

R2 Reasonable Potential Tool Parameter Report

Compiled on 26 March, 2025

PR0024163 - 001 : Chlorine, total residual

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: 11 NA

Mean: 11.49 NA

Max: 40 NA

WQS - SB: NA NA

WQS - SD: NA NA

RWC: 47.86 NA

RECEIVING WATER CONCENTRATION CALCULATIONS

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

$$\text{Number of samples} = n$$

$$\text{Maximum effluent concentration} = max$$

$$\text{Dilution Ratio} = DR$$

$$\text{Coefficient of Variation (CV)} = S_n/\mu \text{ or } 0.6 \text{ when } n < 10$$

$$\text{Z-statistic} = Z_x$$

$$\text{Reasonable Potential Multiplier (RPM)} = \frac{\exp(Z_{95} \ln(1 + CV^2)^{0.5} - 0.5 \ln(1 + CV^2))}{\exp(Z_x \ln(1 + CV^2)^{0.5} - 0.5 \ln(1 + CV^2))}$$

$$\text{Receiving Water Concentration} = max * RPM / \text{Dilution Ratio}$$

$$n = 59$$

$$max = 40$$

$$DR = 1$$

$$CV = 0.33$$

$$Z_{95} = 1.645$$

$$Z_x = 1.084$$

$$\begin{aligned} RPM &= \frac{\exp(1.645 \ln(1 + 0.33^2)^{0.5} - 0.5 \ln(1 + 0.33^2))}{\exp(1.084 \ln(1 + 0.33^2)^{0.5} - 0.5 \ln(1 + 0.33^2))} \\ &= 1.2 \end{aligned}$$

$$\begin{aligned} RWC &= 40 * 1.2 / 1 \\ &= 47.86 \end{aligned}$$