



## 1990 FLOOD ANALYSIS--THE BIG PICTURE

Upper Baker Normal Full Pool 724 feet  
Upper Baker November 15<sup>th</sup> requirement 707.9 feet  
Lower Baker (Shannon) Full 438.6 feet  
Ross November 20<sup>th</sup> level is **1595.6**  
Ross minimum winter pool at 1592.1

DATE	TIME	SAUK <sup>1</sup>	CON.	MTV	B/R	SHANNON	BAKER	ROSS	CORPS FLOOD NOTES RE ROSS AND UPPER BAKER <sup>2</sup>
09NOV90	0100	4920	19500	22200	4020	436.67	704.51		
09NOV90	0200	5190	20000	22200	4000	436.77	704.52		
09NOV90	0300	5810	20500	22300	4040	436.985	704.54		
09NOV90	0400	7570	21400	22700	4000	437.2	704.6		
09NOV90	0500	9150	22200	23300	3970	437.372	704.71		
09NOV90	0600	10800	24200	24300	3950	437.544	704.85		
09NOV90	0700	12900	27600	25400	3980	437.73	705.08		
09NOV90	0800	15300	31100	26800	3950	437.98	705.35		
09NOV90	0900	18500	35400	28300	3980	438.21	705.69		
09NOV90	1000	22200	40600	30000	3980	438.4	706.08		

<sup>1</sup> All gauge readings obtained from USGS with exception of Ross elev. Column which came from Corps of Engineers

<sup>2</sup> All info from Corps log books obtained from FOIA request.



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09NOV90	1100	25500	45800	31800	3970	438.55	706.53	1592.5	<p>Corps calls PSE. S/R to reach 90000 cfs at Concrete by 2000 hours (8 pm), 9 hours away. U/B at level 705.2 releasing about 3,400 cfs. Lower Baker ("L/B") 1 ft from full (438.6 is full), releasing 3,600 cfs. Corps request U/B release 5,000 cfs. PSE was going to reduce U/B to keep from spilling L/B. Corps requested PSE cooperation. PSE replies they will check with supervisors. PSE wanted to know if Corps would give latitude in reaching 707.9 ft level requirement by 15 November. Corps willing to work with them if weather permitted.</p> <p>Corps calls SCL to discuss current weather conditions. 2 very intense storms on the way. Concrete forecasted to reach 90,000 cfs by 2000 hours. Ross discharging 2,900 cfs. Corps requested increase in discharge to 5,000 cfs. Diablo and Gorge full and spilling. Qin=11,000 cfs. Ross below flood control elevation for this date.</p>
09NOV90	1145								<p>PSE advises Corps that although they had no legal obligation to do so they will spill U/B at 5,000 cfs. PSE wanted Corps to work with them to capture peak inflow into U/B. Corps agrees. Again requested latitude on 15 November target. Corps agrees. PSE advises L/B full. Spilling to pass inflow. Will not draft L/B. Corps gives their blessing.</p>
09NOV90	1200	28400	53400	34000	5220	438.63	707.01		



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09NOV90	1300	31000	64900	36300	15800	438.42	707.48		
09NOV90	1400	33500	72300	38600	15600	438.34	707.9		
09NOV90	1445								PSE advises Corps, "I saw the pool rising so I opened seven gates. After awhile it looked like that was too much so I closed one gate and I'm probably going to close one more." This, in two hours, put another 10000 cfs at the Concrete gage.
09NOV90	1500	35900	75800	41000	13800	438.33	708.35		
09NOV90	1600	37600	80100	43200	13800	438.33	708.79		
09NOV90	1645								Corps request SCL to reduce Ross outflow to 5,000 cfs from 7,575 cfs. SCL agrees to do this ASAP.
09NOV90	1700	39900	83300	45700	13800	438.32	709.25		
09NOV90	1800	42400	87700	47800	13800	438.325	709.7		
09NOV90	1830								Corps request SCL to hold Ross outflow to 5,000 cfs. SCL advises this may not be possible when Ross is in load swing after 2000 tonight. Shouldn't be a problem. They will stabilize the outflow swings through Diablo. Will try and average 5,000 cfs from Ross.
09NOV90	1900	44300	91400	50000	13900	438.33	710.13		
09NOV90	2000	45700	95600	52200	14100	438.34	710.55		
09NOV90	2100	47000	99100	54600	14200	438.34	710.95		
09NOV90	2200	48400	103000	56800	14500	438.34	711.36		
09NOV90	2300	49600	106000	59000	14600	438.33	711.76		
09NOV90	2400	50700	110000	61100	14800	438.3	712.16		



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10NOV90	0100	51900	113000	63100	15000	438.27	712.57		
10NOV90	0200	53000	116000	65300	15200	438.24	712.99		
10NOV90	0300	54100	120000	67100	15600	438.2	713.41		
10NOV90	0320								SCL contacts Corps. Diablo out of storage. Will have to increase outflows to pass Ross. Concerned on impacts to Skagit and wanted to cutback on Ross outflows. Corps informed SCL their forecast showed Ross running out of storage by Sunday (Nov 11 <sup>th</sup> ) if rain continues. Corps wanted to maintain 5,000 cfs discharge to preserve storage.
10NOV90	0400	54800	123000	69400	15800	438.16	713.84		
10NOV90	0500	56900	124000	71600	15700	438.12	714.27		
10NOV90	0600	58400	128000	73500	16100	438.09	714.71		
10NOV90	0700	59800	129000	75100	16400	438.06	715.15		
10NOV90	0800	61300	131000	76700	16800	438.03	715.61		
10NOV90	0900	62600	134000	77800	16500	438.02	716.07		
10NOV90	1000	63900	136000	79100	16100	438.05	716.59		
10NOV90	1100	64900	139000	81000	16600	438.08	717.03		
10NOV90	1200	66600	142000	84200	16900	438.09	717.45		
10NOV90	1300	68300	144000	87500	17400	438.09	717.86		
10NOV90	1330								PSE tells Corps that they are not passing any water from U/B to L/B. Corps advises that U/B was within 2 feet of being full and requested PSE discharge 5,000 cfs from U/B. PSE said to give them 30 minutes to see if units could be restarted.
10NOV90	1400	<b>69800</b>	147000	91000	17800	437.96	718.31		



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10NOV90	1410								PSE to release 5,000 cfs fm U/B at 1430. Will reduce L/B outflow to build to 438 level then to re-establish outflow. Corps questions need to reduce L/B outflow but PSE refuses.
10NOV90	1500	68300	148000	94500	15100	438.01	718.76		
10NOV90	1600	66300	149000	97800	15400	438.06	719.16		
10NOV90	1700	63500	149000	101000	16300	438.104	719.51		
10NOV90	1730								Corps notifies PSE that they feel flood level forecast too low. Thought MV should be about 35.4. Corps had unconfirmed reading at Concrete of 39.9 which would make the MV stage even higher.
10NOV90	1800	60000	148000	105000	18600	438.148	719.87		
10NOV90	1840							1598.2	SCL advises Qin=40,000 cfs Qout=5,000 cfs. Local inflow between Ross and Newhalem gage is receding. SCL requested increasing Ross discharge to compensate for the receding local inflow and maintaining the Newhalem gage at 21,000 cfs. Wayne Wagner of the Corps approved the request.
10NOV90	1900	49900	146000	108000	18700	438.17	720.23		
10NOV90	2000	47000	144000	111000	18100	438.16	720.57		
10NOV90	2010								PSE informs Corps re induced surcharge at U/B. PSE will cooperate with Corps IF Corp requires gate settings that induce surcharge above 724 feet (normal full pool). PSE doesn't think that will work but admits they have never tried that before.



