

# **EXHIBIT 3**

# Water Availability Analysis for Stampede Reservoir Application 31487

## Introduction

The U.S. Bureau of Reclamation (Reclamation) filed Application 31487 with the California State Water Resources Control Board (SWRCB) on January 8, 2004. This application supplements Permit 11605 and seeks, among other things, to increase the maximum annual diversion to storage from 126,000 acre-feet to 226,500 acre-feet in Stampede Reservoir. SWRCB (May 2007) requested a Water Availability Analysis in connection with the water right Application 31487. Accordingly, this WAA is prepared by the applicant for Stampede Reservoir.

## Background

The Truckee River originates at the outlet of Lake Tahoe at Tahoe City, California, and flows about 120 miles to its terminus in Pyramid Lake on the Pyramid Lake Indian Reservation. Most of the runoff in the Truckee River basin occurs in the Sierra Nevada in California. A portion of that runoff is stored in Lake Tahoe and Prosser Creek, Stampede, Boca, and Martis Creek Reservoirs<sup>1</sup>, and Donner and Independence Lakes (Figure 1). Operation of these reservoirs regulates much of the flow in the Truckee River basin in most years. These reservoirs together can store about a million acre-feet of water. A number of court decrees, agreements, and regulations govern day-to-day operations of these reservoirs, administered by the Federal Water Master for the *Orr Ditch* and *Alpine* courts. The reservoirs are operated to capture runoff as available when flow in the Truckee River is greater than that needed to serve downstream water rights recognized by the *Orr Ditch* decree and met by streamflows in the Truckee River, known as Floriston Rates, measured at the Farad gauge near the California-Nevada State line. Floriston Rates provide water to serve hydropower generation, M&I use in the Truckee Meadows, instream flows and agricultural water rights. Releases are made from the reservoirs as necessary to meet dam safety or flood control requirements. Releases are made from Lake Tahoe and Boca Reservoir when unregulated flow cannot meet Floriston Rates. Minimum reservoir releases are

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<sup>1</sup> Martis Creek Reservoir is used only for flood control purposes.



Figure 1 - Location Map

maintained as specified in applicable agreements and reservoir permits or licenses (Reclamation and CDWR, August 2004).

Water is stored in Prosser Creek, Stampede and Boca Reservoirs, Lake Tahoe and Donner and Independence Lakes under a system of priorities. The following schedule has historically been followed by the Federal Water Master's Office (Water Master, November 1998) and is summarized below.

1. Deliver pre-1870 irrigation rights (only if Floriston Rates are not met);
2. Divert up to 60 cfs to Sierra Valley (1870 priority) in accordance with the *Sierra Valley* decree;
3. Donner Lake and Independence Lake (first 3,000 acre-feet);
4. Provide Floriston Rate flows;
5. Lake Tahoe and Boca Reservoir (first 25,000 acre-feet);
6. Truckee River diversions to Newlands Project under Claim No. 3 of the *Orr Ditch* decree and OCAP;
7. Boca Reservoir;
8. Independence Lake;
9. Stampede Reservoir; and
10. Prosser Creek Reservoir.

Truckee River water is diverted at Derby Diversion Dam (located about 36 miles upstream of Pyramid Lake) via the Truckee Canal, according to Claim No. 3 of the *Orr Ditch* decree and Operating Criteria and Procedures (OCAP) for the Bureau of Reclamation's Newlands Irrigation Project. The Truckee Canal extends about 32 miles through the Truckee Division of the Newlands Project to Lahontan Reservoir, located in the Carson Division of the Project in the lower Carson River basin. Lahontan Reservoir also captures Carson River inflow (Reclamation, August 2004).

### **Truckee River Reservoirs**

Information on Truckee River reservoirs is summarized in Table 1, below (CDWR, June 1991).

**Table 1  
Truckee River Reservoirs <sup>1</sup>**

Reservoir Name	Dam Owner	Dam Operator	Usable Storage Capacity (Acre-Feet)	Dam Construction Date <sup>2</sup>	Dam Height (feet)	Drainage Area (Square Miles)
Lake Tahoe	U.S. Bureau of Reclamation	U.S. Bureau of Reclamation	744,600	1913	18	506
Donner Lake	Truckee Meadows Water Authority/Truckee-Carson Irrigation Dist.	Truckee Meadows Water Authority	9,500	1930's	14	14
Martis Creek	U.S. Army Corps of Engineers	U.S. Army Corps of Engineers	20400 <sup>3</sup>	1971	113	40
Prosser Creek	U.S. Bureau of Reclamation	U.S. Bureau of Reclamation	29,800	1962	163	50
Independence Lake	Truckee Meadows Water Authority	Truckee Meadows Water Authority	17,500	1939	31	8
Stampede Reservoir	U.S. Bureau of Reclamation	U.S. Bureau of Reclamation	226,500	1970	239	136
Boca Reservoir	U.S. Bureau of Reclamation	Washoe County Water Conservation Dist.	41,100	1937	116	172

<sup>1</sup> Based on Truckee River Atlas, 1991.

<sup>2</sup> Date existing dam was completed. With respect to Lake Tahoe and Donner and Independence Lakes, these dams replaced earlier constructions.

<sup>3</sup> Flood control storage only.

## **Floriston Rates**

The Truckee River is regulated to meet the Floriston Rates at Farad (State line). Floriston Rates are set forth in the *Truckee River General Electric* decree (1915) as modified by the Truckee River Agreement which is incorporated into the *Orr Ditch* decree.

Floriston Rates and Reduced Floriston Rates are shown in Figure 2. The *Truckee River General Electric* decree, *Orr-Ditch* decree which incorporated the Truckee River Agreement, and Tahoe-Prosser Exchange Agreement provide the current operational framework and rules for the operation of Lake Tahoe, Boca Reservoir and Prosser Creek Reservoir. These reservoirs may store water in accordance with their storage priorities when Floriston Rates are met from natural flow. Both Stampede and Prosser Creek Reservoirs are junior in priority to divert water in relation to other Truckee River reservoirs. Both Stampede and Prosser Creek Reservoirs are also junior in priority to divert in relation to the allowable diversions at Derby Dam under Claim No. 3 of the *Orr Ditch* decree and the OCAP.

