Roseville Rail Yard Study

Presentation for the Placer County Air Pollution Control Board

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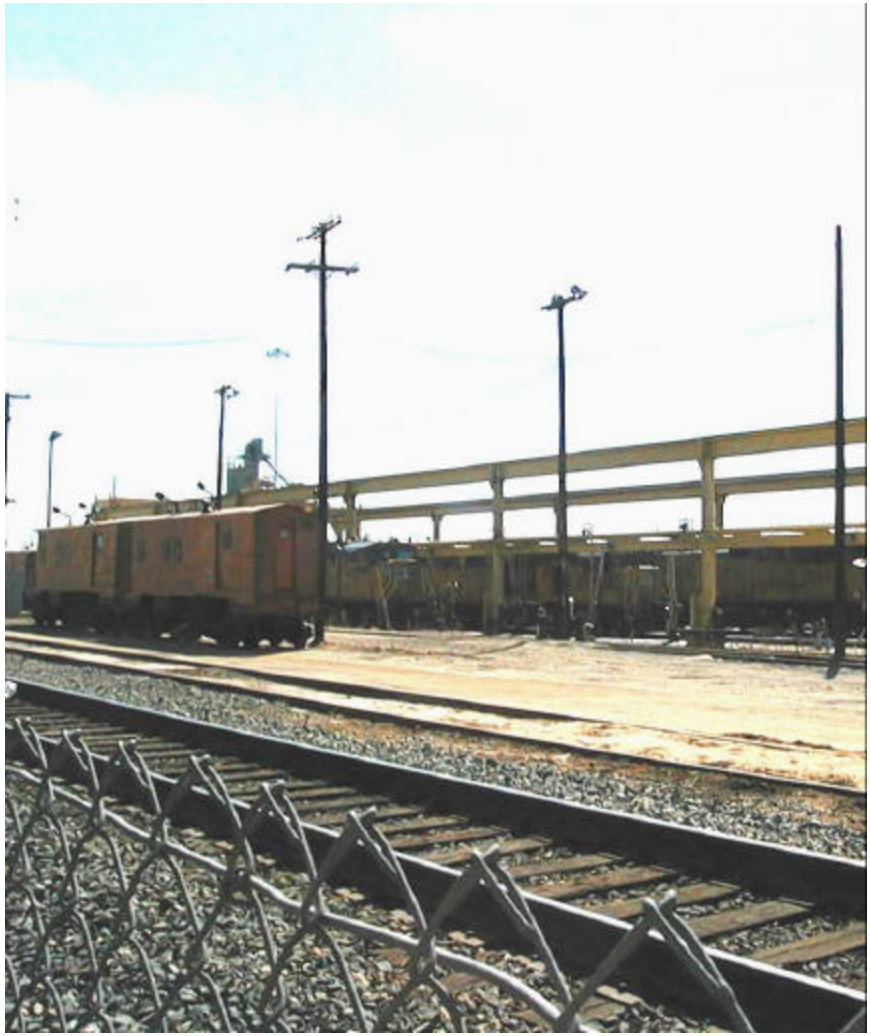
Overview

- Background
- Roseville Rail Yard
- Study Approach
- Results
  - Diesel PM Emission Inventory
  - Health Risk Assessment
- Conclusions and Recommendations



Background

Study Objectives

- Estimate diesel PM emissions from locomotive activities at the Yard
- Conduct air dispersion modeling to estimate the ambient concentration of diesel PM
- Characterize the exposures to nearby residents and estimate increased potential cancer risk

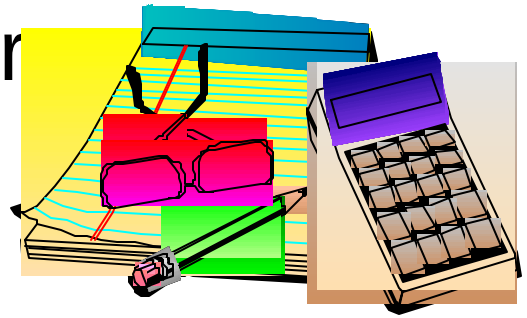
Why Are We Concerned About Diesel PM?

- Diesel PM is a toxic air contaminant
  - Causes cancer
  - Increases premature deaths, hospital admissions, respiratory diseases

- Diesel NOx and ROG contribute to ozone and PM formation

What is a Health Risk Assessment?

