

RECLAMATION

Managing Water in the West

Windy Gap Firming Project

Water Resources Technical Report Appendices



U.S. Department of the Interior
Bureau of Reclamation
Great Plains Region

December 2007

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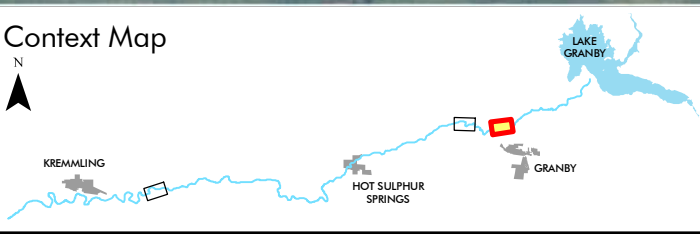
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Appendix A:
Aerial Photographs of the Colorado River from
Lake Granby to Gore Canyon



ERO
ERO Resources Corp.
1842 Clarkson Street
Denver, CO 80218
(303) 830-1188
Fax: 830-1199

Aerial Photograph: 1974 APFO



1 Inch = 400 Feet



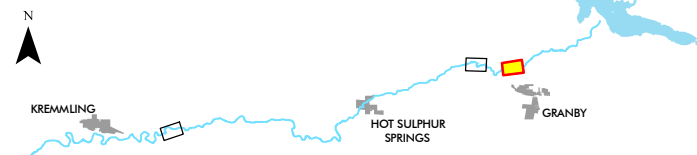
Figure 1a
Colorado River
1972 - 1974 Historic Imagery
Prepared for: Windy Gap Firing Project
File: 2390-Map6.mxd
Date: May 2006



ERO Resources Corp.
1842 Clarkson Street
Denver, CO 80218
(303) 830-1188
Fax: 830-1199

Aerial Photograph: 2005 USGS

Context Map



1 Inch = 400 Feet



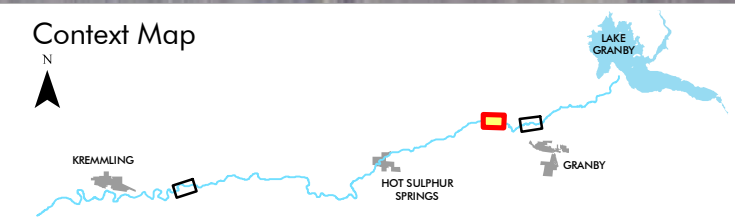
Figure 1b
Colorado River
2005 Imagery

Prepared for: Windy Gap Firing Project
File: 2390-VEG_CORiver2005_Apdix_A_mpbk.mxd(JP)
Date: May 2006



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Fax: 830-1199

Aerial Photograph: 1974 APFO



1 Inch = 400 Feet



Figure 2a
Colorado River
1972 - 1974 Historic Imagery
Prepared for: Windy Gap Firing Project
File: 2390-Map2a.mxd
Date: May 2006

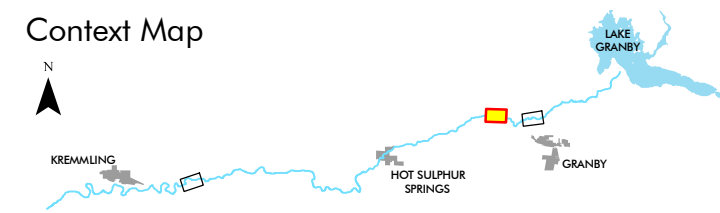


COLORADO RIVER AT WINDY GAP, NEAR GRANBY, CO.
Gauge No. 9034250

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Fax: 830-1199

Aerial Photograph: 2005 USGS

Context Map



1 Inch = 400 Feet



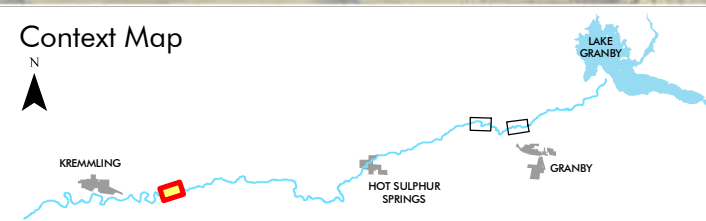
Figure 2b
Colorado River
2005 Imagery

Prepared for: Windy Gap Firming Project
File: 2390-VEG_CORiver2005_Apdix_A_mpbk.mxd(JP)
Date: May 2006



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Denver, CO 80218
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Fax: 830-1199

Aerial Photograph: 1972 APFO



1 Inch = 400 Feet



Figure 3a
Colorado River
1972 - 1974 Historic Imagery

Prepared for: Windy Gap Firing Project
File: 2390-Map25.mxd
Date: April 2006



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Denver, CO 80218
(303) 830-1188
Fax: 830-1199

Aerial Photograph: 2005 USGS

Context Map

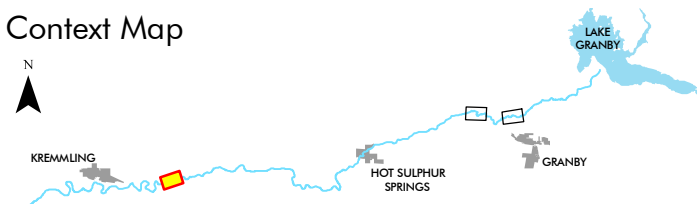


Figure 3b
Colorado River
2005 Imagery



Prepared for: Windy Gap Farming Project
File: 2390-VEG_CORiver2005_Apdix_A_mpbk.mxd(JP)
Date: May 2006

1 Inch = 400 Feet

Appendix B:
Hydrology Model Output—Flow Duration Curves

Figure B-1. Flow Duration Curves—Colorado River at Hot Sulphur Springs (large and small scale versions).

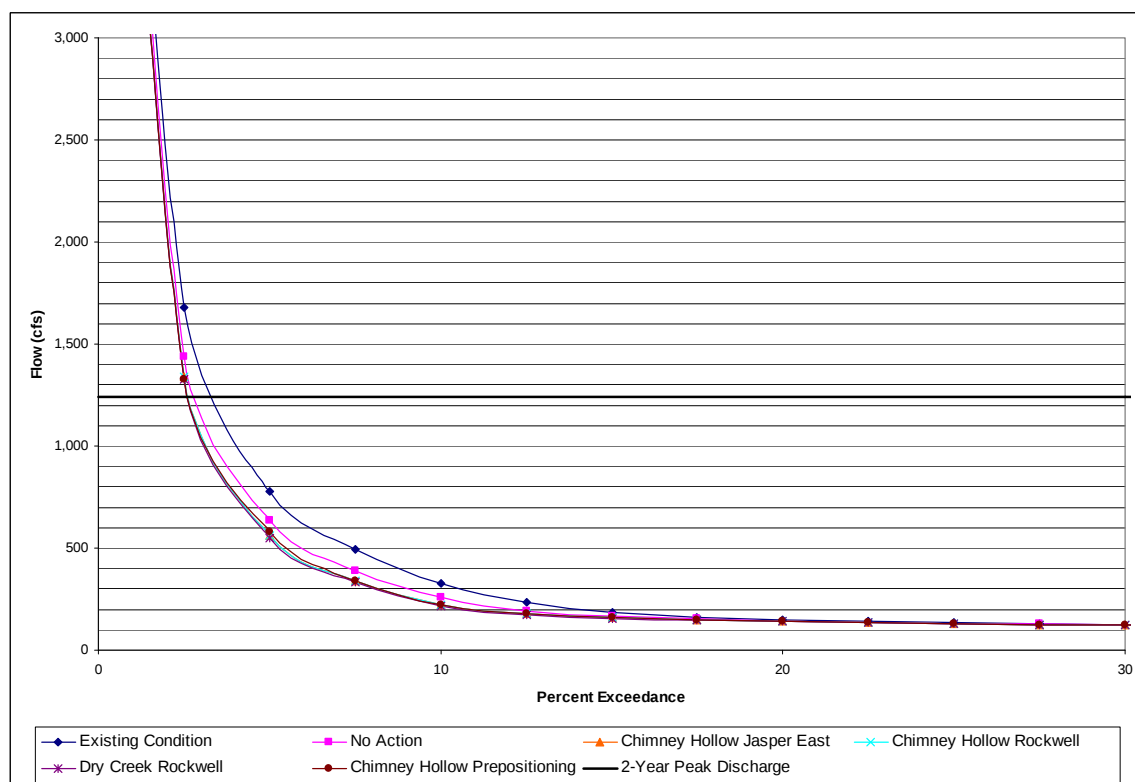
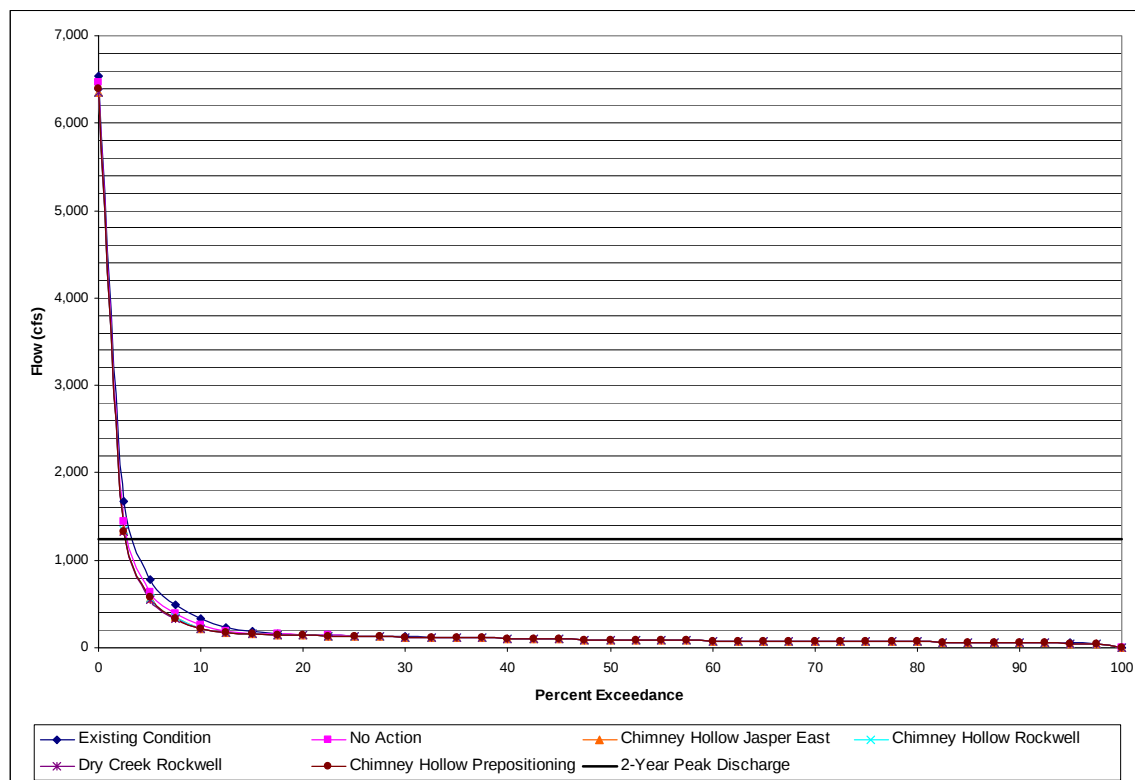


Figure B-2. Flow Duration Curves—Colorado River Near Kremmling (large and small scale versions).

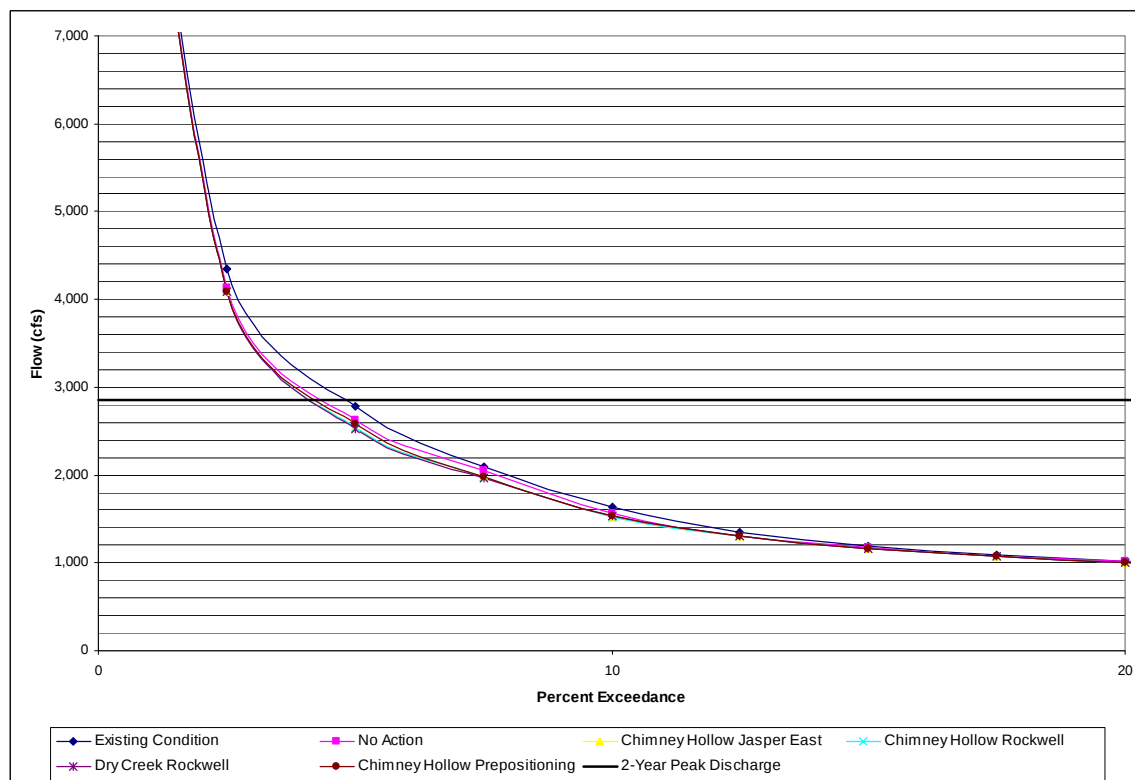
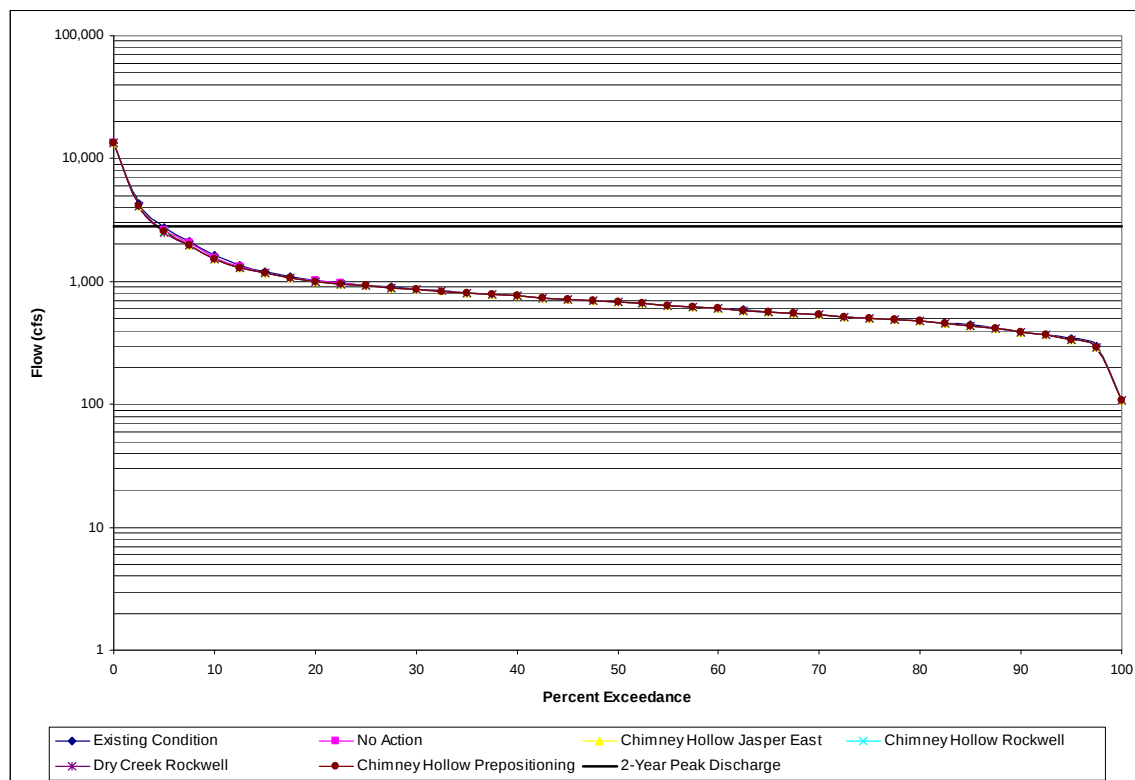
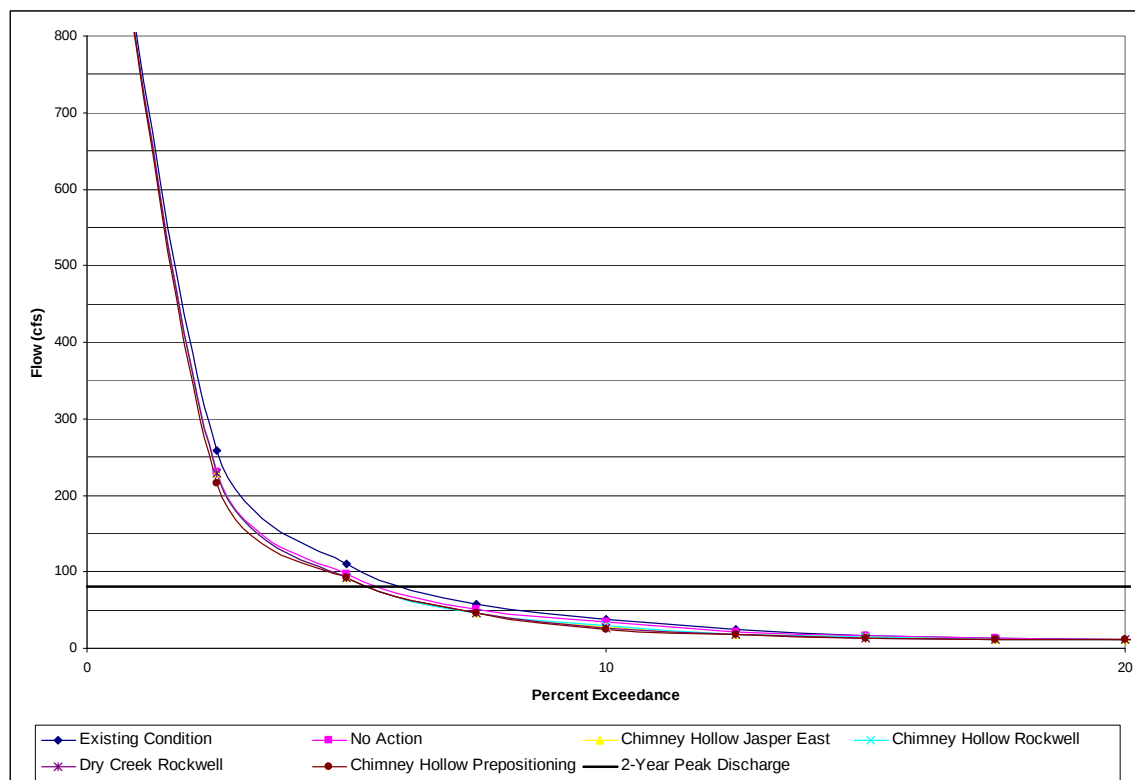
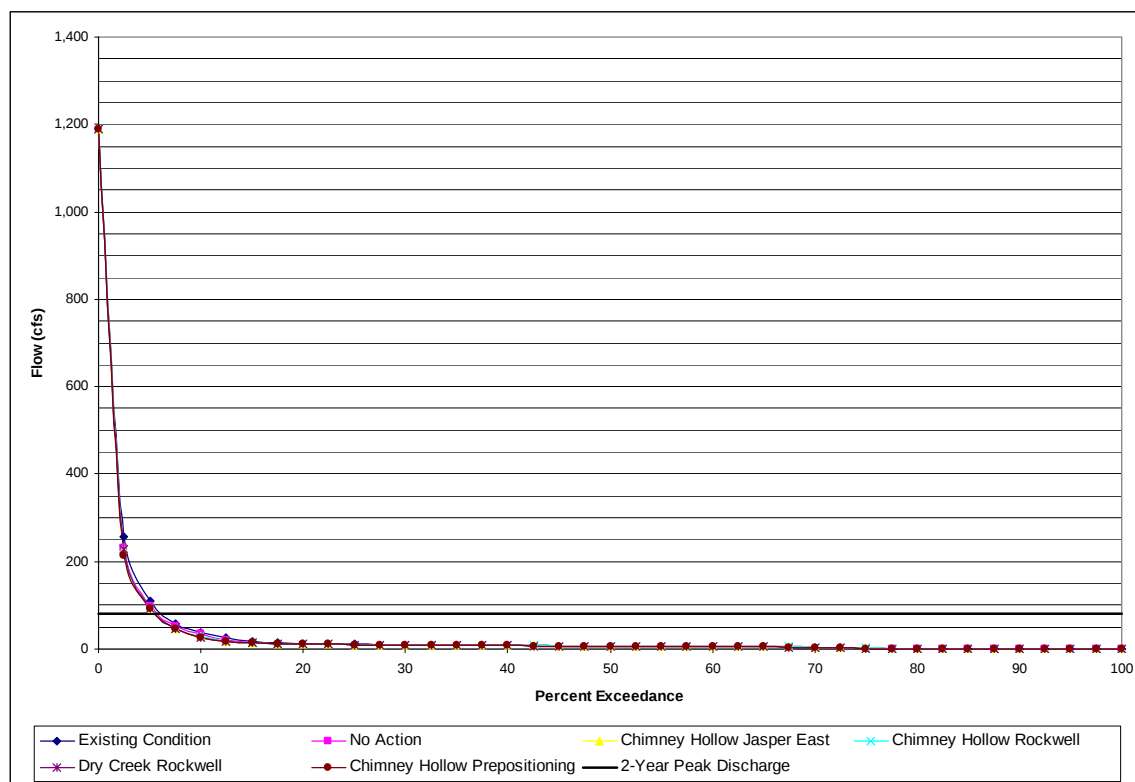


Figure B-3. Flow Duration Curves—Willow Creek (large and small scale versions).



Appendix C:
Windy Gap Firing Project Participant and
Non-Participant Demands, Firm Yields and
Average Yields for All Alternatives

WINDY GAP FIRING PROJECT
WATER RESOURCES TECHNICAL REPORT APPENDICES

Table C-1. Windy Gap Firing Project Participant Demands, Firm Yield and Average Yield for each Alternative.

Month	Existing Conditions			No Action			Chimney Hollow with Prepositioning			Chimney Hollow with Jasper East			Chimney Hollow with Rockwell			Dry Creek and Rockwell		
	Demand (ac-ft)	Firm Yield (ac-ft)	Average Yield (ac-ft)	Demand (ac-ft)	Firm Yield (ac-ft)	Average Yield (ac-ft)	Demand (ac-ft)	Firm Yield (ac-ft)	Average Yield (ac-ft)	Demand (ac-ft)	Firm Yield (ac-ft)	Average Yield (ac-ft)	Demand (ac-ft)	Firm Yield (ac-ft)	Average Yield (ac-ft)	Demand (ac-ft)	Firm Yield (ac-ft)	Average Yield (ac-ft)
Oct	1,520	0	780	3,820	940	2,080	2,560	2,560	2,560	2,550	2,550	2,550	2,550	2,550	2,550	2,580	2,580	2,580
Nov	2,350	0	1,440	2,980	0	1,820	2,500	2,500	2,500	2,380	2,380	2,380	2,380	2,380	2,380	2,490	2,490	2,490
Dec	2,350	0	1,270	2,980	0	1,650	2,500	2,500	2,500	2,380	2,380	2,380	2,380	2,380	2,380	2,490	2,490	2,490
Jan	2,350	0	1,110	2,980	0	1,420	2,500	2,500	2,500	2,380	2,380	2,380	2,380	2,380	2,380	2,490	2,490	2,490
Feb	2,350	0	960	2,980	0	1,260	2,500	2,500	2,500	2,380	2,380	2,380	2,380	2,380	2,380	2,490	2,490	2,490
Mar	2,350	0	850	2,980	0	1,120	2,500	2,500	2,500	2,380	2,380	2,380	2,380	2,380	2,380	2,490	2,490	2,490
Apr	1,040	0	680	1,605	0	960	1,370	1,370	1,370	1,350	1,350	1,350	1,350	1,350	1,350	1,380	1,380	1,380
May	930	0	820	1,540	0	1,360	1,320	1,320	1,320	1,300	1,300	1,300	1,300	1,300	1,300	1,330	1,330	1,330
Jun	930	0	660	1,540	106	1,150	1,320	1,320	1,320	1,300	1,300	1,300	1,300	1,300	1,300	1,330	1,330	1,330
Jul	1,490	0	960	3,020	183	2,360	2,150	2,150	2,150	2,130	2,130	2,130	2,130	2,130	2,130	2,170	2,170	2,170
Aug	1,500	0	910	3,420	0	2,410	2,350	2,350	2,350	2,340	2,340	2,340	2,340	2,340	2,340	2,380	2,380	2,380
Sep	1,520	0	830	3,820	0	2,320	2,560	2,560	2,560	2,550	2,550	2,550	2,550	2,550	2,550	2,580	2,580	2,580
Total	20,680	0	1,1270	33,665	1,229	19,910	26,130	26,130	26,130	25,420	25,420	25,420	25,420	25,420	25,420	26,200	26,200	26,200

WINDY GAP FIRMING PROJECT
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Table C-2. Windy Gap Non-Participant Demands, Firm Yield, and Average Yield for each Alternative.

Month	Existing Conditions			No Action			Chimney Hollow with Prepositioning			Chimney Hollow with Jasper East			Chimney Hollow with Rockwell			Dry Creek and Rockwell		
	Demand (ac-ft)	Firm Yield (ac-ft)	Average Yield (ac-ft)	Demand (ac-ft)	Firm Yield (ac-ft)	Average Yield (ac-ft)	Demand (ac-ft)	Firm Yield (ac-ft)	Average Yield (ac-ft)	Demand (ac-ft)	Firm Yield (ac-ft)	Average Yield (ac-ft)	Demand (ac-ft)	Firm Yield (ac-ft)	Average Yield (ac-ft)	Demand (ac-ft)	Firm Yield (ac-ft)	Average Yield (ac-ft)
Oct	10	0	10	290	0	100	290	0	110	290	0	110	290	0	110	290	0	110
Nov	10	0	0	70	0	20	70	0	30	70	0	30	70	0	30	70	0	30
Dec	10	0	0	70	0	20	70	0	30	70	0	30	70	0	30	70	0	30
Jan	0	0	0	50	0	20	50	0	20	50	0	20	50	0	20	50	0	20
Feb	0	0	0	40	0	10	40	0	10	40	0	10	40	0	10	40	0	10
Mar	10	0	0	60	0	20	60	0	20	60	0	20	60	0	20	60	0	20
Apr	10	0	0	120	0	60	120	0	70	120	0	70	120	0	70	120	0	70
May	30	0	30	730	0	610	730	0	610	730	0	620	730	0	620	730	0	620
Jun	40	0	30	1050	0	670	1,050	0	670	1,050	0	690	1,050	0	690	1,050	0	690
Jul	50	0	30	870	0	400	870	0	440	870	0	440	870	0	440	870	0	440
Aug	30	0	20	440	0	150	440	0	170	440	0	170	440	0	170	440	0	170
Sep	20	0	20	310	0	110	310	0	120	310	0	110	310	0	110	310	0	120
Total	220	0	140	4,100	0	2,190	4,100	0	2,300	4,100	0	2,320	4,100	0	2,320	4,100	0	2,330

WINDY GAP FIRING PROJECT
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Table C-3. Middle Park Water Conservancy District Demands, Firm Yield and Average Yield for each Alternative.

Month	Existing Conditions			No Action			Chimney Hollow with Prepositioning			Chimney Hollow with Jasper East			Chimney Hollow with Rockwell			Dry Creek and Rockwell		
	Demand (ac-ft)	Firm Yield (ac-ft)	Average Yield (ac-ft)	Demand (ac-ft)	Firm Yield (ac-ft)	Average Yield (ac-ft)	Demand (ac-ft)	Firm Yield (ac-ft)	Average Yield (ac-ft)	Demand (ac-ft)	Firm Yield (ac-ft)	Average Yield (ac-ft)	Demand (ac-ft)	Firm Yield (ac-ft)	Average Yield (ac-ft)	Demand (ac-ft)	Firm Yield (ac-ft)	Average Yield (ac-ft)
Oct	21	0	15	429	0	292	429	0	419	429	0	419	429	0	419	429	0	419
Nov	21	0	15	429	0	292	429	0	419	429	0	419	429	0	419	429	0	419
Dec	21	0	15	429	0	292	429	0	419	429	0	419	429	0	419	429	0	419
Jan	21	0	15	429	0	287	429	0	415	429	0	415	429	0	415	429	0	415
Feb	21	0	15	429	0	283	429	0	410	429	0	410	429	0	410	429	0	410
Mar	21	0	15	429	0	283	429	0	372	429	0	330	429	0	354	429	0	362
Apr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
May	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Jun	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sep	21	0	15	429	0	298	429	429	425	429	429	425	429	429	426	429	429	426
Total	145	0	102	3,000	0	2,026	3,000	429	2,880	3,000	429	2,839	3,000	429	2,864	3,000	429	2,871

Appendix D:
Hydrology Model Output—
Changes in Streamflows, Windy Gap Diversions and Lake Granby Spills

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Table D-1. Lake Granby Spills (cfs).

Average Year (1950-1996)

	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Annual
Exist. Conditions	0	18	352	216	41	10	5	0	53
Alt 1 (No Action)	0	17	316	189	37	9	4	0	48
Alt 2 (Proposed Action)	0	13	260	163	24	9	4	0	40
Alt 3	0	14	282	170	28	10	4	0	42
Alt 4	0	14	282	170	28	10	4	0	42
Alt 5	0	14	282	168	28	10	4	0	42

Flow change from Existing Conditions

Alt 1 (No Action)	0	-1	-37	-27	-4	0	-1	0	-6
Alt 2 (Proposed Action)	0	-5	-92	-53	-17	0	0	0	-14
Alt 3	0	-4	-70	-46	-12	0	-1	0	-11
Alt 4	0	-4	-70	-46	-12	0	-1	0	-11
Alt 5	0	-4	-71	-47	-12	0	-1	0	-11

Percent change in flow from Existing Conditions

Alt 1 (No Action)	0%	-4%	-10%	-13%	-9%	-4%	-18%	0%	-11%
Alt 2 (Proposed Action)	0%	-26%	-26%	-24%	-41%	-3%	-9%	0%	-26%
Alt 3	0%	-22%	-20%	-21%	-30%	2%	-12%	0%	-21%
Alt 4	0%	-22%	-20%	-21%	-30%	2%	-12%	0%	-21%
Alt 5	0%	-22%	-20%	-22%	-30%	2%	-13%	0%	-21%

Dry Year Average (1954, 1966, 1977, 1981, 1989)

Exist. Conditions	0	0	0	0	0	0	0	0	0
All Alternatives	0	0	0	0	0	0	0	0	0

No change in flow between Existing Conditions and all other alternatives in dry years.

Wet Year Average (1957, 1983, 1984, 1986, 1995)

Exist. Conditions	0	123	845	887	249	23	0	0	178
Alt 1 (No Action)	0	122	845	744	249	25	0	0	166
Alt 2 (Proposed Action)	0	126	859	696	155	30	0	0	156
Alt 3	0	132	845	722	188	23	0	0	160
Alt 4	0	132	845	722	188	23	0	0	160
Alt 5	0	131	839	719	174	23	0	0	158

Flow change from Existing Conditions

Alt 1 (No Action)	0	-1	0	-143	0	2	0	0	-12
Alt 2 (Proposed Action)	0	2	14	-191	-94	7	0	0	-22
Alt 3	0	8	0	-166	-61	0	0	0	-18
Alt 4	0	8	0	-165	-61	0	0	0	-18
Alt 5	0	8	-6	-169	-75	0	0	0	-21

Percent change in flow from Existing Conditions

Alt 1 (No Action)	0%	-1%	0%	-16%	0%	9%	0%	0%	-7%
Alt 2 (Proposed Action)	0%	2%	2%	-22%	-38%	29%	0%	0%	-13%
Alt 3	0%	7%	0%	-19%	-25%	1%	0%	0%	-10%
Alt 4	0%	7%	0%	-19%	-25%	1%	0%	0%	-10%
Alt 5	0%	6%	-1%	-19%	-30%	0%	0%	0%	-12%

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Table D-2. Adams Tunnel Diversions (cfs).

