



MEMORANDUM

Pima County Department of Environmental Quality

DATE: 5/25/2011

TO: Alex Gallego
Assistant Superintendent Operations & Facilities Planning

FROM: Beth Gorman
Program Manager

RE: Pima County DEQ Beryllium Monitoring Report 1st Quarter 2011

Attached is the Pima County Department of Environmental Quality's (PDEQ) Air Monitoring Division Beryllium Monitoring Network Summary for the 1st Quarter of 2011.

Highlights:

- 108 samples collected resulting in 95 valid and 13 invalid samples (87.9% 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) 740-3340.

Attachment

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



Pima County

Department of Environmental Quality

Air Monitoring Division

Beryllium Monitoring Network Summary

1st Quarter 2011



*Pima County Department of Environmental Quality
33 N. Stone Avenue, Suite 700
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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 1st quarter of 2011 there was a total of 108 PM₁₀ samples collected resulting in 95 valid and 13 invalid samples; for a data recovery of 87.9 %. Nine 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 98 samples analyzed for beryllium. Beryllium concentrations are reported as <0.225 ng/m³ 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, PM₁₀ concentrations (µg/m³) calculated in standard conditions, PM₁₀ 24-hour NAAQS standard, precision measurements, Beryllium analysis results, accompanying graphs and a brief explanation of all invalid samples for the 1st quarter of 2011.

PM₁₀ /Beryllium Concentrations

Monthly Summary of PM₁₀/Beryllium Data

January 2011

Date	Location	Standard Concentration PM ₁₀ (µg/m ³)	24-hour NAAQS PM ₁₀ (µg/m ³)	Beryllium (ng/m ³)
01/01/11	Transportation Bldg	17.3	150	<0.225
01/02/11	Sunnyside H.S.	INVALID	150	INVALID
01/03/11	Ocotillo #1	12.9	150	<0.225
01/03/11	Ocotillo #2	15.4	150	<0.225
01/04/11	Los Amigos	17.1	150	<0.225
01/05/11	Los Niños	29.7	150	<0.225
01/06/11	Chaparral M.S.	35.2	150	<0.225
01/07/11	Transportation Bldg	26.8	150	<0.225
01/08/11	Sunnyside H.S.	34.3	150	<0.225
01/09/11	Ocotillo #1	13.2	150	<0.225
01/09/11	Ocotillo #2	14.1	150	<0.225
01/10/11	Los Amigos	26.5	150	<0.225
01/11/11	Los Niños	25.4	150	<0.225
01/12/11	Chaparral M.S.	31.2	150	<0.225
01/13/11	Transportation Bldg	25.2	150	<0.225
01/14/11	Sunnyside H.S.	21.1	150	<0.225
01/15/11	Ocotillo #1	21.8	150	<0.225
01/15/11	Ocotillo #2	23.9	150	<0.225
01/16/11	Los Amigos	13.7	150	<0.225
01/17/11	Los Niños	18.8	150	<0.225
01/18/11	Chaparral M.S.	23.9	150	<0.225
01/19/11	Transportation Bldg	21.9	150	<0.225
01/20/11	Sunnyside H.S.	INVALID	150	INVALID
01/21/11	Ocotillo #1	31.5	150	<0.225
01/21/11	Ocotillo #2	34.5	150	<0.225
01/22/11	Los Amigos	20.7	150	<0.225
01/23/11	Los Niños	20.8	150	<0.225
01/24/11	Chaparral M.S.	25.3	150	<0.225
01/25/11	Transportation Bldg.	28.3	150	<0.225
01/26/11	Sunnyside H.S.	INVALID	150	INVALID
01/27/11	Ocotillo #1	14.8	150	<0.225
01/27/11	Ocotillo #2	16.7	150	<0.225
01/28/11	Los Amigos	23.7	150	<0.225
01/29/11	Los Niños	22.2	150	<0.225
01/30/11	Chaparral M.S.	INVALID	150	INVALID
01/31/11	Transportation Bldg	INVALID	150	INVALID

Sample running on 01/02/11 invalid due a power failure.