- Evaluation of the potential for a chemical to cause cancer or other illness



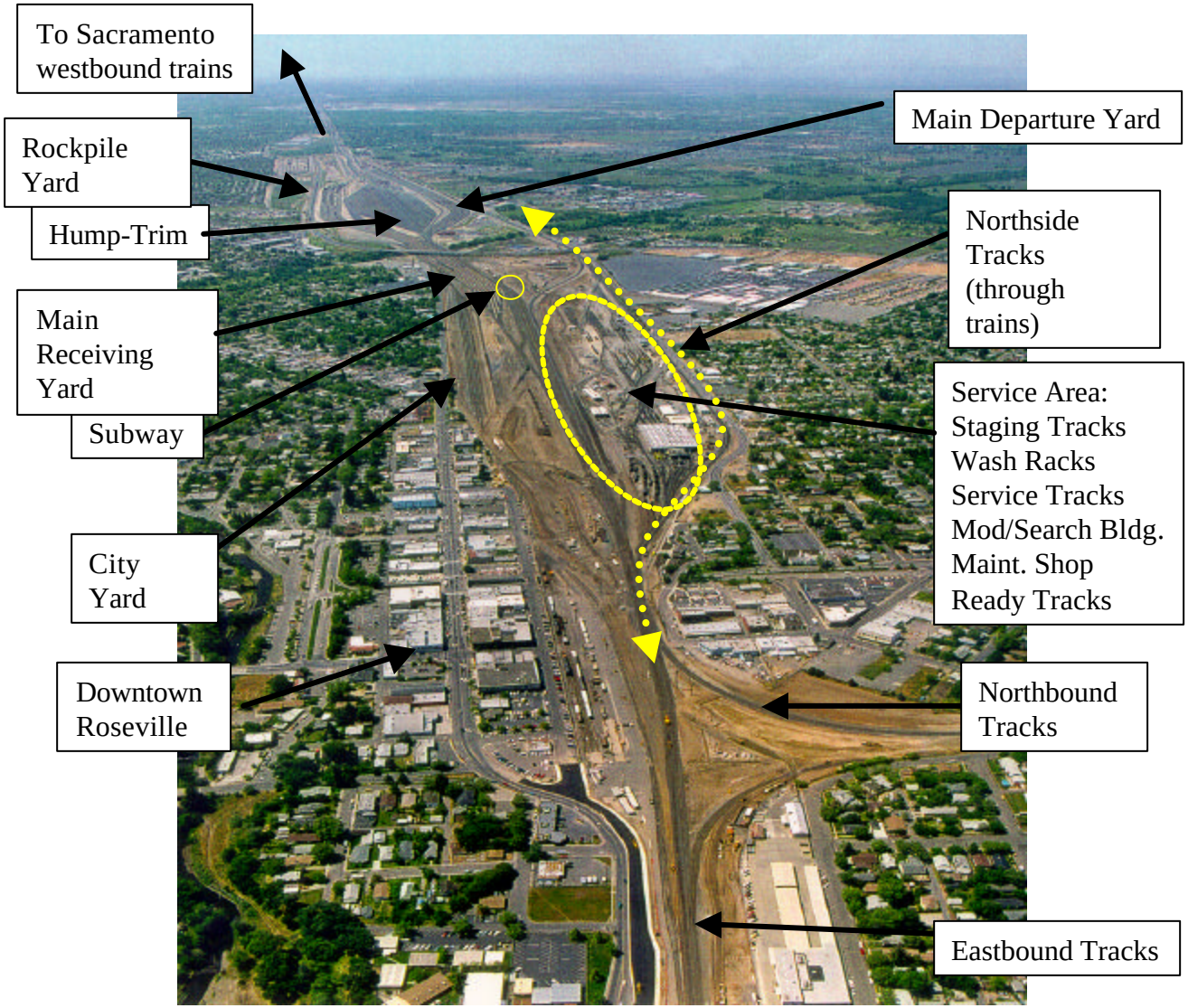
  - uses mathematical models to estimate exposures (risk)
  - risk expressed as number of excess cancers in a population of a million over a 70-year lifetime