## **Little Truckee River**

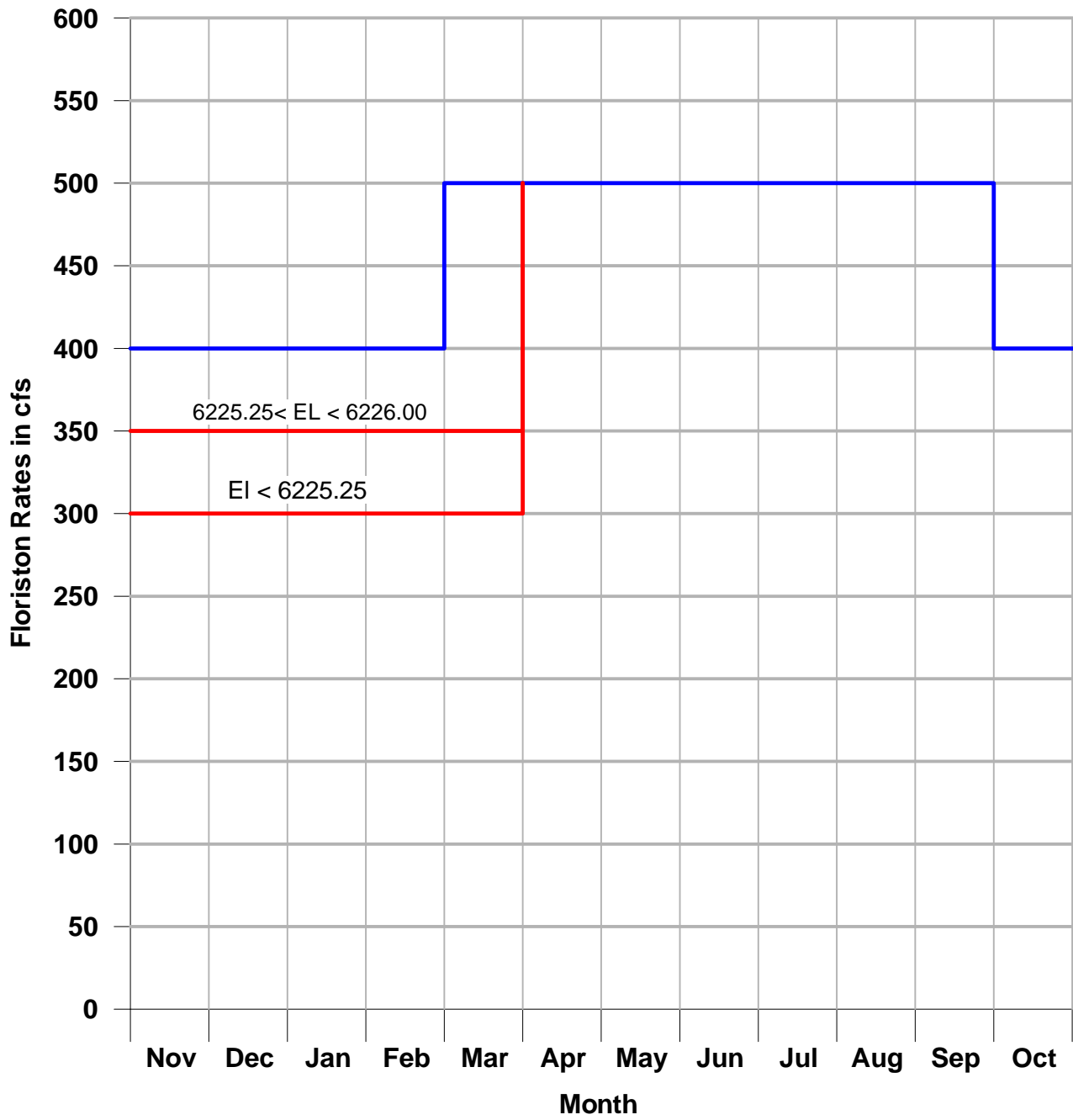
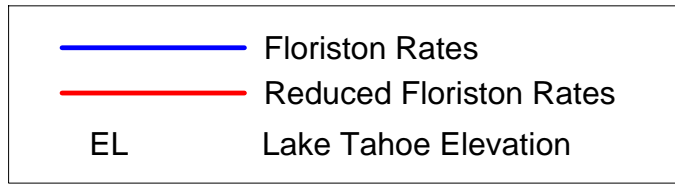
Stampede Dam and Reservoir are located on the Little Truckee River. The Little Truckee River is the largest tributary to the Truckee River. The Little Truckee River is regulated by a dam on Webber Lake (privately owned) and by Stampede and Boca Reservoirs. Independence Creek, a tributary to the Little Truckee River upstream of Stampede Reservoir, is regulated by a dam on Independence Lake, which is owned by Truckee Meadows Water Authority (TMWA). In summer months, water is diverted from the Little Truckee River upstream of its confluence with Independence Creek, through the Little Truckee Ditch to the Sierra Valley (Feather River basin).

## **Stampede Reservoir**

Stampede Reservoir was completed in 1970 (storage began in August 1969) by Reclamation as part of the Washoe Project. The zoned earthfill dam is 239 feet high and impounds up to 226,500 acre-feet of water, making Stampede the second largest reservoir on the Truckee River.

Figure 2

### Floriston Rates



The reservoir was authorized for irrigation, flood control, municipal, fish and wildlife, recreation and other beneficial purposes. The primary use to date has been to store water for threatened and endangered fishes of Pyramid Lake and flood control; incidental uses include recreation and hydroelectric power.

Stampede is the only reservoir in the Truckee River watershed that has a hydroelectric powerplant. A small hydro plant added to the dam's outlet works in 1988 can produce up to 3.65 megawatts, depending on reservoir releases. Power production is incidental to operation of the reservoir for other purposes (CDWR, June 1991).

Application 15673 was filed by Reclamation on January 7, 1954. Permit 11605 (Applications 15673) provides for 350 cfs of direct diversion from about April 1 to about November 1 of each year and for maximum diversion of 126,000 acre-feet to storage from January 1 to December 31 of each year. Application 15673 referred to a storage reservoir with a capacity of 126,000 acre-feet. Stampede Reservoir was constructed with a capacity of 226,500 acre-feet and storage began on August 1, 1969. Figure 3 shows the storage hydrograph of Stampede Reservoir for water years 1970 through 2006. Figure 3 shows that Stampede Reservoir filled to nearly its full capacity of 226,500 acre-feet in ten years over the 37 years of record.

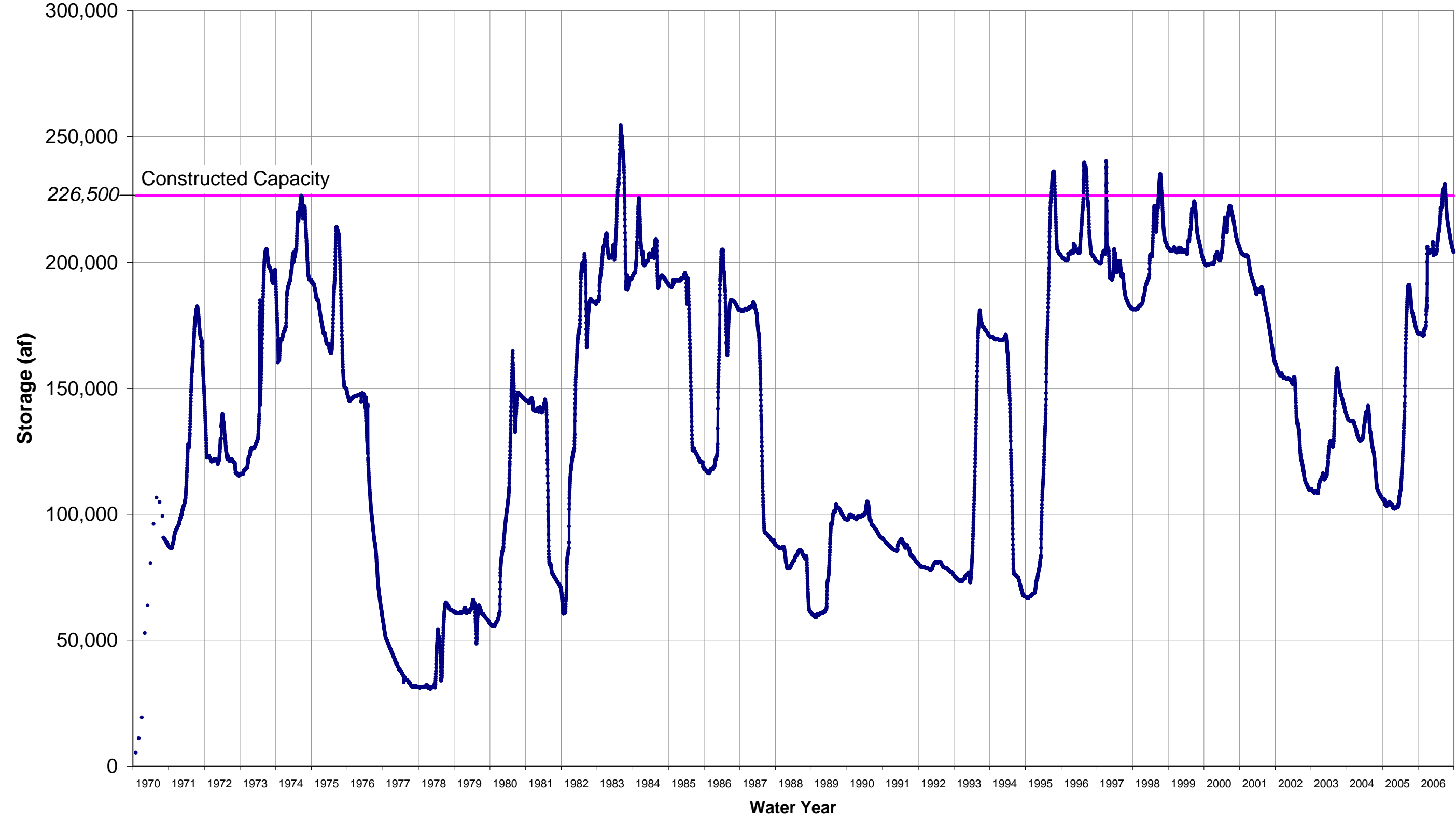
Reclamation filed Application 31487 on January 8, 2004 for the purpose of increasing the maximum diversion to storage from 126,000 acre-feet to 226,500 acre-feet in Stampede Reservoir annually. This application supplements permit 11605. The maximum annual quantity of water diverted to storage under Application 31487 and Permit 11605 is to be limited to 226,500 acre-feet per year (SWRCB, January 2007).