Samples running on 1/20/11, 1/26/11, 1/30/11 and 1/31/11 invalid due to SUSD not changing the filters resulting in double exposures.

NAAQS = National Ambient Air Quality Standard for PM₁₀

PM₁₀ /Beryllium Concentrations (continued)

Monthly Summary of PM₁₀/Beryllium Data

February 2011

Date	Location	Standard Concentration PM₁₀ (µg/m³)	24-hour NAAQS PM₁₀ (µg/m³)	Beryllium (ng/m³)
02/01/11	Sunnyside H.S.	18.1	150	<0.225
02/02/11	Ocotillo #1	22.0	150	<0.225
02/02/11	Ocotillo #2	23.5	150	<0.225
02/03/11	Los Amigos	26.4	150	<0.225
02/04/11	Los Niños	INVALID	150	INVALID
02/05/11	Chaparral M.S.	INVALID	150	INVALID
02/06/11	Transportation Bldg	INVALID	150	INVALID
02/07/11	Sunnyside H.S.	INVALID	150	INVALID
02/08/11	Ocotillo #1	39.8	150	<0.225
02/08/11	Ocotillo #2	40.5	150	<0.225
02/09/11	Los Amigos	46.7	150	<0.225
02/10/11	Los Ninos	INVALID	150	INVALID
02/11/11	Chaparral M.S.	22.4	150	<0.225
02/12/11	Transportation Bldg	16.4	150	<0.225
02/13/11	Sunnyside H.S.	29.5	150	<0.225
02/14/11	Ocotillo #1	29.4	150	<0.225
02/14/11	Ocotillo #2	26.7	150	<0.225
02/15/11	Los Amigos	33.4	150	<0.225
02/16/11	Los Ninos	26.9	150	<0.225
02/17/11	Chaparral M.S.	55.5	150	<0.225
02/18/11	Transportation Bldg	32.9	150	<0.225
02/19/11	Sunnyside H.S.	4.0	150	<0.225
02/20/11	Ocotillo #1	5.0	150	<0.225
02/20/11	Ocotillo #2	4.8	150	<0.225
02/21/11	Los Amigos	11.5	150	<0.225
02/22/11	Los Niños	16.2	150	<0.225
02/23/11	Chaparral M.S.	INVALID	150	INVALID
02/24/11	Transportation Bldg	10.2	150	<0.225
02/25/11	Sunnyside H.S.	24.1	150	<0.225
02/26/11	Ocotillo #1	21.8	150	<0.225
02/26/11	Ocotillo #2	4.9	150	<0.225
02/27/11	Los Amigos	8.9	150	<0.225
02/28/11	Los Niños	5.0	150	<0.225

Samples running on 02/04/11 and 2/10/11 invalid do to power failures, resulting in the total sample run time being <1380 minutes.

Samples running on 02/5/1 and 2/6/11 invalid for PM10 due to SUSD not changing the filters resulting in double exposures.

Sample running on 2/7/11 invalid due to SUSD not installing the filter.

Sample running on 2/23/11 invalid due to the motor flow control being set to zero resulting in the sampler not running.

NAAQS = National Ambient Air Quality Standard for PM₁₀

PM₁₀ /Beryllium Concentrations (continued)**Monthly Summary of PM₁₀/Beryllium Data****March 2011**

