

APPENDIX A. AVERAGE MONTHLY FLOW (CFS) BY WATER YEAR
FOR PRE-PROJECT CONDITIONS

Susitna-Watana Hydroelectric Project
(FERC No. 14241)

Stream Flow Assessment

Prepared for

Alaska Energy Authority



Prepared by

Tetra Tech

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Table A-1 – Average Monthly Flow for Susitna River near Denali for Pre-Project Conditions based on the USGS Extended Record

WY	Susitna River near Denali											
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1950	1,320	432	238	202	183	179	191	2,850	5,640	7,220	6,080	1,620
1951	681	219	207	197	187	181	290	3,750	6,110	7,400	5,870	6,190
1952	1,040	463	305	252	200	192	194	1,360	9,050	8,070	6,060	3,630
1953	1,620	608	269	207	187	187	289	5,620	8,260	6,190	6,320	4,020
1954	1,040	342	234	219	200	184	222	5,150	8,180	6,200	8,440	3,110
1955	985	465	332	286	224	207	213	2,270	8,320	8,360	7,190	3,690
1956	902	306	219	199	198	196	197	4,860	9,090	9,050	7,480	5,330
1957	1,070	520	350	269	234	213	213	3,470	12,200	11,200	9,770	4,020
1958	1,280	610	288	219	150	120	210	1,160	8,370	9,150	6,540	1,880
1959	939	390	170	119	81	42	43	1,780	8,890	8,330	7,880	2,500
1960	1,580	760	575	444	321	275	265	3,350	5,240	9,040	7,910	4,820
1961	1,780	660	483	331	271	281	415	2,960	6,410	8,080	7,250	2,690
1962	1,290	680	440	280	240	220	280	2,200	9,090	10,200	9,450	3,650
1963	1,080	510	310	250	230	200	210	3,250	6,760	10,500	10,200	3,950
1964	925	290	185	140	140	110	130	910	11,600	7,580	6,550	2,630
1965	1,470	702	279	220	200	208	320	2,460	4,650	6,760	5,760	6,960
1966	920	300	240	210	200	200	280	1,630	6,850	8,290	6,430	3,200
1967	957	321	278	252	227	205	195	3,550	7,870	8,140	8,770	4,640
1968	911	471	382	344	320	312	368	4,930	9,010	11,800	9,830	2,190
1969	700	304	172	145	140	145	229	1,770	8,150	9,450	3,920	2,210
1970	1,000	501	339	265	221	193	319	2,210	5,010	8,450	6,220	1,950
1971	528	395	276	170	125	120	135	629	8,100	10,400	10,400	3,290
1972	1,040	478	380	339	307	286	270	3,470	6,560	10,400	8,660	2,780
1973	667	323	211	178	164	153	153	1,040	5,740	8,350	7,270	2,450
1974	876	462	366	310	271	235	262	2,540	5,640	9,550	9,290	5,450
1975	2,140	673	381	300	200	200	200	1,640	7,040	12,100	7,290	3,570
1976	1,540	375	169	112	97	90	123	1,810	5,940	8,560	10,100	1,820
1977	894	467	331	266	240	231	246	1,500	8,250	10,000	10,200	3,710
1978	1,150	652	439	348	300	246	263	2,030	5,250	8,990	8,640	3,620
1979	865	463	312	263	229	203	250	2,790	7,650	9,500	9,180	4,510
1980	2,160	878	533	395	330	290	280	1,890	6,410	11,800	7,170	2,640
1981	1,300	745	473	344	274	235	210	3,010	7,160	11,900	12,000	2,740

WY	Susitna River near Denali cont.											
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1982	831	481	326	227	157	127	120	2,460	5,870	9,750	6,450	4,450
1983	1,150	439	363	330	300	277	281	1,970	7,450	10,500	8,050	2,600
1984	1,220	433	277	220	205	200	196	2,050	8,380	10,800	8,820	2,150
1985	1,300	611	438	357	306	291	376	2,480	8,060	10,500	7,220	3,860
1986	1,270	589	404	304	238	201	229	2,670	7,060	13,200	5,710	3,440
1987	3,920	615	325	267	253	249	344	3,170	7,170	9,400	7,140	3,580
1988	1,180	564	360	321	297	292	331	5,090	9,260	9,090	6,230	3,400
1989	1,540	503	281	251	234	265	331	3,230	8,160	8,500	8,950	6,060
1990	2,240	599	306	290	281	310	770	7,710	9,620	7,910	7,210	6,900
1991	1,280	406	308	283	275	234	276	2,240	8,910	7,600	6,180	3,100
1992	1,310	458	403	350	315	324	581	2,100	7,500	8,250	5,580	1,820
1993	721	476	369	320	275	253	412	6,260	7,790	6,540	5,870	7,070
1994	2,770	662	422	337	287	231	516	4,490	8,740	6,690	6,070	1,840
1995	819	447	337	284	252	249	377	4,910	7,340	7,900	5,430	5,650
1996	1,230	464	229	204	199	202	274	2,220	4,240	5,170	5,610	2,100
1997	638	350	299	262	230	200	260	2,280	5,650	7,610	7,720	3,500
1998	726	308	241	202	187	172	283	2,420	7,650	8,120	7,070	4,430
1999	1,610	551	379	285	204	155	207	2,300	7,110	6,980	7,560	2,680
2000	1,370	562	361	277	238	210	281	2,850	9,230	8,830	4,480	4,200
2001	1,730	556	377	307	254	222	261	2,320	8,750	6,350	6,420	2,360
2002	905	426	294	235	217	200	204	3,940	4,590	5,300	7,080	5,480
2003	3,140	1,070	441	229	294	214	431	2,250	7,650	8,520	6,210	3,180
2004	1,630	517	321	256	223	204	424	6,370	7,540	6,640	5,210	1,390
2005	975	409	294	260	230	244	831	8,480	9,450	8,200	6,910	7,370
2006	1,940	366	283	255	220	212	242	3,870	6,120	7,130	8,320	3,250
2007	3,270	598	333	269	232	202	345	3,330	4,780	6,760	6,160	4,050
2008	1,140	509	369	248	197	198	244	2,560	6,490	6,500	6,110	3,620
2009	1,110	315	258	253	225	219	678	6,170	6,970	5,980	5,100	2,820
2010	1,630	615	328	257	232	218	314	4,560	5,520	7,920	6,630	4,230
Average	1,330	503	326	263	229	212	293	3,120	7,400	8,580	7,300	3,640
Maximum	3,920	1,070	575	444	330	324	831	8,480	12,200	13,200	12,000	7,370
Minimum	528	219	169	112	81	42	43	629	4,240	5,170	3,920	1,390
Median	1,150	476	325	262	230	207	265	2,560	7,500	8,350	7,140	3,500

Table A-2 – Average Monthly Flow for Maclaren River near Paxson for Pre-Project Conditions based on the USGS Extended Record

WY	Maclaren River near Paxson											
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1950	477	162	91	66	51	47	56	1,060	2,150	2,710	2,270	558
1951	240	83	70	61	52	47	102	1,390	2,310	2,720	2,240	2,360
1952	358	172	120	101	64	56	59	496	3,480	3,000	2,270	1,350
1953	575	219	108	70	52	52	102	2,130	3,090	2,380	2,390	1,530
1954	348	132	95	83	64	50	79	1,950	2,980	2,370	3,040	1,160
1955	333	173	129	113	89	70	76	853	3,200	3,130	2,780	1,380
1956	308	120	83	63	62	60	61	1,840	3,520	3,410	2,780	1,950
1957	360	191	135	108	95	76	76	1,380	3,270	2,790	2,440	2,270
1958	545	247	204	124	83	73	97	1,270	3,530	3,520	2,700	784
1959	378	115	123	129	95	62	78	587	2,880	2,680	2,080	856
1960	549	250	190	150	110	94	92	1,740	2,120	3,360	3,050	2,440
1961	687	195	149	110	94	96	145	1,240	2,680	3,370	3,300	1,170
1962	381	210	170	120	100	92	120	632	2,920	3,260	2,930	1,130
1963	383	210	130	100	91	80	83	2,130	3,110	4,650	3,140	1,210
1964	416	140	98	85	88	71	72	386	4,300	2,760	2,220	871
1965	379	147	49	44	42	41	62	984	2,270	3,220	2,410	2,100
1966	522	180	55	45	45	43	50	265	2,990	2,510	2,090	954
1967	369	95	70	65	60	55	53	1,020	3,630	3,250	3,610	1,420
1968	417	130	100	97	95	95	95	208	3,250	3,430	2,130	680
1969	265	121	69	58	55	58	95	849	2,610	2,690	974	470
1970	249	117	73	59	50	53	69	746	1,750	2,440	2,370	773
1971	301	192	131	83	60	55	66	365	3,410	3,530	3,660	1,170
1972	375	156	123	115	107	97	99	1,220	3,070	3,260	2,680	1,370
1973	550	243	136	87	65	53	51	576	2,910	2,860	2,270	821
1974	307	123	83	69	62	57	57	649	2,070	2,630	2,440	1,540
1975	385	232	140	115	110	100	103	768	3,180	3,650	1,980	1,570
1976	553	235	139	106	94	90	105	781	2,870	2,810	2,600	600
1977	302	168	119	97	92	90	93	366	3,940	3,830	3,390	1,300
1978	512	265	186	162	140	121	134	709	2,320	3,200	2,360	924
1979	307	192	142	122	110	100	111	634	2,430	3,060	2,220	1,140
1980	734	370	246	160	106	82	81	901	2,520	3,530	2,470	917
1981	368	257	202	159	130	111	95	1,160	2,500	3,670	4,120	1,110

WY	Maclaren River near Paxson cont.											
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1982	443	230	170	138	93	77	69	496	1,940	2,730	1,680	1,560
1983	516	287	199	148	123	116	123	853	2,750	3,000	2,540	1,200
1984	481	200	121	95	90	83	88	967	3,140	2,940	2,400	598
1985	278	164	128	113	102	107	110	1,560	4,230	3,340	1,530	1,140
1986	380	145	101	100	100	115	105	992	2,610	4,760	1,910	1,340
1987	1,480	255	142	114	105	100	132	1,170	2,550	3,090	2,410	1,220
1988	316	161	121	111	102	96	99	1,640	2,980	2,780	2,120	1,220
1989	490	179	135	119	105	103	118	1,030	2,920	2,510	2,820	1,810
1990	681	205	134	129	126	135	283	2,700	3,380	2,470	2,480	2,650
1991	430	142	124	110	94	84	106	901	3,060	2,460	1,760	940
1992	337	133	116	106	99	104	122	551	2,730	2,940	2,270	804
1993	252	174	136	116	102	95	151	2,270	2,820	2,310	2,080	2,560
1994	931	225	153	126	110	93	185	1,540	3,260	2,380	2,160	649
1995	278	162	127	110	101	100	144	1,750	2,650	2,820	1,910	2,040
1996	422	164	90	79	75	74	99	742	1,510	1,790	1,940	745
1997	210	125	111	99	90	80	98	758	1,850	2,610	2,650	1,170
1998	248	113	93	81	76	71	105	822	2,580	2,820	2,350	1,460
1999	548	180	133	106	81	65	81	759	2,440	2,320	2,680	897
2000	468	183	128	104	92	83	105	941	3,390	3,190	1,450	1,410
2001	585	181	133	112	97	87	99	811	3,230	2,300	2,300	816
2002	307	155	114	94	87	79	80	1,410	1,640	1,890	2,560	1,910
2003	1,050	359	158	93	116	85	149	767	2,700	3,130	2,220	1,120
2004	580	177	120	98	85	74	152	2,280	2,650	2,350	1,850	470
2005	326	140	110	99	85	84	279	3,120	3,590	2,970	2,440	2,650
2006	666	135	106	97	87	84	96	1,430	2,230	2,530	3,110	1,120
2007	1,120	211	128	108	96	86	129	1,280	1,780	2,400	2,180	1,390
2008	378	181	142	100	79	80	98	931	2,320	2,330	2,160	1,300
2009	372	114	95	95	86	85	254	2,250	2,480	2,110	1,820	1,010
2010	547	207	122	99	90	84	118	1,680	2,020	2,860	2,350	1,520
Average	465	182	125	102	88	81	106	1,140	2,800	2,920	2,420	1,290
Maximum	1,480	370	246	162	140	135	283	3,120	4,300	4,760	4,120	2,650
Minimum	210	83	49	44	42	41	50	208	1,510	1,790	974	470
Median	383	177	124	101	92	83	99	967	2,820	2,820	2,360	1,170

Table A-3 – Average Monthly Flow for Susitna River near Cantwell for Pre-Project Conditions based on the USGS Extended Record

WY	Susitna River near Cantwell											
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1950	3,920	1,540	842	594	452	415	501	7,260	12,600	14,500	12,700	5,160
1951	2,330	758	638	554	471	424	954	8,930	13,300	14,500	12,600	13,600
1952	3,420	1,640	1,120	940	578	507	530	3,390	20,900	17,000	13,400	9,180
1953	5,100	2,110	1,000	638	471	471	955	12,300	17,600	12,900	13,200	9,690
1954	3,440	1,240	879	758	578	447	721	11,000	16,300	13,000	16,700	8,150
1955	3,290	1,650	1,210	1,060	819	638	698	5,850	19,300	17,800	16,400	9,050
1956	3,030	1,120	758	566	560	542	548	11,300	21,400	20,200	15,800	11,700
1957	3,570	1,830	1,270	1,000	879	698	698	8,750	19,500	15,000	13,100	12,700
1958	5,100	2,400	1,970	1,160	763	667	900	8,170	16,600	14,700	14,400	4,680
1959	2,930	1,280	887	848	763	566	729	10,200	15,000	16,100	19,800	10,800
1960	4,050	1,710	1,310	1,090	850	696	759	10,000	9,840	14,800	15,200	13,100
1961	4,840	1,800	1,610	1,460	1,030	1,070	1,590	9,690	15,700	14,800	16,700	6,720
1962	3,280	1,800	1,400	1,300	1,000	940	1,200	10,000	28,300	20,900	16,000	9,410
1963	4,330	2,200	1,400	1,000	850	760	720	11,300	15,000	22,800	18,200	9,190
1964	3,850	1,300	877	644	586	429	465	2,810	34,600	17,000	11,500	5,350
1965	3,130	1,910	921	760	680	709	1,100	8,820	16,400	18,300	13,400	12,900
1966	3,120	1,000	750	700	650	650	875	4,390	18,500	12,200	12,700	6,520
1967	2,320	780	720	680	640	560	513	9,450	19,600	16,900	19,200	10,300
1968	3,080	1,490	1,330	1,230	1,200	1,200	1,220	9,270	19,500	17,500	10,900	5,410
1969	2,410	1,060	618	508	485	548	998	7,470	12,300	13,500	6,600	3,380
1970	1,640	815	543	437	426	463	887	7,580	9,910	13,900	12,300	5,210
1971	2,150	1,530	1,050	731	503	470	529	1,910	22,000	18,100	22,700	9,800
1972	4,060	2,050	1,370	1,070	922	881	876	9,690	20,000	16,700	15,600	9,420
1973	2,940	1,340	858	698	698	578	594	5,160	17,900	11,600	13,000	5,660
1974	2,260	893	598	504	446	415	574	10,400	11,400	12,000	10,300	7,720
1975	2,270	1,000	942	889	862	819	936	9,800	20,900	17,900	11,500	10,400
1976	4,800	1,180	626	563	548	519	806	7,960	15,700	12,100	12,700	4,250
1977	2,350	1,580	1,430	1,080	951	879	988	8,070	24,400	14,700	12,300	7,960
1978	4,690	2,130	1,540	1,200	981	943	1,000	7,530	12,200	13,500	10,400	5,360
1979	3,000	1,510	988	817	749	698	849	8,840	15,900	18,700	13,100	6,750
1980	4,530	2,550	1,440	1,030	858	819	984	7,490	17,400	20,500	14,900	8,570
1981	5,470	2,490	1,660	1,690	1,190	919	1,220	12,100	14,000	20,900	22,800	9,420

WY	Susitna River near Cantwell cont.											
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1982	3,830	1,630	1,300	1,060	698	573	573	8,220	16,500	16,500	11,000	9,940
1983	3,310	1,600	1,400	1,300	1,200	1,150	1,210	8,200	16,500	16,200	17,000	8,660
1984	5,380	2,130	1,600	1,500	1,500	1,480	1,400	8,570	18,800	17,700	14,300	5,140
1985	2,760	1,630	1,170	990	880	844	1,030	5,540	15,800	19,900	12,700	7,520
1986	3,090	1,370	891	729	674	660	735	7,250	15,500	18,900	11,000	8,110
1987	8,020	2,080	1,150	949	890	879	1,220	8,210	14,800	19,300	13,900	8,440
1988	3,640	1,480	940	916	879	879	931	11,100	19,200	16,600	12,500	8,720
1989	4,760	1,810	1,180	1,180	1,060	1,060	1,270	8,690	17,300	15,200	14,400	9,790
1990	4,990	1,800	1,090	1,040	1,000	1,090	2,590	16,500	21,800	15,100	15,300	16,900
1991	4,270	1,460	1,310	1,120	1,060	952	948	3,750	16,500	13,600	11,700	7,780
1992	3,580	1,450	1,310	1,160	1,060	1,100	1,250	3,800	14,900	16,500	13,500	6,380
1993	2,660	1,640	1,210	1,100	1,030	963	1,520	13,400	15,100	12,400	12,000	13,700
1994	6,210	2,000	1,510	1,220	1,050	895	1,950	9,260	20,000	13,400	11,900	5,850
1995	2,760	1,660	1,240	1,090	1,010	1,000	1,710	11,300	15,900	16,400	11,700	12,200
1996	4,000	1,590	844	727	690	638	789	4,120	9,970	10,200	10,900	6,520
1997	2,080	1,140	1,010	907	817	730	900	6,000	12,200	15,600	15,800	8,520
1998	2,360	1,030	848	735	689	644	969	5,990	15,700	16,500	14,600	10,200
1999	4,740	1,790	1,230	968	740	592	743	5,840	14,700	14,600	16,200	7,060
2000	4,200	1,830	1,180	947	839	759	964	7,190	19,900	18,700	10,400	9,770
2001	4,980	1,810	1,230	1,030	884	792	902	5,640	20,100	14,200	14,000	6,490
2002	2,950	1,570	1,120	908	832	760	776	7,320	10,500	11,600	15,300	10,300
2003	6,870	3,300	1,550	973	1,330	886	1,300	5,000	15,700	18,800	13,600	8,560
2004	5,050	1,490	1,070	862	744	626	1,640	15,200	16,300	12,900	11,300	3,980
2005	1,990	1,020	946	842	722	605	1,580	17,400	22,200	17,300	14,100	14,700
2006	5,130	1,270	877	819	812	795	900	10,100	15,000	14,900	19,700	7,750
2007	6,530	1,890	1,380	1,200	1,120	1,030	1,350	11,000	12,600	13,800	12,300	8,540
2008	3,070	1,940	1,680	1,090	784	795	982	7,480	13,500	14,100	12,600	9,190
2009	3,400	909	758	810	758	783	2,800	14,700	14,900	12,400	11,800	7,870
2010	4,410	1,680	1,090	860	789	761	1,090	12,600	12,800	17,800	12,900	10,100
Average	3,800	1,600	1,130	938	820	755	1,030	8,630	16,900	15,800	13,900	8,620
Maximum	8,020	3,300	1,970	1,690	1,500	1,480	2,800	17,400	34,600	22,800	22,800	16,900
Minimum	1,640	758	543	437	426	415	465	1,910	9,840	10,200	6,600	3,380
Median	3,570	1,600	1,120	947	817	759	948	8,570	16,300	15,600	13,200	8,560

Table A-4 – Average Monthly Flow for Susitna River at Gold Creek for Pre-Project Conditions based on the USGS Extended Record

WY	Susitna River at Gold Creek											
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1950	6,330	2,580	1,440	1,030	788	726	870	11,500	19,600	22,600	19,900	8,300
1951	3,850	1,300	1,100	960	820	740	1,620	14,100	20,800	22,600	19,700	21,200
1952	5,570	2,740	1,900	1,600	1,000	880	920	5,420	32,400	26,400	20,900	14,500
1953	8,200	3,500	1,700	1,100	820	820	1,620	19,300	27,300	20,200	20,600	15,300
1954	5,600	2,100	1,500	1,300	1,000	780	1,240	17,300	25,300	20,400	26,100	12,900
1955	5,370	2,760	2,050	1,790	1,400	1,100	1,200	9,320	29,900	27,600	25,800	14,300
1956	4,950	1,900	1,300	980	970	940	950	17,700	33,300	31,100	24,500	18,300
1957	5,810	3,050	2,140	1,700	1,500	1,200	1,200	13,800	30,200	23,300	20,500	19,800
1958	8,210	3,950	3,260	1,960	1,310	1,150	1,530	12,900	25,700	22,900	22,500	7,550
1959	4,810	2,150	1,510	1,450	1,310	980	1,250	16,000	23,300	25,000	31,200	16,900
1960	6,560	2,850	2,200	1,850	1,450	1,200	1,300	15,800	15,500	23,000	23,600	20,500
1961	7,790	3,000	2,690	2,450	1,750	1,810	2,650	17,400	29,500	24,600	22,100	13,400
1962	5,920	2,700	2,100	1,900	1,500	1,400	1,700	12,600	43,300	25,900	23,600	15,900
1963	6,720	2,800	2,000	1,600	1,500	1,000	830	19,000	26,000	34,400	23,700	12,300
1964	6,450	2,250	1,490	1,050	966	713	745	4,310	50,600	22,900	16,400	9,570
1965	6,290	2,800	1,210	960	860	900	1,360	13,000	25,700	27,800	21,100	19,400
1966	7,210	2,100	1,630	1,400	1,300	1,300	1,780	9,650	33,000	19,900	21,800	11,800
1967	4,160	1,600	1,500	1,500	1,400	1,200	1,170	15,500	29,500	26,800	32,600	16,900
1968	4,900	2,350	2,050	1,980	1,900	1,900	1,910	16,200	31,600	26,400	17,200	8,820
1969	3,820	1,630	882	724	723	816	1,510	11,000	15,500	16,100	8,880	5,090
1970	3,120	1,220	866	824	768	776	1,080	11,400	18,600	22,700	20,000	9,120
1971	5,290	3,410	2,290	1,440	1,040	950	1,080	3,750	32,900	23,900	31,900	14,400
1972	5,850	3,090	2,510	2,240	2,030	1,820	1,710	21,900	34,400	22,800	19,300	12,400
1973	4,830	2,250	1,460	1,200	1,200	1,000	1,030	8,240	27,800	18,300	20,300	9,070
1974	3,730	1,520	1,030	874	777	724	992	16,200	17,900	18,800	16,200	12,200
1975	3,740	1,700	1,600	1,520	1,470	1,400	1,590	15,400	32,300	27,700	18,100	16,300
1976	7,740	1,990	1,080	974	950	900	1,370	12,600	24,400	18,900	19,800	6,880
1977	3,870	2,650	2,400	1,830	1,620	1,500	1,680	12,700	38,000	22,900	19,200	12,600
1978	7,570	3,530	2,590	2,030	1,670	1,600	1,700	11,900	19,100	21,000	16,400	8,610
1979	4,910	2,530	1,680	1,400	1,290	1,200	1,450	13,900	24,700	28,900	20,500	10,800
1980	7,310	4,190	2,420	1,750	1,470	1,400	1,670	12,100	29,100	32,700	21,000	13,300
1981	7,720	3,570	1,910	2,010	1,980	1,590	2,040	16,600	19,300	33,900	37,900	13,800

WY	Susitna River at Gold Creek cont.											
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1982	7,460	3,260	1,880	1,680	1,490	1,350	1,780	13,400	26,100	24,100	15,300	17,800
1983	6,890	2,630	2,360	2,260	2,000	1,690	1,900	14,900	24,500	21,100	24,500	13,600
1984	8,300	3,150	2,260	2,050	1,970	1,900	1,810	13,000	26,800	23,500	20,400	9,430
1985	5,670	3,090	2,390	1,940	1,640	1,730	1,980	11,200	26,300	26,500	19,900	15,600
1986	6,940	2,670	1,930	1,660	1,560	1,390	1,570	12,100	20,000	21,900	17,300	12,900
1987	12,700	3,450	1,950	1,610	1,520	1,500	2,050	13,000	23,000	29,900	21,800	13,300
1988	5,920	2,480	1,600	1,560	1,500	1,500	1,590	17,400	29,700	25,700	19,500	13,800
1989	7,670	3,010	2,000	2,000	1,800	1,800	2,140	13,700	26,800	23,700	22,400	15,400
1990	8,030	3,000	1,850	1,760	1,700	1,850	4,250	25,600	33,800	23,500	23,700	26,500
1991	6,900	2,450	2,200	1,900	1,800	1,620	1,610	6,050	25,600	21,200	18,300	12,300
1992	5,820	2,440	2,200	1,960	1,800	1,870	2,100	6,100	23,100	25,500	21,100	10,200
1993	4,380	2,730	2,040	1,860	1,750	1,640	2,540	20,900	23,500	19,300	18,700	21,300
1994	9,910	3,330	2,530	2,060	1,790	1,530	3,220	14,600	31,100	21,000	18,600	9,360
1995	4,530	2,780	2,100	1,850	1,720	1,700	2,850	17,700	24,700	25,500	18,400	19,100
1996	6,480	2,660	1,440	1,250	1,190	1,100	1,350	6,610	15,700	16,000	17,100	10,400
1997	3,510	1,960	1,750	1,630	1,510	1,400	1,640	9,660	19,100	24,400	24,700	13,600
1998	3,940	1,780	1,550	1,410	1,350	1,290	1,750	9,620	24,600	25,800	22,800	16,200
1999	7,740	3,040	2,110	1,700	1,420	1,220	1,410	9,380	23,100	22,900	25,400	11,400
2000	6,890	3,100	2,020	1,670	1,540	1,440	1,720	11,500	31,300	29,500	16,400	15,500
2001	8,110	3,070	2,100	1,770	1,590	1,480	1,620	9,020	31,000	22,000	21,800	10,400
2002	4,840	2,630	1,900	1,550	1,420	1,300	1,330	11,500	16,500	18,100	23,800	16,300
2003	11,000	5,390	2,590	1,650	2,240	1,510	2,170	8,020	24,300	29,200	21,100	13,500
2004	8,110	2,500	1,810	1,470	1,280	1,080	2,730	23,600	25,300	20,200	17,700	6,450
2005	3,300	1,730	1,610	1,440	1,240	1,050	2,610	26,900	34,300	26,800	22,000	22,900
2006	8,240	2,140	1,500	1,400	1,390	1,360	1,540	15,700	23,300	23,100	30,800	12,300
2007	10,400	3,140	2,320	2,020	1,910	1,740	2,270	17,200	19,700	21,600	19,300	13,500
2008	5,020	3,220	2,810	1,840	1,340	1,360	1,670	11,900	21,100	22,000	19,700	14,500
2009	5,530	1,550	1,300	1,390	1,300	1,340	4,550	22,900	23,100	19,400	18,500	12,500
2010	7,120	2,810	1,840	1,470	1,350	1,300	1,850	19,600	20,000	27,500	20,100	15,800
Average	6,320	2,670	1,890	1,590	1,420	1,300	1,740	13,800	26,300	24,000	21,400	13,700
Maximum	12,700	5,390	3,260	2,450	2,240	1,900	4,550	26,900	50,600	34,400	37,900	26,500
Minimum	3,120	1,220	866	724	723	713	745	3,750	15,500	16,000	8,880	5,090
Median	6,290	2,700	1,910	1,630	1,450	1,340	1,620	13,000	25,600	23,300	20,500	13,500

Table A-5 – Average Monthly Flow for Chulitna River near Talkeetna for Pre-Project Conditions based on the USGS Extended Record

WY	Chulitna River near Talkeetna											
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1950	5,320	1,870	1,130	1,020	924	903	959	10,500	18,200	21,500	18,900	7,080
1951	2,970	1,100	1,040	993	942	910	1,340	13,000	19,000	21,700	18,700	19,400
1952	4,530	1,990	1,300	1,180	1,010	965	979	4,620	26,200	23,400	18,900	13,100
1953	7,010	2,630	1,200	1,040	942	942	1,350	17,900	23,900	19,400	19,600	14,200
1954	4,540	1,460	1,150	1,100	1,010	926	1,070	16,500	23,400	19,400	23,800	11,700
1955	4,290	2,000	1,420	1,280	1,130	1,040	1,070	8,320	24,500	24,100	21,800	13,200
1956	3,930	1,330	1,100	1,000	997	986	990	15,500	26,300	25,900	22,000	17,000
1957	4,700	2,240	1,490	1,200	1,150	1,070	1,070	12,100	24,900	22,000	19,800	18,800
1958	6,990	3,020	2,430	1,390	1,040	948	1,220	10,500	23,200	25,000	20,800	8,000
1959	4,200	1,880	1,260	1,100	1,050	738	890	7,410	23,700	25,700	22,100	9,960
1960	4,720	2,280	1,700	1,450	1,100	933	1,000	13,900	17,400	23,700	19,300	12,400
1961	5,140	1,950	1,750	1,450	1,100	1,080	1,600	10,100	20,500	27,400	24,600	16,000
1962	5,780	2,400	1,500	1,300	1,000	930	1,170	7,740	20,600	27,200	22,000	13,500
1963	3,510	1,500	1,550	1,600	1,300	846	700	11,100	17,700	28,900	18,400	11,300
1964	8,060	2,300	1,000	1,010	820	770	1,130	2,350	40,300	24,400	20,300	9,230
1965	5,640	2,900	2,100	1,600	1,400	1,300	1,400	7,450	20,100	23,200	22,500	22,300
1966	6,070	1,620	1,350	1,200	1,100	1,100	1,300	3,970	21,700	23,700	27,700	12,200
1967	4,680	1,680	1,500	1,460	1,260	1,050	972	12,400	25,500	35,600	33,700	12,500
1968	3,480	1,660	1,400	1,240	1,200	1,150	1,350	10,900	29,000	30,100	20,700	7,380
1969	2,900	1,480	1,140	974	900	824	1,330	6,000	18,600	20,800	11,300	6,700
1970	4,580	1,890	1,320	1,200	1,150	1,100	1,440	9,640	19,700	26,100	24,700	11,300
1971	3,830	2,210	1,400	1,110	950	934	982	4,470	22,200	27,300	23,800	11,100
1972	5,440	2,160	1,430	1,170	1,040	939	893	9,760	17,900	25,800	21,000	12,100
1973	5,520	2,130	1,440	1,260	1,170	1,110	1,110	6,610	21,100	19,700	20,500	8,990
1974	3,720	1,910	1,490	1,300	1,190	1,100	1,200	10,800	17,600	20,700	20,000	13,300
1975	6,120	2,380	1,550	1,310	1,150	1,100	1,110	7,480	23,400	26,500	19,600	15,400
1976	6,320	1,560	1,110	1,020	977	960	1,110	7,480	20,400	21,400	21,200	7,170
1977	3,810	2,090	1,780	1,290	1,160	1,120	1,160	7,620	27,200	22,800	21,400	13,100
1978	6,030	2,470	1,760	1,450	1,240	1,120	1,170	7,280	16,600	23,500	18,900	9,800
1979	3,520	2,120	1,590	1,340	1,220	1,150	1,340	13,000	22,900	26,100	20,700	11,600
1980	8,020	3,620	1,950	1,610	1,410	1,300	1,680	9,140	22,500	34,900	20,800	8,240
1981	5,710	3,210	2,020	1,620	1,410	1,170	1,440	9,970	22,400	29,900	33,200	12,000

WY	Chulitna River near Talkeetna cont.											
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1982	4,830	2,250	1,220	1,030	873	789	1,070	6,290	18,400	25,600	20,400	18,200
1983	5,500	2,510	1,850	1,570	1,040	1,050	1,250	8,880	18,900	22,300	22,200	11,000
1984	8,620	2,920	2,390	2,050	1,510	1,260	1,380	7,310	18,600	22,300	22,800	9,920
1985	4,730	2,670	2,160	1,900	1,400	1,160	1,130	5,710	18,900	27,100	20,800	13,200
1986	6,360	1,900	1,480	1,320	1,130	959	956	4,750	14,700	22,800	17,900	14,800
1987	17,600	4,070	2,210	1,600	1,410	1,300	1,770	11,000	20,800	23,500	20,700	11,600
1988	3,490	2,240	1,880	1,580	1,370	1,240	1,230	11,600	21,800	21,300	17,700	11,100
1989	5,210	2,230	1,880	1,370	1,200	1,170	1,230	7,650	22,800	18,600	25,000	18,700
1990	8,810	3,120	2,060	1,940	1,930	2,070	3,910	22,300	25,900	18,700	18,900	21,100
1991	4,570	1,580	1,320	1,240	975	877	1,520	13,100	25,700	21,100	14,000	8,730
1992	3,890	1,330	1,150	1,090	1,080	1,130	1,360	5,870	22,200	23,700	18,500	8,570
1993	3,160	2,400	1,870	1,390	1,170	1,100	1,820	19,900	23,900	20,600	18,300	24,000
1994	11,200	3,360	1,880	1,520	1,330	1,140	2,110	15,400	26,300	19,300	19,400	6,350
1995	3,680	1,900	1,490	1,270	1,170	1,160	1,290	14,800	21,600	22,000	16,600	16,700
1996	5,200	2,140	1,150	1,050	1,020	1,060	1,520	10,200	13,600	17,900	18,600	7,660
1997	2,850	1,560	1,350	1,250	1,160	1,070	1,280	8,150	16,700	22,000	22,400	11,600
1998	3,220	1,390	1,190	1,080	1,030	984	1,370	8,280	22,000	23,500	20,300	13,900
1999	6,440	2,460	1,690	1,320	1,080	928	1,080	7,900	20,800	20,300	22,800	9,560
2000	5,720	2,510	1,610	1,290	1,180	1,100	1,340	9,720	28,200	26,600	14,000	13,400
2001	6,770	2,480	1,680	1,380	1,230	1,130	1,250	7,790	25,100	17,500	18,500	8,910
2002	4,150	1,830	1,310	1,150	1,090	1,010	1,020	14,100	14,400	16,000	21,400	19,100
2003	12,600	4,970	2,020	1,050	1,120	989	2,150	9,600	21,400	24,600	18,200	9,630
2004	6,130	2,760	1,570	1,300	1,160	1,080	1,720	16,700	19,500	20,000	16,100	6,290
2005	5,810	2,440	1,510	1,330	1,200	1,310	4,130	27,000	29,500	23,400	19,500	22,600
2006	7,910	1,700	1,480	1,330	1,120	1,080	1,200	9,870	16,700	19,800	24,700	11,900
2007	13,100	2,940	1,310	1,100	940	828	1,550	6,930	12,000	19,000	19,000	14,700
2008	5,620	2,080	1,250	1,070	985	988	1,150	8,120	18,700	18,500	18,900	11,900
2009	5,090	1,690	1,340	1,300	1,160	1,130	1,700	17,000	19,500	17,800	14,800	9,780
2010	7,490	3,390	1,610	1,310	1,200	1,120	1,550	9,790	15,200	21,600	20,500	12,700
Average	5,750	2,260	1,550	1,300	1,140	1,060	1,370	10,400	21,500	23,200	20,600	12,600
Maximum	17,600	4,970	2,430	2,050	1,930	2,070	4,130	27,000	40,300	35,600	33,700	24,000
Minimum	2,850	1,100	1,000	974	820	738	700	2,350	12,000	16,000	11,300	6,290
Median	5,210	2,160	1,490	1,290	1,130	1,070	1,250	9,720	21,400	22,800	20,400	11,900

Table A-6 – Average Monthly Flow for Talkeetna River near Talkeetna for Pre-Project Conditions based on the USGS Extended Record

WY	Talkeetna River near Talkeetna											
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1950	2,580	1,020	591	507	459	449	477	4,780	8,240	9,550	8,370	3,400
1951	1,540	550	519	495	469	452	700	5,880	8,770	9,540	8,280	8,960
1952	2,260	1,080	741	621	502	480	488	2,240	13,800	11,200	8,830	6,040
1953	3,360	1,390	661	519	469	469	697	8,100	11,600	8,500	8,680	6,370
1954	2,270	822	581	550	502	460	550	7,250	10,700	8,570	11,100	5,360
1955	2,170	1,090	800	698	564	519	535	3,850	12,700	11,700	11,000	5,950
1956	1,990	742	550	499	497	491	493	7,450	14,300	13,300	10,400	7,700
1957	2,350	1,210	839	661	581	535	535	5,760	12,900	9,850	8,650	8,330
1958	3,360	1,580	1,300	767	536	498	617	5,170	10,400	10,200	9,300	3,570
1959	2,020	896	632	559	537	428	489	5,040	10,000	10,700	11,300	5,860
1960	2,490	1,130	855	722	562	497	524	6,410	7,270	9,970	9,220	7,140
1961	2,840	1,070	959	833	611	615	910	5,990	10,600	11,000	9,940	6,550
1962	2,660	1,140	782	692	537	510	620	4,430	13,400	11,200	9,740	6,430
1963	2,190	911	778	719	619	459	405	6,370	9,370	13,200	9,070	5,340
1964	3,370	1,030	547	507	450	413	516	1,470	17,100	9,820	8,400	3,820
1965	3,120	1,570	1,100	720	620	540	580	3,470	11,100	12,200	11,200	10,600
1966	4,440	1,460	876	711	526	395	422	2,410	13,000	10,100	10,700	5,370
1967	2,390	897	750	637	546	471	427	4,110	9,290	12,600	14,200	6,970
1968	2,030	1,250	987	851	777	743	983	8,840	14,100	11,200	7,550	4,120
1969	1,640	827	556	459	401	380	519	3,870	5,210	7,080	3,790	2,070
1970	1,450	765	587	504	458	440	545	3,950	7,980	10,300	8,750	5,990
1971	2,820	1,650	1,100	679	459	402	503	2,140	19,000	11,800	16,800	5,990
1972	2,630	1,310	845	727	628	481	519	3,520	12,700	12,000	9,580	8,710
1973	3,630	1,370	889	748	654	574	577	3,860	12,200	7,680	9,930	3,860
1974	1,810	960	745	645	559	482	535	5,680	8,030	7,750	7,700	4,760
1975	1,970	1,000	774	694	586	508	522	4,080	13,200	12,100	8,490	7,960
1976	2,880	773	558	524	480	470	613	3,440	10,600	9,030	8,090	3,210
1977	1,860	1,100	1,070	700	549	506	548	4,240	18,300	9,340	8,000	5,960
1978	3,270	1,120	860	746	576	485	534	2,950	7,430	10,800	7,000	3,570
1979	1,660	1,140	932	762	652	577	710	7,790	12,000	14,400	8,270	4,040
1980	3,380	1,720	868	808	741	700	1,040	4,820	11,400	13,900	7,220	5,400
1981	2,600	1,140	717	652	535	545	671	4,530	6,590	15,400	14,700	4,380

WY	Talkeetna River near Talkeetna cont.											
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1982	2,350	1,240	708	650	467	285	480	3,310	12,900	11,100	7,270	9,560
1983	3,350	1,240	1,080	836	580	565	669	4,550	9,010	8,700	8,800	3,940
1984	3,280	1,100	781	690	626	600	555	4,010	9,330	8,900	9,760	3,820
1985	2,200	1,160	897	717	548	498	522	4,170	10,400	11,100	10,200	8,430
1986	3,320	1,000	783	681	590	400	396	2,540	6,210	9,150	8,030	6,890
1987	10,000	1,990	1,120	832	737	659	894	5,060	9,710	11,100	9,870	5,360
1988	1,720	1,140	965	818	707	606	595	5,270	10,100	9,670	7,970	5,120
1989	2,500	1,130	965	697	577	550	600	3,630	10,700	8,360	12,400	8,550
1990	4,100	1,550	1,050	996	990	1,060	1,910	11,500	13,100	8,450	8,710	11,000
1991	2,210	820	673	610	407	340	716	6,160	12,800	9,970	6,360	4,080
1992	1,900	672	540	494	480	521	690	2,800	10,400	11,200	8,530	3,990
1993	1,570	1,210	961	716	552	502	907	10,200	11,600	9,210	8,390	12,100
1994	5,150	1,660	968	790	675	531	1,050	6,920	13,600	8,640	8,830	3,010
1995	1,810	973	773	637	548	540	629	6,740	10,300	10,200	7,480	7,630
1996	2,500	1,090	538	457	440	467	749	4,720	6,180	8,070	8,370	3,600
1997	1,420	808	698	616	545	478	609	3,790	7,610	10,200	10,500	5,380
1998	1,590	718	569	481	446	413	660	3,990	10,400	11,100	9,240	6,330
1999	3,060	1,240	873	666	486	374	492	3,670	9,690	9,480	11,400	4,440
2000	2,740	1,270	834	648	562	500	658	4,490	15,200	13,800	6,340	6,230
2001	3,200	1,250	869	715	598	525	613	3,620	12,300	8,010	8,360	4,150
2002	2,020	943	665	539	493	430	439	7,200	6,540	7,210	10,100	8,700
2003	5,740	2,400	1,020	464	513	417	1,020	4,440	9,840	12,000	8,270	4,460
2004	2,920	1,380	816	656	541	482	843	7,530	8,710	8,950	7,230	2,990
2005	2,780	1,230	777	682	579	666	1,970	14,200	16,500	10,900	8,700	11,000
2006	3,700	880	771	671	514	479	573	4,680	7,700	9,050	13,300	5,440
2007	6,150	1,460	665	500	382	309	717	3,270	5,480	8,520	8,590	6,700
2008	2,690	1,060	615	479	414	416	531	3,790	8,520	8,460	8,540	5,440
2009	2,450	873	694	654	547	517	823	7,790	8,870	7,960	6,710	4,540
2010	3,530	1,680	834	665	575	515	763	4,500	6,860	9,930	9,220	5,800
Average	2,840	1,160	801	655	553	502	670	5,120	10,700	10,300	9,210	5,940
Maximum	10,000	2,400	1,300	996	990	1,060	1,970	14,200	19,000	15,400	16,800	12,100
Minimum	1,420	550	519	457	382	285	396	1,470	5,210	7,080	3,790	2,070
Median	2,580	1,130	782	666	547	491	595	4,500	10,400	9,970	8,710	5,440

Table A-7 – Average Monthly Flow for Susitna River at Sunshine for Pre-Project Conditions based on the USGS Extended Record

WY	Susitna River at Sunshine											
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1950	15,000	5,820	3,150	2,210	1,670	1,530	1,860	28,100	48,400	56,400	49,500	19,800
1951	8,860	2,830	2,370	2,060	1,740	1,560	3,580	34,600	51,300	56,600	48,900	52,300
1952	13,100	6,200	4,210	3,520	2,150	1,880	1,970	13,000	77,200	64,900	51,400	35,400
1953	19,600	8,000	3,750	2,370	1,740	1,740	3,580	47,700	66,800	50,300	51,300	37,600
1954	13,100	4,680	3,280	2,830	2,150	1,650	2,690	42,900	63,000	50,700	64,500	31,500
1955	12,600	6,230	4,550	3,970	3,060	2,370	2,600	22,600	71,500	67,500	61,800	35,100
1956	11,500	4,220	2,830	2,100	2,080	2,010	2,030	43,000	78,900	75,200	60,700	45,600
1957	13,600	6,920	4,780	3,750	3,280	2,600	2,600	33,500	72,500	58,100	51,200	49,300
1958	19,600	9,100	7,440	4,360	2,850	2,480	3,370	31,700	63,800	57,000	54,500	18,000
1959	11,200	4,800	3,320	3,170	2,850	2,100	2,720	38,900	58,200	62,200	73,400	40,900
1960	15,500	6,450	4,910	4,080	3,170	2,590	2,830	38,400	38,200	56,400	58,800	50,300
1961	18,600	6,810	6,070	5,500	3,870	4,000	5,970	43,000	70,300	61,700	55,200	32,700
1962	14,000	6,090	4,680	4,210	3,280	3,060	3,750	30,600	97,200	64,400	59,000	39,000
1963	15,900	6,320	4,440	3,520	3,280	2,150	1,760	45,100	65,300	81,300	58,800	30,000
1964	15,200	5,030	3,280	2,260	2,070	1,510	1,580	10,000	103,000	58,700	44,700	23,800
1965	16,600	7,460	3,900	2,790	2,460	2,410	3,230	28,800	64,100	68,900	55,600	51,900
1966	20,700	6,060	4,190	3,500	3,050	2,850	3,690	21,500	76,200	52,500	57,200	30,800
1967	11,400	4,170	3,740	3,540	3,240	2,800	2,670	35,200	68,500	66,600	76,200	42,200
1968	12,000	6,110	5,110	4,730	4,460	4,400	4,850	41,900	76,000	66,200	44,900	23,000
1969	9,370	4,100	2,400	2,000	1,910	2,030	3,400	26,500	37,500	42,100	22,600	12,400
1970	7,810	3,290	2,420	2,230	2,070	2,050	2,710	27,600	47,400	58,600	51,600	26,700
1971	14,200	8,670	5,720	3,530	2,510	2,280	2,650	10,300	79,300	61,600	76,000	36,700
1972	14,800	7,490	5,620	4,950	4,420	3,850	3,720	44,900	78,000	60,600	51,400	36,900
1973	14,900	6,160	3,930	3,240	3,070	2,620	2,670	21,700	67,600	47,200	53,000	23,000
1974	9,550	4,160	2,950	2,520	2,240	2,040	2,560	38,000	46,900	48,500	43,000	30,600
1975	9,870	4,530	3,950	3,660	3,420	3,180	3,530	34,700	76,400	69,000	47,900	43,400
1976	18,700	4,630	2,730	2,510	2,400	2,300	3,330	28,800	61,400	50,300	50,200	17,800
1977	9,870	6,340	5,850	4,200	3,610	3,350	3,720	30,100	88,000	57,900	49,500	33,600
1978	19,100	7,890	5,790	4,620	3,730	3,490	3,730	26,600	48,200	56,200	42,400	21,600
1979	11,300	6,210	4,380	3,590	3,210	2,960	3,610	37,100	63,400	72,200	51,600	26,500
1980	18,900	10,200	5,500	4,260	3,660	3,480	4,560	30,300	69,700	77,400	51,200	33,000
1981	18,200	8,010	4,380	4,430	4,200	3,550	4,530	36,200	50,900	85,600	84,900	32,500

WY	Susitna River at Sunshine cont.											
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1982	16,500	7,030	4,040	3,500	3,230	2,880	3,800	26,600	62,800	63,000	45,600	48,800
1983	16,200	6,300	5,610	5,220	4,660	3,480	4,200	31,400	58,100	55,400	60,600	30,000
1984	21,300	8,270	5,550	4,900	4,600	4,500	4,550	25,900	59,300	59,100	58,700	23,900
1985	12,400	6,250	4,880	4,560	3,820	3,750	4,090	25,800	60,900	68,000	55,000	40,800
1986	16,700	6,080	4,310	3,700	3,380	2,880	3,100	22,000	46,900	56,000	45,900	35,200
1987	36,600	9,390	5,180	4,080	3,740	3,580	4,940	32,600	58,200	71,200	55,500	33,600
1988	13,300	6,120	4,300	3,960	3,660	3,500	3,640	41,100	69,900	63,500	50,100	34,200
1989	17,900	7,030	4,970	4,490	3,960	3,920	4,570	30,900	65,900	58,500	60,100	42,800
1990	21,600	7,780	4,870	4,630	4,510	4,890	10,700	62,800	78,400	57,900	58,300	63,200
1991	16,000	5,470	4,780	4,170	3,700	3,290	3,920	21,200	66,000	55,400	44,900	29,400
1992	13,400	5,200	4,580	4,110	3,810	3,990	4,650	15,600	59,800	64,500	53,300	25,300
1993	10,200	6,690	5,030	4,290	3,840	3,580	5,820	53,200	61,100	51,500	48,800	56,800
1994	27,000	8,550	5,880	4,750	4,090	3,430	7,290	38,900	74,400	53,800	49,200	22,000
1995	10,900	6,320	4,790	4,140	3,780	3,740	5,850	44,000	61,100	63,600	47,100	48,200
1996	15,800	6,340	3,300	2,860	2,730	2,630	3,510	20,300	39,700	43,400	46,100	25,000
1997	9,510	5,330	4,600	4,120	3,740	3,370	4,150	25,800	50,600	64,000	64,700	36,100
1998	10,700	4,730	3,860	3,380	3,190	3,000	4,480	25,500	64,300	67,200	60,000	42,800
1999	20,800	8,270	5,770	4,420	3,410	2,770	3,440	25,000	60,500	60,100	65,800	30,300
2000	18,500	8,430	5,500	4,300	3,830	3,490	4,420	30,700	79,600	75,500	43,500	41,000
2001	21,700	8,340	5,740	4,710	4,020	3,630	4,120	23,600	73,900	54,200	54,300	25,900
2002	11,900	6,010	4,260	3,480	3,200	2,900	2,960	31,800	42,000	46,200	59,300	44,600
2003	30,000	13,600	6,090	3,550	4,630	3,230	5,470	22,200	61,300	70,600	52,900	32,400
2004	19,500	6,600	4,380	3,520	3,030	2,620	6,070	56,000	61,800	52,800	45,500	16,600
2005	10,600	5,010	3,970	3,510	3,030	2,840	7,970	68,800	81,900	66,300	55,900	59,200
2006	21,200	5,060	3,770	3,440	3,180	3,080	3,510	36,100	54,800	58,200	72,600	31,900
2007	29,300	7,850	4,980	4,220	3,840	3,450	5,060	36,900	45,900	54,800	50,300	36,400
2008	13,500	7,250	5,750	3,880	2,950	2,980	3,680	28,100	53,600	54,800	50,900	36,100
2009	13,900	4,040	3,300	3,380	3,080	3,100	9,340	54,900	57,600	49,800	45,900	30,600
2010	18,800	7,680	4,460	3,530	3,200	3,040	4,370	44,000	48,900	66,200	52,700	39,200
Average	15,900	6,490	4,490	3,720	3,260	2,960	4,030	33,200	63,700	60,500	54,200	34,900
Maximum	36,600	13,600	7,440	5,500	4,660	4,890	10,700	68,800	103,000	85,600	84,900	63,200
Minimum	7,810	2,830	2,370	2,000	1,670	1,510	1,580	10,000	37,500	42,100	22,600	12,400
Median	15,000	6,300	4,460	3,700	3,240	2,980	3,690	31,400	63,000	58,700	52,700	33,600

Table A-8 – Average Monthly Flow for Willow Creek near Willow for Pre-Project Conditions based on the USGS Extended Record

WY	Willow Creek near Willow											
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1950	290	132	87	73	52	56	55	141	886	658	559	326
1951	166	97	88	78	63	52	65	422	1,140	848	774	923
1952	298	130	99	69	45	43	48	300	1,480	1,120	753	686
1953	292	192	104	88	62	51	65	503	1,060	534	763	476
1954	196	123	88	63	51	43	55	400	563	679	852	560
1955	278	142	54	60	50	38	34	200	1,080	1,280	914	529
1956	200	103	78	61	51	34	51	279	971	1,010	704	556
1957	201	143	92	71	59	36	54	626	1,130	584	436	896
1958	355	193	115	72	63	47	60	315	703	472	569	277
1959	249	117	89	54	50	47	52	405	1,270	807	1,130	563
1960	249	139	87	84	60	43	58	651	719	672	661	643
1961	282	152	117	135	73	54	62	373	1,010	872	790	637
1962	328	161	91	100	79	73	74	300	1,500	959	872	617
1963	227	125	102	92	72	67	71	554	1,350	1,590	1,290	406
1964	349	149	104	79	68	60	72	163	1,450	801	559	369
1965	272	156	112	87	77	75	94	256	838	859	780	1,000
1966	369	172	124	86	74	63	68	197	925	660	721	444
1967	247	170	113	78	69	64	68	472	1,260	1,040	889	577
1968	207	122	93	85	83	79	77	643	1,430	1,000	459	257
1969	132	72	60	71	67	56	65	348	550	474	351	195
1970	183	121	92	76	62	60	60	383	728	748	753	405
1971	263	173	115	86	72	56	57	133	1,080	1,030	1,330	367
1972	215	159	97	88	75	60	56	254	1,370	1,190	563	706
1973	422	191	117	89	79	73	71	323	1,100	678	698	344
1974	210	132	100	91	79	60	63	654	1,060	725	483	368
1975	222	143	99	85	75	65	63	283	1,190	1,170	639	882
1976	329	162	119	81	70	58	61	267	1,150	758	433	235
1977	183	133	118	88	75	66	73	356	1,800	1,030	483	801
1978	374	154	126	83	73	60	76	291	647	607	307	259
1979	232	91	110	83	74	75	100	1,050	1,430	1,150	398	368
1980	402	364	152	112	85	73	102	473	1,410	1,290	955	700
1981	288	127	57	57	53	58	86	481	484	1,020	1,290	367

WY	Willow Creek near Willow cont.											
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1982	398	177	99	96	74	34	75	579	1,190	816	500	1,080
1983	409	150	119	94	78	64	103	600	889	338	766	565
1984	631	170	118	95	84	72	75	394	828	579	537	380
1985	177	82	69	66	70	67	66	340	1,340	1,230	1,130	952
1986	419	131	91	69	53	42	51	371	608	669	612	705
1987	1,200	191	137	101	77	61	87	497	823	573	581	632
1988	264	96	80	67	74	62	88	632	997	672	563	587
1989	408	185	128	90	74	69	141	577	1,140	541	784	808
1990	475	215	138	109	99	98	205	1,580	1,500	481	378	1,140
1991	321	181	144	104	83	71	89	782	1,230	704	402	463
1992	269	165	126	93	73	59	67	456	1,260	582	440	437
1993	188	102	76	62	60	64	75	968	1,020	356	439	1,180
1994	508	248	141	110	105	65	100	501	1,540	727	538	365
1995	263	154	121	97	80	72	100	574	1,040	691	524	592
1996	254	136	106	82	68	56	72	397	528	392	525	313
1997	169	147	101	82	74	68	82	455	923	488	666	538
1998	237	141	119	100	88	80	91	308	965	608	773	509
1999	321	166	124	100	83	70	64	280	941	626	700	425
2000	344	198	149	112	93	76	86	375	1,340	1,060	607	700
2001	351	181	126	89	75	66	78	376	1,470	660	457	325
2002	190	95	71	60	56	50	46	664	662	310	666	905
2003	794	246	130	94	134	59	98	328	790	496	469	401
2004	449	169	83	70	58	50	85	829	634	228	210	340
2005	622	164	123	111	92	75	258	1,620	1,580	701	651	1,260
2006	403	100	71	60	54	51	50	555	928	558	1,680	654
2007	790	212	115	79	66	50	84	359	580	362	412	632
2008	300	119	72	60	52	51	66	414	822	745	553	505
2009	262	127	103	88	57	50	117	943	708	337	370	290
2010	354	134	106	94	69	48	74	457	541	563	528	529
Average	332	153	105	84	71	60	79	487	1,040	745	666	573
Maximum	1,200	364	152	135	134	98	258	1,620	1,800	1,590	1,680	1,260
Minimum	132	72	54	54	45	34	34	133	484	228	210	195
Median	288	149	104	85	73	60	72	405	1,040	679	607	538

Table A-9 – Average Monthly Flow for Skwentna River near Skwentna for Pre-Project Conditions based on the USGS Extended Record

WY	Skwentna River near Skwentna											
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1950	4,510	1,950	1,120	813	631	585	694	7,950	13,100	15,100	13,400	5,870
1951	2,830	1,020	867	762	657	596	1,240	9,650	13,800	15,100	13,300	14,100
1952	4,010	2,060	1,460	1,240	792	702	732	3,790	19,700	17,000	13,800	9,880
1953	5,790	2,590	1,310	867	657	657	1,240	12,900	17,500	13,600	13,900	10,400
1954	4,040	1,600	1,160	1,020	792	626	968	11,700	16,700	13,700	16,900	8,920
1955	3,890	2,070	1,560	1,380	1,090	867	942	6,490	18,400	17,700	16,100	9,800
1956	3,590	1,460	1,020	777	770	747	755	11,600	20,000	19,500	16,100	12,400
1957	4,180	2,280	1,630	1,310	1,160	942	942	9,230	18,700	15,500	13,800	13,400
1958	5,810	2,910	2,420	1,500	1,020	903	1,190	8,860	17,000	15,200	14,400	5,370
1959	3,500	1,640	1,170	1,120	1,020	777	976	10,500	15,600	16,500	18,600	11,100
1960	3,530	1,850	1,400	1,100	961	843	835	10,500	13,400	16,700	16,000	9,170
1961	3,890	1,600	1,600	1,400	1,150	1,150	1,700	11,200	20,600	16,500	13,900	12,000
1962	4,600	2,200	1,400	1,200	860	760	1,000	6,610	15,600	14,900	12,100	6,720
1963	2,800	1,250	1,100	1,000	810	700	650	7,760	14,000	20,400	12,000	7,180
1964	5,360	1,550	840	970	750	600	840	1,640	27,300	16,500	12,700	6,220
1965	4,430	1,790	1,300	920	800	740	770	4,810	17,200	19,400	14,000	13,100
1966	4,120	1,580	1,150	1,100	1,100	1,100	1,300	4,500	19,600	14,200	17,300	9,810
1967	5,580	1,400	900	720	650	650	780	1,790	14,400	14,700	15,800	9,520
1968	3,830	1,560	1,180	1,020	1,000	950	1,290	13,500	20,800	17,500	10,600	3,860
1969	1,930	678	624	600	600	626	1,490	11,100	19,600	13,700	7,470	3,780
1970	5,650	1,610	832	766	700	650	728	11,700	22,900	21,100	13,000	6,660
1971	2,920	2,020	1,180	865	721	613	607	5,960	25,400	20,600	15,900	6,020
1972	3,020	1,330	1,100	989	898	811	742	8,050	15,300	16,800	13,400	9,260
1973	4,550	2,340	1,320	910	702	606	727	6,350	15,200	13,800	9,870	6,160
1974	3,540	1,700	1,260	1,020	902	811	1,010	6,770	10,700	11,700	10,500	11,800
1975	4,560	2,330	919	800	750	750	767	7,850	19,100	19,500	11,700	8,470
1976	4,700	1,970	1,260	971	897	800	1,270	8,810	15,100	14,600	11,100	8,160
1977	6,200	2,880	2,870	2,830	1,820	1,200	1,200	8,910	36,700	25,300	20,200	10,300
1978	5,800	2,370	1,550	1,210	944	841	1,020	9,010	13,800	18,100	13,700	7,480
1979	4,940	1,580	1,550	1,160	1,040	981	1,600	11,700	15,000	15,800	16,200	7,450
1980	7,250	4,190	2,230	1,780	1,620	1,350	1,960	11,800	24,800	28,600	13,900	8,780
1981	5,630	2,690	1,480	1,240	1,270	925	2,140	22,400	24,700	21,400	16,500	7,640

WY	Skwentna River near Skwentna cont.											
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1982	5,180	2,270	1,480	1,170	986	777	770	5,160	16,000	14,000	10,500	15,200
1983	4,400	2,010	1,470	1,190	1,150	1,100	1,570	9,040	16,900	15,500	16,300	5,530
1984	3,790	1,930	1,280	944	828	817	2,040	10,800	17,300	18,200	18,500	6,640
1985	4,820	1,560	1,080	1,060	1,020	938	895	6,730	16,800	20,300	16,000	10,400
1986	5,700	1,720	1,340	1,170	1,050	895	1,020	8,030	15,500	17,500	13,500	9,950
1987	13,200	2,740	1,440	1,180	1,140	1,110	1,530	8,540	14,500	20,000	17,000	9,990
1988	5,010	3,000	1,960	1,660	1,500	1,460	1,730	11,000	19,500	20,400	13,600	9,240
1989	5,840	2,160	1,060	935	933	1,060	1,370	9,170	15,700	17,800	23,200	15,900
1990	7,920	2,890	1,360	1,280	1,250	1,390	3,200	17,200	20,800	16,400	14,300	14,900
1991	4,880	1,780	1,140	1,140	1,140	988	1,330	7,810	19,200	17,300	14,400	9,430
1992	5,280	2,230	1,920	1,650	1,460	1,490	3,180	7,580	14,600	16,400	11,400	5,530
1993	2,960	2,160	1,760	1,460	1,170	1,070	1,910	13,800	15,600	13,100	12,700	14,000
1994	6,930	2,470	1,910	1,570	1,370	1,180	2,380	10,000	19,000	14,100	12,600	6,560
1995	3,310	2,090	1,600	1,420	1,320	1,310	2,130	11,900	16,000	16,900	12,400	12,900
1996	4,630	1,990	1,120	980	932	867	1,050	4,670	10,700	10,900	11,600	7,270
1997	2,590	1,470	1,270	1,120	992	869	1,110	6,880	13,200	16,500	16,600	9,530
1998	2,890	1,300	1,030	875	812	751	1,200	6,710	16,500	17,200	15,500	11,300
1999	5,560	2,260	1,590	1,210	883	680	894	6,670	15,600	15,600	16,800	8,070
2000	4,980	2,300	1,520	1,180	1,020	909	1,200	8,150	20,100	19,100	11,500	10,800
2001	5,820	2,280	1,580	1,300	1,090	956	1,110	6,310	19,300	14,700	14,500	7,230
2002	3,520	1,980	1,450	1,200	1,110	1,020	1,040	7,820	11,300	12,300	15,400	11,100
2003	7,620	3,900	1,950	1,280	1,700	1,170	1,630	5,650	16,200	18,300	14,100	9,270
2004	5,710	1,890	1,390	1,140	1,000	852	2,030	15,400	16,800	13,600	12,000	4,620
2005	2,450	1,330	1,250	1,120	973	826	1,930	17,300	20,700	17,400	14,700	15,200
2006	5,800	1,630	1,160	1,090	1,080	1,060	1,190	10,300	15,100	15,400	18,700	8,510
2007	7,190	2,340	1,760	1,550	1,460	1,340	1,720	11,600	13,300	14,500	13,000	9,300
2008	3,640	2,400	2,110	1,410	1,050	1,060	1,290	8,200	14,200	14,600	13,200	9,960
2009	3,980	1,200	1,020	1,080	1,020	1,050	3,250	14,900	15,500	13,100	12,500	8,630
2010	5,070	2,100	1,410	1,140	1,060	1,020	1,410	13,200	13,500	17,700	13,500	10,800
Average	4,780	2,020	1,400	1,160	1,020	916	1,330	9,280	17,400	16,700	14,200	9,320
Maximum	13,200	4,190	2,870	2,830	1,820	1,490	3,250	22,400	36,700	28,600	23,200	15,900
Minimum	1,930	678	624	600	600	585	607	1,640	10,700	10,900	7,470	3,780
Median	4,600	1,990	1,340	1,140	1,000	869	1,200	8,860	16,500	16,500	13,900	9,270

Table A-10 – Average Monthly Flow for Yentna River near Susitna Station for Pre-Project Conditions based on the USGS Extended Record

WY	Yentna River near Susitna Station											
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1950	12,600	4,770	2,550	1,780	1,340	1,230	1,490	23,700	40,200	47,000	41,400	16,600
1951	7,320	2,280	1,910	1,650	1,400	1,250	2,920	29,100	42,100	47,100	41,100	42,900
1952	10,900	5,080	3,430	2,850	1,730	1,510	1,580	10,500	59,000	51,600	41,900	29,500
1953	16,400	6,590	3,040	1,910	1,400	1,400	2,920	39,700	53,000	42,600	43,000	31,800
1954	10,900	3,820	2,660	2,280	1,730	1,320	2,170	36,300	51,000	42,600	51,900	26,600
1955	10,400	5,110	3,710	3,220	2,470	1,910	2,100	19,000	55,200	53,400	49,000	29,600
1956	9,560	3,430	2,280	1,690	1,670	1,620	1,640	34,800	59,700	57,900	48,700	37,700
1957	11,300	5,680	3,900	3,040	2,660	2,100	2,100	27,300	56,000	48,000	43,300	41,400
1958	16,400	7,510	6,120	3,560	2,300	2,000	2,730	26,500	51,400	47,800	43,700	15,000
1959	9,270	3,920	2,690	2,560	2,300	1,690	2,200	31,200	47,800	50,400	56,100	33,200
1960	10,000	5,260	3,990	3,130	2,750	2,410	2,390	29,400	37,600	46,600	44,600	25,700
1961	11,000	4,560	4,550	4,000	3,290	3,300	4,840	31,400	57,300	46,100	38,900	33,600
1962	13,000	6,240	3,990	3,420	2,460	2,180	2,860	18,600	43,700	41,800	33,800	18,900
1963	7,930	3,570	3,140	2,860	2,320	2,000	1,860	21,800	39,300	57,000	33,600	20,200
1964	15,100	4,410	2,400	2,770	2,150	1,720	2,400	4,650	75,800	46,000	35,500	17,500
1965	12,500	5,090	3,710	2,630	2,290	2,120	2,210	13,500	47,900	54,000	39,100	36,600
1966	11,600	4,490	3,280	3,140	3,140	3,140	3,700	12,700	54,500	39,700	48,300	27,500
1967	15,700	3,990	2,570	2,060	1,860	1,860	2,230	5,090	40,300	41,200	44,000	26,700
1968	10,800	4,440	3,370	2,920	2,860	2,720	3,690	37,600	57,900	48,800	29,600	10,900
1969	5,480	1,940	1,790	1,720	1,720	1,790	4,230	31,000	54,600	38,200	21,000	10,700
1970	15,900	4,570	2,380	2,200	2,000	1,860	2,080	32,700	63,700	58,900	36,500	18,700
1971	8,270	5,750	3,380	2,470	2,070	1,760	1,740	16,700	70,700	57,400	44,500	16,900
1972	8,540	3,780	3,150	2,830	2,570	2,320	2,120	22,600	42,800	47,000	37,400	26,000
1973	12,800	6,640	3,750	2,600	2,010	1,740	2,080	17,900	42,500	38,700	27,700	17,300
1974	10,000	4,830	3,600	2,920	2,580	2,320	2,870	19,000	29,900	32,700	29,400	33,000
1975	10,300	5,470	3,210	2,890	2,670	2,540	2,530	20,900	54,800	57,100	35,600	27,900
1976	12,700	4,860	3,100	2,770	2,490	2,300	3,330	26,800	44,100	45,200	36,600	21,300
1977	14,500	7,630	6,740	6,160	4,460	3,150	3,050	24,300	89,000	67,300	55,700	31,900
1978	15,700	5,920	3,810	3,210	2,770	2,590	2,940	22,500	38,600	50,800	41,000	21,700
1979	14,000	5,140	4,130	3,470	3,120	2,880	4,080	33,500	46,800	53,300	50,600	25,700
1980	22,000	12,000	6,060	4,610	4,170	3,760	5,200	30,500	66,400	81,100	46,700	28,400
1981	18,500	8,370	4,370	3,710	3,740	2,750	5,480	45,600	55,100	64,400	58,900	25,900

WY	Yentna River near Susitna Station cont.											
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1982	12,300	6,250	4,540	3,660	2,850	2,230	2,180	13,900	40,900	46,700	39,800	47,600
1983	12,500	5,660	4,120	3,340	3,240	3,090	4,420	25,900	48,800	44,600	47,100	15,800
1984	10,700	5,440	3,580	2,640	2,310	2,280	5,750	30,900	50,100	52,500	53,400	19,000
1985	13,700	4,370	3,010	2,960	2,850	2,620	2,500	19,300	48,500	58,800	46,200	29,800
1986	16,300	4,850	3,740	3,280	2,930	2,500	2,850	23,000	44,600	55,000	43,600	32,000
1987	38,400	6,760	3,830	3,240	3,140	3,080	4,000	27,000	46,900	61,500	52,600	30,700
1988	13,100	7,320	4,980	4,330	3,980	3,890	4,480	35,300	60,100	62,400	44,300	29,100
1989	16,100	5,430	2,940	2,650	2,650	2,940	3,640	29,000	50,200	55,800	69,500	50,400
1990	24,100	7,170	3,640	3,470	3,400	3,720	8,340	53,100	63,400	52,100	46,100	46,600
1991	13,000	4,570	3,140	3,140	3,130	2,770	3,540	23,300	59,300	54,400	45,900	29,600
1992	14,800	5,540	4,890	4,290	3,890	3,960	8,410	22,400	47,100	52,000	36,800	15,400
1993	7,210	5,410	4,530	3,870	3,210	2,950	4,700	41,300	48,000	40,800	39,100	42,600
1994	20,100	6,240	4,650	3,730	3,210	2,710	6,100	30,400	57,100	44,100	39,000	18,900
1995	8,690	5,150	3,810	3,340	3,080	3,040	5,300	36,100	48,200	51,200	38,000	40,200
1996	12,800	4,920	2,550	2,190	2,070	1,910	2,380	13,300	32,800	33,400	35,700	21,100
1997	7,520	4,090	3,490	3,050	2,760	2,550	3,150	21,400	40,900	50,400	50,900	29,800
1998	8,490	3,600	2,870	2,550	2,440	2,330	3,420	20,500	50,600	52,400	47,800	35,600
1999	17,000	6,470	4,430	3,330	2,570	2,180	2,660	20,900	47,800	48,200	51,800	25,300
2000	15,100	6,610	4,220	3,230	2,830	2,620	3,320	25,600	61,000	58,200	36,400	33,600
2001	17,900	6,530	4,410	3,580	2,970	2,700	3,080	19,300	57,700	45,400	44,200	21,000
2002	9,330	4,850	3,420	2,750	2,510	2,290	2,340	23,400	34,600	38,200	46,600	33,900
2003	22,300	10,500	4,780	2,960	4,110	2,690	4,030	16,100	49,300	55,300	42,900	27,600
2004	16,300	4,600	3,250	2,600	2,240	1,880	5,120	46,400	51,100	42,400	37,300	12,700
2005	6,200	3,110	2,870	2,540	2,170	1,810	4,960	52,100	61,300	52,700	45,700	46,400
2006	16,600	3,910	2,650	2,470	2,450	2,400	2,730	30,900	45,400	47,600	56,300	25,300
2007	21,000	5,870	4,240	3,670	3,440	3,130	4,170	35,500	41,200	45,300	40,400	27,900
2008	9,700	6,020	5,220	3,320	2,360	2,400	2,990	24,400	44,000	44,900	40,400	30,100
2009	10,800	2,760	2,280	2,440	2,280	2,360	8,920	45,600	46,900	40,600	38,500	25,600
2010	14,100	5,200	3,320	2,600	2,380	2,290	3,340	40,700	42,100	53,300	41,800	33,100
Average	13,400	5,350	3,640	3,020	2,650	2,400	3,480	26,900	50,600	49,900	43,100	27,900
Maximum	38,400	12,000	6,740	6,160	4,460	3,960	8,920	53,100	89,000	81,100	69,500	50,400
Minimum	5,480	1,940	1,790	1,650	1,340	1,230	1,490	4,650	29,900	32,700	21,000	10,700
Median	12,700	5,140	3,580	2,960	2,570	2,330	2,990	25,900	48,800	48,800	43,000	27,900

Table A-11 – Average Monthly Flow for Susitna River at Susitna Station for Pre-Project Conditions based on the USGS Extended Record

WY	Susitna River at Susitna Station											
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1950	35,500	13,100	7,050	5,890	5,070	4,880	5,370	62,100	101,000	116,000	103,000	46,600
1951	21,800	6,690	6,120	5,680	5,210	4,930	8,680	75,300	105,000	116,000	102,000	107,000
1952	31,500	14,200	8,480	7,500	5,810	5,420	5,550	27,600	146,000	127,000	105,000	76,800
1953	46,000	19,400	7,750	6,120	5,210	5,210	8,790	99,500	131,000	105,000	107,000	81,700
1954	31,900	9,730	7,240	6,700	5,810	5,070	6,440	91,200	126,000	106,000	128,000	69,900
1955	31,200	14,100	9,410	8,270	6,970	6,120	6,410	51,100	137,000	132,000	122,000	76,600
1956	28,400	8,740	6,700	5,740	5,710	5,620	5,650	88,000	148,000	143,000	121,000	95,300
1957	33,500	16,200	10,000	7,750	7,240	6,410	6,410	70,500	138,000	118,000	107,000	103,000
1958	46,100	22,600	17,900	9,190	6,710	6,260	7,670	68,900	126,000	117,000	109,000	42,800
1959	27,600	10,400	7,340	7,100	6,710	5,740	6,530	78,900	118,000	124,000	139,000	85,400
1960	28,800	12,100	9,220	7,820	6,980	6,430	6,550	78,000	96,100	117,000	115,000	85,200
1961	33,500	12,100	11,100	10,000	7,670	7,970	11,100	87,900	132,000	122,000	109,000	79,800
1962	31,600	12,700	8,920	8,030	6,860	6,540	7,340	56,300	143,000	121,000	105,000	64,400
1963	26,800	10,900	8,160	7,240	6,770	5,860	5,490	71,300	117,000	141,000	103,000	58,700
1964	36,400	9,790	6,810	6,450	5,920	5,180	5,730	15,500	151,000	120,000	102,000	45,900
1965	33,600	14,300	10,700	7,930	7,130	6,560	6,840	37,400	122,000	130,000	110,000	103,000
1966	39,600	13,100	9,230	8,230	7,210	6,490	6,970	30,500	129,000	110,000	120,000	72,900
1967	35,600	9,770	8,060	7,050	6,380	5,960	6,020	28,600	109,000	121,000	124,000	77,500
1968	25,000	12,000	9,880	8,850	8,400	8,120	10,200	92,200	136,000	126,000	86,700	36,600
1969	15,900	7,990	6,370	5,780	5,460	5,400	8,180	66,500	104,000	96,600	52,100	25,000
1970	31,100	10,100	7,020	6,420	6,010	5,790	6,540	70,000	122,000	129,000	103,000	58,700
1971	25,300	15,400	10,500	7,590	6,060	5,490	6,030	35,600	147,000	130,000	126,000	56,400
1972	25,000	11,900	8,970	8,110	7,380	6,390	6,440	51,400	120,000	124,000	108,000	82,000
1973	37,500	15,100	9,570	8,060	7,090	6,430	6,720	47,800	115,000	105,000	90,200	45,800
1974	22,600	10,700	8,700	7,720	7,000	6,400	7,080	56,000	90,900	95,200	87,300	78,000
1975	19,500	10,400	9,420	8,600	7,800	7,050	6,870	47,500	129,000	136,000	91,400	77,700
1976	31,500	9,930	6,000	6,530	5,610	5,370	7,250	70,500	107,000	115,000	99,600	48,900
1977	30,100	18,300	13,100	10,100	8,910	6,770	6,230	56,200	166,000	144,000	125,000	83,800
1978	38,200	12,600	7,530	6,970	6,770	6,590	7,030	48,700	90,900	118,000	102,000	55,500
1979	36,800	15,000	9,310	8,820	7,950	7,030	8,680	81,300	120,000	142,000	128,000	74,300
1980	58,600	31,600	14,700	10,100	9,020	8,910	12,000	66,600	143,000	181,000	126,000	78,000
1981	35,000	16,200	8,520	7,770	7,590	6,180	10,400	83,600	109,000	153,000	160,000	67,200

