



# MEMORANDUM

Pima County Department of Environmental Quality

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**TO:** Bernie Cohn  
Assistant Superintendent of Operations

**DATE:** 4/8/14  
**FROM:** Beth Gorman  
Senior Program Manager

**RE: Pima County DEQ Beryllium Monitoring Report 4th Quarter 2013**

Attached is the Pima County Department of Environmental Quality's (PDEQ) Air Monitoring Division Beryllium Monitoring Network Summary for the 4th Quarter of 2013.

**Highlights:**

- 108 samples collected resulting in 89 valid and 19 invalid samples (82.41% data recovery). EPA requires monitoring data recovery at 75%.
- No beryllium values were detected over the Practical Quantitation Limit (PQL).
- The PQL was updated from 0.265 to 0.225 to reflect the lowest standard used in the analysis.
- PDEQ and SUSD staff are continuing to employ stringent monitoring protocols to ensure quality data is being collected properly to better protect public health.

For additional information on this report, please contact me at Pima County Department of Environmental Quality at (520) 724-7400.

Attachment

Cc: Ursula Kramer, Pima County Department of Environmental Quality Director  
Richard Grimaldi, Pima County Department of Environmental Deputy Director



**PIMA COUNTY**

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**ENVIRONMENTAL QUALITY**

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**Pima County**

**Department of Environmental Quality**

**Air Monitoring Division**

**Beryllium Monitoring Network Summary**

**4th Quarter 2013**

*Pima County Department of Environmental Quality  
33 N. Stone Avenue, Suite 700  
Tucson, Arizona 85701*

## **Summary**

The Pima County Department of Environmental Quality has contracted with the Pima County Regional Wastewater Reclamation Department (RWRD) to perform analysis on filters sampled in the Beryllium Monitoring Network located in the Sunnyside Unified School District.

For the 4th quarter of 2013 there was a total of 108 PM<sub>10</sub> samples collected resulting in 89 valid and 19 invalid samples; for a data recovery of 82.41 %. Ten samples were collected to be used as precision checks as recommended in *40 CFR, Part 58, Appendix A, Section 5.3.1*. All samples run for a 24-hour period as specified in *40 CFR, Part 50, Appendix B*.

There were a total of 89 samples analyzed for beryllium. Beryllium concentrations are reported as <0.225 ng/m<sup>3</sup> PQL (Practical Quantitation Level. In the preamble to a November 13, 1985 rulemaking (50 FR 46906), the PQL was defined as “the lowest concentration of an analyte that can be reliably measured within specific limits of precision and accuracy during routine laboratory operating conditions.” The Agency has used the PQL to estimate or evaluate the minimum concentration at which most laboratories can be expected to reliably measure a specific chemical contaminant during day-to-day analysis.

The following pages display the sampling dates, sampling locations, PM<sub>10</sub> concentrations (µg/m<sup>3</sup>) calculated in standard conditions, PM<sub>10</sub> 24-hour NAAQS standard, precision measurements, beryllium analysis results, accompanying graphs and a brief explanation of all invalid samples for the 4th quarter of 2013.

# PM<sub>10</sub> /Beryllium Concentrations

## Monthly Summary of PM<sub>10</sub>/Beryllium Data

October 2013

Date	Location	Standard Concentration PM <sub>10</sub> (µg/m <sup>3</sup> )	24-hour NAAQS PM <sub>10</sub> (µg/m <sup>3</sup> )	Beryllium (ng/m <sup>3</sup> )
10/01/13	Ocotillo #1	21.7	150	<0.225
10/01/13	Ocotillo #2	24.4	150	<0.225
10/02/13	Los Amigos	INVALID	INVALID	INVALID
10/03/13	Los Niños	29.5	150	<0.225
10/04/13	Chaparral M.S.	31.3	150	<0.225
10/05/13	Transportation Bldg	25.5	150	<0.225
10/06/13	Sunnyside H.S.	22.4	150	<0.225
10/07/13	Ocotillo #1	24.8	150	<0.225
10/07/13	Ocotillo #2	27.6	150	<0.225
10/08/13	Los Amigos	53.2	150	<0.225
10/09/13	Los Niños	65.1	150	<0.225
10/10/13	Chaparral M.S.	28.0	150	<0.225
10/11/13	Transportation Bldg	20.1	150	<0.225
10/12/13	Sunnyside H.S.	23.3	150	<0.225
10/13/13	Ocotillo #1	18.2	150	<0.225
10/13/13	Ocotillo #2	28.3	150	<0.225
10/14/13	Los Amigos	24.3	150	<0.225
10/15/13	Los Niños	25.4	150	<0.225
10/16/13	Chaparral M.S.	INVALID	INVALID	INVALID
10/17/13	Transportation Bldg.	26.2	150	<0.225
10/18/13	Sunnyside H.S.	34.2	150	<0.225
10/19/13	Ocotillo #1	27.7	150	<0.225
10/19/13	Ocotillo #2	40.4	150	<0.225
10/20/13	Los Amigos	28.4	150	<0.225
10/21/13	Los Niños	25.1	150	<0.225
10/22/13	Chaparral M.S.	29.1	150	<0.225
10/23/13	Transportation Bldg.	21.5	150	<0.225
10/24/13	Sunnyside H.S.	31.7	150	<0.225
10/25/13	Ocotillo #1	26.9	150	<0.225
10/25/13	Ocotillo #2	39.7	150	<0.225
10/26/13	Los Amigos	25.0	150	<0.225
10/27/13	Los Niños	19.8	150	<0.225
10/28/13	Chaparral M.S.	48.3	150	<0.225
10/29/13	Transportation Bldg.	27.5	150	<0.225
10/30/13	Sunnyside H.S.	38.9	150	<0.225
10/31/13	Ocotillo #1	28.9	150	<0.225
10/31/13	Ocotillo #2	43.4	150	<0.225