Average Year (1950-1996)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Exist. Conditions	409	523	417	285	430	406	224	206	263	252	225	404	336
Alt 1	415	522	416	285	450	411	295	236	283	262	235	410	351
Alt 2	450	518	343	282	477	421	282	282	321	276	254	450	362
Alt 3	424	523	357	292	479	411	335	285	304	267	247	414	361
Alt 4	424	524	357	292	479	411	335	285	304	267	247	414	361
Alt 5	435	530	357	291	476	414	320	277	304	271	252	423	362

Flow change from Existing Conditions

Alt 1	6	-1	-1	-1	20	5	72	30	20	10	10	6	15
Alt 2	41	-6	-74	-3	47	15	58	76	58	24	29	47	26
Alt 3	15	0	-60	6	50	5	112	79	41	15	22	11	25
Alt 4	15	0	-60	6	49	5	111	79	42	15	22	11	25
Alt 5	26	6	-60	6	46	8	96	71	42	19	27	20	26

Percent change in flow from Existing Conditions

Alt 1	2%	0%	0%	0%	5%	1%	32%	15%	8%	4%	4%	2%	4%
Alt 2	10%	-1%	-18%	-1%	11%	4%	26%	37%	22%	10%	13%	12%	8%
Alt 3	4%	0%	-14%	2%	12%	1%	50%	38%	16%	6%	10%	3%	7%
Alt 4	4%	0%	-14%	2%	12%	1%	50%	38%	16%	6%	10%	3%	7%
Alt 5	6%	1%	-14%	2%	11%	2%	43%	35%	16%	8%	12%	5%	8%

Dry Year Average (1954, 1966, 1977, 1981, 1989)

Exist. Conditions	452	541	426	293	550	550	541	407	458	296	250	449	434
All Alternatives	457	541	426	293	550	550	542	410	468	299	261	448	437

No change in flow between Existing Conditions and all other alternatives in dry years.

Wet Year Average (1957, 1983, 1984, 1986, 1995)

Exist. Conditions	372	497	426	293	255	134	85	105	116	219	168	340	250
Alt 1	386	500	426	293	310	135	134	211	120	223	190	349	272
Alt 2	424	465	297	250	379	153	108	135	150	242	212	381	265
Alt 3	391	491	364	293	399	135	172	261	150	230	196	339	284
Alt 4	391	491	364	293	399	135	172	260	150	230	196	339	284
Alt 5	398	508	364	293	382	135	151	207	151	238	200	344	280

Flow change from Existing Conditions

Alt 1	13	3	0	0	55	0	49	106	3	4	22	9	22
Alt 2	51	-32	-129	-43	124	19	23	30	34	23	44	40	16
Alt 3	18	-7	-62	0	144	0	87	156	34	11	28	-1	35
Alt 4	19	-7	-62	0	144	0	87	156	34	11	28	-1	35
Alt 5	26	11	-62	0	127	0	67	102	35	19	32	3	30

Percent change in flow from Existing Conditions

Alt 1	4%	1%	0%	0%	22%	0%	58%	102%	3%	2%	13%	3%	9%
Alt 2	14%	-7%	-30%	-15%	49%	14%	27%	29%	29%	10%	26%	12%	6%
Alt 3	5%	-1%	-15%	0%	56%	0%	103%	149%	29%	5%	17%	0%	14%
Alt 4	5%	-1%	-15%	0%	56%	0%	103%	149%	29%	5%	17%	0%	14%
Alt 5	7%	2%	-15%	0%	50%	0%	79%	97%	30%	8%	19%	1%	12%

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Table D-3. Windy Gap Diversions (AF).

Average Year (1950-1996)

	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Annual
Exist. Conditions	4522	17648	11053	2869	439	0	0	0	36532
Alt 1	4522	18571	12462	6780	1238	0	0	0	43573
Alt 2	4521	19866	14618	6006	1072	0	0	0	46084
Alt 3	4521	19738	14204	8050	1538	0	0	0	48052
Alt 4	4521	19738	14195	8007	1536	0	0	0	47997
Alt 5	4521	20070	14726	7720	1446	0	0	0	48483

Flow change from Existing Conditions

Alt 1	0	923	1408	3911	799	0	0	0	7041
Alt 2	0	2218	3565	3137	633	0	0	0	9552
Alt 3	0	2090	3151	5181	1099	0	0	0	11520
Alt 4	0	2090	3142	5138	1097	0	0	0	11466
Alt 5	0	2421	3672	4850	1007	0	0	0	11951

Percent change in flow from Existing Conditions

Alt 1	0%	5%	13%	136%	182%	0%	0%	0%	19%
Alt 2	0%	13%	32%	109%	144%	0%	0%	0%	26%
Alt 3	0%	12%	29%	181%	250%	0%	0%	0%	32%
Alt 4	0%	12%	28%	179%	250%	0%	0%	0%	31%
Alt 5	0%	14%	33%	169%	229%	0%	0%	0%	33%

Dry Year Average (1954, 1966, 1977, 1981, 1989)

Exist. Conditions	1049	3723	2658	374	0	0	0	0	7804
All Alternatives	1049	3723	2658	374	0	0	0	0	7804

No change in flow between Existing Conditions and all other alternatives in dry years.

Wet Year Average (1957, 1983, 1984, 1986, 1995)

Exist. Conditions	2808	20532	14280	892	0	0	0	0	38512
Alt 1	2808	21384	16116	17029	6532	0	0	0	63870
Alt 2	2808	29670	22293	15516	3636	0	0	0	73923
Alt 3	2808	29003	21738	19215	6177	0	0	0	78940
Alt 4	2808	29000	21729	19084	6153	0	0	0	78775
Alt 5	2808	29676	21745	18463	4851	0	0	0	77543

Flow change from Existing Conditions

Alt 1	0	852	1836	16137	6532	0	0	0	25357
Alt 2	0	9138	8013	14624	3636	0	0	0	35411
Alt 3	0	8471	7458	18323	6177	0	0	0	40428
Alt 4	0	8468	7449	18192	6153	0	0	0	40262
Alt 5	0	9144	7465	17571	4851	0	0	0	39031

Percent change in flow from Existing Conditions

Alt 1	0%	4%	13%	1809%	0%	0%	0%	0%	66%
Alt 2	0%	45%	56%	1639%	0%	0%	0%	0%	92%
Alt 3	0%	41%	52%	2054%	0%	0%	0%	0%	105%
Alt 4	0%	41%	52%	2039%	0%	0%	0%	0%	105%
Alt 5	0%	45%	52%	1970%	0%	0%	0%	0%	101%

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Table D-4. Modeled Colorado River below Lake Granby Flows during Spill Events.

Existing Conditions				No Action—Alternative 1				Proposed Action— Alternative 2				Alternatives 3 to 5			
Spill Periods	# Days	Daily Average Spill (cfs)	Daily Maximum Spill (cfs)	Spill Periods	# Days	Daily Average Spill (cfs)	Daily Maximum Spill (cfs)	Spill Periods	# Days	Daily Average Spill (cfs)	Daily Maximum Spill (cfs)	Spill Periods	# Days	Daily Average Spill (cfs)	Daily Maximum Spill (cfs)
6/52-8/52	92	571	2,767	6/52-8/52	92	370	1,481	7/52-8/52	62	324	1,438	7/52-8/52	62	330	1,481
7/53-8/53	26	753	5,633	7/53-8/53	24	141	303								
8/57	31	303	458	8/57	31	304	459								
6/58	30	1,091	2,817	6/58	30	1,091	2,817	6/58	30	783	2,022	6/58	30	1060	2,737
7/60	31	320	911	7/60	25	302	740								
7/61	31	261	761									7/61	15	157	281
9/61-10/61	61	277	333	9/61-10/61	61	241	300	9/61-10/61	61	236	278	9/61-10/61	61	260	333
5/62-7/62	92	715	3,271	5/62-7/62	92	706	3,270	6/62-7/62	61	963	3,253	6/62-7/62	61	952	3,246
7/69	31	620	1,763	7/69	31	326	927								
6/70-7/70	61	977	3,911	6/70-7/70	61	815	3,062	6/70-7/70	61	635	2,108	6/70-7/70	61	818	3,079
6/71-8/71	63	1,209	4,904	6/71-8/71	63	1,197	4,840	6/71-8/71	64	1040	4,065	6/71-8/71	63	1076	4,186
6/73-8/73	92	603	2,605	6/73-8/73	92	571	2,606	6/73-8/73	92	589	2,643	6/73-8/73	92	452	2,607
6/74	30	818	2,113	6/74	30	819	2,114	6/74	30	577	1,490	6/74	30	615	1,587
8/79	31	177	267												
6/80-7/80	61	870	3,503	6/80-7/80	61	581	1,985	6/80-7/80	61	310	1,096	6/80-7/80	61	444	1,268
7/83-8/83	62	1,852	5,271	7/83-8/83	62	1,852	5,271	7/83-8/83	62	973	4,556	7/83-8/83	62	1042	4,954
5/84-8/84	123	988	5,225	5/84-8/84	123	986	5,225	5/84-8/84	123	1013	5,415	5/84-8/84	123	1003	5,231
6/85-7/85	61	641	2,569	6/85-7/85	59	658	2,569	6/85-7/85	51	656	2,518	6/85-7/85	55	670	2,568
6/86-8/86	62	1,483	5,633	6/86-7/86	61	1,483	5,633	6/86-8/86	63	1438	5,618	6/86-7/86	61	1484	5,633
7/95-8/95	62	445	2,020	8/95	31	181	274					8/95	31	182	275
6/96-7/96	61	901	3,694	6/96-7/96	61	870	3,534	6/96-7/96	61	881	3,584	6/96-7/96	61	880	3,586

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Table D-5. Big Thompson River Diversions (AF).

Average Year (1950-1996)

	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Annual
Exist. Conditions	44	3771	8540	8421	1693	561	176	17	23224
Alt 1	44	3756	8248	8284	1693	561	176	17	22780
Alt 2	4	2840	7684	7336	1515	525	131	6	20041
Alt 3	2	3346	8251	8213	1693	561	176	17	22259
Alt 4	2	3344	8251	8213	1693	561	176	17	22258
Alt 5	2	3187	8112	8139	1601	554	176	6	21779

Flow change from Existing Conditions

Alt 1	0	-15	-291	-137	0	0	0	0	-444
Alt 2	-41	-932	-856	-1085	-177	-37	-45	-11	-3183
Alt 3	-42	-426	-289	-208	0	0	0	0	-965
Alt 4	-42	-427	-289	-208	0	0	0	0	-966
Alt 5	-42	-585	-428	-282	-91	-7	0	-11	-1445

Percent change in flow from Existing Conditions

Alt 1	0%	0%	-3%	-2%	0%	0%	0%	0%	-2%
Alt 2	-92%	-25%	-10%	-13%	-10%	-7%	-26%	-63%	-14%
Alt 3	-95%	-11%	-3%	-2%	0%	0%	0%	0%	-4%
Alt 4	-95%	-11%	-3%	-2%	0%	0%	0%	0%	-4%
Alt 5	-95%	-16%	-5%	-3%	-5%	-1%	0%	-63%	-6%

Dry Year Average (1954, 1966, 1977, 1981, 1989)

Exist. Conditions	0	0	0	551	0	0	0	0	551
All Alternatives	0	0	0	475	0	0	0	0	475

No change in flow between Existing Conditions and all other alternatives in dry years.

Wet Year Average (1957, 1983, 1984, 1986, 1995)

Exist. Conditions	0	5758	24737	16613	3788	1299	160	0	52354
Alt 1	0	5758	24719	16606	3788	1299	160	0	52330
Alt 2	14	5404	23630	16143	3788	1299	160	0	50439
Alt 3	0	5758	24719	16606	3788	1299	160	0	52330
Alt 4	0	5758	24719	16606	3788	1299	160	0	52330
Alt 5	0	5758	24719	16606	3788	1299	160	0	52330

Flow change from Existing Conditions

Alt 1	0	0	-18	-7	0	0	0	0	-25
Alt 2	14	-354	-1106	-470	0	0	0	0	-1916
Alt 3	0	0	-18	-7	0	0	0	0	-25
Alt 4	0	0	-18	-7	0	0	0	0	-25
Alt 5	0	0	-18	-7	0	0	0	0	-25

Percent change in flow from Existing Conditions

Alt 1	0%	0%	0%	0%	0%	0%	0%	0%	0%
Alt 2	0%	-6%	-4%	-3%	0%	0%	0%	0%	-4%
Alt 3	0%	0%	0%	0%	0%	0%	0%	0%	0%
Alt 4	0%	0%	0%	0%	0%	0%	0%	0%	0%
Alt 5	0%	0%	0%	0%	0%	0%	0%	0%	0%

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Table D-6. Big Thompson River Diversions (cfs).

Average Year (1950-1996)

	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Annual
Exist. Conditions	1	61	144	137	28	9	3	0	32
Alt 1	1	61	139	135	28	9	3	0	31
Alt 2	0	46	129	119	25	9	2	0	28
Alt 3	0	54	139	134	28	9	3	0	31
Alt 4	0	54	139	134	28	9	3	0	31
Alt 5	0	52	136	132	26	9	3	0	30

Flow change from Existing Conditions

Alt 1	0	0	-5	-2	0	0	0	0	-1
Alt 2	-1	-15	-14	-18	-3	-1	-1	0	-4
Alt 3	-1	-7	-5	-3	0	0	0	0	-1
Alt 4	-1	-7	-5	-3	0	0	0	0	-1
Alt 5	-1	-10	-7	-5	-1	0	0	0	-2

Percent change in flow from Existing Conditions

Alt 1	0%	0%	-3%	-2%	0%	0%	0%	0%	-2%
Alt 2	-92%	-25%	-10%	-13%	-10%	-7%	-26%	-63%	-14%
Alt 3	-95%	-11%	-3%	-2%	0%	0%	0%	0%	-4%
Alt 4	-95%	-11%	-3%	-2%	0%	0%	0%	0%	-4%
Alt 5	-95%	-16%	-5%	-3%	-5%	-1%	0%	-63%	-6%

Dry Year Average (1954, 1966, 1977, 1981, 1989)

Exist. Conditions	0	0	0	9	0	0	0	0	1
All Alternatives	0	0	0	8	0	0	0	0	1

No change in flow between Existing Conditions and all other alternatives in dry years.

Wet Year Average (1957, 1983, 1984, 1986, 1995)

Exist. Conditions	0	94	416	270	62	22	3	0	72
Alt 1	0	94	415	270	62	22	3	0	72
Alt 2	0	88	397	263	62	22	3	0	70
Alt 3	0	94	415	270	62	22	3	0	72
Alt 4	0	94	415	270	62	22	3	0	72
Alt 5	0	94	415	270	62	22	3	0	72

Flow change from Existing Conditions

Alt 1	0	0	0	0	0	0	0	0	0
Alt 2	0	-6	-19	-8	0	0	0	0	-3
Alt 3	0	0	0	0	0	0	0	0	0
Alt 4	0	0	0	0	0	0	0	0	0
Alt 5	0	0	0	0	0	0	0	0	0

Percent change in flow from Existing Conditions

Alt 1	0%	0%	0%	0%	0%	0%	0%	0%	0%
Alt 2	0%	-6%	-4%	-3%	0%	0%	0%	0%	-4%
Alt 3	0%	0%	0%	0%	0%	0%	0%	0%	0%
Alt 4	0%	0%	0%	0%	0%	0%	0%	0%	0%
Alt 5	0%	0%	0%	0%	0%	0%	0%	0%	0%

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Table D-7. Big Thompson River Streamflow below Lake Estes (AF).

Average Year (1950-1996)

	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Annual
Exist. Conditions	2310	10798	24419	11438	7007	3506	2409	1549	63436
Alt 1	2310	10813	24710	11575	7007	3506	2409	1549	63880
Alt 2	2351	11730	25275	12523	7184	3543	2454	1560	66619
Alt 3	2352	11224	24708	11646	7007	3506	2409	1549	64402
Alt 4	2352	11225	24708	11646	7007	3506	2409	1549	64403
Alt 5	2352	11383	24846	11720	7098	3513	2409	1560	64881

Flow change from Existing Conditions

Alt 1	0	15	291	137	0	0	0	0	444
Alt 2	41	932	856	1085	177	37	45	11	3183
Alt 3	42	426	289	208	0	0	0	0	965
Alt 4	42	427	289	208	0	0	0	0	966
Alt 5	42	585	428	282	91	7	0	11	1445

Percent change in flow from Existing Conditions

Alt 1	0%	0%	1%	1%	0%	0%	0%	0%	1%
Alt 2	2%	9%	4%	9%	3%	1%	2%	1%	5%
Alt 3	2%	4%	1%	2%	0%	0%	0%	0%	2%
Alt 4	2%	4%	1%	2%	0%	0%	0%	0%	2%
Alt 5	2%	5%	2%	2%	1%	0%	0%	1%	2%

Dry Year Average (1954, 1966, 1977, 1981, 1989)

Exist. Conditions	2168	10155	16303	9599	5938	2946	2343	1367	50819
All Alternatives	2168	10155	16303	9675	5938	2946	2343	1367	50895

No change in flow between Existing Conditions and all other alternatives in dry years.

Wet Year Average (1957, 1983, 1984, 1986, 1995)

Exist. Conditions	2233	7869	21560	20163	9971	3892	2335	1473	69496
Alt 1	2233	7869	21578	20170	9971	3892	2335	1473	69521
Alt 2	2218	8223	22666	20633	9971	3892	2335	1473	71412
Alt 3	2233	7869	21578	20170	9971	3892	2335	1473	69521
Alt 4	2233	7869	21578	20170	9971	3892	2335	1473	69521
Alt 5	2233	7869	21578	20170	9971	3892	2335	1473	69521

Flow change from Existing Conditions

Alt 1	0	0	18	7	0	0	0	0	25
Alt 2	-14	354	1106	470	0	0	0	0	1916
Alt 3	0	0	18	7	0	0	0	0	25
Alt 4	0	0	18	7	0	0	0	0	25
Alt 5	0	0	18	7	0	0	0	0	25

Percent change in flow from Existing Conditions

Alt 1	0%	0%	0%	0%	0%	0%	0%	0%	0%
Alt 2	-1%	4%	5%	2%	0%	0%	0%	0%	3%
Alt 3	0%	0%	0%	0%	0%	0%	0%	0%	0%
Alt 4	0%	0%	0%	0%	0%	0%	0%	0%	0%
Alt 5	0%	0%	0%	0%	0%	0%	0%	0%	0%

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Table D-8. Big Thompson River Streamflow below Lake Estes (cfs).

Average Year (1950-1996)

	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Annual
Exist. Conditions	39	176	410	186	114	59	39	26	92
Alt 1	39	176	415	188	114	59	39	26	93
Alt 2	40	191	425	204	117	60	40	26	97
Alt 3	40	183	415	189	114	59	39	26	93
Alt 4	40	183	415	189	114	59	39	26	93
Alt 5	40	185	418	191	115	59	39	26	94

Flow change from Existing Conditions

Alt 1	0	0	5	2	0	0	0	0	1
Alt 2	1	15	14	18	3	1	1	0	4
Alt 3	1	7	5	3	0	0	0	0	1
Alt 4	1	7	5	3	0	0	0	0	1
Alt 5	1	10	7	5	1	0	0	0	2

Percent change in flow from Existing Conditions

Alt 1	0%	0%	1%	1%	0%	0%	0%	0%	1%
Alt 2	2%	9%	4%	9%	3%	1%	2%	1%	5%
Alt 3	2%	4%	1%	2%	0%	0%	0%	0%	1%
Alt 4	2%	4%	1%	2%	0%	0%	0%	0%	1%
Alt 5	2%	5%	2%	2%	1%	0%	0%	1%	2%

Dry Year Average (1954, 1966, 1977, 1981, 1989)

Exist. Conditions	36	165	274	156	97	50	38	23	74
All Alternatives	36	165	274	157	97	50	38	23	74

No change in flow between Existing Conditions and all other alternatives in dry years.

Wet Year Average (1957, 1983, 1984, 1986, 1995)

Exist. Conditions	38	128	362	328	162	65	38	25	101
Alt 1	38	128	363	328	162	65	38	25	101
Alt 2	37	134	381	336	162	65	38	25	103
Alt 3	38	128	363	328	162	65	38	25	101
Alt 4	38	128	363	328	162	65	38	25	101
Alt 5	38	128	363	328	162	65	38	25	101

Flow change from Existing Conditions

Alt 1	0	0	0	0	0	0	0	0	0
Alt 2	0	6	19	8	0	0	0	0	3
Alt 3	0	0	0	0	0	0	0	0	0
Alt 4	0	0	0	0	0	0	0	0	0
Alt 5	0	0	0	0	0	0	0	0	0

Percent change in flow from Existing Conditions

Alt 1	0%	0%	0%	0%	0%	0%	0%	0%	0%
Alt 2	-1%	4%	5%	2%	0%	0%	0%	0%	3%
Alt 3	0%	0%	0%	0%	0%	0%	0%	0%	0%
Alt 4	0%	0%	0%	0%	0%	0%	0%	0%	0%
Alt 5	0%	0%	0%	0%	0%	0%	0%	0%	0%

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Table D-9. Big Thompson River Streamflow at Canyon Gage (AF).

Average Year (1950-1996)

	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Annual
Exist. Conditions	3993	14031	30651	15301	9740	4797	3413	2251	84177
Alt 1	3993	14046	30857	15438	9740	4797	3413	2251	84535
Alt 2	4034	14962	31266	16386	9917	4833	3458	2261	87119
Alt 3	4036	14456	30903	15509	9740	4797	3413	2251	85105
Alt 4	4036	14458	30903	15509	9740	4797	3413	2251	85105
Alt 5	4036	14616	31008	15583	9831	4804	3413	2261	85551

Flow change from Existing Conditions

Alt 1	0	15	206	137	0	0	0	0	358
Alt 2	41	932	615	1085	177	37	45	11	2942
Alt 3	42	426	252	208	0	0	0	0	928
Alt 4	42	427	251	208	0	0	0	0	928
Alt 5	42	585	356	282	91	7	0	11	1374

Percent change in flow from Existing Conditions

Alt 1	0%	0%	1%	1%	0%	0%	0%	0%	0%
Alt 2	1%	7%	2%	7%	2%	1%	1%	0%	3%
Alt 3	1%	3%	1%	1%	0%	0%	0%	0%	1%
Alt 4	1%	3%	1%	1%	0%	0%	0%	0%	1%
Alt 5	1%	4%	1%	2%	1%	0%	0%	0%	2%

Dry Year Average (1954, 1966, 1977, 1981, 1989)

Exist. Conditions	2881	11595	18843	11669	7603	3950	3370	2239	62150
All Alternatives	2881	11595	18843	11746	7603	3950	3370	2239	62226

No change in flow between Existing Conditions and all other alternatives in dry years.

Wet Year Average (1957, 1983, 1984, 1986, 1995)

Exist. Conditions	5314	10937	34554	27292	14027	5593	3309	2060	103086
Alt 1	5314	10937	34239	27300	14027	5593	3309	2060	102778
Alt 2	5299	11290	34305	27762	14027	5593	3309	2060	103645
Alt 3	5314	10937	34590	27300	14027	5593	3309	2060	103129
Alt 4	5314	10937	34587	27300	14027	5593	3309	2060	103125
Alt 5	5314	10937	34555	27300	14027	5593	3309	2060	103093

Flow change from Existing Conditions

Alt 1	0	0	-315	7	0	0	0	0	-308
Alt 2	-14	354	-249	470	0	0	0	0	560
Alt 3	0	0	36	7	0	0	0	0	43
Alt 4	0	0	33	7	0	0	0	0	40
Alt 5	0	0	1	7	0	0	0	0	8

Percent change in flow from Existing Conditions

Alt 1	0%	0%	-1%	0%	0%	0%	0%	0%	0%
Alt 2	0%	3%	-1%	2%	0%	0%	0%	0%	1%
Alt 3	0%	0%	0%	0%	0%	0%	0%	0%	0%
Alt 4	0%	0%	0%	0%	0%	0%	0%	0%	0%
Alt 5	0%	0%	0%	0%	0%	0%	0%	0%	0%

Table D-10. Big Thompson River Streamflow at Canyon Gage (cfs).

Average Year (1950-1996)

	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Annual
Exist. Conditions	67	228	515	249	158	81	56	38	123
Alt 1	67	228	519	251	158	81	56	38	124
Alt 2	68	243	525	266	161	81	56	38	128
Alt 3	68	235	519	252	158	81	56	38	125
Alt 4	68	235	519	252	158	81	56	38	125
Alt 5	68	238	521	253	160	81	56	38	125

Flow change from Existing Conditions

Alt 1	0	0	3	2	0	0	0	0	0
Alt 2	1	15	10	18	3	1	1	0	4
Alt 3	1	7	4	3	0	0	0	0	1
Alt 4	1	7	4	3	0	0	0	0	1
Alt 5	1	10	6	5	1	0	0	0	2

Percent change in flow from Existing Conditions

Alt 1	0%	0%	1%	1%	0%	0%	0%	0%	0%
Alt 2	1%	7%	2%	7%	2%	1%	1%	0%	3%
Alt 3	1%	3%	1%	1%	0%	0%	0%	0%	1%
Alt 4	1%	3%	1%	1%	0%	0%	0%	0%	1%
Alt 5	1%	4%	1%	2%	1%	0%	0%	0%	2%

Dry Year Average (1954, 1966, 1977, 1981, 1989)

Exist. Conditions	48	189	317	190	124	66	55	38	93
All Alternatives	48	189	317	191	124	66	55	38	93

No change in flow between Existing Conditions and all other alternatives in dry years.

Wet Year Average (1957, 1983, 1984, 1986, 1995)

Exist. Conditions	89	178	581	444	228	94	54	35	150
Alt 1	89	178	575	444	228	94	54	35	150
Alt 2	89	184	576	452	228	94	54	35	151
Alt 3	89	178	581	444	228	94	54	35	150
Alt 4	89	178	581	444	228	94	54	35	150
Alt 5	89	178	581	444	228	94	54	35	150

Flow change from Existing Conditions

Alt 1	0	0	-5	0	0	0	0	0	0
Alt 2	0	6	-4	8	0	0	0	0	1
Alt 3	0	0	1	0	0	0	0	0	0
Alt 4	0	0	1	0	0	0	0	0	0
Alt 5	0	0	0	0	0	0	0	0	0

Percent change in flow from Existing Conditions

Alt 1	0%	0%	-1%	0%	0%	0%	0%	0%	0%
Alt 2	0%	3%	-1%	2%	0%	0%	0%	0%	1%
Alt 3	0%	0%	0%	0%	0%	0%	0%	0%	0%
Alt 4	0%	0%	0%	0%	0%	0%	0%	0%	0%
Alt 5	0%	0%	0%	0%	0%	0%	0%	0%	0%

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Table D-11. Modeled Lake Granby Spills.

Spill Event	May-August			June-August			May-July			July-August			Sept-October			June-July		
	% of time spill occurs	Daily Avg. Spill (cfs)	Daily Max. Spill (cfs)	% of time spill occurs	Daily Avg. Spill (cfs)	Daily Max. Spill (cfs)	% of time spill occurs	Daily Avg. Spill (cfs)	Daily Max. Spill (cfs)	% of time spill occurs	Daily Avg. Spill (cfs)	Daily Max. Spill (cfs)	% of time spill occurs	Daily Avg. Spill (cfs)	Daily Max. Spill (cfs)	% of time spill occurs	Daily Avg. Spill (cfs)	Daily Max. Spill (cfs)
Existing Conditions	2	988	5,225	6	886	2,767	2	715	3,271	6	1,079	5,633	2	277	333	13	1,014	5,633
No Action (Alt 1)	2	986	5,225	2	678	2,606	2	706	3,270	4	1,374	5,271	2	241	300	13	934	5,633
Proposed Action (Alt 2)	2	1,013	5,415	2	589	2,643	0	-	-	2	973	4,556	2	236	278	15	846	5,618
Alternatives 3 to 5	2	1,003	5,231	2	452	2,607	0	-	-	2	1,042	4,954	2	260	333	15	903	5,633

Spill Event	June			July			August		
	% of time spill occurs	Daily Avg. Spill (cfs)	Daily Max. Spill (cfs)	% of time spill occurs	Daily Avg. Spill (cfs)	Daily Max. Spill (cfs)	% of time spill occurs	Daily Avg. Spill (cfs)	Daily Max. Spill (cfs)
Existing Conditions	4	955	2,817	6	400	1,763	4	240	458
No Action (Alt 1)	4	955	2,817	4	314	927	4	243	459
Proposed Action (Alt 2)	4	680	2,022	0	-	-	0	-	-
Alternatives 3 to 5	4	838	2,737	2	157	281	2	182	275

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Table D-12. Colorado River Streamflow below Lake Granby at USGS gage (cfs).

Average Year (1950-1996)

	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Annual
Exist. Conditions	20	84	400	258	68	28	25	20	82
Alt 1	20	83	363	232	65	28	24	20	76
Alt 2	20	81	310	213	56	27	24	20	69
Alt 3	20	82	332	218	59	28	24	20	72
Alt 4	20	82	332	218	59	28	24	20	72
Alt 5	20	82	331	217	58	28	24	20	72

Flow change from Existing Conditions

Alt 1	0	-1	-37	-26	-3	0	-1	0	-6
Alt 2	0	-3	-90	-45	-13	-1	-1	0	-13
Alt 3	0	-2	-68	-40	-10	0	-1	0	-10
Alt 4	0	-2	-68	-40	-10	0	-1	0	-10
Alt 5	0	-2	-69	-41	-10	0	-1	0	-10

Percent change in flow from Existing Conditions

Alt 1	0%	-1%	-9%	-10%	-4%	-2%	-4%	0%	-7%
Alt 2	0%	-3%	-23%	-17%	-18%	-3%	-3%	2%	-15%
Alt 3	0%	-3%	-17%	-15%	-14%	-1%	-4%	0%	-12%
Alt 4	0%	-3%	-17%	-15%	-14%	-1%	-4%	0%	-12%
Alt 5	0%	-3%	-17%	-16%	-15%	-1%	-4%	0%	-13%

Dry Year Average (1954, 1966, 1977, 1981, 1989)

Exist. Conditions	20	57	57	57	30	20	20	20	30
All Alternatives	20	57	57	57	30	20	20	20	30

No change in flow between Existing Conditions and all other alternatives in dry years.

Wet Year Average (1957, 1983, 1984, 1986, 1995)

Exist. Conditions	20	181	886	896	245	33	20	20	199
Alt 1	20	180	886	769	245	35	20	20	189
Alt 2	20	184	899	721	167	37	20	24	180
Alt 3	20	189	886	747	192	31	20	20	183
Alt 4	20	189	886	747	192	31	20	20	183
Alt 5	20	189	880	743	178	31	20	20	181

Flow change from Existing Conditions

Alt 1	0	-1	0	-127	0	2	0	0	-11
Alt 2	0	2	14	-175	-77	4	0	4	-19
Alt 3	0	8	0	-149	-52	-3	0	0	-17
Alt 4	0	8	0	-149	-52	-3	0	0	-17
Alt 5	0	8	-6	-153	-66	-3	0	0	-19

Percent change in flow from Existing Conditions

Alt 1	0%	-1%	0%	-14%	0%	6%	0%	0%	-5%
Alt 2	0%	1%	2%	-20%	-32%	11%	0%	18%	-10%
Alt 3	0%	5%	0%	-17%	-21%	-8%	0%	0%	-8%
Alt 4	0%	5%	0%	-17%	-21%	-8%	0%	0%	-8%
Alt 5	0%	4%	-1%	-17%	-27%	-9%	0%	0%	-9%

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Table D-13. Colorado River Streamflow above Windy Gap (cfs).

Average Year (1950-1996)

	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Annual
Exist. Conditions	213	545	1137	519	168	83	79	78	260
Alt 1	213	544	1084	487	164	82	78	78	252
Alt 2	213	540	1020	462	152	82	78	79	243
Alt 3	213	541	1047	469	156	82	78	78	246
Alt 4	213	541	1047	469	156	82	78	78	246
Alt 5	213	540	1045	467	155	82	78	78	246

Flow change from Existing Conditions

Alt 1	0	-1	-52	-32	-3	0	-1	0	-7
Alt 2	0	-5	-117	-57	-16	-1	-1	0	-16
Alt 3	0	-4	-90	-50	-12	0	-1	0	-13
Alt 4	0	-4	-90	-50	-12	0	-1	0	-13
Alt 5	0	-4	-91	-52	-12	0	-1	0	-13

Percent change in flow from Existing Conditions

Alt 1	0%	0%	-5%	-6%	-2%	-1%	-1%	0%	-3%
Alt 2	0%	-1%	-10%	-11%	-9%	-1%	-1%	1%	-6%
Alt 3	0%	-1%	-8%	-10%	-7%	0%	-1%	0%	-5%
Alt 4	0%	-1%	-8%	-10%	-7%	0%	-1%	0%	-5%
Alt 5	0%	-1%	-8%	-10%	-7%	0%	-2%	0%	-5%

Dry Year Average (1954, 1966, 1977, 1981, 1989)

Exist. Conditions	145	197	187	133	94	66	67	74	104
All Alternatives	145	197	187	133	94	66	67	74	104

No change in flow between Existing Conditions and all other alternatives in dry years.

