California Environmental Protection Agency

Air Resources Board

DRAFT 06/01/00

Children's Environmental Health

Criteria for the Selection of Communities for Special Air Monitoring Studies for Children

The California Air Resources Board (ARB) is establishing special air monitoring studies to evaluate the adequacy of the current air pollution monitoring network to determine the exposure of infants and children to air pollutants, including toxic air contaminants. This effort is being undertaken to meet the requirements of recent legislation, Senate Bill 25 (see insert box below for a summary of the law). Senate Bill 25 requires the ARB to conduct special air monitoring in no fewer than six communities across the State to gather the data necessary to: 1) conduct the adequacy evaluation, 2) identify areas where the exposure of infants and children are not adequately measured, and 3) to make recommendations to improve the air pollution monitoring network to more accurately reflect the exposure of infants and children to air pollutants. The purpose of this document is to outline the criteria that the ARB will use to select the six communities to be used in the monitoring network evaluation and to solicit public input. The ARB, in cooperation with the local air districts, plans to meet in several communities across the State over the next few months to gather comments from the public. These comments, along with the ARB's assessments of local air pollution impacts, will allow the selection of communities to be studied in the evaluation of the current network.

Senate Bill 25

Senate Bill 25 (Chapter 731, Escutia, 1999) established new requirements in California law for the protection of children's health from environmental hazards. There are three areas in the new law which affect existing ARB programs: 1) the review of ambient air quality standards to determine if they adequately protect infants and children, and the revision of standards found to be inadequate to protect infants and children; 2) expanded monitoring of air pollutants to assess the monitoring network's ability to measure children's exposures; and, 3) identification and control of toxic air contaminants that may cause infants and children to be especially susceptible to illness. Specific to air monitoring, the new law requires the ARB to conduct special monitoring to gather the data necessary to determine the adequacy of the existing air pollution monitoring network to assess the exposure of infants and children to air pollutants including criteria and toxic pollutants. The law directs the ARB to conduct these special studies in six communities in nonattainment areas around the State, at schools, day care centers, and outdoor facilities where children are typically present and in close proximity to industrial sources and major traffic areas.

Selection of Community Criteria

Senate Bill 25 requires the ARB to expand its existing monitoring program in nonattainment areas across the State at schools, day care centers, and outdoor recreational facilities that are in close proximity to, or downwind from, major industrial sources, including freeways and major traffic areas. The provisions in SB 25 further direct the ARB to include a combination of existing monitoring facilities, new sites, and indoor and personal exposure measurements to provide the most comprehensive data possible on the levels of children's exposure to air pollutants. In order to meet these requirements, and to ensure that sufficient data can be collected to fulfill the task of evaluating the network, the ARB developed broad criteria for the selection of potential communities to be monitored. The ARB included additional criteria for selecting communities to allow a variety of potential exposure scenarios where children's exposures may not currently be monitored and to utilize data generated under existing programs applicable to the evaluation required by the legislation. The following criteria were developed to evaluate in general which communities may be considered as candidates for selection in the evaluation of the network:

- Suggested communities by local air districts, citizens, and environmental groups
- Location of existing monitoring sites for air toxics and special monitoring studies
- Review of health studies planned or in progress
- Representation of regional exposures
- Review of nonattainment areas of State

Once potential communities are selected, the ARB will use a second set of criteria to assist in the identification of specific communities and possible monitoring sites:

- Proximity of schools and commercial day care centers
- Proximity of major industrial sources and high risk facilities
- Proximity of freeways or major traffic areas
- Review of data from other databases, such as business permits

After the six communities are selected, the ARB will design a community site plan that will allow us to maximize data collection to be used in the evaluation of the current sites, to identify areas where children's exposures may not be adequately measured, and to formulate recommendations to improve the network.

