# The Implicative Comparisons of 90th Percentile Lead and Copper Compliance Calculations on Historic NYC Public Water System Data

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Since 1991, the Lead and Copper Rule (LCR) enacted by the Environmental Protection Agency (EPA) aimed to provide regulation for lead (Pb) and copper (Cu) in public water systems (PWS). During monitoring periods, 1st-liter (L1) samples are collected based on a tiering system that prioritizes single-family homes with lead service lines (LSL) or with solder constructed after 1982. If Pb or Cu concentrations exceed specific action levels (AL), corrosion control treatments (CCT) are implemented to protect public health. The Michigan Department of Environmental, Great Lakes, and Energy (EGLE) adopted a state-wide LCR (MI LCR) in response to the Flint, Michigan Water Crisis. The MI LCR introduces a sequential 5th-liter (L5) sample to better represent the water in contact with LSLs. The LCR was revised in 2021 to include the L5 sample in its compliance. This study applies the MI LCR, the revised and original LCR to historic NYC PWS data to reassess Pb and Cu concentrations considered against the consumer confidence report (CCR) values. After processing the database with Excel to determine annual Pb and Cu concentrations of each compliance, the matplotlib based seaborn library was utilized to model the statistics of the 90th percentile values. The MI LCR yielded significantly higher concentrations than the revised and original LCR, some even nearing the ALs. The revised LCR yielded lower Pb concentrations than the original LCR, which contradicts the revised LCR's intentions. These samples were taken without the context of sampling priority, suggesting that the inherent concentrations are higher.

**Awards Won:**