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10NOV90	2030								Corps ask SCL if they were aware of surcharge schedule for Ross. SCL says not aware but would contact supervisor. Jerry Garman, Ass't. Chief System Power Supply calls and questioned whether he could legally raise Ross above 1602.5. Corps advises surcharge was permissible. SCL approves but wants dispatcher alerted one hour before exceeding 1602.5 for legal record.
10NOV90	2100	44000	141000	115000	17800	438.13	720.86		
10NOV90	2124							1599.38	SCL advises Corps that Qin=42,000 (1 hr), 40,300 (6 hrs) Qout=9,764. Corps advises we are now in Spilling Gate Regulation, Schedule A. Discharge from Ross is required to be 8,500 cfs. Current discharge is near 10,000 cfs. Corps gives approval to keep discharge at 10,000 cfs. Newhalem gage no longer to be held constant at 21,000 cfs.
10NOV90	2200	41700	138000	118000	16600	438.09	721.12		
10NOV90	2223							1599.58	Qin=38,400 (1 hr) 40,325 (6 hr) Corps request no change in discharge.
10NOV90	2300	39500	134000	122000	15800	438.05	721.41		
10NOV90	2325							1599.75	Qin=33,750 (1 hr) 39,723 (6 hr). Corps request no change in discharge.
10NOV90	2400	37400	131000	126000	15000	438	721.69		
11NOV90	0100	35500	127000	130000	14300	437.93	721.94		
11NOV90	0200	34000	122000	134000	14000	437.87	722.16		



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11NOV90	0230							1600.30	Qin=36,000 cfs. Qout=11,000 cfs. Corps discusses with SCL to insure discharges being maintained. Would probably go to full powerhouse (14,000 cfs) in next hour or two. SCL needed one hour advanced warning.
11NOV90	0300	32600	118000	138000	12700	437.794	722.35		
11NOV90	0330							1600.46	Qin=34,000 cfs Qout=10,500 Newhalem 20,500 cfs. Concrete receding and will be below 35.5 ft in a few hours. Corps instructs SCL to increase outflow to <b>full powerhouse discharge of 14,000 cfs</b> over the next hour. Room in Diablo and Gorge so SCL will regulate Ross outflow to 2,000 cfs the 1 <sup>st</sup> hour and increase as pool fills. Increase in Rockport gage should be less than 0.6" and well below peak especially considering local is on recession.
11NOV90	0400	31300	113000	140000	12900	437.718	722.54		
11NOV90	0410								<b>Corps advises Rockport peaked @ 14.45 ft/60,600 cfs on 11/10/90 at 1400 hours.</b>
11NOV90	0500	29900	109000	140670	12500	437.635	722.73		
11NOV90	0600	28700	106000	141330	12200	437.54	722.87		
11NOV90	0700	27700	103000	<b>142000</b>	12000	437.45	722.96		
11NOV90	0800	26600	99800	141500	11800	437.35	723.1		



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11NOV90	0845								Corps request PSE increase in discharge of 3,700 cfs from U/B. Opening one of the automatic gates 6 feet gives 3,700 cfs. at current pool. PSE said it would take 2 hours before increase got into the river. PSE likes to make gate changes on the hour so requested Corps to make request before then.
11NOV90	0900	25500	97100	141000	11500	437.25	723.22		
11NOV90	0930							1601.26	Corps contacts SCL for current readings. Qin=32,500 Qout=15,078 Corps instructs SCL to increase discharge 1,000 cfs. May increase as downstream recession progresses. SCL will institute at 0945. Results will be seen at Newhalem @1300 hours.
11NOV90	1000	24600	93700	140000	11400	437.26	723.25		
11NOV90	1040								PSE 1000 readings: U/B 723.27. T/W=9,400 cfs. Corps requested discharge of 2,900 cfs from U/B.
11NOV90	1100	23700	90800	137500	11400	437.27	723.31		
11NOV90	1130								SCL advises that two increases of 1,000 cfs were made @1015 and 1115. Corps request next increase be 2,000 cfs at 1215.
11NOV90	1200	22700	89400	135000	11500	437.44	723.28		
11NOV90	1300	21800	86700	133330	11600	437.58	723.25		





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11NOV90	1330								U/B 723.24 T/W 12,200 cfs. Corps request PSE discharge from U/B be increased by 3,500 cfs for total discharge of 15,700 cfs. U/B pool has began to draft. If the inflow averages 7,500 the pool would be down to 720.00 by tomorrow afternoon. Corps decided to make one more opening @1600 hours of about 3,000 cfs and instruct PSE to allow the pool to draft to 720. After 720 PSE can resume operation but should not exceed discharge of 20,000 cfs from U/B.
11NOV90	1400	21000	85000	131670	11800	437.7	723.15		Corps summarizes SCL discharges: 1015 +1,000 for total 16,100 1115 +1,000 for total 16,972 1215 +2,000 for total 18,350 1330 +2,000 Corps request no more changes in Ross outflow be made until further notice. Corps tells SCL to hold discharge charges to keep Newhalem below 24,000 cfs. Inflows to Ross are persisting in the lower 30,000 cfs range. At current rate of rise the pool will be to 1602.5 feet by late tonight or early tomorrow morning.
11NOV90	1500	20300	85700	130000	15000	437.84	723.04		
11NOV90	1600	19600	85700	127670	15300	437.94	722.93		



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11NOV90	1630							1601.79	SCL informs Corps Qin=26,525 (1 hr) 28,650 (6 hr). Corps requested from SCL if they had any information of flooding downstream. SCL said no but would check by radio with field personnel for more information. SCL felt ½ foot increase at Newhalem gage would not cause any problems. Corps requested the Ross discharge be increased to maintain Newhalem gage at 490.0
11NOV90	1700	18900	84900	125330	15400	438.035	722.82		
11NOV90	1800	18300	83100	123000	15600	438.12	722.67		
11NOV90	1900	17700	82900	121000	15700	438.21	722.53		
11NOV90	2000	17100	81600	118000	15700	438.28	722.41		
11NOV90	2100	16600	80500	115000	16000	438.35	722.28		
11NOV90	2200	16100	79500	112000	16800	438.4	722.11		
11NOV90	2225								Corps contacts SCL to see if they had heard anything about downstream conditions. SCL stated main area of concern was Marblemount area however they could take another ½ foot of water. SCL would "ease" Ross discharge another 1,000 cfs.
11NOV90	2300	15600	79400	109000	17100	438.43	721.98		
11NOV90	2400	15400	79400	106000	17100	438.45	721.83		
12NOV90	0100	14900	79300	104000	18100	438.45	721.67		
12NOV90	0200	14500	79200	101000	18000	438.44	721.51		



