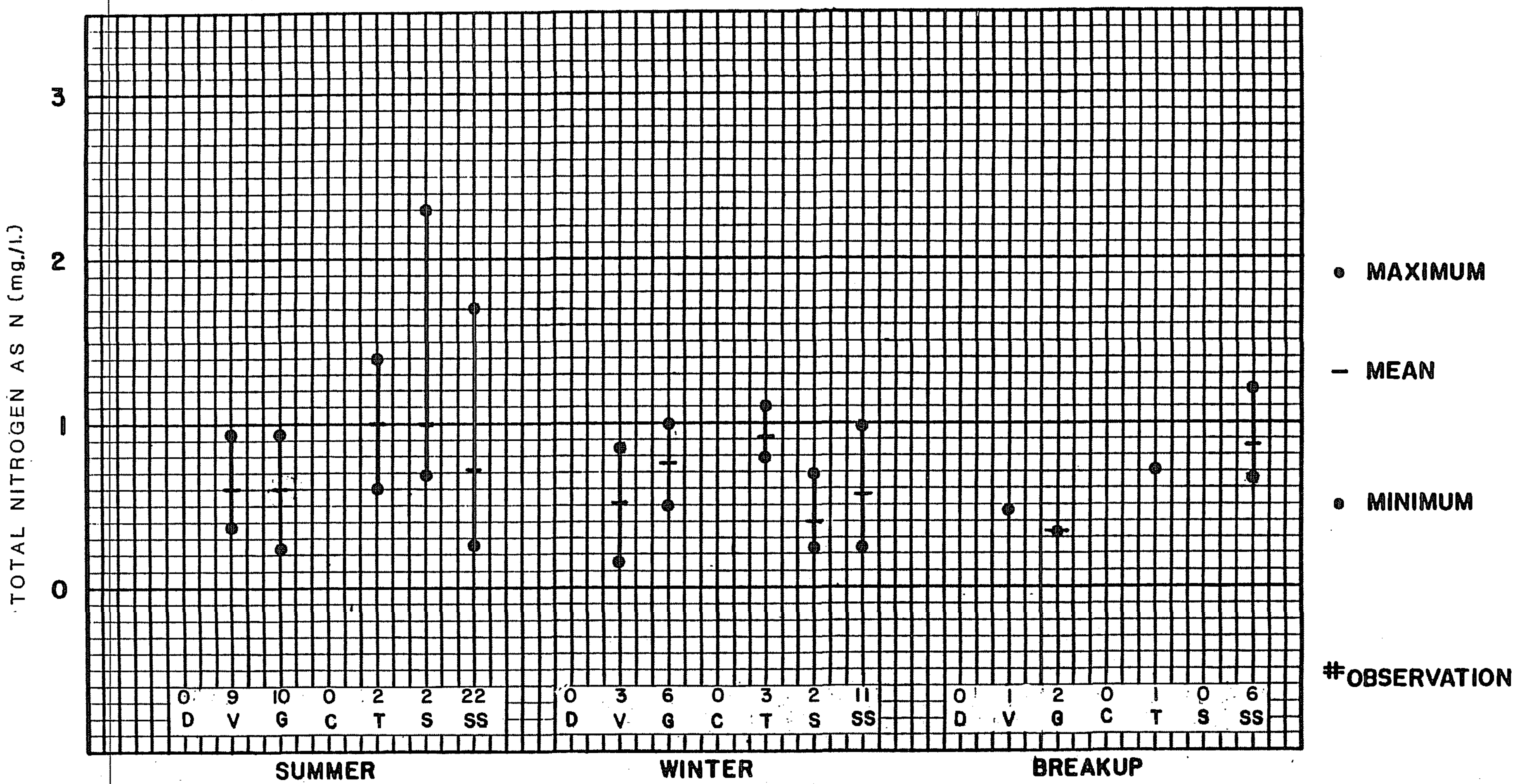
2. AT VEE CANYON, 5 SUMMER OBSERVATIONS, 3 WINTER OBSERVATIONS, AND 1 BREAKUP OBSERVATION WERE LESS THAN THE DETECTION LIMIT OF 0.10 mg./l.

3. AT GOLD CREEK, 6 SUMMER OBSERVATIONS, 2 WINTER OBSERVATIONS AND 2 BREAKUP OBSERVATIONS WERE LESS THAN THE DETECTION LIMIT OF 0.10 mg./l.

DATA SUMMARY - NITRATE NITROGEN

SOURCE: USGS AND R & M

FIGURE E.2.2.109



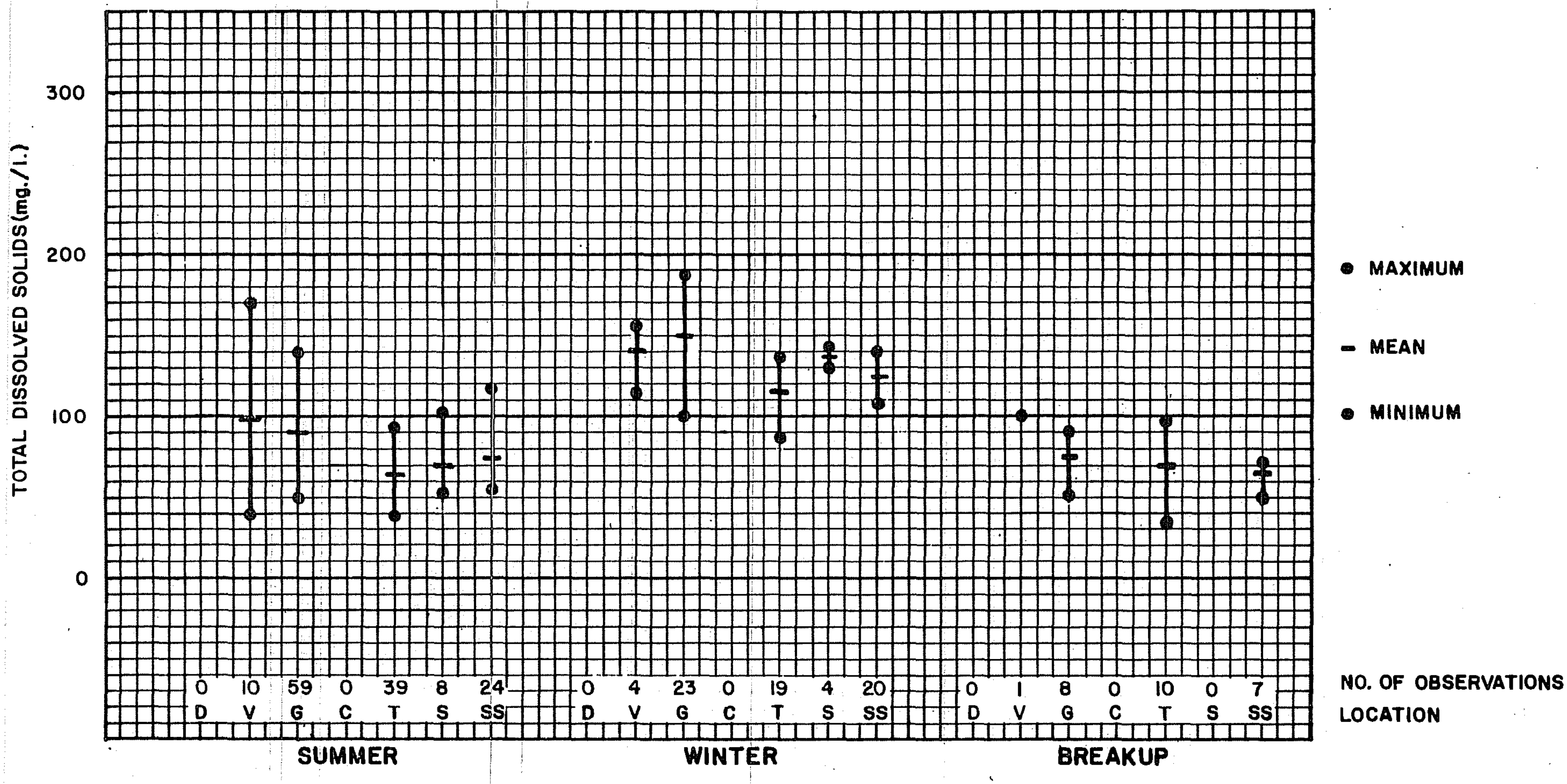
D-DENALI V-VEE CANYON G-GOLD CREEK C-CHULITNA T-TALKEETNA S-SUNSHINE SS-SUSITNA STATION

No criterion established

DATA SUMMARY-TOTAL NITROGEN

SOURCE: USGS AND R&M

FIGURE E.2.2.110



D-DENALI V-VEE CANYON G-GOLD CREEK C-CHULITNA T-TALKEETNA S-SUNSHINE SS-SUSITNA STATION

NOTES:

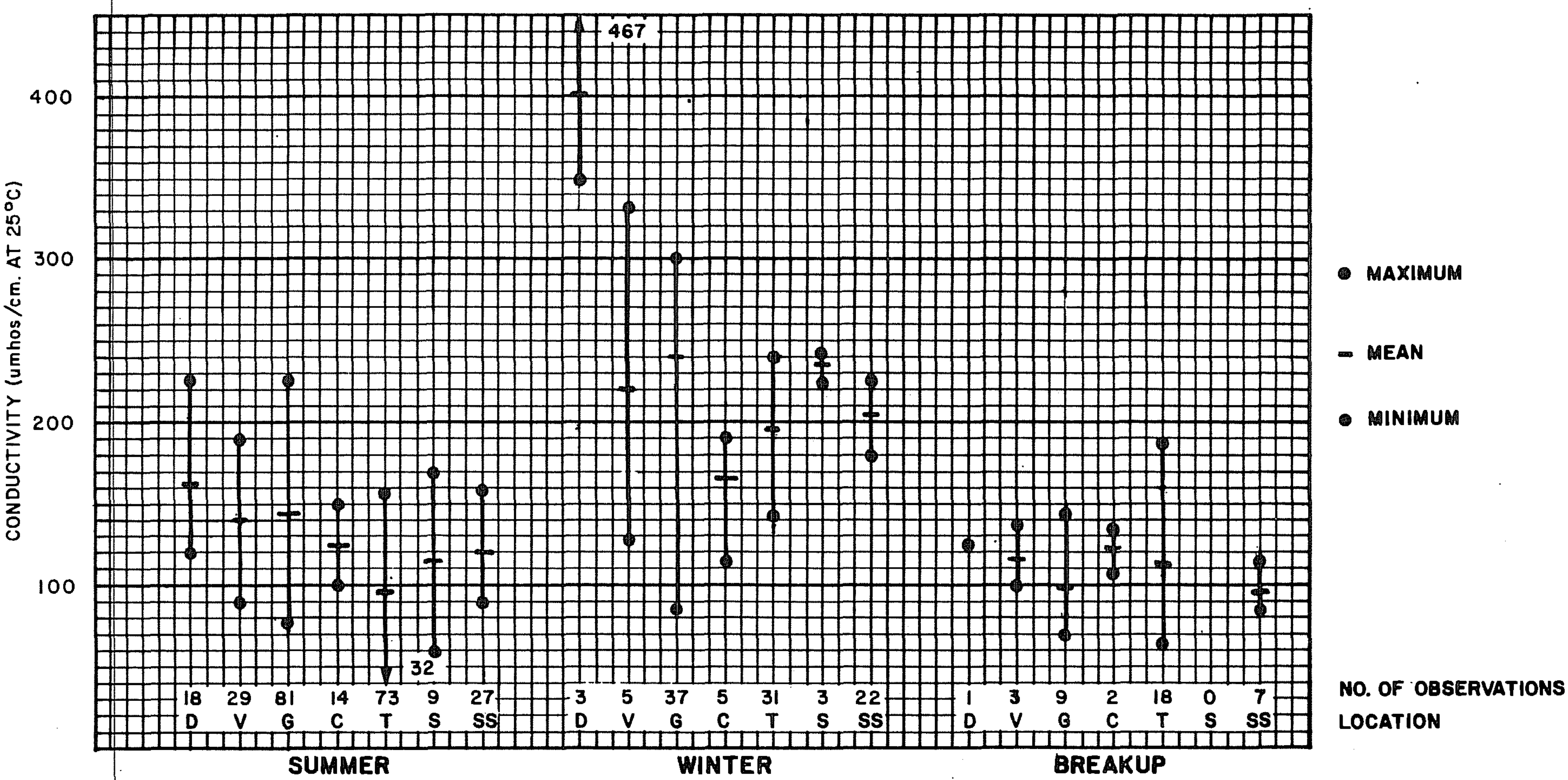
1.A. CRITERION: 1,500 mg./l. (ADEC 1979).

1.B. ESTABLISHED TO PROTECT NATURAL CONDITIONS OF FRESHWATER ECOSYSTEMS (500 mg./l. IS THE CRITERION FOR WATER SUPPLIES).

DATA SUMMARY – TOTAL DISSOLVED SOLIDS

SOURCE: USGS AND R&M

FIGURE E.2.2.111



D-DENALI V-VEE CANYON G-GOLD CREEK C-CHULITNA T-TALKEETNA S-SUNSHINE SS-SUSITNA STATION

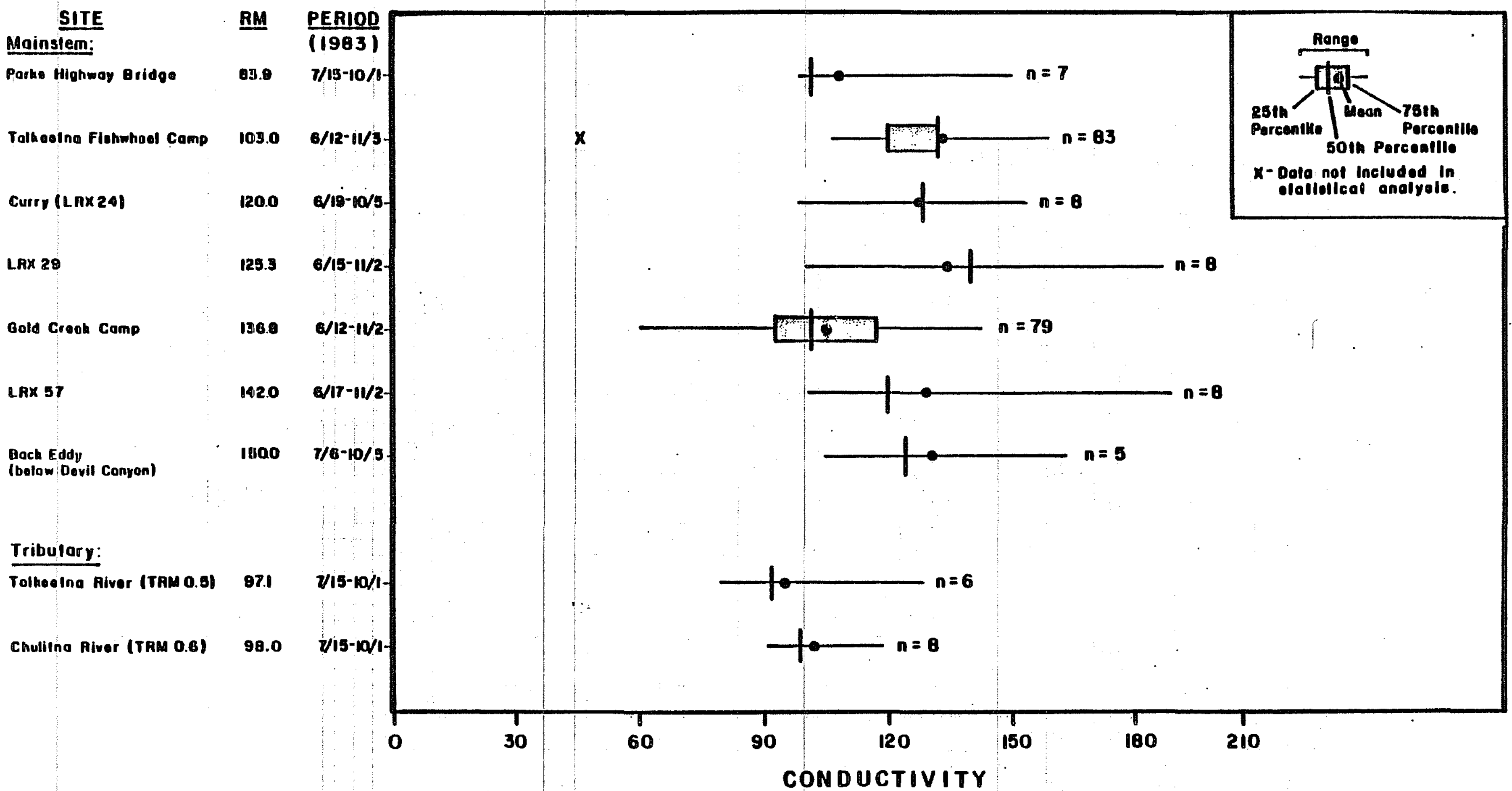
NOTES:

1. NO CRITERION ESTABLISHED.

DATA SUMMARY - CONDUCTIVITY

SOURCE: USGS AND R&M

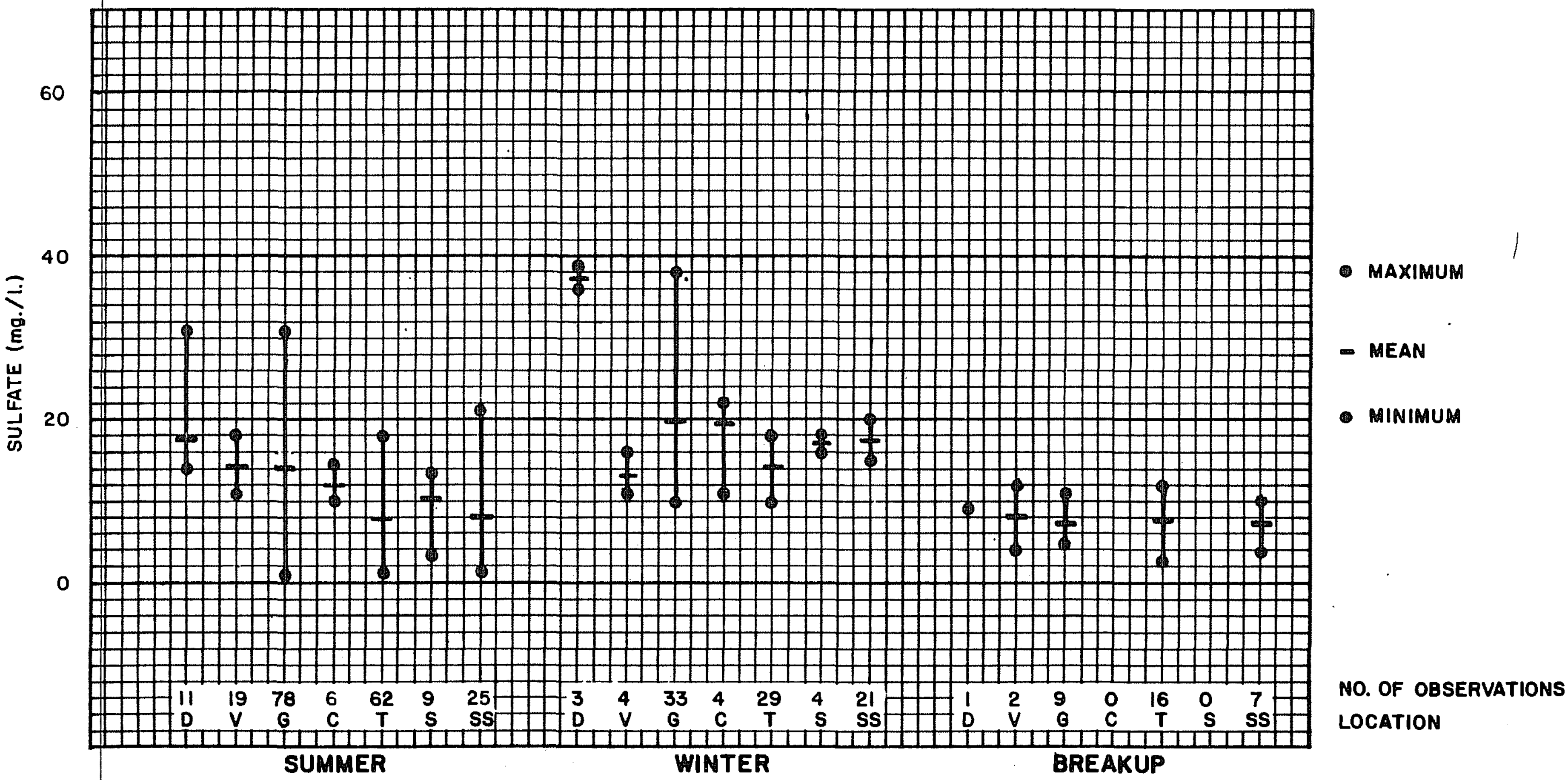
FIGURE E.2.2.112



CONDUCTIVITY DATA SUMMARY SHOWING RANGE, 25th, 50th (MEDIAN), AND 75th PERCENTILE FOR MAINSTEM AND TRIBUTARY STUDY SITES

SOURCE: ADF & G 1984c

FIGURE E.2.2.113



D-DENALI V-VEE CANYON G-GOLD CREEK C-CHULITNA T-TALKEETNA S-SUNSHINE SS-SUSITNA STATION

NOTES:

1.A. CRITERION: SHALL NOT EXCEED 200mg./l. (ADEC 1979).

1.B. ESTABLISHED TO PROTECT WATER SUPPLIES.

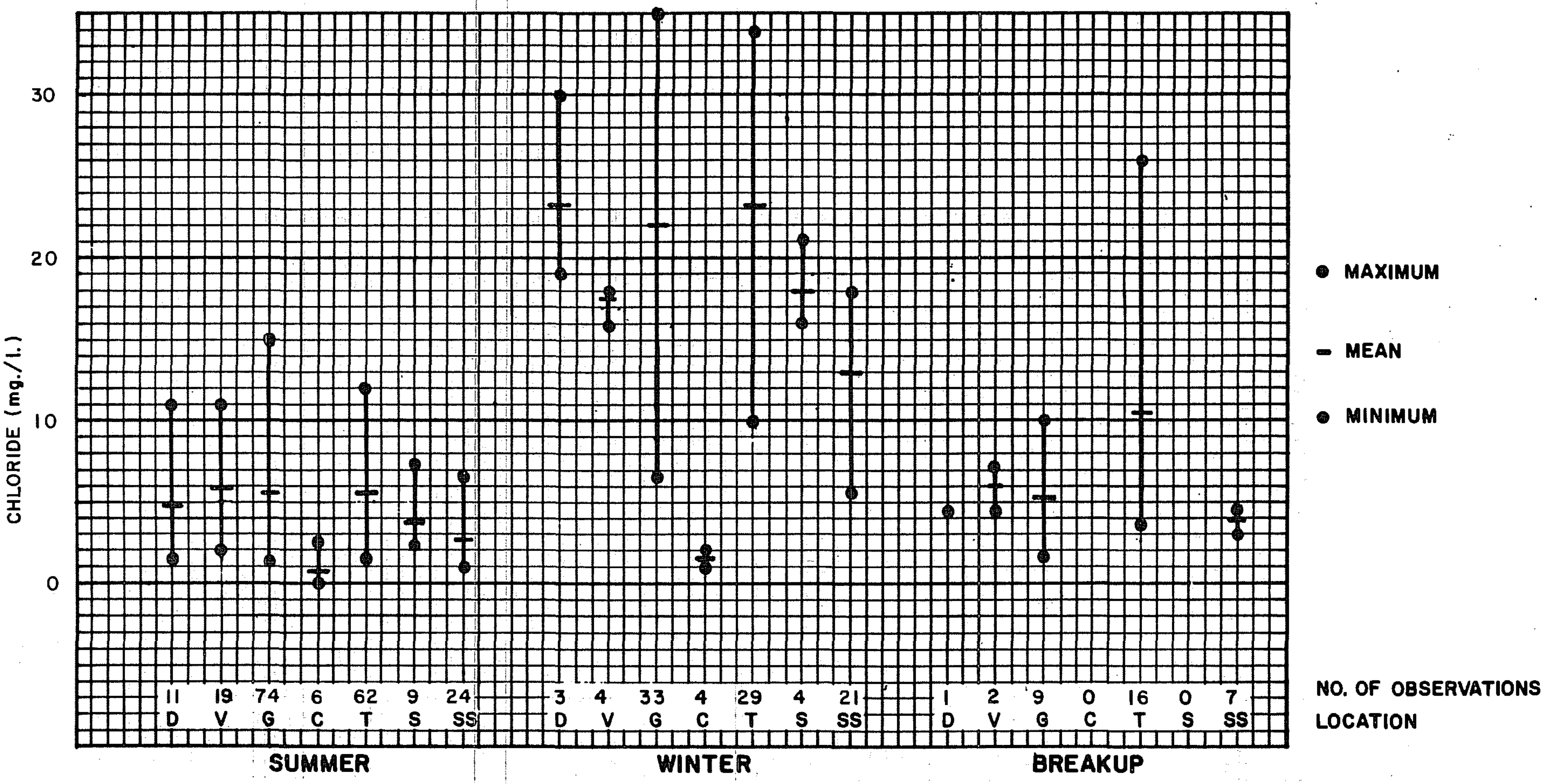
2. AT GOLD CREEK, 1 SUMMER OBSERVATION AND 1 BREAKUP OBSERVATION WERE LESS THAN 5.0 mg./l.

3. AT TALKEETNA, 1 SUMMER OBSERVATION WAS LESS THAN 1.0 mg./l.

SOURCE: USGS AND R&M

DATA SUMMARY - SULFATE

FIGURE E.2.2.114



D-DENALI V-VEE CANYON G-GOLD CREEK C-CHULITNA T-TALKEETNA S-SUNSHINE SS-SUSITNA STATION

NOTES:

1. A. CRITERION: LESS THAN 200 mg/l (ADEC 1979).

1. B. ESTABLISHED TO PROTECT WATER SUPPLIES.

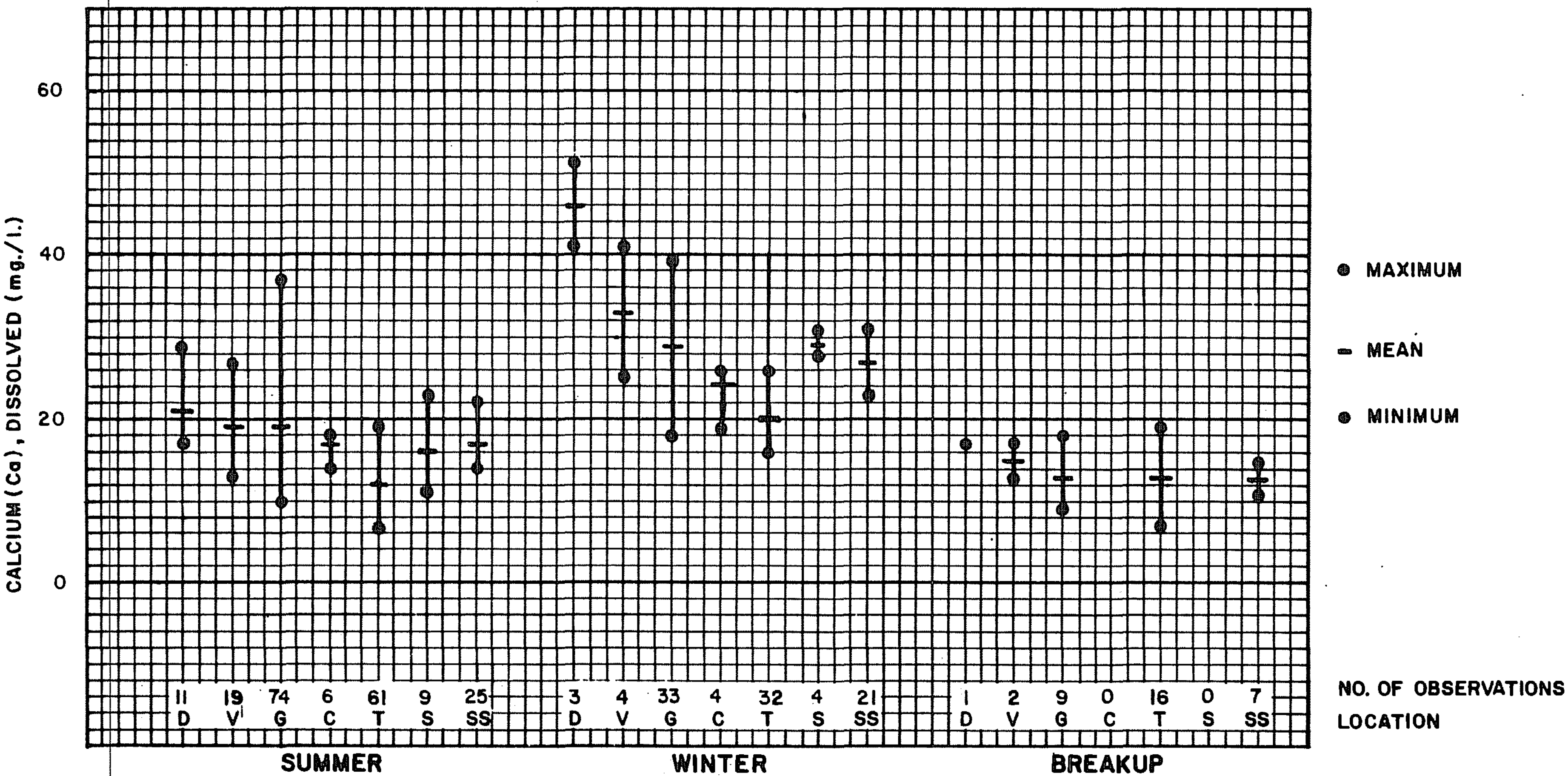
2. AT VEE CANYON, 3 SUMMER OBSERVATIONS WERE LESS THAN THE DETECTION LIMIT OF 1.0 mg/l.

