Appendix A Assessing Regional Criteria Pollutant Emissions Impacts Under CEQA In Light of the Friant Ranch Ruling

Appendices

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ASSESSING REGIONAL CRITERIA POLLUTANT EMISSIONS IMPACTS UNDER CEQA

IN LIGHT OF THE *FRIANT RANCH* RULING

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California Environmental Quality Act (CEQA) practitioners continually adapt and expand how environmental assessments address impacts. Over the years impact analyses and how lead agencies determine what a 'significant' impact is has been clarified through case law and updates to the CEQA Guidelines. However, sometimes court rulings create uncertainty for CEQA practitioners to address them based on the information and tools at hand. Such is the case for requests made on regional air quality impacts in the *recent Sierra Club et al. v County of Fresno et al. and Friant Ranch, L.P,* (2014 266 Cal. App. 5th Dist, Case No. F066798), referred to as *Friant Ranch*.

Background

The Friant Ranch project is a proposed master planned retirement community for active adults (55 and older) on approximately 942 acres in central Fresno County. The regional air quality analysis was prepared in accordance with the adopted San Joaquin Valley Air Pollution Control District's (SJVAPCD) Guide for Assessing and Mitigating Air Quality Impacts (GAMAQI). While the SJVAPCD is in the process of updating the GAMAQI, in general, the regional air quality significance thresholds and methodology between the adopted 2002 GAMAQI and the draft GAMAQI are similar. The EIR used a threshold for ozone precursors from the SJVAPCD GAMAQI which was based on the New Source Review offset thresholds for stationary sources 10 tons per year for (ROG and NOx). This threshold approach was adopted by most air pollution control districts in California who have adopted CEQA air quality guidelines.

Based on the SJVAPCD significance thresholds for criteria air pollutants, air quality impacts of the Friant Ranch project were identified as a significant unavoidable impact of the project in the Environmental Impact Report (EIR). Due to the size of the project, emissions of reactive organic gases (ROGs) and oxides of nitrogen (NO_x) exceed the SJVAPCD's significance thresholds by 10 times in a region that is designated as non-attainment under the California and National ambient air quality standards (AAQS) for these pollutants. At build-out, the proposed Friant Community Plan would emit approximately 117.38 tons per year of PM_{10}, 109.52 tons per year of ROGs, and 102.19 tons per year of NO_x.

[1] This paper represents the personal opinions of the contributing authors and not an opinion of the consulting firms for which they work. This paper does not represent legal advice. CEQA lead agencies are advised to consult with their legal counsel in matters of CEQA legal adequacy.

The central issue in the court case was not the methodology applied to quantifying regional air quality impacts or the determination that the magnitude of emissions was substantial and therefore 'significant' but, that the EIR did not adequately relate the magnitude of emissions over the threshold to the health-based effects of the criteria air pollutants emissions. The court found that simply reporting that the emissions exceed the threshold was not sufficient. Per the *Friant Ranch* ruling:

> "*The discussion of the adverse health effects, however, was not connected to the levels of the pollutant that would be emitted by the completed project. Instead, the discussion of adverse health effects was general in nature."*

The court agreed with the plaintiffs that the EIR was inadequate because it did not explain what it meant to exceed the significance threshold by 10 times and because it didn't provide a meaningful analysis of the adverse health effects that would be associated with the project's estimated emissions. Per the ruling, the

> *"EIR, however, provided no information about the composition of the particulate matter that was expected to be produced by the project."*

Drawing from *Bakersfield Citizens* (supra, 124 Cal. App. 4th 1184), health impacts resulting from adverse air quality impacts must be identified and analyzed. Despite the fact that the Friant Ranch EIR included a general discussion of adverse health effects, the court found it was 'short' on analysis as it did not correlate the additional tons per year of regional emission that would be generated by the project (i.e., the adverse air quality impacts) to adverse human health impacts that could be expected to result from those regional emissions. The *Friant Ranch* ruling indicated that the EIR should have provided an analysis of the correlation between the project's regional emissions and human health impacts.