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12NOV90	0220								SCL calls Corps to inform them Hwy 20 @ Marblemount has about 1" of water on it. SCL doesn't see a problem with that. Newhalem discharge was about 26,000 cfs. Local inflow receding therefore water on road should recede. Ross pool appear to have stopped rising. SCL will hold Newhalem to 26,000 cfs max until further notice. SCL suggested Hwy 20 could take another 6 inches in an emergency.
12NOV90	0300	14100	79000	99400	18200	438.41	721.36		
12NOV90	0400	13800	77900	97400	17900	438.38	721.2		
12NOV90	0500	13600	77200	95300	18000	438.348	721.04		
12NOV90	0600	13300	76900	93500	18000	438.316	720.86		
12NOV90	0700	13200	76500	91600	18000	438.29	720.7		
12NOV90	0800	13000	75000	90300	18000	438.25	720.54		
12NOV90	0830							1601.9	SCL informs Corps Ross slowly drafting. Inflows are about 21,000 and current release is 23,000. Local below Ross slowly receding. SCL maintaining Newhalem at 490 feet (26,000 cfs). SCL felt this flow would prevent further flooding of Hwy 20. Corps felt no need to flood Hwy 20 in order to draft Ross. SCL agreed.
12NOV90	0900	12700	74700	88700	17200	438.22	720.36		
12NOV90	1000	12500	74000	87500	17100	438.22	720.18		



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12NOV90	1015								Corps contacts PSE for status of Upper and Lower Baker. U/B 720.38 Qin=4,800 cfs. Qout=14,200 L/B 438.21 Qin=16,323 Qout=17,115 PSE states that when they reach 720 they will stop U/B reducing outflow to pass inflow. Corps advises another weather system on the way. Forecast Concrete to go above 90,000 cfs therefore request U/B maintain its current outflow. PSE advises needed to check with supervisors.
12NOV90	1100	12300	72600	86300	17100	438.21	720		
12NOV90	1200	12200	71700	84800	17200	438.2	719.82		
12NOV90	1215								Corps contacts PSE for status of Upper and Lower Baker. U/B 719.83 Qin 3,200 Qout=14,200. L/B 438.19 Qin= 15,720 Qout=15,720 PSE agrees to continue to draft U/B at 14,200.
12NOV90	1300	12000	71200	83900	17300	438.19	719.65		
12NOV90	1400	11800	70400	82800	17300	438.18	719.48		
12NOV90	1500	11600	69100	82100	16200	438.19	719.29		
12NOV90	1600	11400	68800	81000	16200	438.2	719.09		
12NOV90	1700	11200	68000	80100	16400	438.212	718.95		
12NOV90	1715								PSE advises Corps they are bringing three units back on line which will contribute 4,800 cfs. They will adjust spill gates to maintain a total release from U/B of about 14,000 cfs.
12NOV90	1800	11100	67300	79200	16000	438.224	718.79		



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12NOV90	1850								Corps contacts PSE. PSE only able to get one unit on line but should be able to get another before long. U/B 718.81 Qin=4,480 cfs Qout=14,200 cfs
12NOV90	1900	11000	67100	78200	16300	438.28	718.57		
12NOV90	2000	11000	66300	77400	16400	438.3	718.41		
12NOV90	2100	11000	66500	76600	16200	438.31	718.33		
12NOV90	2200	11000	66000	75900	16300	438.33	718.22		
12NOV90	2300	11100	66700	75100	16300	438.38	718.13		
12NOV90	2400	11100	66400	74300	16500	438.42	718.05		
13NOV90	0100	11400	66300	73600	16600	438.48	717.99		
13NOV90	0200	11800	69100	73000	18000	438.49	717.95		
13NOV90	0300	12300	69500	72600	18100	438.49	717.95		
13NOV90	0400	13000	70900	72000	18100	438.51	717.95		
13NOV90	0500	13800	72400	71600	18300	438.54	718		
13NOV90	0600	14700	74400	71200	19000	438.55	718.04		
13NOV90	0700	16000	76900	71100	19000	438.57	718.11		
13NOV90	0730								Corps request SCL to maintain flow at Newhalem at 26,000 cfs.
13NOV90	0800	17300	79400	71100	18800	438.6	718.18		
13NOV90	0900	18700	81400	71200	21700	438.63	718.24		
13NOV90	1000	20400	86100	71500	22200	438.56	718.32		



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13NOV90	1015								<p>Corps talks with PSE about draw down to flood control pool level. Corps advises they will have to regulate for flood control probably tonight and to evacuate storage when possible. Expected weather to turn cold and be out of flood potential situation until next week. PSE stated they would call tomorrow to discuss drawdown schedule to minimum flood control pool. Corps would be agreeable if weather cooperated to allow them to hold some water above the 15 November flood control pool.</p> <p>U/B 719.20 Qin=18,000 Qout=13,900 Concrete rising rapidly. Corps requested U/B discharge be reduced to 5,000 cfs until further notice.</p> <p>Qin=26,500 Qout=22,000 Corps advises SCL Concrete rising rapidly and request Ross be reduced to 5,000 cfs until further notice.</p> <p>Corps calls Skagit County and advises about changes at Ross and U/B. Pointed out to them that river below Ross will see significant reduction in flow, about 17,000 cfs. Didn't want people to think flood was over. As soon as Concrete peaks Ross discharge would e increased again.</p>
	1040							1601.2	
	1045								
	1050								
13NOV90	1100	21900	89000	71900	22200	438.47	718.36		
13NOV90	1200	23200	87000	72700	10500	438.2	718.54		



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13NOV90	1245								SCL J. Whaley, Manager Resource Operations called Corps to express concern about Ross exceeding elevation 1602.5. He felt treaty did not permit a surcharge. Corps shows SCL sections in treaty and SCL agreed surcharge was allowed but someone should call Gordon Tofte because of his involvement on several IJC Boards of control.
13NOV90	1300	24200	83400	73300	10400	438.22	718.68		
13NOV90	1330								SCL states Ross would not be filled above 1603.3 and that there would be a wave of water going downstream once the gates are overtopped. Later call with SCL supervisor informed Corps reservoir would be filled above 1603.3. The 1603.3 elevation is the elevation at which upper management is to be notified by dispatcher. <b>SCL emphasized that at elevation 1604.5 one of the galleys will be flooded. This includes electrical circuitry controlling the spillway gates.</b> Corps responds by saying they were hopeful they would not need that elevation.
13NOV90	1400	24600	84100	73900	10200	438.19	718.81		
13NOV90	1500	24800	85400	74800	10200	438.15	718.92		
13NOV90	1600	24500	86600	75600	10200	438.11	719.04		
13NOV90	1700	23900	87000	76500	10200	438.062	719.14		