3. AT GOLD CREEK, 2 SUMMER OBSERVATIONS WERE LESS THAN THE DETECTION LIMIT OF 1.0 mg/l.

DATA SUMMARY – CHLORIDE

SOURCE: USGS AND R&M

FIGURE E.2.2.115



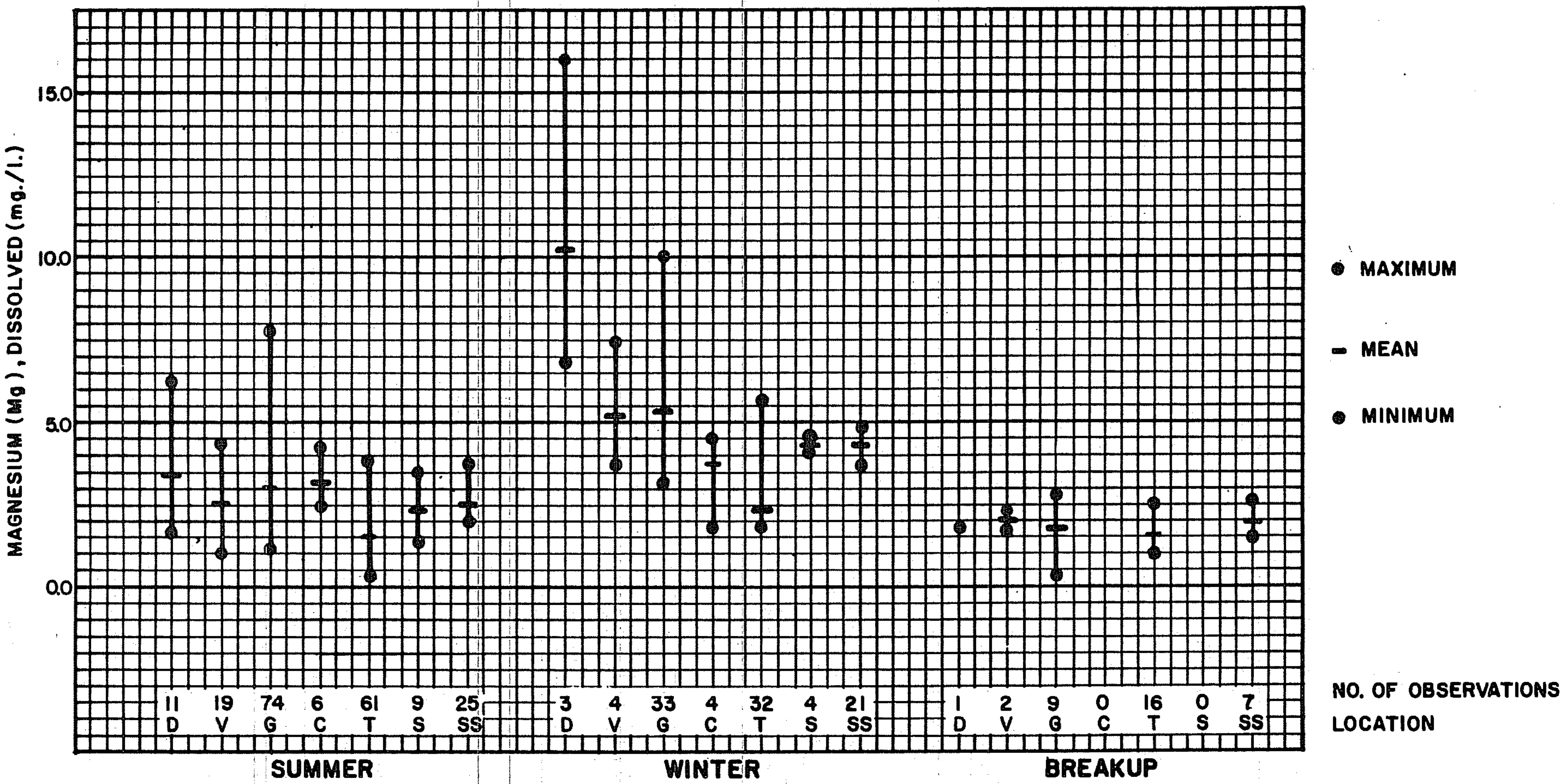
D-DENALI V-VEE CANYON G-GOLD CREEK C-CHULITNA T-TALKEETNA S-SUNSHINE SS-SUSITNA STATION

NOTES:
1. NO CRITERION ESTABLISHED.
2. (d)= DISSOLVED

DATA SUMMARY – CALCIUM (d)

SOURCE: USGS AND R&M

FIGURE E.2.2.116



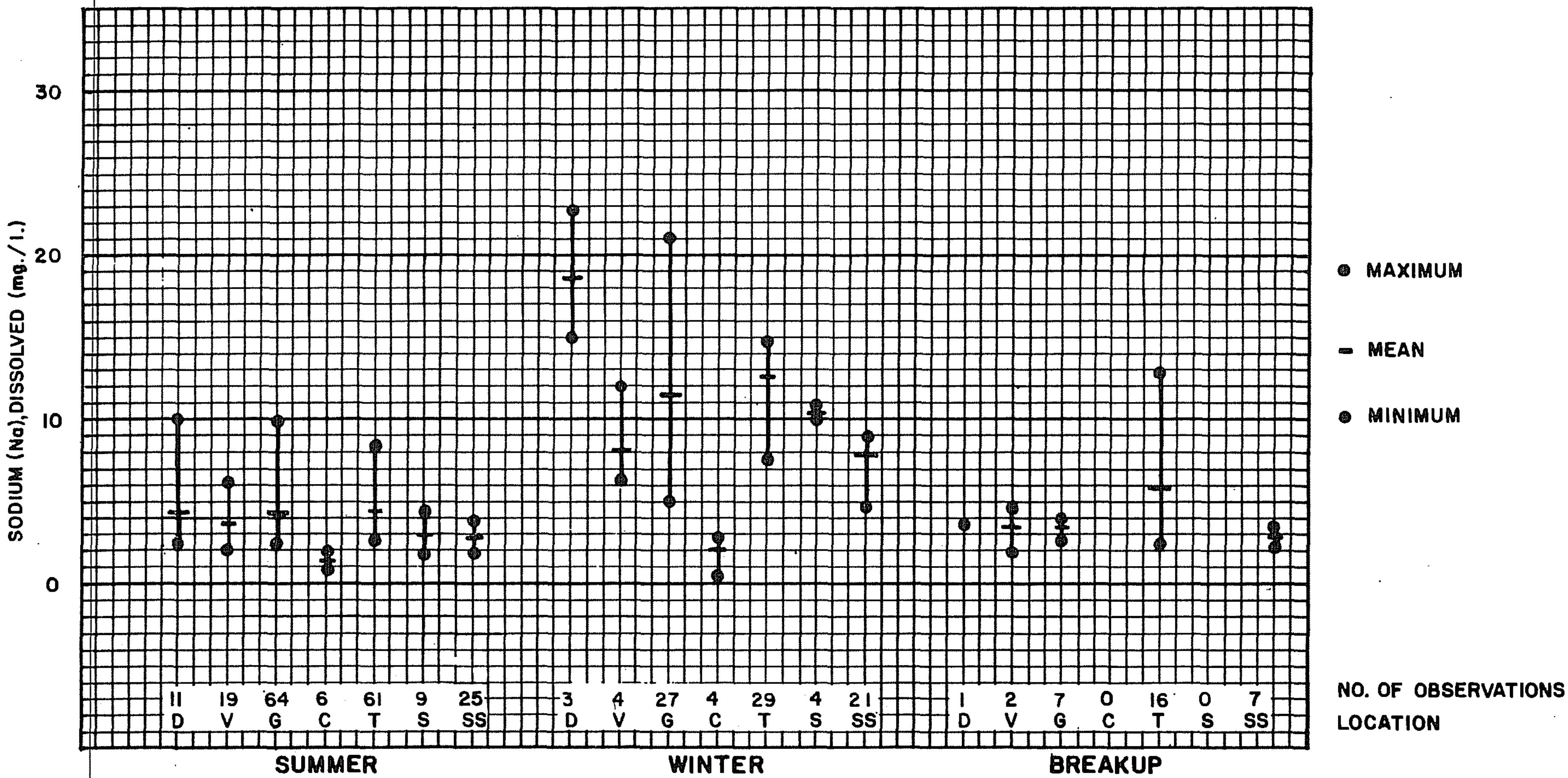
D-DENALI V-VEE CANYON G-GOLD CREEK C-CHULITNA T-TALKEETNA S-SUNSHINE SS-SUSITNA STATION

NOTES:
1. NO CRITERION ESTABLISHED.
2. (d)- DISSOLVED.

DATA SUMMARY-MAGNESIUM (d)

SOURCE: USGS AND R&M

FIGURE E.2.2.117



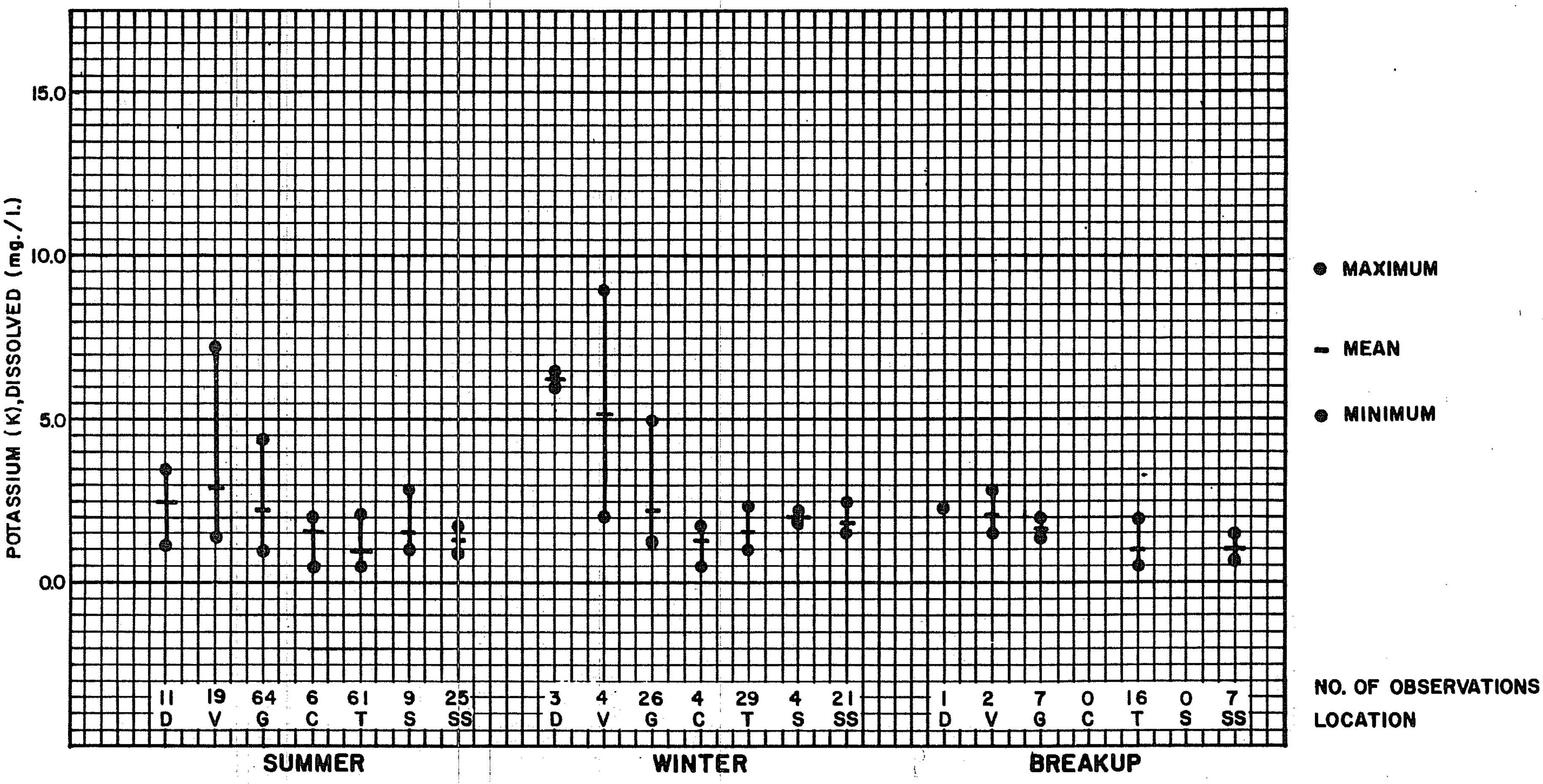
D-DENALI V-VEE CANYON G-GOLD CREEK C-CHULITNA T-TALKEETNA S-SUNSHINE SS-SUSITNA STATION

NOTES:
1. NO CRITERION ESTABLISHED.
2. (d)- DISSOLVED

DATA SUMMARY-SODIUM (d)

SOURCE: USGS AND R&M

FIGURE E.2.2.118



D-DENALI V-VEE CANYON G-GOLD CREEK C-CHULITNA T-TALKEETNA S-SUNSHINE SS-SUSITNA STATION

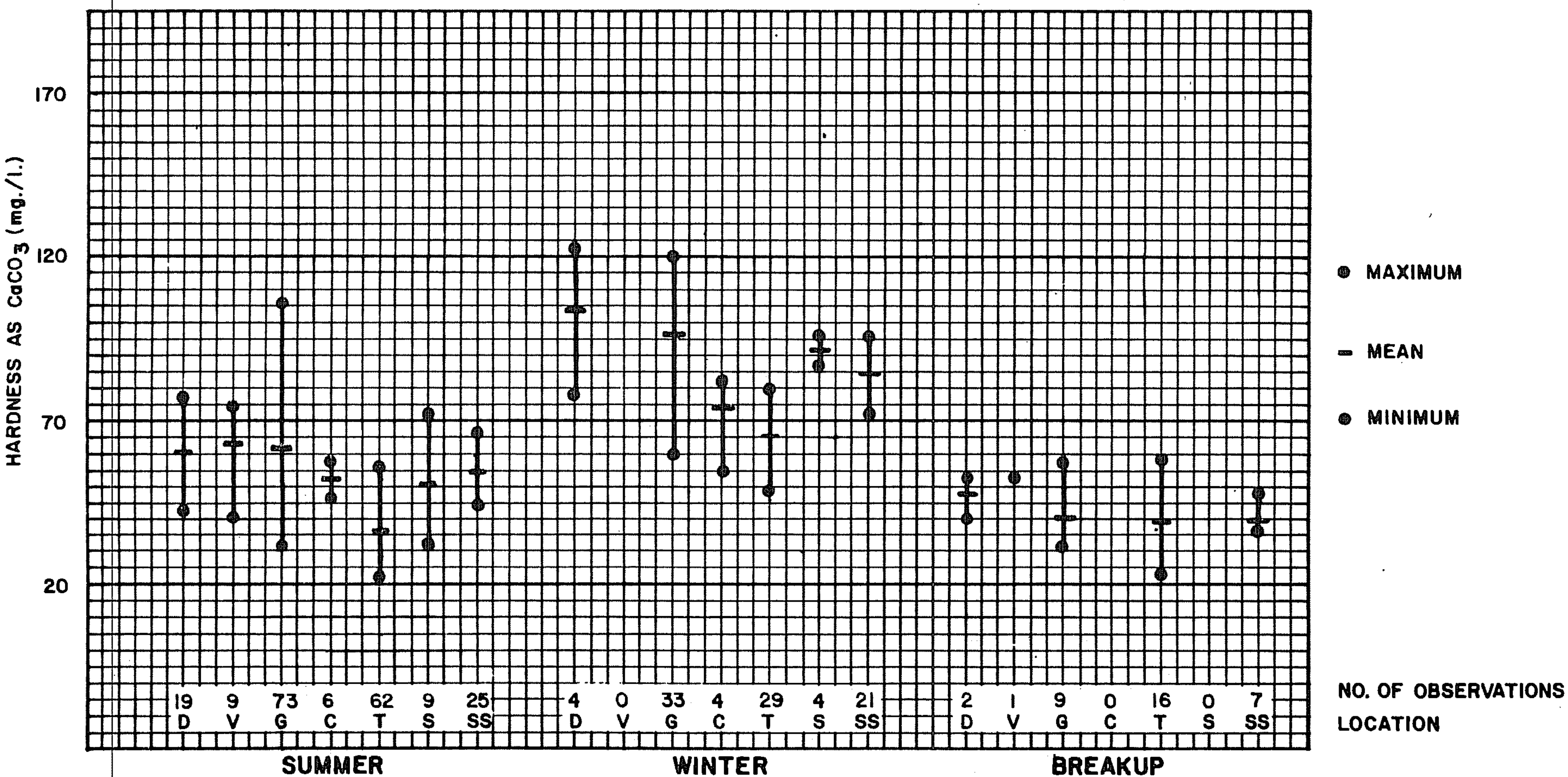
NOTES:

1. NO CRITERION ESTABLISHED.
2. AT VEE CANYON, 1 SUMMER OBSERVATION AND 1 WINTER OBSERVATION WERE LESS THAN THE DETECTION LIMIT OF 1.0 mg./l.
3. (d) = DISSOLVED

DATA SUMMARY-POTASSIUM (d)

SOURCE: USGS AND R&M

FIGURE E.2.2.119



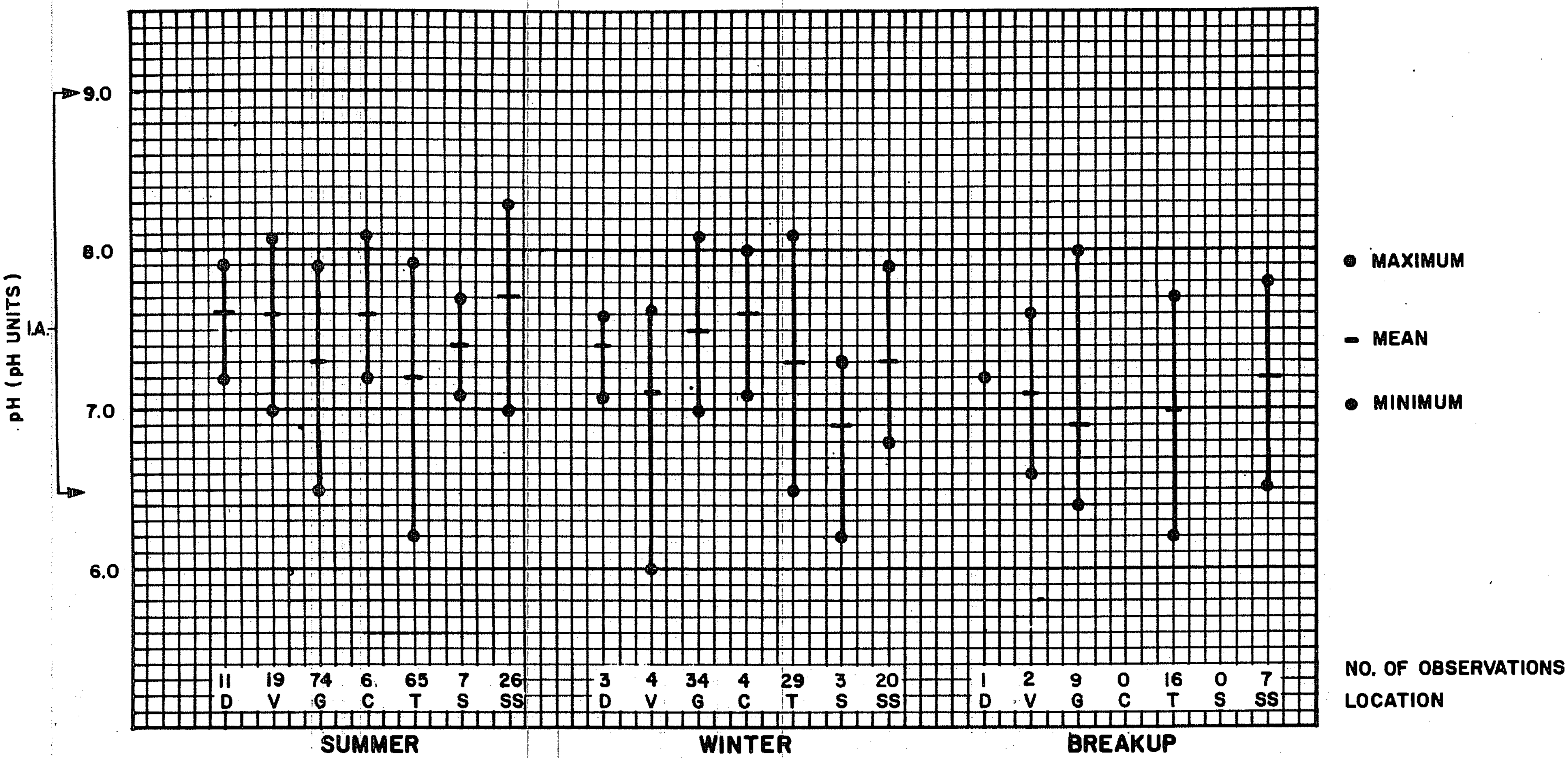
D-DENALI V-VEE CANYON G-GOLD CREEK C-CHULITNA T-TALKEETNA S-SUNSHINE SS-SUSITNA STATION

NOTES:
1. NO CRITERION ESTABLISHED.
2. SOME METALS HAVE VARIABLE SYNERGISTIC EFFECTS WITH HARDNESS, DEPENDENT ON THE PREVAILING HARDNESS IN THE WATER. THE CRITERIA FOR CADIUM, FOR EXAMPLE, ARE 0.0012 mg./l. IN HARD WATER AND 0.0004 mg./l. IN SOFT WATER.

DATA SUMMARY - HARDNESS

SOURCE: USGS AND R&M

FIGURE E.2.2.120



D-DENALI V-VEE CANYON G-GOLD CREEK C-CHULITNA T-TALKEETNA S-SUNSHINE SS-SUSITNA STATION

NOTES:

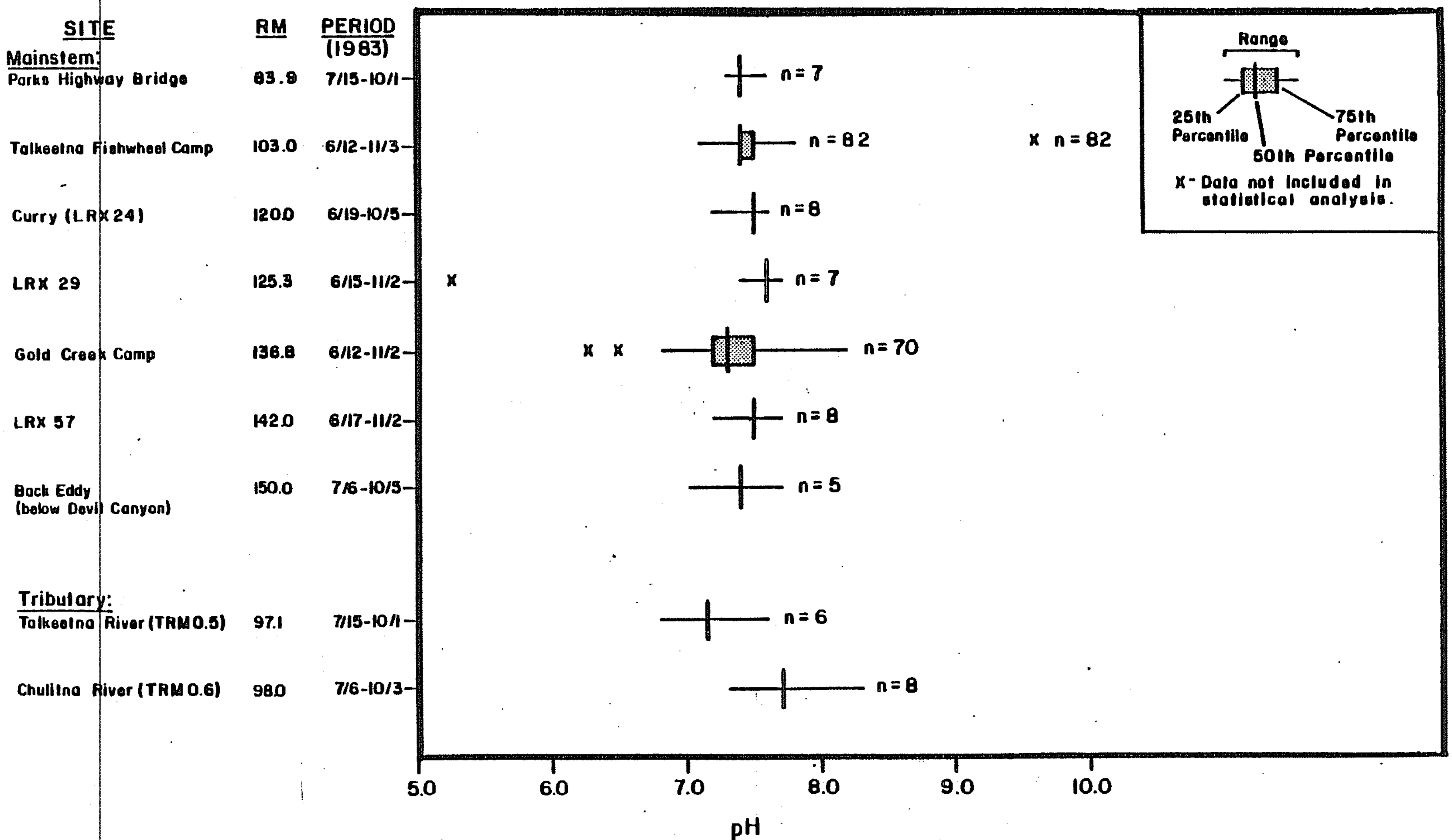
I. A. CRITERIA: NOT LESS THAN 6.5 OR GREATER THAN 9.0 pH UNITS. SHALL NOT VARY MORE THAN 0.5 pH UNITS FROM NATURAL CONDITION (ADEC 1979).

