



MEMORANDUM

Pima County Department of Environmental Quality

DATE: June 18, 2009

TO: Raul Ochoa
Assistant Superintendent Operations & Facilities Planning

FROM: Teresa Sobolewski
Environmental Manager

RE: Pima County DEQ Beryllium Monitoring Report 1st Quarter 2009

Attached is the Pima County Department of Environmental Quality's (PDEQ) Air Monitoring Division Beryllium Monitoring Network Summary for the 1st Quarter of 2009.

Highlights:

- 105 samples collected resulting in 102 valid and 3 invalid samples (97.1% data recovery). EPA requires monitoring data recovery at 75%.
- No beryllium values were detected over the Practical Quantitation Level (PQL).

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 2009



*Pima County Department of Environmental Quality
150 West Congress St., 1st Floor
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 1st quarter of 2009 there was a total of 105 samples collected resulting in 102 valid and 3 invalid samples; for a data recovery of 97.1%. Eight 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 102 samples analyzed for beryllium. Beryllium concentrations are reported as $<0.265 \text{ ng/m}^3$ 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_{10} concentrations ($\mu\text{g/m}^3$) calculated in standard conditions, PM_{10} 24-hour NAAQS standard, precision measurements, Beryllium analysis results, accompanying graphs and a brief explanation of all invalid samples for the 1st quarter of 2009.

PM₁₀ /Beryllium Concentrations

Monthly Summary of PM₁₀/Beryllium Data

January - 2009

Date	Location	Standard Concentration PM ₁₀ (µg/m ³)	24-hour NAAQS PM ₁₀ (µg/m ³)	Beryllium (ng/m ³)
01/01/09	Ocotillo #1	13.6	150	<0.265
01/01/09	Ocotillo #2	13.9	150	<0.265
01/02/09	Los Amigos	11.7	150	<0.265
01/03/09	Los Niños	12.0	150	<0.265
01/04/09	Chaparral M.S.	9.5	150	<0.265
01/05/09	Transportation Bldg	7.9	150	<0.265
01/06/09	Sunnyside H.S.	11.2	150	<0.265
01/07/09	Ocotillo #1	INVALID	150	<0.265
01/07/09	Ocotillo #2	16.3	150	<0.265
01/08/09	Los Amigos	20.6	150	<0.265
01/09/09	Los Niños	20.2	150	<0.265
01/10/09	Chaparral M.S.	INVALID	150	<0.265
01/11/09	Transportation Bldg	11.4	150	<0.265
01/12/09	Sunnyside H.S.	25.3	150	<0.265
01/13/09	Ocotillo #1	29.3	150	<0.265
01/13/09	Ocotillo #2	31.6	150	<0.265
01/14/09	Los Amigos	26.5	150	<0.265
01/15/09	Los Niños	18.4	150	<0.265
01/16/09	Chaparral M.S.	16.9	150	<0.265
01/17/09	Transportation Bldg	22.9	150	<0.265
01/18/09	Sunnyside H.S.	23.5	150	<0.265
01/19/09	Ocotillo #1	21.3	150	<0.265
01/19/09	Ocotillo #2	21.9	150	<0.265
01/20/09	Los Amigos	31.8	150	<0.265
01/21/09	Los Niños	33.8	150	<0.265
01/22/09	Chaparral M.S.	10.5	150	<0.265
01/23/09	Transportation Bldg	7.2	150	<0.265
01/24/09	Sunnyside H.S.	5.7	150	<0.265
01/25/09	Ocotillo #1	6.2	150	<0.265
01/25/09	Ocotillo #2	6.0	150	<0.265
01/26/09	Los Amigos	12.4	150	<0.265
01/27/09	Los Ninos	14.0	150	<0.265
01/28/09	Chaparral M.S.	17.8	150	<0.265
01/29/09	Transportation Bldg	19.3	150	<0.265
01/30/09	Sunnyside H.S.	23.2	150	<0.265
01/31/09	Ocotillo #1	10.8	150	<0.265
01/31/09	Ocotillo #2	15.2	150	<0.265

Sample running on 01/07/09 invalid due to corner of filter missing resulting in an invalid representative weight.

