To: Brown, Anthony R (RM)[anthony.brown@bp.com]; Lombardi, Marc (marc.lombardi@amecfw.com)[marc.lombardi@amecfw.com]
Cc: Gary Riley[Riley.Gary@epa.gov]; Greg Reller[gr@burlesonconsulting.com]; Cory Koger[Cory.S.Koger@usace.army.mil]
From: Deschambault, Lynda
Sent: Tue 2/14/2017 4:00:52 PM
Subject: FW: Leviathan Mine - OW - El Nino Monitoring January 7-9, 2017

Please provide an update.

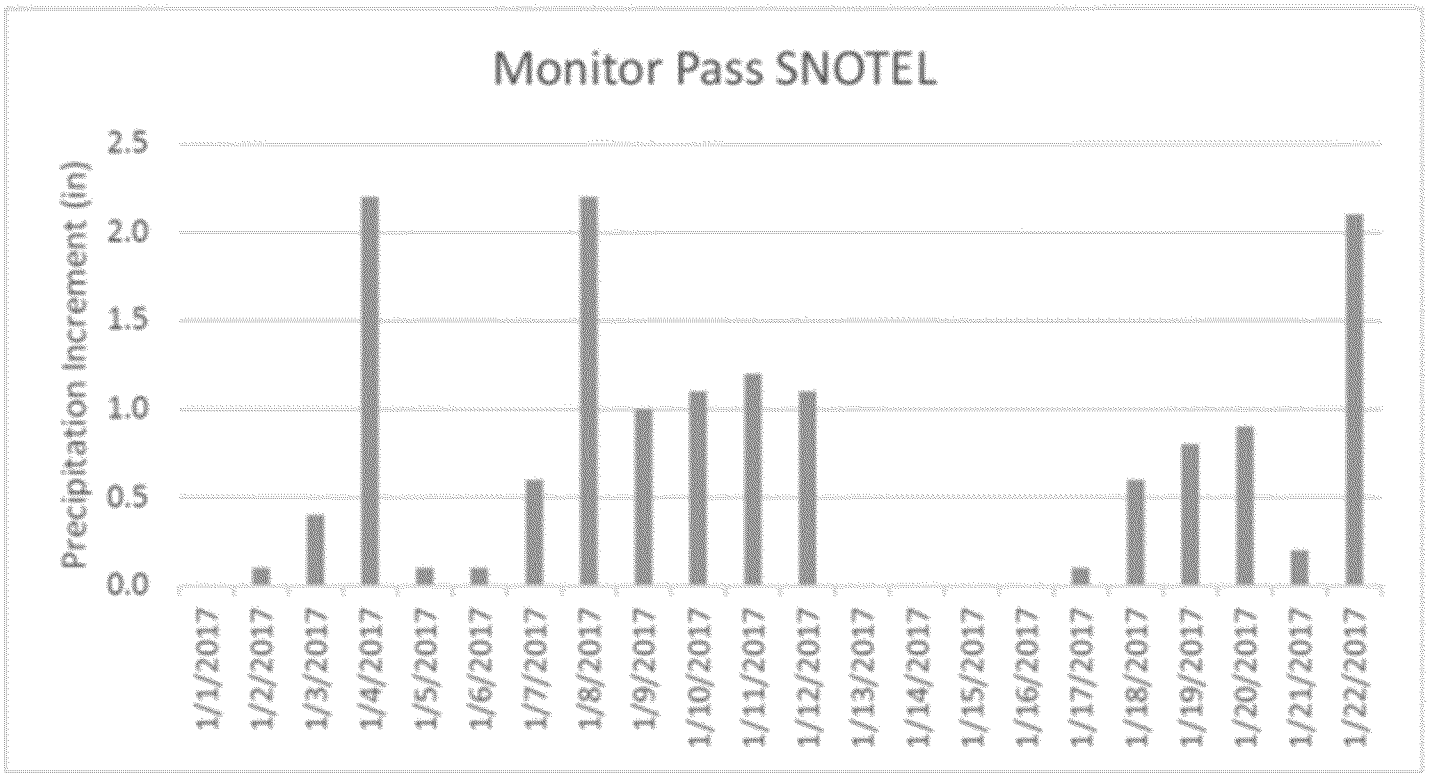
From: Lombardi, Marc [mailto:Marc.Lombardi@amecfw.com]
Sent: Tuesday, January 24, 2017 1:23 PM
To: Deschambault, Lynda <Deschambault.Lynda@epa.gov>; Riley, Gary <riley.gary@epa.gov>
Cc: Brown, Anthony R (RM) <anthony.brown@bp.com>; Sanchez, Yolanda <Sanchez.Yolanda@epa.gov>; Greg Reller <gr@burlesonconsulting.com>; Cohen, Adam <Adam.Cohen@dgslaw.com>
Subject: RE: Leviathan Mine - OW - El Nino Monitoring January 7-9, 2017

