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September 24, 2012

George Alexeeff
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Subject: Comments on Draft California Communities Environmental Health Screening Tool

Dear Dr. Alexeeff:

First, I want to thank you for inviting me to participate in the Sept. 7 Academic Workshop on the draft screening tool. I thought the discussions were insightful, highlighting areas of agreement and disagreement between the panelists in a productive manner.

I've taken the liberty of drafting the enclosed written comments on the draft screening tool, reflecting both my thoughts on the documents prepared prior to the workshop, and on some of the issues raised at the workshop.

If you have any questions regarding these comments, or would like to discuss them further, please let me know.

Sincerely,

Gary Rubenstein
Senior Partner

attachment

Comments on OEHHA's Draft California Communities Environmental Health Screening Tool

Gary Rubenstein, Sierra Research
Sept. 24, 2012

General Comments

- This tool has been presented as a tool that can be used for a variety of purposes; however, analytical tools should be designed to meet specific objectives, and not simply distributed so that others may devise circumstances in which to use them. A tool such as this is not "one-size-fits-all," and should be tailored to meet specific analytical needs.

- The tool reflects a good start at attempting to introduce scientific principles to an area that has been traditionally difficult to assess – disproportionate environmental impacts in disadvantaged communities. However, before the tool becomes widely used, it would help to develop variants of the tool – using the same core group of indicators – tailored for specific purposes. Examples of potential uses of the tool include:

    - Community needs
    - Allocating cleanup or enforcement resources
    - Siting policy

  Looking at these examples, we see that prioritizing communities for these different purposes involve different criteria. For example, if the objective was to prioritize communities for provision of additional health care resources, the indicators listed for public health impacts, sensitive populations, and socioeconomic status would be most relevant; indicators related to existing environmental conditions and the presence of existing facilities would be less relevant. However, if the goal was to prioritize cleanup or enforcement resources, then the environmental burden might be as important, or more so, than population vulnerability. Finally, if the objective was to identify communities in which siting policies for new housing should consider buffers from existing emitting activities, indicators of vulnerable populations would be most relevant.

  These are simply examples of possible uses of a screening cool, and are not intended to be a recommendation of specific uses. The most important points, from my perspective, are the following:

    - The uses of the screening tool need to be established before a scoring mechanism is derived, so that the selection and weighting of indicators is appropriate for the intended use;
    - The screening tool is an investigative tool, and not a regulation; it should be a part of a thoughtful regulatory or planning process, but not an end unto itself; and

- The application of the screening tool must be consistent throughout the relevant jurisdiction, so as to preclude the tool from being used on a case-by-case basis to oppose or support projects that are unpopular or popular.

1. **Discuss the adequacy of the scoring of each indicator and component to differentiate most impacted communities from others. Include discussion of alternatives that could improve the approach**.

- Some of the proposed environmental indicators (ozone, $PM_{2.5}$) are ambient measurements of pollutant concentrations. One stated objective of the screening tool is expressed as follows: "an area with a high score would be expected to experience greater cumulative impacts, as compared to areas with low scores." However, the approach of ranking all geographic areas, and assigning them percentiles, does not meet this objective in cases where ambient pollutant concentrations are below established "safe levels," such as ambient air quality standards. For example, an area with an ozone concentration of 65 ppb would be ranked higher (worse) than an area with a concentration of 60 ppb, despite the fact that both areas are experiencing concentrations that are less than the ambient air quality standard of 70 ppb and, hence, the score for this particular indicator should be the same (zero) for both geographic areas. The percentile approach means that one-half of the geographic areas will always have a score (for a particular indicator) that is in the top half of the range – even if all of those areas have air quality that is better than the state standards. Similarly, the percentile approach means that as the air quality in some areas improves, the score will be forced higher in other areas, even if that area's air quality does not change.

- **Exposure Indicators** – The proposed screening tool uses ozone concentrations, $PM_{2.5}$ concentrations, pesticide use, toxic releases from facilities, and traffic data as exposure indicators.

