Data Review and Validation Report



Yerington Paiute Tribe of Yerington

Reviewers: Celine Bethel, YPT, M. Ronca-Battista, TAMS Center

date of this report: November 16, 2020

# Data Reviewed

Parameter(s): PM10

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Org ID | Site ID |  | Par Code | Par Name | Method Code |
| YERINGTON | 2012 |  | 81102 | PM10 Total 0-10um STP | 079 |

Dates reviewed: 1/1/2020 00:00 through 1/31/2020 23:00

# QC Data Review Summary

Conducted by Celine Bethel, YPT

The data reviewed was all within QAPP-documented performance and QC limits, and meets or exceeds the NAAQS regulatory QC requirements (see the requirements and checklist in Attachment A, excerpted from the QAPP and consistent with the validation tables in Appendix D of the QA Handbook vol. 2).

# Level 0 Verification

Level 0 automated checks are conducted on polled or imported data that flags values that do not meet site operator-set criteria. These flags are added to the parameter records and are sortable in the database’s table, and values that did not meet the criteria are color-coded in the chart. Values that are flagged are not necessarily invalid, but are reviewed thoroughly before final validation, as described further in this report.

## Flagging Due to Data Outside Range

|  |  |
| --- | --- |
| Alert Min | Alert Max |
| -50 | 75 |

No PM10 values were less than the minimum value of -50 microg/m3, and the values that exceeded the maximum of 75 microg/m3 were all investigated and judged to be valid (see the discussion of high concentrations as investigated as part of the Level 1 data review).

## Flagging Due To <75% Capture for Hour (n-minute data)

No hourly records were comprised of less than 75% (see Summary Table in Attachment B).

## Flagging Due to Repeating (Identical) Values

|  |
| --- |
| Alert Stuck Count |
| 3 |

No values were flagged as having identical values as two previous records.

## Flagging Due to Extreme Change Between Consecutive Values

|  |
| --- |
| Alert Amt Change |
| 50 |

All values that exhibited a change from the previous record greater than 50 microg/m3 were investigated (see Level 1 review) and judged valid.

## Flagging Due to Lost Polling

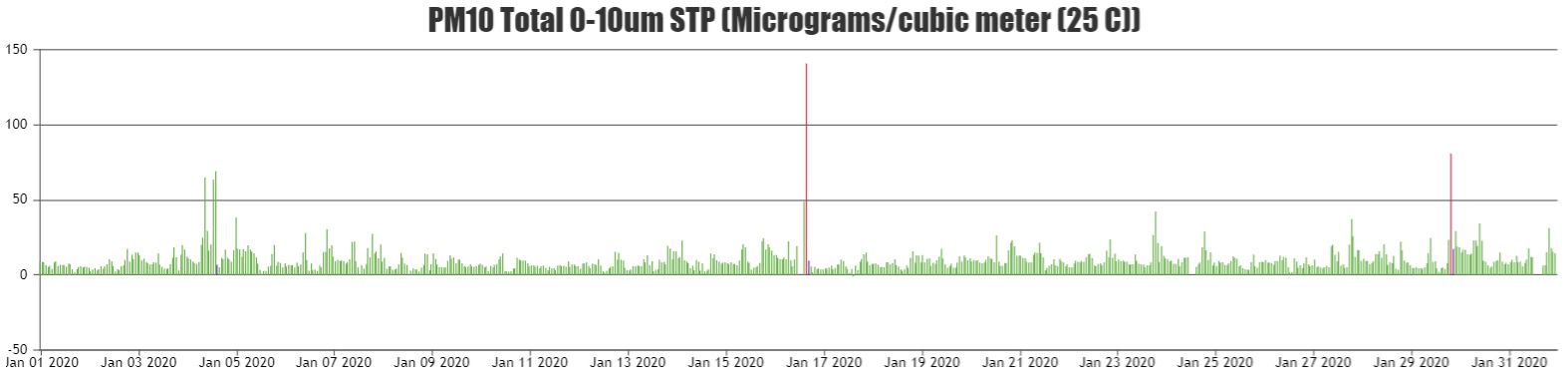
Every day in this time period had 100% completeness (see Attachment B for data summary).