I. B. ESTABLISHED TO PROTECT FRESHWATER AQUATIC ORGANISMS.

DATA SUMMARY- pH

SOURCE: USGS AND R&M

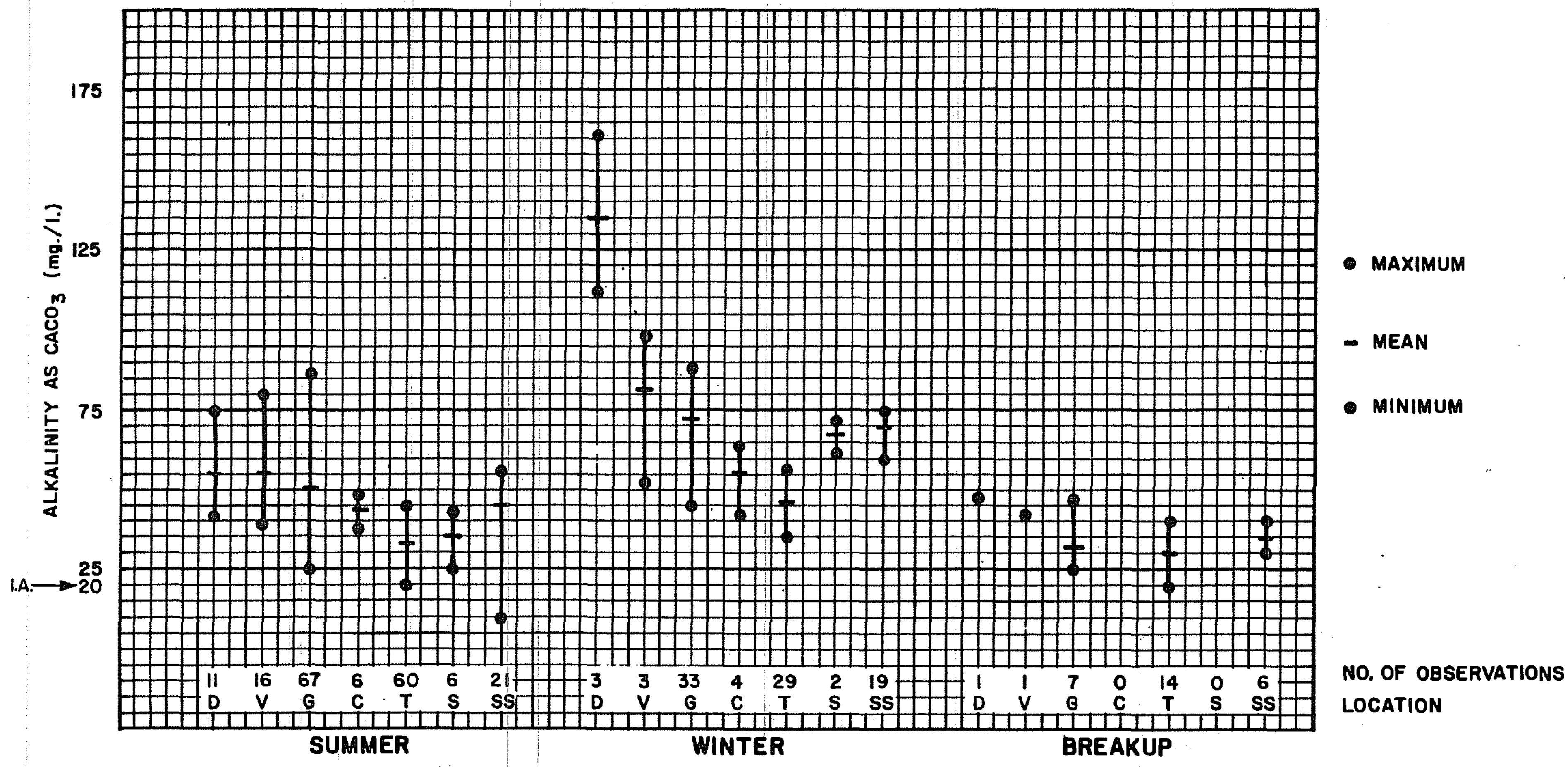
FIGURE E.2.2.121



pH DATA SUMMARY SHOWING RANGE, 25th, 50th (MEDIAN), AND 75th PERCENTILE FOR MAINSTEM AND TRIBUTARY WATER QUALITY STUDY SITES

SOURCE: ADF & G 1984c

FIGURE E.2.2.122



D-DENALI V-VEE CANYON G-GOLD CREEK C-CHULITNA T-TALKEETNA S-SUNSHINE SS-SUSITNA STATION

NOTES:

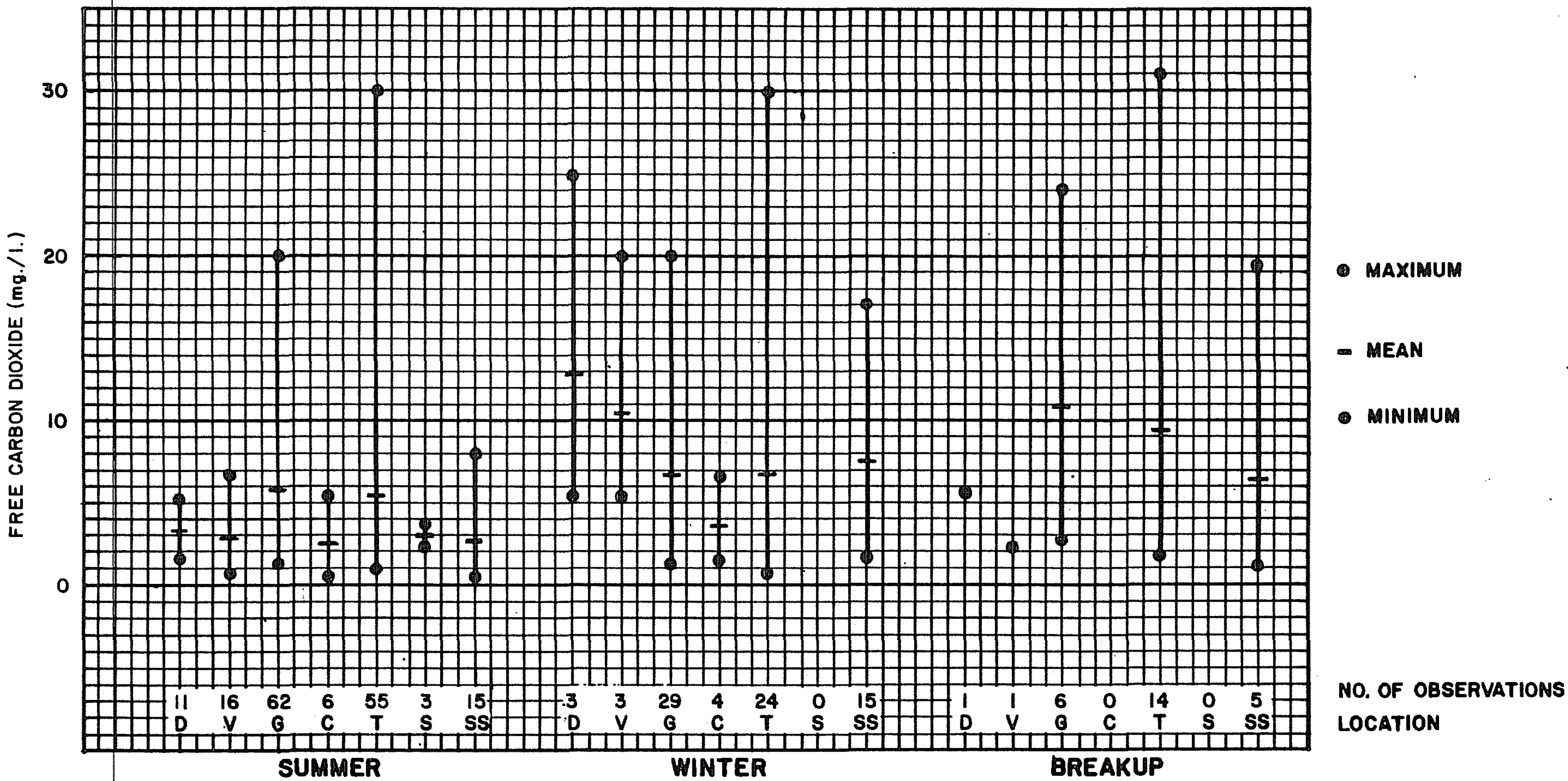
I. A. CRITERION: 20 mg./l. OR MORE EXCEPT WHERE NATURAL CONDITIONS ARE LESS (EPA 1976).

I. B. ESTABLISHED TO PROTECT FRESHWATER AQUATIC ORGANISMS.

DATA SUMMARY - ALKALINITY

SOURCE: USGS AND R&M

FIGURE E.2.2.123



D-DENALI V-VEE CANYON G-GOLD CREEK C-CHULITNA T-TALKEETNA S-SUNSHINE SS-SUSITNA STATION

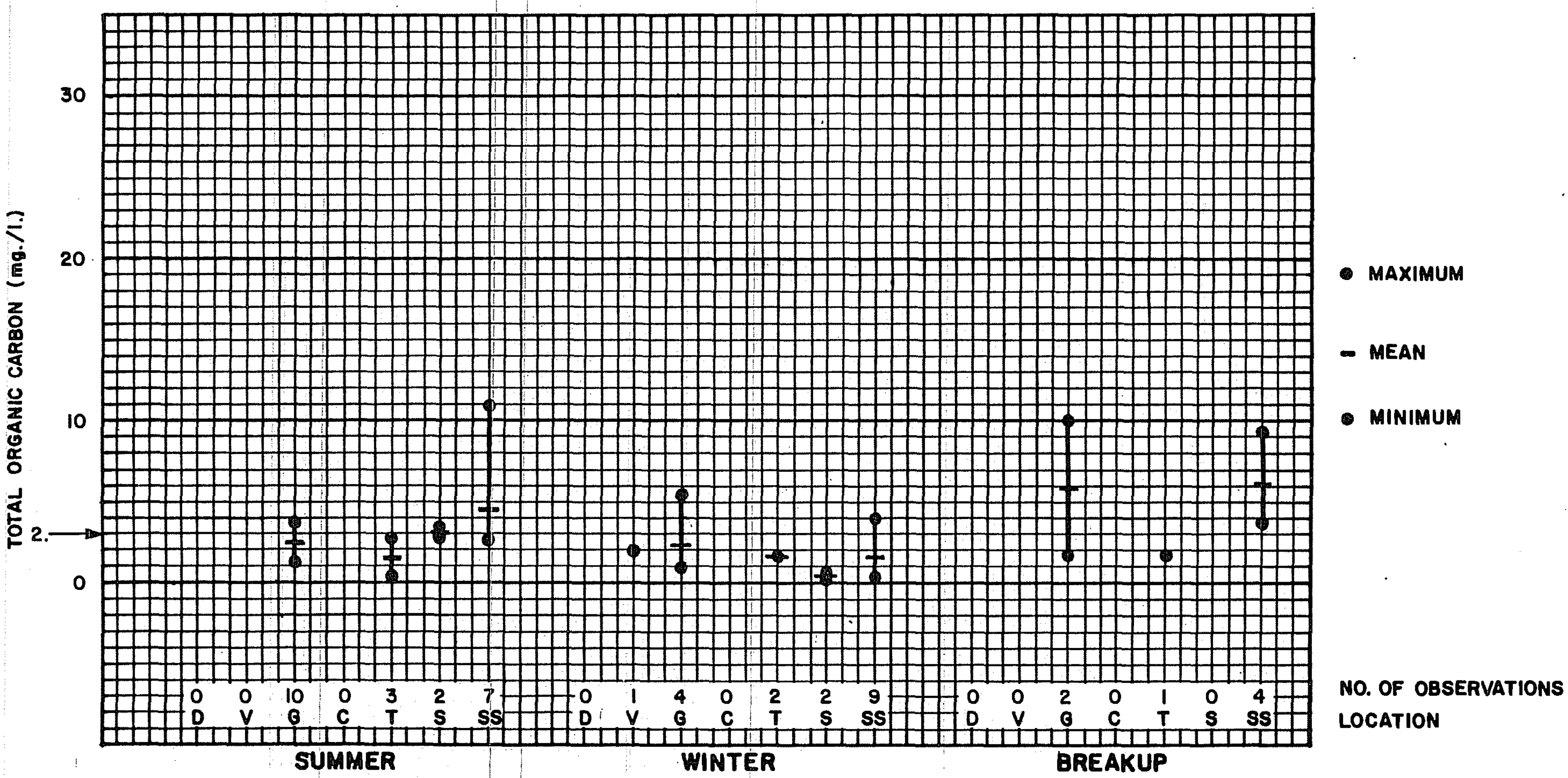
NOTE:

1. NO CRITERION ESTABLISHED.

DATA SUMMARY - FREE CARBON DIOXIDE

SOURCE: USGS AND R&M

FIGURE E.2.2.124



D-DENALI V-VEE CANYON G-GOLD CREEK C-CHULITNA T-TALKEETNA S-SUNSHINE SS-SUSITNA STATION

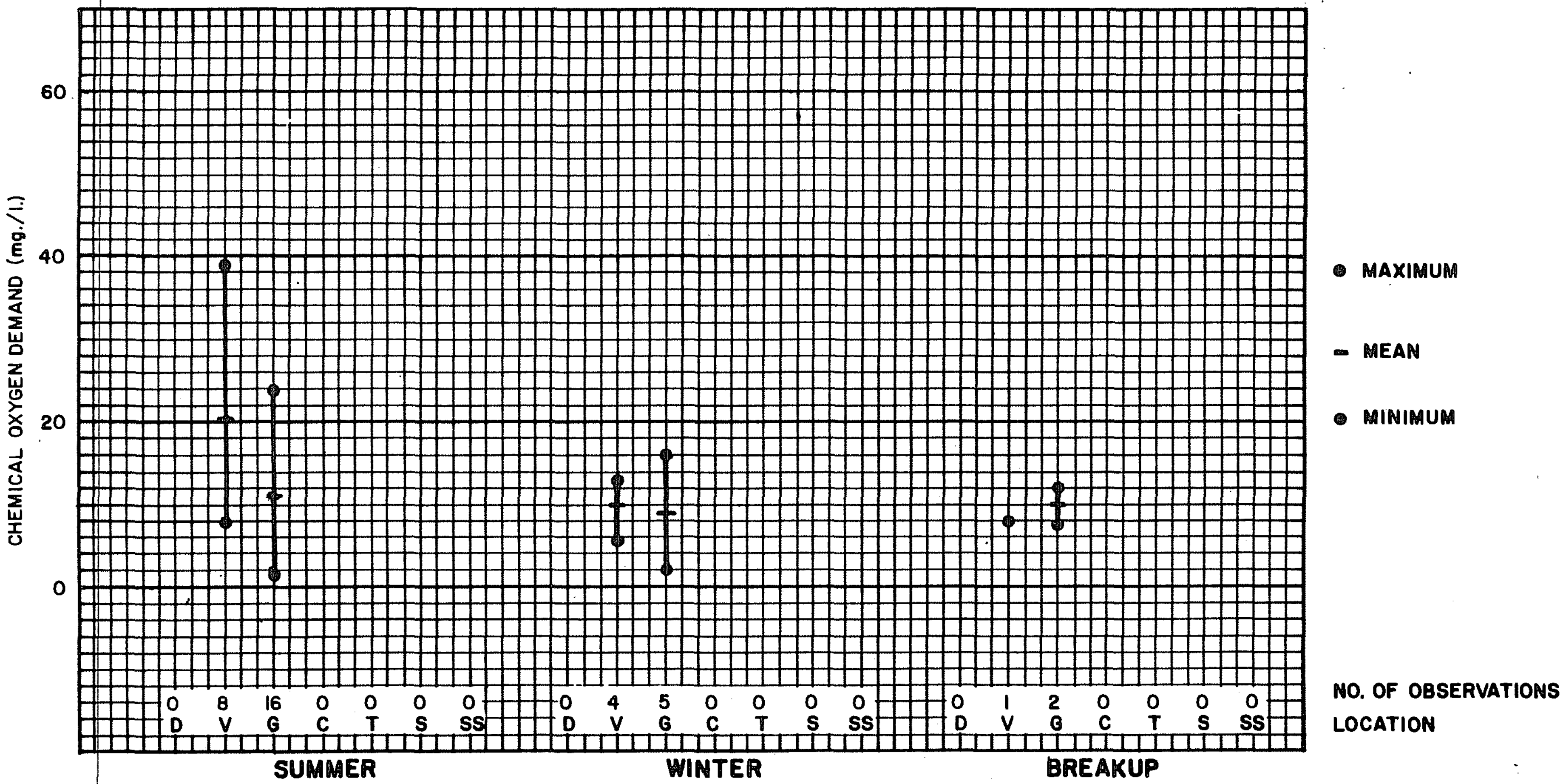
NOTES:

1. NO CRITERION ESTABLISHED.
2. WATERS CONTAINING LESS THAN 3.0 mg./l. HAVE BEEN OBSERVED TO BE RELATIVELY CLEAN (McNEELY et al. 1979).

DATA SUMMARY-TOTAL ORGANIC CARBON

SOURCE: USGS AND R&M

FIGURE E.2.2.125



D-DENALI V-VEE CANYON G-GOLD CREEK C-CHULITNA T-TALKEETNA S-SUNSHINE SS-SUSITNA STATION

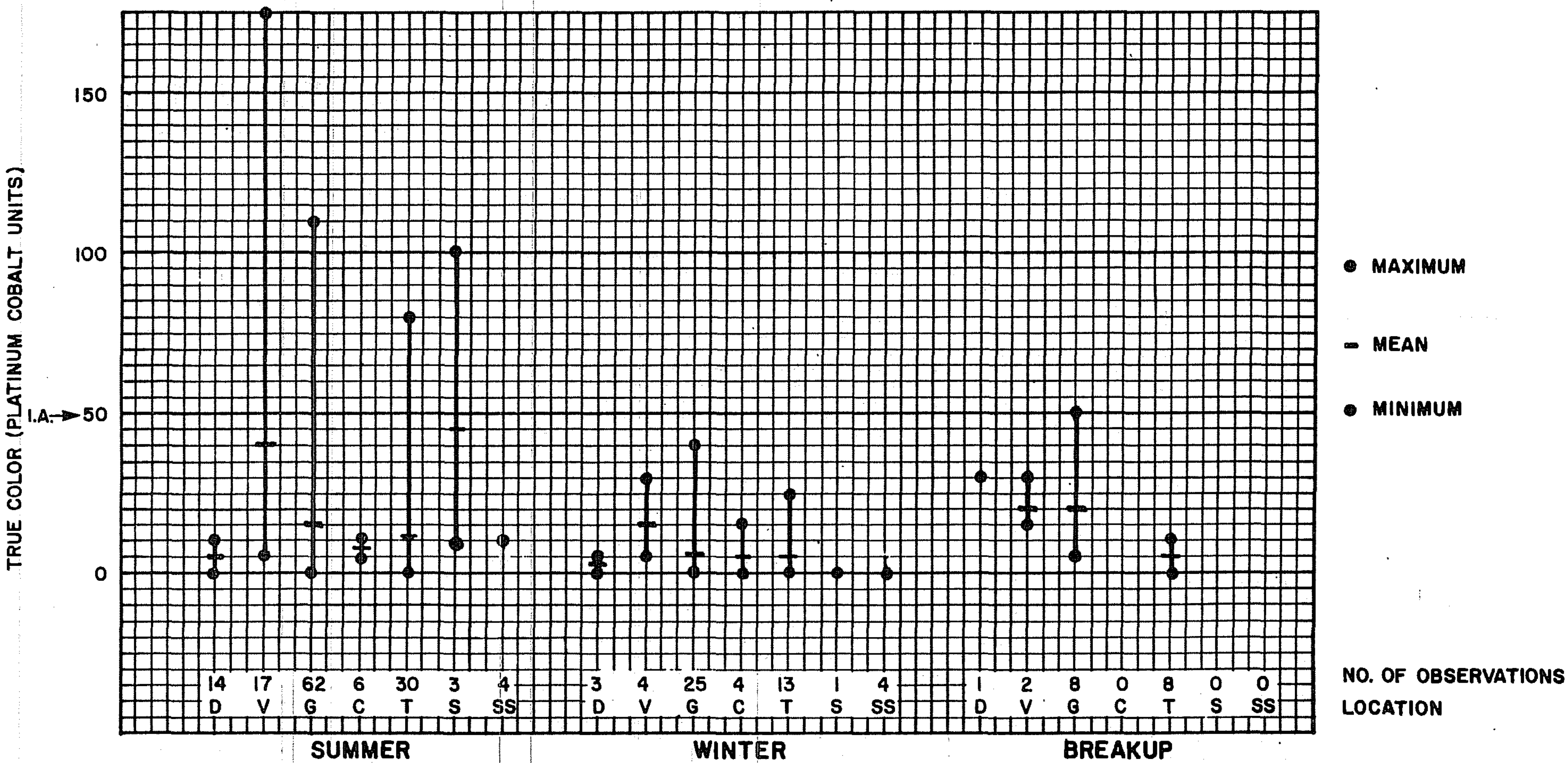
NOTES:

1. NO CRITERION ESTABLISHED.
2. AT GOLD CREEK, 2 SUMMER OBSERVATIONS WERE LESS THAN 1.0 mg./l.

DATA SUMMARY-CHEMICAL OXYGEN DEMAND

SOURCE: R & M

FIGURE E.2.2.126



D-DENALI V-VEE CANYON G-GOLD CREEK C-CHULITNA T-TALKEETNA S-SUNSHINE SS-SUSITNA STATION

NOTES:

1.A. CRITERION: SHALL NOT EXCEED 50 UNITS (ADEC 1979).

1.B. ESTABLISHED TO PREVENT THE REDUCTION OF PHOTOSYNTHETIC ACTIVITY WHICH MAY HAVE DELETERIOUS EFFECTS ON AQUATIC LIFE.

2. AT DENALI, 1 SUMMER OBSERVATION WAS LESS THAN 5 UNITS. ONE SUMMER OBSERVATION WAS GREATER THAN 5 UNITS.

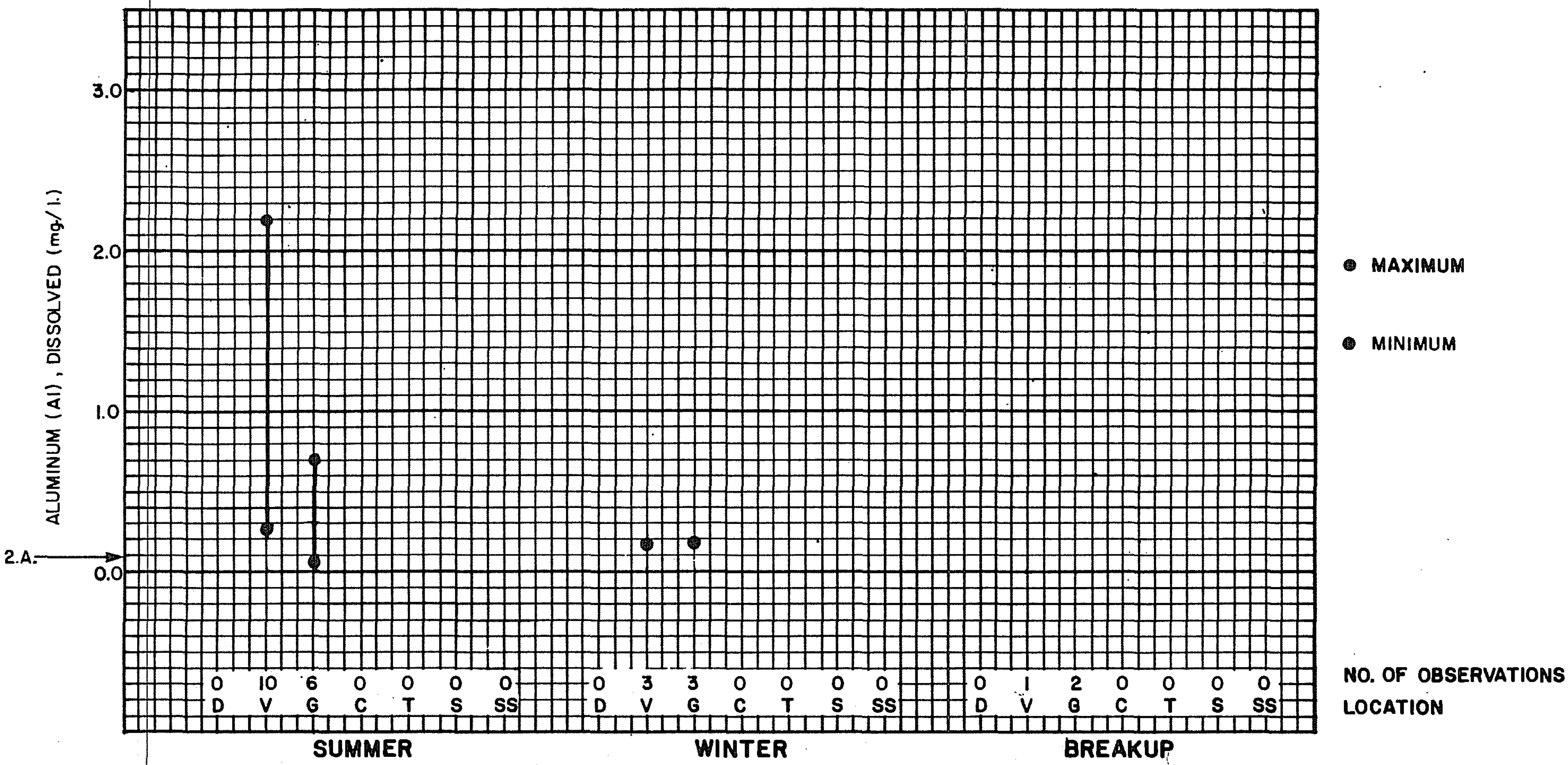
3. AT SUSITNA STATION, 2 SUMMER OBSERVATIONS AND 2 WINTER OBSERVATIONS WERE LESS THAN 5 UNITS.

4. AT TALKEETNA, 1 WINTER OBSERVATION WAS LESS THAN 5 UNITS.

SOURCE: USGS AND R&M

DATA SUMMARY - TRUE COLOR

FIGURE E.2.2.127



D-DENALI V-VEE CANYON G-GOLD CREEK C-CHULITNA T-TALKEETNA S-SUNSHINE SS-SUSITNA STATION

NOTES:

1. NO CRITERION ESTABLISHED.

2. A. A LIMIT OF 0.073 mg./l. HAS BEEN SUGGESTED BY EPA (SITTIG 1981).

2.B. THIS SUGGESTED LIMIT IS BASED ON THE EFFECTS OF ALUMINUM ON HUMAN HEALTH.

3. AT VEE CANYON, 7 SUMMER OBSERVATIONS WERE LESS THAN 0.10 mg./l. TWO WINTER OBSERVATIONS AND THE ONE SUMMER OBSERVATION WERE LESS THAN THE DETECTION LIMIT OF 0.05 mg./l.