    - Ozone Concentrations – As the principal component of "smog," ambient measurements of ozone concentration would appear to be an appropriate exposure indicator. Although the level of resolution from monitoring stations is far poorer than the granularity of zip codes, ozone is a regional pollutant without steep gradients (particularly in urban areas). Consequently, the spatial-interpolation algorithm used by OEHHA is appropriate. However, the 3-year average of summer daily maximum 8-hour average ozone concentrations is not a good metric, because it suggests that there is a meaningful distinction in exposures at various concentrations below the state ambient air quality standard. A better indicator of exposure might be something similar to degree days: the sum of 8-hour ozone concentrations in excess of the state standard. The result would be expressed as ppb-hours, and could be averaged over three years to smooth out weather variations. Failing to calculate a value for zip codes with no monitor within 50 km would tend to bias the score higher, because those zip codes tend to be locations with low ozone concentrations (and hence less of a need for monitoring). A maximum

score of 10 should be assigned to a fixed (not relative) concentration (e.g., 2 times the state standard): for example, a score of 10 would be assigned to 2 x 70 ppb x 8760 hours = 1,226,400 ppb-hours.

- $PM_{2.5}$ Concentrations – Because $PM_{2.5}$ is a regional pollutant, ambient $PM_{2.5}$ concentrations would appear to be an appropriate exposure indicator. Because $PM_{2.5}$ emissions are both directly emitted and formed in the atmosphere, there is the potential for somewhat steeper gradients in ambient concentrations; nonetheless, the level of resolution of monitoring stations is likely sufficient to enable the use of this metric as an indicator. Similar to the comments above regarding ozone levels, the use of the average of quarterly means of daily average $PM_{2.5}$ concentrations is not a good metric. A better indicator of exposure would, again, be something similar to degree days: the sum of 24-hour average $PM_{2.5}$ concentrations in excess of the federal standard.[1] The result would be expressed as $\mu g/m^3$-days, and could be averaged over three years to smooth out weather variations. Again, a maximum score of 10 would be assigned to a fixed (not relative) concentration (e.g., 2 times the federal standard): for example, a score of 10 would be assigned to 2 x 35 $\mu g/m^3$ x 365 days = 25,550 $\mu g/m^3$-days.[2]

- Pesticide Use – In contrast with measured ambient concentrations of pollutants, this indicator reflects the density of pesticide application per square mile, without regard to emission rates or dispersion. As a result, this indicator can't be compared with any safe or acceptable level of exposure, since exposure is not measured or calculated. While we understand OEHHA's objective in using this indicator, there should be a mechanism for relating this indicator to exposure, accounting for dispersion.

- Toxic Releases – Similar to that for pesticide use, this indicator does not reflect exposure and, in some cases, may not reflect emissions. This is because facilities subject to the TRI program (which is the source of the data used for this indicator) are required to report usage and transfer of chemicals, in addition to releases (emissions). Furthermore, some release mechanisms (e.g., well injection, landfill disposal) may not result in material exposures, or may result in exposures that are only remotely related to the quantity of materials reported. (For example, the recycling of a toxic compound is considered a "release" in the TRI program.) If the TRI data were screened to reflect only releases to air and water (as suggested on p. 19 of the documentation for the proposed tool), this indicator would reflect emissions (but not exposure). In contrast, the California Air Resources Board and local air districts maintain an extensive monitoring network for air toxics which better reflect exposures (rather than "releases") for a variety of air contaminants. A health risk index can be calculated based on these ambient measurements, and this index could be used to create an indicator for this tool.

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[1] There is no 24-hour average state standard for $PM_{2.5}$.

[2] Since some $PM_{2.5}$ monitoring is performed on a one-in-six-day schedule, an adjustment to this metric to reflect the different monitoring frequencies at different monitoring locations may be required.

Similar to the approach used for ozone and $PM_{2.5}$, GIS-based spatial averaging can be performed to provide values for all zip codes.