Gary / Lynda,

Below is a summary of observations of precipitation at Monitor Pass, and streamflow and water quality for Leviathan Creek at Station 15 for approximately the first three weeks of January 2017.

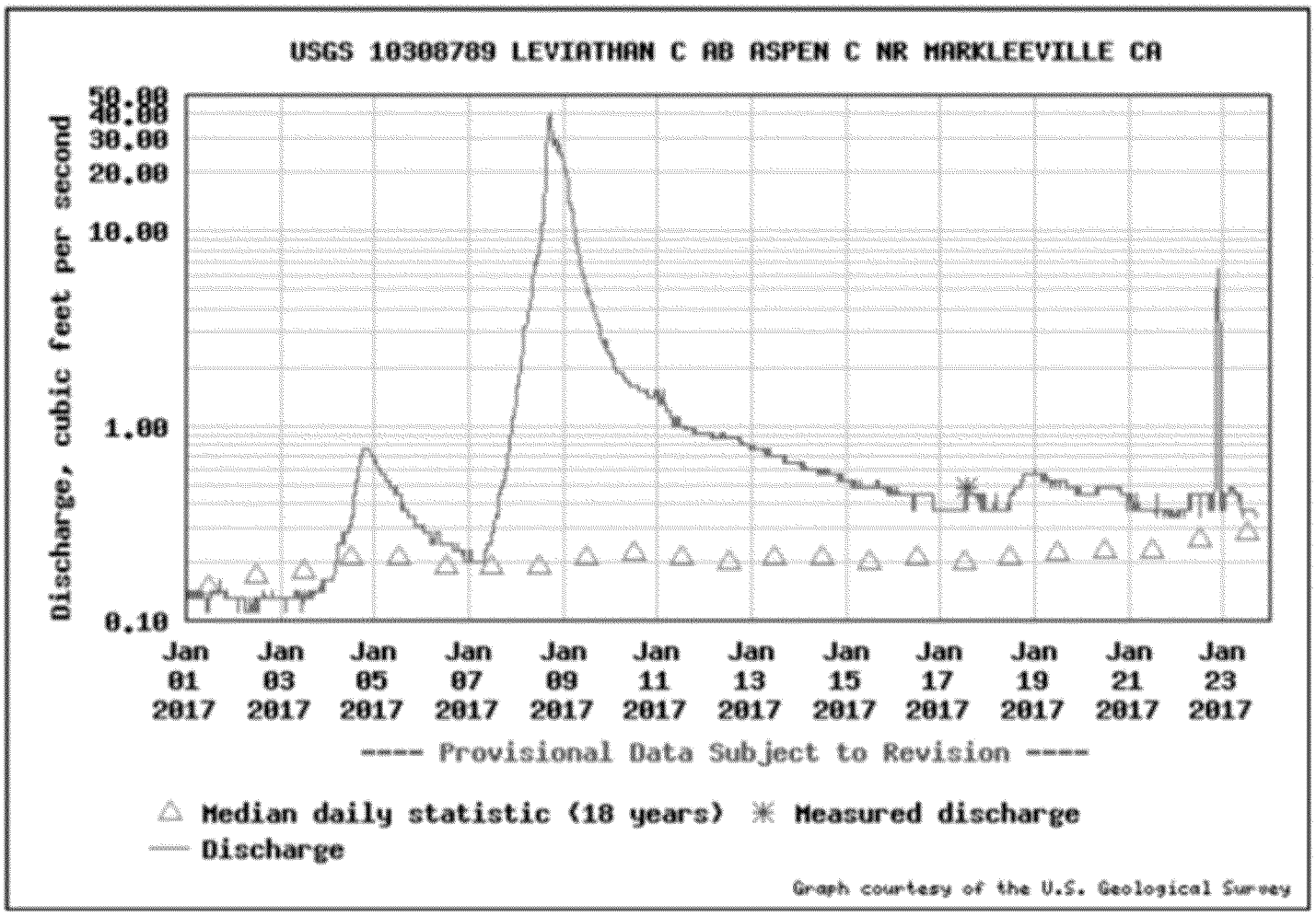
Precipitation

Precipitation measured by the Monitor Pass SNOTEL station shows that precipitation fell most days, with more than 2 inches falling on three days and 1 inch or more falling on an additional 4 days of this 22 day period. The cumulative precipitation during this period is 14.8 inches.



