

Project No. 370-01-1999

2010 Annual Report on Water Use and Mitigation for the Sam's Hollow Water Company

Prepared for:

Sam's Hollow Water Company
Bear Lake, Idaho

April 21, 2011

For information concerning this report, contact
Greg W. Sullivan, M.S., E.I.T.
Charles G. Brockway, Ph.D., P.E.



CHARLES E. BROCKWAY, Ph.D., P.E.
CHARLES G. BROCKWAY, Ph.D., P.E.
ERICK POWELL, Ph.D., P.E.

2016 NORTH WASHINGTON, SUITE 4
TWIN FALLS, IDAHO 83301

Project No. 370-01-1999

2010 Annual Report on Water Use and Mitigation for the Sam's Hollow Water Company

Prepared for:

**Sam's Hollow Water Company
Bear Lake, Idaho**

April 21, 2011

For information concerning this report, contact
Greg W. Sullivan, M.S., E.I.T.
Charles G. Brockway, Ph.D., P.E.



CHARLES E. BROCKWAY, Ph.D., P.E.
CHARLES G. BROCKWAY, Ph.D., P.E.
ERICK POWELL, Ph.D., P.E.

2016 NORTH WASHINGTON, SUITE 4
TWIN FALLS, IDAHO 83301

2010 Annual Report on Water Use and Mitigation Sam's Hollow Water Company

Brockway Engineering, PLLC
April 21, 2011

Introduction

The Water Management and Operations Plan for Mitigation (the "Plan") dated June 19, 2006 for Sam's Hollow Water Company requires an annual report of water use on residences and facilities in use during the year. The reporting requirements are outlined in the Plan, which was submitted to the Idaho Department of Water Resources. The Plan requires the submittal of the number and type of facilities (residences, commercial, and other) utilizing ground water during the year, the estimated depletion to Bear Lake resulting from the occupancy of the facilities, irrigated acres taken out of production within the project, and the volume of mitigation water returned to Bear Lake through the mitigation facilities.

The mitigation facilities consist of conveyance channel which delivers water from the end of the irrigation system to a pipeline which conveys water to Bear Lake from Fish Haven Creek. Water delivered through the irrigation system and mitigation pipeline is measured through a flow meter before it returns to Bear Lake.

Sam's Hollow Water Company has shares in Fish Haven Water Users for delivery through three ditches from Fish Haven Creek to the project. Deliveries into the ditches are measured through calibrated flumes. During 2010, deliveries through Ditch No. 3, the lower ditch, were the source of water for mitigation. A portion of the flow through Ditch No. 3 was delivered into a pond and thence through the flow meter and into Bear Lake.

Project Build-Out

In 2006 there were no homes or water-using facilities in use on the Project. Project build out during 2007 was minimal with only one residence being furnished water. In 2008 there were an additional 9 units constructed. There were 4 units constructed in 2009 for a total of 14 residential households. In 2010 there were an additional 3 units constructed. Locations of the residences are shown on the attached map. Construction on the clubhouse was initiated in 2007 and completed in 2008. Previous annual reports did not include the clubhouse in mitigation calculations.

Irrigated Acres

Mitigation for water use on residential and commercial units requires that irrigated acres formerly supplied with surface water be dried up to compensate for consumptive use depletion of the development. The 2008 annual report documented the fact that 2.05 acres had been removed from irrigation due to construction of roadways (note that other roads were in place prior to the approved mitigation plan and are not accounted for). The assumed area of house footprints, driveways, and other hardscape areas per residence is 4,000 ft². The assumed area of turf, garden area and landscaping areas per residence is 5,000 ft² for a total displaced area of 9,000 ft² per residence. The approximate area removed from irrigation for the clubhouse, pool area and parking lot is 1.0 acres or 43,560 ft². Seven (7) constructed residences and the club house are within the area in which surface water has historically been applied. Therefore, the total area that has been removed from irrigation is 4.5 acres. Based on procedures developed by Dr. Robert Hill and adopted in the Bear River Ground Water Management Plan, the consumptive depletion for grass pasture is 1.18 ac-ft/acre/year. The 4.5 acres removed therefore resulted in a depletion reduction of 5.31 ac-ft for 2010.