- Traffic Density – This indicator uses traffic density as a surrogate for transportation related emissions which, in turn, are a surrogate for exposure to transportation related air pollutants. With respect to criteria pollutants, this indicator is somewhat duplicative of the ozone and $PM_{2.5}$ indicators. This indicator does not reflect exposures, which would be affected by both emission rates and dispersion. As an example, although traffic levels (and hence traffic density) typically increases over time, mobile source emissions have been decreasing over time, and exposures depend heavily on whether receptors are predominantly upwind or downwind of roadways. Furthermore, by excluding roads that are locally maintained, exposures to pollutants from many busy traffic intersections may be excluded. Exposures to emissions from roadway traffic can be represented through ambient monitored concentrations of toxic air contaminants that are traceable to vehicle exhaust (such as 1,3-butadiene, which is widely monitored [ARB, *The California Almanac of Emissions and Air Quality, 2009 Edition*]); such monitored concentrations would reflect traffic volumes, trends in emission changes, and dispersion.

- **Public Health Impacts** – The proposed screening tool uses asthma-related emergency room visits, cancer mortality rates, heart-disease mortality rates, and average low birth weight rates as indicators for public health impacts.

  - As a general comment, these indicators are all reflective of pre-existing conditions in the affected community, and may reflect community susceptibility to the impacts of environmental pollution; however, they do not reflect the public health impacts of environmental pollution. Consequently, these indicators, if used, should be placed under "population characteristics" rather than "pollution burden."

  - Asthma-Related Emergency Room Visits – This indicator is weakened to the extent that the patient's residence is different from the patient's workplace. In addition, the graphic accompanying this indicator suggests that the data were age-adjusted, but there is no explanation presented as to the reason for, or method of, performing this age-adjustment.

  - Cancer Mortality – With a typical overall cancer incidence of approximately 250,000 in one million, and a much lower incidence of cancer due to environmental causes (e.g., approximately 1,000 in one million, or less, for combined impacts of all air pollution exposures), it is unclear how cancer mortality can be a meaningful indicator. It may be possible to identify specific cancers that are more closely linked to environmental causes; however, even such an approach would be fraught with uncertainty. To the extent that this indicator is intended to reflect the susceptibility of the population to harm from environmental pollutants, it should not be restricted

to cancers that are linked to environmental causes; however, if that is the objective, it might be closely linked to, and duplicative of, the age indicator. We recommend that this indicator be deleted.

- Heart Disease Mortality Rates – Heart disease, like cancer, results from a number of genetic, lifestyle, and environmental factors. Although air pollution, in particular, is known to exacerbate the effects of pre-existing heart disease, the preliminary indicator map shown in the draft methodology document suggests a pattern in which environmental exposures are poorly linked, and perhaps inversely linked, to heart disease mortality rates. As was the case for cancer mortality, to the extent that this indicator is intended to reflect the susceptibility of the population to harm from environmental pollutants, it might be closed linked to, and duplicative of, the age indicator. We recommend that this indicator be re-assessed, or perhaps deleted.

- Average Low Birth Weight Rate – The draft methodology document acknowledges that there are a number of racial/ethnic and socioeconomic factors that contribute to the frequency of low birth rates. This leads to the likelihood that these factors are accounted for twice in the proposed screening tool – once as a public health impact, and once as a socioeconomic factor. We recommend that this indicator be deleted.

- **Environmental Effects** – The proposed screening tool uses characteristics of hazardous waste cleanup sites, impaired water bodies, leaking underground storage tanks, and solid waste and hazardous waste disposal facilities as indicators of environmental impacts.

  - As a general comment, although this category of indicators is labeled "environmental effects," it includes a mix of indicators, some of which reflect pollution burden (loosely related to exposure) as might be related to cumulative impacts. As such, these indicators are probably better described as surrogates for environmental exposures that are not addressed under the "exposures" category.

