Water Savings through PLUS WaterSIP 2012

PLUS estimates that the WaterSIP project will save at least 6 MG in 2012, more than three times what was expected. In the initial months of 2012, PLUS located and repaired several major leaks on S Rosebud Circle. It was the evaluation of tools for potential purchase and use in a new PLUS leak detection protocol (being developed as part of the WaterSIP 2012 project) that led to the discovery of the leaks on S Rosebud. As of July 2012, PLUS has experienced significant reduction in the monthly potable water production primarily resulting from these repairs. As both Figure 1 and Table 1 indicates, PLUS is back at water production levels not seen since 2009.

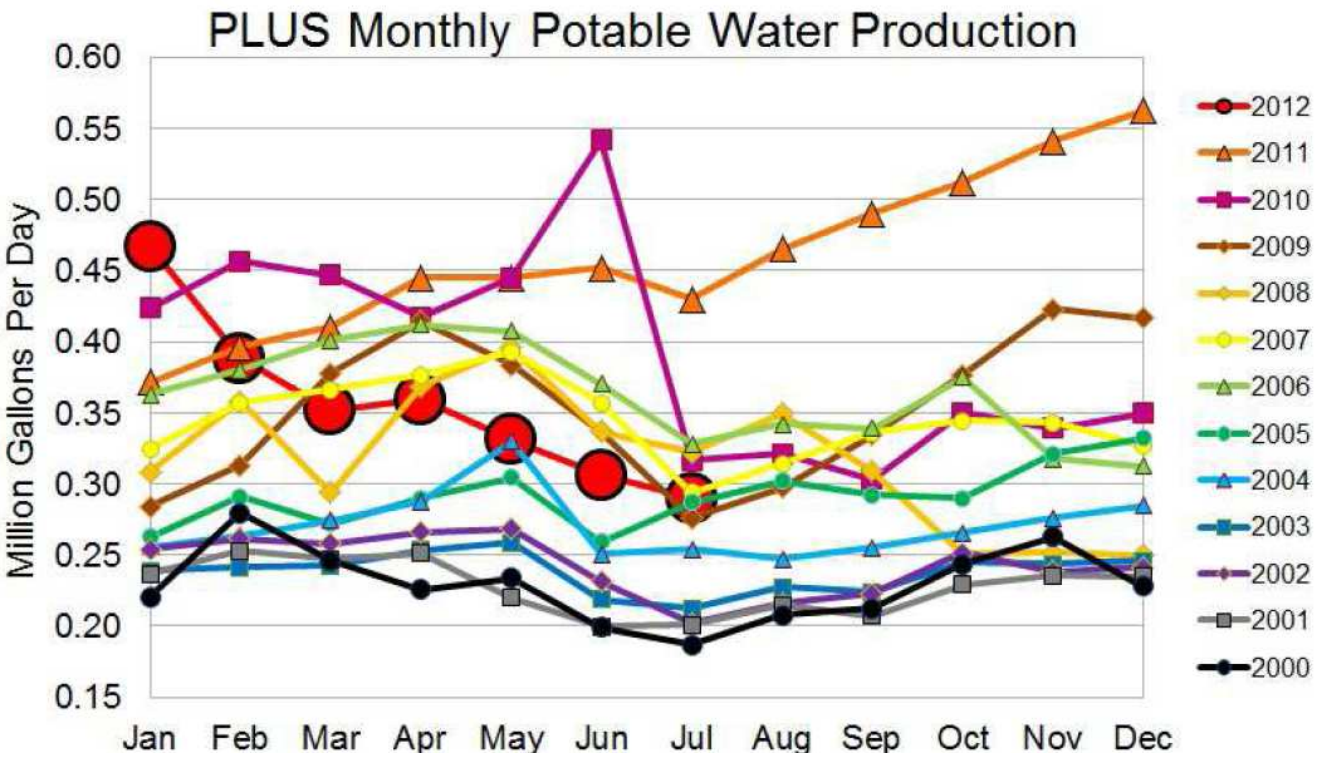

Figure 1. PLUS monthly potable water production in million gallons per day.

Distribution system leakage rates are calculated by comparing water treatment plant outflow data reported on a per connection basis. The baseline period is 2000 through 2008, during which the WTP produced an average of 221 GPD per residential connection. Applying the current PLUS customer base of 1516 service connections yields the gross WTP production rate (Annual Volume = GPD x 1516 x 365). The number of PLUS service connections has remained relatively unchanged since the end of 2006.

Differences in annual WTP output represents either the increase or reduction in distribution system leakage. Leakage rates increased from 2009 to 2011, peaking at 27% or total WTP production or 46 MG in losses.

Table 1. PLUS monthly potable water production in gallons per day per connection.

Month/Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Jan	206	219	232	213	217	205	242	212	203	187	279	245	308
Feb	252	233	239	215	217	227	254	233	236	206	300	261	256
Mar	230	228	235	216	233	212	268	239	194	248	294	270	232
Apr	211	232	243	226	244	226	275	246	243	273	274	293	237
May	219	203	245	230	280	237	272	256	261	252	293	293	218
Jun	186	184	211	194	213	202	247	233	222	221	356	298	202
Jul	175	176	184	189	216	224	219	192	213	181	208	284	
Aug	194	198	197	202	210	235	228	205	230	196	211	307	
Sep	199	191	203	200	217	228	226	219	204	220	200	323	
Oct	228	212	230	218	226	226	250	225	165	248	230	338	
Nov	246	217	218	217	235	250	212	224	166	278	223	357	
Dec	213	217	220	219	242	259	209	214	165	274	230	371	
Annual	**214**	**209**	**221**	**211**	**229**	**228**	**242**	**225**	**208**	**232**	**258**	**303**	**242**
									221				

Table 2. PLUS annual water loss trends and WaterSIP program goals.

Year	Home Usage GPD	Project Year	Goal Reduction(a) in Loss Rate	Goal Loss Rate(b)	Goal Savings MG(c)	Actual Loss Rate(d)	Actual Losses MG(d)	Actual Saved MG(c)
2008	221							
2009	232	-2				5%	6	
2010	258	-1				14%	21	
2011	303	0	0%	25%	0	27%	46	
2012	242	1	10%	23%	2	9%	12	34
2013		2	20%	20%	2			
2014		3	40%	15%	6			
2015		4	60%	10%	6			
2016		5	80%	5%	10			

(a) = Project goal is to reduce the 2011 loss rate by 80% over 5 years
(b) = Loss rate goal, baseline is 2000-2008 average household usage, 221 GPD
(c) = Water savings, compared to prior year usage
(d) = Overall measured losses, relative to the 2000-2008 baseline

The 2011-12 WaterSIP project savings goal was 2 MG, but 34 MG will have been saved in 2012 if flow patterns remain steady through to December. This 34 MG savings is far beyond what PLUS thought possible.

The nature of the PLUS distribution system leak problem is such that leakage has increased 6 to 25 MG in a single year. Thus, by December 2012 the actual could be significantly less than 34 MG, yet will remain far more than the original 2 MG goal for the first project year.

Additional sections of distribution system pipe are sure to fail in the coming years given that over 60 miles of pipe were likely installed in 1998-1999 using the same grossly improper bedding methods. Therefore, PLUS needs to continue with the 5 year project so that it can consistently maintain leakage levels below the 10% level and eventually return to the estimated 5% level reflected in the 2009 data.