



Draft ARB Health Risk Assessment for the BNSF San Bernardino Railyard

May 8, 2008

California Environmental Protection Agency

 **Air Resources Board**



Presentation Overview

- Background
- Methodology
- Results
- Actions to Reduce Health Risks
- Next Steps

Background

- **Part of our commitment to address pollution impacts on communities**
 - Implementation of the ARB Goods Movement Plan
 - Required by the ARB/UP/BNSF Railroad Agreement
- **State's goals**
 - Reduce exposure to diesel PM as quickly as possible
 - Reduce risks by at least 85% by 2020
 - Obtain emission reductions needed to attain air quality standards

Health Risk Assessments under the Agreement

Railyard Health Risk Assessments Completed in 2007

BNSF Commerce/Eastern
BNSF Hobart
BNSF Richmond
BNSF Stockton
BNSF Watson
UP Commerce
UP LATC
UP Mira Loma
UP Stockton

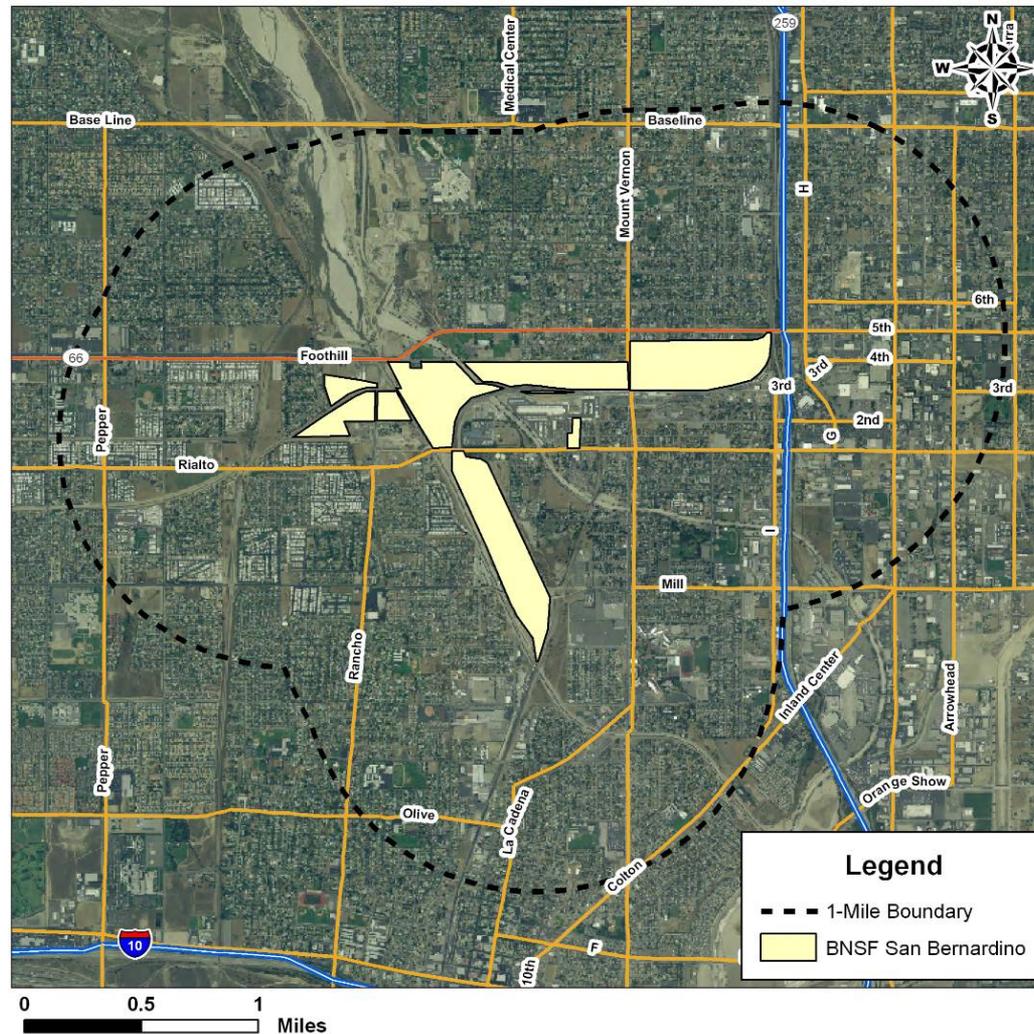
Railyard Health Risk Assessments Completed/Released in 2008

