Data Correction

1. Remove out of control points due to sensor failures, using Qry_1_Remove Bad Points.
2. Atmospheric temperature less than $-50 \, ^\circ \text{C}$ was removed.
3. Dew point less than $-50 \, ^\circ \text{C}$ was removed.
4. PAR less than 0 was removed.
5. CO2 concentration $< 0 \, \text{ppm}$ was removed.
6. Water contents $< -0.1$ or $> 1.0$ were removed.
7. Soil temperatures less than $-50 \, ^\circ \text{C}$ and less than $< -10 \, ^\circ \text{C} @ 16 \, \text{cm}$ were removed.

CO2 concentration correction

1. Before this change, ideal gas low was assumed:
   \[
   \text{Corrected} = \frac{\text{Uncorrected} \times 101.3}{\text{[kPa]}} \times \frac{273 + t}{298}
   \]
   This equation was given by VAISALA.
   a. Convert current (mA) to uncorrected conc.:
      \[
      C_m \, (\text{ppm}) = 625 \times [\text{mA}] - 2500
      \]
   b. Calculate Kt for temperature
      \[
      K_{t_2}: 0.06 \times ([C_m_2] \times 10^{-4})^3 - 0.125 \times ([C_m_2] \times 10^{-4})^2 + 0.12 \times [C_m_2] \times 10^{-4} + 0.003
      \]
   c. Temp correction factor
      \[
      C_t \, (\text{ppm}) = 14000 \times (-K_t^2 + K_t) \times (25 - \text{Atmospheric Temp}) / 25
      \]
   d. Pressure correction factor:
      \[
      C_p \, (\text{ppm}) = 1380 \times [C_m] \times 10^{-4} \times ([\text{kPa]} - 101.3) / 101.3
      \]
   e. Corrected Conc (ppm) = $[C_m] - [C_t] - [C_p]$