Figure 3

### Storage in Stampede Reservoir

Water Years 1970 - 2006  
USGS Gage (ID #10344300)



\* Storage began Aug. 1, 1969. Daily data available starting Aug. 8, 1970. Missing daily data linearly interpolated.

## **Unappropriated Water**

Section 210 (a) (2) (B) of the Settlement Act (PL 101-618) states:

Section 204 of this title, the Preliminary Settlement Agreement as modified by the Ratification Agreement, and the Operating Agreement, shall not take effect until the Pyramid Lake Tribe's claim to the remaining waters of the Truckee River which are not subject to vested or perfected rights has been finally resolved in a manner satisfactory to the State of Nevada and the Pyramid Lake Tribe.

In 1993, the Pyramid Tribe and Nevada signed a Memorandum of Understanding (MOU) to implement Section 210 (a) (2) (B) of the Settlement Act (MOU, July 1993). The Nevada State Engineer's 1998 unappropriated water decisions, Ruling 4659 and 4683, approved Pyramid Lake Paiute Tribe's Applications 48061 and 48494 (Nevada State Engineer, August and November 1998)<sup>3</sup>. Approval of Tribe's Applications 48061 and 48494 to appropriate the remaining waters of the Truckee River is consistent with the principle underlying Section 210 (a) (2) (B) of the Settlement Act and 1993 MOU. Appeals are pending from the Nevada State Engineer's decisions approving Tribe's applications for the appropriation of the remaining waters of the Truckee River and from the denial of Truckee-Carson Irrigation District's competing application.

## **OCAP – Newlands Project**

Truckee River water is diverted at Derby Diversion Dam via the Truckee Canal to the Newlands Project as provided in Claim No. 3 of the *Orr Ditch* decree and OCAP. The Truckee Canal extends about 32 miles through the Truckee Division of the Project to Lahontan Reservoir, located in the Carson Division of the Newlands Project in the lower Carson River basin. Lahontan Reservoir also captures Carson River inflow (Reclamation, August 2004). Water supply for the Truckee Division is solely provided from the Truckee River through the Truckee Canal. Water supply for the Carson Division is provided from the Carson and Truckee Rivers. Diversion of water from the Truckee River to Lahontan Reservoir and for the Carson Division of

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<sup>3</sup> Tribe gives its consent to store water from the little Truckee River in Stampede Reservoir that would otherwise flow to Pyramid Lake.

the Newlands Project is limited by the *Orr Ditch* decree and OCAP to what is needed to supplement the supply provided by the Carson River.

OCAP were first instituted in 1967 and reinstated annually through 1972. In 1973, the Federal District Court in Washington D.C. ordered implementation of more restrictive OCAP to maximize the use of Carson River water and to minimize the use of Truckee River water within the Newlands Project. OCAP were modified in 1988 and were adjusted most recently in 1997 in response to changes in irrigated acreage in the Newlands Project (Reclamation, December 1987 and August 2004).

### **Instream Flows – Lower Truckee River**

Water is released from Stampede Reservoir for maintaining instream flows for cui-ui and Lahontan cutthroat trout (LCT) in the lower Truckee River. Cui-ui and LCT are, respectively, listed as endangered and threatened under the Endangered Species Act of 1973, as amended. The goal of the U.S. Fish and Wildlife Service (FWS) and Pyramid Lake Paiute Tribe is to conserve cui-ui and LCT in the lower Truckee River. To this end Stampede Project water has been managed for the benefit of both species. Recently, FWS and the Pyramid Tribe expanded the cui-ui/LCT conservation management to restore the lower Truckee River ecosystem, which includes establishment and maintenance of willows and cottonwoods in the river reach. Currently, the project water stored in Stampede and Prosser Creek Reservoirs for the benefit of Pyramid Lake fishes is managed using flow regime criteria based on six hydrologic year types and the amount of project water stored in Stampede Reservoir on March 1. Table 2 shows the six flow regimes as inflow targets to Pyramid Lake (Reclamation, August 2004). For the purpose of this water availability analysis, Flow Regime No. 1 (highest target flow rates) is assumed as the target flow in the lower Truckee River.

**Table 2**  
**Pyramid Lake Inflow Targets (cfs) for Flow Regime Nos. 1-6**

Month	1	2	3	4	5	6
January	160	150	120	110	100	90
February	160	150	120	110	100	90
March	290	220	200	160	160	140
April	590	490	420	350	300	200
May	1,000	800	600	530	400	300
June	800	600	500	400	270	170
July	300	300	300	200	150	120
August	200	200	200	200	150	110
September	170	170	120	110	100	100
October	160	150	120	110	100	100
November	160	150	120	110	100	90
December	160	150	120	110	100	90

Source: Revised Draft Environmental Impact Statement/Environmental Impact Report  
Truckee River Operating Agreement, August 2004

### **Water Availability Analysis**

Water availability analysis for the diversion of water to storage in Stampede Reservoir is presented in the spreadsheet as shown in Table 3. The analysis is based on the historical operation of Stampede Reservoir from August 1969 through September 2006. The amount of available water is calculated for the periods with higher Truckee River flows. In addition, the available amounts of water are calculated for the periods when the storage of such water would not interfere with any downstream water rights and would be the water that would have otherwise flowed to Pyramid Lake. Storing this water will not interfere with any California water rights including any new water that may be appropriated in California because the Interstate Allocation specifies water for use in Nevada is junior. It will not interfere with Nevada water rights because it will only be stored in priority after all other Nevada water rights have been satisfied. The underpinnings of these conditions for the analysis are summarized below.