UP Colton
UP ICTF/Dolores
UP Industry
UP Oakland
BNSF Barstow (draft)
BNSF San Bernardino (draft)
BNSF San Diego (draft)

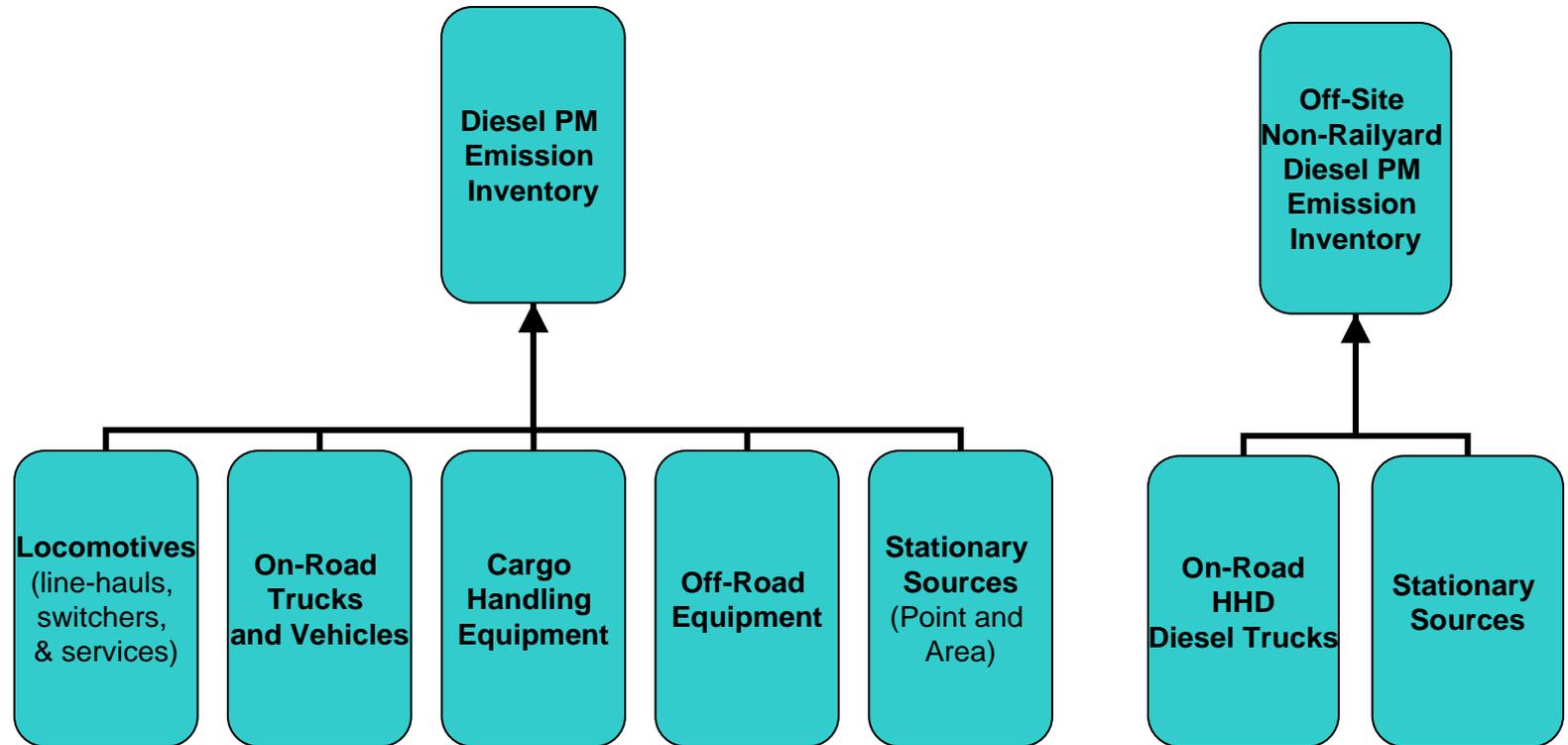
Methodology and Scope of Study

- **Two Major Parts:**
 - Estimation of diesel particulate matter air concentrations by computer modeling
 - Baseline emission inventory
 - Health risk assessments for significant diesel sources
- **Focus on diesel PM** - other toxics evaluated, small relative to diesel PM