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13NOV90	1800	22900	85100	77400	10100	438.014	719.23	1601.91↑	Qin=20,000 cfs Qout=5,000 cfs Concrete gage 31.56 (down .28 in last hour) Sauk has peaked. Rockport has peaked. Local inflow between Ross and Newhalem has dropped considerably. Corps to increase Ross releases 4,000 to 5,000 per hour for next 3 hours to a maximum of 20,000-23,000 cfs not to exceed 90,000 cfs @ Concrete. Mt. Vernon should have receded enough to handle this flow. SCL instructed to increase flows to a target of 487.00 (13,000 cfs) @ Newhalem. Skagit County notified of schedule.
13NOV90	1830								U/B 719.20 Qin=8,900 Qout=4,850 <b>PSE requested to reduce Shannon outflow by 1,700 cfs to rebuild Shannon pool.</b> Would result in a small reduction at Concrete until recent outflow change from Ross arrives. Corps cautioned PSE re pool increases @U/B but said no changes should be needed there until tomorrow.
13NOV90	1900	21800	80800	78700	10200	437.96	719.29		
13NOV90	1930							1602.00	Qin=18,200 Qout=10,000+ Corps request SCL to increase discharge by 5,000 cfs per hour for next 2 hours to maximum outflow 20,000 cfs or 489.5 @ Newhalem gage and to keep it there all night.
13NOV90	2000	21000	73600	80000	8790	437.94	719.34		
13NOV90	2045								Corps instructs SCL increase Ross outflow to follow inflow. Stop reducing outflow when powerhouse capacity is reached (15,000 cfs)





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13NOV90	2100	20300	67400	81000	8790	437.94	719.43		
13NOV90	2200	19400	63900	82400	8770	437.94	719.52		
13NOV90	2300	18600	61100	83500	8810	437.94	719.59		
13NOV90	2400	17800	59700	84800	8860	437.94	719.62		
14NOV90	0100	17200	59000	85600	8770	437.92	719.65		
14NOV90	0200	16700	59800	85900	8790	437.89	719.68		
14NOV90	0300	16200	61500	86300	8810	437.85	719.72		
14NOV90	0400	15900	63000	85800	8680	437.8129	719.73		
14NOV90	0500	15500	64900	84900	8620	437.7757	719.76		
14NOV90	0520							1602.16	Qin=21,000 cfs Qout=23,400 Newhalem 26,820 (490.12) Corps request SCL maintain Newhalem stages at elevation 490.
14NOV90	0600	15100	66000	83900	8730	437.7386	719.77		
14NOV90	0700	14700	66300	82700	8660	437.7	719.8		
14NOV90	0800	14300	66100	81300	8680	437.66	719.8		
14NOV90	0900	13900	65300	79900	8530	437.6	719.8		
14NOV90	1000	13600	64300	78600	8590	437.56	719.81		



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14NOV90	1030								Corps contacts PSE to discuss evacuation plan for U/B. Merkle and Singleton participated. Following was passed on to PSE dispatcher: 1. Corps wants U/B drafted to 707.8 in 7 to 10 days 2. Wants U/B discharge to be maintained at 3,000 cfs above inflow 3. Expects in 3 days or less inflow plus evacuation rate will be less than powerhouse capacity. 4. Proposed operation subject to changing weather conditions. Plan was also passed on to Jim Dodge (882-4412) and requested info passed on to upper management. Requested comments from upper management.
14NOV90	1100	13200	64100	77400	8550	437.52	719.81		
14NOV90	1200	13000	65900	76300	11800	437.47	719.79		
14NOV90	1210							1601.93	Qin=17,600 Qout=22,327 Corps requested SCL maintain Newhalem at elevation 490. As pool is drafted, when it falls below flood control rule curve, normal operations may be resumed.
14NOV90	1300	12700	65400	74900	11500	437.41	719.74		PSE (Pat Damiano 462-3421), contacts Corps to discuss proposed evacuation plan. Wanted to know what assumptions Corps made. Advised PSE management had no problem with evacuation plan. Discharge would be adjusted twice daily, morning and afternoon. Contacts for any changes to plan should be Damiano or Davies.



### **1990 FLOOD ANALYSIS--THE BIG PICTURE**

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14NOV90	1400	12500	64900	74200	11400	437.38	719.7		
14NOV90	1500	12300	62400	73500	8510	437.39	719.65		
14NOV90	1600	12200	61500	72700	8530	437.44	719.59		
14NOV90	1700	12000	60500	71900	8590	437.5	719.54		
14NOV90	1800	11900	60200	71400	8640	437.55	719.49		
14NOV90	1900	11800	59700	70800	8680	437.61	719.43		
14NOV90	2000	11800	59300	70300	8660	437.66	719.37		
14NOV90	2100	11700	58800	69600	8750	437.71	719.31		
14NOV90	2200	11600	58900	69100	8620	437.74	719.26		
14NOV90	2300	11400	58500	68500	8660	437.74	719.24		
14NOV90	2400	11400	57900	67900	8700	437.74	719.2		
15NOV90	0100	11300	57700	67200	8730	437.74	719.15		
15NOV90	0200	11200	57600	66600	8700	437.75	719.1		
15NOV90	0300	11000	57500	65900	8680	437.75	719.07		
15NOV90	0400	10900	56700	65400	8730	437.75	719.02		
15NOV90	0500	10700	56700	64800	8640	437.75	718.96		
15NOV90	0600	10600	56100	64300	8750	437.75	718.91		
15NOV90	0640							1600.83	Qin=15,000 cfs Qout=24,900 cfs Newhalem 490.12 (26,820 cfs). Evacuation proceeding as planned.
15NOV90	0700	10500	56400	63600	8550	437.75	718.87		
15NOV90	0800	10400	55800	63100	8640	437.75	718.82		
15NOV90	0900	10300	54000	62600	8570	437.79	718.75		



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15NOV90	0910								Corps calls SCL (Dave Bell 386-4278) to request change in evacuation procedure at Ross. Corps requested 4,500 cfs over inflow be passed at Ross or powerhouse capacity, whichever is greater. SCL agrees to change however may not implement until noon.
15 NOV90	0920								PSE advises Corps U/B 718.80. Qin 4,346. Qout 6,650. PSE would adjust discharge about noon to comply with Corps evacuation plan.
15NOV90	1000	10100	54700	62300	8750	437.78	718.71		
15NOV90	1100	9920	55000	61700	8730	437.78	718.65		
15NOV90	1200	9840	54900	61300	8700	437.81	718.6		
15NOV90	1300	9730	52900	60800	8230	437.82	718.54		
15NOV90	1400	9660	53900	60400	8490	437.82	718.47		
15NOV90	1500	9550	53500	59900	8530	437.82	718.41		
15NOV90	1600	9480	52800	59400	8660	437.82	718.36		
15NOV90	1700	9400	52100	59000	8590	437.81	718.3		
15NOV90	1800	9330	50900	58500	8570	437.8	718.24		
15NOV90	1900	9300	49100	58000	8510	437.79	718.19		
15NOV90	2000	9300	47500	57600	8530	437.78	718.13		
15NOV90	2100	9300	47300	57300	8490	437.77	718.07		
15NOV90	2200	9260	46500	56800	8510	437.75	718		
15NOV90	2300	9220	46700	56400	8490	437.74	717.93		
15NOV90	2400	9150	46200	55900	8490	437.72	717.89		
16NOV90	0100	9080	45900	55300	8550	437.71	717.82		