Sample running on 01/10/09 invalid due to no post flow rate annotated on chart recorder resulting in PDEQ not being able to calculate the average sample flow rate.

NAAQS = National Ambient Air Quality Standard for PM₁₀

PM₁₀ /Beryllium Concentrations (continued)

Monthly Summary of PM₁₀/Beryllium Data

February - 2009

Date	Location	Standard Concentration PM₁₀ (µg/m³)	24-hour NAAQS PM₁₀ (µg/m³)	Beryllium (ng/m³)
02/01/09	Los Amigos	15.4	150	<0.265
02/02/09	Los Niños	35.8	150	<0.265
02/03/09	Chaparral M.S.	17.7	150	<0.265
02/04/09	Transportation Bldg	30.4	150	<0.265
02/05/09	Sunnyside H.S.	28.9	150	<0.265
02/06/09	Ocotillo #1	31.8	150	<0.265
02/06/09	Ocotillo #2	34.7	150	<0.265
02/07/09	Los Amigos	17.7	150	<0.265
02/08/09	Los Niños	1.5	150	<0.265
02/09/09	Chaparral M.S.	12.8	150	<0.265
02/10/09	Transportation Bldg	4.8	150	<0.265
02/11/09	Sunnyside H.S.	11.9	150	<0.265
02/12/09	Ocotillo #1	14.6	150	<0.265
02/12/09	Ocotillo #2	16.1	150	<0.265
02/13/09	Los Amigos	14.7	150	<0.265
02/14/09	Los Niños	14.0	150	<0.265
02/15/09	Chaparral M.S.	17.5	150	<0.265
02/16/09	Transportation Bldg	15.2	150	<0.265
02/17/09	Sunnyside H.S.	14.4	150	<0.265
02/18/09	Ocotillo #1	12.8	150	<0.265
02/18/09	Ocotillo #2	13.7	150	<0.265
02/19/09	Los Amigos	23.1	150	<0.265
02/20/09	Los Niños	24.8	150	<0.265
02/21/09	Chaparral M.S.	22.5	150	<0.265
02/22/09	Transportation Bldg	26.3	150	<0.265
02/23/09	Sunnyside H.S.	37.2	150	<0.265
02/24/09	Ocotillo #1	27.4	150	<0.265
02/24/09	Ocotillo #2	28.7	150	<0.265
02/25/09	Los Amigos	27.0	150	<0.265
02/26/09	Los Ninos	25.5	150	<0.265
02/27/09	Chaparral M.S.	24.2	150	<0.265
02/28/09	Transportation Bldg	24.2	150	<0.265

NAAQS = National Ambient Air Quality Standard for PM₁₀

PM₁₀ /Beryllium Concentrations (continued)

Monthly Summary of PM₁₀/Beryllium Data

March - 2009

Date	Location	Standard Concentration PM₁₀ (µg/m³)	24-hour NAAQS PM₁₀ (µg/m³)	Beryllium (ng/m³)
03/01/09	Sunnyside H.S.	70.4	150	<0.265
03/02/09	Ocotillo #1	35.4	150	<0.265
03/02/09	Ocotillo #2	39.5	150	<0.265
03/03/09	Los Amigos	42.4	150	<0.265
03/04/09	Los Niños	31.5	150	<0.265
03/05/09	Chaparral M.S.	23.7	150	<0.265
03/06/09	Transportation Bldg	27.1	150	<0.265
03/07/09	Sunnyside H.S.	20.7	150	<0.265
03/08/09	Ocotillo #1	15.2	150	<0.265
03/08/09	Ocotillo #2	15.9	150	<0.265
03/09/09	Los Amigos	9.4	150	<0.265
03/10/09	Los Niños	16.7	150	<0.265
03/11/09	Chaparral M.S.	14.3	150	<0.265
03/12/09	Transportation Bldg	16.7	150	<0.265
03/13/09	Sunnyside H.S.	24.0	150	<0.265
03/14/09	Ocotillo #1	19.0	150	<0.265
03/14/09	Ocotillo #2	21.2	150	<0.265
03/15/09	Los Amigos	14.1	150	<0.265
03/16/09	Los Niños	22.7	150	<0.265
03/17/09	Chaparral M.S.	27.6	150	<0.265
03/18/09	Transportation Bldg	26.3	150	<0.265
03/19/09	Sunnyside H.S.	31.5	150	<0.265
03/20/09	Ocotillo #1	26.9	150	<0.265
03/20/09	Ocotillo #2	29.1	150	<0.265
03/21/09	Los Amigos	23.5	150	<0.265
03/22/09	Los Niños	30.2	150	<0.265
03/23/09	Chaparral M.S.	84.2	150	<0.265
03/24/09	Transportation Bldg	38.6	150	<0.265
03/25/09	Sunnyside H.S.	34.9	150	<0.265
03/26/09	Ocotillo #1	29.4	150	<0.265
03/26/09	Ocotillo #2	INVALID	150	<0.265
03/27/09	Los Amigos	32.2	150	<0.265
03/28/09	Los Ninos	20.2	150	<0.265
03/29/09	Chaparral M.S.	22.8	150	<0.265
03/30/09	Transportation Bldg	40.3	150	<0.265
03/31/09	Sunnyside H.S.	32.8	150	<0.265