WY	Susitna River at Susitna Station cont.											
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1982	33,900	17,600	11,700	9,030	7,210	5,440	5,820	44,900	108,000	115,000	94,600	110,000
1983	34,000	15,200	9,890	8,370	8,420	7,120	7,680	62,100	104,000	103,000	108,000	54,900
1984	39,400	19,000	11,500	7,440	6,700	6,470	13,000	60,400	107,000	109,000	111,000	51,000
1985	30,800	11,000	8,230	7,970	6,950	6,500	6,820	45,700	113,000	135,000	109,000	84,100
1986	50,700	18,400	11,100	8,870	7,750	5,970	7,190	47,600	91,000	125,000	102,000	77,000
1987	88,500	17,500	9,350	7,790	7,500	7,350	9,860	65,400	109,000	139,000	120,000	73,500
1988	34,400	19,100	12,500	10,700	9,740	9,500	11,100	83,600	136,000	141,000	103,000	70,400
1989	41,400	13,800	7,000	6,240	6,230	7,000	8,900	70,300	115,000	127,000	155,000	116,000
1990	59,100	18,700	8,840	8,370	8,210	9,060	21,400	121,000	142,000	119,000	107,000	107,000
1991	33,700	11,400	7,500	7,500	7,480	6,560	8,620	56,500	134,000	124,000	106,000	71,700
1992	37,500	14,000	12,200	10,600	9,500	9,690	21,500	55,100	109,000	119,000	87,200	39,200
1993	18,800	13,700	11,300	9,470	7,700	7,030	12,500	105,000	123,000	108,000	101,000	116,000
1994	60,500	19,800	12,700	9,940	8,510	7,220	15,600	83,800	140,000	110,000	103,000	46,600
1995	25,300	13,700	9,980	8,370	7,590	7,520	12,100	89,400	120,000	124,000	96,700	98,500
1996	35,200	14,000	7,140	6,360	6,170	6,180	8,220	47,300	82,700	93,400	97,800	53,000
1997	18,900	10,800	9,340	8,250	7,300	6,410	8,150	50,100	97,400	122,000	123,000	69,500
1998	21,100	9,600	7,620	6,450	5,990	5,540	8,820	49,000	123,000	128,000	115,000	82,400
1999	40,500	16,500	11,700	8,910	6,510	5,020	6,600	48,400	116,000	115,000	123,000	58,600
2000	36,200	16,900	11,100	8,670	7,530	6,700	8,810	59,300	145,000	139,000	83,400	78,900
2001	42,300	16,700	11,600	9,540	8,000	7,040	8,210	47,000	139,000	107,000	108,000	56,000
2002	27,400	12,900	8,730	7,300	6,840	6,290	6,380	67,100	87,100	95,400	117,000	95,900
2003	66,800	31,500	13,300	7,070	9,340	6,680	12,800	50,700	121,000	134,000	106,000	66,200
2004	42,200	15,000	9,380	7,870	6,900	6,230	13,200	108,000	120,000	109,000	94,400	38,100
2005	26,300	11,600	8,780	7,980	7,060	7,250	19,000	134,000	151,000	129,000	113,000	119,000
2006	47,200	10,900	8,580	7,850	6,920	6,670	7,480	68,500	105,000	115,000	136,000	69,000
2007	65,300	18,000	10,100	8,120	7,050	6,230	10,400	69,400	89,300	111,000	104,000	79,100
2008	31,900	16,000	11,800	7,610	6,260	6,300	7,500	57,900	108,000	109,000	104,000	75,200
2009	31,800	9,320	7,830	7,730	6,970	6,860	18,300	107,000	113,000	102,000	93,000	64,300
2010	43,200	17,900	9,620	7,920	7,220	6,790	9,560	83,000	98,000	127,000	109,000	80,600
Average	36,000	14,400	9,510	7,910	7,080	6,510	8,990	66,100	120,000	122,000	109,000	72,800
Maximum	88,500	31,600	17,900	10,700	9,740	9,690	21,500	134,000	166,000	181,000	160,000	119,000
Minimum	15,900	6,690	6,000	5,680	5,070	4,880	5,370	15,500	82,700	93,400	52,100	25,000
Median	33,700	13,800	9,310	7,870	7,000	6,430	7,670	65,400	120,000	121,000	107,000	74,300

APPENDIX B. FLOW DURATION CURVES FOR PRE-PROJECT
CONDITIONS

Susitna-Watana Hydroelectric Project
(FERC No. 14241)

Stream Flow Assessment

Prepared for

Alaska Energy Authority



Prepared by

Tetra Tech

February 2013

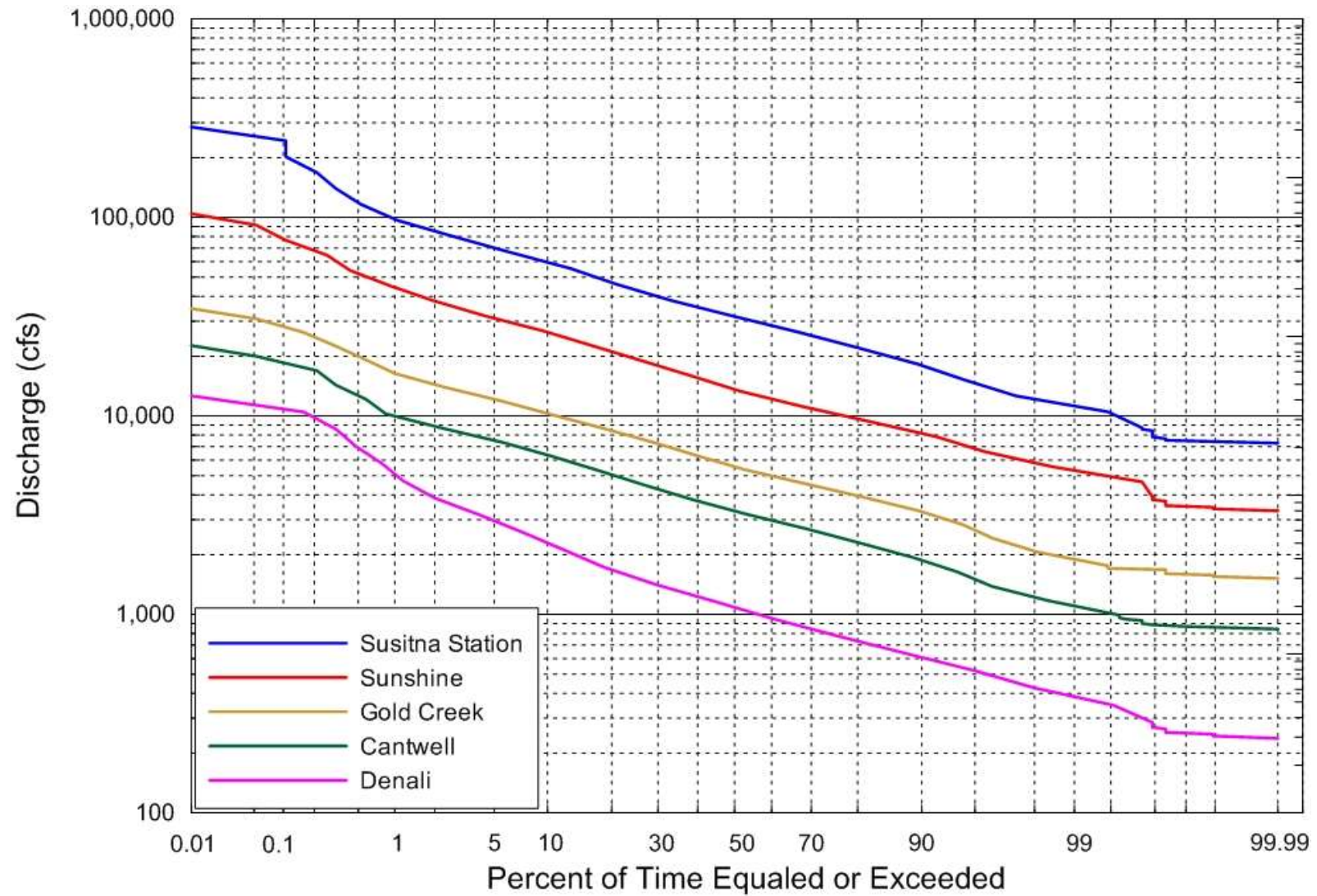


Figure B-1 – Monthly Flow-duration Curves for October for Mainstem Gages for Pre-Project Conditions based on the USGS Extended Record

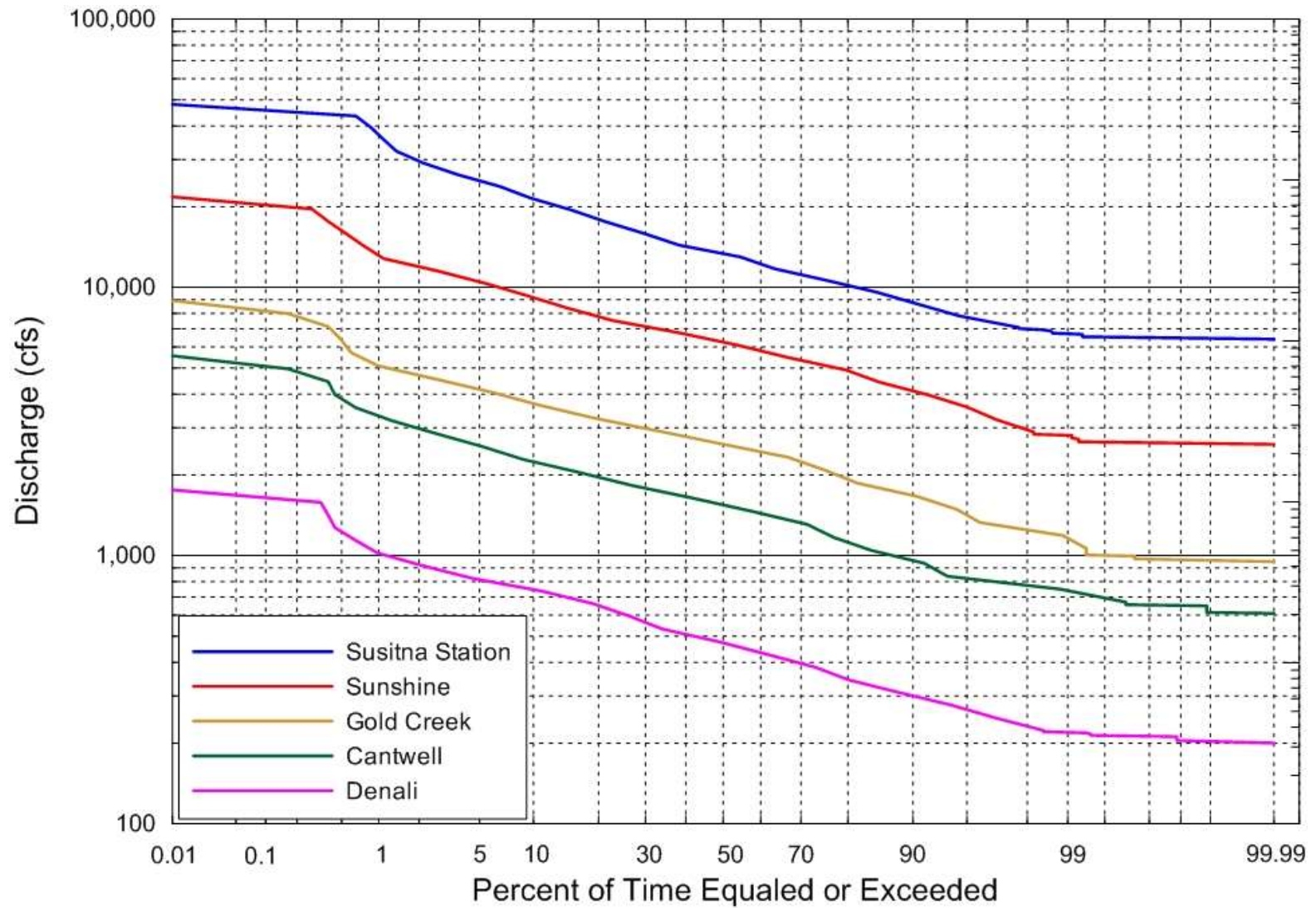


Figure B-2 – Monthly Flow-duration Curves for November for Mainstem Gages for Pre-Project Conditions based on the USGS Extended Record

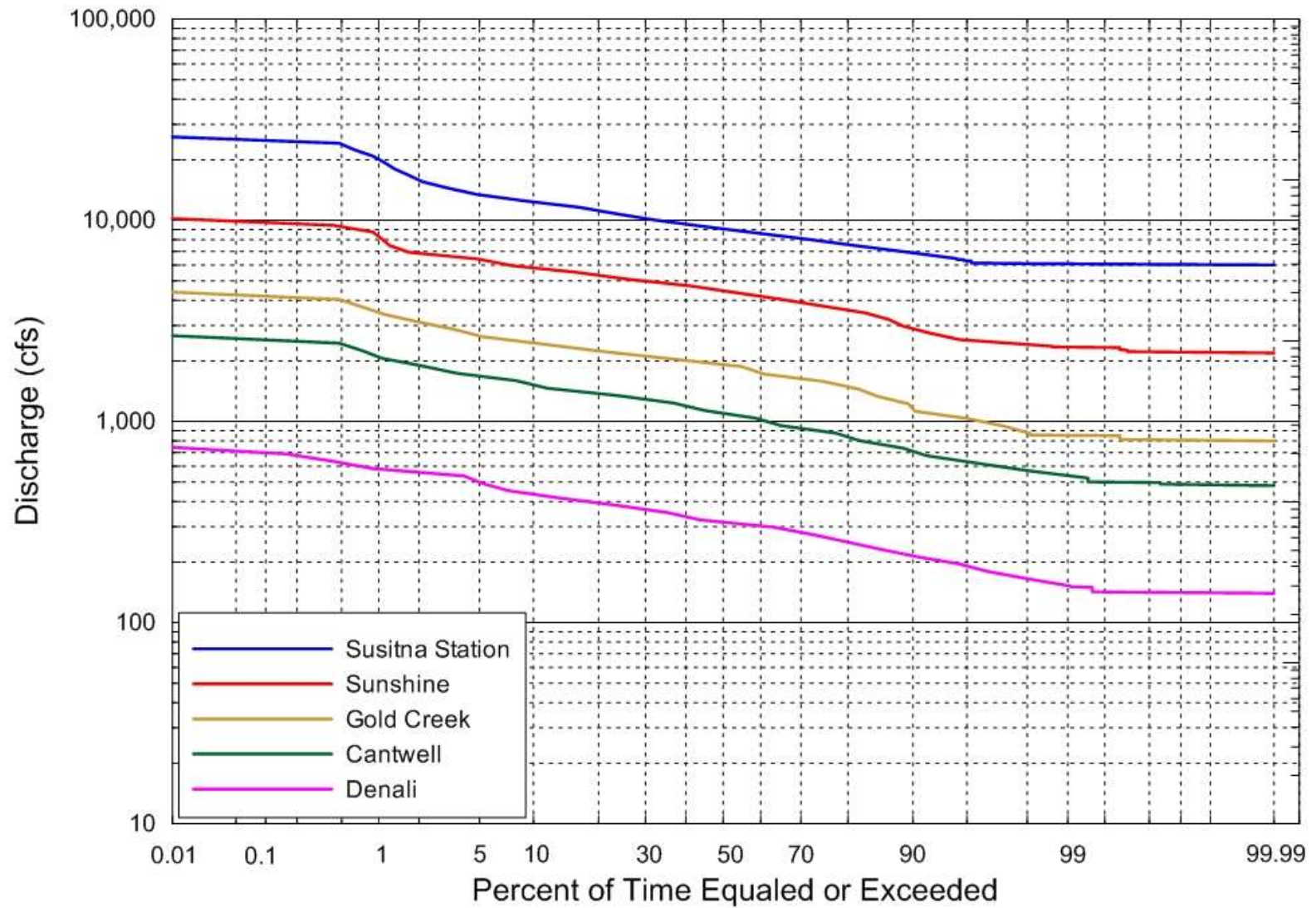


Figure B-3 – Monthly Flow-duration Curves for December for Mainstem Gages for Pre-Project Conditions based on the USGS Extended Record

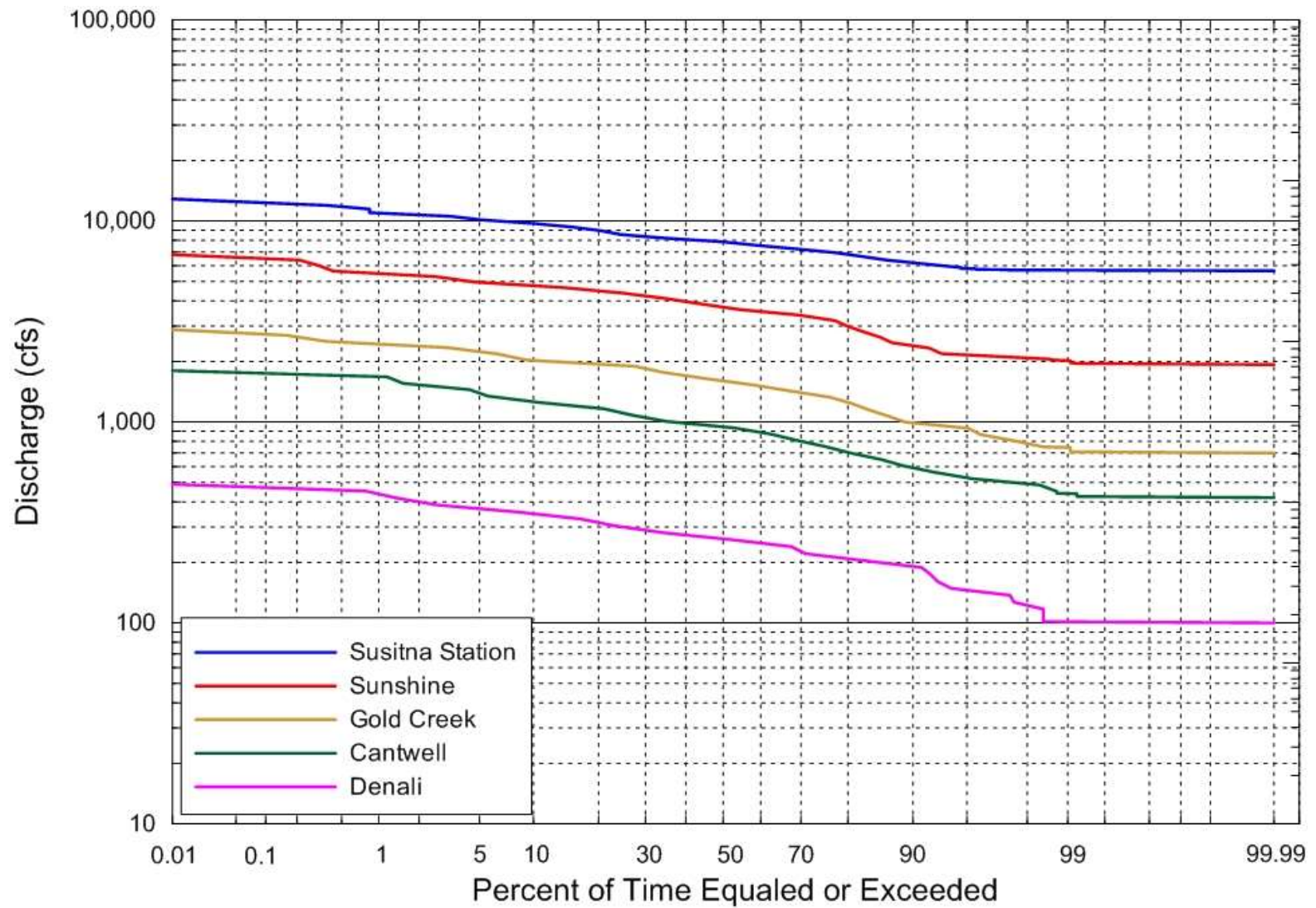


Figure B-4 – Monthly Flow-duration Curves for January for Mainstem Gages for Pre-Project Conditions based on the USGS Extended Record

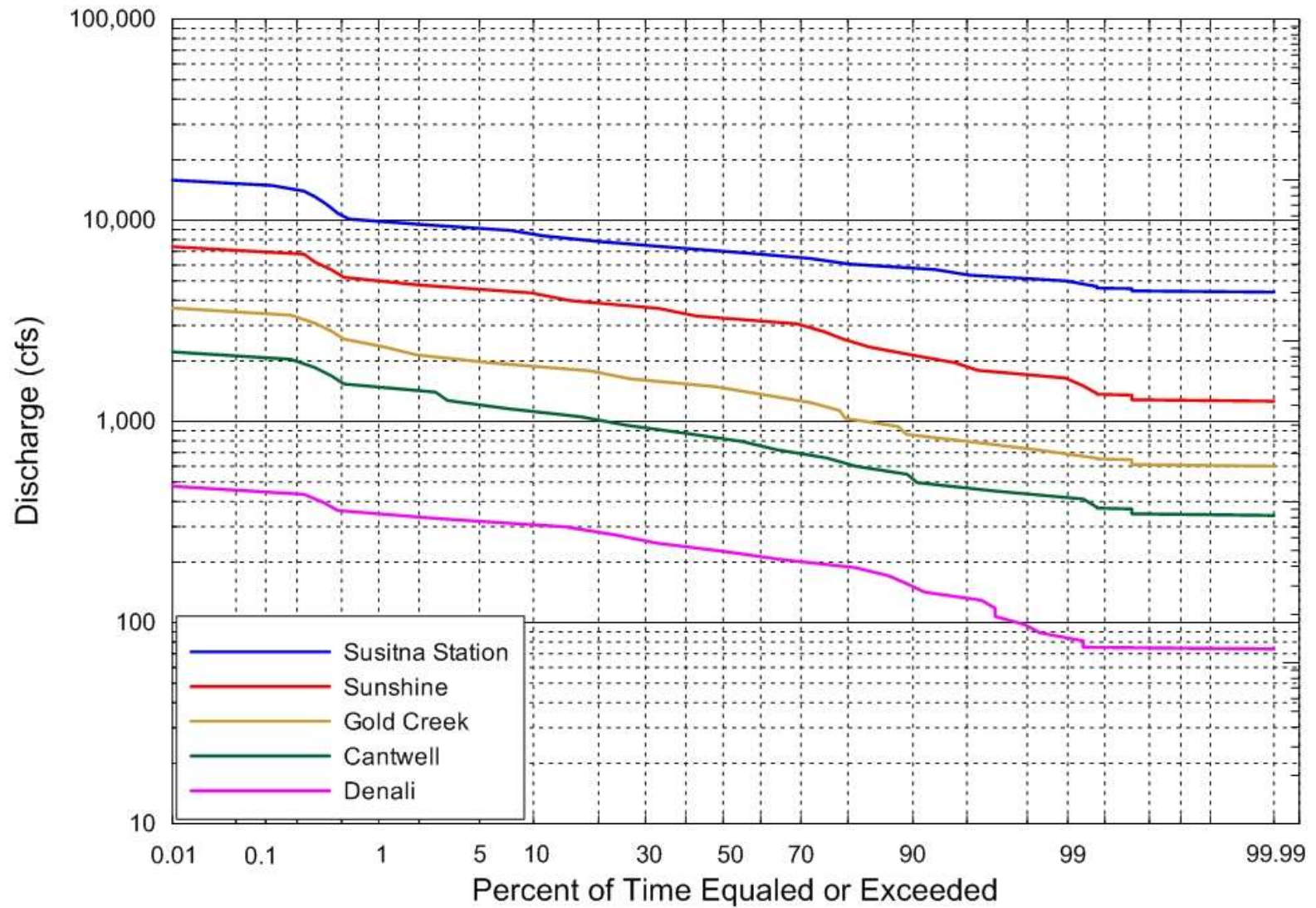


Figure B-5 – Monthly Flow-duration Curves for February for Mainstem Gages for Pre-Project Conditions based on the USGS Extended Record

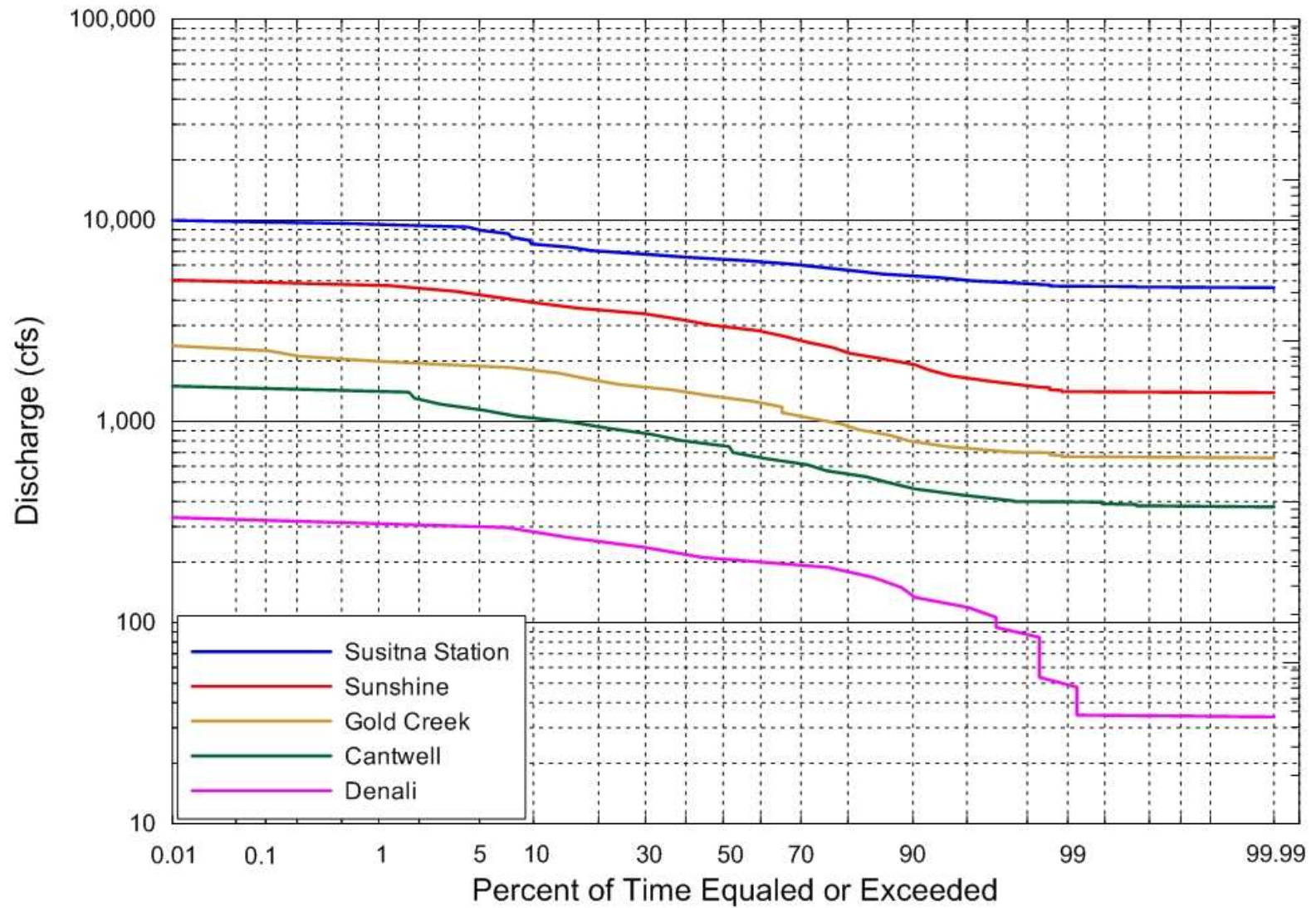


Figure B-6 – Monthly Flow-duration Curves for March for Mainstem Gages for Pre-Project Conditions based on the USGS Extended Record

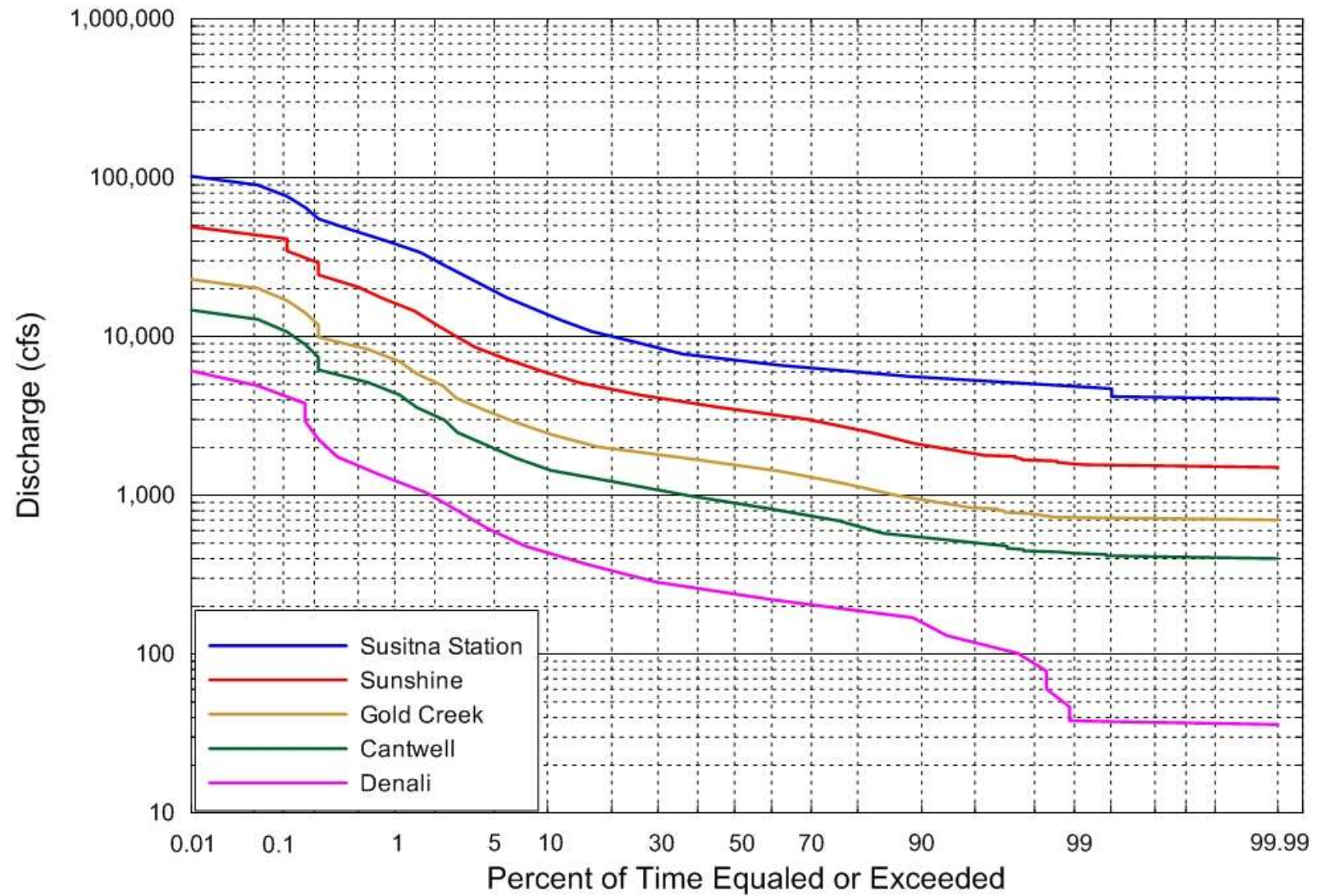


Figure B-7 – Monthly Flow-duration Curves for April for Mainstem Gages for Pre-Project Conditions based on the USGS Extended Record

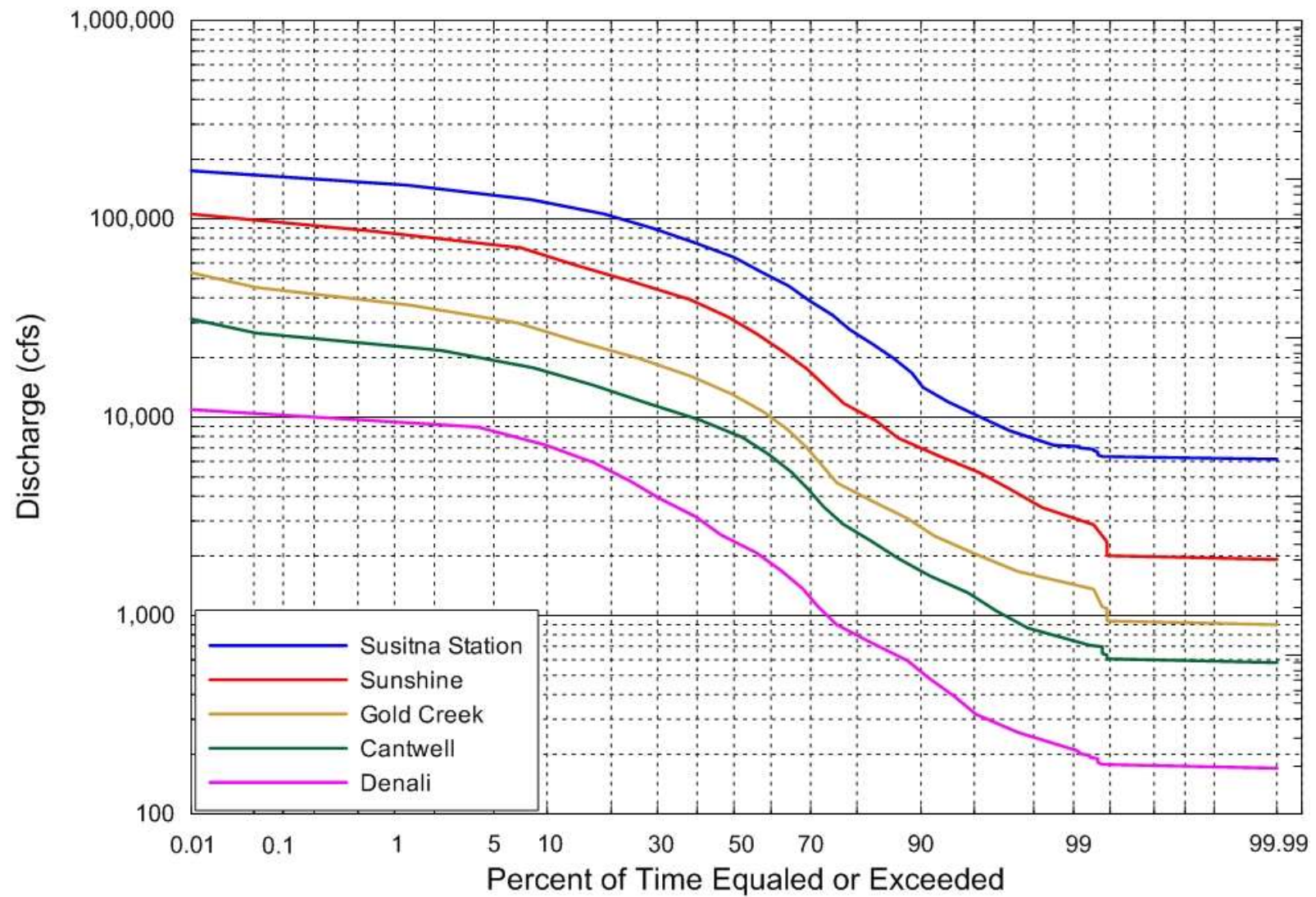


Figure B-8 – Monthly Flow-duration Curves for May for Mainstem Gages for Pre-Project Conditions based on the USGS Extended Record

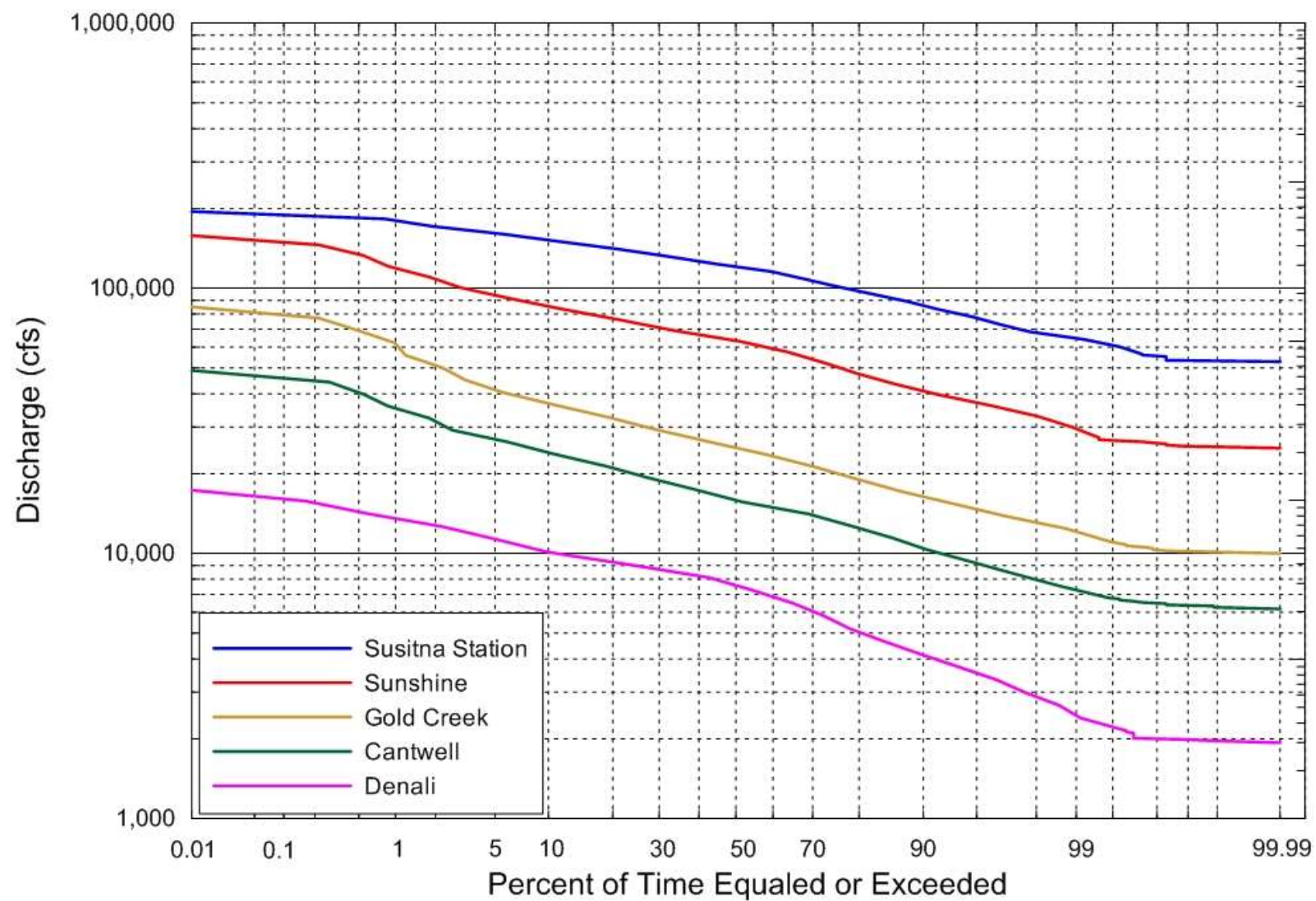


Figure B-9 – Monthly Flow-duration Curves for June for Mainstem Gages for Pre-Project Conditions based on the USGS Extended Record

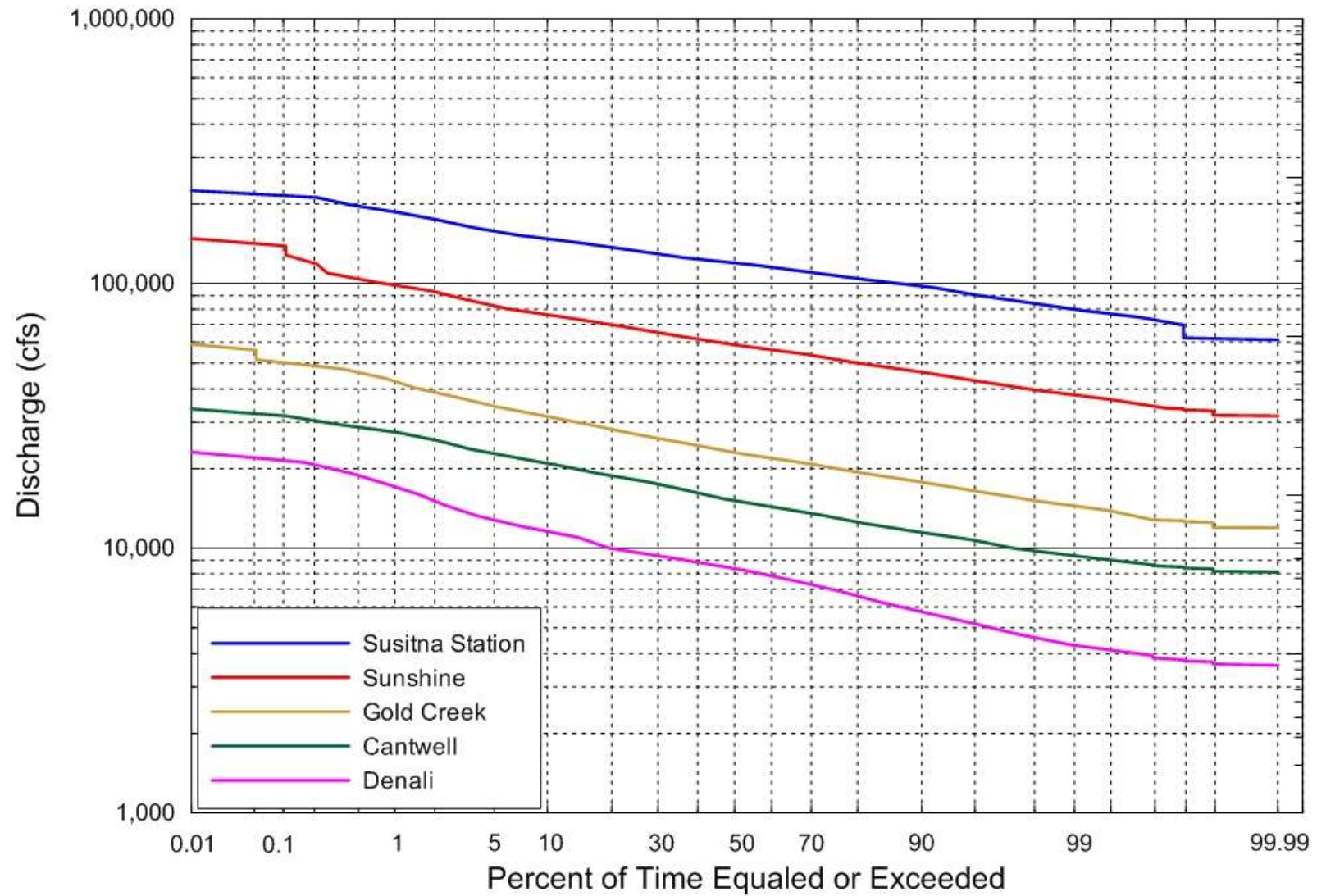


Figure B-10 – Monthly Flow-duration Curves for July for Mainstem Gages for Pre-Project Conditions based on the USGS Extended Record

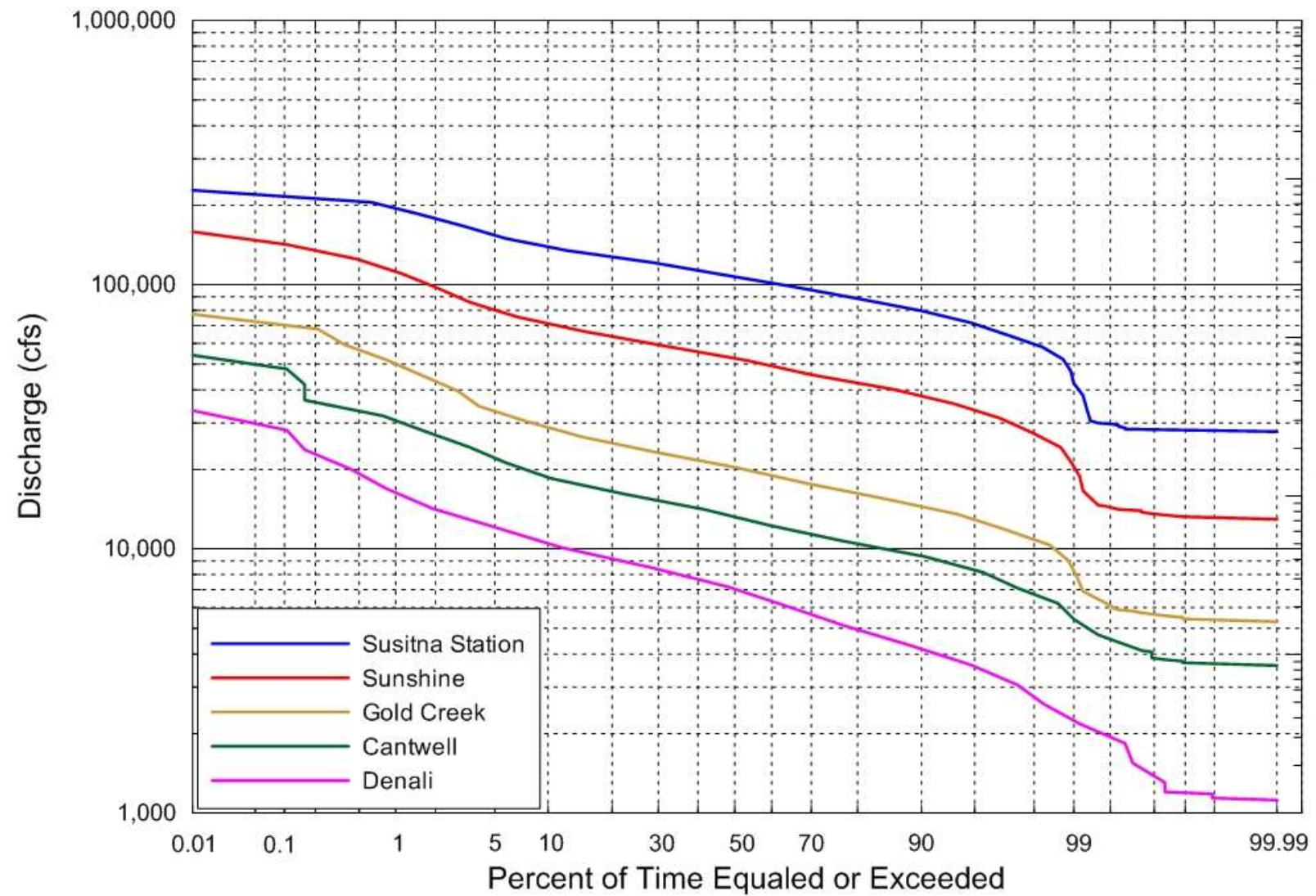


Figure B-11 – Monthly Flow-duration Curves for August for Mainstem Gages for Pre-Project Conditions based on the USGS Extended Record

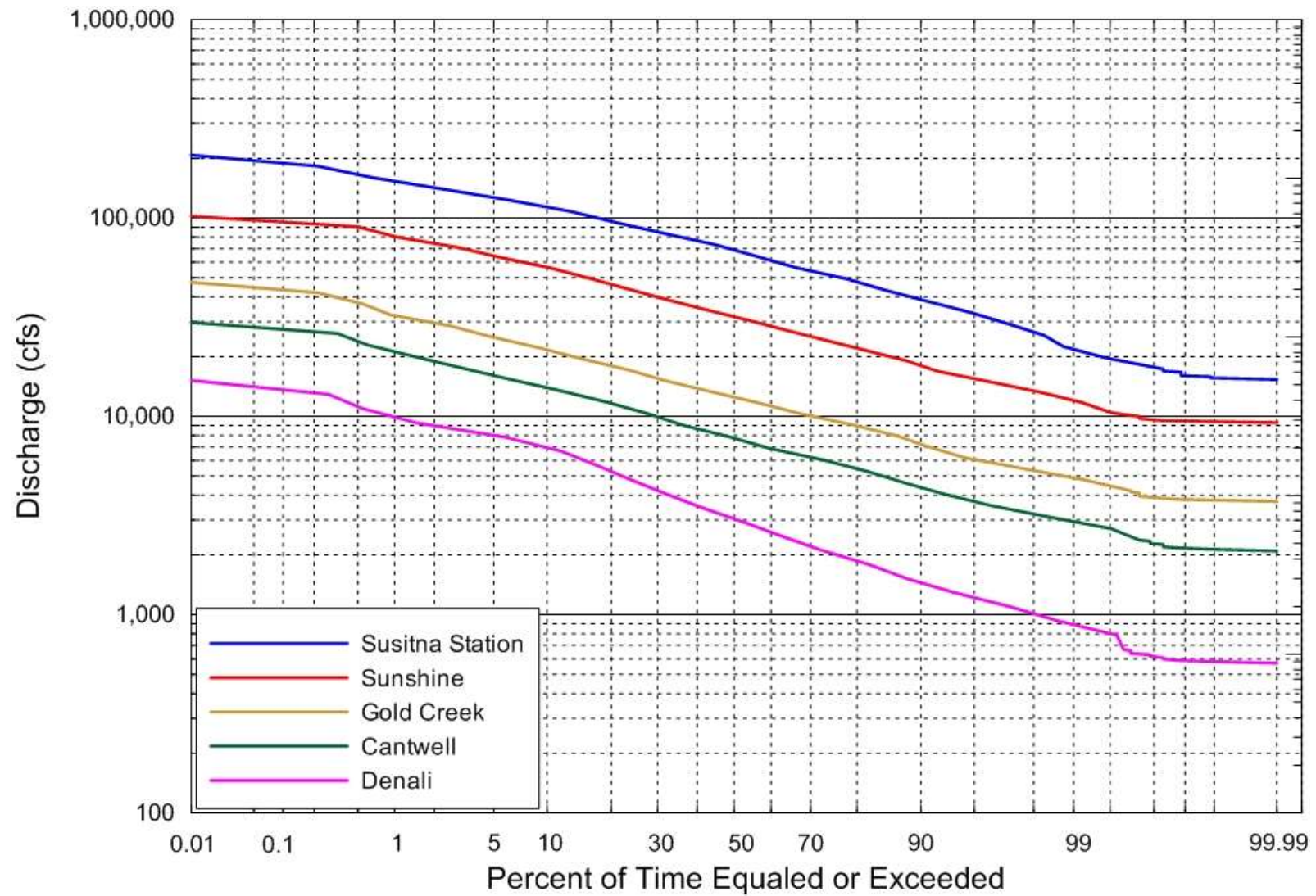


Figure B-12 – Monthly Flow-duration Curves for September for Mainstem Gages for Pre-Project Conditions based on the USGS Extended Record

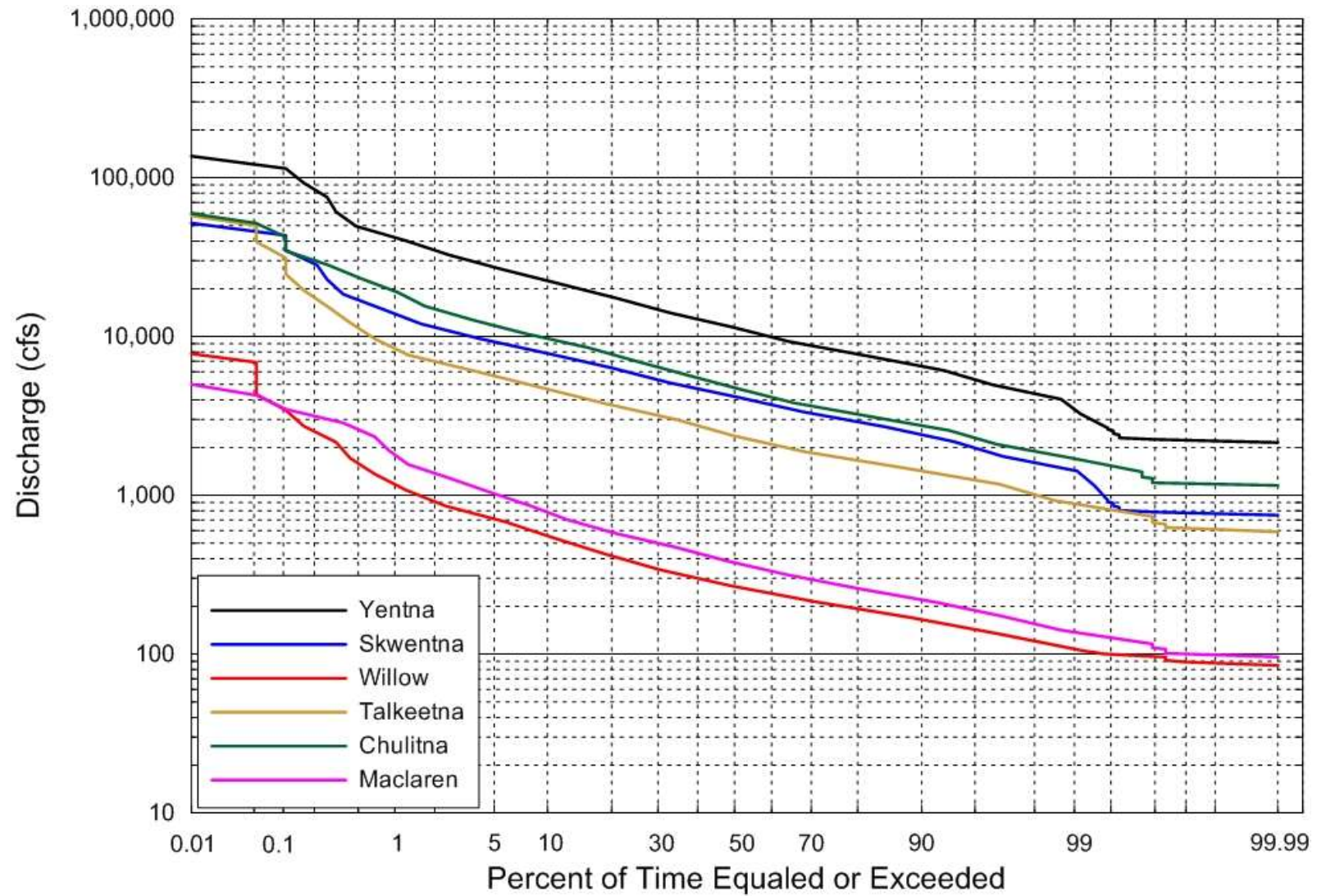


Figure B-13 – Monthly Flow-duration Curves for October for Tributary Gages for Pre-Project Conditions based on the USGS Extended Record

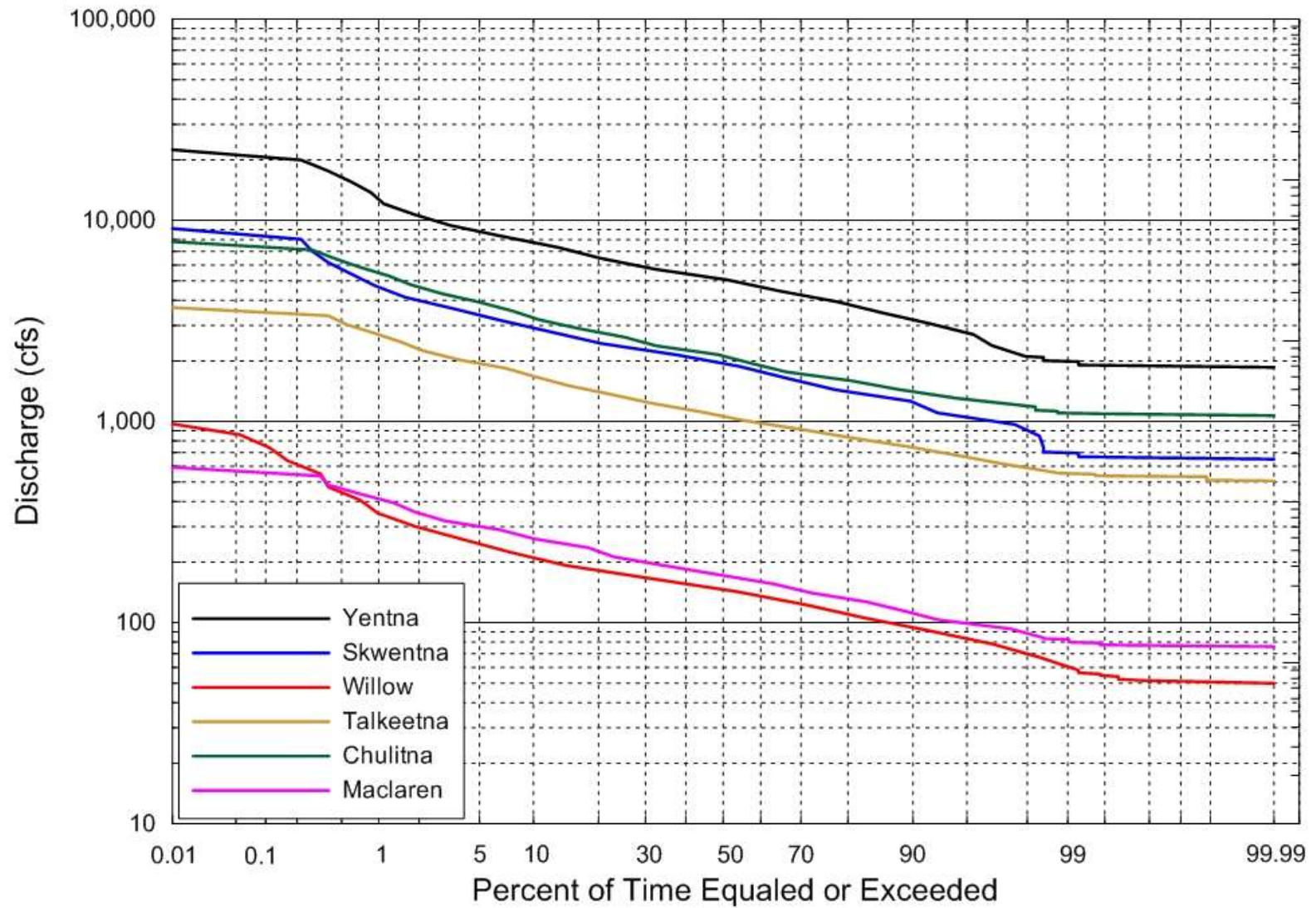


Figure B-14 – Monthly Flow-duration Curves for November for Tributary Gages for Pre-Project Conditions based on the USGS Extended Record

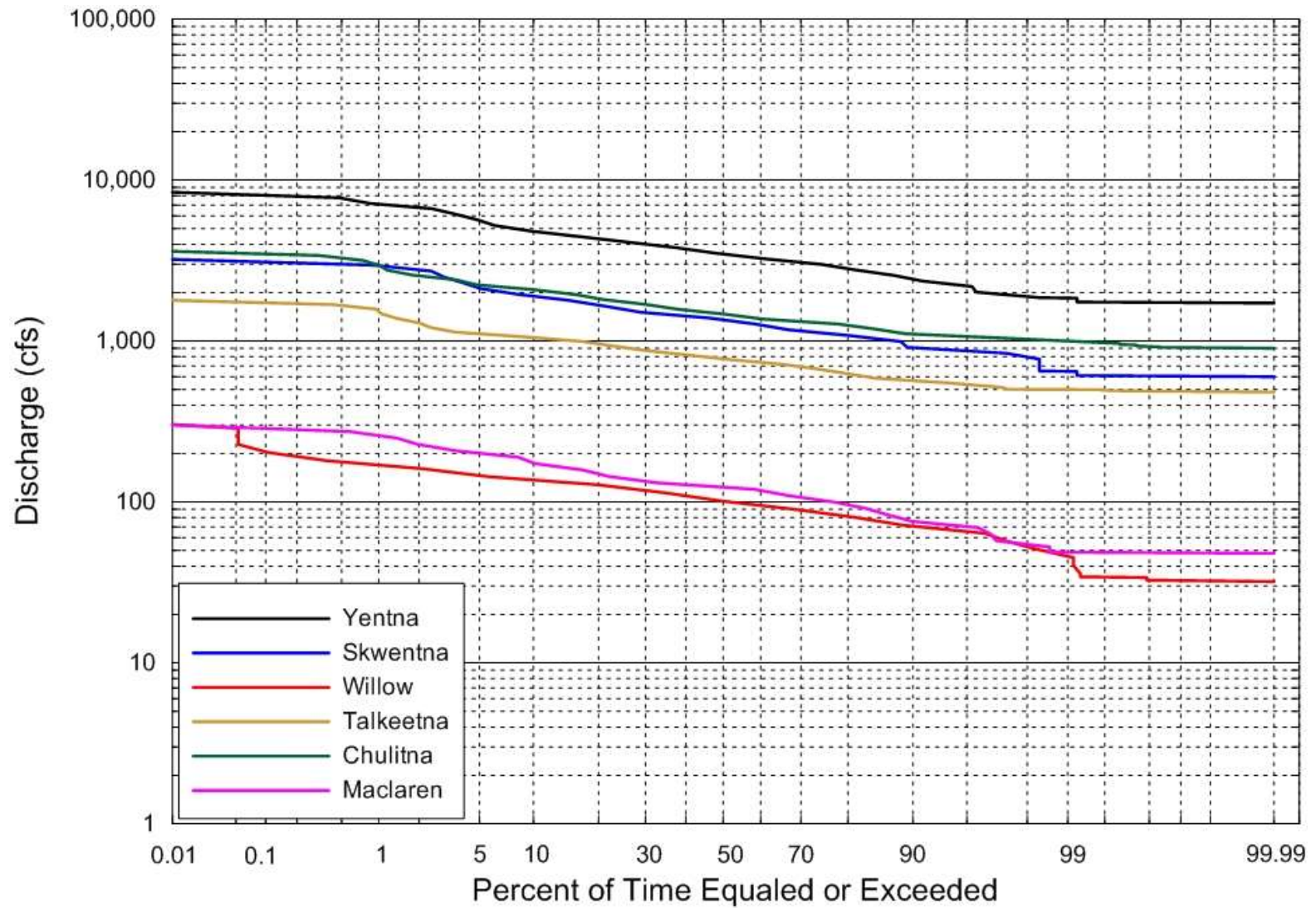


Figure B-15 – Monthly Flow-duration Curves for December for Tributary Gages for Pre-Project Conditions based on the USGS Extended Record

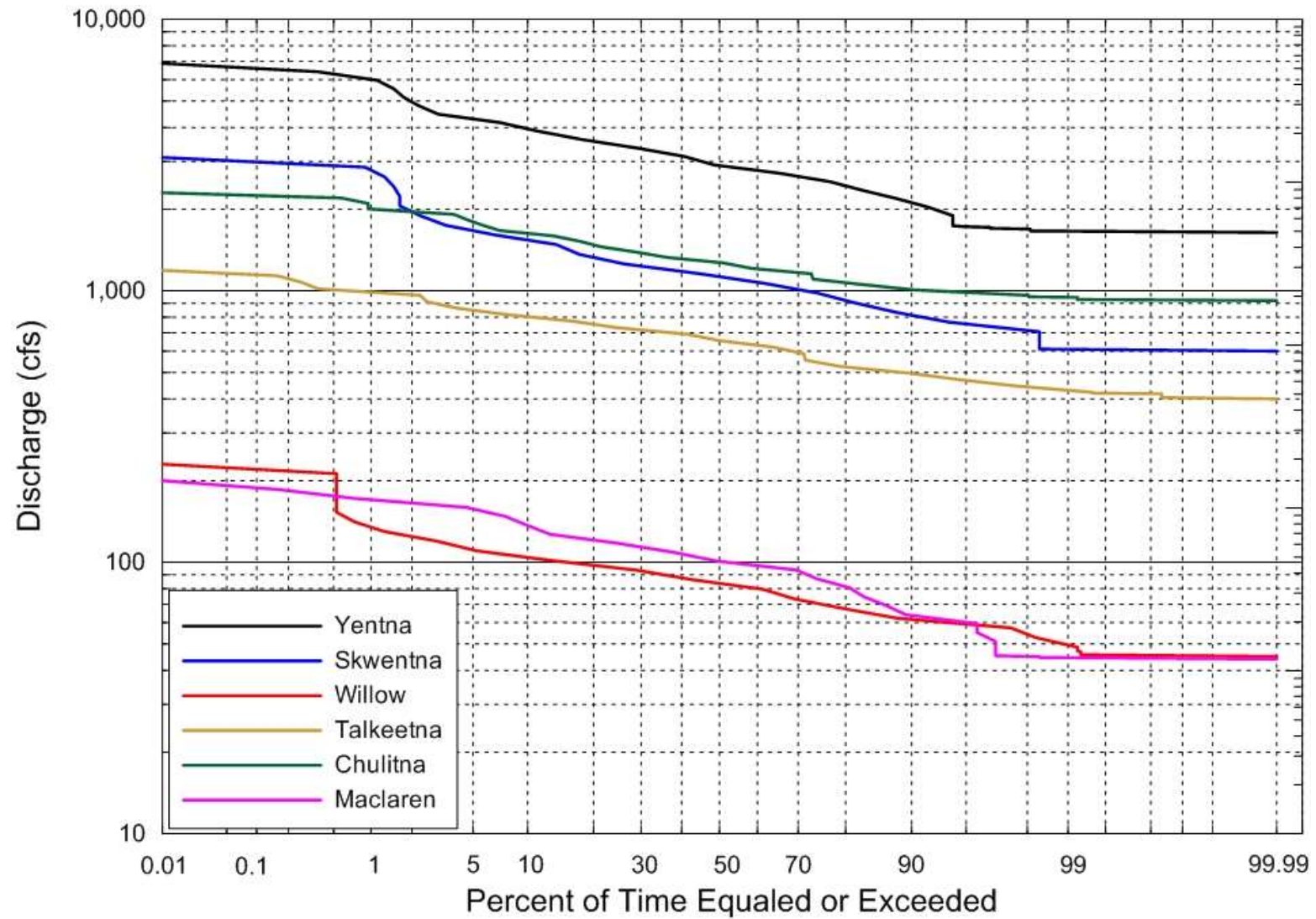


Figure B-16 – Monthly Flow-duration Curves for January for Tributary Gages for Pre-Project Conditions based on the USGS Extended Record

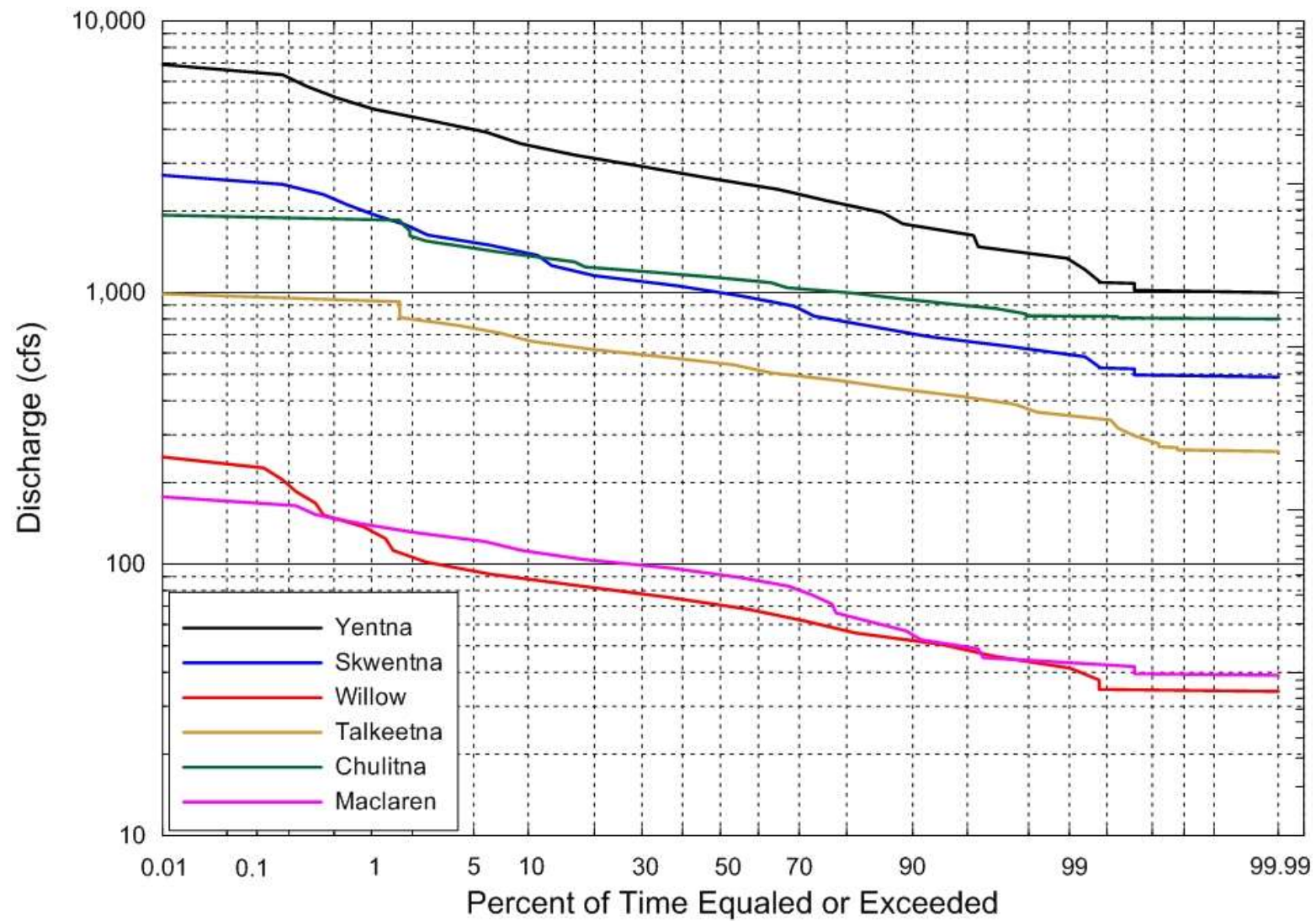


Figure B-17 – Monthly Flow-duration Curves for February for Tributary Gages for Pre-Project Conditions based on the USGS Extended Record

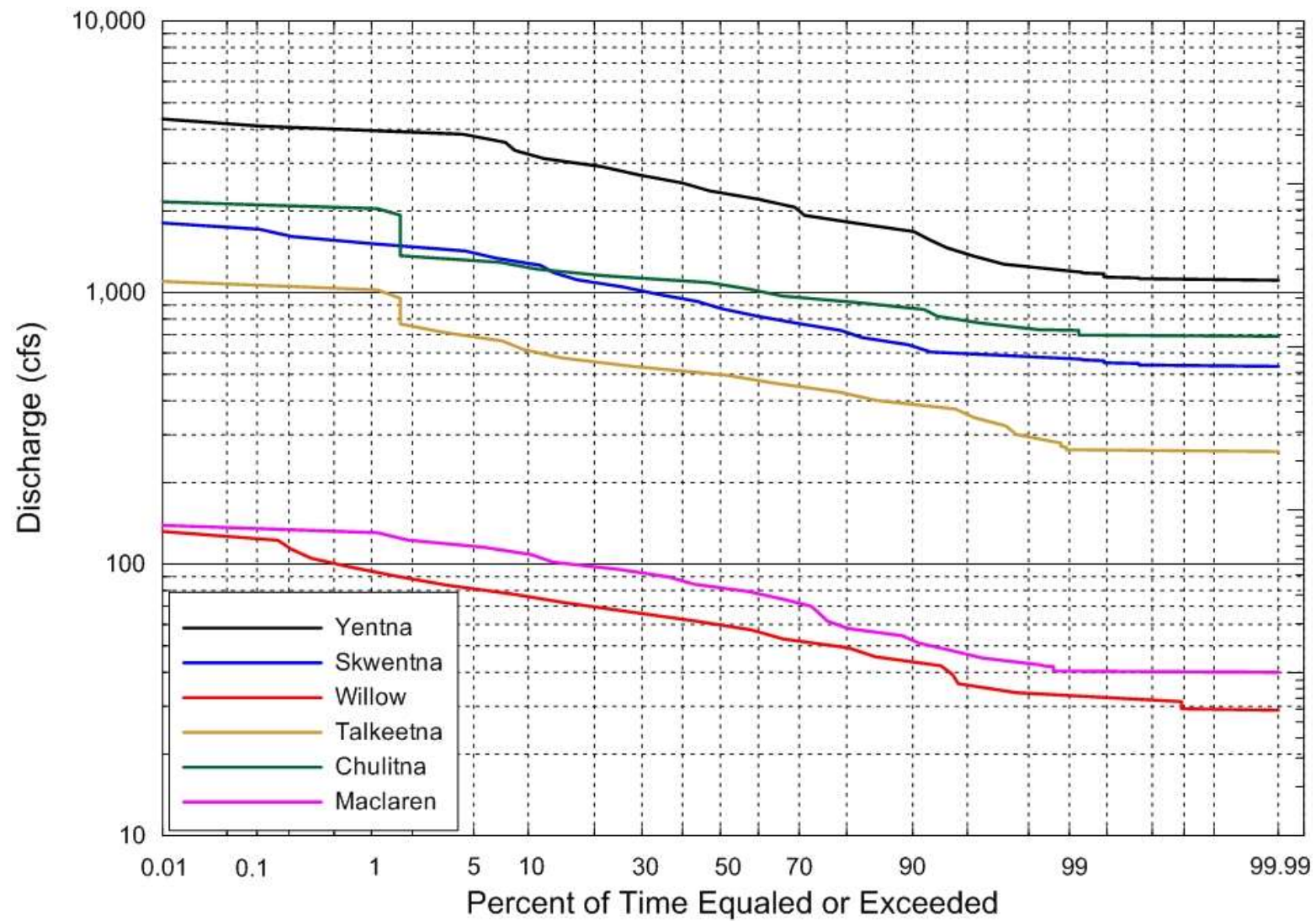


Figure B-18 – Monthly Flow-duration Curves for March for Tributary Gages for Pre-Project Conditions based on the USGS Extended Record

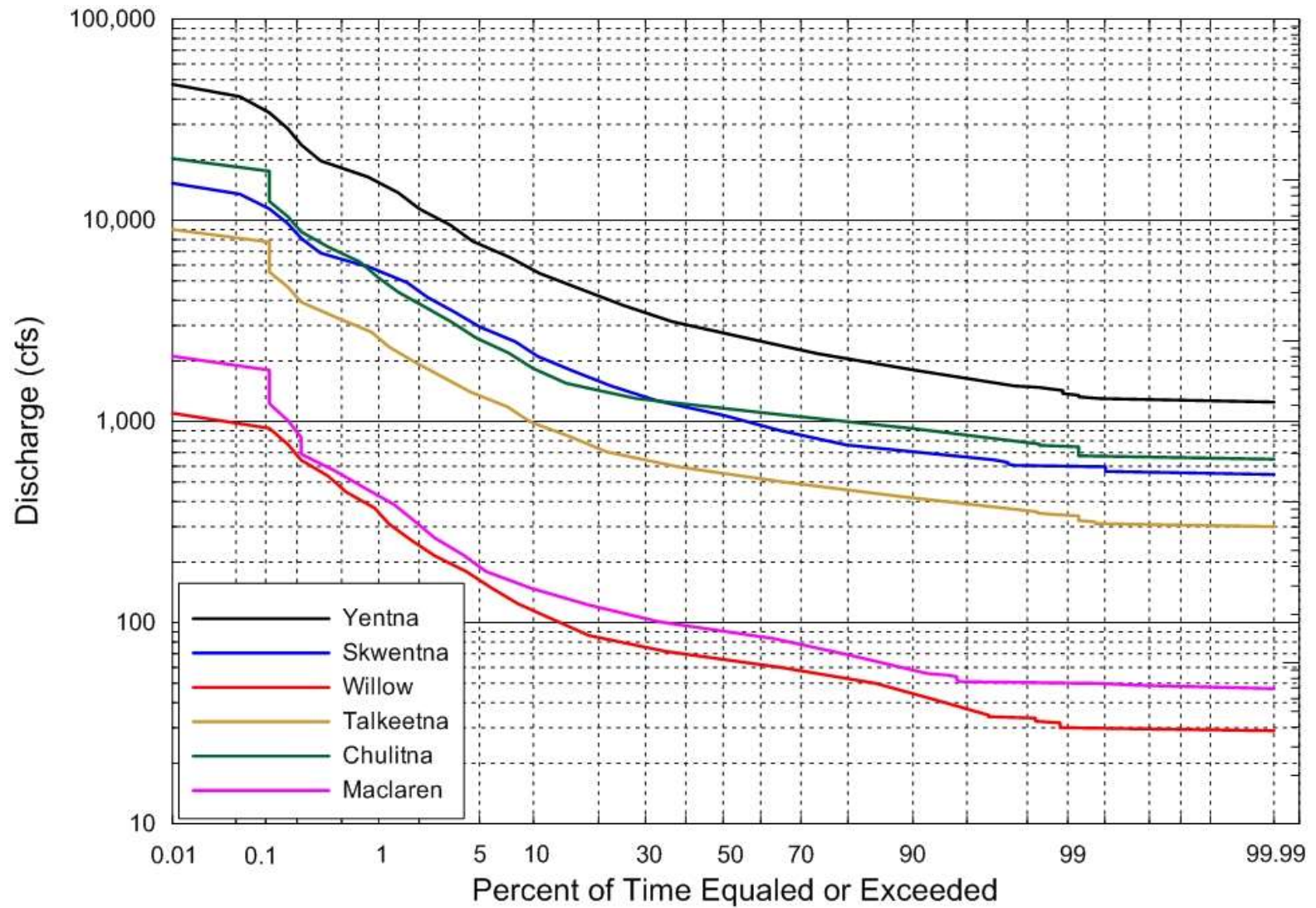


Figure B-19 – Monthly Flow-duration Curves for April for Tributary Gages for Pre-Project Conditions based on the USGS Extended Record