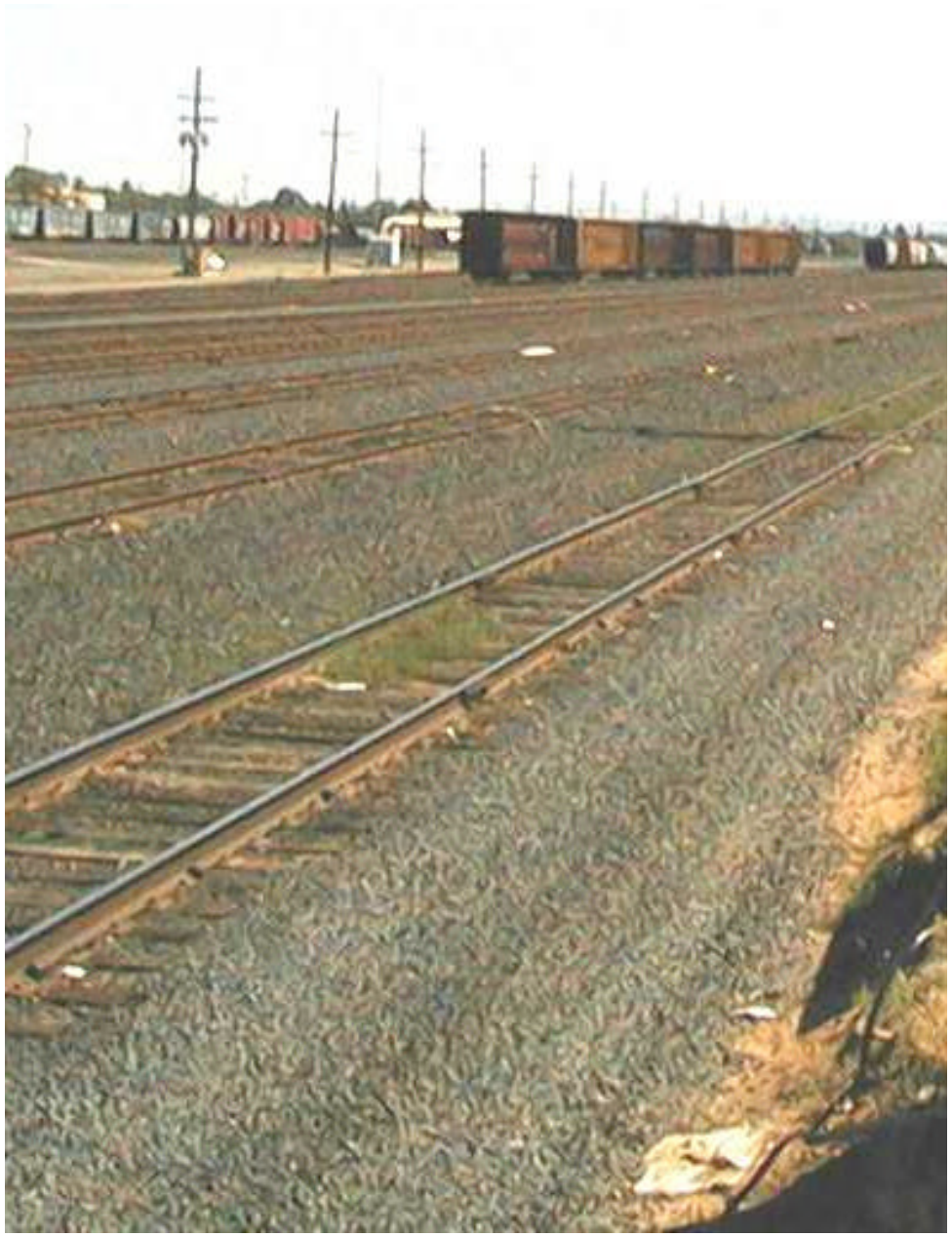
Roseville Rail Yard

Roseville Rail Yard

- Located near City of Roseville
  - Occupies about 950 acres, 2/3 in Placer County and 1/3 in Sacramento County
- Maintenance, service and classification yard (24/7 operation)
- In operation since 1905
- About 31,000 locomotives stopped at the Yard in 2000
  - additional 15,000 trains passed through on northside tracks

Roseville Rail Yard





Study Approach

Study Approach

- Estimated diesel PM emissions from all locomotive activities
  - movement
  - idling
  - testing
- Allocated emissions to appropriate area in Yard
- Key activity assumptions and data inputs provided by UPRR

Study Approach (cont.)