Sample running on 03/26/09 invalid due to ink from the chart recorder transferring onto the filter causing an incorrect post-sampling representative weight.

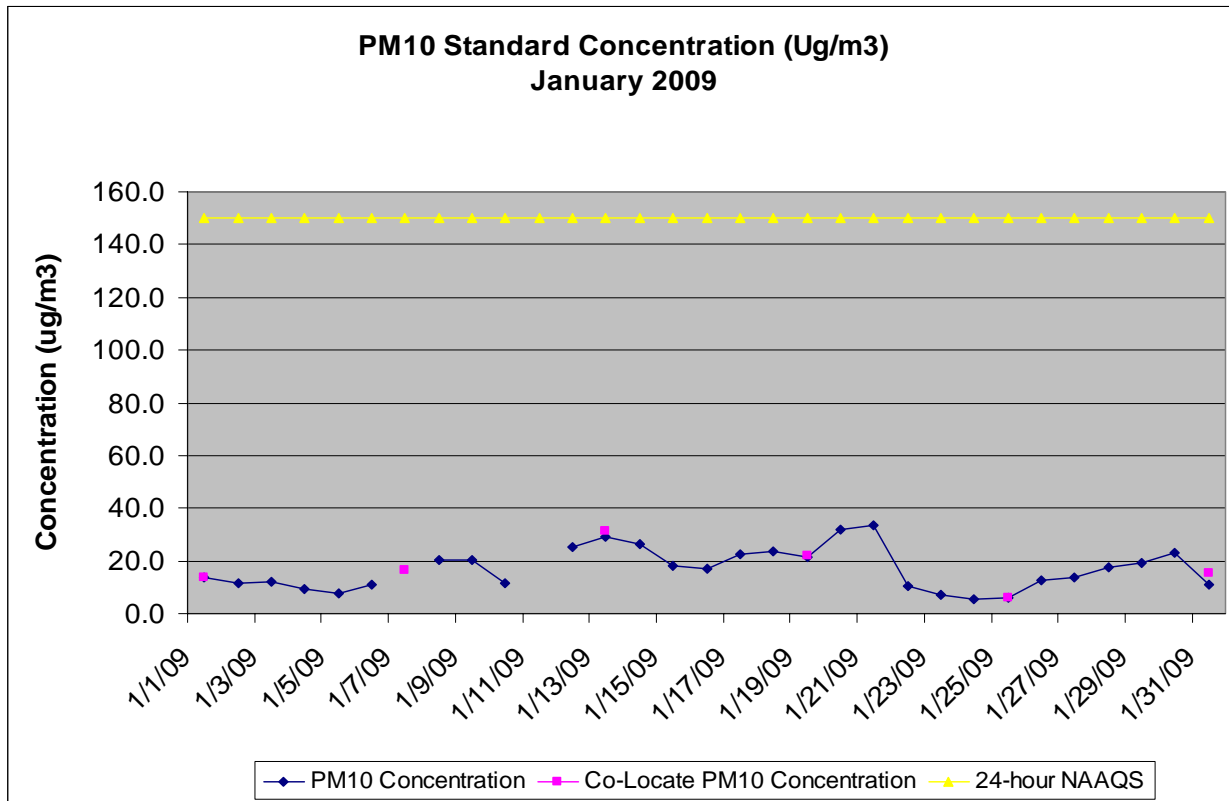
NAAQS = National Ambient Air Quality Standard for PM₁₀

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 15µg/m³ (40CFR58, Appendix A, Section 4c).