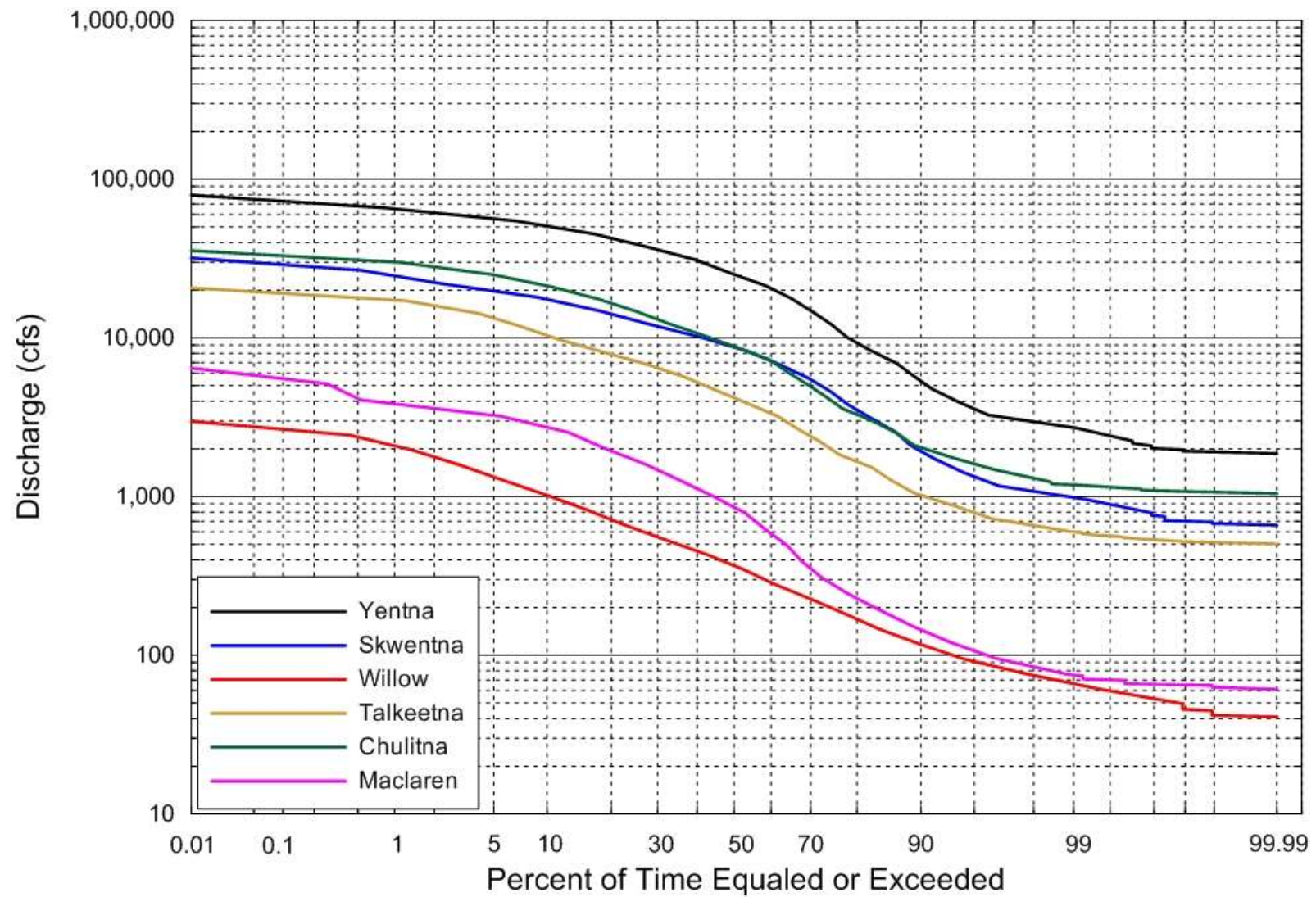


Figure B-20 – Monthly Flow-duration Curves for May for Tributary Gages for Pre-Project Conditions based on the USGS Extended Record

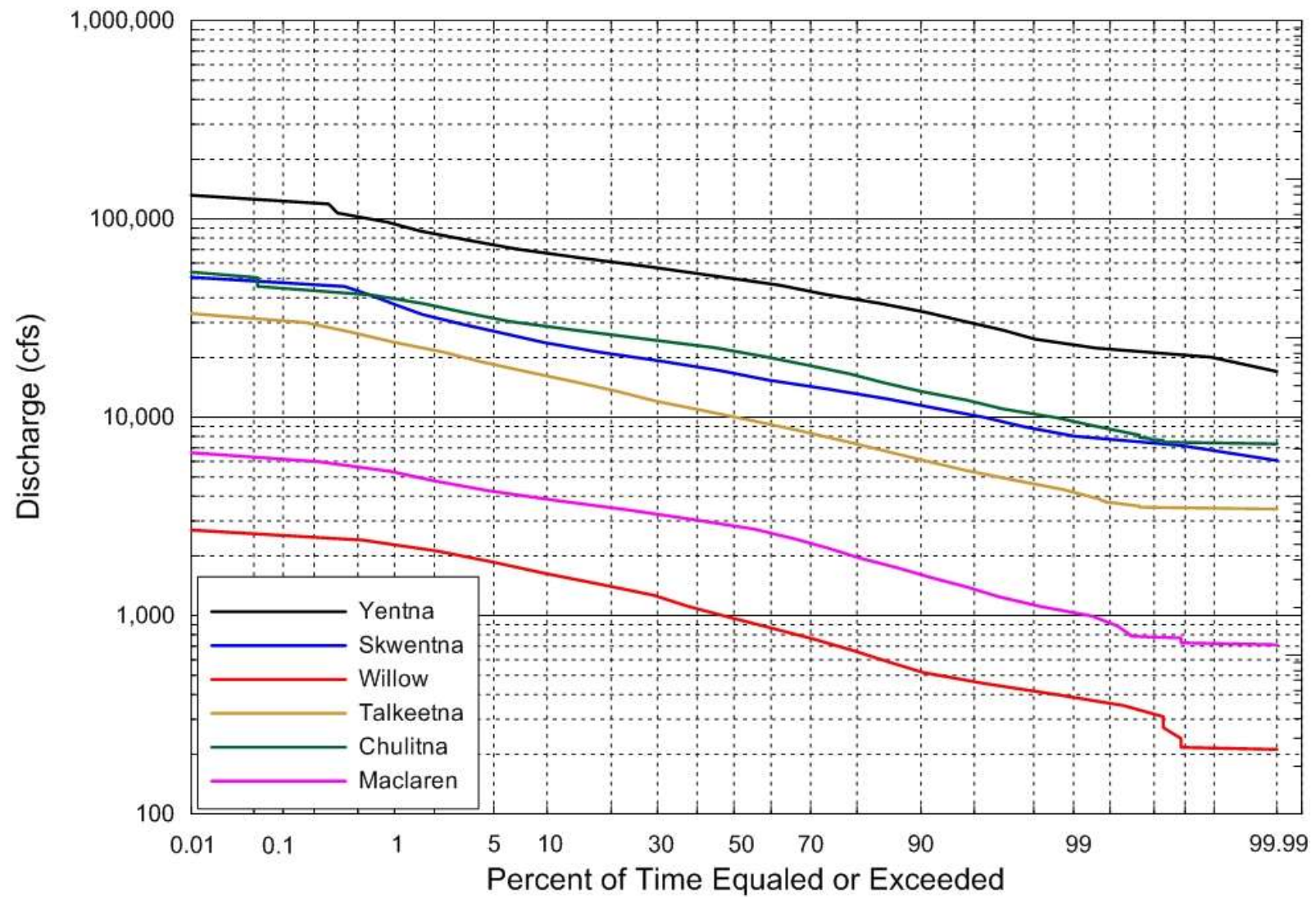


Figure B-21 – Monthly Flow-duration Curves for June for Tributary Gages for Pre-Project Conditions based on the USGS Extended Record

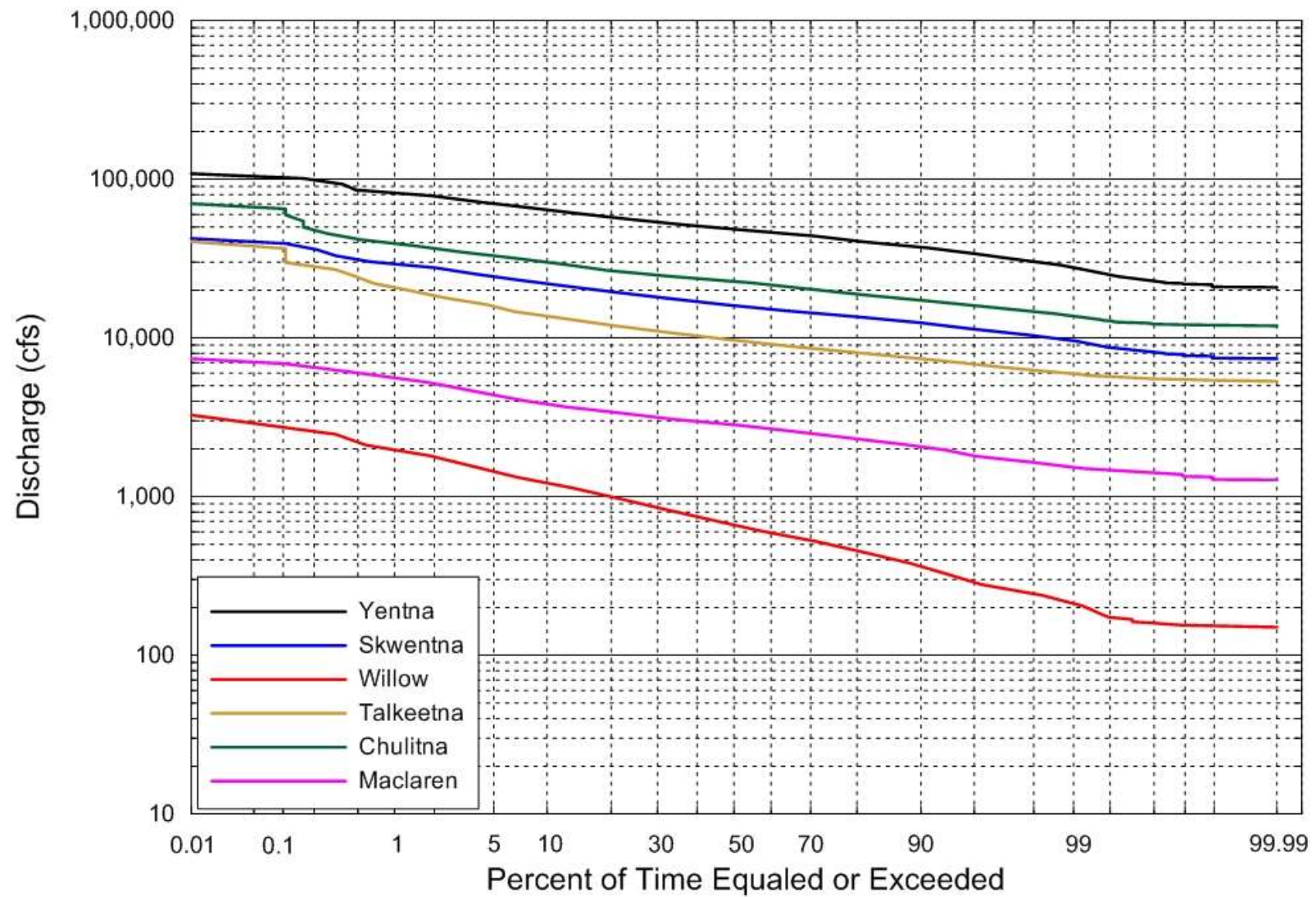


Figure B-22 – Monthly Flow-duration Curves for July for Tributary Gages for Pre-Project Conditions based on the USGS Extended Record

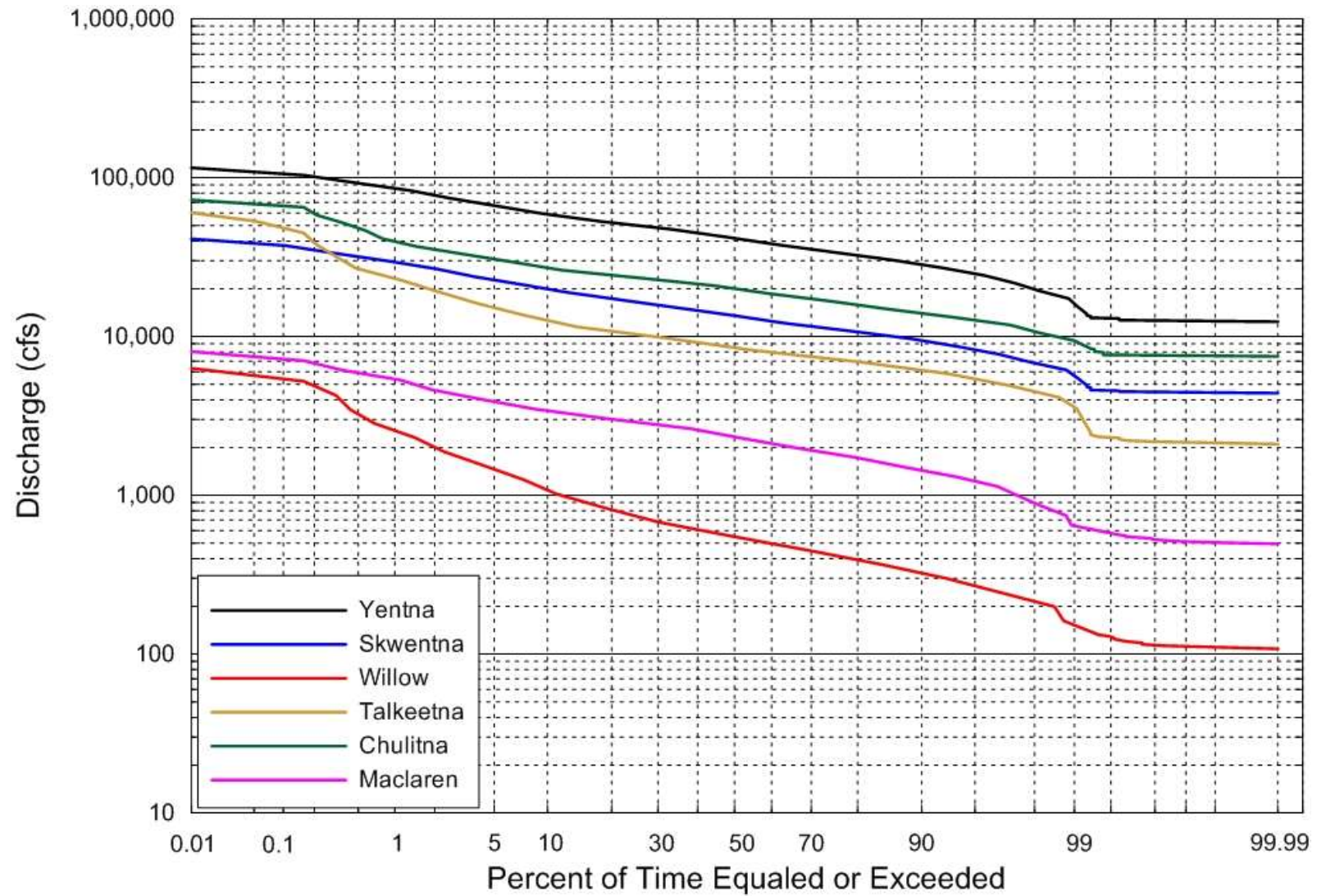


Figure B-23 – Monthly Flow-duration Curves for August for Tributary Gages for Pre-Project Conditions based on the USGS Extended Record

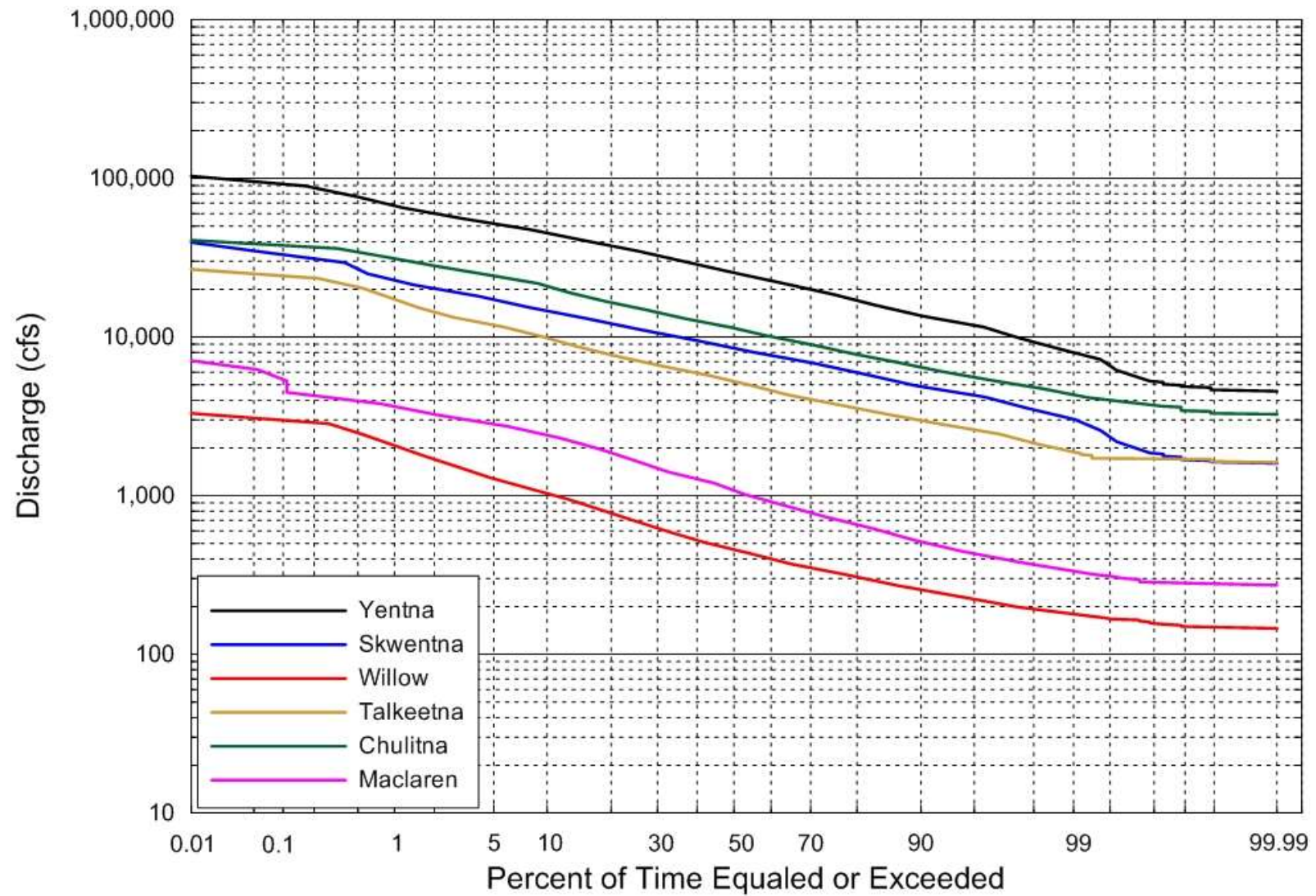


Figure B-24 – Monthly Flow-duration Curves for September for Tributary Gages for Pre-Project Conditions based on the USGS Extended Record

APPENDIX C. FLOW EXCEEDENCE SUMMARY DATA (CFS) FOR PRE-PROJECT CONDITIONS

**Susitna-Watana Hydroelectric Project
(FERC No. 14241)**

Stream Flow Assessment

Prepared for

Alaska Energy Authority



Prepared by

Tetra Tech

February 2013

Table C-1 – Annual and Monthly Flow Exceedence Ordinates (cfs) for Pre-Project Conditions for Susitna River near Denali based on the USGS Extended Record

Susitna River near Denali													
Percentile	Annual	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
99%	110	391	219	160	100	87	50	36	218	2,400	4,310	2,260	900
95%	181	524	269	190	140	140	120	122	322	3,520	5,180	3,580	1,200
90%	200	600	300	215	190	150	140	150	520	4,090	5,750	4,200	1,440
75%	263	794	378	269	219	200	190	197	960	5,560	7,000	5,260	2,020
50%	650	1,100	471	310	260	227	207	243	2,380	7,630	8,400	7,040	3,070
25%	5,070	1,500	600	380	300	264	242	300	4,610	8,990	9,600	8,690	4,690
10%	8,500	2,350	740	440	340	300	290	438	7,210	10,100	11,500	10,500	6,990
5%	9,570	2,960	809	500	361	320	311	588	8,720	11,300	12,800	12,100	8,070
1%	12,700	5,200	1,000	580	440	340	323	1,240	9,550	14,000	17,100	15,800	9,850

Table C-2 - Annual and Monthly Flow Exceedence Ordinates (cfs) for Pre-Project Conditions for Maclaren River near Paxson based on the USGS Extended Record

Maclaren River near Paxson													
Percentile	Annual	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
99%	47	137	83	48	44	42	40	50	75	1,010	1,540	613	331
95%	60	194	98	70	60	50	47	50	110	1,370	1,810	1,240	428
90%	76	220	110	75	64	55	52	59	147	1,600	2,050	1,450	515
75%	100	280	139	100	85	76	64	72	280	2,160	2,410	1,820	715
50%	220	380	170	122	101	90	83	93	890	2,850	2,830	2,340	1,070
25%	1,820	531	210	140	117	100	96	110	1,700	3,380	3,290	2,900	1,640
10%	2,950	798	262	180	135	110	110	148	2,780	3,870	3,830	3,400	2,400
5%	3,400	1,010	300	198	150	126	120	190	3,260	4,200	4,350	3,890	2,870
1%	4,400	1,800	400	260	170	140	133	418	3,800	5,070	5,610	5,390	3,640

Table C-3 - Annual and Monthly Flow Exceedence Ordinates (cfs) for Pre-Project Conditions for Susitna River near Cantwell based on the USGS Extended Record

Susitna River near Cantwell													
Percentile	Annual	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
99%	440	1,100	700	548	440	414	400	431	750	7,130	9,440	5,760	2,980
95%	560	1,550	800	638	548	471	430	491	1,210	9,160	10,700	8,400	3,680
90%	694	1,900	950	720	578	500	465	530	1,650	10,400	11,500	9,370	4,320
75%	940	2,490	1,200	879	758	670	578	698	3,180	13,200	13,100	10,900	5,890
50%	2,050	3,300	1,550	1,120	940	819	758	879	8,190	15,900	15,200	13,300	7,770
25%	11,400	4,670	1,900	1,310	1,120	970	879	1,130	12,400	19,900	18,000	16,000	10,800
10%	16,500	6,310	2,200	1,500	1,300	1,060	1,060	1,490	17,000	24,000	20,800	18,800	14,000
5%	19,400	7,410	2,600	1,610	1,430	1,200	1,200	2,000	19,700	27,000	22,900	21,700	16,100
1%	25,700	10,100	3,230	2,090	1,700	1,500	1,500	4,320	23,700	34,400	27,500	30,000	20,800

Table C-4 - Annual and Monthly Flow Exceedence Ordinates (cfs) for Pre-Project Conditions for Susitna River at Gold Creek based on the USGS Extended Record

Susitna River at Gold Creek													
Percentile	Annual	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
99%	750	1,900	1,100	850	750	700	660	710	1,400	12,100	14,600	8,240	4,910
95%	960	2,710	1,400	1,100	950	800	750	830	2,100	14,900	16,400	12,900	6,000
90%	1,200	3,300	1,700	1,200	980	860	800	930	2,800	16,400	17,800	14,500	7,340
75%	1,600	4,200	2,100	1,600	1,400	1,200	1,000	1,200	5,000	20,000	20,000	17,000	9,560
50%	3,400	5,500	2,600	1,900	1,600	1,400	1,300	1,520	13,000	25,100	23,000	20,400	12,500
25%	17,800	7,790	3,100	2,200	1,900	1,690	1,500	1,820	20,000	30,500	26,900	24,000	16,800
10%	25,300	10,300	3,690	2,500	2,000	1,850	1,800	2,500	27,100	36,700	31,300	28,500	21,800
5%	29,800	12,000	4,200	2,700	2,200	2,000	1,900	3,300	31,000	41,100	34,500	32,700	25,000
1%	39,300	16,100	5,100	3,460	2,500	2,400	2,100	7,000	37,800	58,800	42,600	51,100	32,000

Table C-5 - Annual and Monthly Flow Exceedence Ordinates (cfs) for Pre-Project Conditions for Chulitna River near Talkeetna based on the USGS Extended Record

Chulitna River near Talkeetna													
Percentile	Annual	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
99%	820	1,700	1,100	1,000	950	820	730	750	1,200	9,600	13,800	9,410	4,310
95%	965	2,370	1,300	1,080	995	900	800	884	1,540	11,900	16,100	12,700	5,540
90%	1,040	2,790	1,440	1,100	1,010	942	877	933	2,100	13,500	17,300	14,000	6,460
75%	1,230	3,440	1,620	1,300	1,100	1,010	950	1,000	4,000	17,100	19,600	16,600	8,400
50%	2,840	4,780	2,110	1,500	1,280	1,130	1,070	1,170	8,940	21,800	22,700	20,000	11,500
25%	16,100	6,990	2,640	1,740	1,420	1,210	1,130	1,350	14,800	25,100	25,600	23,400	15,100
10%	23,400	9,820	3,230	2,100	1,600	1,400	1,230	1,810	21,400	28,600	30,000	26,900	20,900
5%	26,200	12,000	3,890	2,200	1,800	1,440	1,300	2,580	25,000	31,200	33,400	30,700	24,200
1%	33,700	19,100	5,400	2,920	2,000	1,930	2,060	5,190	30,600	39,000	39,100	40,000	31,400

Table C-6 - Annual and Monthly Flow Exceedence Ordinates (cfs) for Pre-Project Conditions for Talkeetna River near Talkeetna based on the USGS Extended Record

Talkeetna River near Talkeetna													
Percentile	Annual	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
99%	380	900	550	500	440	350	260	340	600	4,170	5,890	3,670	1,900
95%	450	1,200	661	520	460	400	350	390	800	5,310	6,830	5,600	2,600
90%	500	1,400	746	550	495	440	390	420	1,000	6,120	7,400	6,240	3,000
75%	621	1,770	900	661	550	480	440	488	2,000	7,940	8,280	7,250	3,800
50%	1,430	2,360	1,100	791	660	550	500	550	4,160	9,990	9,680	8,460	5,220
25%	7,240	3,400	1,310	900	720	600	540	682	7,200	12,800	11,400	10,200	7,110
10%	10,500	4,690	1,700	1,040	800	680	600	965	10,200	16,000	13,700	12,600	9,890
5%	12,800	5,640	2,000	1,100	855	750	700	1,350	13,200	18,600	15,900	15,000	12,000
1%	18,100	8,530	2,630	1,520	1,000	990	1,050	2,510	17,600	23,800	20,600	23,400	17,100

Table C-7 - Annual and Monthly Flow Exceedence Ordinates (cfs) for Pre-Project Conditions for Susitna River at Sunshine based on the USGS Extended Record

Susitna River at Sunshine													
Percentile	Annual	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
99%	1,740	5,280	2,820	2,340	2,030	1,570	1,390	1,560	3,060	29,700	38,000	21,000	12,000
95%	2,310	6,880	3,590	2,500	2,110	1,900	1,650	1,850	5,340	37,000	43,000	33,900	15,300
90%	2,830	8,120	4,100	2,830	2,370	2,120	1,920	2,030	6,990	40,800	46,400	38,000	18,000
75%	3,750	10,400	5,140	3,750	3,260	2,830	2,370	2,660	13,100	50,600	52,000	44,500	23,800
50%	8,220	13,600	6,100	4,520	3,700	3,280	2,930	3,520	31,100	63,500	58,600	52,900	32,000
25%	45,000	19,500	7,470	5,190	4,350	3,760	3,490	4,330	47,800	73,900	67,600	61,200	42,600
10%	64,000	26,300	9,150	5,840	4,780	4,330	3,920	5,900	65,800	85,100	76,800	71,400	56,200
5%	72,800	31,300	10,400	6,370	4,940	4,510	4,390	7,760	75,100	93,400	82,500	80,000	64,200
1%	91,200	45,000	13,000	8,490	5,620	4,990	4,790	15,700	85,100	119,000	97,600	111,000	80,300

Table C-8 - Annual and Monthly Flow Exceedence Ordinates (cfs) for Pre-Project Conditions for Willow Creek near Willow based on the USGS Extended Record

Willow Creek near Willow													
Percentile	Annual	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
99%	38	108	58	47	51	42	32	29	68	391	209	159	177
95%	51	141	80	65	60	49	34	38	92	461	288	266	223
90%	60	163	97	70	61	51	43	44	117	521	367	325	253
75%	80	203	119	88	71	60	50	55	195	711	491	421	328
50%	171	268	149	101	85	71	61	65	374	968	666	548	455
25%	526	373	171	121	94	80	68	78	624	1,320	912	737	693
10%	930	559	211	140	106	90	76	115	1,010	1,630	1,230	1,090	1,040
5%	1,240	708	249	150	112	96	80	161	1,310	1,850	1,400	1,480	1,290
1%	1,870	1,140	349	170	130	130	93	353	2,160	2,330	2,030	2,610	2,050

Table C-9 - Annual and Monthly Flow Exceedence Ordinates (cfs) for Pre-Project Conditions for Skwentna River near Skwentna based on the USGS Extended Record

Skwentna River near Skwentna													
Percentile	Annual	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
99%	600	1,460	700	650	600	585	596	600	970	8,080	9,610	5,730	3,030
95%	750	2,000	1,090	867	762	651	600	650	1,290	10,200	11,400	8,360	4,320
90%	850	2,400	1,240	900	800	700	636	700	1,960	11,500	12,400	9,520	4,860
75%	1,140	3,080	1,500	1,100	976	810	747	800	4,500	13,700	14,000	11,100	6,460
50%	2,660	4,200	1,950	1,350	1,100	1,000	873	1,090	8,880	16,600	16,000	13,500	8,520
25%	12,000	5,800	2,330	1,570	1,270	1,140	1,050	1,460	12,900	20,100	18,800	16,300	11,400
10%	17,200	7,800	2,900	1,880	1,530	1,380	1,300	2,200	17,800	23,600	22,000	19,900	14,700
5%	19,900	9,050	3,300	2,130	1,710	1,500	1,400	2,970	19,600	27,400	24,200	22,700	17,000
1%	26,400	13,400	4,460	2,900	2,800	1,950	1,470	5,630	24,600	37,000	29,600	29,400	22,200

Table C-10 - Annual and Monthly Flow Exceedence Ordinates (cfs) for Pre-Project Conditions for Yentna River near Susitna Station based on the USGS Extended Record

Yentna River near Susitna Station													
Percentile	Annual	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
99%	1,460	3,600	2,000	1,860	1,650	1,260	1,250	1,360	2,770	22,800	27,300	16,200	7,840
95%	1,910	5,380	2,850	2,280	1,720	1,670	1,400	1,600	3,420	29,800	33,900	24,900	11,900
90%	2,280	6,530	3,140	2,400	2,100	1,730	1,690	1,850	5,120	34,100	37,500	28,500	13,700
75%	2,970	8,300	3,990	2,970	2,570	2,280	1,910	2,150	12,100	40,800	42,800	34,200	18,600
50%	6,950	11,300	5,120	3,440	2,860	2,570	2,290	2,720	25,400	50,000	48,500	41,900	25,400
25%	36,500	16,300	6,230	4,200	3,420	3,050	2,800	3,800	39,000	58,700	55,400	49,700	35,200
10%	51,300	22,600	7,750	4,810	4,000	3,430	3,140	5,680	51,200	66,500	64,100	59,000	45,800
5%	58,700	27,300	8,770	5,590	4,380	3,960	3,810	7,590	56,700	73,600	70,100	67,100	51,100
1%	73,700	41,900	12,900	6,990	6,010	4,710	3,890	15,200	64,700	95,300	81,700	84,600	67,000

Table C-11 - Annual and Monthly Flow Exceedence Ordinates (cfs) for Pre-Project Conditions for Susitna River at Susitna Station based on the USGS Extended Record

Susitna River at Susitna Station													
Percentile	Annual	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
99%	5,210	11,000	6,700	6,000	5,670	4,930	4,700	5,000	7,160	65,500	80,200	44,100	21,600
95%	5,840	15,000	7,750	6,280	5,810	5,340	5,070	5,400	10,400	77,000	90,800	70,900	33,100
90%	6,400	18,000	8,720	6,850	6,190	5,810	5,280	5,550	14,700	86,200	98,300	79,700	38,800
75%	7,710	23,500	10,700	7,840	7,000	6,380	5,800	6,120	32,800	102,000	108,000	92,400	50,800
50%	19,000	31,700	13,000	9,000	7,880	6,990	6,440	7,000	64,000	121,000	120,000	107,000	68,600
25%	94,000	42,900	16,700	10,700	8,570	7,530	7,000	9,210	95,200	136,000	133,000	123,000	90,300
10%	124,000	60,000	21,300	12,000	9,720	8,500	7,520	13,500	122,000	152,000	147,000	138,000	114,000
5%	138,000	70,000	25,000	13,300	10,300	9,200	9,000	19,000	135,000	161,000	157,000	153,000	125,000
1%	164,000	97,500	36,500	19,900	11,000	10,000	9,500	37,100	150,000	182,000	186,000	195,000	154,000

APPENDIX D. FLOOD FREQUENCY REGRESSION PLOTS

Susitna-Watana Hydroelectric Project (FERC No. 14241)

Stream Flow Assessment

Prepared for

Alaska Energy Authority



Prepared by

Tetra Tech

February 2013

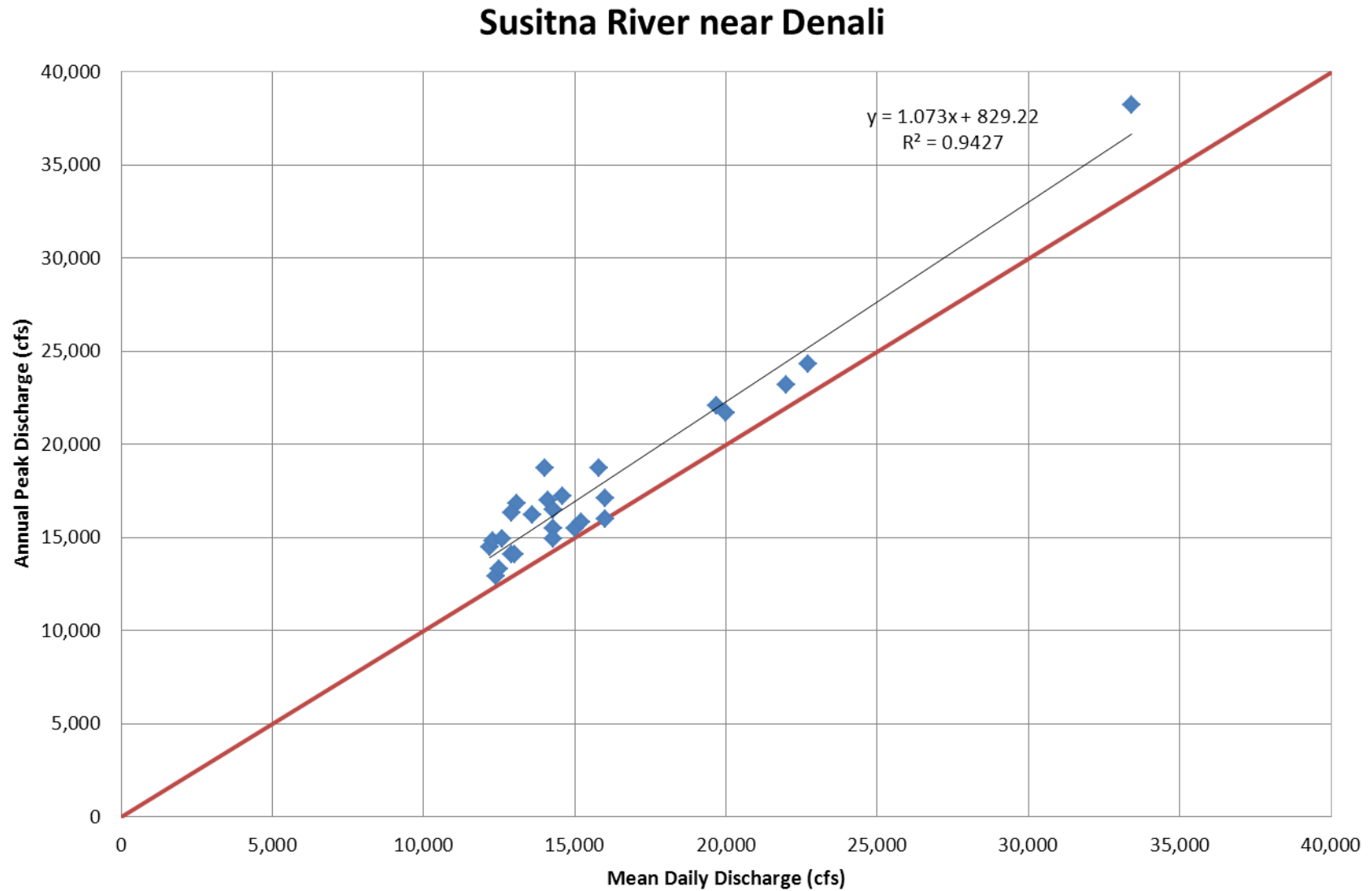


Figure D-1 – Susitna River near Denali regression to extend the Pre-Project USGS available record annual peak data.

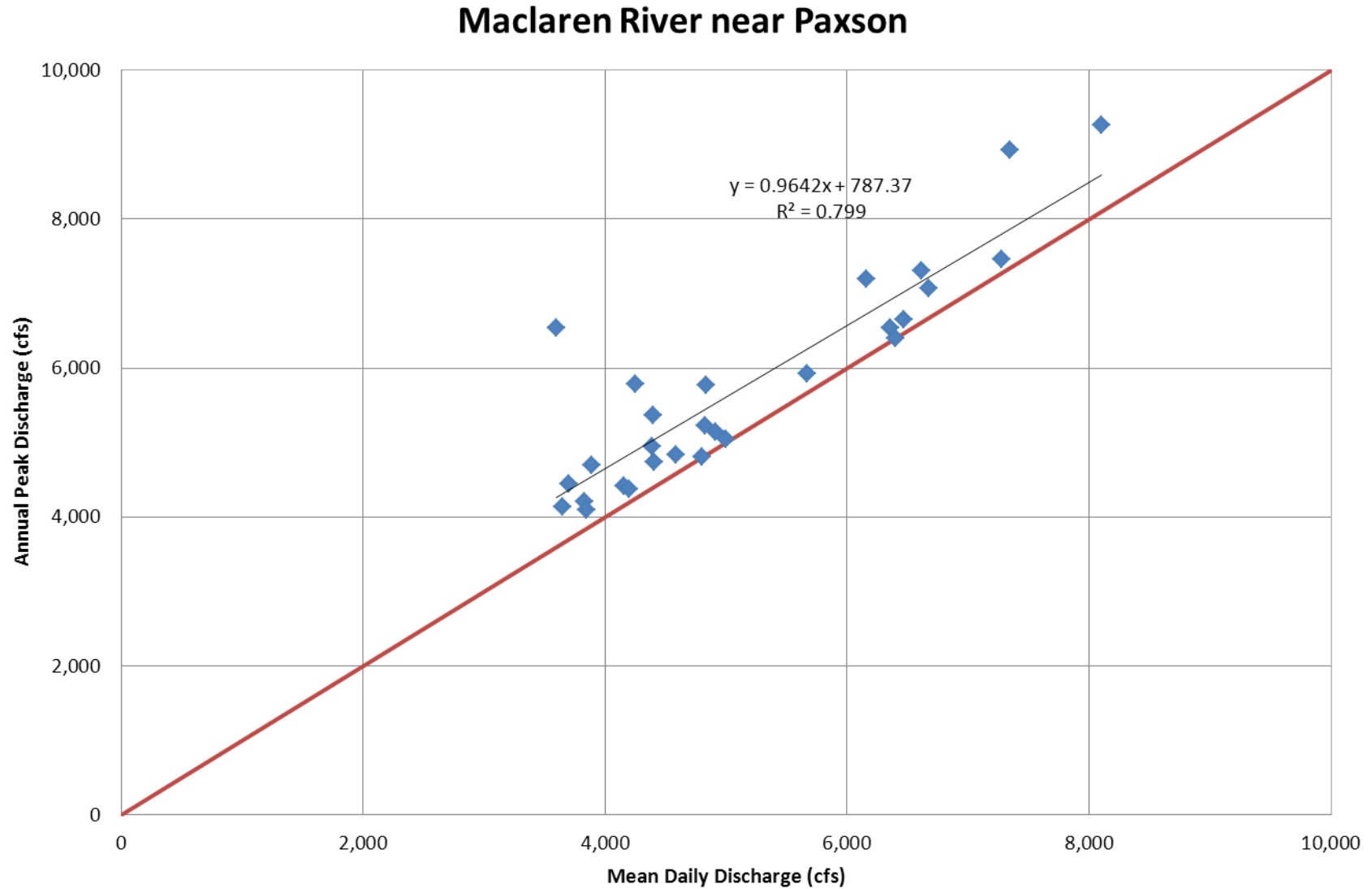


Figure D-2 – Maclaren River near Paxson regression to extend the Pre-Project USGS available record annual peak data.

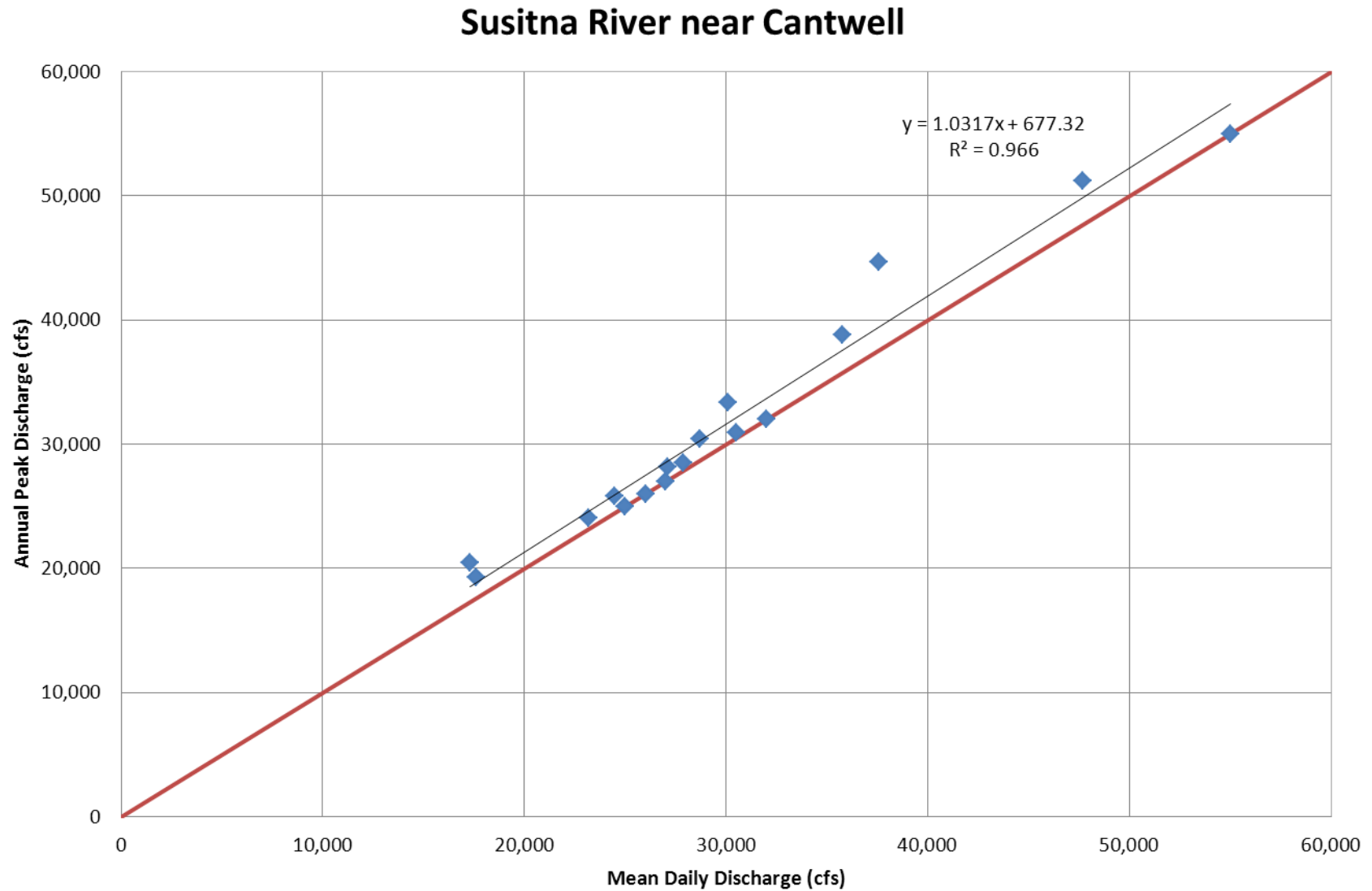


Figure D-3 – Susitna River near Cantwell regression to extend the Pre-Project USGS available record annual peak data.

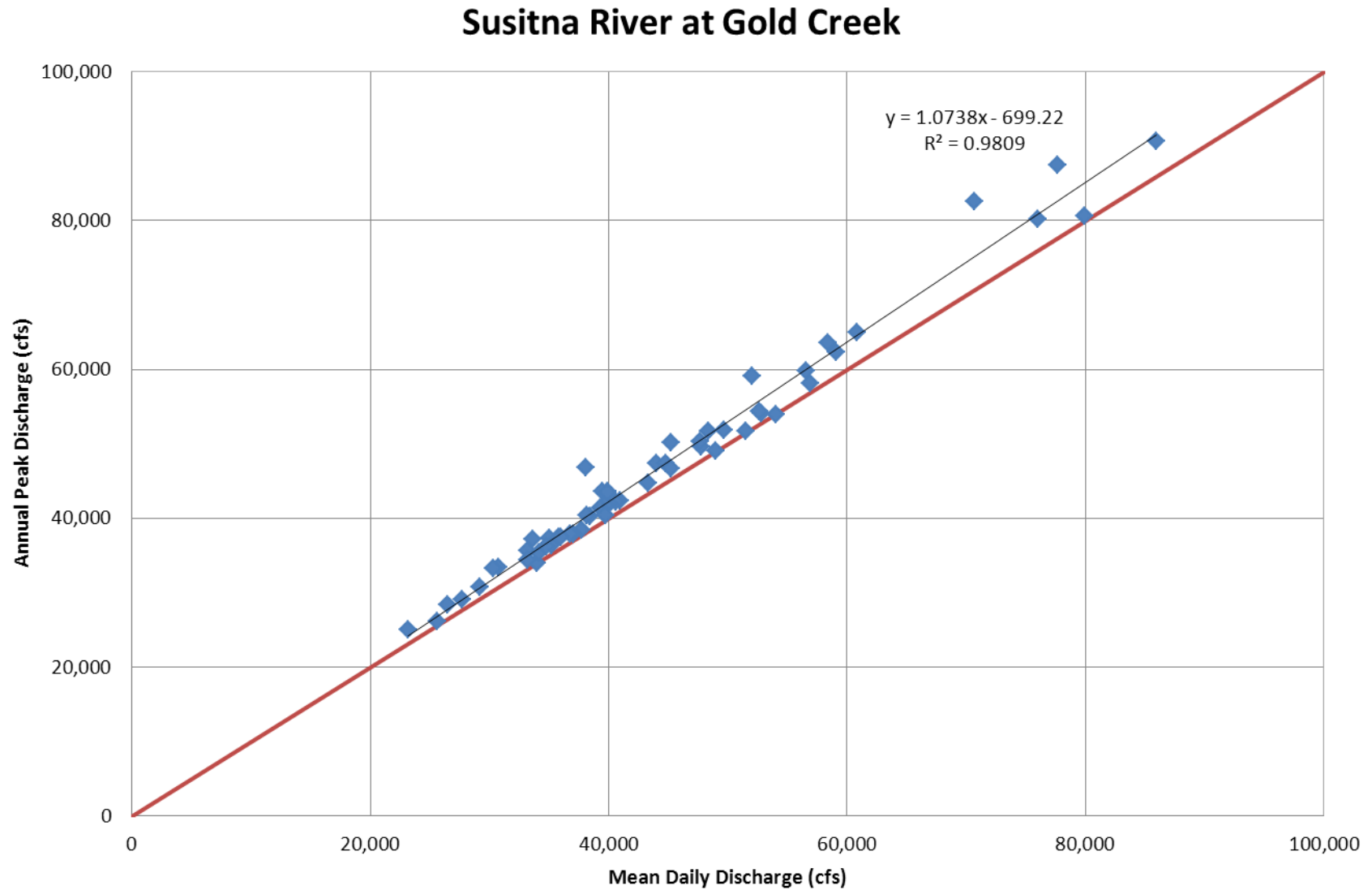


Figure D-4 – Susitna River at Gold Creek regression to extend the Pre-Project USGS available record annual peak data.

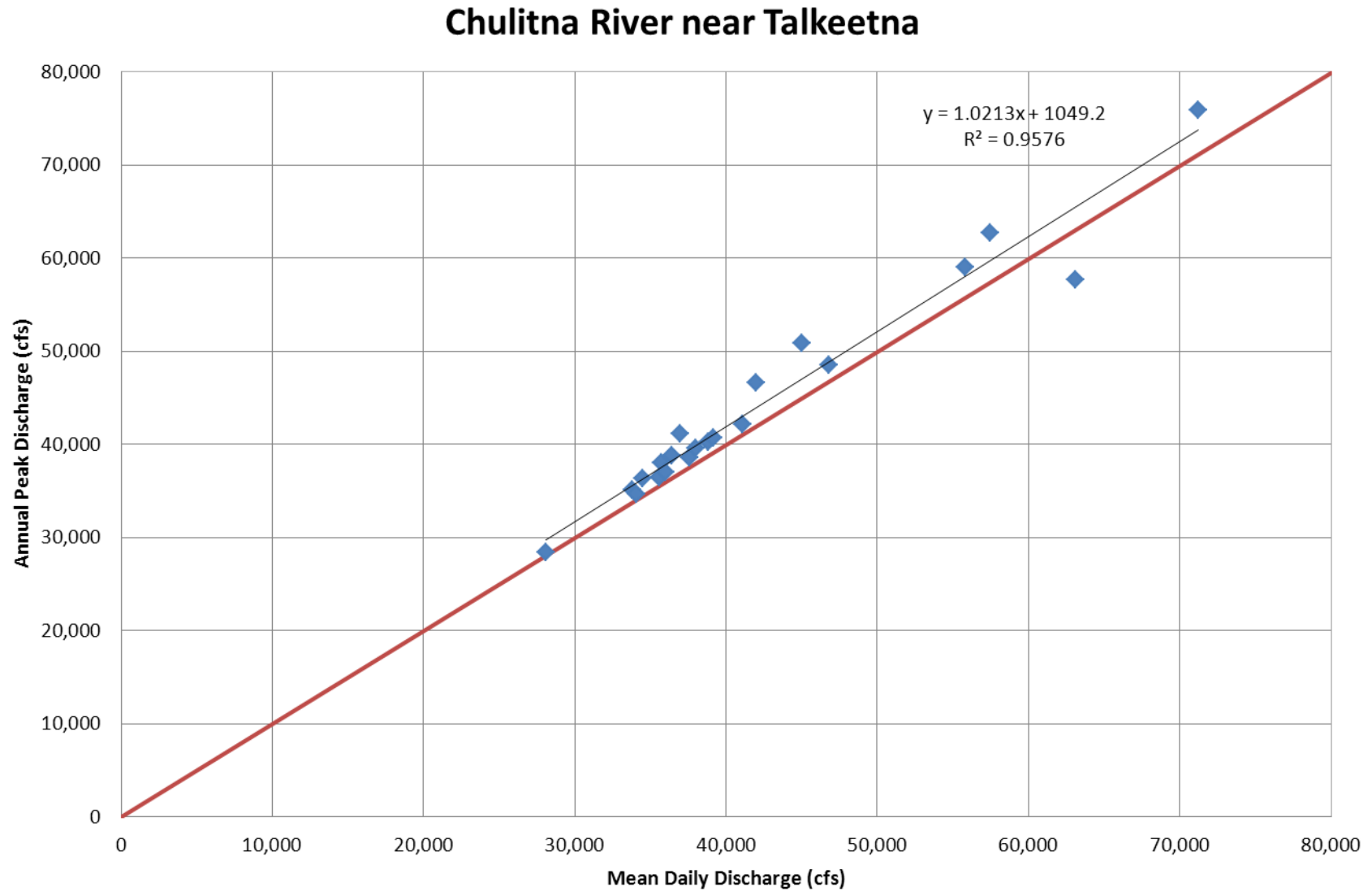


Figure D-5 – Chulitna River near Talkeetna regression to extend the Pre-Project USGS available record annual peak data.

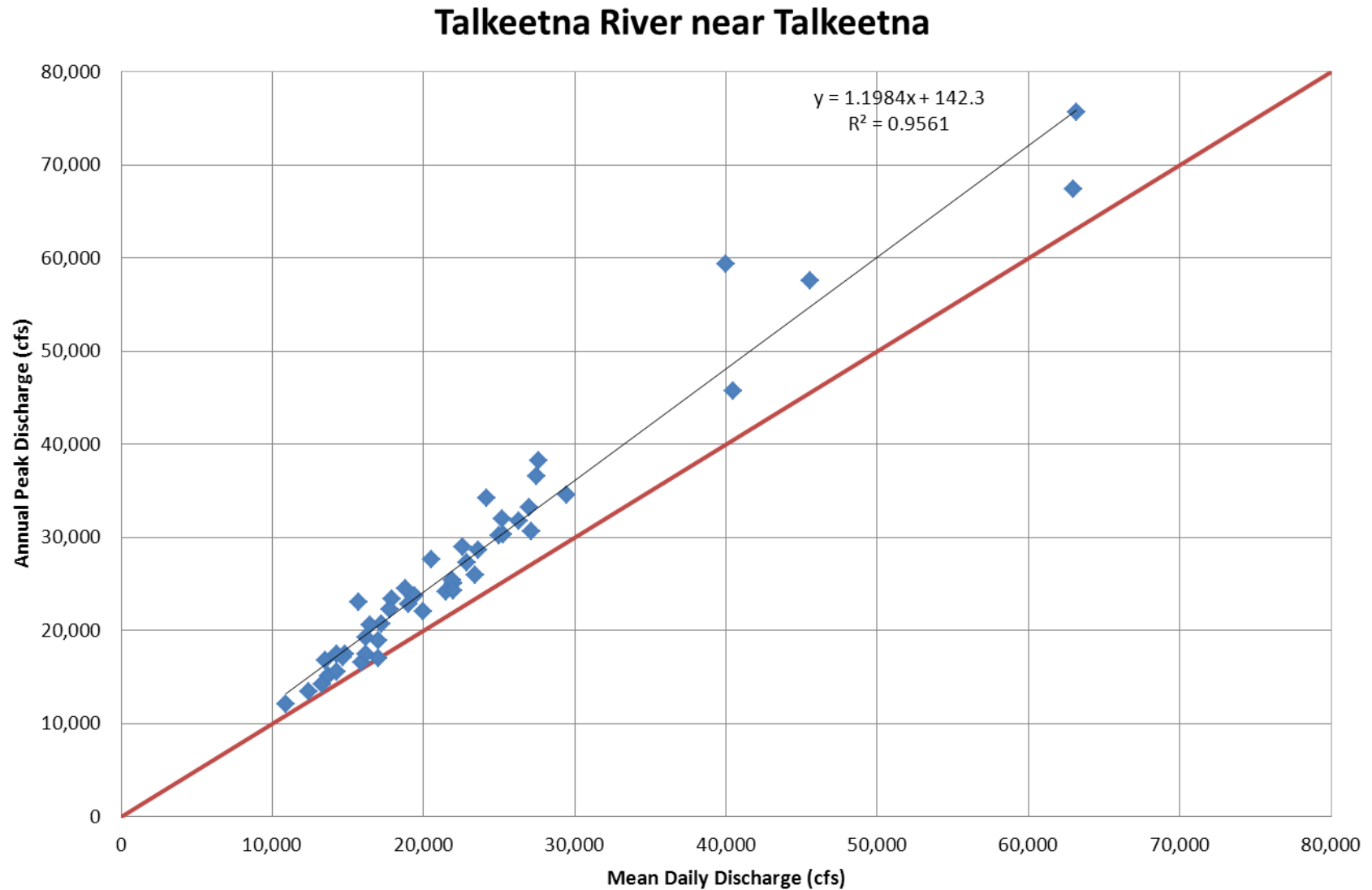


Figure D-6 – Talkeetna River near Talkeetna regression to extend the Pre-Project USGS available record annual peak data.

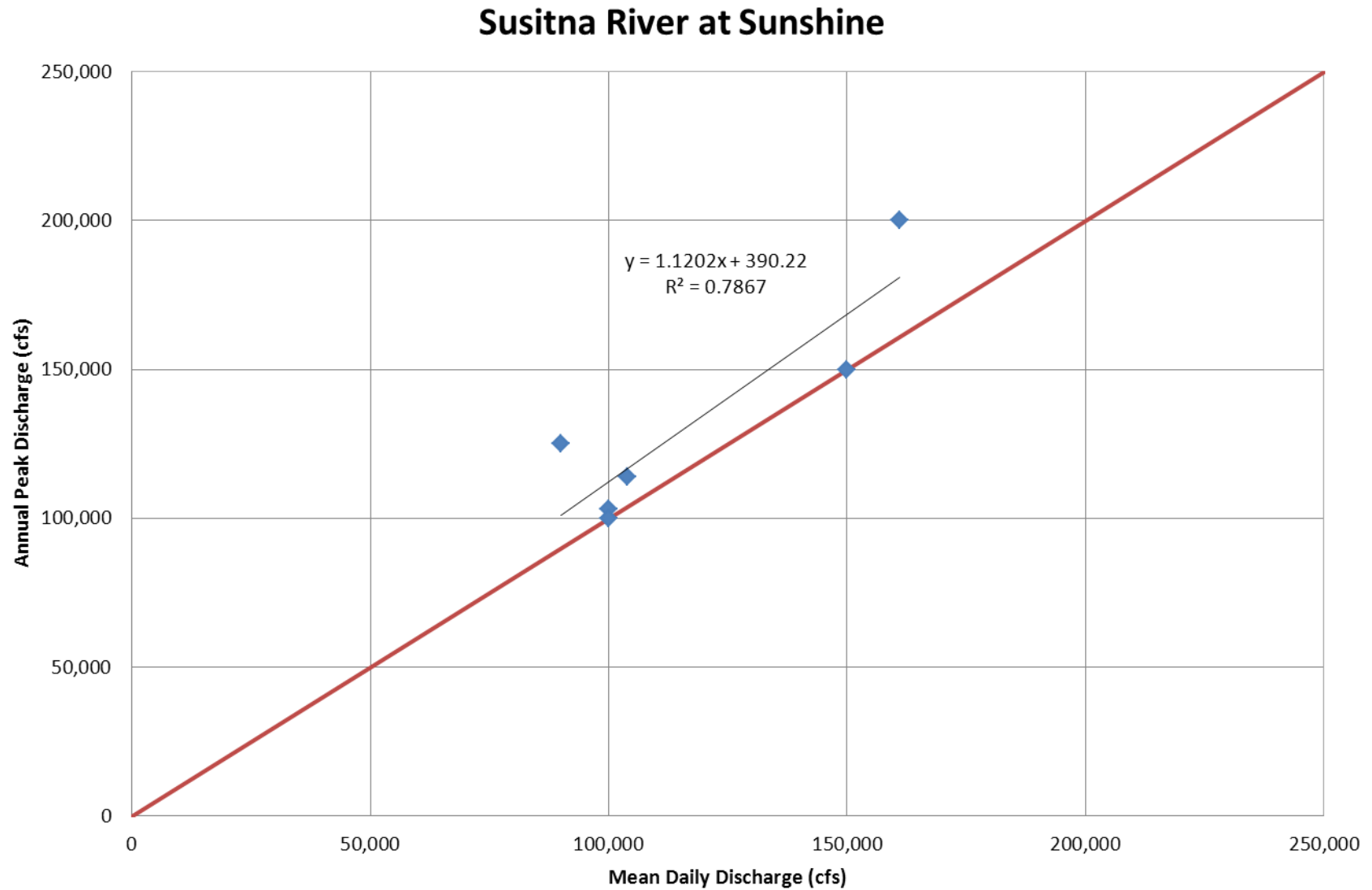


Figure D-7 – Susitna River at Sunshine regression to extend the Pre-Project USGS available record annual peak data.

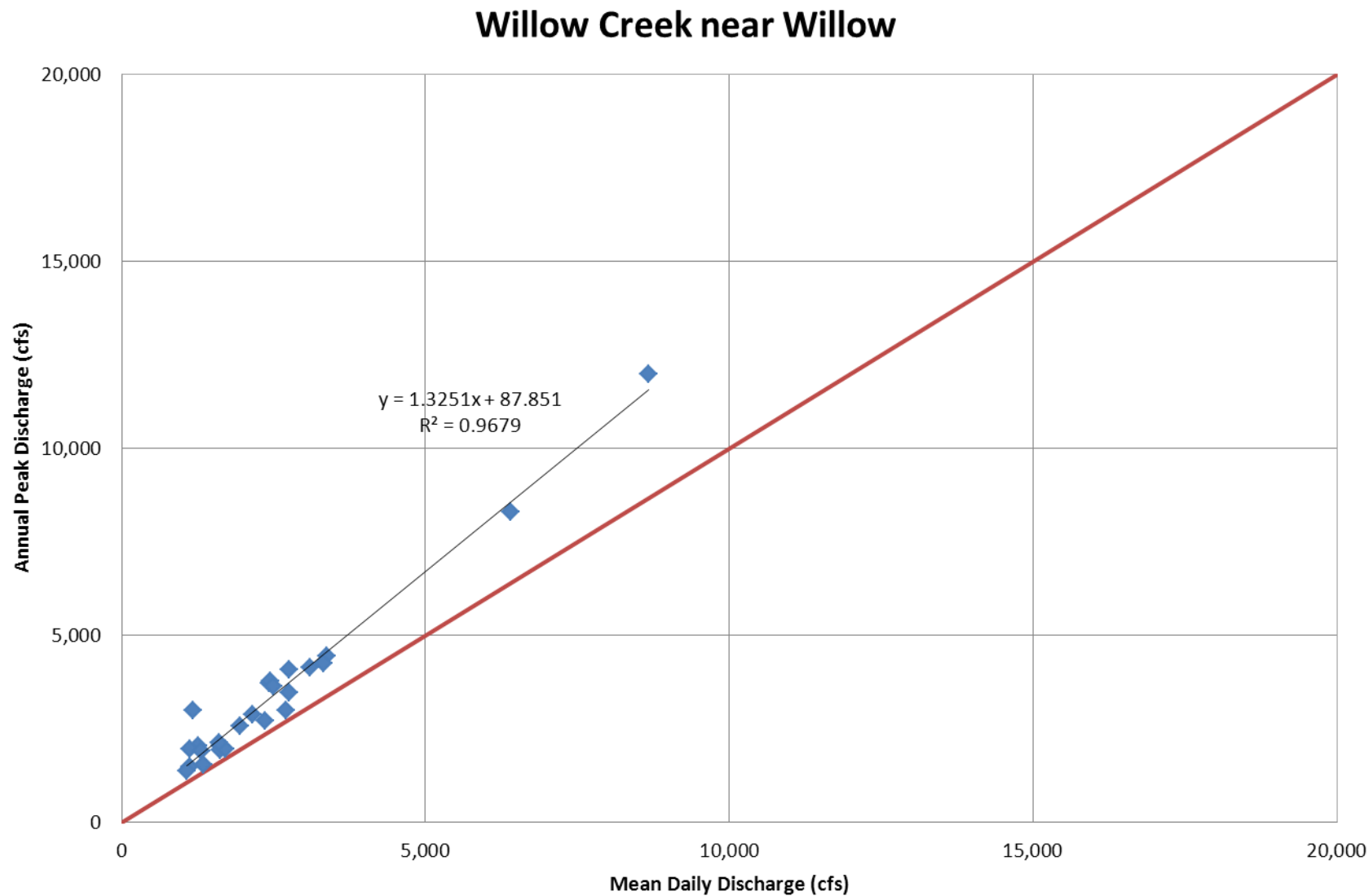


Figure D-8 – Willow Creek near Willow regression to extend the Pre-Project USGS available record annual peak data.

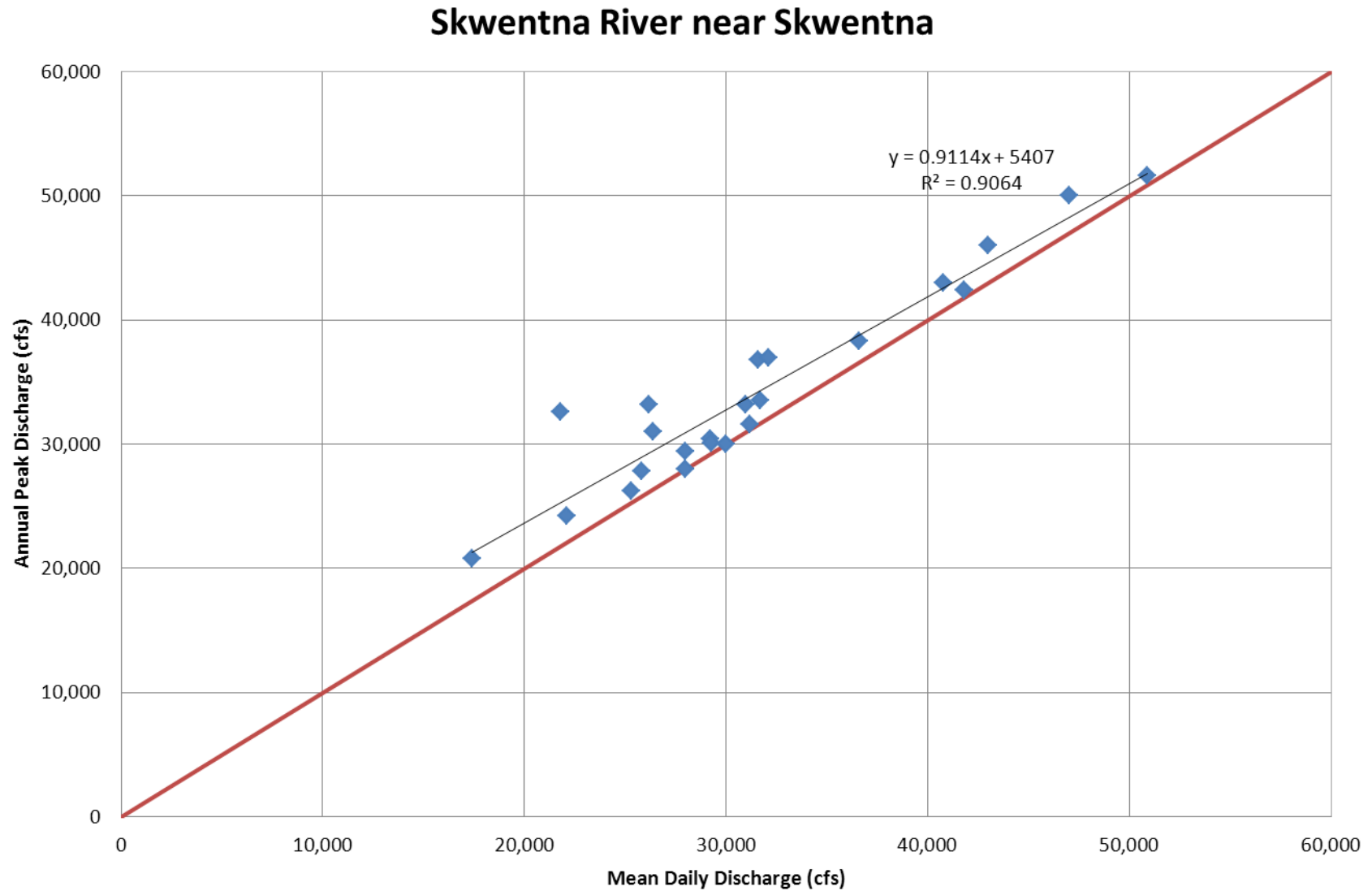


Figure D-9 – Skwentna River near Skwentna regression to extend the Pre-Project USGS available record annual peak data.

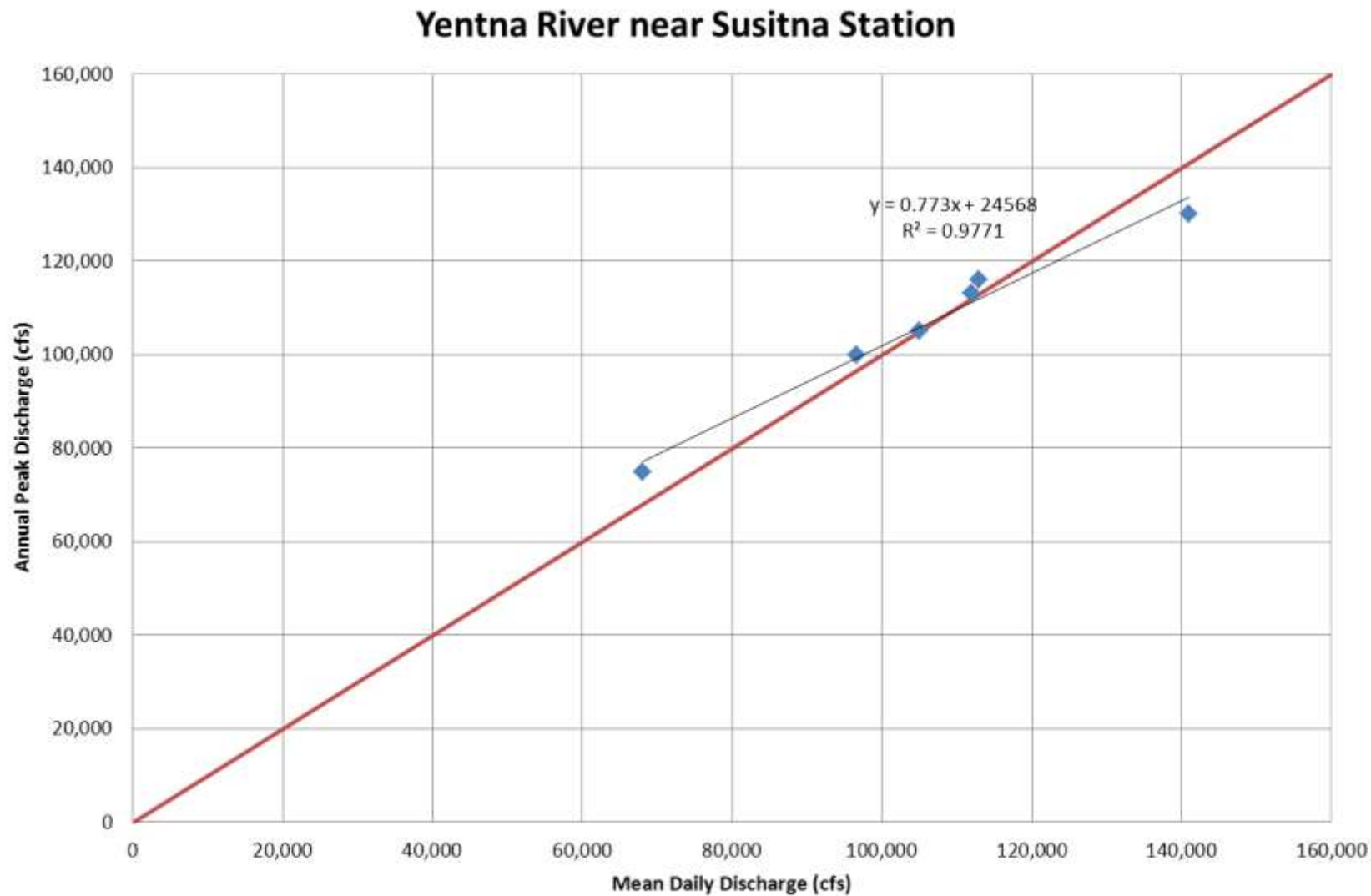


Figure D-10 – Yentna River near Susitna Station regression to extend the Pre-Project USGS available record annual peak data.

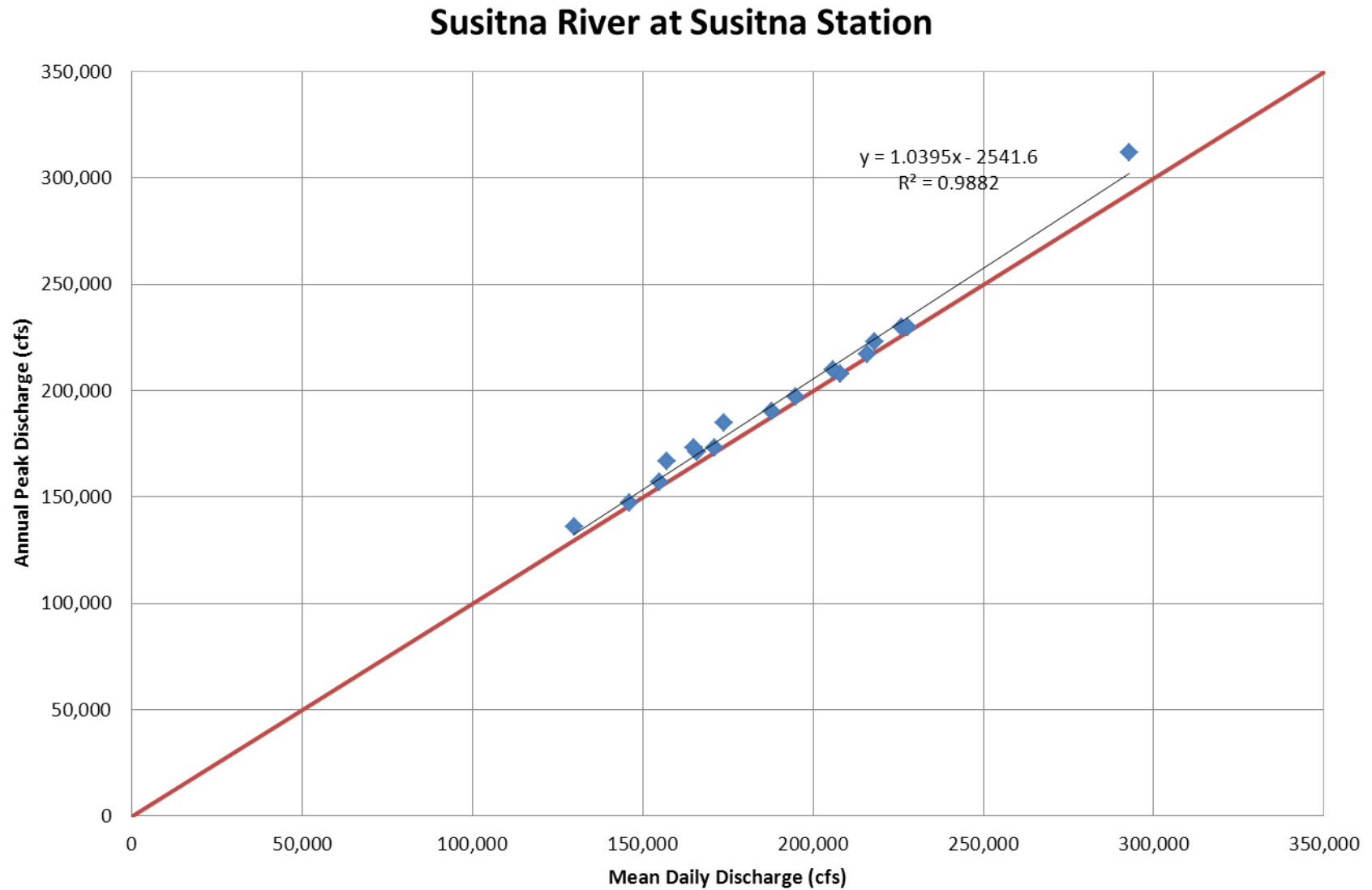


Figure D-11 – Susitna River at Susitna Station regression to extend the Pre-Project USGS available record annual peak data.