Criteria to be Used for General Evaluation

Suggested communities by local air districts, citizens, and environmental groups. The selection of communities shall be done in partnership with the local air districts and in response to community concerns. The ARB plans to review requests made by local air districts to conduct special community assessments where the district or citizens have concerns over potential health issues. Local air districts will also be requested to review complaints by citizens regarding air pollutant emissions to examine if potential exposures to children may exist which are not being monitored by the current network.

Location of existing monitoring sites and other special monitoring studies: In order to utilize resources most efficiently and to enable the ARB to compare the data sets for evaluating the network, existing monitoring sites and locations of special air monitoring studies which may provide additional information will be considered. The ARB and local air districts operate over 200 monitoring stations statewide for criteria air pollutants, which measure pollutants such as ozone, particulate matter, nitrogen oxides, and sulfur oxides. Shown here are the locations of the ARB's existing 21 site air toxics monitoring network. The air toxics network monitors for about 60 selected toxic air contaminants, such as benzene, 1,3 butadiene, and hexavalent chromium. Selected summaries of various air pollutant data from these sites are available from the ARB website at http://www.arb.ca.gov/aqd/aqd.htm. Complete data sets for all air pollutants and toxic air contaminants monitored are also available free from the ARB in CD ROM format.

In addition to routine monitoring data that are collected, available information from special air monitoring studies will be examined. Data from these studies may be used to augment data collected under the routine monitoring if the special monitoring has occurred in or near a potential community. An example of the type of special studies to be examined is discussed below:

> *MATES II.* During 1998 and 1999, the ARB participated in a yearlong monitoring effort in cooperation with the South Coast Air Quality Management District (SCAQMD) to estimate Basin-wide cancer risk from 20 air toxics. The ARB and the SCAQMD regularly monitored a network of 10 fixed sites over the year. In addition, the SCAQMD conducted a microscale study, which placed 14 mobile platforms in residential areas near industrial sources. The microscale monitoring only lasted for a period of four weeks at each location.

Review of health studies: The ARB is conducting several studies related to air pollution and its potential health effects on children. Several of these studies require air monitoring at locations near or where children are present and will be reviewed to determine if the data would enhance the evaluation required under SB 25. These studies are summarized below.

> *Children's Health Study*. The objective of this study is to evaluate how the lungs and respiratory health of school children are impacted by air pollution as they grow during their school years. Approximately 5,000 children from 12 southern California communities have been followed annually for up to eight years. Most of the communities are in or near Los Angeles. Extensive dedicated routine and intensive air monitoring has occurred to characterize the pollutant exposures for the participants. Pollutants of concern include the common criteria pollutants, including measures of particulate matter for which there are no air quality standards, and other exposures associated with vehicular emissions, as well as metals in community air. A major emphasis has been, and continues to be, identifying and understanding the factors that impact the children's exposures

and ultimately their health. These factors include roadway traffic density and proximity of homes and schools to roadways, both of which can increase children's exposures to vehicular emissions. This study is in its final three years. During this time, the studies will focus on enhanced exposure assessment including improved in-classroom air monitoring of particulate matter and oxides of nitrogen, and analysis of the data to further understand the health effects of long-term exposure to community air pollution.

Childhood Asthma Study. A second major community health study is about to begin in the Fresno area. The study will focus on childhood asthma and how air pollution exposures impact the progression and severity of asthma in approximately 450 children. These children will be followed for up to five years. The air quality of Fresno and the communities nearby are under intensive study as a result of a major interagency and privately sponsored effort. The asthma study will make use of the results of this air quality monitoring effort and perform additional air monitoring in the communities, at schools, and in homes to further ascertain pollutant exposures. The study will focus on the effects of criteria pollutants, including various components of particulate matter, as well as other air contaminants known to cause asthma attacks such as environmental tobacco smoke, pollens, and molds. A major emphasis of the exposure analysis will be to evaluate the impacts on health of vehicular emissions by direct measurement and consideration of proximity to roadways of residences, schools, and other places where the children spend time. Consideration of the impacts of other pollutants, such as certain toxic air contaminants and pesticides, may be added to the study if this is determined to be feasible.