  - Hazardous Waste Cleanup Sites – As a surrogate for exposures or potential cumulative impacts associated with hazardous waste cleanup sites, it is unclear why sites that are closed, with remediation completed, can be ranked with a score as high as 8 (out of 12) under certain circumstances. The scoring for these sites should reflect, to some extent, the potential for exposure. If remediation has been completed at a site, and the relevant environmental agencies have concluded that no significant environmental risk remains, the site should be given a score of zero. If the intent of this indicator was to attempt to capture past exposures, the analysis would be much more complicated, and should reflect the duration of the exposure and the time (before the present) that remediation has been completed.

- Impaired Water Bodies – The use of a count of the number of pollutants which exceed clean water standards in water bodies is a poor measure of exposure, and can be related as much to measurement accuracy as to environmental harm. In addition, by summing the count of such pollutants in streams or waterways which intersect a particular zip code, anomalous results can be obtained. For example, a stream which has concentrations of 10 pollutants slightly in excess of applicable water quality standards, and which passes through an unpopulated corner of a zip code area, would be scored 10 times higher than a single, large lake which had one pollutant at levels 10 times the applicable water quality standard. This indicator, if retained, should be modified to reflect both the degree of contamination in excess of water quality standards, and the potential for exposure (using either surface area or proximity to potable water as a surrogate).

- Leaking Underground Storage Tanks – Due to the close correlation between population density and the density of service stations (and hence the density of leaking underground storage tanks), this indicator might better reflect relative exposures if it were normalized to population. In addition, similar to the comments above regarding hazardous waste cleanup sites, leaking underground storage tanks that have been remediated, with their cases closed, should be given a score of zero.

- Solid Waste/Hazardous Waste Disposal Facilities – Similar to the comments above regarding hazardous waste cleanup sites and impaired water bodies, it is unclear why permitted, compliant solid waste, hazardous waste, or composting facilities should be assigned a score greater than zero.

- **Sensitive Populations** – The screening tool proposes to use the population of children and population of elderly individuals as indicators for sensitive populations.

  - As a general comment, and as discussed above, these indicators are more similar to those discussed above under "public health impacts," and should be grouped accordingly.

  - Population of Children – The definition of children as age 5 or less is inconsistent with the approach OEHHA has used in other screening tools. For example, in other tools OEHHA has defined children as the 14-year span between age 2 and age 16, and assigned an age sensitivity factor of 3 to the child category. In addition, in other tools OEHHA has defined infants as the 2.3-year span between the beginning of the third trimester as a fetus until age 2, and has assigned an age sensitivity factor of 10 to the infant category.

  - Population of Elderly – The definition of elderly as age 65 or more is inconsistent with the approach OEHHA has used in other screening tools. For example, in other tools OEHHA does not apply an increased sensitivity before age 70. The fact that this indicator might run contrary to others (e.g., income or wealth) is not a problem – it is reality. During the Sept. 7 workshop, it was

suggested that this indicator be removed because, in some cases, it can be correlated with retirement communities with individuals of adequate income and good access to healthcare. We disagree: this segment of the population is unquestionably more sensitive to adverse health outcomes arising from environmental pollution and if, in some geographic areas, the increased sensitivity is offset by higher income and better access to healthcare, that should be reflected in the tool.

- Potential Composite Age Index – One possibility to address the age-related aspect of population sensitivity to environmental burdens would be to replace both the population of children and population of elderly with a single age index. This index could be designed to reflect the increased sensitivity to environmental burdens as follows (using OEHHA's sensitivity factors for inhalation risk as an example):

  $$\text{AgeIndex} = 10 \times (P_{<2}) + 3 \times (P_{2.5\text{-}16}) + 1 \times (P_{16\text{-}70}) + Y \times (P_{>70})$$

  Where:
  P_{nn} = population fraction for the age range indicated.
  Y = age sensitivity for population over 70 years of age (to be determined)

- **Socioeconomic Factors** – The screening tool proposes to use educational attainment, income, poverty and race/ethnicity as indicators for socioeconomic factors.

  - As a general comment, it appears that several of the socioeconomic indicators are related, or reflect the same population sensitivity to environmental burdens. Only independent socioeconomic indicators should be used in the screening tool.