Wet Year Average (1957, 1983, 1984, 1986, 1995)

Exist. Conditions	179	1041	2660	1730	462	124	82	86	558
Alt 1	179	1040	2604	1565	462	126	82	86	539
Alt 2	179	1044	2618	1517	367	128	82	89	529
Alt 3	179	1050	2605	1543	397	121	82	87	533
Alt 4	179	1050	2605	1543	398	121	82	87	533
Alt 5	179	1049	2598	1540	383	121	82	87	531

Flow change from Existing Conditions

Alt 1	0	-1	-56	-165	0	2	0	0	-19
Alt 2	0	2	-42	-213	-95	4	0	3	-29
Alt 3	0	8	-55	-187	-64	-3	0	2	-25
Alt 4	0	8	-55	-187	-64	-3	0	2	-25
Alt 5	0	8	-62	-190	-78	-3	0	2	-27

Percent change in flow from Existing Conditions

Alt 1	0%	0%	-2%	-10%	0%	2%	0%	0%	-3%
Alt 2	0%	0%	-2%	-12%	-21%	3%	0%	4%	-5%
Alt 3	0%	1%	-2%	-11%	-14%	-2%	0%	2%	-5%
Alt 4	0%	1%	-2%	-11%	-14%	-2%	0%	2%	-5%
Alt 5	0%	1%	-2%	-11%	-17%	-2%	0%	2%	-5%

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Table D-14. Colorado River Streamflow below Windy Gap at USGS gage (cfs).

Average Year (1950-1996)

	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Annual
Exist. Conditions	137	258	951	472	161	83	79	78	209
Alt 1	137	242	875	377	144	82	78	78	192
Alt 2	137	217	774	365	135	82	78	79	180
Alt 3	137	220	808	338	131	82	78	78	180
Alt 4	137	220	808	339	131	82	78	78	180
Alt 5	137	214	798	341	132	82	78	78	179

Flow change from Existing Conditions

Alt 1	0	-16	-76	-95	-16	0	-1	0	-17
Alt 2	0	-41	-177	-108	-26	-1	-1	0	-29
Alt 3	0	-38	-143	-135	-30	0	-1	0	-29
Alt 4	0	-38	-143	-134	-29	0	-1	0	-29
Alt 5	0	-44	-153	-131	-29	0	-1	0	-30

Percent change in flow from Existing Conditions

Alt 1	0%	-6%	-8%	-20%	-10%	-1%	-1%	0%	-8%
Alt 2	0%	-16%	-19%	-23%	-16%	-1%	-1%	1%	-14%
Alt 3	0%	-15%	-15%	-28%	-18%	0%	-1%	0%	-14%
Alt 4	0%	-15%	-15%	-28%	-18%	0%	-1%	0%	-14%
Alt 5	0%	-17%	-16%	-28%	-18%	0%	-2%	0%	-14%

Dry Year Average (1954, 1966, 1977, 1981, 1989)

Exist. Conditions	127	136	142	127	94	66	67	74	93
All Alternatives	127	136	142	127	94	66	67	74	93

No change in flow between Existing Conditions and all other alternatives in dry years.

Wet Year Average (1957, 1983, 1984, 1986, 1995)

Exist. Conditions	132	707	2420	1716	462	124	82	86	505
Alt 1	132	692	2333	1288	355	126	82	86	451
Alt 2	132	561	2243	1265	308	128	82	89	427
Alt 3	132	578	2239	1231	297	121	82	87	423
Alt 4	132	578	2239	1233	297	121	82	87	424
Alt 5	132	566	2233	1239	305	121	82	87	423

Flow change from Existing Conditions

Alt 1	0	-15	-87	-427	-106	2	0	0	-54
Alt 2	0	-146	-177	-450	-154	4	0	3	-78
Alt 3	0	-130	-181	-485	-165	-3	0	2	-81
Alt 4	0	-129	-181	-483	-164	-3	0	2	-81
Alt 5	0	-141	-187	-476	-157	-3	0	2	-81

Percent change in flow from Existing Conditions

Alt 1	0%	-2%	-4%	-25%	-23%	2%	0%	0%	-11%
Alt 2	0%	-21%	-7%	-26%	-33%	3%	0%	4%	-15%
Alt 3	0%	-18%	-7%	-28%	-36%	-2%	0%	2%	-16%
Alt 4	0%	-18%	-7%	-28%	-36%	-2%	0%	2%	-16%
Alt 5	0%	-20%	-8%	-28%	-34%	-2%	0%	2%	-16%

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Table D-15. Willow Creek Streamflow at USGS/NCWCD gage (cfs).

Average Year (1950-1996)

	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Annual
Exist. Conditions	6	51	143	32	12	3	8	8	25
Alt 1	6	51	127	26	11	3	8	8	23
Alt 2	6	49	116	20	9	4	8	8	22
Alt 3	6	50	121	22	10	3	8	8	22
Alt 4	6	50	121	22	10	3	8	8	22
Alt 5	6	49	120	21	10	3	7	8	22

Flow change from Existing Conditions

Alt 1	0	0	-16	-6	-1	0	0	0	-2
Alt 2	0	-2	-27	-11	-3	0	0	0	-4
Alt 3	0	-1	-22	-10	-2	0	0	0	-3
Alt 4	0	-1	-22	-10	-2	0	0	0	-3
Alt 5	0	-2	-23	-11	-2	0	0	0	-3

Percent change in flow from Existing Conditions

Alt 1	0%	0%	-11%	-19%	-5%	0%	0%	0%	-7%
Alt 2	0%	-4%	-19%	-36%	-25%	3%	0%	1%	-14%
Alt 3	0%	-3%	-15%	-32%	-18%	0%	-1%	3%	-12%
Alt 4	0%	-3%	-15%	-32%	-18%	0%	-1%	3%	-12%
Alt 5	0%	-4%	-16%	-34%	-16%	0%	-4%	3%	-12%

Dry Year Average (1954, 1966, 1977, 1981, 1989)

Exist. Conditions	4	0	10	0	2	2	6	7	5
All Alternatives	4	0	10	0	2	2	6	7	5

No change in flow between Existing Conditions and all other alternatives in dry years.

Wet Year Average (1957, 1983, 1984, 1986, 1995)

Exist. Conditions	5	184	434	112	58	14	7	11	73
Alt 1	5	184	378	75	58	14	7	11	65
Alt 2	5	184	378	75	40	14	7	11	64
Alt 3	5	184	378	75	46	14	7	12	64
Alt 4	5	184	378	75	46	14	7	12	64
Alt 5	5	184	378	75	46	14	7	13	64

Flow change from Existing Conditions

Alt 1	0	0	-56	-38	0	0	0	0	-8
Alt 2	0	0	-56	-38	-18	0	0	0	-9
Alt 3	0	0	-56	-38	-12	0	0	2	-9
Alt 4	0	0	-56	-38	-12	0	0	2	-9
Alt 5	0	0	-56	-38	-12	0	0	2	-9

Percent change in flow from Existing Conditions

Alt 1	0%	0%	-13%	-34%	0%	0%	0%	0%	-11%
Alt 2	0%	0%	-13%	-34%	-30%	0%	0%	0%	-13%
Alt 3	0%	0%	-13%	-34%	-20%	0%	0%	15%	-12%
Alt 4	0%	0%	-13%	-34%	-20%	0%	0%	15%	-12%
Alt 5	0%	0%	-13%	-34%	-20%	0%	0%	18%	-12%

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Table D-16. Colorado River Streamflow at Hot Sulphur Springs at USGS/NCWCD gage (cfs).

Average Year (1950-1996)

	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Annual
Exist. Conditions	146	278	953	482	170	87	87	83	216
Alt 1	146	262	877	386	153	87	86	83	199
Alt 2	146	237	776	374	144	86	86	84	187
Alt 3	146	240	810	347	140	87	86	84	187
Alt 4	146	240	810	348	140	87	86	84	187
Alt 5	146	235	800	351	141	87	86	84	186

Flow change from Existing Conditions

Alt 1	0	-16	-76	-95	-16	0	-1	0	-17
Alt 2	0	-41	-177	-108	-26	-1	-1	0	-29
Alt 3	0	-38	-143	-135	-30	0	-1	0	-29
Alt 4	0	-38	-143	-134	-29	0	-1	0	-29
Alt 5	0	-44	-153	-131	-29	0	-1	0	-30

Percent change in flow from Existing Conditions

Alt 1	0%	-6%	-8%	-20%	-10%	-1%	-1%	0%	-8%
Alt 2	0%	-15%	-19%	-22%	-15%	-1%	-1%	1%	-14%
Alt 3	0%	-14%	-15%	-28%	-17%	0%	-1%	0%	-13%
Alt 4	0%	-14%	-15%	-28%	-17%	0%	-1%	0%	-13%
Alt 5	0%	-16%	-16%	-27%	-17%	0%	-2%	0%	-14%

Dry Year Average (1954, 1966, 1977, 1981, 1989)

Exist. Conditions	137	137	139	142	101	67	75	80	98
All Alternatives	137	137	139	142	101	67	75	80	98

No change in flow between Existing Conditions and all other alternatives in dry years.

Wet Year Average (1957, 1983, 1984, 1986, 1995)

Exist. Conditions	150	730	2414	1709	468	127	90	90	511
Alt 1	150	715	2328	1282	361	129	90	90	457
Alt 2	150	584	2237	1259	314	130	90	93	433
Alt 3	150	601	2234	1224	303	124	90	91	430
Alt 4	150	601	2234	1227	303	124	90	91	430
Alt 5	150	589	2227	1233	311	124	90	92	429

Flow change from Existing Conditions

Alt 1	0	-15	-87	-427	-106	2	0	0	-54
Alt 2	0	-146	-177	-450	-154	4	0	3	-78
Alt 3	0	-130	-181	-485	-165	-3	0	2	-81
Alt 4	0	-129	-181	-483	-164	-3	0	2	-81
Alt 5	0	-141	-187	-476	-157	-3	0	2	-81

Percent change in flow from Existing Conditions

Alt 1	0%	-2%	-4%	-25%	-23%	2%	0%	0%	-10%
Alt 2	0%	-20%	-7%	-26%	-33%	3%	0%	4%	-15%
Alt 3	0%	-18%	-7%	-28%	-35%	-2%	0%	2%	-16%
Alt 4	0%	-18%	-7%	-28%	-35%	-2%	0%	2%	-16%
Alt 5	0%	-19%	-8%	-28%	-34%	-2%	0%	2%	-16%

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Table D-17. Colorado River below Williams Fork (cfs).

Average Year (1950-1996)

	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Annual
Exist. Conditions	186	308	1194	735	276	191	232	209	341
Alt 1	186	292	1118	641	261	190	231	208	324
Alt 2	186	267	1017	629	251	190	231	209	312
Alt 3	186	270	1051	602	247	190	231	209	312
Alt 4	186	270	1051	603	247	190	231	209	312
Alt 5	186	264	1041	606	248	190	230	209	311

Flow change from Existing Conditions

Alt 1	0	-16	-76	-94	-15	-1	-1	0	-17
Alt 2	0	-41	-176	-106	-24	-1	-1	0	-29
Alt 3	0	-38	-143	-133	-28	-1	-1	0	-29
Alt 4	0	-38	-143	-132	-28	-1	-1	0	-29
Alt 5	0	-44	-153	-129	-27	-1	-2	0	-30

Percent change in flow from Existing Conditions

Alt 1	0%	-5%	-6%	-13%	-5%	-1%	-1%	0%	-5%
Alt 2	0%	-13%	-15%	-14%	-9%	-1%	-1%	0%	-9%
Alt 3	0%	-12%	-12%	-18%	-10%	0%	-1%	0%	-9%
Alt 4	0%	-12%	-12%	-18%	-10%	0%	-1%	0%	-8%
Alt 5	0%	-14%	-13%	-18%	-10%	0%	-1%	0%	-9%

Dry Year Average (1954, 1966, 1977, 1981, 1989)

Exist. Conditions	190	148	146	338	266	178	214	206	204
All Alternatives	190	148	146	338	266	178	214	206	204

No change in flow between Existing Conditions and all other alternatives in dry years.

Wet Year Average (1957, 1983, 1984, 1986, 1995)

Exist. Conditions	216	803	2965	2314	639	215	242	220	704
Alt 1	216	788	2878	1887	533	217	242	220	651
Alt 2	216	657	2787	1864	485	219	242	223	626
Alt 3	216	674	2784	1829	475	212	242	222	623
Alt 4	216	674	2784	1832	475	212	242	222	623
Alt 5	216	662	2778	1838	482	212	242	222	623

Flow change from Existing Conditions

Alt 1	0	-15	-87	-427	-106	2	0	0	-54
Alt 2	0	-146	-177	-450	-154	4	0	3	-78
Alt 3	0	-130	-181	-485	-165	-3	0	2	-81
Alt 4	0	-129	-181	-483	-164	-3	0	2	-81
Alt 5	0	-141	-187	-476	-157	-3	0	2	-81

Percent change in flow from Existing Conditions

Alt 1	0%	-2%	-3%	-18%	-17%	1%	0%	0%	-8%
Alt 2	0%	-18%	-6%	-19%	-24%	2%	0%	2%	-11%
Alt 3	0%	-16%	-6%	-21%	-26%	-1%	0%	1%	-12%
Alt 4	0%	-16%	-6%	-21%	-26%	-1%	0%	1%	-11%
Alt 5	0%	-18%	-6%	-21%	-25%	-1%	0%	1%	-12%

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Table D-18. Colorado River Streamflow near Kremmling at USGS gage (cfs).

Average Year (1950-1996)

	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Annual
Exist. Conditions	664	1145	2619	1745	1026	909	832	583	969
Alt 1	664	1129	2542	1660	1010	901	830	583	952
Alt 2	664	1104	2442	1647	1002	899	830	583	940
Alt 3	664	1107	2476	1620	998	901	830	583	940
Alt 4	664	1107	2476	1621	998	901	830	583	940
Alt 5	664	1101	2466	1624	999	901	830	583	939

Flow change from Existing Conditions

Alt 1	0	-15	-76	-85	-16	-8	-1	0	-17
Alt 2	0	-40	-176	-98	-24	-10	-1	0	-29
Alt 3	0	-37	-143	-125	-28	-8	-2	0	-29
Alt 4	0	-37	-142	-124	-28	-8	-2	0	-29
Alt 5	0	-43	-153	-121	-28	-8	-2	0	-30

Percent change in flow from Existing Conditions

Alt 1	0%	-1%	-3%	-5%	-2%	-1%	0%	0%	-2%
Alt 2	0%	-4%	-7%	-6%	-2%	-1%	0%	0%	-3%
Alt 3	0%	-3%	-5%	-7%	-3%	-1%	0%	0%	-3%
Alt 4	0%	-3%	-5%	-7%	-3%	-1%	0%	0%	-3%
Alt 5	0%	-4%	-6%	-7%	-3%	-1%	0%	0%	-3%

Dry Year Average (1954, 1966, 1977, 1981, 1989)

Exist. Conditions	615	422	473	924	943	866	674	547	622
All Alternatives	615	422	473	924	943	866	674	547	622

No change in flow between Existing Conditions and all other alternatives in dry years.

Wet Year Average (1957, 1983, 1984, 1986, 1995)

Exist. Conditions	764	2231	5885	4725	1694	945	804	633	1681
Alt 1	764	2216	5798	4298	1588	947	804	633	1627
Alt 2	764	2086	5707	4274	1540	948	804	637	1603
Alt 3	764	2102	5704	4240	1529	942	804	635	1600
Alt 4	764	2102	5704	4242	1530	942	804	635	1600
Alt 5	764	2091	5697	4249	1537	942	804	635	1600

Flow change from Existing Conditions

Alt 1	0	-15	-87	-427	-106	2	0	0	-54
Alt 2	0	-145	-178	-450	-154	4	0	4	-78
Alt 3	0	-129	-182	-485	-165	-3	0	2	-81
Alt 4	0	-129	-181	-483	-164	-3	0	2	-81
Alt 5	0	-140	-188	-476	-157	-3	0	2	-81

Percent change in flow from Existing Conditions

Alt 1	0%	-1%	-1%	-9%	-6%	0%	0%	0%	-3%
Alt 2	0%	-7%	-3%	-10%	-9%	0%	0%	1%	-5%
Alt 3	0%	-6%	-3%	-10%	-10%	0%	0%	0%	-5%
Alt 4	0%	-6%	-3%	-10%	-10%	0%	0%	0%	-5%
Alt 5	0%	-6%	-3%	-10%	-9%	0%	0%	0%	-5%

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Table D-19. Colorado River at Hot Sulphur Springs Channel Maintenance Flows (1950-1996).

Recurrence Interval	Flow Range	Range of dates flow occurs	When most of flow occurs	Average flow (cfs)					
				Existing Conditions	No Action	Proposed Action	Alternative 3	Alternative 4	Alternative 5
0.8x1.5-yr flow to 2-yr flow	510 cfs to 1,240 cfs	late March to mid-October	May through July	768	783	783	784	795	802
2-yr flow to 5-yr flow	1,240 cfs to 3,160 cfs	May 1 to late September	June and July	2,018	2,050	2,039	2,041	2,047	2,054
5-yr flow to 10-yr flow	3,160 cfs to 4,600 cfs	late May to mid-July	June	3,750	3,713	3,756	3,757	3,736	3,772
10-yr flow to 25-yr flow	4,600 cfs to 6,520 cfs	late May to mid-July	June	5,016	5,290	5,359	5,360	5,337	5,298
At or greater than 25-yr flow	6,520 cfs or greater	12-Jul	one day	6,545	-	-	-		

Recurrence Interval	Flow Range	Average Number of Days/Year Flow Occurs				Percentage of Years Flow Occurs			
		Existing Conditions	No Action	Proposed Action	Alts 3 - 5	Existing Conditions	No Action	Proposed Action	Alts 3 - 5
0.8x1.5-yr flow to 2-yr flow	510 cfs to 1,240 cfs	23	21	19	19-20	62%	53%	53%	51-53%
2-yr flow to 5-yr flow	1,240 cfs to 3,160 cfs	23.5	21.5	22	22	38%	36%	34%	34%
5-yr flow to 10-yr flow	3,160 cfs to 4,600 cfs	10	10	11	11	28%	26%	19%	17-19%
10-yr flow to 25-yr flow	4,600 cfs to 6,520 cfs	4	4.2	5.3	5.3	13%	11%	6%	6%
At or greater than 25-yr flow	6,520 cfs or greater	1	0	0	0	2%	0%	0%	0%

Recurrence Interval	Flow Range	Number of Days/Year Flow Occurs in 47-yr model period					
		Existing Conditions	No Action	Proposed Action	Alternative 3	Alternative 4	Alternative 5
0.8x1.5-yr flow to 2-yr flow	510 cfs to 1,240 cfs	663	520	466	466	457	490
2-yr flow to 5-yr flow	1,240 cfs to 3,160 cfs	423	365	346	348	342	353
5-yr flow to 10-yr flow	3,160 cfs to 4,600 cfs	135	118	96	96	95	82
10-yr flow to 25-yr flow	4,600 cfs to 6,520 cfs	24	21	16	16	16	18
At or greater than 25-yr flow	6,520 cfs or greater	1	0	0	0	0	0

Appendix E:
Hydrology Model Output—Stream Stage Changes

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Table E-1. Big Thompson River Stage at Canyon Gage (feet).

Average Year (1950-1996)

	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
Exist. Conditions	2.21	2.96	3.59	3.02	2.71	2.31	2.11	1.92
Alt 1	2.21	2.96	3.59	3.02	2.71	2.31	2.11	1.92
Alt 2	2.21	3.00	3.61	3.07	2.72	2.31	2.11	1.93
Alt 3	2.21	2.98	3.60	3.03	2.71	2.31	2.11	1.92
Alt 4	2.21	2.98	3.60	3.03	2.71	2.31	2.11	1.92
Alt 5	2.21	2.98	3.60	3.03	2.71	2.31	2.11	1.93

Change in stage from existing conditions

Alt 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alt 2	0.00	0.04	0.02	0.05	0.01	0.00	0.00	0.01
Alt 3	0.00	0.02	0.01	0.01	0.00	0.00	0.00	0.00
Alt 4	0.00	0.02	0.01	0.01	0.00	0.00	0.00	0.00
Alt 5	0.00	0.02	0.01	0.01	0.00	0.00	0.00	0.01

Percent change in stage from existing conditions

Alt 1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Alt 2	0.0%	1.4%	0.6%	1.7%	0.4%	0.0%	0.0%	0.5%
Alt 3	0.0%	0.7%	0.3%	0.3%	0.0%	0.0%	0.0%	0.0%
Alt 4	0.0%	0.7%	0.3%	0.3%	0.0%	0.0%	0.0%	0.0%
Alt 5	0.0%	0.7%	0.3%	0.3%	0.0%	0.0%	0.0%	0.5%

Dry Year Average (1954, 1966, 1977, 1981, 1989)

	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
Exist. Conditions	2.04	2.82	3.20	2.83	2.55	2.20	2.10	1.92
All Alternatives	2.04	2.82	3.20	2.83	2.55	2.20	2.10	1.92

No change in stage between Existing Conditions and all alternatives in dry years.

Wet Year Average (1957, 1983, 1984, 1986, 1995)

	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
Exist. Conditions	2.36	2.78	3.69	3.46	2.96	2.39	2.09	1.89
Alt 1	2.36	2.78	3.68	3.46	2.96	2.39	2.09	1.89
Alt 2	2.36	2.80	3.69	3.48	2.96	2.39	2.09	1.89
Alt 3	2.36	2.78	3.69	3.46	2.96	2.39	2.09	1.89
Alt 4	2.36	2.78	3.69	3.46	2.96	2.39	2.09	1.89
Alt 5	2.36	2.78	3.69	3.46	2.96	2.39	2.09	1.89

Change in stage from existing conditions

Alt 1	0.00	0.00	-0.01	0.00	0.00	0.00	0.00	0.00
Alt 2	0.00	0.02	0.00	0.02	0.00	0.00	0.00	0.00
Alt 3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alt 4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alt 5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Percent change in stage from existing conditions

Alt 1	0.0%	0.0%	-0.3%	0.0%	0.0%	0.0%	0.0%	0.0%
Alt 2	0.0%	0.7%	0.0%	0.6%	0.0%	0.0%	0.0%	0.0%
Alt 3	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Alt 4	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Alt 5	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Table E-2. Colorado River Stage below Windy Gap Reservoir at USGS gage (feet).

Average Year (1950-1996)

	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
Exist. Conditions	0.68	0.90	1.81	1.19	0.71	0.58	0.57	0.57
Alt 1	0.67	0.88	1.71	1.05	0.69	0.58	0.57	0.57
Alt 2	0.67	0.83	1.59	1.03	0.67	0.58	0.57	0.57
Alt 3	0.67	0.84	1.63	0.99	0.66	0.58	0.57	0.57
Alt 4	0.67	0.84	1.63	1.00	0.66	0.58	0.57	0.57
Alt 5	0.67	0.83	1.61	1.00	0.67	0.58	0.57	0.57

Change in stage from existing conditions

Alt 1	0.00	-0.03	-0.10	-0.13	-0.03	0.00	0.00	0.00
Alt 2	0.00	-0.07	-0.22	-0.16	-0.04	0.00	0.00	0.00
Alt 3	0.00	-0.06	-0.18	-0.19	-0.05	0.00	0.00	0.00
Alt 4	0.00	-0.06	-0.18	-0.19	-0.05	0.00	0.00	0.00
Alt 5	0.00	-0.07	-0.19	-0.19	-0.05	0.00	0.00	0.00

Percent change in stage from existing conditions

Alt 1	-0.1%	-3.0%	-5.4%	-11.3%	-4.0%	-0.2%	-0.3%	0.0%
Alt 2	-0.3%	-7.8%	-12.2%	-13.2%	-6.1%	-0.3%	-0.2%	0.1%
Alt 3	-0.3%	-7.1%	-10.1%	-16.2%	-7.0%	-0.2%	-0.3%	0.1%
Alt 4	-0.3%	-7.1%	-10.0%	-16.1%	-7.0%	-0.2%	-0.3%	0.1%
Alt 5	-0.3%	-8.1%	-10.7%	-15.8%	-6.8%	-0.2%	-0.4%	0.1%

Dry Year Average (1954, 1966, 1977, 1981, 1989)

	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
Exist. Conditions	0.65	0.67	0.68	0.65	0.60	0.55	0.55	0.57
All Alternatives	0.65	0.67	0.68	0.65	0.60	0.55	0.55	0.57

No change in stage between Existing Conditions and all alternatives in dry years.

Wet Year Average (1957, 1983, 1984, 1986, 1995)

	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
Exist. Conditions	0.69	1.58	3.20	2.59	1.19	0.66	0.58	0.59
Alt 1	0.69	1.56	3.12	2.19	1.03	0.67	0.58	0.59
Alt 2	0.68	1.39	3.05	2.16	0.96	0.66	0.58	0.59
Alt 3	0.68	1.41	3.05	2.13	0.95	0.66	0.58	0.59
Alt 4	0.68	1.41	3.05	2.13	0.95	0.66	0.58	0.59
Alt 5	0.68	1.39	3.04	2.14	0.96	0.65	0.58	0.59

Change in stage from existing conditions

Alt 1	0.00	-0.02	-0.08	-0.40	-0.16	0.00	0.00	0.00
Alt 2	-0.01	-0.19	-0.15	-0.43	-0.23	0.00	0.00	0.01
Alt 3	-0.01	-0.17	-0.15	-0.46	-0.25	-0.01	0.00	0.00
Alt 4	-0.01	-0.17	-0.15	-0.46	-0.25	-0.01	0.00	0.00
Alt 5	-0.01	-0.19	-0.16	-0.45	-0.24	-0.01	0.00	0.00

Percent change in stage from existing conditions

Alt 1	-0.1%	-1.4%	-2.4%	-15.4%	-13.7%	0.5%	0.0%	0.0%
Alt 2	-1.0%	-12.2%	-4.6%	-16.5%	-19.3%	0.2%	0.0%	1.0%
Alt 3	-0.8%	-10.9%	-4.7%	-17.9%	-20.8%	-1.1%	0.0%	0.5%
Alt 4	-0.8%	-10.9%	-4.7%	-17.8%	-20.7%	-1.1%	0.0%	0.5%
Alt 5	-0.9%	-11.8%	-4.9%	-17.5%	-19.8%	-1.3%	0.0%	0.6%

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Table E-3. Colorado River Stage near Kremmling at USGS gage (feet).

Average Year (1950-1996)

	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
Exist. Conditions	4.68	6.01	8.67	7.22	5.66	5.32	5.11	4.43
Alt 1	4.68	5.97	8.55	7.06	5.62	5.30	5.11	4.43
Alt 2	4.68	5.91	8.39	7.03	5.60	5.30	5.11	4.43
Alt 3	4.68	5.92	8.44	6.98	5.59	5.30	5.11	4.43
Alt 4	4.68	5.92	8.44	6.98	5.59	5.30	5.11	4.43
Alt 5	4.68	5.90	8.43	6.99	5.59	5.30	5.11	4.43

Change in stage from existing conditions

Alt 1	0.00	-0.04	-0.12	-0.17	-0.04	-0.02	0.00	0.00
Alt 2	0.00	-0.10	-0.28	-0.20	-0.06	-0.03	0.00	0.00
Alt 3	0.00	-0.09	-0.23	-0.25	-0.07	-0.02	0.00	0.00
Alt 4	0.00	-0.09	-0.23	-0.24	-0.07	-0.02	0.00	0.00
Alt 5	0.00	-0.11	-0.24	-0.24	-0.07	-0.02	-0.01	0.00

Percent change in stage from existing conditions

Alt 1	0.0%	-0.7%	-1.4%	-2.3%	-0.7%	-0.4%	-0.1%	0.0%
Alt 2	-0.1%	-1.7%	-3.2%	-2.7%	-1.1%	-0.5%	-0.1%	0.0%
Alt 3	-0.1%	-1.6%	-2.6%	-3.4%	-1.3%	-0.4%	-0.1%	0.0%
Alt 4	-0.1%	-1.6%	-2.6%	-3.4%	-1.3%	-0.4%	-0.1%	0.0%
Alt 5	-0.1%	-1.8%	-2.8%	-3.3%	-1.2%	-0.4%	-0.1%	0.0%

Dry Year Average (1954, 1966, 1977, 1981, 1989)

	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
Exist. Conditions	4.49	4.01	4.17	5.31	5.39	5.19	4.70	4.33
All Alternatives	4.49	4.01	4.17	5.31	5.39	5.19	4.70	4.33

No change in stage between Existing Conditions and all alternatives in dry years.

Wet Year Average (1957, 1983, 1984, 1986, 1995)

	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
Exist. Conditions	5.03	8.26	12.17	11.20	7.25	5.46	5.04	4.57
Alt 1	5.03	8.23	12.08	10.81	7.03	5.46	5.04	4.57
Alt 2	5.02	8.02	12.01	10.79	6.93	5.46	5.04	4.58
Alt 3	5.02	8.04	12.01	10.76	6.91	5.44	5.04	4.58
Alt 4	5.02	8.04	12.01	10.76	6.91	5.44	5.04	4.58
Alt 5	5.02	8.02	12.00	10.76	6.93	5.44	5.04	4.58

Change in stage from existing conditions

Alt 1	0.00	-0.03	-0.08	-0.39	-0.22	0.00	0.00	0.00
Alt 2	-0.01	-0.24	-0.16	-0.42	-0.31	0.00	0.00	0.01
Alt 3	-0.01	-0.22	-0.16	-0.45	-0.33	-0.02	0.00	0.00
Alt 4	-0.01	-0.22	-0.16	-0.45	-0.33	-0.02	0.00	0.00
Alt 5	-0.01	-0.23	-0.16	-0.44	-0.32	-0.02	0.00	0.01

Percent change in stage from existing conditions

Alt 1	0.0%	-0.3%	-0.7%	-3.5%	-3.0%	0.0%	0.0%	0.0%
Alt 2	-0.2%	-2.9%	-1.3%	-3.7%	-4.3%	-0.1%	0.0%	0.2%
Alt 3	-0.2%	-2.6%	-1.3%	-4.0%	-4.6%	-0.3%	0.0%	0.1%
Alt 4	-0.2%	-2.6%	-1.3%	-4.0%	-4.6%	-0.3%	0.0%	0.1%
Alt 5	-0.2%	-2.8%	-1.4%	-3.9%	-4.4%	-0.3%	0.0%	0.1%

Appendix F:

Hydrology Model Output—Lake and Reservoir Changes

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Table F-1. Carter Lake Storage Content (AF).