Date	Location	Standard Concentration PM₁₀ (µg/m³)	24-hour NAAQS PM₁₀ (µg/m³)	Beryllium (ng/m³)
03/01/11	Chaparral M.S.	INVALID	150	INVALID
03/02/11	Transportation Bldg	12.0	150	<0.265
03/03/11	Sunnyside H.S.	21.7	150	<0.265
03/04/11	Ocotillo #1	17.6	150	<0.265
03/04/11	Ocotillo #2	18.9	150	<0.265
03/05/11	Los Amigos	18.4	150	<0.265
03/06/11	Los Niños	15.0	150	<0.265
03/07/11	Chaparral M.S.	79.2	150	<0.265
03/08/11	Transportation Bldg	27.1	150	<0.265
03/09/11	Sunnyside H.S.	82.5	150	<0.265
03/10/11	Ocotillo #1	25.2	150	<0.265
03/10/11	Ocotillo #2	25.7	150	<0.265
03/11/11	Los Amigos	22.4	150	<0.265
03/12/11	Los Niños	20.4	150	<0.265
03/13/11	Chaparral M.S.	18.2	150	<0.265
03/14/11	Transportation Bldg	32.6	150	<0.265
03/15/11	Sunnyside H.S.	34.3	150	<0.265
03/16/11	Ocotillo #1	27.8	150	<0.265
03/16/11	Ocotillo #2	29.2	150	<0.265
03/17/11	Los Amigos	26.4	150	<0.265
03/18/11	Los Niños	25.9	150	<0.265
03/19/11	Chaparral M.S.	54.1	150	<0.265
03/20/11	Transportation Bldg	42.1	150	<0.265
03/21/11	Sunnyside H.S.	70.0	150	<0.265
03/22/11	Ocotillo #1	11.2	150	<0.265
03/22/11	Ocotillo #2	12.2	150	<0.265
03/23/11	Los Amigos	19.3	150	<0.265
03/24/11	Los Ninos	23.1	150	<0.265
03/25/11	Chaparral M.S.	26.5	150	<0.265
03/26/11	Transportation Bldg	INVALID	150	INVALID
03/27/11	Sunnyside H.S.	23.9	150	<0.265
03/28/11	Ocotillo #1	23.2	150	<0.265
03/28/11	Ocotillo #2	24.9	150	<0.265
03/29/11	Los Amigos	24.9	150	<0.265
03/30/11	Los Ninos	28.0	150	<0.265
03/31/11	Chaparral M.S.	27.8	150	<0.265

Sample running on 3/1/11 invalid due to the motor flow control being set to zero resulting in the sampler not running.

Sample running on 3/26/11 due to no flow rate being annotated resulting in PDEQ not being able to calculate the PM10 concentration.