Table 3  
Estimates of Available Water for Storage in Stampede Reservoir

[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]
Month-Year	EOM Stampede Storage af	Stampede Change in Storage af	Little Truckee River above Boca (afm)	Adjusted Little Truckee River above Boca (afm)	EOM Boca Storage af	Boca Change in Storage af	Little Truckee River below Boca (afm)	Adjusted Little Truckee River below Boca (afm)	Truckee River at Farad (afm)	Floriston Rates (afm)	Flow at Farad in Excess of Floriston Rates (afm)	Truckee Canal at Wadsworth (afm)	Truckee River near Nixon (afm)	Pyramid Lake inflow targets under Flow Regime No. 1 (afm)	Inflow to Pyramid Lake above Flow Regime No. 1 (afm)	Stampede Stored Water Adverse to Floriston Rates?	Stampede Stored Water Within Flow Regime No. 1?	Available Water in addition to Stored Amount in Stampede (afm)	Available Water for Storage in Stampede Reservoir (afm)
	111,367				32,667														
Apr-71	127,333	15,967	15,475		33,667	1,000	19,458		61,222	29,752	31,470	23,901	45,800	35,107	10,693	no	no	10,693	26,660
May-71	157,639	30,306	23,318		37,400	3,733	20,771		114,641	30,744	83,897	45,304	75,884	61,488	14,396	no	no	14,396	44,702
Jun-71	177,867	20,227	25,942		40,800	3,400	21,717		137,157	29,752	107,405	30,432	103,775	47,603	56,172	no	no	21,717	41,944
Jul-71	180,167	2,300	12,676		39,667	-1,133	13,456	12,323	59,512	30,744	28,768	28,183	27,711	18,446	9,265	no	no	9,265	11,565
																		<b>TOTAL</b>	<b>124,871</b>
	126,667				29,433														
Mar-73	129,833	3,167	3,763		32,333	2,900	2,469		31,688	30,744	944	861	39,685	17,831	21,854	no	no	944	4,111
Apr-73	149,200	19,367	11,409		40,900	8,567	7,624		53,115	29,752	23,363	5,875	50,815	35,107	15,707	no	no	7,624	26,991
May-73	193,900	44,700	3,166		40,667	-233	3,655	3,422	79,565	30,744	48,821	12,720	60,924	61,488	-563	no	yes (563 af)	0	44,137
																		<b>TOTAL</b>	<b>75,239</b>
	162,633				32,733														
Nov-73	169,500	6,867	5,954		32,500	-233	6,512	6,278	40,693	23,802	16,891	31,595	19,513	9,521	9,993	no	no	5,954	12,821
Dec-73	172,793	3,293	4,532		32,200	-300	5,252	4,952	26,918	24,595	2,323	3,731	32,289	9,838	22,451	no	no	2,323	5,615
Jan-74	189,333	16,541	3,402		32,000	-200	6,946	6,746	62,846	24,595	38,251	835	79,702	9,838	69,864	no	no	3,402	19,942
Feb-74	193,267	3,933	2,146		31,500	-500	3,318	2,818	38,402	22,215	16,187	852	44,729	8,886	35,843	no	no	2,146	6,079
Mar-74	203,333	10,067	8,983		32,500	1,000	12,405		83,082	30,744	52,338	2,454	93,342	17,831	75,511	no	no	8,983	19,050
Apr-74	205,133	1,800	24,040		33,167	667	25,478		122,221	29,752	92,469	6,163	121,012	35,107	85,904	no	no	24,040	25,840
May-74	220,400	15,267	30,180		39,167	6,000	23,265		135,451	30,744	104,707	11,585	115,299	61,488	53,812	no	no	23,265	38,532
Jun-74	224,467	4,067	25,071		40,900	1,733	23,068		92,749	29,752	62,997	12,875	74,202	47,603	26,598	no	no	23,068	27,134
																		<b>TOTAL</b>	<b>155,014</b>
	166,600				37,033														
May-75	197,200	30,600	23,157		34,000	-3,033	32,272	29,239	172,324	30,744	141,580	10,278	158,335	61,488	96,847	no	no	23,157	53,757
Jun-75	212,233	15,033	28,905		41,000	7,000	21,792		120,603	29,752	90,851	12,797	109,922	47,603	62,319	no	no	21,792	36,826
																		<b>TOTAL</b>	<b>90,583</b>
	104,000				23,233														
Apr-80	133,300	29,300	4,917		22,933	-300	8,465	8,165	56,985	29,752	27,233	8,791	46,695	35,107	11,587	no	no	4,917	34,217
May-80	153,167	19,867	25,190		20,167	-2,767	28,931	26,164	125,117	30,744	94,374	11,808	103,835	61,488	42,347	no	no	25,190	45,057
																		<b>TOTAL</b>	<b>79,274</b>
	61,000				27,600														
Nov-81	82,233	21,233	4,249		30,433	2,833	3,223		58,038	17,851	40,187	28,122	37,551	9,521	28,030	no	no	3,223	24,456
Dec-81	114,267	32,033	3,501		32,500	2,067	5,042		79,571	24,595	54,976	34,181	62,640	9,838	52,802	no	no	3,501	35,534
Jan-82	124,367	10,100	2,142		31,667	-833	4,465	3,631	33,402	24,595	8,807	9,306	38,579	9,838	28,740	no	no	2,142	12,242
Feb-82	156,067	31,700	3,418		32,400	733	9,389		78,819	22,215	56,604	689	94,207	8,886	85,321	no	no	3,418	35,118
Mar-82	172,667	16,600	4,887		31,400	-1,000	10,899	9,899	54,938	30,744	24,194	341	68,545	17,831	50,713	no	no	4,887	21,487
Apr-82	198,867	26,200	17,306		32,100	700	23,958		141,116	29,752	111,364	7,813	147,586	35,107	112,479	no	no	17,306	43,506
May-82	200,800	1,933	57,122		32,700	600	56,295		264,476	30,744	233,732	13,648	248,985	61,488	187,498	no	no	56,295	58,228
Jun-82	176,667	-24,133	62,535	38,402	39,767	7,067	52,200		147,669	29,752	117,917	10,852	152,628	47,603	105,025	no	no	38,402	38,402
Jul-82	185,433	8,767	2,067		40,333	567	1,297		47,038	30,744	16,294	13,722	36,889	18,446	18,442	no	no	1,297	10,064
																		<b>TOTAL</b>	<b>279,037</b>
	202,500				24,300														
Mar-83	202,667	167	22,616		27,733	3,433	28,929		190,691	30,744	159,947	2,122	223,775	17,831	205,944	no	no	22,616	22,782
Apr-83	227,600	24,933	3,663		10,240	-17,493	29,992	12,499	185,891	29,752	156,139	4,683	201,124	35,107	166,017	no	no	3,663	28,597
May-83	254,400	26,800	63,003		30,800	20,560	47,213		242,936	30,744	212,192	9,866	249,997	61,488	188,509	no	no	47,213	74,013
Jun-83	239,867	-14,533	103,101	88,567	28,733	-2,067	106,393	104,327	310,235	29,752	280,483	10,366	321,183	47,603	273,580	no	no	88,567	88,567
Jul-83	192,667	-47,200	79,987	32,787	40,400	11,667	69,515		179,583	30,744	148,840	15,560	171,295	18,446	152,848	no	no	32,787	32,787
																		<b>TOTAL</b>	<b>246,747</b>
	194,567				35,200														
Oct-83	197,500	2,933	1,109		32,133	-3,067	4,206	1,139	27,128	24,595	2,533	4,014	26,041	9,838	16,203	no	no	1,109	4,042
Nov-83	223,533	26,033	1,406		16,233	-15,900	19,447	3,547	146,916	23,802	123,114	2,364	158,221	9,521	148,701	no	no	1,406	27,440