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16NOV90	0200	9040	45600	54800	8510	437.7	717.74		
16NOV90	0300	8940	45600	54200	8470	437.69	717.69		
16NOV90	0400	8830	45600	53600	8550	437.68	717.63		
16NOV90	0500	8730	45000	52900	8490	437.67	717.58		
16NOV90	0600	8690	45300	52400	8420	437.65	717.51		
16NOV90	0700	8620	45800	51900	8530	437.62	717.44		
16NOV90	0715								PSE contacts Corps. U/B 717.46. Qin 3,200 Qout 6,650. Passing inflow at L/B.
	0720							1599.52	Qin= 11,850 Qout=18,900
16NOV90	0800	8520	44800	51400	8490	437.61	717.38		
16NOV90	0900	8450	44700	51000	8640	437.6	717.31		
16NOV90	1000	8350	44600	50600	8510	437.58	717.25		
16NOV90	1100	8280	44600	50300	8530	437.57	717.19		
16NOV90	1200	8210	44400	50000	8440	437.55	717.13		
16NOV90	1300	8140	44000	49700	8510	437.53	717.06		
16NOV90	1400	8110	43200	49400	8420	437.52	717		
16NOV90	1500	8070	42400	49200	8400	437.5	716.93		
16NOV90	1600	8070	41900	48900	8400	437.49	716.87		
16NOV90	1700	8040	41700	48700	8360	437.47	716.8		
16NOV90	1800	8010	41800	48500	8490	437.45	716.73		
16NOV90	1900	8010	41300	48200	8470	437.44	716.67		
16NOV90	2000	7970	41300	48000	8400	437.42	716.61		
16NOV90	2100	7940	40400	47700	7000	437.41	716.55		
16NOV90	2200	7900	38500	47300	6960	437.41	716.51		



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16NOV90	2300	7870	38100	47000	6940	437.42	716.46		
16NOV90	2400	7870	37900	46700	6980	437.44	716.42		
17NOV90	0100	7840	38100	46400	6940	437.46	716.37		
17NOV90	0200	7800	37600	46100	7020	437.47	716.34		
17NOV90	0300	7770	37800	45700	6960	437.4967	716.31		
17NOV90	0400	7740	38400	45200	6920	437.53	716.27		
17NOV90	0500	7740	38600	44800	6980	437.56	716.24		
17NOV90	0600	7740	39700	44400	7810	437.58	716.2		
17NOV90	0700	7770	39700	44000	7860	437.58	716.17		
17NOV90	0800	7800	40000	44100	7840	437.58	716.12		
17NOV90	0900	7870	40100	43800	7940	437.6	716.06		
17NOV90	1000	8010	40000	43800	7880	437.64	716		
17NOV90	1100	8070	40000	43900	7880	437.68	715.89		
17NOV90	1200	8070	39800	44100	7900	437.72	715.84		
17NOV90	1300	8010	39600	44200	7980	437.75	715.79		
17NOV90	1400	7900	39400	44300	7960	437.78	715.7		
17NOV90	1500	7800	39300	44400	7980	437.82	715.61		
17NOV90	1600	7700	38900	44500	8020	437.84	715.54		
17NOV90	1700	7610	38400	44500	7980	437.86	715.47		
17NOV90	1800	7540	38400	44500	7980	437.88	715.41		
17NOV90	1900	7440	38400	44400	7920	437.88	715.35		
17NOV90	2000	7380	38100	44300	7980	437.88	715.28		
17NOV90	2100	7310	38000	44100	7980	437.88	715.19		
17NOV90	2200	7250	38100	43900	8050	437.88	715.13		



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17NOV90	2300	7150	38200	43700	8000	437.88	715.08		
17NOV90	2400	7090	38400	43500	8000	437.88	715.01		
18NOV90	0100	7030	38400	43400	8050	437.88	714.93		
18NOV90	0200	6960	38300	43200	8020	437.88	714.87		
18NOV90	0300	6870	38300	42900	7960	437.88	714.79		
18NOV90	0400	6840	38400	42700	7980	437.87	714.73		
18NOV90	0500	6780	38000	42500	7980	437.86	714.67		
18NOV90	0600	6720	38000	42400	7940	437.85	714.6		
18NOV90	0700	6660	37900	42400	7960	437.84	714.52		
18NOV90	0800	6600	37700	42300	7980	437.84	714.45		
18NOV90	0900	6540	36500	42200	8000	437.79	714.38		
18NOV90	1000	6480	36500	42200	7960	437.77	714.32		
18NOV90	1100	6420	36200	42000	7900	437.73	714.26		
18NOV90	1200	6330	35900	41900	7880	437.71	714.2		
18NOV90	1300	6270	34900	41600	7300	437.67	714.14		
18NOV90	1400	6240	33200	41500	5760	437.7	714.1		
18NOV90	1500	6180	35000	41200	7300	437.69	714.04		
18NOV90	1600	6150	34800	40900	7280	437.67	713.99		
18NOV90	1700	6120	34600	40600	7300	437.65	713.91		
18NOV90	1800	6090	34100	40300	6370	437.64	713.86		
18NOV90	1900	6070	33800	39900	6370	437.64	713.81		
18NOV90	2000	6040	33600	39500	6420	437.64	713.76		
18NOV90	2100	6010	33800	39200	6370	437.63	713.71		
18NOV90	2200	5950	33600	39000	6390	437.62	713.65		



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18NOV90	2300	5950	33400	38700	6350	437.61	713.6		
18NOV90	2400	5920	33300	38500	6350	437.6	713.54		
19NOV90	0100	5860	32800	38300	5490	437.6	713.5		
19NOV90	0200	5830	32500	38100	5510	437.6	713.44		
19NOV90	0300	5810	32300	37800	5490	437.61	713.4		
19NOV90	0400	5750	30500	37700	2860	437.7	713.35		
19NOV90	0500	5720	32000	37500	5530	437.74	713.29		
19NOV90	0600	5690	32200	37300	5570	437.75	713.22		
19NOV90	0700	5660	32500	37100	5550	437.76	713.17		
19NOV90	0800	5610	32000	36900	5530	437.78	713.13		
19NOV90	0900	5580	32300	36600	5470	437.8	713.07		
19NOV90	1000	5550	31900	36300	5380	437.81	713.01		
19NOV90	1010								Corps notifies SCL of Canadian officials that need to be notified incase Ross is going to exceed 1602.5. Mr. Robin Round (604-387-1183) and Mr. Kasianchuck (604-387-6989) SCL had already talked to Mr. Round. SCL suggested meeting with Corp to discuss surcharge operation at Ross. Corps agreed to meeting in near future.
19NOV90	1030								PSE advises Corp U/B 712.98. Qin 1500. Qout 4,550. Passing inflow at L/B.
19NOV90	1035							1595.59	Qin=6-7,000 Qout=14,713 The flood control rule curve elevation for November 20 <sup>th</sup> is 1595.6. Since project is below rule curve project released by Corps to resume normal operation.
19NOV90	1100	5520	32000	36100	5400	437.82	712.97		





