

Rail Yard Emissions and Schoolchildren: Growing Concern over Air Toxics

Before the end of the twentieth century, railroads as a means of transport seemed on the way out, a last dying vestige of an older time, like cattle drives or transatlantic passenger ships. But we have seen a resurgence in rail transport for freight because of increasing imports, and in passenger rail as an alternative for commuters. One of the consequences of increasing rail traffic is greater activity at rail yards, which can have serious impacts on local air quality.

Exacerbating the problem is the continued influx of people into California. As cities and towns grow, they fill in the spaces within and between their borders. So at the same time that rail yards and rail operations are expanding, people are moving closer to them. Though less study has been focused on rail emissions than on highway and industrial emissions, that is changing. Between November 2007 and June 2008, 16 major freight rail yards in California completed draft or final health risk assessments (HRAs). As of September 2008, draft mitigation plans had been published in response to four of those HRAs, with the remainder to follow in the coming months. However, some areas need further evaluation. The community has and should use this opportunity to evaluate the parameters for these assessments in order to get the most accurate picture of health risks and to define plans for the most effective mitigation.

Research has opened a Pandora's box on diesel particulates, which are now believed to account for about 70 percent of the total ambient air toxics risk in California. The smaller the particle, the more dangerous it seems to be. The first to be regulated was PM_{10} , particles less than 10 microns in diameter (10 millionths of an inch). Regulatory agencies then focused on $PM_{2.5}$ as more harmful, and lately the concern is increasing about ultrafine particles ($PM_{0.1}$), which pose even greater risks. One of the difficulties with $PM_{0.1}$ is that it can form from vapors after emission, so conventional exhaust filters are mostly useless. Though there are other pollutants of concern in train emissions, diesel particulates are by far the biggest problem.

THE J.R. DAVIS RAIL YARD HRA

The current concern about rail yard emissions arose from the California Air Resources Board's 2004 health risk assessment of the J.R. Davis Rail Yard in Roseville, California. The Placer County Air Pollution Control District asked CARB to perform the assessment when it could not resolve the mounting complaints about noise and odors around the rail yard.

The Union Pacific Railroad began expanding the yard in 1997, and in the year 2000, the yard was used by 31,000 locomotives, with another 15,000 passing through on parallel tracks. When the assessment was released in October 2004, the impacts it revealed were unexpectedly serious.

The South Coast Air Quality Management District (SCAQMD) limits excess cancer risk (ECR) for toxic emissions from existing industrial facilities to less than 10 or 25 per million, depending on the facility. (ECR means over and above the risk of the ambient air quality.) The ECR for the Roseville yard was estimated at about 645 per million for a 10- to 40-acre area around the rail yard. **Elevated risk levels (more than 10 per million) were estimated to occur as far as 18 miles from the facility.**

2005 STATEWIDE AGREEMENT

The magnitude of these numbers galvanized the air quality agencies into action. In 2005 CARB came to an agreement with the Union Pacific and the Burlington Northern and Santa Fe railroads to reduce emissions at 30 rail yards in California. Short-term measures aimed to reduce diesel particulate matter by 20 percent. In 2006, CARB began preparing HRAs at 16 major freight rail yards. The results of those studies will be used to craft long-term mitigation. In addition to the HRA program, some of the elements of the agreement address:

- + Idle reduction,
- + Low-sulfur diesel fuel,
- + Visible emissions reduction,
- + Identification of mitigation measures for reducing risks at designated rail yards, and
- + Ongoing evaluation of other, medium, and longer-term emission control measures.

RAIL YARD EMISSIONS AND SCHOOLCHILDREN: GROWING CONCERN OVER AIR TOXICS

The SCAQMD put its money where its mouth is when it adopted new regulations governing rail yard air emissions and risk assessment. Rules 3501, 3502, and 3503 are similar to the measures in CARB's voluntary agreement, but they are more comprehensive, covering nine more rail yards, establishing risk thresholds, and requiring recordkeeping and public hearings before finalizing HRAs. Proposed Rule 3504 will require mitigation for emissions above the thresholds.

The railroads filed suit in March 2006. They assert that SCAQMD's rules are illegal because local rules (1) are preempted by the Interstate Commerce Commission Termination Act, (2) violate interstate commerce provisions under the U.S. Constitution, and (3) violate the Clean Air Act. The parties agreed to a "Standstill Agreement" in June, which postponed key compliance dates in the rules pending resolution by the Court. The trial began and ended in November 2006, and in May 2007 the presiding judge ruled in favor of the railroads. The SCAQMD-proposed rules were preempted in their entirety by federal jurisdiction over the railroads. SCAQMD appealed the ruling to the Ninth Circuit Court and mediation ensued. The most recent appellate brief was filed September 15, 2008, and the appellate court has yet to make a final ruling.



Participation in the agreement is voluntary on the part of the railroads, a fact which has earned criticism from the SCAQMD and some community groups (see box). Criticism has also been leveled at CARB for reaching agreement behind closed doors without soliciting input, and for a clause that releases railroads from the agreement "if any local government or agency adopts a measure overlapping any provisions in the CARB agreement."¹

CARB maintains that federal law places too many constraints on state and local regulation of interstate railroad operations, and that a voluntary agreement is the best available solution. One of the consequences of the statewide agreement is that CARB

and the railroads shared responsibility for performing the HRAs (and planning mitigation measures). The railroads compiled the emissions data, which CARB staff used to complete the risk assessments.

THE HRAS AND MITIGATION PLANS

There is an obvious weakness in this scenario: the railroads and CARB have very different priorities. The guidelines for the rail yard HRAs leave room for flexibility in both the gathering and interpretation of data. It is always possible to follow the letter of the guidelines while completely missing the spirit.