**Table 3  
Estimates of Available Water for Storage in Stampede Reservoir**

[1] Month-Year	[2] EOM Stampede Storage af	[3] Stampede Change in Storage af	[4] Little Truckee River above Boca (afm)	[5] Adjusted Little Truckee River above Boca (afm)	[6] EOM Boca Storage af	[7] Boca Change in Storage af	[8] Little Truckee River below Boca (afm)	[9] Adjusted Little Truckee River below Boca (afm)	[10] Truckee River at Farad (afm)	[11] Floriston Rates (afm)	[12] Flow at Farad in Excess of Floriston Rates (afm)	[13] Truckee Canal at Wadsworth (afm)	[14] Truckee River near Nixon (afm)	[15] Pyramid Lake inflow targets under Flow Regime No. 1 (afm)	[16] Inflow to Pyramid Lake above Flow Regime No. 1 (afm)	[17] Stampede Stored Water Adverse to Floriston Rates?	[18] Stampede Stored Water Within Flow Regime No. 1?	[19] Available Water in addition to Stored Amount in Stampede (afm)	[20] Available Water for Storage in Stampede Reservoir (afm)
Dec-83	205,300	-18,233	43,690	25,457	27,533	11,300	34,941		221,117	24,595	196,522	1,379	240,139	9,838	230,301	no	no	25,457	25,457
Jan-84	198,933	-6,367	21,489	15,122	25,000	-2,533	25,196	22,663	187,716	24,595	163,121	724	210,883	9,838	201,045	no	no	15,122	15,122
Feb-84	200,600	1,667	6,613		25,467	467	7,587		100,145	23,008	77,137	1,638	118,909	9,203	109,706	no	no	6,613	8,280
Mar-84	202,967	2,367	16,370		31,700	6,233	14,454		81,055	30,744	50,311	4,762	95,861	17,831	78,030	no	no	14,454	16,820
Apr-84	204,833	1,867	22,019		32,767	1,067	22,727		62,787	29,752	33,035	6,728	65,798	35,107	30,690	no	no	22,019	23,885
May-84	208,733	3,900	37,305		40,700	7,933	30,307		102,587	30,744	71,843	12,391	94,651	61,488	33,164	no	no	30,307	34,207
Jun-84	192,900	-15,833	39,342	23,509	40,467	-233	40,129	39,895	84,861	29,752	55,109	12,347	76,715	47,603	29,111	no	no	23,509	23,509
																		<b>TOTAL</b>	<b>178,762</b>
	122,367				23,400														
Feb-86	159,467	37,100	4,415		31,367	7,967	8,940		132,936	22,215	110,721	18,091	183,874	8,886	174,988	no	no	4,415	41,515
Mar-86	204,833	-45,367	12,292		30,367	-1,000	21,572	20,572	250,413	30,744	219,669	3,110	292,899	17,831	275,068	no	no	12,292	57,658
Apr-86	191,433	-13,400	54,930	41,530	31,367	1,000	58,013		151,993	29,752	122,241	7,444	172,602	35,107	137,494	no	no	41,530	41,530
May-86	167,067	-24,367	59,340	34,973	37,867	6,500	55,047		147,808	30,744	117,064	9,646	149,038	61,488	87,550	no	no	34,973	34,973
Jun-86	184,733	17,667	2,733		39,067	1,200	1,199		77,419	29,752	47,667	11,990	73,543	47,603	25,940	no	no	1,199	18,865
Jul-86	184,700	-33	2,559	2,525	40,600	1,533	665		31,914	30,744	1,170	12,188	15,852	18,446	-2,594	no	no	0	0
																		<b>TOTAL</b>	<b>194,542</b>
	113,055				37,442														
May-93	166,418	53,364	2,104		38,588	1,147	1,208		98,777	30,744	68,033	8,505	78,440	61,488	16,953	no	no	1,208	54,572
Jun-93	177,603	11,184	17,121		38,115	-473	17,903	17,430	75,927	29,752	46,175	6,311	63,959	47,603	16,356	no	no	16,356	27,540
																		<b>TOTAL</b>	<b>82,112</b>
	80,983				16,802														
Mar-95	113,122	32,140	5,601		31,206	14,404	8		67,537	18,446	49,091	27,463	72,960	17,831	55,129	no	no	8	32,148
Apr-95	147,337	34,215	3,283		34,853	3,647	5,004		56,987	29,752	27,235	2,910	61,892	35,107	26,785	no	no	3,283	37,497
May-95	200,501	53,164	13,569		34,224	-629	17,078	16,449	138,744	30,744	108,000	4,272	150,426	61,488	88,939	no	no	13,569	66,733
Jun-95	231,284	30,783	28,770		38,494	4,270	25,418		124,403	29,752	94,651	5,893	138,783	47,603	91,180	no	no	25,418	56,202
Jul-95	226,855	-4,430	32,071	27,641	36,882	-1,611	34,028	32,417	93,977	30,744	63,233	7,105	94,437	18,446	75,991	no	no	27,641	27,641
																		<b>TOTAL</b>	<b>220,221</b>
	203,933				28,223														
Feb-96	204,500	567	22,982		32,661	4,438	23,034		74,269	23,008	51,261	772	99,245	9,203	90,042	no	no	22,982	23,549
Mar-96	203,967	-533	25,716	25,182	32,501	-160	32,122	31,962	91,039	30,744	60,296	1,049	113,752	17,831	95,921	no	no	25,182	25,182
Apr-96	215,967	12,000	23,788		37,208	4,707	23,764		118,155	29,752	88,403	3,015	127,220	35,107	92,112	no	no	23,764	35,764
May-96	238,367	22,400	33,051		38,842	1,634	32,955		207,868	30,744	177,124	4,933	223,934	61,488	162,446	no	no	32,955	55,355
Jun-96	224,267	-14,100	30,718	16,618	38,589	-253	30,858	30,605	113,157	29,752	83,405	5,958	106,473	47,603	58,869	no	no	16,618	16,618
																		<b>TOTAL</b>	<b>156,469</b>
	199,833				14,144														
Nov-96	203,333	3,500	1,845		12,073	-2,072	3,912	1,841	31,014	23,802	7,212	4,982	32,747	9,521	23,226	no	no	1,841	5,341
Dec-96	209,567	6,233	14,196		23,893	11,821	5,313		126,377	24,595	101,782	20,144	125,871	9,838	116,033	no	no	5,313	11,546
Jan-97	203,900	-5,667	66,958	61,291	26,167	2,273	79,686		376,007	24,595	351,412	1,981	453,640	9,838	443,802	no	no	61,291	61,291
Feb-97	193,567	-10,333	17,153	6,820	25,891	-276	24,050	23,774	180,694	22,215	158,479	1,071	215,861	8,886	206,975	no	no	6,820	6,820
Mar-97	204,067	10,500	13,710		32,138	6,247	15,057		136,411	30,744	105,667	928	161,117	17,831	143,286	no	no	13,710	24,210
Apr-97	200,133	-3,933	28,124	24,190	34,883	2,745	33,761		95,008	29,752	65,256	2,945	106,235	35,107	71,127	no	no	24,190	24,190
May-97	198,333	-1,800	27,503	25,703	34,624	-259	35,381	35,122	99,352	30,744	68,608	6,081	102,407	61,488	40,919	no	no	25,703	25,703
Jun-97	192,833	-5,500	14,430	8,930	35,837	1,213	15,063		74,112	29,752	44,360	4,005	77,631	47,603	30,028	no	no	8,930	8,930
																		<b>TOTAL</b>	<b>168,031</b>
	187,533				19,144														
Feb-98	192,467	4,933	1,864		20,255	1,111	1,687		24,956	22,215	2,741	608	34,495	8,886	25,609	no	no	1,687	6,620
Mar-98	203,133	10,667	8,053		32,719	12,464	1,004		86,208	30,744	55,464	756	106,637	17,831	88,806	no	no	1,004	11,671
Apr-98	213,000	9,867	16,348		35,200	2,481	16,661		119,980	29,752	90,228	1,408	133,448	35,107	98,340	no	no	16,348	26,214
May-98	212,267	-733	44,331	43,597	32,106	-3,093	49,412	46,319	162,347	30,744	131,603	3,656	167,385	61,488	105,898	no	no	43,597	43,597
Jun-98	230,767	18,500	25,398		36,731	4,625	21,199		179,821	29,752	150,069	4,641	191,683	47,603	144,079	no	no	21,199	39,699
Jul-98	224,367	-6,400	19,753	13,353	35,523	-1,208	20,711	19,504	86,446	30,744	55,702	6,821	81,971	18,446	63,525	no	no	13,353	13,353
																		<b>TOTAL</b>	<b>141,155</b>

