



PM-10 Monitoring Rosemary's Mountain Quarry for



Town Hall Meeting: 2009 Results

SCS Tracer Environmental

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Sampling Equipment

BGI PQ-100 Sampler

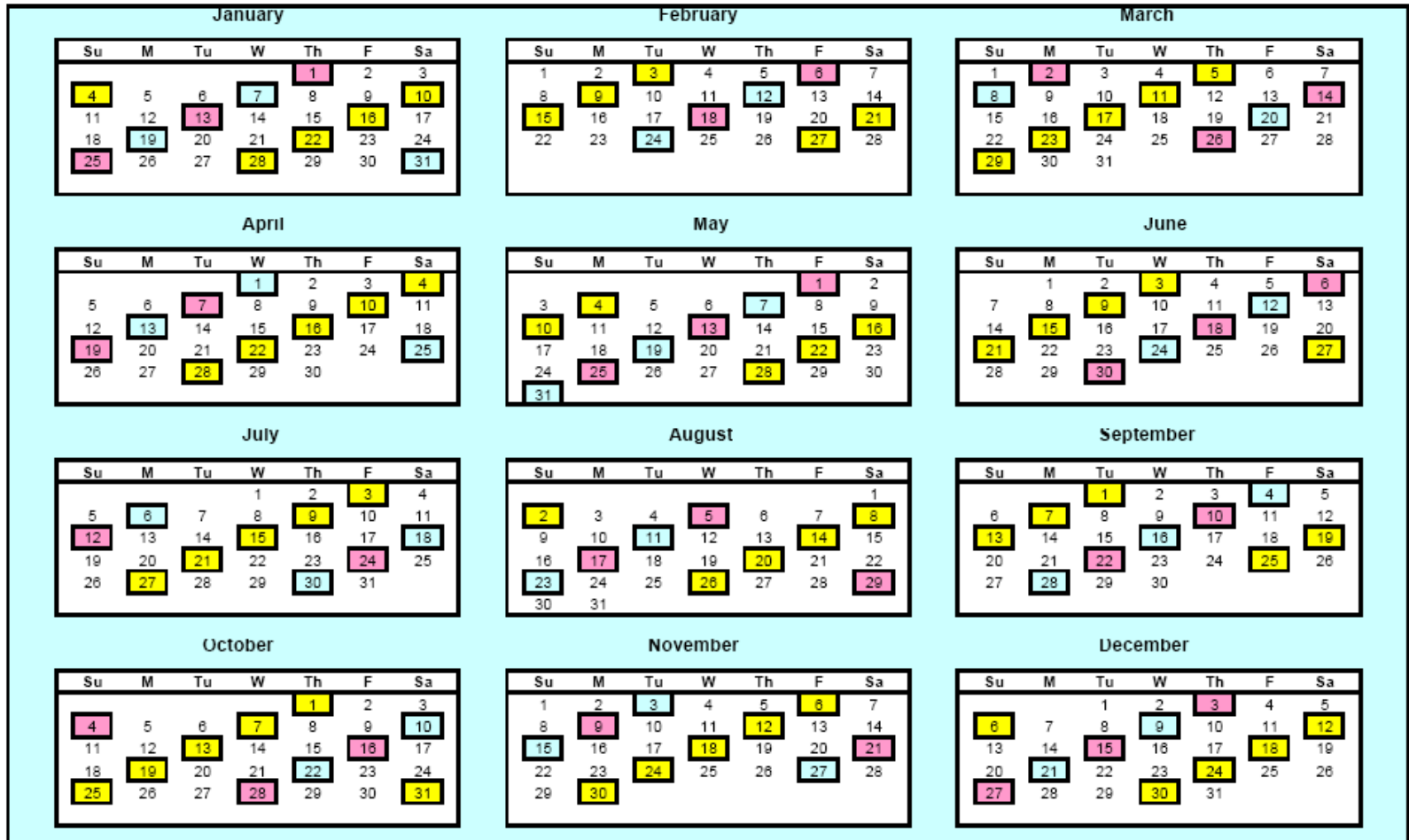
- US EPA Reference Method
 - (RFPS-1298-124)
- Operates with either AC or DC Power
- Portable
- Highly Reliable
- Easy to Calibrate
- Adaptable to Sample for Additional Parameters



Sampling Frequencies

2009 Monitoring Schedule

3-day & 6-day Monitoring Schedule for TSP, Pb, PM-10, PM-2.5, and VOC. 12-day Monitoring Schedule for PM-2.5 Collocation.