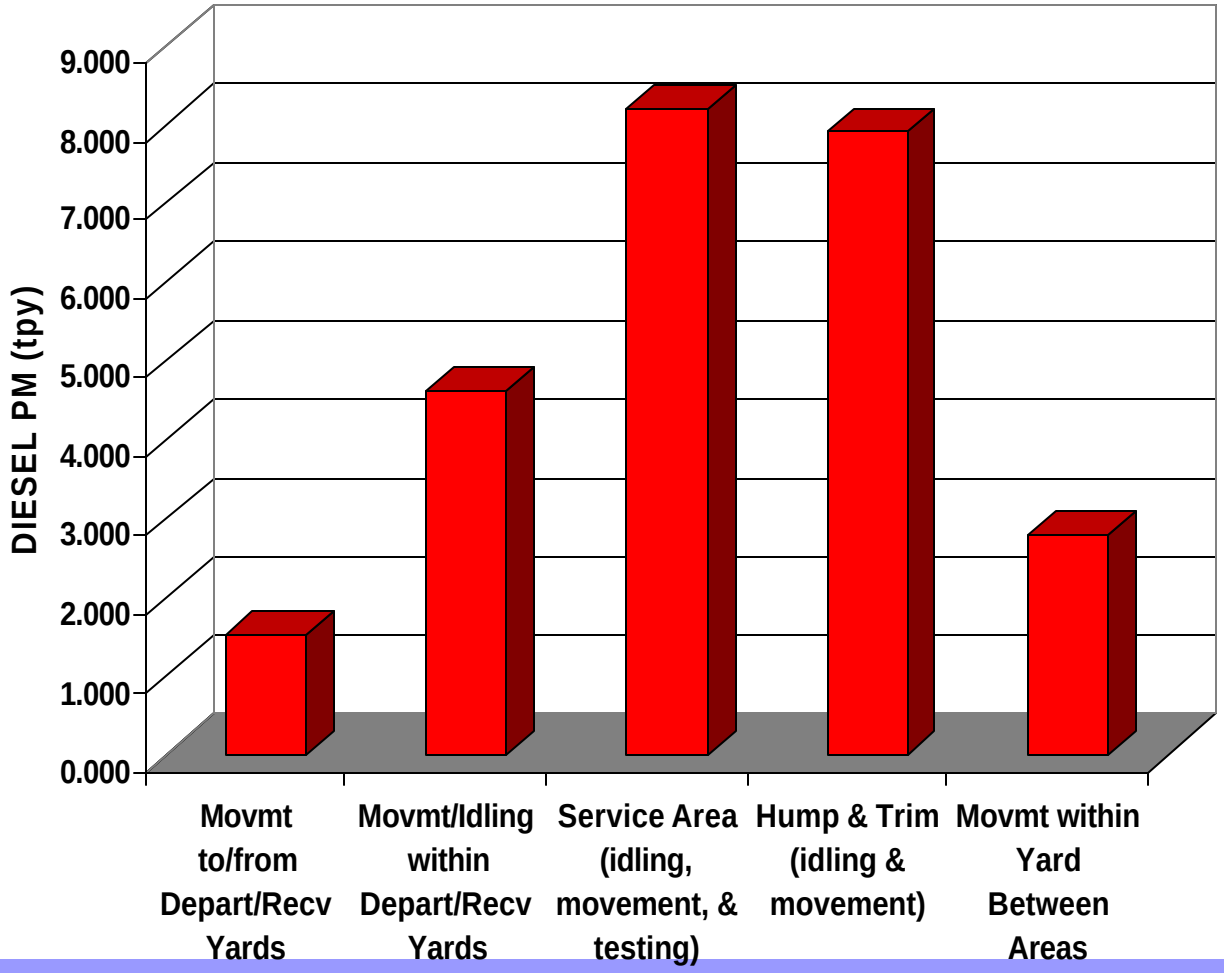
- U.S. EPA ISCST3 model
- Two meteorological datasets (Roseville and McClellan)
- Urban dispersion for near source risks and rural for regional
- Followed OEHHA Guidelines for Health Risk Assessments