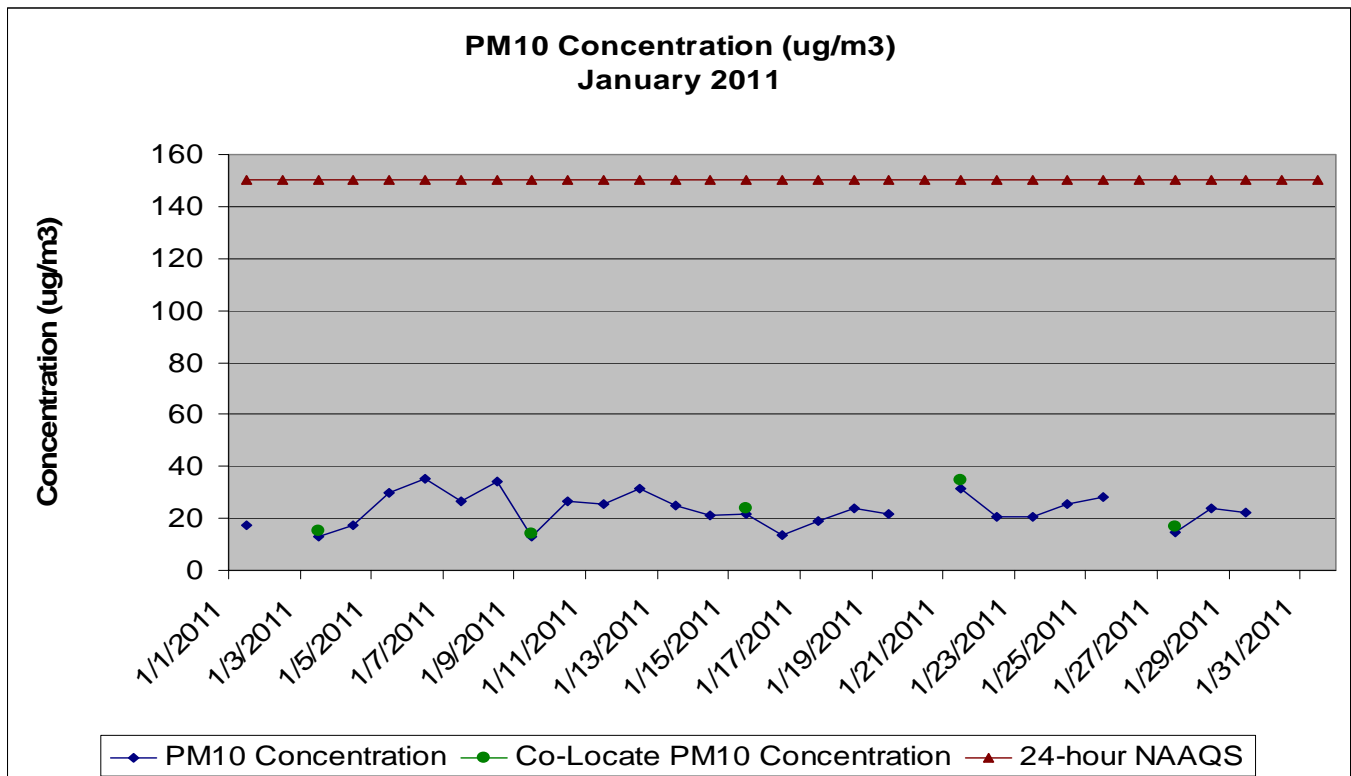
NAAQS = National Ambient Air Quality Standard for PM₁₀

Precision of Duplicate Pairs – PM10

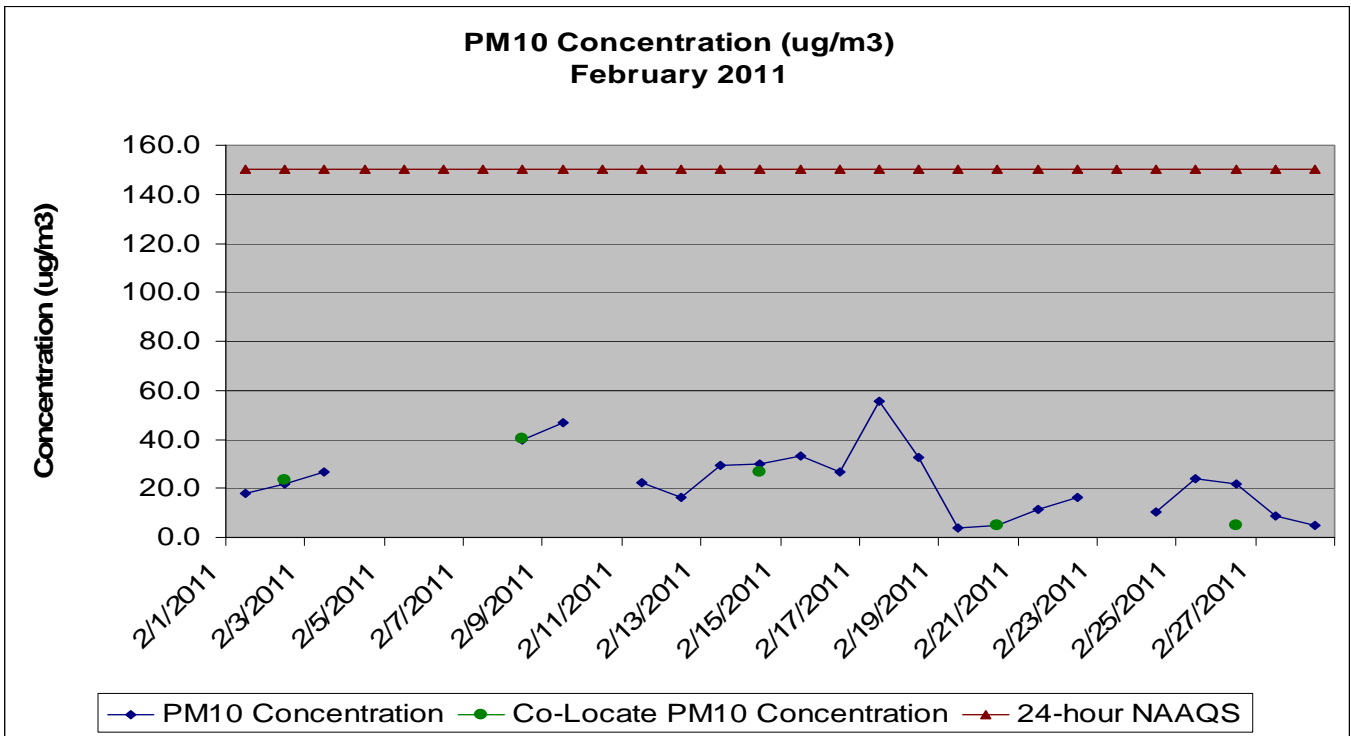
At low concentrations, agreement between the measurements of collocated samplers, expressed as relative percent difference, may be relatively poor. For this reason, collocated measurement pairs are selected for use in the precision and bias calculations only when both measurement pairs are equal to or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