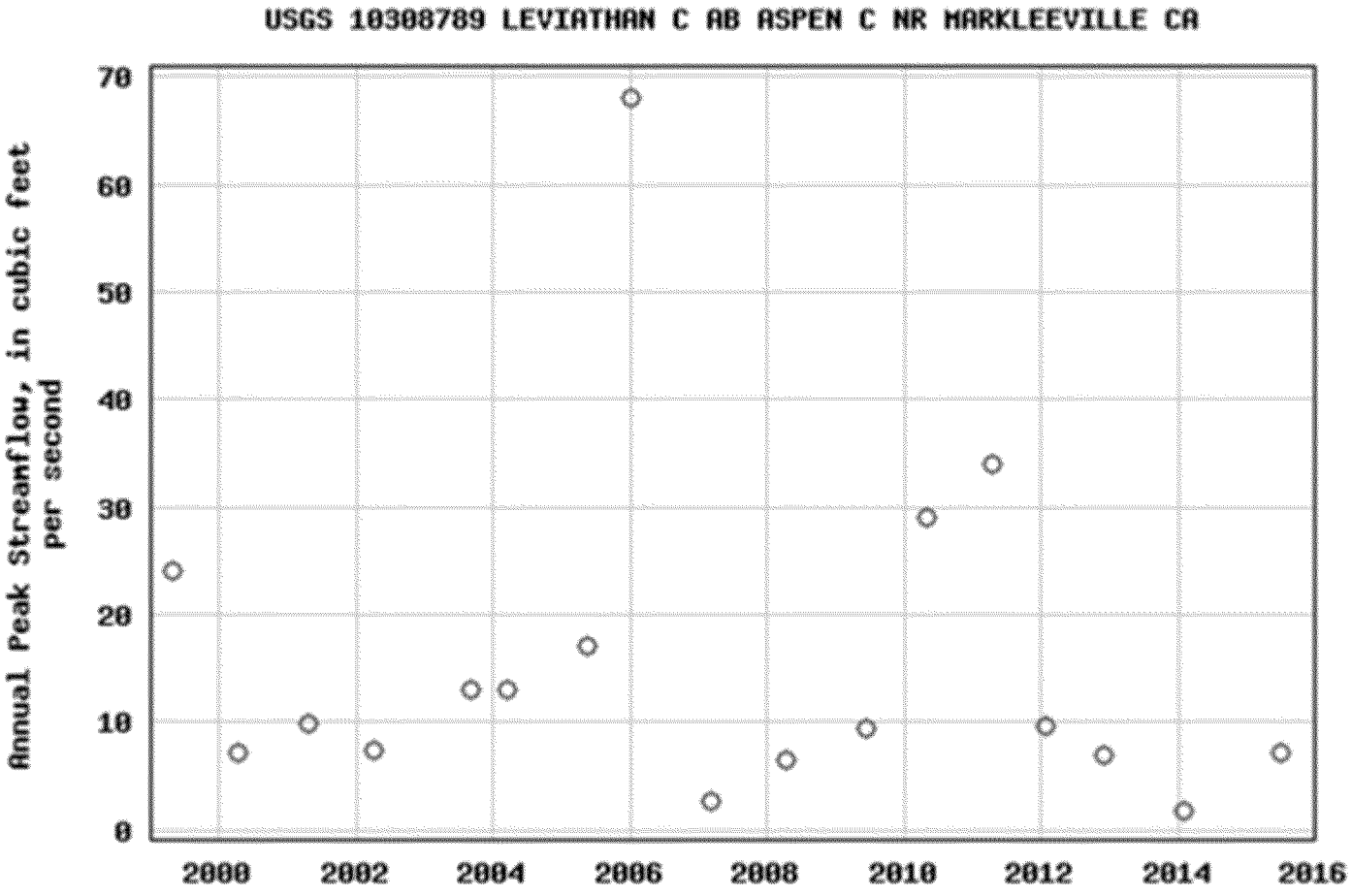
Streamflow

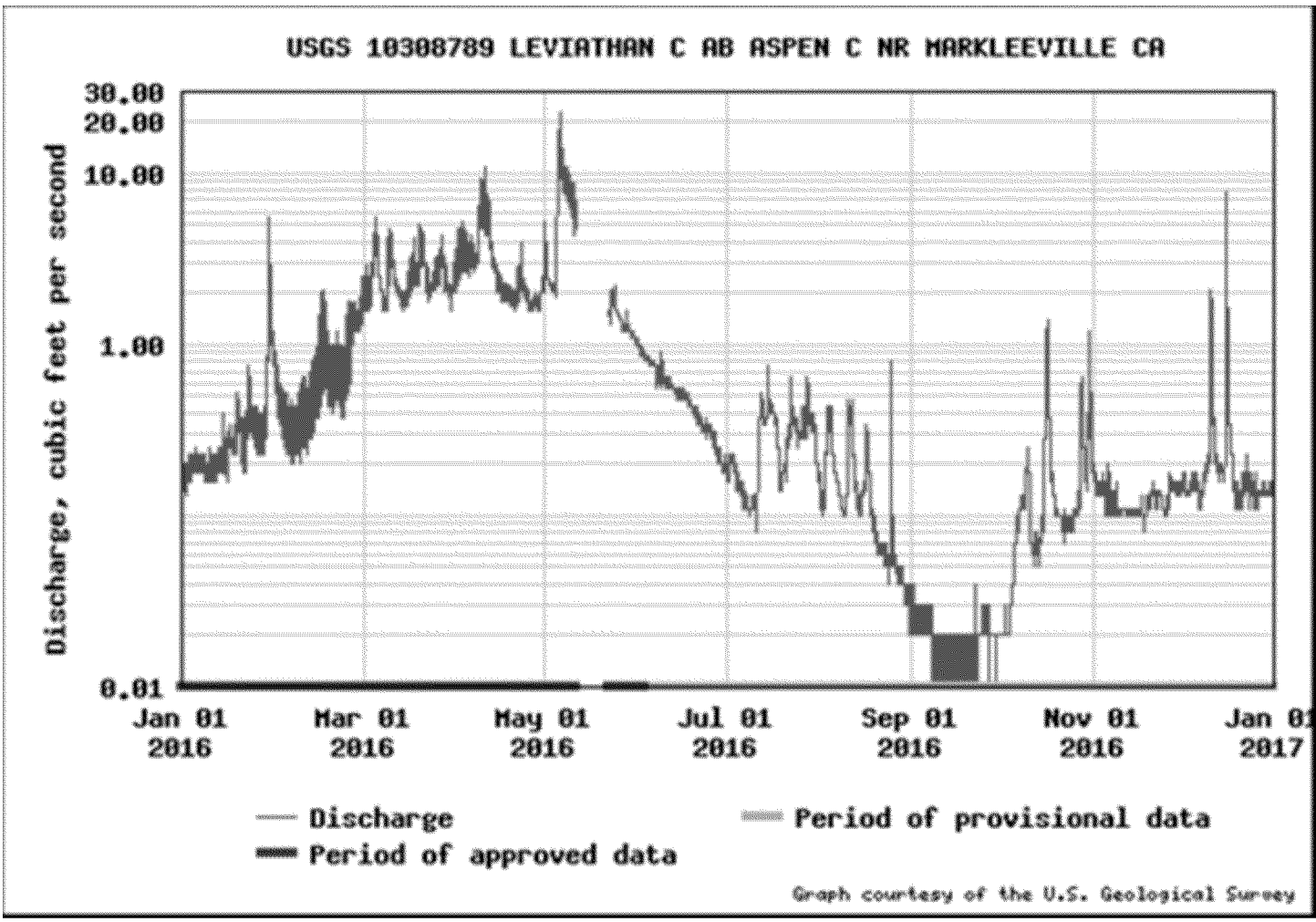
Streamflow in Leviathan Creek is measured at Station 15, the USGS gaging station downstream of the beaver dam/pond complex but upstream of the confluence with Aspen Creek. Three relatively high flow events correspond with the >2 inch precipitation events. The first, on January 4, had a peak flow of approximately 0.8 cubic feet per second (cfs) or approximately 360 gallons per minute (gpm). This relatively small flowrate appears as a peak because it was substantially higher than the flowrate before or after the event, and because flowrate is plotted on a log scale. The second, on January 8, had a much higher flowrate of approximately 40 cfs (~17,950 gpm). The third, on January 22, had a peak flowrate of approximately 7 cfs (~3,140 gpm).



