

Health Risk Assessments for Railyards

The Air Resources Board (ARB) entered into the Statewide Railroad Agreement (Agreement) with the Union Pacific Railroad (UP) and BNSF Railway (BNSF) in June 2005. The Agreement requires a number of short-term and long-term actions to reduce diesel particulate matter emissions. As part of the Agreement, the railroad companies agreed to work with ARB to prepare health risk assessments for 16 large railyards. The information derived from the railyard health risk assessments will provide the public with information on risks associated with railyard emissions and most importantly identify the greatest opportunities for future emission reduction measures.

First Things First: Identifying the Air Pollution Sources

One of the first tasks in performing a railyard health risk assessment is to quantify air toxic emissions released within a railyard and significant sources of air toxic emissions nearby the railyard. UP and BNSF are responsible for providing information on the sources operating within the railyards. This includes both the emission inventory and air dispersion modeling data. The ARB will use these data, in conjunction with other sources of information, to characterize the distributions of emissions within the railyards and significant sources of emissions nearby the railyard (e.g., freeways, refineries, trucks operating outside the railyard). Using all of this information, ARB will estimate air pollution exposure and develop the health risk assessments.

What Information Does the Health Risk Assessment Provide?

Health risk assessments provide information to estimate potential lifetime cancer and non-cancer health risks. Health risk assessments do not gather information or health data on specific individuals, but provide estimates for the potential health impacts on a population at large. Consequently, the risk communicated is not actual risk but estimated theoretical risk. The health risk assessment process uses standardized general assumptions designed to assure that public health is fully protected. In this case, the assumptions used in the health risk assessments were a residential setting with the exposed population living at the same location for 70 years, doing moderate activity outdoors for 24 hours a day, for 350 days of the year.

- ◆ For **cancer** health effects, the risk is expressed as the maximum number of additional cases or chances in a population of a million people who might be expected to get cancer over a 70-year lifetime. The number may be stated as “10 in a million” or “10 chances per million”. Therefore, a potential cancer risk of 10 in a million means if one million people were exposed to a certain level of a pollutant or chemical there is a chance that as many as 10 of them may develop cancer over their 70-year lifetime. This would be new cases of cancer above the expected rate of cancer that might normally occur in the general U.S. population which is about 200,000 to 250,000 chances in a million (one in four to five people). In the Los Angeles basin, the regional cancer risk due to exposure to air pollution is estimated at 1,000 in a million. The statewide average cancer risk from breathing current levels of pollutants in California’s ambient air over a 70-year lifetime is estimated to be 720 in one million.

What is a Health Risk Assessment?

A health risk assessment is a tool that is used to evaluate the potential for a chemical to cause cancer or other illness. A risk assessment uses mathematical models to estimate the theoretical maximum health impacts from exposure to certain concentrations or levels of toxic air pollutants released from a facility or found in the air.

- ◆ For **noncancer** health effects, a reference exposure level or REL is used to predict if there will be certain identified adverse health effects, such as lung irritation, liver damage, or birth defects. These adverse health effects may happen after chronic (long-term) or acute (short-term) exposure. To calculate a noncancer health risk number, the REL is compared to the concentration that a person is exposed to and a “hazard index” (HI) is calculated. The greater the HI is above 1.0 indicates a greater potential for possible adverse health effects. If the HI is less than 1.0, then it is an indicator that adverse effects are not likely to happen.

Has There Been a Risk Assessment Done Before for a Railyard?

Yes, but only one. The ARB staff performed a health risk assessment related to locomotives and their activity at the J. R. Davis Yard (Yard) in Roseville, California. The study report can be found at: <http://www.arb.ca.gov/diesel/documents/rstudy.htm>. The Yard is the largest service and maintenance railyard in the West with over 30,000 locomotives visiting annually. The results of the risk assessment show a large area impacted by the diesel particulate matter emissions associated with the operations and activities of the Yard. The potential cancer risk exceeded 500 in a million for some areas. The impact was spread over a very large area with elevated cancer risks of greater than 10 to a 100 in a million over most of the city.

Which Railyards Will Be Subject to Risk Assessments (and Estimated Completion Date)?

UP - Southern California

Commerce (Spring 2007)
LATC (Los Angeles) (Spring 2007)
Mira Loma (Spring 2007)
Dolores/ICTF (December 2007)
City of Industry (December 2007)
Colton (December 2007)

BNSF – Southern California

Hobart (Los Angeles Intermodal) (Spring 2007)
Commerce/Eastern (Spring 2007)
Watson/Wilmington (Spring 2007)
Sheila Mechanical (Spring 2007) (Not a designated yard, but supports Hobart and Commerce/Eastern)
Barstow (December 2007)
San Bernardino (December 2007)
San Diego (December 2007)

UP – Northern California

Stockton (Spring 2007)
Oakland (December 2007)
Roseville * (* UP Roseville was completed in 2004)

BNSF – Northern California

Stockton (Spring 2007)
Richmond (Spring 2007)

What are the Next Steps?

ARB staff will present the draft health risk assessments to the public for review and comment. Once the public review process has been completed, the railyard health risk assessment information will be used to evaluate and identify future mitigation measures that can be implemented at each of the railyards.

More information on California’s railyard health risk assessments can be found at: <http://www.arb.ca.gov/railyard/hra/hra.htm>.



You may obtain this document in an alternative format by contacting ARB’s ADA Coordinator at (916) 323-4916 (voice); TTY/TDD/Speech-to-Speech users may dial 7-1-1 for the California Relay Service.