Sample running on 10/2/13 invalid due to sampler not running.

Sample running on 10/16/13 invalid due to a power failure.

NAAQS = National Ambient Air Quality Standard for PM<sub>10</sub>

**PM<sub>10</sub> /Beryllium Concentrations (continued)**

**Monthly Summary of PM<sub>10</sub>/Beryllium Data**

**November 2013**

<b>Date</b>	<b>Location</b>	<b>Standard Concentration PM<sub>10</sub> (µg/m<sup>3</sup>)</b>	<b>24-hour NAAQS PM<sub>10</sub> (µg/m<sup>3</sup>)</b>	<b>Beryllium (ng/m<sup>3</sup>)</b>
11/01/13	Los Amigos	30.5	150	<0.225
11/02/13	Los Niños	41.5	150	<0.225
11/03/13	Chaparral M.S.	6.1	150	<0.225
11/04/13	Transportation Bldg	17.9	150	<0.225
11/04/13	Sunnyside H.S.	24.4	150	<0.225
11/06/13	Ocotillo #1	23.6	150	<0.225
11/06/13	Ocotillo #2	29.5	150	<0.225
11/07/13	Los Amigos	19.9	150	<0.225
11/08/13	Los Niños	INVALID	INVALID	INVALID
11/09/13	Chaparral M.S.	21.9	150	<0.225
11/10/13	Transportation Bldg	31.2	150	<0.225
11/11/13	Sunnyside H.S.	32.9	150	<0.225
11/12/13	Ocotillo #1	31.8	150	<0.225
11/12/13	Ocotillo #2	37.1	150	<0.225
11/13/13	Los Amigos	27.2	150	<0.225
11/14/13	Los Niños	INVALID	INVALID	INVALID
11/15/13	Chaparral M.S.	27.7	150	<0.225
11/16/13	Transportation Bldg	16.7	150	<0.225
11/17/13	Sunnyside H.S.	19.2	150	<0.225
11/18/13	Ocotillo #1	25.3	150	<0.225
11/18/13	Ocotillo #2	INVALID	INVALID	INVALID
11/19/13	Los Amigos	25.6	150	<0.225
11/20/13	Los Niños	24.1	150	<0.225
11/21/13	Chaparral M.S.	19.8	150	<0.225
11/22/13	Transportation Bldg.	0.5	150	<0.225
11/23/13	Sunnyside H.S.	2.4	150	<0.225
11/24/13	Ocotillo #1	INVALID	INVALID	INVALID
11/24/13	Ocotillo #2	INVALID	INVALID	INVALID
11/25/13	Los Amigos	INVALID	INVALID	INVALID
11/26/13	Los Niños	INVALID	INVALID	INVALID
11/27/13	Chaparral M.S.	8.4	150	<0.225
11/28/13	Transportation Bldg.	9.7	150	<0.225
11/29/13	Sunnyside H.S.	12.6	150	<0.225
11/30/13	Ocotillo #1	INVALID	INVALID	INVALID
11/30/13	Ocotillo #2	INVALID	INVALID	INVALID

Samples running on 11/8/13, 11/25/13, 11/26/13 invalid due to double exposure caused by the filter not being changed.

Samples running on 11/14/13, 11/24/13 and 11/30/13 invalid due to no sample caused by the filter not being changed.

Sample running on 11/18/13 invalid due to sample running less than 23:30.

