# Progress Report on Mitigation Measures for the Roseville Rail Yard

Board Meeting
December 14, 2006
PCAPCD



# **Mitigation Commitment**

The UPRR mitigation commitment is to reduce PM emissions from the rail yard by 10% (2.5 tons/year reduction to 22.5 tons/year total) by the end of 2007.



- Locomotive Traffic (Visits and Service)
- Reduction of Unnecessary Idling
- Low Sulfur Diesel Fuel Use
- Switcher Fleet Replacement
- Upgrade of Locomotive Fleet



- Locomotive traffic most likely has increased
  - Intermodal cargo up significantly
  - Cargo shipping migrating toward rail
- Some service and repair relocated to Stockton
- UPRR to conduct new traffic survey for 2007



# Reduction of Unnecessary Idling

- Idling reduction devices installed on 85% of intrastate locomotives visiting Roseville
- Tier 2 locomotives are equipped with these devices as standard equipment from the factory
- UPPR will estimate PM reduction from use of these devices for the year 2007



### Low Sulfur Diesel Fuel Use

- As of approximately June 1, 2006, all fuel dispensed at Roseville is CARB diesel with 15 ppm maximum sulfur
- Fuel dispensed at Roseville is approximately 2,600,000 gallons per month
- Out-of-state diesel fuel has decreased from 2,500-3,000 ppm sulfur in year 2000 to approximately 500 ppm in year 2006
- Estimated PM reduction due to fuel is approximately 10% as of 2006.
- PM reduction will be evaluated in 2007 for the then current sulfur level of out-of-state fuel



# Switcher Fleet Replacement

- Four Gen-Set Switcher locomotives being co-funded using Moyer money for use in the hump and trim operations
- Deliveries of switchers in 2007, but possibly some slipping into 2008
- PM reduction of 2.4 tons/year when the new switchers are fully operational
- NOx reductions of 64 tons/year



- Tier 2 locomotives being added to the fleet and routed through Roseville
- Older locomotives less prevalent (example is fewer GP-4X type)
- UPRR will estimate PM reduction using year 2007 locomotive visits to Roseville as compared to year 2000.

# Particulate Emissions Changes

	2000	2005	2006	2007	Change
Yard Traffic Arrival/Departures Through Locomotives Service Area PM Change (TPY)	31,000 15,000 21,500 0				
Idling Devices Interstate (%) Intrastate (%) Est. PM Red. (TPY)	0 0 0		85		
Fuel Sulfur Content (ppm) EPA CARB PM Reduction	2,500 140 0		500 15 10		



# Particulate Emissions Changes (Concluded)

	2000	2005	2006	2007	Change
Upgrade of Fleet GP-4X (% of Visits) Tier 2 (% of Visits) Est. PM Red. (%)	49 0 0				
Replace Switchers with GSS # Replaced PM Reduction (TPY)	0 0				
Monitoring Results PM-2.5 (ug/M3) Black Carbon (ug/M3)		9.5 1.5			
Facility PM Change (TPY)	0				

# **Monitoring Project**



# Overview

- Monitoring Period
- Equipment Assessment
- ARB Audits
- Ralston Fire Incident
- Next Steps



- The study started June 15
- Ralston Fire incident contributes significant PM impacts
- The monitoring period ended October 15
- Total period of 123 days (2952 hourly observations)
- Measurements collected during the wild fire incident period (9/5~9/17/06) will be excluded from data analysis.

# **Equipment Assessment**

#### Aethalometer

- 6 units (four rack-mounted "AE-20" units, two portable "AE-42" units)
- 623/A479 at Church St./Vernon St. pair
- 626/624 at Denio/Pool pair
- A330/625 as back-up units at Denio/Vernon St. site

### NOx Analyzer

- 7 units (three TECO-42, one TECO-42C, three Horiba APNA-360)
- ■Three TECO as primary unit at Church St; Vernon St.; and Denio
- One Horiba as primary unit at Pool
- Others as back-up units at Church St., Denio, and Pool

# **Equipment Assessment (Cont.)**

#### BAM and EBAM

- ■Two BAM (#4514 & #4515) at Church St./Vernon St. site
- ■Two EBAM (#2237 & #2238) at Denio/Pool site

#### PM 2.5 FRM Sampler

- ■8 samplers (6 Anderson Samplers used at Church St., Vernon St., and Denio site; 2 BGI samplers used at Pool site)
- Each site has two samplers to run Teflon and quartz filters simultaneously.

