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Agenda Item #7  
REPORT #RWSC 2009 - 07

**REPORT TO REGIONAL WATER SUPPLY COMMISSION  
MEETING OF WEDNESDAY, 18 MARCH 2009**

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SUBJECT      2008/2009 WINTER PRECIPITATION

PURPOSE

The purpose of this report is to provide an update on the 2008/2009 winter precipitation, and the potential for watering restrictions in the summers of 2009 and 2010.

BACKGROUND

Between September 1, 2008 and March 8, 2009, 713 mm of precipitation has been recorded at Sooke Dam. This is the second lowest amount of precipitation for this period since daily records started in 1914. The lowest is 667 mm in 2000/2001 and the third lowest is 738 mm in 1992/1993. Average precipitation during the September 1 to March 8 period is 1,295 mm.

Stage 3 watering restrictions were imposed in 2001 as a result of the 2000/2001 drought however, this was before Sooke Dam was raised.

ALTERNATIVES

Alternative 1

Take no conservation action at this time but continue to monitor precipitation and reservoir levels with regular reports to the Commission.

There have been two extreme 2-year droughts where the second year of the drought was as dry as the first year. The most extreme 2-year drought ended in 1930 and the next extreme 2-year drought ended in 1994. Analyses on these two droughts were conducted to determine the potential for watering restrictions in 2009 and 2010 if the same weather patterns established themselves. The analyses started on March 9 of the year following the first year of drought. Figure 1 shows the total storage for Sooke and Goldstream Reservoirs assuming the conditions from March 9, 1929 to December 31, 1931. The minimum storage required to avoid Stage 2 watering restrictions is also shown. The graph shows that Stage 2 restrictions would have been avoided over the above period. Figure 2 shows total storage for the analyzed period between March 9, 1993 and December 31, 1995. Again, Stage 2 watering restrictions would not have been necessary during this period.

Therefore, based on historical weather data and the analysis of 2-year droughts, Stage 2 watering restrictions will not have to be implemented in 2009, and there is little probability of having to implement them in 2010. While the analysis shows that Stage 2 watering restrictions would not be required in 2011, it is too far in the future to attach any probability of having to implement greater than Stage 1 watering restrictions. It should be noted that each year of a 2-year drought had slightly more precipitation than the driest 1-year drought.

A third analysis was conducted on the driest period from March 9 to August 31 of the following year. This was a 1-year drought in 1925/1926. It was assumed that weather conditions starting on March 9, 1925 would be the same for the 2009/2010/2011 period. Figure 3 shows that, if a drought like the one that occurred during 1925/1926 also occurs in the winter of 2009/2010, Stage 2 restrictions would be implemented in the May through September 2010 period. Watering restrictions greater than Stage 1 would not be required in 2011 if weather conditions in 1926/1927 were repeated again in 2010/2011.

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**Re: 2008/2009 Winter Precipitation**

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Alternative 2

As a precautionary approach, implement Stage 2 of the Outdoor Water Use bylaw during July and August 2009.

It should be noted that the above analyses were conducted on historical data. Historical weather data may not be a reliable indicator of future weather patterns because of climate change. In order to determine if climate change has had any effect on precipitation in the recent past and to identify any trends, a 10-year moving average was plotted (Figure 4). This graph shows that there were 3 relatively dry periods up to about the late 1940's, a wet period occurring from about the late 1940's up to the late 1970's and another dry period in the 1980's and 1990's. Since the latter part of the 1990's, there has been no discernable trend. This period is characterized by greater variance which is one of the indicators of climate change.

Victoria's climate is partially determined by the El Nino and La Nina weather patterns which exist over the Pacific Ocean. In general terms, El Nino is a warming of the Pacific Ocean and usually results in less precipitation in the Victoria area. La Nina is a cooling of the Pacific Ocean and usually brings more precipitation to this area. An El Nino occurs about every 3 to 7 years, as does its cold La Nina counterpart. This past winter, La Nina conditions existed in the Pacific Ocean which, in most cases would have resulted in a higher amount of precipitation than occurred. This reversal could also possibly be an indicator of climate change.

With climate change, historical weather patterns may not repeat themselves. Given the uncertainty resulting from climate change, it is difficult to state the probability of the level of precipitation for next winter. Climate change is supposed to bring more extreme weather, which could mean an even drier winter next year than this past winter, or it could mean a wet winter.

RECOMMENDATION

That the Regional Water Supply Commission take no conservation action at this time, but continue to monitor precipitation and storage levels.

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Concurrence