Pilot Asthma Study. A third study is underway to determine whether children with asthma are adversely impacted by exposure to volatile organic compounds (VOCs) in community air. It is a pilot level study with a major emphasis on method evaluation. The study site is Huntington Park.

Representation of regional exposures: *C*ertain scenarios that may result in regional exposures will be reviewed to ensure that the monitoring studies identify potential areas of children's exposures that may not be adequately measured by the current network. For example, a valley community surrounded by agricultural operations or a coastal community with heavy industrial activities related to seaports may be considered for potential criteria and toxic exposures.

Review of nonattainment areas of State: Senate Bill 25 requires the special monitoring for children to be conducted in nonattainment areas of the State. Nonattainment refers to a geographic area identified by the United States Environmental Protection Agency and/or ARB as not meeting either a national ambient air quality standard or a California ambient air quality standard for a given pollutant. Senate Bill 25 does not specify which pollutant standards shall be considered for the nonattainment status. Therefore, all criteria pollutant standards will be considered, making virtually the entire State available for consideration for special monitoring as only one area of the State, Lake County, has received recognition for having received attainment status of all State and federal

ambient air quality standards. More information regarding the designation of nonattainment status of certain areas in the State can be found on the ARB website at http://www.arb.ca.gov/desig/desig.htm.

Criteria to be Used for Specific Community Selection

Proximity of schools and commercial day care centers: Once potential communities are identified, the location of schools and commercial day care centers will be examined to study exposures where children are present. Parks and outdoor recreational facilities will be noted, such as neighborhood ball parks and soccer fields if information is available. These locations can be superimposed on the maps of potential communities.

Proximity of major industrial sources and high-risk facilities: The proximity of major industrial sources and high-risk facilities to areas where children are present will also be considered. The ARB and local air districts collect, estimate, and forecast emission inventory data throughout California. These data are used to estimate the quantity of emissions from different types of emission sources such as point sources, area sources, and mobile sources. The ARB also maintains an emissions inventory of over 8,000 sources of toxic air pollutants. This inventory was established pursuant to the requirements of another law, referred to as the Hot Spots Program. Under this Program, stationary sources are required to report the types and quantities of certain substances their facilities routinely release into the air. Toxic air emissions from stationary sources are quantified and compiled into an inventory. Once a community is considered for selection for special monitoring, the inventory for that area will be mapped to provide a visual representation of the proximity of facilities. Emissions inventory data for air pollutants, including toxics, can be found on the ARB website at http://www.arb.ca.gov/emisinv/eib.htm. The ARB website also has an interactive program that allows the user to map criteria pollutant emissions by zip code. This website can be found at http://eisdot.gislab.teale.ca.gov/ceigis.htm.

Proximity of freeways and other major traffic areas: Senate Bill 25 requires the consideration of children's exposures near freeways and major traffic areas, as studies have shown mobile sources to be a significant contributor to the overall risk from all air pollutants. The location of freeways and major traffic areas will be superimposed on the maps of proposed communities to determine if there were potential areas which may have elevated levels of mobile source pollutants, such as benzene and 1,3-butadiene.

Review of data from other databases: The ARB is not only concerned with the major industrial sources, but also with neighborhood-type facilities such as dry cleaners or service stations, as there may be elevated risks from toxic air contaminants associated with these smaller sources which are not currently in the inventory. Therefore, the ARB plans to review other databases, such as the Yellow Pages and local business permit files, and superimpose those facilities of potential concern that may not already be included in the emission inventory databases.

For More Information

If you would like to provide comments on the criteria to be used in the selection of communities for the evaluation of the current air monitoring network under the SB 25 program, please contact Linda Murchison, Chief of the ARB's Emission Inventory Branch at (916) 322-6021.