Average Year (1950-1996)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Exist. Conditions	79799	88414	96909	102489	104132	102811	91807	72239	58704	56419	60765	69731
Alt 1	79745	88383	96870	102357	103439	101555	90475	70958	57706	55746	60384	69601
Alt 2	79799	88120	96168	101396	102919	101753	91128	71821	58429	55747	60203	69766
Alt 3	80276	88799	97070	102418	103693	101858	90748	71437	58192	56012	60692	70098
Alt 4	80272	88796	97069	102416	103691	101857	90748	71436	58190	56007	60688	70095
Alt 5	80135	88543	96554	101995	103499	101701	90664	71372	58047	55702	60357	69909

Volume change from existing conditions

Alt 1	-55	-31	-39	-132	-694	-1256	-1332	-1281	-998	-674	-382	-130
Alt 2	0	-294	-741	-1093	-1213	-1058	-678	-418	-276	-672	-562	34
Alt 3	477	385	161	-71	-439	-953	-1058	-801	-513	-407	-73	367
Alt 4	473	383	160	-73	-441	-954	-1059	-803	-515	-412	-78	364
Alt 5	336	129	-355	-494	-633	-1110	-1143	-867	-657	-718	-409	177

Percent change in volume from existing conditions

Alt 1	0%	0%	0%	0%	-1%	-1%	-1%	-2%	-2%	-1%	-1%	0%
Alt 2	0%	0%	-1%	-1%	-1%	-1%	-1%	-1%	0%	-1%	-1%	0%
Alt 3	1%	0%	0%	0%	0%	-1%	-1%	-1%	-1%	-1%	0%	1%
Alt 4	1%	0%	0%	0%	0%	-1%	-1%	-1%	-1%	-1%	0%	1%
Alt 5	0%	0%	0%	0%	-1%	-1%	-1%	-1%	-1%	-1%	-1%	0%

Dry Year Average (1954, 1966, 1977, 1981, 1989)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Exist. Conditions	79931	88647	97205	104144	105531	100778	86821	67320	56214	56315	60530	69616
Alt 1	79934	88662	97211	104124	105283	100292	86418	67184	56201	55911	60484	69599
Alt 2	80423	88977	97494	104407	105619	100821	87101	67660	56525	55230	59728	70041
Alt 3	79982	88578	97010	104027	105265	100391	86558	67198	56172	55627	60117	69645
Alt 4	79978	88574	97007	104023	105263	100390	86556	67196	56170	55621	60112	69642
Alt 5	79693	88078	96180	103351	104902	100106	86316	66897	55789	54989	59512	69419

Volume change from existing conditions

Alt 1	3	14	6	-19	-247	-486	-403	-137	-13	-404	-46	-17
Alt 2	491	330	288	264	89	43	280	340	310	-1085	-802	424
Alt 3	51	-70	-196	-116	-265	-387	-263	-122	-43	-688	-413	29
Alt 4	47	-73	-199	-121	-268	-388	-265	-124	-44	-694	-418	26
Alt 5	-238	-569	-1026	-793	-629	-672	-505	-423	-425	-1326	-1018	-198

Percent change in volume from existing conditions

Alt 1	0%	0%	0%	0%	0%	0%	0%	0%	0%	-1%	0%	0%
Alt 2	1%	0%	0%	0%	0%	0%	0%	1%	1%	-2%	-1%	1%
Alt 3	0%	0%	0%	0%	0%	0%	0%	0%	0%	-1%	-1%	0%
Alt 4	0%	0%	0%	0%	0%	0%	0%	0%	0%	-1%	-1%	0%
Alt 5	0%	-1%	-1%	-1%	-1%	-1%	-1%	-1%	-1%	-2%	-2%	0%

Wet Year Average (1957, 1983, 1984, 1986, 1995)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Exist. Conditions	79608	88093	96588	101685	103760	107865	104952	87135	68882	57867	62712	70223
Alt 1	79521	88017	96553	101633	103229	106662	103276	85225	66502	56680	61643	69893
Alt 2	80475	88702	95855	99260	101311	106003	103045	85139	66775	57495	62767	70961
Alt 3	80329	88851	97231	101955	103875	107273	103377	85449	67148	57397	62636	70737
Alt 4	80325	88844	97228	101953	103872	107272	103376	85448	67147	57393	62632	70735
Alt 5	80193	88613	96699	101456	103564	106986	103256	85299	66926	57256	62591	70714

Volume change from existing conditions

Alt 1	-87	-76	-35	-51	-532	-1203	-1676	-1910	-2380	-1187	-1069	-330
Alt 2	867	609	-734	-2424	-2450	-1862	-1906	-1996	-2107	-372	55	738
Alt 3	721	757	642	271	115	-592	-1575	-1686	-1735	-470	-77	514
Alt 4	717	751	640	269	112	-593	-1575	-1687	-1736	-474	-80	513
Alt 5	584	520	111	-228	-196	-879	-1696	-1836	-1956	-611	-121	491

Percent change in volume from existing conditions

Alt 1	0%	0%	0%	0%	-1%	-1%	-2%	-2%	-3%	-2%	-2%	0%
Alt 2	1%	1%	-1%	-2%	-2%	-2%	-2%	-2%	-3%	-1%	0%	1%
Alt 3	1%	1%	1%	0%	0%	-1%	-2%	-2%	-3%	-1%	0%	1%
Alt 4	1%	1%	1%	0%	0%	-1%	-2%	-2%	-3%	-1%	0%	1%
Alt 5	1%	1%	0%	0%	0%	-1%	-2%	-2%	-3%	-1%	0%	1%

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Table F-2. Carter Lake Elevations (feet).

Average Year (1950-1996)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Exist. Conditions	5729	5738	5746	5751	5753	5751	5741	5721	5707	5705	5709	5718
Alt 1	5729	5738	5746	5751	5752	5750	5740	5720	5706	5704	5709	5718
Alt 2	5729	5737	5745	5750	5752	5750	5740	5721	5707	5704	5709	5718
Alt 3	5729	5738	5746	5751	5752	5751	5740	5720	5706	5704	5709	5719
Alt 4	5729	5738	5746	5751	5752	5751	5740	5720	5706	5704	5709	5719
Alt 5	5729	5738	5746	5751	5752	5750	5740	5720	5706	5704	5709	5719

Elevation change from existing conditions

Alt 1	0	0	0	0	-1	-1	-1	-1	-1	-1	0	0
Alt 2	0	0	-1	-1	-1	-1	-1	0	0	-1	-1	0
Alt 3	0	0	0	0	0	-1	-1	-1	-1	0	0	0
Alt 4	0	0	0	0	0	-1	-1	-1	-1	0	0	0
Alt 5	0	0	0	0	-1	-1	-1	-1	-1	-1	0	0

Dry Year Average (1954, 1966, 1977, 1981, 1989)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Exist. Conditions	5729	5738	5746	5753	5754	5750	5736	5716	5704	5704	5709	5718
Alt 1	5729	5738	5746	5753	5754	5749	5736	5716	5704	5704	5709	5718
Alt 2	5729	5738	5747	5753	5754	5750	5736	5716	5705	5703	5708	5719
Alt 3	5729	5738	5746	5752	5754	5749	5736	5716	5704	5704	5708	5718
Alt 4	5729	5738	5746	5752	5754	5749	5736	5716	5704	5704	5708	5718
Alt 5	5729	5737	5745	5752	5753	5749	5735	5716	5704	5703	5708	5718

Elevation change from existing conditions

Alt 1	0	0	0	0	0	0	0	0	0	0	0	0
Alt 2	1	0	0	0	0	0	0	0	0	-1	-1	0
Alt 3	0	0	0	0	0	0	0	0	0	-1	0	0
Alt 4	0	0	0	0	0	0	0	0	0	-1	0	0
Alt 5	0	-1	-1	-1	-1	-1	-1	0	0	-1	-1	0

Wet Year Average (1957, 1983, 1984, 1986, 1995)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Exist. Conditions	5729	5737	5746	5750	5752	5756	5753	5736	5718	5706	5711	5719
Alt 1	5729	5737	5746	5750	5752	5755	5752	5734	5715	5705	5710	5719
Alt 2	5730	5738	5745	5748	5750	5754	5752	5734	5715	5706	5711	5720
Alt 3	5729	5738	5746	5751	5752	5755	5752	5735	5716	5706	5711	5720
Alt 4	5729	5738	5746	5751	5752	5755	5752	5735	5716	5706	5711	5719
Alt 5	5729	5738	5746	5750	5752	5755	5752	5734	5716	5705	5711	5719

Elevation change from existing conditions

Alt 1	0	0	0	0	0	-1	-1	-2	-2	-1	-1	0
Alt 2	1	1	-1	-2	-2	-2	-2	-2	-2	0	0	1
Alt 3	1	1	1	0	0	0	-1	-2	-2	0	0	1
Alt 4	1	1	1	0	0	0	-1	-2	-2	-1	0	1
Alt 5	1	1	0	0	0	-1	-1	-2	-2	-1	0	1

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Table F-3. Carter Lake Surface Area (acres).

Average Year (1950-1996)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Exist. Conditions	1016	1056	1092	1114	1119	1115	1070	980	913	901	924	968
Alt 1	1016	1056	1092	1113	1117	1110	1064	974	908	898	922	967
Alt 2	1016	1054	1089	1110	1115	1111	1067	978	912	898	921	968
Alt 3	1018	1057	1093	1113	1118	1111	1066	976	910	899	923	970
Alt 4	1018	1057	1093	1113	1118	1111	1066	976	910	899	923	970
Alt 5	1017	1056	1091	1112	1117	1111	1065	976	910	897	922	969

Surface area change from existing conditions

Alt 1	0	0	0	0	-2	-4	-6	-6	-5	-4	-2	-1
Alt 2	0	-1	-3	-4	-4	-4	-3	-2	-1	-4	-3	0
Alt 3	2	2	1	0	-1	-3	-5	-4	-3	-2	0	2
Alt 4	2	2	1	0	-1	-3	-5	-4	-3	-2	0	2
Alt 5	2	1	-1	-2	-2	-4	-5	-4	-3	-4	-2	1

Percent change in surface area from existing conditions

Alt 1	0%	0%	0%	0%	0%	0%	-1%	-1%	-1%	0%	0%	0%
Alt 2	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Alt 3	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Alt 4	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Alt 5	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Dry Year Average (1954, 1966, 1977, 1981, 1989)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Exist. Conditions	1017	1057	1093	1119	1124	1107	1048	956	900	901	922	967
Alt 1	1017	1057	1093	1119	1123	1105	1046	955	900	898	922	967
Alt 2	1019	1058	1095	1120	1124	1107	1049	958	902	895	918	969
Alt 3	1017	1056	1093	1119	1123	1106	1047	955	900	897	920	967
Alt 4	1017	1056	1093	1119	1123	1106	1047	955	900	897	920	967
Alt 5	1015	1054	1089	1116	1122	1105	1046	954	898	893	917	966

Surface area change from existing conditions

Alt 1	0	0	0	0	-1	-2	-2	-1	0	-2	0	0
Alt 2	2	1	1	1	0	0	1	2	2	-6	-4	2
Alt 3	0	0	-1	0	-1	-1	-1	-1	0	-4	-2	0
Alt 4	0	0	-1	0	-1	-1	-1	-1	0	-4	-2	0
Alt 5	-1	-3	-4	-3	-2	-2	-2	-2	-2	-7	-5	-1

Percent change in surface area from existing conditions

Alt 1	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Alt 2	0%	0%	0%	0%	0%	0%	0%	0%	0%	-1%	0%	0%
Alt 3	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Alt 4	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Alt 5	0%	0%	0%	0%	0%	0%	0%	0%	0%	-1%	-1%	0%

Wet Year Average (1957, 1983, 1984, 1986, 1995)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Exist. Conditions	1015	1054	1091	1111	1118	1130	1121	1049	964	909	934	970
Alt 1	1015	1054	1091	1111	1116	1127	1116	1041	952	902	928	969
Alt 2	1019	1057	1088	1102	1109	1125	1115	1040	953	907	934	974
Alt 3	1018	1058	1093	1112	1118	1129	1116	1042	955	906	933	973
Alt 4	1018	1058	1093	1112	1118	1129	1116	1042	955	906	933	973
Alt 5	1018	1057	1091	1110	1117	1128	1116	1041	954	906	933	973

Surface area change from existing conditions

Alt 1	0	0	0	0	-2	-3	-6	-9	-12	-6	-5	-2
Alt 2	4	3	-3	-9	-9	-5	-6	-9	-10	-2	0	4
Alt 3	3	3	3	1	0	-2	-5	-8	-8	-2	0	2
Alt 4	3	3	3	1	0	-2	-5	-8	-8	-2	0	2
Alt 5	3	2	0	-1	-1	-2	-6	-8	-10	-3	-1	2

Percent change in surface area from existing conditions

Alt 1	0%	0%	0%	0%	0%	0%	0%	-1%	-1%	-1%	-1%	0%
Alt 2	0%	0%	0%	-1%	-1%	0%	-1%	-1%	-1%	0%	0%	0%
Alt 3	0%	0%	0%	0%	0%	0%	0%	-1%	-1%	0%	0%	0%
Alt 4	0%	0%	0%	0%	0%	0%	0%	-1%	-1%	0%	0%	0%
Alt 5	0%	0%	0%	0%	0%	0%	0%	-1%	-1%	0%	0%	0%

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Table F-4. Horsetooth Reservoir Storage Content (AF).

Average Year (1950-1996)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Exist. Conditions	95275	107063	119226	124883	128797	136336	131433	112084	96326	87209	83572	87201
Alt 1	95114	106966	119022	124576	128478	135818	130688	111348	95696	86703	83109	86827
Alt 2	92301	103959	112504	114494	118210	126118	121990	105135	91570	83245	79277	83055
Alt 3	95293	107314	117864	122246	126807	134545	129787	111163	95994	87090	83489	87066
Alt 4	95289	107312	117860	122240	126802	134541	129783	111160	95993	87089	83486	87060
Alt 5	94683	106770	116946	120623	124983	132917	128271	110045	95275	86458	82747	86269

Volume change from existing conditions

Alt 1	-161	-97	-204	-307	-318	-517	-745	-736	-630	-506	-463	-374
Alt 2	-2975	-3104	-6722	-10389	-10587	-10218	-9442	-6949	-4756	-3963	-4295	-4146
Alt 3	17	252	-1362	-2637	-1990	-1791	-1646	-921	-332	-119	-83	-136
Alt 4	14	249	-1366	-2643	-1995	-1795	-1649	-923	-333	-120	-86	-141
Alt 5	-593	-293	-2280	-4260	-3814	-3419	-3161	-2039	-1051	-751	-825	-933

Percent change in volume from existing conditions

Alt 1	0%	0%	0%	0%	0%	0%	-1%	-1%	-1%	-1%	-1%	0%
Alt 2	-3%	-3%	-6%	-8%	-8%	-7%	-7%	-6%	-5%	-5%	-5%	-5%
Alt 3	0%	0%	-1%	-2%	-2%	-1%	-1%	-1%	0%	0%	0%	0%
Alt 4	0%	0%	-1%	-2%	-2%	-1%	-1%	-1%	0%	0%	0%	0%
Alt 5	-1%	0%	-2%	-3%	-3%	-3%	-2%	-2%	-1%	-1%	-1%	-1%

Dry Year Average (1954, 1966, 1977, 1981, 1989)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Exist. Conditions	93978	106733	118625	121645	120491	119895	111307	94664	81539	85468	80166	84444
Alt 1	94148	107054	118952	121945	120761	119971	110966	93979	81072	84981	80005	84506
Alt 2	90427	103610	111994	111184	108506	106874	97516	84305	76190	81323	75131	79240
Alt 3	93988	107192	117123	118144	116924	116191	107596	92233	80843	85091	79589	83982
Alt 4	93978	107188	117119	118137	116913	116176	107581	92218	80833	85085	79573	83965
Alt 5	92422	105732	114991	114958	112978	111868	102981	89226	79921	84442	78461	82266

Volume change from existing conditions

Alt 1	170	321	327	300	270	76	-341	-685	-467	-487	-161	63
Alt 2	-3552	-3123	-6631	-10460	-11985	-13021	-13791	-10358	-5349	-4145	-5035	-5204
Alt 3	9	460	-1502	-3501	-3567	-3704	-3711	-2431	-696	-377	-577	-462
Alt 4	0	455	-1506	-3508	-3578	-3719	-3727	-2445	-705	-383	-594	-478
Alt 5	-1557	-1000	-3634	-6687	-7513	-8027	-8326	-5438	-1618	-1026	-1705	-2178

Percent change in volume from existing conditions

Alt 1	0%	0%	0%	0%	0%	0%	0%	-1%	-1%	-1%	0%	0%
Alt 2	-4%	-3%	-6%	-9%	-10%	-11%	-12%	-11%	-7%	-5%	-6%	-6%
Alt 3	0%	0%	-1%	-3%	-3%	-3%	-3%	-3%	-1%	0%	-1%	-1%
Alt 4	0%	0%	-1%	-3%	-3%	-3%	-3%	-3%	-1%	0%	-1%	-1%
Alt 5	-2%	-1%	-3%	-5%	-6%	-7%	-7%	-6%	-2%	-1%	-2%	-3%

Wet Year Average (1957, 1983, 1984, 1986, 1995)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Exist. Conditions	98237	107911	119336	126038	133750	145665	144729	126990	109704	91118	90557	92445
Alt 1	97178	107156	118525	125174	133186	145322	144232	126402	109118	90144	89238	91121
Alt 2	96746	106152	113033	115092	123638	138272	137897	120108	102841	87139	86828	89436
Alt 3	98635	108482	118472	124291	132910	145249	144460	127178	110253	91821	91988	93201
Alt 4	98634	108478	118460	124276	132902	145248	144462	127181	110258	91823	91990	93198
Alt 5	98278	108206	117826	122800	131469	144259	143476	126063	108980	91277	91484	92710

Volume change from existing conditions

Alt 1	-1059	-754	-811	-864	-564	-343	-497	-588	-586	-974	-1319	-1323
Alt 2	-1491	-1759	-6303	-10947	-10112	-7392	-6831	-6882	-6864	-3979	-3729	-3009
Alt 3	398	571	-864	-1748	-839	-416	-269	188	549	703	1431	756
Alt 4	397	567	-876	-1763	-848	-416	-266	191	553	705	1433	754
Alt 5	41	295	-1509	-3238	-2281	-1406	-1252	-927	-725	158	927	266

Percent change in volume from existing conditions

Alt 1	-1%	-1%	-1%	-1%	0%	0%	0%	0%	-1%	-1%	-1%	-1%
Alt 2	-2%	-2%	-5%	-9%	-8%	-5%	-5%	-5%	-6%	-4%	-4%	-3%
Alt 3	0%	1%	-1%	-1%	-1%	0%	0%	0%	1%	1%	2%	1%
Alt 4	0%	1%	-1%	-1%	-1%	0%	0%	0%	1%	1%	2%	1%
Alt 5	0%	0%	-1%	-3%	-2%	-1%	-1%	-1%	-1%	0%	1%	0%

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Table F-5. Horsetooth Reservoir Elevations (feet).

Average Year (1950-1996)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Exist. Conditions	5395	5403	5410	5414	5416	5420	5418	5406	5396	5390	5388	5390
Alt 1	5395	5402	5410	5413	5416	5420	5417	5405	5395	5390	5387	5390
Alt 2	5393	5401	5406	5407	5410	5414	5412	5401	5393	5388	5385	5387
Alt 3	5395	5403	5409	5412	5415	5419	5417	5405	5396	5390	5388	5390
Alt 4	5395	5403	5409	5412	5415	5419	5417	5405	5396	5390	5388	5390
Alt 5	5395	5402	5409	5411	5414	5418	5416	5404	5395	5390	5387	5389

Elevation change from existing conditions

Alt 1	0	0	0	0	0	0	0	0	0	0	0	0
Alt 2	-2	-2	-4	-6	-6	-6	-6	-4	-3	-3	-3	-3
Alt 3	0	0	-1	-2	-1	-1	-1	-1	0	0	0	0
Alt 4	0	0	-1	-2	-1	-1	-1	-1	0	0	0	0
Alt 5	0	0	-1	-3	-2	-2	-2	-1	-1	0	-1	-1

Dry Year Average (1954, 1966, 1977, 1981, 1989)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Exist. Conditions	5394	5402	5410	5412	5411	5411	5405	5395	5386	5389	5386	5388
Alt 1	5394	5403	5410	5412	5411	5411	5405	5394	5386	5389	5385	5388
Alt 2	5392	5400	5406	5405	5403	5402	5397	5388	5383	5386	5382	5385
Alt 3	5394	5403	5409	5410	5409	5408	5403	5393	5386	5389	5385	5388
Alt 4	5394	5403	5409	5410	5409	5408	5403	5393	5386	5389	5385	5388
Alt 5	5393	5402	5408	5408	5406	5406	5400	5391	5385	5388	5384	5387

Elevation change from existing conditions

Alt 1	0	0	0	0	0	0	0	0	0	0	0	0
Alt 2	-2	-2	-4	-7	-8	-8	-9	-7	-3	-3	-3	-3
Alt 3	0	0	-1	-2	-2	-2	-2	-2	0	0	0	0
Alt 4	0	0	-1	-2	-2	-2	-2	-2	0	0	0	0
Alt 5	-1	-1	-2	-4	-5	-5	-5	-3	-1	-1	-1	-1

Wet Year Average (1957, 1983, 1984, 1986, 1995)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Exist. Conditions	5397	5403	5410	5414	5419	5425	5425	5415	5404	5393	5392	5393
Alt 1	5396	5403	5410	5414	5419	5425	5424	5415	5404	5392	5391	5393
Alt 2	5396	5402	5406	5408	5413	5421	5421	5411	5400	5390	5390	5391
Alt 3	5397	5403	5410	5413	5418	5425	5424	5415	5405	5393	5393	5394
Alt 4	5397	5403	5410	5413	5418	5425	5424	5415	5405	5393	5393	5394
Alt 5	5397	5403	5409	5412	5418	5424	5424	5414	5404	5393	5393	5394

Elevation change from existing conditions

Alt 1	-1	0	-1	-1	0	0	0	0	0	-1	-1	-1
Alt 2	-1	-1	-4	-7	-6	-4	-3	-4	-4	-3	-2	-2
Alt 3	0	0	-1	-1	0	0	0	0	0	0	1	0
Alt 4	0	0	-1	-1	0	0	0	0	0	0	1	0
Alt 5	0	0	-1	-2	-1	-1	-1	-1	0	0	1	0

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Table F-6. Horsetooth Reservoir Surface Area (acres).

Average Year (1950-1996)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Exist. Conditions	1570	1664	1759	1803	1834	1892	1854	1703	1579	1505	1475	1505
Alt 1	1569	1663	1757	1801	1832	1888	1849	1697	1574	1501	1471	1502
Alt 2	1546	1639	1706	1722	1751	1813	1781	1648	1541	1472	1438	1470
Alt 3	1570	1666	1748	1783	1818	1879	1842	1696	1576	1504	1474	1504
Alt 4	1570	1666	1748	1783	1818	1879	1842	1696	1576	1504	1474	1504
Alt 5	1566	1661	1741	1770	1804	1866	1830	1687	1570	1499	1468	1497

Surface area change from existing conditions

Alt 1	-1	-1	-2	-2	-2	-4	-6	-6	-5	-4	-4	-3
Alt 2	-24	-24	-53	-81	-83	-79	-74	-55	-38	-33	-36	-35
Alt 3	0	2	-11	-21	-16	-14	-13	-7	-3	-1	-1	-1
Alt 4	0	2	-11	-21	-16	-14	-13	-7	-3	-1	-1	-1
Alt 5	-5	-2	-18	-33	-30	-26	-25	-16	-8	-6	-7	-8

Percent change in surface area from existing conditions

Alt 1	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Alt 2	-2%	-1%	-3%	-5%	-5%	-4%	-4%	-3%	-2%	-2%	-2%	-2%
Alt 3	0%	0%	-1%	-1%	-1%	-1%	-1%	0%	0%	0%	0%	0%
Alt 4	0%	0%	-1%	-1%	-1%	-1%	-1%	0%	0%	0%	0%	0%
Alt 5	0%	0%	-1%	-2%	-2%	-1%	-1%	-1%	-1%	0%	0%	-1%

Dry Year Average (1954, 1966, 1977, 1981, 1989)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Exist. Conditions	1560	1661	1754	1778	1769	1764	1697	1565	1458	1491	1446	1482
Alt 1	1561	1663	1757	1780	1771	1765	1694	1560	1454	1486	1445	1483
Alt 2	1531	1636	1702	1696	1675	1662	1588	1481	1411	1456	1402	1438
Alt 3	1560	1665	1743	1751	1741	1735	1668	1546	1452	1487	1441	1478
Alt 4	1560	1665	1743	1751	1741	1735	1668	1546	1452	1487	1441	1478
Alt 5	1547	1653	1726	1726	1710	1701	1631	1521	1444	1482	1431	1464

Surface area change from existing conditions

Alt 1	1	3	3	2	2	1	-3	-6	-4	-4	-1	1
Alt 2	-29	-25	-52	-82	-94	-102	-109	-84	-46	-35	-44	-44
Alt 3	0	4	-12	-27	-28	-29	-29	-19	-6	-3	-5	-4
Alt 4	0	4	-12	-28	-28	-29	-29	-20	-6	-3	-5	-4
Alt 5	-13	-8	-29	-52	-59	-63	-66	-44	-14	-9	-15	-18

Percent change in surface area from existing conditions

Alt 1	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Alt 2	-2%	-1%	-3%	-5%	-5%	-6%	-6%	-5%	-3%	-2%	-3%	-3%
Alt 3	0%	0%	-1%	-2%	-2%	-2%	-2%	-1%	0%	0%	0%	0%
Alt 4	0%	0%	-1%	-2%	-2%	-2%	-2%	-1%	0%	0%	0%	0%
Alt 5	-1%	0%	-2%	-3%	-3%	-4%	-4%	-3%	-1%	-1%	-1%	-1%

Wet Year Average (1957, 1983, 1984, 1986, 1995)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Exist. Conditions	1594	1670	1760	1812	1872	1962	1955	1820	1684	1537	1532	1548
Alt 1	1585	1664	1754	1806	1868	1960	1952	1815	1680	1529	1522	1537
Alt 2	1582	1656	1710	1727	1794	1907	1904	1766	1630	1505	1502	1523
Alt 3	1597	1675	1753	1799	1866	1959	1954	1821	1689	1543	1544	1554
Alt 4	1597	1675	1753	1799	1866	1959	1954	1821	1689	1543	1544	1554
Alt 5	1594	1673	1748	1787	1855	1952	1946	1813	1679	1538	1540	1550

Surface area change from existing conditions

Alt 1	-8	-6	-6	-7	-4	-3	-4	-5	-5	-8	-11	-11
Alt 2	-12	-14	-49	-86	-79	-55	-51	-54	-54	-32	-30	-24
Alt 3	3	4	-7	-14	-7	-3	-2	1	4	6	12	6
Alt 4	3	4	-7	-14	-7	-3	-2	1	4	6	12	6
Alt 5	0	2	-12	-25	-18	-10	-9	-7	-6	1	7	2

Percent change in surface area from existing conditions

Alt 1	-1%	0%	0%	0%	0%	0%	0%	0%	0%	-1%	-1%	-1%
Alt 2	-1%	-1%	-3%	-5%	-4%	-3%	-3%	-3%	-3%	-2%	-2%	-2%
Alt 3	0%	0%	0%	-1%	0%	0%	0%	0%	0%	0%	1%	0%
Alt 4	0%	0%	0%	-1%	0%	0%	0%	0%	0%	0%	1%	0%
Alt 5	0%	0%	-1%	-1%	-1%	-1%	0%	0%	0%	0%	0%	0%

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Table F-7. Lake Granby Storage Content (AF).

Average Year (1950-1996)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Exist. Conditions	392085	366820	341591	330560	359922	421577	460226	464045	455930	442984	431303	415026
Alt 1	375517	349831	324402	313299	342582	406348	447842	451966	442721	428682	416173	399130
Alt 2	347032	320296	297214	288342	317666	384243	429224	432979	421431	405761	392131	373100
Alt 3	373055	348455	325782	315110	338641	398789	440901	444804	435379	422196	410900	395333
Alt 4	373126	348523	325851	315183	338727	398882	440986	444881	435454	422272	410974	395406
Alt 5	372811	348289	326283	316166	339261	398192	439943	444390	435245	422218	411010	395315

Volume change from existing conditions

Alt 1	-16568	-16989	-17189	-17261	-17340	-15229	-12384	-12079	-13210	-14302	-15130	-15896
Alt 2	-45053	-46525	-44376	-42218	-42256	-37334	-31002	-31065	-34499	-37223	-39172	-41926
Alt 3	-19030	-18366	-15809	-15450	-21281	-22788	-19325	-19240	-20552	-20788	-20404	-19694
Alt 4	-18959	-18298	-15740	-15377	-21195	-22695	-19241	-19163	-20476	-20713	-20329	-19620
Alt 5	-19274	-18531	-15307	-14395	-20661	-23385	-20283	-19655	-20685	-20767	-20293	-19712

Percent change in volume from existing conditions

Alt 1	-4%	-5%	-5%	-5%	-5%	-4%	-3%	-3%	-3%	-3%	-4%	-4%
Alt 2	-11%	-13%	-13%	-13%	-12%	-9%	-7%	-7%	-8%	-8%	-9%	-10%
Alt 3	-5%	-5%	-5%	-5%	-6%	-5%	-4%	-4%	-5%	-5%	-5%	-5%
Alt 4	-5%	-5%	-5%	-5%	-6%	-5%	-4%	-4%	-4%	-5%	-5%	-5%
Alt 5	-5%	-5%	-4%	-4%	-6%	-6%	-4%	-4%	-5%	-5%	-5%	-5%

Dry Year Average (1954, 1966, 1977, 1981, 1989)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Exist. Conditions	425474	397704	371255	358008	363122	377224	373173	352229	329995	464189	471203	451956
Alt 1	413553	385275	358483	345085	350219	364360	360322	339294	316476	452114	460349	440504
Alt 2	392465	362290	337183	325622	330786	344981	340739	315133	286001	433249	444243	422445
Alt 3	408798	381121	357167	345760	349635	362347	357849	335808	312144	444913	453675	435074
Alt 4	408856	381172	357215	345813	349699	362425	357930	335884	312209	444982	453741	435138
Alt 5	409269	381737	358853	348339	352598	365587	361326	337760	312086	445292	454289	435660

Volume change from existing conditions

Alt 1	-11921	-12429	-12772	-12923	-12903	-12865	-12852	-12935	-13518	-12076	-10855	-11452
Alt 2	-33009	-35414	-34072	-32386	-32336	-32243	-32435	-37096	-43993	-30941	-26960	-29511
Alt 3	-16677	-16583	-14088	-12248	-13487	-14877	-15325	-16421	-17851	-19277	-17528	-16881
Alt 4	-16618	-16532	-14040	-12195	-13422	-14800	-15244	-16345	-17786	-19207	-17462	-16818
Alt 5	-16205	-15967	-12402	-9669	-10524	-11638	-11847	-14469	-17909	-18898	-16914	-16296

Percent change in volume from existing conditions

Alt 1	-3%	-3%	-3%	-4%	-4%	-3%	-3%	-4%	-4%	-3%	-2%	-3%
Alt 2	-8%	-9%	-9%	-9%	-9%	-9%	-9%	-11%	-13%	-7%	-6%	-7%
Alt 3	-4%	-4%	-4%	-3%	-4%	-4%	-4%	-5%	-5%	-4%	-4%	-4%
Alt 4	-4%	-4%	-4%	-3%	-4%	-4%	-4%	-5%	-5%	-4%	-4%	-4%
Alt 5	-4%	-4%	-3%	-3%	-3%	-3%	-3%	-4%	-5%	-4%	-4%	-4%

Wet Year Average (1957, 1983, 1984, 1986, 1995)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Exist. Conditions	388275	365149	341064	328406	359729	446172	518555	537833	537752	435839	419616	407788
Alt 1	363298	339436	315032	302274	332378	420373	507306	537841	537501	417738	396764	383761
Alt 2	331243	307094	287584	279938	313305	405424	496032	531995	534233	392974	368951	354034
Alt 3	359220	337175	315981	304398	329098	412851	500744	532751	533188	409116	387708	377272
Alt 4	359312	337271	316079	304499	329203	412967	500817	532776	533216	409198	387796	377362
Alt 5	358909	336919	316425	305593	329551	411860	498623	531433	533089	408955	387441	376952

Volume change from existing conditions

Alt 1	-24977	-25714	-26031	-26132	-27351	-25798	-11249	9	-251	-18101	-22852	-24027
Alt 2	-57032	-58055	-53480	-48468	-46424	-40748	-22522	-5838	-3519	-42865	-50665	-53755
Alt 3	-29055	-27975	-25083	-24008	-30631	-33321	-17810	-5081	-4564	-26723	-31909	-30516
Alt 4	-28963	-27878	-24985	-23907	-30526	-33204	-17738	-5056	-4536	-26641	-31821	-30427
Alt 5	-29365	-28230	-24639	-22813	-30178	-34311	-19931	-6399	-4664	-26884	-32176	-30837

Percent change in volume from existing conditions

Alt 1	-6%	-7%	-8%	-8%	-8%	-6%	-2%	0%	-4%	-5%	-6%	-6%
Alt 2	-15%	-16%	-16%	-15%	-13%	-9%	-4%	-1%	-1%	-10%	-12%	-13%
Alt 3	-7%	-8%	-7%	-7%	-9%	-7%	-3%	-1%	-1%	-6%	-8%	-7%
Alt 4	-7%	-8%	-7%	-7%	-8%	-7%	-3%	-1%	-1%	-6%	-8%	-7%
Alt 5	-8%	-8%	-7%	-7%	-8%	-8%	-4%	-1%	-1%	-6%	-8%	-8%

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Table F-8. Lake Granby Elevations (feet).