Specific examples cited include:

- *"The information provided doesn't enable a reader to determine whether the 100-plus tons per year of PM_{10}, ROG, and NO_x will require people with respiratory difficulties to wear filtering devices when they go outdoors in the project area or nonattainment basis or, in contrast, will be no more than a drop in the bucket to those people breathing the air containing the additional pollutants."*

- *"If an estimate of the project's impact on the "days exceeding standards" had been provided, the public and decision makers might have some idea of the magnitude of the air pollutant impact on human health. As presently written, the final EIR does not inform the reader what impact, if any, the project is likely to have on the days of nonattainment per year—it might double those days or it might not even add a single a day per year. Similarly, no connection or correlation is made between (1) the EIR's statement that exposure to ambient levels of ozone ranging from 0.10 to 0.40 parts per million for one to two hours has been found to significantly alter lung functions and (2) the emissions that the project is expected to produce*."

These examples, highlight the difficulty that air quality practitioner have with the *Friant Ranch* ruling, as discussed further below. The current practice in addressing air quality impacts in CEQA documents is to relate health impacts to the regional significance thresholds, which are related to the AAQS. However, as cited in the *Friant Ranch* ruling, the court found this disclosure too general and not specific enough. However, on the other end of the spectrum, there are not adequate tools available to characterize health impacts of a single project to the degree requested. The court did not provide guidance in this. Rather, the court cited that the "County has discretion in choosing what type of analysis to provide and we will not direct County on how to exercise that discretion. (§ 21168.5.) Nonetheless, there must be some analysis of the correlation between the project's [regional] emissions and human health impacts." So CEQA air quality practitioners are now left scratching their heads on how to comply with the ruling and are seeking guidance from the regional air districts.

The court in the *Friant Ranch* ruling is clearly viewing the EIR analysis of regional criteria pollutants through a project-level paradigm, when this is clearly a cumulative impact issue. As such, the court's suggestions as to a remedy are based on the wrong paradigm, which creates further substantial challenge for the CEQA practitioner.

Origin of Criteria Air Pollutant Significance Thresholds

Before we get into addressing the specific components of the ruling, it is important to discuss how the regional significance thresholds (lbs per day and/or tons per year) were developed for CEQA significance findings and how they related to human health and welfare.

Regional significance thresholds are derived from the United Stated Environmental Protection Agency (USEPA) health-based standards. Regional significance thresholds have been used by air districts in California for the last 25 years. Air quality practitioners prior to the development of bright-line significance threshold struggled with the need to define the level at which a project's emissions are deemed significant. It is important to note that regional criteria air pollutant emissions are by definition a cumulative impact.

Regional air quality impacts, similar to greenhouse gas (GHG) emissions impacts are inherently cumulative in nature. Land use projects on their own would not single-handedly cause emissions that exceed the ambient air quality standards. In fact, localized emissions modeling requires air quality modelers to consider the background concentrations when calculating localized impacts. An analysis of regional emissions impacts addresses whether the additional amount of emissions generated by a project should be considered significant in the context of the existing cumulative effect, which is based on criteria air pollutant emissions for which the air basin is designated as nonattainment for. Therefore, the regional criteria air pollutant analysis in a CEQA document is not a project-level analysis, but a cumulative impact analysis.

Therefore, the "one molecule rule", as defined in the *Communities for a Better Environment v. California Resources Agency and California Building Industry Association* (2002 126 Cal. Rptr. 2d. 441, Cal.App.3 Dist., 2002) (CBE Case), applies. As defined in the CBE case, just because criteria air pollutant emissions

adds to the effect in the nonattainment area does not necessarily create a significant cumulative effect, and the "one [additional] molecule rule" is not the law. Consequently, air districts have developed these bright-line thresholds to define what constitutes a significant impact.

For example, in the South Coast Air Basin, these bright-line significance thresholds were originally developed based on the annual emissions permitting thresholds in the USEPA Prevention of Significant Deterioration (PSD) of Air Quality regulation. The USEPA thresholds are the increment of air pollution an area is allowed to increase. PSD increments prevent the air quality in clean areas from deteriorating to the level set by the National AAQS. Similar to CEQA thresholds, the USEPA thresholds require projects that generate regulated sources of emissions to demonstrate that new emissions emitted from a proposed major stationary source or major modification, in conjunction with other applicable emissions increases and decreases from existing sources, will not cause or contribute to a violation of any applicable National AAQS or PSD increment. Consequently, the thresholds used by air districts in California to determine significant impacts are derived from the health based AAQS. Table 1 shows the primary health and welfare effects from the criteria air pollutant emissions of concern for land use projects.