Estimated Project Depletion

The estimated consumptive depletion from residences and other facilities was determined using procedures developed by Dr. Robert Hill and adopted in the Bear River Ground Water Management Plan. For the Sam's Hollow system, the depletion values for potable water and irrigation of residences and commercial facilities were developed and included in the Plan for the project. Table 1 was developed to assist in estimating depletion each year based on the facilities build out. Table 1 shows the

annual unit depletion and the number of units on line in 2010. The total estimated depletion from the seventeen (17) units and club house on line in 2010 is 8.25 acre feet.

Table 1. Depletion analysis for Sam's Hollow Water Company in 2010. All depletions are in acre-feet annually.

Entities with On-Site Sewage Disposal

	Unit Depletion	Occupied Units	Total Depletion
Domestic Potable Water - Homesites	0.03	1	0.03
Irrigation - Homesites	0.14	1	0.14

Entities with St. Charles Sewer District Service

	Unit Depletion	Occupied Units	Total Depletion
Domestic Potable Water - Homesites	0.19	16	3.04
Irrigation - Homesites	0.14	16	2.24

Domestic/Irrigating - Condominiums (Per Building = 4 units)	0.5	0	0.00
Irrigation - Condominiums	0.14	0	0.00

Potable Water - Commercial	2.8	1	2.80
-----------------------------------	-----	---	------

All Depletion Values are in Acre-Feet Annually

The annual depletion value is based on a rate of 40.2% occupancy

Total Homesites	17
Total Condominiums	0
Total Commercial Sites	1
Total Depletion	8.25 afa

* The annual depletion value is based on a rate of 40.2% occupancy.

Water Supply Available for Mitigation

The 140.5 shares in Fish Haven Water Users owned by Sam's Hollow Water Company can be diverted through any of three ditches: the Upper North Ditch, Number 1 Ditch, and Number 3 Ditch. Each ditch has been instrumented with water measuring flumes and flow measurements have been recorded since May 22, 2004. The flumes were installed by the Fish Haven Water Users Company with assistance from Sam's Hollow Water Company and are being monitored by Sam's Hollow Water Company.

During 2010, discharge readings were obtained from June 1, 2010 through October 12, 2010 and are shown on the attached spreadsheet. This log shows that there was approximately 1217.83 acre-feet of irrigation water diverted into Upper North Ramped Flume, Ditch No. 1 and Ditch No. 3 during the irrigation season of 2010, of which 152.10 acre-feet was allotted to Sam's Hollow Water Company.

Mitigation Water Returned to Bear Lake

Water was returned to Bear Lake via the mitigation pipeline and was measured by the flow meter located just east of the Fish Haven Cemetery. The pipeline, conveying water from the retention pond, under the highway, and to Bear Lake is an 8-inch PVC pipe with a Siemens SITRANS FM electromagnetic water meter Type MAG 8000 installed in the pipeline (see attached photograph). The meter has a totalizer and instantaneous discharge readout which reads in gallons and gallons per minute. The meter is maintained by Sam's Hollow staff.

The meter was installed in 2007 to record the mitigation water volume. For the 2010 season, mitigation flow commenced to Bear Lake on October 14, 2010. The mitigation flow turn terminated on November 15, 2010. Table 2 shows the mitigation pipeline flow meter readings

Table 2. Flow Meter Readings for the Sam's Hollow Mitigation pipeline

Date	Time	Totalizer Reading (gallons)	Volume (acre-feet)	Mitigation Volume (acre-feet)
10/14/2010	-	5643700	17.32	0
11/15/2010	-	9127300	28.01	10.69

The total volume returned to Bear Lake during the 2010 irrigation season was 10.69 acre feet, which exceeded the total mitigation requirement for the 17 residential units and the club house of 8.25 acre feet. The consumptive use reduction appurtenant to the 4.50 acres removed from irrigation provided 5.31 acre feet to mitigate for the project depletion in 2010, which was insufficient to provide the entire mitigation requirement. Therefore,

2.50 acres (2.94 acre feet) of additional irrigated acres beyond those dried up on the residential footprints should be dried up to mitigate fully for the current development build-out.