Average Year (1950-1996)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Exist. Conditions	8258	8254	8250	8248	8253	8263	8268	8269	8268	8266	8264	8262
Alt 1	8255	8251	8247	8245	8250	8260	8267	8267	8266	8264	8262	8259
Alt 2	8251	8246	8242	8241	8246	8257	8264	8264	8263	8260	8258	8255
Alt 3	8255	8251	8247	8245	8249	8259	8265	8266	8265	8263	8261	8259
Alt 4	8255	8251	8247	8245	8249	8259	8265	8266	8265	8263	8261	8259
Alt 5	8255	8251	8247	8246	8249	8259	8265	8266	8265	8263	8261	8259

Elevation change from existing conditions

Alt 1	-3	-3	-3	-3	-3	-2	-2	-2	-2	-2	-2	-2
Alt 2	-7	-8	-8	-8	-7	-6	-5	-5	-5	-6	-6	-7
Alt 3	-3	-3	-3	-3	-4	-3	-3	-3	-3	-3	-3	-3
Alt 4	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3
Alt 5	-3	-3	-3	-2	-3	-4	-3	-3	-3	-3	-3	-3

Dry Year Average (1954, 1966, 1977, 1981, 1989)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Exist. Conditions	8263	8259	8255	8253	8253	8256	8255	8252	8248	8269	8270	8267
Alt 1	8261	8257	8253	8250	8251	8254	8253	8250	8246	8267	8268	8265
Alt 2	8258	8253	8249	8247	8248	8250	8250	8245	8240	8264	8266	8263
Alt 3	8261	8256	8252	8251	8251	8253	8253	8249	8245	8266	8267	8265
Alt 4	8261	8256	8252	8251	8251	8253	8253	8249	8245	8266	8267	8265
Alt 5	8261	8256	8253	8251	8252	8254	8253	8249	8245	8266	8267	8265

Elevation change from existing conditions

Alt 1	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2
Alt 2	-5	-6	-6	-5	-5	-5	-5	-6	-8	-5	-4	-4
Alt 3	-3	-3	-2	-2	-2	-2	-2	-3	-3	-3	-3	-3
Alt 4	-3	-3	-2	-2	-2	-2	-2	-3	-3	-3	-3	-3
Alt 5	-2	-2	-2	-2	-2	-2	-2	-2	-3	-3	-3	-2

Wet Year Average (1957, 1983, 1984, 1986, 1995)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Exist. Conditions	8257	8254	8250	8248	8253	8266	8277	8280	8280	8265	8262	8260
Alt 1	8253	8250	8245	8243	8248	8262	8275	8280	8280	8262	8259	8257
Alt 2	8248	8244	8240	8239	8245	8260	8274	8279	8280	8258	8254	8252
Alt 3	8253	8249	8246	8243	8248	8261	8274	8279	8279	8261	8257	8256
Alt 4	8253	8249	8246	8243	8248	8261	8274	8279	8279	8261	8257	8256
Alt 5	8253	8249	8246	8244	8248	8261	8274	8279	8279	8261	8257	8256

Elevation change from existing conditions

Alt 1	-4	-4	-4	-5	-5	-4	-2	0	0	-3	-3	-4
Alt 2	-9	-10	-9	-9	-8	-6	-3	-1	-1	-7	-8	-8
Alt 3	-5	-5	-4	-4	-5	-5	-3	-1	-1	-4	-5	-5
Alt 4	-5	-5	-4	-4	-5	-5	-3	-1	-1	-4	-5	-5
Alt 5	-5	-5	-4	-4	-5	-5	-3	-1	-1	-4	-5	-5

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Table F-9. Lake Granby Surface Area (acres).

Average Year (1950-1996)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Exist. Conditions	6221	6026	5824	5732	5970	6440	6722	6750	6691	6597	6512	6392
Alt 1	6094	5891	5680	5584	5830	6327	6632	6662	6595	6493	6401	6274
Alt 2	5868	5644	5440	5359	5620	6159	6497	6524	6440	6324	6221	6075
Alt 3	6075	5880	5692	5600	5798	6270	6582	6610	6542	6445	6362	6246
Alt 4	6076	5880	5692	5601	5799	6271	6583	6611	6542	6446	6363	6246
Alt 5	6073	5878	5696	5609	5803	6265	6575	6607	6541	6445	6363	6245

Surface area change from existing conditions

Alt 1	-127	-135	-144	-148	-140	-113	-90	-88	-96	-104	-111	-118
Alt 2	-353	-382	-384	-374	-351	-281	-225	-226	-251	-273	-290	-317
Alt 3	-146	-147	-132	-132	-172	-170	-140	-140	-149	-152	-150	-147
Alt 4	-145	-146	-132	-132	-171	-169	-140	-139	-149	-151	-149	-146
Alt 5	-148	-148	-128	-123	-167	-174	-147	-143	-150	-152	-149	-147

Percent change in surface area from existing conditions

Alt 1	-2%	-2%	-2%	-3%	-2%	-2%	-1%	-1%	-1%	-2%	-2%	-2%
Alt 2	-6%	-6%	-7%	-7%	-6%	-4%	-3%	-3%	-4%	-4%	-4%	-5%
Alt 3	-2%	-2%	-2%	-2%	-3%	-3%	-2%	-2%	-2%	-2%	-2%	-2%
Alt 4	-2%	-2%	-2%	-2%	-3%	-3%	-2%	-2%	-2%	-2%	-2%	-2%
Alt 5	-2%	-2%	-2%	-2%	-3%	-3%	-2%	-2%	-2%	-2%	-2%	-2%

Dry Year Average (1954, 1966, 1977, 1981, 1989)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Exist. Conditions	6469	6263	6061	5957	5998	6108	6076	5910	5727	6751	6802	6662
Alt 1	6381	6169	5960	5853	5894	6007	5975	5805	5611	6663	6723	6579
Alt 2	6224	5991	5787	5691	5734	5852	5817	5600	5336	6526	6606	6447
Alt 3	6346	6137	5950	5858	5890	5991	5955	5776	5574	6611	6675	6539
Alt 4	6347	6138	5950	5859	5890	5992	5956	5777	5574	6612	6675	6540
Alt 5	6350	6142	5964	5879	5914	6017	5983	5792	5573	6614	6679	6544

Surface area change from existing conditions

Alt 1	-88	-94	-101	-104	-103	-100	-101	-106	-116	-88	-79	-83
Alt 2	-246	-273	-274	-266	-263	-256	-259	-311	-391	-225	-196	-215
Alt 3	-123	-126	-111	-99	-108	-116	-121	-135	-154	-140	-127	-123
Alt 4	-123	-126	-111	-98	-107	-116	-120	-134	-153	-139	-127	-122
Alt 5	-120	-121	-98	-78	-84	-91	-93	-118	-154	-137	-123	-119

Percent change in surface area from existing conditions

Alt 1	-1%	-2%	-2%	-2%	-2%	-2%	-2%	-2%	-2%	-1%	-1%	-1%
Alt 2	-4%	-4%	-5%	-4%	-4%	-4%	-4%	-5%	-7%	-3%	-3%	-3%
Alt 3	-2%	-2%	-2%	-2%	-2%	-2%	-2%	-2%	-3%	-2%	-2%	-2%
Alt 4	-2%	-2%	-2%	-2%	-2%	-2%	-2%	-2%	-3%	-2%	-2%	-2%
Alt 5	-2%	-2%	-2%	-1%	-1%	-1%	-2%	-2%	-3%	-2%	-2%	-2%

Wet Year Average (1957, 1983, 1984, 1986, 1995)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Exist. Conditions	6192	6013	5819	5714	5968	6619	7151	7298	7297	6545	6426	6339
Alt 1	5999	5806	5599	5486	5745	6429	7068	7298	7295	6412	6256	6158
Alt 2	5738	5529	5352	5280	5581	6317	6984	7253	7270	6227	6043	5925
Alt 3	5966	5787	5607	5505	5718	6373	7019	7259	7262	6348	6188	6108
Alt 4	5967	5788	5608	5506	5719	6374	7020	7259	7262	6349	6189	6109
Alt 5	5964	5785	5611	5516	5722	6366	7003	7249	7261	6347	6186	6105

Surface area change from existing conditions

Alt 1	-193	-207	-221	-228	-223	-190	-84	0	-2	-133	-170	-181
Alt 2	-454	-484	-468	-435	-388	-302	-167	-45	-27	-318	-383	-414
Alt 3	-226	-226	-212	-209	-250	-246	-132	-39	-35	-197	-238	-231
Alt 4	-225	-225	-211	-208	-250	-246	-132	-39	-35	-196	-238	-230
Alt 5	-228	-228	-208	-198	-246	-254	-148	-49	-36	-198	-240	-233

Percent change in surface area from existing conditions

Alt 1	-3%	-3%	-4%	-4%	-4%	-3%	-1%	0%	0%	-2%	-3%	-3%
Alt 2	-7%	-8%	-8%	-8%	-6%	-5%	-2%	-1%	0%	-5%	-6%	-7%
Alt 3	-4%	-4%	-4%	-4%	-4%	-4%	-2%	-1%	0%	-3%	-4%	-4%
Alt 4	-4%	-4%	-4%	-4%	-4%	-4%	-2%	-1%	0%	-3%	-4%	-4%
Alt 5	-4%	-4%	-4%	-3%	-4%	-4%	-2%	-1%	0%	-3%	-4%	-4%

Appendix G:
Cumulative Effects
Hydrologic Model Output—Flow Duration Curves

Figure G-1. Flow Duration Curves—Colorado River at Hot Sulphur Springs, Cumulative Effects (large and small scale versions).

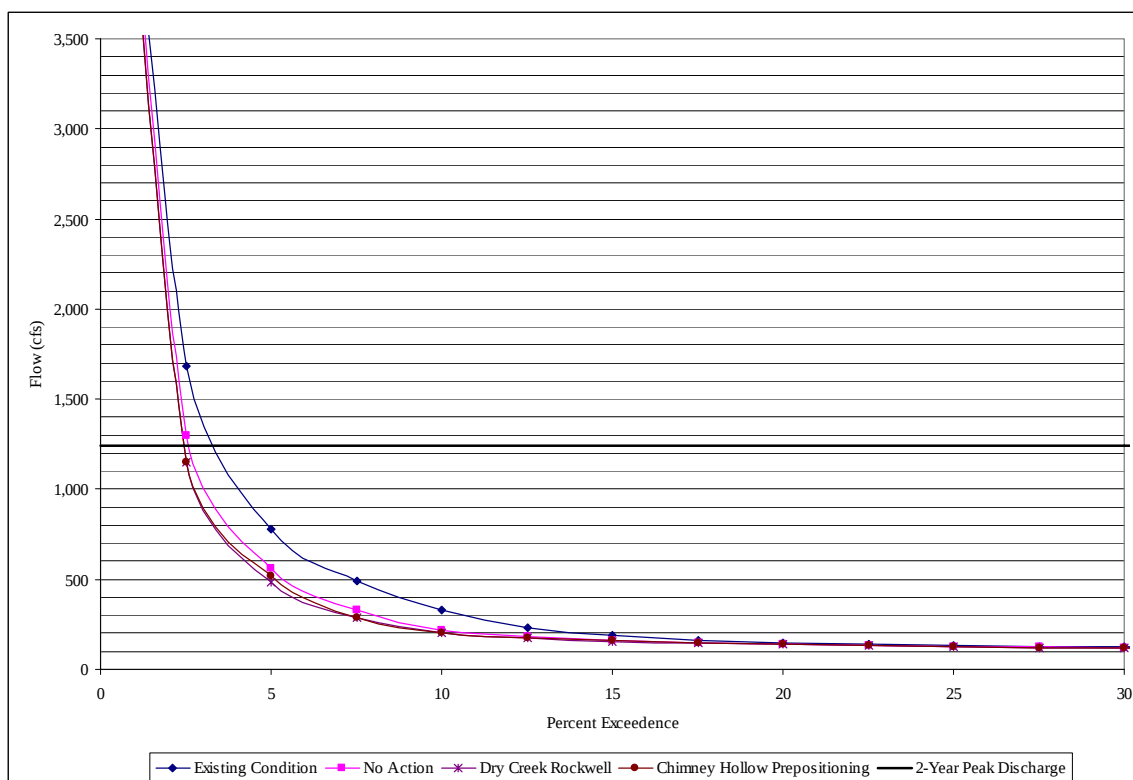
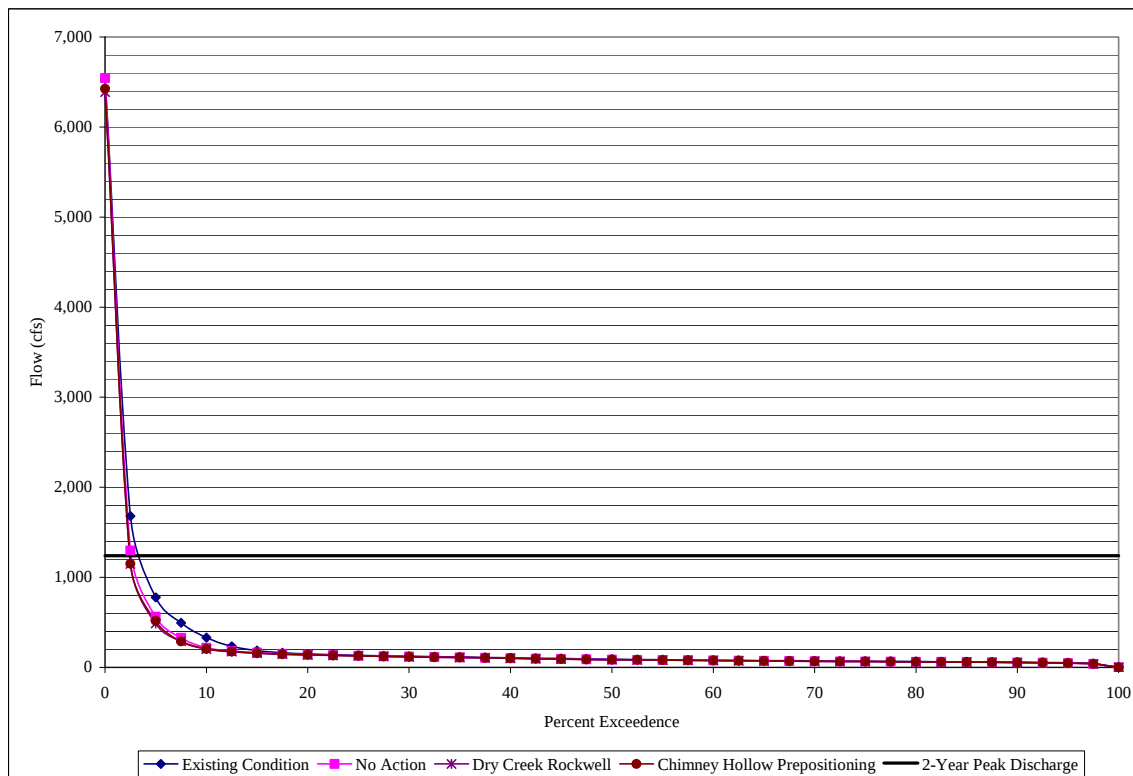


Figure G-2. Flow Duration Curves—Colorado River near Kremmling, Cumulative Effects (large and small scale versions).

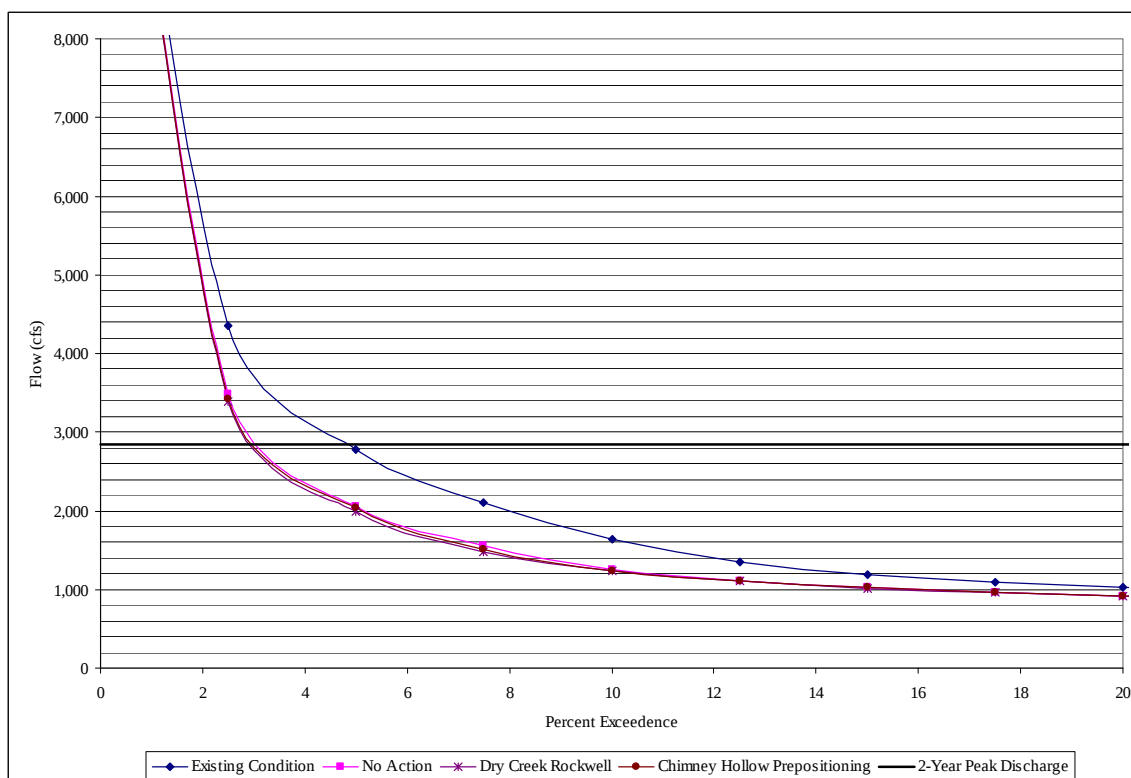
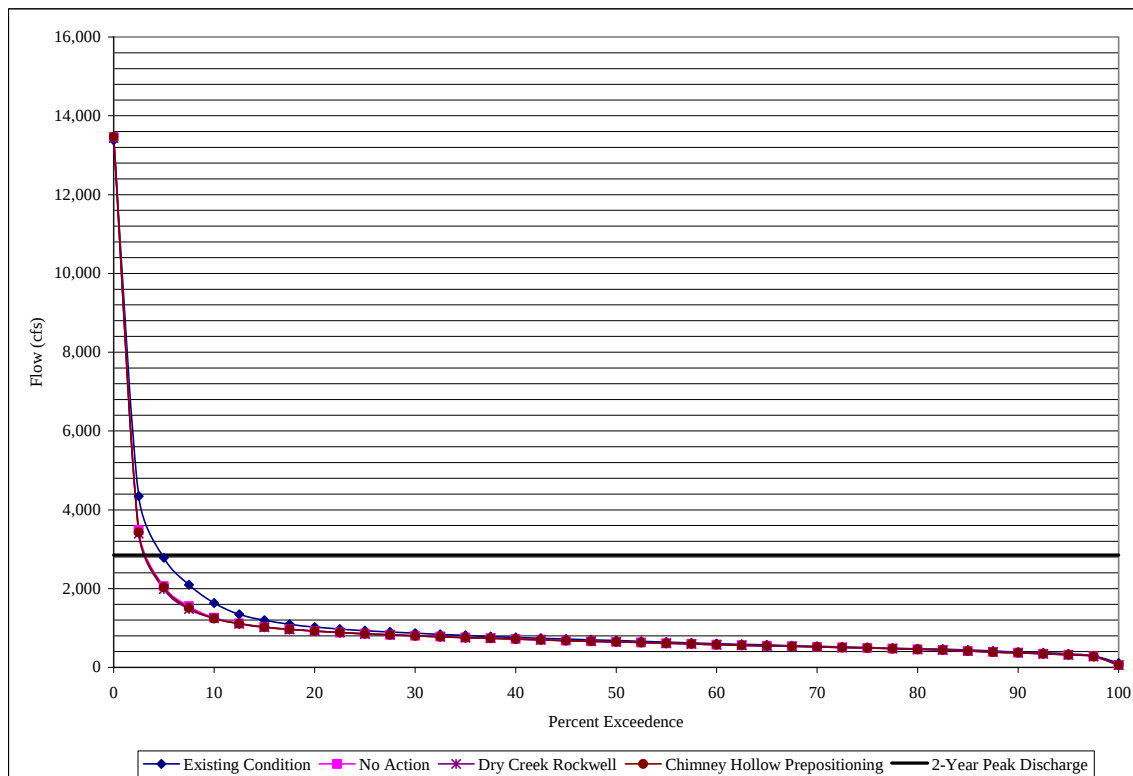
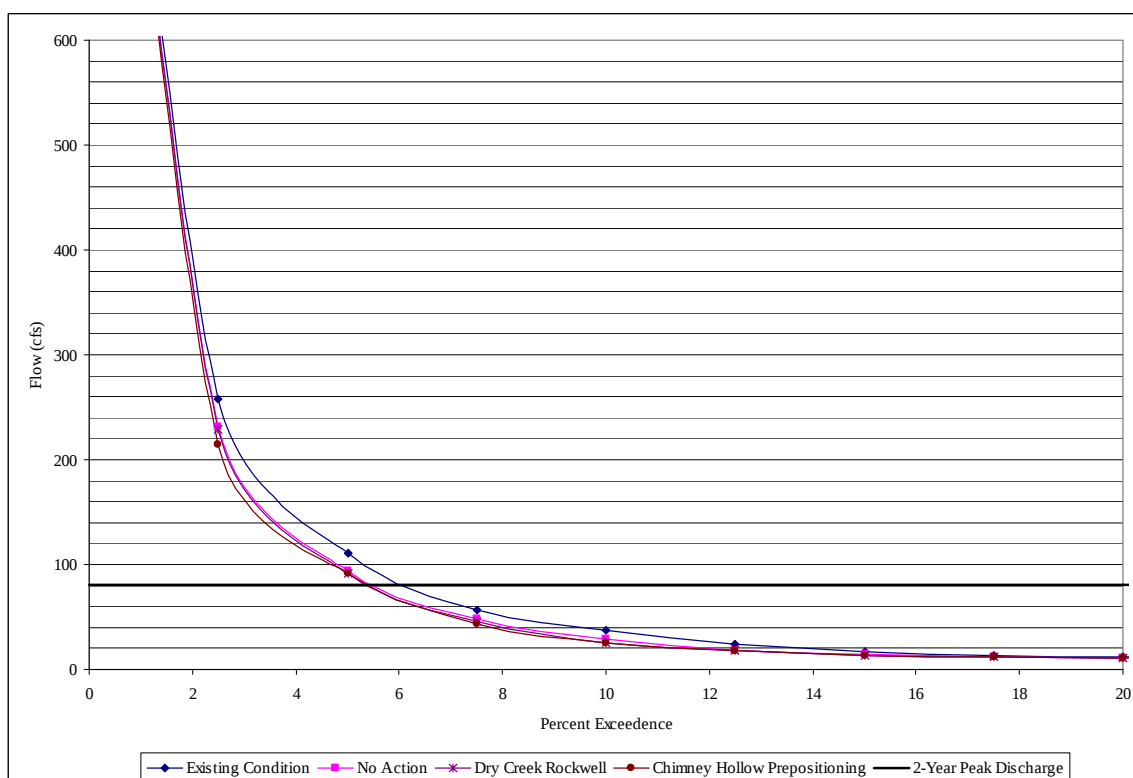
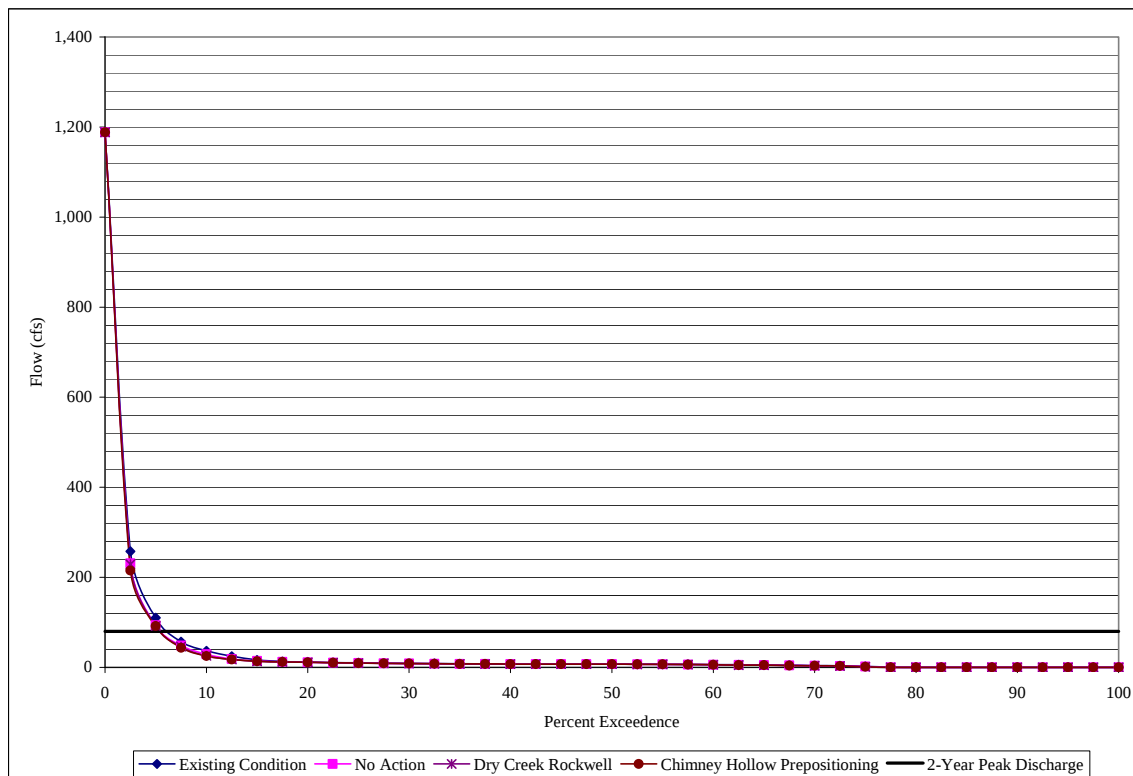


Figure G-3. Flow Duration Curves—Willow Creek, Cumulative Effects (large and small scale versions).



Appendix H:
Cumulative Effects—Windy Gap Firming Project Participant and
Non-Participant Demands, Firm Yields, and Average Yields for
All Alternatives

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Table H-1. Windy Gap Firing Project Participant Demands, Firm Yield, and Average Yield (AF), Cumulative Effects.

Month	Existing Conditions			No Action			Chimney Hollow with Prepositioning			Dry Creek and Rockwell		
	Demand (AF)	Firm Yield (AF)	Average Yield (AF)	Demand (AF)	Firm Yield (AF)	Average Yield (AF)	Demand (AF)	Firm Yield (AF)	Average Yield (AF)	Demand (AF)	Firm Yield (AF)	Average Yield (AF)
Oct	1,520	0	780	3,820	579	1,807	2,385	2,385	2,385	2,366	2,366	2,366
Nov	2,350	0	1,440	2,980	0	1,719	2,202	2,202	2,202	2,228	2,228	2,228
Dec	2,350	0	1,270	2,980	0	1,497	2,202	2,202	2,202	2,228	2,228	2,228
Jan	2,350	0	1,110	2,980	0	1,240	2,202	2,202	2,202	2,228	2,228	2,228
Feb	2,350	0	960	2,980	0	1,060	2,202	2,202	2,202	2,228	2,228	2,228
Mar	2,350	0	850	2,980	0	921	2,202	2,202	2,202	2,228	2,228	2,228
Apr	1,040	0	680	1,605	0	897	1,249	1,249	1,249	1,221	1,221	1,221
May	930	0	820	1,540	0	1,344	1,203	1,203	1,203	1,176	1,176	1,176
Jun	930	0	660	1,540	0	1070	1,203	1,203	1,203	1,176	1,176	1,176
Jul	1,490	0	960	3,020	0	2,247	1,992	1,992	1,992	1,970	1,970	1,970
Aug	1,500	0	910	3,420	0	2,235	2,189	2,189	2,189	2,168	2,168	2,168
Sep	1,520	0	830	3,820	0	2,112	2,385	2,385	2,385	2,366	2,366	2,366
Total	20,680	0	11,270	33,365	579	18,149	23,616	23,616	23,616	23,583	23,583	23,583

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Table H-2. Windy Gap Firing Project Non-Participant Demands, Firm Yield, and Average Yield (AF), Cumulative Effects.

Month	Existing Conditions			No Action			Chimney Hollow with Prepositioning			Dry Creek and Rockwell		
	Demand (AF)	Firm Yield (AF)	Average Yield (AF)	Demand (AF)	Firm Yield (AF)	Average Yield (AF)	Demand (AF)	Firm Yield (AF)	Average Yield (AF)	Demand (AF)	Firm Yield (AF)	Average Yield (AF)
Oct	10	0	10	290	0	70	290	0	80	290	0	80
Nov	10	0	0	70	0	20	70	0	20	70	0	20
Dec	10	0	0	70	0	20	70	0	20	70	0	20
Jan	0	0	0	50	0	10	50	0	10	50	0	10
Feb	0	0	0	40	0	10	40	0	10	40	0	10
Mar	10	0	0	60	0	20	60	0	20	60	0	20
Apr	10	0	0	120	0	60	120	0	60	120	0	60
May	30	0	30	730	0	600	730	0	600	730	0	610
Jun	40	0	30	1,050	0	630	1,050	0	650	1,050	0	650
Jul	50	0	30	870	0	340	870	0	350	870	0	360
Aug	30	0	20	440	0	130	440	0	140	440	0	140
Sep	20	0	20	310	0	80	310	0	90	310	0	90
Total	220	0	140	4,100	0	1,990	4,100	0	2,050	4,100	0	2,070

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Table H-3. Middle Park Water Conservancy District Demands, Firm Yield, and Average Yield (AF), Cumulative Effects.

Month	Existing Conditions			No Action			Chimney Hollow with Prepositioning			Dry Creek and Rockwell		
	Demand (AF)	Firm Yield (AF)	Average Yield (AF)	Demand (AF)	Firm Yield (AF)	Average Yield (AF)	Demand (AF)	Firm Yield (AF)	Average Yield (AF)	Demand (AF)	Firm Yield (AF)	Average Yield (AF)
Oct	21	0	15	429	0	289	429	0	407	429	0	409
Nov	21	0	15	429	0	274	429	0	401	429	0	401
Dec	21	0	15	429	0	274	429	0	401	429	0	401
Jan	21	0	15	429	0	269	429	0	397	429	0	397
Feb	21	0	15	429	0	260	429	0	387	429	0	392
Mar	21	0	15	429	0	255	429	0	347	429	0	338
Apr	0	0	0	0	0	0	0	0	0	0	0	0
May	0	0	0	0	0	0	0	0	0	0	0	0
Jun	0	0	0	0	0	0	0	0	0	0	0	0
Jul	0	0	0	0	0	0	0	0	0	0	0	0
Aug	0	0	0	0	0	0	0	0	0	0	0	0
Sep	21	0	15	429	0	0	429	429	419	429	429	419
Total	147	0	105	3,000	0	1,922	3,000	429	2,759	3,000	429	2,757

Appendix I:
Cumulative Effects—Hydrology Model Output—
Changes in Streamflows, Windy Gap Diversions, and
Lake Granby Spills

WINDY GAP FIRING PROJECT
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Table I-1. Lake Granby Spills (cfs), Cumulative Effects.

Average Year (1950-1996)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Exist. Conditions	0	0	0	0	18	352	216	41	10	5	0	0	53
Alt 1	0	0	0	0	17	296	176	28	7	5	0	0	44
Alt 2	0	0	0	0	13	227	160	24	3	5	0	0	36
Alt 5	0	0	0	0	14	250	163	24	6	4	0	0	39
Flow change from Existing Conditions													
Alt 1	0	0	0	0	-1	-56	-40	-13	-3	0	0	0	-9
Alt 2	0	0	0	0	-5	-125	-56	-17	-6	0	0	0	-17
Alt 5	0	0	0	0	-4	-102	-53	-16	-4	0	0	0	-15
Percent change in flow from Existing Conditions													
Alt 1	0%	0%	0%	0%	-5%	-16%	-18%	-32%	-29%	5%	0%	0%	-18%
Alt 2	0%	0%	0%	0%	-26%	-35%	-26%	-41%	-68%	2%	0%	0%	-32%
Alt 5	0%	0%	0%	0%	-23%	-29%	-24%	-40%	-38%	-6%	0%	0%	-28%

Dry Year Average (1954, 1966, 1977, 1981, 1989)

Exist. Conditions	0	0	0	0	0	0	0	0	0	0	0	0	0
Alt 1	0	0	0	0	0	0	0	0	0	0	0	0	0
Alt 2	0	0	0	0	0	0	0	0	0	0	0	0	0
Alt 5	0	0	0	0	0	0	0	0	0	0	0	0	0
Flow change from Existing Conditions													
Alt 1	0	0	0	0	0	0	0	0	0	0	0	0	0
Alt 2	0	0	0	0	0	0	0	0	0	0	0	0	0
Alt 5	0	0	0	0	0	0	0	0	0	0	0	0	0
Percent change in flow from Existing Conditions													
Alt 1	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Alt 2	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Alt 5	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Wet Year Average (1957, 1983, 1984, 1986, 1995)

Exist. Conditions	0	0	0	0	123	845	887	249	23	0	0	0	178
Alt 1	0	0	0	0	122	845	744	171	25	0	0	0	160
Alt 2	0	0	0	0	125	858	664	154	29	0	0	0	153
Alt 5	0	0	0	0	130	843	689	151	23	0	0	0	154
Flow change from Existing Conditions													
Alt 1	0	0	0	0	-1	0	-144	-77	2	0	0	0	-19
Alt 2	0	0	0	0	2	13	-224	-95	6	0	0	0	-25
Alt 5	0	0	0	0	7	-2	-199	-98	0	0	0	0	-25
Percent change in flow from Existing Conditions													
Alt 1	0%	0%	0%	0%	-1%	0%	-16%	-31%	8%	0%	0%	0%	-11%
Alt 2	0%	0%	0%	0%	1%	2%	-25%	-38%	27%	0%	0%	0%	-14%
Alt 5	0%	0%	0%	0%	6%	0%	-22%	-39%	1%	0%	0%	0%	-14%

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Table I-2. Adams Tunnel Diversions (cfs), Cumulative Effects.