APPENDIX E. FLOOD FREQUENCY CURVES FOR PRE-PROJECT
CONDITIONS

**Susitna-Watana Hydroelectric Project
(FERC No. 14241)**

Stream Flow Assessment

Prepared for

Alaska Energy Authority



Prepared by

Tetra Tech

February 2013

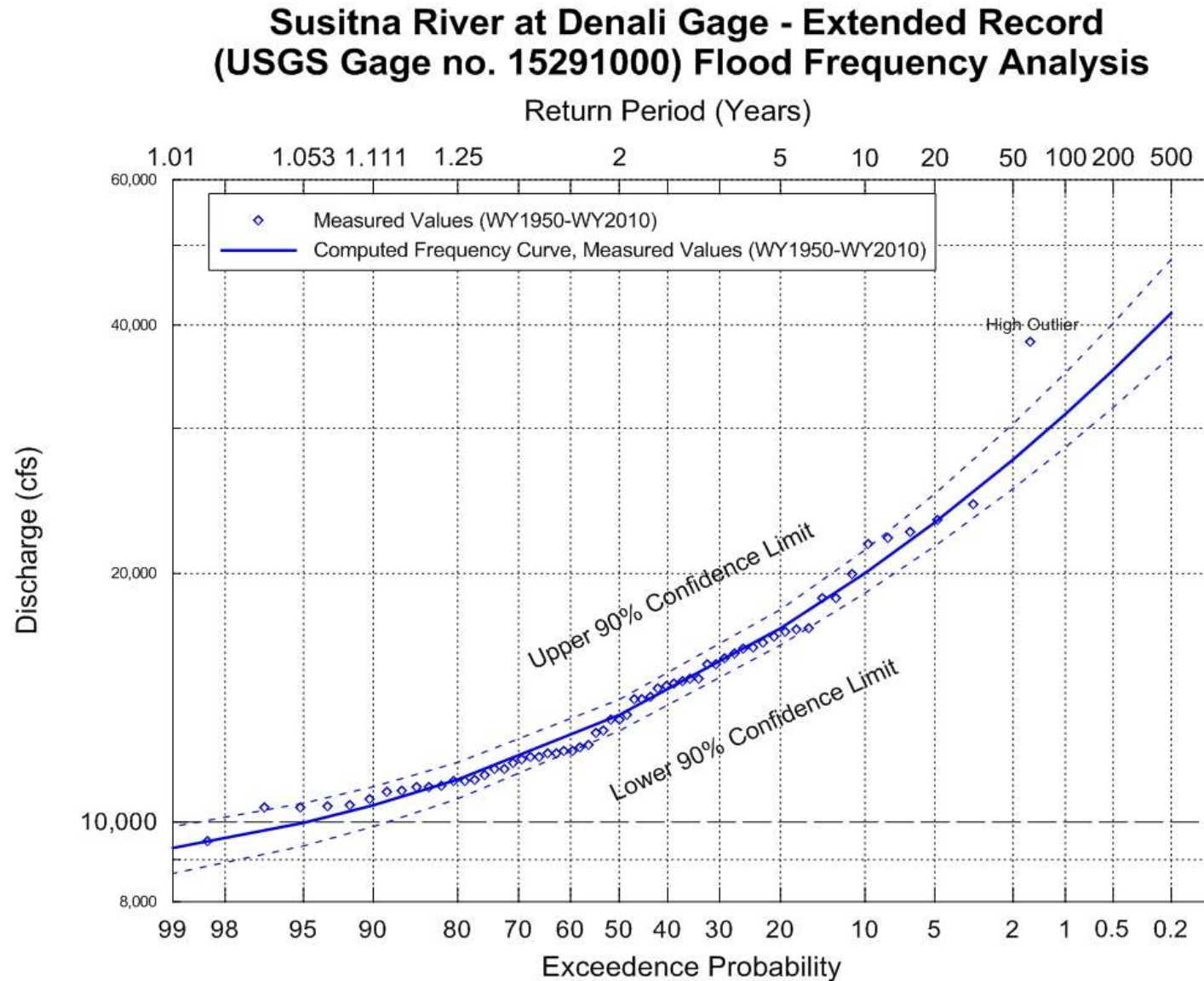


Figure E-1 – Flood Frequency Curve for Susitna River near Denali for Pre-Project Conditions based on the USGS Extended Record

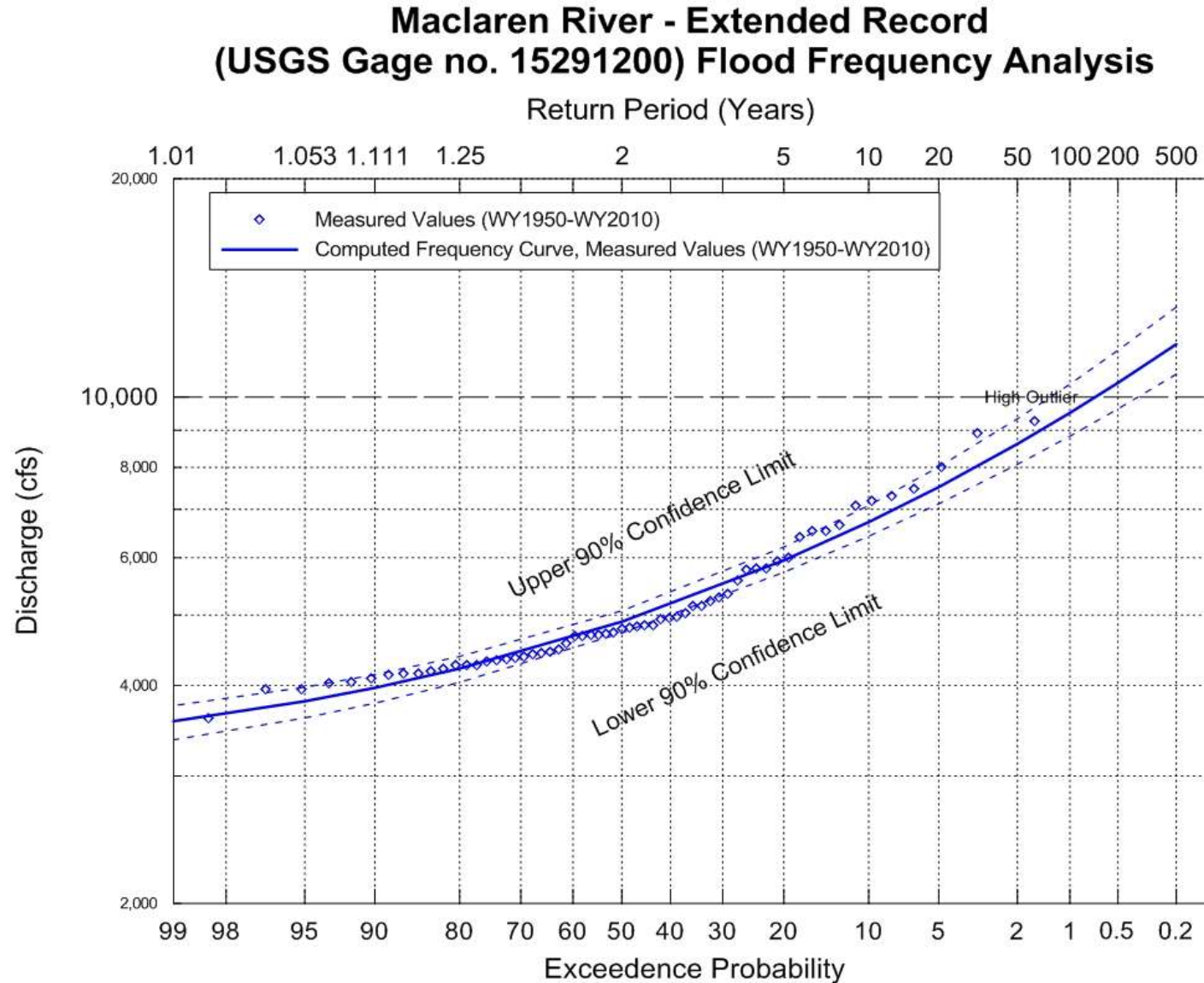


Figure E-2 – Flood Frequency Curve for Maclaren River near Paxson for Pre-Project Conditions based on the USGS Extended Record

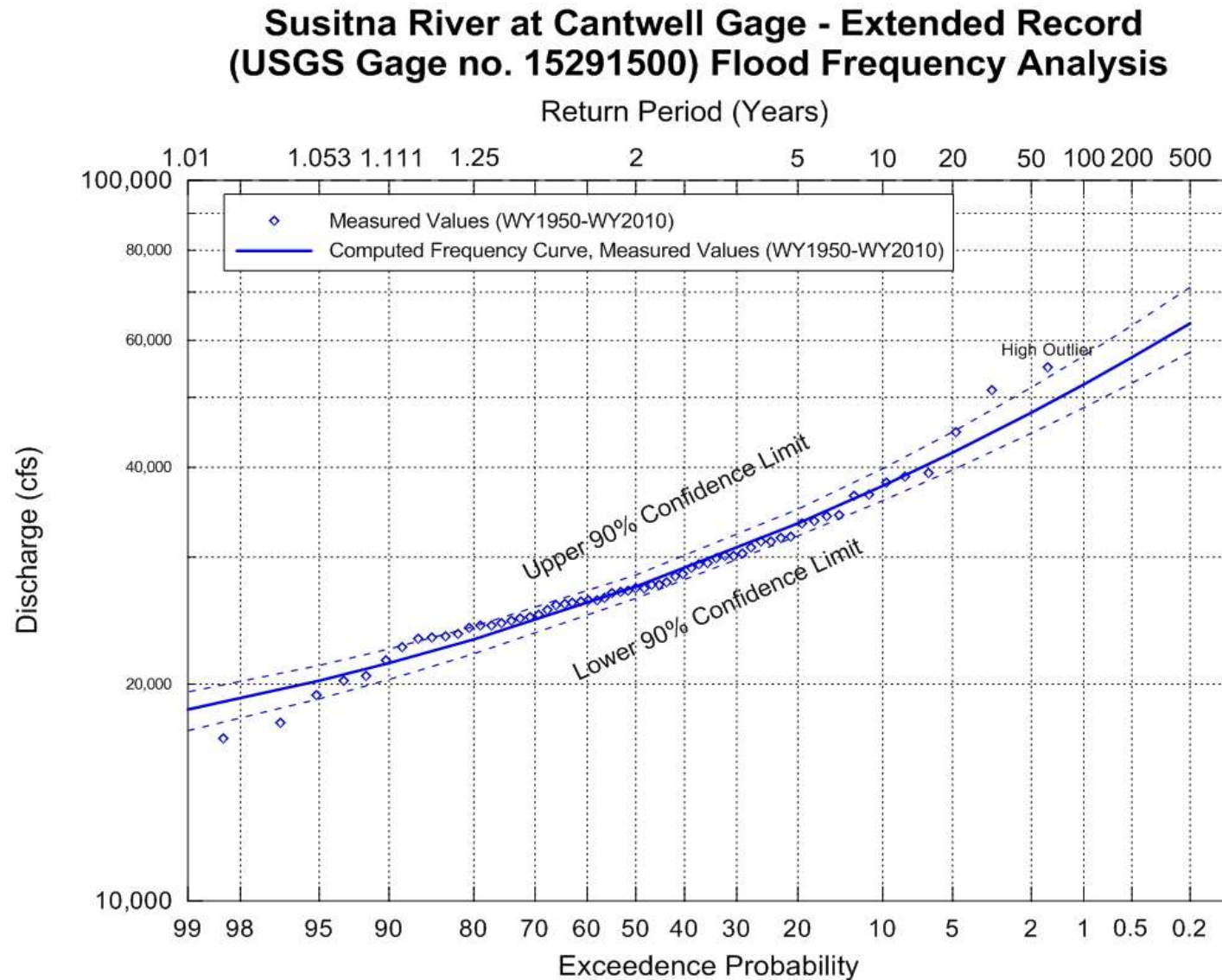


Figure E-3 – Flood Frequency Curve for Susitna River near Cantwell for Pre-Project Conditions based on the USGS Extended Record

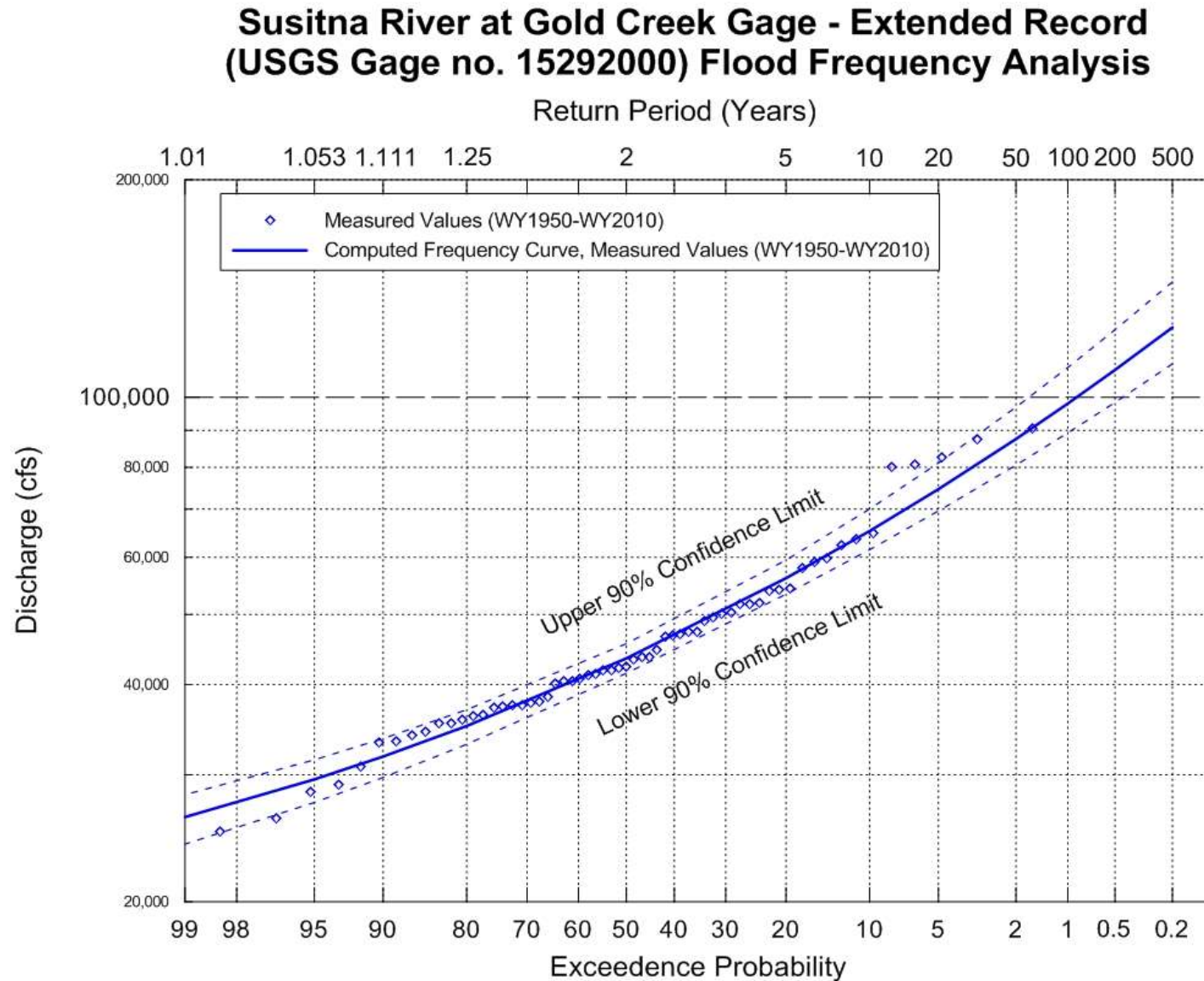


Figure E-4 – Flood Frequency Curve for Susitna River at Gold Creek for Pre-Project Conditions based on the USGS Extended Record

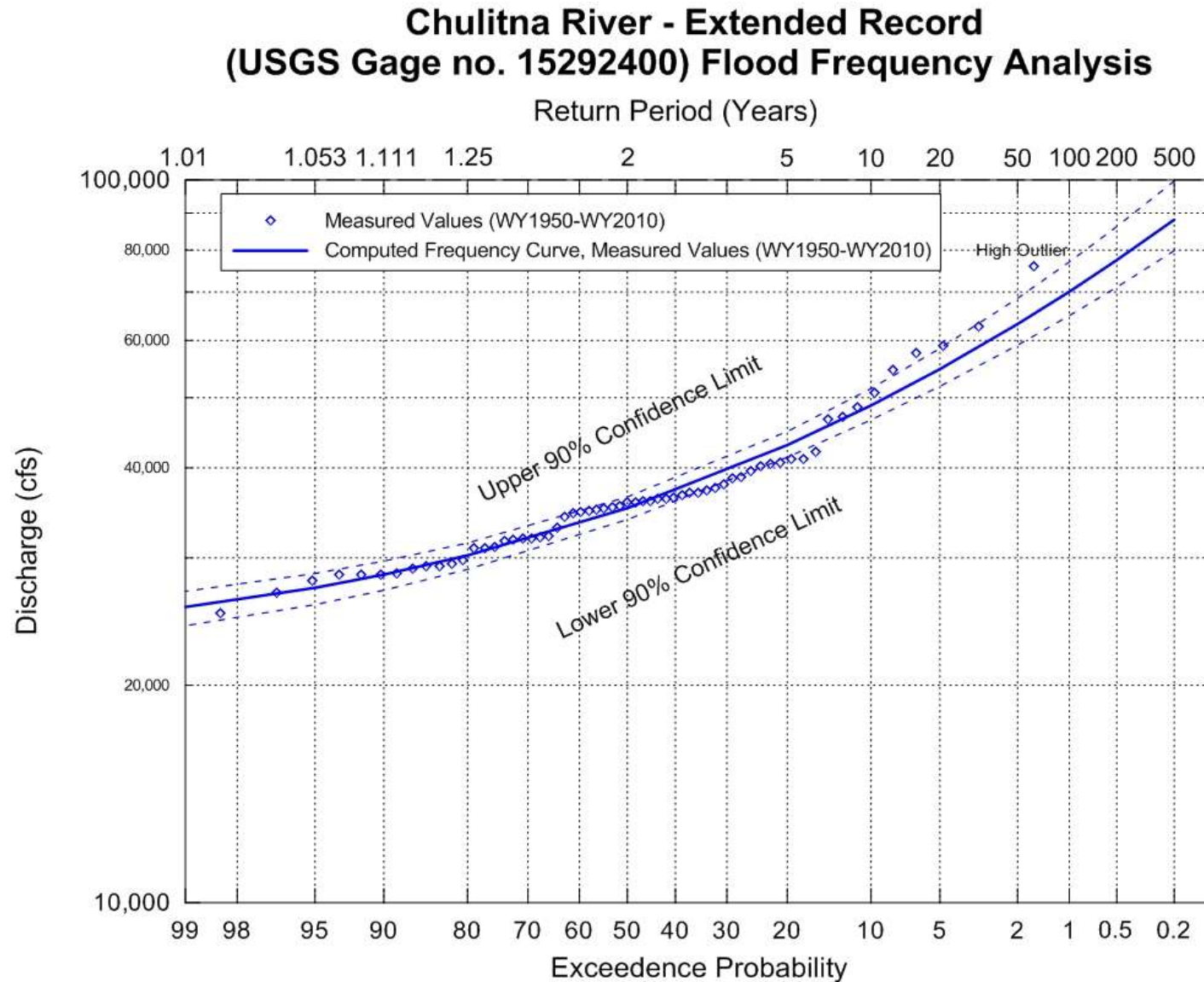


Figure E-5 – Flood Frequency Curve for Chulitna River near Talkeetna for Pre-Project Conditions based on the USGS Extended Record

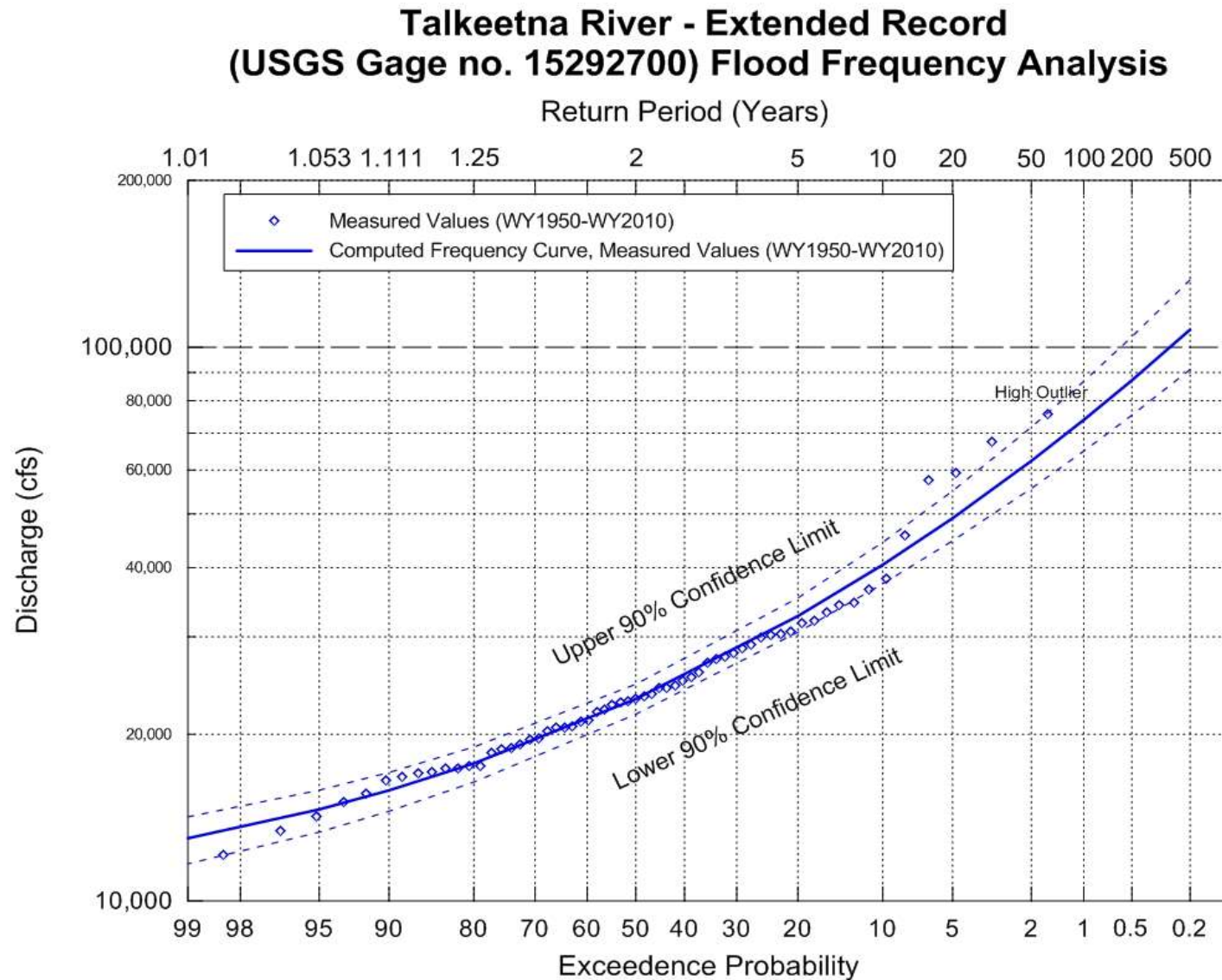


Figure E-6 – Flood Frequency Curve for Talkeetna River near Talkeetna for Pre-Project Conditions based on the USGS Extended Record

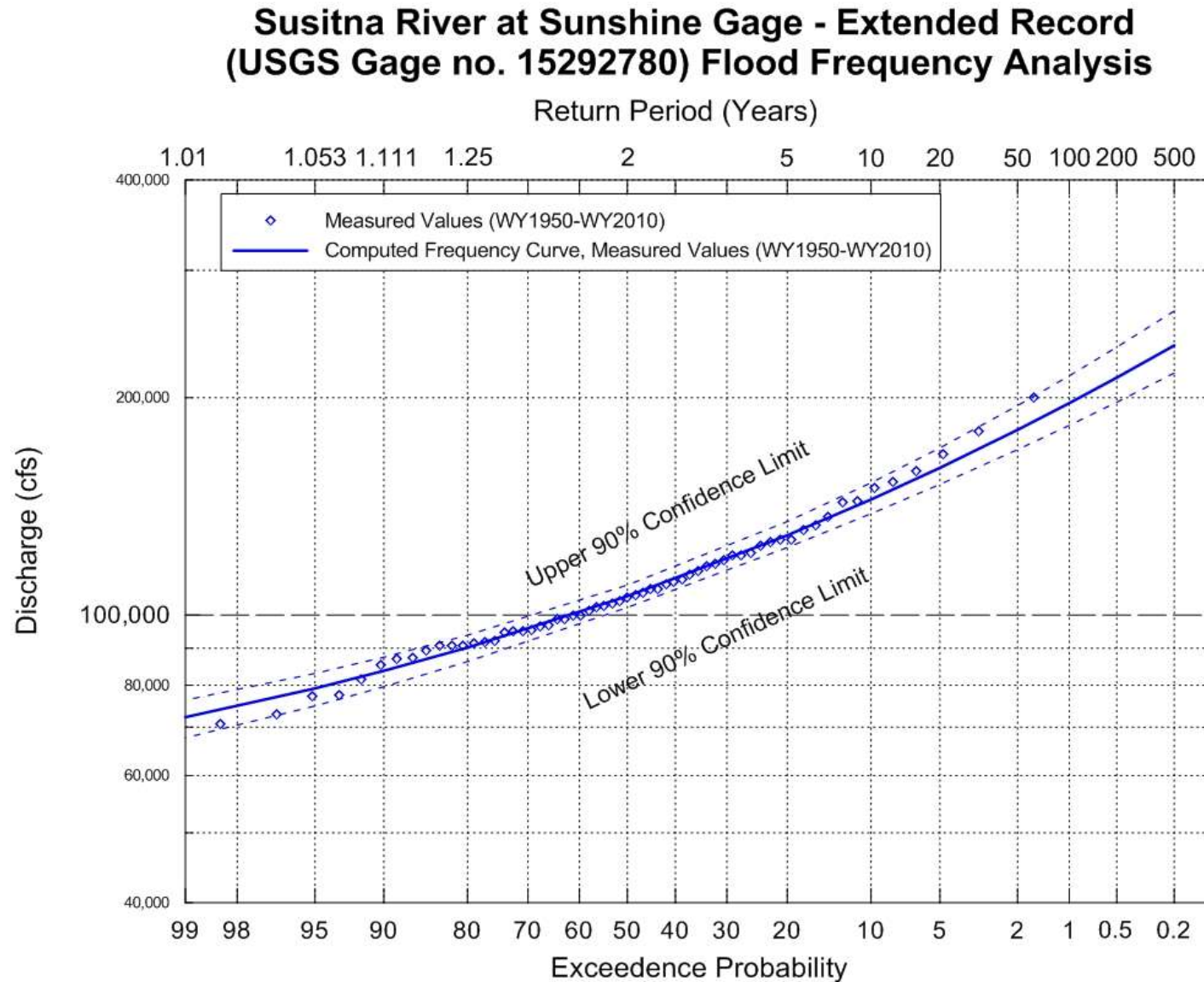


Figure E-7 – Flood Frequency Curve for Susitna River at Sunshine for Pre-Project Conditions based on the USGS Extended Record

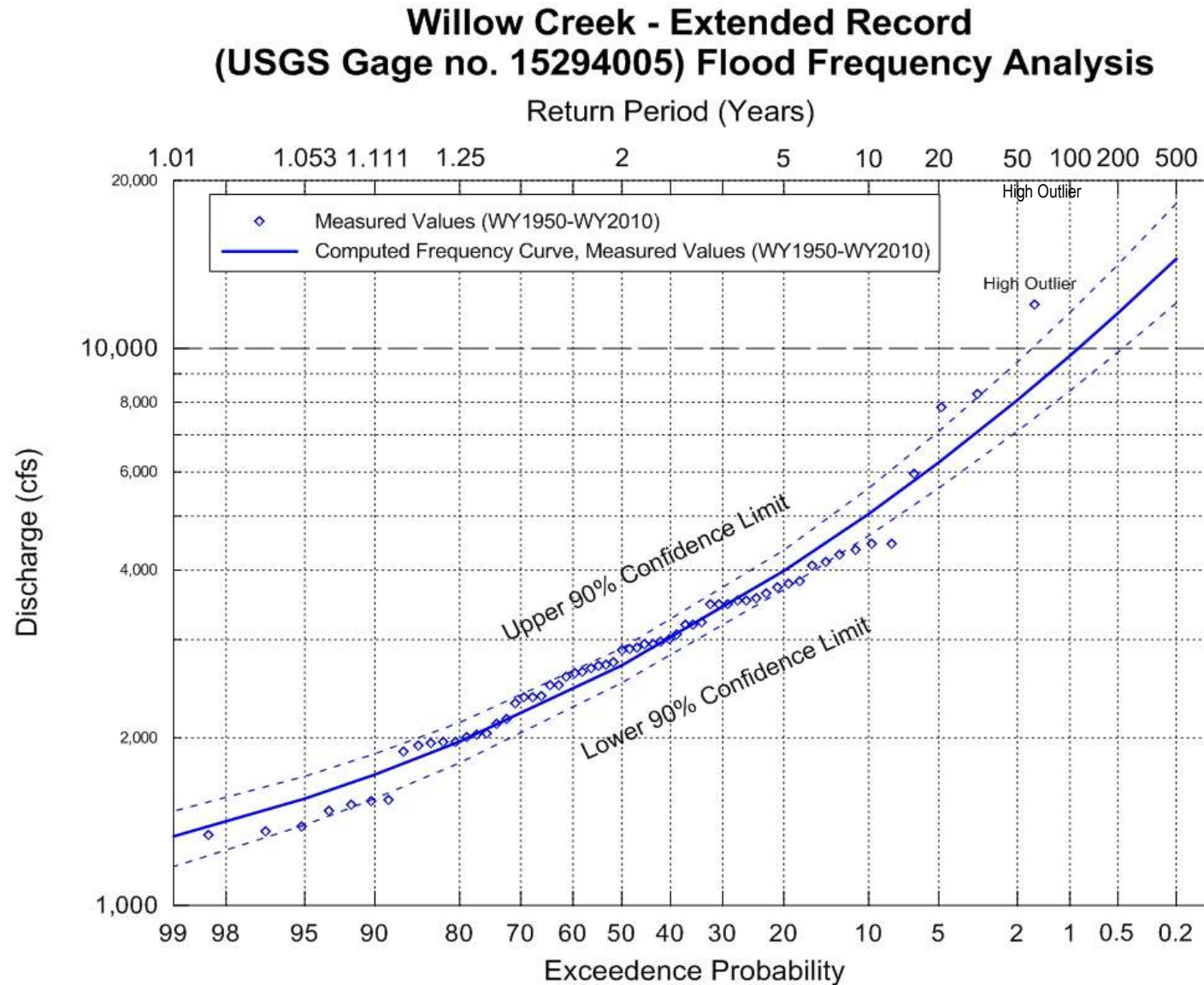


Figure E-8 – Flood Frequency Curve for Willow Creek near Willow for Pre-Project Conditions based on the USGS Extended Record

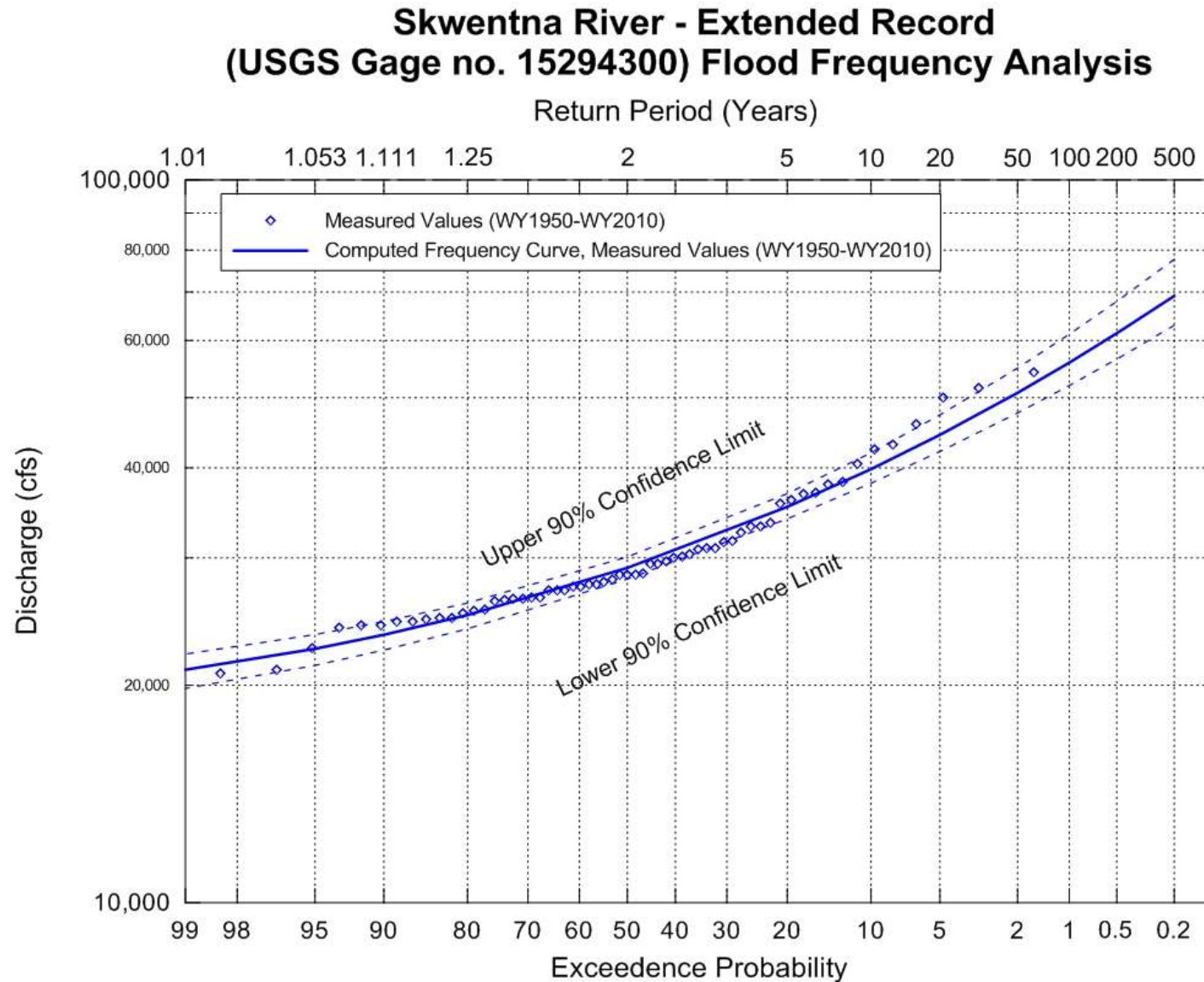


Figure E-9 – Flood Frequency Curve for Skwentna River near Skwentna for Pre-Project Conditions based on the USGS Extended Record

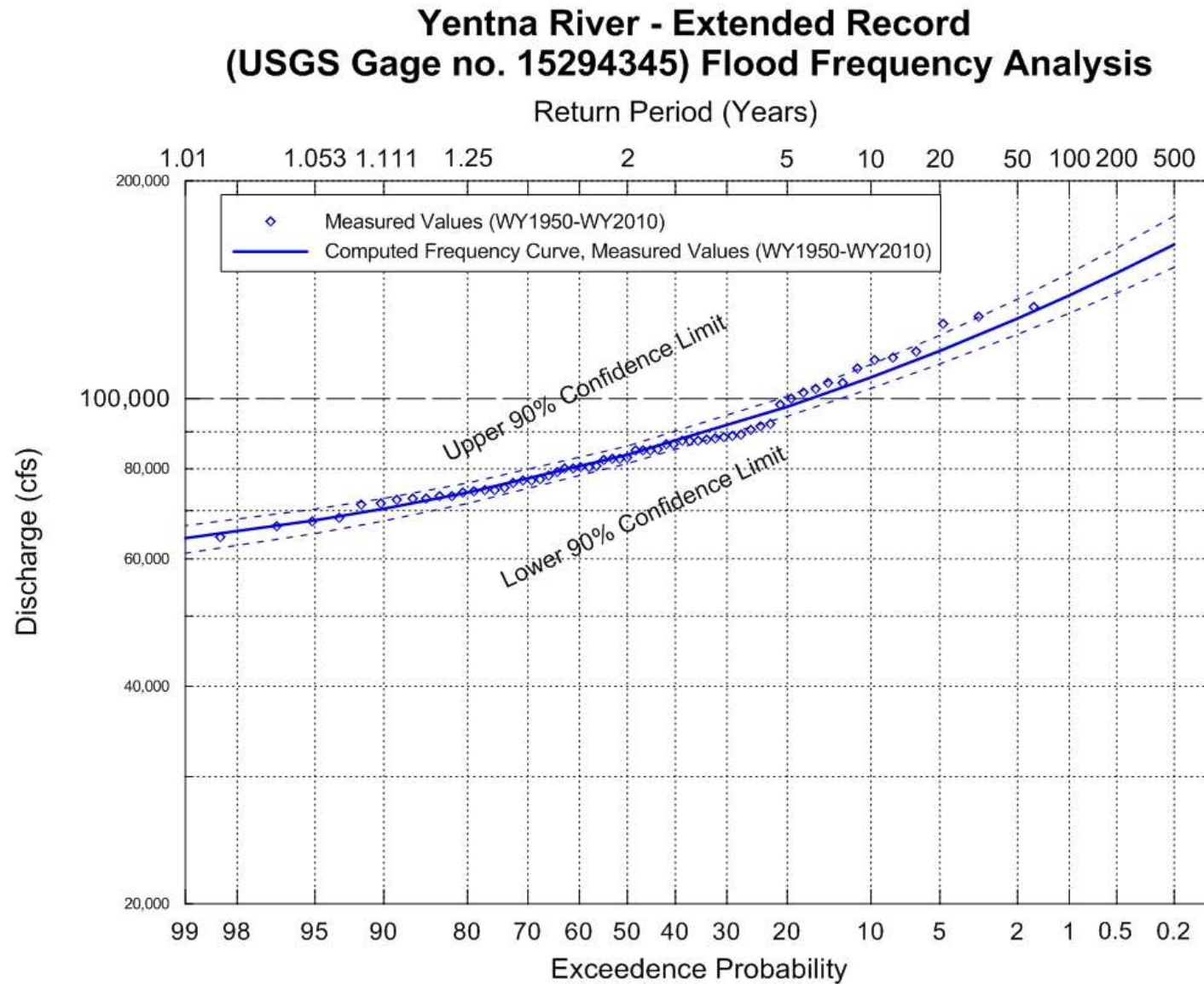


Figure E-10 – Flood Frequency Curve for Yentna River near Susitna Station for Pre-Project Conditions based on the USGS Extended Record

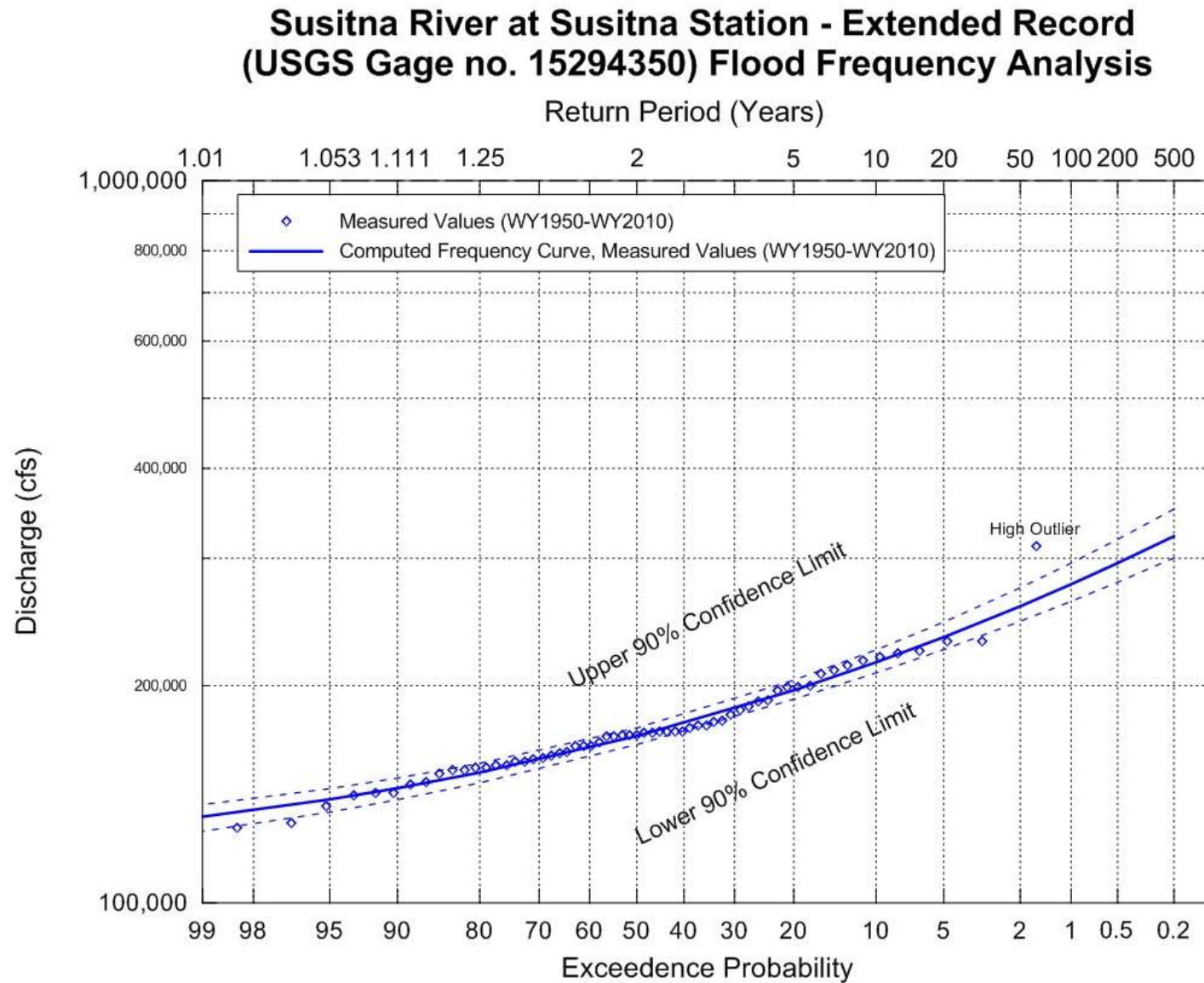


Figure E-11 – Flood Frequency Curve for Susitna River at Susitna Station for Pre-Project Conditions based on the USGS Extended Record.

APPENDIX F. AVERAGE MONTHLY FLOW (CFS) BY WATER YEAR
FOR POST-PROJECT CONDITIONS

**Susitna-Watana Hydroelectric Project
(FERC No. 14241)**

Stream Flow Assessment

Prepared for

Alaska Energy Authority



Prepared by

Tetra Tech

February 2013

Table F-1 – Average Monthly Flow for Susitna River at Gold Creek for Max LF OS-1 Conditions based on the HEC-ResSim model

WY	Susitna River at Gold Creek											
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1950	7,580	7,900	8,570	9,030	9,760	7,810	7,390	8,320	9,370	9,610	9,200	7,210
1951	7,310	7,950	8,930	9,570	10,500	8,590	8,420	9,530	9,950	9,890	9,450	9,340
1952	7,610	8,170	8,970	9,510	10,200	8,350	7,940	7,990	11,700	10,200	9,430	8,020
1953	7,850	8,020	8,540	8,940	9,590	7,710	7,380	9,320	9,980	9,030	16,700	15,600
1954	7,630	7,780	8,570	9,060	9,710	7,800	7,410	9,140	9,740	9,160	16,200	13,500
1955	7,360	7,900	8,630	9,100	9,730	7,760	7,280	7,860	10,600	9,990	20,200	14,800
1956	7,440	7,760	8,550	9,060	9,810	7,900	7,450	9,340	11,100	14,800	24,900	18,500
1957	7,690	7,940	8,630	9,050	9,740	7,740	7,230	8,460	10,500	9,360	17,800	19,900
1958	9,010	8,050	8,750	8,950	9,490	7,560	7,110	8,130	9,750	9,320	19,300	7,770
1959	7,270	7,810	8,590	9,120	9,810	7,850	7,430	9,000	9,590	9,670	19,800	17,500
1960	8,500	7,910	8,640	9,100	9,690	7,770	7,270	8,810	8,830	9,610	9,890	19,700
1961	9,330	7,910	8,700	9,150	9,650	7,760	7,340	9,510	11,800	12,200	22,400	13,400
1962	8,350	7,810	8,580	9,050	9,700	7,750	7,240	7,350	12,300	20,100	23,600	16,300
1963	8,020	7,630	8,470	8,980	9,670	7,590	7,020	9,670	10,500	18,000	23,900	12,500
1964	8,100	7,800	8,540	8,980	9,670	7,770	7,300	7,190	13,000	12,100	16,600	9,820
1965	7,990	7,780	8,370	8,850	9,560	7,680	7,220	8,160	10,000	9,860	16,600	19,000
1966	9,860	7,930	8,720	9,170	9,850	7,960	7,590	8,800	12,500	9,330	9,890	11,500
1967	7,280	7,810	8,710	9,290	9,990	8,030	7,570	9,190	10,200	10,100	25,600	17,200
1968	7,340	7,790	8,590	9,140	9,790	7,870	7,340	9,390	11,000	12,200	17,400	9,310
1969	7,070	7,710	8,480	9,040	9,830	7,970	7,620	8,210	8,460	8,340	8,230	7,250
1970	8,290	9,340	10,900	5,270	771	772	1,030	6,960	10,600	10,400	9,780	7,910
1971	8,660	9,360	10,300	10,900	10,800	953	1,060	3,390	11,600	9,120	10,100	12,900
1972	7,450	7,850	8,750	9,260	9,870	7,900	7,310	11,600	12,200	15,500	19,500	12,700
1973	7,270	7,830	8,570	9,080	9,830	7,860	7,400	7,840	10,500	9,070	9,330	7,240
1974	7,240	7,930	8,820	9,450	10,300	8,430	8,140	9,780	9,500	9,480	9,140	8,130
1975	7,780	8,700	9,900	10,800	12,200	1,660	1,550	8,280	11,400	10,200	8,960	10,800
1976	9,050	7,730	8,450	8,980	9,710	7,820	7,410	8,450	9,830	9,100	9,130	6,960
1977	7,250	8,110	8,980	9,460	10,200	8,240	7,810	8,770	12,100	9,420	13,000	12,500
1978	8,580	7,990	8,660	9,030	9,600	7,710	7,180	8,040	9,080	9,250	8,790	7,170
1979	7,370	7,980	8,750	9,250	9,960	8,060	7,650	8,810	9,960	10,300	11,200	11,000
1980	8,340	8,100	8,610	8,980	9,560	7,690	7,190	8,090	10,800	14,700	21,600	13,400
1981	8,510	7,820	8,270	8,760	9,640	7,670	7,190	7,910	8,580	15,800	34,500	14,300

WY	Susitna River at Gold Creek											
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1982	8,160	8,110	8,450	8,970	9,750	7,820	7,500	8,470	9,960	9,200	11,300	17,900
1983	8,740	7,840	8,660	9,190	9,770	7,710	7,240	9,120	9,490	8,500	18,300	14,000
1984	9,180	7,810	8,490	8,900	9,490	7,560	7,000	8,030	9,410	8,950	19,900	9,680
1985	7,740	8,070	8,830	9,200	9,790	7,920	7,440	8,780	10,500	8,980	14,900	15,700
1986	8,810	7,990	8,740	9,210	9,900	7,890	7,450	8,460	8,590	8,200	8,880	8,520
1987	11,400	7,970	8,530	8,970	9,610	7,720	7,260	8,190	9,460	10,100	21,500	13,600
1988	7,450	7,840	8,550	9,080	9,740	7,850	7,350	9,010	10,300	11,100	19,500	14,300
1989	8,910	7,920	8,590	9,100	9,720	7,800	7,310	8,300	9,940	9,390	19,700	15,600
1990	9,320	7,910	8,570	9,050	9,720	7,830	7,670	10,100	11,200	23,700	23,700	25,600
1991	8,920	7,820	8,660	9,130	9,780	7,810	7,300	7,290	9,980	9,330	8,990	7,890
1992	7,510	7,860	8,690	9,170	9,790	7,910	7,430	7,320	9,740	9,840	9,220	8,980
1993	7,190	7,930	8,680	9,180	9,840	7,880	7,520	9,580	9,480	8,980	12,700	21,500
1994	10,800	7,960	8,650	9,030	9,630	7,690	7,410	8,410	10,500	10,700	18,700	9,870
1995	7,220	7,940	8,680	9,150	9,850	7,890	7,570	9,040	9,700	9,610	16,700	19,300
1996	8,350	7,870	8,530	9,020	9,730	7,820	7,370	7,500	9,090	9,110	9,220	7,800
1997	7,720	8,730	9,880	10,800	12,100	2,600	1,570	7,240	9,970	10,400	10,200	8,200
1998	7,580	8,350	9,450	10,200	11,300	9,480	2,450	6,360	10,600	10,400	9,680	8,480
1999	7,970	8,130	8,850	9,340	10,100	8,140	7,700	8,230	9,920	9,720	10,000	7,530
2000	7,680	7,960	8,620	9,060	9,770	7,850	7,390	8,160	10,800	11,500	16,500	15,400
2001	9,550	7,950	8,610	9,050	9,750	7,790	7,280	7,700	10,600	9,280	16,100	10,700
2002	7,270	7,890	8,630	9,090	9,780	7,840	7,360	8,250	9,020	9,150	9,820	8,310
2003	9,830	8,280	8,570	8,860	9,580	7,550	7,120	7,310	9,610	10,200	20,700	13,800
2004	9,760	7,820	8,590	9,040	9,710	7,790	7,550	9,960	9,570	9,000	16,800	7,510
2005	7,040	7,820	8,710	9,230	9,930	8,010	7,780	10,700	10,900	19,500	22,100	22,700
2006	9,860	7,760	8,530	9,040	9,750	7,810	7,350	8,850	9,700	9,460	20,800	12,600
2007	11,100	7,940	8,620	9,080	9,730	7,760	7,300	8,850	9,080	9,210	12,500	13,700
2008	7,430	7,990	8,780	9,090	9,630	7,790	7,320	8,190	9,380	9,450	9,140	12,200
2009	7,690	7,680	8,540	9,120	9,840	7,910	7,900	9,880	9,370	8,970	13,700	12,900
2010	8,130	7,860	8,560	9,010	9,690	7,750	7,330	9,310	9,080	9,960	18,100	16,500
Average	8,240	7,990	8,750	9,140	9,750	7,460	6,950	8,490	10,200	10,800	15,400	12,700
Maximum	11,400	9,360	10,900	10,900	12,200	9,480	8,420	11,600	13,000	23,700	34,500	25,600
Minimum	7,040	7,630	8,270	5,270	771	772	1,030	3,390	8,460	8,200	8,230	6,960
Median	7,970	7,910	8,630	9,080	9,750	7,810	7,350	8,450	9,960	9,610	16,200	12,600

Table F-2 – Average Monthly Flow for Susitna River at Sunshine for Max LF OS-1 Conditions based on the HEC-ResSim model

WY	Susitna River at Sunshine											
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1950	16,700	11,200	10,200	10,200	10,700	8,680	8,360	24,400	38,200	43,200	39,200	18,800
1951	12,400	9,520	10,100	10,700	11,400	9,470	10,300	29,800	40,400	43,700	38,600	40,900
1952	15,300	11,700	11,200	11,400	11,400	9,410	8,980	14,900	56,500	48,500	40,400	29,100
1953	19,400	12,600	10,500	10,200	10,500	8,690	9,260	37,300	49,500	39,100	47,300	38,500
1954	15,300	10,400	10,300	10,600	10,900	8,730	8,820	34,200	47,400	39,700	54,100	32,900
1955	14,600	11,400	11,100	11,300	11,400	9,100	8,660	20,700	51,800	50,200	55,900	36,300
1956	14,200	10,100	10,000	10,200	10,900	9,030	8,510	34,200	56,500	58,400	61,700	45,900
1957	15,800	11,900	11,200	11,100	11,500	9,210	8,620	27,500	53,100	44,100	48,000	49,800
1958	20,900	13,300	12,900	11,400	11,000	8,960	8,890	26,300	47,900	43,200	51,600	18,400
1959	13,700	10,500	10,300	10,900	11,400	9,040	8,860	31,400	44,400	46,800	61,300	42,600
1960	17,700	11,600	11,300	11,400	11,400	9,230	8,780	30,900	31,600	42,600	45,300	49,600
1961	20,600	11,800	12,000	12,200	11,800	10,000	10,600	34,700	52,500	49,100	56,000	32,800
1962	16,600	11,300	11,100	11,400	11,500	9,480	9,280	24,500	66,200	58,600	59,100	39,900
1963	17,400	11,200	10,900	10,900	11,500	8,820	7,950	34,800	50,100	64,600	59,300	30,500
1964	17,100	10,600	10,300	10,200	10,800	8,630	8,120	12,100	65,800	47,600	45,200	24,300
1965	18,300	12,500	11,000	10,700	11,200	9,250	9,070	23,100	48,600	51,100	51,300	51,100
1966	24,100	12,000	11,200	11,300	11,600	9,570	9,470	20,200	55,700	41,800	45,500	30,800
1967	14,700	10,400	10,900	11,300	11,900	9,700	9,060	28,300	49,500	49,800	69,000	43,100
1968	14,600	11,600	11,600	11,900	12,400	10,400	10,200	34,500	55,600	51,800	45,500	23,900
1969	12,700	10,200	9,920	10,300	11,000	9,240	9,450	23,500	30,400	34,200	22,300	14,600
1970	13,000	11,500	12,400	7,050	2,080	2,040	2,610	22,700	38,900	46,600	41,700	25,700
1971	17,600	14,700	13,600	13,000	12,700	2,290	2,600	9,450	57,400	47,100	54,300	35,400
1972	16,600	12,300	11,800	12,000	12,300	10,000	9,290	33,700	56,100	53,100	52,000	37,400
1973	17,500	11,800	11,000	11,100	11,700	9,550	9,030	20,900	50,100	38,000	42,000	21,600
1974	13,100	10,600	10,700	11,100	11,800	9,810	9,660	30,900	38,900	39,100	35,900	26,700
1975	14,000	11,600	12,100	13,000	14,100	3,750	3,440	26,700	55,500	51,500	39,100	37,600
1976	20,500	10,500	10,000	10,500	11,200	9,290	9,290	24,300	46,700	40,500	39,800	17,900
1977	13,300	11,800	12,400	11,900	12,200	10,200	9,820	25,500	62,200	44,600	43,400	33,300
1978	20,500	12,400	11,800	11,600	11,700	9,660	9,180	22,500	38,000	44,400	35,100	20,300
1979	13,800	11,700	11,400	11,500	11,900	9,880	9,750	31,300	49,000	53,500	42,500	26,900
1980	20,000	14,200	11,700	11,500	11,800	9,840	9,990	25,500	51,200	59,000	52,600	33,200
1981	19,200	12,300	10,700	11,200	11,900	9,700	9,640	27,200	39,800	67,100	81,800	33,700

WY	Susitna River at Sunshine cont.											
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1982	17,200	12,000	10,500	10,800	11,500	9,410	9,480	21,300	46,500	47,800	41,800	49,100
1983	18,400	11,600	11,800	12,200	12,500	9,570	9,470	25,100	43,000	42,900	54,000	30,900
1984	22,500	13,000	11,700	11,800	12,100	10,200	9,720	20,700	41,600	44,400	58,500	24,600
1985	14,500	11,300	11,200	11,800	12,000	10,000	9,530	22,600	45,100	50,700	50,100	40,900
1986	18,900	11,500	11,000	11,300	11,700	9,440	8,940	18,000	35,400	42,300	37,600	30,900
1987	35,500	14,000	11,700	11,400	11,900	9,860	10,100	27,400	44,500	51,000	55,700	34,200
1988	14,900	11,500	11,200	11,500	11,900	9,910	9,380	32,200	50,500	48,800	50,000	35,200
1989	19,200	12,000	11,500	11,600	11,900	9,980	9,680	24,800	49,300	44,100	57,300	43,300
1990	23,200	12,800	11,500	11,900	12,500	10,900	13,900	46,700	55,700	58,300	58,200	62,700
1991	18,400	10,900	11,200	11,400	11,700	9,550	9,550	22,000	50,200	43,600	35,900	25,000
1992	15,300	10,600	11,000	11,300	11,800	10,100	9,950	16,300	46,400	48,800	41,600	24,400
1993	13,100	11,900	11,600	11,600	12,000	9,890	10,700	41,300	47,400	41,100	42,600	57,300
1994	28,200	13,300	11,900	11,700	12,000	9,650	11,300	32,500	53,700	43,300	49,500	23,000
1995	13,600	11,500	11,300	11,400	11,900	10,000	10,500	35,100	45,800	47,800	45,300	48,600
1996	17,900	11,600	10,300	10,600	11,300	9,410	9,480	20,700	33,000	36,400	38,300	22,600
1997	13,800	12,100	12,600	13,300	14,300	4,890	3,980	22,800	41,400	49,700	50,300	31,100
1998	14,400	11,300	11,700	12,200	13,100	11,200	5,300	21,300	50,600	51,700	47,100	35,100
1999	21,300	13,400	12,400	12,100	12,100	9,760	9,660	23,700	47,000	46,700	50,900	26,700
2000	19,400	13,400	12,000	11,700	12,100	9,970	10,000	26,900	58,800	57,600	43,900	40,900
2001	23,700	13,300	12,200	12,000	12,200	10,000	9,750	21,700	53,500	41,200	48,800	26,700
2002	14,400	11,300	10,900	11,000	11,600	9,510	8,970	28,100	34,600	37,200	45,300	36,600
2003	29,100	16,600	12,100	10,800	12,000	9,360	10,300	21,200	46,600	51,300	52,600	33,100
2004	21,400	12,000	11,100	11,100	11,500	9,390	10,700	42,000	46,000	41,700	44,600	18,000
2005	14,400	11,100	11,000	11,300	11,700	9,860	12,600	52,300	58,500	58,800	56,200	59,000
2006	23,500	10,700	10,700	11,100	11,600	9,580	9,310	28,700	41,200	44,500	62,300	32,800
2007	30,300	12,800	11,200	11,300	11,700	9,530	9,970	28,300	35,300	42,200	43,700	36,800
2008	16,000	12,100	11,700	11,200	11,200	9,470	9,290	24,100	41,700	41,800	40,700	33,800
2009	16,300	10,200	10,500	11,100	11,600	9,740	12,200	41,900	44,000	39,300	40,800	31,600
2010	19,900	12,800	11,100	11,100	11,600	9,550	9,750	33,200	37,900	48,700	50,200	40,700
Average	18,000	11,900	11,300	11,300	11,600	9,190	9,160	27,400	47,600	47,200	48,400	34,100
Maximum	35,500	16,600	13,600	13,300	14,300	11,200	13,900	52,300	66,200	67,100	81,800	62,700
Minimum	12,400	9,520	9,920	7,050	2,080	2,040	2,600	9,450	30,400	34,200	22,300	14,600
Median	17,200	11,700	11,200	11,300	11,700	9,550	9,470	26,300	47,400	46,700	47,300	33,200

Table F-3 – Average Monthly Flow for Susitna River at Susitna Station for Max LF OS-1 Conditions based on the HEC-ResSim model

WY	Susitna River at Susitna Station											
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1950	37,200	18,500	14,100	13,900	14,100	12,000	11,900	58,400	90,800	102,000	92,900	45,600
1951	25,300	13,400	13,900	14,300	14,900	12,800	15,400	70,400	94,400	103,000	92,100	95,700
1952	33,800	19,600	15,500	15,400	15,100	13,000	12,600	29,500	125,000	111,000	94,100	70,500
1953	45,800	24,000	14,500	14,000	14,000	12,200	14,500	89,200	113,000	94,200	103,000	82,500
1954	34,100	15,500	14,200	14,500	14,500	12,200	12,600	82,500	110,000	94,700	118,000	71,300
1955	33,200	19,300	15,900	15,600	15,300	12,800	12,500	49,300	117,000	115,000	116,000	77,900
1956	31,100	14,600	13,900	13,800	14,600	12,600	12,100	79,200	125,000	126,000	122,000	95,600
1957	35,700	21,200	16,500	15,100	15,500	13,000	12,400	64,500	119,000	104,000	104,000	104,000
1958	47,400	26,700	23,400	16,200	14,900	12,700	13,200	63,600	110,000	103,000	106,000	43,200
1959	30,100	16,100	14,300	14,800	15,200	12,700	12,700	71,300	104,000	109,000	127,000	87,100
1960	31,000	17,200	15,600	15,100	15,200	13,100	12,500	70,500	89,500	104,000	102,000	84,400
1961	35,500	17,100	17,000	16,700	15,600	14,000	15,700	79,600	114,000	109,000	110,000	80,000
1962	34,300	17,900	15,300	15,200	15,100	13,000	12,900	50,300	112,000	115,000	106,000	65,300
1963	28,200	15,800	14,600	14,600	15,000	12,500	11,700	61,000	102,000	124,000	103,000	59,200
1964	38,200	15,400	13,800	14,400	14,600	12,300	12,300	17,500	114,000	109,000	102,000	46,400
1965	35,400	19,400	17,800	15,800	15,900	13,400	12,700	31,700	106,000	112,000	105,000	102,000
1966	42,900	19,000	16,200	16,000	15,800	13,200	12,800	29,100	108,000	99,100	108,000	72,900
1967	38,900	16,000	15,200	14,800	15,000	12,900	12,400	21,700	90,100	104,000	117,000	78,400
1968	27,600	17,500	16,400	16,000	16,300	14,200	15,600	84,700	116,000	111,000	87,400	37,500
1969	19,200	14,100	13,900	14,100	14,600	12,600	14,200	63,400	96,700	88,600	51,800	27,100
1970	36,200	18,200	17,000	11,200	6,020	5,780	6,430	65,000	113,000	117,000	93,300	57,700
1971	28,700	21,400	18,400	17,100	16,200	5,500	5,980	34,800	125,000	115,000	104,000	55,000
1972	26,700	16,700	15,100	15,100	15,200	12,500	12,000	40,100	97,900	117,000	108,000	82,500
1973	40,100	20,800	16,600	16,000	15,700	13,400	13,100	47,000	97,300	95,400	79,200	44,300
1974	26,100	17,100	16,400	16,300	16,600	14,200	14,200	48,900	83,000	85,800	80,200	74,200
1975	23,700	17,400	17,600	17,900	18,500	7,620	6,780	39,600	108,000	118,000	82,600	72,000
1976	33,300	15,800	13,300	14,500	14,400	12,300	13,200	66,000	92,300	105,000	89,300	49,000
1977	33,600	23,700	19,600	17,700	17,500	13,600	12,300	51,600	140,000	131,000	119,000	83,500
1978	39,600	17,200	13,500	14,000	14,700	12,800	12,500	44,500	80,700	106,000	94,800	54,200
1979	39,300	20,500	16,300	16,700	16,600	14,000	14,800	75,500	105,000	124,000	119,000	74,800
1980	59,700	35,600	20,800	17,400	17,100	15,300	17,500	61,800	124,000	163,000	128,000	78,200
1981	36,000	20,500	14,800	14,500	15,300	12,300	15,500	74,600	97,600	134,000	156,000	68,400

WY	Susitna River at Susitna Station cont.											
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1982	34,700	22,500	18,300	16,300	15,500	12,000	11,500	39,700	91,800	99,600	90,900	110,000
1983	36,200	20,500	16,100	15,300	16,200	13,200	13,000	55,800	88,700	90,800	101,000	55,800
1984	40,600	23,800	17,600	14,300	14,200	12,200	18,200	55,300	89,400	94,400	111,000	51,700
1985	32,900	16,000	14,600	15,200	15,200	12,800	12,300	42,600	96,900	117,000	104,000	84,200
1986	52,900	23,800	17,900	16,400	16,100	12,500	13,000	43,600	79,500	112,000	93,400	72,700
1987	87,400	22,100	15,900	15,200	15,600	13,600	15,000	60,200	94,900	119,000	120,000	74,100
1988	36,000	24,500	19,400	18,200	18,000	15,900	16,900	74,600	116,000	126,000	103,000	71,500
1989	42,800	18,800	13,500	13,400	14,200	13,100	14,000	64,300	98,800	113,000	152,000	116,000
1990	60,800	23,700	15,500	15,700	16,200	15,100	24,600	105,000	120,000	120,000	107,000	107,000
1991	36,100	16,800	13,900	14,700	15,500	12,800	14,200	57,300	118,000	112,000	97,500	67,200
1992	39,300	19,500	18,600	17,800	17,500	15,800	26,800	55,700	95,800	103,000	75,500	38,300
1993	21,600	18,900	17,800	16,800	15,800	13,300	17,300	93,400	110,000	98,000	95,000	117,000
1994	61,700	24,600	18,800	16,900	16,400	13,400	19,600	77,400	119,000	99,500	103,000	47,500
1995	28,000	18,900	16,500	15,700	15,700	13,800	16,700	80,500	104,000	109,000	94,900	98,800
1996	37,400	19,300	14,200	14,100	14,700	13,000	14,200	47,800	76,100	86,400	90,100	50,700
1997	23,200	17,600	17,400	17,400	17,900	7,930	7,980	47,100	88,200	108,000	109,000	64,500
1998	24,900	16,200	15,400	15,200	15,900	13,800	9,640	44,900	109,000	112,000	102,000	74,700
1999	41,000	21,700	18,300	16,600	15,200	12,000	12,800	47,000	102,000	101,000	108,000	54,900
2000	37,100	21,800	17,700	16,100	15,800	13,200	14,400	55,400	124,000	121,000	83,800	78,700
2001	44,300	21,600	18,100	16,800	16,200	13,400	13,800	45,100	118,000	94,100	103,000	56,800
2002	29,900	18,300	15,400	14,900	15,200	12,900	12,400	63,400	79,800	86,300	103,000	87,900
2003	65,900	34,500	19,300	14,300	16,700	12,800	17,600	49,600	106,000	115,000	106,000	66,900
2004	44,000	20,400	16,100	15,500	15,400	13,000	17,800	93,600	104,000	98,400	93,500	39,400
2005	30,100	17,700	15,800	15,800	15,800	14,300	23,700	118,000	127,000	121,000	113,000	119,000
2006	49,400	16,600	15,500	15,500	15,300	13,200	13,300	61,100	91,400	102,000	125,000	69,800
2007	66,300	22,900	16,400	15,200	14,900	12,300	15,300	60,800	78,700	98,300	97,700	79,400
2008	34,400	20,800	17,700	14,900	14,600	12,800	13,100	54,000	96,300	95,900	94,200	72,900
2009	34,100	15,500	15,000	15,500	15,500	13,500	21,200	93,600	99,800	92,000	88,000	65,300
2010	44,300	23,100	16,300	15,500	15,600	13,300	14,900	72,300	86,900	109,000	107,000	82,100
Average	38,100	19,800	16,300	15,500	15,400	12,700	14,100	60,300	104,000	108,000	103,000	72,100
Maximum	87,400	35,600	23,400	18,200	18,500	15,900	26,800	118,000	140,000	163,000	156,000	119,000
Minimum	19,200	13,400	13,300	11,200	6,020	5,500	5,980	17,500	76,100	85,800	51,800	27,100
Median	36,000	19,000	16,100	15,400	15,500	13,000	13,200	60,200	104,000	109,000	103,000	72,700

APPENDIX G. MONTHLY FLOW DURATION CURVES FOR POST-
PROJECT CONDITIONS

Susitna-Watana Hydroelectric Project
(FERC No. 14241)

Stream Flow Assessment

Prepared for

Alaska Energy Authority



Prepared by

Tetra Tech

February 2013

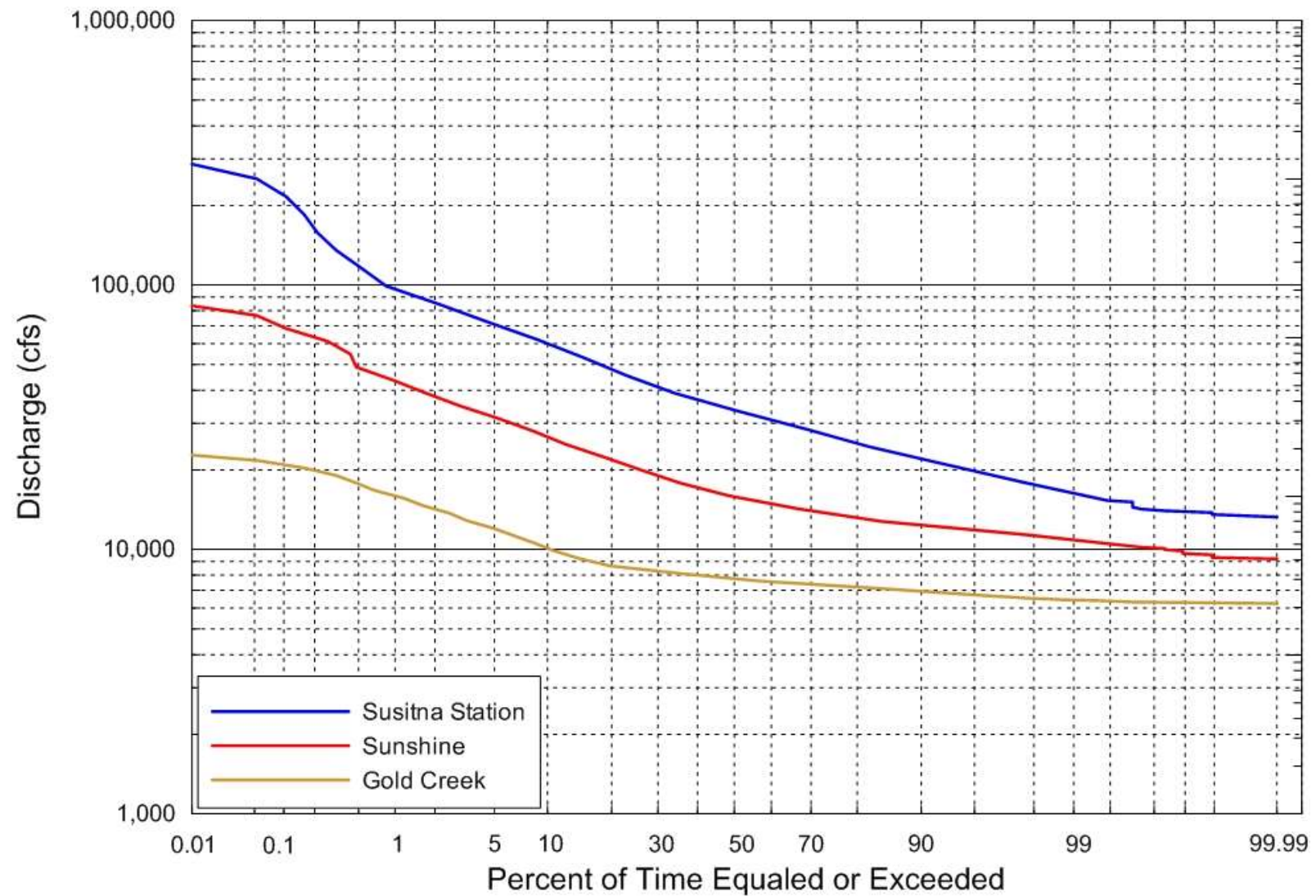


Figure G-1 – Monthly Flow-duration Curves for October for three Mainstem Gages for Max LF OS-1 Conditions based on the HEC-ResSim Model

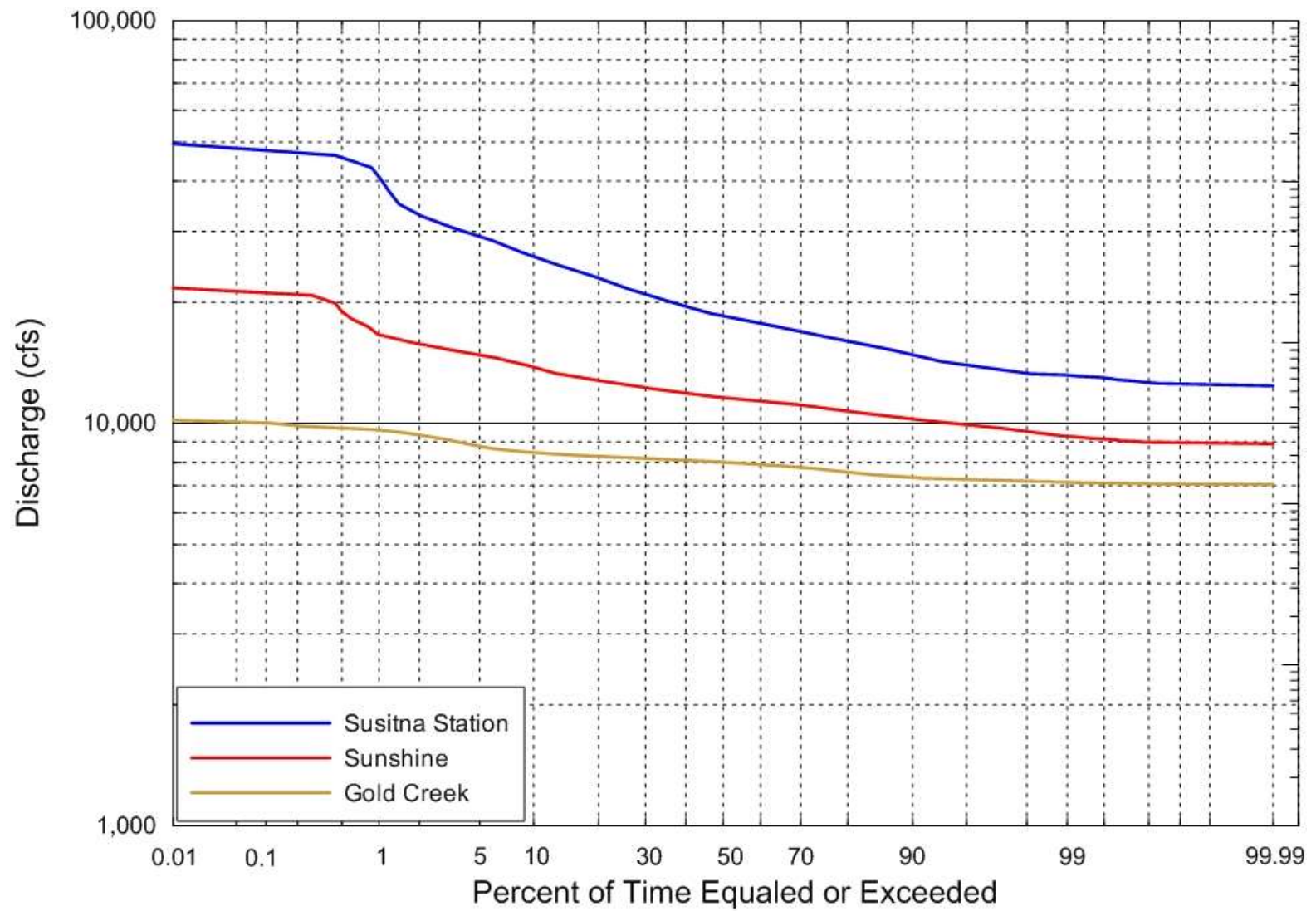


Figure G-2 – Monthly Flow-duration Curves for November for three Mainsem Gages for Max LF OS-1 Conditions based on the HEC-ResSim Model