**Table 3**  
**Estimates of Available Water for Storage in Stampede Reservoir**

[1] Month-Year	[2] EOM Stampede Storage af	[3] Stampede Change in Storage af	[4] Little Truckee River above Boca (afm)	[5] Adjusted Little Truckee River above Boca (afm)	[6] EOM Boca Storage af	[7] Boca Change in Storage af	[8] Little Truckee River below Boca (afm)	[9] Adjusted Little Truckee River below Boca (afm)	[10] Truckee River at Farad (afm)	[11] Floriston Rates (afm)	[12] Flow at Farad in Excess of Floriston Rates (afm)	[13] Truckee Canal at Wadsworth (afm)	[14] Truckee River near Nixon (afm)	[15] Pyramid Lake inflow targets under Flow Regime No. 1 (afm)	[16] Inflow to Pyramid Lake above Flow Regime No. 1 (afm)	[17] Stampede Stored Water Adverse to Floriston Rates?	[18] Stampede Stored Water Within Flow Regime No. 1?	[19] Available Water in addition to Stored Amount in Stampede (afm)	[20] Available Water for Storage in Stampede Reservoir (afm)
	204,133				32,800														
Jan-99	204,600	467	5,994		32,800	0	7,290		41,316	24,595	16,721	413	53,619	9,838	43,781	no	no	5,994	6,461
Feb-99	204,333	-267	8,360	8,094	32,967	167	8,481		109,474	22,215	87,259	346	128,943	8,886	120,058	no	no	8,094	8,094
Mar-99	204,567	233	15,646		32,467	-500	21,648	21,148	113,098	30,744	82,354	937	131,286	17,831	113,455	no	no	15,646	15,879
Apr-99	208,300	3,733	26,727		34,800	2,333	30,440		103,615	29,752	73,862	1,897	117,302	35,107	82,195	no	no	26,727	30,461
May-99	220,200	11,900	41,399		35,933	1,133	42,653		182,340	30,744	151,597	4,931	188,588	61,488	127,101	no	no	41,399	53,299
Jun-99	223,433	3,233	30,530		40,000	4,067	26,223		127,240	29,752	97,488	4,253	127,716	47,603	80,112	no	no	26,223	29,457
																		<b>TOTAL</b>	<b>143,650</b>
	202,300				19,927														
Mar-00	204,033	1,733	9,842		31,763	11,836	299		42,167	30,744	11,423	42	47,445	17,831	29,613	no	no	299	2,032
Apr-00	216,233	12,200	16,818		33,415	1,652	16,330		62,047	29,752	32,295	1,885	61,811	35,107	26,703	no	no	16,330	28,530
May-00	217,667	1,433	25,712		38,860	5,445	20,057		75,213	30,744	44,469	4,850	63,533	61,488	2,045	no	no	2,045	3,478
Jun-00	222,156	4,490	3,779		37,690	-1,170	4,509	3,339	38,811	29,752	9,059	4,550	25,214	47,603	-22,389	no	yes (4490 af)	0	0
																		<b>TOTAL</b>	<b>34,041</b>
	125,600				19,300														
Apr-03	128,000	2,400	14,624		23,533	4,233	12,603		44,156	29,752	14,404	31,333	15,840	35,107	-19,267	no	yes (2400 af)	0	0
May-03	140,667	12,667	15,346		29,933	6,400	9,877		59,472	30,744	28,729	7,422	47,714	61,488	-13,773	no	yes (12667 af)	0	0
Jun-03	157,000	16,333	3,396		30,867	933	1,910		44,257	29,752	14,505	5,129	33,616	47,603	-13,987	no	yes (13987 af)	0	2,346
																		<b>TOTAL</b>	<b>2,346</b>
	126,267				21,867														
May-05	173,333	47,067	7,035		29,367	7,500	67		99,685	30,744	68,941	3,535	96,091	61,488	34,604	no	no	67	47,134
Jun-05	191,233	17,900	4,211		30,300	933	2,839		60,555	29,752	30,803	4,489	56,356	47,603	8,753	no	no	2,839	20,739
																		<b>TOTAL</b>	<b>67,873</b>
	171,300				22,467														
Dec-05	197,333	26,033	2,822		28,533	6,067	46		60,934	21,521	39,414	135	63,418	9,838	53,580	no	no	46	26,079
Jan-06	204,267	6,933	17,443		32,300	3,767	17,796		89,236	21,521	67,716	0	124,905	9,838	115,067	no	no	17,443	24,376
Feb-06	207,933	3,667	10,324		34,000	1,700	10,875		47,288	22,215	25,073	0	51,481	8,886	42,595	no	no	10,324	13,991
Mar-06	203,967	-3,967	22,869	18,903	32,167	-1,833	30,635	28,801	83,211	30,744	52,467	476	92,356	17,831	74,525	no	no	18,903	18,903
Apr-06	212,033	8,067	33,463		35,667	3,500	39,053		120,417	29,752	90,664	1,042	122,479	35,107	87,372	no	no	33,463	41,530
May-06	221,833	9,800	46,415		38,600	2,933	48,583		175,260	30,744	144,516	4,199	166,433	61,488	104,945	no	no	46,415	56,215
Jun-06	231,233	9,400	15,261		40,400	1,800	14,751		96,575	29,752	66,823	4,742	85,864	47,603	38,261	no	no	14,751	24,151
																		<b>TOTAL</b>	<b>205,245</b>

Column	Explanation
[1]	Month within water year (Oct. 1 - Sept 30.)
[2]	USGS Gage (ID# 10344300) Stampede Reservoir near Truckee. End-of-month 8:00am reading was prorated to end-of-month midnight reading. (8am reading from current day * 8 + 8am reading from next day * 16 / 24 = 12 am storage of current day).
[3]	Difference in Stampede storage between end of current month and end of preceding month. Positive or negative signs represent gain or reduction in storage, respectively.
[4]	USGS Gage (ID# 10344400) Little Truckee River above Boca Reservoir near Truckee.
[5]	USGS Gage (ID# 10344400) flow adjusted for stored water releases from Stampede Reservoir [4] + [3] if value in [3] is negative.
[6]	USGS Gage (ID# 10344900) Boca Reservoir near Truckee. End-of-month reading prorated (see explanation of [2]).
[7]	Difference in Boca Storage (see explanation of [3]).
[8]	USGS Gage (ID# 10344500) Little Truckee River below Boca Dam near Truckee.
[9]	USGS Gage (ID# 10344500) flow adjusted for stored water releases from Boca Reservoir. [8] + [7] if value in [7] is negative.
[10]	USGS Gage (ID# 10346000) Truckee River at Farad
[11]	See Figure 1. Months with reduced Floriston Rates include: Feb-1980, Mar-1980, Mar-1993, Feb-1995, and Mar-1995. During all of these months, Lake Tahoe elevation was below 6225.25 feet, except for February 1980 in which Lake Tahoe elevation ranged from 6224.8 to 6225.51 feet.
[12]	[10] - [11]
[13]	USGS Gage (ID# 10351300) Truckee Canal near Wadsworth. Diversions to Truckee Canal are implemented by U.S. Bureau of Reclamation under OCAP.
[14]	USGS Gage (ID# 10351700) Truckee river near Nixon
[15]	See Table 2. Flow Regime No. 1 used for water availability analysis.
[16]	[14] - [15]
[17]	No: if value in [12] is positive. Yes: if value in [12] is negative.
[18]	No: if value in [16] is positive. Yes: if value in [16] is negative and Stampede is storing water; value shown in parentheses.
[19]	Smaller of [4], [8], [12], or [16] but greater than zero. Values in [4] and [8] are substituted by [5] and [9], respectively, if flows are adjusted.
[20]	[3] + [19] - [18] but greater than zero. Negative values in [3] are treated as zero.