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19NOV90	1200	5500	31900	36000	5380	437.83	712.92		
19NOV90	1300	5470	32200	35900	5360	437.84	712.87		
19NOV90	1400	5470	31900	35800	5340	437.85	712.82		
19NOV90	1500	5440	32000	35800	5360	437.86	712.78		
19NOV90	1600	5440	32000	35700	5400	437.88	712.73		
19NOV90	1700	5440	32000	35600	5400	437.89	712.69		
19NOV90	1800	5440	31600	35600	5400	437.9	712.63		
19NOV90	1900	5440	31500	35500	5360	437.92	712.57		
19NOV90	2000	5410	30700	35500	5400	437.94	712.53		
19NOV90	2100	5410	30000	35500	5360	437.94	712.45		
19NOV90	2200	5380	29800	35400	5420	437.95	712.41		
19NOV90	2300	5360	29900	35400	5400	437.95	712.37		
19NOV90	2400	5330	29800	35400	5420	437.96	712.33		
20NOV90	0100	5330	30100	35200	5360	437.96	712.29		
20NOV90	0200	5300	29900	35000	5400	437.96	712.24		
20NOV90	0300	5300	29700	34800	5380	437.97	712.19		
20NOV90	0400	5300	29700	34500	5380	437.97	712.14		
20NOV90	0500	5270	28800	34300	5400	437.97	712.09		
20NOV90	0600	5250	27600	34000	5380	437.97	712.03		
20NOV90	0700	5190	26300	33900	5420	437.97	711.99		
20NOV90	0750								PSE advises 0600 readings U/B 712.03 Qin 1,230. Qout 4,446. Anticipate being down to flood control pool in about 6 days.
20NOV90	0800	5170	25300	33800	5440	437.99	711.91		



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20NOV90	0835							1594.94	Corps advises SCL that weather forecast for Thursday indicates a significant potential for flooding. <b>Ross is about 3 feet above the normal flood control pool for winter conditions.</b> Even though Ross is not required to be at the lower elevation until the end of November Corps ask SCL if they would consider drafting to that elevation over the next 48 hours. SCL said they would ask their supervisors.
20NOV90	0840								Corps called PSE Bill Gaines and requested U/B to reach flood control pool by midnight Wednesday. Major storm system reaching the area by that time. Corp tells PSE to pass inflow and hold the flood control pool until notified by Corps to store above that level in case the inflows increase as a result of the expected rain.
20NOV90	0900	5140	24600	33600	5380	438	711.88		
20NOV90	0955								SCL advises Corps that they have tentatively agreed to draft as requested. Project discharge will be raised to 13,500 cfs. Final work will come from SCL later today.
20NOV90	1000	5110	23100	33500	4070	438.06	711.81		
20NOV90	1100	5060	25900	33100	5110	438.1	711.7		
20NOV90	1200	5030	26700	32700	5090	438.09	711.6		
20NOV90	1215							1594.84	Qin=5,625 Qout=15,300 SCL advises Corps project has increased discharge as requested.



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20NOV90	1220								PSE advises Corps U/B 709.70. Qin 2-3,000. Qout 7,231. Project has increased discharge as requested.
20NOV90	1300	5000	26900	32000	5070	438.07	711.49		
20NOV90	1400	4950	26600	31300	5110	438.05	711.4		
20NOV90	1500	4920	26300	30600	5070	438.04	711.31		
20NOV90	1600	4900	26400	30000	5040	438.03	711.22		
20NOV90	1700	4870	26100	29800	5090	438.02	711.09		
20NOV90	1800	4870	26300	29800	5020	438	711		
20NOV90	1900	4840	26000	29900	5070	437.97	710.88		
20NOV90	2000	4840	25800	30000	5050	437.95	710.78		
20NOV90	2100	4820	27300	30000	5070	437.92	710.68		
20NOV90	2200	4820	30200	29900	5050	437.91	710.59		
20NOV90	2300	4820	32000	29900	5040	437.89	710.5		
20NOV90	2400	4790	32900	29800	5020	437.87	710.39		
21NOV90	0100	4740	33300	29800	5020	437.85	710.3		
21NOV90	0200	4710	33300	29800	5020	437.83	710.19		
21NOV90	0300	4690	32900	30200	4950	437.82	710.08		
21NOV90	0400	4660	32500	31000	5020	437.8	709.97		
21NOV90	0500	4640	32600	32000	4960	437.78	709.88		
21NOV90	0600	4610	32500	32800	4960	437.75	709.77		
21NOV90	0700	4580	32500	33600	5000	437.72	709.67		



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21NOV90	0725							1593.83	Qin=6,275 Qout=11,534 SCL advises Corps that between 0000-0600 hours project discharge was dropped to an average of about 11,500 cfs. <b>This was not in agreement with previous understanding on draft rate.</b> Current discharge has been raised to 15,000 cfs.
21NOV90	0730								PSE advises Corps U/B <b>709.7</b> . Qin 1,600. Qout 7,063. Project evacuation continuing as requested.
21NOV90	0800	4560	32500	34100	5040	437.69	709.57		
21NOV90	0830								PSE, Bill Gaines contacts Corp to discuss weather forecast and project operation. PSE weather forecast same as Corps. PSE agrees to continue drafting of project.
21NOV90	0900	4560	32500	34500	5050	437.66	709.46		
21NOV90	0950								SCL called Corp to discuss weather forecast and project operation. He explained that while discharges were dropped to near 11,000 cfs the average daily discharge was 13,000± which was sufficient to draft as per agreement. They will continue to draft at current rate.
21NOV90	1000	4530	31900	34800	5040	437.65	709.37		
21NOV90	1100	4530	31000	34900	4980	437.63	709.26		
21NOV90	1200	4530	31000	34900	4950	437.6	709.16		



## 1990 FLOOD ANALYSIS--THE BIG PICTURE

DATE	TIME	SAUK <sup>1</sup>	CON.	MTV	B/R	SHANNON	BAKER	ROSS	CORPS FLOOD NOTES RE ROSS AND UPPER BAKER <sup>2</sup>
21NOV90	1210								Corps calls SCL to relay forecast river stages. Also requested that Ross continue to draft to November 30 <sup>th</sup> flood control pool. If inflows should rise requested SCL pass inflow and not store until requested to do by the Corps.
21NOV90	1300	4530	30900	35000	5020	437.58	709.07		
21NOV90	1400	4530	30600	35100	5050	437.56	708.95		
21NOV90	1500	4560	31000	35100	4950	437.54	708.87		
21NOV90	1600	4580	30800	35000	4980	437.52	708.77		
21NOV90	1700	4610	31100	34900	4960	437.51	708.68		
21NOV90	1800	4640	30900	34700	5050	437.5	708.59		
21NOV90	1850								PSE advises Corps U/B 708.60. Qin N/A. Qout 6,950. Corps requested PSE to pass inflow and not fill once flood control pool is reached unless he wants to draft further.
21NOV90	1900	4690	31000	34600	5040	437.49	708.51		
21NOV90	2000	4790	30900	34400	5040	437.48	708.42		
21NOV90	2100	4900	31200	34300	5020	437.47	708.33		
21NOV90	2200	5030	31100	34300	4890	437.46	708.23		
21NOV90	2300	5140	31700	34400	4950	437.45	708.14		
21NOV90	2400	5300	31500	34400	4930	437.45	708.05		
22NOV90	0100	5470	31400	34500	4930	437.47	707.97		
22NOV90	0200	5720	31700	34700	4960	437.49	707.87		