# Level 1 Validation (Site Operator Review)

## Unusually High Concentrations (Spikes)

There were two episodes of high PM10 concentrations during the month, as shown in Figure 1. The rationale for their validity is described in this section.

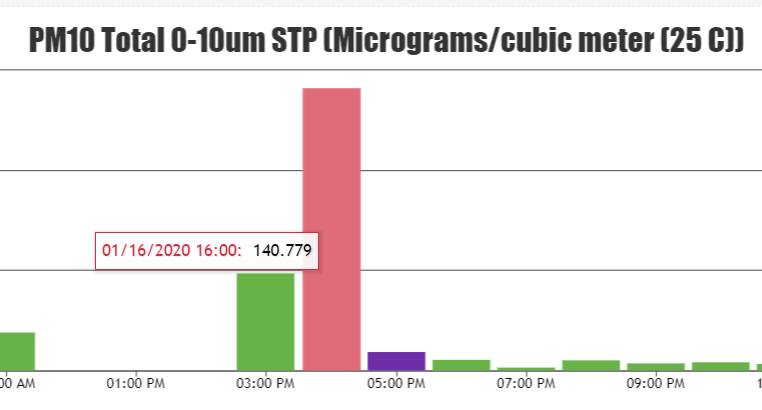
Figure : January 2020



### 4.1.1 Spike on 1/16/2020 at 16:00

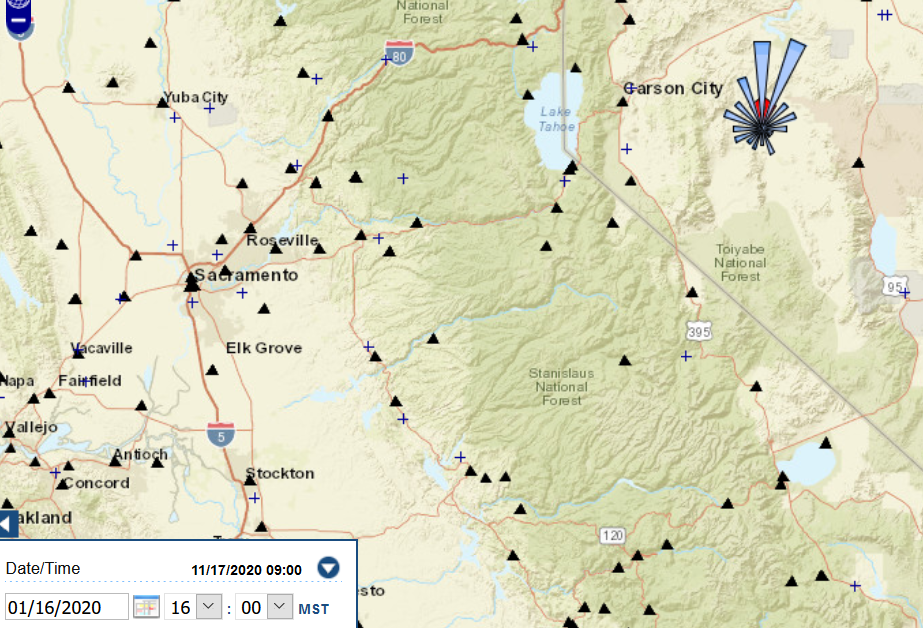
Figure 2 shows the first set of values exceeding the MAX limit of 75 microg/m3, flagged in red.

Figure : Spike on 01/16/20



The predominant wind direction at this time was from the north, as obtained from Airnow Tech for that date (<https://www.airnowtech.org/navigator/>) and shown Figure 3.

Figure : Wind Rose for Jan. 16, 2020



At this time, the downwind site reporting PM10 is Spanish Springs AQS Code:320311007 , and data for this datetime show a peak of PM10 at that site, as shown in Figure 4.