BNSF San Bernardino Railyard and One-Mile Off-site Boundary



Diesel PM Emission Inventory



Summary of the BNSF San Bernardino Railyard 2005 Diesel PM Emissions

Sources	Diesel PM Emissions (tons per year)	
	Total Diesel PM Emissions	Percent of Total
Locomotives	10.6	48%
<i>Line Hauls</i>	6.13	28%
<i>Switchers</i>	4.06	18%
<i>Fueling</i>	0.39	2%
On-Road Trucks and Vehicles	4.35	20%
Cargo Handling Equipment	3.65	17%
Off-Road Equipment	3.35	15%
Stationary Sources	0.09	<1%
TOTAL	22	100%

Summary of Nearby Non-Railyard Diesel PM Emissions

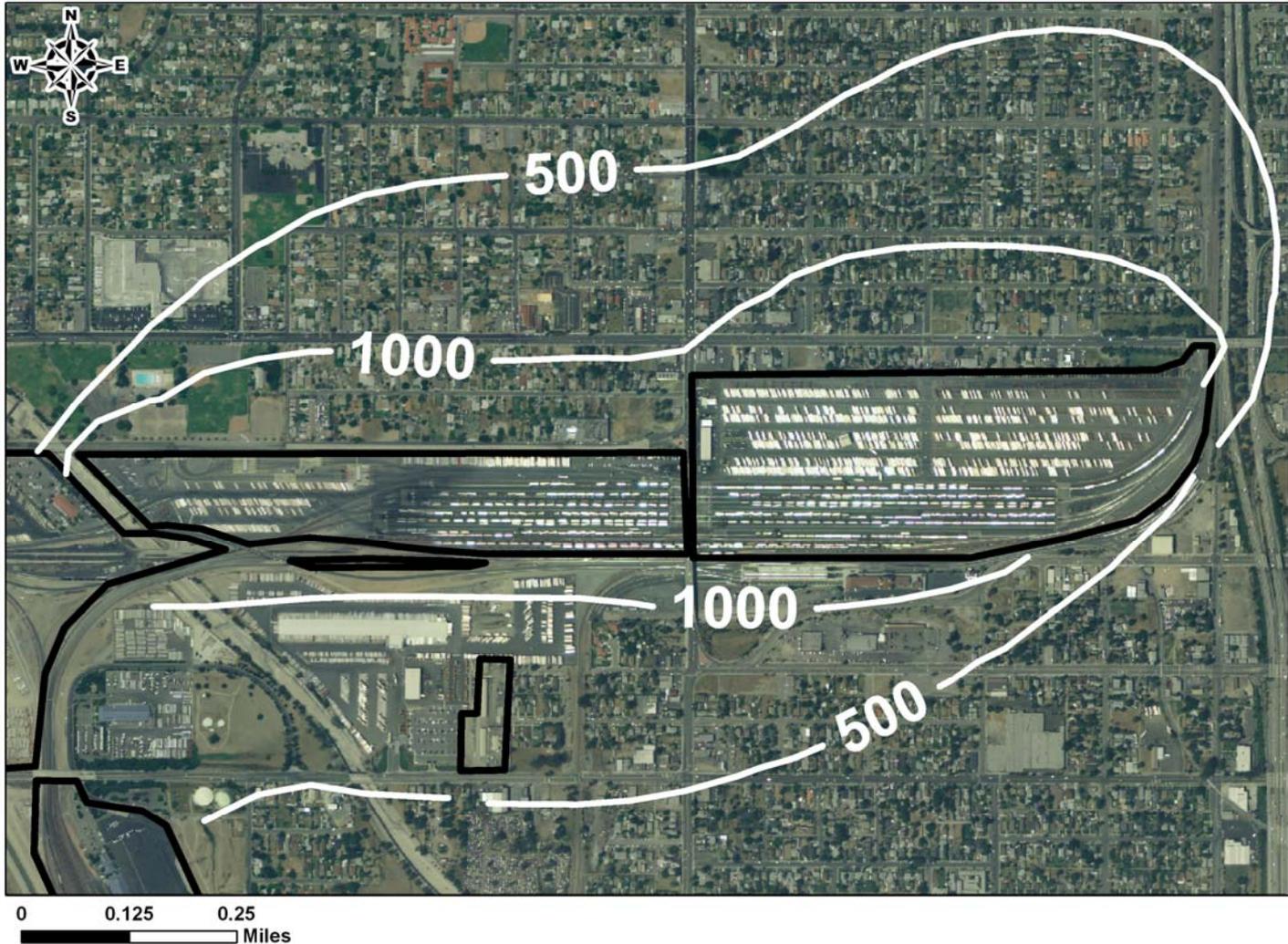
Sources	Tons per Year
Heavy Duty Diesel Trucks	10.6
Stationary Sources	0.2
Total	10.8