Average Year (1950-1996)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Exist. Conditions	409	523	417	285	430	406	224	206	263	252	225	404	336
Alt 1	411	518	416	283	446	411	295	232	278	258	232	405	348
Alt 2	439	515	343	282	473	420	277	280	315	274	253	441	359
Alt 5	427	527	357	291	473	412	318	268	297	267	248	417	358
Flow change from Existing Conditions													
Alt 1	2	-5	-1	-2	17	5	71	26	15	6	8	1	12
Alt 2	31	-8	-74	-3	43	14	53	74	52	22	28	38	23
Alt 5	19	3	-60	6	43	6	94	63	34	15	23	13	22
Percent change in flow from Existing Conditions													
Alt 1	1%	-1%	0%	-1%	4%	1%	32%	13%	6%	2%	3%	0%	4%
Alt 2	7%	-2%	-18%	-1%	10%	3%	24%	36%	20%	9%	12%	9%	7%
Alt 5	5%	1%	-14%	2%	10%	1%	42%	30%	13%	6%	10%	3%	6%

Dry Year Average (1954, 1966, 1977, 1981, 1989)

Exist. Conditions	452	541	426	293	550	550	541	407	458	296	250	449	434
Alt 1	456	541	426	293	550	550	538	399	462	299	261	449	435
Alt 2	507	550	364	293	550	550	550	543	530	301	278	484	458
Alt 5	494	550	364	293	550	550	550	498	486	302	276	467	448
Flow change from Existing Conditions													
Alt 1	4	0	0	0	0	0	-3	-8	4	3	10	0	1
Alt 2	55	9	-62	0	0	0	9	136	73	6	27	36	24
Alt 5	42	9	-62	0	0	0	9	91	28	6	26	19	14
Percent change in flow from Existing Conditions													
Alt 1	1%	0%	0%	0%	0%	0%	0%	-2%	1%	1%	4%	0%	0%
Alt 2	12%	2%	-15%	0%	0%	0%	2%	33%	16%	2%	11%	8%	6%
Alt 5	9%	2%	-15%	0%	0%	0%	2%	22%	6%	2%	10%	4%	3%

Wet Year Average (1957, 1983, 1984, 1986, 1995)

Exist. Conditions	372	497	426	293	255	134	85	105	116	219	168	340	250
Alt 1	385	500	426	288	307	135	134	210	118	222	185	348	271
Alt 2	399	457	297	250	374	153	106	133	150	241	211	379	262
Alt 5	389	507	364	293	386	135	144	167	166	236	195	340	276
Flow change from Existing Conditions													
Alt 1	13	3	0	-5	52	0	49	106	2	3	17	8	21
Alt 2	26	-40	-129	-43	118	18	21	28	34	21	43	39	12
Alt 5	16	9	-62	0	131	0	59	62	50	17	28	0	26
Percent change in flow from Existing Conditions													
Alt 1	3%	1%	0%	-2%	20%	0%	58%	101%	2%	1%	10%	2%	8%
Alt 2	7%	-8%	-30%	-15%	46%	14%	25%	27%	29%	10%	26%	11%	5%
Alt 5	4%	2%	-15%	0%	51%	0%	70%	60%	43%	8%	16%	0%	10%

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Table I-3. Windy Gap Diversions (AF), Cumulative Effects.

Average Year (1950-1996)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Exist. Conditions	0	0	0	4522	17648	11053	2869	439	0	0	0	0	36532
Alt 1	0	0	0	4376	17449	10585	5661	902	0	0	0	0	38973
Alt 2	0	0	0	4368	18851	12697	4098	777	0	0	0	0	40791
Alt 5	0	0	0	4368	19055	12561	6071	937	0	0	0	0	42991
Flow change from Existing Conditions													
Alt 1	0	0	0	-146	-199	-469	2792	463	0	0	0	0	2441
Alt 2	0	0	0	-154	1203	1643	1229	338	0	0	0	0	4259
Alt 5	0	0	0	-154	1406	1507	3202	498	0	0	0	0	6459
Percent change in flow from Existing Conditions													
Alt 1	0%	0%	0%	-3%	-1%	-4%	97%	105%	0%	0%	0%	0%	7%
Alt 2	0%	0%	0%	-3%	7%	15%	43%	77%	0%	0%	0%	0%	12%
Alt 5	0%	0%	0%	-3%	8%	14%	112%	113%	0%	0%	0%	0%	18%

Dry Year Average (1954, 1966, 1977, 1981, 1989)

Exist. Conditions	0	0	0	1049	3723	2658	374	0	0	0	0	0	7804
Alt 1	0	0	0	1038	2288	534	0	0	0	0	0	0	3860
Alt 2	0	0	0	1038	2288	534	0	0	0	0	0	0	3860
Alt 5	0	0	0	1038	2288	534	0	0	0	0	0	0	3860
Flow change from Existing Conditions													
Alt 1	0	0	0	-11	-1436	-2124	-374	0	0	0	0	0	-3944
Alt 2	0	0	0	-11	-1435	-2124	-374	0	0	0	0	0	-3944
Alt 5	0	0	0	-11	-1435	-2124	-374	0	0	0	0	0	-3944
Percent change in flow from Existing Conditions													
Alt 1	0%	0%	0%	-1%	-39%	-80%	-100%	0%	0%	0%	0%	0%	-51%
Alt 2	0%	0%	0%	-1%	-39%	-80%	-100%	0%	0%	0%	0%	0%	-51%
Alt 5	0%	0%	0%	-1%	-39%	-80%	-100%	0%	0%	0%	0%	0%	-51%

Wet Year Average (1957, 1983, 1984, 1986, 1995)

Exist. Conditions	0	0	0	2808	20532	14280	892	0	0	0	0	0	38512
Alt 1	0	0	0	2801	20804	17894	15463	5157	0	0	0	0	62118
Alt 2	0	0	0	2801	28406	22218	13167	2826	0	0	0	0	69417
Alt 5	0	0	0	2801	28575	21711	16016	2595	0	0	0	0	71699
Flow change from Existing Conditions													
Alt 1	0	0	0	-8	272	3614	14571	5157	0	0	0	0	23606
Alt 2	0	0	0	-8	7874	7938	12275	2826	0	0	0	0	30905
Alt 5	0	0	0	-8	8043	7431	15124	2595	0	0	0	0	33186
Percent change in flow from Existing Conditions													
Alt 1	0%	0%	0%	0%	1%	25%	1633%	0%	0%	0%	0%	0%	61%
Alt 2	0%	0%	0%	0%	38%	56%	1376%	0%	0%	0%	0%	0%	80%
Alt 5	0%	0%	0%	0%	39%	52%	1696%	0%	0%	0%	0%	0%	86%

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Table I-4. Modeled Colorado River Flows during Spill Events, Cumulative Effects.

Spill Event	May-August			June-August			May-July			July-August			Sept-October			June-July		
	Percent of time spill occurs	Daily Average Spill (cfs)	Daily Max. Spill (cfs)	Percent of time spill occurs	Daily Average Spill (cfs)	Daily Max. Spill (cfs)	Percent of time spill occurs	Daily Average Spill (cfs)	Daily Max. Spill (cfs)	Percent of time spill occurs	Daily Average Spill (cfs)	Daily Max. Spill (cfs)	Percent of time spill occurs	Daily Average Spill (cfs)	Daily Max. Spill (cfs)	Percent of time spill occurs	Daily Average Spill (cfs)	Daily Max. Spill (cfs)
Existing Conditions	2	988	4,313	4	590	2,284	2	715	2,700	4	771	5,271	2	277	333	13	845	4,649
No Action	2	986	4,312	4	450	2,166	2	706	2,698	2	1,096	4,384	2	208	227	13	871	4,648
Proposed Action	2	1,010	4,455	2	481	2,200	0	-	-	4	609	3,416	2	221	221	13	859	4,647
Alternative 5	2	997	4,316	2	457	2,167	0	-	-	4	644	3,735	2	177	202	15	827	4,628

Spill Event	June			July			August		
	Percent of time spill occurs	Daily Average Spill (cfs)	Daily Max. Spill (cfs)	Percent of time spill occurs	Daily Average Spill (cfs)	Daily Max. Spill (cfs)	Percent of time spill occurs	Daily Average Spill (cfs)	Daily Max. Spill (cfs)
Existing Conditions	4	955	2,325	6	417	1,763	4	240	458
No Action	4	954	2,324	2	199	334	4	105	152
Proposed Action	4	608	1,349	2	385	912	0	-	-
Alternative 5	4	431	1,834	0	-	-	0	-	-

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Table I-5. Big Thompson River Diversions (AF), Cumulative Effects.

Average Year (1950-1996)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Exist. Conditions	0	0	0	44	6847	9952	8699	1693	561	176	17	0	27990
Alt 1	0	0	0	59	6834	9727	8571	1693	561	176	17	0	27638
Alt 2	0	0	0	4	6000	9318	7645	1515	526	139	6	0	25154
Alt 5	0	0	0	2	6415	9691	8426	1656	561	176	6	0	26934
Flow change from Existing Conditions													
Alt 1	0	0	0	14	-13	-225	-128	0	0	0	0	0	-352
Alt 2	0	0	0	-41	-847	-634	-1053	-177	-35	-37	-11	0	-2836
Alt 5	0	0	0	-42	-432	-261	-273	-37	0	0	-11	0	-1056
Percent change in flow from Existing Conditions													
Alt 1	0%	0%	0%	32%	0%	-2%	-1%	0%	0%	0%	0%	0%	-1%
Alt 2	0%	0%	0%	-92%	-12%	-6%	-12%	-10%	-6%	-21%	-63%	0%	-10%
Alt 5	0%	0%	0%	-95%	-6%	-3%	-3%	-2%	0%	0%	-63%	0%	-4%

Dry Year Average (1954, 1966, 1977, 1981, 1989)

Exist. Conditions	0	0	0	0	0	0	551	0	0	0	0	0	551
Alt 1	0	0	0	0	0	0	687	0	0	0	0	0	687
Alt 2	0	0	0	0	0	0	0	0	0	0	0	0	0
Alt 5	0	0	0	0	0	0	0	0	0	0	0	0	0
Flow change from Existing Conditions													
Alt 1	0	0	0	0	0	0	136	0	0	0	0	0	136
Alt 2	0	0	0	0	0	0	-551	0	0	0	0	0	-551
Alt 5	0	0	0	0	0	0	-551	0	0	0	0	0	-551
Percent change in flow from Existing Conditions													
Alt 1	0%	0%	0%	0%	0%	0%	25%	0%	0%	0%	0%	0%	25%
Alt 2	0%	0%	0%	0%	0%	0%	-100%	0%	0%	0%	0%	0%	-100%
Alt 5	0%	0%	0%	0%	0%	0%	-100%	0%	0%	0%	0%	0%	-100%

Wet Year Average (1957, 1983, 1984, 1986, 1995)

Exist. Conditions	0	0	0	0	15320	28709	18670	3788	1299	160	0	0	67946
Alt 1	0	0	0	0	15320	28829	18662	3788	1299	160	0	0	68058
Alt 2	0	0	0	14	14966	28289	18247	3788	1299	160	0	0	66763
Alt 5	0	0	0	0	15320	28686	18662	3788	1299	160	0	0	67915
Flow change from Existing Conditions													
Alt 1	0	0	0	0	0	119	-7	0	0	0	0	0	112
Alt 2	0	0	0	14	-354	-420	-423	0	0	0	0	0	-1182
Alt 5	0	0	0	0	0	-23	-7	0	0	0	0	0	-30
Percent change in flow from Existing Conditions													
Alt 1	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Alt 2	0%	0%	0%	0%	0%	-2%	-1%	0%	0%	0%	0%	0%	-2%
Alt 5	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

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Table I-6. Big Thompson River Diversions (CFS), Cumulative Effects.

Average Year (1950-1996)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Exist. Conditions	0	0	0	1	111	167	141	28	9	3	0	0	39
Alt 1	0	0	0	1	111	163	139	28	9	3	0	0	38
Alt 2	0	0	0	0	98	157	124	25	9	2	0	0	35
Alt 5	0	0	0	0	104	163	137	27	9	3	0	0	37
Flow change from Existing Conditions													
Alt 1	0	0	0	0	0	-4	-2	0	0	0	0	0	0
Alt 2	0	0	0	-1	-14	-11	-17	-3	-1	-1	0	0	-4
Alt 5	0	0	0	-1	-7	-4	-4	-1	0	0	0	0	-1
Percent change in flow from Existing Conditions													
Alt 1	0%	0%	0%	32%	0%	-2%	-1%	0%	0%	0%	0%	0%	-1%
Alt 2	0%	0%	0%	-92%	-12%	-6%	-12%	-10%	-6%	-21%	-63%	0%	-10%
Alt 5	0%	0%	0%	-95%	-6%	-3%	-3%	-2%	0%	0%	-63%	0%	-4%

Dry Year Average (1954, 1966, 1977, 1981, 1989)

Exist. Conditions	0	0	0	0	0	0	9	0	0	0	0	0	1
Alt 1	0	0	0	0	0	0	11	0	0	0	0	0	1
Alt 2	0	0	0	0	0	0	0	0	0	0	0	0	0
Alt 5	0	0	0	0	0	0	0	0	0	0	0	0	0
Flow change from Existing Conditions													
Alt 1	0	0	0	0	0	0	2	0	0	0	0	0	0
Alt 2	0	0	0	0	0	0	-9	0	0	0	0	0	-1
Alt 5	0	0	0	0	0	0	-9	0	0	0	0	0	-1
Percent change in flow from Existing Conditions													
Alt 1	0%	0%	0%	0%	0%	0%	25%	0%	0%	0%	0%	0%	25%
Alt 2	0%	0%	0%	0%	0%	0%	-100%	0%	0%	0%	0%	0%	-100%
Alt 5	0%	0%	0%	0%	0%	0%	-100%	0%	0%	0%	0%	0%	-100%

Wet Year Average (1957, 1983, 1984, 1986, 1995)

Exist. Conditions	0	0	0	0	249	482	304	62	22	3	0	0	94
Alt 1	0	0	0	0	249	484	304	62	22	3	0	0	94
Alt 2	0	0	0	0	243	475	297	62	22	3	0	0	92
Alt 5	0	0	0	0	249	482	304	62	22	3	0	0	94
Flow change from Existing Conditions													
Alt 1	0	0	0	0	0	2	0	0	0	0	0	0	0
Alt 2	0	0	0	0	-6	-7	-7	0	0	0	0	0	-2
Alt 5	0	0	0	0	0	0	0	0	0	0	0	0	0
Percent change in flow from Existing Conditions													
Alt 1	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Alt 2	0%	0%	0%	0%	0%	-2%	-1%	0%	0%	0%	0%	0%	-2%
Alt 5	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

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Table I-7. Big Thompson River Streamflow below Lake Estes (AF), Cumulative Effects.

Average Year (1950-1996)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Exist. Conditions	739	661	877	2310	10798	24419	11438	7007	3506	2409	1549	988	66701
Alt 1	739	661	877	2296	10811	24709	11566	7007	3506	2409	1549	988	67118
Alt 2	739	661	877	2351	11645	25200	12492	7184	3542	2446	1560	988	69684
Alt 5	739	661	877	2352	11230	24732	11711	7043	3506	2409	1560	988	67809
Flow change from Existing Conditions													
Alt 1	0	0	0	-14	13	290	128	0	0	0	0	0	417
Alt 2	0	0	0	41	847	781	1053	177	35	37	11	0	2983
Alt 5	0	0	0	42	432	313	273	37	0	0	11	0	1108
Percent change in flow from Existing Conditions													
Alt 1	0%	0%	0%	-1%	0%	1%	1%	0%	0%	0%	0%	0%	1%
Alt 2	0%	0%	0%	2%	8%	3%	9%	3%	1%	2%	1%	0%	4%
Alt 5	0%	0%	0%	2%	4%	1%	2%	1%	0%	0%	1%	0%	2%

Dry Year Average (1954, 1966, 1977, 1981, 1989)

Exist. Conditions	562	475	762	2168	10155	16303	9599	5938	2946	2343	1367	917	53535
Alt 1	562	475	762	2168	10155	16303	9463	5938	2946	2343	1367	917	53399
Alt 2	562	475	762	2168	10155	16303	10150	5938	2946	2343	1367	917	54086
Alt 5	562	475	762	2168	10155	16303	10150	5938	2946	2343	1367	917	54086
Flow change from Existing Conditions													
Alt 1	0	0	0	0	0	0	-136	0	0	0	0	0	-136
Alt 2	0	0	0	0	0	0	551	0	0	0	0	0	551
Alt 5	0	0	0	0	0	0	551	0	0	0	0	0	551
Percent change in flow from Existing Conditions													
Alt 1	0%	0%	0%	0%	0%	0%	-1%	0%	0%	0%	0%	0%	0%
Alt 2	0%	0%	0%	0%	0%	0%	6%	0%	0%	0%	0%	0%	1%
Alt 5	0%	0%	0%	0%	0%	0%	6%	0%	0%	0%	0%	0%	1%

Wet Year Average (1957, 1983, 1984, 1986, 1995)

Exist. Conditions	754	675	940	2233	7869	21560	20163	9971	3892	2335	1473	984	72849
Alt 1	754	675	940	2233	7869	21578	20170	9971	3892	2335	1473	984	72874
Alt 2	754	675	940	2218	8223	22649	20586	9971	3892	2335	1473	984	74701
Alt 5	754	675	940	2233	7869	21578	20170	9971	3892	2335	1473	984	72874
Flow change from Existing Conditions													
Alt 1	0	0	0	0	0	18	7	0	0	0	0	0	25
Alt 2	0	0	0	-14	354	1089	423	0	0	0	0	0	1852
Alt 5	0	0	0	0	0	18	7	0	0	0	0	0	25
Percent change in flow from Existing Conditions													
Alt 1	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Alt 2	0%	0%	0%	-1%	4%	5%	2%	0%	0%	0%	0%	0%	3%
Alt 5	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

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Table I-8. Big Thompson River Streamflow below Lake Estes (CFS), Cumulative Effects.

Average Year (1950-1996)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Exist. Conditions	12	12	14	39	176	410	186	114	59	39	26	16	92
Alt 1	12	12	14	39	176	415	188	114	59	39	26	16	93
Alt 2	12	12	14	40	189	423	203	117	60	40	26	16	96
Alt 5	12	12	14	40	183	416	190	115	59	39	26	16	94
Flow change from Existing Conditions													
Alt 1	0	0	0	0	0	5	2	0	0	0	0	0	1
Alt 2	0	0	0	1	14	13	17	3	1	1	0	0	4
Alt 5	0	0	0	1	7	5	4	1	0	0	0	0	2
Percent change in flow from Existing Conditions													
Alt 1	0%	0%	0%	-1%	0%	1%	1%	0%	0%	0%	0%	0%	1%
Alt 2	0%	0%	0%	2%	8%	3%	9%	3%	1%	2%	1%	0%	4%
Alt 5	0%	0%	0%	2%	4%	1%	2%	1%	0%	0%	1%	0%	2%

Dry Year Average (1954, 1966, 1977, 1981, 1989)

Exist. Conditions	9	9	12	36	165	274	156	97	50	38	23	15	74
Alt 1	9	9	12	36	165	274	154	97	50	38	23	15	74
Alt 2	9	9	12	36	165	274	165	97	50	38	23	15	75
Alt 5	9	9	12	36	165	274	165	97	50	38	23	15	75
Flow change from Existing Conditions													
Alt 1	0	0	0	0	0	0	-2	0	0	0	0	0	0
Alt 2	0	0	0	0	0	0	9	0	0	0	0	0	1
Alt 5	0	0	0	0	0	0	9	0	0	0	0	0	1
Percent change in flow from Existing Conditions													
Alt 1	0%	0%	0%	0%	0%	0%	-1%	0%	0%	0%	0%	0%	0%
Alt 2	0%	0%	0%	0%	0%	0%	6%	0%	0%	0%	0%	0%	1%
Alt 5	0%	0%	0%	0%	0%	0%	6%	0%	0%	0%	0%	0%	1%

Wet Year Average (1957, 1983, 1984, 1986, 1995)

Exist. Conditions	12	12	15	38	128	362	328	162	65	38	25	16	101
Alt 1	12	12	15	38	128	363	328	162	65	38	25	16	101
Alt 2	12	12	15	37	134	381	335	162	65	38	25	16	103
Alt 5	12	12	15	38	128	363	328	162	65	38	25	16	101
Flow change from Existing Conditions													
Alt 1	0	0	0	0	0	0	0	0	0	0	0	0	0
Alt 2	0	0	0	0	6	18	7	0	0	0	0	0	3
Alt 5	0	0	0	0	0	0	0	0	0	0	0	0	0
Percent change in flow from Existing Conditions													
Alt 1	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Alt 2	0%	0%	0%	-1%	4%	5%	2%	0%	0%	0%	0%	0%	3%
Alt 5	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

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Table I-9. Big Thompson River Streamflow at Canyon Gage (AF), Cumulative Effects.

Average Year (1950-1996)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Exist. Conditions	1138	1064	1478	3993	14031	30651	15301	9740	4797	3413	2251	1510	89367
Alt 1	1138	1064	1478	3979	14044	30877	15429	9740	4797	3413	2251	1510	89718
Alt 2	1138	1064	1478	4034	14878	31285	16355	9917	4832	3450	2261	1510	92203
Alt 5	1138	1064	1478	4036	14462	30913	15574	9777	4797	3413	2261	1510	90422
Flow change from Existing Conditions													
Alt 1	0	0	0	-14	13	225	128	0	0	0	0	0	352
Alt 2	0	0	0	41	847	634	1053	177	35	37	11	0	2836
Alt 5	0	0	0	42	432	261	273	37	0	0	11	0	1056
Percent change in flow from Existing Conditions													
Alt 1	0%	0%	0%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%
Alt 2	0%	0%	0%	1%	6%	2%	7%	2%	1%	1%	0%	0%	3%
Alt 5	0%	0%	0%	1%	3%	1%	2%	0%	0%	0%	0%	0%	1%

Dry Year Average (1954, 1966, 1977, 1981, 1989)

Exist. Conditions	1016	890	1419	2881	11595	18843	11669	7603	3950	3370	2239	1685	67160
Alt 1	1016	890	1419	2881	11595	18843	11533	7603	3950	3370	2239	1685	67024
Alt 2	1016	890	1419	2881	11595	18843	12220	7603	3950	3370	2239	1685	67711
Alt 5	1016	890	1419	2881	11595	18843	12220	7603	3950	3370	2239	1685	67711
Flow change from Existing Conditions													
Alt 1	0	0	0	0	0	0	-136	0	0	0	0	0	-136
Alt 2	0	0	0	0	0	0	551	0	0	0	0	0	551
Alt 5	0	0	0	0	0	0	551	0	0	0	0	0	551
Percent change in flow from Existing Conditions													
Alt 1	0%	0%	0%	0%	0%	0%	-1%	0%	0%	0%	0%	0%	0%
Alt 2	0%	0%	0%	0%	0%	0%	5%	0%	0%	0%	0%	0%	1%
Alt 5	0%	0%	0%	0%	0%	0%	5%	0%	0%	0%	0%	0%	1%

Wet Year Average (1957, 1983, 1984, 1986, 1995)

Exist. Conditions	1252	1189	1633	5314	10937	34554	27292	14027	5593	3309	2060	1433	108593
Alt 1	1252	1189	1633	5314	10937	34434	27300	14027	5593	3309	2060	1433	108480
Alt 2	1252	1189	1633	5299	11290	34974	27715	14027	5593	3309	2060	1433	109775
Alt 5	1252	1189	1633	5314	10937	34577	27300	14027	5593	3309	2060	1433	108623
Flow change from Existing Conditions													
Alt 1	0	0	0	0	0	-120	7	0	0	0	0	0	-112
Alt 2	0	0	0	-14	354	420	423	0	0	0	0	0	1182
Alt 5	0	0	0	0	0	23	7	0	0	0	0	0	30
Percent change in flow from Existing Conditions													
Alt 1	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Alt 2	0%	0%	0%	0%	3%	1%	2%	0%	0%	0%	0%	0%	1%
Alt 5	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

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Table I-10. Big Thompson River Streamflow at Canyon Gage (cfs), Cumulative Effects.

Average Year (1950-1996)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Exist. Conditions	19	19	24	67	228	515	249	158	81	56	38	25	123
Alt 1	19	19	24	67	228	519	251	158	81	56	38	25	124
Alt 2	19	19	24	68	242	526	266	161	81	56	38	25	127
Alt 5	19	19	24	68	235	519	253	159	81	56	38	25	125
Flow change from Existing Conditions													
Alt 1	0	0	0	0	0	4	2	0	0	0	0	0	0
Alt 2	0	0	0	1	14	11	17	3	1	1	0	0	4
Alt 5	0	0	0	1	7	4	4	1	0	0	0	0	1
Percent change in flow from Existing Conditions													
Alt 1	0%	0%	0%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%
Alt 2	0%	0%	0%	1%	6%	2%	7%	2%	1%	1%	0%	0%	3%
Alt 5	0%	0%	0%	1%	3%	1%	2%	0%	0%	0%	0%	0%	1%

Dry Year Average (1954, 1966, 1977, 1981, 1989)

Exist. Conditions	17	16	23	48	189	317	190	124	66	55	38	27	93
Alt 1	17	16	23	48	189	317	188	124	66	55	38	27	93
Alt 2	17	16	23	48	189	317	199	124	66	55	38	27	94
Alt 5	17	16	23	48	189	317	199	124	66	55	38	27	94
Flow change from Existing Conditions													
Alt 1	0	0	0	0	0	0	-2	0	0	0	0	0	0
Alt 2	0	0	0	0	0	0	9	0	0	0	0	0	1
Alt 5	0	0	0	0	0	0	9	0	0	0	0	0	1
Percent change in flow from Existing Conditions													
Alt 1	0%	0%	0%	0%	0%	0%	-1%	0%	0%	0%	0%	0%	0%
Alt 2	0%	0%	0%	0%	0%	0%	5%	0%	0%	0%	0%	0%	1%
Alt 5	0%	0%	0%	0%	0%	0%	5%	0%	0%	0%	0%	0%	1%

Wet Year Average (1957, 1983, 1984, 1986, 1995)

Exist. Conditions	20	21	27	89	178	581	444	228	94	54	35	23	150
Alt 1	20	21	27	89	178	579	444	228	94	54	35	23	150
Alt 2	20	21	27	89	184	588	451	228	94	54	35	23	152
Alt 5	20	21	27	89	178	581	444	228	94	54	35	23	150
Flow change from Existing Conditions													
Alt 1	0	0	0	0	0	-2	0	0	0	0	0	0	0
Alt 2	0	0	0	0	6	7	7	0	0	0	0	0	2
Alt 5	0	0	0	0	0	0	0	0	0	0	0	0	0
Percent change in flow from Existing Conditions													
Alt 1	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Alt 2	0%	0%	0%	0%	3%	1%	2%	0%	0%	0%	0%	0%	1%
Alt 5	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

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Table I-11. Modeled Lake Granby Spills, Cumulative Effects.

Existing Conditions				No Action—Alternative 1				Proposed Action—Alternative 2				Alternative 5			
Spill Periods	# Days	Daily Average Spill (cfs)	Daily Maximum Spill (cfs)	Spill Periods	# Days	Daily Average Spill (cfs)	Daily Maximum Spill (cfs)	Spill Periods	# Days	Daily Average Spill (cfs)	Daily Maximum Spill (cfs)	Spill Periods	# Days	Daily Average Spill (cfs)	Daily Maximum Spill (cfs)
6/52-8/52	92	571	2,284	6/52-8/52	90	345	1,230	7/52-8/52	62	324	1,197	7/52-8/52	62	329	1,230
7/53-8/53	26	162	407	8/53	8	108	145								
8/57	31	303	458	8/57	25	102	152								
6/58	30	1091	2,235	6/58	30	1,090	2,324	6/58	30	633	1,349	6/58	30	861	1,834
7/60	31	320	911	7/60	18	199	334								
7/61	26	302	761												
9/61-10/61	61	277	333	9/61-10/61	61	208	227	10/61	31	221	221	9/61-10/61	61	177	202
5/62-7/62	92	715	2,700	5/62-7/62	92	702	2,698	6/62-7/62	61	961	2,679	6/62-7/62	61	951	2,673
7/69	31	620	1,763												
6/70-7/70	61	977	3,228	6/70-7/70	61	744	2,222	6/70-7/70	46	409	1,131	6/70-7/70	61	533	1,306
6/71-8/71	63	1209	4,048	6/71-8/71	63	1,167	3,862	6/71-8/71	63	1,040	3,285	6/71-8/71	63	1,087	3,433
6/73-8/73	92	602	2,605	6/73-8/73	92	555	2,166	6/73-8/73	80	481	2,200	6/73-8/73	87	457	2,167
6/74	30	818	1,744	6/74	30	817	1,737	6/74	30	582	1,240	6/74	30	591	1,259
8/79	31	177	267												
6/80-7/80	61	870	2,892	6/80-7/80	61	416	945	7/80	31	385	912	6/80-7/80	47	373	945
7/83-8/83	62	1,097	5,271	7/83-8/83	62	1,096	4,384	7/83-8/83	62	894	3,416	7/83-8/83	62	959	3,735
5/84-8/84	123	988	4,313	5/84-8/84	123	986	4,312	5/84-8/84	123	1,010	4,455	5/84-8/84	123	997	4,316
6/85-7/85	59	660	2,121	6/85-7/85	56	688	2,119	6/85-7/85	52	634	2,011	6/85-7/85	54	640	2,019
6/86-8/86	62	1,461	4,649	6/86-8/86	62	1,460	4,648	6/86-8/86	63	1,440	4,647	6/86-7/86	61	1,478	4,628
7/95-8/95	62	445	2,020												
6/96-7/96	61	901	3,049	6/96-7/96	61	749	2,392	6/96-7/96	61	667	2,067	6/96-7/96	61	730	2,313

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Table I-12. Colorado River Streamflow below Lake Granby at USGS gage (cfs), Cumulative Effects.

Average Year (1950-1996)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Exist. Conditions	20	20	20	20	84	400	258	68	28	25	20	20	82
Alt 1	20	20	20	20	83	344	223	57	25	25	20	20	73
Alt 2	20	20	20	20	81	279	210	55	22	24	20	20	66
Alt 5	20	20	20	20	82	300	213	55	24	24	20	20	68
Flow change from Existing Conditions													
Alt 1	0	0	0	0	-1	-56	-35	-11	-3	0	0	0	-9
Alt 2	0	0	0	0	-3	-121	-48	-13	-6	0	0	0	-16
Alt 5	0	0	0	0	-2	-100	-45	-13	-4	-1	0	0	-14
Percent change in flow from Existing Conditions													
Alt 1	0%	0%	0%	0%	-1%	-14%	-14%	-16%	-10%	0%	0%	0%	-11%
Alt 2	0%	0%	0%	0%	-4%	-30%	-19%	-19%	-22%	-1%	2%	0%	-19%
Alt 5	0%	0%	0%	0%	-3%	-25%	-17%	-19%	-15%	-3%	0%	0%	-17%

Dry Year Average (1954, 1966, 1977, 1981, 1989)

	20	20	20	20	57	57	57	30	20	20	20	20	30
Exist. Conditions	20	20	20	20	57	57	57	30	20	20	20	20	30
Alt 1	20	20	20	20	57	57	57	30	20	20	20	20	30
Alt 2	20	20	20	20	57	57	57	30	20	20	20	20	30
Alt 5	20	20	20	20	57	57	57	30	20	20	20	20	30
Flow change from Existing Conditions													
Alt 1	0	0	0	0	0	0	0	0	0	0	0	0	0
Alt 2	0	0	0	0	0	0	0	0	0	0	0	0	0
Alt 5	0	0	0	0	0	0	0	0	0	0	0	0	0
Percent change in flow from Existing Conditions													
Alt 1	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Alt 2	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Alt 5	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Wet Year Average (1957, 1983, 1984, 1986, 1995)

	20	20	20	20	181	886	896	245	33	20	20	20	199
Exist. Conditions	20	20	20	20	181	886	896	245	33	20	20	20	199
Alt 1	20	20	20	20	180	886	768	175	35	20	20	20	183
Alt 2	20	20	20	20	183	899	689	167	37	20	23	20	177
Alt 5	20	20	20	20	188	884	714	163	31	20	20	20	177
Flow change from Existing Conditions													
Alt 1	0	0	0	0	-1	0	-128	-69	2	0	0	0	-17
Alt 2	0	0	0	0	2	13	-207	-78	3	0	3	0	-22
Alt 5	0	0	0	0	7	-2	-182	-81	-3	0	0	0	-22
Percent change in flow from Existing Conditions													
Alt 1	0%	0%	0%	0%	-1%	0%	-14%	-28%	5%	0%	0%	0%	-8%
Alt 2	0%	0%	0%	0%	1%	1%	-23%	-32%	10%	0%	16%	0%	-11%
Alt 5	0%	0%	0%	0%	4%	0%	-20%	-33%	-8%	0%	0%	0%	-11%

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Table I-13. Colorado River Streamflow above Windy Gap (cfs), Cumulative Effects.

