

APPENDIX A.

Summary of streamflow data collected during five seepage studies and streamflow gain and loss estimates for the lower reach of the Snake River, between the near Minidoka and at King Hill gaging stations, Idaho, March 2001 through November 2002

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Table A1. Estimates of streamflow gains and losses in specified subreaches of the Snake River between the near Minidoka and at King Hill gaging stations, Idaho, March 5-6, 2001

[ft³/s, cubic feet per second; mi, mile; ---, no data; estimated gain/loss presented across from the downstream site; values in **boldface** are statistically significant]

Site number (see figure 3)	Gaging-station name (number) or intermediate measurement site	River mile		Discharge (ft ³ /s)	Date	Time	Total gain or (loss) (ft ³ /s)	Gain or (loss) per mile (ft ³ /s/mi)
L1	Snake River near Minidoka (13081500)	673.5		595	3/5/2001	2230		
			total estimated inflow	0				
			total estimated outflow	0				
L2	Snake River at Highway 77(25), near Rupert	664.0		¹ ---	---	---	---	---
			total estimated inflow	0				
			total estimated outflow	0				
			estimated outflow to storage in Milner Lake ²	0				
L3	Snake River at Highway 27, at Burley	651.6		³ ---	---	---	---	---
			total estimated inflow	5				
			total estimated outflow	0				
			estimated outflow to storage in Milner Lake ²	0				
L4	Snake River at Milner (13088000)	638.7		644	3/6/2001	1530	44	1
				636	3/5/2001	0730		
			total estimated inflow	0				
			total estimated outflow	0				
L5	Snake River above Murtaugh Bridge, near Murtaugh	630.5		610	3/5/2001	1140	(26)	(3)
			total estimated inflow	0				
			total estimated outflow	0				
L6	Snake River near Kimberly (13090000)	617.2		884	3/5/2001	1800	274	21
				892	3/5/2001	1330		
			total estimated inflow	0				
			total estimated outflow	0				
L7	Snake River above Shoshone Falls, near Kimberly	615.2		890	3/5/2001	1425	(2)	(1)
			total estimated inflow	0				
			total estimated outflow	0				
L8	Snake River below Perrine Bridge, at Twin Falls	611.0		950	3/5/2001	1610	60	14
			total estimated inflow	57				
			total estimated outflow	0				

Table A1. Estimates of streamflow gains and losses in specified subreaches of the Snake River between the near Minidoka and at King Hill gaging stations, Idaho, March 5-6, 2001--Continued

Site number (see figure 3)	Gaging-station name (number) or intermediate measurement site	River mile		Discharge (ft ³ /s)	Date	Time	Total gain or (loss) (ft ³ /s)	Gain or (loss) per mile (ft ³ /s/mi)
L9	Snake River above Crystal Springs, near Buhl	601.1		1540	3/6/2001	0845	533	54
			total estimated inflow	33				
			total estimated outflow	0				
L10	Snake River near Buhl (13094000)	596.8		1900	3/6/2001	1045	327	76
			total estimated inflow	1890	3/6/2001	0915		
			total estimated outflow	0				
L11	Snake River below Clear Lakes outlet, near Buhl	592.8		2510	3/6/2001	1115	620	155
			total estimated inflow	0				
			total estimated outflow	0				
L12	Snake River above Banbury Springs, near Hagerman	589.2		2870	3/5/2001	1156	360	100
			total estimated inflow	125				
			total estimated outflow	0				
L13	Snake River above Thousand Springs, near Hagerman	585.6		3640	3/5/2001	1031	645	179
			total estimated inflow	0				
			total estimated outflow	0				
L14	Snake River below Thousand Springs, near Hagerman	582.9		4930	3/5/2001	0911	1,290	478
			total estimated inflow	72				
			total estimated outflow	0				
L15	Snake River above Lower Salmon Falls Power Plant, near Bliss	576.8		5470	3/6/2001	1151	468	77
			total estimated inflow	30				
			total estimated outflow	0				
			estimated outflow to storage above Lower Salmon Falls Power Plant ⁴	0				
L16	Snake River below Lower Salmon Falls, near Hagerman (13135000)	572.5		5590	3/6/2001	1800	90	21
				5460	3/5/2001	1230		
			total estimated inflow	1304				
			total estimated outflow	0				
L17	Snake River above Bliss Dam, near Bliss	564.9		6630	3/5/2001	1618	(134)	(18)
			total estimated inflow	0				

Table A1. Estimates of streamflow gains and losses in specified subreaches of the Snake River between the near Minidoka and at King Hill gaging stations, Idaho, March 5-6, 2001--Continued

Site number (see figure 3)	Gaging-station name (number) or intermediate measurement site	River mile	Discharge (ft ³ /s)	Date	Time	Total gain or (loss) (ft ³ /s)	Gain or (loss) per mile (ft ³ /s/mi)
			total estimated outflow			0	
			estimated outflow to storage above Bliss Dam ⁴			60	
L18	Snake River below Bliss Dam, near Bliss (13153776)	559.1	6600	3/5/2001	1930	30	5
			6880	3/5/2001	1030		
			total estimated inflow			0	
			total estimated outflow			0	
L19	Snake River above Bancroft Springs, near King Hill	553.2	7010	3/5/2001	1326	130	22
			total estimated inflow			10	
			total estimated outflow			0	
L20	Snake River at King Hill (13154500)	546.6	7090	3/5/2001	1630	70	11

¹ Discharge was not measured because of river or weather conditions.

² Estimate based on reservoir-stage data (USGS station number 13087900).

³ Discharge was measured but not used in the calculations because of questionable accuracy (see table A3).

⁴ Estimate based on reservoir-stage data (Idaho Power Company).

Table A2. Discharge data from gaging stations along the Snake River between near Minidoka and at King Hill, Idaho, March 5-6, 2001

[ft³/s, cubic feet per second]

Site number (see figure A5)	Gaging-station name (number)	Date	Time	Discharge (ft ³ /s)
L1	Snake River near Minidoka (13081500)	3/5/2001	2230	595
L4	Snake River at Milner (13088000)	3/6/2001 3/5/2001	1530 0730	644 636
L6	Snake River near Kimberly (13090000)	3/5/2001 3/5/2001	1800 1330	884 892
L10	Snake River near Buhl (13094000)	3/6/2001 3/6/2001	1045 0915	1900 1890
L16	Snake River below Lower Salmon Falls, near Hagerman (13135000)	3/6/2001 3/5/2001	1800 1230	5590 5460
L18	Snake River below Bliss Dam, near Bliss (13153776)	3/5/2001 3/5/2001	1930 1030	6600 6880
L20	Snake River at King Hill (13154500)	3/5/2001	1630	7090

Table A3. Discharge data from acoustic Doppler measurements along the Snake River between the near Minidoka and at King Hill gaging stations, Idaho, March 5-6, 2001

[ft³/s, cubic feet per second; COV, coefficient of variation; σ , standard deviation; μ , mean; ---, no data]

Site number (see figure		Date	Time	Discharge (ft ³ /s)	COV (σ/μ)
A5)	Intermediate measurement site				
L2	Snake River at Highway 77(25), near Rupert	---	---	¹ ---	---
L3	Snake River at Highway 27, at Burley	3/6/2001	0920	² 869	0.04
L5	Snake River above Murtaugh Bridge, near Murtaugh	3/5/2001	1140	610	.08
L7	Snake River above Shoshone Falls, near Kimberly	3/5/2001	1425	890	.09
L8	Snake River below Perrine Bride, at Twin Falls	3/5/2001	1610	950	.14
L9	Snake River above Crystal Springs, near Buhl	3/6/2001	0845	1540	.05
L11	Snake River below Clear Lakes outlet, near Buhl	3/6/2001	1115	2510	.12
L12	Snake River above Banbury Springs, near Hagerman	3/5/2001	1156	2870	.02
L13	Snake River above Thousand Springs, near Hagerman	3/5/2001	1031	3640	.04
L14	Snake River below Thousand Springs, near Hagerman	3/5/2001	0911	4930	.01
L15	Snake River above Lower Salmon Falls Power Plant, near Bliss	3/6/2001	1151	5470	.01
L17	Snake River above Bliss Dam, near Bliss	3/5/2001	1618	6630	.04
L19	Snake River above Bancroft Springs, near King Hill	3/5/2001	1326	7010	.04

¹ Discharge was not measured because of shallow depths and limited access.

² Accuracy is questionable because of backwater effects and very slow velocities.

Table A4. Discharge data for all inspected inflow and outflow sites along the Snake River between the near Minidoka and at King Hill gaging stations, Idaho, March 2-12, 2001

[Latitude and longitude in degrees, minutes, seconds referenced in North American Datum of 1983; ft³/s, cubic feet per second; site numbers shown in figure A5; ---, no data; DM, daily mean discharge; values in shaded areas indicate canal withdrawals]

Inspection site name	Gaging-station number	Location		Date	Time	Discharge (ft ³ /s)
		Latitude	Longitude			
Subreach between site numbers L1 and L2						
F Drain near Declo	13082060	42 32 48	113 37 14	3/5/2001	---	0
D-3 Drain near Declo	13082032	42 36 49	113 36 10	3/5/2001	---	0
Subreach between site numbers L2 and L3						
D-5 Drain near Rupert	13082062	42 33 15	113 38 38	3/5/2001	---	---
D-4 Drain near Rupert	13082064	42 34 15	113 38 25	3/5/2001	---	0
Marsh Creek near Declo	13082320	42 31 26	113 40 02	3/5/2001	---	¹ ---
Spring Creek near Declo	13082330	42 31 01	113 41 03	3/5/2001	---	¹ ---
D-16 Drain near Heyburn	13084705	42 32 30	113 45 24	3/5/2001	---	0
Subreach between site numbers L3 and L4						
B Drain near Heyburn	13084707	42 33 33	113 47 01	3/5/2001	---	0
D-17 Drain near Heyburn	13085060	42 32 53	113 50 51	3/5/2001	---	0
Main Drain North near Heyburn	13085065	42 33 02	113 51 59	3/5/2001	1200	5
G Drain near Burley	13085070	42 31 56	113 53 12	3/5/2001	---	---
J Drain near Burley	13085080	42 31 53	113 53 29	3/5/2001	---	---
A&B Irrigation Pump near Milner	13085500	42 32 01	113 56 51	3/5/2001	DM	0
PA Lateral Pump near Milner	13085800	42 32 02	113 58 19	3/5/2001	DM	0
Milner Irrigation Pump near Milner	13086000	42 31 10	114 00 38	3/5/2001	DM	0
Northside A Lateral near Milner	13086510	42 32 17	114 02 40	3/5/2001	DM	0
Northside Crosscut Canal near Milner	13086520	42 33 31	114 03 08	3/5/2001	DM	0
Milner-Gooding Canal near Milner	13086530	42 33 39	114 02 59	3/5/2001	DM	0
North Side Main Canal near Milner	13087000	42 31 46	114 01 10	3/5/2001	DM	0
Twin Falls Main Canal near Milner	13087500	42 31 18	114 01 03	3/5/2001	DM	0
Subreach between site numbers L4 and L5						
---	---	---	---	---	---	---
Subreach between site numbers L5 and L6						
Miscellaneous agriculture return near Hansen	13089690	42 33 55	114 19 24	3/5/2001	---	0
Twin Falls Coulee near Hansen	13089695	42 34 11	114 20 32	3/5/2001	---	0
Devil's Washbowl Spring near Kimberly	13089600	42 35 18	114 20 45	3/12/2001	1015	¹ 12.8
Subreach between site numbers L6 and L7						
Devil's Corral Springs near Kimberly	13090100	42 35 38	114 21 55	3/6/2001	0850	¹ 37.4
Subreach between site numbers L7 and L8						
Fish Hatchery Waste O near Twin Falls	13090370	42 35 31	114 26 05	3/5/2001	---	---
Mary Alice Lake discharge near Twin Falls	---	42 35 46	114 26 51	3/5/2001	---	---
Subreach between site numbers L8 and L9						
Perrine Coulee near Twin Falls	13090460	42 35 53	114 28 20	3/5/2001	---	¹ 2.4
Blue Lakes Outlet near Twin Falls	13091500	42 36 30	114 28 34	3/7/2001	---	¹ 195
Warm Creek near Twin Falls	13091700	42 37 15	114 29 55	3/5/2001	1200	20
Rock Creek above Highway 30/93 at Twin Falls	² 13092747	42 33 47	114 29 42	3/6/2001	DM	37
Jerome Golf Course Drain 1	13091733	42 38 03	114 31 02	3/5/2001	---	0
Miscellaneous agriculture return near Twin Falls	---	42 37 21	114 33 23	3/5/2001	---	0
Sonnicksen Drain near Twin Falls	13093150	42 38 40	114 33 26	3/5/2001	---	0
Miscellaneous agriculture return near Twin Falls	---	42 38 23	114 33 32	3/5/2001	---	0
Miscellaneous agriculture return near Twin Falls	---	42 37 36	114 34 29	3/5/2001	---	0
Sucker Flat Drain near Filer	13093190	42 38 25	114 35 30	3/5/2001	---	0
Miscellaneous agriculture return near Filer	---	42 37 51	114 35 41	3/5/2001	---	0
Miscellaneous agriculture return near Filer	---	42 38 54	114 36 58	3/5/2001	---	0