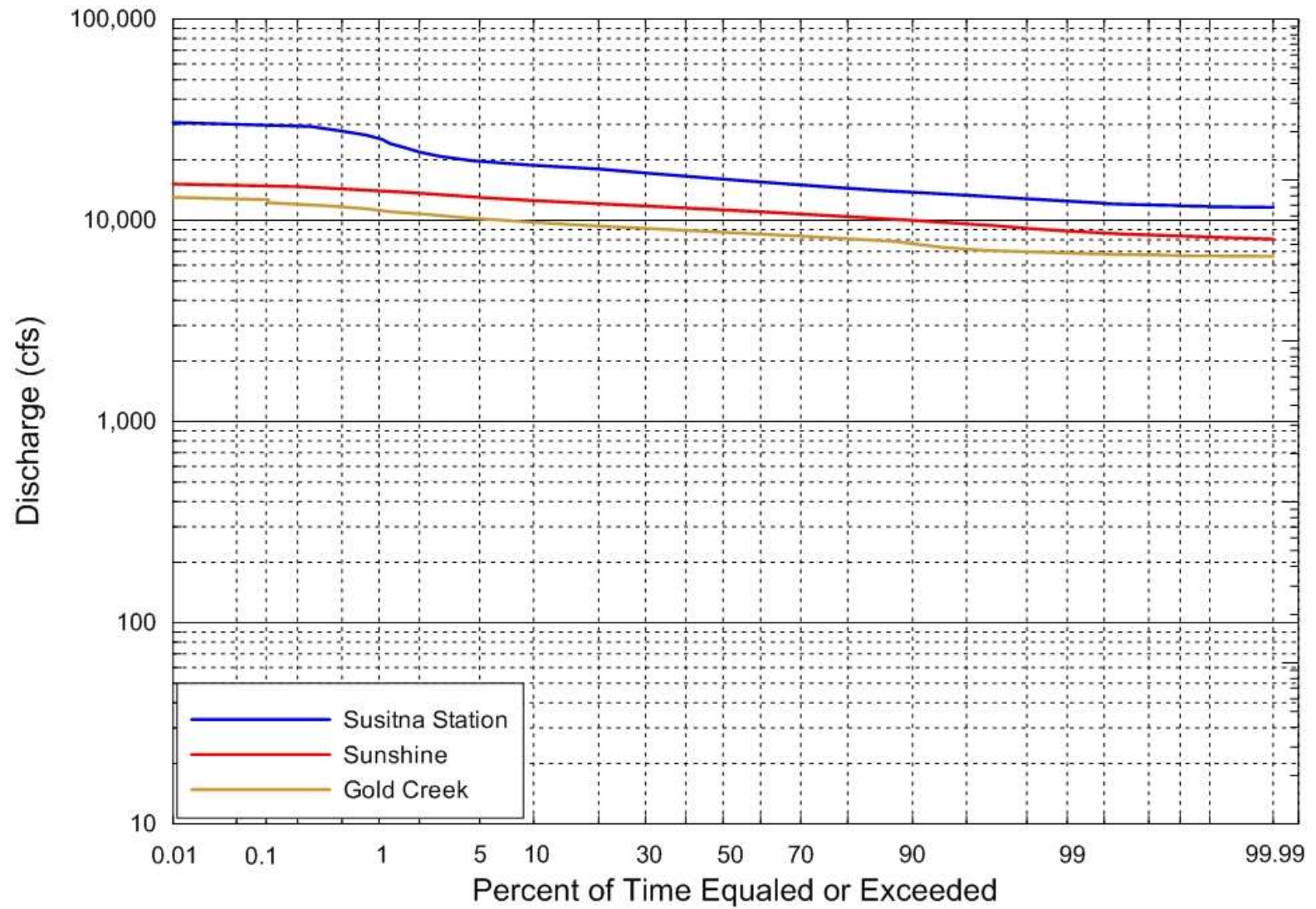


Figure G-3 – Monthly Flow-duration Curves for December for three Mainstem Gages for Max LF OS-1 Conditions based on the HEC-ResSim Model

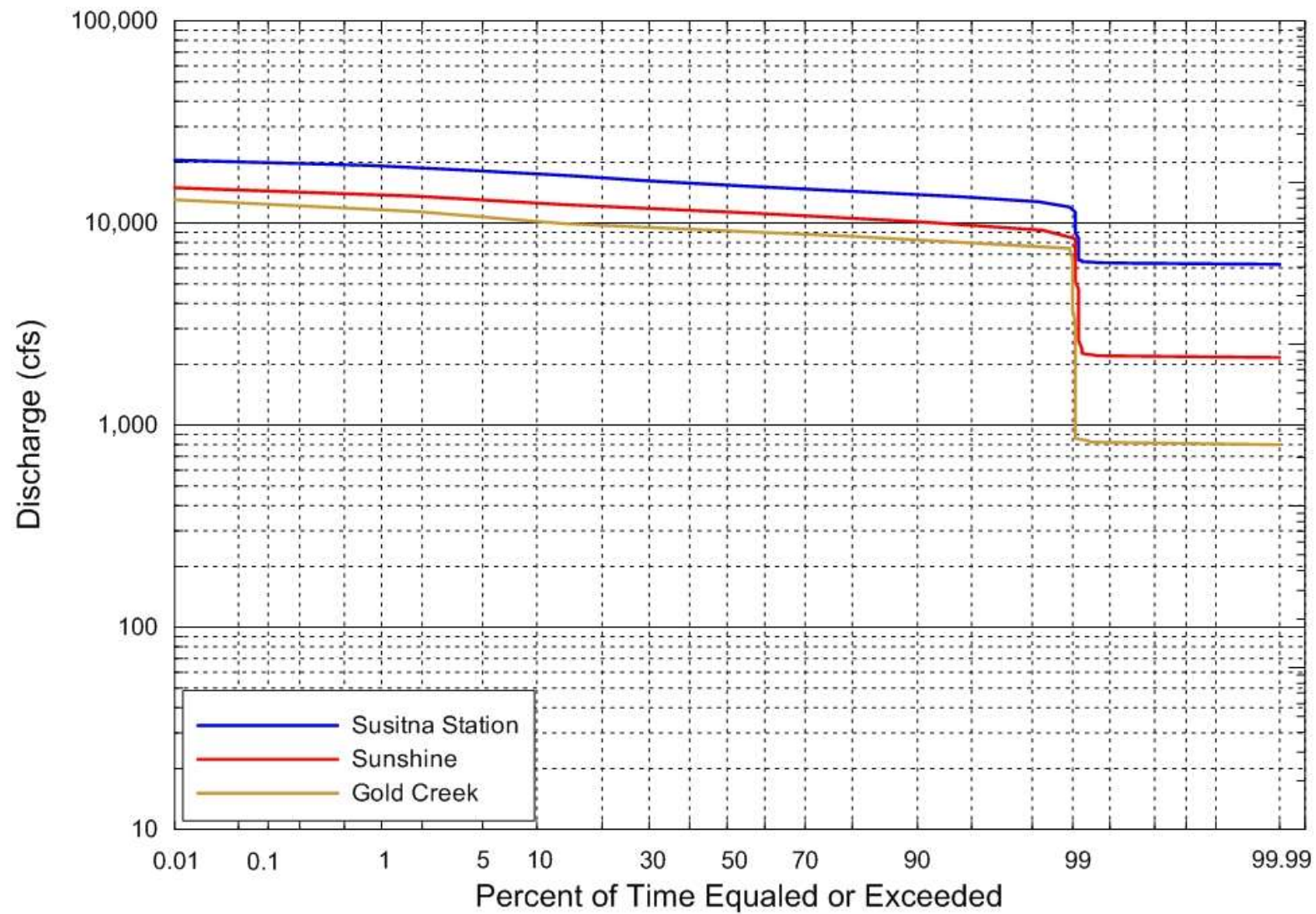


Figure G-4 – Monthly Flow-duration Curves for January for three Mainstem Gages for Max LF OS-1 Conditions based on the HEC-ResSim Model

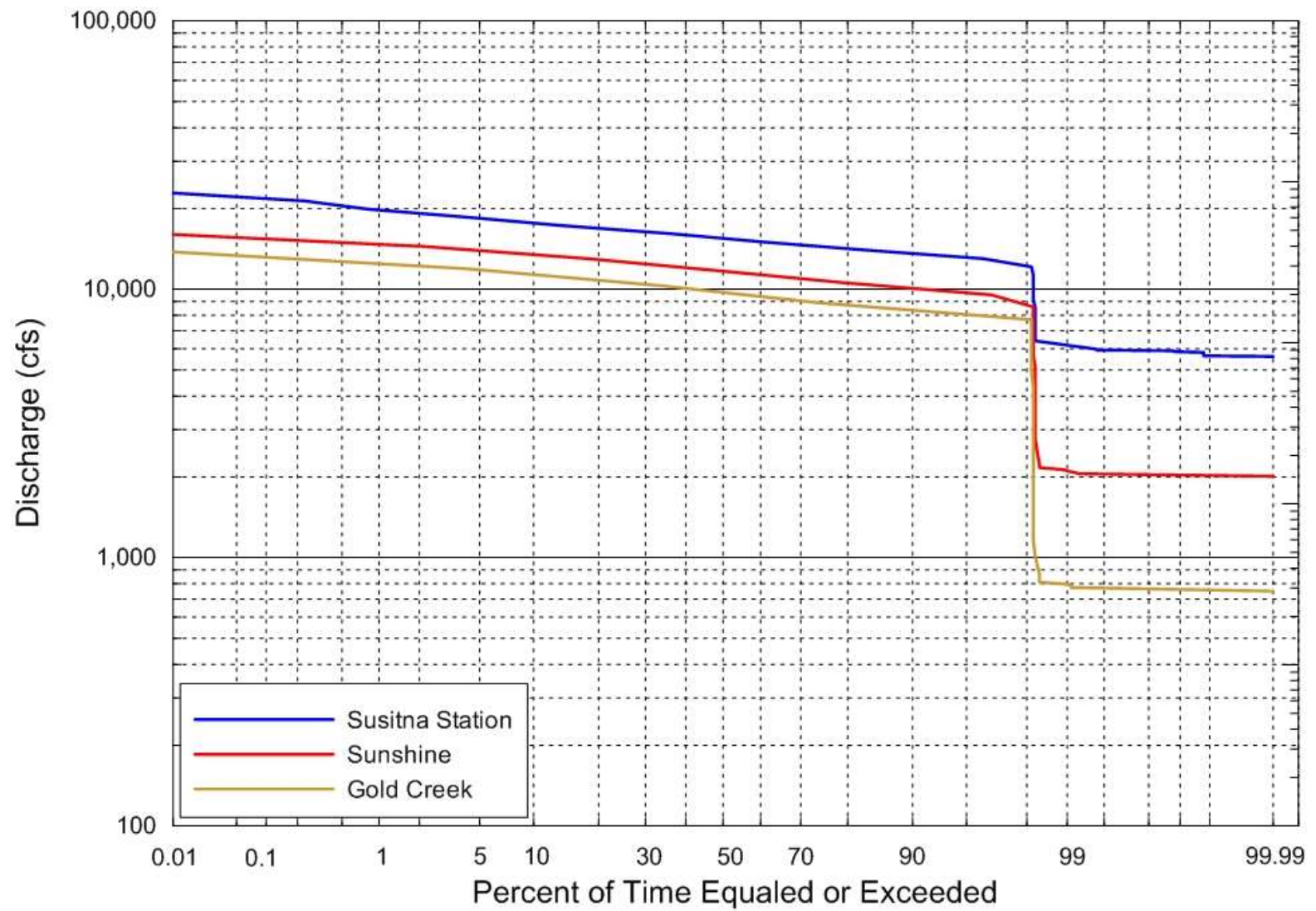


figure G-5 – Monthly Flow-duration Curves for February for three Mainstem Gages for Max LF OS-1 Conditions based on the HEC-ResSim Model

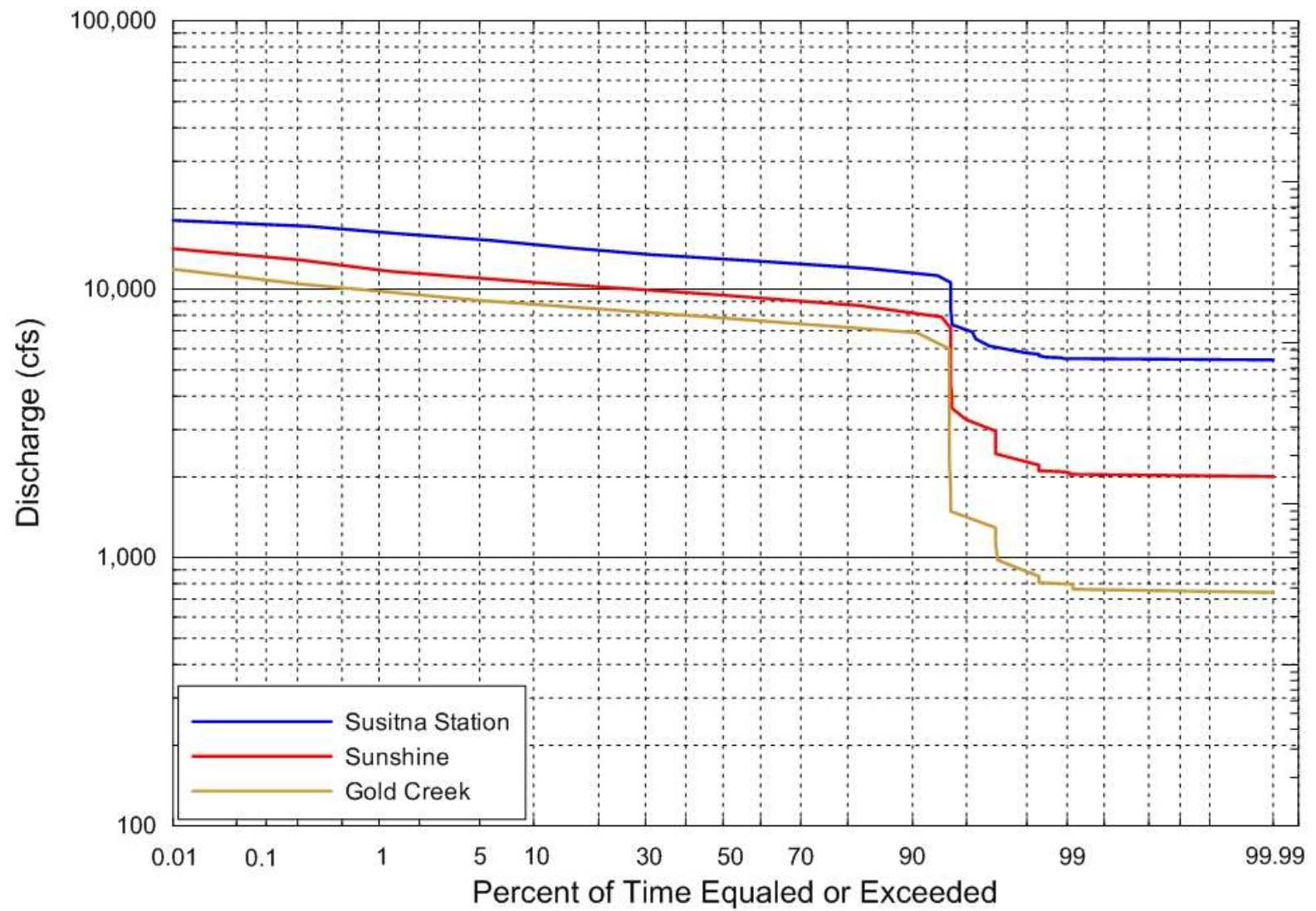


Figure G-6 – Monthly Flow-duration Curves for March for three Mainstem Gages for Max LF OS-1 Conditions based on the HEC-ResSim Model

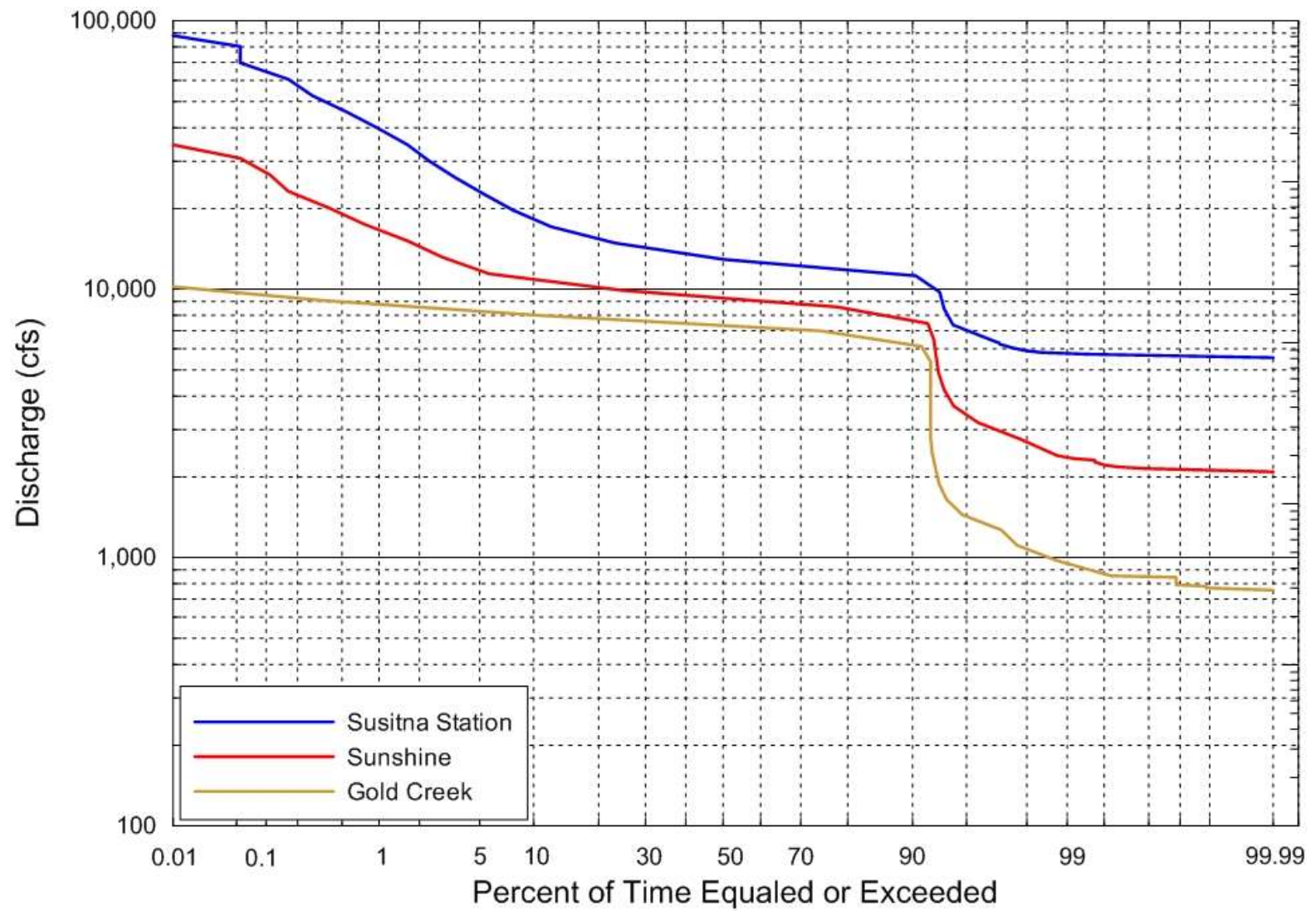


Figure G-7 – Monthly Flow-duration Curves for April for three Mainstem Gages for Max LF OS-1 Conditions based on the HEC-ResSim Model

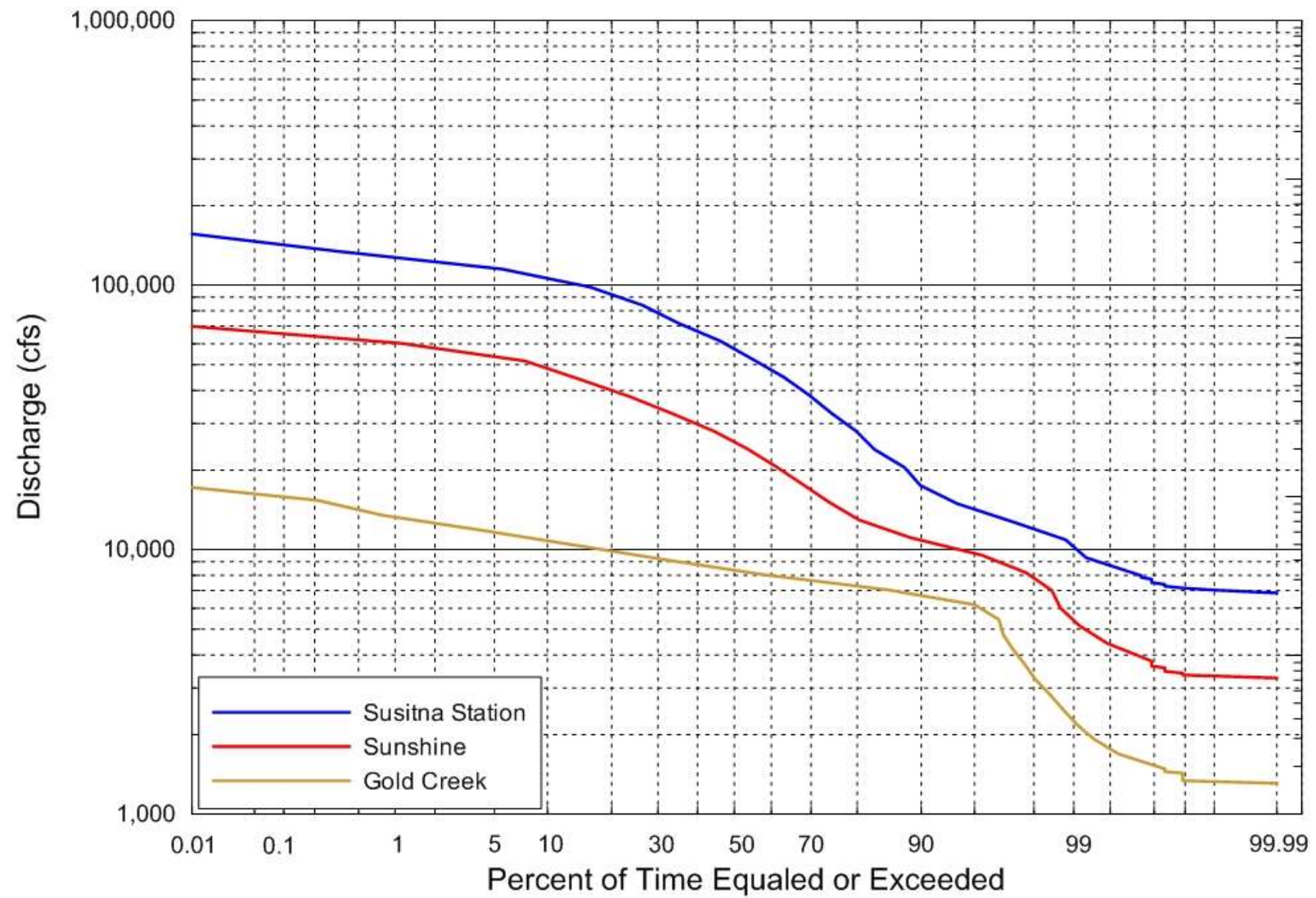


Figure G-8 – Monthly Flow-duration Curves for May for three Mainstem Gages for Max LF OS-1 Conditions based on the HEC-ResSim Model

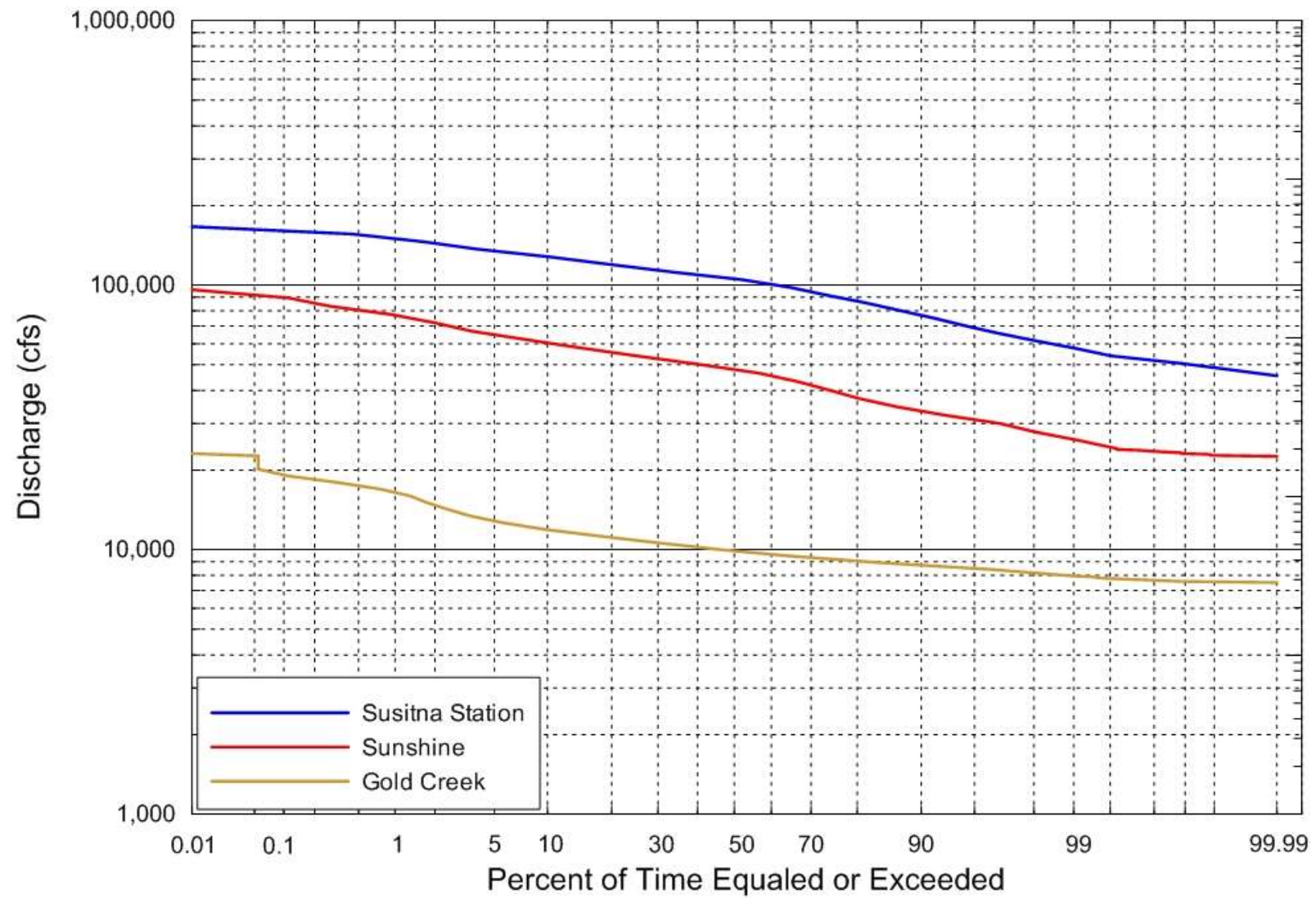


Figure G-9 – Monthly Flow-duration Curves for June for three Mainstem Gages for Max LF OS-1 Conditions based on the HEC-ResSim Model

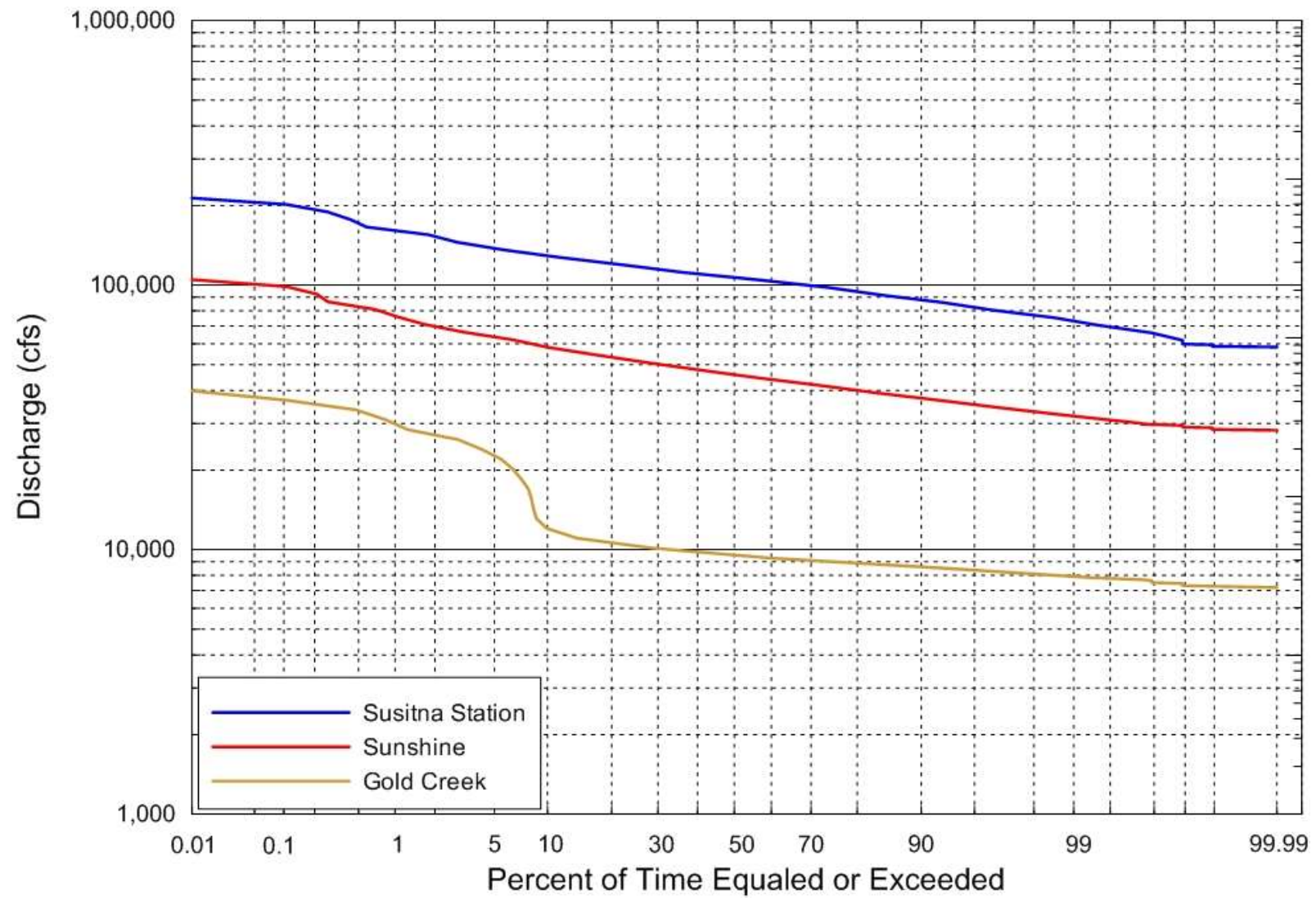


Figure G-10 – Monthly Flow-duration Curves for July for three Mainstem Gages for Max LF OS-1 Conditions based on the HEC-ResSim Model

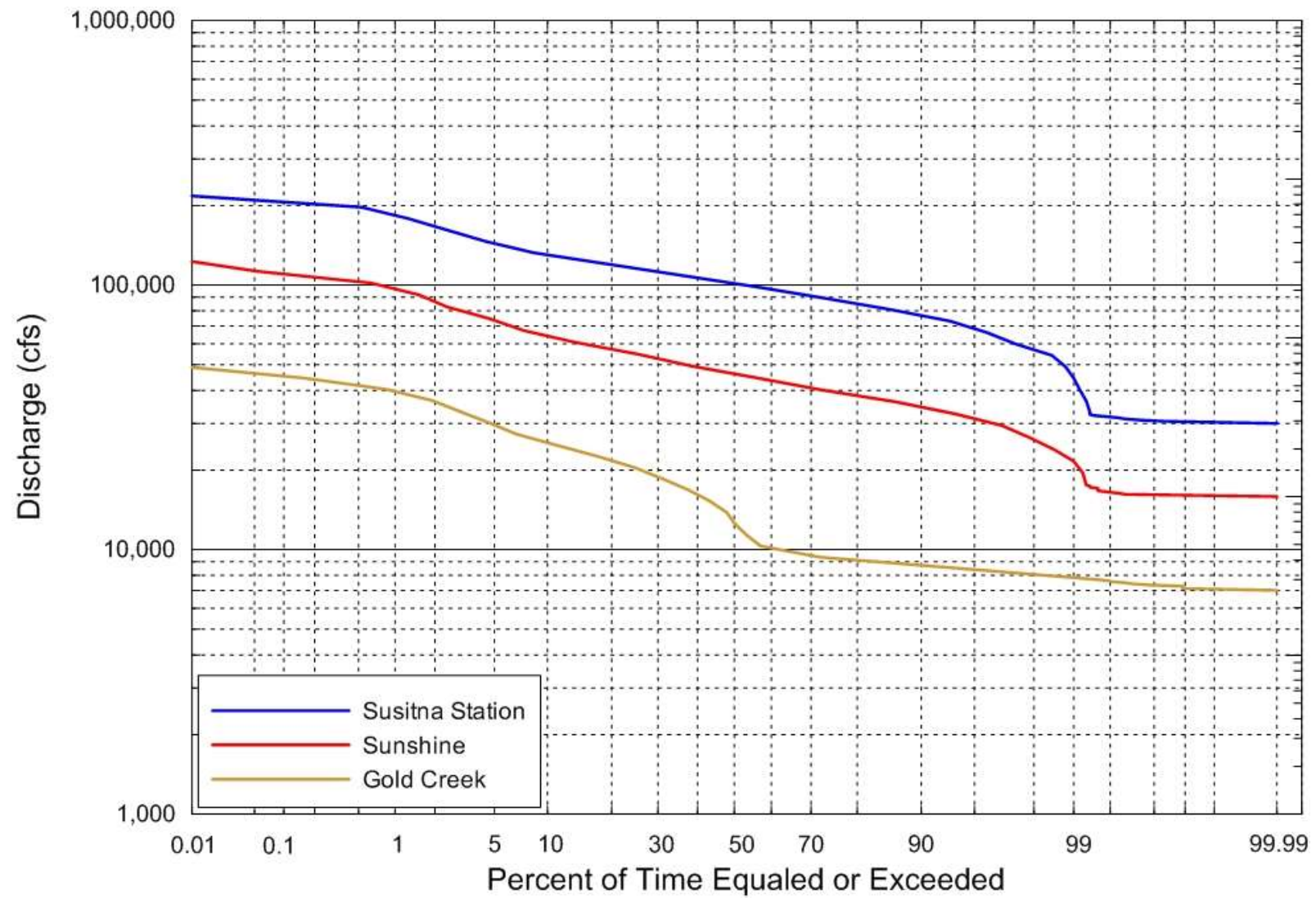


Figure G-11 – Monthly Flow-duration Curves for August for three Mainstem Gages for Max LF OS-1 Conditions based on the HEC-ResSim Model

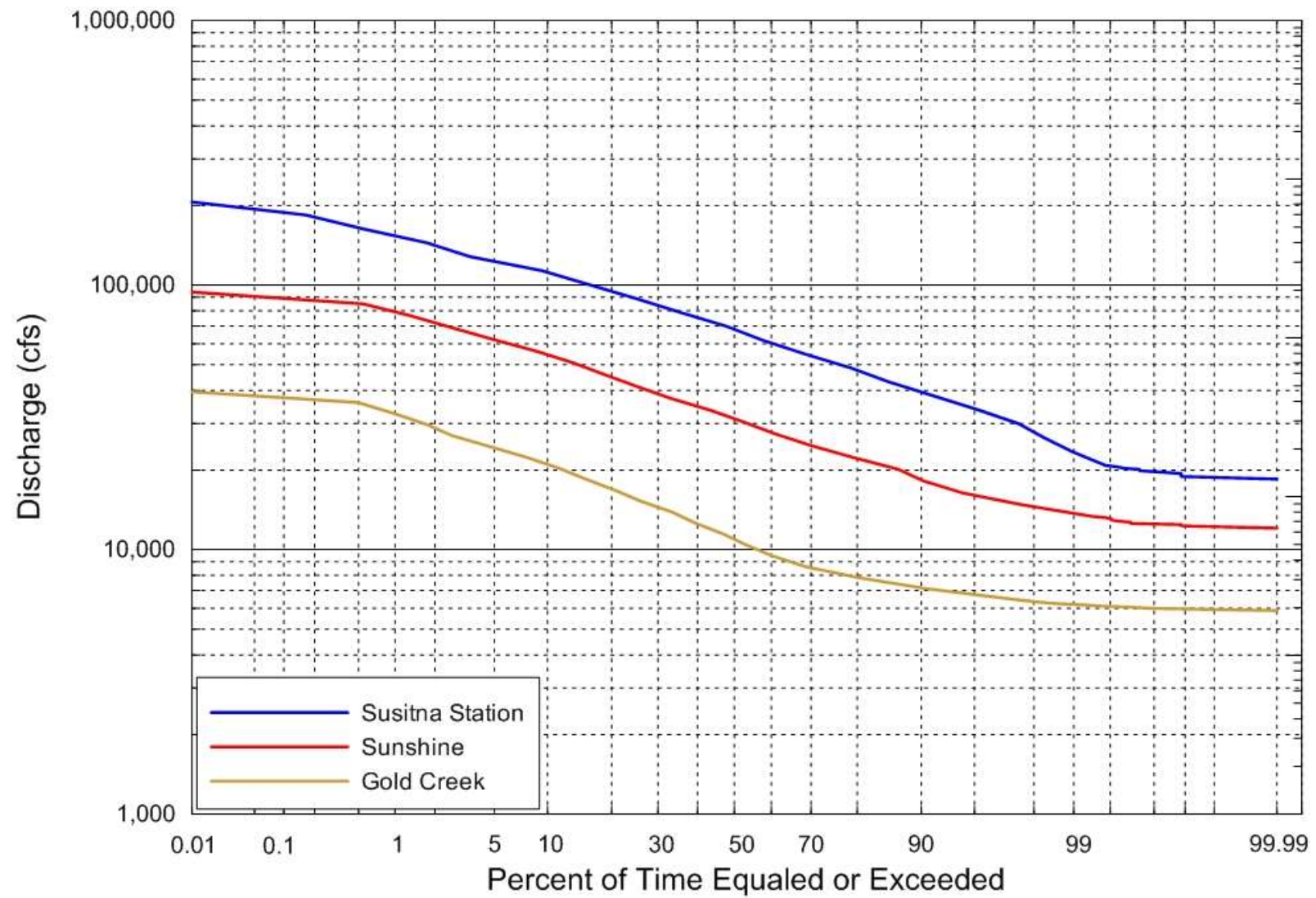


Figure G-12 – Monthly Flow-duration Curves for September for three Mainstem Gages for Max LF OS-1 Conditions based on the HEC-ResSim Model

APPENDIX H. MONTHLY FLOW DURATION COMPARISON FOR PRE-PROJECT AND POST-PROJECT CONDITIONS

**Susitna-Watana Hydroelectric Project
(FERC No. 14241)**

Stream Flow Assessment

Prepared for

Alaska Energy Authority



Prepared by

Tetra Tech

February 2013

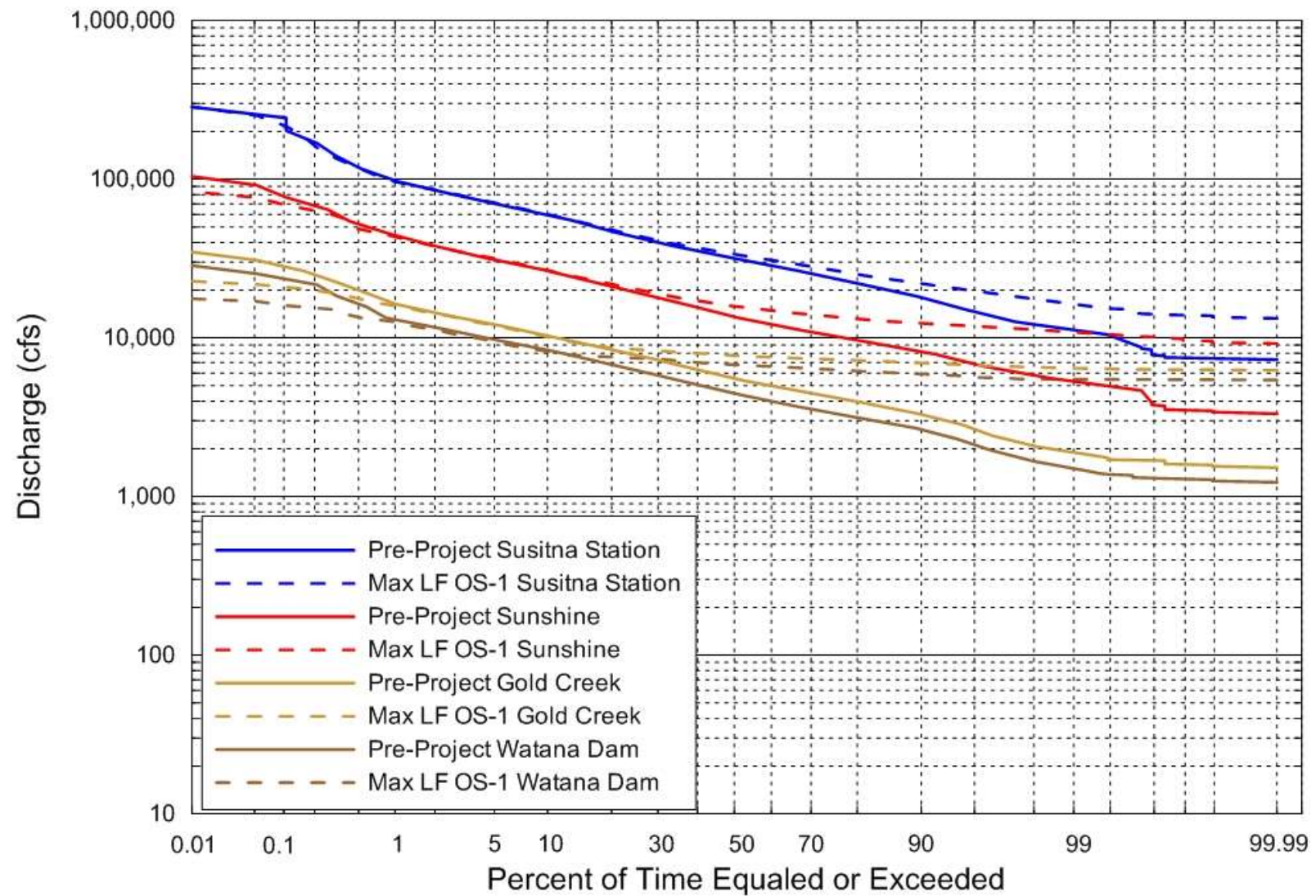


Figure H-1 – Monthly Flow-duration Curves for October to compare Pre-Project and Max LF OS-1 Conditions

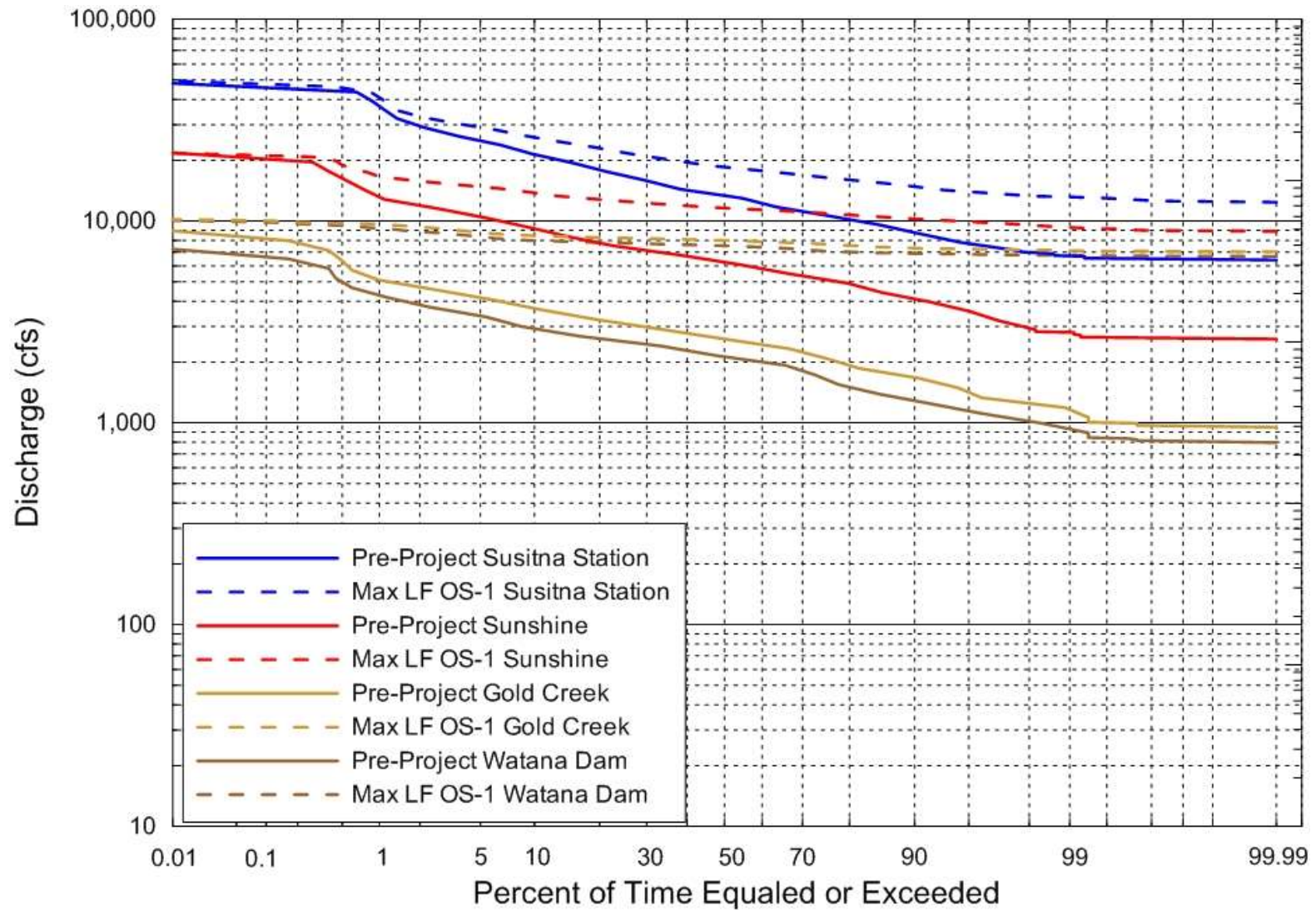


Figure H-2 – Monthly Flow-duration Curves for November to compare Pre-Project and Max LF OS-1 Conditions

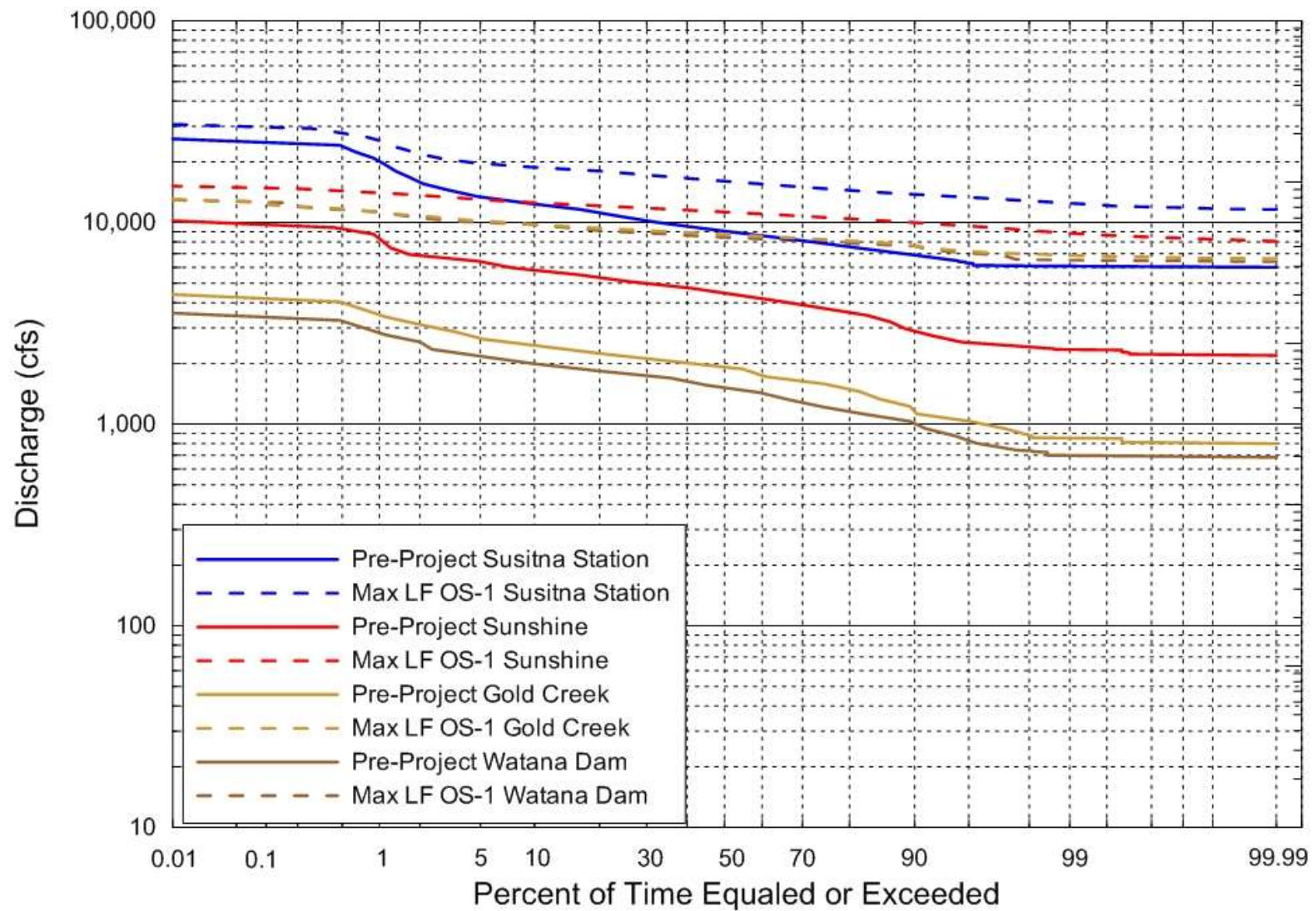


Figure H-3 – Monthly Flow-duration Curves for December to compare Pre-Project and Max LF OS-1 Conditions

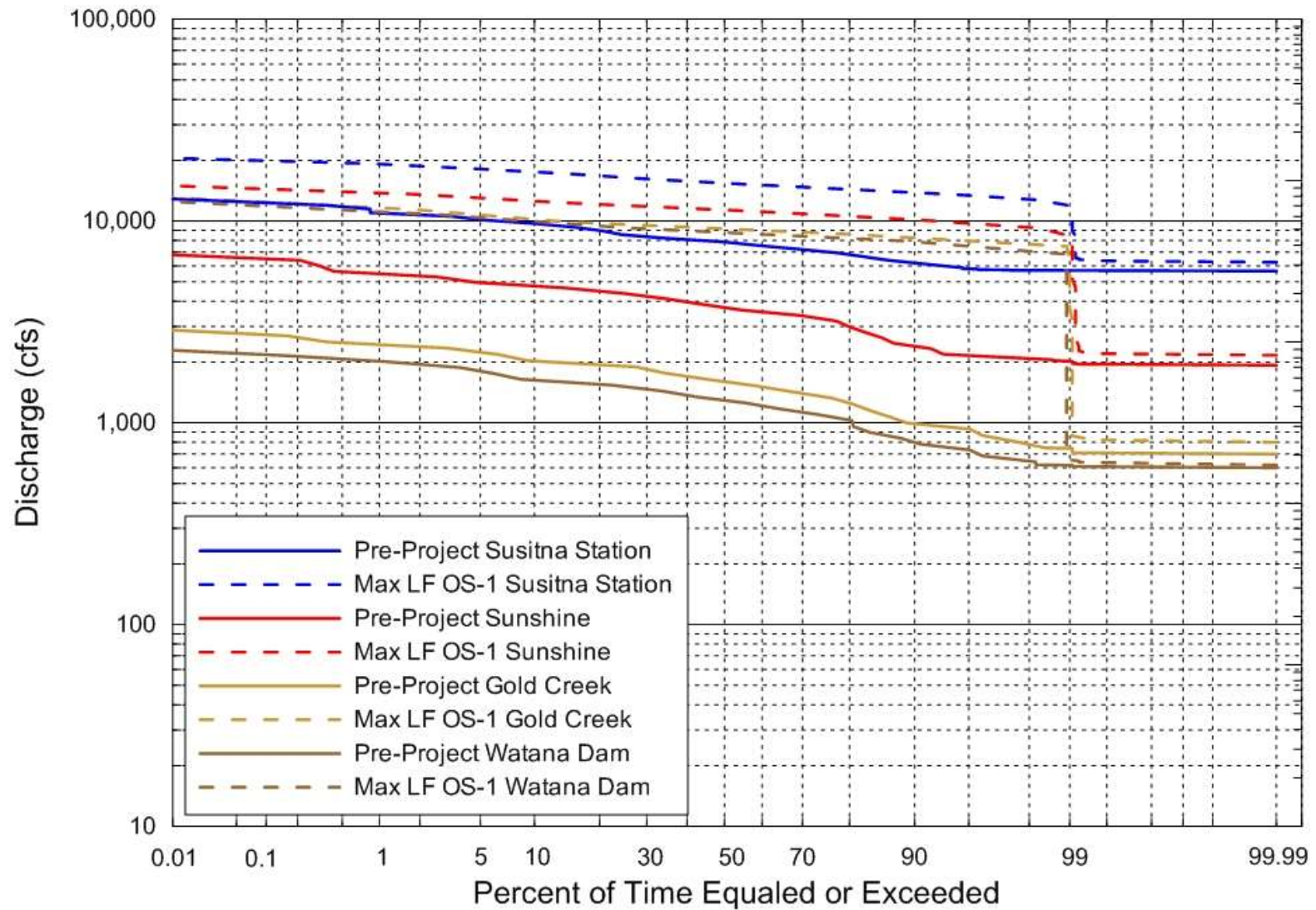


Figure H-4 – Monthly Flow-duration Curves for January to compare Pre-Project and Max LF OS-1 Conditions

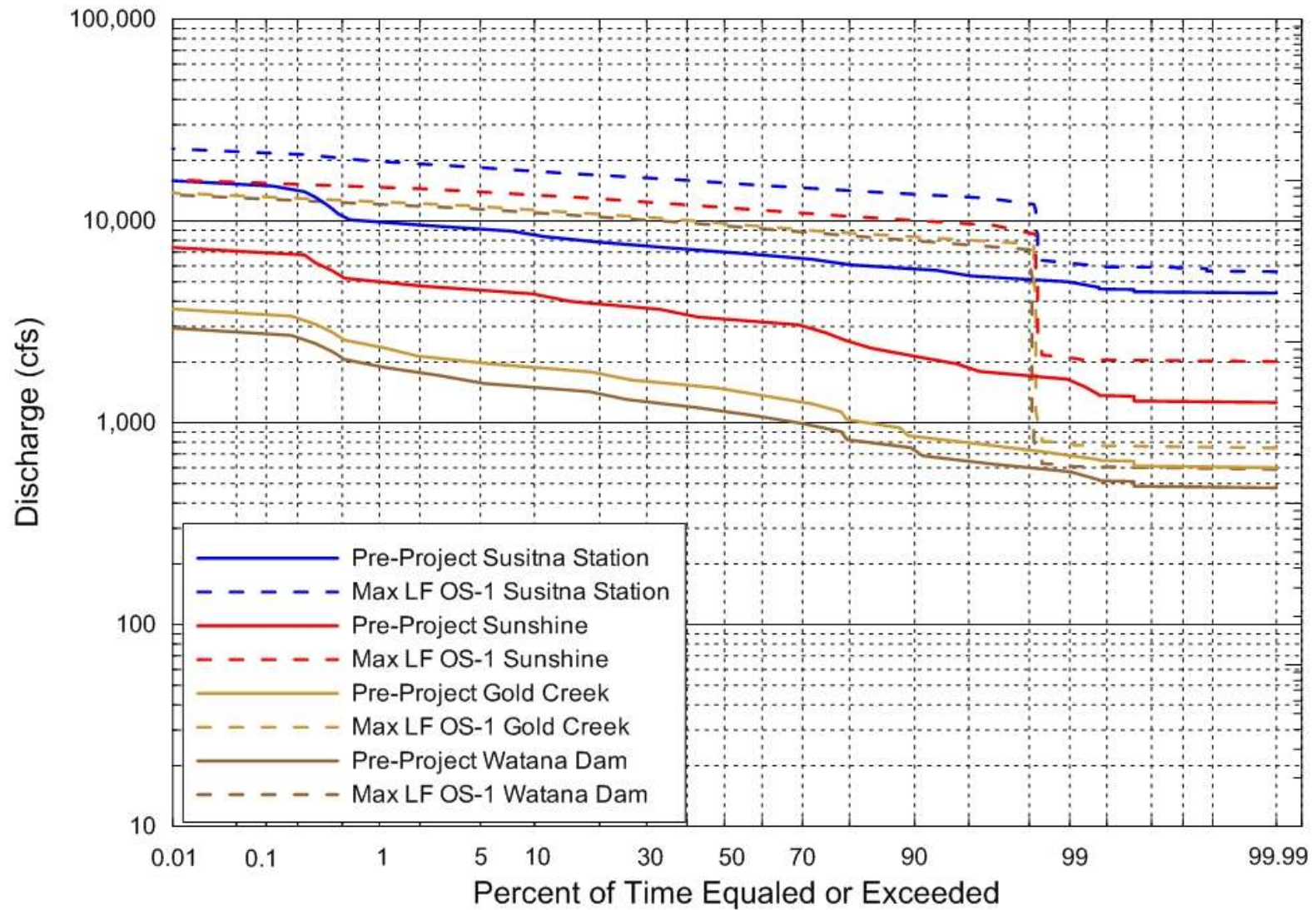


Figure H-5 – Monthly Flow-duration Curves for February to compare Pre-Project and Max LF OS-1 Conditions

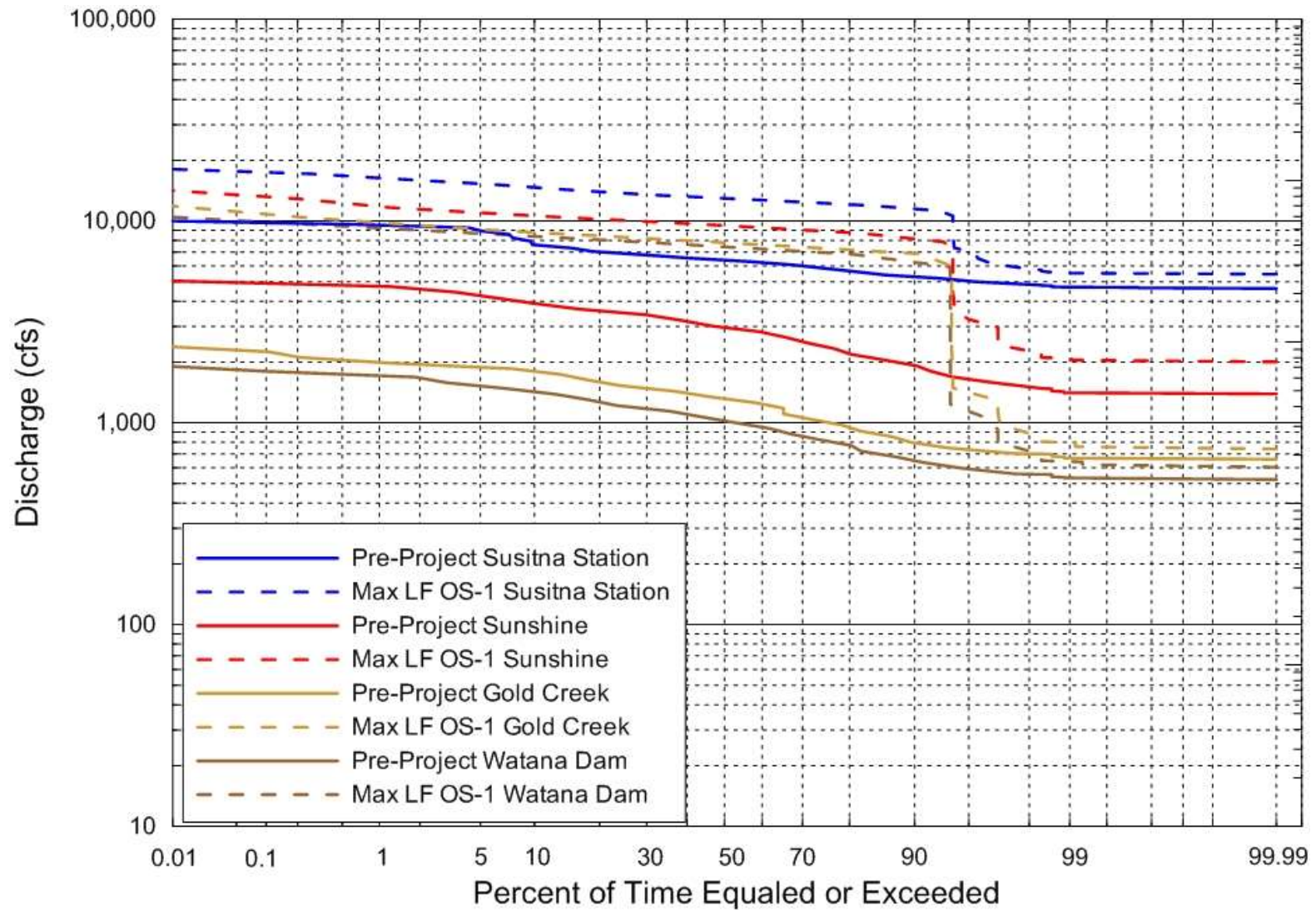


Figure H-6 – Monthly Flow-duration Curves for March to compare Pre-Project and Max LF OS-1 Conditions

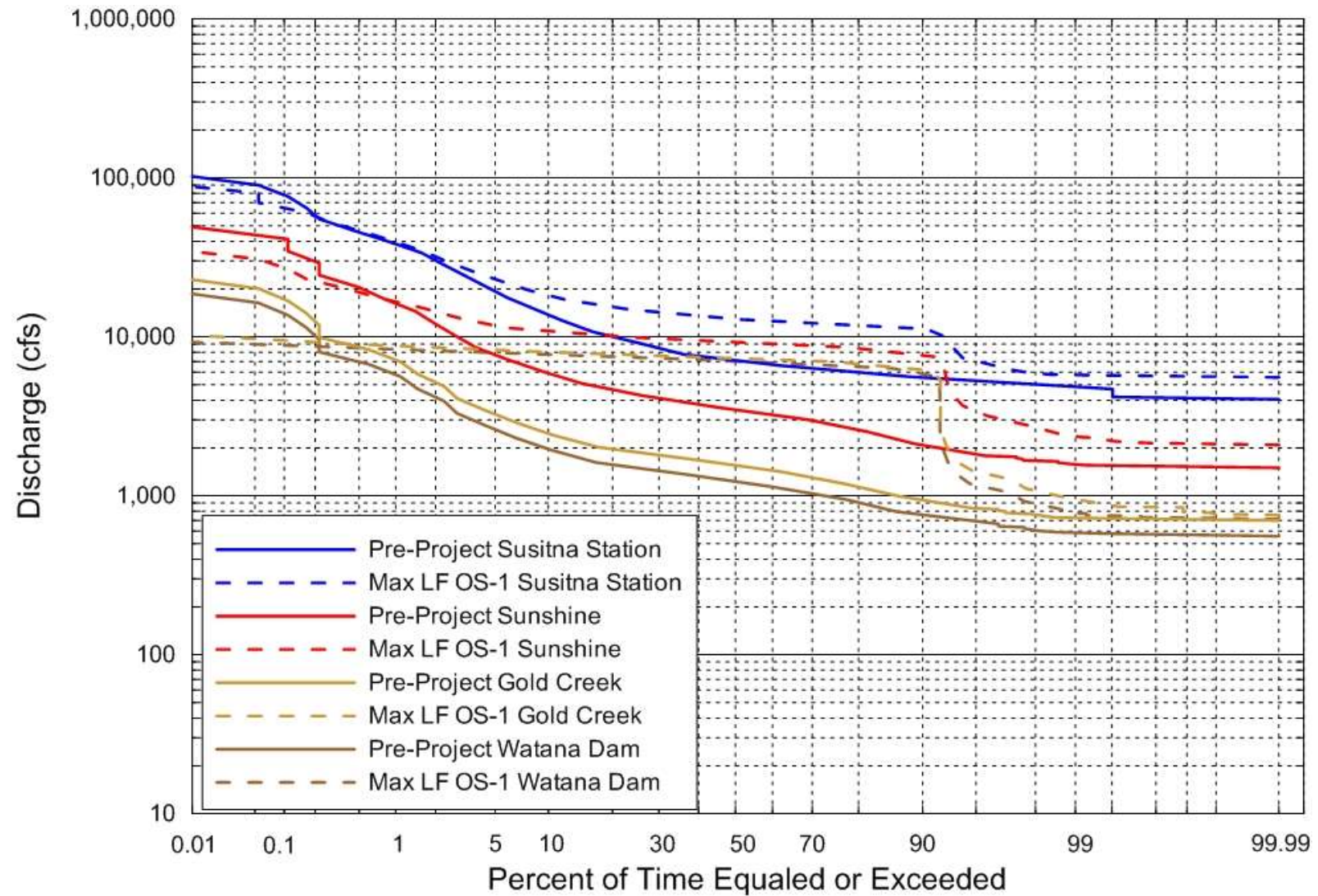


Figure H-7 – Monthly Flow-duration Curves for April to compare Pre-Project and Max LF OS-1 Conditions

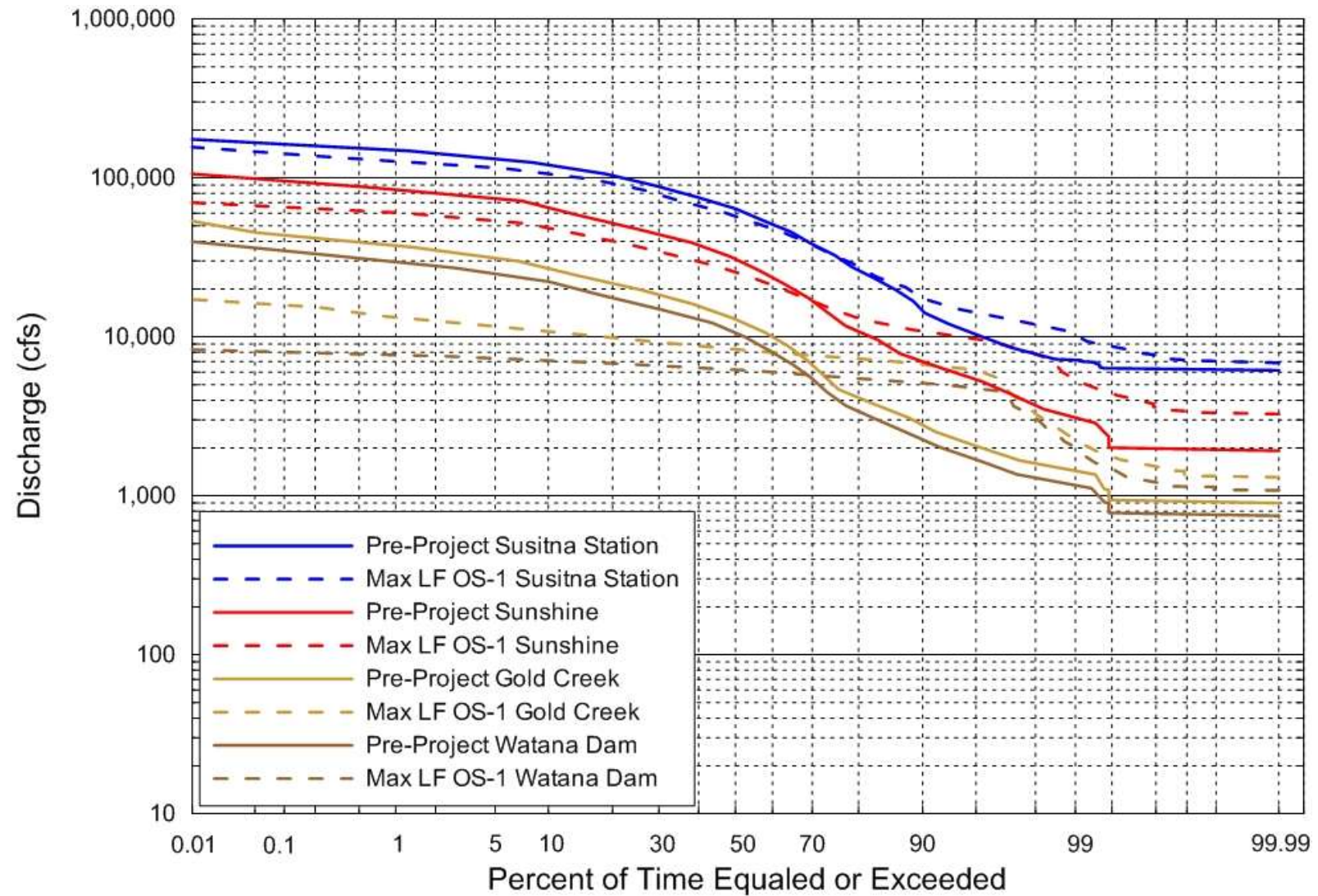


Figure H-8 – Monthly Flow-duration Curves for May to compare Pre-Project and Max LF OS-1 Conditions

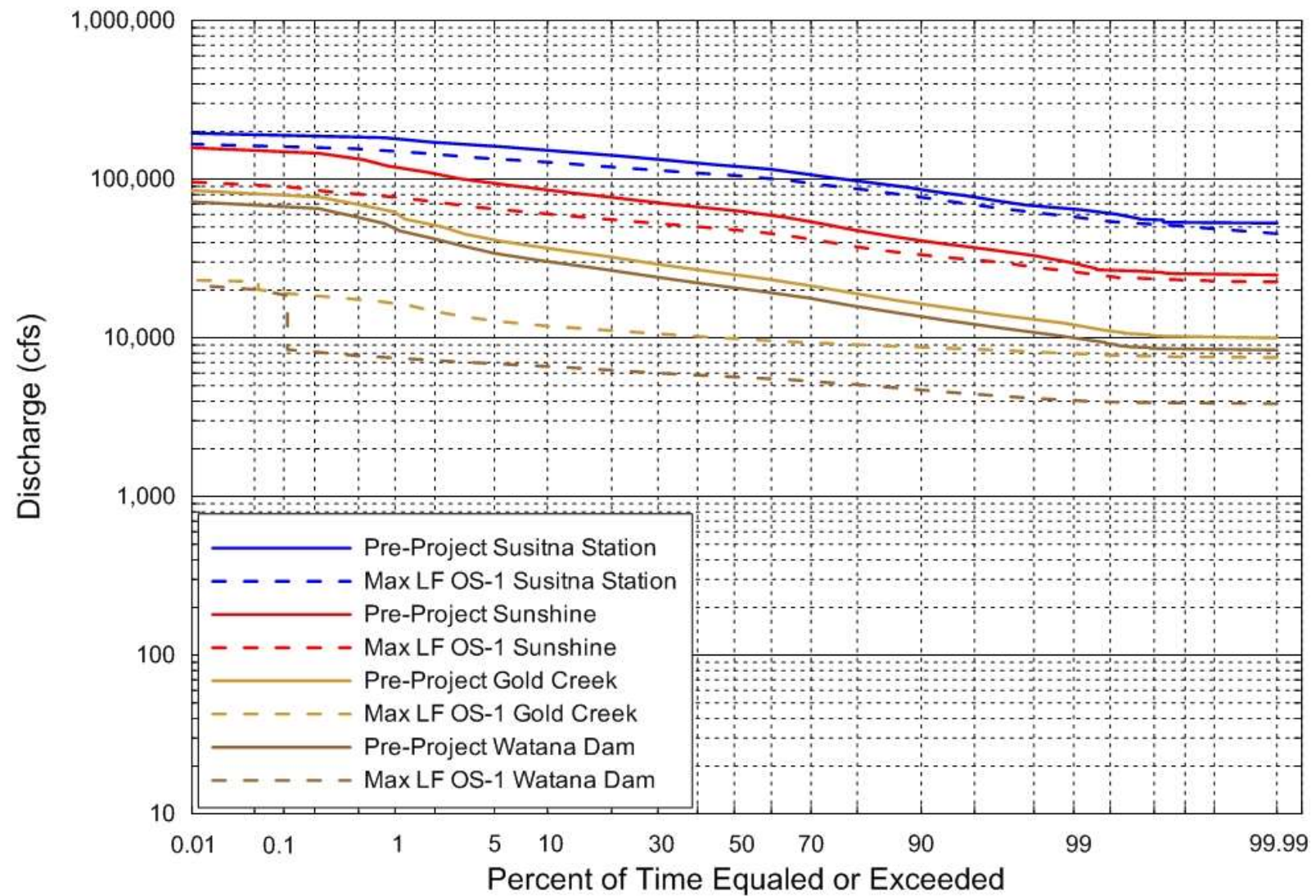


Figure H-9 – Monthly Flow-duration Curves for June to compare Pre-Project and Max LF OS-1 Conditions

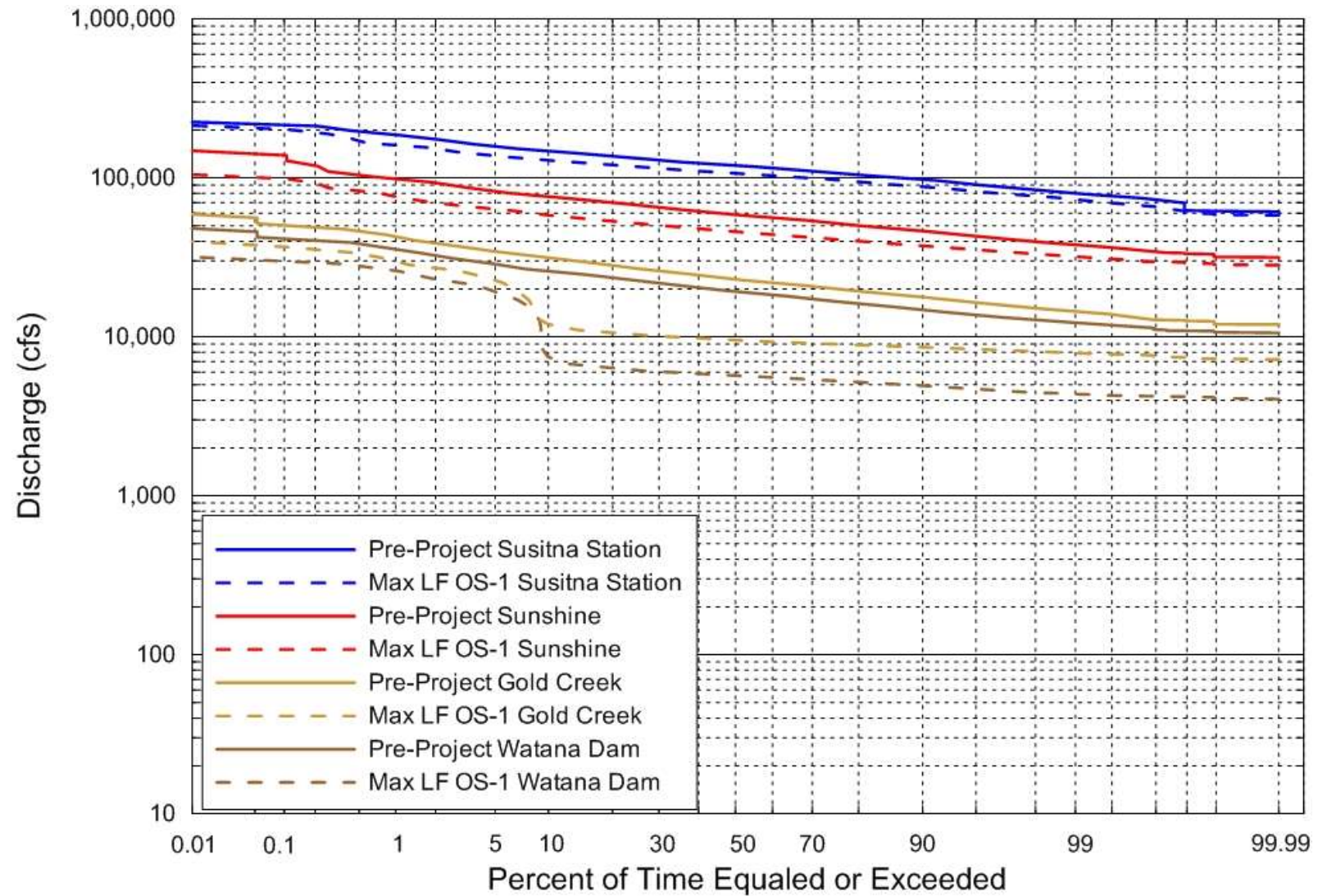


Figure H-10 – Monthly Flow-duration Curves for July to compare Pre-Project and Max LF OS-1 Conditions

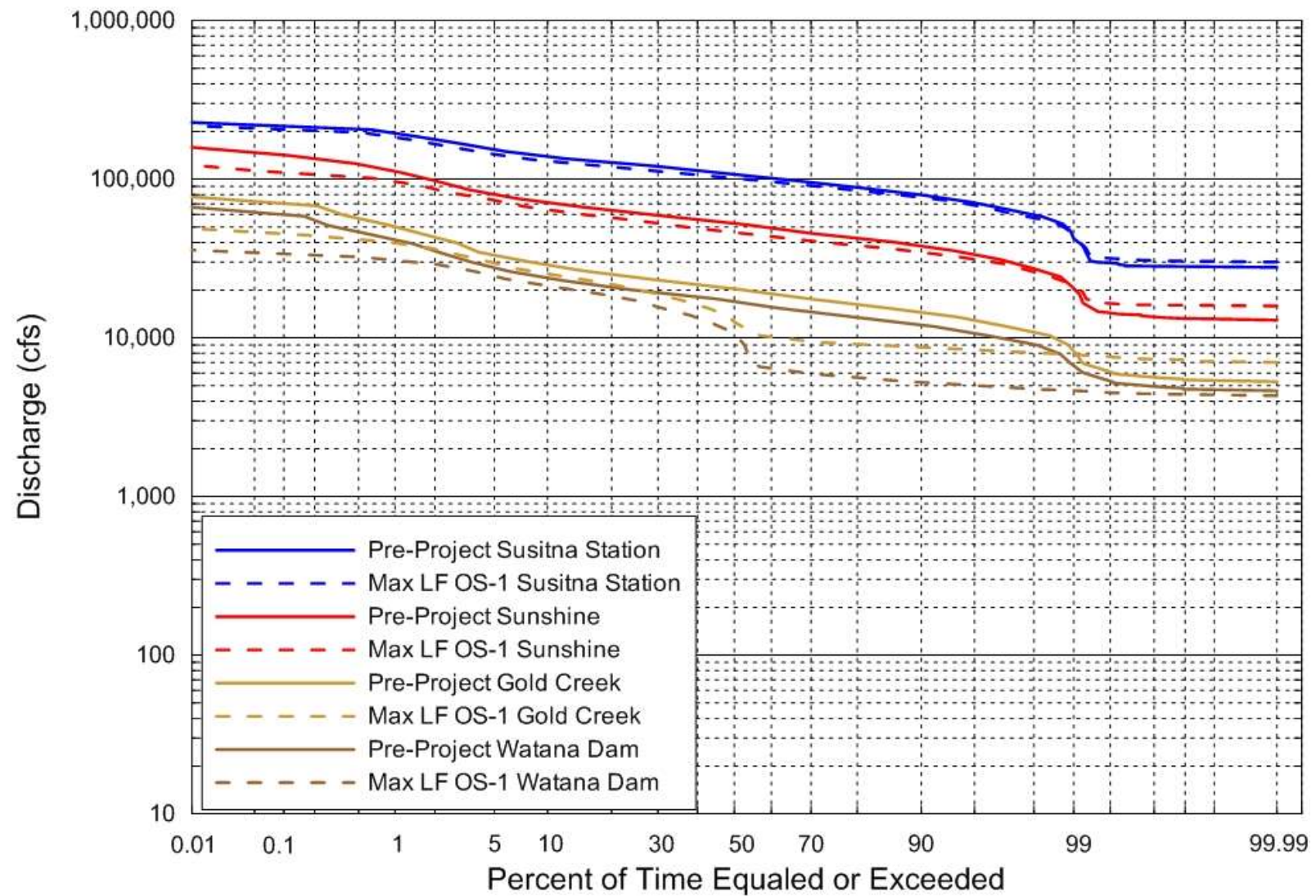


Figure H-11 – Monthly Flow-duration Curves for August to compare Pre-Project and Max LF OS-1 Conditions

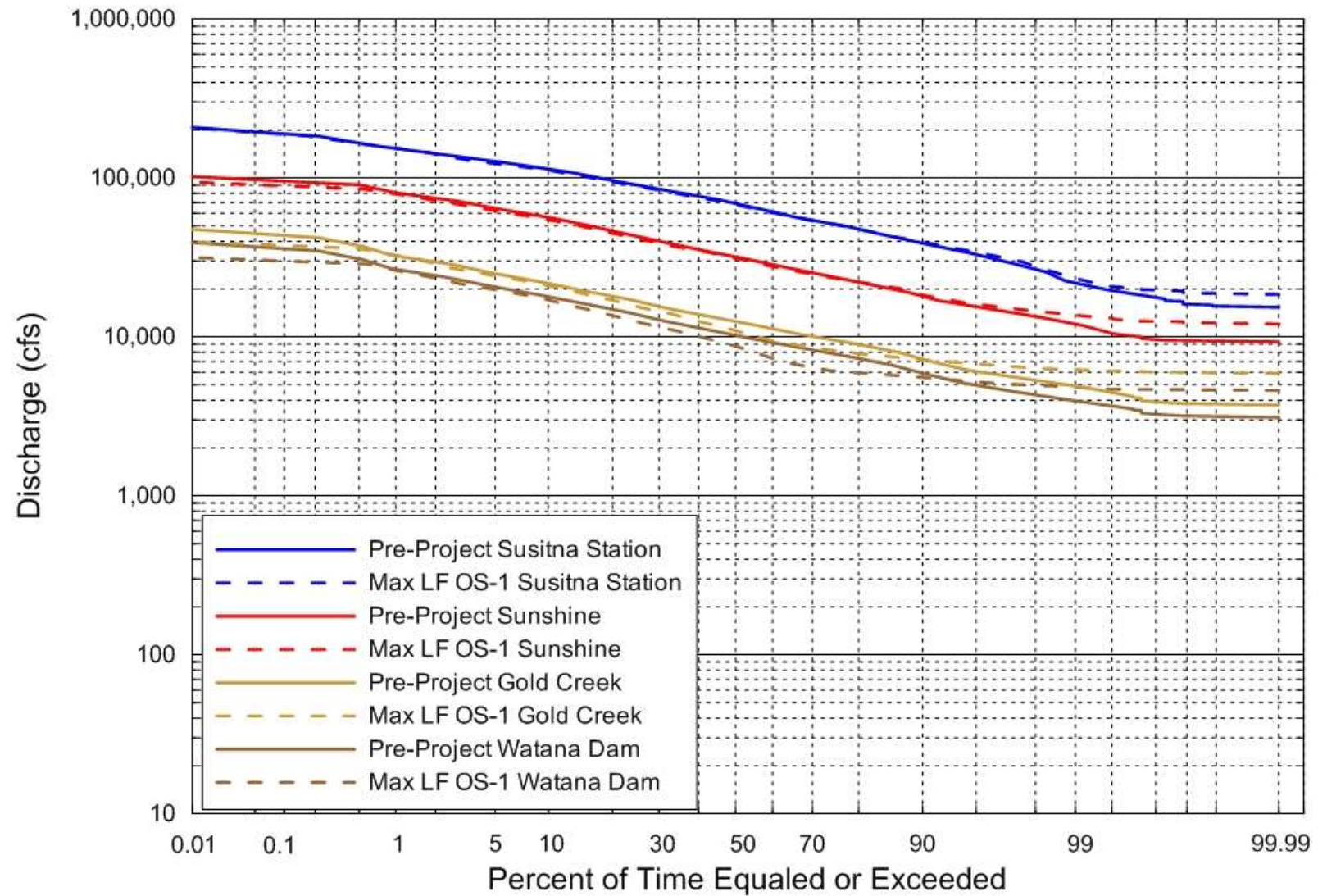


Figure H-12 – Monthly Flow-duration Curves for September to compare Pre-Project and Max LF OS-1 Conditions.