Results

Diesel PM Emission Inventory at the Roseville Rail Yard

- Estimated 22-25 tons of diesel PM in 2000
- Monthly and hourly emissions fairly constant
- Locomotive movement, idling, testing responsible for about 50%, 45% and 5% of emissions, respectively

Contribution of Diesel PM by Area and Activity



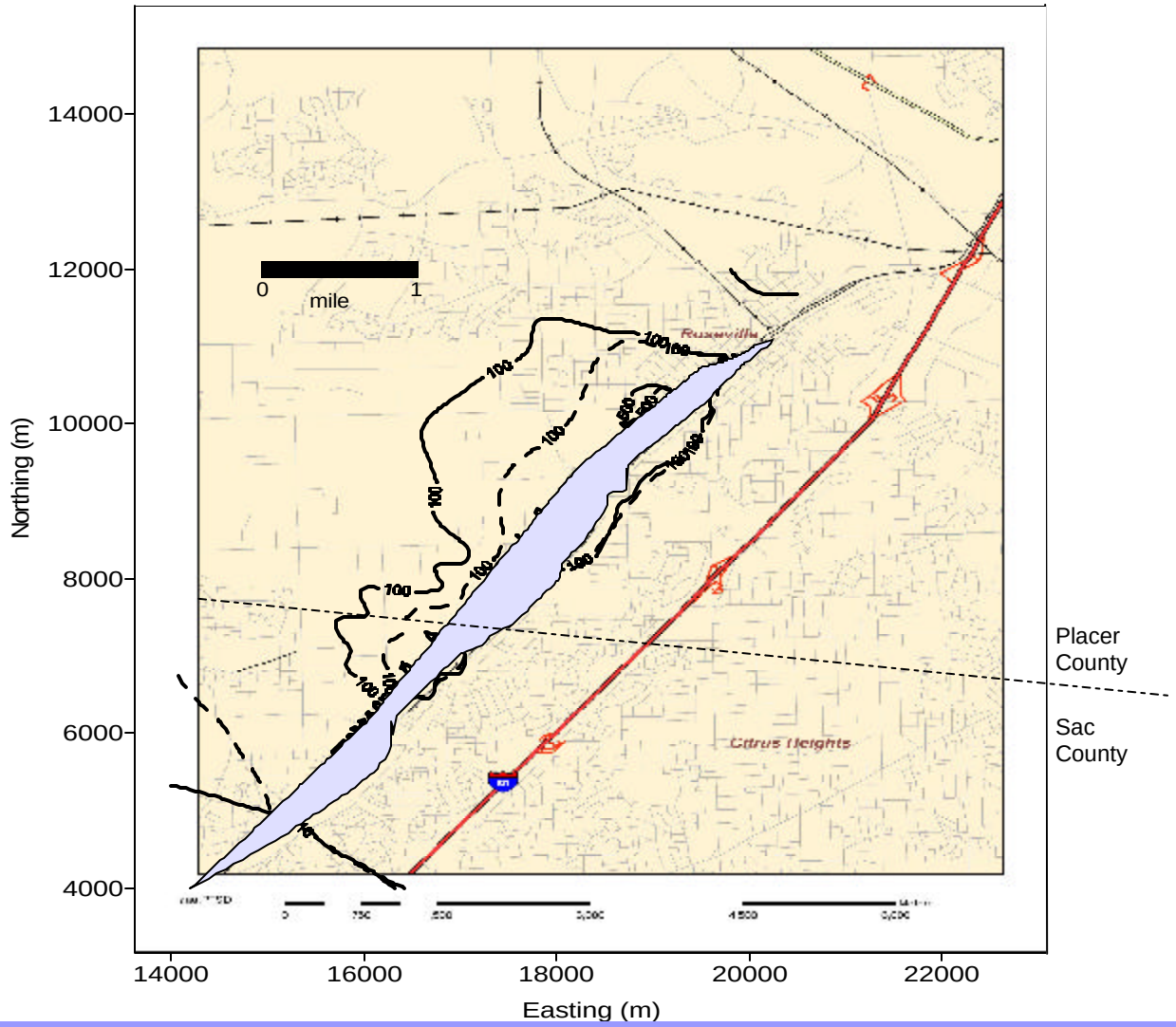
Health Risk Assessment Results

- Risks are depicted as isopleths overlaid on a regional map
- Near source risk is high by two areas
  - Nearby the *Service Track* and *Hump and Trim* areas
- Elevated concentrations and risks extend over a very large area