Correspondence with Brent Skinner on March 12, 2010 indicated that 22.2 acres of previously irrigated land covered by the 140.5 shares in Fish Haven Water Users was dried up in 2009. These additional 22.2 acres are sufficient to mitigate for the 2010 project depletion.

Projection of 2011 Sufficiency of Mitigation Water

It is estimated that the mitigation requirement for 2011, based on a projected build-out, will be 3 additional homes comprised of 1 residential home outside of the currently irrigated area and 2 within the currently irrigated area. It is expected that there will be 1 residential home with on-site sewage treatment and 19 homes connected to the St. Charles Sewer District for a total of 20 residential units on line. The club house will continue to be utilized with no additional conversion of irrigated areas to commercial uses. The calculated depletion for residences and commercial uses under these assumptions will be 9.24 acre feet. It is estimated that the seasonal water availability for Sam's Hollow in 2011 will be more than adequate to provide mitigation water for the expected number of units on-line in 2011. Currently (March 29, 2011) the Bear River Basin snow pack based on NRCS SNOTEL data is at 68% of normal. The runoff for Fish Haven Creek may be lower than normal based on the current snow pack but ample water for mitigation is expected to be available. It is therefore expected that the diversion available to Ditch No. 1 will be ample to provide mitigation water to Bear Lake for 2011.

Regarding the consumptive use balance, the projected 19 units on line in 2011 (9 homes and the club house within the currently irrigated area) will provide a total of 5.79 acre-feet of the required 9.24 acre-feet estimated depletion for 2011. Therefore, 3.45 acre-feet must be provided from additional irrigation reduction in the amount of 2.92 acres. The 22.2 acres dried up in 2009 will be sufficient to mitigate for the proposed additional 2011 project depletion.



Terminus of the Sam's Hollow mitigation pipeline.

Note: Date on photo is incorrect. The correct date is July 2007.

SAM'S HOLLOW WATER COMPANY AVAILABLE IRRIGATION DIVERSIONS

Water Year	2010	Measurements By The Reserve Staff
2010	100	100
2011	100	100
2012	100	100
2013	100	100
2014	100	100
2015	100	100
2016	100	100
2017	100	100
2018	100	100
2019	100	100
2020	100	100
2021	100	100
2022	100	100
2023	100	100
2024	100	100
2025	100	100
2026	100	100
2027	100	100
2028	100	100
2029	100	100
2030	100	100
2031	100	100
2032	100	100
2033	100	100
2034	100	100
2035	100	100
2036	100	100
2037	100	100
2038	100	100
2039	100	100
2040	100	100
2041	100	100
2042	100	100
2043	100	100
2044	100	100
2045	100	100
2046	100	100
2047	100	100
2048	100	100
2049	100	100
2050	100	100
2051	100	100
2052	100	100
2053	100	100
2054	100	100
2055	100	100
2056	100	100
2057	100	100
2058	100	100
2059	100	100
2060	100	100
2061	100	100
2062	100	100
2063	100	100
2064	100	100
2065	100	100
2066	100	100
2067	100	100
2068	100	100
2069	100	100
2070	100	100
2071	100	100
2072	100	100
2073	100	100
2074	100	100
2075	100	100
2076	100	100
2077	100	100
2078	100	100
2079	100	100
2080	100	100
2081	100	100
2082	100	100
2083	100	100
2084	100	100
2085	100	100
2086	100	100
2087	100	100
2088	100	100
2089	100	100
2090	100	100
2091	100	100
2092	100	100
2093	100	100
2094	100	100
2095	100	100
2096	100	100
2097	100	100
2098	100	100
2099	100	100
2100	100	100