Figure : Spanish Springs PM10

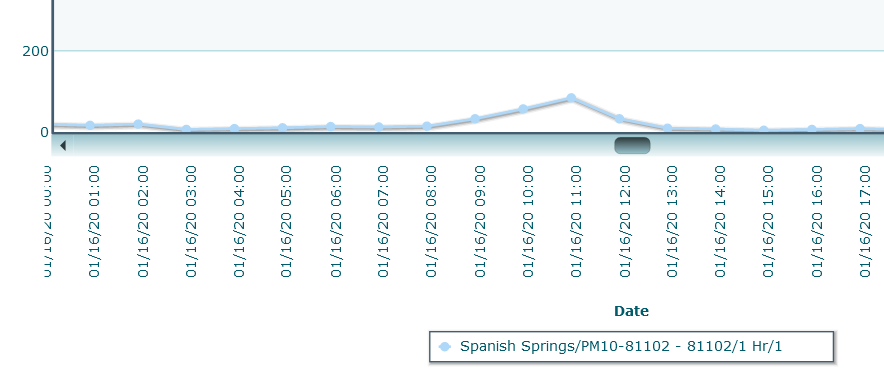
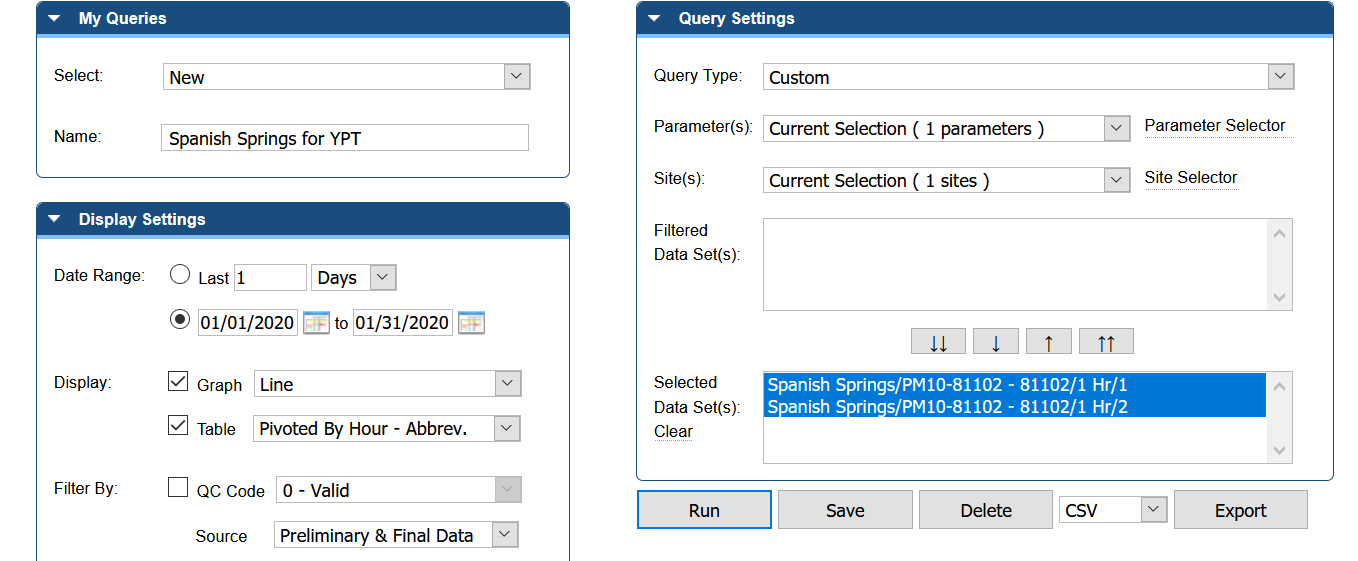


Figure 4 was created from Airnow tech data (<https://www.airnowtech.org/data/> ) from the downwind site, Spanish Springs, with the specifications for this corroborating site shown in Figure 5.