#### Data Logger

Each site has one data logger collecting data from instruments excluding PM2.5 FRM sampler.

#### Met Tower

100% data recovery

# Data Completeness

	Denio Site								
	Wind Spd	Wind Dir	NO	NOx	Aeth	EBAM	Teflon	Quartz	
	(EBAM)	(EBAM)	TECO-42	TECO-42	626	2237	Filter*	Filter*	
monitoring period	6/15~10/15	6/15~10/15	6/15~10/15	6/15~10/15	6/15~10/15	6/15~10/15	6/16~8/27	6/16~8/27	
total observations**	2965	2965	2952	2952	35584	2965	25	25	
count	2963	2963	2853	2853	32820	2942	25	24	
%	99.9%	99.9%	96.6%	96.6%	92.2%	99.2%	100%	96%	

	Pool Site								
	Wind Spd	Wind Dir	NO	NOx	Aeth	EBAM	Teflon	Quartz	
	(EBAM)	(EBAM)	Horiba	Horiba	624	2238	Filter*	Filter*	
monitoring period	6/15~10/15	6/15~10/15	6/15~10/15	6/15~10/15	6/15~10/15	6/15~10/15	6/16~8/27	6/16~8/27	
total observations**	2965	2965	2952	2952	35584	2965	25	25	
count	2963	2963	2906	2906	34424	2638	25	25	
%	99.9%	99.9%	98.4%	98.4%	96.7%	89.0%	100%	100%	

<sup>\*</sup>The filter analysis results from SCAQMD Lab are available until 8/27/06.

<sup>\*\*</sup>All measurements are hourly averages except aethalometer. The measurements from aethalometers are 5-minute averages.

# Data Completeness (cont.)

	Church St. Site							
	Wind Spd	Wind Dir	NO	NOx	Aeth	BAM	Teflon	Quartz
	(BAM)	(BAM)	TECO-42	TECO-42	623	4514	Filter*	Filter*
monitoring period	6/15~10/15	6/15~10/15	6/15~10/15	6/15~10/15	6/15~10/15	6/15~10/15	6/16~8/27	6/16~8/27
total observations**	2965	2965	2952	2952	35584	2965	26	26
count	2965	2965	2888	2888	34106	2944	24	25
%	100%	100%	97.8%	97.8%	95.8%	99.3%	92.3%	96.2%

	Vernon St. Site								
	Wind Spd	Wind Dir	NO	NOx	Aeth	BAM	Teflon	Quartz	
	(BAM)	(BAM)	TECO-42C	TECO-42C	479	4515	Filter*	Filter*	
monitoring period	6/15~10/15	6/15~10/15	6/15~10/15	6/15~10/15	6/15~10/15	6/15~10/15	6/16~8/27	6/16~8/27	
total observations**	2965	2965	2952	2952	35584	2965	26	26	
count	2965	2965	2926	2926	33738	2941	24	26	
%	100%	100%	99.1%	99.1%	94.8%	99.2%	92.3%	100%	

<sup>\*</sup>The filter analysis results from SCAQMD Lab are available until 8/27/06.

<sup>\*\*</sup>All measurements are hourly averages except aethalometer. The measurements from aethalometers are 5-minute averages.

### **ARB Audit**

# Two audits have been conducted in this second year study

- July 5 & 6
- October 24, 25, & 30

### Instrument of audits

- NOx analyzer
- BAM/EBAM
- PM2.5 FRM samplers

### Audit parameters

- 3 levels of concentration audit (NOx analyzer)
- ■Flow rate, temperature sensor (BAM/EBAM, FRM samplers)
- Leak test (FRM sampler)
- ■Site survey

# Audit Results (cont.)

#### First audit

All audited instruments were passed.