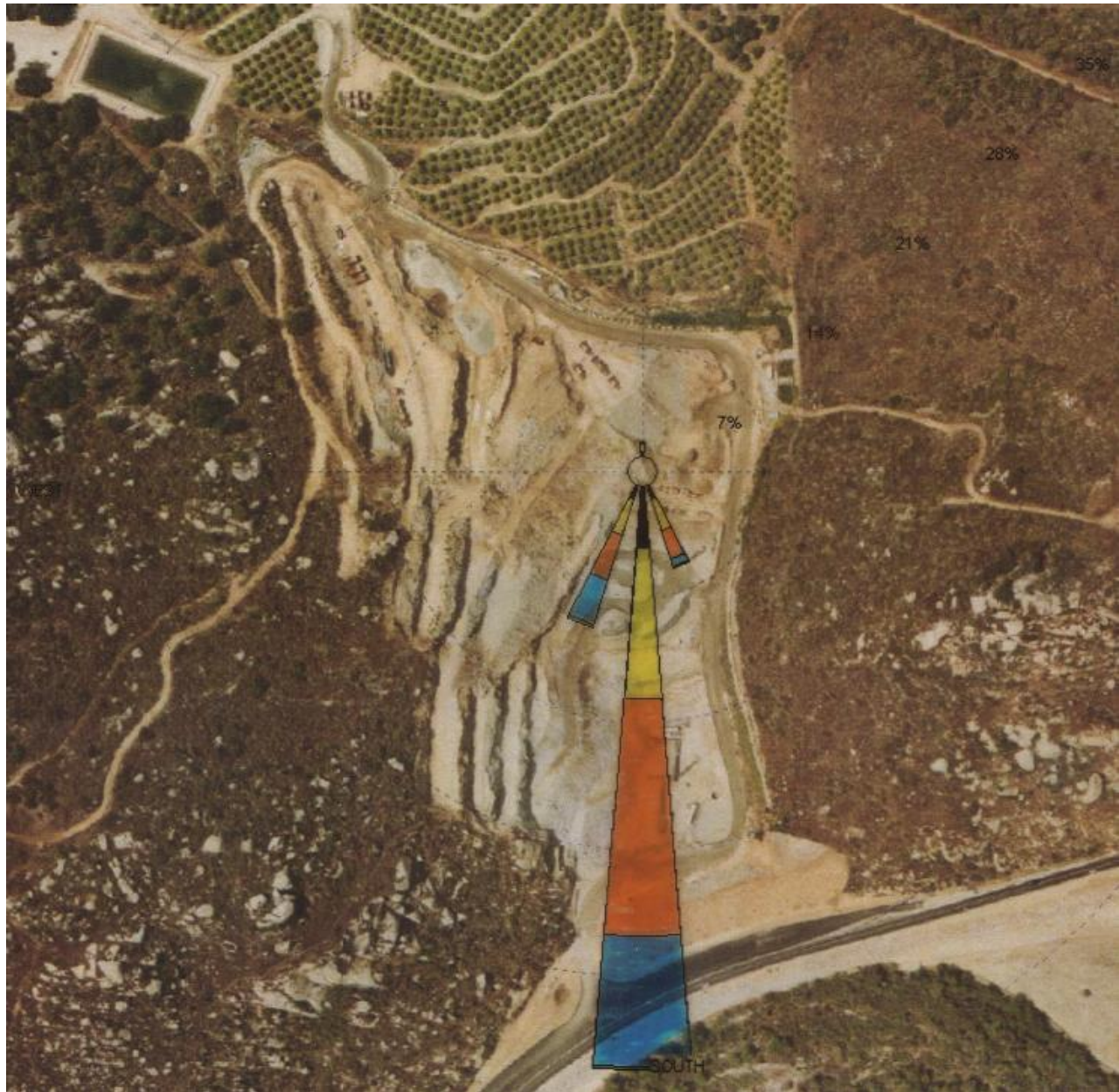
& & = 1/3 day sampling

& = 1/6 day sampling

= 1/12 day sampling



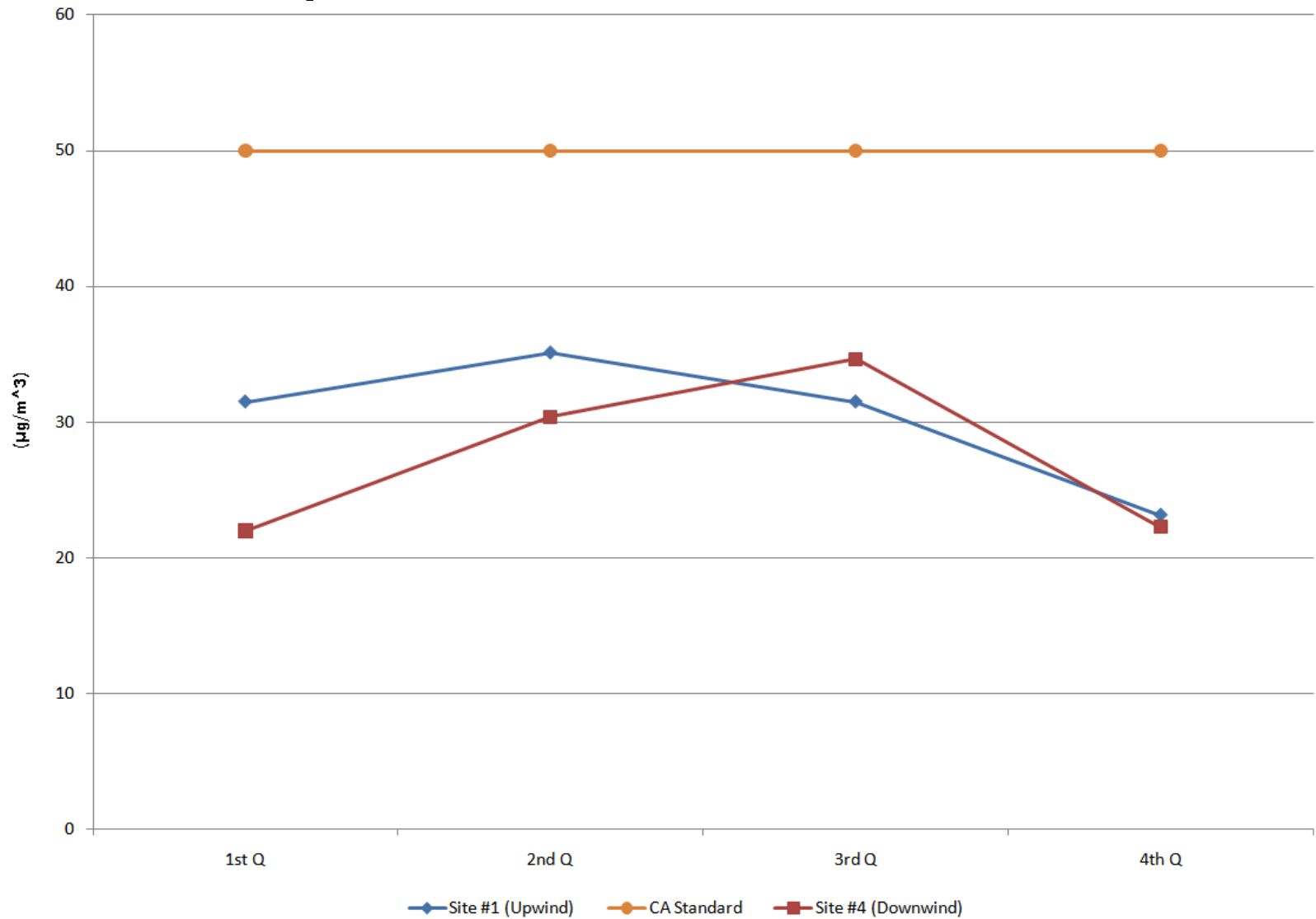
Site With 2009 Wind Rose



Average Results

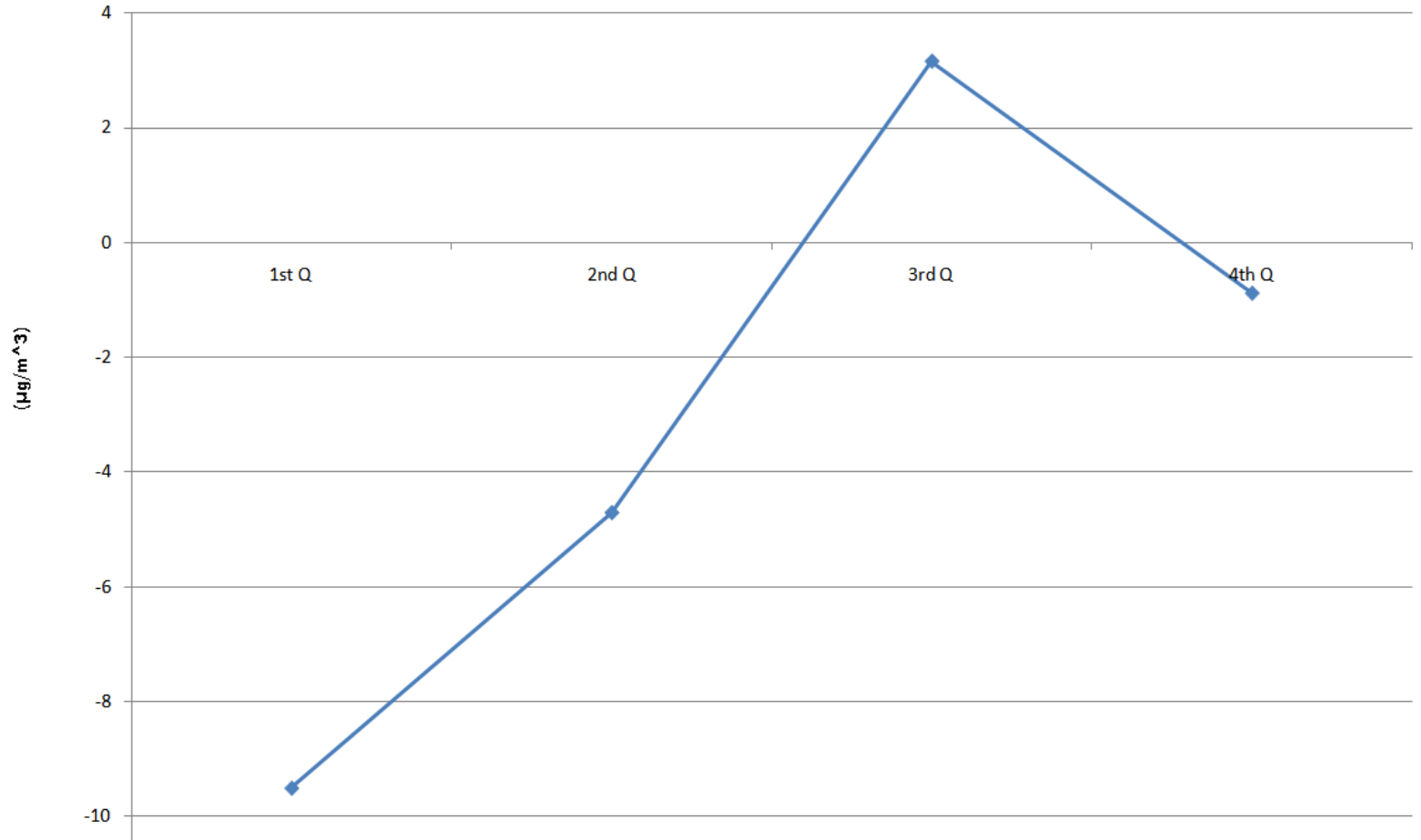
Period	Averaging Type	Site #1	Site #2	Site #3	Site #4	Escondido
1st Q	Mean Concentration	31.5	22.5	17.3	22	24.6
2nd Q	Mean Concentration	35.1	28.5	26.9	30.4	20.4
3rd Q	Mean Concentration	31.5	26.9	34.1	34.7	26.0
4th Q	Mean Concentration	23.2	22.1	18.9	22.3	28.0
1st Q	Median Concentration	25	16.6	12.5	18.8	20
2nd Q	Median Concentration	41.6	29.1	25.0	29.1	20.5
3rd Q	Median Concentration	29.1	22.9	35.4	33.3	26.0
4th Q	Median Concentration	25.0	20.8	20.8	20.8	26.0

2009 Quarterly Mean Upwind Vs. Downwind



Quarterly Mean Differential

(Upwind Vs. Downwind)



Crystalline Silica Sampling

- Sampling Method and Equipment is/was Identical to that Used in PM₁₀ Sampling
- PVC Filter is Used Instead of Teflon Filter
- Analytical Method: X-Ray Powder Diffraction
- Detects Quartz, Cristobalite, Tridymite
- Definition of Respirable Dust
 - Occupational Definition: **4 µm Particle Aerodynamic Diameter**
 - Environmental Definition: 10 µm Particle Aerodynamic Diameter