Sample Date	Primary Sampler Number	Measured PM ₁₀ ($\mu\text{g}/\text{m}^3$)	Duplicate Sampler Number	Measured PM ₁₀ ($\mu\text{g}/\text{m}^3$)	Difference ($\mu\text{g}/\text{m}^3$)	Percent Difference %
1/15/11	1	21.8	2	23.9	2.1	9.19
1/21/11	1	31.5	2	34.5	3.0	9.09
2/2/11	1	22.0	2	23.5	1.5	6.59
2/8/11	1	39.8	2	40.5	0.7	1.74
2/14/11	1	29.8	2	26.7	3.1	-10.97
3/4/11	1	17.6	2	18.9	1.3	7.12
3/10/11	1	25.2	2	25.7	0.5	1.96
3/16/11	1	27.8	2	29.2	1.4	4.91
3/28/11	1	23.2	2	24.9	1.7	7.07

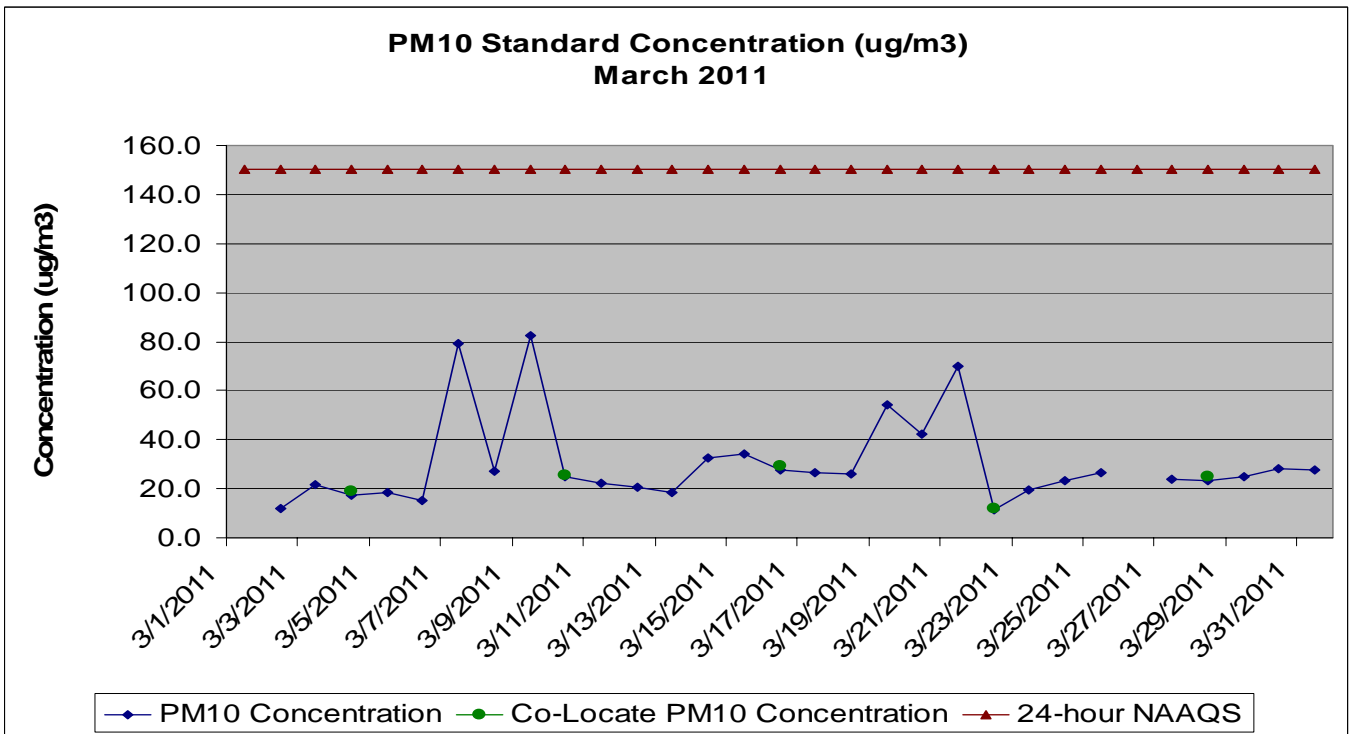
PM₁₀ Concentration Charts



- Sample running on 01/02/11 invalid due a power failure.
- Samples running on 1/20/11, 1/26/11, 1/30/11 and 1/31/11 invalid due to SUSD not changing the filters resulting in double exposures.



- Samples running on 02/04/11 and 2/10/11 invalid do to power failures, resulting in the total sample run time being <1380 minutes.
- Samples running on 02/5/1 and 2/6/11 invalid for PM10 due to SUSD not changing the filters resulting in double exposures.
- Sample running on 2/7/11 invalid due to SUSD not installing the filter.
- Sample running on 2/23/11 invalid due to the motor flow control being set to zero resulting in the sampler not running.



- Sample running on 3/1/11 invalid due to the motor flow control being set to zero resulting in the sampler not running.
- Sample running on 3/26/11 due to no flow rate being annotated resulting in PDEQ not being able to calculate the PM10 concentration.

Audit Results

Audits were performed on all of the samplers for the 1st quarter of 2011. 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
June	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 =** 296.0
Audit Date: 03/18/11 **Ps =** 692.8
Motor: 1424 **Temp c =** 27.20
Temp f: 80.96 **Ta =** 300.1
Press: 27.323 **Pa =** 694.0
Altim: 29.995 **Orifice Calibration Relationship**
 m= 1.31620 b= -0.04542

Plate No.	Orifice dH2O	Qa Orifice	Sampler dPex	Sampler dPext
18	3.52	34.3	1.90	0.91
13	3.00	31.8	1.64	0.84
10	2.51	29.2	1.38	0.77
7	1.68	24.1	1.01	0.66
5	1.11	19.8	0.71	0.55

Orifice dH2O 2.364
 Sample dPex 1.3
 Orifice Qa(m3/m) 0.802796
 Sample Qa dPex 28.27443

Audit flow rate % diff: 5.17 %

Orifice		
dH2O	Qa (CFM)	Qa (M3/m)
2.364	28.34	0.80

Sampler w/Orifice		
dPex	Qa (CFM)	Qa (M3/m)
1.33	29.81	0.84

Sampler Audit Relationship		
m =	0.024	
b =	0.078	
r =	0.999	
	pm10	tsp
Set Point (cfm)	40.5	50.6
Set Point (H20)	2.6	3.9