Table A4. Discharge data for all inspected inflow and outflow sites along the Snake River between the near Minidoka and at King Hill gaging stations, Idaho, March 2-12, 2001--Continued

Inspection site name	Gaging-station number	Location		Date	Time	Discharge (ft ³ /s)
		Latitude	Longitude			
Subreach between site numbers L9 and L10						
Miscellaneous agriculture return near Filer	---	42 39 17	114 38 16	3/5/2001	---	---
Crystal Springs near Filer	13093400	42 39 36	114 38 32	3/8/2001	1245	¹ 487
Cedar Draw near Filer	13093550	42 39 13	114 39 15	3/5/2001	---	33
Miscellaneous agriculture return near Buhl	---	42 39 31	114 40 42	3/5/2001	---	0
Waste I near Buhl	13093900	42 39 33	114 41 28	3/5/2001	---	0
Subreach between site numbers L10 and L11						
Miscellaneous agriculture return near Buhl	---	42 40 03	114 43 10	3/6/2001	---	0
Miscellaneous agriculture return near Buhl	---	42 40 07	114 44 18	3/6/2001	---	0
J8 Drain near Buhl	---	42 40 27	114 44 27	3/6/2001	---	0
Clear Lakes Outlet near Buhl	13094500	42 40 01	114 46 45	3/8/2001	1240	¹ 471
Subreach between site numbers L11 and L12						
Mud Creek near Buhl	13094700	42 39 33	114 47 20	3/6/2001	---	³ 20
Deep Creek near Buhl	---	42 39 29	114 48 38	3/6/2001	---	³ 0
Briggs Creek Spring near Buhl	13095200	42 40 20	114 49 00	3/9/2001	1415	¹ 104
Subreach between site numbers L12 and L13						
Irrigation Ditch to Blind Canyon near Buhl	13095490	42 42 28	114 47 30	3/6/2001	---	---
South Coulee (Cedar Draw) near Buhl	13095360	42 41 46	114 48 19	3/6/2001	---	---
Box Canyon Springs near Wendell	² 13095500	42 42 29	114 48 35	3/2/2001	1720	¹ 356
Blind Canyon Spring near Buhl	13095400	42 42 12	114 49 20	3/5/2001	1305	¹ 10.1
Unnamed Spring near Buhl	13095350	42 41 51	114 49 21	3/5/2001	1225	¹ 2.7
Salmon Falls Creek near Hagerman	² 13108150	42 41 47	114 51 15	3/5/2001	DM	125
Subreach between site numbers L13 and L14						
Sand Springs near Hagerman	13132600	42 43 36	114 50 00	3/5/2001	1115	¹ 70.9
Drain near Bickel Springs near Hagerman	13133785	42 45 28	114 50 48	3/5/2001	---	---
Bickel Spring near Hagerman	13132790	42 45 29	114 51 19	3/5/2001	1405	¹ 15.8
Subreach between site numbers L14 and L15						
Riley Creek near Hagerman	13133800	42 45 50	114 51 40	3/5/2001	1430	72
Subreach between site numbers L15 and L16						
Billingsly Creek near Hagerman	13134600	42 46 44	114 51 22	3/6/2001	1310	30
Subreach between site numbers L16 and L17						
W Drain near Tuttle	13152895	42 51 50	114 51 58	3/6/2001	---	---
Birch Creek near Hagerman	13135100	42 51 10	114 53 30	3/6/2001	1110	11
Malad Power Flume near Bliss	² 13152940	42 51 54	114 53 11	3/2/2001	1115	1190
Malad River near Bliss	² 13153500	42 51 48	114 54 04	3/2/2001	1335	103
Subreach between site numbers L17 and L18						
Tuana Gulch near Bliss	---	42 54 34	115 00 02	3/6/2002	---	0
Irrigation Ditch near Bliss	13152450	42 55 56	115 00 19	3/6/2002	---	0
Subreach between site numbers L18 and L19						
---	---	---	---	---	---	---
Subreach between site numbers L19 and L20						
Clover Creek near Bliss	13154000	43 01 30	115 00 20	3/6/2001	---	10

¹ Streamflow resulting from spring discharge; not used in calculation of gain/loss estimates.

² Long-term United States Geological Survey or Idaho Power Company gaging station.

³ Combined spring discharge and agriculture return flows; springflow was subtracted from field-measured value to obtain an approximate agriculture return-flow value.

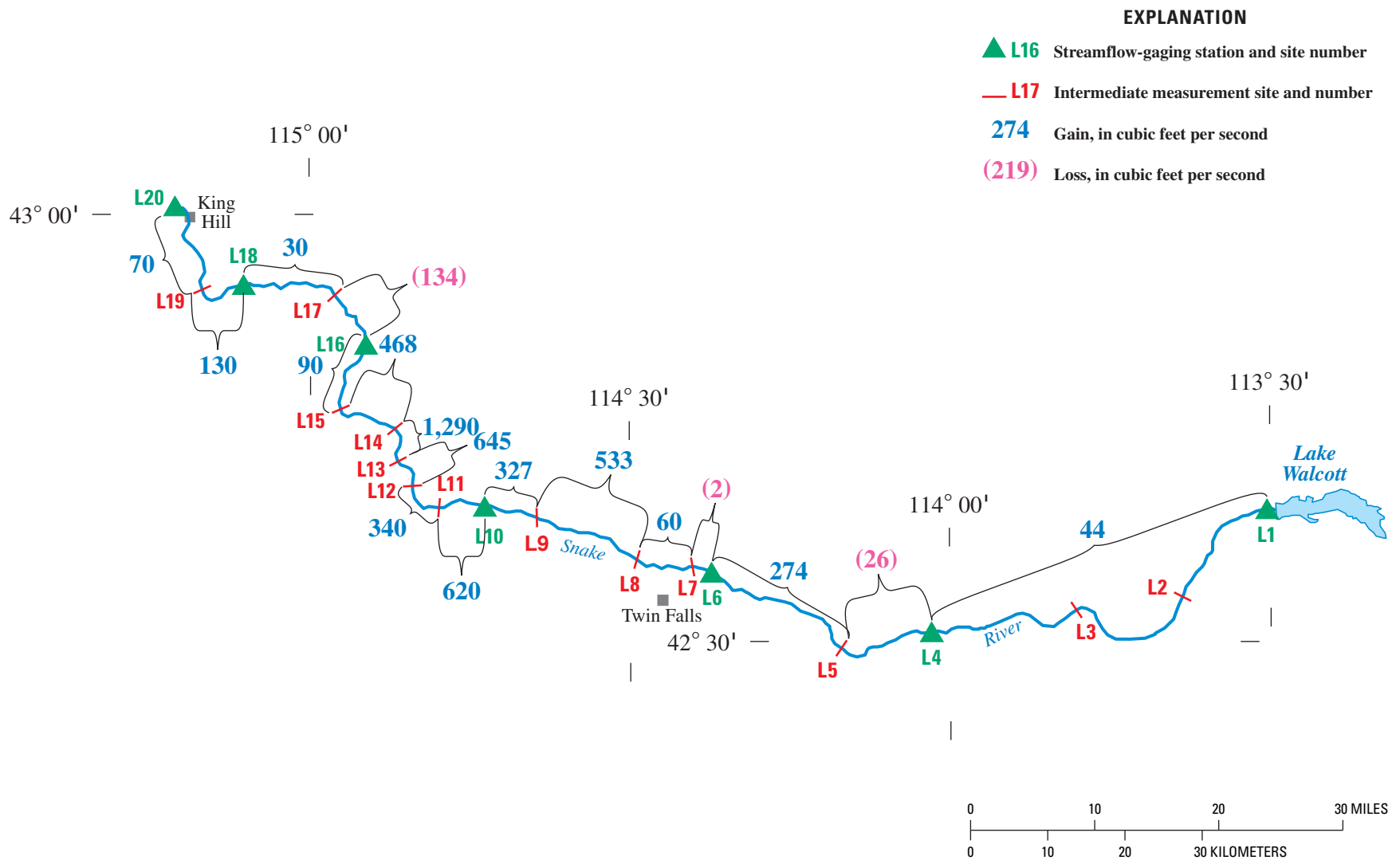


Figure A5. Streamflow gains and losses along the lower reach of the Snake River, between the near Minidoka and at King Hill gaging stations, southeastern Idaho, March 5–6, 2001.

Table A6. Estimates of streamflow gains and losses in specified subreaches of the Snake River between the near Minidoka and at King Hill gaging stations, Idaho, November 5-7, 2001

[ft³/s, cubic feet per second; mi, mile; ---, no data; estimated gain/loss presented across from the downstream site; values in **boldface** are statistically significant]

Site number (see figure 3)	Gaging-station name (number) or intermediate measurement site	River mile		Discharge (ft ³ /s)	Date	Time	Total gain or (loss) (ft ³ /s)	Gain or (loss) per mile (ft ³ /s/mi)
L1	Snake River near Minidoka (13081500)	673.5		570	11/5/2001	0630		
			total estimated inflow	0				
			total estimated outflow	0				
L2	Snake River at Highway 77(25), near Rupert	664.0		574	11/5/2001	1100	4	0
			total estimated inflow	0				
			total estimated outflow	0				
			estimated outflow to storage in Milner Lake ¹	0				
L3	Snake River at Highway 27, at Burley	651.6		605	11/5/2001	1300	31	3
			total estimated inflow	25				
			total estimated outflow	0				
			estimated outflow to storage in Milner Lake ¹	0				
L4	Snake River at Milner (13088000)	638.7		635	11/5/2001	2300	5	0
				622	11/5/2001	1015		
			total estimated inflow	0				
			total estimated outflow	0				
L5	Snake River above Murtaugh Bridge, near Murtaugh	630.5		694	11/5/2001	1411	72	9
			total estimated inflow	0				
			total estimated outflow	0				
L6	Snake River near Kimberly (13090000)	617.2		899	11/5/2001	2030	205	15
				969	11/7/2001	1545		
			total estimated inflow	0				
			total estimated outflow	0				
L7	Snake River above Shoshone Falls, near Kimberly	615.2		1120	11/7/2001	1640	151	76
			total estimated inflow	30				
			total estimated outflow	0				
L8	Snake River below Perrine Bridge, at Twin Falls	611.0		1250	11/7/2001	1530	100	24
			total estimated inflow	143				
			total estimated outflow	0				

Table A6. Estimates of streamflow gains and losses in specified subreaches of the Snake River between the near Minidoka and at King Hill gaging stations, Idaho, November 5-7, 2001--Continued

Site number (see figure 3)	Gaging-station name (number) or intermediate measurement site	River mile		Discharge (ft ³ /s)	Date	Time	Total gain or (loss) (ft ³ /s)	Gain or (loss) per mile (ft ³ /s/mi)
L9	Snake River above Crystal Springs, near Buhl	601.1		1700	11/7/2001	1340	307	31
			total estimated inflow	84				
			total estimated outflow	0				
L10	Snake River near Buhl (13094000)	596.8		2380	11/7/2001	1545	596	139
				2300	11/6/2001	1130		
			total estimated inflow	0				
			total estimated outflow	0				
L11	Snake River below Clear Lakes outlet, near Buhl	592.8		2920	11/6/2001	1335	620	155
			total estimated inflow	0				
			total estimated outflow	0				
L12	Snake River above Banbury Springs, near Hagerman	589.2		2810	11/6/2001	1315	(110)	(31)
			total estimated inflow	157				
			total estimated outflow	0				
L13	Snake River above Thousand Springs, near Hagerman	585.6		3810	11/6/2001	1350	843	234
			total estimated inflow	0				
			total estimated outflow	0				
L14	Snake River below Thousand Springs, near Hagerman	582.9		5110	11/6/2001	1140	1,300	481
			total estimated inflow	80				
			total estimated outflow	0				
L15	Snake River above Lower Salmon Falls Power Plant, near Bliss	576.8		5850	11/7/2001	1145	660	108
			total estimated inflow	50				
			total estimated outflow	0				
			estimated outflow to storage above Lower Salmon Falls Power Plant ²	3---				
L16	Snake River below Lower Salmon Falls, near Hagerman (13135000)	572.5		---	---	---	---	---
				6490	11/6/2001	1030		
			total estimated inflow	1176				
			total estimated outflow	0				
L17	Snake River above Bliss Dam, near Bliss	564.9		⁴ ---	---	---	---	---
			total estimated inflow	2				

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Table A6. Estimates of streamflow gains and losses in specified subreaches of the Snake River between the near Minidoka and at King Hill gaging stations, Idaho, November 5-7, 2001--Continued

Site number (see figure 3)	Gaging-station name (number) or intermediate measurement site	River mile	Discharge (ft ³ /s)	Date	Time	Total gain or (loss) (ft ³ /s)	Gain or (loss) per mile (ft ³ /s/mi)
			total estimated outflow	0			
			estimated outflow to storage above Bliss Dam ²	-70			
L18	Snake River below Bliss Dam, near Bliss (13153776)	559.1	7800	11/6/2001	1700	62	5
			7820	11/6/2001	0745		
			total estimated inflow	0			
			total estimated outflow	0			
L19	Snake River above Bancroft Springs, near King Hill	553.2	7800	11/6/2001	1050	(20)	(3)
			total estimated inflow	15			
			total estimated outflow	0			
L20	Snake River at King Hill (13154500)	546.6	7770	11/6/2001	1445	(45)	(7)

¹ Estimate based on reservoir-stage data (USGS station number 13087900).