APPENDIX I. MONTHLY FLOW EXCEEDENCE COMPARISON (CFS)
FOR PRE-PROJECT AND POST-PROJECT CONDITIONS

Susitna-Watana Hydroelectric Project
(FERC No. 14241)

Stream Flow Assessment

Prepared for

Alaska Energy Authority



Prepared by

Tetra Tech

February 2013

Table I-1 – Monthly Flow Exceedence Ordinate (cfs) Comparison for Pre-Project and Max LF OS-1 Conditions at the Proposed Watana Dam Site

Watana Dam												
Perce ntile	Oct		Nov		Dec		Jan		Feb		Mar	
	Pre- Project	Max LF OS-1	Pre- Project	Max LF OS-1	Pre- Project	Max LF OS-1	Pre- Project	Max LF OS-1	Pre- Project	Max LF OS-1	Pre- Project	Max LF OS-1
99%	1,540	5,440	924	6,750	696	6,510	618	656	588	597	532	643
95%	2,170	5,640	1,120	6,830	875	6,990	756	7,670	635	7,960	595	1,120
90%	2,610	5,890	1,340	6,900	981	7,640	795	7,910	750	8,250	643	6,650
75%	3,410	6,320	1,680	7,090	1,210	8,070	1,060	8,420	957	8,580	807	6,990
50%	4,460	6,680	2,100	7,540	1,520	8,460	1,280	8,910	1,120	9,360	1,040	7,590
25%	6,300	7,450	2,510	7,770	1,770	8,990	1,520	9,260	1,320	10,400	1,200	7,930
10%	8,390	8,230	2,950	8,010	1,980	9,740	1,640	9,790	1,450	11,100	1,440	8,270
5%	9,740	9,450	3,400	8,360	2,170	9,960	1,790	10,300	1,600	11,400	1,520	8,540
1%	13,000	12,600	4,220	9,170	2,820	11,300	2,030	11,500	1,930	12,800	1,700	9,260
Perce ntile	Apr		May		Jun		Jul		Aug		Sep	
	Pre- Project	Max LF OS-1	Pre- Project	Max LF OS-1	Pre- Project	Max LF OS-1	Pre- Project	Max LF OS-1	Pre- Project	Max LF OS-1	Pre- Project	Max LF OS-1
99%	581	776	1,150	2,010	10,100	4,040	12,300	4,370	6,790	4,650	3,970	4,830
95%	694	1,150	1,690	4,760	12,100	4,400	13,700	4,670	10,700	4,950	4,960	5,170
90%	755	5,910	2,260	5,120	13,600	4,670	14,800	4,930	12,100	5,220	5,910	5,520
75%	956	6,700	4,090	5,610	16,700	5,230	16,700	5,310	14,000	5,750	7,860	6,090
50%	1,220	7,050	10,700	6,220	20,700	5,680	19,200	5,700	17,000	10,400	10,100	8,710
25%	1,520	7,470	16,400	6,690	25,200	6,100	22,600	6,150	19,900	17,200	13,800	12,500
10%	2,010	7,750	22,200	7,040	30,400	6,620	26,100	7,440	23,600	21,400	17,900	17,200
5%	2,650	7,940	25,000	7,290	34,100	6,890	28,700	19,300	27,000	24,600	20,600	19,900
1%	5,680	8,450	30,800	7,820	49,200	7,430	35,200	26,000	42,200	31,000	26,200	26,000

Table I-2 – Monthly Flow Exceedence Ordinate (cfs) Comparison for Pre-Project and Max LF OS-1 Conditions for the Susitna River at Gold Creek

Susitna River at Gold Creek												
Perce ntile	Oct		Nov		Dec		Jan		Feb		Mar	
	Pre- Project	Max LF OS-1	Pre- Project	Max LF OS-1	Pre- Project	Max LF OS-1	Pre- Project	Max LF OS-1	Pre- Project	Max LF OS-1	Pre- Project	Max LF OS-1
99%	1,900	6,440	1,100	7,140	850	6,880	750	7,070	700	795	660	800
95%	2,710	6,710	1,400	7,250	1,100	7,210	950	7,880	800	8,160	750	1,400
90%	3,300	6,920	1,700	7,330	1,200	7,660	980	8,220	860	8,500	800	6,900
75%	4,200	7,300	2,100	7,690	1,600	8,240	1,400	8,720	1,200	8,850	1,000	7,250
50%	5,500	7,730	2,600	8,010	1,900	8,740	1,600	9,190	1,400	9,800	1,300	7,850
25%	7,790	8,390	3,100	8,230	2,200	9,230	1,900	9,560	1,690	10,700	1,500	8,210
10%	10,300	10,100	3,690	8,450	2,500	9,760	2,000	10,300	1,850	11,400	1,800	8,620
5%	12,000	12,000	4,200	8,760	2,700	10,200	2,200	10,600	2,000	11,700	1,900	9,040
1%	16,100	15,900	5,100	9,610	3,460	11,300	2,500	11,700	2,400	13,200	2,100	9,650
Perce ntile	Apr		May		Jun		Jul		Aug		Sep	
	Pre- Project	Max LF OS-1	Pre- Project	Max LF OS-1	Pre- Project	Max LF OS-1	Pre- Project	Max LF OS-1	Pre- Project	Max LF OS-1	Pre- Project	Max LF OS-1
99%	710	952	1,400	2,240	12,100	7,980	14,600	7,880	8,240	7,900	4,910	6,200
95%	830	1,420	2,100	6,200	14,900	8,480	16,400	8,380	12,900	8,420	6,000	6,730
90%	930	6,250	2,800	6,620	16,400	8,700	17,800	8,600	14,500	8,730	7,340	7,170
75%	1,200	6,970	5,000	7,460	20,000	9,200	20,000	9,000	17,000	9,260	9,560	8,150
50%	1,520	7,390	13,000	8,300	25,100	9,890	23,000	9,480	20,400	12,600	12,500	11,000
25%	1,820	7,750	20,000	9,560	30,500	10,800	26,900	10,300	24,000	20,300	16,800	15,500
10%	2,500	7,990	27,100	10,800	36,700	11,900	31,300	12,000	28,500	25,600	21,800	21,100
5%	3,300	8,210	31,000	11,600	41,100	12,800	34,500	22,400	32,700	29,500	25,000	24,200
1%	7,000	8,730	37,800	13,300	58,800	16,500	42,600	29,700	51,100	39,600	32,000	32,200

Table I-3 – Monthly Flow Exceedance Ordinate (cfs) Comparison for Pre-Project and Max LF OS-1 Conditions for the Susitna River at Sunshine

Susitna River at Sunshine												
Perce ntile	Oct		Nov		Dec		Jan		Feb		Mar	
	Pre- Project	Max LF OS-1	Pre- Project	Max LF OS-1	Pre- Project	Max LF OS-1	Pre- Project	Max LF OS-1	Pre- Project	Max LF OS-1	Pre- Project	Max LF OS-1
99%	5,280	11,000	2,820	9,300	2,340	8,880	2,030	8,840	1,570	2,110	1,390	2,080
95%	6,880	11,800	3,590	9,920	2,500	9,590	2,110	9,810	1,900	9,760	1,650	3,270
90%	8,120	12,400	4,100	10,300	2,830	10,000	2,370	10,200	2,120	10,100	1,920	8,290
75%	10,400	13,500	5,140	10,900	3,750	10,600	3,260	10,700	2,830	10,700	2,370	8,920
50%	13,600	15,800	6,100	11,600	4,520	11,300	3,700	11,400	3,280	11,700	2,930	9,510
25%	19,500	20,200	7,470	12,500	5,190	11,900	4,350	11,900	3,760	12,700	3,490	10,000
10%	26,300	26,800	9,150	13,800	5,840	12,500	4,780	12,600	4,330	13,500	3,920	10,600
5%	31,300	31,700	10,400	14,700	6,370	13,000	4,940	13,100	4,510	14,000	4,390	11,100
1%	45,000	42,900	13,000	16,500	8,490	14,000	5,620	13,900	4,990	15,100	4,790	11,700
Perce ntile	Apr		May		Jun		Jul		Aug		Sep	
	Pre- Project	Max LF OS-1	Pre- Project	Max LF OS-1	Pre- Project	Max LF OS-1	Pre- Project	Max LF OS-1	Pre- Project	Max LF OS-1	Pre- Project	Max LF OS-1
99%	1,560	2,360	3,060	5,400	29,700	26,400	38,000	32,000	21,000	21,900	12,000	13,800
95%	1,850	3,360	5,340	9,710	37,000	31,100	43,000	35,000	33,900	31,400	15,300	15,900
90%	2,030	7,850	6,990	10,700	40,800	33,400	46,400	37,400	38,000	34,900	18,000	18,300
75%	2,660	8,700	13,100	14,600	50,600	39,800	52,000	41,100	44,500	39,500	23,800	23,300
50%	3,520	9,320	31,100	25,900	63,500	48,000	58,600	45,800	52,900	46,000	32,000	31,300
25%	4,330	9,890	47,800	36,900	73,900	54,100	67,600	51,800	61,200	55,100	42,600	41,400
10%	5,900	10,700	65,800	48,500	85,100	60,400	76,800	58,200	71,400	64,800	56,200	54,300
5%	7,760	11,600	75,100	54,900	93,400	65,000	82,500	63,900	80,000	73,300	64,200	62,000
1%	15,700	17,000	85,100	60,400	119,000	77,200	97,600	77,000	111,000	97,800	80,300	80,300

Table I-4 – Monthly Flow Exceedence Ordinate (cfs) Comparison for Pre-Project and Max LF OS-1 Conditions for the Susitna River at Susitna Station

Susitna River at Susitna Station												
Perce ntile	Oct		Nov		Dec		Jan		Feb		Mar	
	Pre- Project	Max LF OS-1	Pre- Project	Max LF OS-1	Pre- Project	Max LF OS-1	Pre- Project	Max LF OS-1	Pre- Project	Max LF OS-1	Pre- Project	Max LF OS-1
99%	11,000	16,500	6,700	13,200	6,000	12,500	5,670	11,900	4,930	6,020	4,700	5,450
95%	15,000	19,600	7,750	14,000	6,280	13,300	5,810	13,400	5,340	13,200	5,070	7,000
90%	18,000	21,900	8,720	14,800	6,850	13,800	6,190	13,900	5,810	13,600	5,280	11,500
75%	23,500	26,700	10,700	16,500	7,840	14,800	7,000	14,500	6,380	14,400	5,800	12,300
50%	31,700	33,600	13,000	18,500	9,000	16,000	7,880	15,400	6,990	15,500	6,440	12,900
25%	42,900	43,800	16,700	21,800	10,700	17,600	8,570	16,400	7,530	16,600	7,000	13,700
10%	60,000	60,200	21,300	25,800	12,000	18,800	9,720	17,500	8,500	17,600	7,520	14,600
5%	70,000	70,600	25,000	29,200	13,300	19,700	10,300	18,100	9,200	18,400	9,000	15,300
1%	97,500	97,000	36,500	40,900	19,900	25,400	11,000	19,000	10,000	19,700	9,500	16,300
Perce ntile	Apr		May		Jun		Jul		Aug		Sep	
	Pre- Project	Max LF OS-1	Pre- Project	Max LF OS-1	Pre- Project	Max LF OS-1	Pre- Project	Max LF OS-1	Pre- Project	Max LF OS-1	Pre- Project	Max LF OS-1
99%	5,000	5,760	7,160	10,100	65,500	58,200	80,200	73,700	44,100	45,200	21,600	22,900
95%	5,400	6,880	10,400	14,000	77,000	69,500	90,800	81,700	70,900	68,900	33,100	34,200
90%	5,550	11,300	14,700	17,400	86,200	77,400	98,300	88,100	79,700	76,600	38,800	39,400
75%	6,120	12,100	32,800	32,700	102,000	90,400	108,000	97,600	92,400	88,400	50,800	50,900
50%	7,000	12,900	64,000	57,700	121,000	106,000	120,000	107,000	107,000	102,000	68,600	68,000
25%	9,210	14,700	95,200	85,800	136,000	117,000	133,000	118,000	123,000	116,000	90,300	88,800
10%	13,500	18,100	122,000	106,000	152,000	128,000	147,000	129,000	138,000	129,000	114,000	112,000
5%	19,000	23,000	135,000	116,000	161,000	134,000	157,000	139,000	153,000	144,000	125,000	123,000
1%	37,100	39,000	150,000	128,000	182,000	149,000	186,000	162,000	195,000	188,000	154,000	152,000

APPENDIX J. ANNUAL AND MONTHLY STAGE EXCEEDANCE
CURVES (PRE-PROJECT AND MAXIMUM LOAD FOLLOWING OS-1
CONDITIONS) FOR SUNSHINE GAGE LOCATION AND SUSITNA
STATION GAGE LOCATION

Susitna-Watana Hydroelectric Project
(FERC No. 14241)

Stream Flow Assessment

Prepared for

Alaska Energy Authority



Prepared by

Tetra Tech

February 2013

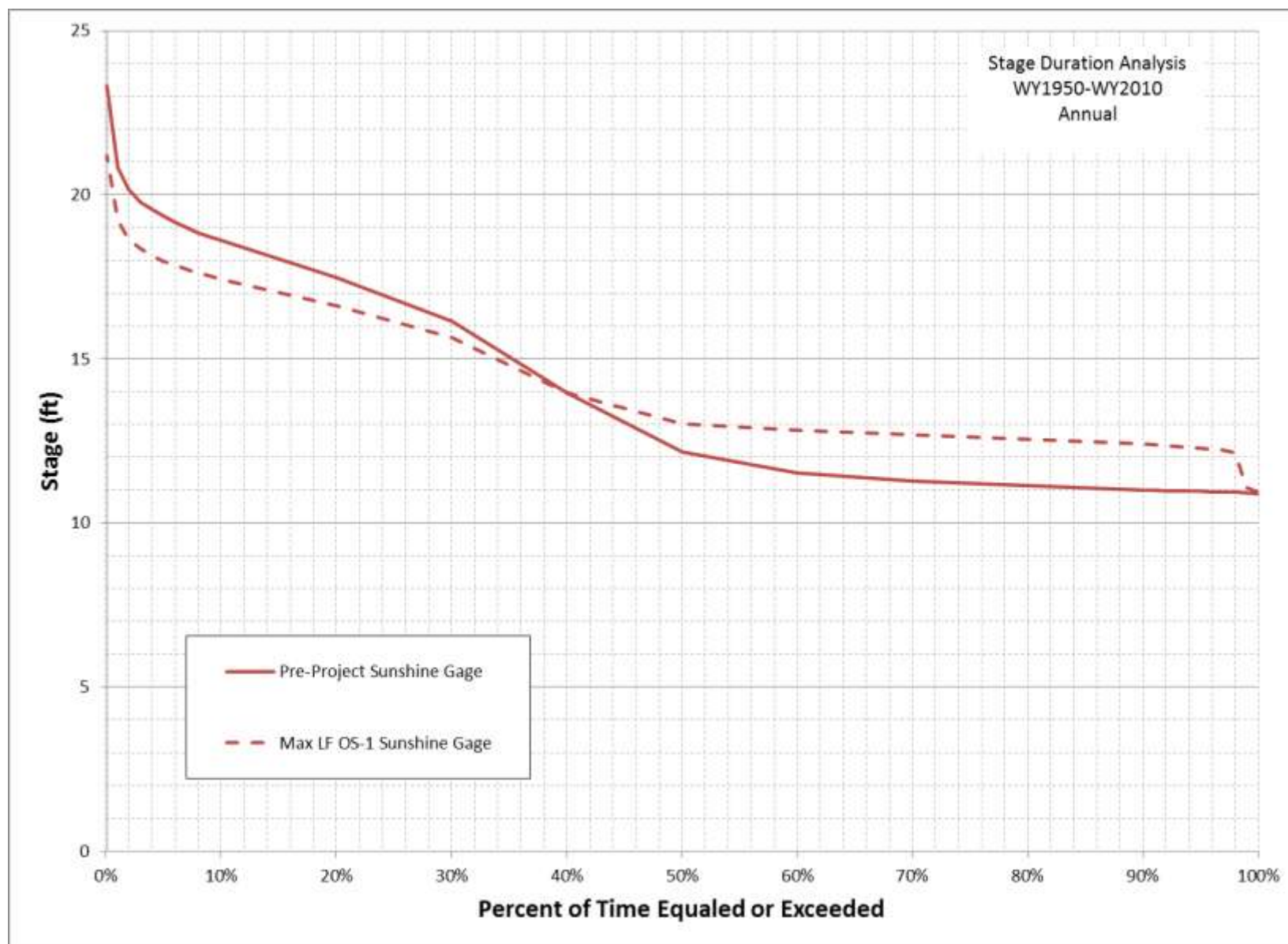


Figure J-1 - Annual Stage Exceedence Curves for pre-Project and Max LF OS-1 Conditions, Sunshine Gage

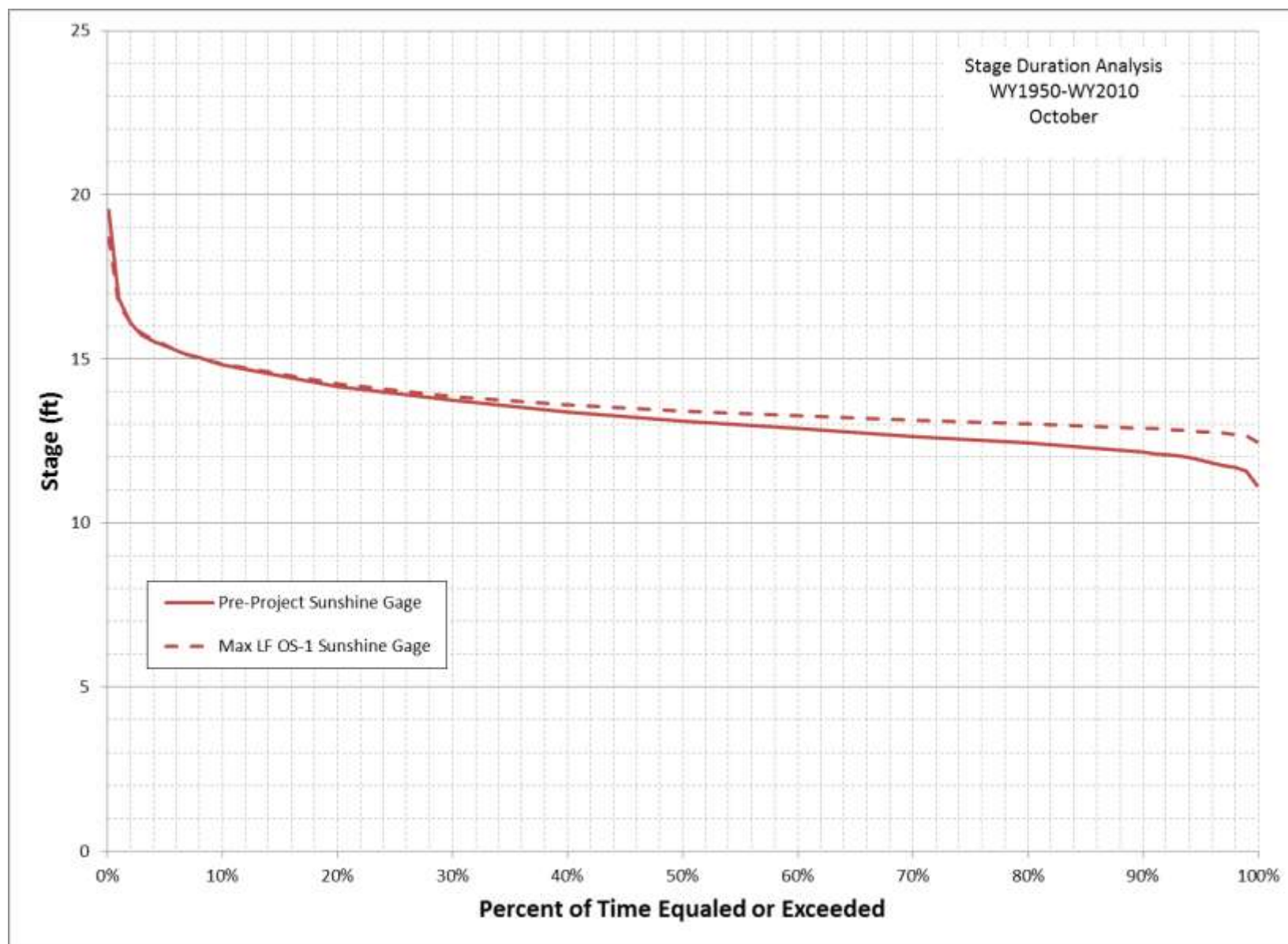


Figure J-2 - Monthly Stage Exceedance Curves for October for pre-Project and Max LF OS-1 Conditions, Sunshine Gage

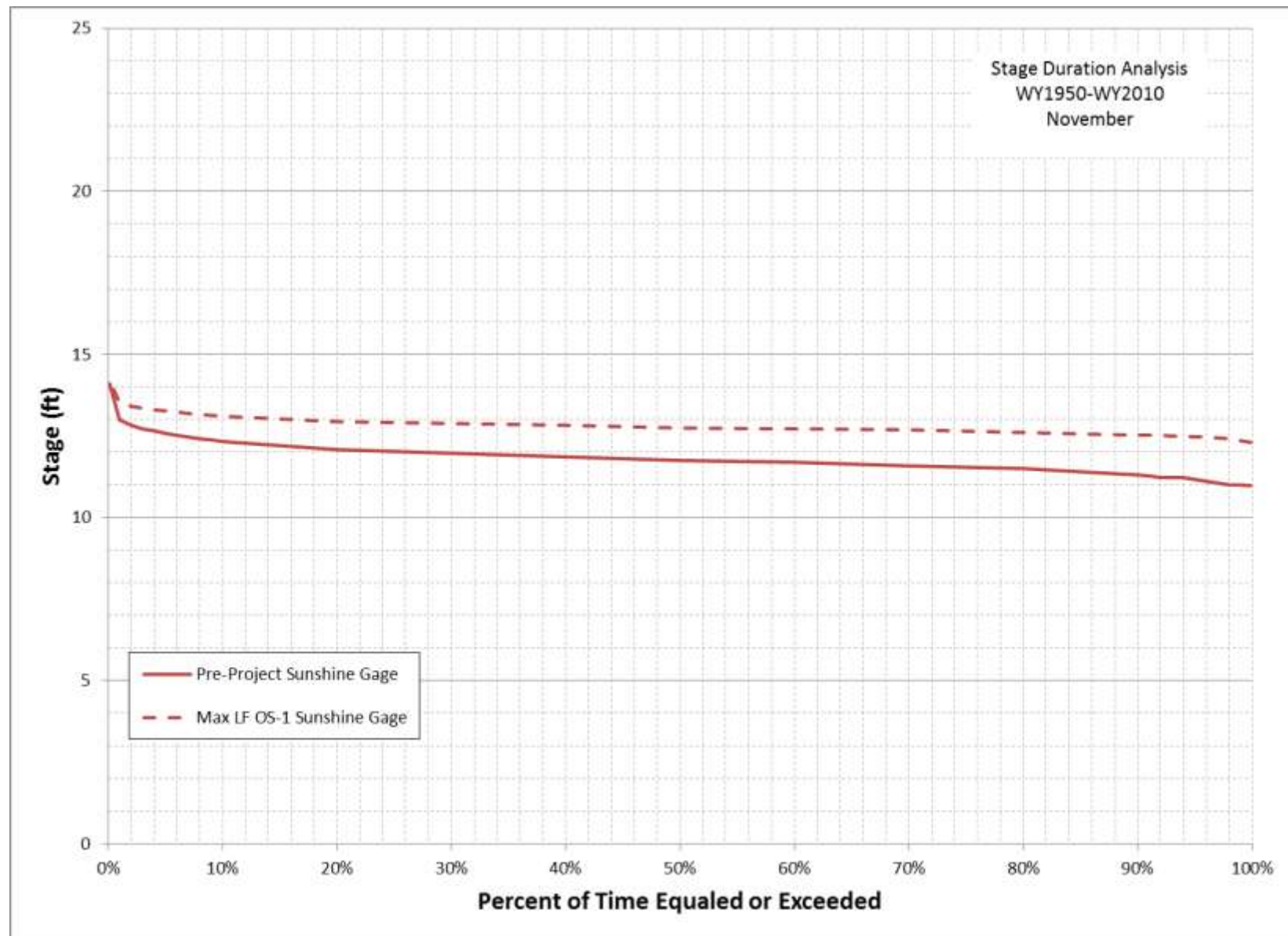


Figure J-3 - Monthly Stage Exceedance Curves for November for pre-Project and Max LF OS-1 Conditions, Sunshine Gage

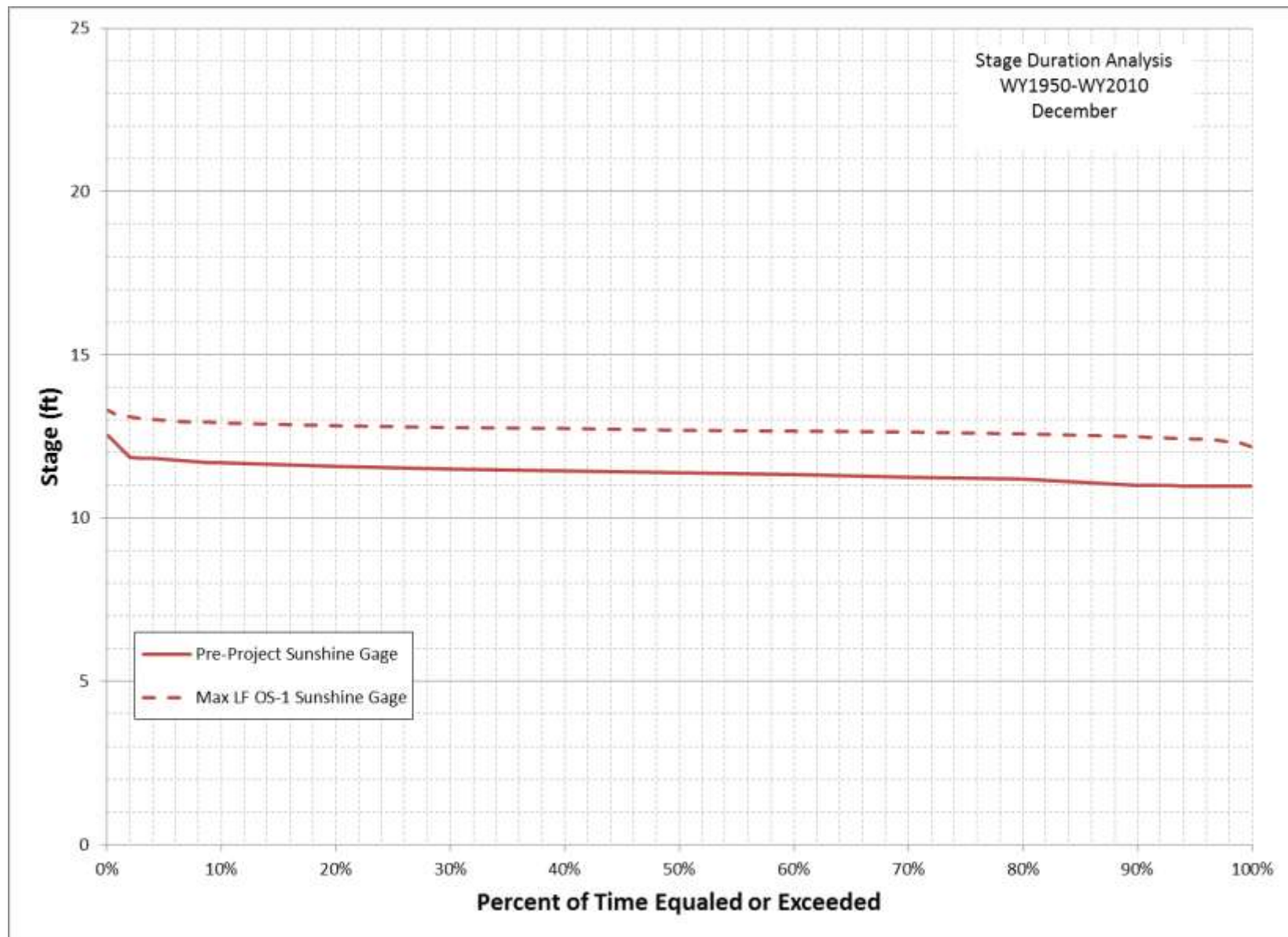


Figure J-4 - Monthly Stage Exceedence Curves for December for pre-Project and Max LF OS-1 Conditions, Sunshine Gage

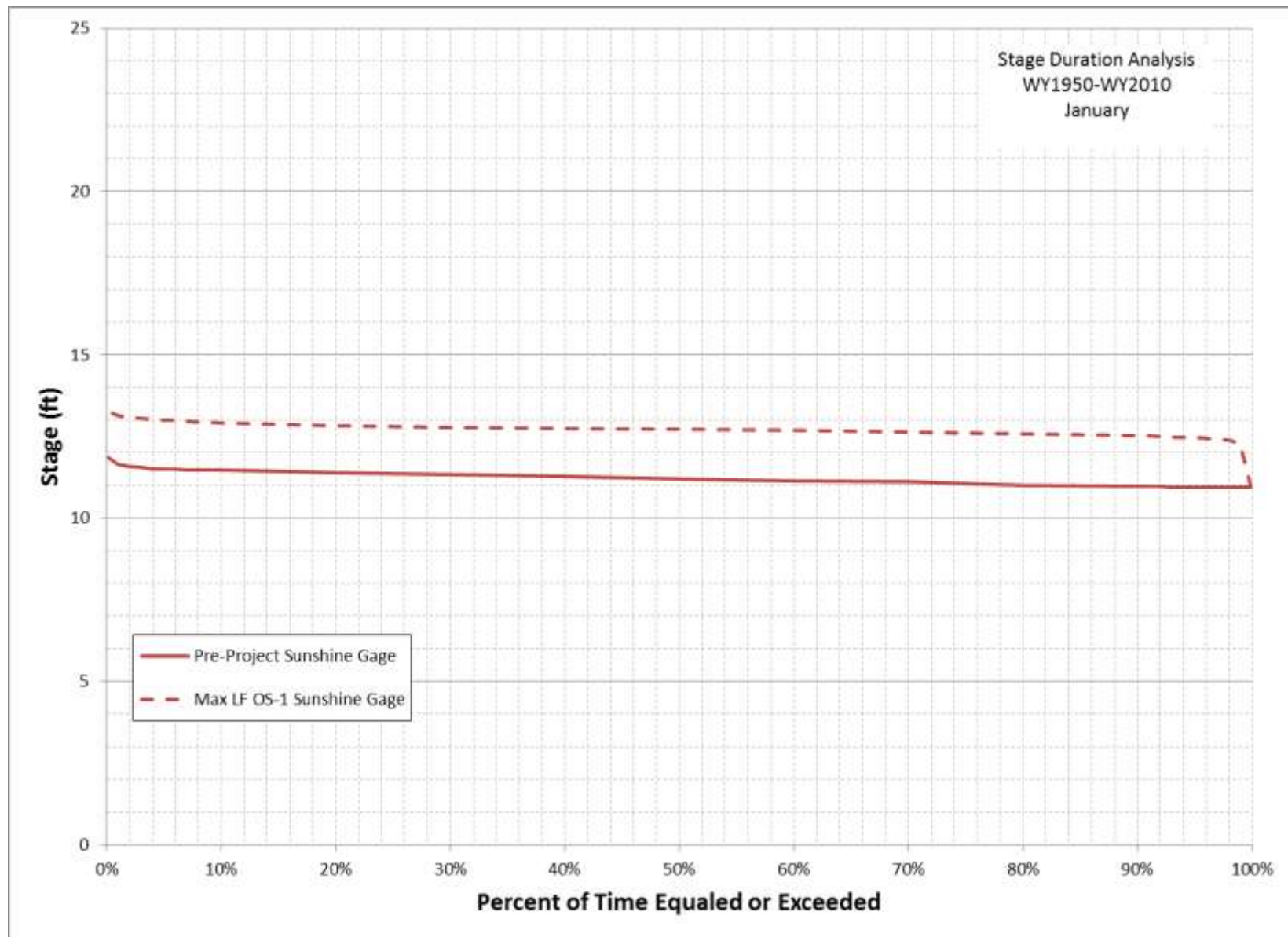


Figure J-5 - Monthly Stage Exceedence Curves for January for pre-Project and Max LF OS-1 Conditions, Sunshine Gage

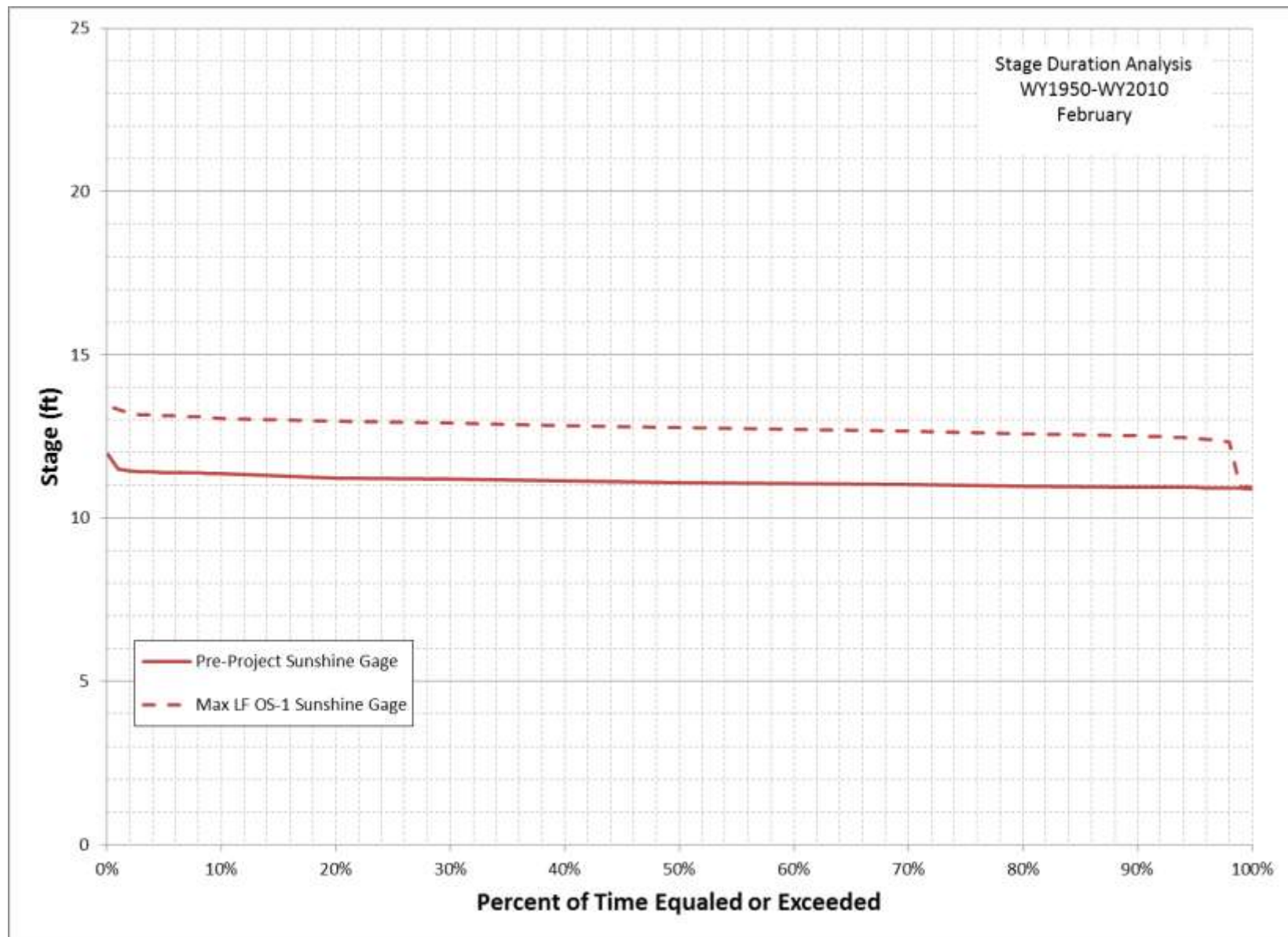


Figure J-6 - Monthly Stage Exceedence Curves for February for pre-Project and Max LF OS-1 Conditions, Sunshine Gage

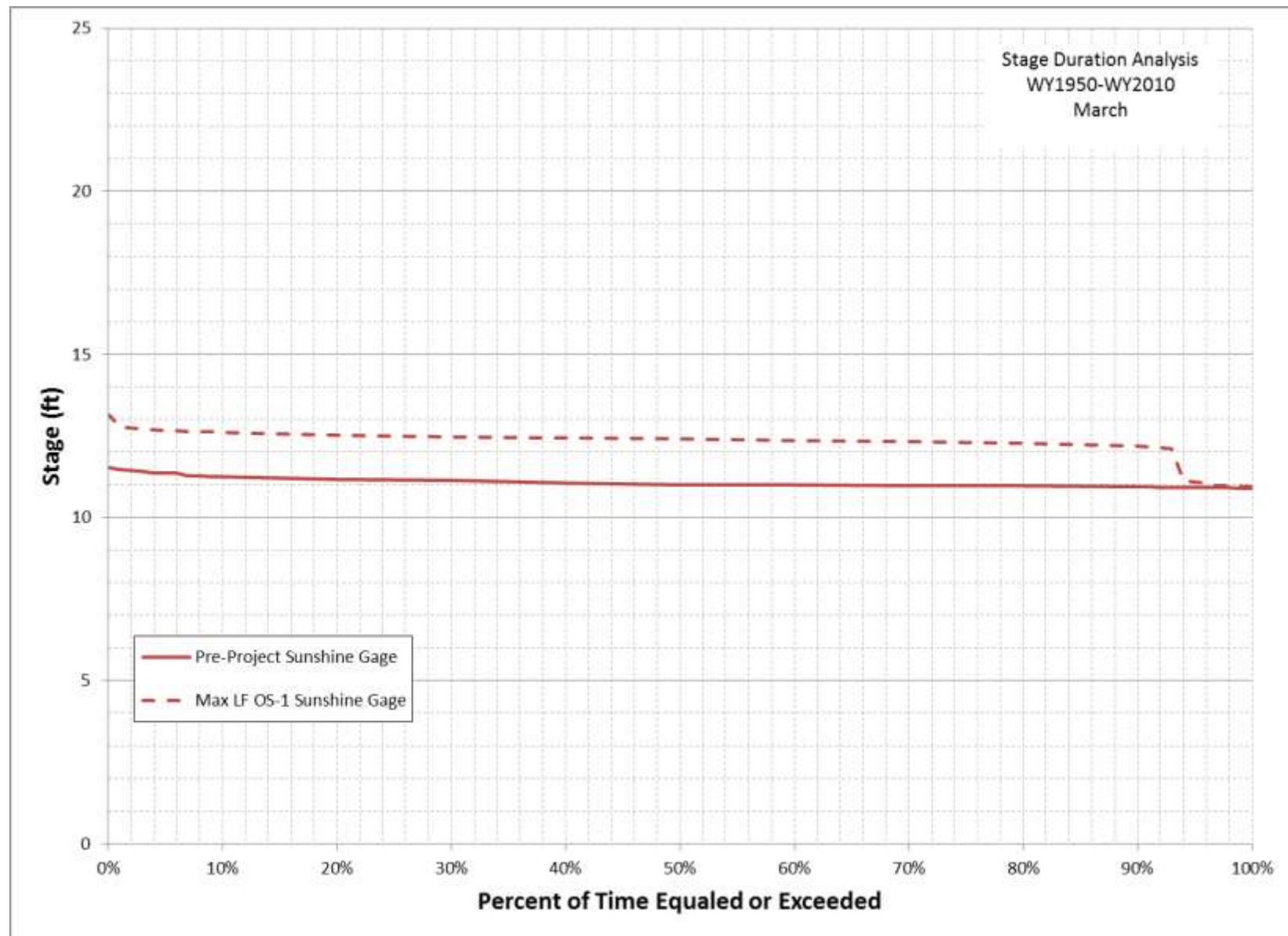


Figure J-7 - Monthly Stage Exceedance Curves for March for pre-Project and Max LF OS-1 Conditions, Sunshine Gage

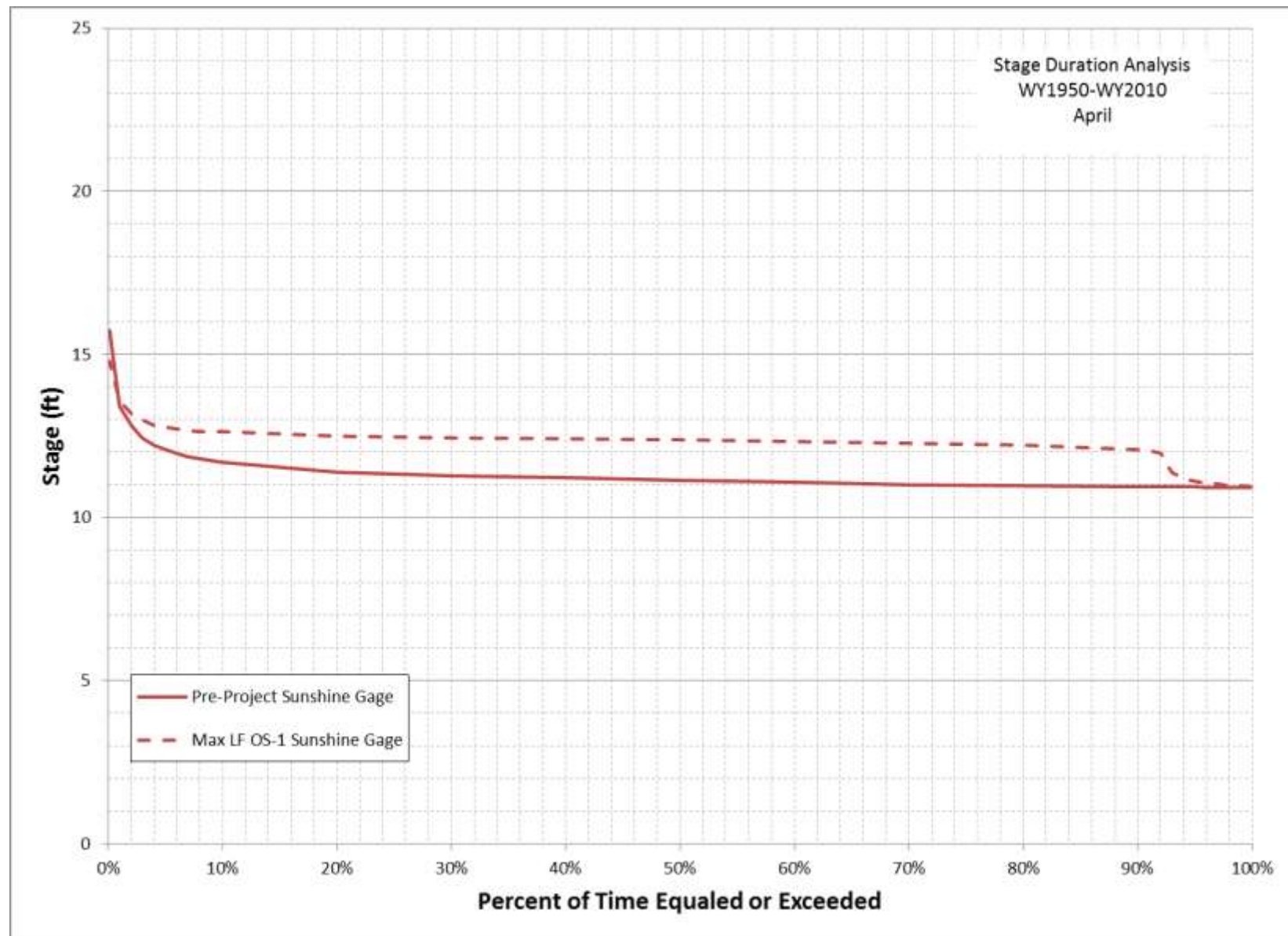


Figure J-8 - Monthly Stage Exceedence Curves for April for pre-Project and Max LF OS-1 Conditions, Sunshine Gage

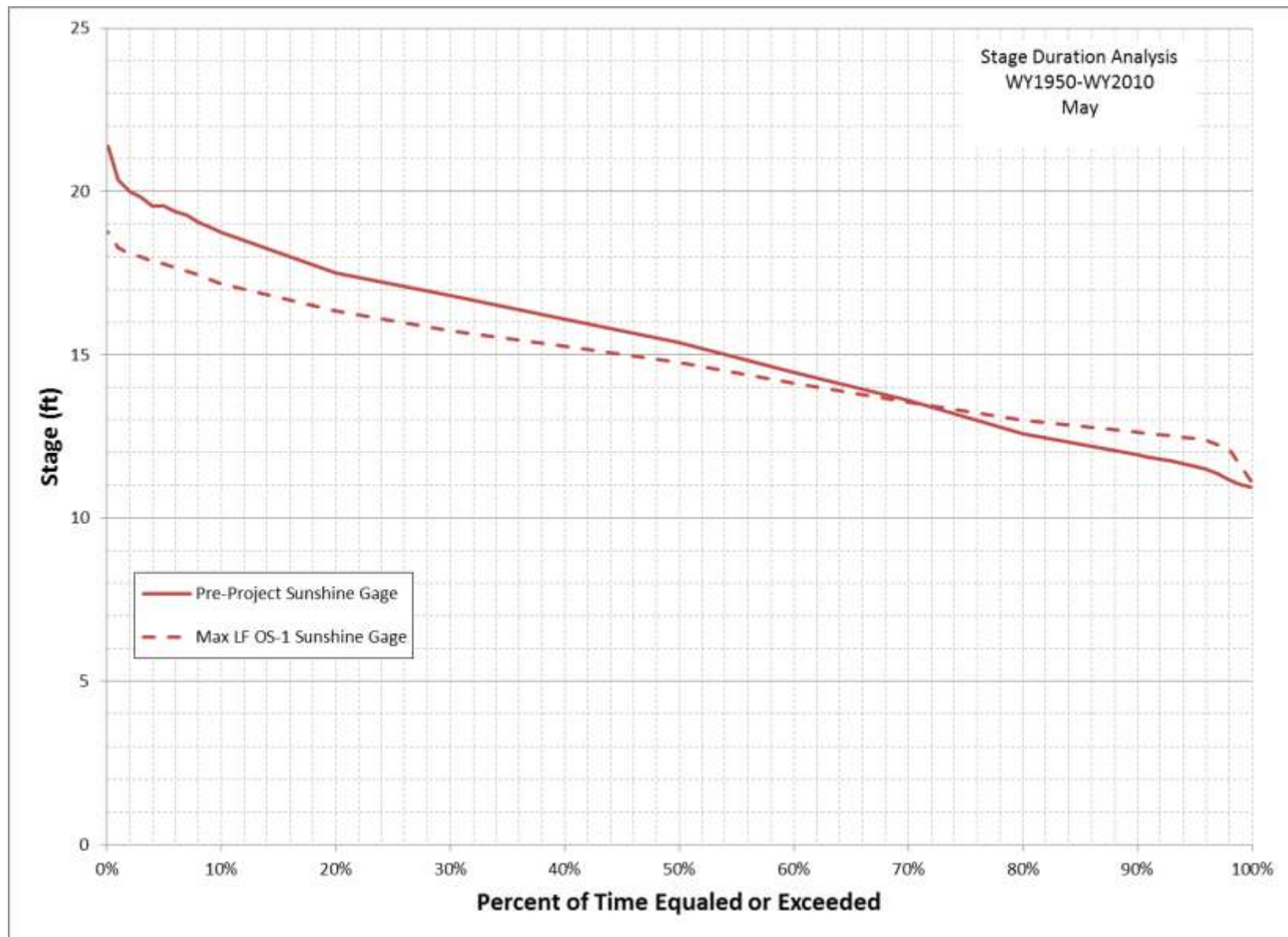


Figure J-9 - Monthly Stage Exceedance Curves for May for pre-Project and Max LF OS-1 Conditions, Sunshine Gage

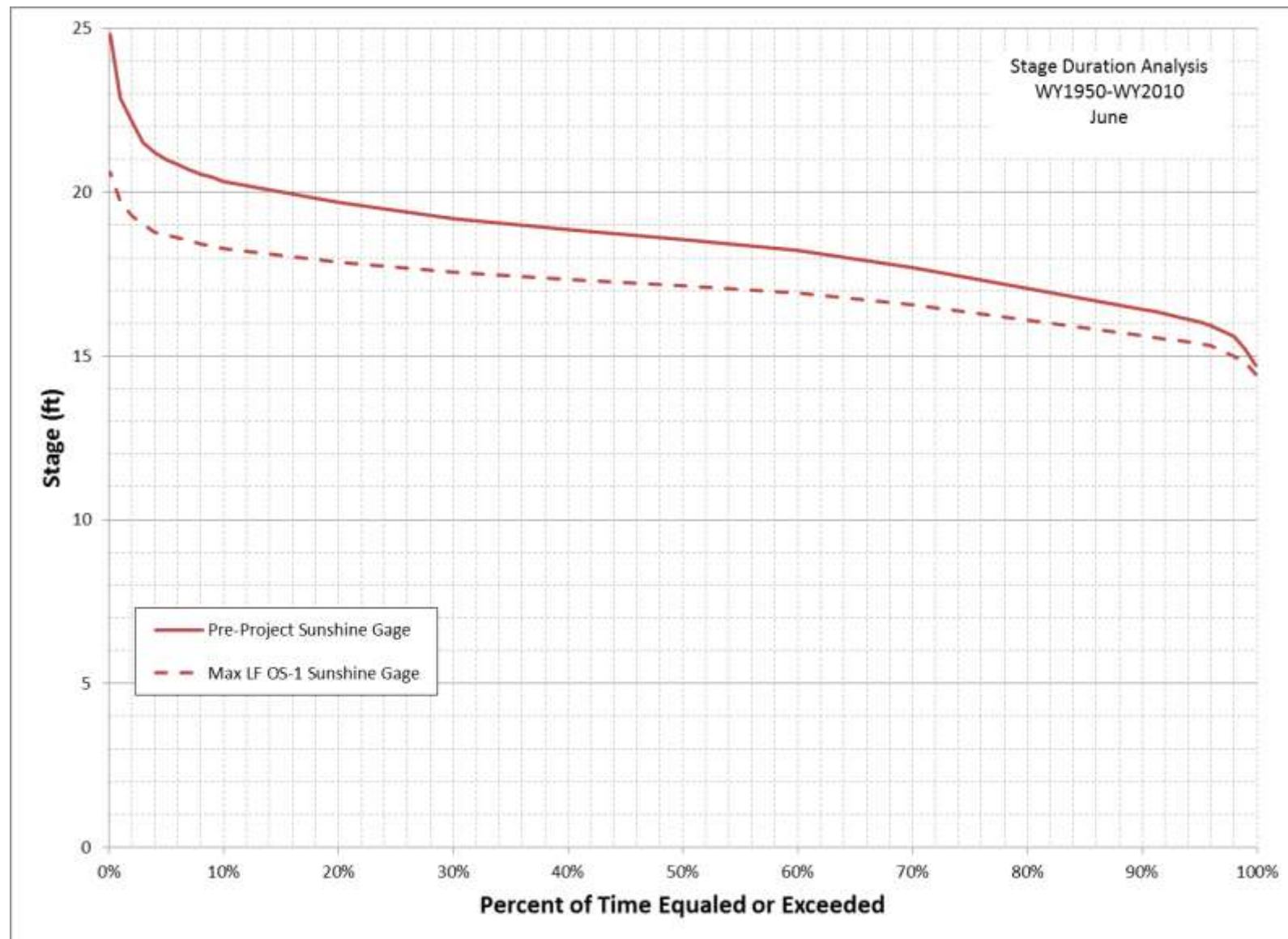


Figure J-10 - Monthly Stage Exceedence Curves for June for pre-Project and Max LF OS-1 Conditions, Sunshine Gage

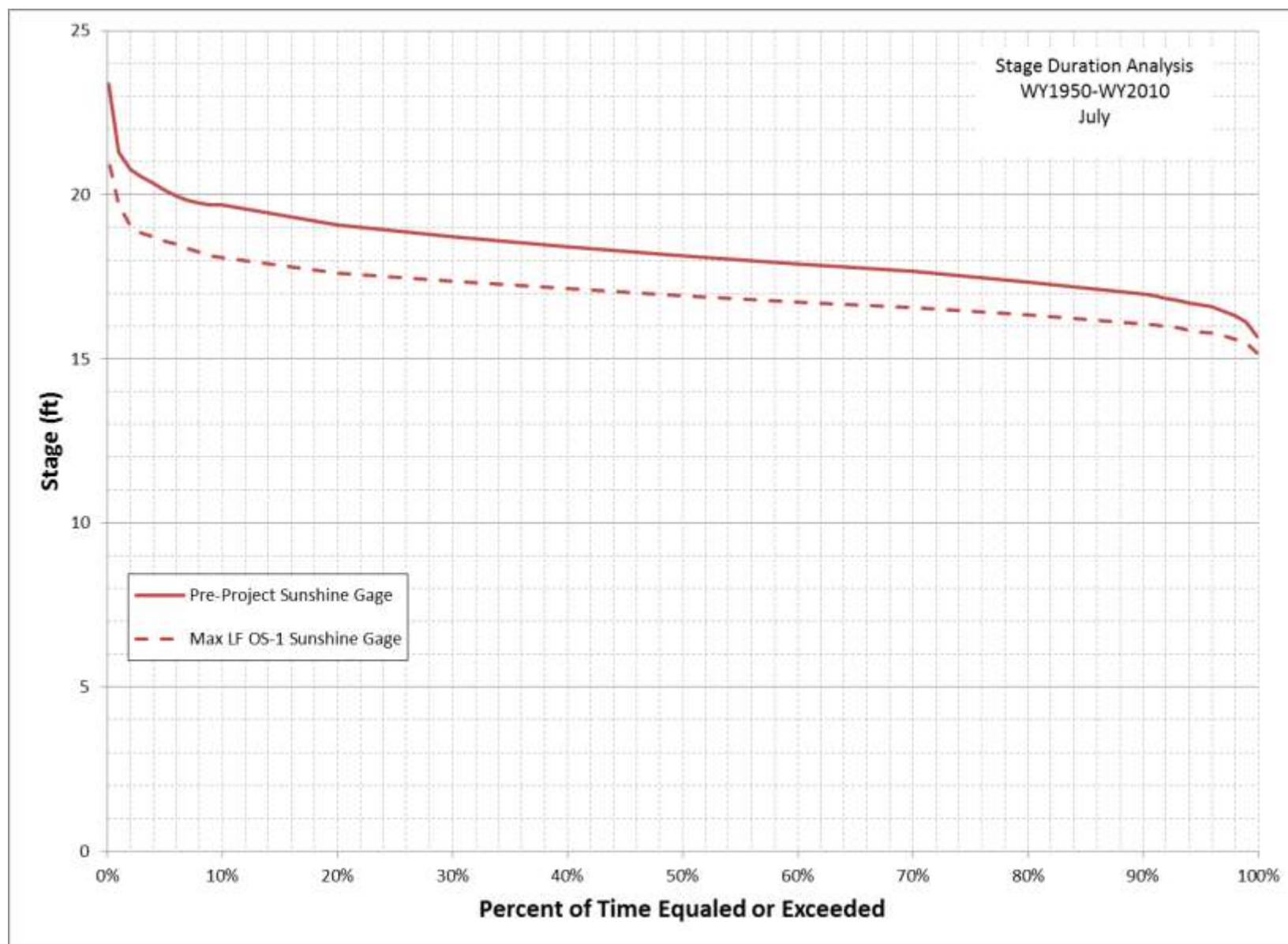


Figure J-11 - Monthly Stage Exceedence Curves for July for pre-Project and Max LF OS-1 Conditions, Sunshine Gage

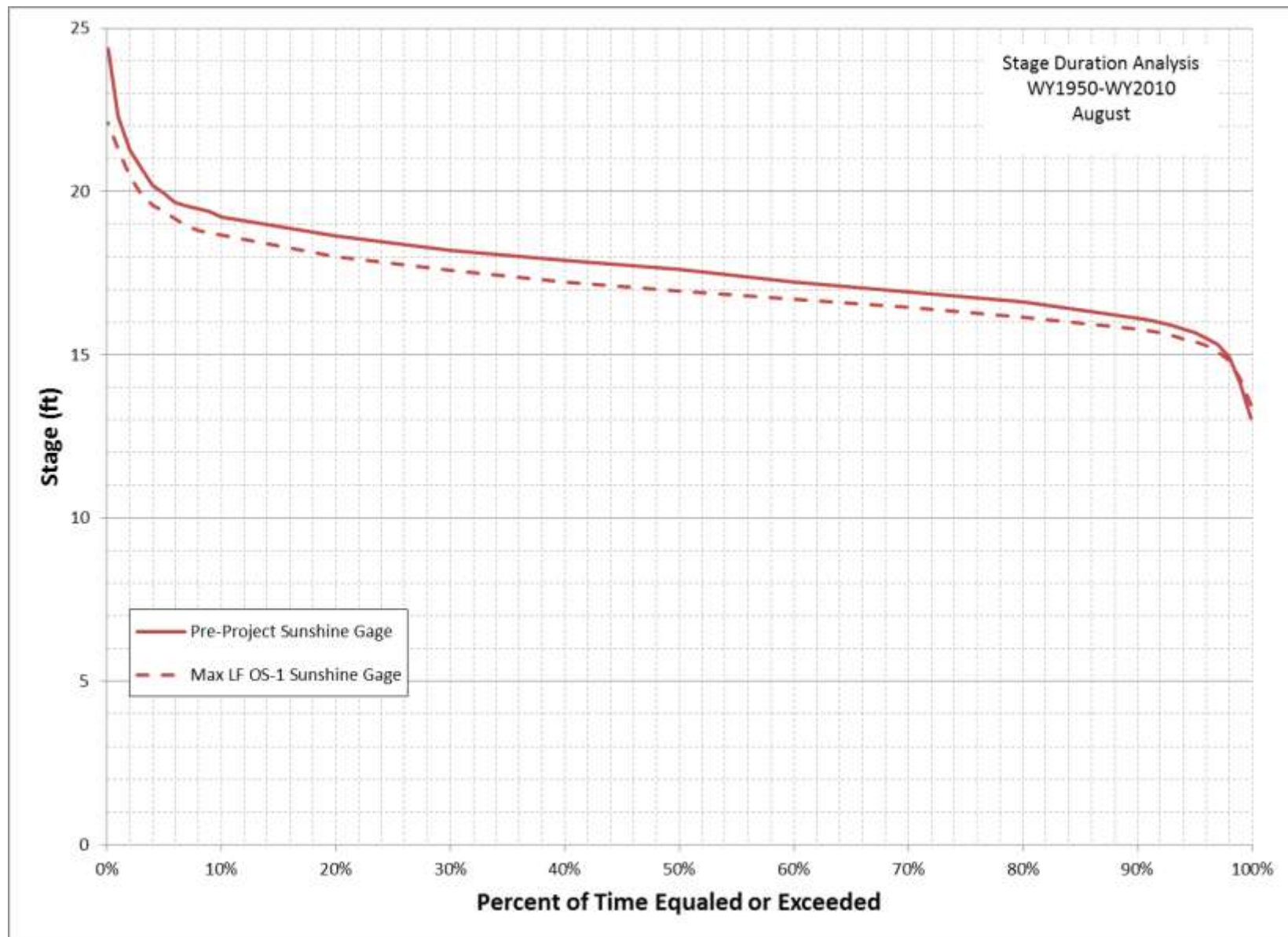


Figure J-12 - Monthly Stage Exceedence Curves for August for pre-Project and Max LF OS-1 Conditions, Sunshine Gage

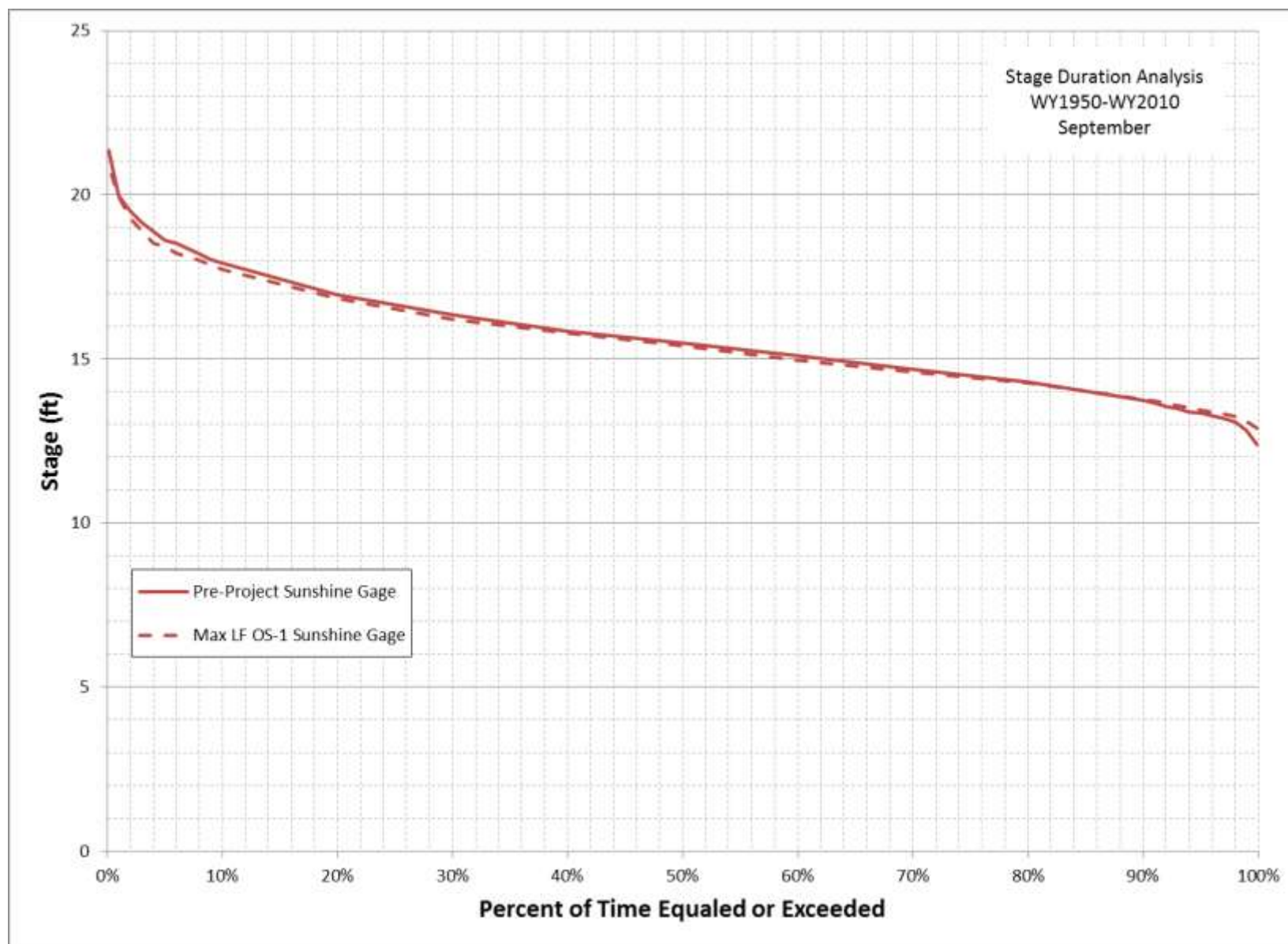


Figure J-13 - Monthly Stage Exceedence Curves for September for pre-Project and Max LF OS-1 Conditions, Sunshine Gage