Comparison of Local Diesel PM Emissions with Regional Sources

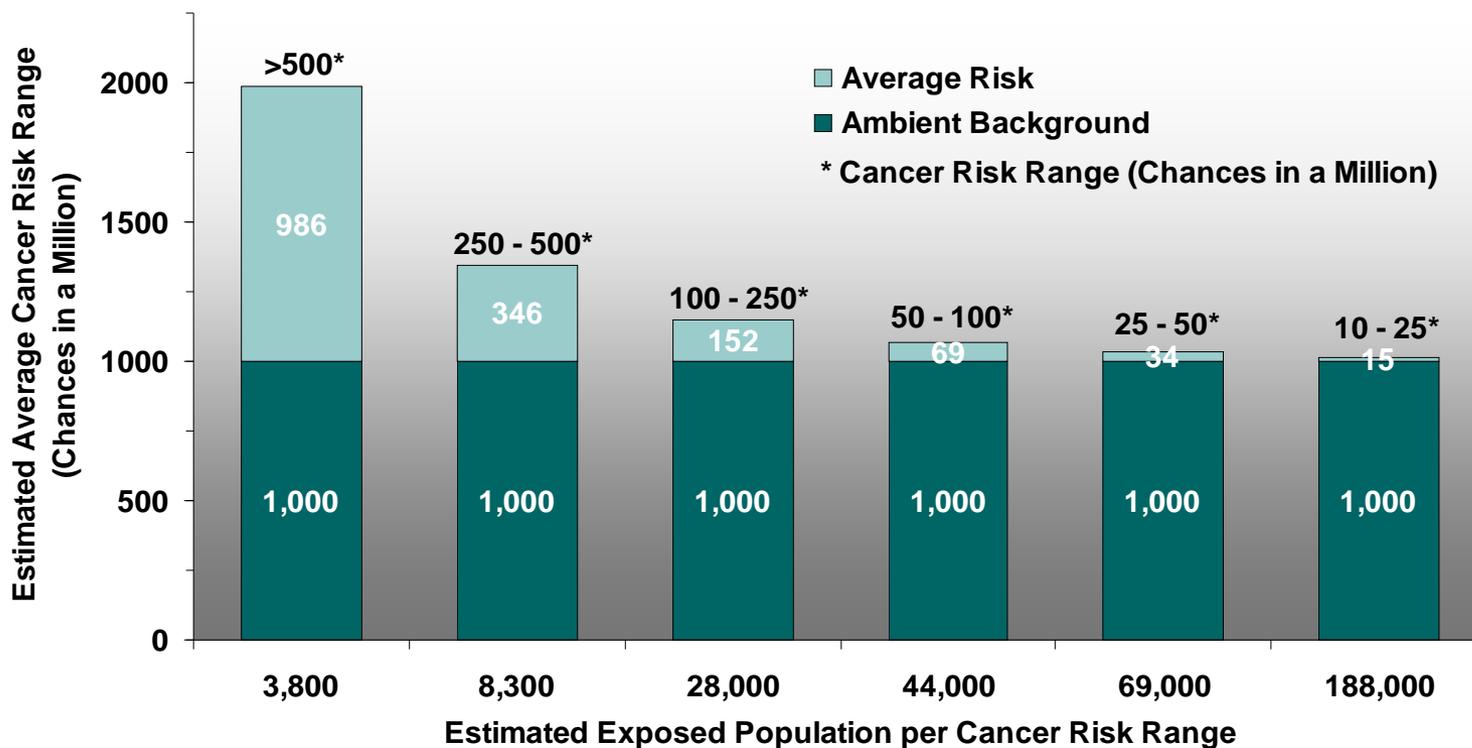
(tons per year in 2005)