1. Water flowing to Stampede Reservoir occurs after the satisfaction of upstream rights in the Little Truckee River, including diversions to Sierra Valley.
2. Storage priority in Stampede Reservoir is junior to Boca Reservoir.
3. Water is not stored in Stampede and Boca Reservoirs adverse to Floriston Rates or Reduced Floriston Rates.
4. Water is not stored in Stampede Reservoir or as Additional Supplemental Storage (above 25,000 acre-feet) in Boca Reservoir unless allowable OCAP diversions at Derby Dam are satisfied.
5. *Orr Ditch* water rights are satisfied by meeting Floriston Rates or Reduced Floriston Rates (whichever is in effect) at Farad and allowable *Orr Ditch* decree and OCAP diversions at Derby Dam.
6. Diversion requirements at Derby Dam are assumed to be the same as historical diversions for the purpose of this analysis.<sup>4</sup>
7. Water would not be diverted to storage in Stampede Reservoir unless target flows under Flow Regime No. 1 are met in the lower Truckee River.

The spreadsheet analysis is aimed at periods when full or near full storage in Boca Reservoir is achieved. In other words, Stampede Reservoir was in priority to store water. In addition, flows at Farad exceed the applicable Floriston Rates and flows in the lower Truckee River exceed the target flows under Flow Regime No. 1.

Generally, during wet periods all downstream water rights in the basin can be served by unregulated runoff into the main stem of the Truckee River, leaving sufficient additional runoff in the Little Truckee River to fill both Stampede and Boca Reservoirs.

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<sup>4</sup> It should be noted that the allowable OCAP diversions at Derby Dam changed several times during the period from August 1969 through September 2006 and that there were times when the historical diversions substantially exceeded the allowable OCAP diversions.

## Summary of Results

The estimates of water available for diversion to storage in Stampede Reservoir for the years during the period extending from water years 1970 through 2006 (37 years) are summarized in Table 4.

**Table 4**  
**Available Water for Storage in**  
**Stampede Reservoir**  
**WY 1970-2006**

Water Year	Acre-Feet
1971	124,870
1973	75,240
1974	155,010
1975	90,580
1980	79,270
1982	279,040
1983	246,750
1984	178,760
1986	194,540
1993	82,110
1995	220,220
1996	156,470
1997	168,030
1998	141,150
1999	143,650
2000	34,040
2003	2,350
2005	67,870
2006	205,250

Table 4 indicates that the amounts of water available for diversion to storage in Stampede Reservoir ranged from 2,350 to 279,040 acre-feet per year during the period 1970 through 2006 (37 years). There were 11 years out of 37 years of record when in excess of 126,000 acre-feet of water was available for diversion to storage in Stampede Reservoir. The result of this analysis indicates that as much as 279,040 acre-feet could be available for diversion to storage in Stampede Reservoir in a single year.

Water is carried over in Stampede Reservoir depending on hydrologic conditions and releases made for the Pyramid Lake fishes in the lower Truckee River in prior years. During dry periods, a significant portion of water stored in Stampede Reservoir is released for the benefit of listed fishes in the lower Truckee River. For example, Stampede Reservoir was practically emptied in water years 1976 and 1977. If the period 1976-1977 were followed by 1982 or 1983, Stampede Reservoir can be filled to its capacity (226,500 acre-feet) in one year.

### **Hydrologic Year Type Classification**

Table 6 shows estimates of Little Truckee River runoff at the Stampede damsite in spring and summer (March-September) for the period from 1901 through 2006 (106 years). The hydrologic year type classification for the Little Truckee River is based on estimated runoff at the Stampede damsite. The year types used in this analysis are consistent with the SWRCB classification method and runoff in the Little Truckee River is used as an index for water year classification. Figure 4 shows a frequency analysis of Little Truckee River runoff in spring and summer (March-September) for the period 1901 through 2006. The frequency analysis was conducted to determine five hydrologic year types based on roughly twenty-percentile groupings of ranked data. The resulting runoff index for the five hydrologic year types are shown in Table 5 below. Table 6 shows the hydrologic year classes for the period 1901 through 2006 based on the runoff index of the Little Truckee River.

**Table 5  
Little Truckee River Runoff Index  
For Year Type Classification**

<b>Hydrologic Year Type</b>	<b>Index (Runoff at Stampede damsite in acre-feet)</b>
Wet	Greater than 150,000
Above Average	Equal to or less than 150,000 and Greater than 107,000
Average	Equal to or less than 107,000 and Greater than 76,000
Below Average	Equal to or less than 76,000 and Greater than 52,000
Dry	Equal to or less than 52,000

Little Truckee River Runoff at Stampede Damsite  
Flow Duration Curve for Hydrologic Year Type Classification, 1901-2006

