

## 1. Supplementary Figures

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Figure S1: XPOD low-cost methane sensor configuration.



Figure S2: Inlet setup atop monitoring vehicle.



Figure S3: Oil and gas storage and flaring facility on the Eastern plains of Colorado



Figure S4: Oil and gas facility on the Eastern plains of Colorado.

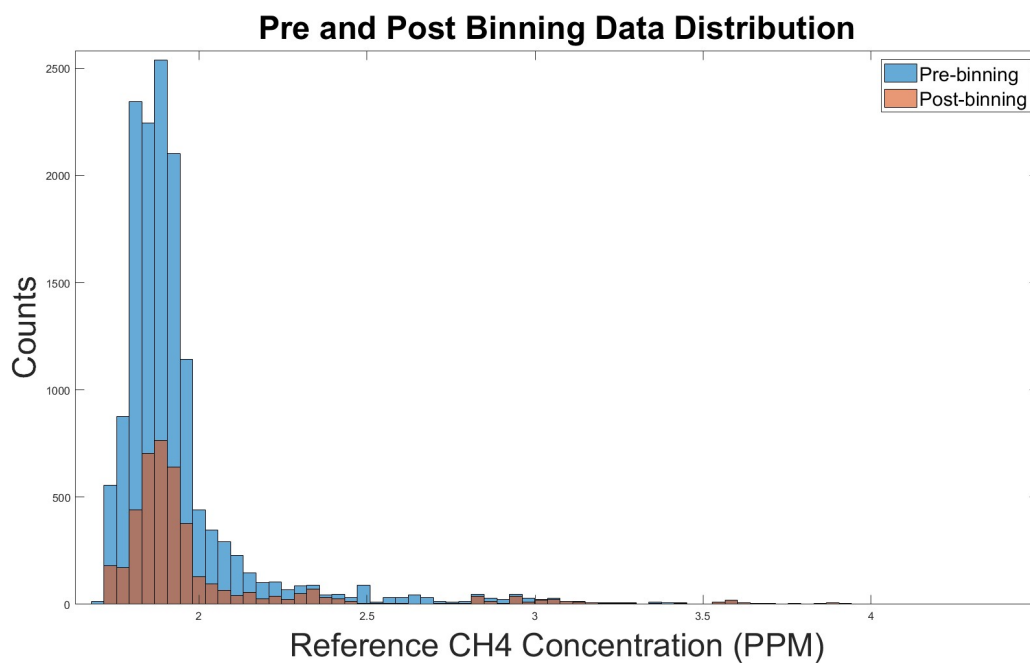


Figure S5: Pre- and post-binning reference methane distribution. Binning data reduced the overall number of data points in our sample set but resampled the overall distribution so that baseline concentrations of  $\text{CH}_4$  were not oversampled for model fitting.

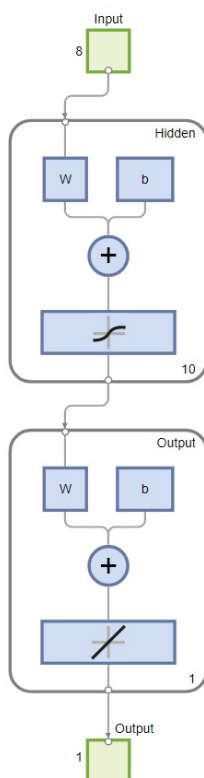


Figure S6: Sample ANN architecture employed in model fitting.

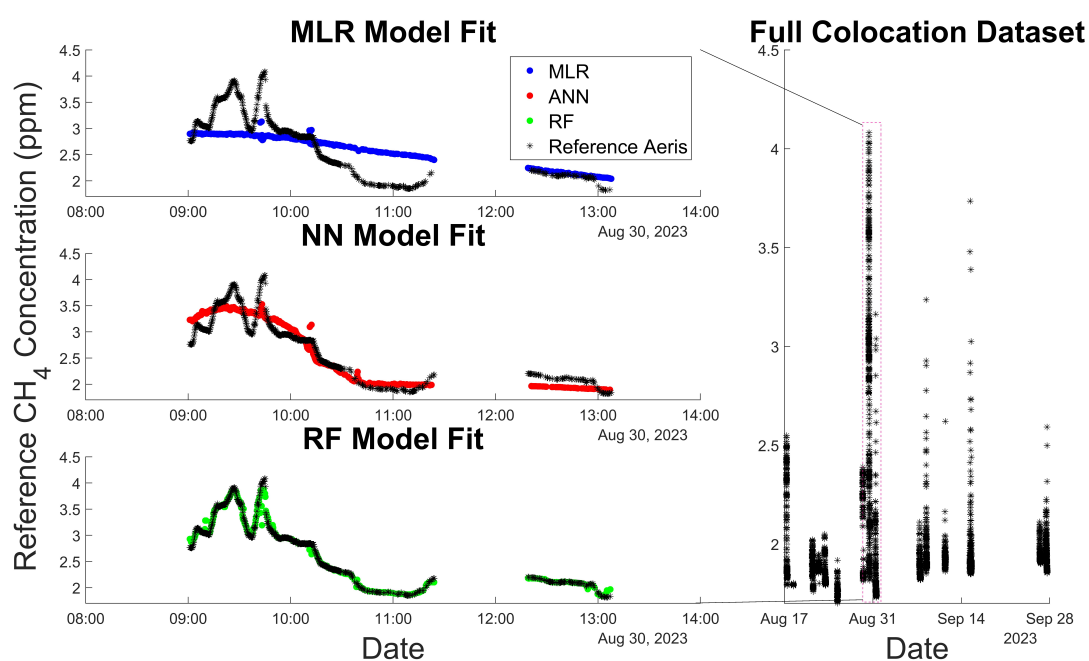


Figure S7: Time series plot comparison during data collection on August 30th, 2023. Note that the MLR model is able to capture the general trend and fits baseline data well. The neural network does an improved job of fitting the local variation in  $\text{CH}_4$  but misses peaks. The RF model is able to fit both short-term  $\text{CH}_4$  peaks and baseline  $\text{CH}_4$  values.