### 1990 FLOOD ANALYSIS--THE BIG PICTURE

DATE	TIME	SAUK <sup>1</sup>	CON.	MTV	B/R	SHANNON	BAKER	ROSS	CORPS FLOOD NOTES RE ROSS AND UPPER BAKER <sup>2</sup>
22NOV90	0230								PSE advises Corps U/B 707.83. Qin 2,000. Qout 6,900. PSE would "probably" continue to draft for awhile because they expect flows to increase.
22NOV90	0300	6090	31900	34900	5040	437.54	707.77		
22NOV90	0400	6780	33000	35100	5070	437.64	707.71		
22NOV90	0430							1592.46	Qin=12,975 Qout=15,600 SCL advises Corps that inflows are starting to rise and will soon equal outflow. Corps request SCL continue to draft as long as inflows permit and then pass inflow to maintain pool level. SCL stated they would spill as needed.
22NOV90	0440								PSE advises Corps U/B 707.7. Qin N/A. Qout 6,895. U/B started to rise again. Corps wanted to know if they could hold at 707.9 until Corps needed to store water. PSE says no problem. Spill gates can be opened with 5 minutes notice. L/B is at 437.6 and slowly filling from local runoff. PSE will probably store some of spill from U/B into L/B.
22NOV90	0500	7670	33800	35300	5130	437.7	707.66		
22NOV90	0600	8520	35100	35600	5050	437.78	707.62		
22NOV90	0700	9510	37100	36000	5070	437.86	707.61		
22NOV90	0800	10500	38800	36600	5160	437.95	707.58		
22NOV90	0900	11600	40800	37300	5130	438.02	707.56		
22NOV90	1000	13000	45000	38500	7730	438.02	707.56		



### 1990 FLOOD ANALYSIS--THE BIG PICTURE

DATE	TIME	SAUK <sup>1</sup>	CON.	MTV	B/R	SHANNON	BAKER	ROSS	CORPS FLOOD NOTES RE ROSS AND UPPER BAKER <sup>2</sup>
22NOV90	1030							1592.2	Qin=8,575 (6 hr average) Qout=15,285 Corps request SCL reduce Ross outflow to 5,000 cfs because Concrete expected to reach 90,000 cfs by 1500 today. SCL will reduce Ross to 10,000 cfs at 1100 and 7,000 cfs at 1200 and 5,000 cfs at 1300. Pondage at Ross and Diablo would be used to reduce Newhalem y about 10,000 cfs to reflect a 10,000 cfs reduction at Ross.
22NOV90	1040								PSE advises Corps U/B <b>707.57</b> Qin 6,875. Qout 6,815. Corps advises PSE Concrete will reach 90,000 cfs by 1500. Requested PSE to reduce U/B outflow to powerhouse maximum capacity until further notice. <b>PSE agrees indicating reduction would be made at 1100 hours with equal reduction in L/B.</b>
22NOV90	1100	14100	47500	39700	7670	437.98	707.55		
22NOV90	1200	15000	49200	41100	6400	437.91	707.54		
22NOV90	1300	15700	51000	42500	6400	437.86	707.54		
22NOV90	1400	16200	52400	43800	6350	437.78	707.55		
22NOV90	1500	16500	53000	45300	5130	437.75	707.6		
22NOV90	1600	16800	53000	46700	5070	437.75	707.61		
22NOV90	1700	17200	53600	48000	5130	437.75	707.63		
22NOV90	1800	18300	53100	49300	5070	437.74	707.66		
22NOV90	1900	20600	52600	50500	5230	437.74	707.72		
22NOV90	2000	21800	52200	51600	5110	437.78	707.78		
22NOV90	2100	22800	52800	52600	5250	437.83	<b>707.85</b>		



### 1990 FLOOD ANALYSIS--THE BIG PICTURE

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22NOV90	2130								Corps contacts PSE. U/B 707.89. Qin 8,300. Qout 4,795. Weather and streamflow forecast not very definitive as to when Concrete will reach 90,000 cfs. Considering they reached minimum flood control pool (707.9) and uncertain forecast and that inflow only slightly exceeds outflow L. Merkle of Corps tells PSE to hold U/B outflow to 5,000 cfs.
	2130							1592.15	Corps contacts SCL. Qin=8,575 Qout=4,498 Weather forecast not very definitive as to when Concrete will reach 90,000 cfs. Considering that we are essentially at minimum winter flood pool level (1592.1) and uncertain forecasts and that inflow only slightly exceeds outflow, Merkle of Corps tells SCL to maintain outflow at 5,000 cfs.
22NOV90	2200	23800	54500	53500	5220	437.88	707.94		
22NOV90	2300	24400	55700	54500	5250	437.93	708.03		
22NOV90	2400	24800	56900	55300	5660	437.99	708.14		
23NOV90	0100	25200	57900	56200	5800	438.05	708.26		
23NOV90	0200	25500	58900	57100	5820	438.11	708.4		
23NOV90	0300	25900	60200	57700	7560	438.09	708.56		
23NOV90	0400	26300	62400	58500	7670	438.07	708.69		
23NOV90	0500	26600	63200	59200	7630	438.02	708.81		
23NOV90	0600	26800	64200	59900	7540	437.97	708.95		
23NOV90	0700	26900	65600	60600	7460	437.87	709.1		
23NOV90	0800	26800	65500	61400	7480	437.77	709.23		





**1990 FLOOD ANALYSIS--THE BIG PICTURE**

DATE	TIME	SAUK <sup>1</sup>	CON.	MTV	B/R	SHANNON	BAKER	ROSS	CORPS FLOOD NOTES RE ROSS AND UPPER BAKER <sup>2</sup>
23NOV90	0900	26400	65000	62300	7520	437.69	709.35		
23NOV90	1000	25600	65500	63000	7380	437.6	709.49		
23NOV90	1100	24500	64500	63700	7380	437.5	709.64		
23NOV90	1200	23800	64200	64400	7480	437.44	709.77		
23NOV90	1300	23500	63900	65200	7180	437.35	709.93		
23NOV90	1400	23500	59900	65800	4070	437.48	710.15		
23NOV90	1500	23900	61300	66500	6400	437.47	710.39		
23NOV90	1600	24400	63100	67000	6420	437.5	710.68		
23NOV90	1700	25100	64100	67600	6540	437.55	710.98		
23NOV90	1800	27100	65700	68200	6480	437.64	711.35		
23NOV90	1900	30800	68600	68800	6580	437.8	711.74		
23NOV90	2000	35000	71700	69300	7480	437.95	712.16		
23NOV90	2100	39100	78500	69900	9340	438.05	712.58		
23NOV90	2200	42700	85700	70300	12500	438.01	713		
23NOV90	2300	46000	92100	71100	12500	437.92	713.43		
23NOV90	2400	49000	97000	71600	12700	437.85	713.82		
24NOV90	0100	52000	101000	72500	11300	437.8	714.21		
24NOV90	0125							1594.44	Qin=30,125 cfs Qout=3,971. Corps calls SCL to get hourly data. Notices that releases from Ross have been fluctuating somewhat below 5,000 cfs. SCL says they were adjusting outflow to control spill at Diablo and Gorge. Corps request SCL to keep flows close to 5000 cfs. Forecast is for Ross to reach 1602 by tomorrow night assuming 5,000 cfs output.