Table 1 Primary Sources and Effects of Criteria Air Pollutants

Pollutants	**Primary Health and Welfare Effects**
Carbon Monoxide	Aggravation of some heart diseases (angina); Reduced tolerance for exercise; Impairment of mental function; Impairment of fetal development; Death at high levels of exposure
Nitrogen Dioxide	Aggravation of respiratory illness
Ozone ($O_{3)}$[1]	Aggravation of respiratory and cardiovascular diseases; Reduced lung function, Increased cough and chest discomfort
Particulate Matter (PM_{10} and $PM_{2.5)}$	Reduced lung function; Aggravation of respiratory & cardio-respiratory diseases; Increases in mortality rate; Reduced lung function growth in children

Source: South Coast Air Quality Management District (SCAQMD). 2005, May 6. Guidance Document for Addressing Air Quality, Issues in General Plans and Local Planning, http://www.aqmd.gov/docs/default-source/planning/air-quality-guidance/complete-guidance-document.pdf?sfvrsn=4

[1] Ozone is a secondary criteria air pollutant and not emitted directly by a project.

One way to think about the existing thresholds is to think about the regional inventory of criteria pollutants. While a project that exceeds the thresholds by itself cannot "bounce the needle" on the ambient concentrations of criteria pollutants, when you amalgamate all the land use and other sources that exceed the thresholds, then you are dealing with a meaningful majority of the regional criteria

pollutant emissions. The existing thresholds are a tool by which to ensure that CEQA evaluations are conducted for projects that meaningfully contribute to the regional inventory. But this does not mean that a single project would substantially change ambient conditions in a specifically measurable way in terms of health effect. Rather it means that without control, the cumulative projects above this threshold would contribute to meaningfully changes in ambient concentrations which would have measurable changes in health effects. Using CEQA terminology, the thresholds do not identify the level at which a project results in a significant impact, instead the thresholds identify when the project's emissions are a considerable contribution to a cumulatively significant impact.

Limits of Air Quality Dispersion Modeling for Regional Criteria Pollutants

As a measure of cumulative contribution, the regional significance thresholds for criteria pollutants only indirectly tie emissions generated by a project to the health-based standards of the AAQS. The health-based standards of the AAQS are based on the concentration of air pollutant emissions in the air and not the quantity of emissions (mass emissions) generated within an air basin. If the ruling requires something more than a general discussion of the health implications of exceeding the regional significance thresholds of the air district, how can lead agencies comply with the ruling?

Ozone and Secondary Particulate Matter

Ozone and secondary PM cannot be modeled with one of the dispersion models used for localized pollutants (such as diesel particulate matter) because they are formed with complex chemical reactions in the atmosphere sometimes many miles from the source of emissions. The models need to simulate dispersion, deposition, atmospheric chemistry, and meteorology, in a three dimensional scale. The models need to include all precursor emission sources in a gridded inventory that accounts for the time of day and location of the emission sources throughout a modeling domain. Some simplified models referred to as mesoscale models have been developed to model the impact on a smaller scale for large point sources such as power plants, but according to USEPA they are not considered a reliable predictor of actual concentrations of ozone. In addition, emissions from development projects are primarily generated by mobile sources. Cars and trucks travel an average of 7-10 miles for each trip resulting in emissions being spread throughout the road network, not from a single project site. Therefore, ozone, and to lesser extent PM_{10} must be modeled using a regional atmospheric model.

Ozone air quality attainment plans use regional atmospheric models to determine the emission carrying capacity of the air basin. If the carrying capacity is exceeded, locations within the modeling domain will exceed the ambient air quality standard. The more that the carrying capacity is exceeded, the higher the concentration experienced in the areas exceeding the standard. When air basins are close to attainment, the areas that exceed the standard become more isolated. Attainment modeling is used to determine the amount of reductions needed to reach attainment at the last location within the basin. This means that most locations in a basin, including those with very large projects, may have no exceedances of the standard and areas with less favorable meteorology with no projects and limited local sources can exceed the standard.