Date	Upper North Ramped Flume*					NO 1 NORTH * Parshall Flume*					No. 3 North 12" Ramped Flume					Total add	Sam's Hollow Total add
	Gage ft	Discharge cfs	Measured sf/d	Estimated sf/d	Accum sf	Gage ft	Discharge cfs	Measured sf/d	Estimated sf/d	Accum sf	Gage ft	Discharge cfs	Measured sf/d	Estimated sf/d	Accum sf		
1-May					248.5 in ditch 38.9%					133.8 in ditch 16.9%							
2-May																	
3-May																	
4-May																	
5-May																	
6-May																	
7-May																	
8-May																	
9-May																	
10-May																	
11-May																	
12-May																	
13-May																	
14-May																	
15-May																	
16-May																	
17-May																	
18-May																	
19-May																	
20-May																	
21-May																	
22-May																	
23-May																	
24-May																	
25-May																	
26-May																	
27-May																	
28-May																	
29-May																	
30-May																	
31-May																	
1-Jun																	
2-Jun																	
3-Jun																	
4-Jun																	
5-Jun																	
6-Jun																	
7-Jun																	
8-Jun																	
9-Jun																	
10-Jun																	
11-Jun																	
12-Jun																	
13-Jun																	
14-Jun																	
15-Jun																	
16-Jun																	
17-Jun																	
18-Jun																	
19-Jun																	
20-Jun																	
21-Jun																	
22-Jun																	
23-Jun																	
24-Jun																	
25-Jun																	
26-Jun																	
27-Jun																	
28-Jun																	
29-Jun																	
30-Jun																	
1-Jul																	
2-Jul																	
3-Jul																	