NAAQS = National Ambient Air Quality Standard for PM<sub>10</sub>

**PM<sub>10</sub> /Beryllium Concentrations (continued)**

**Monthly Summary of PM<sub>10</sub>/Beryllium Data**

**December 2013**

<b>Date</b>	<b>Location</b>	<b>Standard Concentration PM<sub>10</sub> (µg/m<sup>3</sup>)</b>	<b>24-hour NAAQS PM<sub>10</sub> (µg/m<sup>3</sup>)</b>	<b>Beryllium (ng/m<sup>3</sup>)</b>
12/01/13	Los Amigos	INVALID	INVALID	INVALID
12/02/13	Los Niños	INVALID	INVALID	INVALID
12/03/13	Chaparral M.S.	12.6	150	<0.225
12/04/13	Transportation Bldg.	10.7	150	<0.225
12/05/13	Sunnyside H.S.	11.9	150	<0.225
12/06/13	Ocotillo #1	10.0	150	<0.225
12/06/13	Ocotillo #2	12.1	150	<0.225
12/07/13	Los Amigos	14.9	150	<0.225
12/08/13	Los Niños	INVALID	INVALID	INVALID
12/09/13	Chaparral M.S.	17.1	150	<0.225
12/10/13	Transportation Bldg.	17.7	150	<0.225
12/11/13	Sunnyside H.S.	21.6	150	<0.225
12/12/13	Ocotillo #1	18.6	150	<0.225
12/12/13	Ocotillo #2	20.0	150	<0.225
12/13/13	Los Amigos	16.2	150	<0.225
12/14/13	Los Niños	18.9	150	<0.225
12/15/13	Chaparral M.S.	16.8	150	<0.225
12/16/13	Transportation Bldg.	15.6	150	<0.225
12/17/13	Sunnyside H.S.	28.8	150	<0.225
12/18/13	Ocotillo #1	INVALID	INVALID	INVALID
12/18/13	Ocotillo #2	INVALID	INVALID	INVALID
12/19/13	Los Amigos	INVALID	INVALID	INVALID
12/20/13	Los Niños	22.7	150	<0.225
12/21/13	Chaparral M.S.	13.6	150	<0.225
12/22/13	Transportation Bldg.	12.4	150	<0.225
12/23/13	Sunnyside H.S.	13.3	150	<0.225
12/24/13	Ocotillo #1	INVALID	INVALID	INVALID
12/24/13	Ocotillo #2	INVALID	INVALID	INVALID
12/25/13	Los Amigos	8.4	150	<0.225
12/26/13	Los Niños	15.9	150	<0.225
12/27/13	Chaparral M.S.	10.5	150	<0.225
12/28/13	Transportation Bldg.	14.2	150	<0.225
12/29/13	Sunnyside H.S.	15.1	150	<0.225
12/30/13	Ocotillo #1	16.2	150	<0.225
12/30/13	Ocotillo #2	18.2	150	<0.225
12/31/13	Los Amigos	21.8	150	<0.225

Samples running 12/1/13 and 12/2/13, 12/24/13 invalid due to no sample caused by the filter not being changed.

Sample running on 12/8/13 invalid due to a power failure.

Samples running on 12/18/13 invalid due to double exposure caused by the filter not being changed.

Sample running on 12/19/13 invalid due to sample not running.

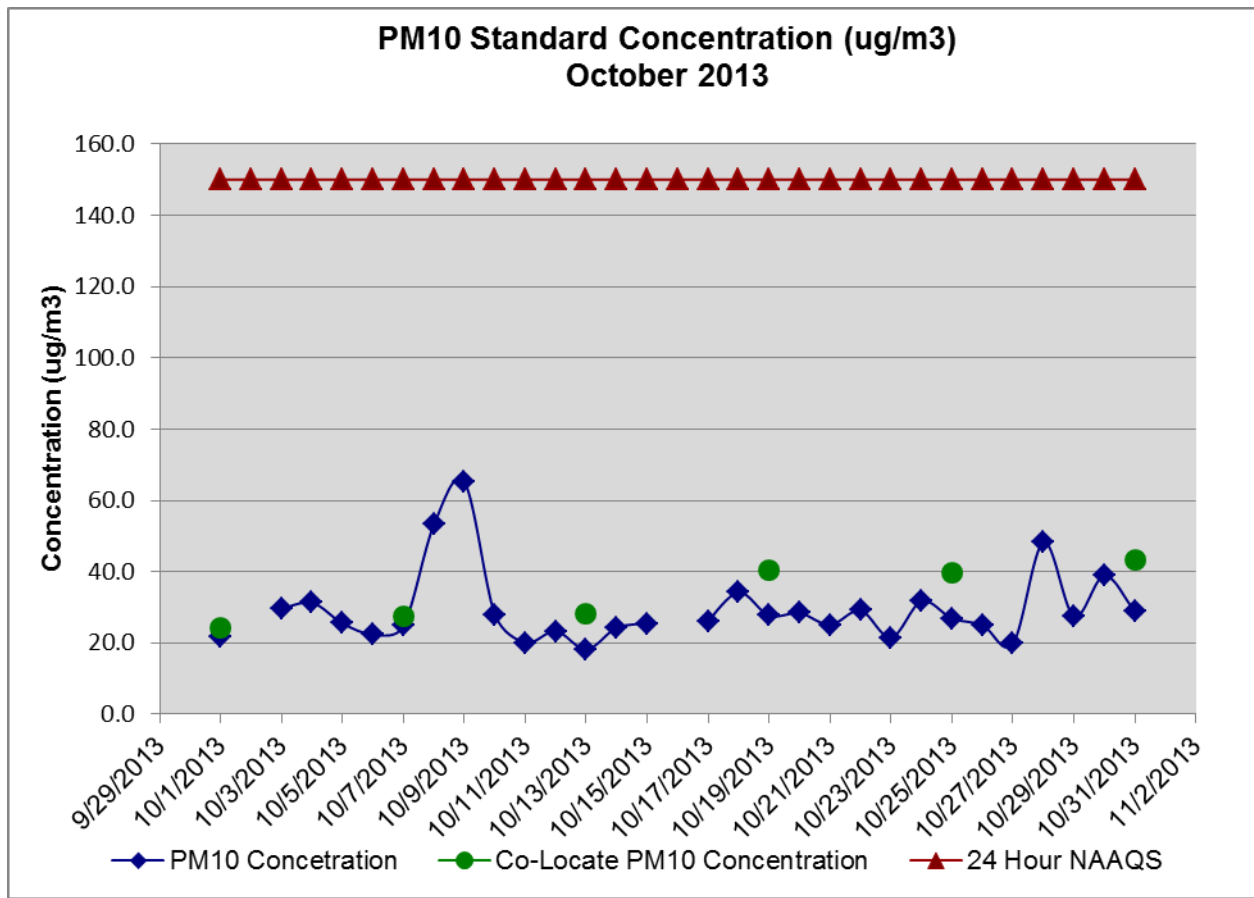
NAAQS = National Ambient Air Quality Standard for PM<sub>10</sub>