² Estimate based on reservoir-stage data (Idaho Power Company).

³ Unable to estimate reservoir-storage changes because of large variability.

⁴ Discharge was measured but not used in the calculations because of questionable accuracy (see table A8).

Table A7. Discharge data from gaging stations along the Snake River between near Minidoka and at King Hill, Idaho, November 5-7, 2001

[ft³/s, cubic feet per second; ---, no data]

Site number (see figure		Gaging-station name (number)	Date	Time	Discharge (ft ³ /s)
A10)					
L1		Snake River near Minidoka (13081500)	11/5/2001	0630	570
L4		Snake River at Milner (13088000)	11/5/2001	2300	635
			11/5/2001	1015	622
L6		Snake River near Kimberly (13090000)	11/5/2001	2030	899
			11/7/2001	1545	969
L10		Snake River near Buhl (13094000)	11/7/2001	1545	2380
			11/6/2001	1130	2300
L16		Snake River below Lower Salmon Falls, near Hagerman (13135000)	---	---	¹ ---
			11/6/2001	1030	6490
L18		Snake River below Bliss Dam, near Bliss (13153776)	11/6/2001	1700	7800
			11/6/2001	0745	7820
L20		Snake River at King Hill (13154500)	11/6/2001	1445	7770

¹ Discharge data not used because of unsteady streamflow conditions.

Table A8. Discharge data from acoustic Doppler measurements along the Snake River between the near Minidoka and at King Hill gaging stations, Idaho, November 5-7, 2001

[ft³/s, cubic feet per second; COV, coefficient of variation; σ , standard deviation; μ , mean]

Site number (see figure		Date	Time	Discharge (ft ³ /s)	COV (σ/μ)
A10)	Intermediate measurement site				
L2	Snake River at Highway 77(25) near Rupert	11/5/2001	1100	574	0.29
L3	Snake River at Highway 27 at Burley	11/5/2001	1300	605	.54
L5	Snake River above Murtaugh Bridge near Murtaugh	11/5/2001	1411	694	.05
L7	Snake River above Shoshone Falls near Kimberly	11/7/2001	1640	1120	.05
L8	Snake River below Perrine Bride at Twin Falls	11/7/2001	1530	1250	.07
L9	Snake River above Crystal Springs near Buhl	11/7/2001	1340	1700	.05
L11	Snake River below Clear Lakes outlet near Buhl	11/6/2001	1335	2920	.03
L12	Snake River above Banbury Springs near Hagerman	11/6/2001	1315	2810	.06
L13	Snake River above Thousand Springs near Hagerman	11/6/2001	1350	3810	.02
L14	Snake River below Thousand Springs near Hagerman	11/6/2001	1140	5110	.03
L15	Snake River above Lower Salmon Falls Power Plant near Bliss	11/7/2001	1145	5850	.09
L17	Snake River above Bliss Dam near Bliss	11/6/2001	1408	¹ 8080	.07
L19	Snake River above Bancroft Springs near King Hill	11/6/2001	1050	7800	.02

¹ Accuracy is questionable because of unsteady releases from Lower Salmon Falls Power Plant.

Table A9. Discharge data for all inspected inflow and outflow sites along the Snake River between the near Minidoka and at King Hill gaging stations, Idaho, November 6, 2001

[Latitude and longitude in degrees, minutes, seconds referenced in North American Datum of 1983; ft³/s, cubic feet per second; site numbers shown in figure A10; ---, no data; DM, daily mean discharge; values in shaded areas indicate canal withdrawals]

Inspection site name	Gaging-station number	Location		Date	Time	Discharge (ft ³ /s)
		Latitude	Longitude			
Subreach between site numbers L1 and L2						
F Drain near Declo	13082060	42 32 48	113 37 14	11/6/2001	---	0
D-3 Drain near Declo	13082032	42 36 49	113 36 10	11/6/2001	---	0
Subreach between site numbers L2 and L3						
D-5 Drain near Rupert	13082062	42 33 15	113 38 38	11/6/2001	---	0
D-4 Drain near Rupert	13082064	42 34 15	113 38 25	11/6/2001	---	0
Marsh Creek near Declo	13082320	42 31 26	113 40 02	11/6/2001	---	¹ ---
Spring Creek near Declo	13082330	42 31 01	113 41 03	11/6/2001	---	¹ ---
D-16 Drain near Heyburn	13084705	42 32 30	113 45 24	11/6/2001	---	0
Subreach between site numbers L3 and L4						
B Drain near Heyburn	13084707	42 33 33	113 47 01	11/6/2001	---	0
D-17 Drain near Heyburn	13085060	42 32 53	113 50 51	11/6/2001	0830	5
Main Drain North near Heyburn	13085065	42 33 02	113 51 59	11/6/2001	0900	20
G Drain near Burley	13085070	42 31 56	113 53 12	11/6/2001	---	---
J Drain near Burley	13085080	42 31 53	113 53 29	11/6/2001	---	---
A&B Irrigation Pump near Milner	13085500	42 32 01	113 56 51	11/6/2001	DM	0
PA Lateral Pump near Milner	13085800	42 32 02	113 58 19	11/6/2001	DM	0
Milner Irrigation Pump near Milner	13086000	42 31 10	114 00 38	11/6/2001	DM	0
Northside A Lateral near Milner	13086510	42 32 17	114 02 40	11/6/2001	DM	0
Northside Crosscut Canal near Milner	13086520	42 33 31	114 03 08	11/6/2001	DM	0
Milner-Gooding Canal near Milner	13086530	42 33 39	114 02 59	11/6/2001	DM	0
North Side Main Canal near Milner	13087000	42 31 46	114 01 10	11/6/2001	DM	0
Twin Falls Main Canal near Milner	13087500	42 31 18	114 01 03	11/6/2001	DM	0
Subreach between site numbers L4 and L5						
---	---	---	---	---	---	---
Subreach between site numbers L5 and L6						
Miscellaneous agriculture return near Hansen	13089690	42 33 55	114 19 24	11/6/2001	---	0
Twin Falls Coulee near Hansen	13089695	42 34 11	114 20 32	11/6/2001	---	0
Devil's Washbowl Spring near Kimberly	13089600	42 35 18	114 20 45	11/6/2001	---	---
Subreach between site numbers L6 and L7						
Devil's Corral Springs near Kimberly	13090100	42 35 38	114 21 55	11/6/2001	---	---
Subreach between site numbers L7 and L8						
Fish Hatchery Waste O near Twin Falls	13090370	42 35 31	114 26 05	11/6/2001	1130	30
Mary Alice Lake discharge near Twin Falls	---	42 35 46	114 26 51	11/6/2001	---	0
Subreach between site numbers L8 and L9						
Perrine Coulee near Twin Falls	13090460	42 35 53	114 28 20	11/6/2001	1200	¹ 3.0
Blue Lakes Outlet near Twin Falls	13091500	42 36 30	114 28 34	11/6/2001	---	---
Warm Creek near Twin Falls	13091700	42 37 15	114 29 55	11/6/2001	1230	40
Rock Creek above Highway 30/93 at Twin Falls	² 13092747	42 33 47	114 29 42	11/6/2001	DM	79
Jerome Golf Course Drain 1	13091733	42 38 03	114 31 02	11/6/2001	---	0
Miscellaneous agriculture return near Twin Falls	---	42 37 21	114 33 23	11/6/2001	---	0
Sonnicksen Drain near Twin Falls	13093150	42 38 40	114 33 26	11/6/2001	---	0
Miscellaneous agriculture return near Twin Falls	---	42 38 23	114 33 32	11/6/2001	---	0
Miscellaneous agriculture return near Twin Falls	---	42 37 36	114 34 29	11/6/2001	1250	15
Sucker Flat Drain near Filer	13093190	42 38 25	114 35 30	11/6/2001	1330	5
Miscellaneous agriculture return near Filer	---	42 37 51	114 35 41	11/6/2001	1345	2
Miscellaneous agriculture return near Filer	---	42 38 54	114 36 58	11/6/2001	1350	2

Table A9. Discharge data for all inspected inflow and outflow sites along the Snake River between the near Minidoka and at King Hill gaging stations, Idaho, November 6, 2001--Continued

Inspection site name	Gaging-station number	Location		Date	Time	Discharge (ft ³ /s)
		Latitude	Longitude			
Subreach between site numbers L9 and L10						
Miscellaneous agriculture return near Filer	---	42 39 17	114 38 16	11/6/2001	---	0
Crystal Springs near Filer	13093400	42 39 36	114 38 32	11/6/2001	---	---
Cedar Draw near Filer	13093550	42 39 13	114 39 15	11/6/2001	1455	54
Miscellaneous agriculture return near Buhl	---	42 39 31	114 40 42	11/6/2001	---	0
Waste I near Buhl	13093900	42 39 33	114 41 28	11/6/2001	1530	30
Subreach between site numbers L10 and L11						
Miscellaneous agriculture return near Buhl	---	42 40 03	114 43 10	11/6/2001	---	0
Miscellaneous agriculture return near Buhl	---	42 40 07	114 44 18	11/6/2001	---	0
J8 Drain near Buhl	---	42 40 27	114 44 27	11/6/2001	---	0
Clear Lakes Outlet near Buhl	13094500	42 40 01	114 46 45	11/6/2001	---	---
Subreach between site numbers L11 and L12						
Mud Creek near Buhl ⁴	13094700	42 39 33	114 47 20	11/6/2001	---	---
Deep Creek near Buhl ⁴	---	42 39 29	114 48 38	11/6/2001	---	---
Briggs Creek Spring near Buhl	13095200	42 40 20	114 49 00	11/6/2001	---	---
Subreach between site numbers L12 and L13						
Irrigation Ditch to Blind Canyon near Buhl	13095490	42 42 28	114 47 30	11/6/2001	---	---
South Coulee (Cedar Draw) near Buhl	13095360	42 41 46	114 48 19	11/6/2001	---	---
Box Canyon Springs near Wendell	² 13095500	42 42 29	114 48 35	11/6/2001	DM	¹ 346
Blind Canyon Spring near Buhl	13095400	42 42 12	114 49 20	11/6/2001	---	---
Unnamed Spring near Buhl	13095350	42 41 51	114 49 21	11/6/2001	---	---
Salmon Falls Creek near Hagerman	² 13108150	42 41 47	114 51 15	11/6/2001	DM	157
Subreach between site numbers L13 and L14						
Sand Springs near Hagerman	13132600	42 43 36	114 50 00	11/6/2001	---	---
Drain near Bickel Springs near Hagerman	13133785	42 45 28	114 50 48	11/6/2001	---	---
Bickel Spring near Hagerman	13132790	42 45 29	114 51 19	11/6/2001	---	---
Subreach between site numbers L14 and L15						
Riley Creek near Hagerman	13133800	42 45 50	114 51 40	11/6/2001	---	80
Subreach between site numbers L15 and L16						
Billingsly Creek near Hagerman	13134600	42 46 44	114 51 22	11/6/2001	---	50
Subreach between site numbers L16 and L17						
W Drain near Tuttle	13152895	42 51 50	114 51 58	11/6/2001	---	---
Birch Creek near Hagerman	13135100	42 51 10	114 53 30	11/6/2001	---	10
Malad Power Flume near Bliss	² 13152940	42 51 54	114 53 11	11/6/2001	DM	1070
Malad River near Bliss	² 13153500	42 51 48	114 54 04	11/6/2001	DM	96
Subreach between site numbers L17 and L18						
Tuana Gulch near Bliss	---	42 54 34	115 00 02	11/6/2001	---	2
Irrigation Ditch near Bliss	13152450	42 55 56	115 00 19	11/6/2001	---	0
Subreach between site numbers L18 and L19						
---	---	---	---	---	---	---
Subreach between site numbers L19 and L20						
Clover Creek near Bliss	13154000	43 01 30	115 00 20	11/6/2001	---	15

¹ Streamflow resulting from spring discharge; not used in calculation of gain/loss estimates.

² Long-term United States Geological Survey or Idaho Power Company gaging station.