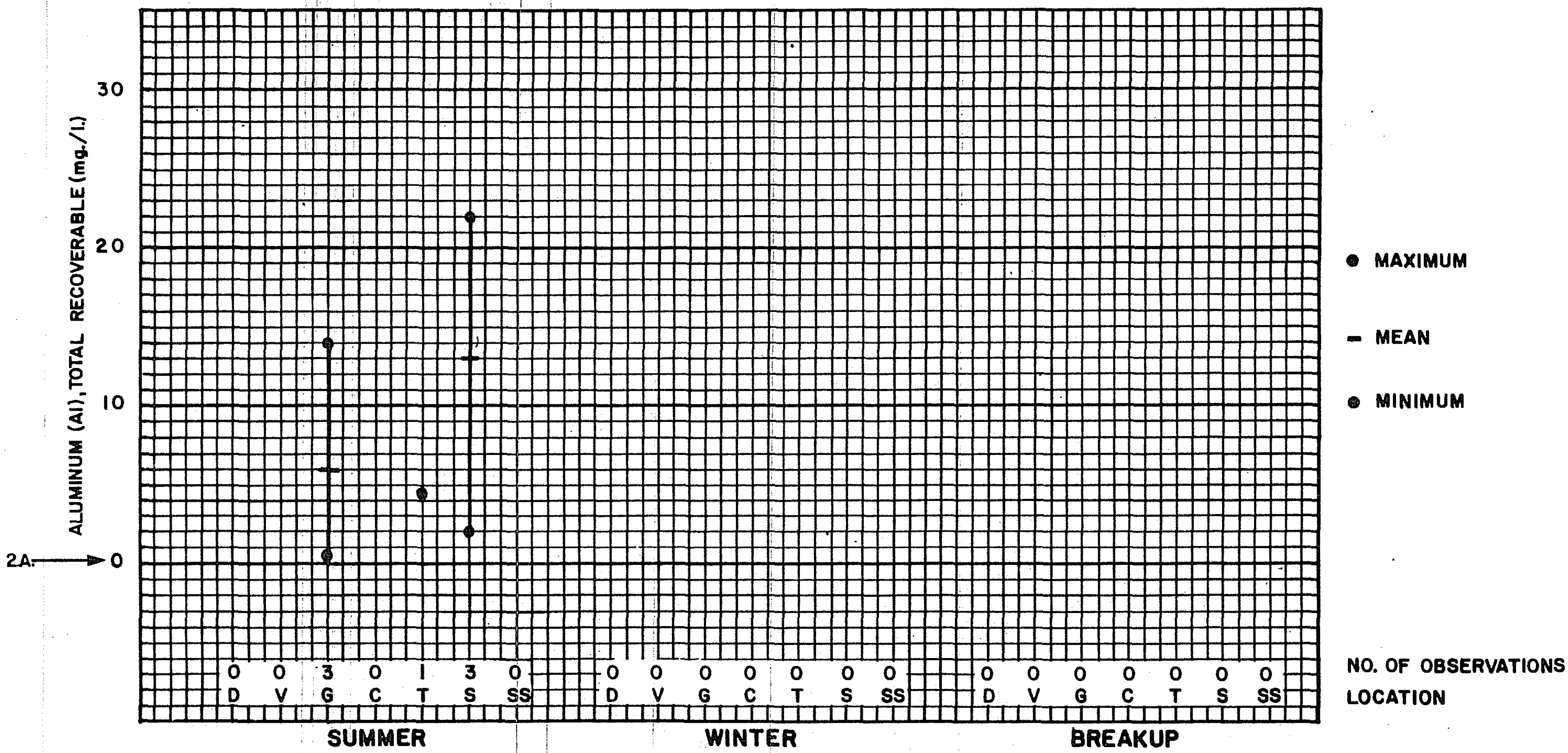
4. AT GOLD CREEK, 4 SUMMER OBSERVATIONS, 2 WINTER OBSERVATIONS AND THE 2 BREAKUP OBSERVATIONS WERE LESS THAN THE DETECTION LIMIT OF 0.05 mg./l.

5. (d) = DISSOLVED.

DATA SUMMARY - ALUMINUM (d)

SOURCE: R&M

FIGURE E.2.2.128



D-DENALI V-VEE CANYON G-GOLD CREEK C-CHULITNA T-TALKEETNA S-SUNSHINE SS-SUSITNA STATION

NOTES:

1. NO CRITERION ESTABLISHED.

2.A. A LIMIT OF 0.073 mg./l. HAS BEEN SUGGESTED BY EPA (SITTIG 1981).

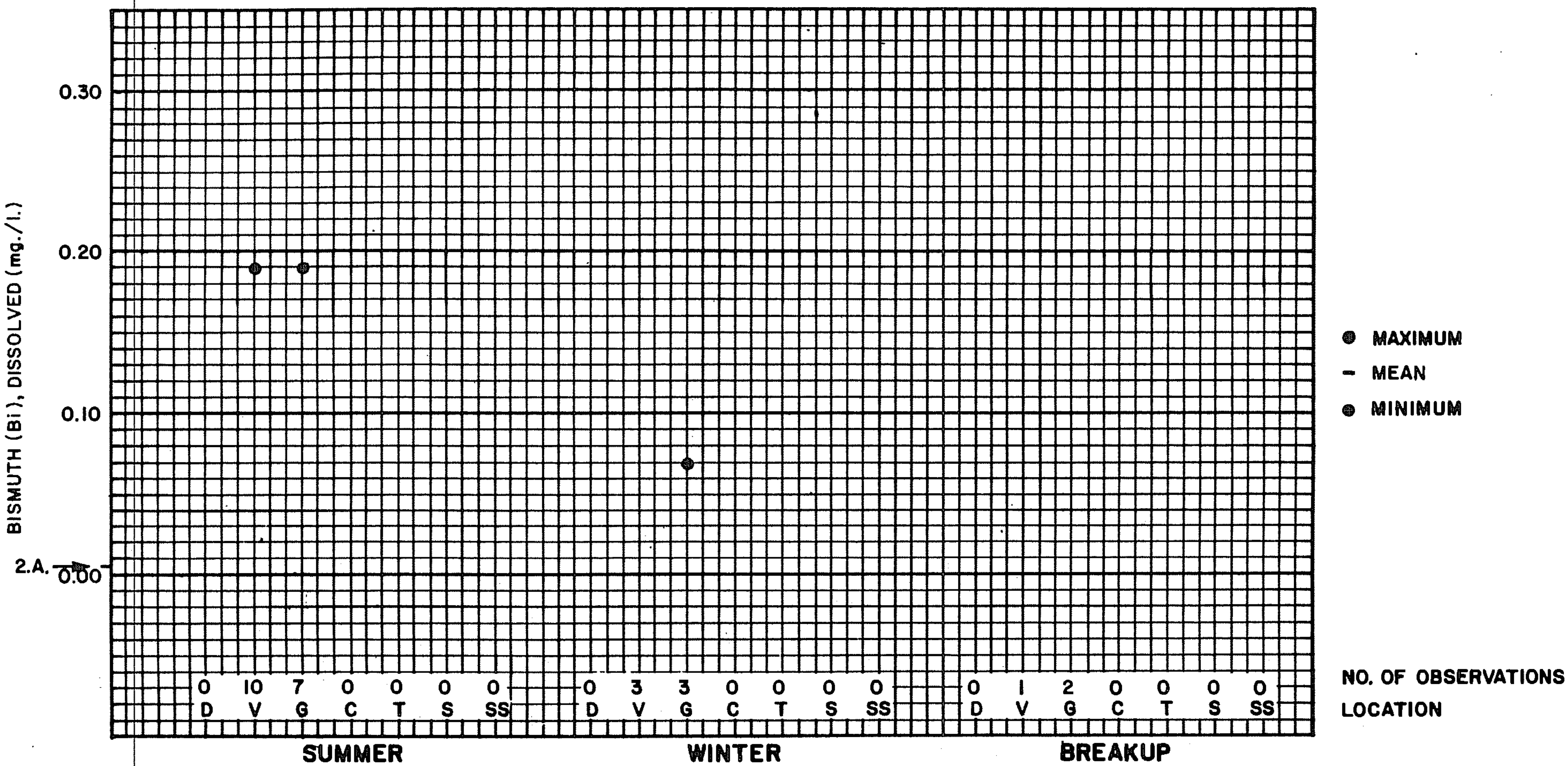
2.B. THIS SUGGESTED LIMIT IS BASED ON THE EFFECTS OF ALUMINUM ON HUMAN HEALTH.

3. (t) = TOTAL RECOVERABLE.

DATA SUMMARY - ALUMINUM (t)

SOURCE: USGS

FIGURE E.2.2.129



D-DENALI V-VEE CANYON G-GOLD CREEK C-CHULITNA T-TALKEETNA S-SUNSHINE SS-SUSITNA STATION

NOTES:

1. NO CRITERION ESTABLISHED.

2.A. EPA HAS SUGGESTED AN AMBIENT LIMIT OF 0.0035 mg./l. (SITTIG 1981).

2.B. THIS SUGGESTED LIMIT FOR BISMUTH IS BASED ON HUMAN HEALTH EFFECTS.

3. AT VEE CANYON, 9 SUMMER OBSERVATIONS, THE 3 WINTER OBSERVATIONS, AND THE 1 BREAKUP OBSERVATION WERE LESS THAN 0.05 mg./l.

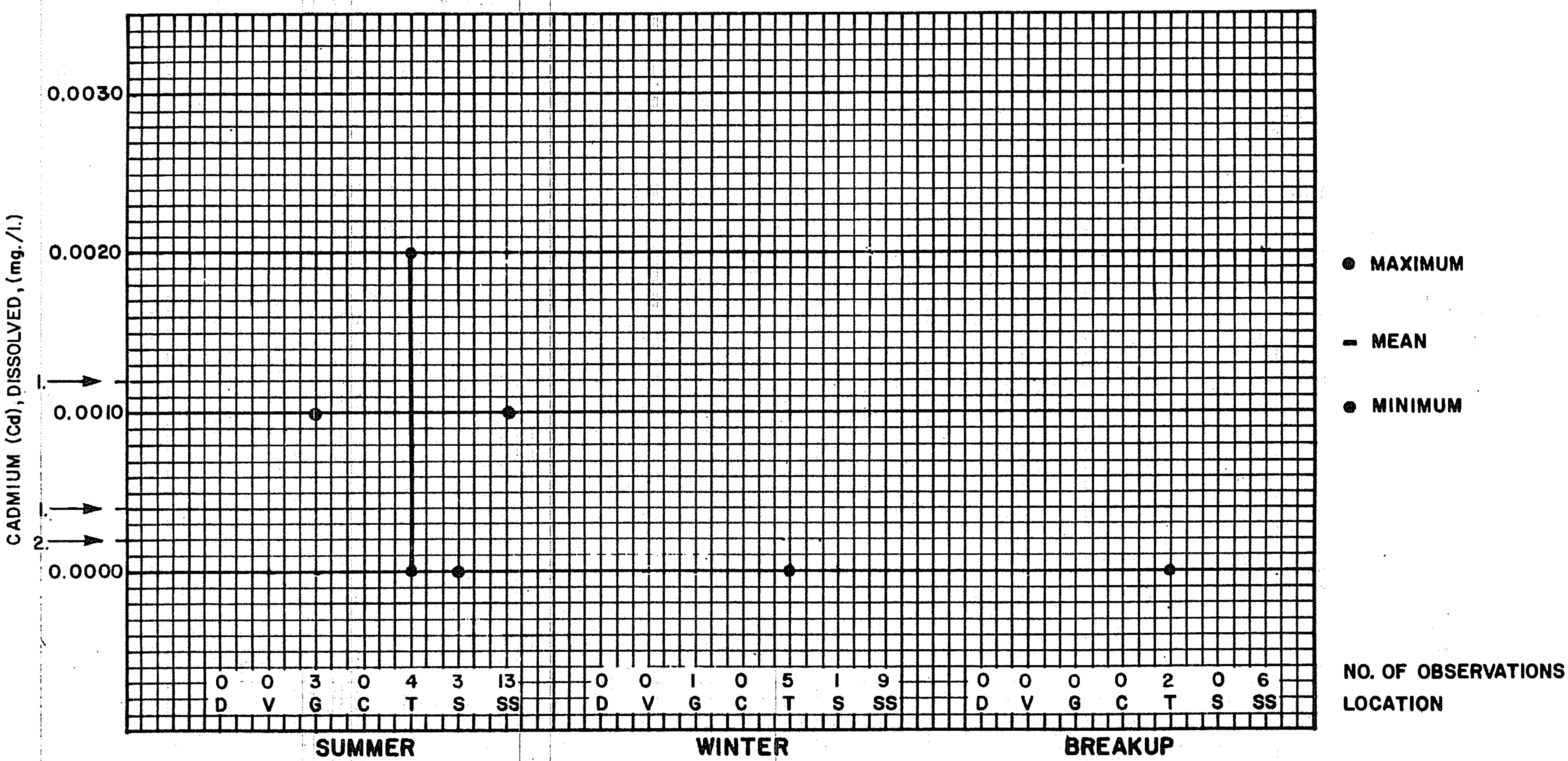
4. AT GOLD CREEK, 6 SUMMER OBSERVATIONS, 2 WINTER OBSERVATIONS, AND THE 2 BREAKUP OBSERVATIONS WERE LESS THAN 0.05 mg./l.

5. (d) = DISSOLVED.

SOURCE: R & M

DATA SUMMARY-BISMUTH (d)

FIGURE E.2.2.130



D-DENALI V-VEE CANYON G-GOLD CREEK C-CHULITNA T-TALKEETNA S-SUNSHINE SS-SUSITNA STATION

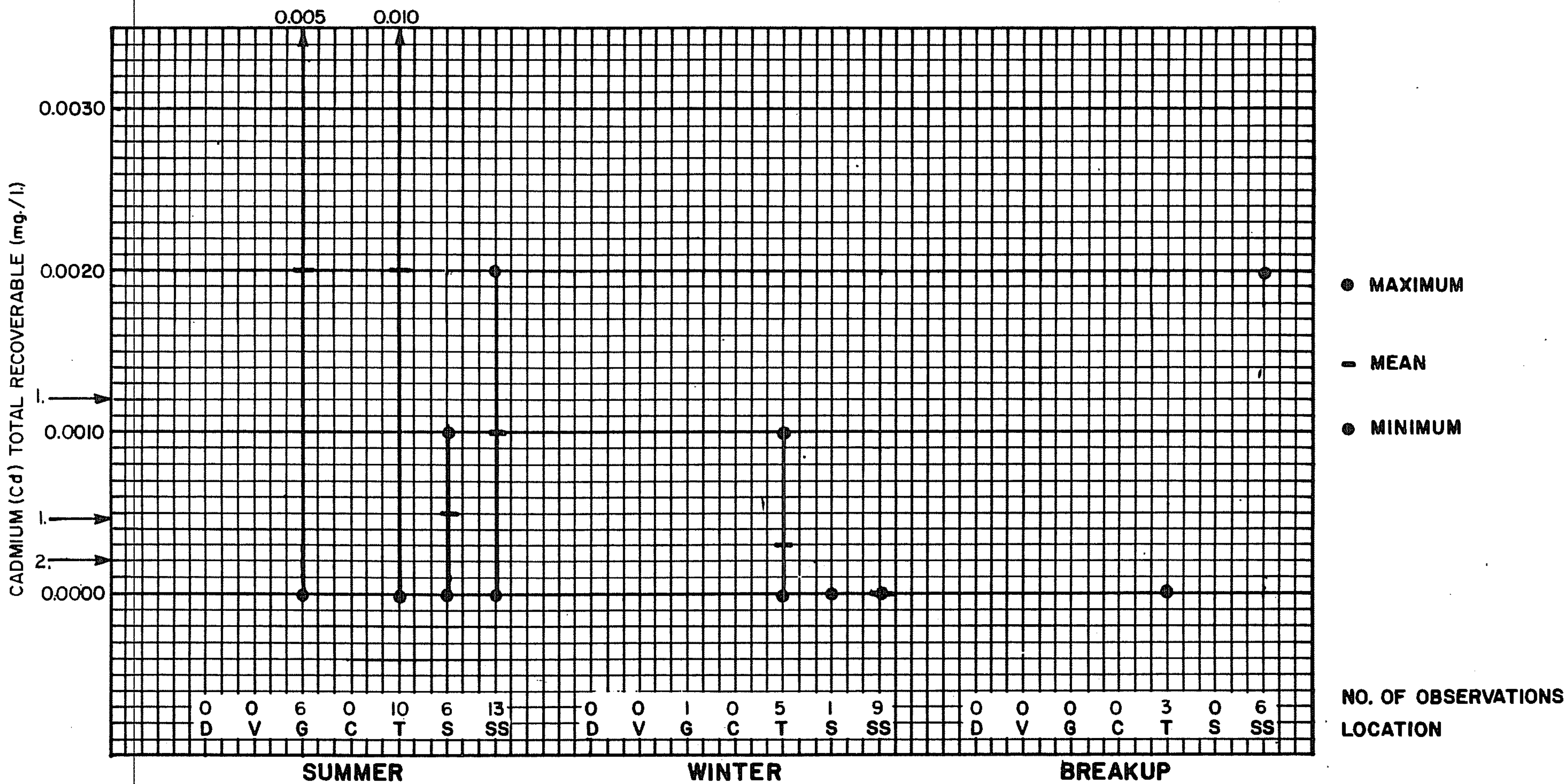
NOTES:

1. CRITERIA: 0.0012 mg./l. IN HARD WATER AND 0.0004 SOFT WATER (EPA 1976).
2. CRITERION: LESS THAN 0.0002 mg./l. (McNEELY et al. 1979).
3. THE ABOVE CRITERIA ESTABLISHED TO PROTECT FRESHWATER AQUATIC ORGANISMS.
4. AT GOLD CREEK, 1 SUMMER OBSERVATION WAS LESS THAN 0.001 mg./l. THE 1 WINTER OBSERVATION WAS LESS THAN 0.003 mg./l.
5. AT TALKEETNA, 2 SUMMER OBSERVATIONS AND 2 WINTER OBSERVATIONS WERE LESS THAN 0.001 mg./l.
6. AT SUNSHINE, 2 SUMMER OBSERVATIONS AND THE 1 WINTER OBSERVATION WERE LESS THAN 0.001 mg./l.
7. AT SUSITNA STATION, 12 SUMMER OBSERVATIONS WERE LESS THAN 0.002 mg./l. THE 9 WINTER OBSERVATIONS AND THE 6 BREAKUP OBSERVATIONS WERE LESS THAN 0.003 mg./l.
8. (d) = DISSOLVED

SOURCE: USGS

DATA SUMMARY - CADMIUM (d)

FIGURE E.2.2.131



D-DENALI V-VEE CANYON G-GOLD CREEK C-CHULITNA T-TALKEETNA S-SUNSHINE SS-SUSITNA STATION

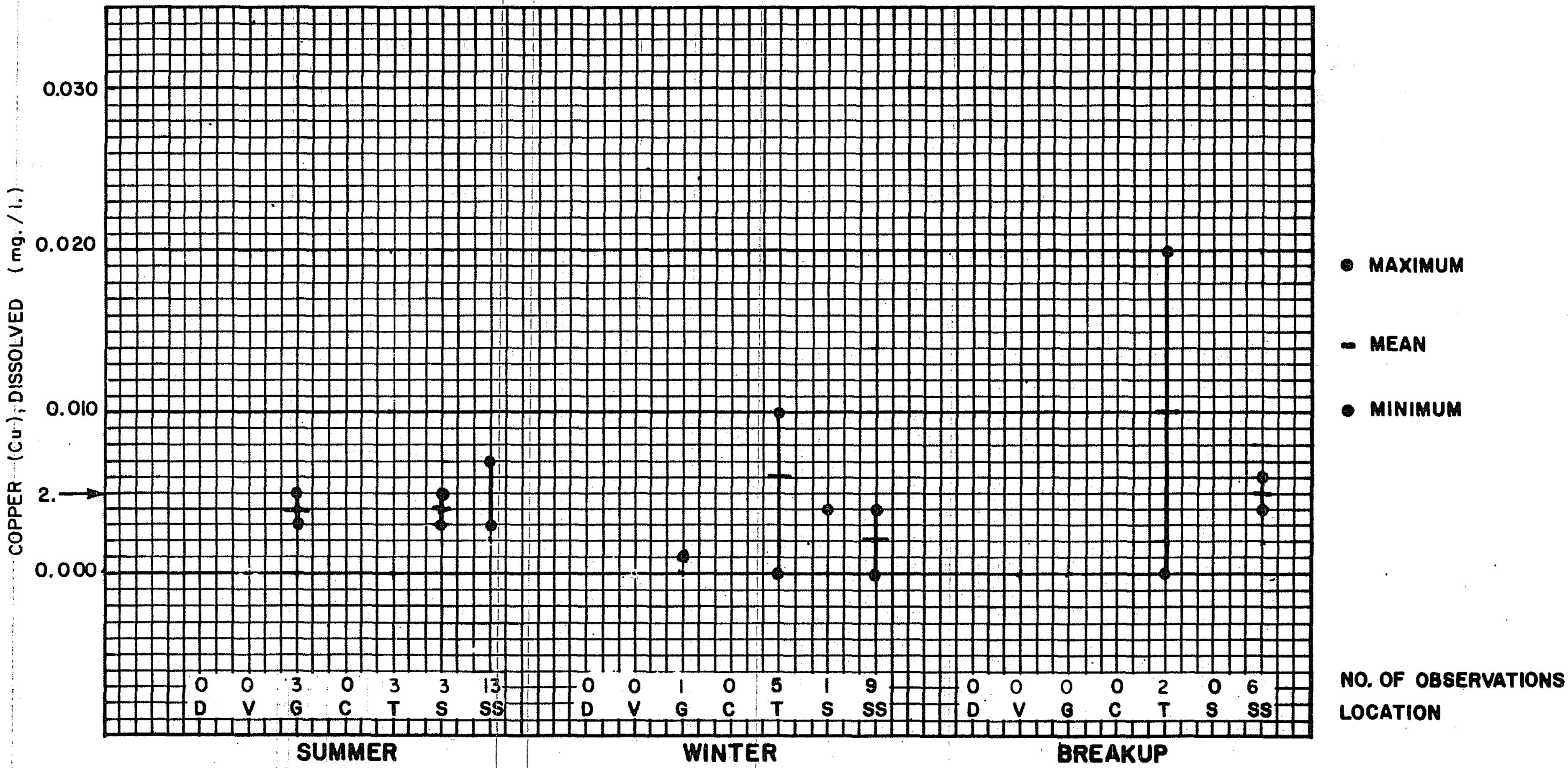
NOTES

1. CRITERIA: 0.0012 IN HARD WATER AND 0.0004 mg/l IN SOFT WATER (EPA 1976).
2. CRITERION LESS THAN 0.0002 mg./l. (McNEELY et al. 1979).
3. ABOVE CRITERIA ESTABLISHED TO PROTECT FRESHWATER AQUATIC ORGANISMS.
4. AT GOLD CREEK, 3 SUMMER OBSERVATIONS WERE LESS THAN 0.010 mg/l. THE 1 WINTER OBSERVATION WAS LESS THAN 0.001 mg./l.
5. AT TALKEETNA, 5 SUMMER OBSERVATIONS, 1 WINTER OBSERVATION AND 2 BREAKUP OBSERVATIONS WERE LESS THAN 0.010 mg./l.
6. AT SUNSHINE, 4 SUMMER OBSERVATIONS WERE LESS THAN 0.010 mg/l.
7. AT SUSITNA STATION, 7 SUMMER OBSERVATIONS, 7 WINTER OBSERVATIONS AND 5 BREAKUP OBSERVATIONS WERE LESS THAN 0.020 mg./l.
8. (t) = TOTAL RECOVERABLE.

DATA SUMMARY - CADMIUM (t)

SOURCE: USGS

FIGURE E.2.2.132



D-DENALI V-VEE CANYON G-GOLD CREEK C-CHULITNA T-TALKEETNA S-SUNSHINE SS-SUSITNA STATION

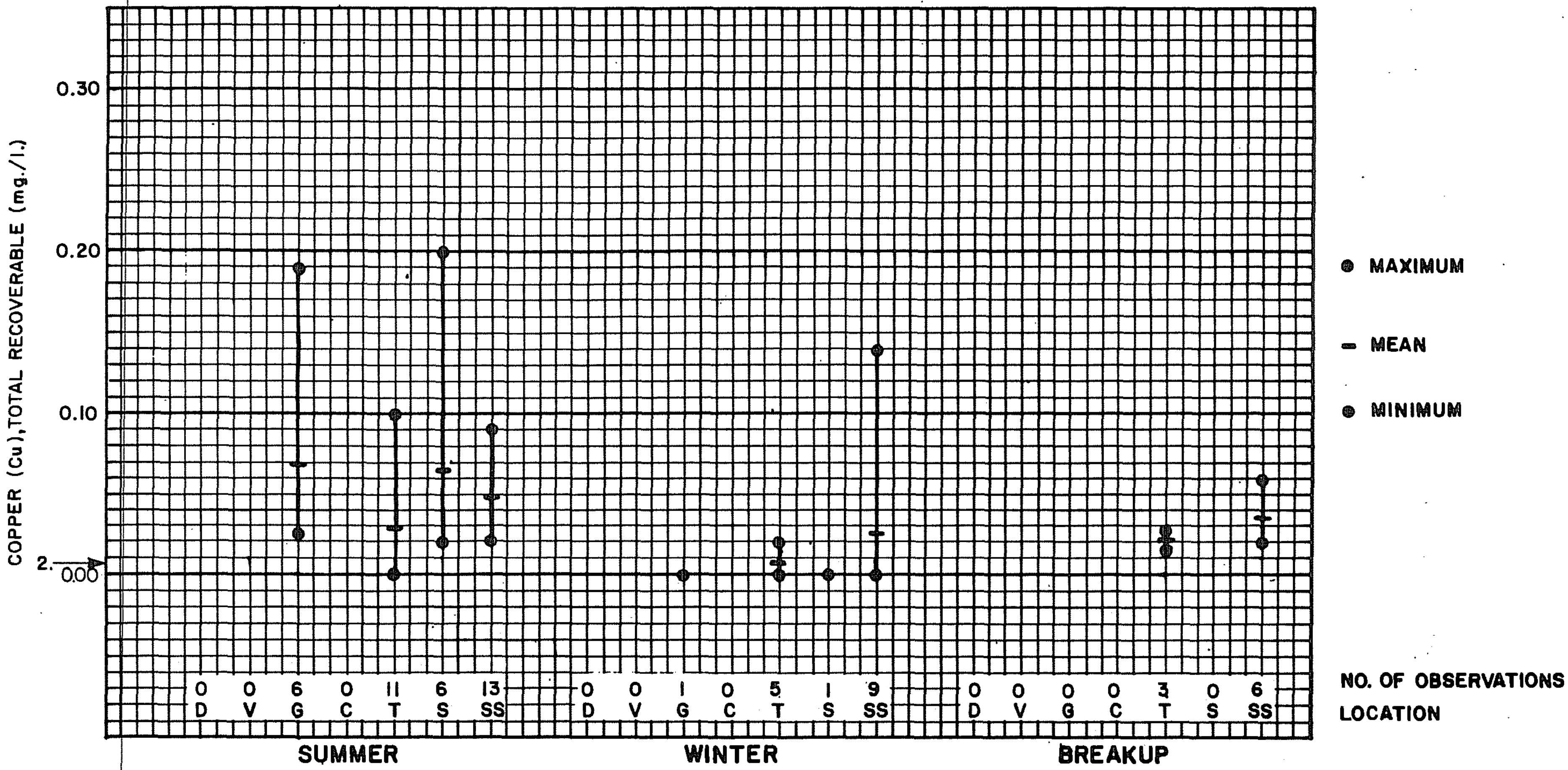
NOTES:

1. CRITERION: 0.01 OF THE 96-HOUR LC_{50} DETERMINED THROUGH BIOASSAY (EPA 1976).
2. CRITERION: 0.005 mg/l (McNEELY et al. 1979).
3. THE ABOVE CRITERIA ESTABLISHED TO PROTECT FRESHWATER AQUATIC ORGANISMS.
4. AT TALKEETNA, THE 3 SUMMER OBSERVATIONS WERE LESS THAN 0.010 mg/l.
5. AT SUSITNA STATION, 6 SUMMER OBSERVATIONS, 2 WINTER OBSERVATIONS AND 2 BREAKUP OBSERVATIONS WERE LESS THAN 0.002 mg/l.
6. (d) = DISSOLVED.