### 1990 FLOOD ANALYSIS--THE BIG PICTURE

DATE	TIME	SAUK <sup>1</sup>	CON.	MTV	B/R	SHANNON	BAKER	ROSS	CORPS FLOOD NOTES RE ROSS AND UPPER BAKER <sup>2</sup>
24NOV90	0200	54700	106000	73600	11700	437.77	714.56		
24NOV90	0300	56600	112000	74600	10700	437.76	714.93		
24NOV90	0400	58400	115000	75900	11200	437.75	715.25		
24NOV90	0500	59900	117000	77300	11300	437.746	715.57		
24NOV90	0600	61300	122000	78700	11900	437.742	715.88		
24NOV90	0700	62300	125000	80600	12600	437.73	716.15		
24NOV90	0800	63300	129000	83600	13200	437.7	716.39		
24NOV90	0900	64300	131000	85800	13700	437.66	716.62		
24NOV90	1000	65500	132560	88700	13900	437.62	716.86		
24NOV90	1100	72500	134780	92000	14300	437.6	717.04		
24NOV90	1200	74500	137000	94900	14600	437.58	717.26		
24NOV90	1300	75800	141000	97500	15900	437.54	717.48		
24NOV90	1400	78000	142000	99900	16500	437.43	717.68		
24NOV90	1500	80600	143000	102000	16600	437.35	717.87		
24NOV90	1600	81000	142000	106000	16500	437.22	718.05		
24NOV90	1615								<p>Corps advises PSE they have been holding U/B outflow at 5,000 cfs since about 1600 hours 22NOV90. At 1400 hours today asked PSE to cutback L/B to get outflow to equal inflow.</p> <p>1400 Qout= 14,074      Qin=10,618            1500 Qout=14,317      Qin=13,216            1600 Qout=13,080      Qin=9,629            1700 Qout=13,080      Qin=12,288</p>
24NOV90	1700	80800	143000	109000	16200	437.1	718.22		



**1990 FLOOD ANALYSIS--THE BIG PICTURE**

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24NOV90	1800	81600	145000	114000	16400	436.98	718.41		
24NOV90	1900	81100	146000	117500	15200	436.91	718.6		
24NOV90	2000	80200	145000	121000	15900	436.88	718.73		
24NOV90	2100	79900	143000	124500	15100	436.85	718.89		
24NOV90	2200	78300	144000	128000	15300	436.83	719.07		
24NOV90	2300	74500	143000	131000	15000	436.79	719.22		
24NOV90	2400	72200	142000	134000	14500	436.74	719.37		
25NOV90	0100	70600	141000	138000	13500	436.69	719.49		
25NOV90	0200	68900	139000	140500	13100	436.63	719.58		
25NOV90	0300	65700	134000	143000	11000	436.62	719.66		
25NOV90	0400	55700	131000	145000	9950	436.63	719.76		
25NOV90	0500	51800	125000	147000	8880	436.645	719.85		
25NOV90	0600	48600	121000	149000	7840	436.66	719.91		
25NOV90	0700	45600	117000	151000	6840	436.68	719.96		
25NOV90	0800	42600	112000	151330	6250	436.68	720.04		
25NOV90	0900	40100	107000	151670	5660	436.69	720.08		
25NOV90	1000	37800	102000	152000	5270	436.69	720.14		
25NOV90	1100	35800	96900	151500	5090	436.69	720.17		
25NOV90	1200	34000	93300	151000	4930	436.69	720.22		
25NOV90	1300	32500	89100	150000	4820	436.69	720.23		
25NOV90	1400	31100	86000	149000	4770	436.69	720.26		
25NOV90	1500	29800	83600	147000	4640	436.67	720.28		
25NOV90	1600	28400	80500	145000	4710	436.66	720.31		
25NOV90	1700	27300	77800	142000	4570	436.64	720.33		



### 1990 FLOOD ANALYSIS--THE BIG PICTURE

DATE	TIME	SAUK <sup>1</sup>	CON.	MTV	B/R	SHANNON	BAKER	ROSS	CORPS FLOOD NOTES RE ROSS AND UPPER BAKER <sup>2</sup>
25NOV90	1800	26000	76100	139000	4640	436.63	720.34		
25NOV90	1900	24900	71900	136000	1720	436.53	720.4		
25NOV90	2000	23900	71100	133000	4530	436.43	720.46		<p>PSE advises Corps U/B 720.5. Qin=5,812. L/B Qin=1,920. At 2000 a transmission line problem in lower Skagit caused both power plants to trip offline. Power plants are expected back online by 2100 hours. Corps requested PSE maintain powerhouse outflow at U/B until tomorrow when guidance on evacuating storage would be issued. Didn't expect to begin drafting until noon tomorrow and didn't expect to begin drafting until Concrete reached 28 feet.</p> <p>SCL advises Corps Ross Qin=15,775. Qout=10,577 cfs. Pool is filling .03 to .04 feet per hour and about 2 to 3 remaining below NFP. Corps instructs SCL to maintain 15,000 cfs or less at the Newhalem gage until tomorrow morning. Wanted to maintain 15,000 cfs flow until Concrete recedes below 28 feet sometime tomorrow. Guidance on evacuation would be issued then.</p>
25NOV90	2100	22900	69000	129000	3460	436.38	720.5		
25NOV90	2200	22000	67100	125000	3380	436.29	720.55		
25NOV90	2300	21200	65300	121000	2480	436.26	720.57		
25NOV90	2400	20200	63500	117000	2480	436.26	720.61		
26NOV90	0100	19500	62000	114000	2460	436.26	720.62		
26NOV90	0200	18800	59900	110000	1690	436.29	720.64		



### 1990 FLOOD ANALYSIS--THE BIG PICTURE

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26NOV90	0300	18100	58200	106000	1670	436.245	720.65		
26NOV90	0400	17400	57500	102000	1690	436.39	720.66		
26NOV90	0500	16900	56300	99000	1690	436.42	720.67		
26NOV90	0600	16200	55800	95600	1690	436.47	720.69		
26NOV90	0700	15600	54300	92400	1670	436.55	720.7		
26NOV90	0800	15100	53600	89200	1670	436.58	720.7		

### INTERESTING NOTES IN CORP UPPER BAKER LOG BOOK

12/5/89: 2 gates (U/B) were opened 6 feet to provide approx. 5,600 cfs in addition to 5,200 powerhouse cfs. U/B 711.44 L/B 436.22.

12/6/89: Bill Gaines called inquiring about the possibility of eliminating spill at U/B and gradually drafting the one foot of excess storage by using the generators exclusively. Corps approved following plan:

1. Pool may be a maximum of 1 foot above the flood control pool.
2. All excess water is to be drafted out by 0600 Monday December 11.

11/23/94: Called Bill Gaines and alerted him that U/B had been above the flood control rule curve since 15 November. He promised to get action taken to bring it below the curve. Upper Baker at 708.28 on 22 November.