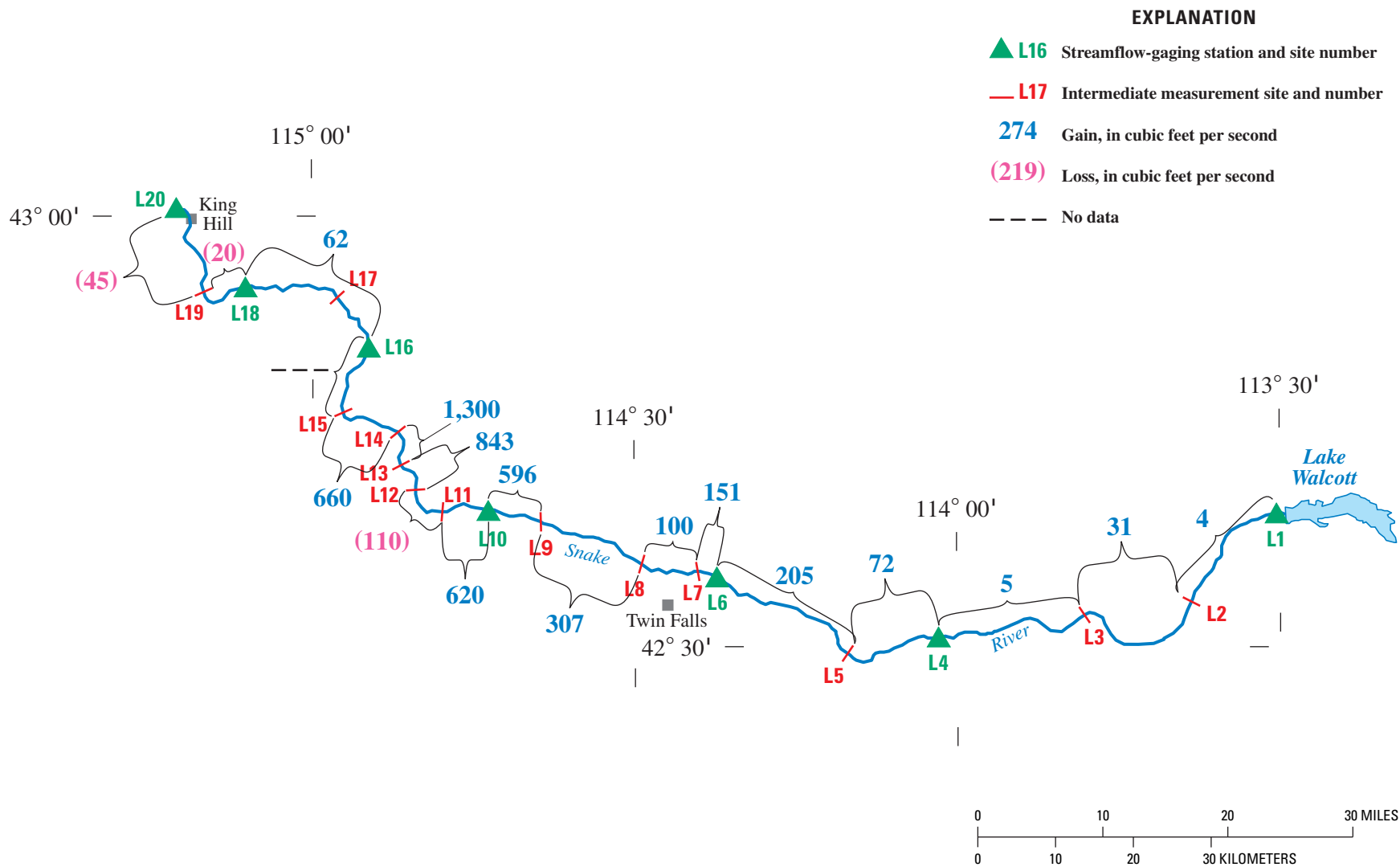


Figure A10. Streamflow gains and losses along the lower reach of the Snake River, between the near Minidoka and at King Hill gaging stations, southeastern Idaho, November 5–7, 2001.

Table A11. Estimates of streamflow gains and losses in specified subreaches of the Snake River between the near Minidoka and at King Hill gaging stations, Idaho, March 11-12, 2002

[ft³/s, cubic feet per second; mi, mile; ---, no data; estimated gain/loss presented across from the downstream site; values in **boldface** are statistically significant]

Site number (see figure 3)	Gaging-station name (number) or intermediate measurement site	River mile	Discharge (ft ³ /s)	Date	Time	Total gain or (loss) (ft ³ /s)	Gain or (loss) per mile (ft ³ /s/mi)
L1	Snake River near Minidoka (13081500)	673.5	590	3/11/2002	0530		
			total estimated inflow			4	
			total estimated outflow			0	
L2	Snake River at Highway 77(25), near Rupert	664.0	594	3/11/2002	1000	0	0
			total estimated inflow			5	
			total estimated outflow			0	
			estimated outflow to storage in Milner Lake ¹			0	
L3	Snake River at Highway 27, at Burley	651.6	² ---	---	---	---	---
			total estimated inflow			3	
			total estimated outflow			0	
			estimated outflow to storage in Milner Lake ¹			0	
L4	Snake River at Milner (13088000)	638.7	609	3/11/2002	1600	7	0
			total estimated inflow			0	
			total estimated outflow			0	
L5	Snake River above Murtaugh Bridge, near Murtaugh	630.5	697	3/11/2002	1600	83	10
			total estimated inflow			0	
			total estimated outflow			0	
L6	Snake River near Kimberly (13090000)	617.2	834	3/11/2002	2230	137	10
			total estimated inflow			0	
			total estimated outflow			0	
L7	Snake River above Shoshone Falls, near Kimberly	615.2	898	3/12/2002	0930	90	45
			total estimated inflow			0	
			total estimated outflow			0	
L8	Snake River below Perrine Bridge, at Twin Falls	611.0	939	3/12/2002	0945	41	10
			total estimated inflow			94	
			total estimated outflow			0	

Table A11. Estimates of streamflow gains and losses in specified subreaches of the Snake River between the near Minidoka and at King Hill gaging stations, Idaho, March 11-12, 2002--Continued

Site number (see figure 3)	Gaging-station name (number) or intermediate measurement site	River mile		Discharge (ft ³ /s)	Date	Time	Total gain or (loss) (ft ³ /s)	Gain or (loss) per mile (ft ³ /s/mi)
L9	Snake River above Crystal Springs, near Buhl	601.1		1270	3/12/2002	1200	237	24
			total estimated inflow	34				
			total estimated outflow	0				
L10	Snake River near Buhl (13094000)	596.8		1930	3/12/2002	1400	626	146
				1950	3/12/2002	1145		
			total estimated inflow	0				
			total estimated outflow	0				
L11	Snake River below Clear Lakes outlet, near Buhl	592.8		2750	3/12/2002	1255	800	200
			total estimated inflow	22				
			total estimated outflow	0				
L12	Snake River above Banbury Springs, near Hagerman	589.2		2670	3/12/2002	1030	(102)	(28)
			total estimated inflow	116				
			total estimated outflow	0				
L13	Snake River above Thousand Springs, near Hagerman	585.6		3500	3/12/2002	0940	714	198
			total estimated inflow	0				
			total estimated outflow	0				
L14	Snake River below Thousand Springs, near Hagerman	582.9		4700	3/12/2002	0900	1,200	444
			total estimated inflow	71				
			total estimated outflow	0				
L15	Snake River above Lower Salmon Falls Power Plant, near Bliss	576.8		5170	3/12/2002	1200	399	65
			total estimated inflow	23				
			total estimated outflow	0				
			estimated outflow to storage above Lower Salmon Falls Power Plant ³	-80				
L16	Snake River below Lower Salmon Falls, near Hagerman (13135000)	572.5		5310	3/12/2002	1400	37	9
				5310	3/12/2002	1000		
			total estimated inflow	1209				
			total estimated outflow	0				
L17	Snake River above Bliss Dam, near Bliss	564.9		6630	3/12/2002	1400	111	15
			total estimated inflow	1				

Table A11. Estimates of streamflow gains and losses in specified subreaches of the Snake River between the near Minidoka and at King Hill gaging stations, Idaho, March 11-12, 2002--Continued

Site number (see figure 3)	Gaging-station name (number) or intermediate measurement site	River mile	Discharge (ft ³ /s)	Date	Time	Total gain or (loss) (ft ³ /s)	Gain or (loss) per mile (ft ³ /s/mi)
			total estimated outflow			0	
			estimated outflow to storage above Bliss Dam ³			40	
L18	Snake River below Bliss Dam, near Bliss (13153776)	559.1	6740	3/12/2002	1700	149	26
			6740	3/12/2002	1215		
			total estimated inflow			0	
			total estimated outflow			0	
L19	Snake River above Bancroft Springs, near King Hill	553.2	6730	3/12/2002	1515	(10)	(2)
			total estimated inflow ⁴			---	
			total estimated outflow			0	
L20	Snake River at King Hill (13154500)	546.6	7310	3/12/2002	1830	⁵ ---	---

¹ Estimate based on reservoir-stage data (USGS station number 13087900).

² Discharge was not measured because of river or weather conditions.

³ Estimate based on reservoir-stage data (Idaho Power Company).

⁴ Apparent snowmelt runoff event; flow on March 12, 2002, was likely much larger than the 100 ft³/s reported for Clover Creek on March 20, 2002.

⁵ Not calculated because of unknown, and likely large, inflows from Clover Creek.

Table A12. Discharge data from gaging stations along the Snake River between near Minidoka and at King Hill, Idaho, March 11-12, 2002

[ft³/s, cubic feet per second]

Site number (see figure A15)	Gaging-station name (number)	Date	Time	Discharge (ft³/s)
L1	Snake River near Minidoka (13081500)	3/11/2002	0530	590
L4	Snake River at Milner (13088000)	3/11/2002	1600	609
		3/11/2002	1200	614
L6	Snake River near Kimberly (13090000)	3/11/2002	2230	834
		3/12/2002	0830	808
L10	Snake River near Buhl (13094000)	3/12/2002	1400	1930
		3/12/2002	1145	1950
L16	Snake River below Lower Salmon Falls, near Hagerman (13135000)	3/12/2002	1400	5310
		3/12/2002	1000	5310
L18	Snake River below Bliss Dam, near Bliss (13153776)	3/12/2002	1700	6740
		3/12/2002	1215	6740
L20	Snake River at King Hill (13154500)	3/12/2002	1830	7310

Table A13. Discharge data from acoustic Doppler measurements along the Snake River between the near Minidoka and at King Hill gaging stations, Idaho, March 11-12, 2002

[ft³/s, cubic feet per second; COV, coefficient of variation; σ , standard deviation; μ , mean; ---, no data]

Site number (see figure A15)		Intermediate measurement site	Date	Time	Discharge (ft ³ /s)	COV (σ/μ)
L2		Snake River at Highway 77(25) near Rupert	3/11/2002	1000	594	0.07
L3		Snake River at Highway 27 at Burley	¹ ---	---	---	---
L5		Snake River above Murtaugh Bridge at Murtaugh	3/11/2002	1600	697	.03
L7		Snake River above Shoshone Falls near Kimberly	3/12/2002	0930	898	.12
L8		Snake River below Perrine Bride at Twin Falls	3/12/2002	0945	939	.03
L9		Snake River above Crystal Springs near Buhl	3/12/2002	1200	1270	.06
L11		Snake River below Clear Lakes outlet near Buhl	3/12/2002	1255	2750	.04
L12		Snake River above Banbury Springs near Hagerman	3/12/2002	1030	2670	.04
L13		Snake River above Thousand Springs near Hagerman	3/12/2002	0940	3500	.04
L14		Snake River below Thousand Springs near Hagerman	3/12/2002	0900	4700	.01
L15		Snake River above Lower Salmon Falls Power Plant near Bliss	3/12/2002	1200	5170	.01
L17		Snake River above Bliss Dam near Bliss	3/12/2002	1400	6630	.04
L19		Snake River above Bancroft Springs near King Hill	3/12/2002	1515	6730	.02

¹ Discharge was not measured because of river or weather conditions.

Table A14. Discharge data for all inspected inflow and outflow sites along the Snake River between the near Minidoka and at King Hill gaging stations, Idaho, March 11-20, 2002

[Latitude and longitude in degrees, minutes, seconds referenced in North American Datum of 1983; ft³/s, cubic feet per second; site numbers shown in figure A15; ---, no data; DM, daily mean discharge; values in shaded areas indicate canal withdrawals]