Sample Date	Primary Sampler Number	Measured PM ₁₀ (µg/m ³)	Duplicate Sampler Number	Measured PM ₁₀ (µg/m ³)	Difference (µg/m ³)	Percent Difference %
1/13/09	1	29.3	2	31.6	2.3	7.55
1/19/09	1	21.3	2	21.9	0.6	2.78
2/06/09	1	31.8	2	34.7	2.9	8.72
2/24/09	1	27.4	2	28.7	1.6	4.63
3/02/09	1	35.4	2	39.5	4.1	10.95
3/08/09	1	15.2	2	15.9	0.7	4.50
3/14/09	1	19.0	2	21.2	2.2	10.95
3/20/09	1	26.9	2	29.1	2.2	7.86

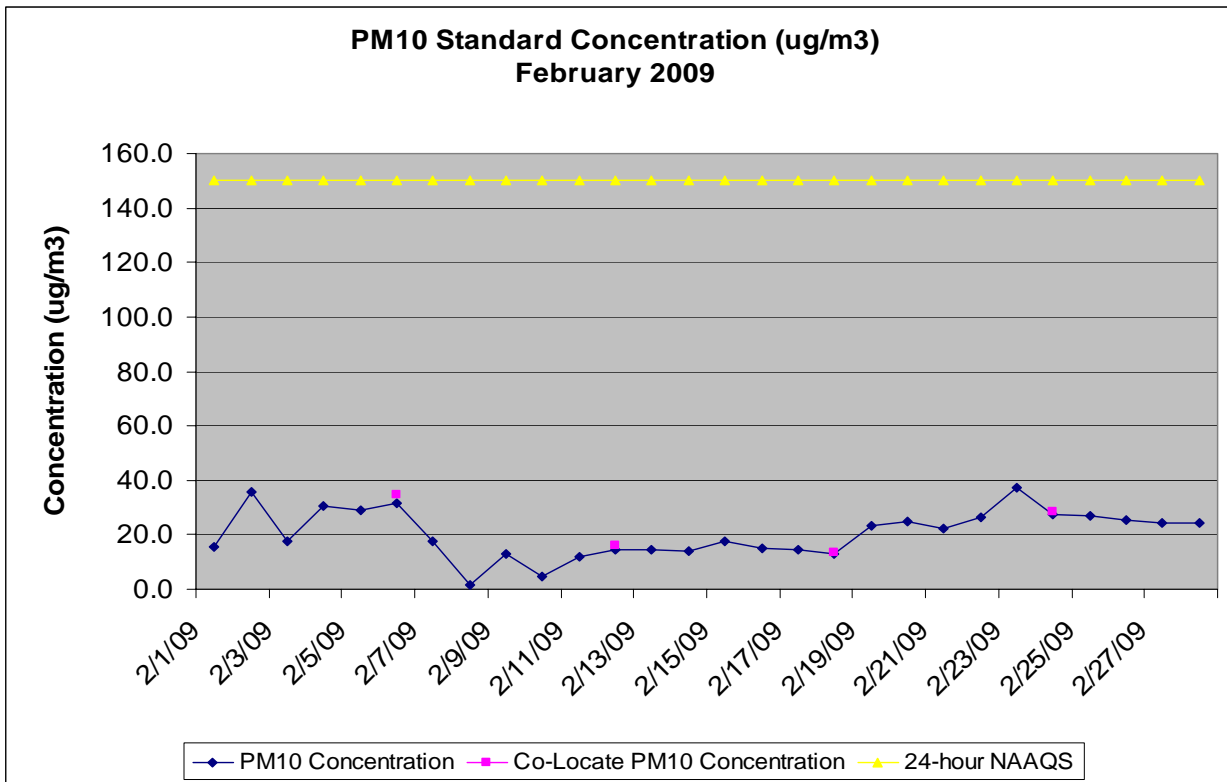
PM₁₀ Concentration Charts



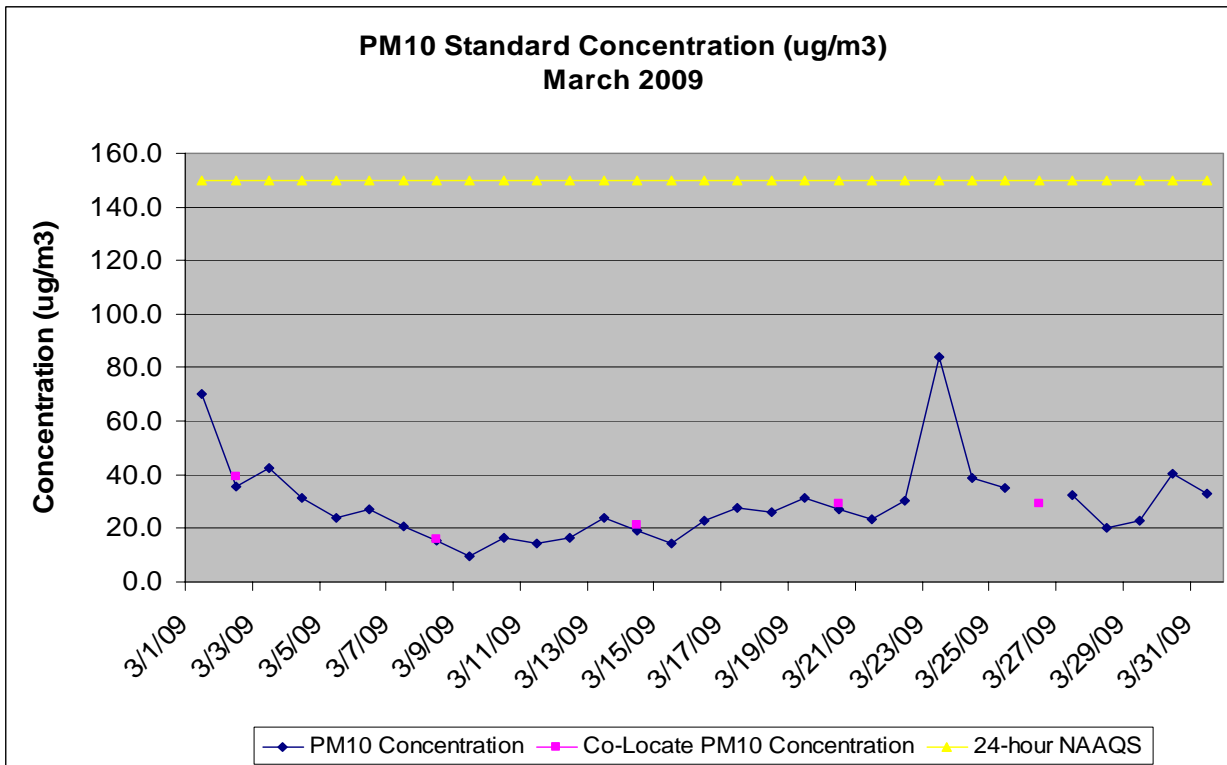
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Sample running on 03/26/09 invalid due to ink from the chart recorder transferring onto the filter causing an incorrect post-sampling representative weight.

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Audit Results

Audits were performed on all of the samplers for the 1st quarter of 2009. 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: 03/27/09 **Ps =** 692.8
Motor: 1424 **Temp c =** 15.00
Temp f: 59.0 **Ta =** 288.0
Press: 27.282 **Pa =** 693.0
Altim: 29.950 **Orifice Calibration Relationship**
 m= 1.31700 b= -0.05774

Plate No.	Orifice dH2O	Qa Orifice	Sampler dPex	Sampler dPext
18	4.40	37.8	2.42	1.00
13	3.69	34.8	2.03	0.92
10	3.06	31.8	1.69	0.84
7	2.04	26.2	1.21	0.71
5	1.30	21.3	0.88	0.60