Date	Upper North Ramped Flume*					NO 1 NORTH * Partial Flume*					No. 3 North 12" Ramped Flume					Sam's Hollow Total add
	Gage ft	Discharge cfs	Measured add	Estimated add	Sam's Hollow 88.5 shares 249.5 in ditch 38.9%	Accum at	Gage ft	Discharge cfs	Measured add	Estimated add	Sam's Hollow 21.0 shares 255.4 in ditch 8.2%	Accum at	Total add			
4-Jul				1.14	0.46	45.11						20.71	12.14	1.78		
5-Jul				0.57	0.23	45.34						21.13	11.57	1.53		
6-Jul	0	0.00	0.00	0.00	0.00	45.34	0.46	2.88	5.90	5.10	0.42	21.55	11.00	1.30		
7-Jul				0.00	0.00	45.34						22.52	17.71	1.85		
8-Jul				0.00	0.00	45.34	0.46	2.88	5.90	18.53	0.94	24.04	24.43	2.41		
9-Jul				0.00	0.00	45.34						25.57	24.43	2.41		
10-Jul				0.00	0.00	45.34						27.09	24.43	2.41		
11-Jul				0.00	0.00	46.34						28.81	24.43	2.41		
12-Jul				0.00	0.00	45.34						30.14	24.43	2.41		
13-Jul				0.00	0.00	45.34	0.48	2.88	5.90	18.53	0.94	31.86	24.43	2.41		
14-Jul				0.00	0.00	45.34						33.19	24.43	2.39		
15-Jul				0.00	0.00	45.34	0.45	2.88	5.98	18.53	0.94	34.71	24.23	2.38		
16-Jul				0.00	0.00	45.34						36.14	21.90	2.11		
17-Jul				0.00	0.00	45.34						37.47	19.58	1.94		
18-Jul				0.00	0.00	45.34						38.70	17.26	1.57		
19-Jul				0.00	0.00	45.34						39.85	14.94	1.30		
20-Jul				0.00	0.00	45.34	0	0.00	0.00	12.81	0.74	40.87	12.81	1.04		
21-Jul				0.00	0.00	45.34						41.91	12.81	1.04		
22-Jul				0.00	0.00	45.34						42.94	12.81	1.04		
23-Jul				0.00	0.00	45.34						43.98	12.81	1.04		
24-Jul				0.00	0.00	45.34						45.02	12.81	1.04		
25-Jul				0.00	0.00	45.34						46.05	12.81	1.04		
26-Jul				0.00	0.00	45.34						47.08	12.81	1.04		
27-Jul				0.00	0.00	45.34						48.13	12.81	1.04		
28-Jul				0.00	0.00	45.34						48.65	8.31	0.52		
29-Jul				0.00	0.00	46.34						48.85	0.00	0.00		
30-Jul				0.00	0.00	45.34						48.85	0.00	0.00		
31-Jul				0.00	0.00	45.34						48.85	0.00	0.00		
1-Aug				0.00	0.00	45.34						48.85	0.00	0.00		
2-Aug				0.00	0.00	45.34						48.85	0.00	0.00		
3-Aug				0.00	0.00	45.34						48.85	0.00	0.00		
4-Aug				0.00	0.00	45.34						48.85	0.00	0.00		
5-Aug				0.00	0.00	45.34						48.85	0.00	0.00		
6-Aug				0.00	0.00	45.34						48.85	0.00	0.00		
7-Aug				0.00	0.00	45.34						48.85	0.00	0.00		
8-Aug				0.00	0.00	45.34						48.85	0.00	0.00		
9-Aug				0.00	0.00	45.34						48.85	0.00	0.00		
10-Aug				0.00	0.00	45.34						48.85	0.00	0.00		
11-Aug				0.00	0.00	45.34						48.85	0.00	0.00		
12-Aug				0.00	0.00	45.34						48.85	0.00	0.00		
13-Aug				0.00	0.00	45.34						48.85	0.00	0.00		
14-Aug				0.00	0.00	45.34						48.85	0.00	0.00		
15-Aug				0.00	0.00	45.34						48.85	0.00	0.00		
16-Aug				0.00	0.00	45.34						48.85	0.00	0.00		
17-Aug				0.00	0.00	45.34						48.85	0.00	0.00		
18-Aug				0.00	0.00	45.34						48.85	0.00	0.00		
19-Aug				0.00	0.00	45.34						48.85	0.00	0.00		
20-Aug				0.00	0.00	45.34						48.85	0.00	0.00		
21-Aug				0.00	0.00	45.34						48.85	0.00	0.00		
22-Aug				0.00	0.00	45.34						48.85	0.00	0.00		
23-Aug				0.00	0.00	45.34						48.85	0.00	0.00		
24-Aug				0.00	0.00	45.34						48.85	0.00	0.00		
25-Aug				0.00	0.00	45.34						48.85	0.00	0.00		
26-Aug				0.00	0.00	45.34						48.85	0.00	0.00		
27-Aug				0.00	0.00	45.34						48.85	0.00	0.00		
28-Aug				0.00	0.00	45.34						48.85	0.00	0.00		
29-Aug				0.00	0.00	45.34						48.85	0.00	0.00		
30-Aug				0.00	0.00	45.34						48.85	0.00	0.00		
31-Aug				0.00	0.00	45.34						48.85	0.00	0.00		
1-Sep				0.00	0.00	45.34						48.85	0.00	0.00		
2-Sep				0.00	0.00	45.34						48.85	0.00	0.00		
3-Sep				0.00	0.00	45.34						48.85	0.00	0.00		
4-Sep				0.00	0.00	45.34						48.85	0.00	0.00		
5-Sep				0.00	0.00	45.34						48.85	0.00	0.00		
6-Sep				0.00	0.00	45.34						48.85	0.00	0.00		
7-Sep				0.00	0.00	45.34						48.85	0.00	0.00		
8-Sep				0.00	0.00	45.34						48.85	0.00	0.00		
9-Sep				0.00	0.00	45.34						48.85	0.00	0.00		
10-Sep				0.00	0.00	45.34						48.85	0.00	0.00		

