R2 Reasonable Potential Tool Parameter Report

Compiled on 26 March, 2025

PR0024163 - 001 : Ammonia & ammonium- total

Evaluated from 2020-03-31 to 2025-01-31

FACILITY INFORMATION:

PRASA HATILLO WTP

STATE ROAD 2, KM 88.9

HATILLO, PR

SUMMARY STATISTICS:

Number of Samples: 59

Min: 60 NA

Mean: 146.46 NA

Max: 1880 NA

WQS - SB: NA NA

WQS - SD: NA NA

RWC: 3801.87 NA

RECEIVING WATER CONCENTRATION CALCULATIONS

assuming a 95% confidence level and a 95% probability basis
calculations from 1991 Technical Support Document pgs 51-55

$$\begin{aligned}
\text{Number of samples} &= n \\
\text{Maximum effluent concentration} &= max \\
\text{Dilution Ratio} &= DR \\
\text{Coefficient of Variation (CV)} &= S_n/\mu \text{ or } 0.6 \text{ when n} < 10 \\
\text{Z-statistic} &= Z_x \\
\text{Reasonable Potential Multiplier (RPM)} &= \frac{exp(Z_{95}\ln(1+CV^2)^{0.5} - 0.5\ln(1+CV^2))}{exp(Z_x\ln(1+CV^2)^{0.5} - 0.5\ln(1+CV^2))} \\
\text{Receiving Water Concentration} &= max * RPM/\text{Dilution Ratio}
\end{aligned}$$

$$\begin{aligned}
n &= 59 \\
max &= 1880 \\
DR &= 1 \\
CV &= 1.96 \\
Z_{95} &= 1.645 \\
Z_x &= 1.084
\end{aligned}$$

$$\begin{aligned}
RPM &= \frac{exp(1.645\ln(1+1.96^2)^{0.5} - 0.5\ln(1+1.96^2))}{exp(1.084\ln(1+1.96^2)^{0.5} - 0.5\ln(1+1.96^2))} \\
&= 2.02
\end{aligned}$$

$$\begin{aligned}
RWC &= 1880 * 2.02/1 \\
&= 3801.87
\end{aligned}$$