Average Year (1950-1996)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Exist. Conditions	65	69	88	213	545	1137	519	168	83	79	78	68	260
Alt 1	61	66	85	211	510	981	441	144	76	77	75	64	233
Alt 2	61	66	85	211	505	903	425	141	72	77	75	64	224
Alt 5	61	66	85	211	506	930	429	141	75	76	75	64	227
Flow change from Existing Conditions													
Alt 1	-4	-3	-3	-2	-35	-156	-78	-23	-6	-2	-4	-4	-27
Alt 2	-4	-3	-3	-2	-39	-234	-94	-26	-10	-2	-3	-4	-35
Alt 5	-4	-3	-3	-2	-38	-207	-90	-27	-8	-3	-3	-4	-33
Percent change in flow from Existing Conditions													
Alt 1	-6%	-5%	-3%	-1%	-6%	-14%	-15%	-14%	-8%	-2%	-5%	-6%	-10%
Alt 2	-6%	-5%	-3%	-1%	-7%	-21%	-18%	-16%	-12%	-3%	-4%	-6%	-14%
Alt 5	-6%	-5%	-3%	-1%	-7%	-18%	-17%	-16%	-9%	-4%	-4%	-6%	-13%

Dry Year Average (1954, 1966, 1977, 1981, 1989)

Exist. Conditions	60	63	90	145	197	187	133	94	66	67	74	65	104
Alt 1	55	60	88	144	187	168	125	82	60	64	71	60	97
Alt 2	55	60	88	144	187	168	124	82	60	64	71	60	97
Alt 5	55	60	88	144	187	168	124	82	60	64	71	60	97
Flow change from Existing Conditions													
Alt 1	-5	-3	-2	-1	-10	-19	-8	-11	-6	-2	-3	-5	-6
Alt 2	-5	-3	-2	-1	-10	-19	-9	-11	-6	-2	-3	-5	-6
Alt 5	-5	-3	-2	-1	-10	-19	-9	-11	-6	-2	-3	-5	-6
Percent change in flow from Existing Conditions													
Alt 1	-8%	-5%	-2%	-1%	-5%	-10%	-6%	-12%	-9%	-3%	-4%	-7%	-6%
Alt 2	-8%	-5%	-2%	-1%	-5%	-10%	-7%	-12%	-9%	-3%	-4%	-7%	-6%
Alt 5	-8%	-5%	-2%	-1%	-5%	-10%	-7%	-12%	-9%	-3%	-4%	-7%	-6%

Wet Year Average (1957, 1983, 1984, 1986, 1995)

Exist. Conditions	72	77	85	179	1041	2660	1730	462	124	82	86	77	558
Alt 1	68	72	81	177	989	2440	1457	374	122	82	82	72	503
Alt 2	68	72	81	177	992	2454	1377	354	124	82	85	72	496
Alt 5	68	72	81	177	997	2439	1402	348	118	82	83	72	496
Flow change from Existing Conditions													
Alt 1	-4	-4	-4	-2	-52	-220	-273	-88	-2	1	-4	-5	-55
Alt 2	-4	-4	-4	-2	-49	-206	-353	-107	0	1	-1	-5	-62
Alt 5	-4	-4	-4	-2	-44	-221	-328	-113	-6	1	-2	-5	-62
Percent change in flow from Existing Conditions													
Alt 1	-6%	-6%	-5%	-1%	-5%	-8%	-16%	-19%	-1%	1%	-5%	-6%	-10%
Alt 2	-6%	-6%	-5%	-1%	-5%	-8%	-20%	-23%	0%	1%	-1%	-6%	-11%
Alt 5	-6%	-6%	-5%	-1%	-4%	-8%	-19%	-25%	-5%	1%	-3%	-6%	-11%

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Table I-14. Colorado River Streamflow below Windy Gap at USGS gage (cfs), Cumulative Effects.

Average Year (1950-1996)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Exist. Conditions	65	69	88	137	258	951	472	161	83	79	78	68	209
Alt 1	61	66	85	138	226	803	348	130	76	77	75	64	179
Alt 2	61	66	85	138	199	690	359	129	72	77	75	64	168
Alt 5	61	66	85	138	196	719	330	125	75	76	75	64	167
Flow change from Existing Conditions													
Alt 1	-4	-3	-3	0	-32	-148	-124	-31	-6	-2	-4	-4	-30
Alt 2	-4	-3	-3	0	-59	-261	-114	-32	-10	-2	-3	-4	-41
Alt 5	-4	-3	-3	0	-61	-232	-142	-35	-8	-3	-3	-4	-42
Percent change in flow from Existing Conditions													
Alt 1	-6%	-5%	-3%	0%	-12%	-16%	-26%	-19%	-8%	-2%	-5%	-6%	-14%
Alt 2	-6%	-5%	-3%	0%	-23%	-27%	-24%	-20%	-12%	-3%	-4%	-6%	-20%
Alt 5	-6%	-5%	-3%	0%	-24%	-24%	-30%	-22%	-9%	-4%	-4%	-6%	-20%

Dry Year Average (1954, 1966, 1977, 1981, 1989)

Exist. Conditions	60	63	90	127	136	142	127	94	66	67	74	65	93
Alt 1	55	60	88	126	149	159	125	82	60	64	71	60	92
Alt 2	55	60	88	126	149	159	124	82	60	64	71	60	92
Alt 5	55	60	88	126	149	159	124	82	60	64	71	60	92
Flow change from Existing Conditions													
Alt 1	-5	-3	-2	-1	13	17	-2	-11	-6	-2	-3	-5	-1
Alt 2	-5	-3	-2	-1	13	17	-3	-11	-6	-2	-3	-5	-1
Alt 5	-5	-3	-2	-1	13	17	-3	-11	-6	-2	-3	-5	-1
Percent change in flow from Existing Conditions													
Alt 1	-8%	-5%	-2%	-1%	10%	12%	-2%	-12%	-9%	-3%	-4%	-7%	-1%
Alt 2	-8%	-5%	-2%	-1%	10%	12%	-3%	-12%	-9%	-3%	-4%	-7%	-1%
Alt 5	-8%	-5%	-2%	-1%	10%	12%	-3%	-12%	-9%	-3%	-4%	-7%	-1%

Wet Year Average (1957, 1983, 1984, 1986, 1995)

Exist. Conditions	72	77	85	132	707	2420	1716	462	124	82	86	77	505
Alt 1	68	72	81	130	651	2139	1206	290	122	82	82	72	417
Alt 2	68	72	81	130	530	2080	1163	308	124	82	85	72	400
Alt 5	68	72	81	130	533	2074	1141	306	118	82	83	72	397
Flow change from Existing Conditions													
Alt 1	-4	-4	-4	-2	-57	-281	-510	-172	-2	1	-4	-5	-88
Alt 2	-4	-4	-4	-2	-177	-340	-552	-153	0	1	-1	-5	-104
Alt 5	-4	-4	-4	-2	-175	-346	-574	-156	-6	1	-2	-5	-108
Percent change in flow from Existing Conditions													
Alt 1	-6%	-6%	-5%	-2%	-8%	-12%	-30%	-37%	-1%	1%	-5%	-6%	-17%
Alt 2	-6%	-6%	-5%	-2%	-25%	-14%	-32%	-33%	0%	1%	-1%	-6%	-21%
Alt 5	-6%	-6%	-5%	-2%	-25%	-14%	-33%	-34%	-5%	1%	-3%	-6%	-21%

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Table I-15. Willow Creek Streamflow at USGS/NCWCD gage (cfs), Cumulative Effects.

Average Year (1950-1996)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Exist. Conditions	8	9	14	6	51	143	32	12	3	8	8	9	25
Alt 1	8	9	14	6	51	127	23	10	4	8	8	9	23
Alt 2	8	9	14	6	49	114	20	9	3	8	8	9	21
Alt 5	8	9	14	6	49	120	20	9	4	8	8	9	22
Flow change from Existing Conditions													
Alt 1	0	0	0	0	0	-16	-9	-2	0	0	0	0	-2
Alt 2	0	0	0	0	-2	-29	-11	-3	0	0	0	0	-4
Alt 5	0	0	0	0	-2	-23	-11	-3	0	0	0	0	-3
Percent change in flow from Existing Conditions													
Alt 1	0%	0%	0%	0%	0%	-11%	-29%	-15%	2%	3%	0%	0%	-9%
Alt 2	0%	0%	0%	0%	-4%	-20%	-36%	-27%	-13%	2%	1%	0%	-15%
Alt 5	0%	0%	0%	0%	-3%	-16%	-36%	-25%	2%	-1%	2%	0%	-13%

Dry Year Average (1954, 1966, 1977, 1981, 1989)

Exist. Conditions	8	8	12	4	0	10	0	2	2	6	7	7	5
Alt 1	8	8	12	4	0	10	0	2	2	6	7	7	5
Alt 2	8	8	12	4	0	10	0	2	2	6	7	7	5
Alt 5	8	8	12	4	0	10	0	2	2	6	7	7	5
Flow change from Existing Conditions													
Alt 1	0	0	0	0	0	0	0	0	0	0	0	0	0
Alt 2	0	0	0	0	0	0	0	0	0	0	0	0	0
Alt 5	0	0	0	0	0	0	0	0	0	0	0	0	0
Percent change in flow from Existing Conditions													
Alt 1	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Alt 2	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Alt 5	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Wet Year Average (1957, 1983, 1984, 1986, 1995)

Exist. Conditions	9	10	18	5	184	434	112	58	14	7	11	12	73
Alt 1	9	10	18	5	184	378	75	52	14	7	11	12	65
Alt 2	9	10	18	5	184	378	75	40	14	7	11	12	64
Alt 5	9	10	18	5	184	378	75	40	14	7	12	12	64
Flow change from Existing Conditions													
Alt 1	0	0	0	0	0	-56	-38	-6	0	0	0	0	-8
Alt 2	0	0	0	0	0	-56	-38	-18	0	0	0	0	-9
Alt 5	0	0	0	0	0	-56	-38	-18	0	0	2	0	-9
Percent change in flow from Existing Conditions													
Alt 1	0%	0%	0%	0%	0%	-13%	-34%	-10%	0%	0%	-1%	0%	-11%
Alt 2	0%	0%	0%	0%	0%	-13%	-34%	-30%	0%	0%	0%	0%	-13%
Alt 5	0%	0%	0%	0%	0%	-13%	-34%	-30%	0%	0%	15%	0%	-13%

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Table I-16. Colorado River at Hot Sulphur Springs at USGS/NCWCD gage (cfs), Cumulative Effects.

Average Year (1950-1996)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Exist. Conditions	69	72	93	146	278	953	482	170	87	87	83	72	216
Alt 1	65	69	90	146	245	803	355	137	80	85	80	68	185
Alt 2	65	69	90	146	218	689	365	136	76	85	80	68	174
Alt 5	65	69	90	146	216	719	336	133	79	84	80	68	174
Flow change from Existing Conditions													
Alt 1	-4	-3	-3	0	-33	-150	-127	-32	-7	-2	-4	-4	-31
Alt 2	-4	-3	-3	0	-60	-263	-116	-33	-11	-2	-3	-4	-42
Alt 5	-4	-3	-3	0	-63	-234	-145	-37	-9	-3	-3	-4	-42
Percent change in flow from Existing Conditions													
Alt 1	-6%	-5%	-3%	0%	-12%	-16%	-26%	-19%	-8%	-2%	-4%	-6%	-14%
Alt 2	-6%	-5%	-3%	0%	-22%	-28%	-24%	-20%	-13%	-3%	-4%	-6%	-19%
Alt 5	-6%	-5%	-3%	0%	-22%	-25%	-30%	-22%	-10%	-3%	-4%	-6%	-20%

Dry Year Average (1954, 1966, 1977, 1981, 1989)

	63	64	95	137	137	139	142	101	67	75	80	69	98
Exist. Conditions	63	64	95	137	137	139	142	101	67	75	80	69	98
Alt 1	58	61	93	136	149	154	136	88	61	73	77	64	96
Alt 2	58	61	93	136	149	154	135	88	61	73	77	64	96
Alt 5	58	61	93	136	149	154	135	88	61	73	77	64	96
Flow change from Existing Conditions													
Alt 1	-5	-4	-2	-1	12	15	-5	-13	-7	-2	-3	-5	-2
Alt 2	-5	-4	-2	-1	12	15	-6	-13	-7	-2	-3	-5	-2
Alt 5	-5	-4	-2	-1	12	15	-6	-13	-7	-2	-3	-5	-2
Percent change in flow from Existing Conditions													
Alt 1	-8%	-6%	-2%	-1%	9%	11%	-4%	-13%	-10%	-3%	-3%	-7%	-2%
Alt 2	-8%	-6%	-2%	-1%	9%	11%	-4%	-13%	-10%	-3%	-3%	-7%	-2%
Alt 5	-8%	-6%	-2%	-1%	9%	11%	-4%	-13%	-10%	-3%	-3%	-7%	-2%

Wet Year Average (1957, 1983, 1984, 1986, 1995)

	78	82	91	150	730	2414	1709	468	127	90	90	82	511
Exist. Conditions	78	82	91	150	730	2414	1709	468	127	90	90	82	511
Alt 1	74	77	86	148	672	2132	1196	294	124	89	85	77	422
Alt 2	74	77	86	148	552	2073	1154	313	125	89	89	77	405
Alt 5	74	77	86	148	554	2066	1132	311	120	89	87	77	402
Flow change from Existing Conditions													
Alt 1	-4	-5	-4	-3	-58	-283	-513	-173	-3	0	-4	-5	-89
Alt 2	-4	-5	-4	-3	-178	-342	-555	-154	-1	0	-1	-5	-105
Alt 5	-4	-5	-4	-3	-176	-348	-577	-157	-7	0	-3	-5	-108
Percent change in flow from Existing Conditions													
Alt 1	-6%	-6%	-5%	-2%	-8%	-12%	-30%	-37%	-2%	0%	-5%	-6%	-17%
Alt 2	-6%	-6%	-5%	-2%	-24%	-14%	-32%	-33%	-1%	0%	-1%	-6%	-21%
Alt 5	-6%	-6%	-5%	-2%	-24%	-14%	-34%	-34%	-5%	0%	-3%	-6%	-21%

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Table I-17. Colorado River Streamflow below Williams Fork (cfs), Cumulative Effects.

Average Year (1950-1996)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Exist. Conditions	179	189	210	186	308	1194	735	276	191	232	209	184	341
Alt 1	177	188	212	181	273	1085	597	265	200	243	208	181	317
Alt 2	177	188	212	182	246	971	607	264	196	242	208	181	306
Alt 5	177	188	212	182	244	1000	578	261	199	242	208	181	306
Flow change from Existing Conditions													
Alt 1	-2	-1	2	-4	-34	-109	-138	-10	10	10	-1	-3	-24
Alt 2	-2	-1	2	-4	-61	-223	-128	-11	6	10	-1	-3	-35
Alt 5	-2	-1	2	-4	-64	-193	-157	-15	8	9	-1	-3	-35
Percent change in flow from Existing Conditions													
Alt 1	-1%	-1%	1%	-2%	-11%	-9%	-19%	-4%	5%	4%	-1%	-2%	-7%
Alt 2	-1%	-1%	1%	-2%	-20%	-19%	-17%	-4%	3%	4%	0%	-2%	-10%
Alt 5	-1%	-1%	1%	-2%	-21%	-16%	-21%	-5%	4%	4%	0%	-2%	-10%

Dry Year Average (1954, 1966, 1977, 1981, 1989)

	173	180	213	190	148	146	338	266	178	214	206	186	204
Exist. Conditions	173	180	213	190	148	146	338	266	178	214	206	186	204
Alt 1	187	197	229	174	160	162	258	274	198	219	221	199	207
Alt 2	187	197	229	174	160	161	258	274	198	219	221	199	207
Alt 5	187	197	229	174	160	161	258	274	198	219	221	199	207
Flow change from Existing Conditions													
Alt 1	13	17	16	-16	12	15	-80	8	20	5	15	14	3
Alt 2	13	17	16	-16	12	15	-80	8	20	5	15	14	3
Alt 5	13	17	16	-16	12	15	-80	8	20	5	15	14	3
Percent change in flow from Existing Conditions													
Alt 1	8%	9%	8%	-8%	8%	10%	-24%	3%	11%	2%	8%	7%	2%
Alt 2	8%	9%	8%	-8%	8%	10%	-24%	3%	11%	2%	8%	7%	1%
Alt 5	8%	9%	8%	-8%	8%	10%	-24%	3%	11%	2%	8%	7%	1%

Wet Year Average (1957, 1983, 1984, 1986, 1995)

	191	205	213	216	803	2965	2314	639	215	242	220	202	704
Exist. Conditions	191	205	213	216	803	2965	2314	639	215	242	220	202	704
Alt 1	192	207	215	200	737	2728	1844	482	215	253	222	203	626
Alt 2	192	207	215	200	616	2668	1802	501	216	253	225	203	609
Alt 5	192	207	215	200	619	2662	1780	498	211	253	223	203	606
Flow change from Existing Conditions													
Alt 1	1	1	2	-16	-66	-237	-470	-157	0	10	2	1	-78
Alt 2	1	1	2	-16	-187	-296	-512	-138	1	10	5	1	-95
Alt 5	1	1	2	-16	-185	-303	-534	-141	-4	10	3	1	-98
Percent change in flow from Existing Conditions													
Alt 1	0%	1%	1%	-7%	-8%	-8%	-20%	-25%	0%	4%	1%	0%	-11%
Alt 2	0%	1%	1%	-7%	-23%	-10%	-22%	-22%	1%	4%	2%	0%	-13%
Alt 5	0%	1%	1%	-7%	-23%	-10%	-23%	-22%	-2%	4%	2%	0%	-14%

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Table I-18. Colorado River Streamflow near Kremmling at USGS gage (cfs), Cumulative Effects.

Average Year (1950-1996)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Exist. Conditions	495	521	557	664	1145	2619	1745	1026	909	832	583	523	969
Alt 1	491	519	558	643	975	2114	1303	953	864	812	563	504	859
Alt 2	490	519	558	643	948	2002	1313	953	859	812	564	504	848
Alt 5	490	519	558	643	945	2030	1286	948	862	811	564	504	848
Flow change from Existing Conditions													
Alt 1	-4	-2	1	-20	-170	-504	-442	-73	-46	-19	-20	-19	-110
Alt 2	-4	-2	1	-20	-197	-617	-432	-73	-50	-20	-20	-19	-121
Alt 5	-4	-2	1	-20	-199	-588	-459	-78	-47	-20	-20	-19	-122
Percent change in flow from Existing Conditions													
Alt 1	-1%	0%	0%	-3%	-15%	-19%	-25%	-7%	-5%	-2%	-3%	-4%	-11%
Alt 2	-1%	0%	0%	-3%	-17%	-24%	-25%	-7%	-5%	-2%	-3%	-4%	-13%
Alt 5	-1%	0%	0%	-3%	-17%	-22%	-26%	-8%	-5%	-2%	-3%	-4%	-13%

Dry Year Average (1954, 1966, 1977, 1981, 1989)

Exist. Conditions	454	483	557	615	422	473	924	943	866	674	547	493	622
Alt 1	471	505	581	586	388	353	748	914	826	670	542	495	591
Alt 2	471	504	581	586	388	348	748	914	826	671	542	494	590
Alt 5	471	504	581	586	388	348	748	914	826	671	542	494	590
Flow change from Existing Conditions													
Alt 1	17	22	24	-29	-34	-120	-176	-29	-40	-4	-4	2	-31
Alt 2	17	22	24	-29	-34	-125	-176	-29	-39	-4	-5	2	-32
Alt 5	17	22	24	-29	-34	-125	-176	-29	-39	-4	-5	2	-32
Percent change in flow from Existing Conditions													
Alt 1	4%	5%	4%	-5%	-8%	-25%	-19%	-3%	-5%	-1%	-1%	0%	-5%
Alt 2	4%	4%	4%	-5%	-8%	-26%	-19%	-3%	-5%	-1%	-1%	0%	-5%
Alt 5	4%	4%	4%	-5%	-8%	-26%	-19%	-3%	-5%	-1%	-1%	0%	-5%

Wet Year Average (1957, 1983, 1984, 1986, 1995)

Exist. Conditions	576	622	639	764	2231	5885	4725	1694	945	804	633	600	1681
Alt 1	569	619	635	698	2015	4956	3930	1430	924	760	611	581	1481
Alt 2	569	619	635	698	1894	4897	3888	1449	924	760	615	581	1464
Alt 5	569	619	635	698	1896	4891	3866	1446	919	760	613	581	1461
Flow change from Existing Conditions													
Alt 1	-7	-3	-4	-66	-216	-929	-794	-264	-21	-44	-22	-19	-200
Alt 2	-7	-3	-4	-66	-337	-988	-837	-245	-21	-44	-19	-19	-217
Alt 5	-7	-3	-4	-66	-335	-994	-859	-248	-25	-44	-20	-19	-220
Percent change in flow from Existing Conditions													
Alt 1	-1%	-1%	-1%	-9%	-10%	-16%	-17%	-16%	-2%	-5%	-3%	-3%	-12%
Alt 2	-1%	-1%	-1%	-9%	-15%	-17%	-18%	-14%	-2%	-5%	-3%	-3%	-13%
Alt 5	-1%	-1%	-1%	-9%	-15%	-17%	-18%	-15%	-3%	-5%	-3%	-3%	-13%

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Table I-19. Colorado River at Hot Sulphur Springs Channel Maintenance Flows (1950-1996), Cumulative Effects.

Recurrence Interval	Flow Range	Range of Dates Flow Occurs	When most of Flow Occurs	Average flow (cfs)			
				Existing Conditions	No Action	Proposed Action	Alternative 5
0.8x1.5-yr flow to 2-yr flow	510 cfs to 1,240 cfs	late March - mid-October	May through July	768	787	794	796
2-yr flow to 5-yr flow	1,240 cfs to 3,160 cfs	May 1 to late September	June and July	2,018	2,085	1,984	2,035
5-yr flow to 10-yr flow	3,160 cfs to 4,600 cfs	late May to mid-July	June	3,750	3,723	3,699	3,701
10-yr flow to 25-yr flow	4,600 cfs to 6,520 cfs	late May to mid-July	June	5,016	5,290	5,252	5,246
At or greater than 25-yr flow	6,520 cfs or greater	12-Jul	one day	6,545	6,545	-	-

Recurrence Interval	Flow Range	Average Number of Days/Year Flow Occurs				Percentage of Years Flow Occurs			
		Existing Conditions	No Action	Proposed Action	Alt 5	Existing Conditions	No Action	Proposed Action	Alt 5
0.8x1.5-yr flow to 2-yr flow	510 cfs to 1,240 cfs	23	21	21	19	62%	49%	47%	47%
2-yr flow to 5-yr flow	1,240 cfs to 3,160 cfs	23.5	21	21	21	38%	34%	32%	32%
5-yr flow to 10-yr flow	3,160 cfs to 4,600 cfs	10.5	8	9	9.5	28%	26%	17%	17%
10-yr flow to 25-yr flow	4,600 cfs to 6,520 cfs	4	8	8	7.5	13%	4%	4%	4%
At or greater than 25-yr flow	6,520 cfs or greater	1	1	0	0	2%	2%	0%	0%

Recurrence Interval	Flow Range	Number of Days Occurs in 47-yr model period			
		Existing Conditions	No Action	Proposed Action	Alt 5
0.8x1.5-yr flow to 2-yr flow	510 cfs to 1,240 cfs	663	476	463	423
2-yr flow to 5-yr flow	1,240 cfs to 3,160 cfs	423	331	315	311
5-yr flow to 10-yr flow	3,160 cfs to 4,600 cfs	137	98	73	76
10-yr flow to 25-yr flow	4,600 cfs to 6,520 cfs	24	16	16	15
At or greater than 25-yr flow	6,520 cfs or greater	1	1	0	0

Appendix J:
Cumulative Effects—Hydrology Model Output—
Stream Stage Changes

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Table J-1. Big Thompson River Stage at Canyon Gage (feet), Cumulative Effects.

Average Year (1950-1996)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Exist. Conditions	1.65	1.66	1.74	2.21	2.96	3.59	3.02	2.71	2.31	2.11	1.92	1.75
Alt 1	1.65	1.66	1.74	2.21	2.96	3.59	3.02	2.71	2.31	2.11	1.92	1.75
Alt 2	1.65	1.66	1.74	2.21	3.00	3.61	3.06	2.72	2.31	2.11	1.93	1.75
Alt 5	1.65	1.66	1.74	2.21	2.98	3.60	3.03	2.71	2.31	2.11	1.93	1.75
Change in stage from existing conditions												
Alt 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alt 2	0.00	0.00	0.00	0.00	0.04	0.02	0.04	0.01	0.00	0.00	0.01	0.00
Alt 5	0.00	0.00	0.00	0.00	0.02	0.01	0.01	0.00	0.00	0.00	0.01	0.00
Percent change in stage from existing conditions												
Alt 1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Alt 2	0.0%	0.0%	0.0%	0.0%	0.0%	1.4%	0.6%	1.3%	0.4%	0.0%	0.0%	0.5%
Alt 5	0.0%	0.0%	0.0%	0.0%	0.7%	0.3%	0.3%	0.0%	0.0%	0.0%	0.5%	0.0%

Dry Year Average (1954, 1966, 1977, 1981, 1989)

Exist. Conditions	1.62	1.61	1.73	2.04	2.82	3.20	2.83	2.55	2.20	2.10	1.92	1.79
Alt 1	1.62	1.61	1.73	2.04	2.82	3.20	2.82	2.55	2.20	2.10	1.92	1.79
Alt 2	1.62	1.61	1.73	2.04	2.82	3.20	2.86	2.55	2.20	2.10	1.92	1.79
Alt 5	1.62	1.61	1.73	2.04	2.82	3.20	2.86	2.55	2.20	2.10	1.92	1.79
Change in stage from existing conditions												
Alt 1	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	0.00	0.00	0.00	0.00	0.00
Alt 2	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00
Alt 5	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00
Percent change in stage from existing conditions												
Alt 1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-0.4%	0.0%	0.0%	0.0%	0.0%	0.0%
Alt 2	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.1%	0.0%	0.0%	0.0%	0.0%	0.0%
Alt 5	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.1%	0.0%	0.0%	0.0%	0.0%	0.0%

Wet Year Average (1957, 1983, 1984, 1986, 1995)

Exist. Conditions	1.69	1.70	1.78	2.36	2.78	3.69	3.46	2.96	2.39	2.09	1.89	1.73
Alt 1	1.69	1.70	1.78	2.36	2.78	3.69	3.46	2.96	2.39	2.09	1.89	1.73
Alt 2	1.69	1.70	1.78	2.36	2.80	3.70	3.48	2.96	2.39	2.09	1.89	1.73
Alt 5	1.69	1.70	1.78	2.36	2.78	3.69	3.46	2.96	2.39	2.09	1.89	1.73
Change in stage from existing conditions												
Alt 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alt 2	0.00	0.00	0.00	0.00	0.02	0.01	0.02	0.00	0.00	0.00	0.00	0.00
Alt 5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Percent change in stage from existing conditions												
Alt 1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Alt 2	0.0%	0.0%	0.0%	0.0%	0.7%	0.3%	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%
Alt 5	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

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Table J-2. Colorado River Stage below Windy Gap Reservoir at USGS gage (feet), Cumulative Effects.

Average Year (1950-1996)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Exist. Conditions	0.55	0.56	0.59	0.68	0.90	1.81	1.19	0.71	0.58	0.57	0.57	0.55
Alt 1	0.54	0.55	0.58	0.67	0.85	1.62	1.01	0.66	0.57	0.57	0.57	0.55
Alt 2	0.54	0.55	0.58	0.67	0.80	1.48	1.02	0.66	0.56	0.57	0.57	0.55
Alt 5	0.54	0.55	0.58	0.67	0.80	1.51	0.98	0.65	0.57	0.57	0.57	0.55
Change in stage from existing conditions												
Alt 1	-0.01	-0.01	0.00	0.00	-0.06	-0.19	-0.18	-0.05	-0.01	0.00	-0.01	-0.01
Alt 2	-0.01	-0.01	0.00	0.00	-0.10	-0.33	-0.17	-0.05	-0.02	0.00	-0.01	-0.01
Alt 5	-0.01	-0.01	0.00	0.00	-0.10	-0.29	-0.21	-0.06	-0.01	0.00	-0.01	-0.01
Percent change in stage from existing conditions												
Alt 1	-1.2%	-1.0%	-0.7%	-0.1%	-6.1%	-10.3%	-15.0%	-7.3%	-2.0%	-0.5%	-1.0%	-1.3%
Alt 2	-1.2%	-1.0%	-0.7%	-0.3%	-11.3%	-18.2%	-14.2%	-7.5%	-3.1%	-0.7%	-0.9%	-1.3%
Alt 5	-1.2%	-1.0%	-0.7%	-0.3%	-11.5%	-16.3%	-17.5%	-8.3%	-2.4%	-0.8%	-1.0%	-1.3%
Dry Year Average (1954, 1966, 1977, 1981, 1989)												
Exist. Conditions	0.54	0.55	0.59	0.65	0.67	0.68	0.65	0.60	0.55	0.55	0.57	0.55
Alt 1	0.53	0.54	0.59	0.65	0.69	0.71	0.65	0.58	0.54	0.55	0.56	0.54
Alt 2	0.53	0.54	0.59	0.65	0.69	0.71	0.65	0.58	0.54	0.55	0.56	0.54
Alt 5	0.53	0.54	0.59	0.65	0.69	0.71	0.65	0.58	0.54	0.55	0.56	0.54
Change in stage from existing conditions												
Alt 1	-0.01	-0.01	0.00	0.00	0.02	0.03	0.00	-0.02	-0.01	0.00	0.00	-0.01
Alt 2	-0.01	-0.01	0.00	0.00	0.02	0.03	-0.01	-0.02	-0.01	0.00	0.00	-0.01
Alt 5	-0.01	-0.01	0.00	0.00	0.02	0.03	-0.01	-0.02	-0.01	0.00	0.00	-0.01
Percent change in stage from existing conditions												
Alt 1	-1.5%	-1.1%	-0.6%	-0.1%	3.2%	4.1%	-0.7%	-3.1%	-1.9%	-0.7%	-0.8%	-1.4%
Alt 2	-1.5%	-1.1%	-0.6%	-0.1%	3.2%	4.0%	-0.9%	-3.1%	-1.9%	-0.7%	-0.8%	-1.4%
Alt 5	-1.5%	-1.1%	-0.6%	-0.1%	3.2%	4.0%	-0.9%	-3.1%	-1.9%	-0.7%	-0.8%	-1.4%
Wet Year Average (1957, 1983, 1984, 1986, 1995)												
Exist. Conditions	0.56	0.57	0.58	0.69	1.58	3.20	2.59	1.19	0.66	0.58	0.59	0.57
Alt 1	0.56	0.56	0.58	0.68	1.50	2.98	2.10	0.93	0.66	0.58	0.58	0.56
Alt 2	0.56	0.56	0.58	0.68	1.34	2.93	2.05	0.96	0.66	0.58	0.58	0.56
Alt 5	0.56	0.56	0.58	0.68	1.34	2.92	2.03	0.96	0.65	0.58	0.58	0.56
Change in stage from existing conditions												
Alt 1	-0.01	-0.01	-0.01	-0.01	-0.08	-0.22	-0.49	-0.26	-0.01	0.00	-0.01	-0.01
Alt 2	-0.01	-0.01	-0.01	-0.01	-0.24	-0.27	-0.54	-0.23	-0.01	0.00	0.00	-0.01
Alt 5	-0.01	-0.01	-0.01	-0.01	-0.24	-0.28	-0.56	-0.24	-0.02	0.00	0.00	-0.01
Percent change in stage from existing conditions												
Alt 1	-1.3%	-1.3%	-1.2%	-0.9%	-5.2%	-7.0%	-19.0%	-21.7%	-1.1%	0.2%	-1.2%	-1.3%
Alt 2	-1.3%	-1.3%	-1.2%	-1.7%	-15.2%	-8.6%	-20.7%	-19.5%	-0.9%	0.2%	-0.2%	-1.3%
Alt 5	-1.3%	-1.3%	-1.2%	-1.6%	-15.1%	-8.8%	-21.6%	-19.9%	-2.3%	0.2%	-0.7%	-1.3%

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Table J-3. Colorado River Stage near Kremmling at USGS gage (feet), Cumulative Effects.