The January 8 high flow event is the second largest flow event recorded at this site. The largest flow, 68 cfs (~30,520 gpm), was measured on December 31, 2005.

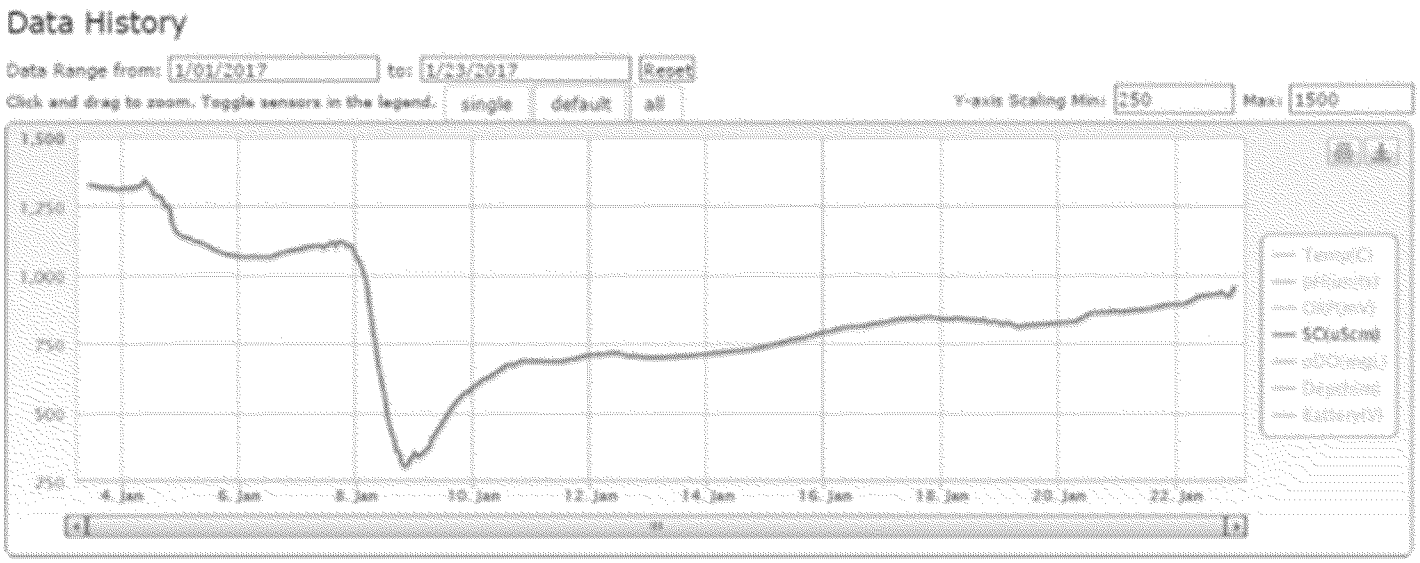
Other relatively large flowrates >20 cfs (>8,975 gpm) occurred in 1999, 2010, 2011, and 2016.