Crystalline Silica Sampling

- Regulatory Standards: **Specific to Occupational Definition**
 - OSHA (TLV): 10,000 $\mu\text{g}/\text{m}^3$ (Quartz), 5000 $\mu\text{g}/\text{m}^3$ (Cristobalite, Tridymite)
 -
 - NIOSH (TLV): 50 $\mu\text{g}/\text{m}^3$ (Total)
 - ACGIH (TLV): 100 $\mu\text{g}/\text{m}^3$ (Quartz), 50 $\mu\text{g}/\text{m}^3$ (Cristobalite, Tridymite)
 - **OEHHA (REL): 3 $\mu\text{g}/\text{m}^3$ (Total)**
- REL: Recommended Exposure Limit (Chronic Exposure)
- TLV: Threshold Limit Value (Concentration Ceiling)

Crystalline Silica Sampling

- Regulatory Method:
 - 4 μm Particle Aerodynamic Diameter
 - OEHHA (REL): 3 $\mu\text{g}/\text{m}^3$ (Total)
- Actual Method Used:
 - 10 μm Particle Aerodynamic Diameter
 - OEHHA (REL): Not Applicable, For Comparison Only
- USEPA AP-42, Chapter 13, Section 2.4-3:
 - Estimates PM_4 Concentration based on Measured PM_{10}
 - PM_4 emissions are estimated to be 40% of PM_{10} emissions
- Sampling Period:
 - Started Sampling in 2nd Quarter (1st Sample May 25th)
 - 3 Samples per Quarter during 2009

2nd Quarter: Crystalline Silica Results

Site #	Sampling Date	Sample ID	Sample Type	PM10 Quartz** (µg/m ³)	Estimated PM4-Quartz AP-42 40% Factor (µg/m ³) ****	OEHHA REL Standard***
1	5/25/2009	023-1CS	Field	1.04	0.42	3.00
2*	"	023-2CS	Field	0.58	0.23	3.00
3	"	023-3CS	Field	1.25	0.50	3.00
4	"	023-4CS	Field	2.37	0.95	3.00
5*	"	023-5CS	Blank	NA	NA	NA
1	6/6/2009	025-1CS	Field	2.87	1.15	3.00
2	"	025-2CS	Field	1.33	0.53	3.00
3	"	025-3CS	Field	2.75	1.10	3.00
4	"	025-4CS	Field	1.46	0.58	3.00
5*	"	025-5CS	Blank	NA	NA	NA
1	6/24/2009	028-1CS	Field	1.75	0.70	3.00
2	"	028-2CS	Field	1.08	0.43	3.00
3	"	028-3CS	Field	2.62	1.05	3.00
4	"	028-4CS	Field	2.83	1.13	3.00
5*	"	028-5CS	Blank	NA	NA	NA

* This testing result is between the limit of detection (LOD) and limit of quantitation (LOQ) and has higher analytical uncertainty than values at or above the LOQ.

** Corrected For Filter Bias

*** The California Office of Environmental Health Hazard Assessment (OEHHA) Standard for Respirable Crystalline Silica

**** Assumes Homogeneous Composition Relative to Particle Size

3rd Quarter: Crystalline Silica Results

Site #	Sampling Date	Sample ID	Sample Type	PM10 Quartz** ($\mu\text{g}/\text{m}^3$)	Estimated PM4-Quartz AP-42 40% Factor ($\mu\text{g}/\text{m}^3$) ****	OEHHA REL Standard***
1	7/24/2009	033-1CS	Field	1.33	0.53	3.00
2*	"	033-2CS	Field	1.33	0.53	3.00
3	"	033-3CS	Field	4.53	1.81	3.00
4	"	033-4CS	Field	1.62	0.65	3.00
5*	"	033-5CS	Blank	NA	NA	NA
1	8/11/2009	036-1CS	Field	3.45	1.38	3.00
2	"	036-2CS	Field	1.83	0.73	3.00
3	"	036-3CS	Field	4.03	1.61	3.00
4	"	036-4CS	Field	4.87	1.95	3.00
5*	"	036-5CS	Blank	NA	NA	NA
1	9/16/2009	042-1CS	Field	0.87	0.35	3.00
2	"	042-2CS	Field	INV	INV	3.00
3	"	042-3CS	Field	2.00	0.80	3.00
4	"	042-4CS	Field	1.12	0.45	3.00
5*	"	042-5CS	Blank	NA	NA	NA

* This testing result is between the limit of detection (LOD) and limit of quantitation (LOQ) and has higher analytical uncertainty than values at or above the LOQ.