#### Second audit

- All audited instruments were passed excluding two BGI FRM samplers used at Pool site.
- BGI FRM samplers used at Pool site failed the leak check; the samplers can't hold the pressure (75 cm of water) within 2 minutes.
- The leak test is to check if there is bypass leakage in the filter cassette.
- Leakage happened due to an O ring worn out at filter cassette holder.
- New O rings have been ordered.

### **Ralston Fire Incident**

- The fire was in Placer County, near to Foresthill area
- Started at 9/5/06 3:51 pm
- 100% containment was declared at 6:00pm on 9/17/06
- The fire burned 8,230 acres.
- The fire produced significant PM emissions that impacted monitors throughout the western portion of Placer County and the Region.

### Ralston Fire Incident (cont.)

- Extended the monitoring period from 9/30 to 10/15/06.
- Suggest DRI not include the data from 9/5 16:00 ~ 9/17 18:00 being in the data analysis (about 12 days).

# **Next Steps**

November 06

Meeting with Dr. Fujita and Dave Campbell at DRI Forward all raw data to DRI

February ~ March 07

Draft second year data analysis report available TAC review Draft report TAC meeting

April 07

Submit 2<sup>nd</sup> year monitoring report to the PCAPCD Board

# **Grant Program**





# **Grant Program Status**

The purpose of the Grant Program is to achieve a one ton of diesel PM reduction in the "background" air through at least \$150k from UPRR.

# 2005 Grant Application

- City of Roseville Refuse Utility Department
  - 9 Refuse trucks were retrofitted with Cleaire Longviews®.
  - Cleaire Longviews® exhaust aftertreatment devices reduce 85% DPM emissions and 25% NOx emissions.
  - The model years of the refuse trucks range from 1994 to 2004.
  - 6 refuse trucks were retrofitted by 4/3/06 and the last three refuse trucks were retrofitted by 4/26/06.
  - The grant fund total for each retrofit is \$12,500 (\$12,500 \* 9 retrofits = \$112,500).
  - The UPRR provided \$50,000 for this project, the PCAPCD provided \$25,000, and the Indian Gaming Grant provided \$37,500.

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# 2006 Grant Application

- Roseville Joint Union High School District
  - One 2005 Bluebird school bus was purchased to replace a 1977 Crown school bus.
  - The 1977 Crown bus provides seating for 78 and the 2005 Blue Bird provides seating for 84.
  - The Bluebird bus has been purchased and inspected by the District. It is ready to be put into service. A request for funding has been made by Roseville JUHSD and will be processed within the next 30 days.
  - The total bus price is \$127,361. UPRR has provided \$100,000 for this project and the PCAPCD has provided \$27,361.

# Summary

	UPRR	PCAPCD	Total (Fund)	Total (diesel PM reduction)
2005 Fund Contribution	\$50,000	\$62,500	\$112,500	0.56 tons/project life
2006 Fund Contribution	\$100,000	\$27,361	\$127,361	0.60 tons/project life
Sum of fund contribution	\$150,000	\$89,861	\$239,861	
Sum of diesel PM reduction	0.67 tons/project life	0.49 tons/project life		1.16 tons/project life

# **Roseville Refuse Truck**





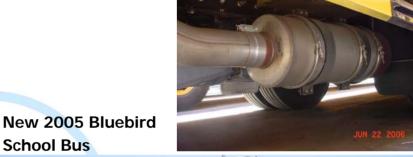


### **Roseville School Bus**





Old 1977 Crown School Bus





# Follow-Up

- In order to achieve a 1 ton diesel PM reduction, 0.33 tons of diesel PM emissions still need to be reduced. This will require an additional \$77,000 by the UPRR. District staff will work with UPRR to increase the grant amount in order to compensate for this shortfall.
- The District is currently designing a bumper sticker that will be placed on the heavy duty vehicles. The bumper stickers will advertise the contributions the UPRR and the PCAPCD have made in order to reduce emissions in the community, by funding the above Clean Air Grant projects.