Regions	Locomotive	Cargo Handling Equipment	On-Road Trucks	Others	Total
South Coast Air Basin	300	500	2,000	5,000	7,800
Port of LA/Long Beach	97	119	523	1,157	1,900
BNSF San Bernardino Railyard	10.6	3.6	4.3	3.4	22
Nearby Roadways	—	—	11	—	11

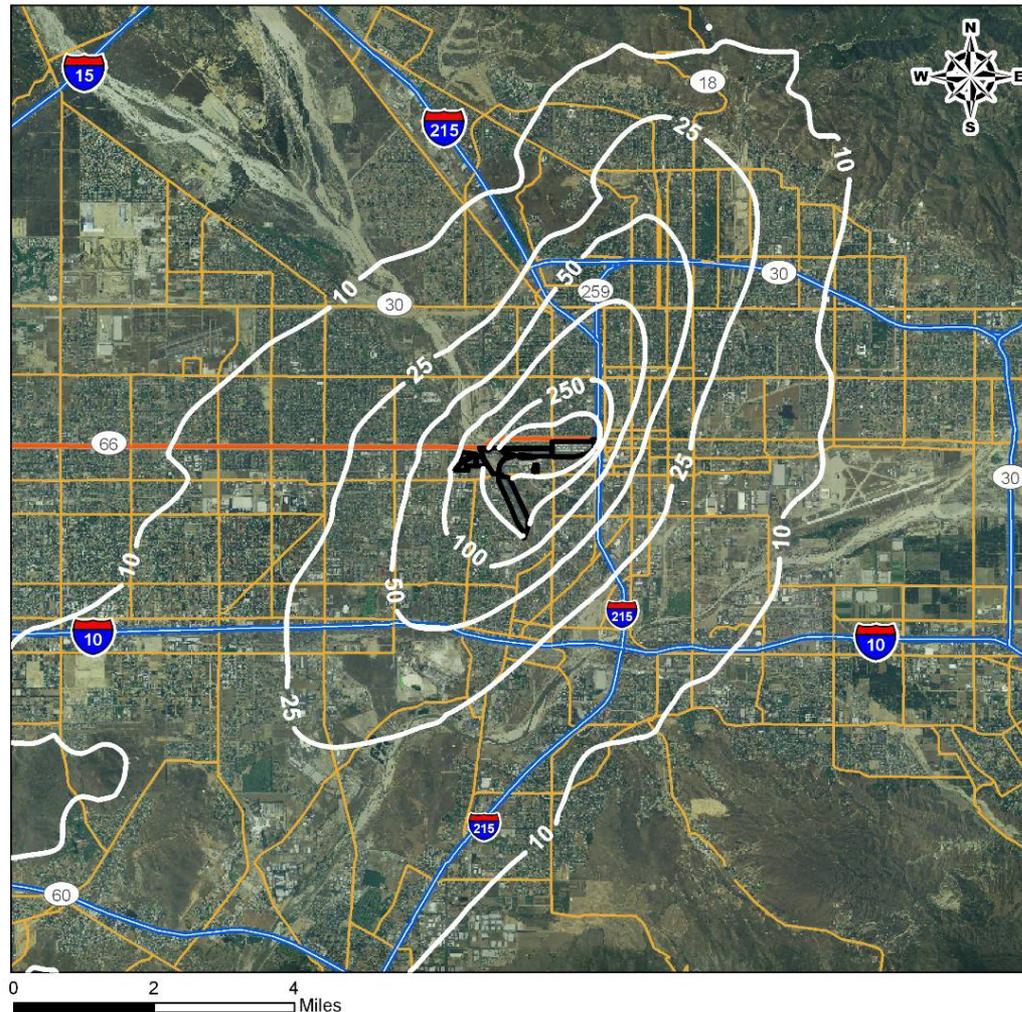
Estimated Near-Source Cancer Risks



BNSF San Bernardino Railyard Estimated Cancer Risks



Estimated Potential Cancer Risks for BNSF San Bernardino Railyard



Estimated Potential Cancer Risks from Non-Railyard Sources