** Corrected For Filter Bias

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**** Assumes Homogeneous Composition Relative to Particle Size

4th Quarter: Crystalline Silica Results

Site #	Sampling Date	Sample ID	Sample Type	PM10 Quartz** ($\mu\text{g}/\text{m}^3$)	Estimated PM4-Quartz AP-42 40% Factor ($\mu\text{g}/\text{m}^3$) ****	OEHHA REL Standard***
1	10/22/2009	048-1CS	Field	2.00	0.80	3.00
2*	"	048-2CS	Field	2.00	0.80	3.00
3	"	048-3CS	Field	1.66	0.66	3.00
4	"	048-4CS	Field	2.83	1.13	3.00
5*	"	048-5CS	Blank	NA	NA	NA
1	11/15/2009	052-1CS	Field	1.75	0.70	3.00
2	"	052-2CS	Field	1.41	0.56	3.00
3	"	052-3CS	Field	0.46	0.18	3.00
4	"	052-4CS	Field	2.70	1.08	3.00
5*	"	052-5CS	Blank	NA	NA	NA
1	12/15/2009	057-1CS	Field	1.21	0.48	3.00
2	"	057-2CS	Field	0.42	0.17	3.00
3	"	057-3CS	Field	0.67	0.27	3.00
4	"	057-4CS	Field	0.54	0.22	3.00
5*	"	057-5CS	Blank	NA	NA	NA

* This testing result is between the limit of detection (LOD) and limit of quantitation (LOQ) and has higher analytical uncertainty than values at or above the LOQ.

** Corrected For Filter Bias

*** The California Office of Environmental Health Hazard Assessment (OEHHA) Standard for Respirable Crystalline Silica

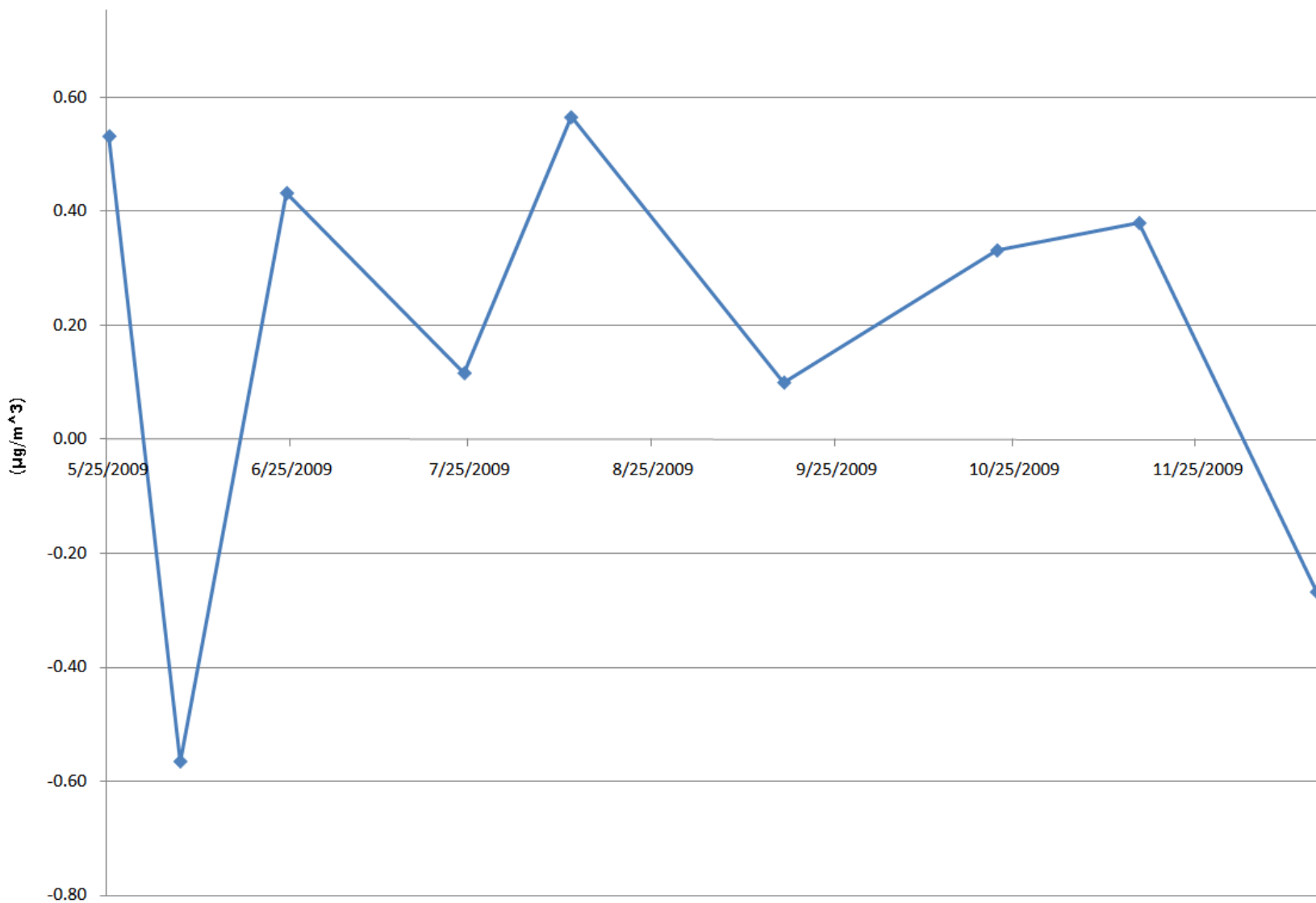
**** Assumes Homogeneous Composition Relative to Particle Size