Inspection site name	Gaging-station number	Location		Date	Time	Discharge (ft ³ /s)
		Latitude	Longitude			
Subreach between site numbers L1 and L2						
F Drain near Declo	13082060	42 32 48	113 37 14	3/12/2002	---	2
D-3 Drain near Declo	13082032	42 36 49	113 36 10	3/12/2002	---	2
Subreach between site numbers L2 and L3						
D-5 Drain near Rupert	13082062	42 33 15	113 38 38	3/12/2002	---	2
D-4 Drain near Rupert	13082064	42 34 15	113 38 25	3/12/2002	---	3
Marsh Creek near Declo	13082320	42 31 26	113 40 02	3/12/2002	---	¹ 6
Spring Creek near Declo	13082330	42 31 01	113 41 03	3/12/2002	---	¹ 6
D-16 Drain near Heyburn	13084705	42 32 30	113 45 24	3/12/2002	---	0
Subreach between site numbers L3 and L4						
B Drain near Heyburn	13084707	42 33 33	113 47 01	3/13/2002	---	1
D-17 Drain near Heyburn	13085060	42 32 53	113 50 51	3/13/2002	---	0
Main Drain North near Heyburn	13085065	42 33 02	113 51 59	3/13/2002	---	0
G Drain near Burley	13085070	42 31 56	113 53 12	3/13/2002	---	2
J Drain near Burley	13085080	42 31 53	113 53 29	3/13/2002	---	0
A&B Irrigation Pump near Milner	13085500	42 32 01	113 56 51	3/13/2002	DM	0
PA Lateral Pump near Milner	13085800	42 32 02	113 58 19	3/13/2002	DM	0
Milner Irrigation Pump near Milner	13086000	42 31 10	114 00 38	3/13/2002	DM	0
Northside A Lateral near Milner	13086510	42 32 17	114 02 40	3/13/2002	DM	0
Northside Crosscut Canal near Milner	13086520	42 33 31	114 03 08	3/13/2002	DM	0
Milner-Gooding Canal near Milner	13086530	42 33 39	114 02 59	3/13/2002	DM	0
North Side Main Canal near Milner	13087000	42 31 46	114 01 10	3/13/2002	DM	0
Twin Falls Main Canal near Milner	13087500	42 31 18	114 01 03	3/13/2002	DM	0
Subreach between site numbers L4 and L5						
---	---	---	---	---	---	---
Subreach between site numbers L5 and L6						
Miscellaneous agriculture return near Hansen	13089690	42 33 55	114 19 24	3/13/2002	---	0
Twin Falls Coulee near Hansen	13089695	42 34 11	114 20 32	3/13/2002	---	0
Devil's Washbowl Spring near Kimberly	13089600	42 35 18	114 20 45	3/14/2002	1545	¹ 11.1
Subreach between site numbers L6 and L7						
Devil's Corral Springs near Kimberly	13090100	42 35 38	114 21 55	3/11/2002	1000	¹ 35.9
Subreach between site numbers L7 and L8						
Fish Hatchery Waste O near Twin Falls	13090370	42 35 31	114 26 05	3/13/2002	---	0
Mary Alice Lake discharge near Twin Falls	---	42 35 46	114 26 51	3/12/2002	---	0
Subreach between site numbers L8 and L9						
Perrine Coulee near Twin Falls	13090460	42 35 53	114 28 20	---	---	¹ ---
Blue Lakes Outlet near Twin Falls	13091500	42 36 30	114 28 34	3/14/2002	1515	¹ 183
Warm Creek near Twin Falls	13091700	42 37 15	114 29 55	3/14/2002	---	40
Rock Creek above Highway 30/93 at Twin Falls	² 13092747	42 33 47	114 29 42	3/13/2002	DM	43
Jerome Golf Course Drain 1	13091733	42 38 03	114 31 02	3/13/2002	---	0
Miscellaneous agriculture return near Twin Falls	---	42 37 21	114 33 23	3/13/2002	---	0
Sonnicksen Drain near Twin Falls	13093150	42 38 40	114 33 26	3/13/2002	---	0
Miscellaneous agriculture return near Twin Falls	---	42 38 23	114 33 32	3/13/2002	---	0
Miscellaneous agriculture return near Twin Falls	---	42 37 36	114 34 29	3/13/2002	0945	5
Sucker Flat Drain near Filer	13093190	42 38 25	114 35 30	3/13/2002	0900	5
Miscellaneous agriculture return near Filer	---	42 37 51	114 35 41	3/13/2002	1020	1
Miscellaneous agriculture return near Filer	---	42 38 54	114 36 58	3/13/2002	---	0

Table A14. Discharge data for all inspected inflow and outflow sites along the Snake River between the near Minidoka and at King Hill gaging stations, Idaho, March 11-20, 2002--Continued

Inspection site name	Gaging-station number	Location		Date	Time	Discharge (ft ³ /s)
		Latitude	Longitude			
Subreach between site numbers L9 and L10						
Miscellaneous agriculture return near Filer	---	42 39 17	114 38 16	3/13/2002	1310	1
Crystal Springs near Filer	13093400	42 39 36	114 38 32	3/13/2002	1200	¹ 455
Cedar Draw near Filer	13093550	42 39 13	114 39 15	3/13/2002	1345	29
Miscellaneous agriculture return near Buhl	---	42 39 31	114 40 42	3/13/2002	1445	4
Waste I near Buhl	13093900	42 39 33	114 41 28	3/13/2002	---	0
Subreach between site numbers L10 and L11						
Miscellaneous agriculture return near Buhl	---	42 40 03	114 43 10	3/13/2002	---	0
Miscellaneous agriculture return near Buhl	---	42 40 07	114 44 18	3/13/2002	---	0
J8 Drain near Buhl	---	42 40 27	114 44 27	3/13/2002	---	0
Clear Lakes Outlet near Buhl	13094500	42 40 01	114 46 45	3/20/2002	1025	¹ 468
Subreach between site numbers L11 and L12						
Mud Creek near Buhl ³	13094700	42 39 33	114 47 20	3/13/2002	1120	22
Deep Creek near Buhl ³	---	42 39 29	114 48 38	3/12/2002	1710	0
Briggs Creek Spring near Buhl	13095200	42 40 20	114 49 00	3/15/2002	1110	¹ 103
Subreach between site numbers L12 and L13						
Irrigation Ditch to Blind Canyon near Buhl	13095490	42 42 28	114 47 30	3/13/2002	---	---
South Coulee (Cedar Draw) near Buhl	13095360	42 41 46	114 48 19	3/13/2002	---	---
Box Canyon Springs near Wendell	² 13095500	42 42 29	114 48 35	3/12/2002	1240	¹ 335
Blind Canyon Spring near Buhl	13095400	42 42 12	114 49 20	3/12/2002	1125	¹ 11.4
Unnamed Spring near Buhl	13095350	42 41 51	114 49 21	3/13/2002	1225	¹ 2.7
Salmon Falls Creek near Hagerman	² 13108150	42 41 47	114 51 15	3/13/2002	DM	116
Subreach between site numbers L13 and L14						
Sand Springs near Hagerman	13132600	42 43 36	114 50 00	3/12/2002	1140	¹ 67.0
Drain near Bickel Springs near Hagerman	13133785	42 45 28	114 50 48	3/12/2002	---	---
Bickel Spring near Hagerman	13132790	42 45 29	114 51 19	3/12/2002	1535	¹ 15.8
Subreach between site numbers L14 and L15						
Riley Creek near Hagerman	13133800	42 45 50	114 51 40	3/12/2002	1530	71
Subreach between site numbers L15 and L16						
Billingsly Creek near Hagerman	13134600	42 46 44	114 51 22	3/11/2002	1415	23.1
Subreach between site numbers L16 and L17						
W Drain near Tuttle	13152895	42 51 50	114 51 58	3/12/2002	---	0
Birch Creek near Hagerman	13135100	42 51 10	114 53 30	3/11/2002	1220	10.5
Malad Power Flume near Bliss	² 13152940	42 51 54	114 53 11	3/11/2002	0825	1110
Malad River near Bliss	² 13153500	42 51 48	114 54 04	3/11/2002	1040	88.4
Subreach between site numbers L17 and L18						
Tuana Gulch near Bliss	---	42 54 34	115 00 02	3/11/2002	1455	1
Irrigation Ditch near Bliss	13152450	42 55 56	115 00 19	3/11/2002	1220	0
Subreach between site numbers L18 and L19						
---	---	---	---	---	---	---
Subreach between site numbers L19 and L20						
Clover Creek near Bliss	13154000	43 01 30	115 00 20	3/20/2002	0945	⁴ 100

¹ Streamflow resulting from spring discharge; not used in calculation of gain/loss estimates.

² Long-term United States Geological Survey or Idaho Power Company gaging station.

³ Combined spring discharge and agriculture return flows; springflow was subtracted from field-measured value to obtain an approximate agriculture return-flow value.

⁴ Apparent snowmelt runoff event; discharge on March 12, 2002, could have been much larger than 100 ft³/s.

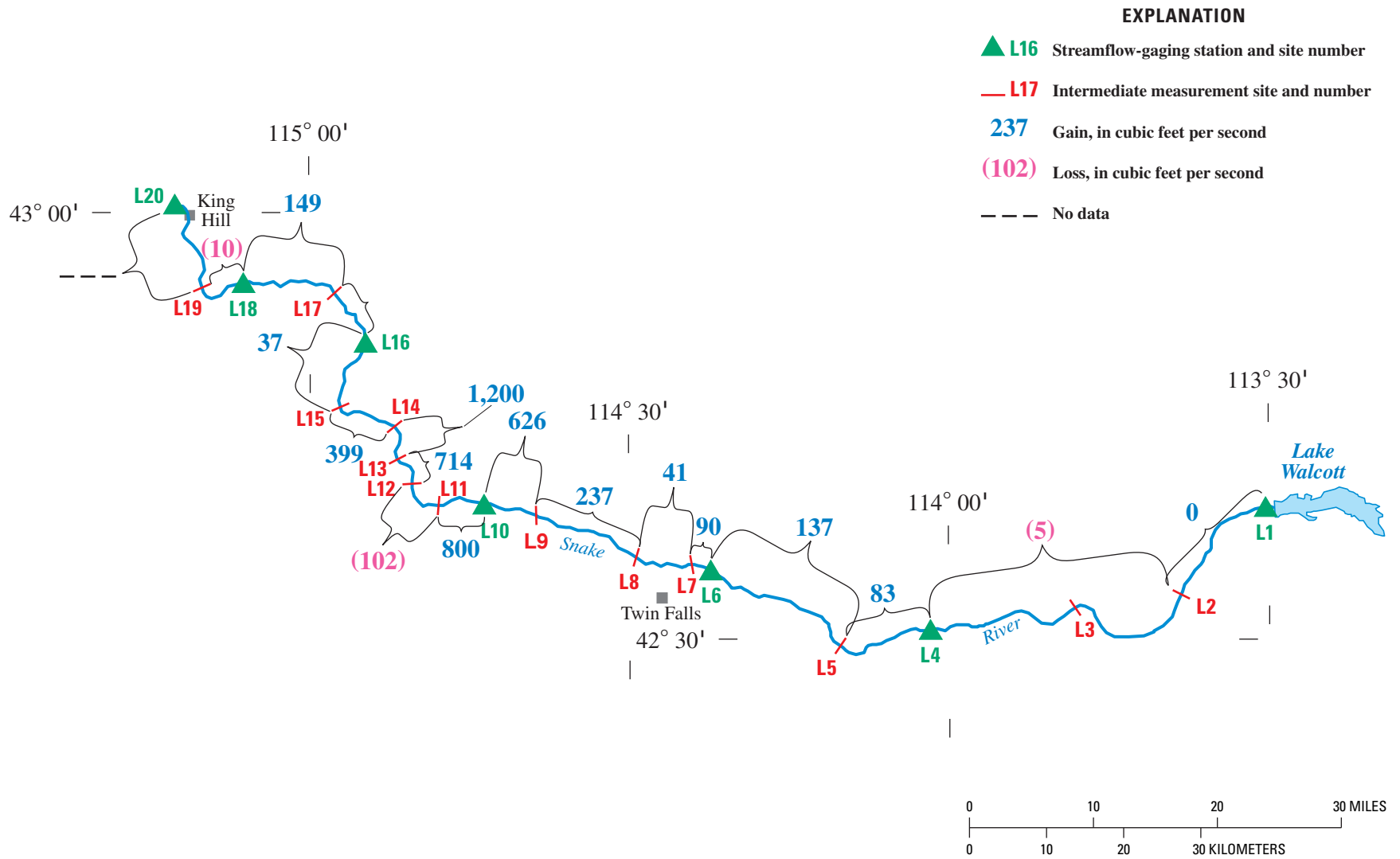


Figure A15. Streamflow gains and losses along the lower reach of the Snake River, between the near Minidoka and at King Hill gaging stations, southeastern Idaho, March 11–12, 2002.

Table A16. Estimates of streamflow gains and losses in specified subreaches of the Snake River between the near Minidoka and at King Hill gaging stations, Idaho, July 24-25, 2002

[ft³/s, cubic feet per second; mi, mile; ---, no data; estimated gain/loss presented across from the downstream site; values in **boldface** are statistically significant]

Site number (see figure 3)	Gaging-station name (number) or intermediate measurement site	River mile	Discharge (ft ³ /s)	Date	Time	Total gain or (loss) (ft ³ /s)	Gain or (loss) per mile (ft ³ /s/mi)
L1	Snake River near Minidoka (13081500)	673.5	8650	7/25/2002	0200		
			total estimated inflow			24	
			total estimated outflow			0	
L2	Snake River at Highway 77(25), near Rupert	664.0	8320	7/25/2002	0630	(354)	(37)
			total estimated inflow			29	
			total estimated outflow			0	
			estimated outflow to storage in Milner Lake ¹			0	
L3	Snake River at Highway 27, at Burley	651.6	8540	7/25/2002	0735	191	(0)
			total estimated inflow			35	
			total estimated outflow			8199	
			estimated outflow to storage in Milner Lake ¹			0	
L4	Snake River at Milner (13088000)	638.7	238	7/25/2002	1345	53	2
			247	7/24/2002	0815		
			total estimated inflow			0	
			total estimated outflow			0	
L5	Snake River above Murtaugh Bridge, near Murtaugh	630.5	295	7/24/2002	1210	48	6
			total estimated inflow			1	
			total estimated outflow			0	
L6	Snake River near Kimberly (13090000)	617.2	578	7/24/2002	1645	282	21
			581	7/24/2002	1130		
			total estimated inflow			0	
			total estimated outflow			0	
L7	Snake River above Shoshone Falls, near Kimberly	615.2	725	7/24/2002	1228	144	72
			total estimated inflow			18	
			total estimated outflow			0	
L8	Snake River below Perrine Bridge, at Twin Falls	611.0	732	7/24/2002	1504	(11)	(2)
			total estimated inflow			235	
			total estimated outflow			0	

Table A16. Estimates of streamflow gains and losses in specified subreaches of the Snake River between the near Minidoka and at King Hill gaging stations, Idaho, July 24-25, 2002--Continued