BNSF San Bernardino Railyard

- Point of Maximum Impact (PMI)
- Maximum Individual Cancer Risk (MICR)

BNSF San Bernardino Railyard PMI and MICR



BNSF San Bernardino Railyard PMI and MICR

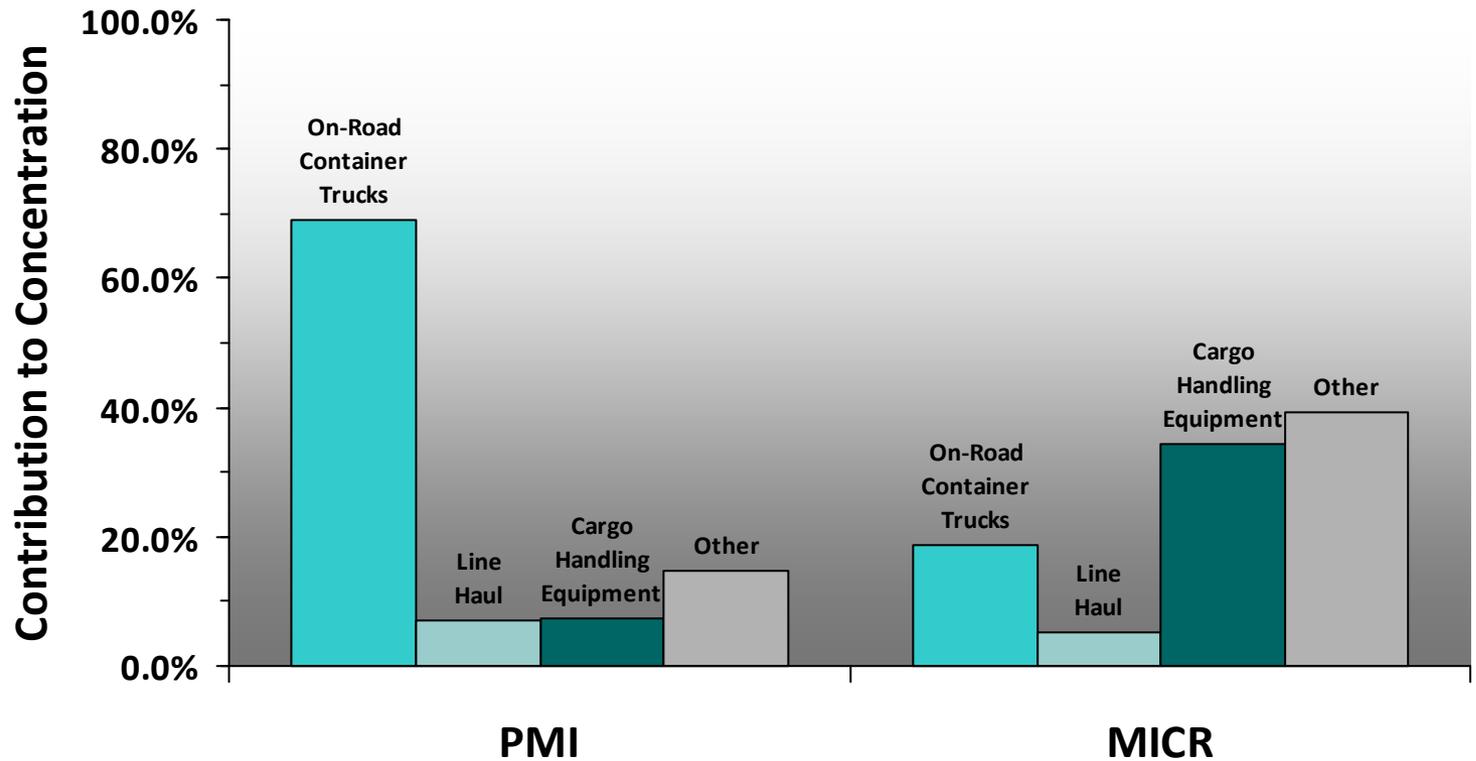
- **Point of Maximum Impact (PMI)**
 - 3,300 Excess Cancer Risks
 - Truck Gate (A Yard)
- **Maximum Individual Cancer Risk (MICR)**
 - 2,000 Excess Cancer Risks
 - East End of A Yard (65% of DPM emissions)
 - Also, will provide an additional MICR near A Yard Truck Gate