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
June	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 =** 296.0
Audit Date: 03/18/11 **Ps =** 692.8
Motor: 1418 **Temp c =** 29.20
Temp f: 84.56 **Ta =** 302.2
Press: 27.362 **Pa =** 695.0
Altim: 30.037 **Orifice Calibration Relationship**
 m= 1.31620 b= -0.04542

Plate No.	Orifice dH2O	Qa Orifice	Sampler dPex	Sampler dPext
18	3.62	34.9	2.15	0.97
13	3.06	32.2	1.81	0.89
10	2.59	29.7	1.54	0.82
7	1.77	24.8	1.11	0.69
5	1.16	20.3	0.76	0.57

Orifice dH2O 2.44
 Sample dPex 1.5
 Orifice Qa(m3/m) 0.817086
 Sample Qa dPex 28.80946

Audit flow rate % diff: 4.91 %

Orifice		
dH2O	Qa (CFM)	Qa (M3/m)
2.44	28.84	0.82

Sampler w/Orifice		
dPex	Qa (CFM)	Qa (M3/m)
1.47	30.27	0.86

Sampler Audit Relationship		
m =	0.027	
b =	0.035	
r =	0.999	
	pm10	tsp
Set Point (cfm)	40.7	50.9
Set Point (H20)	2.9	4.4

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
June	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 =** 296.0
Audit Date: 03/18/11 **Ps =** 692.8
Motor: 1419 **Temp c =** 26.20
Temp f: 79.16 **Ta =** 299.2
Press: 27.401 **Pa =** 696.0
Altim: 30.079 **Orifice Calibration Relationship**
 m= 1.31620 b= -0.04542

Plate No.	Orifice dH2O	Qa Orifice	Sampler dPex	Sampler dPext
18	3.12	32.3	1.33	0.76
13	2.62	29.7	1.10	0.69
10	2.20	27.3	0.90	0.62
7	1.52	22.9	0.54	0.48
5	1.01	18.9	0.28	0.35

Orifice dH2O 2.094
 Sample dPex 0.8
 Orifice Qa(m3/m) 0.75536
 Sample Qa dPex 26.81716

Orifice		
dH2O	Qa (CFM)	Qa (M3/m)
2.094	26.66	0.76

Sampler w/Orifice		
dPex	Qa (CFM)	Qa (M3/m)
0.83	27.77	0.79

Sampler Audit Relationship		
m =	0.031	
b =	-0.226	
r =	0.998	
	pm10	tsp
Set Point (cfm)	40.2	50.3
Set Point (H2O)	2.4	4.0

Audit flow rate % diff: 4.11 %

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
June	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 =** 296.0
Audit Date: 03/23/11 **Ps =** 692.8
Motor: 1421 **Temp c =** 21.60
Temp f: 70.88 **Ta =** 294.6
Press: 27.205 **Pa =** 691.0
Altim: 29.867 **Orifice Calibration Relationship**
 m= 1.31620 b= -0.04542

Plate No.	Orifice dH2O	Qa Orifice	Sampler dPex	Sampler dPext
18	2.42	28.5	0.95	0.64
13	2.06	26.4	0.76	0.57
10	1.73	24.3	0.58	0.50
7	1.20	20.4	0.35	0.39
5	0.81	17.0	0.19	0.28

Orifice dH2O 1.644
 Sample dPex 0.6
 Orifice Qa(m3/m) 0.670582
 Sample Qa dPex 23.83479

Orifice		
dH2O	Qa (CFM)	Qa (M3/m)
1.644	23.67	0.67

Sampler w/Orifice		
dPex	Qa (CFM)	Qa (M3/m)
0.57	24.63	0.70

Sampler Audit Relationship		
m =	0.031	
b =	-0.236	
r =	0.999	
	pm10	tsp
Set Point (cfm)	39.9	49.9
Set Point (H2O)	2.3	3.9