Estimated Crystalline Silica



Estimated Silica Differential

(Upwind Vs. Downwind)



Conclusions: Air Monitoring 2009

- Site #1 was predominantly the upwind monitoring site and Site #4 was predominantly the downwind monitoring site.
- The highest downwind concentrations of PM₁₀ relative to upwind concentrations were found in July and August. These are also the driest months. However, the downwind monitoring site never exceeded the CA standard during 2009.
- Measurements of crystalline silica concentrations were considerably less than the OEHHA REL (3 µg/m³) when the correction factor for PM₄ relative to PM₁₀ is applied.
- The downwind monitoring locations generally had higher percentages of crystalline silica relative to total PM₁₀ mass than the upwind monitoring. This indicates that it is likely that the quarry is generating a measurable amount of crystalline silica. However, this generation is insignificant compared to the background levels of crystalline silica in the area.

Conclusions: Air Monitoring 2009

- In 2009 the data shows that the concentrations of the upwind or background site was generally higher than that of the downwind site. This indicates that there is (was) a non-facility source for particulate matter in the vicinity of the upwind site. This is not unusual considering highway SR 76 is directly south of this monitoring location and the significant amount of construction that was going on during the 1st half of 2009.
- The proximity of SR 76 to the Quarry and the degree of construction that took place upwind from the Quarry dominated the measured impacts at the quarry during 2009.
- The site was not a significant factor of PM₁₀ or crystalline silica emissions during 2009.

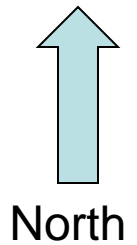
Data Limitations

- The data obtained in this sampling project are 24-hour averaged PM₁₀ concentrations in order to be comparable to the California Standard. Different averaging periods may lead to varying results.
- The area of the Quarry is very large and multiple sources exist at varying times which are significant distances apart. The individual impacts of each source cannot be defined.
- Some sources of particulate generation may be directly upwind from a given sampling site while other sources may not be given a prevailing wind direction. Also, although we are able to determine prevailing wind direction, wind direction is variable throughout a day and the prevailing wind direction for a day is not necessarily coincidental with the periods of the highest generation of particulates at the quarry.
- Wind parameters were only measured at one location within the Quarry. Given the topography of the area, it is likely that wind patterns are different at other locations within the Quarry's boundaries.

Changes for 2010

- Sampling Locations:
 - Site #1: Closer to SR-76. More appropriate site considering the change to the facility layout.
 - Site #3: Lower in elevation and closer to facility operations. The site was moved to attain more representative downwind measurements in relation to Quarry activities.
- Crystalline Silica Measurements:
 - During each month, one sampling event will be chosen at random to measure for Crystalline Silica concentrations on the PM₁₀ filter. Also, in the month of August sampling sites 2 & 3 will be moved such that they are collocated with sites 1 & 4 respectively. These samplers will be fitted with a Very Sharp Cut Cyclone (VSCC) and the flow rate will be adjusted such that the 50% cut size is set at PM₄. During this month sampling Sites 1 and 4 will attain PM₁₀ concentrations (using samplers 1 and 4) and crystalline silica concentrations on the PM₄ filters (using samplers 2 and 3). There will be five sampling events in August resulting in 10 total crystalline silica samples from PM₄ filters.