Nitrogen Dioxide/Oxides of Nitrogen

Theoretically, it would be possible to add the emissions from a large project such as Friant Ranch into the regional attainment model and look for increases in concentration throughout the air basin. This would be considered a sensitivity analysis. The analysis could hold the emissions in the rest of the grid constant and see what happens when emissions are added to the appropriate grid squares. The SJVAB inventory for the ozone precursor NO_x is about 545 tons per day or 198,925 tons per year. Friant Ranch would produce approximately 102 tons per year of NO_x or a 0.051 percent increase. A small increase in emissions of less than a tenth of a percent spread over several grid cells is not likely to move the concentration by an amount beyond the uncertainty in the model.

The regional models account for phenomenon like low level jet streams that can quickly transport emissions from where they are generated to distant locations and wind eddies that recirculate polluted air on a sub-regional basis. In addition, photochemical modeling, in the case of ozone, is dependent of the amount of the individual precursors at all locations in the domain. This is because in the absence of sunlight, NO_x destroys ozone, and areas deficient in NO_x such as rural and mountain areas will experience high ozone concentrations well into the evening while urban areas with many NO_x sources will see rapid decreases in ozone in the evening. Therefore, modeling that adds emissions from a development project in one part of the modeling domain may have a beneficial effect in one area and a negative effect in another. For Friant Ranch, the regional model would be the only way to accurately measure the increase in concentration, if any that would occur by adding the emissions at the project site on the road network receiving traffic from the project. However, the scale of the additional emissions is so small compared to the basin scale variables, that the effect on ambient concentrations would be lost in the "noise" of the model and would be highly unlikely to be directly attributable (or "correlated" in court's language) to the project itself

The San Joaquin Valley Air Basin (SJVAB) is considered NO_x limited, meaning reductions in NO_x have the most effect on ozone formation while the other ozone precursor, ROG, would have little effect because of its abundance in the atmosphere. Most ROG compounds are not considered to have health impacts except for those classified as toxic air contaminants that are regulated separately. ROG is generated by plants. Eliminating all ROG from manmade sources will still leave sufficient biogenic ROG to participate in the photochemical reaction to form ozone.

Inhalable Particulate Matter

PM_{10} is formed by chemical reactions in the atmosphere with precursor emissions and directly from combustion and from fugitive dust. For example, the particulate ammonium nitrate is formed when NO_x and ammonia react in a series of complex chemical reactions. PM_{10} is an amalgamation of numerous particles, and aerosols. The mix of chemicals varies day to day and season to season. In winter, wood smoke and ammonium nitrate are larger portions the mix with occasional days heavily influenced by fugitive dust. In the summer, fugitive dust provides a larger fraction and nitrate is reduced. This variation somewhat complicates the modeling process. Regional PM_{10} emissions in the SJVAB were modeled using a procedure called chemical mass balance. The individual PM_{10} species are allocated into

a grid and reductions from the control measures designed to reduce each constituent are applied to the inventory in each grid square to demonstrate attainment. This process could be done in reverse by adding pollutants generated by the project into the appropriate grid square to see if it would substantially increase concentrations to unhealthful levels. However, again, the regional scale effects and dispersion dwarf nearly all project level emission contributions such that meaningful attribution of ambient concentrations to the project itself will be difficult. More sophisticated atmospheric models for PM_{10} and $PM_{2.5}$ exist, but to our knowledge have not been used in the SJVAB.

Number of Days Air Basins Exceed AAQS

In addition to effects on peak concentration, it is also important to know how many days people are exposed to the unhealthful levels and whether a project would increase the number of days each year in which the air quality standard is exceeded. The modeling only tells what conditions will be during days with the worst conditions (most favorable for forming ozone) called an episode. Poor air quality builds up over a number of days when stagnant conditions occur. Eventually, more favorable conditions return and the air quality is improved. In Fresno the number of days exceeding the federal 8-hour ozone standard of 0.075 ppm was between 50 and 70 days per year between 2009 and 2012. This is down from over 100 days per year in the past. The peak 8-hour readings were as high as 0.116 ppm in 2013. This indicates that the existing conditions are well over the standard on many days. A sufficient regional cumulative increase in emissions could cause the concentration to go up on the worst days and to increase the number of days exceeding the standard. However, as described above, the Friant Ranch emissions are so small relevant to the regional inventory (NOx emission are only 0.051 percent of regional emissions) that any project-attributable change in conditions is likely to be within the model uncertainty and thus would not be a valid result that could be used as the basis for a significant determination under CEQA.