DATA SUMMARY COPPER (d)

SOURCE: USGS

FIGURE E.2.2.133



D-DENALI V-VEE CANYON G-GOLD CREEK C-CHULITNA T-TALKEETNA S-SUNSHINE SS-SUSITNA STATION

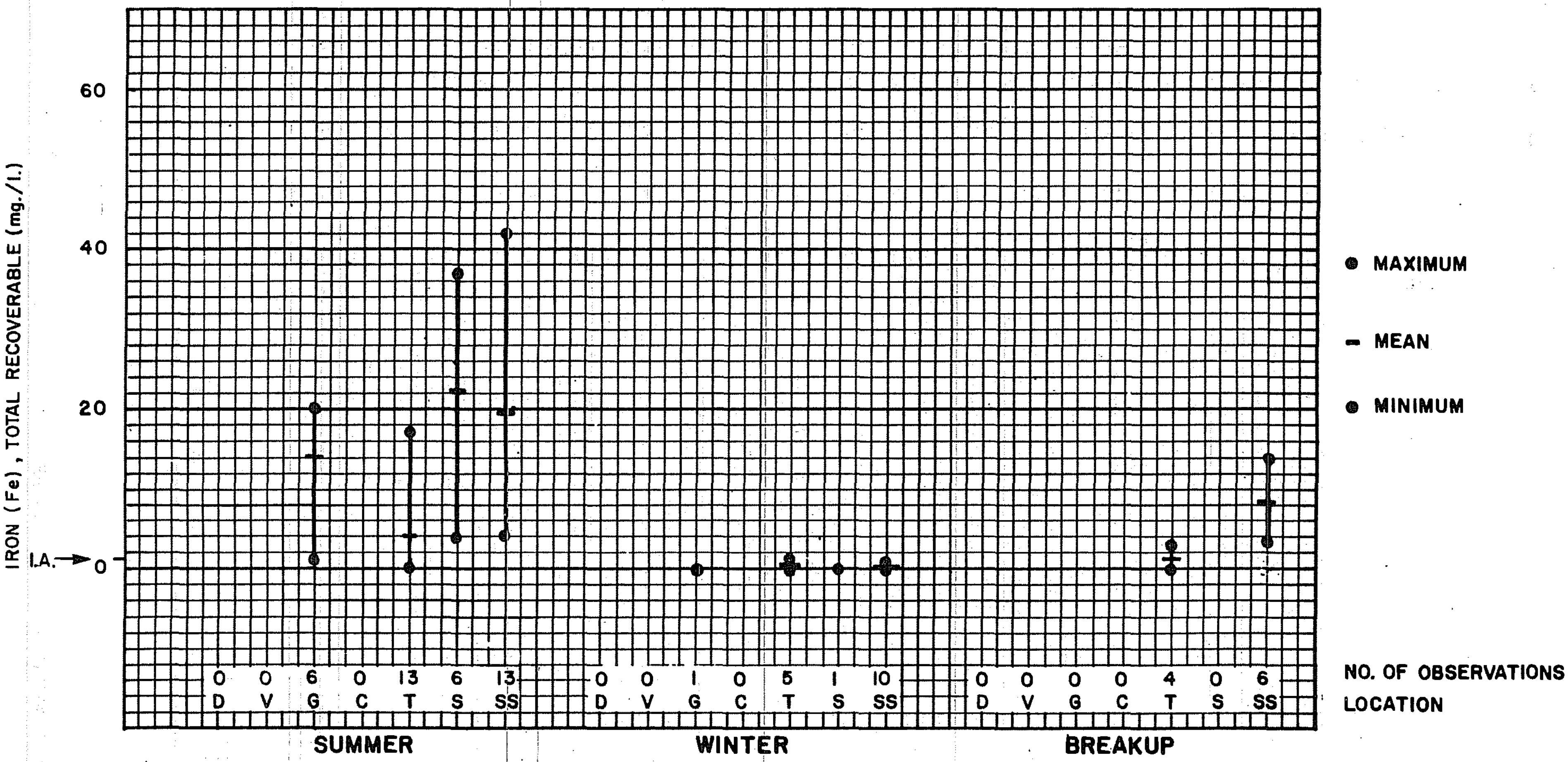
NOTES:

1. CRITERION: 0.01 OF THE 96-HOUR LC_{50} DETERMINED THROUGH BIOASSAY (EPA 1976).
2. CRITERION: 0.005 mg./l. (McNEELY et al. 1979).
3. THE ABOVE CRITERIA ESTABLISHED TO PROTECT FRESHWATER AQUATIC ORGANISMS.
4. AT GOLD CREEK, 1 SUMMER OBSERVATION WAS LESS THAN 0.010 mg./l.
5. AT SUSITNA STATION, 1 SUMMER OBSERVATION AND 2 WINTER OBSERVATIONS WERE LESS THAN 0.020 mg./l.
6. AT TALKEETNA, 1 BREAKUP OBSERVATION WAS LESS THAN 0.020 mg./l.
7. (t) = TOTAL RECOVERABLE.

SOURCE: USGS

DATA SUMMARY-COPPER (t)

FIGURE E.2.2.134



D-DENALI V-VEE CANYON G-GOLD CREEK C-CHULITNA T-TALKEETNA S-SUNSHINE SS-SUSITNA STATION

NOTES:

1.A. CRITERION: LESS THAN 1.0 mg./l. (EPA 1976; SITTIG 1981).

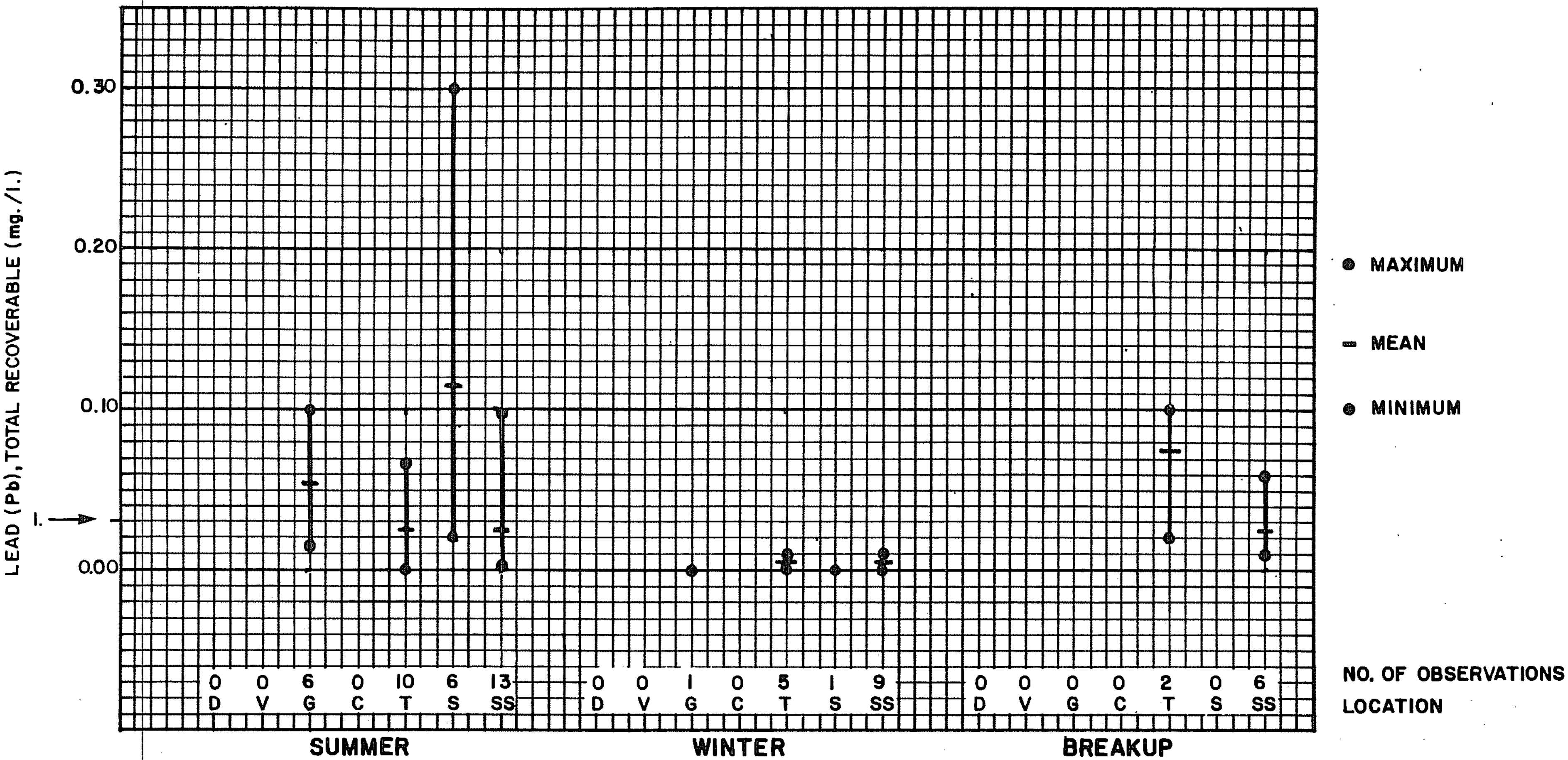
1.B. ESTABLISHED TO PROTECT FRESHWATER AQUATIC ORGANISMS.

2. (t)= TOTAL RECOVERABLE.

DATA SUMMARY - IRON (t)

SOURCE: USGS

FIGURE E.2.2.135



D-DENALI V-VEE CANYON G-GOLD CREEK C-CHULITNA T-TALKEETNA S-SUNSHINE SS-SUSITNA STATION

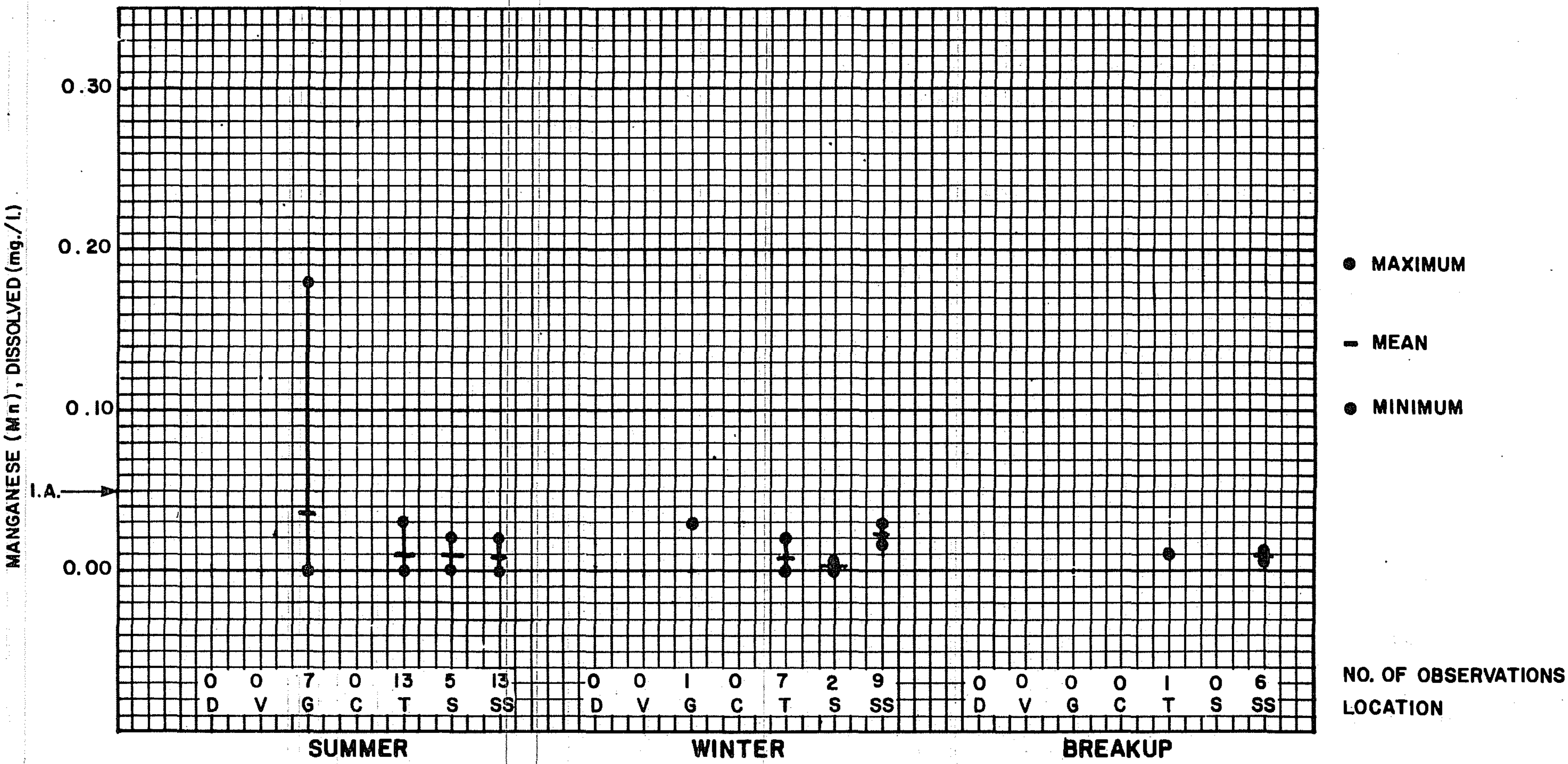
NOTES:

1. CRITERION: LESS THAN 0.03 mg./l. (McNEELY et al. 1979).
2. CRITERION: 0.01 OF THE 96-HOUR LC_{50} DETERMINED BY BIOASSAY (EPA 1976).
3. ABOVE CRITERIA ESTABLISHED TO PROTECT FRESHWATER AQUATIC ORGANISMS.
4. AT GOLD CREEK, 3 SUMMER OBSERVATIONS WERE LESS THAN 0.100 mg./l.
5. AT TALKEETNA, 6 SUMMER OBSERVATIONS AND 1 WINTER OBSERVATION WERE LESS THAN 0.100 mg./l.
6. AT SUNSHINE, 2 SUMMER OBSERVATIONS WERE LESS THAN 0.100 mg./l.
7. AT SUSITNA STATION, 5 SUMMER OBSERVATIONS, 3 WINTER OBSERVATIONS, AND 2 BREAKUP OBSERVATIONS WERE LESS THAN 0.200 mg./l.
8. (t) = TOTAL RECOVERABLE.

SOURCE: USGS

DATA SUMMARY - LEAD (t)

FIGURE E.2.2.136



D-DENALI V-VEE CANYON G-GOLD CREEK C-CHULITNA T-TALKEETNA S-SUNSHINE SS-SUSITNA STATION

NOTES:

1.A. CRITERION: LESS THAN 0.05 mg./l. (EPA 1976)

1.B. ESTABLISHED TO PROTECT WATER SUPPLIES.

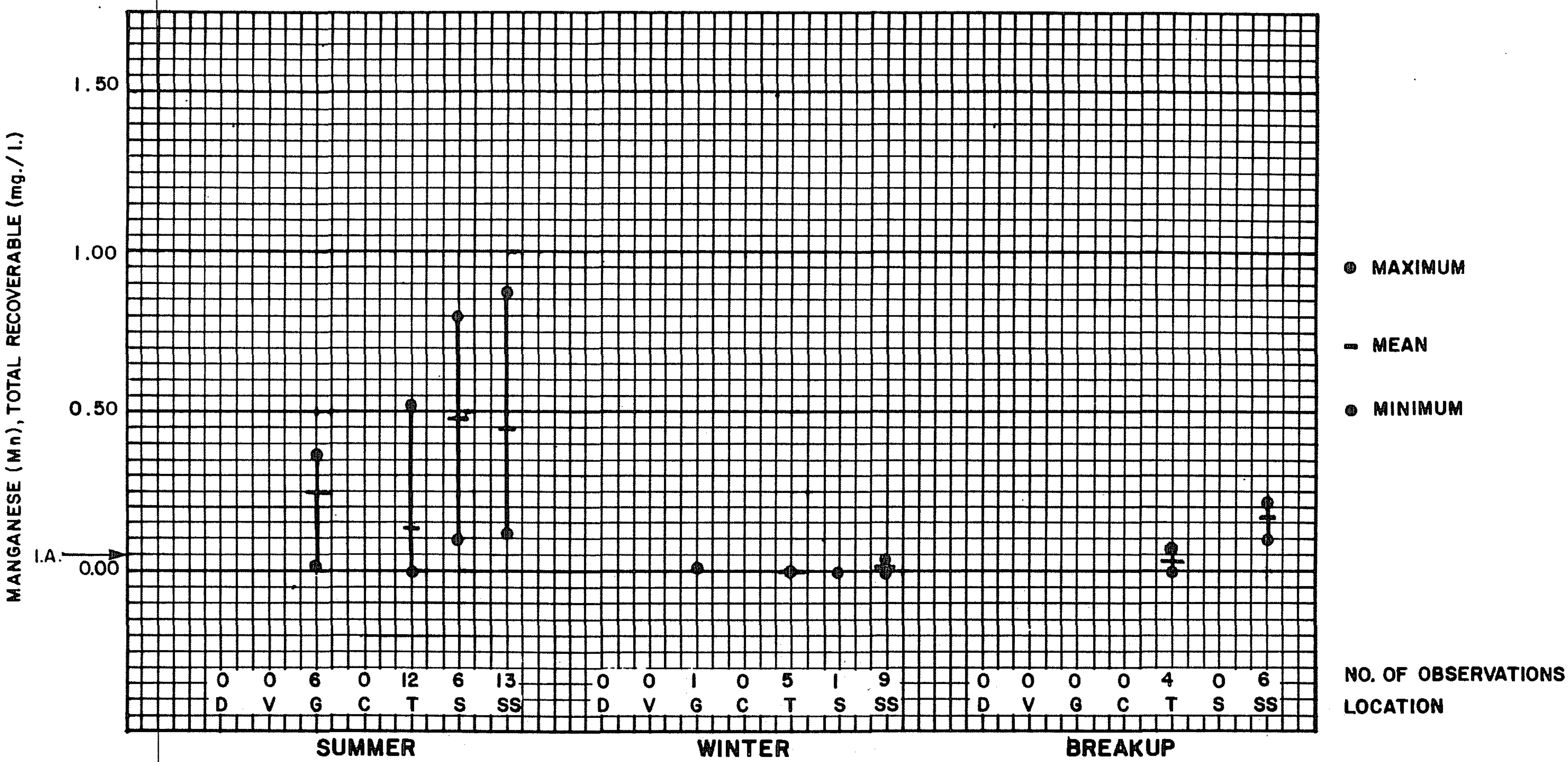
2. AT SUSITNA STATION, 6 SUMMER OBSERVATIONS, 1 WINTER OBSERVATION AND 6 BREAKUP OBSERVATIONS WERE LESS THAN 0.010 mg./l.

3. (d) = DISSOLVED

DATA SUMMARY - MANGANESE (d)

SOURCE: USGS

FIGURE E.2.2.137



D-DENALI V-VEE CANYON G-GOLD CREEK C-CHULITNA T-TALKEETNA S-SUNSHINE SS-SUSITNA STATION

NOTES:

I.A. CRITERION: LESS THAN 0.05 mg./l. (EPA 1976).

I.B. ESTABLISHED TO PROTECT WATER SUPPLIES.

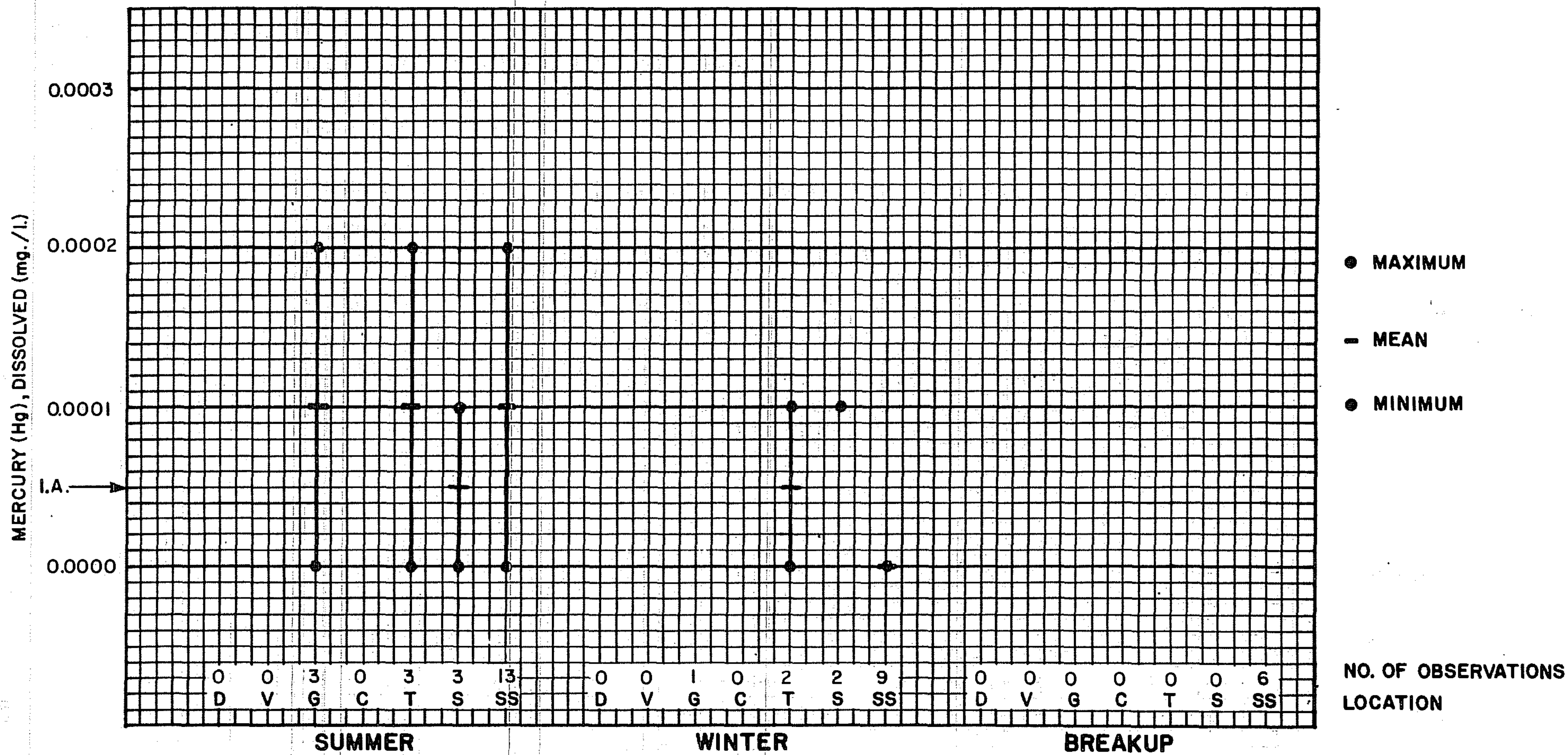
2. AT SUSITNA STATION, 1 BREAKUP OBSERVATION WAS LESS THAN 0.01 mg./l.

3. (t)= TOTAL RECOVERABLE.

DATA SUMMARY - MANGANESE (t)

SOURCE: USGS

FIGURE E.2.2.138



D-DENALI V-VEE CANYON G-GOLD CREEK C-CHULITNA T-TALKEETNA S-SUNSHINE SS-SUSITNA STATION

NOTES:

I.A. CRITERION: LESS THAN 0.00005 mg./l. (EPA 1976).

I.B. ESTABLISHED TO PROTECT FRESHWATER AQUATIC ORGANISMS.

2. AT GOLD CREEK, 1 SUMMER OBSERVATION AND THE 1 WINTER OBSERVATION WERE LESS THAN 0.001 mg./l.

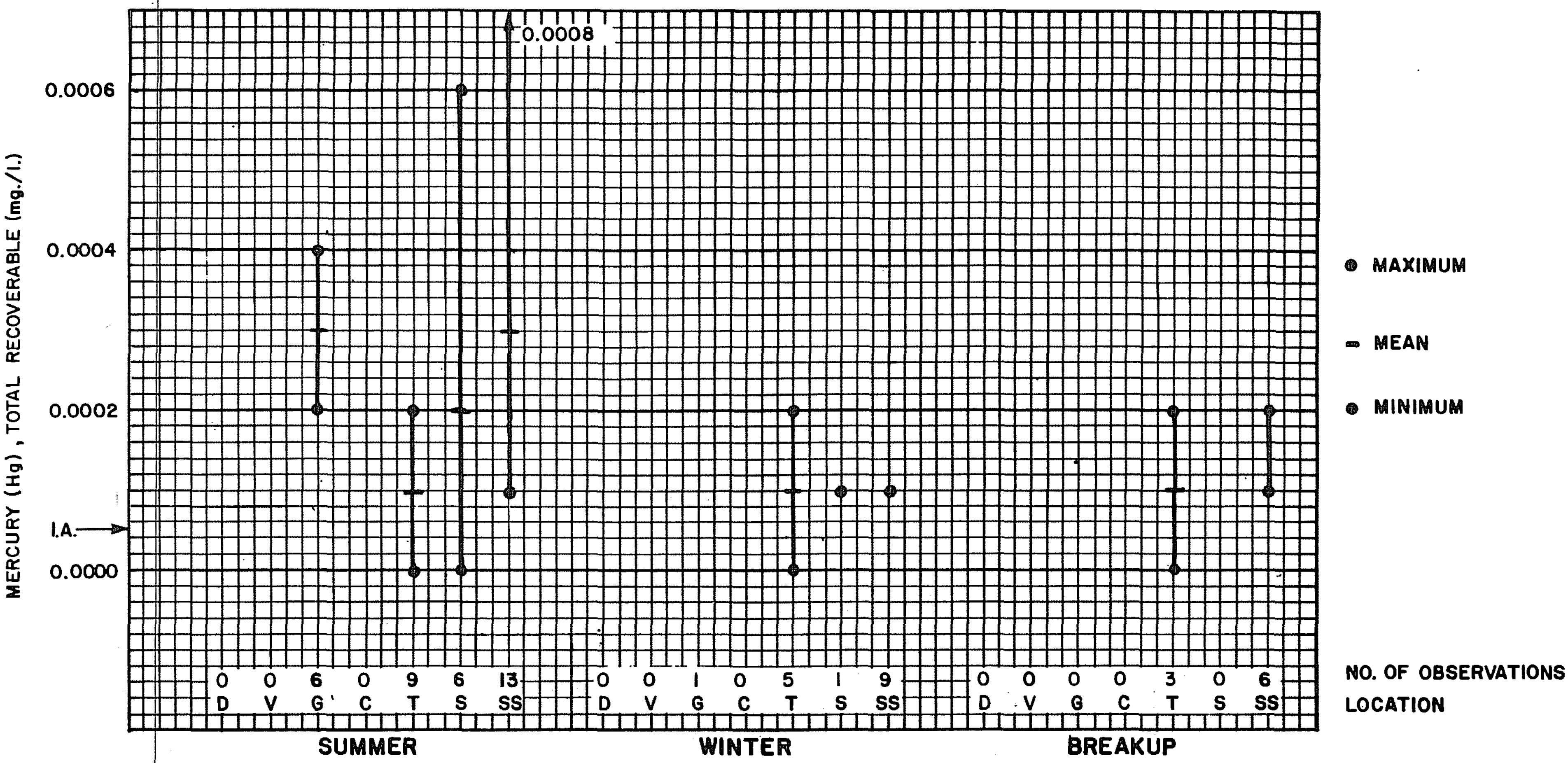
3. AT SUSITNA STATION, 8 SUMMER OBSERVATIONS, 7 WINTER OBSERVATIONS, AND THE 6 BREAKUP OBSERVATIONS WERE LESS THAN 0.0005 mg./l.

4. (d) = DISSOLVED

DATA SUMMARY - MERCURY (d)

SOURCE: USGS

FIGURE E.2.2.139



D-DENALI V-VEE CANYON G-GOLD CREEK C-CHULITNA T-TALKEETNA S-SUNSHINE SS-SUSITNA STATION

NOTES:

I.A. CRITERION: LESS THAN 0.00005 mg./l. (EPA 1976).