Estimated Cancer Risk from the Yard

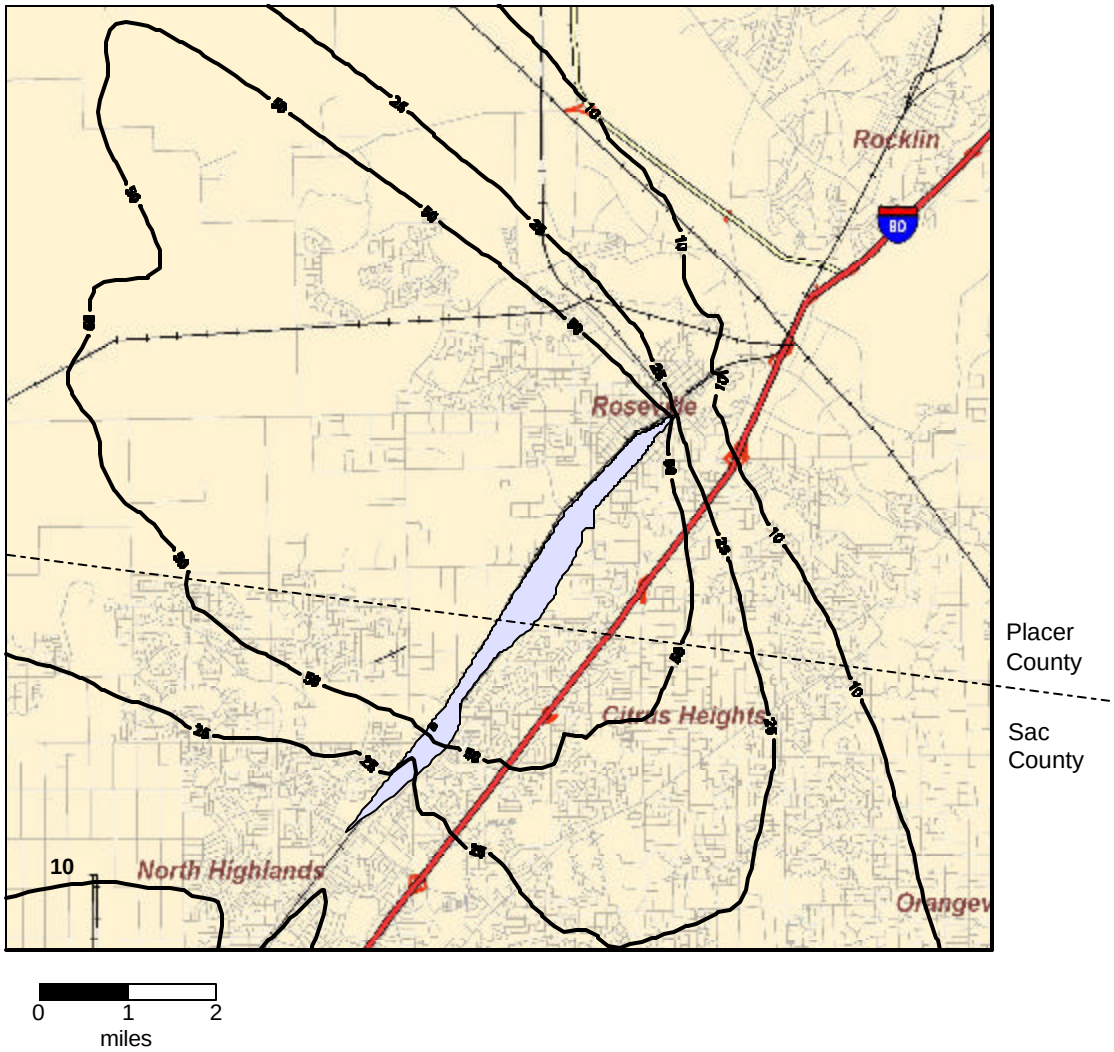
100 and 500 in a million risk isopleths

Solid line - Roseville Met data; Dashed lines - McClellan Met Data



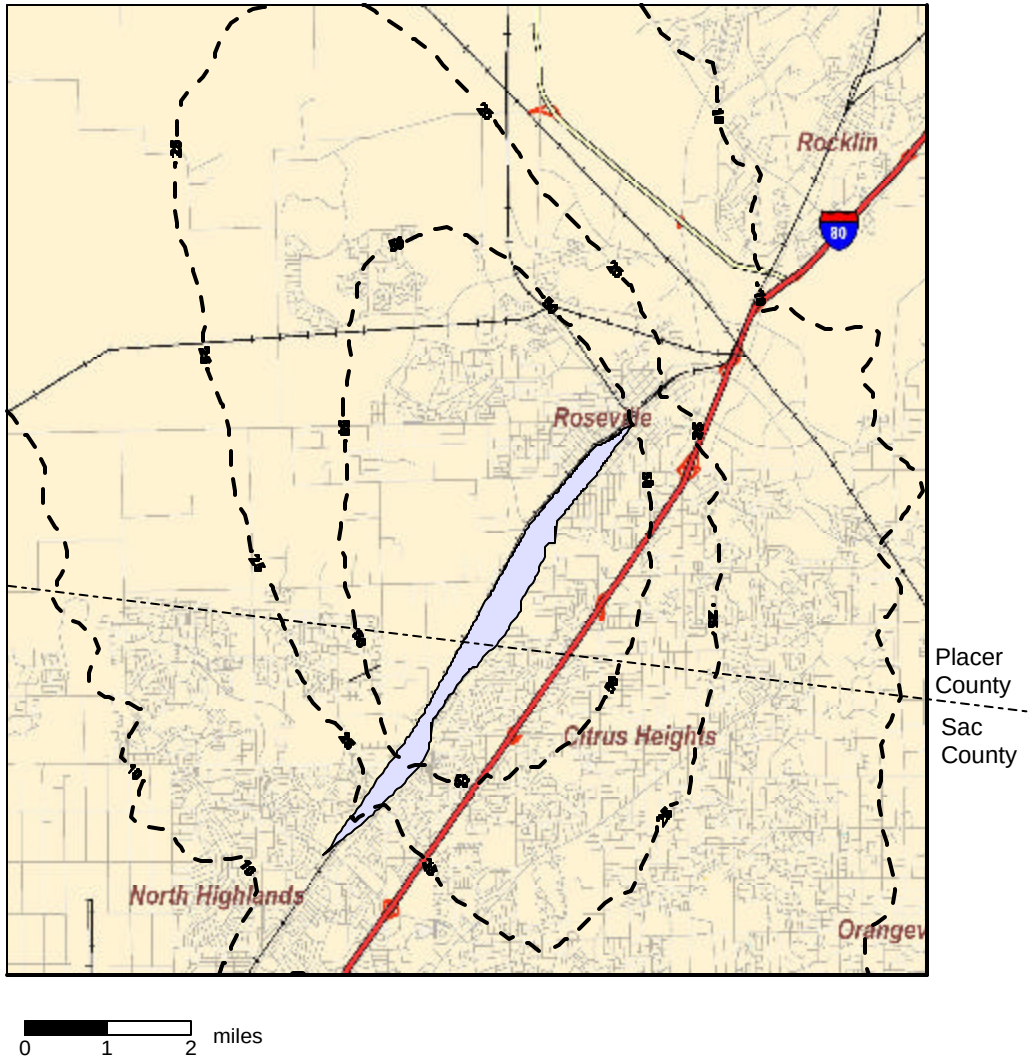
Estimated Cancer Risk from the Yard

10, 25, and 50 in a million risk isopleths, Roseville Met Data

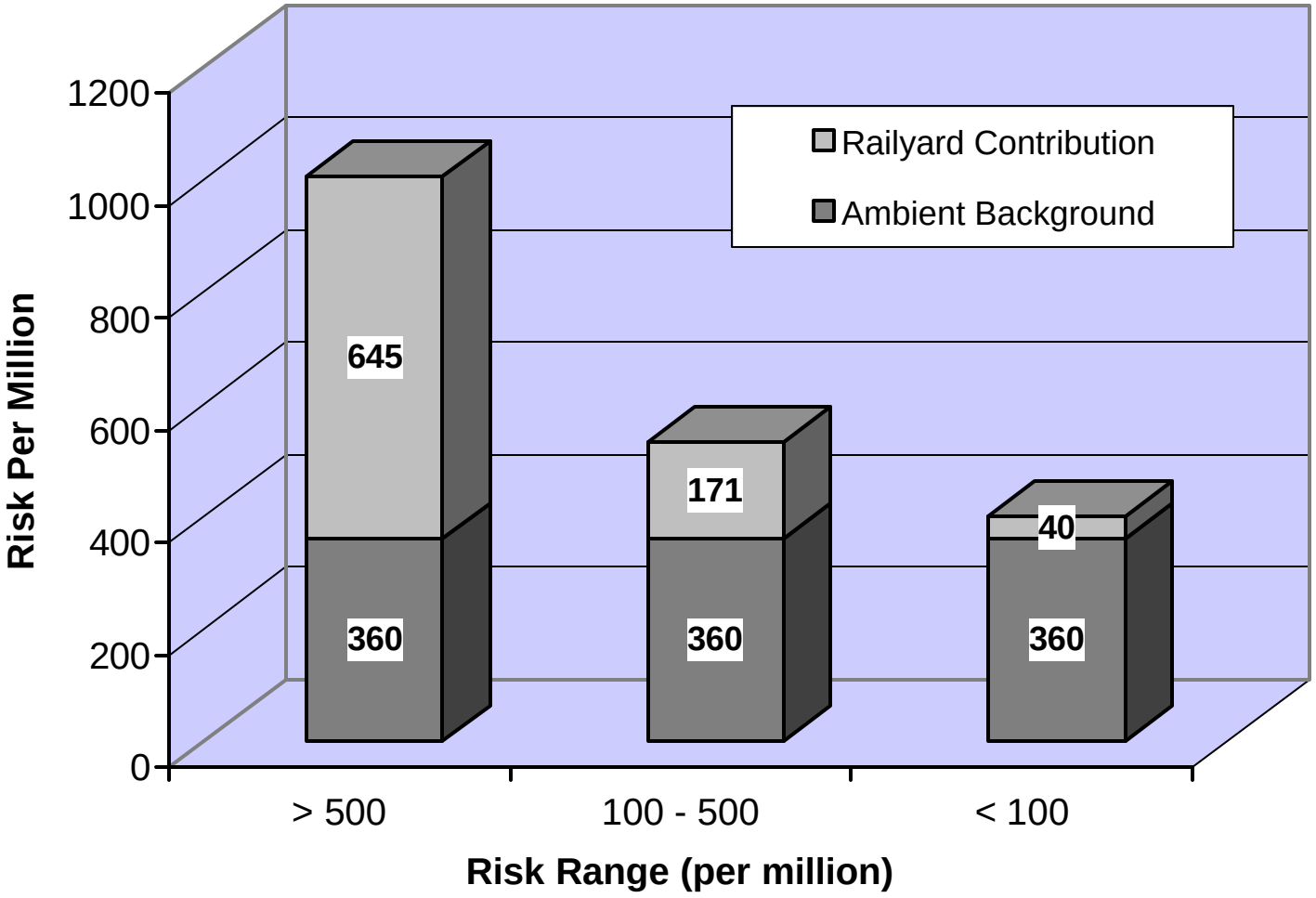


Estimated Cancer Risk from the Yard

(10, 25, and 50 in a million risk isopleths, McClellan Met Data)



Comparison of Roseville Rail Yard Risks to Ambient Background Level in Sacramento Region



Findings

- Year 2000 Diesel PM emissions: 25 tons
  - Moving locomotives account for about 50 percent of emissions, idling locomotive about 45% and testing accounts for about 5%
- Large region impacted by the Diesel PM emissions from the Yard
  - Potential cancer risks greater than 500 in a million occur northwest of the Service Track area and Hump and Trim (10-40 acres)
  - Potential cancer risks greater than 100 in a million occur over a 700-1600 acres
  - Potential cancer risk greater than 10 in a million occur over 46,000-56,000 acres impacted between 140,000 and 155,000 people

Air Resources Board Recommendations

- Short-term and long-term mitigation measures are needed
  - Cleaner fuels
  - Idling reduction
  - Accelerate rebuilt/replacement
  - Inspection & maintenance practices
  - Improved engine technology & exhaust aftertreatmant

Technical Contact

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www.arb.ca.gov/diesel/documents/rrstudy.htm