  - Educational Attainment – It is unclear how educational attainment as an indicator is different than income and/or poverty level. To the extent that education attainment measures the same population sensitivity as one of the economic indicators, it should be deleted from the screening model as an independent indicator. To the extent that it modulates one of the economic indicators (e.g., if higher levels of educational attainment can reduce the population sensitivity to environmental harm associated with lower income levels), then education attainment might be an element of the scoring system for the economic indicators (analogous to the use of permit status to modulate the scoring for waste disposal facilities).

  - Income and Poverty – These two indicators reflect the same comment element: economically disadvantaged populations have poorer access to health care and, as a result, have increased vulnerability to the health effects of environmental burdens. It is unclear what different characteristics are being measured through the use of these two indicators in the context of population

vulnerability. We recommend that one of these two indicators be deleted from the screening tool.

- Race/Ethnicity – The extent to which race/ethnicity reflects increased vulnerability to environmental effects independent of economic factors is unclear. If OEHHA believes, based on published studies, that this is, in fact, an independent indicator of vulnerability, the proposed use of this indicator should be clarified.

2. Discuss possible improvements to the model with respect to the treatment of the Public Health Effects and Sensitive Populations components.

- See comments above.

3. Discuss possible improvements to the model with respect to the selection of indicators used to characterize the Socioeconomic Factors component.

- See comments above.

4. Discuss the types of sensitivity analyses that would be most effective in testing the tool's robustness in identifying highly impacted communities.

- In general, we believe three types of sensitivity analyses should be performed on the tool:

  - First, each proposed indicator should be removed from the tool, one-by-one, and the resultant rankings (with and without the indicator) compared using a rank-order correlation test, as suggested by Dr. McKone at the Sept. 7 workshop. If removal of an indicator does not result in a significant difference in the rankings (as determined using the rank-order correlation test), it would mean one of three things:
    - The particular indicator has no real relationship to the ranking, and should be removed.
    - The particular indicator is duplicative of another indicator, and or the other of this pair should be removed.
    - The mathematical structure of the model is masking the effect of this indicator, and should be re-examined. An example of this latter outcome would be if removal of all of the environmental burden indicators had no significant impact on the rankings.

  - Second, OEHHA should evaluate alternative points in the tool at which the percentile ranks are applied. The current version of the proposed tool applies the ranks to each indicator, and then performs mathematical operations on the indicators to achieve a final score, which is again rank-ordered. Two alternatives would be:
    - combine (appropriately weighted) scores within each major group of indicators (e.g., environmental burden and population vulnerability),

rank these two groups, and then mathematically combine the results of the two groups; or

- combine (appropriately weighted) scores within each major group of indicators; mathematically combine the scores for the two groups; and rank the final combined scores.

- Finally, after the previous checks have been performed, OEHHA should consider conducting a reality check, looking at how the proposed overall scoring scheme would work in evaluating four different types of communities (represented by four zip codes): high income/low emissions density; high income/high emissions density; low income/low emissions density; and low income/high emissions density. For the purposes of this simple reality check, OEHHA could use the proposed economic and TRI release indicators to select the four zip codes to be assessed, and then apply the full screening tool to those four zip codes.

5. <u>Discuss the strengths and weaknesses of the proposed model and model indicators and components as well as make suggestions for improvements - in the context of the Cal/EPA's definition of cumulative impacts.</u>

- Cal/EPA's working definition of cumulative impacts is as follows:

  Cumulative impacts means exposures, public health or environmental effects from the combined emissions and discharges, in a geographic area, including environmental pollution from all sources, whether single or multi-media, routinely, accidentally, or otherwise released. Impacts will take into account sensitive populations and socioeconomic factors, where applicable and to the extent data are available.

  While this working definition uses terms that need to be accounted for in the screening tool, we don't believe it is necessary (and may not be appropriate) to turn these words into a mathematical expression. For example, and as discussed above, several of the indicators identified as "public health effects" more properly reflect population characteristics that increase vulnerability to environmental burdens. We do not believe that grouping these indicators with other indicators of population vulnerability is inconsistent with the working definition.