Site number (see figure 3)	Gaging-station name (number) or intermediate measurement site	River mile		Discharge (ft ³ /s)	Date	Time	Total gain or (loss) (ft ³ /s)	Gain or (loss) per mile (ft ³ /s/mi)
L9	Snake River above Crystal Springs, near Buhl	601.1		1310	7/24/2002	1719	343	35
			total estimated inflow	68				
			total estimated outflow	0				
L10	Snake River near Buhl (13094000)	596.8		2000	7/24/2002	1930	622	145
				2040	7/25/2002	1315		
			total estimated inflow	6				
			total estimated outflow	0				
L11	Snake River below Clear Lakes outlet, near Buhl	592.8		2430	7/25/2002	1509	384	96
			total estimated inflow	78				
			total estimated outflow	0				
L12	Snake River above Banbury Springs, near Hagerman	589.2		2770	7/25/2002	1100	262	73
			total estimated inflow	83				
			total estimated outflow	0				
L13	Snake River above Thousand Springs, near Hagerman	585.6		3720	7/25/2002	1014	867	241
			total estimated inflow	3				
			total estimated outflow	0				
L14	Snake River below Thousand Springs, near Hagerman	582.9		4710	7/25/2002	0939	987	365
			total estimated inflow	50				
			total estimated outflow	0				
L15	Snake River above Lower Salmon Falls Power Plant, near Bliss	576.8		4760	7/25/2002	1300	0	0
			total estimated inflow	20				
			total estimated outflow	0				
			estimated outflow to storage above Lower Salmon Falls Power Plant ²	0				
L16	Snake River below Lower Salmon Falls, near Hagerman (13135000)	572.5		4980	7/25/2002	1500	200	47
				5000	7/25/2002	0730		
			total estimated inflow	1177				
			total estimated outflow	0				
L17	Snake River above Bliss Dam, near Bliss	564.9		6310	7/25/2002	1110	133	18
			total estimated inflow	18				

Table A16. Estimates of streamflow gains and losses in specified subreaches of the Snake River between the near Minidoka and at King Hill gaging stations, Idaho, July 24-25, 2002--Continued

Site number (see figure 3)	Gaging-station name (number) or intermediate measurement site	River mile	Discharge (ft ³ /s)	Date	Time	Total gain or (loss) (ft ³ /s)	Gain or (loss) per mile (ft ³ /s/mi)
			total estimated outflow			0	
			estimated outflow to storage above Bliss Dam ²			0	
L18	Snake River below Bliss Dam, near Bliss (13153776)	559.1	6330	7/25/2002	1400	3	0
			6330	7/25/2002	1330		
			total estimated inflow			0	
			total estimated outflow			0	
L19	Snake River above Bancroft Springs, near King Hill	553.2	6310	7/25/2002	1510	(20)	(3)
			total estimated inflow			13	
			total estimated outflow			0	
L20	Snake River at King Hill (13154500)	546.6	6780	7/25/2002	1630	457	69

¹ Estimate based on reservoir-stage data (USGS station number 13087900).

² Estimate based on reservoir-stage data (Idaho Power Company).

Table A17. Discharge data from gaging stations along the Snake River between near Minidoka and at King Hill, Idaho, July 24-25, 2002

[ft³/s, cubic feet per second]

Site number (see figure A20)	Gaging-station name (number)	Date	Time	Discharge (ft ³ /s)
L1	Snake River near Minidoka (13081500)	7/25/2002	0200	8650
L4	Snake River at Milner (13088000)	7/25/2002	1345	238
		7/24/2002	0815	247
L6	Snake River near Kimberly (13090000)	7/24/2002	1645	578
		7/24/2002	1130	581
L10	Snake River near Buhl (13094000)	7/24/2002	1930	2000
		7/25/2002	1315	2040
L16	Snake River below Lower Salmon Falls, near Hagerman (13135000)	7/25/2002	1500	4980
		7/25/2002	0730	5000
L18	Snake River below Bliss Dam, near Bliss (13153776)	7/25/2002	1400	6330
		7/25/2002	1330	6330
L20	Snake River at King Hill (13154500)	7/25/2002	1630	6780

Table A18. Discharge data from acoustic Doppler measurements along the Snake River between the near Minidoka and at King Hill gaging stations, Idaho, July 24-25, 2002

[ft³/s, cubic feet per second; COV, coefficient of variation; σ , standard deviation; μ , mean]

Site number (see figure A20)	Intermediate measurement site	Date	Time	Discharge (ft ³ /s)	COV (σ/μ)
L2	Snake River at Highway 77(25) near Rupert	7/25/2002	0630	8320	0.01
L3	Snake River at Highway 27 at Burley	7/25/2002	0735	8540	.03
L5	Snake River above Murtaugh Bridge at Murtaugh	7/24/2002	1210	295	.09
L7	Snake River above Shoshone Falls near Kimberly	7/24/2002	1228	725	.11
L8	Snake River below Perrine Bride at Twin Falls	7/24/2002	1504	732	.04
L9	Snake River above Crystal Springs near Buhl	7/24/2002	1719	1310	.06
L11	Snake River below Clear Lakes outlet near Buhl	7/25/2002	1509	2430	.02
L12	Snake River above Banbury Springs near Hagerman	7/25/2002	1100	2770	.07
L13	Snake River above Thousand Springs near Hagerman	7/25/2002	1014	3720	.05
L14	Snake River below Thousand Springs near Hagerman	7/25/2002	0939	4710	.02
L15	Snake River above Lower Salmon Falls Power Plant near Bliss	7/25/2002	1300	4760	.05
L17	Snake River above Bliss Dam near Bliss	7/25/2002	1110	6310	.02
L19	Snake River above Bancroft Springs near King Hill	7/25/2002	1510	6310	.02

Table A19. Discharge data for all inspected inflow and outflow sites along the Snake River between the near Minidoka and at King Hill gaging stations, Idaho, July 24-25, 2002

[Latitude and longitude in degrees, minutes, seconds referenced in North American Datum of 1983; ft³/s, cubic feet per second; site numbers shown in figure A20; ---, no data; DM, daily mean discharge; values in shaded areas indicate canal withdrawals]

Inspection site name	Gaging-station number	Location		Date	Time	Discharge (ft ³ /s)
		Latitude	Longitude			
Subreach between site numbers L1 and L2						
F Drain near Declo	13082060	42 32 48	113 37 14	7/25/2002	---	17.8
D-3 Drain near Declo	13082032	42 36 49	113 36 10	7/25/2002	---	6.5
Subreach between site numbers L2 and L3						
D-5 Drain near Rupert	13082062	42 33 15	113 38 38	7/25/2002	---	5.3
D-4 Drain near Rupert	13082064	42 34 15	113 38 25	7/25/2002	---	7.5
Marsh Creek near Declo ¹	13082320	42 31 26	113 40 02	7/25/2002	---	10.0
Spring Creek near Declo ¹	13082330	42 31 01	113 41 03	7/25/2002	---	0
D-16 Drain near Heyburn	13084705	42 32 30	113 45 24	7/25/2002	---	6.5
Subreach between site numbers L3 and L4						
B Drain near Heyburn	13084707	42 33 33	113 47 01	7/25/2002	---	4.3
D-17 Drain near Heyburn	13085060	42 32 53	113 50 51	7/25/2002	---	4
Main Drain North near Heyburn	13085065	42 33 02	113 51 59	7/25/2002	---	13.1
G Drain near Burley	13085070	42 31 56	113 53 12	7/25/2002	---	12.9
J Drain near Burley	13085080	42 31 53	113 53 29	7/25/2002	---	.2
A&B Irrigation Pump near Milner	13085500	42 32 01	113 56 51	7/25/2002	DM	177
PA Lateral Pump near Milner	13085800	42 32 02	113 58 19	7/25/2002	DM	62
Milner Irrigation Pump near Milner	13086000	42 31 10	114 00 38	7/25/2002	DM	237
Northside A Lateral near Milner	13086510	42 32 17	114 02 40	7/25/2002	DM	54
Northside Crosscut Canal near Milner	13086520	42 33 31	114 03 08	7/25/2002	DM	659
Milner-Gooding Canal near Milner	13086530	42 33 39	114 02 59	7/25/2002	DM	1440
North Side Main Canal near Milner	13087000	42 31 46	114 01 10	7/25/2002	DM	2350
Twin Falls Main Canal near Milner	13087500	42 31 18	114 01 03	7/25/2002	DM	3220
Subreach between site numbers L4 and L5						
---	---	---	---	---	---	---
Subreach between site numbers L5 and L6						
Miscellaneous agriculture return near Hansen	13089690	42 33 55	114 19 24	7/23/2002	1730	1
Twin Falls Coulee near Hansen	13089695	42 34 11	114 20 32	7/24/2002	1700	.2
Devil's Washbowl Spring near Kimberly	13089600	42 35 18	114 20 45	---	---	---
Subreach between site numbers L6 and L7						
Devil's Corral Springs near Kimberly	13090100	42 35 38	114 21 55	---	---	---
Subreach between site numbers L7 and L8						
Fish Hatchery Waste O near Twin Falls	13090370	42 35 31	114 26 05	7/24/2002	0945	16.5
Mary Alice Lake discharge near Twin Falls	---	42 35 46	114 26 51	7/24/2002	1700	1
Subreach between site numbers L8 and L9						
Perrine Coulee near Twin Falls	13090460	42 35 53	114 28 20	7/24/2002	1800	² 3
Blue Lakes Outlet near Twin Falls	13091500	42 36 30	114 28 34	---	---	---
Warm Creek near Twin Falls	13091700	42 37 15	114 29 55	7/25/2002	---	30
Rock Creek above Highway 30/93 at Twin Falls	³ 13092747	42 33 47	114 29 42	7/25/2002	DM	90
Jerome Golf Course Drain 1	13091733	42 38 03	114 31 02	7/25/2002	0800	4.8
Miscellaneous agriculture return near Twin Falls	---	42 37 21	114 33 23	7/25/2002	---	15
Sonnicksen Drain near Twin Falls	13093150	42 38 40	114 33 26	7/24/2002	---	35
Miscellaneous agriculture return near Twin Falls	---	42 38 23	114 33 32	---	---	---
Miscellaneous agriculture return near Twin Falls	---	42 37 36	114 34 29	7/25/2002	1520	16.6
Sucker Flat Drain near Filer	13093190	42 38 25	114 35 30	7/25/2002	0700	40
Miscellaneous agriculture return near Filer	---	42 37 51	114 35 41	---	---	---
Miscellaneous agriculture return near Filer	---	42 38 54	114 36 58	7/25/2002	1315	3

Table A19. Discharge data for all inspected inflow and outflow sites along the Snake River between the near Minidoka and at King Hill gaging stations, Idaho, July 24-25, 2002--Continued

Inspection site name	Gaging-station number	Location		Date	Time	Discharge (ft ³ /s)
		Latitude	Longitude			
Subreach between site numbers L9 and L10						
Miscellaneous agriculture return near Filer	---	42 39 17	114 38 16	7/25/2002	1235	3
Crystal Springs near Filer	13093400	42 39 36	114 38 32	---	---	---
Cedar Draw near Filer	13093550	42 39 13	114 39 15	7/24/2002	DM	56
Miscellaneous agriculture return near Buhl	---	42 39 31	114 40 42	7/25/2002	1005	2.6
Waste I near Buhl	13093900	42 39 33	114 41 28	7/25/2002	1300	6.7
Subreach between site numbers L10 and L11						
Miscellaneous agriculture return near Buhl	---	42 40 03	114 43 10	7/24/2002	1625	1
Miscellaneous agriculture return near Buhl	---	42 40 07	114 44 18	7/24/2002	1550	5
J8 Drain near Buhl	---	42 40 27	114 44 27	---	---	---
Clear Lakes Outlet near Buhl	13094500	42 40 01	114 46 45	---	---	---
Subreach between site numbers L11 and L12						
Mud Creek near Buhl ¹	13094700	42 39 33	114 47 20	7/25/2002	DM	21
Deep Creek near Buhl ¹	---	42 39 29	114 48 38	7/25/2002	0825	57
Briggs Creek Spring near Buhl	13095200	42 40 20	114 49 00	---	---	---
Subreach between site numbers L12 and L13						
Irrigation Ditch to Blind Canyon near Buhl	13095490	42 42 28	114 47 30	7/25/2002	DM	25.2
South Coulee (Cedar Draw) near Buhl	13095360	42 41 46	114 48 19	7/26/2002	0800	3.7
Box Canyon Springs near Wendell	³ 13095500	42 42 29	114 48 35	---	---	---
Blind Canyon Spring near Buhl	13095400	42 42 12	114 49 20	---	---	---
Unnamed Spring near Buhl	13095350	42 41 51	114 49 21	---	---	---
Salmon Falls Creek near Hagerman	³ 13108150	42 41 47	114 51 15	7/25/2002	DM	54
Subreach between site numbers L13 and L14						
Sand Springs near Hagerman	13132600	42 43 36	114 50 00	---	---	---
Drain near Bickel Springs near Hagerman	13133785	42 45 28	114 50 48	7/25/2002	1800	3.2
Bickel Spring near Hagerman	13132790	42 45 29	114 51 19	---	---	---
Subreach between site numbers L14 and L15						
Riley Creek near Hagerman	13133800	42 45 50	114 51 40	7/24/2002	---	50
Subreach between site numbers L15 and L16						
Billingsly Creek near Hagerman	13134600	42 46 44	114 51 22	7/24/2002	---	20
Subreach between site numbers L16 and L17						
W Drain near Tuttle	13152895	42 51 50	114 51 58	7/26/2002	1000	1.5
Birch Creek near Hagerman	13135100	42 51 10	114 53 30	7/23/2002	1120	7.2
Malad Power Flume near Bliss	³ 13152940	42 51 54	114 53 11	7/25/2002	DM	1080
Malad River near Bliss	³ 13153500	42 51 48	114 54 04	7/25/2002	DM	88
Subreach between site numbers L17 and L18						
Tuana Gulch near Bliss	---	42 54 34	115 00 02	7/22/2002	1430	1
Irrigation Ditch near Bliss	13152450	42 55 56	115 00 19	7/25/2002	DM	17
Subreach between site numbers L18 and L19						
---	---	---	---	---	---	---
Subreach between site numbers L19 and L20						
Clover Creek near Bliss	13154000	43 01 30	115 00 20	7/22/2002	1225	13

¹ Combined spring discharge and agriculture return flows; springflow was subtracted from field-measured value to obtain an approximate agriculture return-flow value.