USGS 10308789 LEVIATHAN C AB ASPEN C NR MARKLEEVILLE CA
Annual Peak Streamflow, in cubic feet per second
0
10
20
30
40
50
60
70
2000
2002
2004
2006
2008
2010
2012
2014
2016

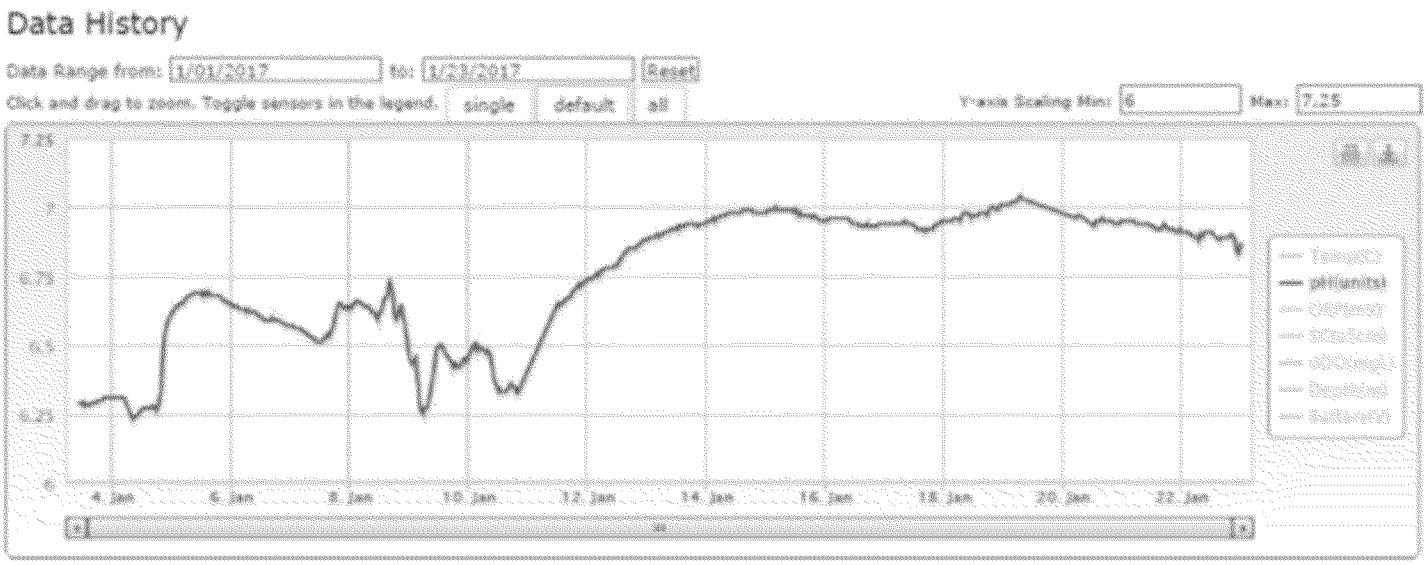


Water Quality

Water quality parameters specific conductance and pH (as well as other parameters) are measured by U.S. EPA's water quality monitor adjacent to the streamflow station. SC values showed an abrupt decline from approximately 1300 to 1100 uS/cm that corresponded with the first (~0.8 cfs) peak flow event; an abrupt decline from approximately 1,100 to 300 uS/cm that corresponded with the second (40 cfs) peak flow event, followed by an increase to about 900 uS/cm. SC did not show a significant change in conjunction with the third peak flow event (~7 cfs).



pH is a measure of the acid – alkaline condition of water. The pH in early January was ~6.25 standard units. Similar to SC, pH values changed abruptly in conjunction with the first two peak flow events. pH increased from about 6.25 to 6.7 in conjunction with the first peak flow event (~0.8 cfs), and then gradually declined over several days to about 6.5. The pH response during the second peak flow event (40 cfs) was more complicated; an initial increase to 6.75, a decline to 6.25, increase to about 6.5, and then a decline to about 6.3. Beginning late January 10, pH gradually increased to approximately 7 on January 19, and then drifted downward slightly to approximately 6.8 to 6.9 by January 22. There was a small (<0.1 unit) pH response in conjunction with the third peak flow event (7 cfs). Note that the scale of the graph makes these relatively small changes – a few tenths of a pH unit – appear more dramatic than they actually are.



If you have any questions or comments, please contact Tony Brown at (714) 228-6770 or anthony.brown@bp.com.

Thanks,

Marc

Marc R. Lombardi, CEM, PG

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