I.B. ESTABLISHED TO PROTECT FRESHWATER AQUATIC ORGANISMS.

2. AT TALKEETNA, I SUMMER OBSERVATION WAS LESS THAN 0.0005 mg./l.

3. AT SUSITNA STATION, 7 SUMMER OBSERVATIONS, 7 WINTER OBSERVATIONS AND 4 BREAKUP OBSERVATIONS WERE LESS THAN 0.0005 mg./l.

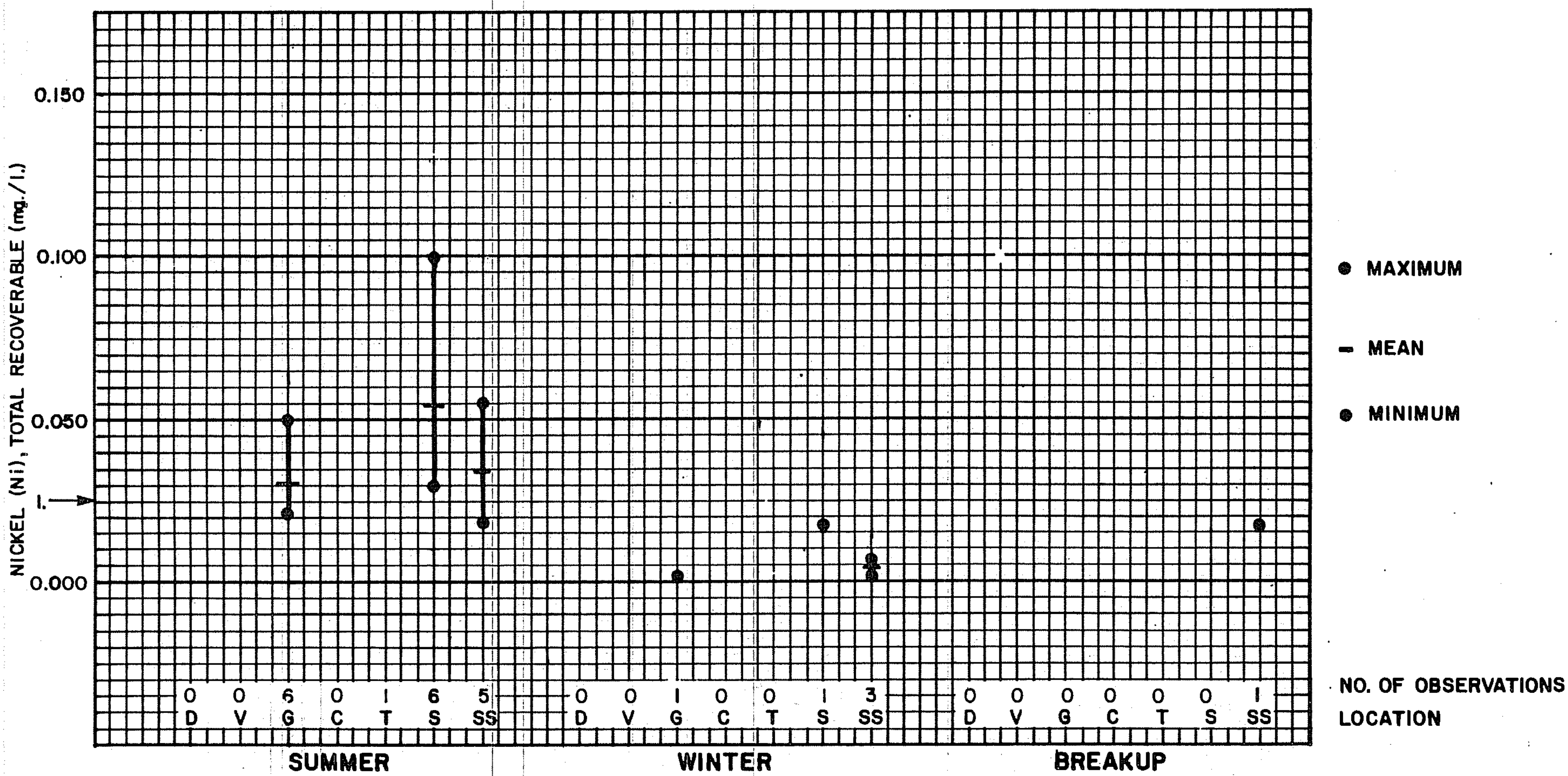
4. AT GOLD CREEK, THE I WINTER OBSERVATION WAS LESS THAN 0.0005 mg./l.

5. (t) = TOTAL RECOVERABLE.

DATA SUMMARY - MERCURY (t)

SOURCE: USGS

FIGURE E.2.2.140



D-DENALI   V-VEE CANYON   G-GOLD CREEK   C-CHULITNA   T-TALKEETNA   S-SUNSHINE   SS-SUSITNA STATION

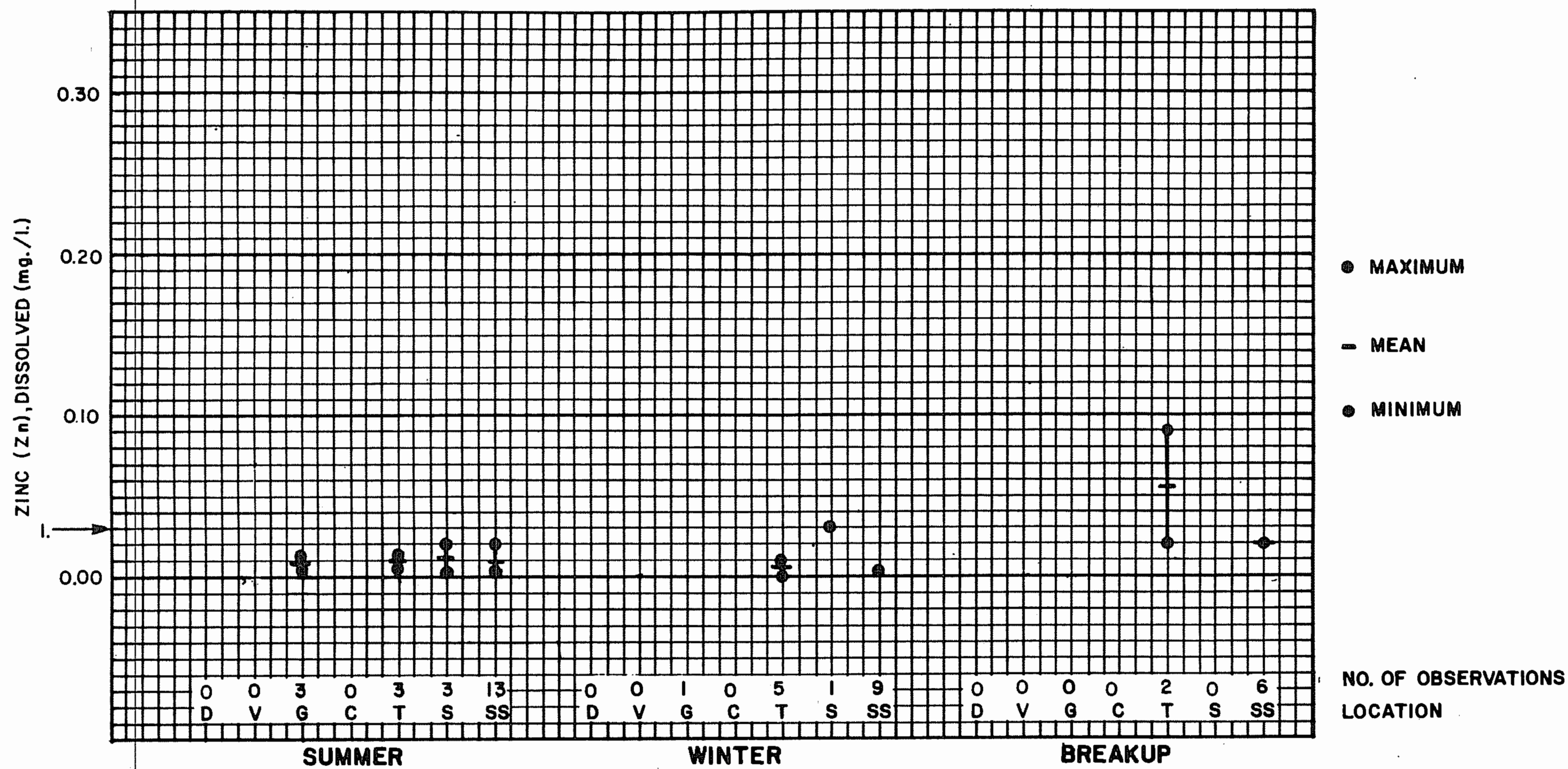
NOTES:

1. CRITERION: LESS THAN 0.025 mg./l. (McNEELY et al. 1979).
2. CRITERION: 0.01 OF THE 96-HOUR LC_{50} DETERMINED THROUGH BIOASSAY (EPA 1976).
3. THE ABOVE CRITERIA ESTABLISHED TO PROTECT FRESHWATER AQUATIC ORGANISMS.
4. AT GOLD CREEK, 2 SUMMER OBSERVATIONS WERE LESS THAN 0.05 mg./l.
5. AT TALKEETNA, THE 1 SUMMER OBSERVATION WAS LESS THAN 0.05 mg./l.
6. AT SUNSHINE, 2 SUMMER OBSERVATIONS WERE LESS THAN 0.05 mg./l.
7. (t) = TOTAL RECOVERABLE.

SOURCE: USGS

DATA SUMMARY- NICKEL (t)

FIGURE E.2.2.141



D-DENALI V-VEE CANYON G-GOLD CREEK C-CHULITNA T-TALKEETNA S-SUNSHINE SS-SUSITNA STATION

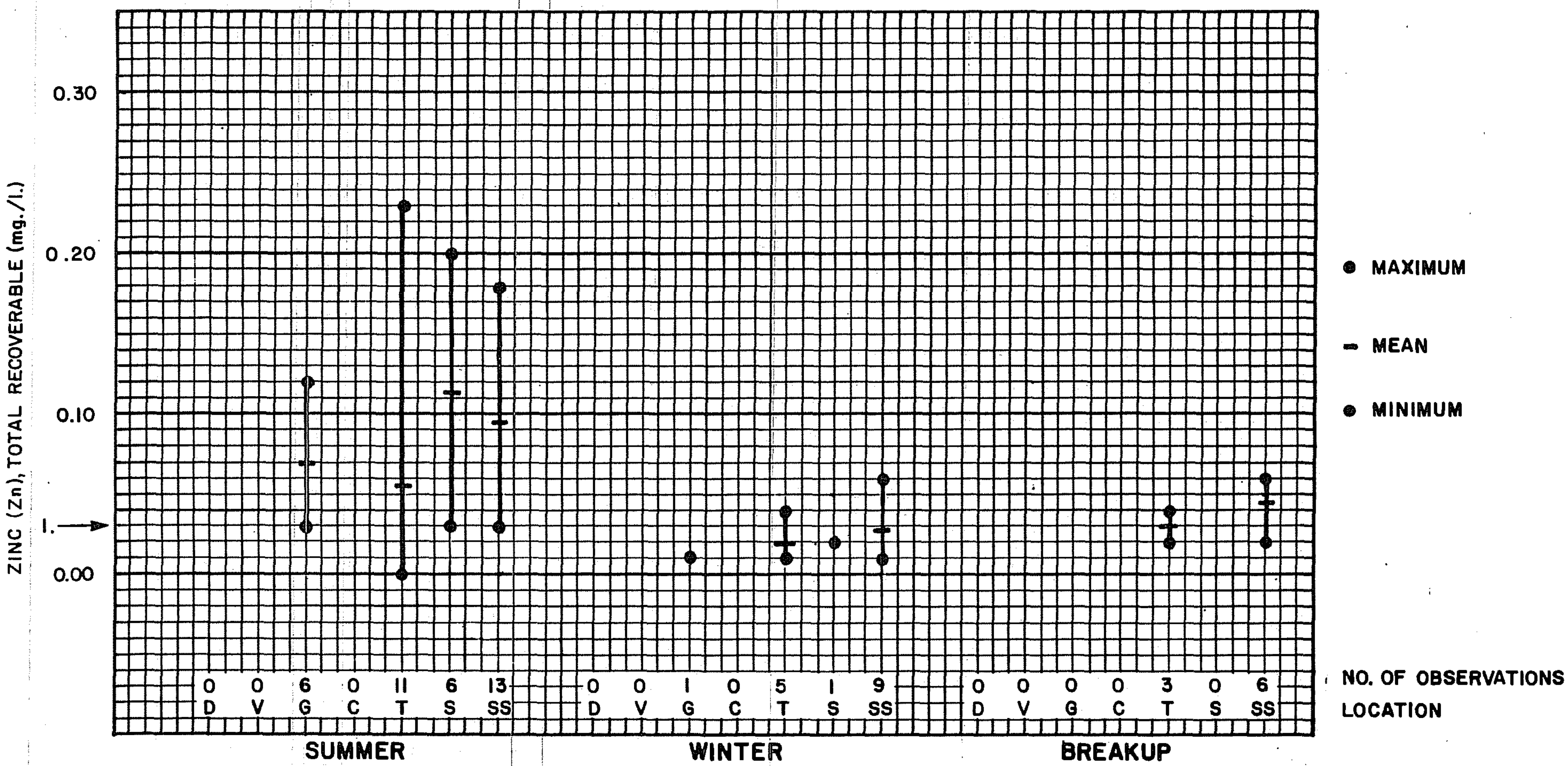
NOTES:

1. CRITERION: LESS THAN 0.03 mg./l. (McNEELY et al. 1979).
2. CRITERION: 0.01 OF THE 96-HOUR LC_{50} DETERMINED THROUGH BIOASSY (EPA 1976).
3. THE ABOVE CRITERIA BASED ON HUMAN HEALTH EFFECTS.
4. AT SUSITNA STATION, 8 SUMMER OBSERVATIONS, 8 WINTER OBSERVATIONS AND 4 BREAKUP OBSERVATIONS WERE LESS THAN 0.020 mg./l.
5. AT GOLD CREEK THE 1 WINTER OBSERVATION WAS LESS THAN 0.012 mg./l.
6. (d) = DISSOLVED

DATA SUMMARY - ZINC (d)

SOURCE: USGS

FIGURE E.2.2.142



D-DENALI V-VEE CANYON G-GOLD CREEK C-CHULITNA T-TALKEETNA S-SUNSHINE SS-SUSITNA STATION

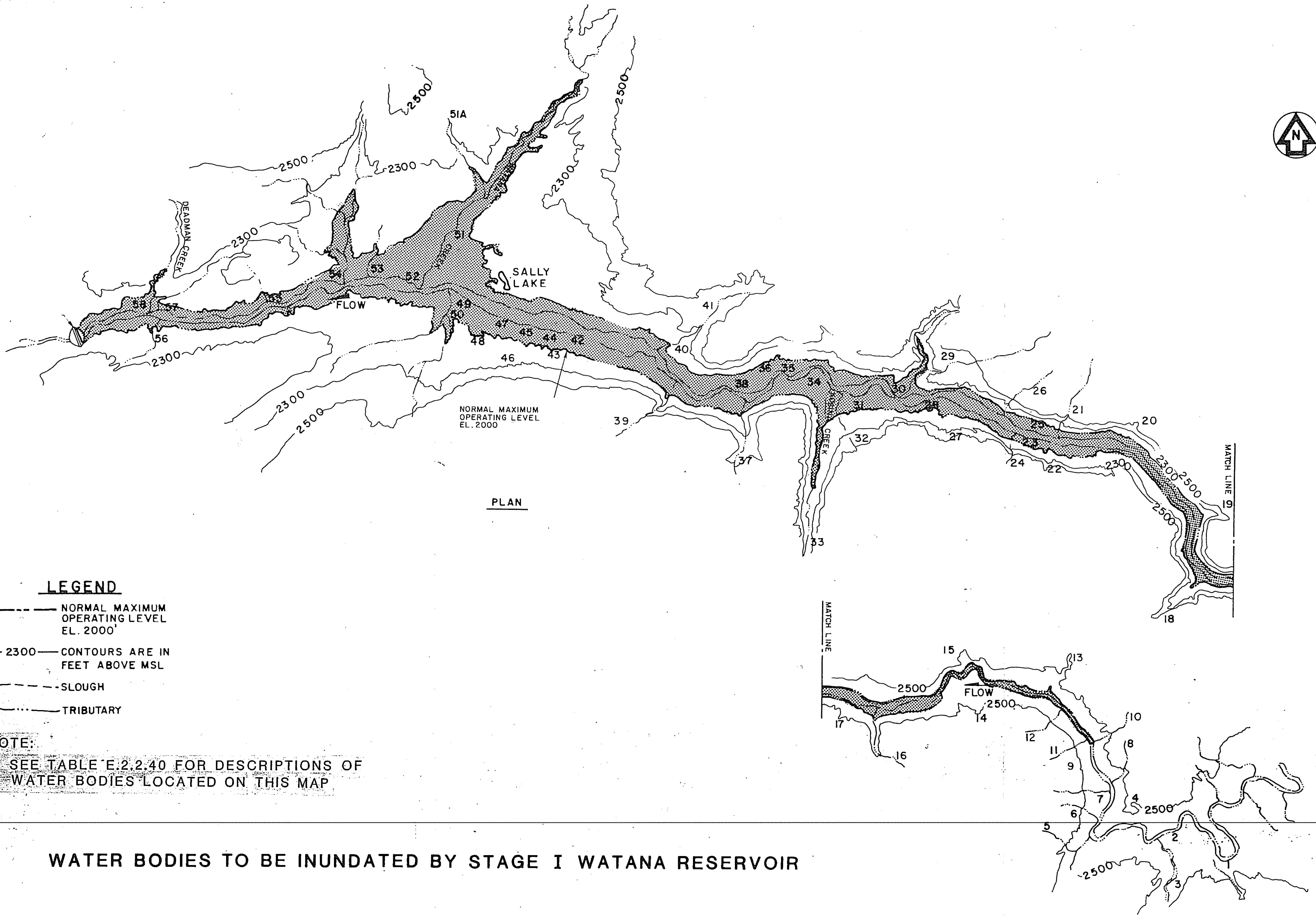
NOTES:

1. CRITERION: LESS THAN 0.03 mg./l. (McNEELY et al. 1979).
2. CRITERION: 0.01 OF THE 96-HOUR LC_{50} DETERMINED THROUGH BIOASSAY (EPA 1976).
3. THE ABOVE CRITERIA ESTABLISHED TO PROTECT FRESHWATER AQUATIC ORGANISMS.
4. AT SUSITNA STATION, 1 SUMMER OBSERVATION AND 2 WINTER OBSERVATIONS WERE LESS THAN 0.020 mg./l.
5. (t) = TOTAL RECOVERABLE.

DATA SUMMARY - ZINC (t)

SOURCE: USGS

FIGURE E.2.2.143



LEGEND

NORMAL MAXIMUM OPERATING LEVEL EL. 2000'

2300 — CONTOURS ARE IN FEET ABOVE MSL

SLOUGH

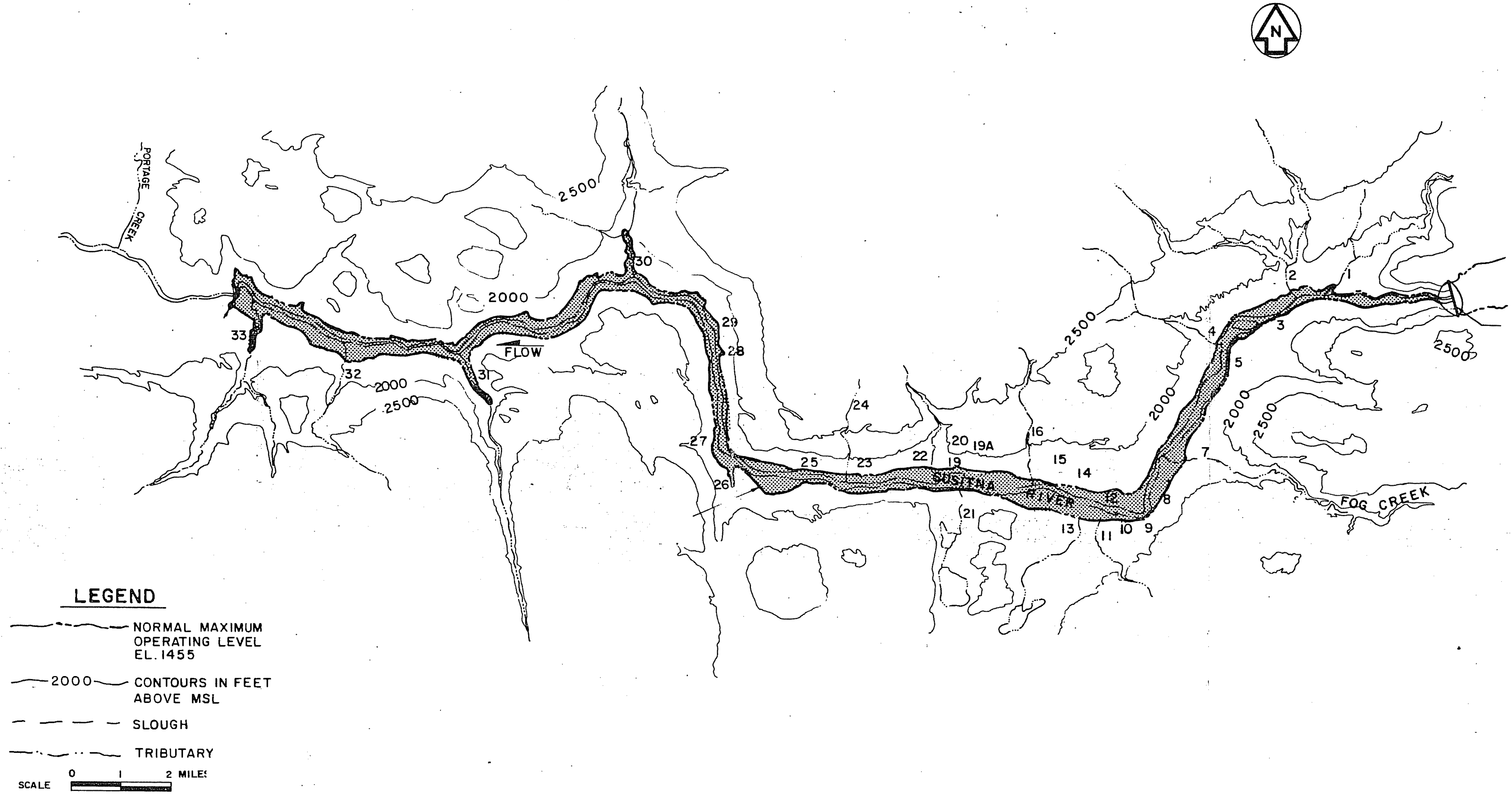
TRIBUTARY

NOTE:

SEE TABLE E.2.2.40 FOR DESCRIPTIONS OF WATER BODIES LOCATED ON THIS MAP

WATER BODIES TO BE INUNDATED BY STAGE I WATANA RESERVOIR

FIGURE E.2.2.144



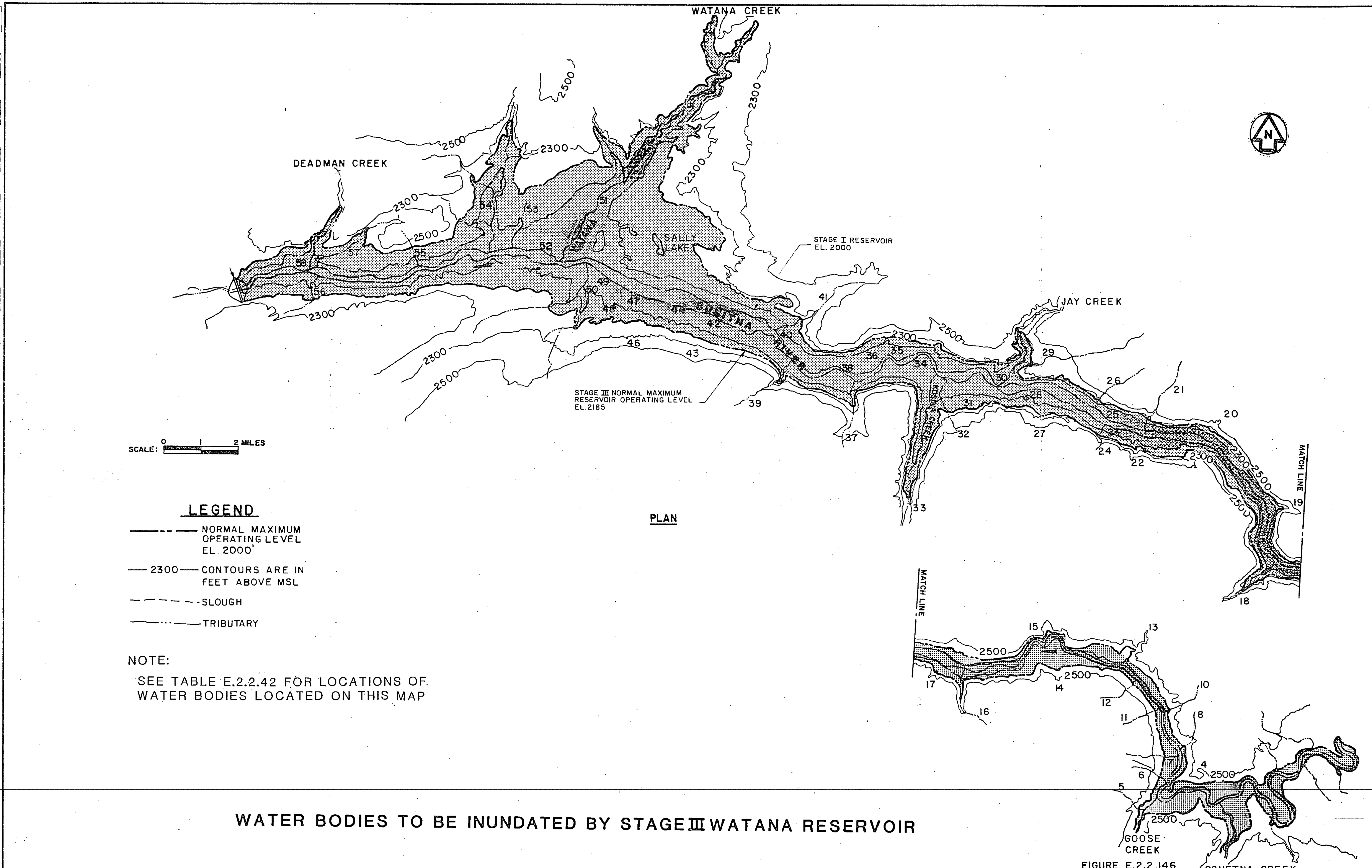
NOTE:

SEE TABLE E.2.2.41 FOR DESCRIPTIONS OF WATER BODIES LOCATED ON THIS MAP

PLAN

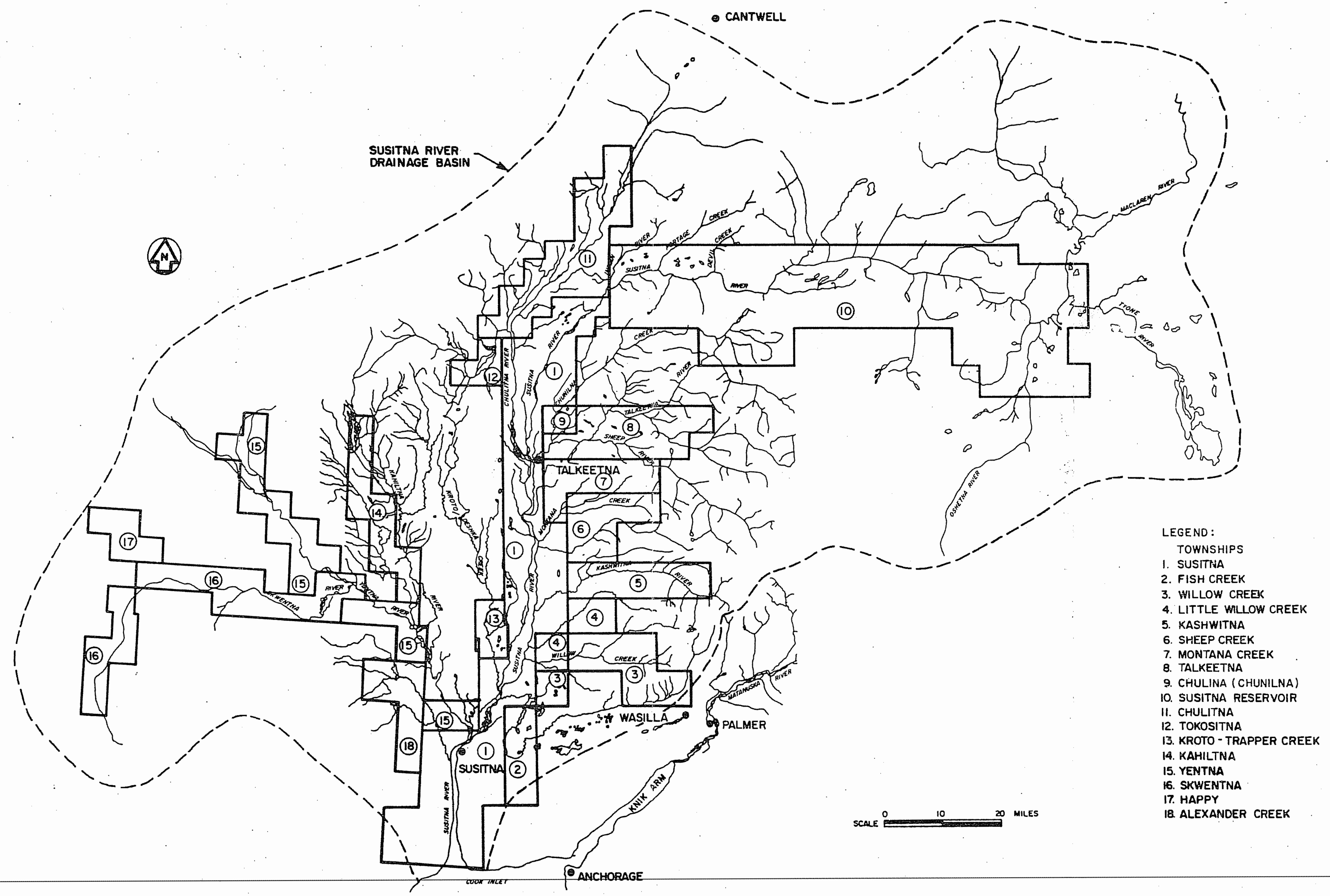
WATER BODIES TO BE INUNDATED BY STAGE II DEVIL CANYON RESERVOIR

FIGURE E.2.2.145



WATER BODIES TO BE INUNDATED BY STAGE III WATANA RESERVOIR

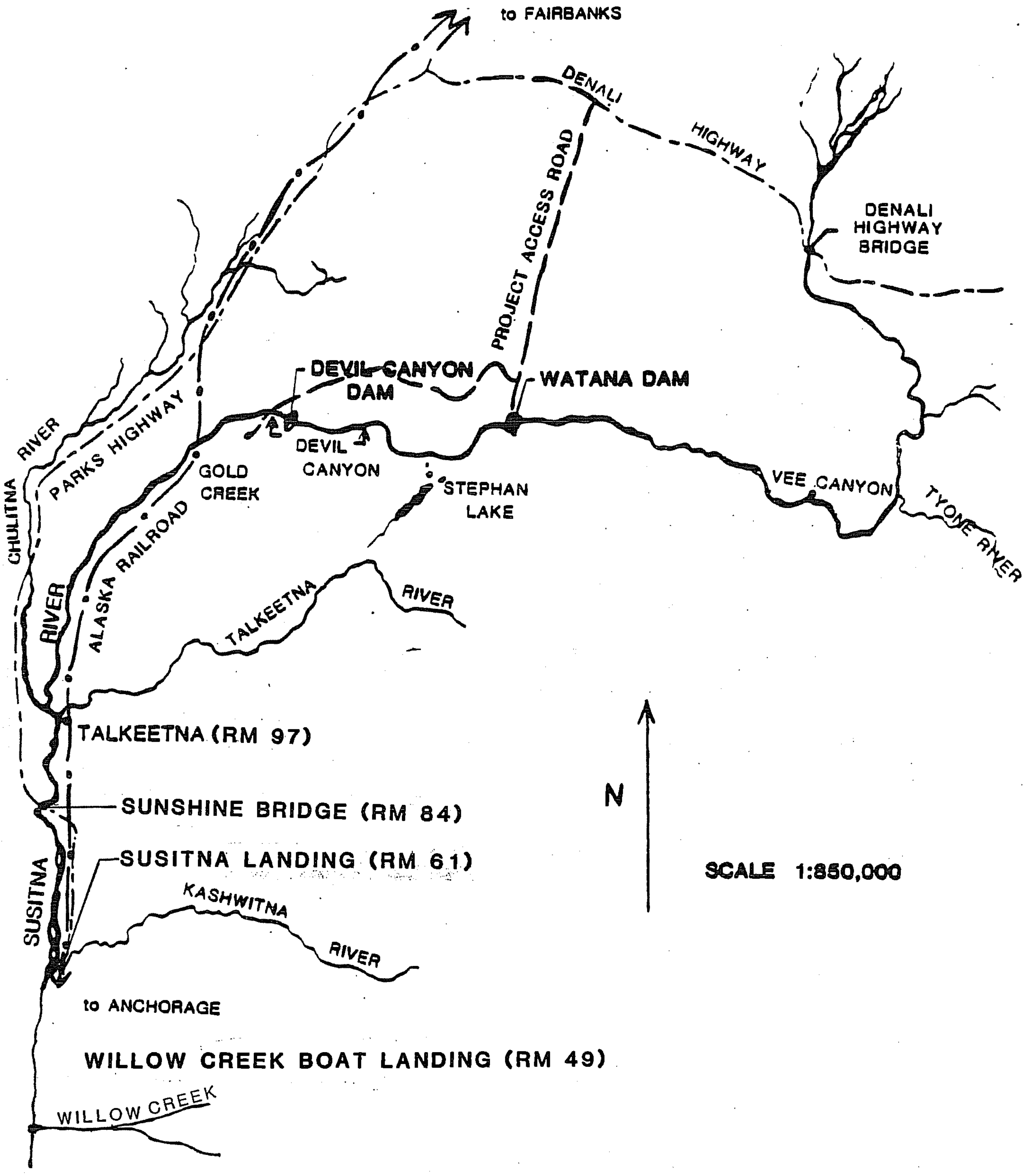
FIGURE E.2.2.146



TOWNSHIP GRIDS INVESTIGATED FOR WATER RIGHTS IN THE SUSITNA RIVER BASIN

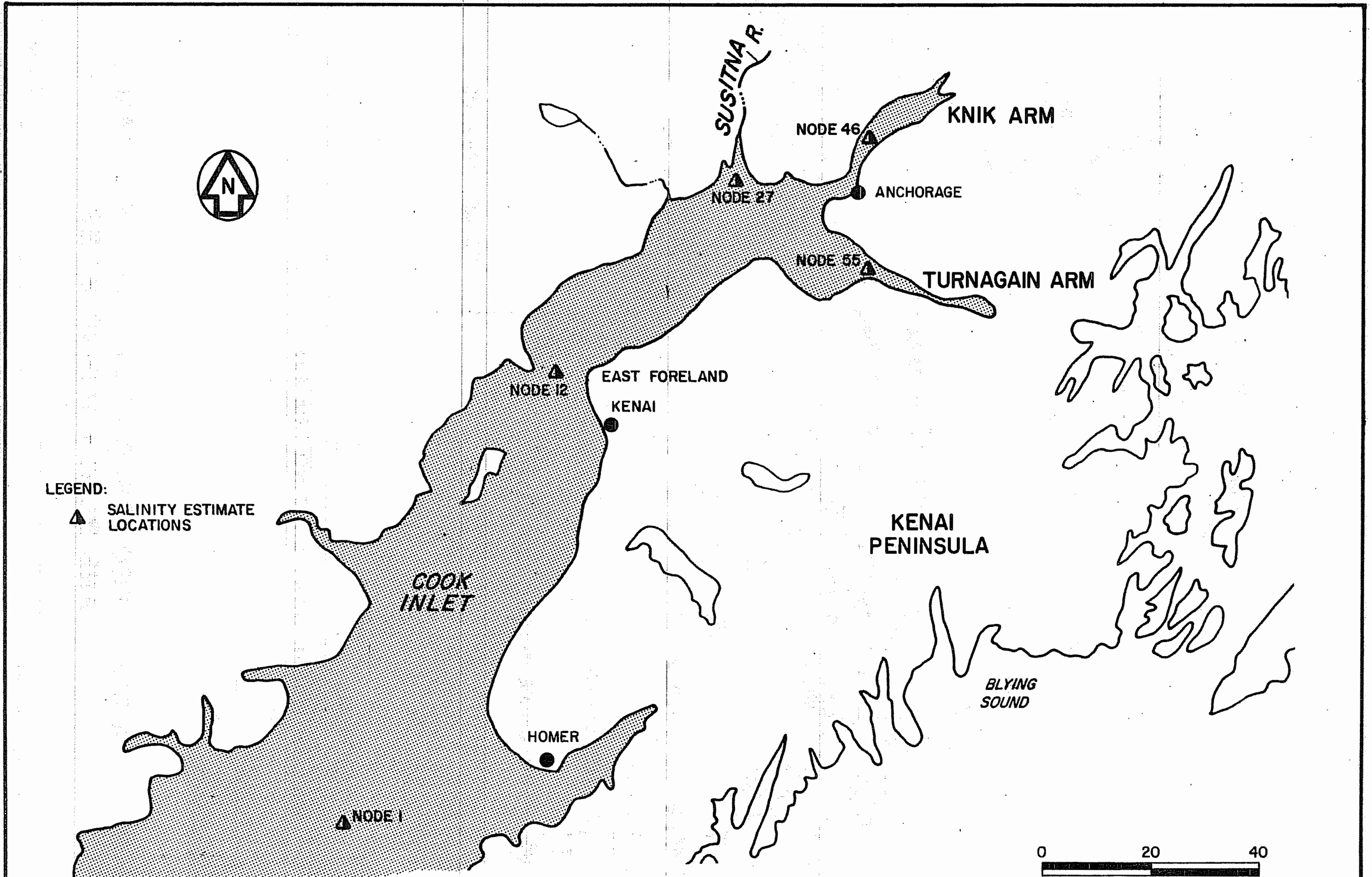
SOURCE: DWIGHT 1981

FIGURE E.2.2.147



SUSITNA RIVER PROPOSED HYDROELECTRIC DAM SITES AND BOAT LANDING SITES

FIGURE E.2.2.148

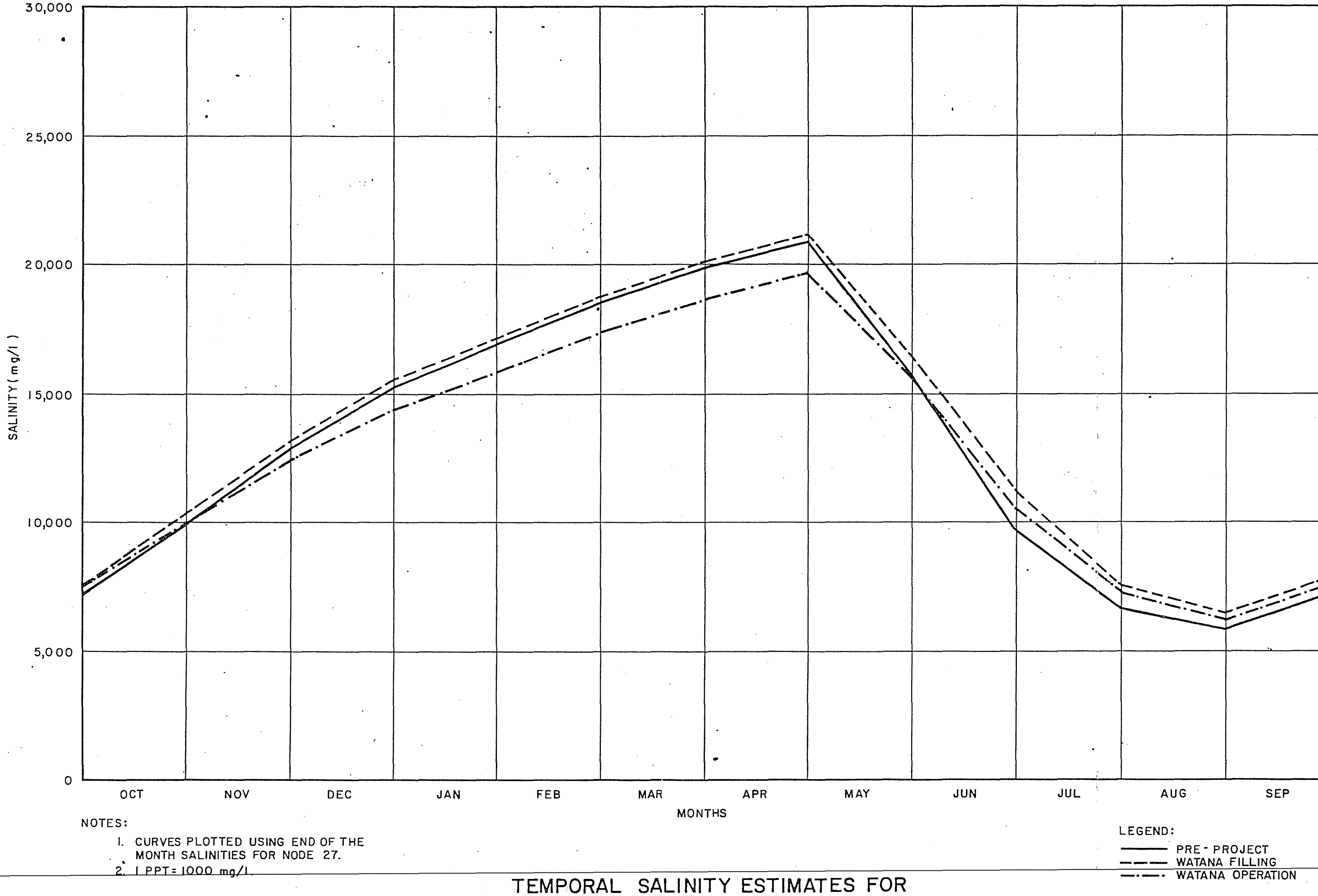


NOTE: MODELING UNDERTAKEN FOR TWO STAGE PROJECT IS APPLICABLE TO THREE STAGE PROJECT.

SOURCE: RMA 1983

SELECT LOCATIONS OF COOK INLET SALINITY ESTIMATES

FIGURE E.2.2.149



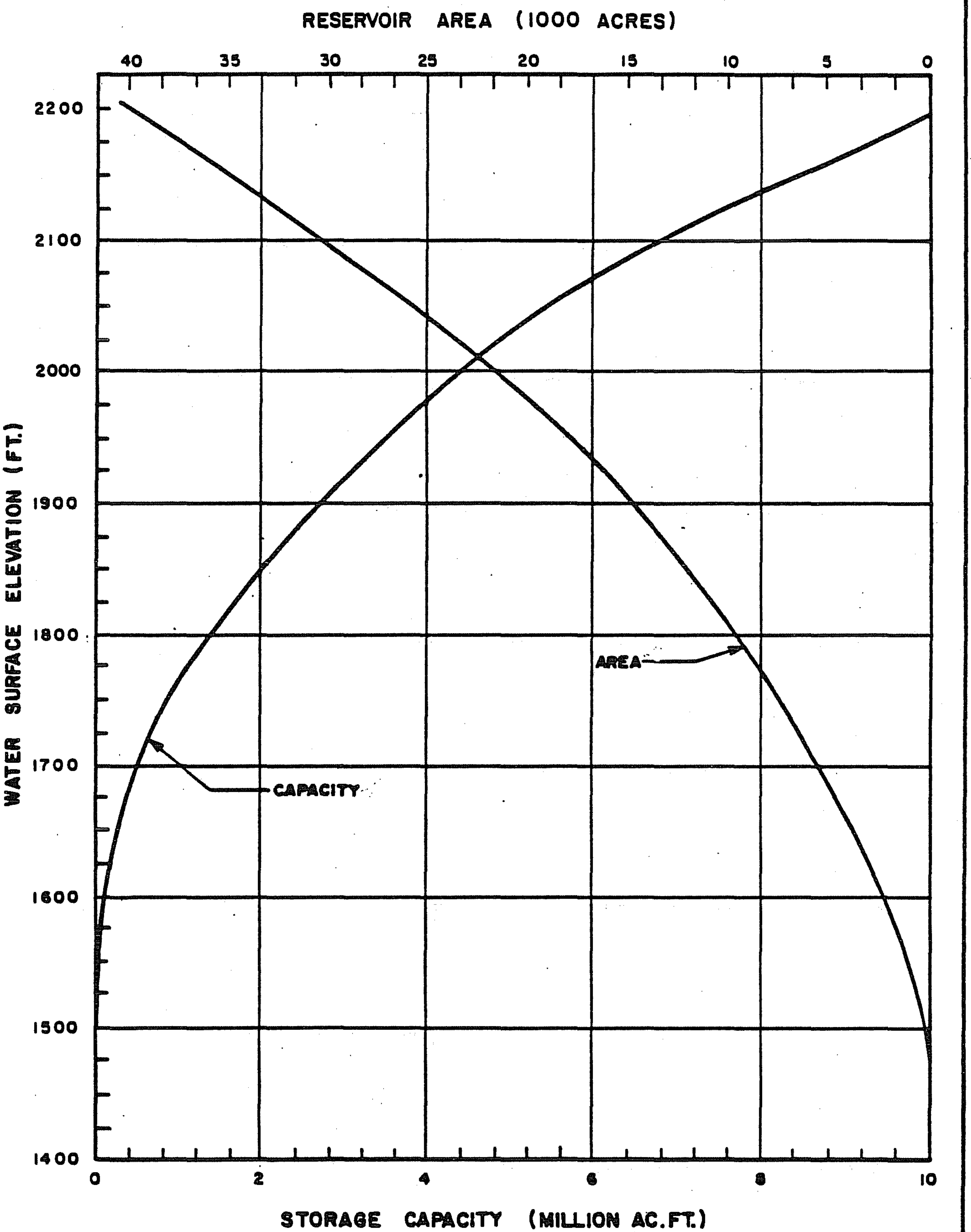
NOTES:

1. CURVES PLOTTED USING END OF THE MONTH SALINITIES FOR NODE 27.
2. 1 PPT = 1000 mg/l
3. MODELING UNDERTAKEN FOR TWO STAGE PROJECT IS APPLICABLE TO THREE STAGE PROJECT.

TEMPORAL SALINITY ESTIMATES FOR COOK INLET NEAR THE SUSITNA RIVER MOUTH

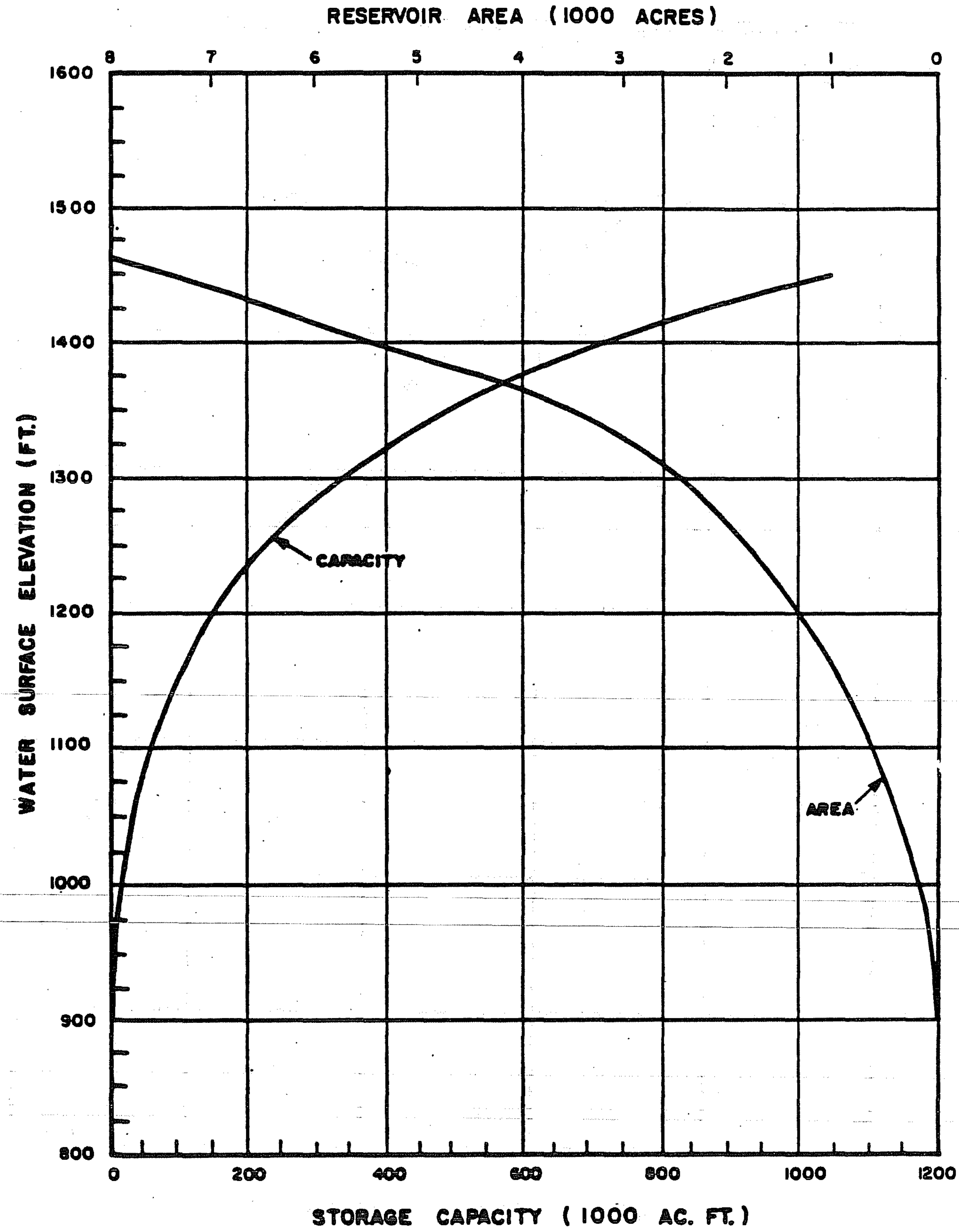
SOURCE: RMA 1983

FIGURE E.2.2.150



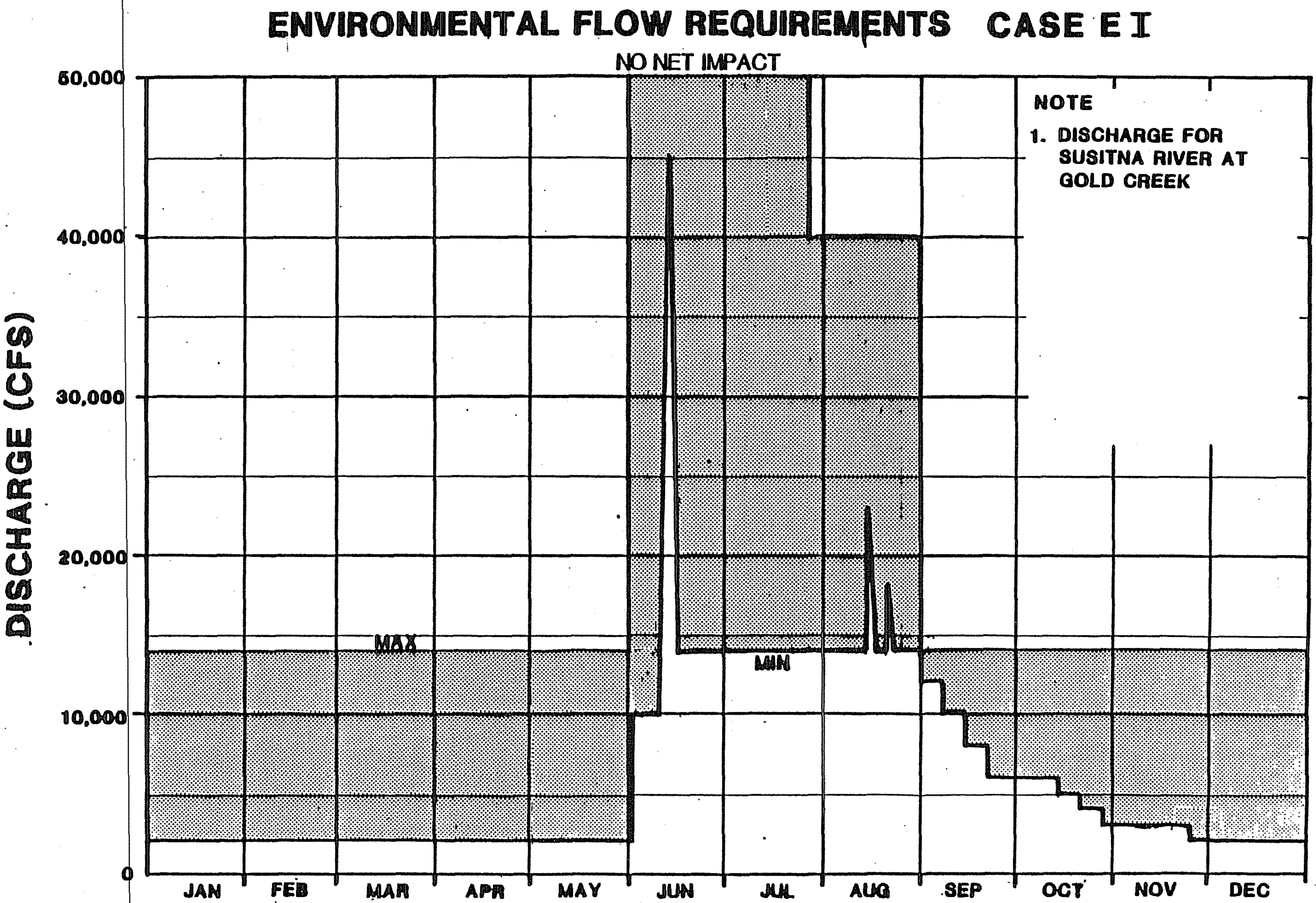
AREA AND CAPACITY CURVES
WATANA RESERVOIR

FIGURE E.2.3.1



AREA AND CAPACITY CURVES
DEVIL CANYON RESERVOIR

FIGURE E.2.3.2



ENVIRONMENTAL FLOW REQUIREMENTS CASE E I
NO NET IMPACT
DISCHARGE (CFS)
50,000
40,000
30,000
20,000
10,000
0
MAX
MIN
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
NOTE
1. DISCHARGE FOR SUSITNA RIVER AT GOLD CREEK