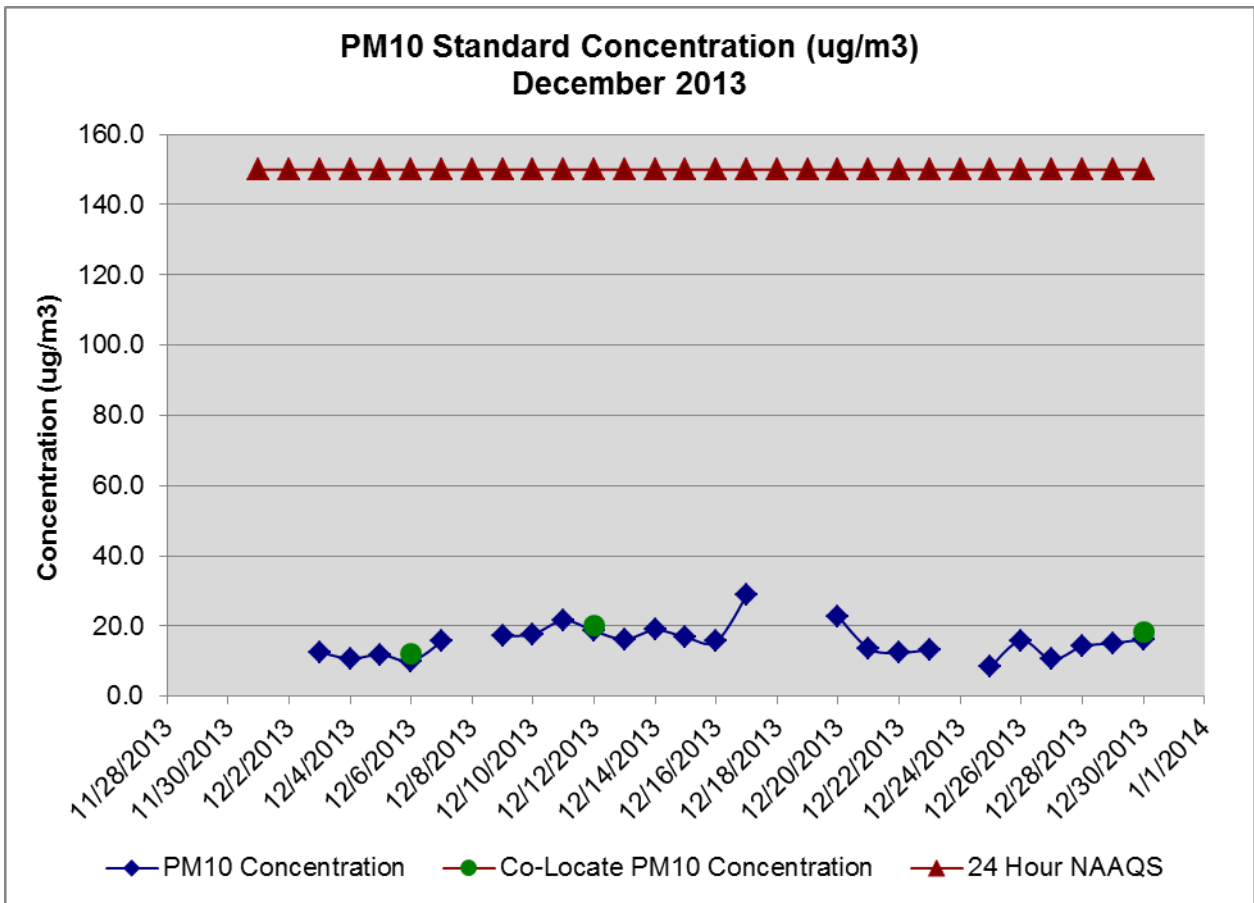