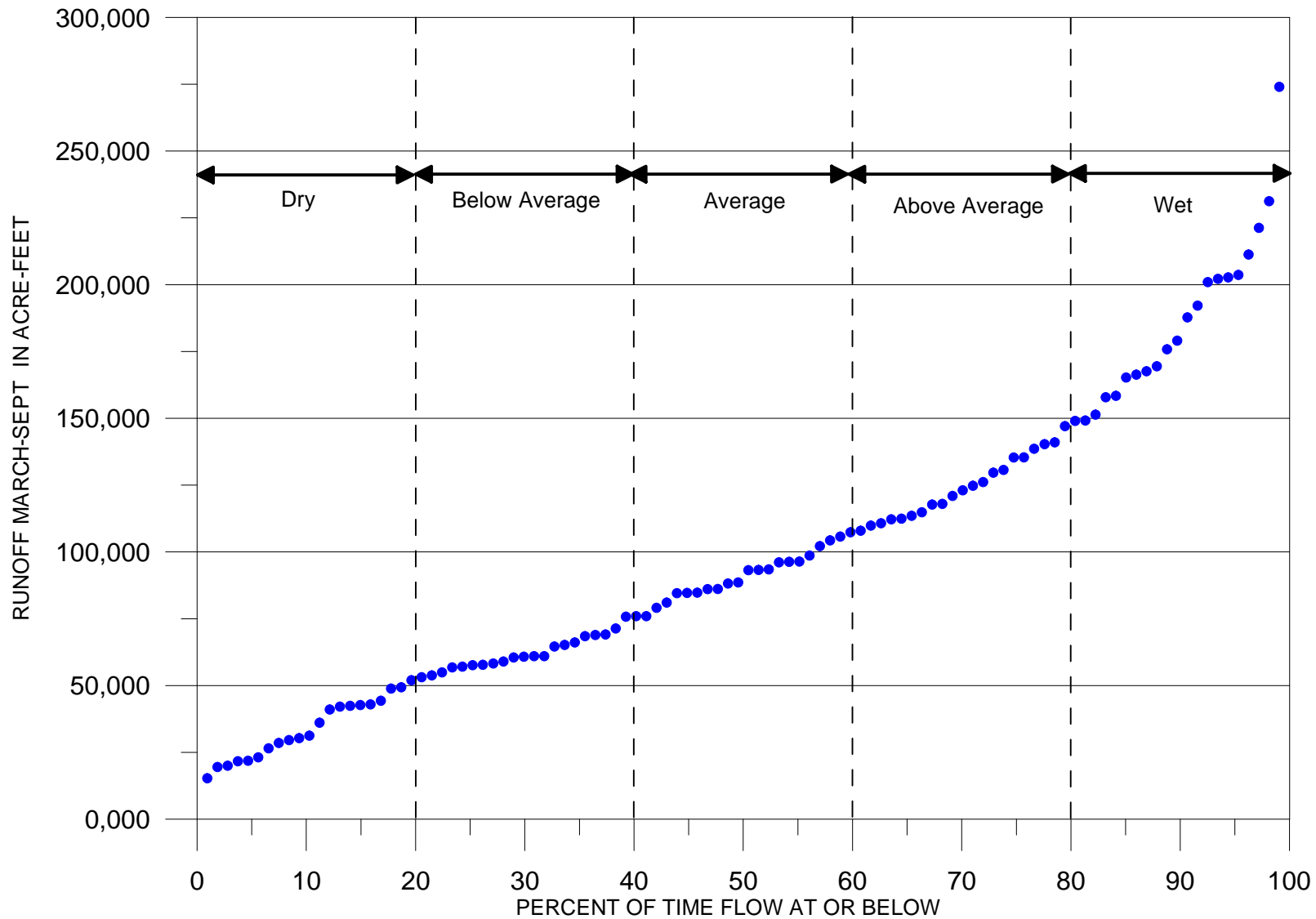


Figure 4

**Table 6**  
**Little Truckee River Runoff at Stampede Damsite**  
**and Hydrologic Year Type Classification**  
**1901-2006**

Year	Runoff at Stampede Damsite <sup>1, 2</sup> (acre-feet)	Hydrologic Year Type
1901	149,000	Above Average
1902	102,180	Average
1903	88,220	Average
1904	202,190	Wet
1905	86,120	Average
1906	169,520	Wet
1907	221,250	Wet
1908	68,920	Below Average
1909	167,630	Wet
1910	105,770	Average
1911	211,290	Wet
1912	54,930	Below Average
1913	60,500	Below Average
1914	187,740	Wet
1915	96,130	Average
1916	179,040	Wet
1917	110,750	Above Average
1918	69,130	Below Average
1919	107,370	Average
1920	59,000	Below Average
1921	117,950	Above Average
1922	166,350	Wet
1923	93,480	Average
1924	19,550	Dry
1925	64,650	Below Average
1926	49,390	Dry
1927	135,420	Above Average
1928	84,700	Average
1929	42,430	Dry
1930	65,240	Below Average
1931	36,110	Dry
1932	104,370	Average
1933	52,030	Below Average
1934	31,280	Dry
1935	96,320	Average
1936	117,720	Above Average
1937	93,250	Average
1938	192,140	Wet
1939	41,040	Dry
1940	126,130	Above Average

**Table 6 (Continued)**  
**Little Truckee River Runoff at Stampede Damsite**  
**and Hydrologic Year Type Classification**  
**1901-2006**

Year	Runoff at Stampede Damsite <sup>1, 2</sup> (acre-feet)	Hydrologic Year Type
1941	98,690	Average
1942	120,990	Above Average
1943	112,240	Above Average
1944	56,830	Below Average
1945	84,780	Average
1946	93,180	Average
1947	42,150	Dry
1948	60,960	Below Average
1949	53,130	Below Average
1950	96,440	Average
1951	75,980	Average
1952	202,730	Wet
1953	114,850	Above Average
1954	48,890	Dry
1955	53,800	Below Average
1956	151,390	Wet
1957	81,070	Average
1958	165,280	Wet
1959	44,300	Dry
1960	57,620	Below Average
1961	29,590	Dry
1962	75,750	Below Average
1963	109,890	Above Average
1964	68,480	Below Average
1965	140,340	Above Average
1966	60,980	Below Average
1967	200,950	Wet
1968	60,810	Below Average
1969	203,630	Wet
1970	84,600	Average
1971	157,900	Wet
1972	71,392	Below Average
1973	107,961	Above Average
1974	130,703	Above Average
1975	124,803	Above Average
1976	21,639	Dry
1977	15,313	Dry
1978	123,095	Above Average
1979	57,757	Below Average
1980	129,681	Above Average
1981	28,550	Dry

**Table 6 (Continued)**  
**Little Truckee River Runoff at Stampede Damsite**  
**and Hydrologic Year Type Classification**  
**1901-2006**

Year	Runoff at Stampede Damsite <sup>1, 2</sup> (acre-feet)	Hydrologic Year Type
1982	175,844	Wet
1983	274,035	Wet
1984	113,526	Above Average
1985	66,169	Below Average
1986	158,405	Wet
1987	30,338	Dry
1988	20,031	Dry
1989	88,597	Average
1990	42,761	Dry
1991	42,965	Dry
1992	26,516	Dry
1993	147,109	Above Average
1994	23,127	Dry
1995	231,247	Wet
1996	135,371	Above Average
1997	86,142	Average
1998	149,196	Above Average
1999	138,651	Above Average
2000	75,971	Below Average
2001	21,909	Dry
2002	58,291	Below Average
2003	79,125	Average
2004	57,120	Below Average
2005	112,452	Above Average
2006	141,060	Above Average

1. *March through September.*
2. *Based on data originally developed by USBR for use in the Washoe Project analysis and the OCAP analysis (1901-1980). Flow was recorded by USGS prior to construction of Stampede Reservoir (1940-1969). Data based on USGS record of storage and releases from Stampede Reservoir (1970-2006).*

Table 7 shows the hydrologic year types for the years with available water for diversion to storage in Stampede Reservoir for the period 1970-2006 (Table 4). Table 7 indicates that water availability for diversion to storage in Stampede Reservoir primarily occurs in wet and above average years.

**Table 7**  
**Hydrologic Year Types for Years with**  
**Available Water for Storage in**  
**Stampede Reservoir**  
**WY 1970-2006**

Water Year	Available Water for Storage (acre-feet)	Hydrologic Year Type
1971	124,870	Wet
1973	75,240	Above Average
1974	155,010	Above Average
1975	90,580	Above Average
1980	79,270	Above Average
1982	279,040	Wet
1983	246,750	Wet
1984	178,760	Above Average
1986	194,540	Wet
1993	82,110	Above Average
1995	220,220	Wet
1996	156,470	Above Average
1997	168,030	Average
1998	141,150	Above Average
1999	143,650	Above Average
2000	34,040	Below Average
2003	2,350	Average
2005	67,870	Above Average
2006	205,250	Above Average



## **Conclusions**

Results of this water availability analysis show that water is available in the Little Truckee River to be diverted to storage in Stampede Reservoir above the current diversion quantity of 126,000 acre-feet per annum. This is water that would otherwise flow into Pyramid Lake. Results of the analysis also show that the applied for water can be diverted to storage in Stampede Reservoir without any impairment to downstream water rights and the flow targets in the lower Truckee River. Based on the results of this water availability analysis, water is available in the Little Truckee River to increase the maximum diversion to storage from 126,000 acre-feet per annum to 226,000 acre-feet per annum in Stampede Reservoir as requested in Application 31487 filed with the SWRCB on January 8, 2004.

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