FIGURE E.2.3.3

ENVIRONMENTAL FLOW REQUIREMENTS CASE E II

MAINTENANCE OF 75% OF CHUM SALMON SIDE SLOUGH SPAWNING HABITAT

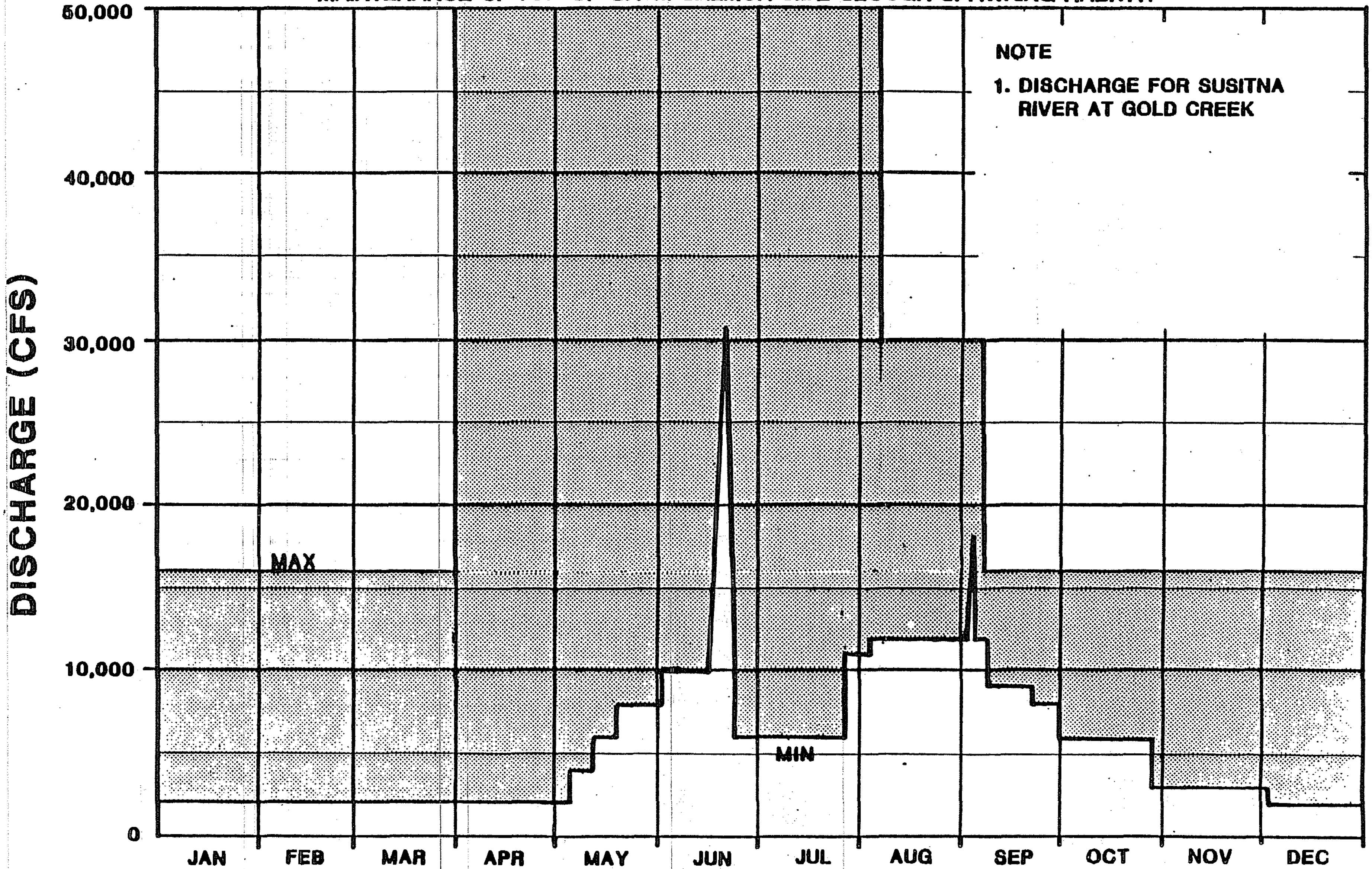


FIGURE E.2.3.4

ENVIRONMENTAL FLOW REQUIREMENTS CASE E III

MAXIMIZE CHINOOK SALMON PRODUCTION

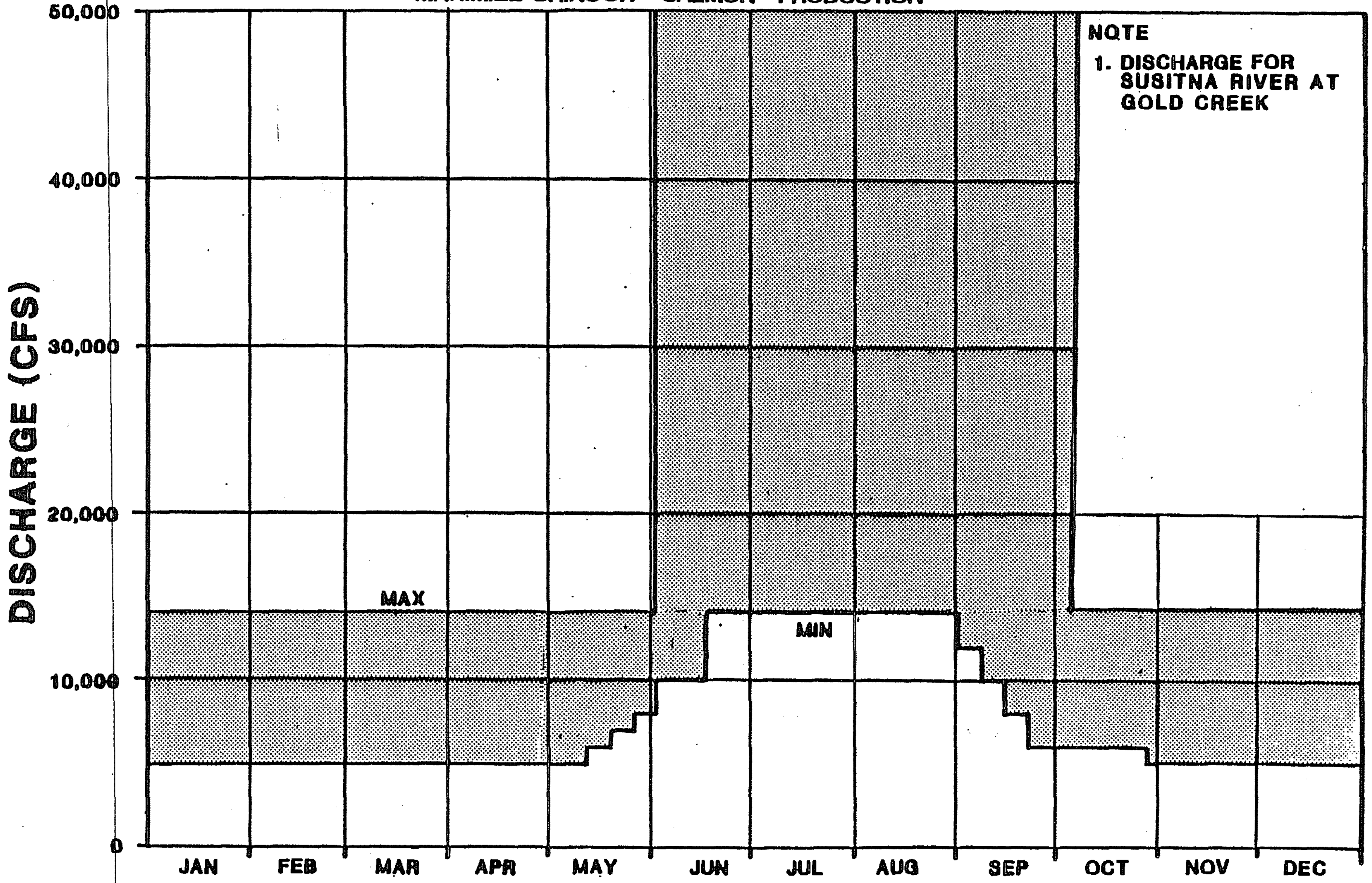


FIGURE E.2.3.5

ENVIRONMENTAL FLOW REQUIREMENTS CASE E IV

MAINTENANCE OF 75% CHINOOK SALMON SIDE CHANNEL REARING HABITAT

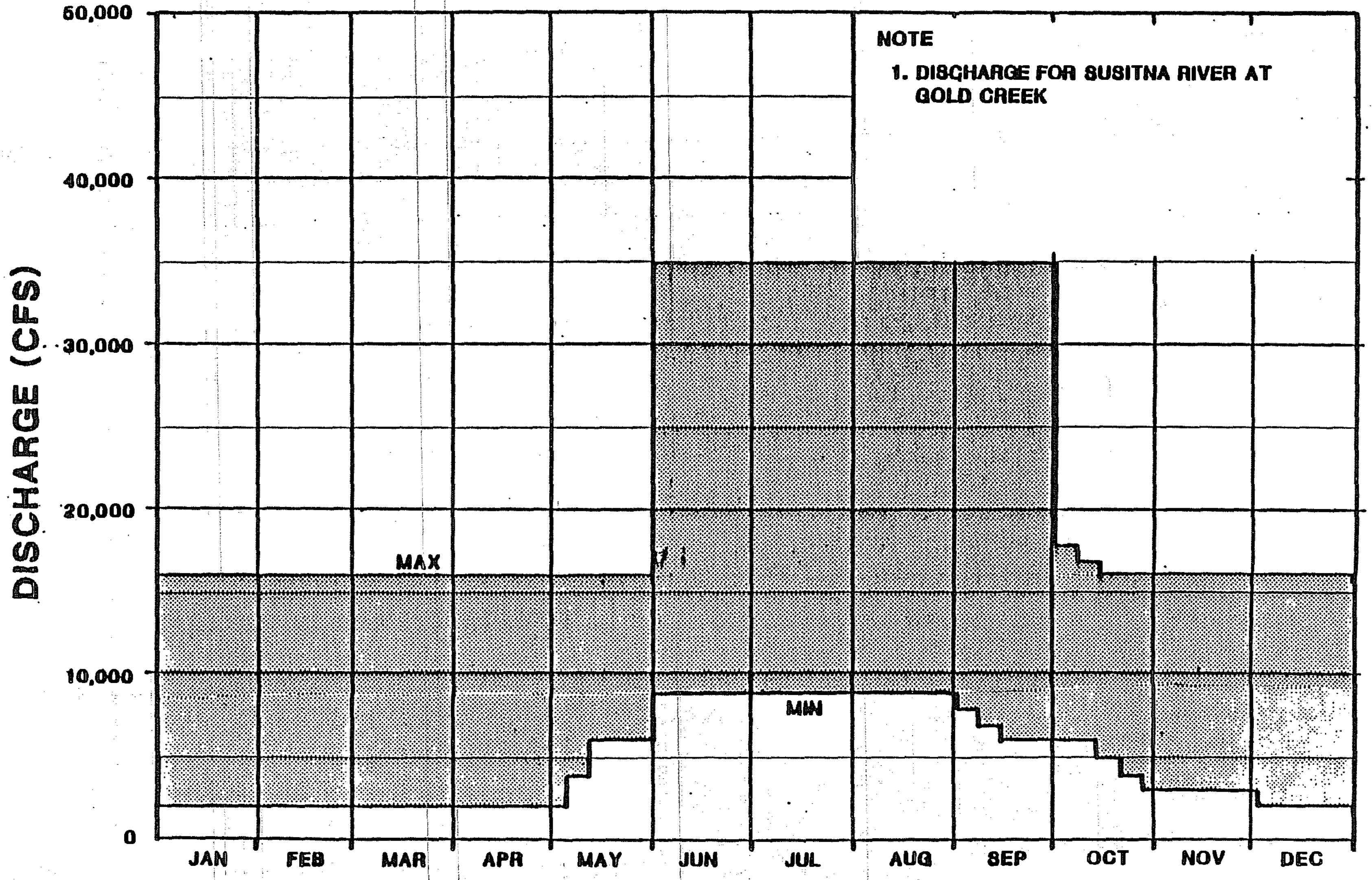


FIGURE E.2.3.6

ENVIRONMENTAL FLOW REQUIREMENTS CASE E IV a

MAINTENANCE OF 75% OF CHINOOK SALMON SIDE CHANNEL REARING

HABITAT-MAINTAIN CHUM SALMON SIDE SLOUGH SPAWNING WITH MINOR HABITAT MODIFICATION

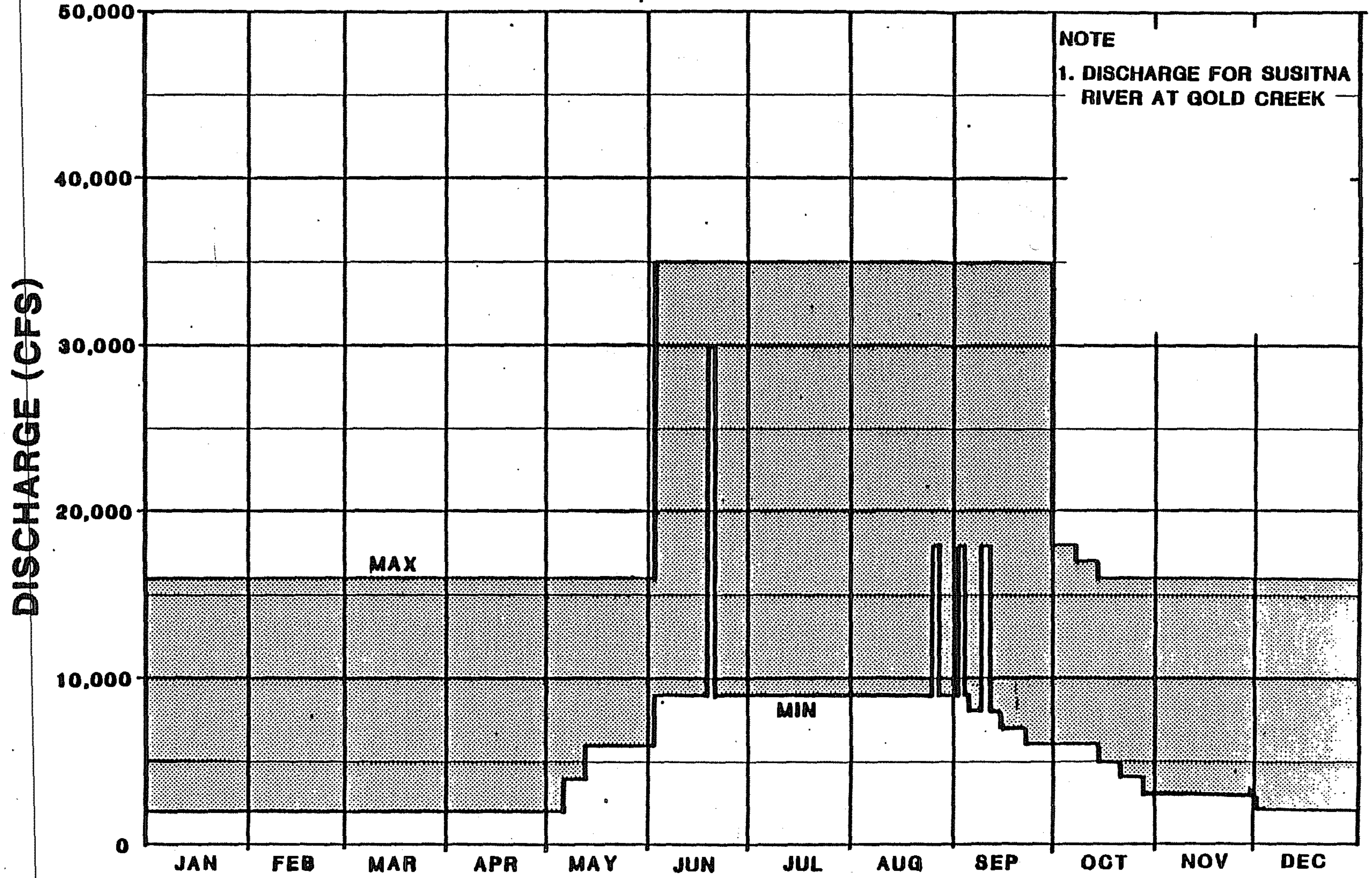


FIGURE E.2.3.7

ENVIRONMENTAL FLOW REQUIREMENTS CASE E IV b

MAINTENANCE OF 75% OF CHINOOK SALMON SIDE CHANNEL

REARING HABITAT- MAINTAIN CHUM SALMON SIDE SLOUGH SPAWNING WITH MODERATE HABITAT MODIFICATION

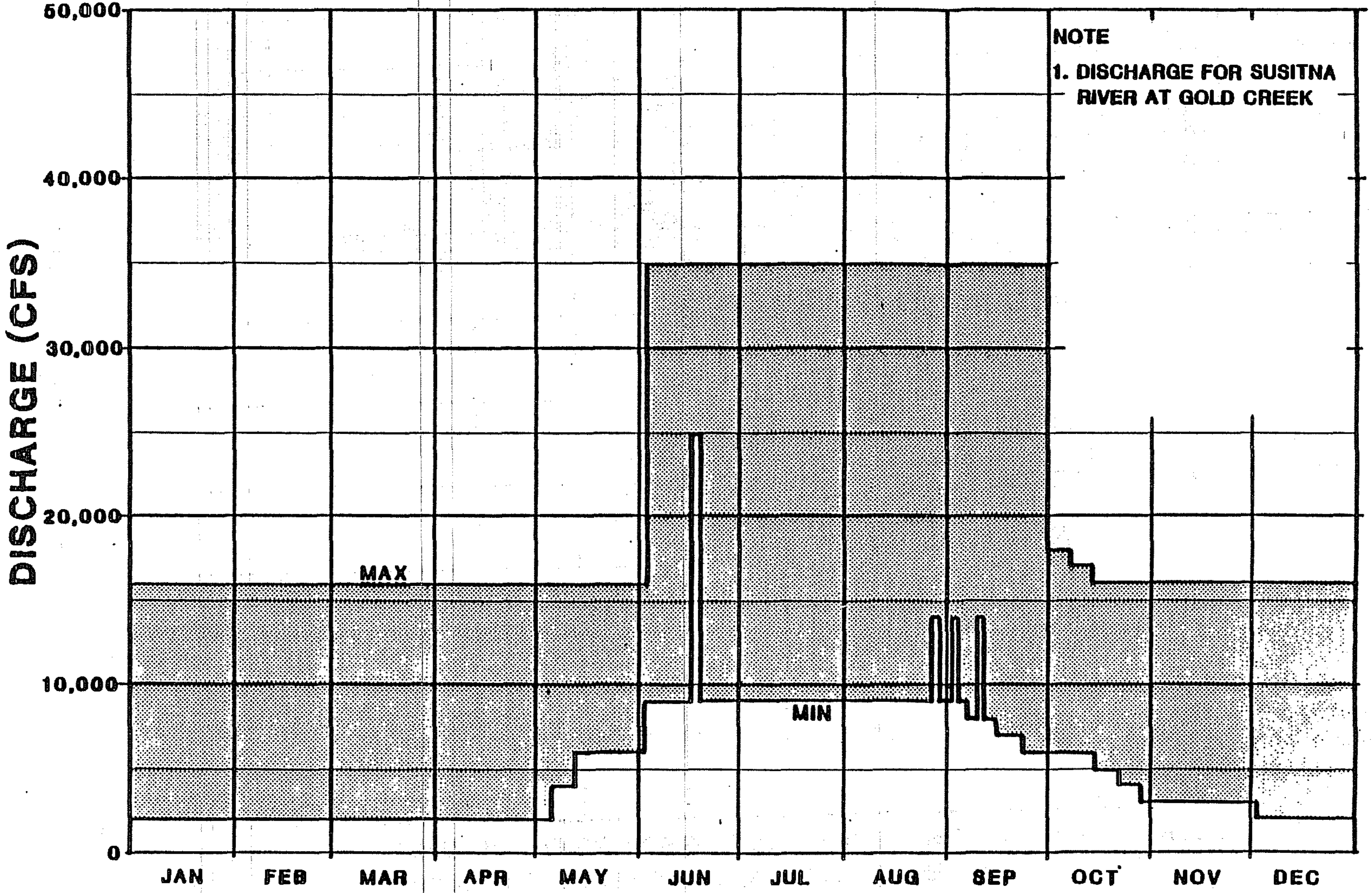


FIGURE E 2.3.8

ENVIRONMENTAL FLOW REQUIREMENTS CASE E V

MAINTENANCE OF 75% OF CHINOOK

SALMON SIDE CHANNEL REARING HABITAT AND75% OF CHUM SALMON SIDE SLOUGH SPAWNING HABITAT

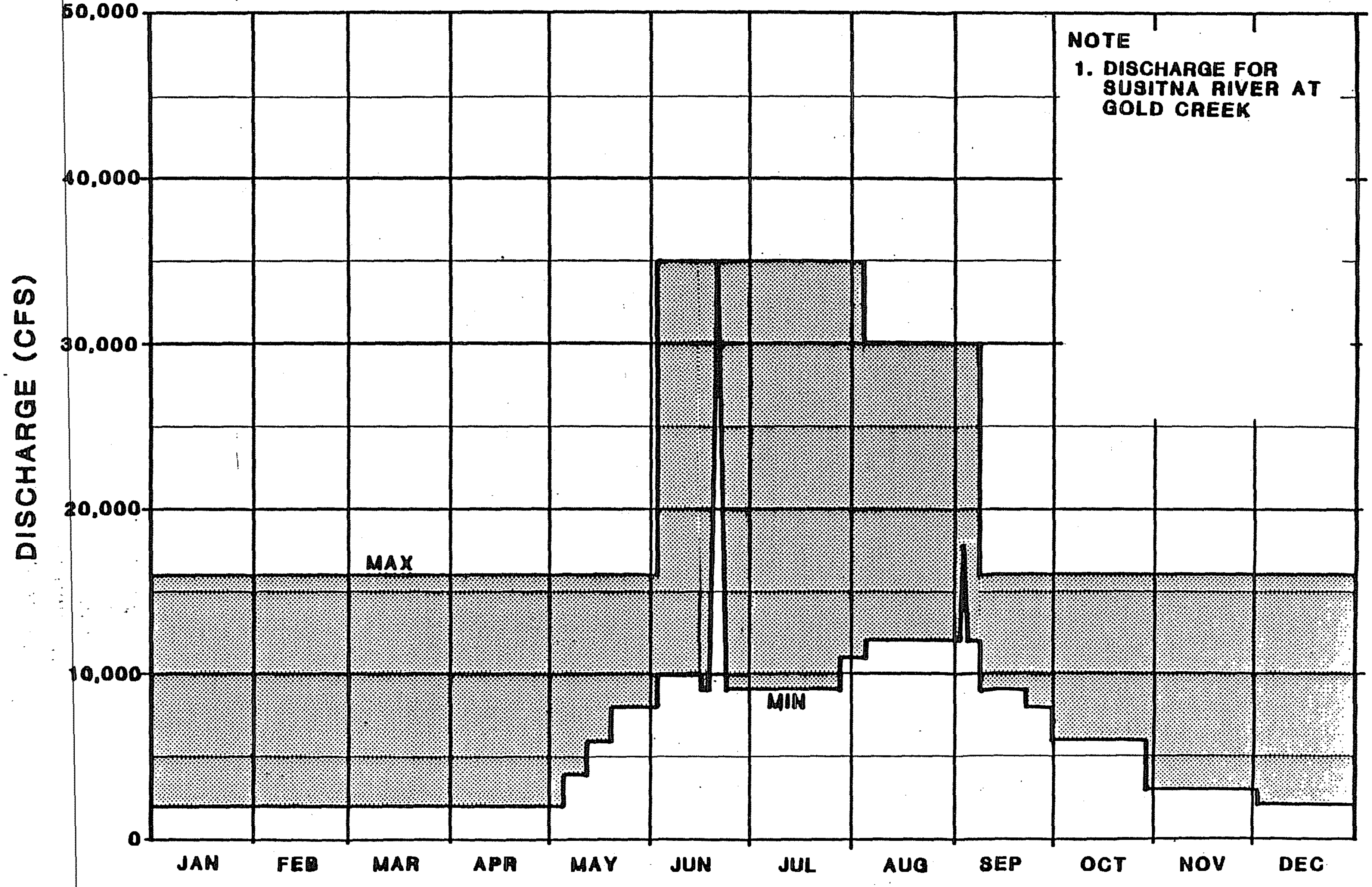


FIGURE E.2.3.9

ENVIRONMENTAL FLOW REQUIREMENTS CASE E VI

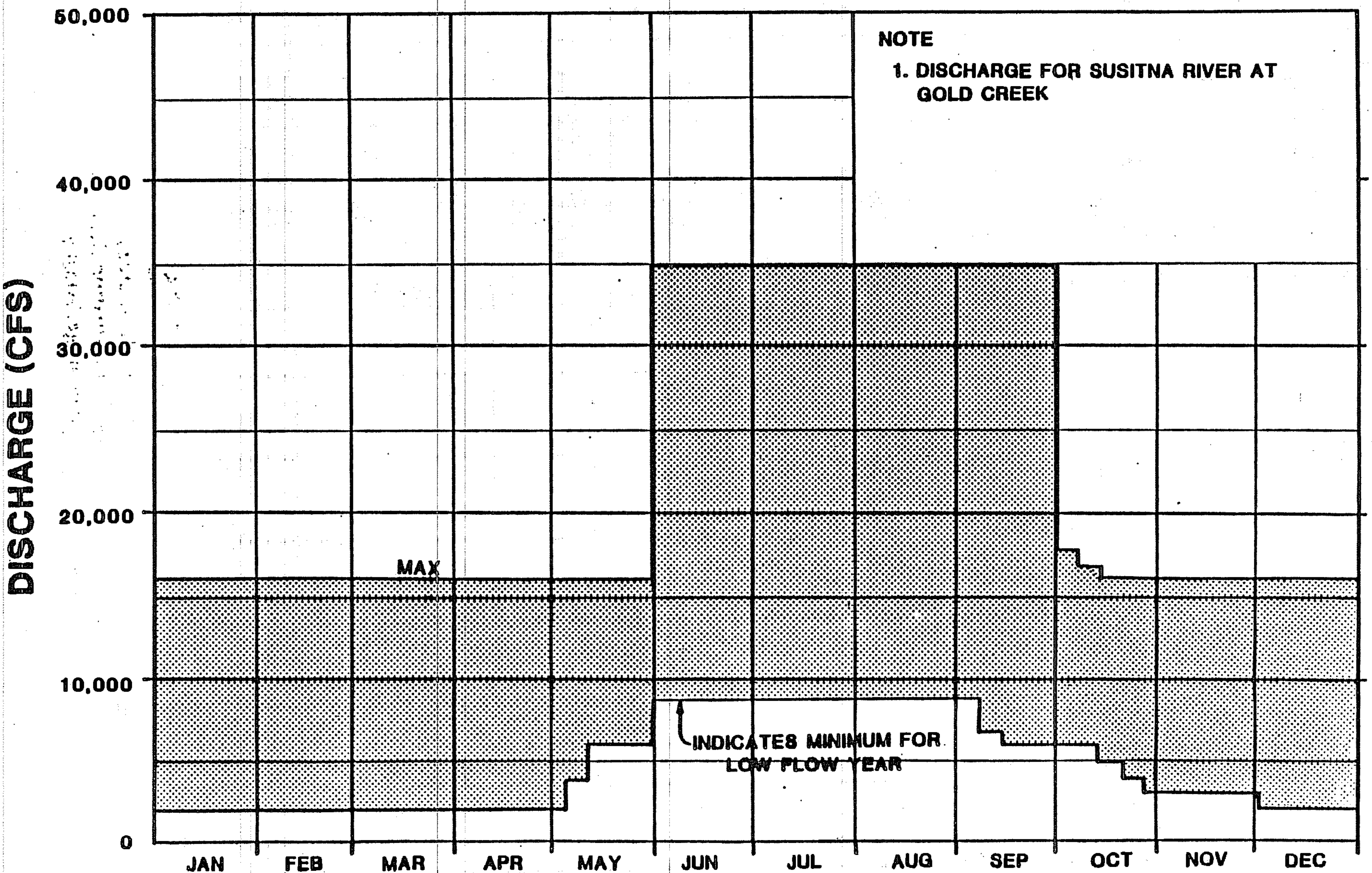


FIGURE E.2.3.10