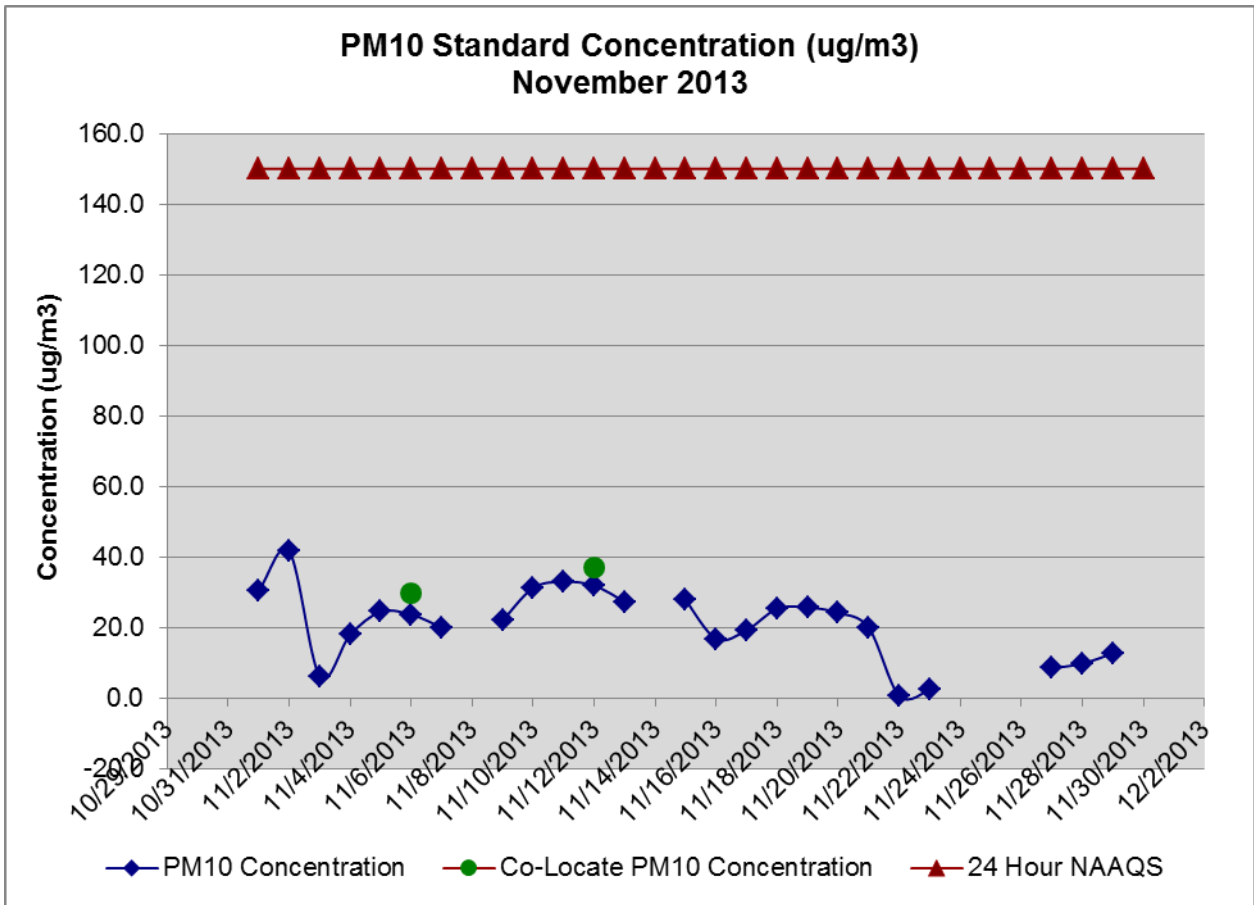
## Precision of Duplicate Pairs – PM10