Audit flow rate % diff: 4.03 %

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
June	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 =** 296.0
Audit Date: 03/18/11 **Ps =** 692.8
Motor: 1420 **Temp c =** 29.30
Temp f: 84.74 **Ta =** 302.3
Press: 27.362 **Pa =** 695.0
Altim: 30.037 **Orifice Calibration Relationship**
 m= 1.31620 b= -0.04542

Plate No.	Orifice dH20	Qa Orifice	Sampler dPex	Sampler dPext
18	2.70	30.8	1.13	0.70
13	2.35	28.3	0.91	0.63
10	2.00	26.2	0.71	0.56
7	1.36	21.9	0.37	0.40
5	0.90	18.0	0.18	0.28

Orifice dH2O 1.862
 Sample dPex 0.7
 Orifice Qa(m3/m) 0.718254
 Sample Qa dPex 25.598

Orifice		
dH2O	Qa (CFM)	Qa (M3/m)
1.862	25.35	0.72
Sampler w/Orifice		
dPex	Qa(CFM)	Qa(M3/m)
0.66	26.35	0.75

Sampler Audit Relationship		
m =	0.034	
b =	-0.344	
r =	0.999	
	pm10	tsp
Set Point (cfm)	40.7	50.9
Set Point (H2O)	2.6	4.5

Audit flow rate % diff: 3.91 %

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
June	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 =** 296.0
Audit Date: 03/18/11 **Ps =** 692.8
Motor: 1417 **Temp c =** 29.30
Temp f: 84.74 **Ta =** 302.3
Press: 27.362 **Pa =** 695.0
Altim: 30.037 **Orifice Calibration Relationship**
 m= 1.3162 b= -0.04542

Plate No.	Orifice dH20	Qa Orifice	Sampler dPex	Sampler dPext
18	2.80	30.8	1.23	0.73
13	2.41	28.7	1.00	0.66
10	2.02	26.4	0.82	0.60
7	1.40	22.2	0.54	0.48
5	0.94	18.4	0.32	0.37

Orifice dH2O 1.914
 Sample dPex 0.8
 Orifice Qa(m3/m) 0.727735
 Sample Qa dPex 25.77646

Orifice		
dH2O	Qa (CFM)	Qa (M3/m)
1.914	25.69	0.73
Sampler w/Orifice		
dPex	Qa (CFM)	Qa (M3/m)
0.78	26.78	0.76

Sampler Audit Relationship		
m =	0.028	
b =	-0.146	
r =	0.999	
	pm10	tsp
Set Point (cfm)	40.7	50.9
Set Point (H2O)	2.3	3.8

Audit flow rate % diff: 4.20 %

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
June	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 =** 296.0
Audit Date: 03/18/11 **Ps =** 692.8
Motor: 1422 **Temp c =** 28.50
Temp f: 83.30 **Ta =** 301.5
Press: 27.362 **Pa =** 695.0
Altim: 30.037 **Orifice Calibration Relationship**
 m= 1.31620 b= -0.04542

Plate No.	Orifice dH20	Qa Orifice	Sampler dPex	Sampler dPext
18	2.77	30.6	1.21	0.72
13	2.37	28.4	1.01	0.66
10	1.95	25.9	0.79	0.59
7	1.35	21.7	0.52	0.47
5	0.89	17.9	0.33	0.38

Orifice dH2O 1.866
 Sample dPex 0.8
 Orifice Qa(m3/m) 0.718081
 Sample Qa dPex 25.41731

Audit flow rate % diff: 4.31 %

Orifice		
dH2O	Qa (CFM)	Qa (M3/m)
1.866	25.35	0.72

Sampler w/Orifice		
dPex	Qa (CFM)	Qa (M3/m)
0.77	26.45	0.75

Sampler Audit Relationship		
m =	0.027	
b =	-0.114	
r =	0.999	
	pm10	tsp
Set Point (cfm)	40.6	50.8
Set Point (H2O)	2.3	3.7