- For several groups of indicators, the proposed screening tool uses percentiles for each indicator, and then takes the average of the percentiles. As an alternative (and as discussed above regarding sensitivity analyses), OEHHA should assess summing the indicators within each group (assuming the scoring maxima are properly weighted to reflect the relative importance of each indicator), and then calculating the percentiles based on the total score for each zip code. The current approach results in all indicators being equally weighted, regardless of the magnitude of the scores. For example, if an indicator has a score range of 0 to 15, and all of the scores are 5 or lower, 10% of the zip codes will nonetheless receive a percentile ranking of 10. When this indicator is combined with another indicator, in which all of the scores are

10 or higher, once again, 10% of the zip codes will receive a percentile ranking of 10. Averaging the percentiles for the two indicators loses the relative importance of each indicator and obscures the significance of the results.

- The combined effect of using percentiles for all indicators, and of multiplying the pollution burden score times the population characteristics score, is to drive the final score based on population characteristics rather than risk of environmental harm. The tool should leave a determination of the final scoring algorithm until after specific uses of the tool have been identified. Rather, the technical document supporting the tool should include an example algorithm that is designed to meet a particular objective, discussing the rationale for excluding or including specific indicators, and for the mathematical algorithm used to weight and relate the indicators into a single score.

- At the Sept. 7 workshop, it was suggested that the tool's indicators be grouped into two major components: indicators that reflect the environmental burden experienced by a community, and indicators that reflect the vulnerability of that community to environmental burdens. We agree with that suggestion. There was also a discussion of whether the scores for these two groups should be mathematically combined by addition or multiplication. To the extent that each group of indicators is viewed as an independent measure of cumulative impacts, we believe they should be summed. To the extent that the population vulnerability score is intended to modulate the environmental burden score, we believe they should be multiplied together. However, in the latter case, we do not believe there is sufficient science to suggest that this modulating factor can be, or should be, as high as six, given the specific indicators of burden and population sensitivity. The six-fold multiplier suggests that, for some communities, a doubling (for example) of ozone levels would result in a 12-fold increase in environmental burdens (assuming, for the sake of this example, that ozone was the only burden indicator). While there are certainly some environmental burdens that result in a disproportionate impact (such as the SO_2 – asthma relationship mentioned at the Sept. 7 workshop), those burdens are not among those suggested as indicators. If the population vulnerability factor is intended to modulate the environmental burden factor, it should probably have a maximum value closer to two than to six.

<u>Wording/Language Comments</u>

- Preface: "An area with a high score would be expected to experience greater cumulative impacts, as compared to areas with low scores." This is not quite correct; the score reflects both impacts and pre-existing conditions. A more correct statement would be "An area with a high score would be expected to experience greater cumulative impacts in combination with heightened sensitivity to these impacts, as compared to areas with low scores."

Issues Raised at the Sept. 7 Workshop

- Use of NATA Data – It was suggested at the Sept. 7 workshop that some of the environmental burden indicators – such as that which is based on TRI data – be replaced with data from EPA's National Air Toxics Assessment (NATA) database. The reasons proposed for this change were: (1) better geographic resolution (to the census tract level); and (2) closer relationship to environmental burdens through the use of ambient modeled ambient concentrations and risk calculations. During the workshop, we had expressed some concerns about the quality of this data source for use in the proposed tool; after looking more closely at the EPA's NATA website and supporting technical documentation, we would strongly recommend against using data from this website in the tool. The reasons are as follows:
    - Geographic limitations: EPA's website, and the NATA database's supporting technical documentation, strongly caution against using the NATA database for exactly the types of purposes envisioned by the screening tool. This caution is explicit regarding the use of NATA assessments at the census block level of resolution:

      "These assessments are based on assumptions and methods that limit the range of questions that can be answered reliably. ***The results cannot be used to identify exposures and risks for specific individuals, or even to identify exposures and risks in small geographic regions*** *such as a specific census block, i.e., hotspots."*[3] [emphasis added]