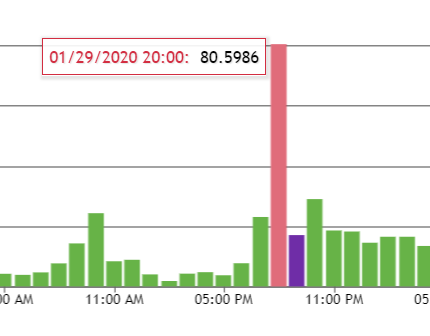
Figure 5: Downwind Site for Jan. 16, 2020



### 4.1.2 Spike on 1/29/2020 at 20:00

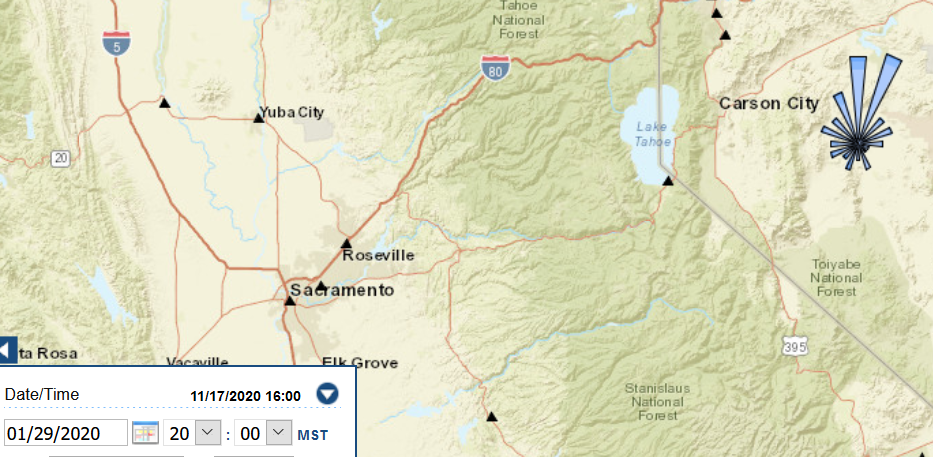
Figure 6 shows the second set of values exceeding the MAX limit of 75 microg/m3, flagged in red.

Figure 6: Spike on Jan. 29, 2020



The prevailing wind on that datetime was also from the north, as shown in Figure 7.

Figure 7: Wind Rose for Jan. 29, 2020



Although this spike is not close to the 3-year historic max of 490 microg/m3 at this site (<https://aqs.epa.gov/aqsweb/aqstmp/ofmeaqsprod2_2020-11-17_14.22.46_9653/2182579_STAT_CR.pdf>) this increase is corroborated by downwind data at that time from Spanish Springs (increased concentration from less than 10 to approximately 17 microg/m3).:

## Logbook Verification

No information was added to logbooks based on additional information obtained after site visits during this time.

## Equipment Downtimes Verification

At no time was the equipment offline during this time period.

## Missing Records from This Time Period

None

## Outliers, Error Codes, Or Anomalies Verification

There were no error codes or operator flags in the records for this time interval.

## Verifying Average Flow Rate and Variability of Flow

Flow rate and variability of flow rate were within limits for this time period, as documented in the QC checklist in Attachment 1.

## Calibration Certificates/Intervals Verification

Calibrations are within specifications and are current for this time period (see Checklist in Attachment 1).

## Verifying Performance Audits (NPAP/PEP/Independent) satisfactory results and loading copies to be available to the level 2 reviewer

One independent audit has been conducted, with the report attached.

## Verifying agreement between the datalogger and instrument values (at least 3 of the highest values per parameter reviewed per month, after several months of verified/documented agreement on larger sets)

The values in the table below were compared and all agree:

|  |  |  |
| --- | --- | --- |
| Date and time: | Datalogger value: | Instrument value: |
|  |  |  |
|  |  |  |
|  |  |  |

## Verifying completeness

Completeness is within specifications and are current for this time period (see Checklist in Attachment 1).