Criteria Air Pollutant Burden: Number of People Exposed to Unhealthful Concentrations

Another factor that is considered in assessing air quality health impacts is the number of people exposed to unhealthful air quality from regional criteria pollutants. Areas with large populations with high pollutant concentrations would expose more people to bad air than areas with small populations and equally poor air quality. It is not acceptable to expose anyone to poor air quality, but it may help prioritize actions to reduce the impacts by where the most people would be helped.

The health impacts of ozone can be presented in a number of ways. The clearest in comparison is to the state and federal ambient ozone standards. If ambient concentrations are below the standard, it is safe to say that no health impact would occur to anyone. When concentrations exceed the standard, impacts will vary based on how much the standard is exceeded. The USEPA developed the Air Quality Index (AQI) as an easy to understand measure of health impact.

> 75 ppb: AQI 100 – Moderate:
> **Sensitive Groups**: Children and people with asthma are the groups most at risk.
> **Health Effects Statements**: Unusually sensitive individuals may experience respiratory symptoms.

Cautionary Statements: Unusually sensitive people should consider limiting prolonged outdoor exertion.

95 ppb: AQI 150 – Unhealthful for Sensitive Groups:
Sensitive Groups: Children and people with asthma are the groups most at risk.
Health Effects Statements: Increasing likelihood of respiratory symptoms and breathing discomfort in active children and adults and people with respiratory disease, such as asthma.
Cautionary Statements: Active children and adults, and people with respiratory disease, such as asthma, should limit prolonged outdoor exertion.

115 ppb: AQI 200 – Unhealthy:
Sensitive Groups: Children and people with asthma are the groups most at risk.
Health Effects Statements: Greater likelihood of respiratory symptoms and breathing difficulty in active children and adults and people with respiratory disease, such as asthma; possible respiratory effects in general population.
Cautionary Statements: Active children and adults, and people with respiratory disease, such as asthma, should avoid prolonged outdoor exertion; everyone else, especially children, should limit prolonged outdoor exertion.

139 ppb: AQI 210 – Very Unhealthful:
Sensitive Groups: Children and people with asthma are the groups most at risk.
Health Effects Statements: Increasingly severe symptoms and impaired breathing likely in active children and adults and people with respiratory disease, such as asthma; increasing likelihood of respiratory effects in general population.
Cautionary Statements: Active children and adults, and people with respiratory disease, such as asthma, should avoid all outdoor exertion; everyone else, especially children, should limit outdoor exertion.

Based on the AQI scale, Fresno experienced one day in the last three years that would be categorized as unhealthful, and as many as 56 days that was unhealthful for sensitive groups or moderate at the worst monitoring station. This raises the question of what would be considered a significant project impact. Would a project need to be solely responsible for increasing the days over the standard by one day, five days, or ten days? Would a project need to increase the AQI to the next higher level – moderate to unhealthful for sensitive groups? This line of reasoning leads back to the basis of the 10 ton per year ozone precursor threshold that is based on a policy determination that this amount is a cumulative contribution deserving mitigation in consideration to the existing impact. Although this approach might in concept be thought useful, since nearly all projects would have such a small contribution in isolation[2], it is unlikely that any one project would change the modeled population exposed to concentrations above ambient thresholds.

[2] In the Friant Ranch case, using ozone precursors as an example, if regional cumulative emissions result in an AQI of 210 and the AQI is linearly related to the amount of emissions, then the project-only contribution would be an increase in the AQI of 0.1. Given the photochemistry issues described above for ozone formation, such a direct linear relationship is not a valid presumption and this points out that ultimately this is a cumulative impact, not a project-only impact.

The Air District's Shoes

The discussion above highlights the difficulties with doing macro-level dispersion modeling and relating mass emissions to the number of people requiring "filtering devices when they go outdoors" or the number of additional days a region may be in nonattainment for. However, do CEQA practitioners really need to go that far? As identified above, regional significance thresholds (lbs per day, and/or tons per year thresholds) are derived from the AAQS. Air basins are identified as either attainment or nonattainment of the California and National AAQS for criteria pollutants. If an air basin is designated as nonattainment, the regional air districts are required to prepare air quality management plans detailing strategies to meet the AAQS in the timeline specified. If air districts already need to forecast future emission levels based on growth, does the decision made by the court overstep into the shoes of the air district?