    - Caveats on use of the model are presented in more detail in EPA's Technical Methods Document for NATA:

      "As described in Section 1.2, NATA is a screening-level assessment that was designed to answer specific types of questions. The underlying assumptions of NATA and the methods limit the range of questions that can be answered reliably. ***NATA results should not be used independently to characterize or compare risk at local levels (e.g., between neighborhoods), nor should they be used to estimate exposure or health risks for individuals or groups within small geographic areas*** *such as census blocks or to design control measures for specific emissions sources or pollutants.*

      NATA evaluations use emissions data for a single year as inputs to models that yield concentration and risk estimates. These estimates reflect chronic exposures. Given these characteristics, ***NATA results should not be used*** *for the following:*

      - *as a definitive means to pinpoint specific risk values within a census tract,*
      - *to characterize or compare risks at local levels such as between neighborhoods,*

[3] *http://www.epa.gov/nata/* (accessed 9/9/2012)

- *to characterize or compare risk among states,*
- *to examine trends from one NATA year to another,*
- *as the sole basis for developing risk reduction plans or regulations,*
- *as the sole basis for determining appropriate controls on specific sources or air toxics, or*
- *as the sole basis to quantify benefits of reduced air toxic emissions.*

The limitations of the assessment methods prevent NATA from serving as a stand-alone tool.

Furthermore, although results are reported at the census tract level, average risk estimates are far more uncertain at this level of spatial resolution than at the county or state level. For analysis of air toxics in smaller areas, such as census blocks or in a suspected "hotspot," other tools such as site-specific monitoring and local-scale assessments coupled with refined and localized data should be used."[4] [emphasis added]

- Meteorological data from 150 stations nationwide were used to represent the entire country.[5] This does not represent an improvement, in terms of spatial resolution, as compared with California ambient monitoring data for either criteria air pollutants or toxic air contaminants. The use of non-representative meteorological data at the census tract level can, and likely will, skew results in unpredictable ways.

- Data Limitations – The most recent NATA data available is for the 2005 calendar year. Thus, the NATA data is not as representative of current conditions as available California-sourced data.

- A comparison of modeling results (based on NATA) with actual monitoring results does not indicate sufficient quality for the purposes of the proposed screening tool. The comparison for the 2005 NATA data, available at *http://www.epa.gov/ttn/atw/nata2005/compare.html*, shows what appears to be, on the surface, good correspondence between modeled and monitored results. However, a closer look at the data suggests otherwise. For example, looking at Table 3-1 in EPA's 2005 comparison report, the average model-to-monitor ratios of concentrations for benzene and 1,3-butadiene (two vehicle-related air toxics that are among the largest contributors to air toxic risk in California) are 0.982 and 0.962 – less than a 5% divergence. These ratios were based on 296 monitoring locations for benzene, and 176 monitoring locations for 1,3-butadiene, and so would appear to be based on robust

[4] "An Overview of Methods for EPA's National-Scale Air Toxics Assessment", January 2011, ICF International. (EPA NATA TMD) p. 5. *http://www.epa.gov/ttn/atw/nata2005/05pdf/nata_tmd.pdf*.
[5] EPA NATA TMD. p. 33.

samples. However, in looking at additional statistics found at Table 3-2 of the same report, we see that there was a divergence of less than 10% between monitored and modeled values only for 15.2% of the benzene monitoring locations, and 8.0% for the 1,3-butadience monitoring locations. The divergence was less than 30% for 48% of the benzene locations, and 31% of the 1,3-butadiene locations. These results indicate that the simple average ratios mask a cancellation of errors that becomes more pronounced with greater geographic resolution (smaller geographic areas).

- In summary, tools like NATA provide a false sense of security with regard to spatial resolution: although the NATA database provides results at the census tract level, the NATA data reflect, of necessity, limited meteorological data, use of default assumptions for source dispersion characteristics, and many other simplifying assumptions that substantially weaken this data source for OEHHA's purposes as compared with other, more robust data sources.