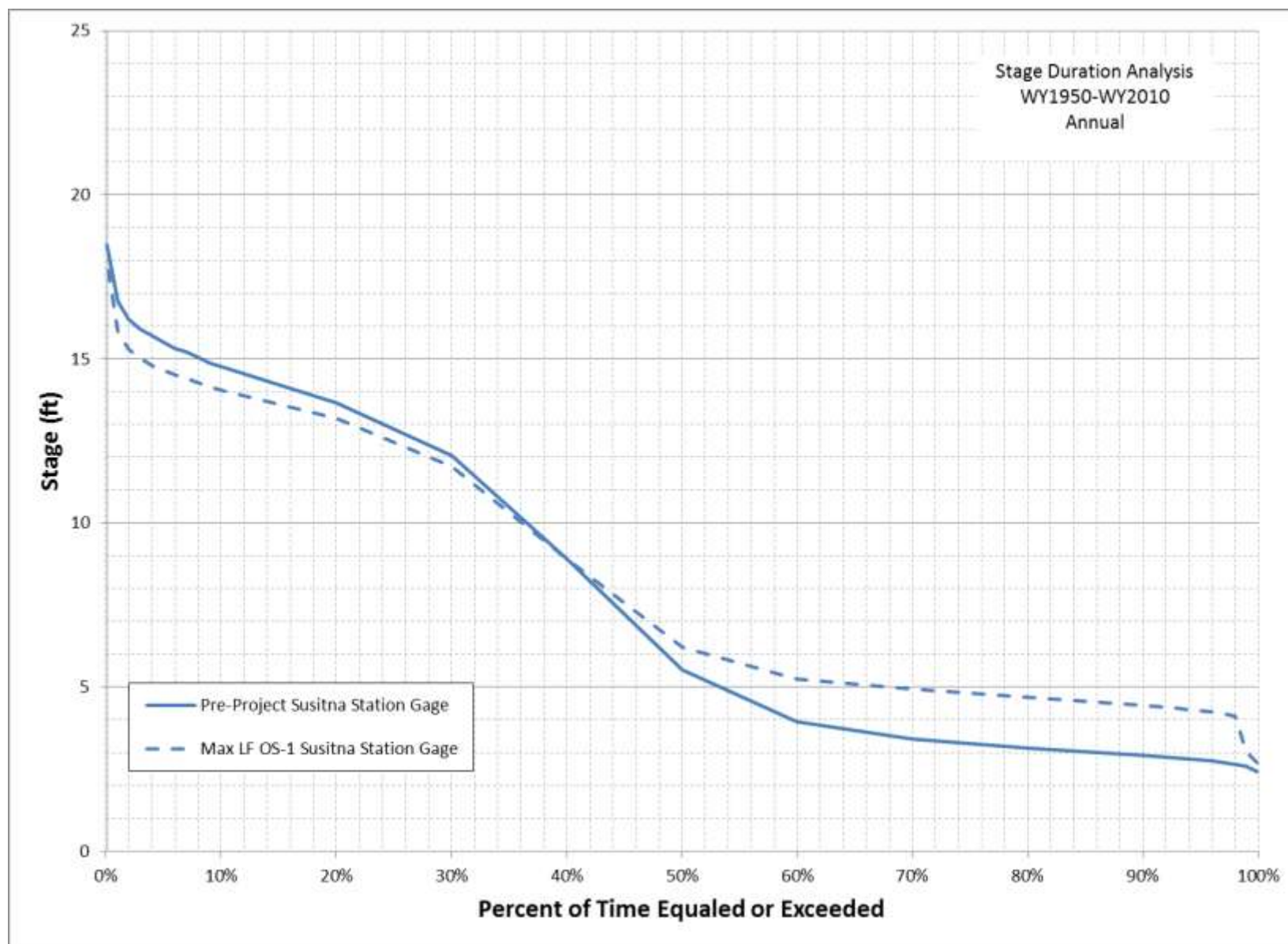


Figure J-14 - Annual Stage Exceedence Curves for pre-Project and Max LF OS-1 Conditions, Susitna Station Gage

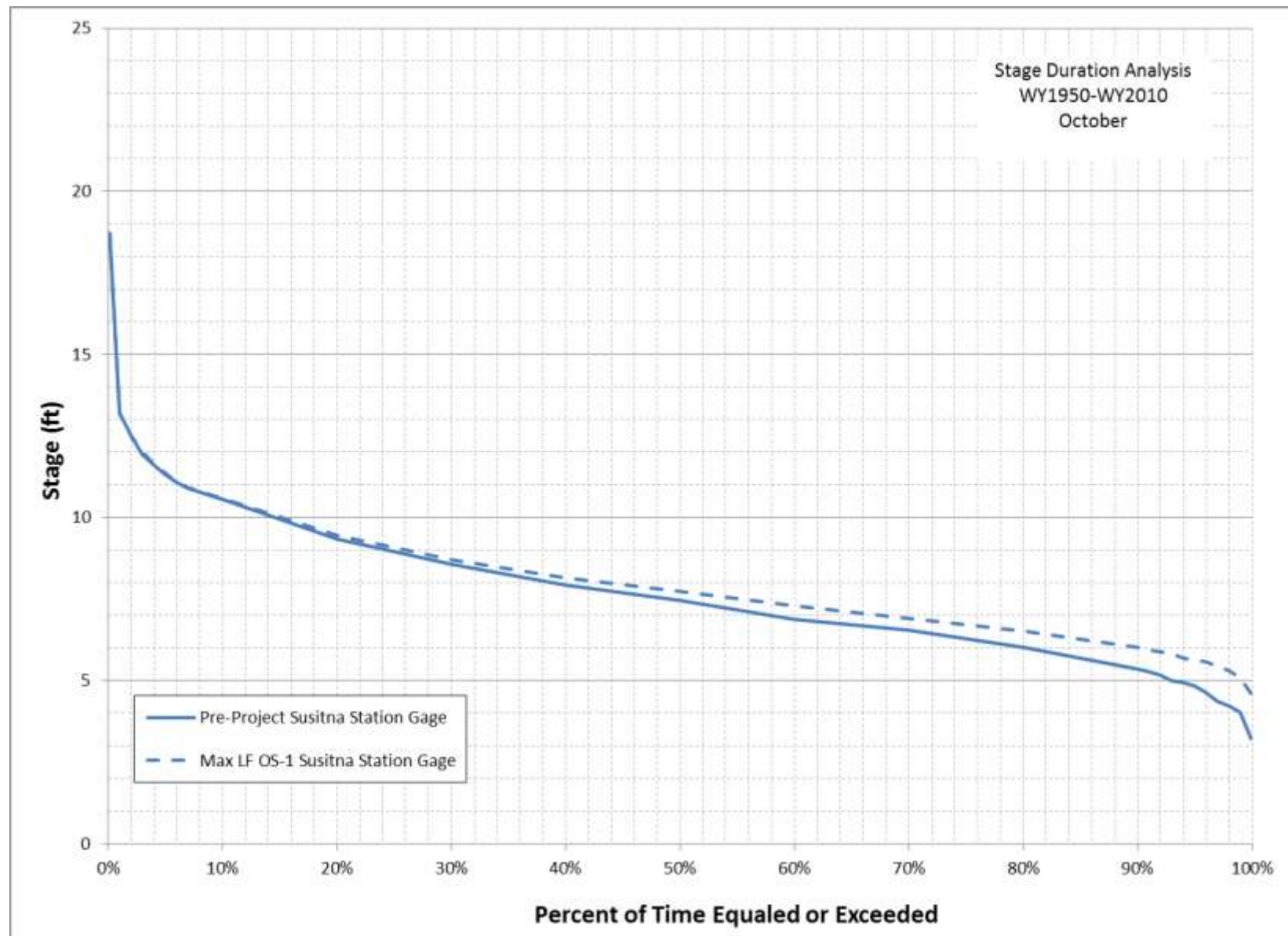


Figure J-15 - Monthly Stage Exceedence Curves for October for pre-Project and Max LF OS-1 Conditions, Susitna Station Gage

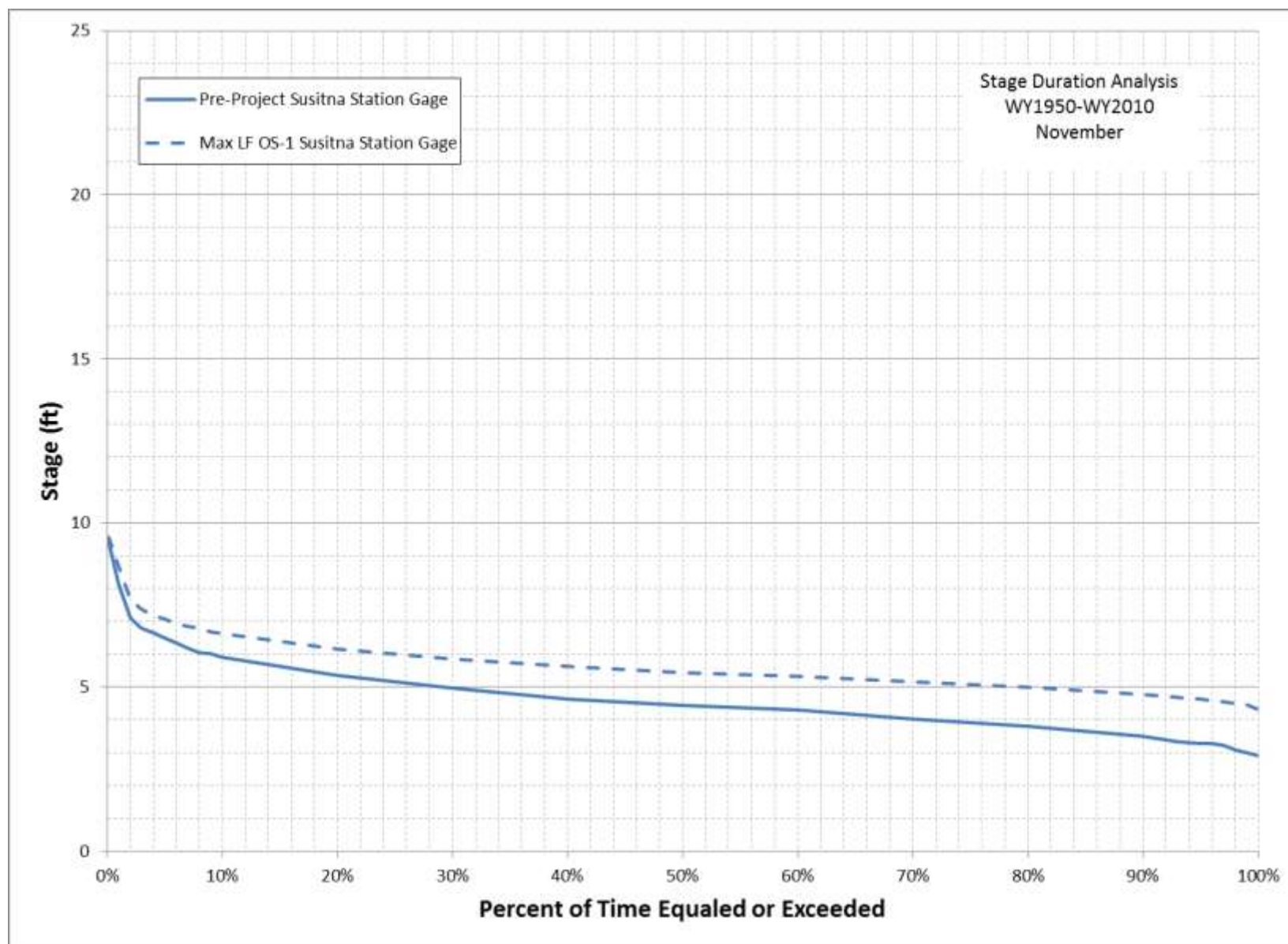


Figure J-16 - Monthly Stage Exceedence Curves for November for pre-Project and Max LF OS-1 Conditions, Susitna Station Gage

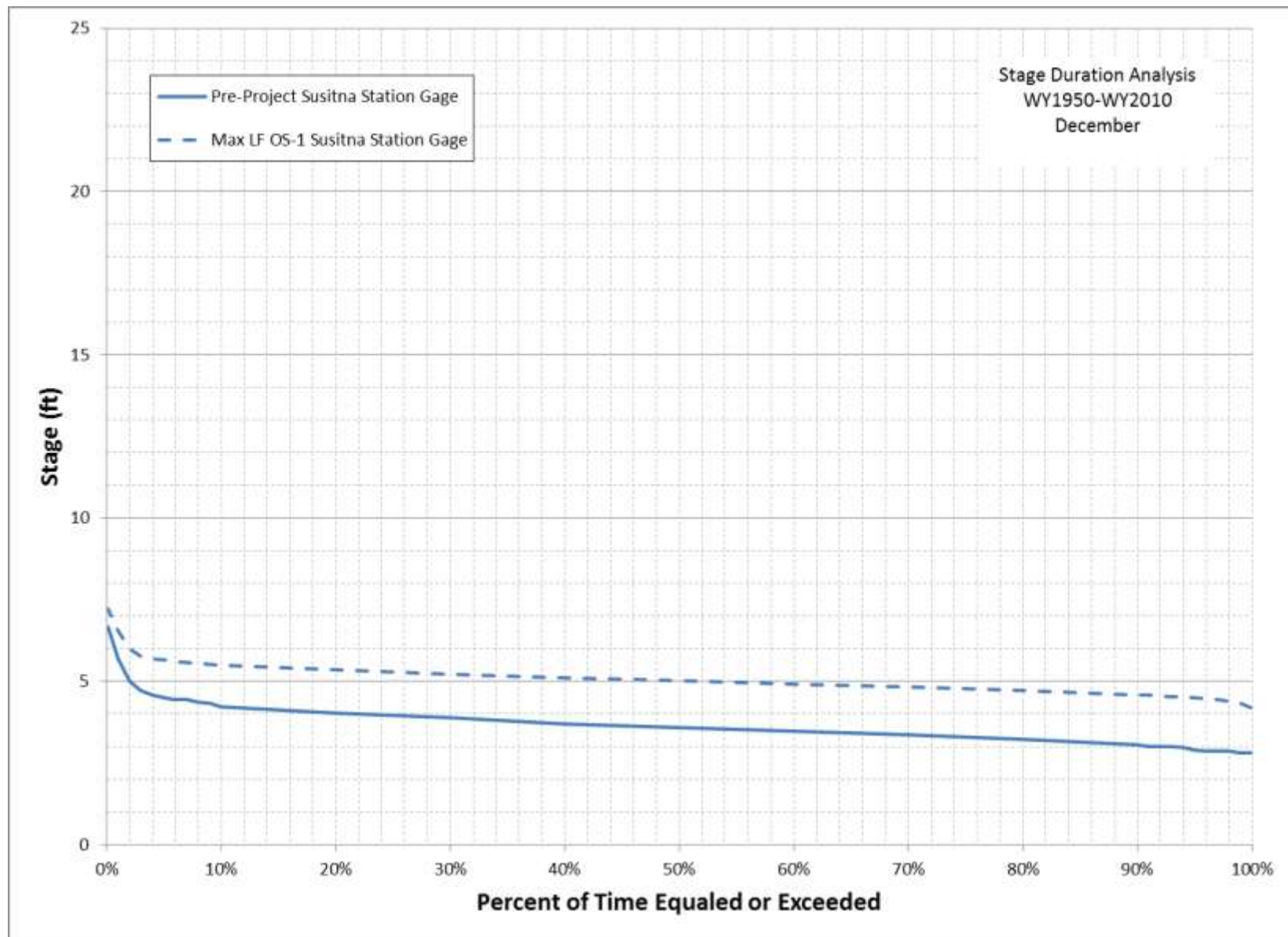


Figure J-17 - Monthly Stage Exceedence Curves for December for pre-Project and Max LF OS-1 Conditions, Susitna Station Gage

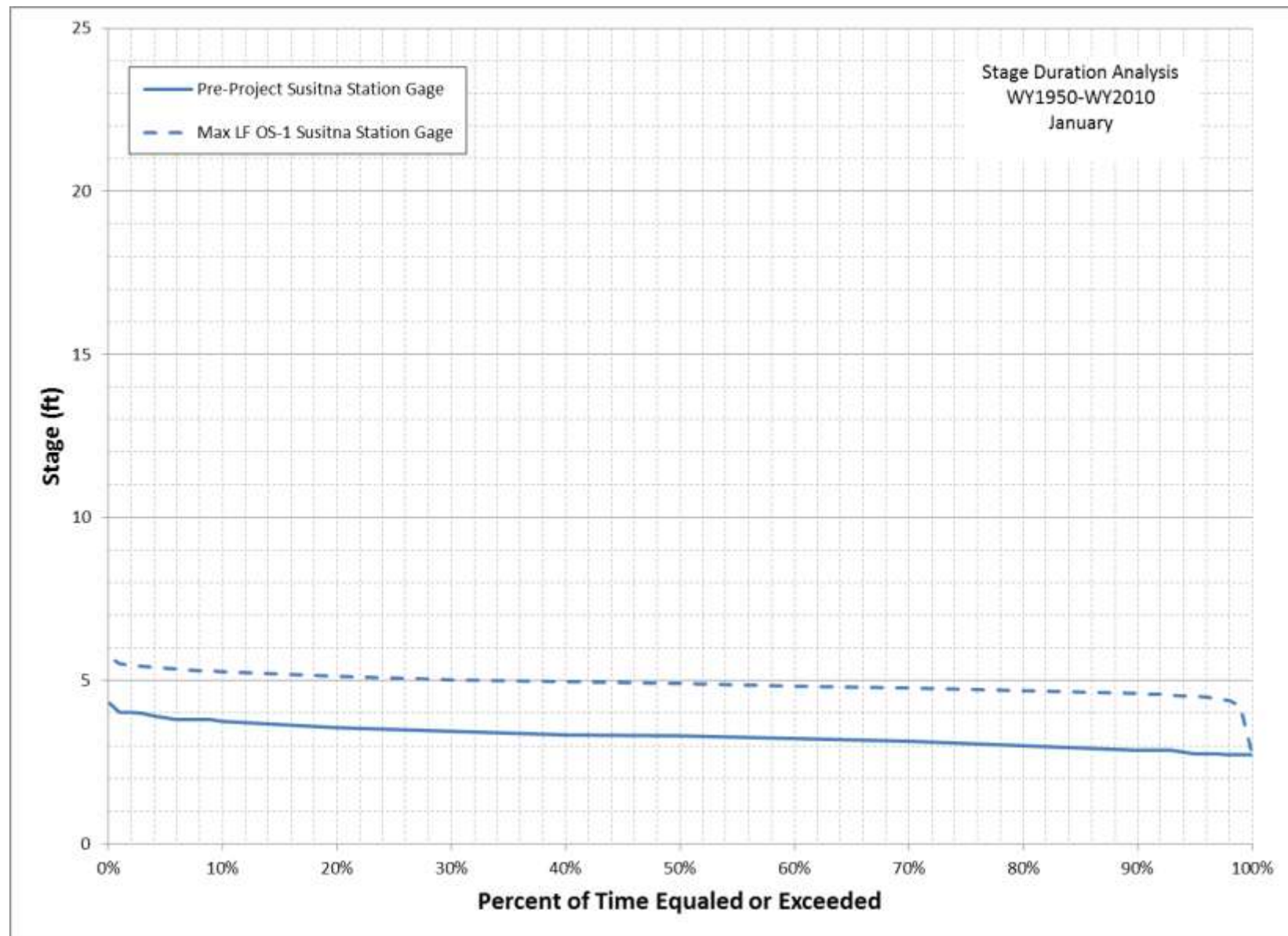


Figure J-18 - Monthly Stage Exceedence Curves for January for pre-Project and Max LF OS-1 Conditions, Susitna Station Gage

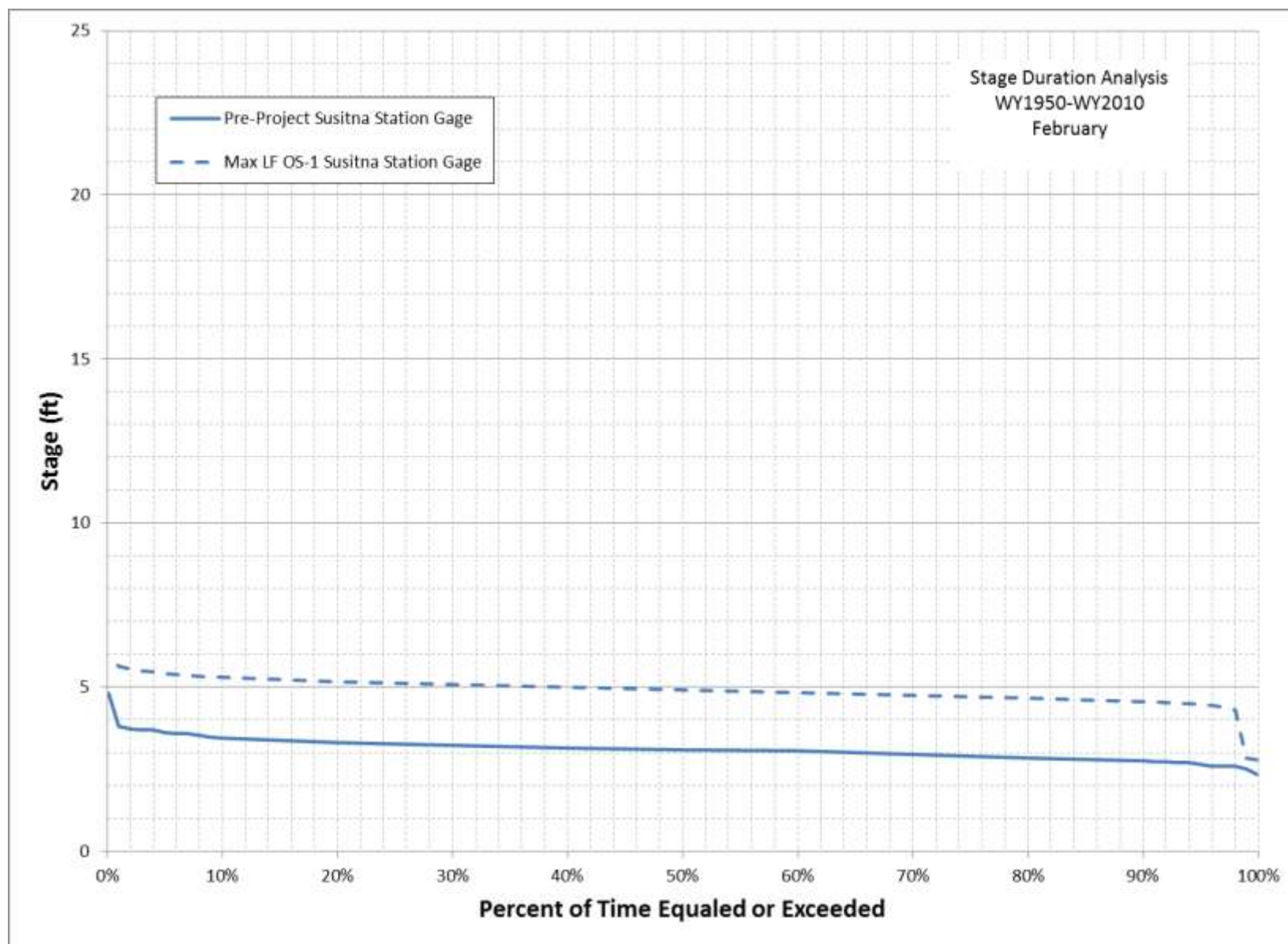


Figure J-19 - Monthly Stage Exceedence Curves for February for pre-Project and Max LF OS-1 Conditions, Susitna Station Gage

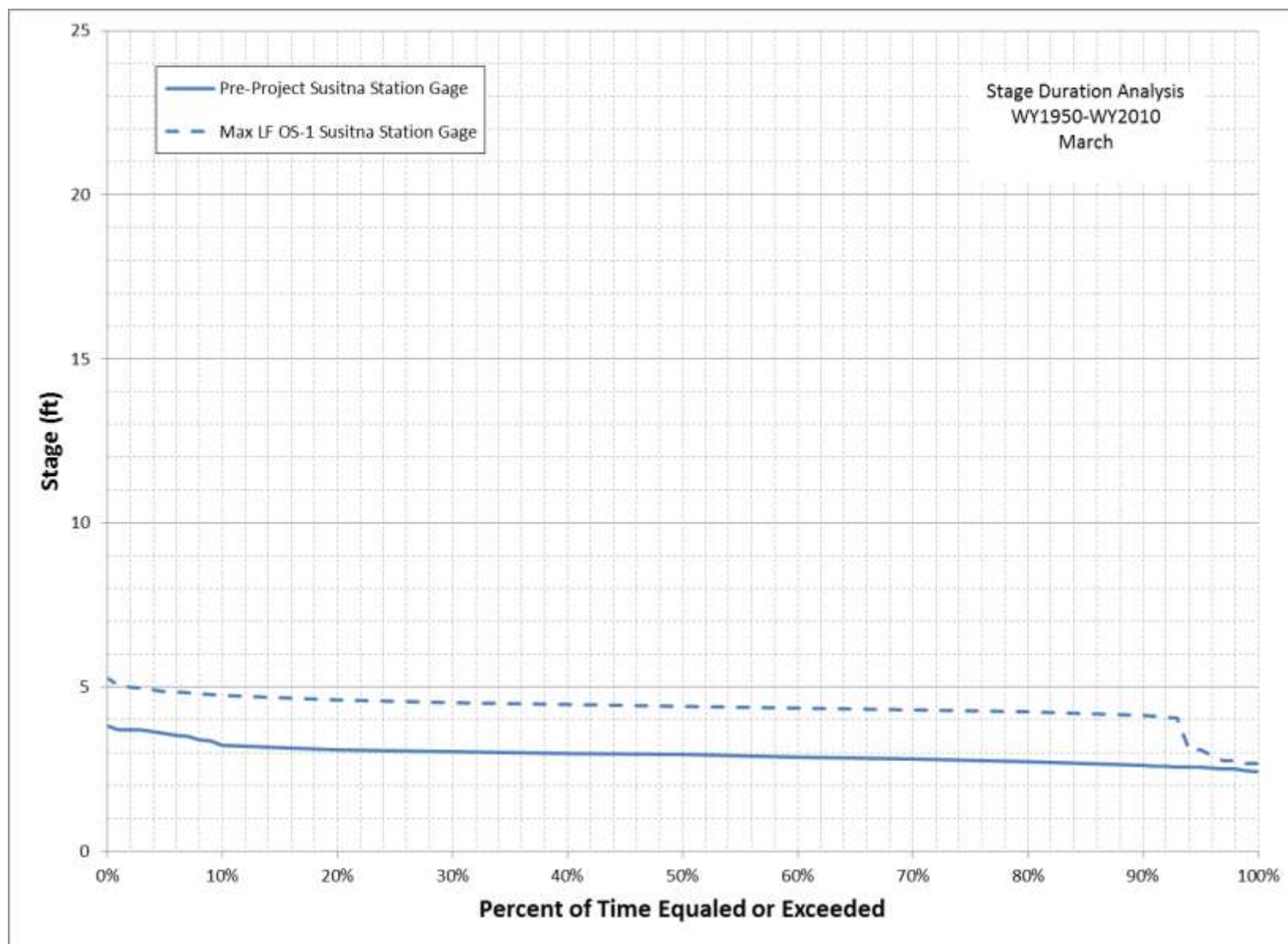


Figure J-20 - Monthly Stage Exceedence Curves for March for pre-Project and Max LF OS-1 Conditions, Susitna Station Gage

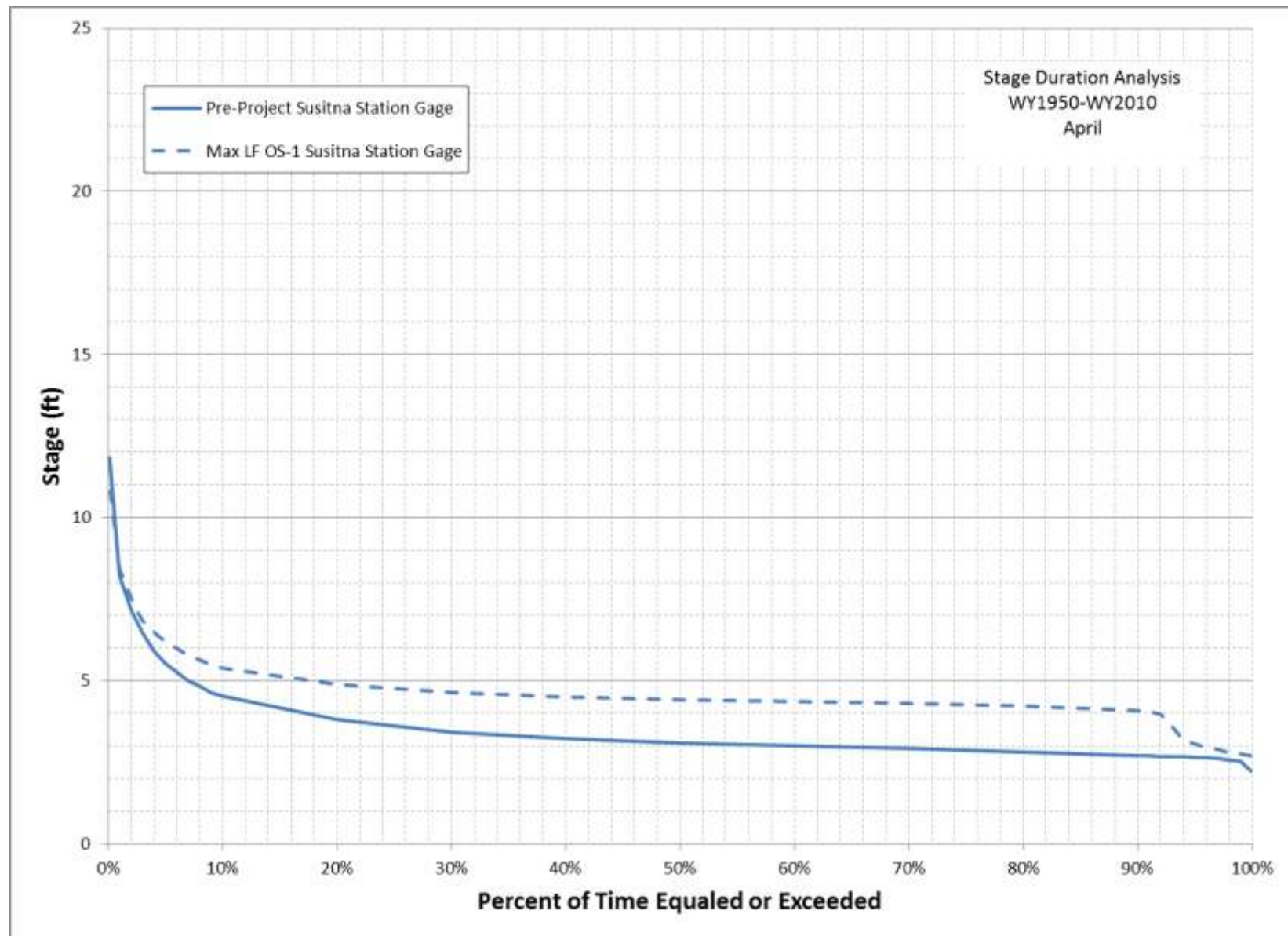


Figure J-21 - Monthly Stage Exceedence Curves for April for pre-Project and Max LF OS-1 Conditions, Susitna Station Gage

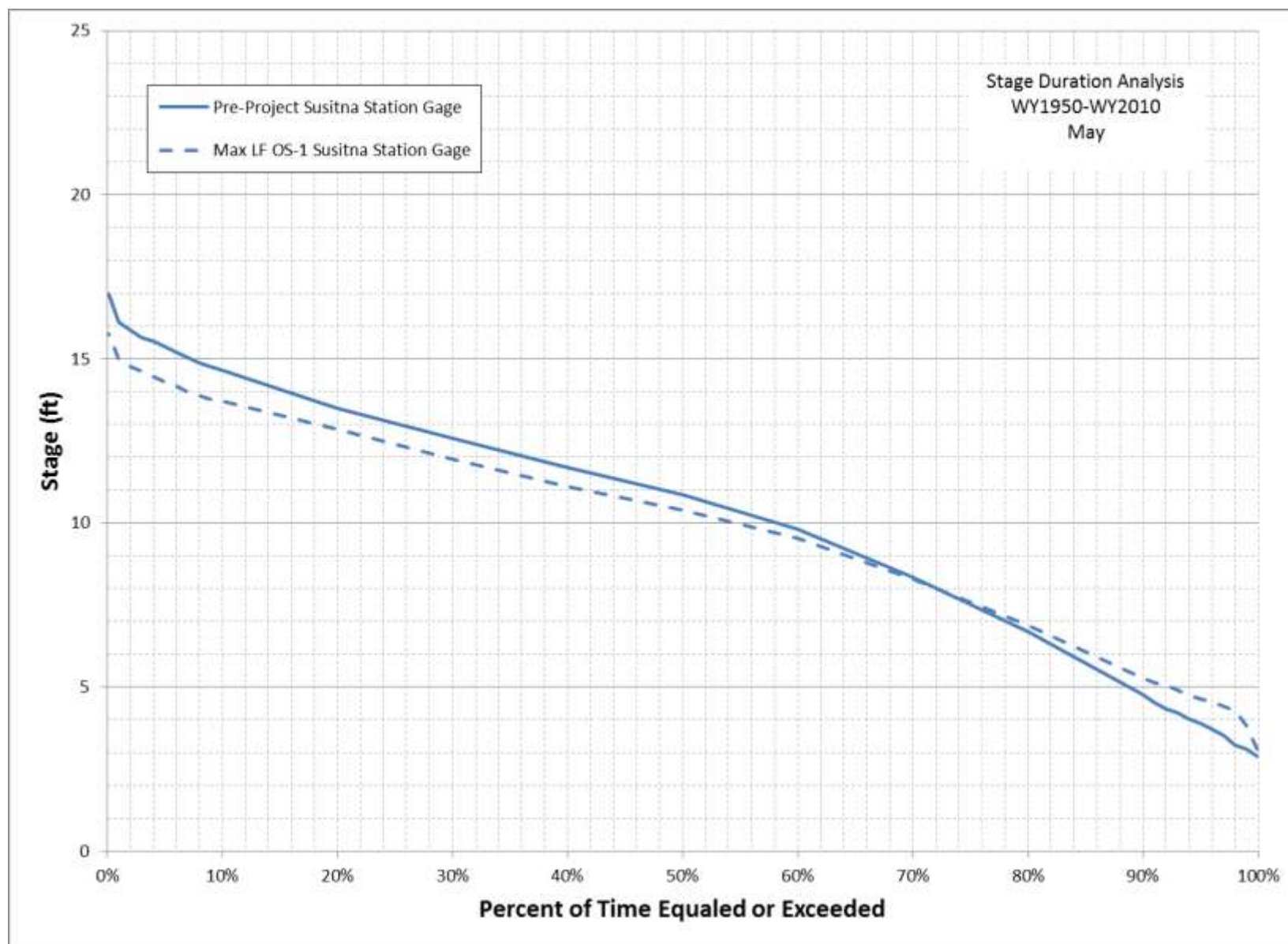


Figure J-22 - Monthly Stage Exceedence Curves for May for pre-Project and Max LF OS-1 Conditions, Susitna Station Gage

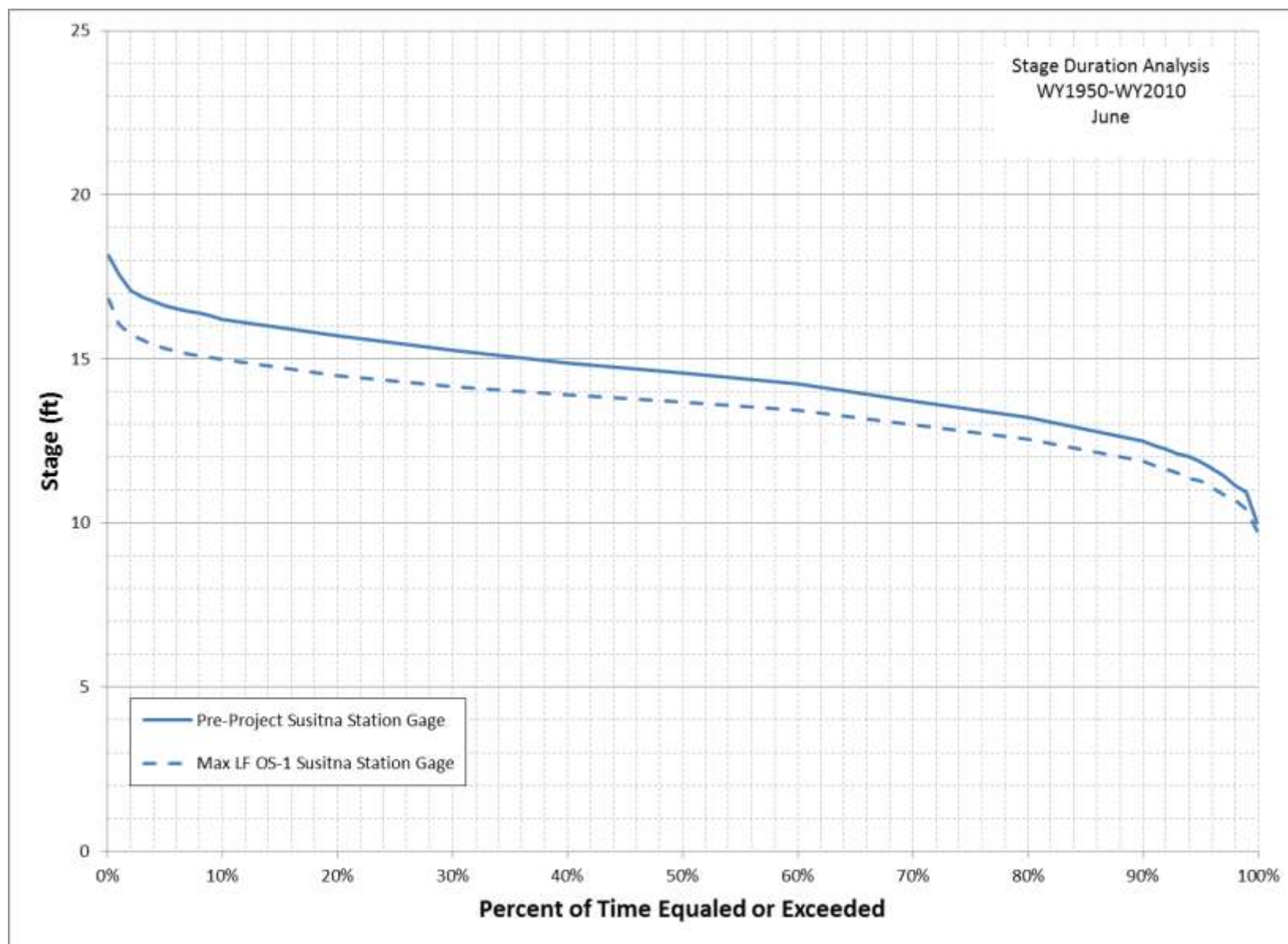


Figure J-23 - Monthly Stage Exceedence Curves for June for pre-Project and Max LF OS-1 Conditions, Susitna Station Gage

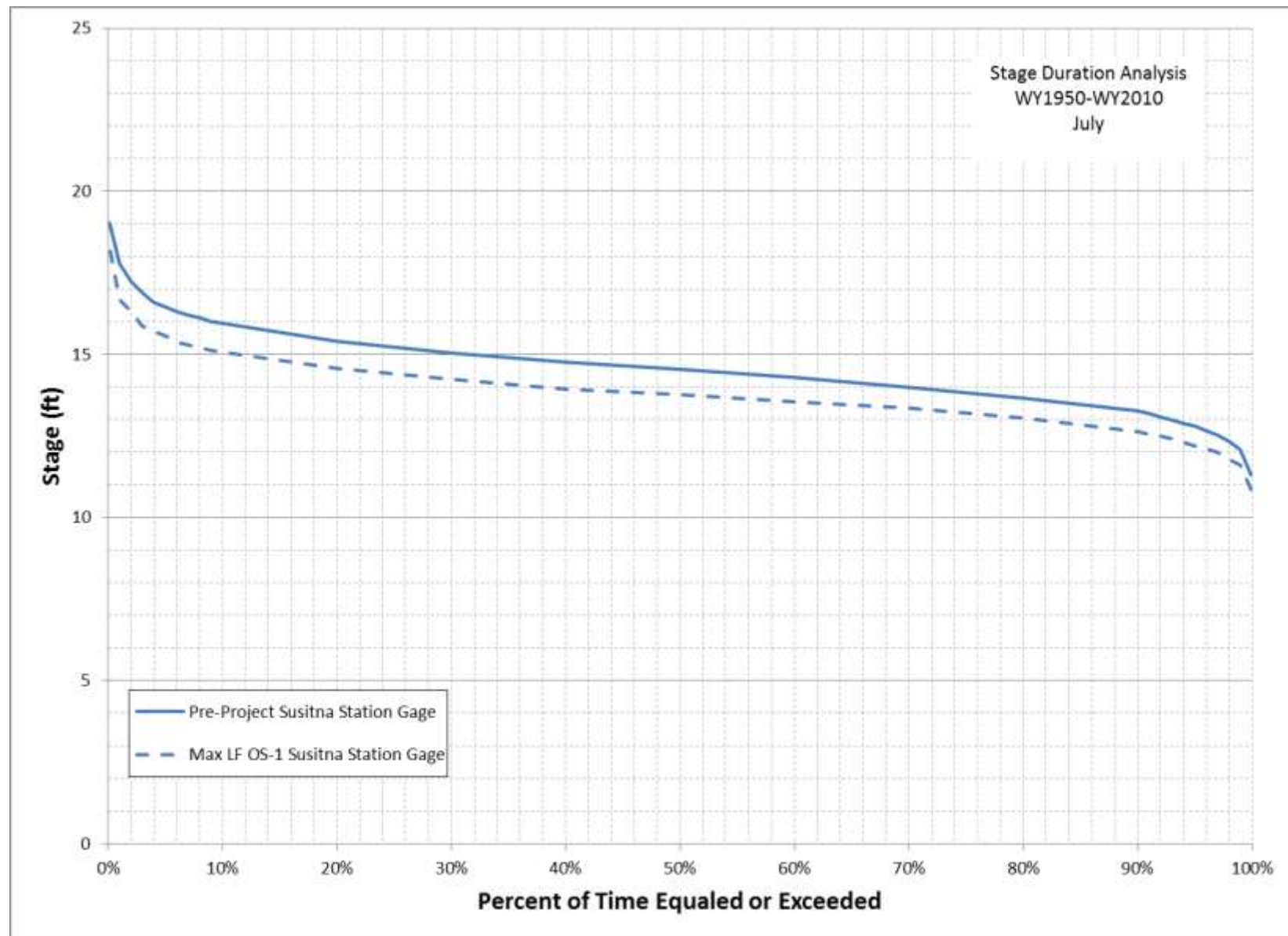


Figure J-24 - Monthly Stage Exceedence Curves for July for pre-Project and Max LF OS-1 Conditions, Susitna Station Gage

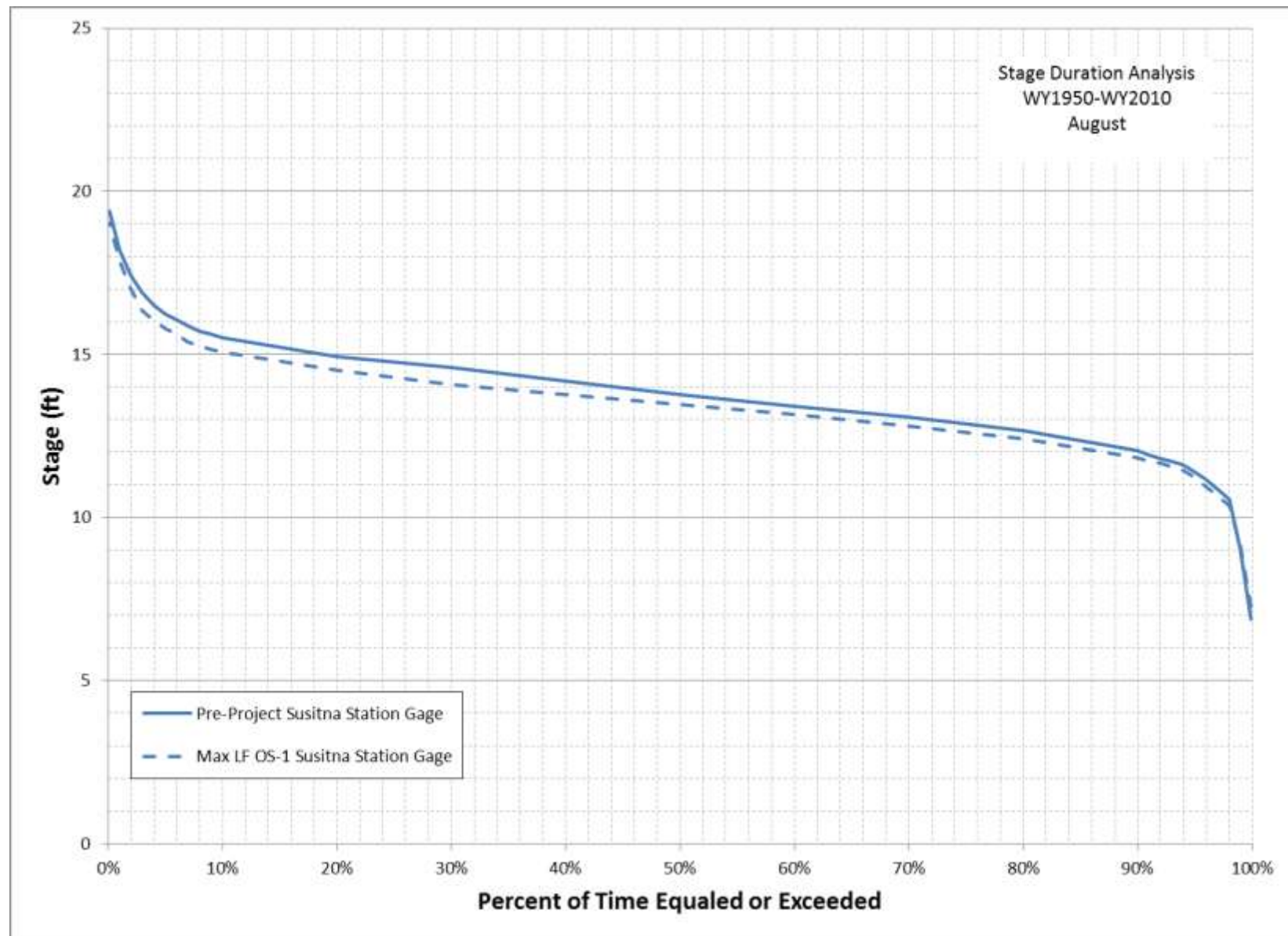


Figure J-25 - Monthly Stage Exceedence Curves for August for pre-Project and Max LF OS-1 Conditions, Susitna Station Gage

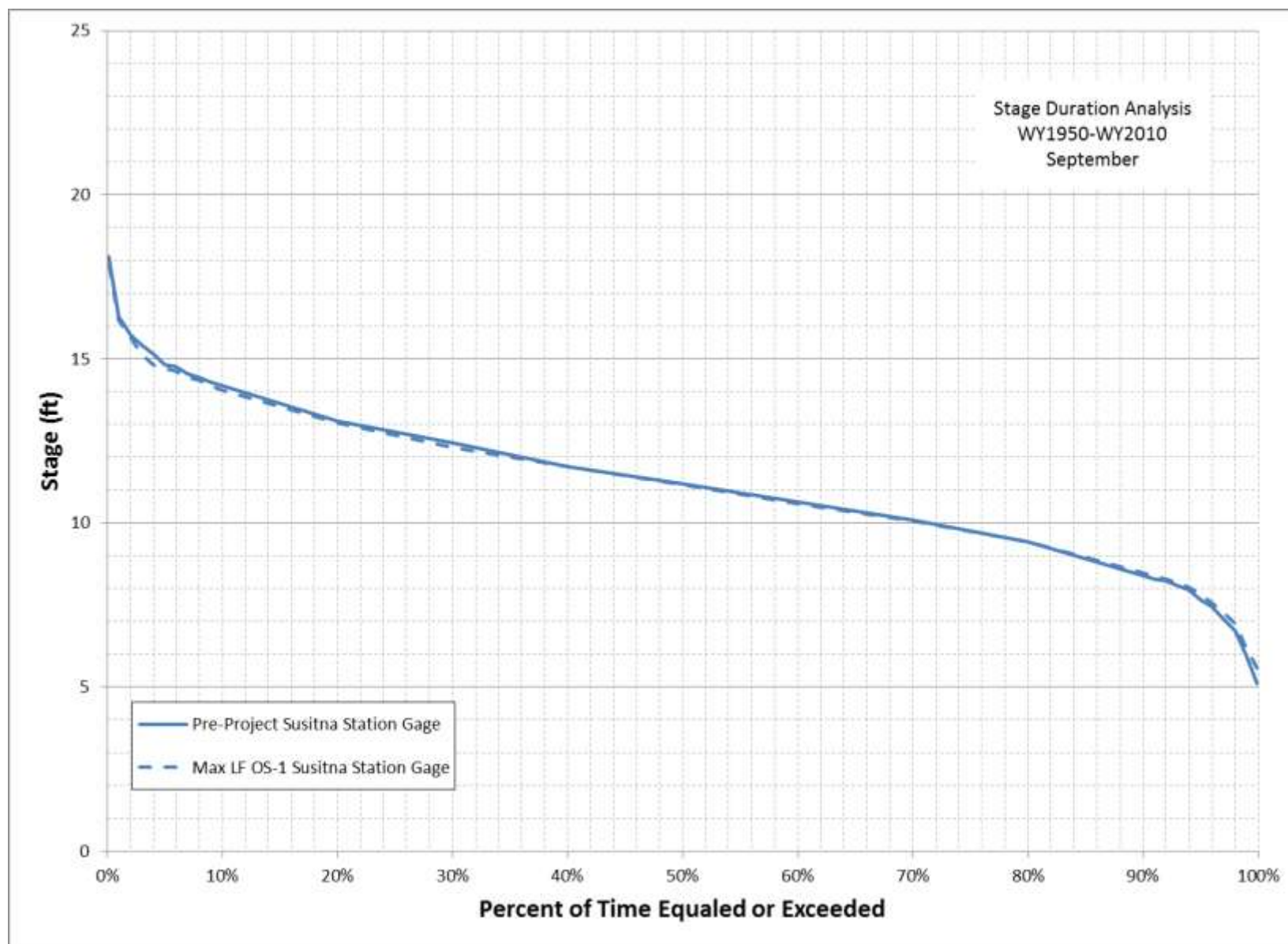


Figure J-26 - Monthly Stage Exceedence Curves for September for pre-Project and Max LF OS-1 Conditions, Susitna Station Gage.

APPENDIX K. PLOTS OF SELECT WATER-SURFACE ELEVATION
EXCEEDENCE VALUES (PRE-PROJECT AND MAXIMUM LOAD
FOLLOWING OS-1 CONDITIONS) FOR SUNSHINE GAGE AND
SUSITNA STATION GAGE CROSS SECTION

Susitna-Watana Hydroelectric Project (FERC No. 14241)

Stream Flow Assessment

Prepared for

Alaska Energy Authority



Prepared by

Tetra Tech

February 2013

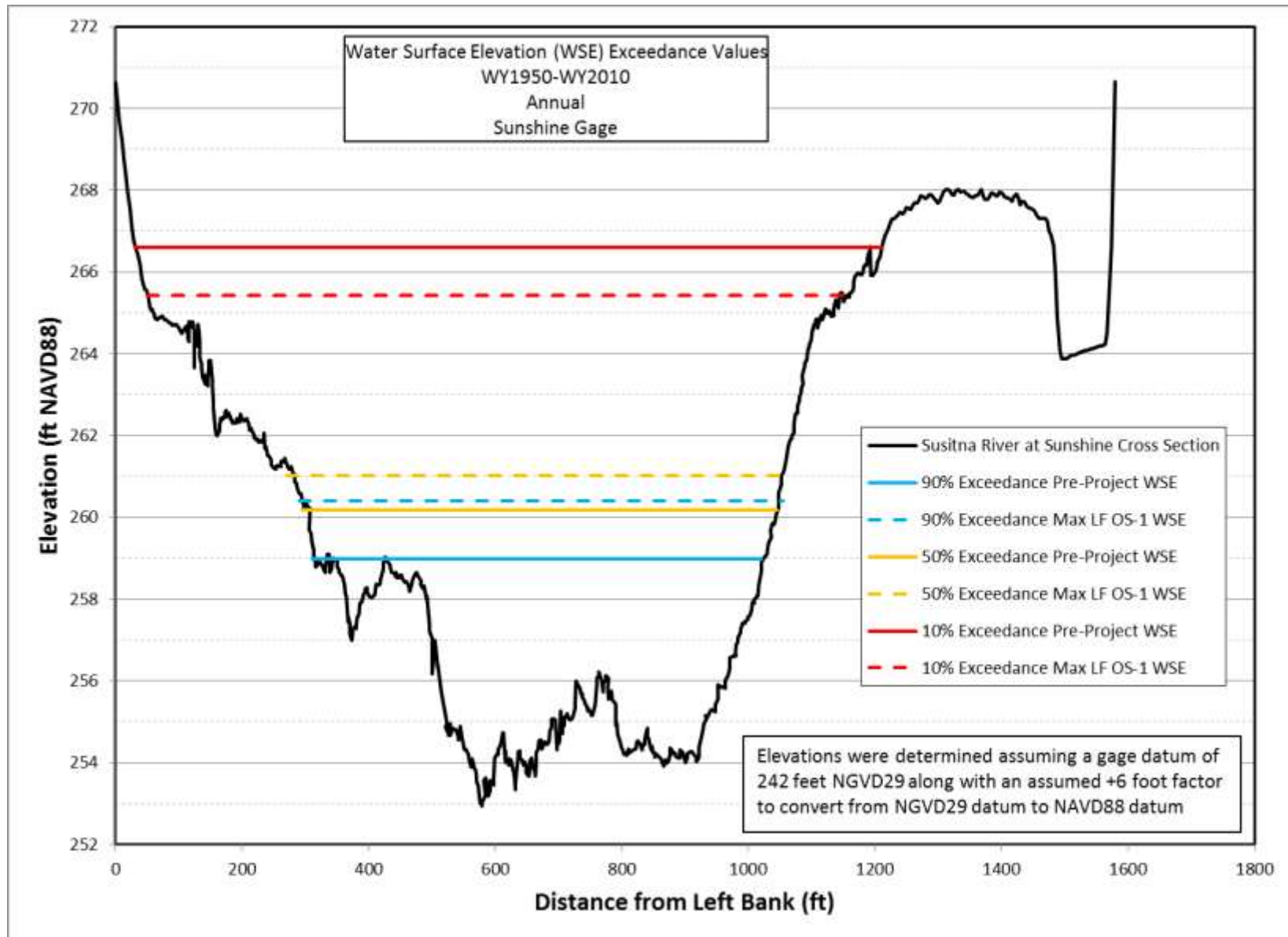


Figure K-1 - Select Annual Water-surface Elevation Exceedance Values, pre-Project and Max LF OS-1 Conditions, Sunshine Gage

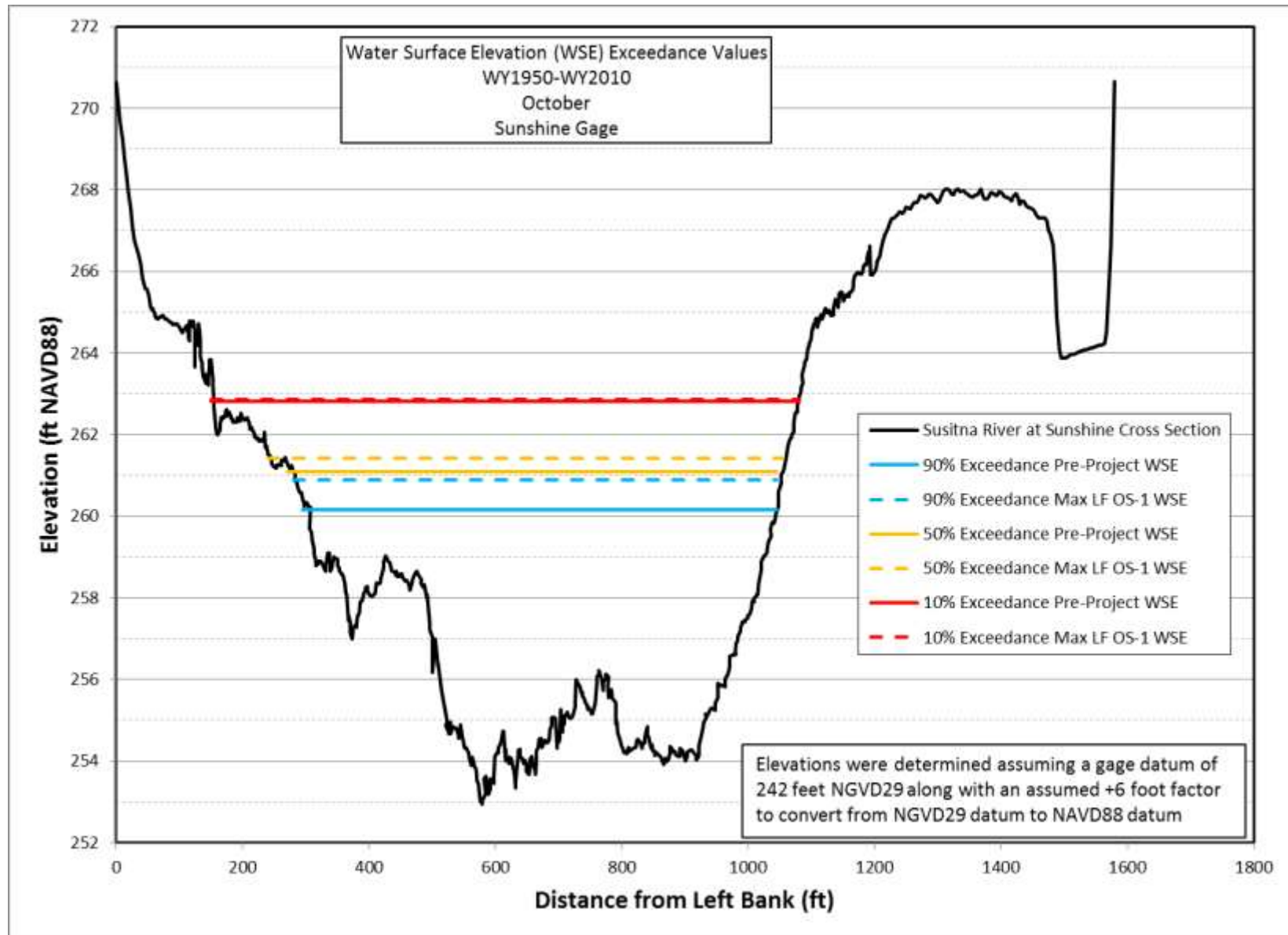


Figure K-2 – Select Water-surface Elevation Exceedance Values for October, pre-Project and Max LF OS-1 Conditions, Sunshine Gage

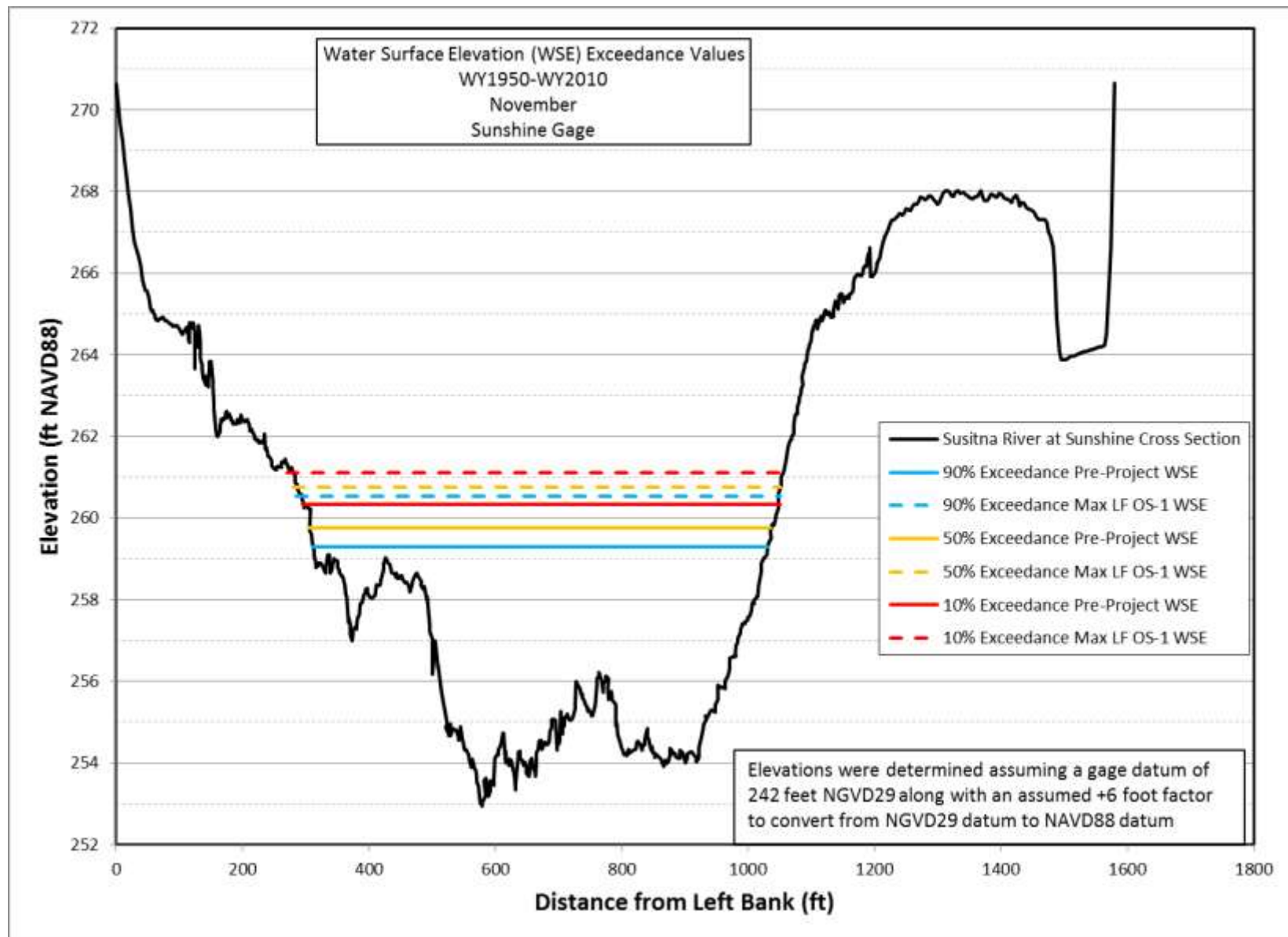


Figure K-3 – Select Water-surface Elevation Exceedance Values for November, pre-Project and Max LF OS-1 Conditions, Sunshine Gage

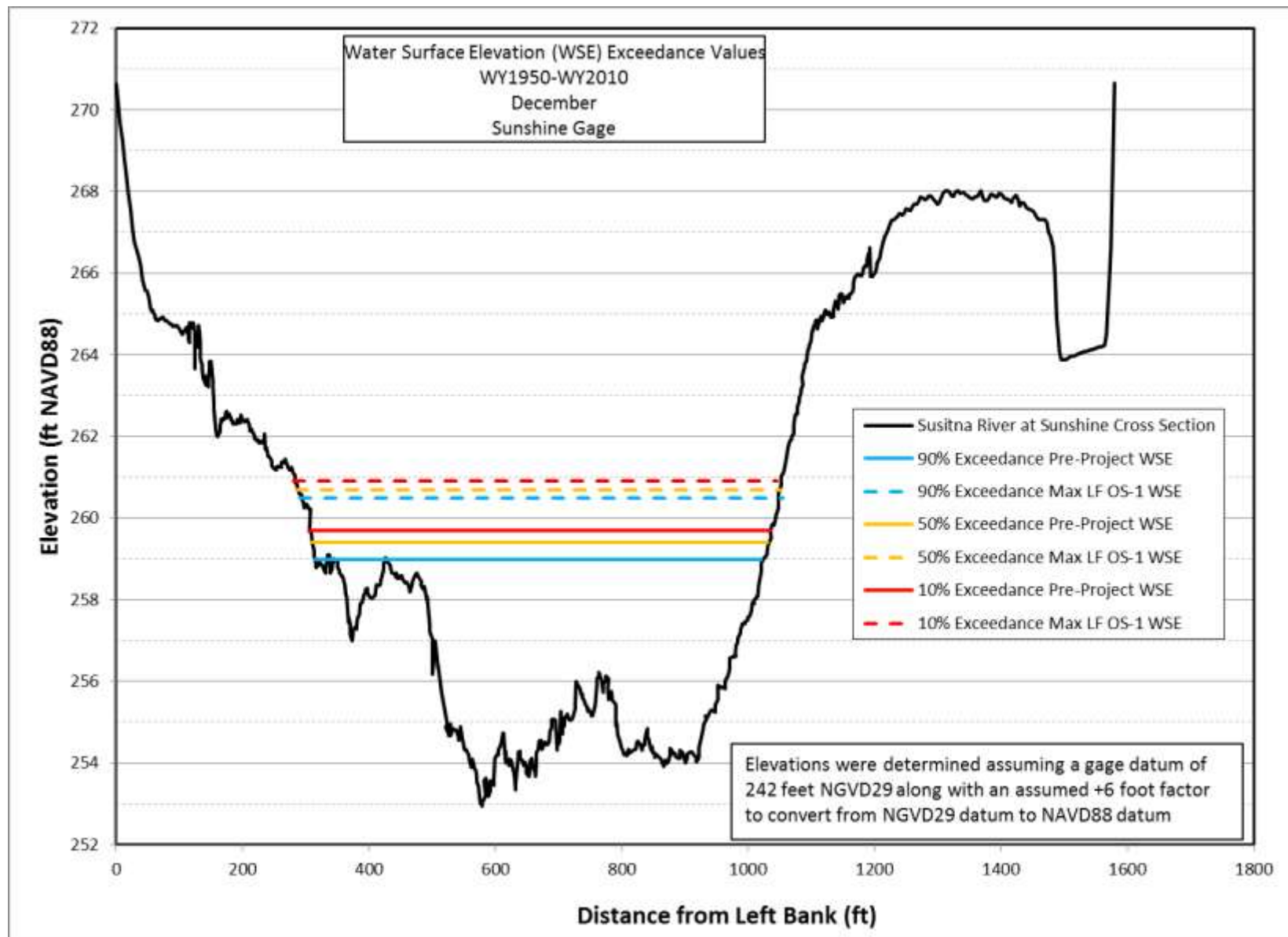


Figure K-4 – Select Water-surface Elevation Exceedance Values for December, pre-Project and Max LF OS-1 Conditions, Sunshine Gage

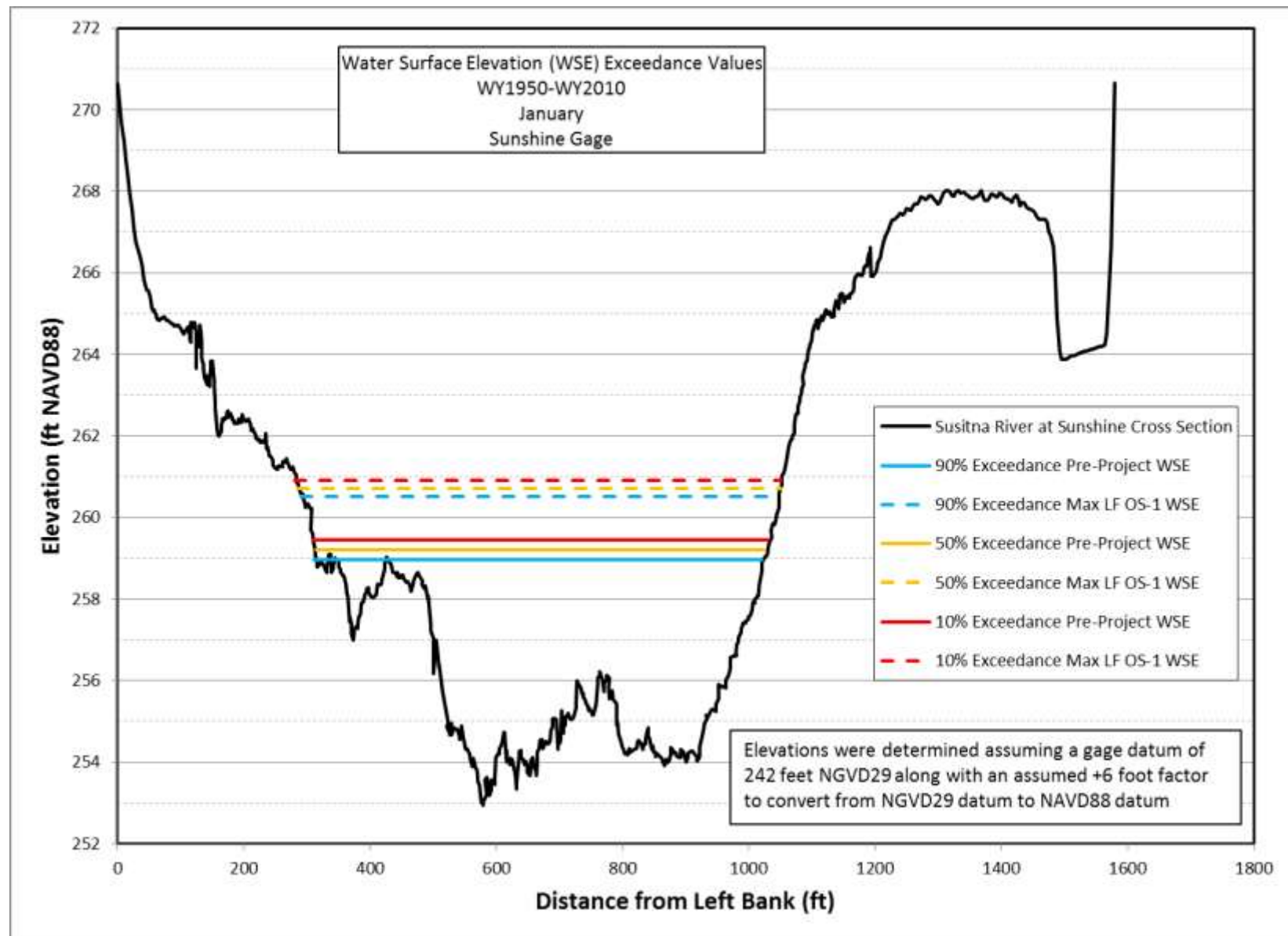


Figure K-5 – Select Water-surface Elevation Exceedance Values for January, pre-Project and Max LF OS-1 Conditions, Sunshine Gage

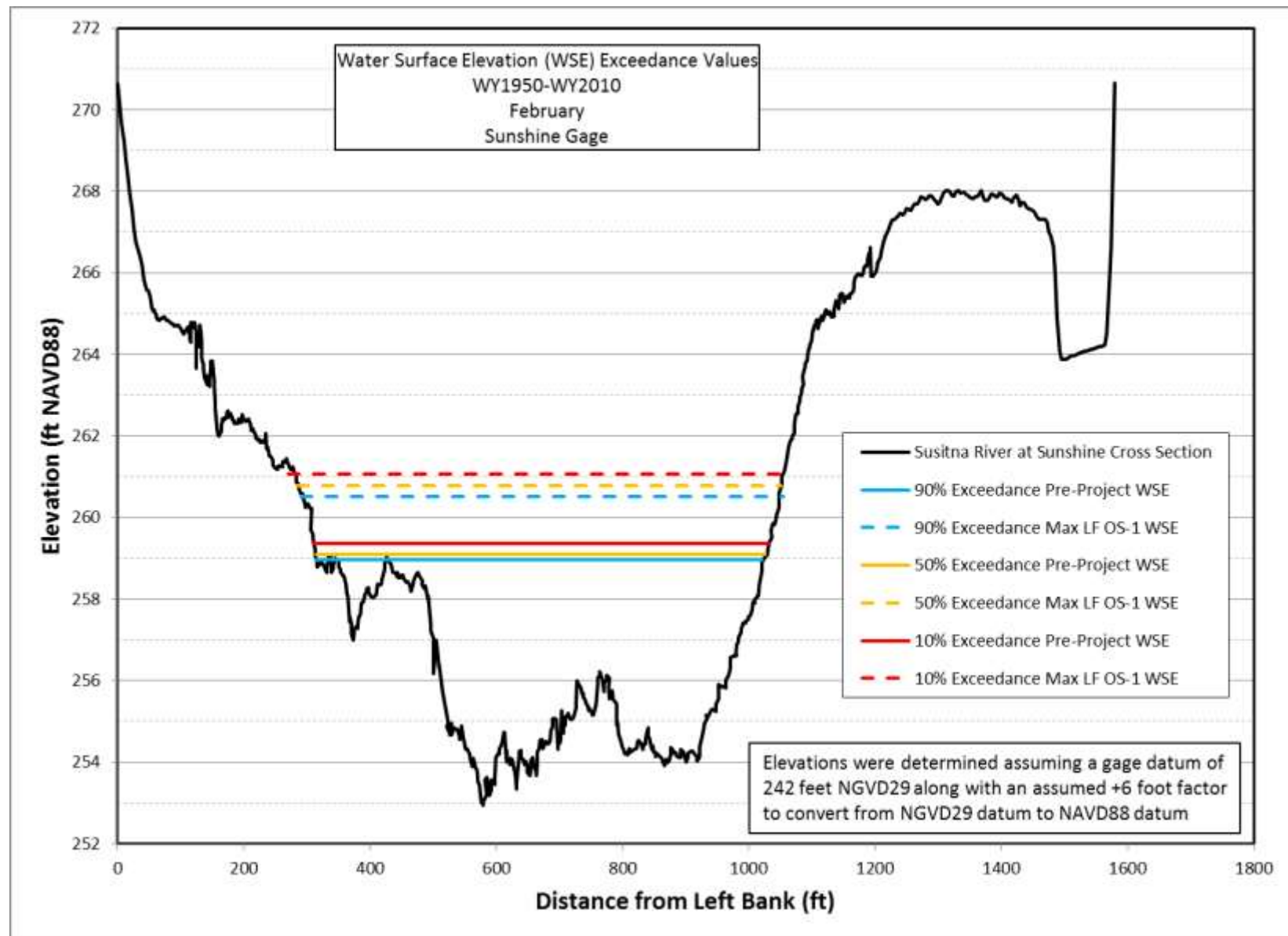


Figure K-6 – Select Water-surface Elevation exceedance Values for February, pre-Project and Max LF OS-1 Conditions, Sunshine Gage

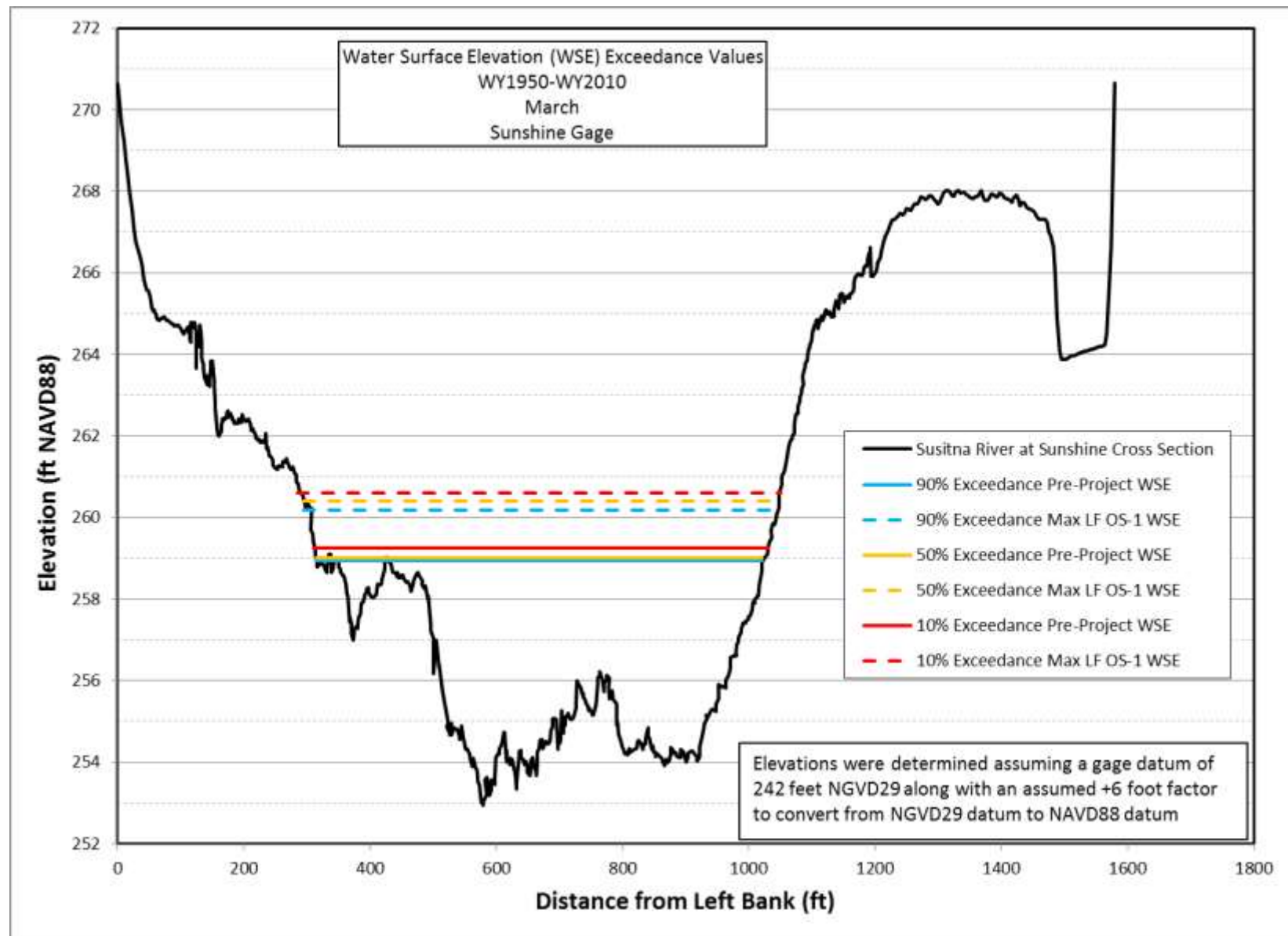


Figure K-7 – Select Water-surface Elevation Exceedance Values for March, pre-Project and Max LF OS-1 Conditions, Sunshine Gage