## Verifying the critical, operational, and systematic review criteria for NAAQS data (data limits are built in to QREST), or the appropriate QAPP tables for other data

Attachment A: Continuous PM10 Validation Criteria (excerpted from QAPP)

Table 14-1. Operational Criteria (must be met for each hourly record):

|  | | Table 14-1: Critical Criteria | | | |
| --- | --- | --- | --- | --- | --- |
| Requirement | Frequency | | Acceptance Criteria | Identification | Information/Action |
| Average Flow Rate | every 24 hours of op | | Average within < + 5.1% of design | No flags generated by system between 1/1/2020 and 7/1/2020 | EPA recommendation |
| One-point Flow Rate Verification | every 30 days each separated  by 14 days | | < + 7.1% of transfer standard | Dates and relative percent difference from transfer standard  RPD=(analyzer-FRstandard)/FRstandard  Date: RPD:  \_\_\_\_\_\_\_\_ \_\_\_%  \_\_\_\_\_\_\_\_ \_\_\_%  \_\_\_\_\_\_\_\_ \_\_\_%  \_\_\_\_\_\_\_\_ \_\_\_%  \_\_\_\_\_\_\_\_ \_\_\_%  \_\_\_\_\_\_\_\_ \_\_\_% | 1 and 2) 40 CFR Part 58, App A, Sec. 3.3  3) Method 2.10 Table 3-1 |

Table 14-2. Operational Criteria

Criteria that are important for maintaining and evaluating the quality of the entire data collection system are included in this Operational Criteria Table. Violation of one or more of these requirements may be cause for invalidating a set of data. The decision should consider other quality control information that is available. The dataset for which one or more of these criteria are not met will be considered suspect unless other quality control information demonstrates that the data are valid. The reason for not meeting these criteria MUST be investigated, fixed, or justified.

|  | | | Table 14-2: Operational Criteria | | |
| --- | --- | --- | --- | --- | --- |
| Requirement | Frequency | Acceptance Criteria | | Identification | Information/Action |
| System Leak Check | During precalibration check | Auditory inspection with faceplate blocked | | Date: | 1, 2 and 3) Method 2.11 Sec. 2.3.2 |
| FR Multi-point  Verification/Calibration | every 365 days and once a  calendar year | 3 of 4 cal points within < + 10.1% of design | | Date : | 1) 40 CFR Part 50 App J Sec. 8.0  2 and 3) Method 2.10 Sec. 2.2.4 |
| Semi Annual Flow Rate Audit | Twice a calendar year and 5-  7 months apart | < + 10.1% of audit standard | | Dates : | 1, 2) Part 58, App A, Sec. 3.3.3  3) Method 2.10 Sec. 7.1.5 |
| Inlet/downtube Cleaning | every 90 days and 4 times a  calendar year | cleaned | | Dates : | 1, 2 and 3) Method 2.10 Sec. 6.1.2 |
| FR Multi-point Verification | 1/yr. | <± 2.1% | | Date: RPD: | Part 50, App.L, Sec 9.2 |

TABLE 14-3. Systematic Criteria

Criteria which are important for the correct interpretation of the data but do not usually impact the validity of a sample or group of samples are included on the third table, the Systematic Issues Table. For example, the data quality objectives are included in this table. If the data quality objectives are not met, this does not invalidate any of the samples but it may impact the error rate associated with the attainment/non-attainment decision.