Projects that exceed the regional significance threshold contribute cumulatively to the nonattainment designation, but do not cause nonattainment in isolation. As the attainment designation is based on the AAQS, which are set at levels of exposure that are determined to not result in adverse health, a project in a nonattainment area with criteria pollutant emissions would cumulatively contribute to health impacts within the air basin. Therefore, in the absence of tools for equating regional emissions to more specific health-based affects, the appropriate place for evaluating how growth within the air basins affects the ability to meet the AAQS and attain the health based standards established by the State and EPA is the regional air quality management plans. Regional air quality management planning specifically accounts for new development in the region based on development patterns set forth in General Plan. The air district runs regional model simulations to determine whether or not an air basin can meet the AAQS. As addressed above, it would be exceedingly difficult to impossible for an individual project to accurately identify how it affects basin-wide concentrations within the uncertainty levels of available regional modeling tools. The air districts are the primary agencies responsible for ensuring the health and welfare of sensitive individuals to elevated concentrations of air quality. Therefore, the most appropriate discussion may be to relate when the air district anticipates the region attaining the health-based standards of the AAQS.

So….what is the CEQA practitioner to do?

As discussed above, regional scale modeling of project-level criteria pollutant emissions will be unrevealing and in nearly all cases will not result in any meaningful identification of changes in ambient levels and human health effects with any certainty. The court ruling is logically flawed in applying a project-level paradigm to a cumulative-level contribution and is asking for an unrealistic and unscientific level of disclosure. As the California Supreme Court has taken up the case, it may resolve the issues in its determination.

In the meantime, lead agencies would be wise to provide the following disclosure when analyzing regional criteria pollutant emissions to better "correlate" project-level criteria pollutant emissions to human health impacts:

1. Describe the cumulative context of regional criteria pollutant emissions and that regional health

effects occur due to the cumulative emissions of existing and future criteria pollutant sources.

2. Characterize the level of project criteria pollutant emissions in comparison to the regional inventory both in terms of tons and percentages.

3. Describe that regional criteria pollutant modeling cannot accurately capture the project-level effect on ambient pollutant concentrations beyond the uncertainty level of the modeling.

4. Disclose that cumulative contributions of regional criteria pollutant emissions collectively can and do have a real-world effect on human health and describe those in the impact analysis (not just in the setting section).

5. Disclose that in general, more criteria pollutant emissions will contribute to more health effects regionally, but that specifically attributing the project's emissions to a specifically defined quantitative or geographic health effect is beyond the resolution of current tools.

6. Differentiate between regional criteria pollutants that are a concern for regional air pollution and localized pollutants (like toxic air contaminants) that are a project-scale concern for the immediate surrounding area of a project. If localized pollutants are studied for their impacts on ambient air quality near the project, explain why this is not appropriate for regional-scale pollutants like ozone precursors.

The situation with the *Friant Ranch* ruling is not unlike the recent court rulings concerning CEQA baselines. In the first Sunnyvale baseline case (*Sunnyvale West Neighborhood Assn. v. City of Sunnyvale City Council*, 2010), the appellate court described in rather bold terms that sole reliance on a future year baseline is never appropriate and that only an existing year baseline is appropriate under CEQA. In a second Sunnyvale baseline case (*Pfeiffer v. City of Sunnyvale City Council* 2011), the same appellate court found that a future year baseline could be appropriate in a CEQA document provided that the analysis also compares project effects to existing conditions. A California Supreme Court ruling (*Neighbors for Smart Rail v. Exposition Metro Line Construction Authority, 4th Appellate District,* 2013) then resolved the issue by finding that use of a future-year baseline only without comparison to existing conditions could actually be appropriate when comparing project conditions to existing conditions would be misleading to the public and decision-makers. The Supreme Court ultimately overturned the original court's key finding, while adding requirements of substantiation that did not exist previously.

Depending on the actions of the Supreme Court, the *Friant Ranch* ruling may or may not be legal precedent on this issue. Given the pragmatic problems with trying to quantitatively correlate project-level criteria pollutant emissions to regional human health effects, it is hoped that future rulings are better informed by the science underlying regional criteria air pollution and associated health effects.