² Streamflow resulting from spring discharge; not used in calculation of gain/loss estimates.

³ Long-term United States Geological Survey or Idaho Power Company gaging station.

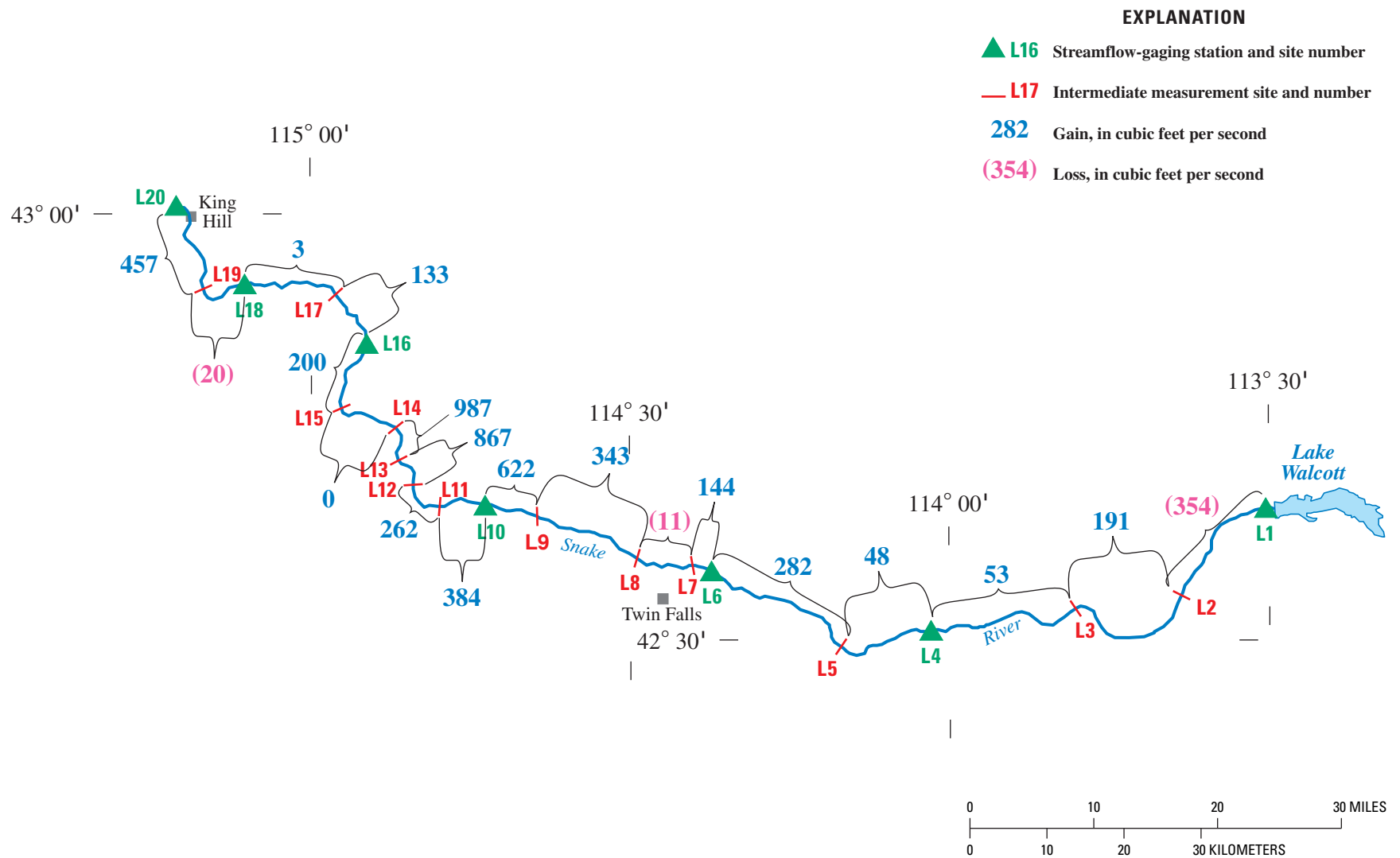


Figure A20. Streamflow gains and losses along the lower reach of the Snake River, between the near Minidoka and at King Hill gaging stations, southeastern Idaho, July 24–25, 2002.

Table A21. Estimates of streamflow gains and losses in specified subreaches of the Snake River between the near Minidoka and at King Hill gaging stations, Idaho, November 6-8, 2002

[ft³/s, cubic feet per second; mi, mile; ---, no data; estimated gain/loss presented across from the downstream site; values in **boldface** are statistically significant]

Site number (see figure 3)	Gaging-station name (number) or intermediate measurement site	River mile		Discharge (ft ³ /s)	Date	Time	Total gain or (loss) (ft ³ /s)	Gain or (loss) per mile (ft ³ /s/mi)
L1	Snake River near Minidoka (13081500)	673.5		600	11/6/2002	1000		
			total estimated inflow	1				
			total estimated outflow	0				
L2	Snake River at Highway 77(25), near Rupert	664.0		512	11/6/2002	1436	(89)	(9)
			total estimated inflow	10				
			total estimated outflow	0				
			estimated outflow to storage in Milner Lake ¹	0				
L3	Snake River at Highway 27, at Burley	651.6		465	11/6/2002	1621	(57)	(5)
			total estimated inflow	16				
			total estimated outflow	0				
			estimated outflow to storage in Milner Lake ¹	0				
L4	Snake River at Milner (13088000)	638.7		446	11/6/2002	2230	(92)	(7)
				443	11/7/2002	0330		
			total estimated inflow	0				
			total estimated outflow	0				
L5	Snake River above Murtaugh Bridge, near Murtaugh	630.5		479	11/7/2002	0731	36	4
			total estimated inflow	0				
			total estimated outflow	0				
L6	Snake River near Kimberly (13090000)	617.2		758	11/7/2002	1400	279	21
				713	11/6/2002	1015		
			total estimated inflow	0				
			total estimated outflow	0				
L7	Snake River above Shoshone Falls, near Kimberly	615.2		704	11/6/2002	1121	(9)	(5)
			total estimated inflow	16				
			total estimated outflow	0				
L8	Snake River below Perrine Bridge, at Twin Falls	611.0		864	11/7/2002	1419	144	34
			total estimated inflow	154				
			total estimated outflow	0				

Table A21. Estimates of streamflow gains and losses in specified subreaches of the Snake River between the near Minidoka and at King Hill gaging stations, Idaho, November 6-8, 2002--Continued

Site number (see figure 3)	Gaging-station name (number) or intermediate measurement site	River mile		Discharge (ft ³ /s)	Date	Time	Total gain or (loss) (ft ³ /s)	Gain or (loss) per mile (ft ³ /s/mi)
L9	Snake River above Crystal Springs, near Buhl	601.1		1160	11/6/2002	1432	142	14
			total estimated inflow	61				
			total estimated outflow	0				
L10	Snake River near Buhl (13094000)	596.8		1930	11/6/2002	1645	709	165
				2040	11/7/2002	0915		
			total estimated inflow	3				
			total estimated outflow	0				
L11	Snake River below Clear Lakes outlet, near Buhl	592.8		2610	11/7/2002	1112	568	142
			total estimated inflow	78				
			total estimated outflow	0				
L12	Snake River above Banbury Springs, near Hagerman	589.2		2600	11/7/2002	1058	(88)	(24)
			total estimated inflow	166				
			total estimated outflow	0				
L13	Snake River above Thousand Springs, near Hagerman	585.6		3770	11/7/2002	1141	1,005	279
			total estimated inflow	0				
			total estimated outflow	0				
L14	Snake River below Thousand Springs, near Hagerman	582.9		4920	11/7/2002	1212	1,150	426
			total estimated inflow	87				
			total estimated outflow	0				
L15	Snake River above Lower Salmon Falls Power Plant, near Bliss	576.8		5110	11/7/2002	1343	103	17
			total estimated inflow	30				
			total estimated outflow	0				
			estimated outflow to storage above Lower Salmon Falls Power Plant ²	230				
L16	Snake River below Lower Salmon Falls, near Hagerman (13135000)	572.5		5140	11/7/2002	1600	230	54
				5020	11/6/2002	1700		
			total estimated inflow	1122				
			total estimated outflow	0				
L17	Snake River above Bliss Dam, near Bliss	564.9		³ ---	---	---	---	---
			total estimated inflow	1				

Table A21. Estimates of streamflow gains and losses in specified subreaches of the Snake River between the near Minidoka and at King Hill gaging stations, Idaho, November 6-8, 2002--Continued

Site number (see figure 3)	Gaging-station name (number) or intermediate measurement site	River mile	Discharge (ft ³ /s)	Date	Time	Total gain or (loss) (ft ³ /s)	Gain or (loss) per mile (ft ³ /s/mi)
			total estimated outflow			0	
			estimated outflow to storage above Bliss Dam ²			400	
L18	Snake River below Bliss Dam, near Bliss (13153776)	559.1	6120	11/7/2002	0030	377	28
			6480	11/8/2002	1500		
			total estimated inflow			0	
			total estimated outflow			0	
L19	Snake River above Bancroft Springs, near King Hill	553.2	⁴ ---	---	---	---	---
			total estimated inflow			5	
			total estimated outflow			0	
L20	Snake River at King Hill (13154500)	546.6	6290	11/8/2002	2115	(195)	(16)

¹ Estimate based on reservoir-stage data (USGS station number 13087900).

² Estimate based on reservoir-stage data (Idaho Power Company).

³ Discharge was measured but not used in the calculations because of questionable accuracy (see table A23).

⁴ Discharge was not measured because of river or weather conditions.

Table A22. Discharge data from gaging stations along the Snake River between near Minidoka and at King Hill, Idaho, November 6-8, 2002

[ft³/s, cubic feet per second]

Site number (see figure A25)	Gaging-station name (number)	Date	Time	Discharge (ft³/s)
L1	Snake River near Minidoka (13081500)	11/6/2002	1000	600
L4	Snake River at Milner (13088000)	11/6/2002 11/7/2002	2230 0330	446 443
L6	Snake River near Kimberly (13090000)	11/7/2002 11/6/2002	1400 1015	758 713
L10	Snake River near Buhl (13094000)	11/6/2002 11/7/2002	1645 0915	1930 2040
L16	Snake River below Lower Salmon Falls, near Hagerman (13135000)	11/7/2002 11/6/2002	1600 1700	5140 5020
L18	Snake River below Bliss Dam, near Bliss (13153776)	11/7/2002 11/8/2002	0030 1500	6120 6480
L20	Snake River at King Hill (13154500)	11/8/2002	2115	6290

Table A23. Discharge data from acoustic Doppler measurements along the Snake River between the near Minidoka and at King Hill gaging stations, Idaho, November 6-8, 2002

[ft³/s, cubic feet per second; COV, coefficient of variation; σ , standard deviation; μ , mean; ---, no data]

Site number (see figure A25)	Intermediate measurement site	Date	Time	Discharge (ft ³ /s)	COV (σ/μ)
L2	Snake River at Highway 77(25) near Rupert	11/6/2002	1436	512	0.04
L3	Snake River at Highway 27 at Burley	11/6/2002	1621	465	.27
L5	Snake River above Murtaugh Bridge at Murtaugh	11/7/2002	0731	479	.05
L7	Snake River above Shoshone Falls near Kimberly	11/6/2002	1121	704	.10
L8	Snake River below Perrine Bride at Twin Falls	11/7/2002	1419	864	.08
L9	Snake River above Crystal Springs near Buhl	11/6/2002	1432	1160	.04
L11	Snake River below Clear Lakes outlet near Buhl	11/7/2002	1112	2610	.10
L12	Snake River above Banbury Springs near Hagerman	11/7/2002	1058	2600	.12
L13	Snake River above Thousand Springs near Hagerman	11/7/2002	1141	3770	.02
L14	Snake River below Thousand Springs near Hagerman	11/7/2002	1212	4920	.01
L15	Snake River above Lower Salmon Falls Power Plant near Bliss	11/7/2002	1343	5110	.05
L17	Snake River above Bliss Dam near Bliss	11/8/2002	1211	¹ 6680	.02
L19	Snake River above Bancroft Springs near King Hill	² ---	---	---	---

¹ Accuracy is questionable because of backwater effects probable changes in channel storage.