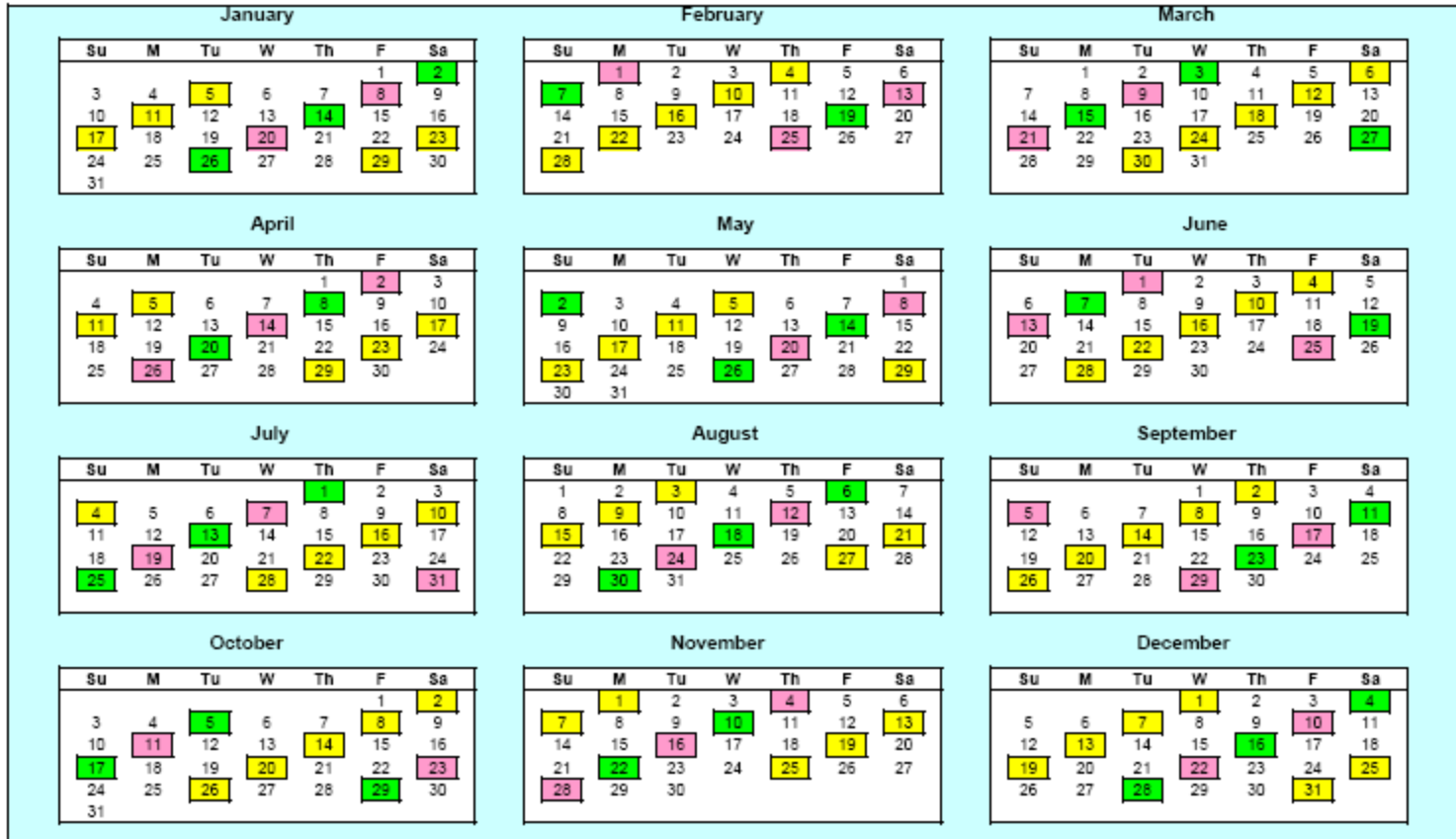
2010 Sampling Location Changes



Sampling Frequencies

2010 Monitoring Schedule

3-day & 6-day Monitoring Schedule for TSP, Pb, PM-10, PM-2.5, and VOC. 12-day Monitoring Schedule for PM-2.5 Collocation.



Yellow & Green & Pink = 1/3 day sampling

Green & Pink = 1/6 day sampling

Pink = 1/12 day sampling

Contact Info

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