Average Year (1950-1996)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Exist. Conditions	4.18	4.25	4.36	4.68	6.01	8.67	7.22	5.66	5.32	5.11	4.43	4.26
Alt 1	4.17	4.25	4.36	4.62	5.58	7.82	6.30	5.45	5.20	5.06	4.38	4.21
Alt 2	4.17	4.25	4.36	4.61	5.51	7.63	6.32	5.45	5.19	5.06	4.38	4.21
Alt 5	4.17	4.25	4.36	4.61	5.51	7.67	6.26	5.44	5.20	5.05	4.38	4.21
Change in stage from existing conditions												
Alt 1	-0.01	-0.01	0.00	-0.07	-0.43	-0.85	-0.92	-0.21	-0.12	-0.05	-0.06	-0.05
Alt 2	-0.01	-0.01	0.00	-0.07	-0.50	-1.04	-0.91	-0.21	-0.13	-0.05	-0.06	-0.05
Alt 5	-0.01	-0.01	0.00	-0.07	-0.51	-1.00	-0.96	-0.22	-0.12	-0.06	-0.06	-0.05
Percent change in stage from existing conditions												
Alt 1	-0.3%	-0.1%	0.1%	-1.5%	-7.1%	-9.8%	-12.7%	-3.7%	-2.2%	-1.0%	-1.3%	-1.3%
Alt 2	-0.3%	-0.1%	0.1%	-1.5%	-8.4%	-12.0%	-12.6%	-3.7%	-2.4%	-1.1%	-1.3%	-1.3%
Alt 5	-0.3%	-0.1%	0.1%	-1.5%	-8.4%	-11.5%	-13.3%	-3.9%	-2.3%	-1.1%	-1.3%	-1.3%

Dry Year Average (1954, 1966, 1977, 1981, 1989)

	4.06	4.14	4.36	4.49	4.01	4.17	5.31	5.39	5.19	4.70	4.33	4.17
Exist. Conditions	4.06	4.14	4.36	4.49	4.01	4.17	5.31	5.39	5.19	4.70	4.33	4.17
Alt 1	4.11	4.21	4.43	4.41	3.90	3.82	4.87	5.30	5.09	4.68	4.32	4.18
Alt 2	4.11	4.21	4.43	4.41	3.90	3.80	4.87	5.30	5.09	4.68	4.31	4.18
Alt 5	4.11	4.21	4.43	4.41	3.90	3.80	4.87	5.30	5.09	4.68	4.31	4.18
Change in stage from existing conditions												
Alt 1	0.05	0.06	0.07	-0.08	-0.11	-0.35	-0.45	-0.09	-0.10	-0.01	-0.01	0.01
Alt 2	0.05	0.06	0.07	-0.08	-0.11	-0.37	-0.45	-0.09	-0.10	-0.01	-0.01	0.00
Alt 5	0.05	0.06	0.07	-0.08	-0.11	-0.37	-0.45	-0.09	-0.10	-0.01	-0.01	0.00
Percent change in stage from existing conditions												
Alt 1	1.2%	1.5%	1.6%	-1.8%	-2.8%	-8.5%	-8.4%	-1.7%	-1.9%	-0.3%	-0.3%	0.1%
Alt 2	1.2%	1.5%	1.6%	-1.8%	-2.8%	-8.8%	-8.4%	-1.7%	-1.9%	-0.3%	-0.3%	0.1%
Alt 5	1.2%	1.5%	1.6%	-1.8%	-2.8%	-8.8%	-8.4%	-1.7%	-1.9%	-0.3%	-0.3%	0.1%

Wet Year Average (1957, 1983, 1984, 1986, 1995)

	4.41	4.55	4.59	5.03	8.26	12.17	11.20	7.25	5.46	5.04	4.57	4.48
Exist. Conditions	4.41	4.55	4.59	5.03	8.26	12.17	11.20	7.25	5.46	5.04	4.57	4.48
Alt 1	4.39	4.54	4.58	4.84	7.85	11.40	10.42	6.69	5.39	4.93	4.51	4.43
Alt 2	4.39	4.54	4.58	4.83	7.64	11.34	10.37	6.73	5.39	4.93	4.52	4.43
Alt 5	4.39	4.54	4.58	4.83	7.65	11.34	10.35	6.72	5.38	4.93	4.52	4.43
Change in stage from existing conditions												
Alt 1	-0.02	-0.01	-0.01	-0.19	-0.40	-0.76	-0.79	-0.55	-0.07	-0.11	-0.06	-0.05
Alt 2	-0.02	-0.01	-0.01	-0.19	-0.62	-0.82	-0.83	-0.52	-0.07	-0.11	-0.05	-0.05
Alt 5	-0.02	-0.01	-0.01	-0.19	-0.61	-0.83	-0.86	-0.53	-0.08	-0.11	-0.06	-0.05
Percent change in stage from existing conditions												
Alt 1	-0.5%	-0.2%	-0.2%	-3.7%	-4.9%	-6.3%	-7.0%	-7.6%	-1.4%	-2.3%	-1.3%	-1.2%
Alt 2	-0.5%	-0.2%	-0.2%	-3.9%	-7.5%	-6.7%	-7.4%	-7.2%	-1.4%	-2.3%	-1.1%	-1.2%
Alt 5	-0.5%	-0.2%	-0.2%	-3.9%	-7.4%	-6.8%	-7.6%	-7.3%	-1.5%	-2.3%	-1.2%	-1.2%

Appendix K:
Cumulative Effects—Hydrology Model Output—
Lake and Reservoir Changes

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Table K-1. Carter Lake Storage Content (AF), Cumulative Effects.

Average Year (1950-1996)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Exist. Conditions	79799	88414	96909	102489	104132	102811	91807	72239	58704	56419	60765	69731
Alt 1	79850	88496	96993	102429	103455	101615	90663	71278	58034	56071	60643	69736
Alt 2	79845	88138	96180	101393	102916	101764	91244	72104	58714	56022	60478	69914
Alt 5	80262	88658	96675	102094	103592	101853	90886	71701	58466	56170	60754	70125
Volume change from existing conditions												
Alt 1	51	82	84	-60	-677	-1196	-1144	-961	-670	-348	-122	4
Alt 2	46	-276	-729	-1096	-1216	-1047	-563	-135	9	-397	-287	182
Alt 5	463	244	-234	-395	-541	-958	-921	-538	-239	-249	-11	393
Percent change in volume from existing conditions												
Alt 1	0%	0%	0%	0%	-1%	-1%	-1%	-1%	-1%	-1%	0%	0%
Alt 2	0%	0%	-1%	-1%	-1%	-1%	-1%	0%	0%	-1%	0%	0%
Alt 5	1%	0%	0%	0%	-1%	-1%	-1%	-1%	0%	0%	0%	1%

Dry Year Average (1954, 1966, 1977, 1981, 1989)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Exist. Conditions	79931	88647	97205	104144	105531	100778	86821	67320	56214	56315	60530	69616
Alt 1	79965	88650	97211	104126	105295	100502	86815	67540	56577	56059	60484	69638
Alt 2	80537	89046	97558	104429	105646	100936	87257	67851	56672	55658	60231	70326
Alt 5	79892	88262	96356	103508	105014	100308	86531	67106	56299	55572	59961	69612
Volume change from existing conditions												
Alt 1	33	3	6	-18	-236	-276	-6	220	362	-256	-46	22
Alt 2	605	399	353	285	115	158	436	531	458	-657	-299	709
Alt 5	-39	-385	-850	-636	-516	-471	-290	-214	84	-743	-569	-4
Percent change in volume from existing conditions												
Alt 1	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%
Alt 2	1%	0%	0%	0%	0%	0%	1%	1%	1%	-1%	0%	1%
Alt 5	0%	0%	-1%	-1%	0%	0%	0%	0%	0%	-1%	-1%	0%

Wet Year Average (1957, 1983, 1984, 1986, 1995)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Exist. Conditions	79608	88093	96588	101685	103760	107865	104952	87135	68882	57867	62712	70223
Alt 1	79536	88081	96861	101927	103282	106662	103276	85237	66641	57144	62012	69965
Alt 2	80509	88659	95733	99134	101178	105880	102943	85058	66778	57699	62941	71052
Alt 5	80377	88813	96804	101516	103692	107232	103566	85567	67125	57682	62943	70889
Volume change from existing conditions												
Alt 1	-72	-13	273	243	-478	-1203	-1675	-1898	-2242	-723	-700	-258
Alt 2	901	566	-855	-2551	-2583	-1984	-2009	-2077	-2104	-168	229	830
Alt 5	769	720	215	-169	-69	-633	-1385	-1568	-1757	-185	230	666
Percent change in volume from existing conditions												
Alt 1	0%	0%	0%	0%	0%	-1%	-2%	-2%	-3%	-1%	-1%	0%
Alt 2	1%	1%	-1%	-3%	-2%	-2%	-2%	-2%	-3%	0%	0%	1%
Alt 5	1%	1%	0%	0%	0%	-1%	-1%	-2%	-3%	0%	0%	1%

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Table K-2. Carter Lake Elevations (feet), Cumulative Effects.

Average Year (1950-1996)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Exist. Conditions	5729	5738	5746	5751	5753	5751	5741	5721	5707	5705	5709	5718
Alt 1	5729	5738	5746	5751	5752	5750	5740	5720	5706	5704	5709	5718
Alt 2	5729	5737	5745	5750	5752	5750	5740	5721	5707	5704	5709	5719
Alt 5	5729	5738	5746	5751	5752	5751	5740	5720	5707	5704	5709	5719
Elevation change from existing conditions												
Alt 1	0	0	0	0	-1	-1	-1	-1	-1	0	0	0
Alt 2	0	0	-1	-1	-1	-1	-1	0	0	0	0	0
Alt 5	0	0	0	0	0	-1	-1	-1	0	0	0	0

Dry Year Average (1954, 1966, 1977, 1981, 1989)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Exist. Conditions	5729	5738	5746	5753	5754	5750	5736	5716	5704	5704	5709	5718
Alt 1	5729	5738	5746	5753	5754	5749	5736	5716	5705	5704	5709	5718
Alt 2	5730	5738	5747	5753	5754	5750	5736	5717	5705	5704	5709	5719
Alt 5	5729	5737	5745	5752	5753	5749	5736	5716	5704	5704	5708	5718
Elevation change from existing conditions												
Alt 1	0	0	0	0	0	0	0	0	0	0	0	0
Alt 2	1	0	0	0	0	0	0	1	0	-1	0	1
Alt 5	0	0	-1	-1	0	0	0	0	0	-1	-1	0

Wet Year Average (1957, 1983, 1984, 1986, 1995)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Exist. Conditions	5729	5737	5746	5750	5752	5756	5753	5736	5718	5706	5711	5719
Alt 1	5729	5737	5746	5751	5752	5755	5752	5734	5715	5705	5710	5719
Alt 2	5730	5738	5745	5748	5750	5754	5751	5734	5715	5706	5711	5720
Alt 5	5729	5738	5746	5750	5752	5755	5752	5735	5716	5706	5711	5720
Elevation change from existing conditions												
Alt 1	0	0	0	0	0	-1	-1	-2	-2	-1	-1	0
Alt 2	1	1	-1	-2	-2	-2	-2	-2	-2	0	0	1
Alt 5	1	1	0	0	0	-1	-1	-2	-2	0	0	1

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Table K-3. Carter Lake Surface Area (acres), Cumulative Effects.

Average Year (1950-1996)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Exist. Conditions	1016	1056	1092	1114	1119	1115	1070	980	913	901	924	968
Alt 1	1016	1056	1093	1113	1117	1110	1065	975	910	899	923	968
Alt 2	1016	1054	1089	1110	1115	1111	1068	979	913	899	922	969
Alt 5	1018	1057	1091	1112	1117	1111	1066	977	912	900	924	970
Surface area change from existing conditions												
Alt 1	0	0	0	0	-2	-4	-5	-5	-3	-2	-1	0
Alt 2	0	-1	-3	-4	-4	-4	-2	-1	0	-2	-1	1
Alt 5	2	1	-1	-1	-2	-3	-4	-3	-1	-1	0	2
Percent change in surface area from existing conditions												
Alt 1	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Alt 2	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Alt 5	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Dry Year Average (1954, 1966, 1977, 1981, 1989)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Exist. Conditions	1017	1057	1093	1119	1124	1107	1048	956	900	901	922	967
Alt 1	1017	1057	1093	1119	1123	1106	1048	957	902	899	922	967
Alt 2	1019	1059	1095	1120	1124	1108	1050	959	902	897	921	971
Alt 5	1016	1055	1090	1117	1122	1105	1047	955	900	897	920	967
Surface area change from existing conditions												
Alt 1	0	0	0	0	-1	-1	0	1	2	-1	0	0
Alt 2	3	2	1	1	0	1	2	3	2	-4	-2	3
Alt 5	0	-2	-3	-2	-2	-2	-1	-1	0	-4	-3	0
Percent change in surface area from existing conditions												
Alt 1	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Alt 2	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Alt 5	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Wet Year Average (1957, 1983, 1984, 1986, 1995)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Exist. Conditions	1015	1054	1091	1111	1118	1130	1121	1049	964	909	934	970
Alt 1	1015	1054	1092	1112	1116	1127	1116	1041	953	905	930	969
Alt 2	1019	1057	1087	1101	1109	1125	1115	1040	954	908	935	974
Alt 5	1019	1057	1092	1110	1118	1129	1117	1042	955	908	935	974
Surface area change from existing conditions												
Alt 1	0	0	1	1	-2	-3	-6	-9	-11	-4	-4	-1
Alt 2	4	3	-3	-10	-9	-6	-7	-9	-10	-1	1	4
Alt 5	4	3	1	-1	0	-2	-5	-7	-9	-1	1	3
Percent change in surface area from existing conditions												
Alt 1	0%	0%	0%	0%	0%	0%	0%	-1%	-1%	0%	0%	0%
Alt 2	0%	0%	0%	-1%	-1%	-1%	-1%	-1%	-1%	0%	0%	0%
Alt 5	0%	0%	0%	0%	0%	0%	0%	-1%	-1%	0%	0%	0%

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Table K-4. Horsetooth Reservoir Storage Content (AF), Cumulative Effects.

Average Year (1950-1996)

Exist. Conditions	95275	107063	119226	124883	128797	136336	131433	112084	96326	87209	83572	87201
Alt 1	95239	107027	119132	124790	128655	135930	130856	111529	95838	86836	83315	87050
Alt 2	93118	104715	113475	115726	119551	127410	123159	106180	92528	84167	80284	84080
Alt 5	95138	107146	117433	121267	125632	133494	128853	110548	95607	86728	83174	86836

Volume change from existing conditions

Alt 1	-36	-36	-93	-93	-141	-405	-577	-555	-488	-373	-257	-151
Alt 2	-2157	-2348	-5750	-9157	-9246	-8926	-8274	-5904	-3797	-3042	-3288	-3122
Alt 5	-137	84	-1793	-3616	-3164	-2842	-2580	-1536	-719	-481	-399	-365

Percent change in volume from existing conditions

Alt 1	0%	0%	0%	0%	0%	0%	0%	0%	-1%	0%	0%	0%
Alt 2	-2%	-2%	-5%	-7%	-7%	-7%	-6%	-5%	-4%	-3%	-4%	-4%
Alt 5	0%	0%	-2%	-3%	-2%	-2%	-2%	-1%	-1%	-1%	0%	0%

Dry Year Average (1954, 1966, 1977, 1981, 1989)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Exist. Conditions	93978	106733	118625	121645	120491	119895	111307	94664	81539	85468	80166	84444
Alt 1	94219	107106	118979	121970	120785	120051	111204	94248	81257	85074	80042	84548
Alt 2	91677	105050	113710	113174	110678	109166	99990	86811	78421	82211	76061	80329
Alt 5	93418	106601	115973	116065	114206	113226	104604	90890	80981	84656	78876	83189

Volume change from existing conditions

Alt 1	240	373	354	325	294	156	-103	-415	-282	-394	-124	104
Alt 2	-2302	-1682	-4915	-8470	-9813	-10729	-11318	-7853	-3118	-3257	-4105	-4115
Alt 5	-561	-131	-2652	-5580	-6284	-6669	-6704	-3773	-558	-812	-1290	-1255

Percent change in volume from existing conditions

Alt 1	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Alt 2	-2%	-2%	-4%	-7%	-8%	-9%	-10%	-8%	-4%	-4%	-5%	-5%
Alt 5	-1%	0%	-2%	-5%	-5%	-6%	-6%	-4%	-1%	-1%	-2%	-1%

Wet Year Average (1957, 1983, 1984, 1986, 1995)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Exist. Conditions	98237	107911	119336	126038	133750	145665	144729	126990	109704	91118	90557	92445
Alt 1	97263	107270	118790	125641	133688	145681	144495	126665	109380	90106	89149	91174
Alt 2	97996	106813	113808	116109	124724	138978	138299	120521	103266	88288	88276	91133
Alt 5	98571	108430	118280	123301	131824	144427	143578	126105	108985	91464	91691	93141

Volume change from existing conditions

Alt 1	-974	-641	-546	-398	-62	16	-234	-325	-324	-1012	-1408	-1271
Alt 2	-241	-1098	-5528	-9930	-9026	-6686	-6430	-6469	-6439	-2830	-2281	-1311
Alt 5	335	519	-1056	-2737	-1926	-1238	-1151	-884	-720	346	1134	696

Percent change in volume from existing conditions

Alt 1	-1%	-1%	0%	0%	0%	0%	0%	0%	0%	-1%	-2%	-1%
Alt 2	0%	-1%	-5%	-8%	-7%	-5%	-4%	-5%	-6%	-3%	-3%	-1%
Alt 5	0%	0%	-1%	-2%	-1%	-1%	-1%	-1%	-1%	0%	1%	1%

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Table K-5. Horsetooth Reservoir Elevation (feet), Cumulative Effects.

Average Year (1950-1996)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Exist. Conditions	5395	5403	5410	5414	5416	5420	5418	5406	5396	5390	5388	5390
Alt 1	5395	5403	5410	5414	5416	5420	5417	5405	5395	5390	5388	5390
Alt 2	5394	5401	5407	5408	5410	5415	5413	5402	5393	5388	5386	5388
Alt 5	5395	5403	5409	5411	5414	5419	5416	5405	5395	5390	5388	5390

Elevation change from existing conditions

Alt 1	0	0	0	0	0	0	0	0	0	0	0	0
Alt 2	-1	-1	-4	-6	-6	-5	-5	-4	-2	-2	-2	-2
Alt 5	0	0	-1	-2	-2	-2	-2	-1	0	0	0	0

Dry Year Average (1954, 1966, 1977, 1981, 1989)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Exist. Conditions	5394	5402	5410	5412	5411	5411	5405	5395	5386	5389	5386	5388
Alt 1	5394	5403	5410	5412	5411	5411	5405	5394	5386	5389	5386	5388
Alt 2	5393	5401	5407	5406	5405	5404	5398	5390	5384	5387	5383	5386
Alt 5	5394	5402	5408	5408	5407	5406	5401	5392	5386	5388	5385	5388

Elevation change from existing conditions

Alt 1	0	0	0	0	0	0	0	0	0	0	0	0
Alt 2	-1	-1	-3	-5	-6	-7	-7	-5	-2	-2	-3	-3
Alt 5	0	0	-2	-3	-4	-4	-4	-2	0	-1	-1	-1

Wet Year Average (1957, 1983, 1984, 1986, 1995)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Exist. Conditions	5397	5403	5410	5414	5419	5425	5425	5415	5404	5393	5392	5393
Alt 1	5396	5403	5410	5414	5419	5425	5424	5415	5404	5392	5391	5393
Alt 2	5397	5402	5407	5408	5414	5422	5421	5411	5400	5391	5391	5393
Alt 5	5397	5403	5410	5413	5418	5424	5424	5414	5404	5393	5393	5394

Elevation change from existing conditions

Alt 1	-1	0	0	0	0	0	0	0	0	-1	-1	-1
Alt 2	0	-1	-3	-6	-5	-3	-3	-4	-4	-2	-1	-1
Alt 5	0	0	-1	-2	-1	-1	-1	-1	0	0	1	0

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Table K-6. Horsetooth Reservoir Surface Area (acres), Cumulative Effects.

Average Year (1950-1996)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Exist. Conditions	1570	1664	1759	1803	1834	1892	1854	1703	1579	1505	1475	1505
Alt 1	1570	1663	1758	1803	1833	1889	1850	1699	1575	1502	1473	1504
Alt 2	1553	1645	1714	1732	1762	1823	1790	1657	1548	1480	1447	1479
Alt 5	1569	1664	1745	1775	1809	1870	1834	1691	1573	1501	1472	1502
Surface area change from existing conditions												
Alt 1	0	0	-1	-1	-1	-3	-4	-4	-4	-3	-2	-1
Alt 2	-17	-18	-45	-72	-72	-69	-64	-46	-30	-25	-28	-26
Alt 5	-1	1	-14	-28	-25	-22	-20	-12	-6	-4	-3	-3
Percent change in surface area from existing conditions												
Alt 1	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Alt 2	-1%	-1%	-3%	-4%	-4%	-4%	-3%	-3%	-2%	-2%	-2%	-2%
Alt 5	0%	0%	-1%	-2%	-1%	-1%	-1%	-1%	0%	0%	0%	0%

Dry Year Average (1954, 1966, 1977, 1981, 1989)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Exist. Conditions	1560	1661	1754	1778	1769	1764	1697	1565	1458	1491	1446	1482
Alt 1	1562	1664	1757	1781	1771	1766	1696	1562	1455	1487	1445	1483
Alt 2	1541	1648	1716	1712	1692	1680	1608	1502	1431	1463	1410	1447
Alt 5	1555	1660	1734	1734	1720	1712	1644	1535	1453	1484	1435	1472
Surface area change from existing conditions												
Alt 1	2	3	3	3	2	1	-1	-3	-2	-3	-1	1
Alt 2	-19	-13	-39	-66	-77	-84	-89	-64	-27	-27	-36	-35
Alt 5	-5	-1	-21	-44	-49	-52	-53	-30	-5	-7	-11	-11
Percent change in surface area from existing conditions												
Alt 1	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Alt 2	-1%	-1%	-2%	-4%	-4%	-5%	-5%	-4%	-2%	-2%	-2%	-2%
Alt 5	0%	0%	-1%	-2%	-3%	-3%	-3%	-2%	0%	0%	-1%	-1%

Wet Year Average (1957, 1983, 1984, 1986, 1995)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Exist. Conditions	1594	1670	1760	1812	1872	1962	1955	1820	1684	1537	1532	1548
Alt 1	1586	1665	1756	1809	1872	1963	1954	1817	1682	1529	1521	1537
Alt 2	1592	1662	1717	1735	1802	1912	1907	1769	1634	1514	1514	1537
Alt 5	1597	1674	1752	1791	1857	1953	1947	1813	1679	1540	1542	1553
Surface area change from existing conditions												
Alt 1	-8	-5	-4	-3	0	0	-2	-3	-3	-8	-11	-10
Alt 2	-2	-9	-43	-78	-70	-50	-48	-51	-51	-23	-19	-11
Alt 5	3	4	-8	-21	-15	-9	-9	-7	-6	3	9	6
Percent change in surface area from existing conditions												
Alt 1	0%	0%	0%	0%	0%	0%	0%	0%	0%	-1%	-1%	-1%
Alt 2	0%	-1%	-2%	-4%	-4%	-3%	-2%	-3%	-3%	-1%	-1%	-1%
Alt 5	0%	0%	0%	-1%	-1%	0%	0%	0%	0%	0%	1%	0%

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Table K-7. Lake Granby Storage Content (AF), Cumulative Effects.

Average Year (1950-1996)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Exist. Conditions	392085	366820	341591	330560	359922	421577	460226	464045	455930	442984	431303	415026
Alt 1	369532	344074	318774	307661	336449	399422	440384	444559	435757	422022	409678	392869
Alt 2	337901	311558	288553	279607	308479	374778	419090	422055	410797	395561	382053	363359
Alt 5	365910	341590	319571	309330	331947	390597	431816	435833	427164	414580	403555	388074
Volume change from existing conditions												
Alt 1	-22553	-22746	-22817	-22899	-23473	-22155	-19842	-19486	-20173	-20963	-21625	-22158
Alt 2	-54184	-55262	-53038	-50954	-51443	-46798	-41136	-41989	-45133	-47423	-49250	-51668
Alt 5	-26175	-25230	-22020	-21231	-27975	-30979	-28410	-28212	-28767	-28404	-27748	-26952
Percent change in volume from existing conditions												
Alt 1	-6%	-6%	-7%	-7%	-7%	-5%	-4%	-4%	-4%	-5%	-5%	-5%
Alt 2	-14%	-15%	-16%	-15%	-14%	-11%	-9%	-9%	-10%	-11%	-11%	-12%
Alt 5	-7%	-7%	-6%	-6%	-8%	-7%	-6%	-6%	-6%	-6%	-6%	-6%

Dry Year Average (1954, 1966, 1977, 1981, 1989)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Exist. Conditions	425474	397704	371255	358008	363122	377224	373173	352229	329995	464189	471203	451956
Alt 1	407502	379266	352483	339074	343462	355807	350637	329846	307538	445739	454329	434453
Alt 2	384991	354898	329786	318214	322635	335039	329561	303917	275273	424161	436300	414711
Alt 5	403466	376255	353431	342857	346720	358761	353819	330394	305290	438368	448320	429706
Volume change from existing conditions												
Alt 1	-17972	-18437	-18772	-18934	-19659	-21418	-22536	-22383	-22457	-18450	-16874	-17503
Alt 2	-40483	-42806	-41470	-39795	-40486	-42185	-43612	-48312	-54722	-40029	-34904	-37244
Alt 5	-22008	-21449	-17824	-15152	-16401	-18464	-19354	-21834	-24705	-25821	-22883	-22249
Percent change in volume from existing conditions												
Alt 1	-4%	-5%	-5%	-5%	-5%	-6%	-6%	-6%	-7%	-4%	-4%	-4%
Alt 2	-10%	-11%	-11%	-11%	-11%	-11%	-12%	-14%	-17%	-9%	-7%	-8%
Alt 5	-5%	-5%	-5%	-4%	-5%	-5%	-5%	-6%	-7%	-6%	-5%	-5%

Wet Year Average (1957, 1983, 1984, 1986, 1995)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Exist. Conditions	388275	365149	341064	328406	359729	446172	518555	537833	537752	435839	419616	407788
Alt 1	356364	332501	308089	295489	325553	414287	501253	532708	533985	410706	389630	376799
Alt 2	323080	299878	280567	272912	305822	397494	487921	523387	525309	383298	359880	345048
Alt 5	351825	329958	309374	298538	322351	404210	490651	524098	525826	401386	380104	369669
Volume change from existing conditions												
Alt 1	-31910	-32648	-32975	-32918	-34176	-31884	-17301	-5124	-3767	-25133	-29986	-30989
Alt 2	-65195	-65271	-60497	-55494	-53907	-48678	-30633	-14445	-12444	-52541	-59737	-62740
Alt 5	-36450	-35191	-31690	-29868	-37378	-41961	-27904	-13735	-11927	-34453	-39512	-38120
Percent change in volume from existing conditions												
Alt 1	-8%	-9%	-10%	-10%	-10%	-7%	-3%	-1%	-1%	-6%	-7%	-8%
Alt 2	-17%	-18%	-18%	-17%	-15%	-11%	-6%	-3%	-2%	-12%	-14%	-15%
Alt 5	-9%	-10%	-9%	-9%	-10%	-9%	-5%	-3%	-2%	-8%	-9%	-9%

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Table K-8. Lake Granby Elevations (feet), Cumulative Effects.

Average Year (1950-1996)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Exist. Conditions	8258	8254	8250	8248	8253	8263	8268	8269	8268	8266	8264	8262
Alt 1	8254	8250	8246	8244	8249	8259	8265	8266	8265	8263	8261	8258
Alt 2	8249	8245	8241	8239	8244	8255	8262	8263	8261	8259	8256	8253
Alt 5	8254	8250	8246	8244	8248	8258	8264	8265	8263	8262	8260	8257
Elevation change from existing conditions												
Alt 1	-4	-4	-4	-4	-4	-3	-3	-3	-3	-3	-3	-3
Alt 2	-9	-9	-9	-9	-9	-7	-6	-6	-7	-7	-8	-8
Alt 5	-4	-4	-4	-4	-5	-5	-4	-4	-4	-4	-4	-4

Dry Year Average (1954, 1966, 1977, 1981, 1989)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Exist. Conditions	8263	8259	8255	8253	8253	8256	8255	8252	8248	8269	8270	8267
Alt 1	8260	8256	8252	8249	8250	8252	8251	8248	8244	8266	8267	8265
Alt 2	8257	8252	8248	8246	8247	8249	8248	8243	8238	8263	8265	8262
Alt 5	8260	8256	8252	8250	8251	8253	8252	8248	8244	8265	8267	8264
Elevation change from existing conditions												
Alt 1	-3	-3	-3	-3	-3	-3	-4	-4	-4	-3	-3	-3
Alt 2	-6	-7	-7	-7	-7	-7	-7	-8	-10	-6	-5	-6
Alt 5	-3	-3	-3	-2	-3	-3	-3	-4	-4	-4	-3	-3

Wet Year Average (1957, 1983, 1984, 1986, 1995)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Exist. Conditions	8257	8254	8250	8248	8253	8266	8277	8280	8280	8265	8262	8260
Alt 1	8252	8248	8244	8242	8247	8261	8275	8279	8280	8261	8258	8256
Alt 2	8247	8243	8239	8238	8244	8259	8273	8278	8278	8257	8253	8250
Alt 5	8252	8248	8244	8242	8247	8260	8273	8278	8278	8259	8256	8255
Elevation change from existing conditions												
Alt 1	-5	-5	-6	-6	-6	-5	-3	-1	-1	-4	-5	-5
Alt 2	-11	-11	-11	-10	-9	-7	-5	-2	-2	-8	-9	-10
Alt 5	-6	-6	-5	-5	-6	-6	-4	-2	-2	-5	-6	-6

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Table K-9. Lake Granby Surface Area (acres), Cumulative Effects.

Average Year (1950-1996)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Exist. Conditions	6221	6026	5824	5732	5970	6440	6722	6750	6691	6597	6512	6392
Alt 1	6048	5844	5631	5535	5779	6275	6578	6609	6544	6444	6353	6227
Alt 2	5793	5568	5360	5277	5539	6086	6422	6444	6361	6247	6145	5999
Alt 5	6019	5824	5638	5549	5742	6208	6516	6545	6482	6389	6307	6191
Surface area change from existing conditions												
Alt 1	-173	-182	-192	-198	-191	-165	-144	-141	-147	-153	-159	-165
Alt 2	-428	-458	-463	-456	-431	-354	-300	-306	-330	-350	-367	-393
Alt 5	-202	-203	-185	-183	-228	-232	-207	-205	-209	-208	-205	-202
Percent change in surface area from existing conditions												
Alt 1	-3%	-3%	-3%	-3%	-3%	-3%	-2%	-2%	-2%	-2%	-2%	-3%
Alt 2	-7%	-8%	-8%	-8%	-7%	-5%	-4%	-5%	-5%	-5%	-6%	-6%
Alt 5	-3%	-3%	-3%	-3%	-4%	-4%	-3%	-3%	-3%	-3%	-3%	-3%

Dry Year Average (1954, 1966, 1977, 1981, 1989)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Exist. Conditions	6469	6263	6061	5957	5998	6108	6076	5910	5727	6751	6802	6662
Alt 1	6337	6123	5912	5803	5839	5939	5898	5726	5533	6617	6679	6535
Alt 2	6167	5932	5726	5627	5665	5770	5724	5500	5234	6459	6548	6390
Alt 5	6306	6100	5920	5835	5866	5963	5923	5731	5513	6563	6636	6500
Surface area change from existing conditions												
Alt 1	-133	-140	-149	-154	-158	-168	-178	-184	-194	-134	-122	-127
Alt 2	-302	-332	-336	-330	-333	-338	-352	-410	-493	-292	-254	-272
Alt 5	-163	-163	-141	-122	-131	-145	-153	-180	-214	-188	-166	-162
Percent change in surface area from existing conditions												
Alt 1	-2%	-2%	-2%	-3%	-3%	-3%	-3%	-3%	-3%	-2%	-2%	-2%
Alt 2	-5%	-5%	-6%	-6%	-6%	-6%	-6%	-7%	-9%	-4%	-4%	-4%
Alt 5	-3%	-3%	-2%	-2%	-2%	-2%	-3%	-3%	-4%	-3%	-2%	-2%

Wet Year Average (1957, 1983, 1984, 1986, 1995)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Exist. Conditions	6192	6013	5819	5714	5968	6619	7151	7298	7297	6545	6426	6339
Alt 1	5944	5748	5538	5425	5687	6384	7023	7258	7268	6360	6203	6104
Alt 2	5668	5464	5285	5212	5514	6257	6925	7187	7202	6154	5972	5852
Alt 5	5907	5727	5549	5453	5661	6308	6945	7193	7206	6291	6130	6049
Surface area change from existing conditions												
Alt 1	-248	-265	-282	-289	-281	-236	-129	-39	-29	-185	-224	-235
Alt 2	-524	-549	-534	-502	-454	-362	-227	-110	-95	-391	-454	-487
Alt 5	-285	-286	-270	-262	-308	-311	-207	-105	-91	-254	-296	-290
Percent change in surface area from existing conditions												
Alt 1	-4%	-4%	-5%	-5%	-5%	-4%	-2%	-1%	0%	-3%	-3%	-4%
Alt 2	-8%	-9%	-9%	-9%	-8%	-5%	-3%	-2%	-1%	-6%	-7%	-8%
Alt 5	-5%	-5%	-5%	-5%	-5%	-5%	-3%	-1%	-1%	-4%	-5%	-5%