

Appendix F. Summary of Prevention of Significant Deterioration Quality Assurance Procedures for Meteorological Data at Ferndale - Mountain View Road Monitoring Site

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Overview

There are currently 19 meteorological monitors operating in the Washington State Ambient Air Monitoring Network (Washington Network) and they comply with the Prevention of Significant Deterioration (PSD)-quality acceptance criteria prescribed in the U.S. Environmental Protection Agency's (EPA) Ambient Monitoring Guidelines for Prevention of Significant Deterioration¹. Ecology's Air Quality Program has published the Meteorological Monitoring Procedure (Meteorological SOP²), which describes the standard procedures of site selection, installation, operation, quality control (QC) and quality assurance (QA) on meteorological monitoring. All individuals involved in ambient air monitoring within the Washington Network must document their QC and QA activities in accordance with procedures specified in Ecology's Air Monitoring Documentation, Data Review, and Validation Procedure³. Per Ecology's Meteorological SOP, station operators must ensure the monitored data meets the PSD - quality acceptance limits for anemometer vane alignment, wind speed, wind direction, ambient temperature, relative humidity and ambient pressure). At Intalco's monitoring site at Ferndale-Mountain View Road (AQS ID: 53-073-0017), only the parameters related to wind data and ambient temperature are applicable.

Quality Control and Quality Assurance

Quality control checks on meteorological parameters are required to be conducted every 90 days or more often should station operators observe any issue that may compromise the data quality. Quality Assurance personnel conduct performance evaluations (audits) annually on meteorological equipment in the field. The procedure is similar to that used by the station operator when performing the quality control check. When parameters exceed the acceptance limits or trigger the action level during quality control checks or audits, operators must take the appropriate corrective measures per Ecology's Meteorological SOP Section 5.3: "If the QC check results are outside the acceptance limits, the QC check has failed and corrective action is required. If results are at or above the action level, but below the acceptance limits, preventive action is required. Failure to take corrective action may result in invalidation of collected data." Detailed descriptions of corrective and preventive actions are included in the Meteorological SOP.

Additionally, Ecology requires an independent laboratory verify ultrasonic anemometers via wind tunnel test once every 365 days. Ecology selects a fixed set of wind velocities (range: 0.25 -32 m/s) and directions (0-360°) to be performed in the wind-tunnel test. If 85% of the test results meet the PSD criteria for wind speed and direction, the ambient data during which the anemometer of question was installed in field is considered valid with PSD-quality. If test results do not meet the threshold of 85%, a QA qualifier is updated to the monitored data

¹ <https://www.epa.gov/nsr/ambient-monitoring-guidelines-prevention-significant-deterioration>

² <https://fortress.wa.gov/ecy/publications/documents/0002003.pdf>

³ <https://fortress.wa.gov/ecy/publications/documents/1702013.pdf>

during the sampling period in EPA’s Air Quality System (AQS). Anemometers that do not meet the acceptance threshold (85%) are sent back to the manufacturer for calibration.

Data Validation

Ecology’s Air Monitoring Documentation, Data Review, and Validation Procedure describes the standard procedures for data review, verification and validation to accept, reject, or qualify data in an objective and consistent manner on all monitoring data in the Washington Network. Data validation consists of initial review and final validation. Station operators conduct initial review during and after data collection but prior to final validation. Final validation, conducted by Quality Assurance personnel, involves a separate qualitative and quantitative system and data review. All monitoring data (1-minute and 1-hour), QC and QA results, electronic logbooks, and other supplementary information are reviewed to ensure data collection meet the requirements stated in 40 CFR Part 58 Appendix A and Ecology’s parameter-specific SOPs. Specifically, the PSD acceptance limits are critical criteria in the final data validation process of meteorological parameters to ensure data submitted to EPA’s Air Quality System is of PSD-quality.

Table 1: PSD - quality QC limits (From Ecology’s Meteorological SOP⁴)

Parameter	Action Level	Acceptance Limits
Distant Object GPS Angle	N/A	2.0° (distant object) ±0.000014 decimal degrees
Temperature	0.65° F	0.9°F of NIST
Relative Humidity	±7 percentage points	±7 percentage points
Atmospheric Pressure	±3 mb	±3 mb
Wind Speed	N/A	±0.25 m/s below 5 m/s and ±5% above 5 m/s
Wind Direction	N/A	±5 degrees

⁴ <https://fortress.wa.gov/ecy/publications/documents/0002003.pdf>

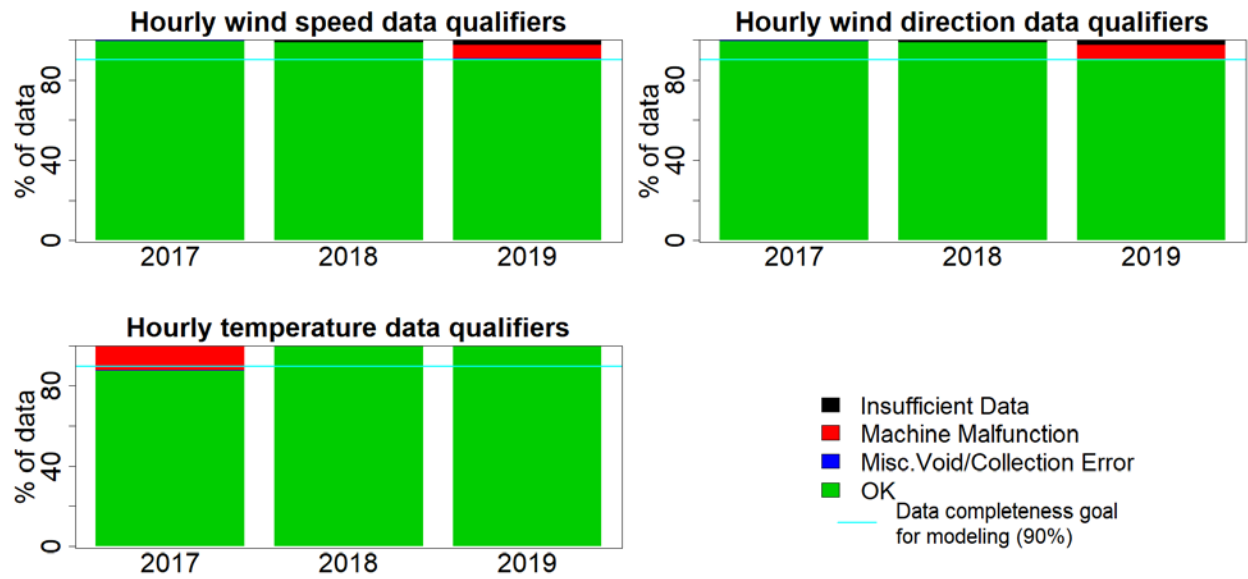


Figure 1: Annual breakdown of Mountain View Rd. meteorological data QC flags.