|  | | Table 14-3: Systematic Criteria | | | |
| --- | --- | --- | --- | --- | --- |
| Requirement | Frequency | | Acceptance Criteria | Identifcation | Information/Action |
| Siting | Every 365 days and 1/  calendar year | | Meets siting criteria or waiver documented | No changes in site, no new roads, no new trees, no new activities | 1) 40 CFR Part 58 App E, Sections 2-5  2) Recommendation  3) 40 CFR Part 58 App E, Sections 2-5 |
| Data Completeness | 24-hour  quarterly | | > 75% | % | 1, 2 and 3) 40 CFR Part 50 App. K, Sec. 2.3b & c |
|  | | Verification/Calibration Standards and Recertifications - All standards should have multi-point certifications against NIST Traceable standards | | | |
| Flow Rate Transfer Std. | every 365 days and once a  calendar year | | < + 2.1% of NIST-traceable Std. | Date: RPD: | 1) 40 CFR Part 50, App.J Sec. 7.3  2) Method 2.11 Sec. 1.1.3  3) 40 CFR Part 50, App.J Sec. 7.3 |
| Field Thermometer | every 365 days and once a  calendar year | | + 0.1degrees C resolution, + 0.1 degrees C accuracy | Date: | 1, 2 and 3) Method 2.10 Sec. 1.1.2 |
| Field Barometer | every 365 days and once a  calendar year | | + 1 mm Hg resolution, + 5 mm Hg accuracy | Date: | 1, 2 and 3) Method 2.10 Sec. 1.1.2 |
| Clock/timer Verification | every 180 days and twice a  calendar year | | 15 min/day | Date : | 1) 40 CFR Part 50, App.J Sec. 7.1.5  2) Recommendation  3) 40 CFR Part 50, App.J Sec. 7.1.5 |

Attachment B: January 2020 PM10 (microg/m3) Summary:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Day- | Max | Min | Avg | STD | Cap |
| 1 | 9.1 | 1.4 | 6.1 | 1.9 | 100 |
| 2 | 17.2 | 2.1 | 6.9 | 4.1 | 100 |
| 3 | 19.8 | 3.0 | 9.8 | 4.7 | 100 |
| 4 | 69.1 | 5.0 | 19.6 | 18.8 | 100 |
| 5 | 38.0 | 0.7 | 11.9 | 8.2 | 100 |
| 6 | 30.4 | 2.6 | 10.0 | 7.6 | 100 |
| 7 | 27.2 | 0.1 | 11.7 | 6.4 | 100 |
| 8 | 14.6 | 0.3 | 6.3 | 4.0 | 100 |
| 9 | 14.4 | 4.7 | 7.8 | 2.8 | 100 |
| 10 | 14.3 | 2.2 | 6.8 | 3.5 | 100 |
| 11 | 9.1 | 3.0 | 5.6 | 1.3 | 100 |
| 12 | 15.3 | 1.4 | 7.0 | 3.4 | 100 |
| 13 | 19.3 | 2.5 | 8.0 | 4.6 | 100 |
| 14 | 22.9 | 2.3 | 8.8 | 4.8 | 100 |
| 15 | 24.4 | 3.5 | 11.7 | 6.4 | 100 |
| 16 | 140.8 | 0.0 | 15.4 | 28.5 | 100 |
| 17 | 14.9 | -1.0 | 6.3 | 3.7 | 100 |
| 18 | 15.6 | 2.7 | 7.5 | 3.2 | 100 |
| 19 | 17.2 | 4.6 | 9.2 | 3.1 | 100 |
| 20 | 26.2 | 5.9 | 11.7 | 5.5 | 100 |
| 21 | 21.4 | 3.1 | 10.0 | 4.1 | 100 |
| 22 | 23.5 | 5.0 | 9.9 | 4.2 | 100 |
| 23 | 42.3 | 4.8 | 11.5 | 8.4 | 100 |
| 24 | 28.7 | 0.0 | 9.6 | 6.2 | 100 |
| 25 | 13.4 | 3.2 | 7.5 | 2.8 | 100 |
| 26 | 12.9 | 1.6 | 7.9 | 3.0 | 100 |
| 27 | 37.3 | 4.5 | 11.7 | 8.3 | 100 |
| 28 | 22.0 | 3.3 | 10.7 | 4.6 | 100 |
| 29 | 80.6 | 2.0 | 12.5 | 16.4 | 100 |
| 30 | 34.1 | 4.6 | 13.8 | 7.1 | 100 |
| 31 | 31.1 | 0.0 | 9.8 | 7.0 | 100 |