At low concentrations, agreement between the measurements of collocated samplers, expressed as relative percent difference, may be relatively poor. For this reason, collocated measurement pairs are selected for use in the precision and bias calculations only when both measurement pairs are equal to or above  $15\mu\text{g}/\text{m}^3$  (40CFR58, Appendix A, Section 4c).

Sample Date	Primary Sampler Number	Measured PM <sub>10</sub> ( $\mu\text{g}/\text{m}^3$ )	Duplicate Sampler Number	Measured PM <sub>10</sub> ( $\mu\text{g}/\text{m}^3$ )	Difference ( $\mu\text{g}/\text{m}^3$ )	Percent Difference %
10/1/13	1	21.7	2	24.4	2.7	11.71
10/7/13	1	24.8	2	27.6	2.8	10.69
10/13/13	1	18.2	2	28.3	10.1	43.44
10/19/13	1	27.7	2	40.4	12.7	37.30
10/25/13	1	26.9	2	39.7	12.8	38.44
10/31/13	1	28.9	2	43.4	14.5	40.11
11/6/13	1	23.6	2	29.5	5.9	22.22
11/12/13	1	31.8	2	37.1	5.3	15.38
12/12/13	1	18.6	2	20.0	1.4	7.25
12/30/13	1	16.2	2	18.2	2.0	11.63

## PM<sub>10</sub> Concentration Charts







## Audit Results

Audits were performed on all seven samplers for the 4th quarter of 2013. If the audit flow rate percent difference is  $\leq \pm 10\%$ , the sampler calibration is accepted. Differences exceeding  $\pm 10\%$  require sampler recalibration. Differences exceeding  $\pm 15\%$  will result in invalidation of all data subsequent to the last calibration or valid flow check. The following pages display the audit results for each sampling location.

### AUDIT SPREADSHEET FOR PARTICULATES

Month	Ts	Ps
Jan	288.8	693.9
Feb	292.4	693.2
Mar	296.0	692.8
Apr	298.9	692.9
May	300.6	692.9
Jun	300.3	693.4
Jul	297.6	694.0
Aug	293.8	694.5
Sep	290.1	694.9
Oct	287.2	695.3
Nov	285.8	695.2
Dec	286.5	694.7

**Sampler:** Chaparral M.S.    **Ts =** 286.5  
**Audit Date:** 12/23/13    **Ps =** 694.7  
**Motor:** 1424    **Temp c =** 11.11  
**Ta =** 284.1  
**Pa =** 698.0  
**Orifice Calibration Relationship**  
**m= 1.22644    b= 0.01572**

Plate No.	Orifice dH2O	Qa Orifice	Sampler dPex	Sampler dPext
18	3.90	35.8	2.14	0.93
13	3.35	33.2	1.87	0.87
10	2.77	30.1	1.59	0.80
7	1.84	24.5	1.12	0.68
5	1.17	19.4	0.82	0.58

Orifice dH2O 2.606  
 Sample dPex 1.5  
 Orifice Qa(m3/m) 0.82694  
 Sample Qa dPex 29.0935

Audit flow rate % diff: 5.96 %

Orifice		
dH2O	Qa (CFM)	Qa (M3/m)
2.606	29.19	0.83

Sampler w/Orifice		
dPex	Qa (CFM)	Qa (M3/m)
1.51	30.94	0.88

Sampler Audit Relationship		
<b>m =</b>	0.022	
<b>b =</b>	0.149	
<b>r =</b>	0.999	
<b>Set Point (cfm)</b>	<b>pm10</b>	<b>tsp</b>
<b>Set Point (H2O)</b>	39.5	49.3
	2.5	3.7

### AUDIT SPREADSHEET FOR PARTICULATES

Month	Ts	Ps
Jan	288.8	693.9
Feb	292.4	693.2
Mar	296.0	692.8
Apr	298.9	692.9
May	300.6	692.9
Jun	300.3	693.4
Jul	297.6	694.0
Aug	293.8	694.5
Sep	290.1	694.9
Oct	287.2	695.3
Nov	285.8	695.2
Dec	286.5	694.7

**Sampler:** Sunnyside H.S.    **Ts =** 286.5  
**Audit Date:** 12/27/13    **Ps =** 694.7  
**Motor:** 1418    **Temp c =** 16.11  
**Ta =** 289.1  
**Pa =** 695.0  
**Orifice Calibration Relationship**  
**m= 1.22644    b= 0.01572**

Plate No.	Orifice dH2O	Qa Orifice	Sampler dPex	Sampler dPext
18	4.06	37.0	2.34	0.99
13	3.41	33.8	2.06	0.93
10	2.82	30.7	1.76	0.86
7	1.88	25.0	1.22	0.71
5	1.23	20.1	0.84	0.59

Orifice dH2O 2.68  
 Sample dPex 1.6  
 Orifice Qa(m3/m) 0.8481  
 Sample Qa dPex 29.8691