² Unable to access measurement site because of unsafe river conditions.

Table A24. Discharge data for all inspected inflow and outflow sites along the Snake River between the near Minidoka and at King Hill gaging stations, Idaho, November 4-8, 2002

[Latitude and longitude in degrees, minutes, seconds referenced in North American Datum of 1983; ft³/s, cubic feet per second; site numbers shown in figure A25; ---, no data; DM, daily mean discharge; values in shaded areas indicate canal withdrawals]

Inspection site name	Gaging-station number	Location		Date	Time	Discharge (ft ³ /s)
		Latitude	Longitude			
Subreach between site numbers L1 and L2						
F Drain near Declo	13082060	42 32 48	113 37 14	11/6/2002	---	0
D-3 Drain near Declo	13082032	42 36 49	113 36 10	11/4/2002	1600	1.3
Subreach between site numbers L2 and L3						
D-5 Drain near Rupert	13082062	42 33 15	113 38 38	11/5/2002	1400	1
D-4 Drain near Rupert	13082064	42 34 15	113 38 25	11/4/2002	DM	3
Marsh Creek near Declo	13082320	42 31 26	113 40 02	11/5/2002	DM	¹ 10.2
Spring Creek near Declo	13082330	42 31 01	113 41 03	11/5/2002	DM	¹ 6.4
D-16 Drain near Heyburn	13084705	42 32 30	113 45 24	11/4/2002	DM	5.7
Subreach between site numbers L3 and L4						
B Drain near Heyburn	13084707	42 33 33	113 47 01	11/6/2002	---	0
D-17 Drain near Heyburn	13085060	42 32 53	113 50 51	11/5/2002	DM	1.3
Main Drain North near Heyburn	13085065	42 33 02	113 51 59	11/5/2002	DM	14.6
G Drain near Burley	13085070	42 31 56	113 53 12	11/6/2002	---	0
J Drain near Burley	13085080	42 31 53	113 53 29	11/6/2002	---	0
A&B Irrigation Pump near Milner	13085500	42 32 01	113 56 51	11/6/2002	DM	0
PA Lateral Pump near Milner	13085800	42 32 02	113 58 19	11/6/2002	DM	0
Milner Irrigation Pump near Milner	13086000	42 31 10	114 00 38	11/6/2002	DM	0
Northside A Lateral near Milner	13086510	42 32 17	114 02 40	11/6/2002	DM	0
Northside Crosscut Canal near Milner	13086520	42 33 31	114 03 08	11/6/2002	DM	0
Milner-Gooding Canal near Milner	13086530	42 33 39	114 02 59	11/6/2002	DM	0
North Side Main Canal near Milner	13087000	42 31 46	114 01 10	11/6/2002	DM	0
Twin Falls Main Canal near Milner	13087500	42 31 18	114 01 03	11/6/2002	DM	0
Subreach between site numbers L4 and L5						
---	---	---	---	---	---	---
Subreach between site numbers L5 and L6						
Miscellaneous agriculture return near Hansen	13089690	42 33 55	114 19 24	11/6/2002	---	0
Twin Falls Coulee near Hansen	13089695	42 34 11	114 20 32	11/6/2002	---	0
Devil's Washbowl Spring near Kimberly	13089600	42 35 18	114 20 45	---	---	¹ ---
Subreach between site numbers L6 and L7						
Devil's Corral Springs near Kimberly	13090100	42 35 38	114 21 55	---	---	¹ ---
Subreach between site numbers L7 and L8						
Fish Hatchery Waste O near Twin Falls	13090370	42 35 31	114 26 05	11/8/2002	1510	15
Mary Alice Lake discharge near Twin Falls	---	42 35 46	114 26 51	11/8/2002	1430	1
Subreach between site numbers L8 and L9						
Perrine Coulee near Twin Falls	13090460	42 35 53	114 28 20	11/6/2002	1100	¹ 1.8
Blue Lakes Outlet near Twin Falls	13091500	42 36 30	114 28 34	---	---	¹ ---
Warm Creek near Twin Falls	13091700	42 37 15	114 29 55	11/8/2002	1300	25
Rock Creek above Highway 30/93 at Twin Falls	² 13092747	42 33 47	114 29 42	11/7/2002	DM	70
Jerome Golf Course Drain 1	13091733	42 38 03	114 31 02	11/8/2002	1345	0
Miscellaneous agriculture return near Twin Falls	---	42 37 21	114 33 23	11/8/2002	1220	0
Sonnicksen Drain near Twin Falls	13093150	42 38 40	114 33 26	11/6/2002	---	0
Miscellaneous agriculture return near Twin Falls	---	42 38 23	114 33 32	11/8/2002	1335	0
Miscellaneous agriculture return near Twin Falls	---	42 37 36	114 34 29	11/8/2002	1225	13.0
Sucker Flat Drain near Filer	13093190	42 38 25	114 35 30	11/6/2002	1430	31
Miscellaneous agriculture return near Filer	---	42 37 51	114 35 41	11/8/2002	1210	10
Miscellaneous agriculture return near Filer	---	42 38 54	114 36 58	11/8/2002	1145	5.0

Table A24. Discharge data for all inspected inflow and outflow sites along the Snake River between the near Minidoka and at King Hill gaging stations, Idaho, November 4-8, 2002--Continued

Inspection site name	Gaging-station number	Location		Date	Time	Discharge (ft ³ /s)
		Latitude	Longitude			
Subreach between site numbers L9 and L10						
Miscellaneous agriculture return near Filer	---	42 39 17	114 38 16	11/8/2002	120	2
Crystal Springs near Filer	13093400	42 39 36	114 38 32	---	---	¹ ---
Cedar Draw near Filer	13093550	42 39 13	114 39 15	11/8/2002	1030	44
Miscellaneous agriculture return near Buhl	---	42 39 31	114 40 42	11/8/2002	950	1
Waste I near Buhl	13093900	42 39 33	114 41 28	11/8/2002	908	14.3
Subreach between site numbers L10 and L11						
Miscellaneous agriculture return near Buhl	---	42 40 03	114 43 10	11/8/2002	850	0.5
Miscellaneous agriculture return near Buhl	---	42 40 07	114 44 18	11/8/2002	840	2
J8 Drain near Buhl	---	42 40 27	114 44 27	11/8/2002	840	0
Clear Lakes Outlet near Buhl	13094500	42 40 01	114 46 45	---	---	¹ ---
Subreach between site numbers L11 and L12						
Mud Creek near Buhl ³	13094700	42 39 33	114 47 20	11/5/2002	1500	58
Deep Creek near Buhl ³	---	42 39 29	114 48 38	11/5/2002	1300	20
Briggs Creek Spring near Buhl	13095200	42 40 20	114 49 00	---	---	¹ ---
Subreach between site numbers L12 and L13						
Irrigation Ditch to Blind Canyon near Buhl	13095490	42 42 28	114 47 30	11/7/2002	---	0
South Coulee (Cedar Draw) near Buhl	13095360	42 41 46	114 48 19	11/7/2002	830	3.5
Box Canyon Springs near Wendell	² 13095500	42 42 29	114 48 35	---	---	¹ ---
Blind Canyon Spring near Buhl	13095400	42 42 12	114 49 20	---	---	¹ ---
Unnamed Spring near Buhl	13095350	42 41 51	114 49 21	---	---	¹ ---
Salmon Falls Creek near Hagerman	² 13108150	42 41 47	114 51 15	11/5/2002	1145	162
Subreach between site numbers L13 and L14						
Sand Springs near Hagerman	13132600	42 43 36	114 50 00	---	---	¹ ---
Drain near Bickel Springs near Hagerman	13133785	42 45 28	114 50 48	11/7/2002	---	0
Bickel Spring near Hagerman	13132790	42 45 29	114 51 19	---	---	¹ ---
Subreach between site numbers L14 and L15						
Riley Creek near Hagerman	13133800	42 45 50	114 51 40	11/5/2002	1010	87
Subreach between site numbers L15 and L16						
Billingsly Creek near Hagerman	13134600	42 46 44	114 51 22	11/4/2002	1600	29.9
Subreach between site numbers L16 and L17						
W Drain near Tuttle	13152895	42 51 50	114 51 58	11/8/2002	---	0
Birch Creek near Hagerman	13135100	42 51 10	114 53 30	11/4/2002	1423	11.9
Malad Power Flume near Bliss	² 13152940	42 51 54	114 53 11	11/4/2002	1352	1000
Malad River near Bliss	² 13153500	42 51 48	114 54 04	11/4/2002	1335	110
Subreach between site numbers L17 and L18						
Tuana Gulch near Bliss	---	42 54 34	115 00 02	11/4/2002	1230	1
Irrigation Ditch near Bliss	13152450	42 55 56	115 00 19	11/8/2002	---	0
Subreach between site numbers L18 and L19						
---	---	---	---	---	---	---
Subreach between site numbers L19 and L20						
Clover Creek near Bliss	13154000	43 01 30	115 00 20	11/4/2002	1100	5

¹ Streamflow resulting from spring discharge; not used in calculation of gain/loss estimates.

² Long-term United States Geological Survey or Idaho Power Company gaging station.

³ Combined spring discharge and agriculture return flows; springflow was subtracted from field-measured value to obtain an approximate agriculture return-flow value.

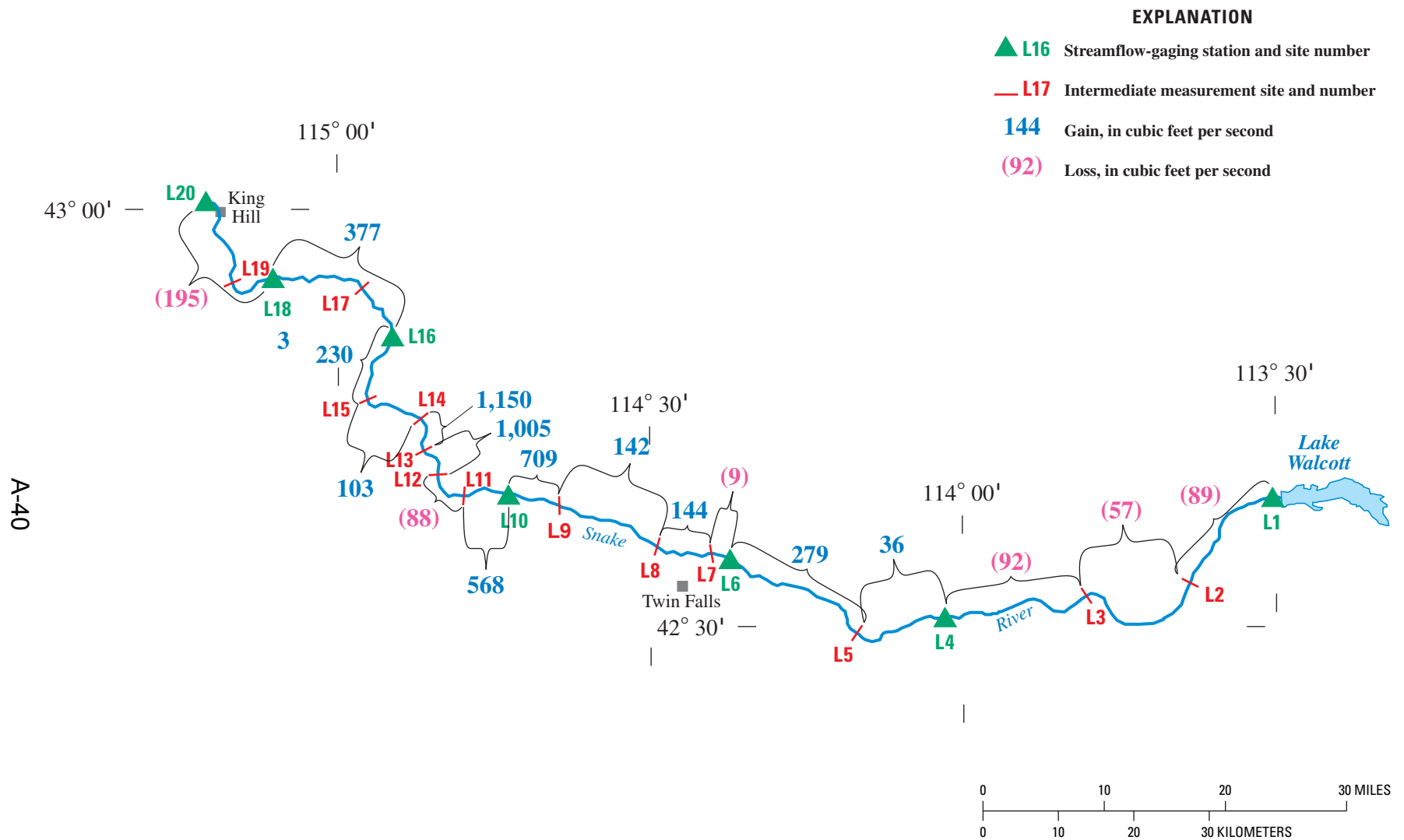


Figure A25. Streamflow gains and losses along the lower reach of the Snake River, between the near Minidoka and at King Hill gaging stations, southeastern Idaho, November 4–8, 2002.