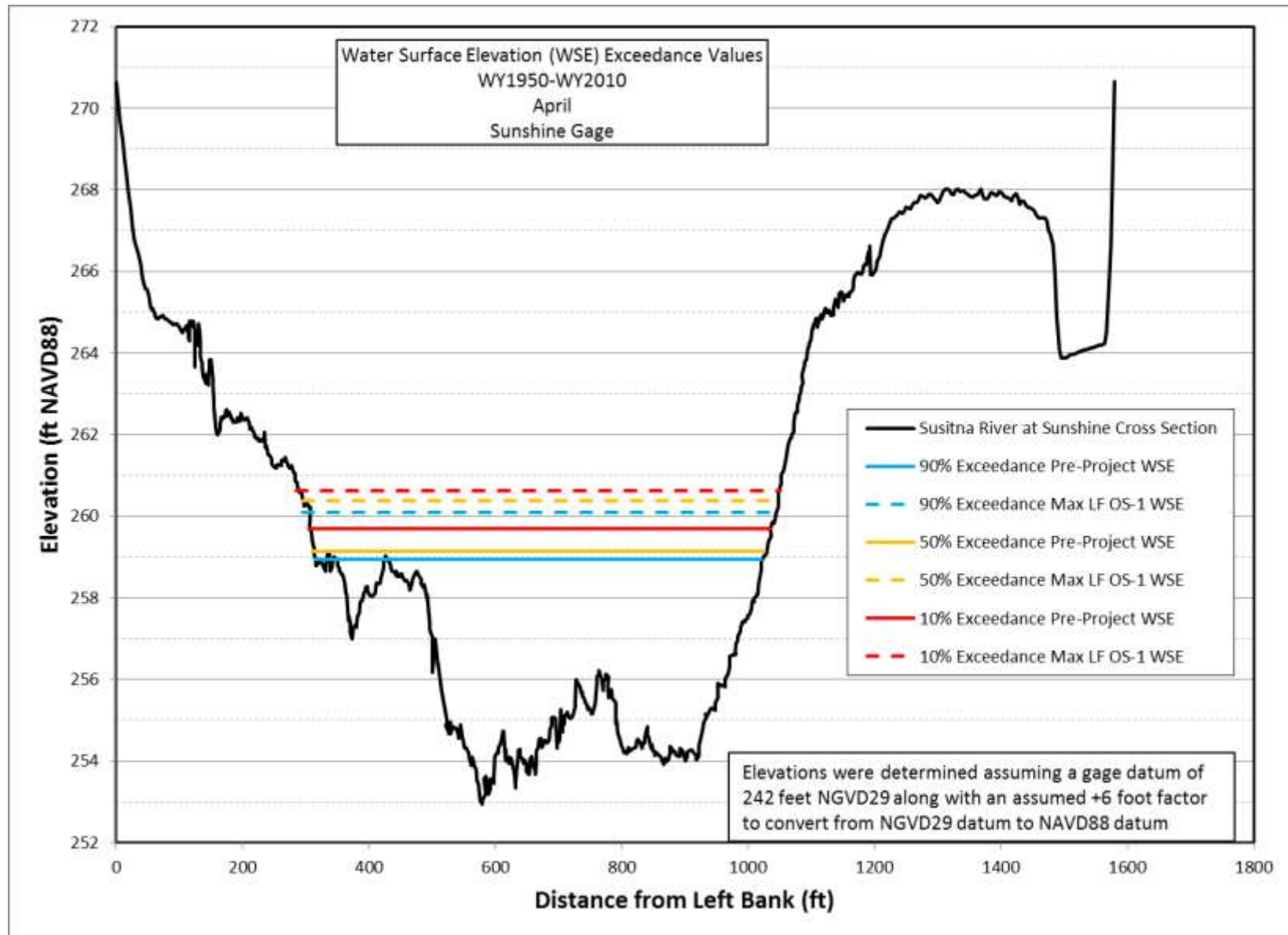


Figure K-8 – Select Water-surface Elevation Exceedance Values for April, pre-Project and Max LF OS-1 Conditions, Sunshine Gage

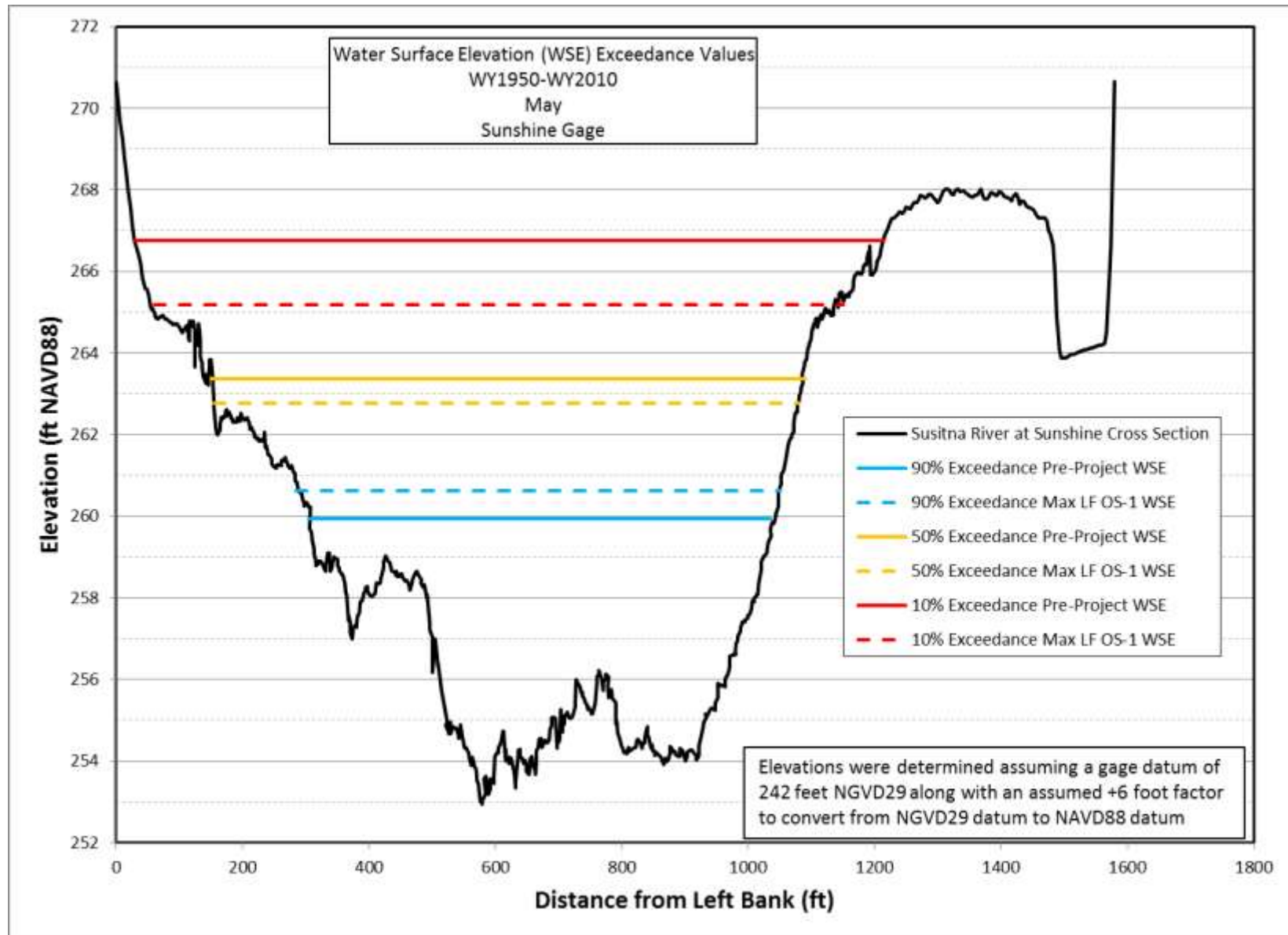


Figure K-9 – Select Water-surface Elevation Exceedance Values for May, pre-Project and Max LF OS-1 Conditions, Sunshine Gage

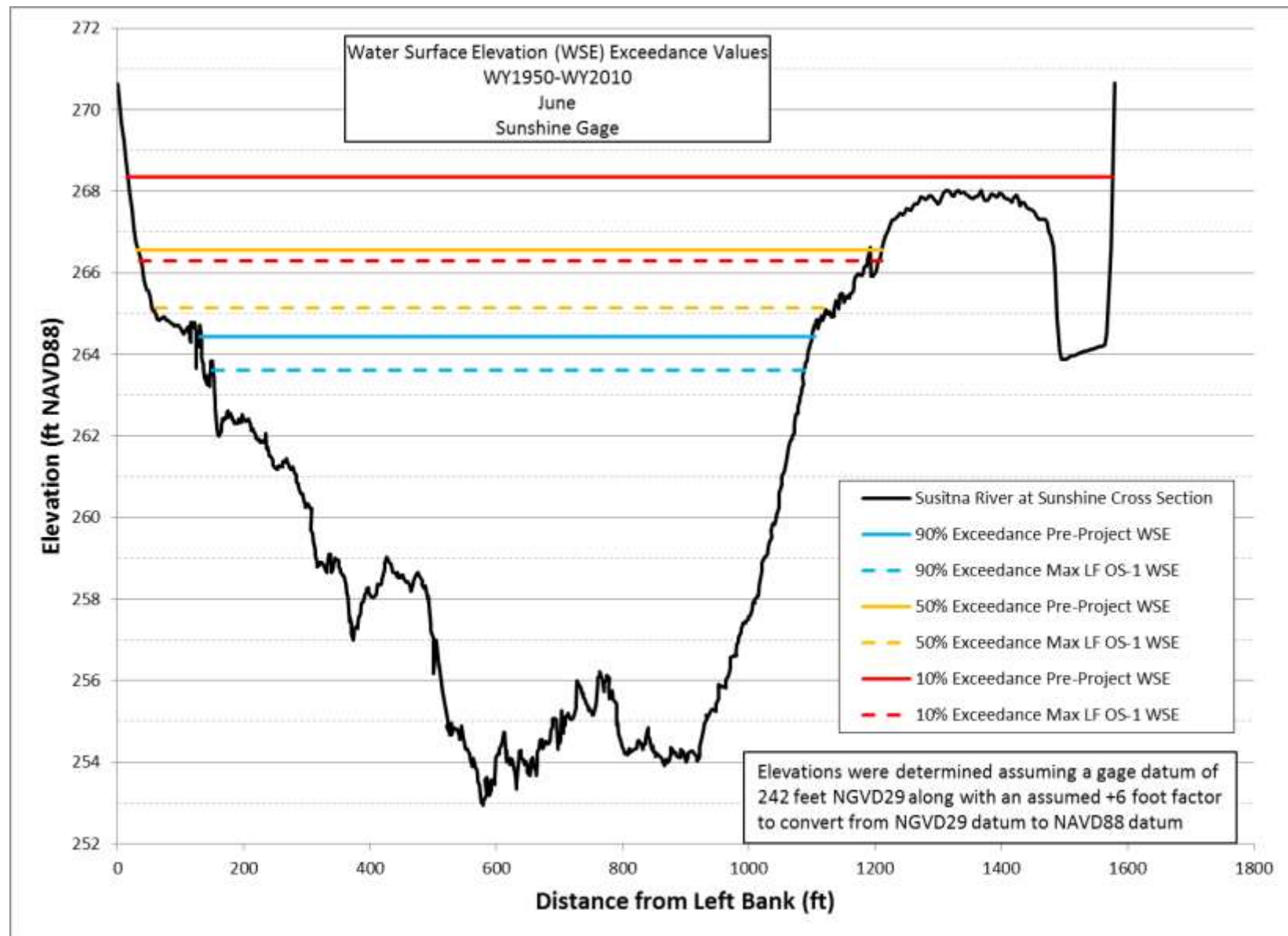


Figure K-10 – Select Water-surface Elevation Exceedance Values for June, pre-Project and Max LF OS-1 Conditions, Sunshine Gage

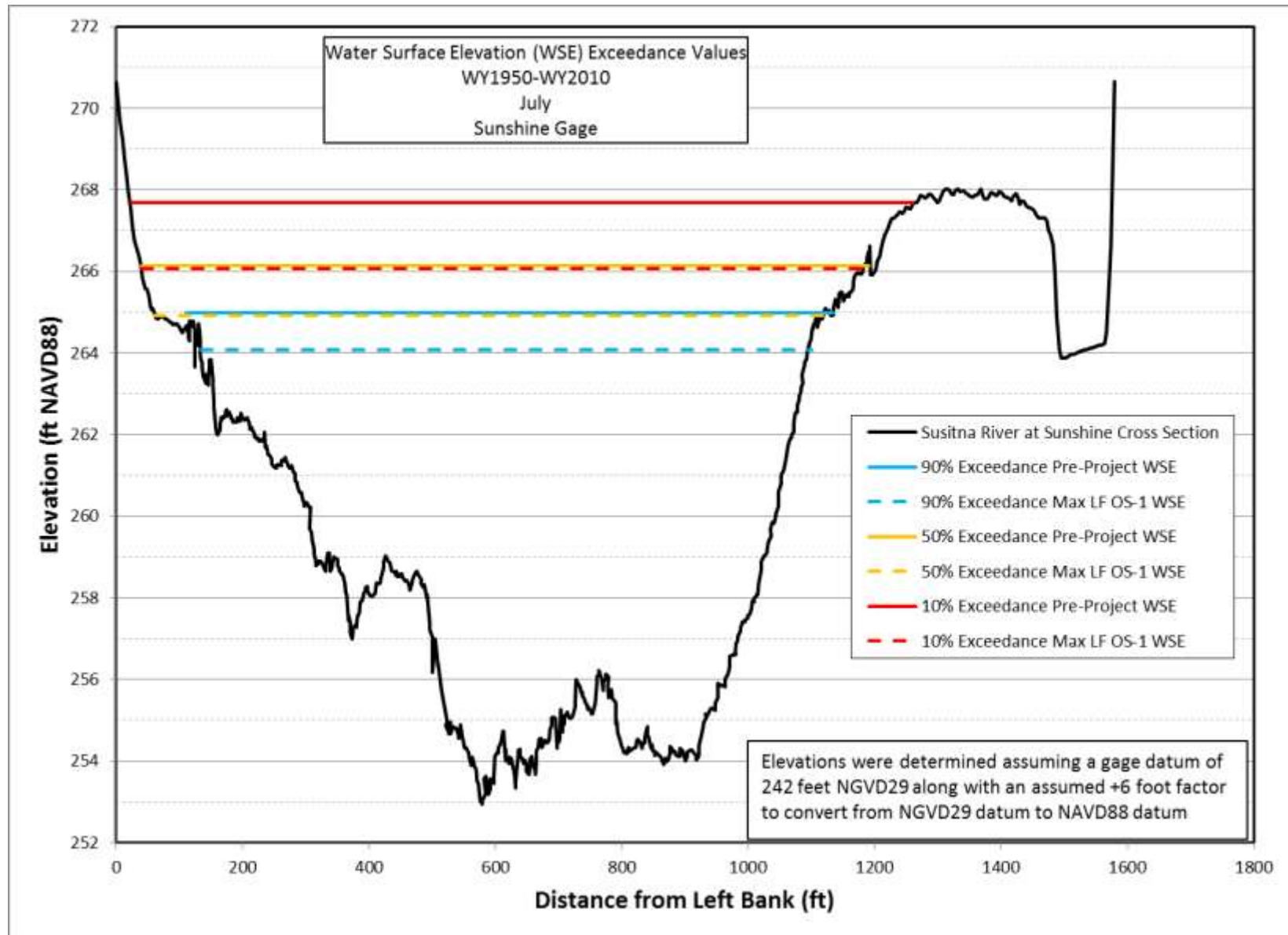


Figure K-11 – Select Water-surface Elevation Exceedance Values for July, pre-Project and Max LF OS-1 Conditions, Sunshine Gage

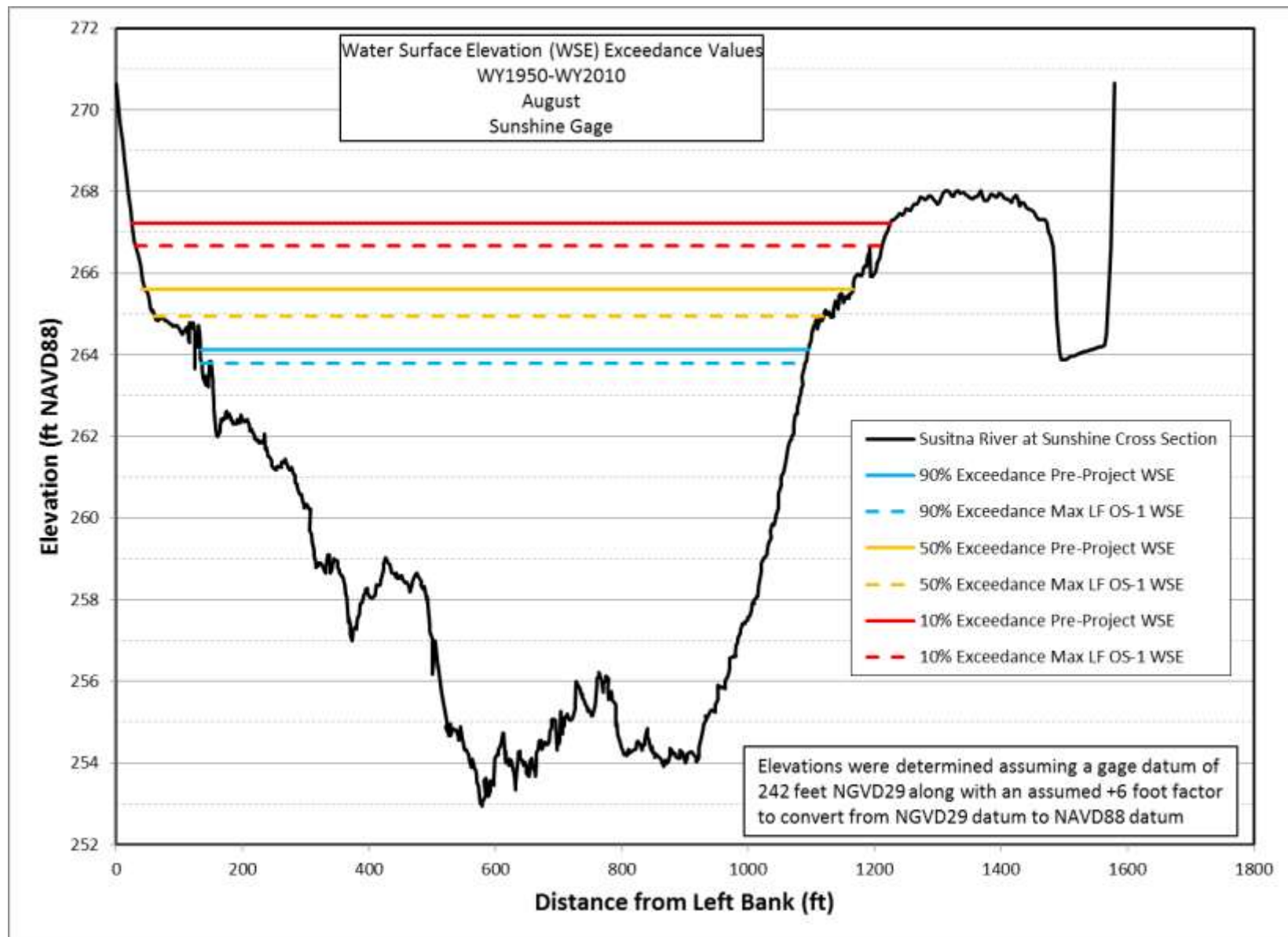


Figure K-12 – Select Water-surface Elevation Exceedance Values for August, pre-Project and Max LF OS-1 Conditions, Sunshine Gage

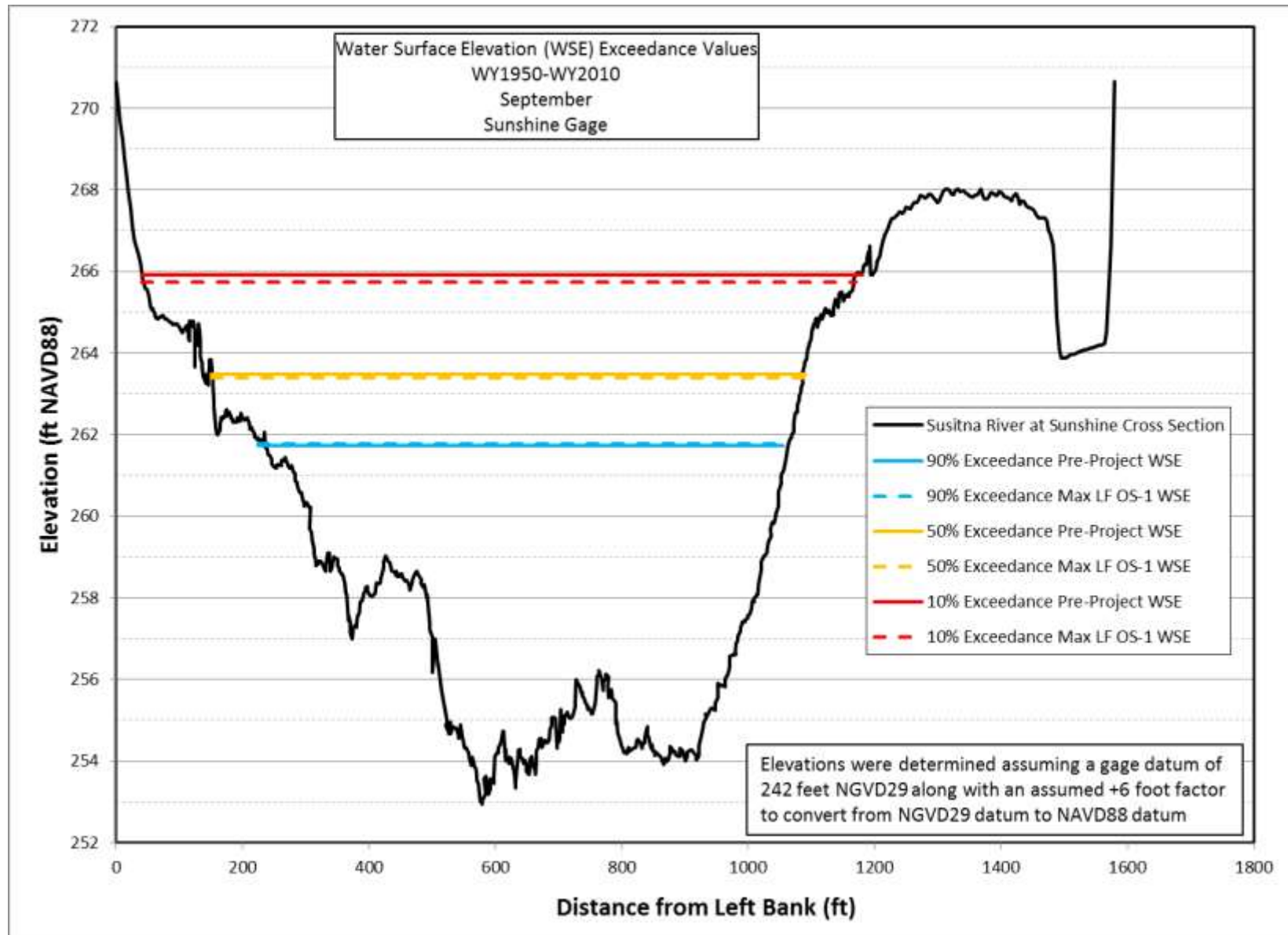


Figure K-13 – Select Water-surface Elevation Exceedance Values for September, pre-Project and Max LF OS-1 Conditions, Sunshine Gage

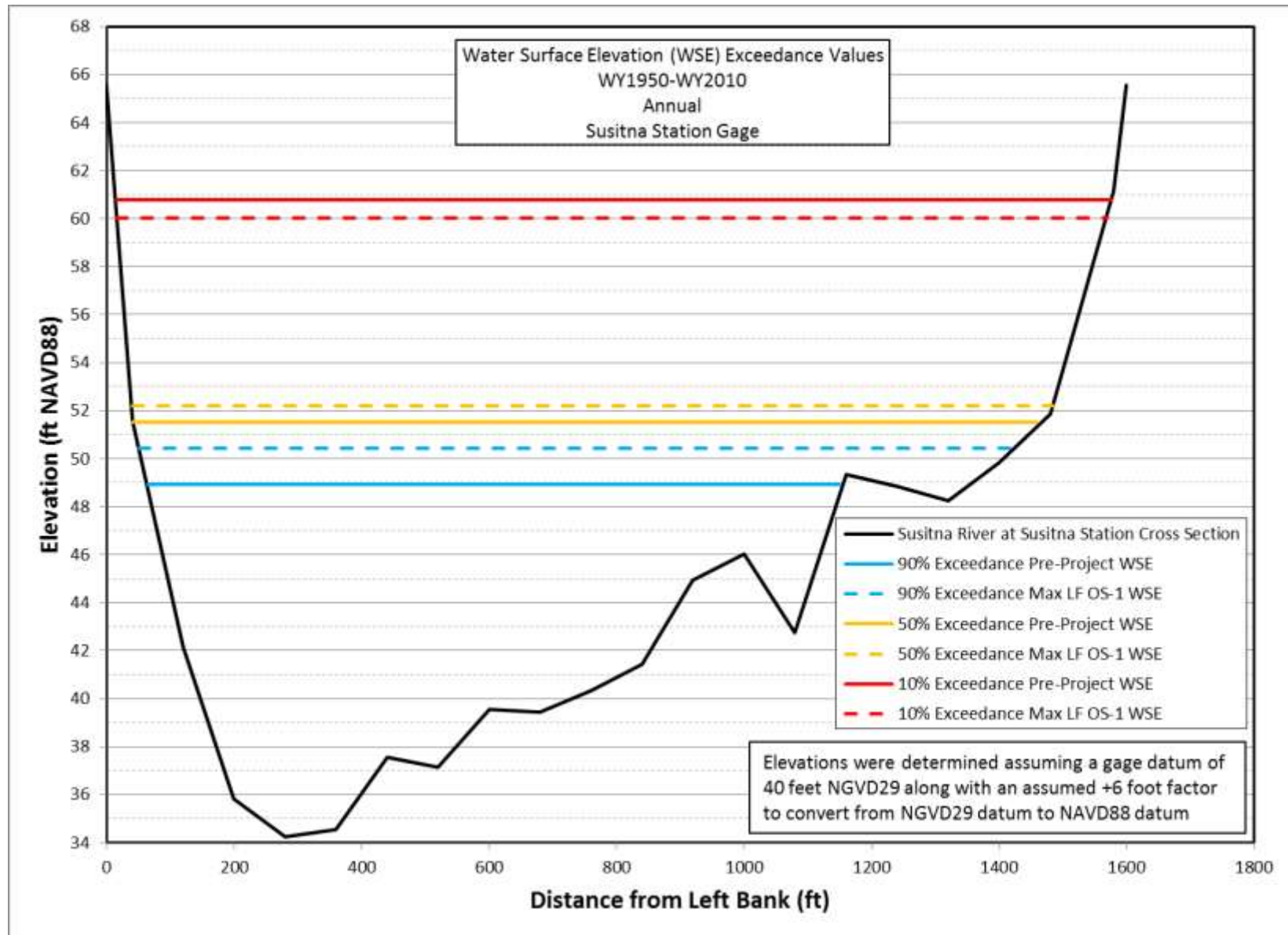


Figure K-14 - Select Annual Water-surface Elevation Exceedance Values, pre-Project and Max LF OS-1 Conditions, Susitna Station Gage

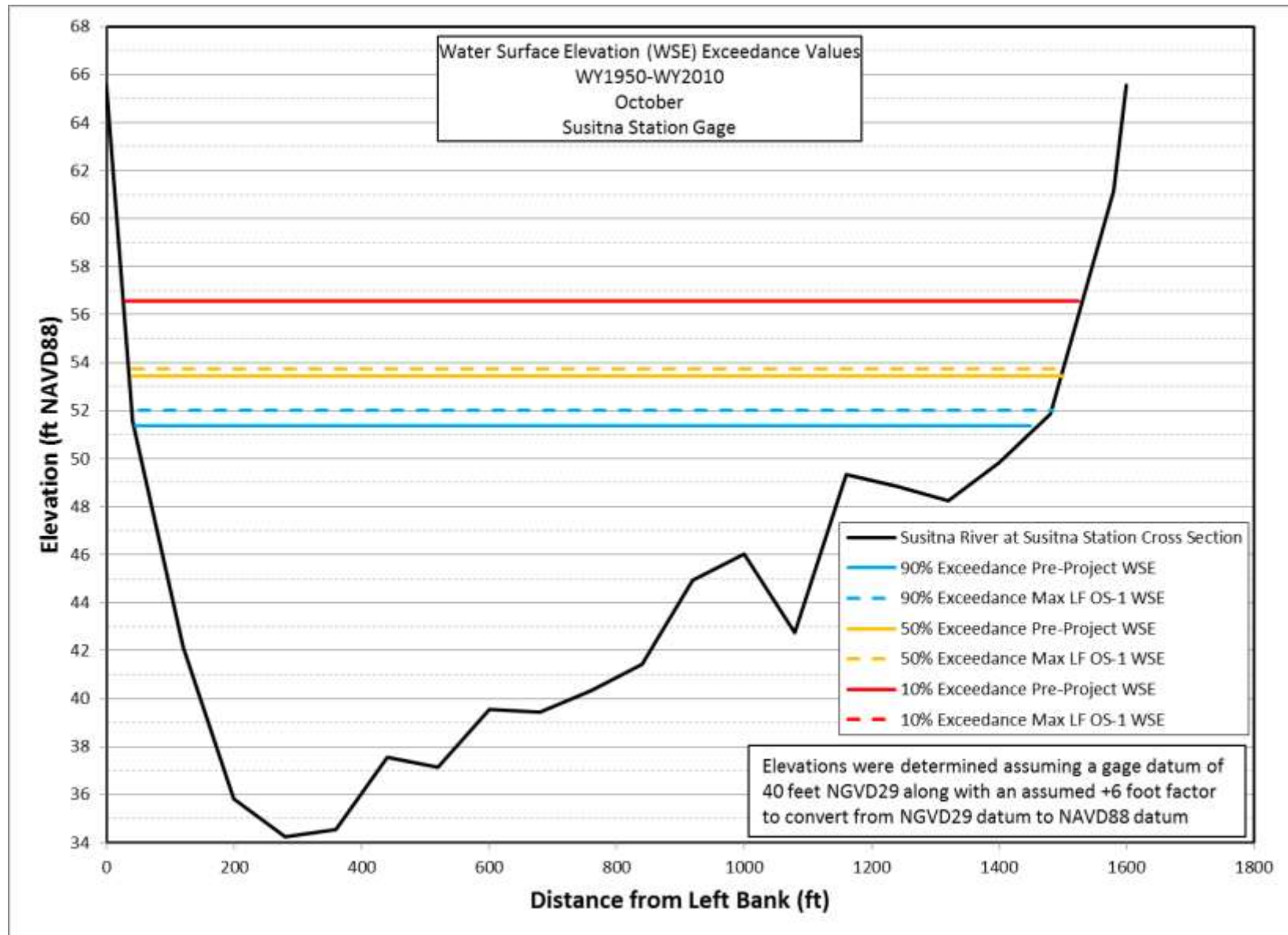


Figure K-15 – Select Water-surface Elevation Exceedance Values for October, pre-Project and Max LF OS-1 Conditions, Susitna Station Gage

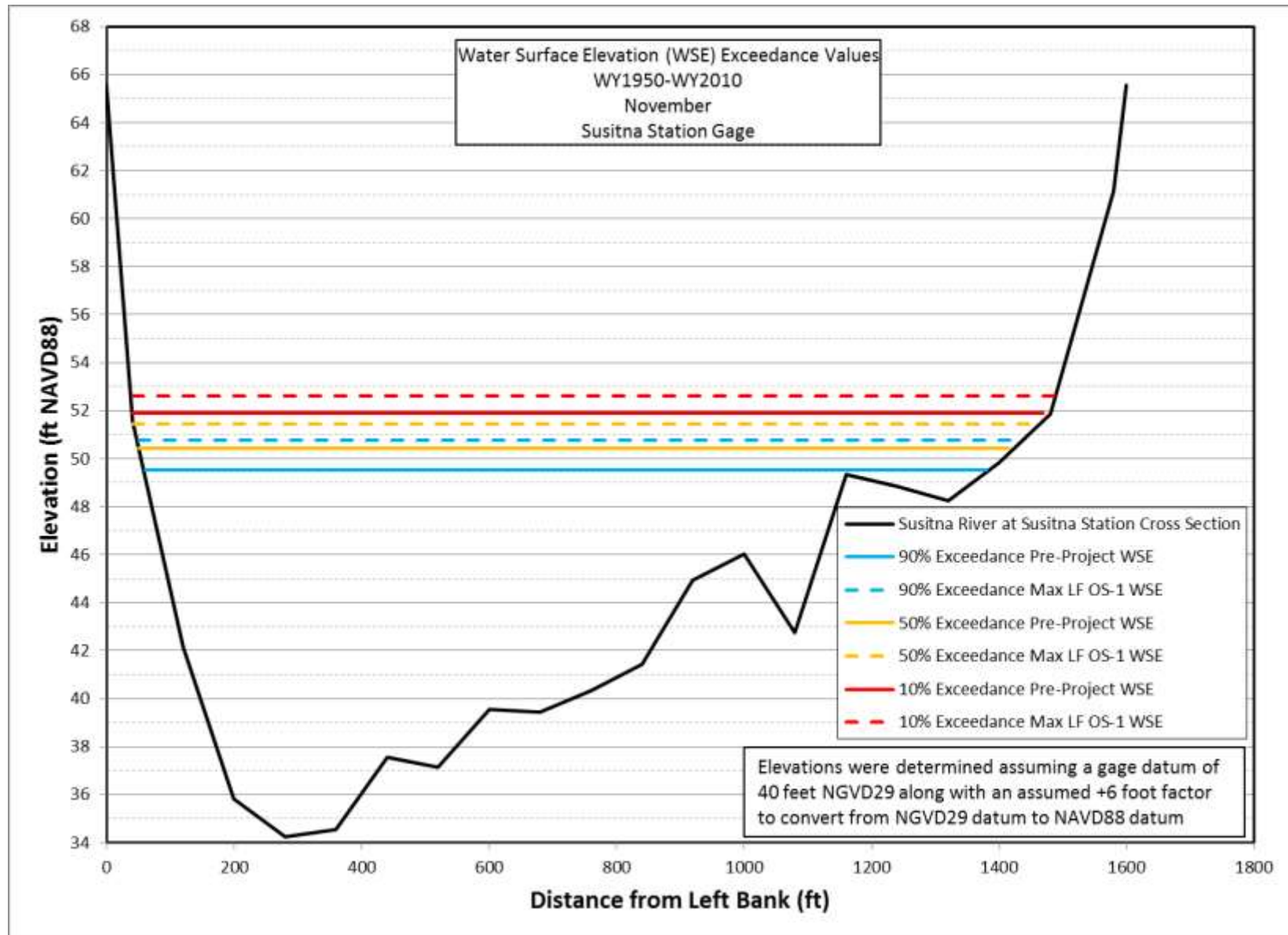


Figure K-16 – Select Water-surface Elevation Exceedance Values for November, pre-Project and Max LF OS-1 Conditions, Susitna Station Gage

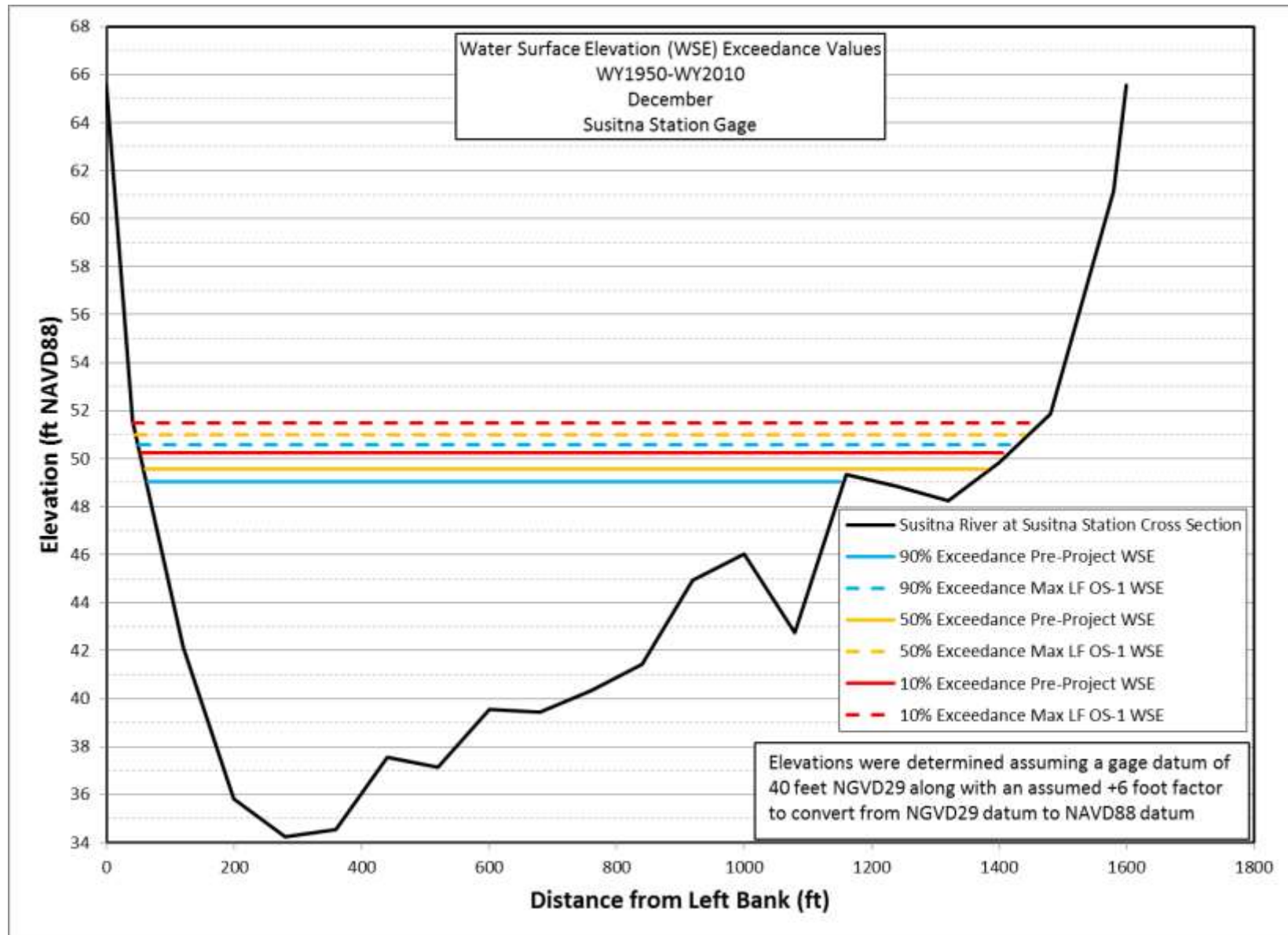


Figure K-17 – Select Water-surface Elevation Exceedance Values for December, pre-Project and Max LF OS-1 Conditions, Susitna Station Gage

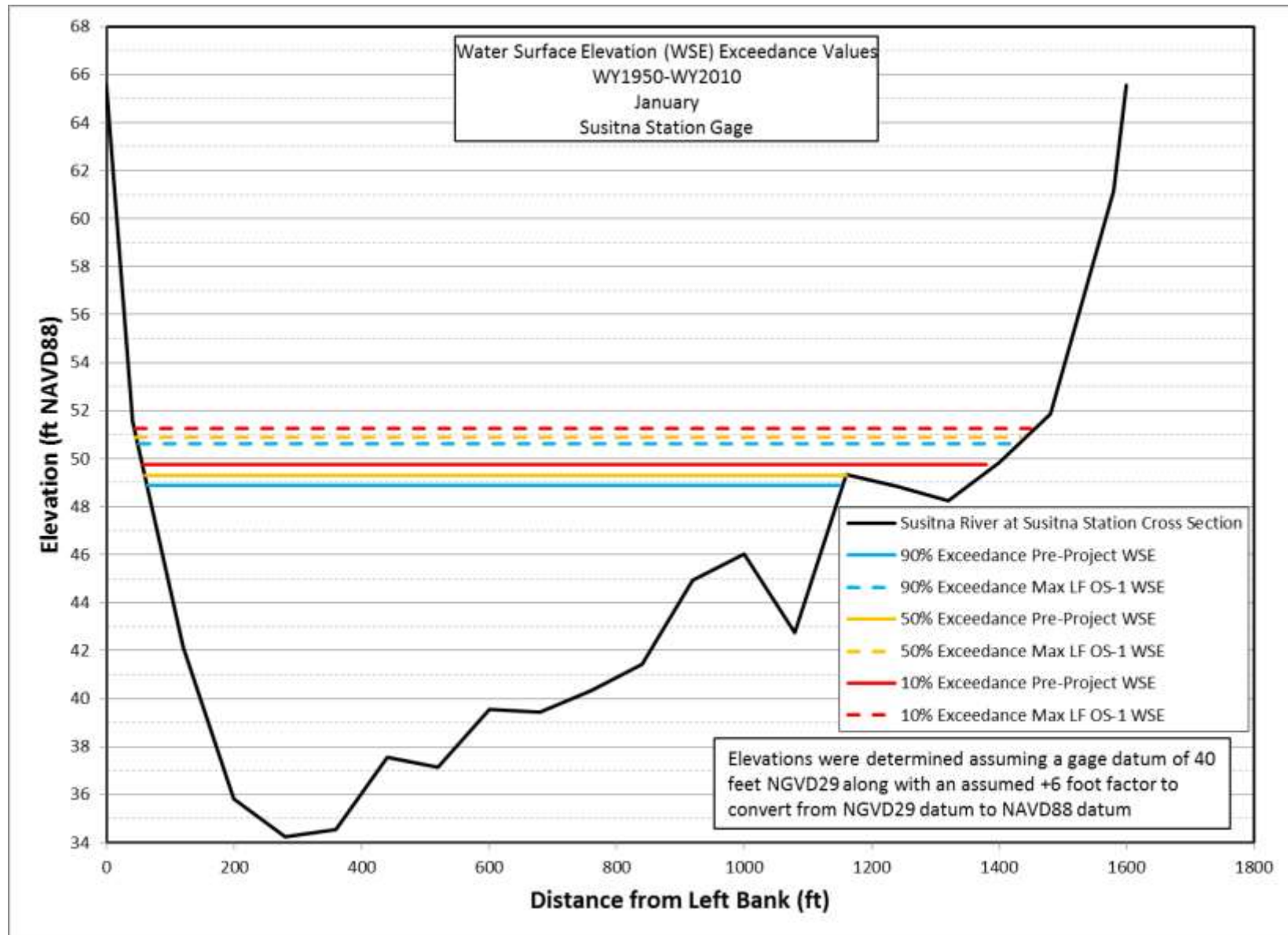


Figure K-18 – Select Water-surface Elevation Exceedance Values for January, pre-Project and Max LF OS-1 Conditions, Susitna Station Gage

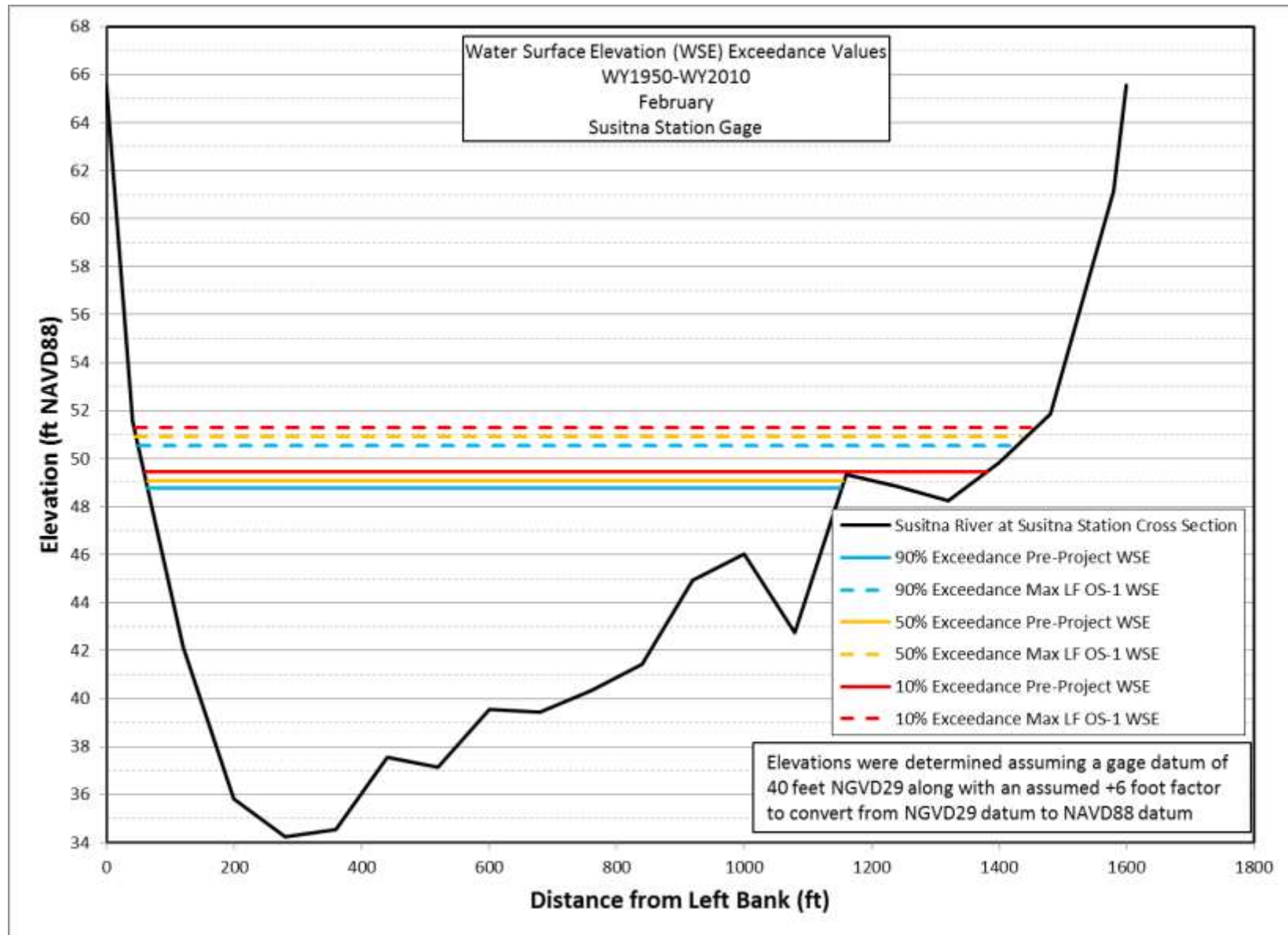


Figure K-19 – Select Water-surface Elevation Exceedance Values for February, pre-Project and Max LF OS-1 Conditions, Susitna Station Gage

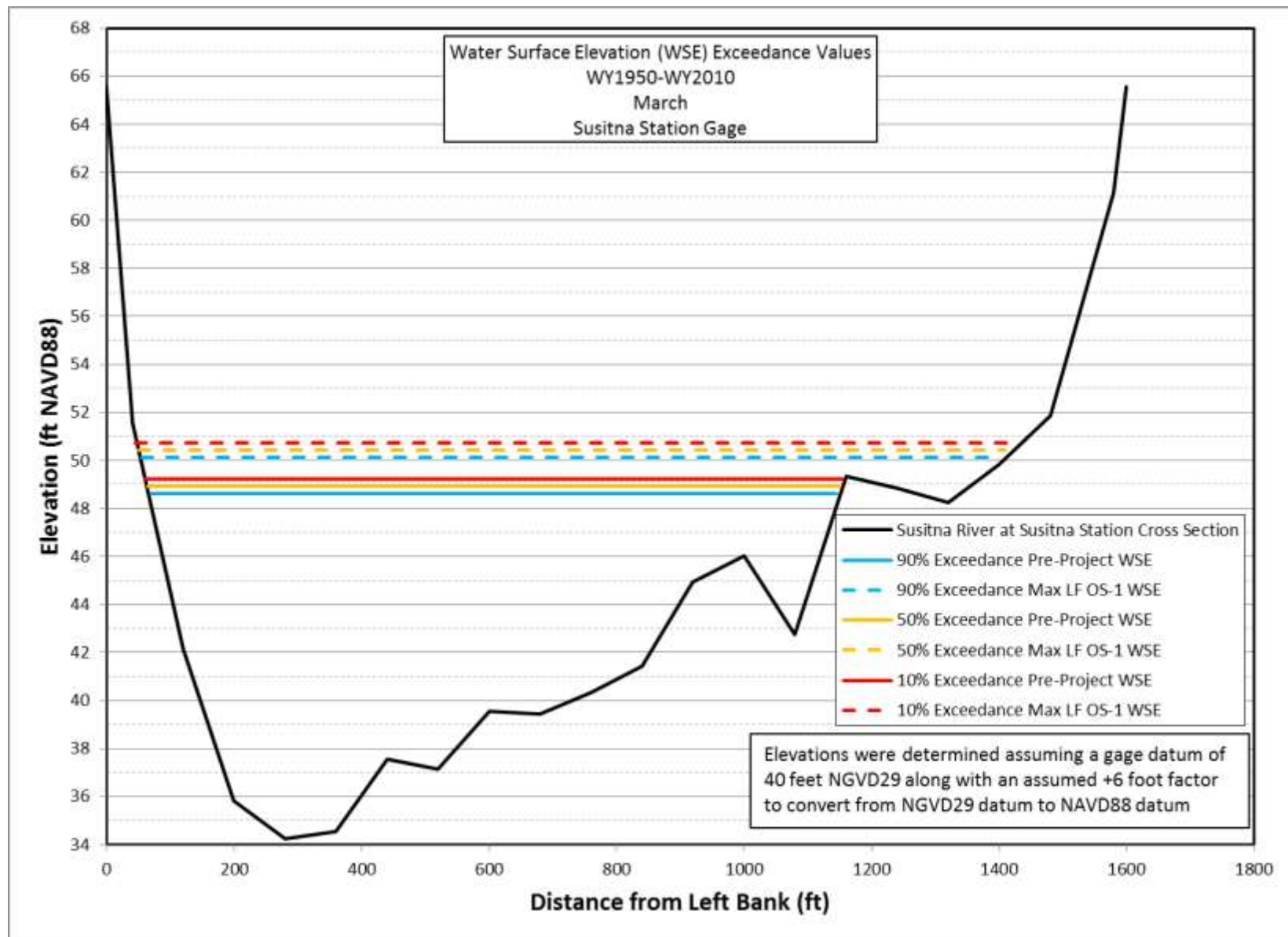


Figure K-20 – Select Water-surface Elevation Exceedance Values for March, pre-Project and Max LF OS-1 Conditions, Susitna Station Gage

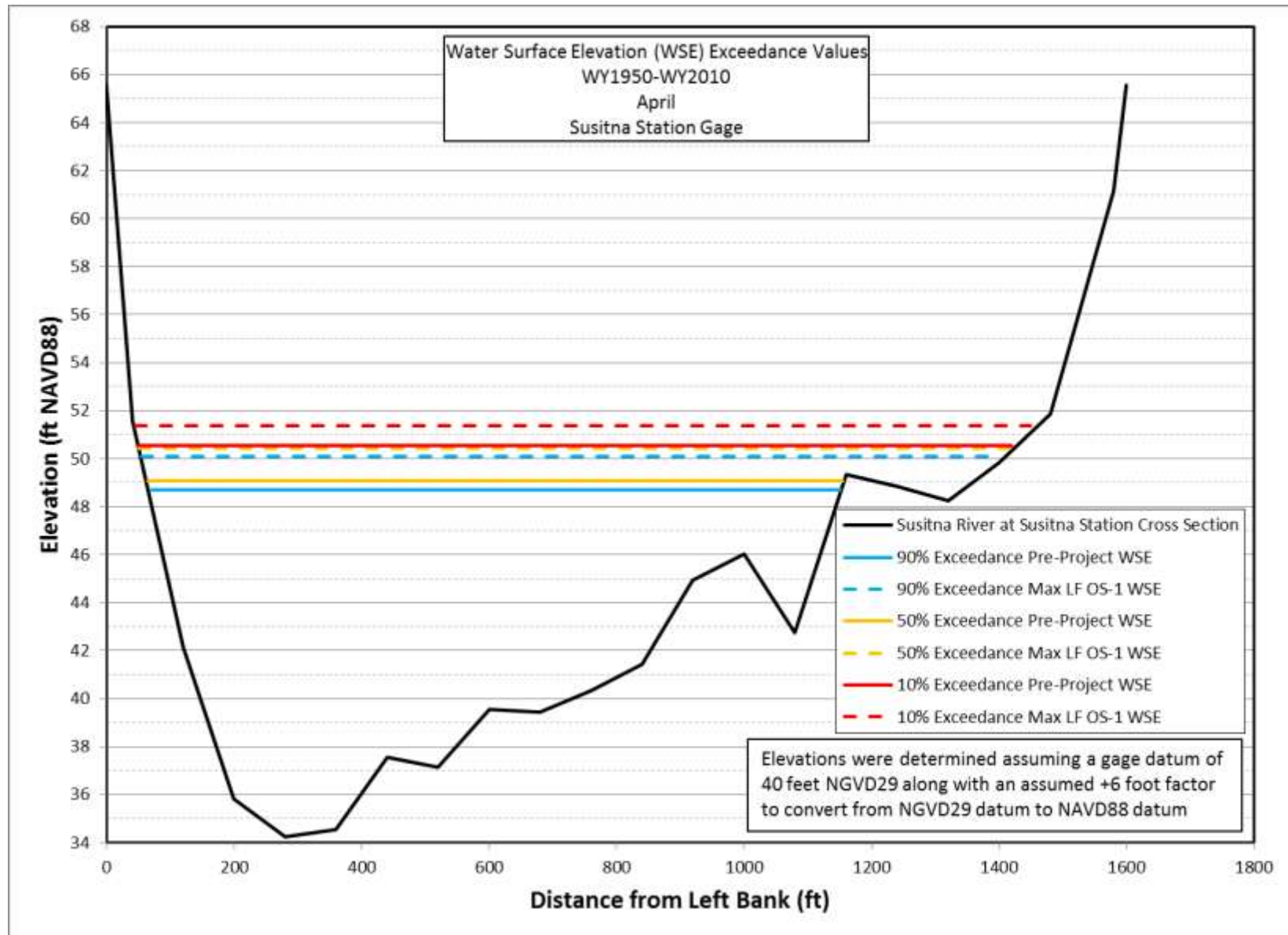


Figure K-21 – Select Water-surface Elevation Exceedance Values for April, pre-Project and Max LF OS-1 Conditions, Susitna Station Gage

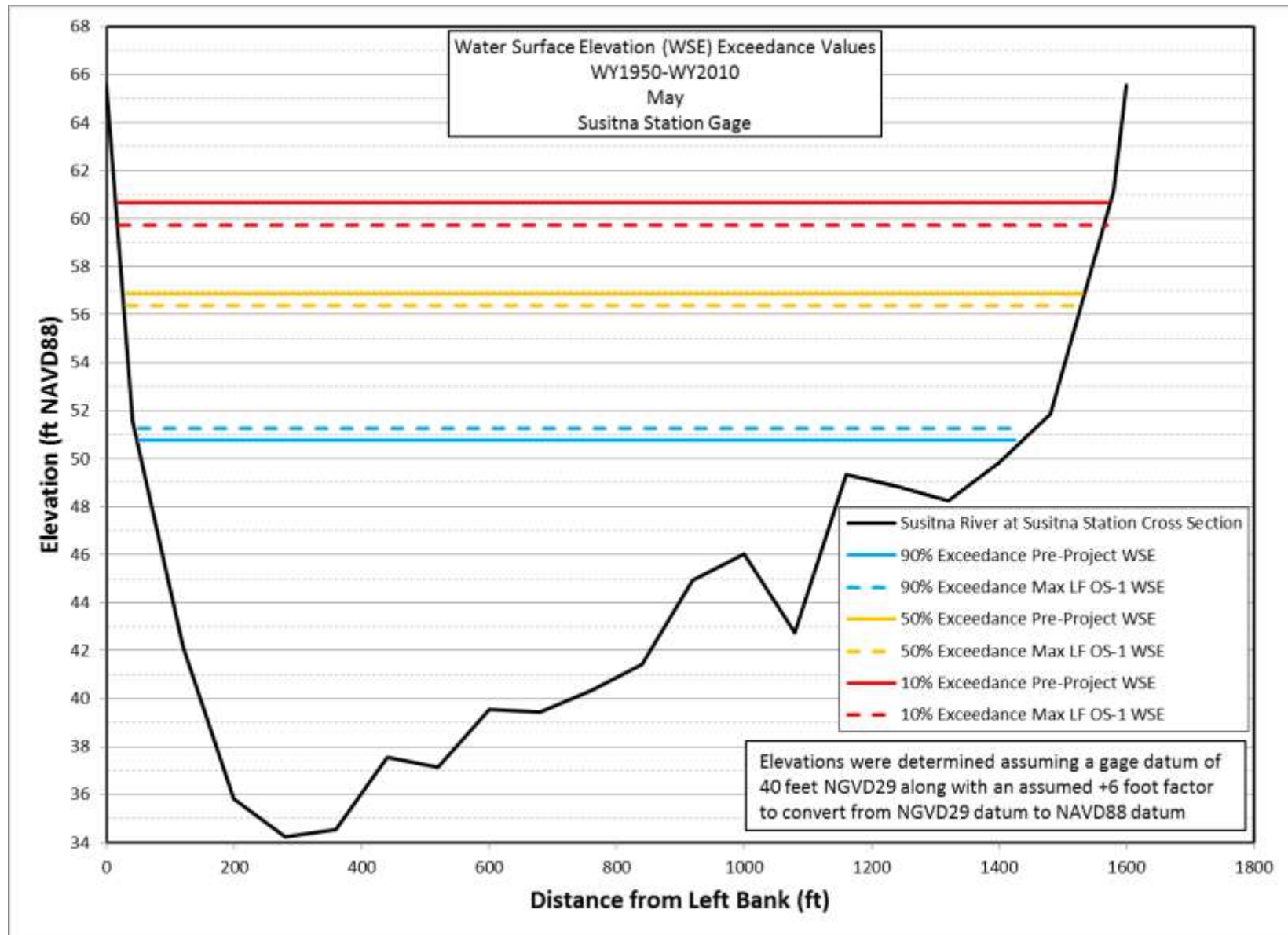


Figure K-22 – Select Water-surface Elevation Exceedance Values for May, pre-Project and Max LF OS-1 Conditions, Susitna Station Gage

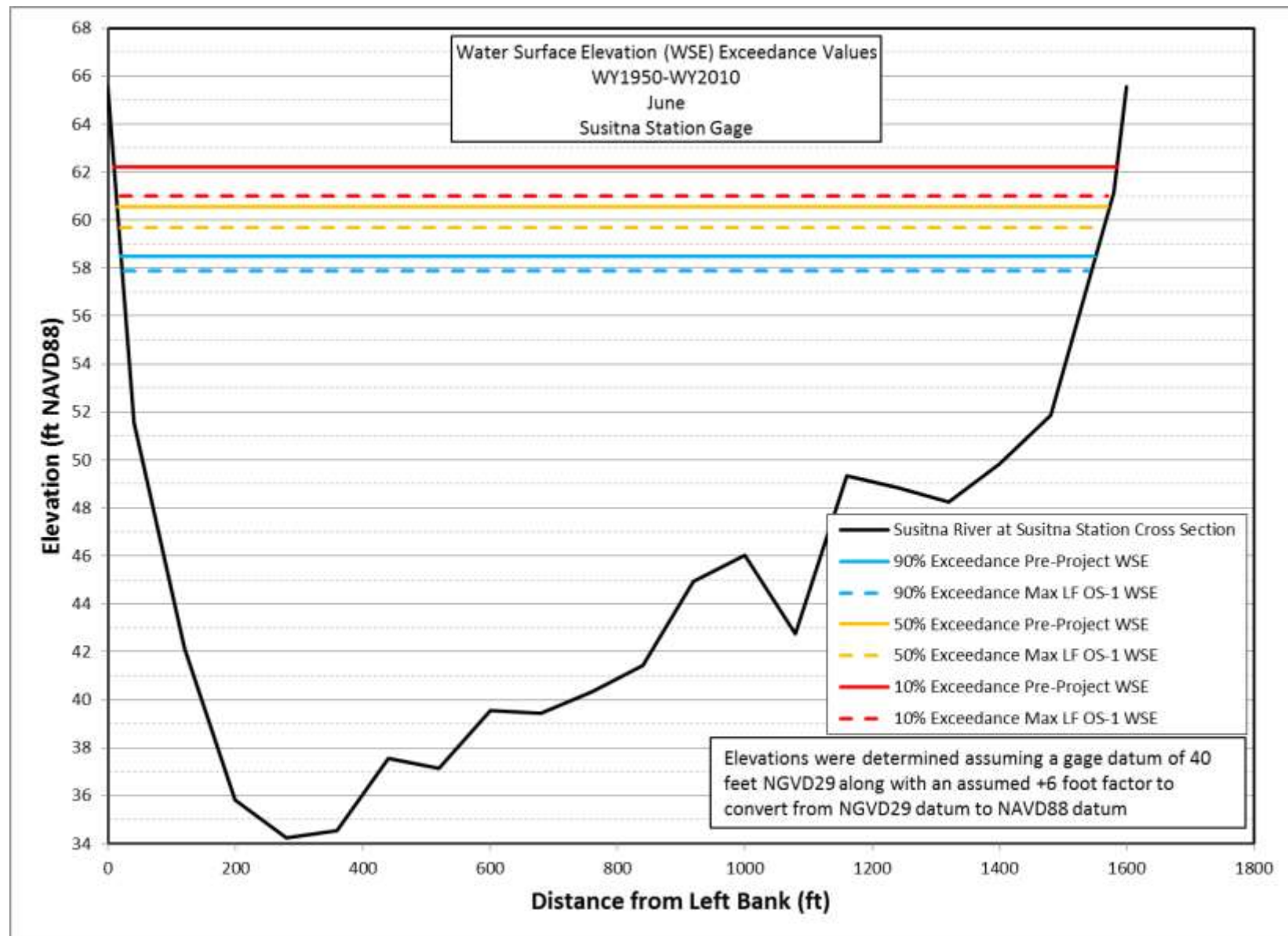


Figure K-23 – Select Water-surface Elevation Exceedance Values for June, pre-Project and Max LF OS-1 Conditions, Susitna Station Gage

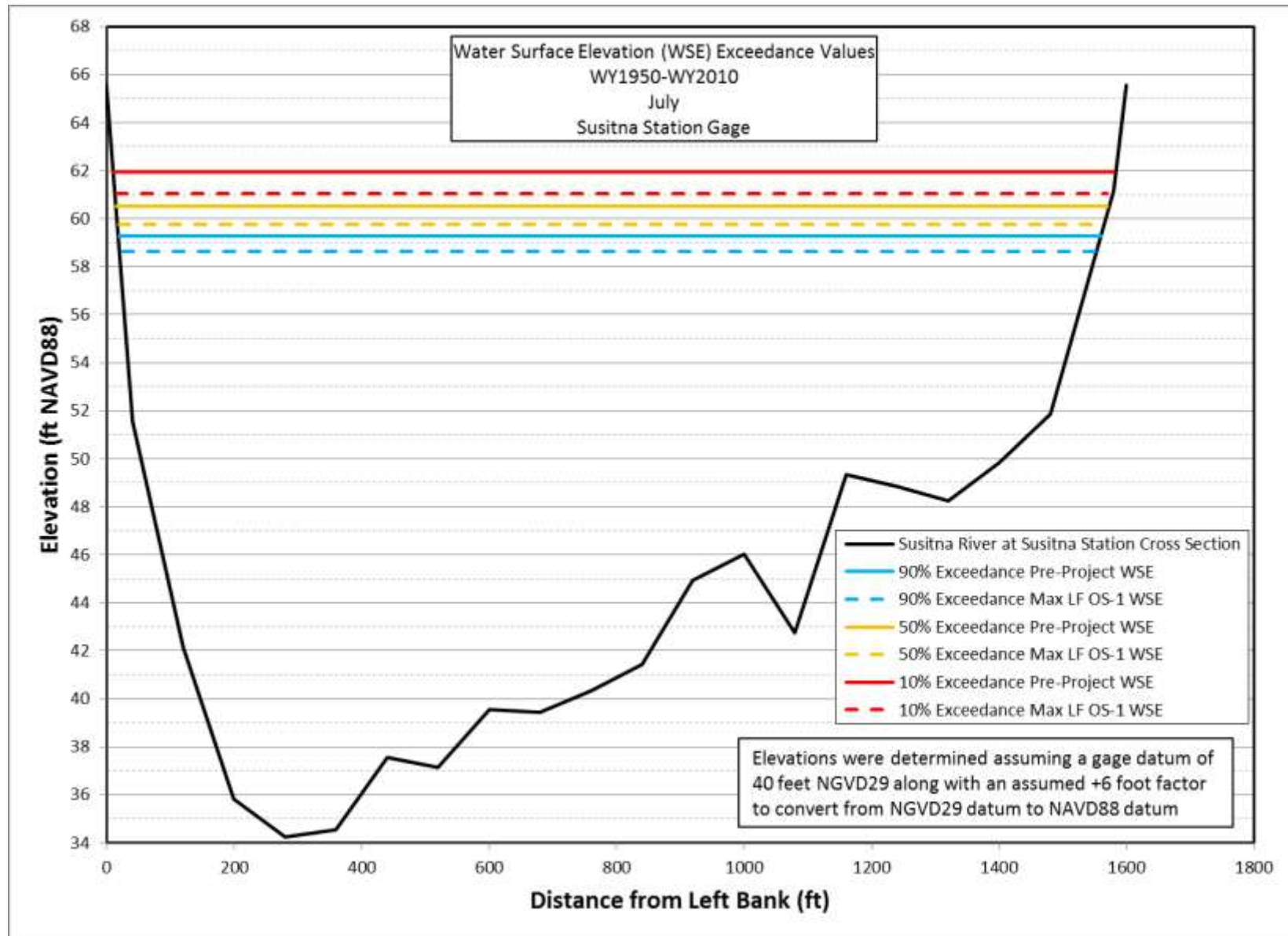


Figure K-24 – Select Water-surface Elevation Exceedance Values for July, pre-Project and Max LF OS-1 Conditions, Susitna Station Gage

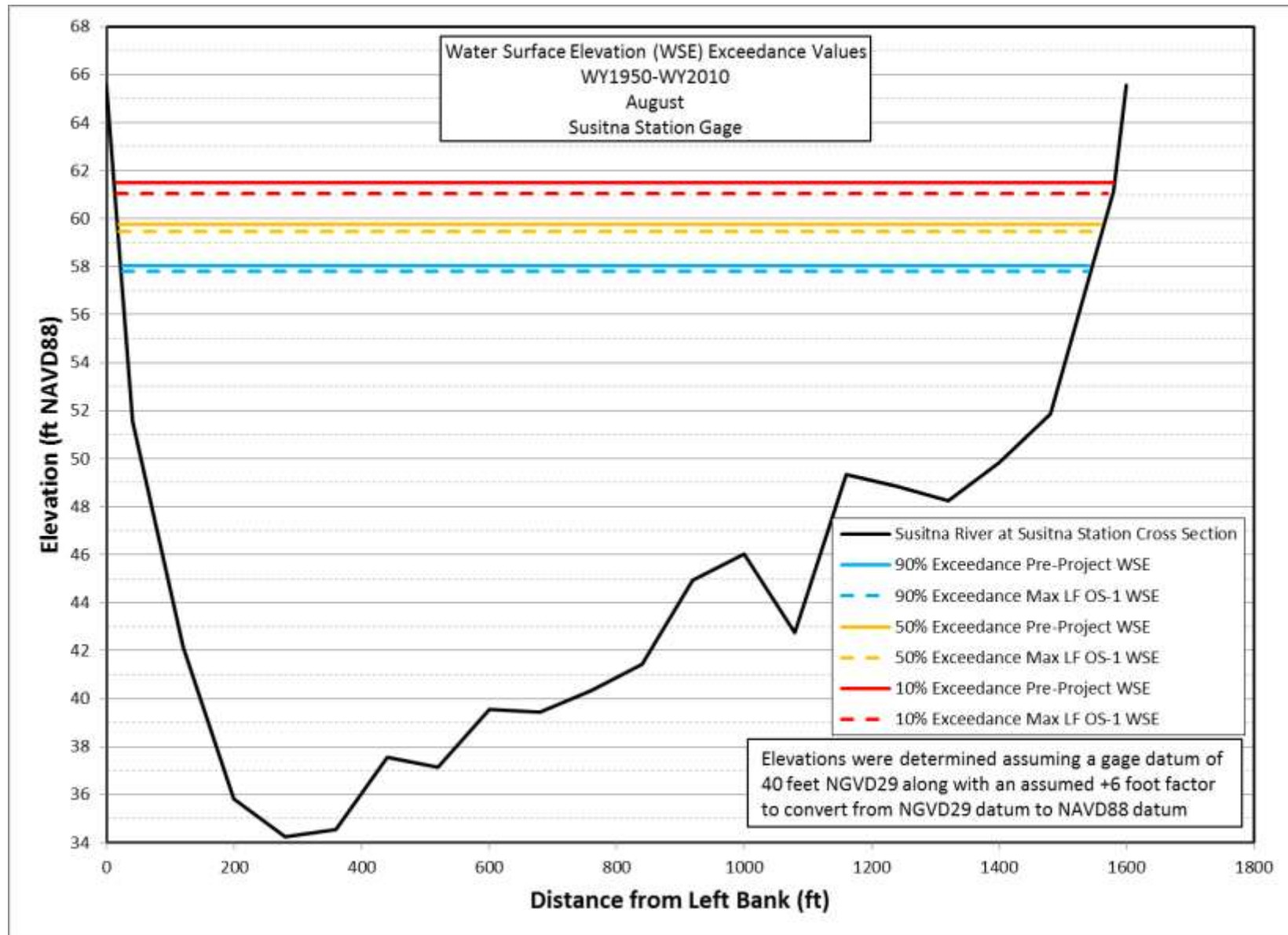


Figure K-25 – Select Water-surface Elevation Exceedance Values for August, pre-Project and Max LF OS-1 Conditions, Susitna Station Gage

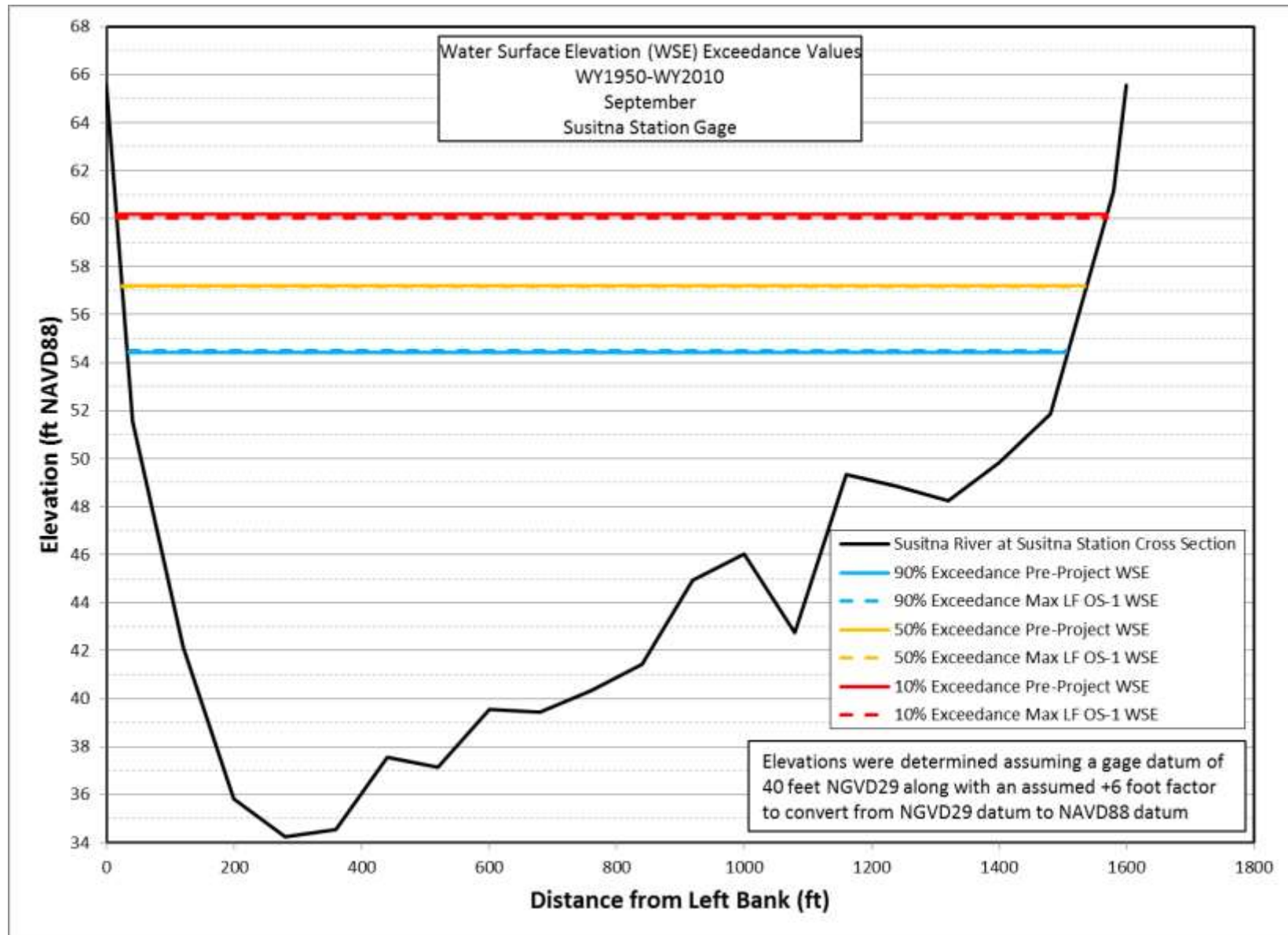


Figure K-26 – Select Water-surface Elevation Exceedance Values for September, pre-Project and Max LF OS-1 Conditions, Susitna Station Gage