Orifice dH2O 2.898
 Sample dPex 1.6
 Orifice Qa(m3/m) 0.877155
 Sample Qa dPex 30.88359

Orifice		
dH2O	Qa(CFM)	Qa(M3/m)
2.898	30.96	0.88

Sampler w/Orifice		
dPex	Qa(CFM)	Qa(M3/m)
1.65	32.63	0.92

Sampler Audit Relationship		
m =	0.024	
b =	0.086	
r =	0.997	
	pm10	tsp
Set Point (cfm)	38.9	48.6
Set Point (H2O)	2.5	3.8

Audit flow rate % diff: 5.37 %

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: 03/27/09 **Ps =** 692.8
Motor: 1418 **Temp c =** 15.70
Temp f: 60.26 **Ta =** 288.7
Press: 27.323 **Pa =** 694.0
Altim: 29.995 **Orifice Calibration Relationship**
 m= 1.31700 b= -0.05774

Plate No.	Orifice dH2O	Qa Orifice	Sampler dPex	Sampler dPext
18	4.14	36.7	2.40	1.00
13	3.48	33.8	2.06	0.93
10	2.89	30.9	1.77	0.86
7	1.96	25.8	1.23	0.72
5	1.25	20.9	0.85	0.59

Orifice dH2O 2.744
 Sample dPex 1.7
 Orifice Qa(m3/m) 0.855076
 Sample Qa dPex 30.1267

Orifice		
dH2O	Qa(CFM)	Qa(M3/m)
2.744	30.18	0.86

Sampler w/Orifice		
dPex	Qa(CFM)	Qa(M3/m)
1.66	31.77	0.90

Sampler Audit Relationship		
m =	0.026	
b =	0.057	
r =	1.000	
	pm10	tsp
Set Point (cfm)	38.9	48.7
Set Point (H2O)	2.7	4.1

Audit flow rate % diff: 5.21 %

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: 03/31/09 **Ps =** 692.8
Motor: 1419 **Temp c =** 18.20
Temp f: 64.76 **Ta =** 291.2
Press: 27.360 **Pa =** 695.0
Altim: 30.035 **Orifice Calibration Relationship**
 m= 1.31700 b= -0.05774

Plate No.	Orifice dH20	Qa Orifice	Sampler dPex	Sampler dPext
18	3.45	33.8	1.49	0.79
13	2.94	31.3	1.23	0.72
10	2.45	28.7	0.98	0.64
7	1.63	23.7	0.56	0.48
5	1.11	19.8	0.27	0.34

Orifice dH2O 2.316
 Sample dPex 0.90
 Orifice Qa(m3/m) 0.791841
 Sample Qa dPex 28.15652

Orifice		
dH2O	Qa(CFM)	Qa(M3/m)
2.316	27.95	0.79

Sampler w/Orifice		
dPex	Qa(CFM)	Qa(M3/m)
0.91	29.12	0.82

Sampler Audit Relationship		
m =	0.032	
b =	-0.293	
r =	0.997	
	pm10	tsp
Set Point (cfm)	39.2	49.0
Set Point (H2O)	2.3	4.0

Audit flow rate % diff: 4.13 %

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: 03/27/09 **Ps =** 692.8
Motor: 1421 **Temp c =** 16.60
Temp f: 61.88 **Ta =** 289.6
Press: 27.282 **Pa =** 693.0
Altim: 29.950 **Orifice Calibration Relationship**
 m= 1.3700 b= -0.05774

Plate No.	Orifice dH20	Qa Orifice	Sampler dPex	Sampler dPext
18	3.49	33.9	1.46	0.78
13	3.04	31.8	1.15	0.69
10	2.58	29.4	0.94	0.63
7	1.74	24.4	0.56	0.48
5	1.13	20.0	0.28	0.34

Orifice dH2O 2.396
 Sample dPex 0.90
 Orifice Qa(m3/m) 0.803653
 Sample Qa dPex 28.55699

