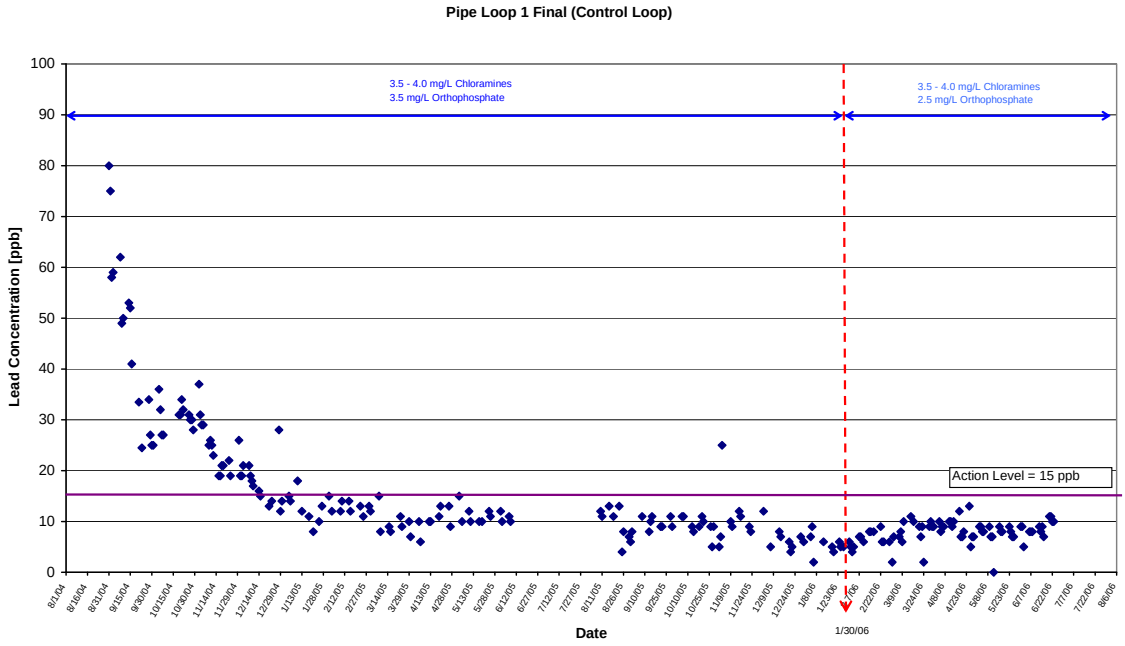
WASA Pipe Loop Study – Updated August 2006



Additional Information on WASA's Pipe Loop Study

WASA is conducting a series of experiments to test the effectiveness of lead control strategies by circulating tap water through lead service lines that have been excavated from their distribution system. Pipe loop 1 is WASA's control loop, which receives the same water as the rest of the distribution system. The text boxes describe the water quality conditions for each time period.

The Y (vertical) axis represents the lead concentration in parts per billion (ppb). The X (horizontal) axis indicates the date the sample was taken. Each data point represents the accumulated lead concentration in water that has been stagnated for 8 hours and circulated through lead service lines for approximately 16 additional hours.

Starting in August 2004, approximately 3 mg/L of orthophosphate was added to the water leaving the Washington Aqueduct's treatment plants. Orthophosphate reacts with the lead to build up a lead phosphate coating (passivating layer) inside the service line. This laboratory data correlates well with the decreasing lead levels seen in the distribution system between late 2004 and the present day.

In late January 2006, the Washington Aqueduct took the first step in decreasing the orthophosphate dose in the drinking water. The initial dose of orthophosphate was on the high end of normal operation in order to rapidly coat (or "passivate") the distribution system pipes. The orthophosphate dose was decreased from 3 mg/L to approximately 2.4 mg/L. Laboratory tests and tap monitoring continue to assess any effects of this operational change.

WASA is also using pipe loop experiments to examine the effects of a switch from addition of chloramines (the current disinfectant) to free chlorine addition to simulate the springtime chlorine "burn". This switch, intended to control bacterial growth in the distribution system, is usually performed for one month each year. In an effort to maintain stable water chemistry, the Washington Aqueduct (which treats DC's drinking water) did not perform this temporary switch to chlorine in 2005 or 2006; monitoring by WASA did not indicate a significant increase in bacterial detections as a result.

Notes on Laboratory Data

Laboratory data from the stagnation loops should be interpreted with care. The amount of lead that leaches from a lead service line depends on many factors. The first is the nature of the service line itself. WASA uses excavated lead service lines from their system in all of their recirculation loops. The age of the service line, the way it was manufactured, and the quality of water it received can influence the amount of lead that leaches into drinking water. Another reason that the data should be interpreted carefully is that laboratory experiments are conducted under controlled conditions. In the distribution system and in individual homes, the quality of water can vary more than it does in the laboratory.