Audit flow rate % diff: 5.62 %

Orifice		
dH2O	Qa (CFM)	Qa (M3/m)
2.68	29.94	0.85

Sampler w/Orifice		
dPex	Qa (CFM)	Qa (M3/m)
1.64	31.63	0.90

Sampler Audit Relationship		
<b>m =</b>	0.024	
<b>b =</b>	0.117	
<b>r =</b>	0.998	
<b>Set Point (cfm)</b>	<b>pm10</b>	<b>tsp</b>
<b>Set Point (H2O)</b>	40.3	50.4
	2.8	4.2

**AUDIT SPREADSHEET FOR PARTICULATES**

Month	Ts	Ps
Jan	288.8	693.9
Feb	292.4	693.2
Mar	296.0	692.8
Apr	298.9	692.9
May	300.6	692.9
Jun	300.3	693.4
Jul	297.6	694.0
Aug	293.8	694.5
Sep	290.1	694.9
Oct	287.2	695.3
Nov	285.8	695.2
Dec	286.5	694.7

**Sampler:** Los Amigos      **Ts =** 286.5  
**Audit Date:** 12/27/13      **Ps =** 694.7  
**Motor:** 1419      **Temp c =** 16.11  
    **Ta =** 289.1  
    **Pa =** 695.0

**Orifice Calibration Relationship**  
**m= 1.22644      b= 0.01572**

Plate No.	Orifice dH20	Qa Orifice	Sampler dPex	Sampler dPext
18	3.59	34.7	1.66	0.83
13	3.07	32.1	1.30	0.74
10	2.55	29.2	1.03	0.65
7	1.73	24.0	0.59	0.50
5	1.15	19.5	0.30	0.35

Orifice dH2O                      2.418  
 Sample dPex                        1.0  
 Orifice Qa(m3/m)                0.80493  
 Sample Qa dPex                  28.6424

Orifice		
dH2O	Qa (CFM)	Qa (M3/m)
2.418	28.41	0.80

Sampler w/Orifice		
dPex	Qa (CFM)	Qa (M3/m)
0.98	29.69	0.84

Sampler Audit Relationship		
<b>m =</b>	0.031	
<b>b =</b>	-0.247	
<b>r =</b>	0.999	
	<b>pm10</b>	<b>tsp</b>
<b>Set Point (cfm)</b>	40.3	50.4
<b>Set Point (H2O)</b>	2.4	4.1

**Audit flow rate % diff: 4.45 %**

**AUDIT SPREADSHEET FOR PARTICULATES**

Month	Ts	Ps
Jan	288.8	693.9
Feb	292.4	693.2
Mar	296.0	692.8
Apr	298.9	692.9
May	300.6	692.9
Jun	300.3	693.4
Jul	297.6	694.0
Aug	293.8	694.5
Sep	290.1	694.9
Oct	287.2	695.3
Nov	285.8	695.2
Dec	286.5	694.7

**Sampler:** Ocotillo #1      **Ts =** 286.5  
**Audit Date:** 12/27/13      **Ps =** 694.7  
**Motor:** 1420      **Temp c =** 13.89  
    **Ta =** 286.9  
    **Pa =** 696.0

**Orifice Calibration Relationship**  
**m= 1.22644      b= 0.01572**

Plate No.	Orifice dH20	Qa Orifice	Sampler dPex	Sampler dPext
18	3.82	35.7	1.74	0.85
13	3.27	33.0	1.32	0.74
10	2.60	29.4	1.01	0.65
7	1.70	23.6	0.56	0.48
5	1.13	19.2	0.23	0.31

Orifice dH2O                      2.504  
 Sample dPex                        1.0  
 Orifice Qa(m3/m)                0.81555  
 Sample Qa dPex                  29.1002

Orifice		
dH2O	Qa (CFM)	Qa (M3/m)
2.504	28.79	0.82

Sampler w/Orifice		
dPex	Qa (CFM)	Qa (M3/m)
0.97	30.12	0.85

Sampler Audit Relationship		
<b>m =</b>	0.032	
<b>b =</b>	-0.284	
<b>r =</b>	0.995	
	<b>pm10</b>	<b>tsp</b>
<b>Set Point (cfm)</b>	40.0	50.0
<b>Set Point (H2O)</b>	2.3	3.9

**Audit flow rate % diff: 4.61 %**

**AUDIT SPREADSHEET FOR PARTICULATES**

Month	Ts	Ps
Jan	288.8	693.9
Feb	292.4	693.2
Mar	296.0	692.8
Apr	298.9	692.9
May	300.6	692.9
Jun	300.3	693.4
Jul	297.6	694.0
Aug	293.8	694.5
Sep	290.1	694.9
Oct	287.2	695.3
Nov	285.8	695.2
Dec	286.5	694.7

**Sampler:** Ocotillo #2      **Ts =** 286.5  
**Audit Date:** 12/27/13      **Ps =** 694.7  
**Motor:** 1425      **Temp c =** 13.89  
                                  **Ta =** 286.9  
                                  **Pa =** 696.0  
**Orifice Calibration Relationship**  
**m= 1.22644      b= 0.01572**