BNSF San Bernardino Railyard

Factors that Influence the PMI and MICR Levels

- PMI: Emission density
 - BNSF San Bernardino A Yard Truck Gate PMI (3,300)
 - Four times the emissions density of BNSF Hobart PMI (~3,000).
- MICR: Emission density and proximity to receptors (residences)
 - BNSF Hobart MICR:
 - About one mile from receptors.
 - BNSF San Bernardino MICR:
 - About 100 ft. from receptors.

BNSF San Bernardino Railyard Contributions by Source Category to PMI and MICR



Actions to Reduce Health Risks



Approach to Reducing Emissions

- **ARB regulations**
 - Fuels (CARB diesel fuel)
 - Cargo handling equipment
 - Transport refrigeration units
 - Heavy-duty diesel on-road trucks and off-road vehicles
- **U.S. EPA regulation**
 - Locomotives
- **Voluntary agreements**
 - 1998 South Coast Air Basin
 - 2005 Statewide
- **Railyard locomotive replacement program**
- **Funding programs**
 - Carl Moyer Incentives
 - Prop 1B: Goods movement emission reduction program

Benefits of California Railyard Diesel PM Emission Reduction Measures

○ **2005-2007**

- CARB diesel fuel for intrastate locomotives
- 2005 railyard agreement



≈15-20%

○ **2005-2010 (additional measures)**

- 1998 NOx locomotive fleet average agreement (in South Coast Air Basin)
- ARB cargo handling equipment regulation
- ARB on-road heavy-duty truck regulation
- ARB transport refrigeration unit regulation
- ARB port and intermodal railyard drayage truck regulation

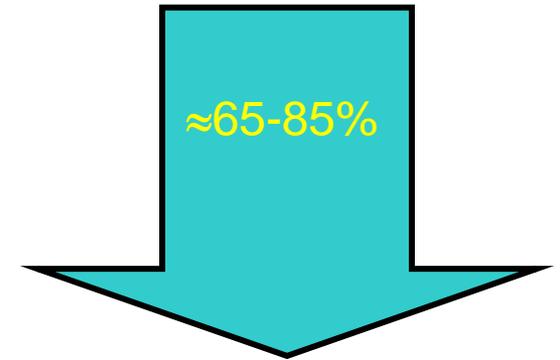


≈50-65%

Additional and Possible Measures

○ **2005-2020**

- U.S. EPA locomotive regulation (March 14, 2008)
- California replacement of switch locomotives





Next Steps

- Begin public comment period
- Review the draft assessments
- Submit written comments to ARB (by June 9)
- Meet with interested stakeholders
- Evaluate any additional feasible mitigation measures

ARB Railyard HRA Contacts

- **Manager, Engineering Evaluation Section**
 - Harold Holmes
(916) 324-8029; hholmes@arb.ca.gov
- **Lead Staff**
 - Eugene Yang, Ph.D., P.E.
(916) 327-1510; eyang@arb.ca.gov
- **ARB Railyard HRA Website**
 - <http://www.arb.ca.gov/railyard/hra/hra.htm>