Orifice		
dH2O	Qa(CFM)	Qa(M3/m)
2.396	28.37	0.80

Sampler w/Orifice		
dPex	Qa(CFM)	Qa(M3/m)
0.88	29.55	0.84

Sampler Audit Relationship		
m =	0.031	
b =	-0.270	
r =	0.998	
	pm10	tsp
Set Point (cfm)	39.1	48.9
Set Point (H2O)	2.1	3.6

Audit flow rate % diff: 4.15 %

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: 03/27/09 **Ps =** 692.8
Motor: 1420 **Temp c =** 14.00
Temp f: 57.20 **Ta =** 287.0
Press: 27.323 **Pa =** 694.0
Altim: 29.995 **Orifice Calibration Relationship**
 m= 1.31700 b= -0.05774

Plate No.	Orifice dH20	Qa Orifice	Sampler dPex	Sampler dPext
18	3.04	31.6	1.26	0.72
13	2.59	29.3	1.02	0.65
10	2.17	26.9	0.77	0.56
7	1.48	22.5	0.43	0.42
5	0.98	18.6	0.19	0.28

Orifice dH2O 2.052
 Sample dPex 0.70
 Orifice Qa(m3/m) 0.743298
 Sample Qa dPex 26.48815

Orifice		
dH2O	Qa(CFM)	Qa(M3/m)
2.052	26.24	0.74

Sampler w/Orifice		
dPex	Qa(CFM)	Qa(M3/m)
0.73	27.32	0.77

Sampler Audit Relationship		
m =	0.034	
b =	-0.348	
r =	0.999	
Set Point (cfm)	pm10	tsp
Set Point (H2O)	38.7	48.4
	2.3	4.1

Audit flow rate % diff: 4.07 %

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: 03/27/09 **Ps =** 692.8
Motor: 1417 **Temp c =** 14.00
Temp f: 57.20 **Ta =** 287.0
Press: 27.323 **Pa =** 694.0
Altim: 29.995 **Orifice Calibration Relationship**
 m= 1.31700 b= -0.05774

Plate No.	Orifice dH20	Qa Orifice	Sampler dPex	Sampler dPext
18	4.04	36.2	1.66	0.83
13	3.42	33.4	1.49	0.78
10	2.84	30.6	1.20	0.70
7	1.88	25.2	0.72	0.55
5	1.23	20.7	0.39	0.40

Orifice dH2O 2.682
 Sample dPex 1.10
 Orifice Qa(m3/m) 0.843494
 Sample Qa dPex 29.89376

Orifice		
dH2O	Qa(CFM)	Qa(M3/m)
2.682	29.78	0.84

Sampler w/Orifice		
dPex	Qa(CFM)	Qa(M3/m)
1.09	31.11	0.88

Sampler Audit Relationship		
m =	0.028	
b =	-0.168	
r =	0.993	
Set Point (cfm)	pm10	tsp
Set Point (H2O)	38.7	48.4
	2.0	3.4

Audit flow rate % diff: 4.46 %

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: 03/27/09 **Ps =** 692.8
Motor: 1422 **Temp c =** 14.40
Temp f: 57.92 **Ta =** 287.4
Press: 27.282 **Pa =** 693.0
Altim: 29.950 **Orifice Calibration Relationship**
 m= 1.31700 b= -0.05774

Plate No.	Orifice dH20	Qa Orifice	Sampler dPex	Sampler dPext
18	3.59	34.3	1.60	0.81
13	3.04	31.7	1.29	0.73
10	2.58	29.3	1.04	0.66
7	1.68	23.9	0.69	0.53
5	1.11	19.7	0.40	0.41

Orifice dH2O 2.400
 Sample dPex 1.0
 Orifice Qa(m3/m) 0.801393
 Sample Qa dPex 28.36977

Audit flow rate % diff: 4.51 %

Orifice		
dH2O	Qa(CFM)	Qa(M3/m)
2.400	28.29	0.80

Sampler w/Orifice		
dPex	Qa(CFM)	Qa(M3/m)
1.00	29.57	0.84

Sampler Audit Relationship		
m =	0.027	
b =	-0.129	
r =	0.996	
	pm10	tsp
Set Point (cfm)	38.8	48.5
Set Point (H2O)	2.1	3.4