Plate No.	Orifice dH2O	Qa Orifice	Sampler dPex	Sampler dPext
18	4.02	36.6	1.47	0.78
13	3.50	34.1	1.31	0.73
10	2.94	31.2	1.07	0.66
7	1.90	25.0	0.76	0.56
5	1.26	20.3	0.54	0.47

Orifice dH2O                      2.724  
 Sample dPex                      1.0  
 Orifice Qa(m3/m)                0.85118  
 Sample Qa dPex                 29.983

Orifice		
dH2O	Qa (CFM)	Qa (M3/m)
2.724	30.05	0.85

Sampler w/Orifice		
dPex	Qa (CFM)	Qa (M3/m)
1.03	31.75	0.90

Sampler Audit Relationship		
<b>m =</b>	0.019	
<b>b =</b>	0.089	
<b>r =</b>	0.997	
	<b>pm10</b>	<b>tsp</b>
<b>Set Point (cfm)</b>	40.0	50.0
<b>Set Point (H2O)</b>	1.7	2.6

Audit flow rate % diff: 5.65 %

**AUDIT SPREADSHEET FOR PARTICULATES**

Month	Ts	Ps
Jan	288.8	693.9
Feb	292.4	693.2
Mar	296.0	692.8
Apr	298.9	692.9
May	300.6	692.9
Jun	300.3	693.4
Jul	297.6	694.0
Aug	293.8	694.5
Sep	290.1	694.9
Oct	287.2	695.3
Nov	285.8	695.2
Dec	286.5	694.7

**Sampler:** Transportation      **Ts =** 286.5  
**Audit Date:** 12/23/13      **Ps =** 694.7  
**Motor:** 1422      **Temp c =** 12.78  
                                  **Ta =** 285.8  
                                  **Pa =** 698.0  
**Orifice Calibration Relationship**  
**m= 1.22644      b= 0.01572**

Plate No.	Orifice dH2O	Qa Orifice	Sampler dPex	Sampler dPext
18	3.34	33.2	1.55	0.80
13	2.82	30.5	1.28	0.72
10	2.42	28.2	1.04	0.65
7	1.64	23.1	0.65	0.52
5	1.09	18.8	0.40	0.40

Orifice dH2O                      2.262  
 Sample dPex                      1.0  
 Orifice Qa(m3/m)                0.77185  
 Sample Qa dPex                 27.3507

Orifice		
dH2O	Qa (CFM)	Qa (M3/m)
2.262	27.25	0.77

Sampler w/Orifice		
dPex	Qa (CFM)	Qa (M3/m)
0.98	28.54	0.81

Sampler Audit Relationship		
<b>m =</b>	0.027	
<b>b =</b>	-0.112	
<b>r =</b>	0.999	
	<b>pm10</b>	<b>tsp</b>
<b>Set Point (cfm)</b>	39.7	49.6
<b>Set Point (H2O)</b>	2.3	3.8

Audit flow rate % diff: 4.72 %

**AUDIT SPREADSHEET FOR PARTICULATES**

Month	Ts	Ps
Jan	288.8	693.9
Feb	292.4	693.2
Mar	296.0	692.8
Apr	298.9	692.9
May	300.6	692.9
Jun	300.3	693.4
Jul	297.6	694.0
Aug	293.8	694.5
Sep	290.1	694.9
Oct	287.2	695.3
Nov	285.8	695.2
Dec	286.5	694.7

**Sampler:** Los Niños      **Ts =** 286.5  
**Audit Date:** 12/23/13      **Ps =** 694.7  
**Motor:** 1421      **Temp c =** 12.78  
                                  **Ta =** 285.8  
                                  **Pa =** 698.0  
**Orifice Calibration Relationship**  
**m= 1.22644      b= 0.01572**

Plate No.	Orifice dH2O	Qa Orifice	Sampler dPex	Sampler dPext
18	3.64	34.7	1.54	0.79
13	3.05	31.7	1.24	0.71
10	2.54	28.9	0.97	0.63
7	1.68	23.4	0.58	0.49
5	1.14	19.2	0.29	0.34

Orifice dH2O                      2.41  
 Sample dPex                        0.9  
 Orifice Qa(m3/m)                0.79712  
 Sample Qa dPex                 28.3375

Audit flow rate % diff: 4.58 %

dH2O	Orifice	
	Qa (CFM)	Qa (M3/m)
2.41	28.14	0.80

dPex	Sampler w/Orifice	
	Qa (CFM)	Qa (M3/m)
0.92	29.44	0.83

Sampler Audit Relationship		
<b>m =</b>	0.029	
<b>b =</b>	-0.197	
<b>r =</b>	0.998	
	<b>pm10</b>	<b>tsp</b>
<b>Set Point (cfm)</b>	39.7	49.6
<b>Set Point (H2O)</b>	2.2	3.7