The guidelines and resultant HRAs may not accurately assess the hazards that are peculiar to sensitive receptors such as schools and schoolchildren. The effects of ultrafine particles (less than 0.1 micron) have become a more serious concern in recent years, but the guidelines do not specifically address them. Nor are noncancer health risks—such as aggravated asthma, decreased lung function, and heart and respiratory disease—specifically addressed, though all have been linked to PM emissions.

Despite some limitations in the guidelines, the HRAs completed so far indicate significant health risks associated with air emissions from major freight rail yards. Appropriate mitigation plans are warranted to reduce these risks. It is crucial that the methodologies and assumptions used by both the railroads and CARB to prepare the HRAs—and to plan and implement mitigation—be monitored, if not dictated, by those most affected by the risk assessment results: the community.

ASSUMPTIONS IN THE PROCESS

Risk estimate calculations can be very sensitive to changes in the underlying assumptions. **Some of the assumptions on which the HRA process is based are explicit in the guidelines; others are implicit, reflected in how the guidelines are implemented.** For instance, the guidelines direct that staging areas be evaluated, but define them in a way that excludes idling trucks on nearby roadways. Trucks use roads both to access rail yards and to wait for loading and unloading, which means idling time. Excluding these idling trucks on roadways discounts a significant source of emissions, which will necessarily understate the risk. In addition, who will monitor that all staging areas have been identified and included in the assessment? The guidelines and agreement don't make this clear.

How then do communities ensure that the HRAs accurately assess the health risks near rail yards? How relevant are these risks to passenger rail transit centers? What are the particular

¹ South Coast Air Quality Management District, "Air Quality Officials Urge State to Reject Flawed Railroad Agreement," *SCAQMD Home Page*, January 27, 2006, <http://www.aqmd.gov/news1/2006/carbmouprjan.2006.html>.

risks or concerns for school districts? And finally, who decides on mitigation measures and how do we know they are working, or even being implemented?

TRANSIT CENTERS

For now, commuter trains are unregulated. According to SCAQMD, they contribute only about 10 percent of all rail emissions. Commuter trains move quickly in and out of stations, which cuts down considerably on local emissions. (Idling locomotives accounted for about 45 percent of the rail yard emissions at Roseville.) Also, as a fairly recent development in southern California, commuter trains tend to be newer and thus use better emissions technology. However, SCAQMD has said it will continue to monitor commuter trains and possibly regulate them in the future.

SCHOOL ISSUES

Schools are a special concern because they pull large numbers of children from a wide area and concentrate them in one place. The area from which a school pulls its students is usually much wider than the immediate vicinity: students at a rural school might live five or more miles away. Growing children are especially vulnerable to diesel particulates because their bodies are smaller—their hearts beat faster and they breathe more rapidly—and *because* they are growing. Air pollution decreases lung function; in children it can interfere with development. Will a child who lives five miles from a rail yard, but attends a school within two miles, be exposed to higher emissions? What about students who live upwind of a rail yard attending a school that is downwind?



RECOMMENDATIONS

The best way for the community, including its school districts, to ensure that the HRA in its area is accurate and that appropriate mitigation is prescribed and implemented, is to be involved throughout the process.

- + Evaluate the HRA process and results.
- + Provide community-specific data and oversight.
- + Participate in the development and implementation of the mitigation measures and monitoring program.

As to *how* the community is to do this, there is no easy answer. The situation of the rail yard HRAs is unprecedented, so the fact is that no one really knows the best way to make it work. Everyone will be feeling their way through this step by step, including governmental agencies like CARB and SCAQMD. That said, here are some suggestions:

- + **Educate yourself.** At the end of this **CENTERVIEWS** is a list of good, basic resources. Do your own research and consult with experts in science, medicine, environmental assessment, and government agencies. Who is doing the latest research and what is it? What is on the horizon for research and technology in this field?
- + **What is the nearest rail yard to your area?** When will it be assessed? What kinds of improvements, expansions, and new facilities or yards are planned for the next five (or more) years? What other development, especially sensitive land uses, are planned near rail yards? Are both kinds of development considered in the HRA?
- + **Stay current.** CARB for one regularly updates its information on the HRA agreement implementation.
- + **Look at Roseville.** What kind of progress are they making? What obstacles have they run into, and which have they overcome? What kinds of mitigation are they considering and implementing? How is it monitored and how is it working?

FINAL THOUGHTS

In the next 10 years, the ports of Los Angeles and Long Beach expect to double the number of containers they receive; in 20 years that number will double again. Rail and rail yard activity will increase proportionally in response. The development and implementation of mitigation for rail emissions continue to advance, but available solutions are only partial and, inevitably, expensive. And though rail and rail yard emissions are already issues of concern at very high levels, only informed community involvement can build the widespread backing that will be needed to support complete solutions to this public health threat.

RESOURCES

CARB Rail Yard Risk Assessment and Mitigation Measures.

<http://www.arb.ca.gov/railyard/hra/hra.htm>

The CARB agreement and implementation progress, updated every six months.

<http://www.arb.ca.gov/railyard/railyard.htm>; <http://www.arb.ca.gov/msprog/offroad/loco/loco.htm>

The Roseville rail yard study report and other documents.

<http://www.arb.ca.gov/diesel/documents/rrstudy.htm>

Placer County Air Pollution Control District posts information on the Roseville rail yard.

<http://www.placer.ca.gov/Air/railroad.aspx>

South Coast Air Quality Management District's news page posts the progress of its lawsuit with the railroads.

<http://www.aqmd.gov/news1/index.html>

The Office of Environmental Health Hazard Assessment:

Guide to Health Risk Assessment.

<http://www.oehha.ca.gov/pdf/HRSguide2001.pdf>

Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments.

http://www.oehha.ca.gov/air/hot_spots/HRSguide.html

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