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Memorandum

Date: August 06, 2008

To: Rodolfo Valdez-Romero, Chula Vista Elementary School District

cc: S. Fahle and L. Billings, CVESD, and Paul Amberg, ICF Jones & Stokes

From: Michael Slavick, Senior Air Quality Specialist, ICF Jones & Stokes

Subject: **MMC Chula Vista Energy Upgrade Project – Sensitive Receptor (Schools)
Listing for Health Risk Impact**

As requested, I have completed my review of the above-referenced report prepared by the Project Applicant's Consultants, Atmospheric Dynamics. In general, the supplemental 2-page report adequately addresses the comments from our prior review memorandum dated July 29, 2008, and I agree with the conclusion that no significant health risk impact are anticipated as a result of the proposed project. My additional observations regarding the 2-page report are as follows:

I have noted that the health risk impact report presented the results of the 70-year cancer risk, chronic hazard index and acute hazard index for the nearby schools (e.g., Otay Elementary, Orange Avenue Preschool, Loma Verde Elementary, Castle Park Middle, Rohr, S.T. Christian, and Montgomery School). San Diego County Air Pollution Control District recommends, at this time, using the standard Office of Environmental Health and Hazard Assessment (OEHHA) 70 year timeframe as the basis for the site specific health risk assessment.

With respect to the exposures on school children, the Air Toxics Hot Spots Program Risk Assessment Guidelines: The Air Toxics Hot Spots Program Guidance Manual for the Preparation of Health Risk Assessments (Guidelines) exists for calculating risks based on 9 year exposure timeframes for school children. According to the OEHHA Guidance, the 9-year exposure scenario coincides with the U.S. EPA's estimates of average residence time. The 9-year exposure timeframe is for the first 9 years of life and is therefore protective of children. Children have higher intake rates on a per kilogram body weight basis and thus receive a higher dose of the pollutants. The 70-year exposure timeframe is considered to be the typical person lifetime. According to the Guidelines, OEHHA recommends the 9-year exposure duration may also be evaluated as supplemental information to show the range of cancer risk on school children. However, as indicated in the report, the significant thresholds only exist for the 70-year cancer risk, and the 1-hour chronic and acute hazard indexes. Therefore, I concur that the report on the health risk impacts at the school locations is consistent with the OEHHA Guidelines.

I see no need for further review. If you should have any questions regarding this review, please do not hesitate to contact me.

MMC Chula Vista

Sensitive Receptor (Schools) Listing for Health Risk Impact*

Name	Cancer Risk	Chronic HI	Acute HI
Orange School	9.71E-09	0.000443	0.0125
Loma Verde School	1.97E-08	0.000899	0.0267
Castle Park School	2.29E-08	0.001040	0.0254
Montgomery School	7.94E-09	0.000363	0.0209
Finney School	5.96E-08	0.002720	0.0178
Castle Park HS	2.06E-08	0.000942	0.0284
Montgomery HS	2.36E-08	0.001080	0.0226
Rohr School	2.07E-08	0.000945	0.0276
S.T. Christian School	2.53E-08	0.001660	0.0221
Otay Elementary	9.83E-09	0.000449	0.0124

* All impacts at each sensitive receptor are far below the significance criteria for cancer (one in a million [1.0E-07] without TBACT and 10 in a million with TBACT), chronic (1.0), and acute (1.0) impacts.

Cancer risk is the probability or chance of contracting cancer over a human life span (assumed to be 70 years). Carcinogens are not assumed to have a threshold below which there would be no human health impact. In other words, any exposure to a carcinogen is assumed to have some probability of causing cancer; the lower the exposure, the lower the cancer risk (i.e., a linear, no-threshold model). Under various state and local regulations, an incremental cancer risk greater than 10-in-one million due to a project is considered to be a significant impact on public health. For example, the 10-in-one-million risk level is used by the Air Toxics Hot Spots (AB 2588) program and California's Proposition 65 as the public notification level for air toxic emissions from existing sources.

Non-cancer health effects can be either chronic or acute. In determining potential non-cancer health risks (chronic and acute) from air toxics, it is assumed there is a dose of the chemical of concern below which there would be no impact on human health. The air concentration corresponding to this dose is called the Reference Exposure Level (REL). Non-cancer health risks are measured in terms of a hazard quotient, which is the calculated exposure of each contaminant divided by its REL. Hazard quotients for pollutants affecting the same target organ are typically summed with the resulting totals

expressed as hazard indices for each organ system. A hazard index of less than 1.0 is considered to be an insignificant health risk. For this health risk assessment, all hazard quotients were summed regardless of target organ. This method leads to a conservative (upper bound) assessment. RELs used in the hazard index calculations were those published in the CARB/OEHHA listings.

Chronic toxicity is defined as adverse health effects from prolonged chemical exposure, caused by chemicals accumulating in the body. Because chemical accumulation to toxic levels typically occurs slowly, symptoms of chronic effects usually do not appear until long after exposure commences. The lowest no-effect chronic exposure level for a non-carcinogenic air toxic is the chronic REL. Below this threshold, the body is capable of eliminating or detoxifying the chemical rapidly enough to prevent its accumulation. The chronic hazard index was calculated using the hazard quotients calculated with annual concentrations.

Acute toxicity is defined as adverse health effects caused by a brief chemical exposure of no more than 24 hours. For most chemicals, the air concentration required to produce acute effects is higher than the level required to produce chronic effects because the duration of exposure is shorter. Because acute toxicity is predominantly manifested in the upper respiratory system at threshold exposures, all hazard quotients are typically summed to calculate the acute hazard index. One-hour average concentrations are divided by acute RELs to obtain a hazard index for health effects caused by relatively high, short-term exposure to air toxics.



Memorandum

Date: July 29, 2008

To: Rodolfo Valdez-Romero, Chula Vista Elementary School District

cc: S. Fahle and L. Billings, CVESD, and Paul Amberg, ICF Jones & Stokes

From: Michael Slavick, Senior Air Quality Specialist, ICF Jones & Stokes

Subject: **Air Quality Analysis and Health Risk Assessment Reports Reviews for the MMC Chula Vista Energy Upgrade project**

Summary of Reports Reviews

As requested, I have completed my review of the Application for Certification (AFC) for the above referenced reports prepared by the Project Applicant's Consultants, CH2M Hill and its air quality subcontractor, Atmospheric Dynamics. I also have completed my reviews of the air quality and public health sections of the Preliminary Staff Assessment (PSA) reports prepared by the California Energy Commission (CEC) and the Preliminary Determination of Compliance (PDOC) report prepared by the San Diego County Air Pollution Control District (APCD). All of these reports presented the independent analyses of air quality impact and the assessment of potential health risks that would result from approval of the proposed MMC Chula Vista Energy Upgrade project. These reports include the air quality analysis of impacts resulting from both construction and operation of the proposed project.

Findings and Primary Concerns with Health Risk Assessment

I have determined that the air quality analyses in each of the above referenced reports are in compliance with all applicable local San Diego County APCD Rules and Regulations. However, the primary concern is that the Health Risk Assessments (HRA) in all of these three reports is not consistent with the State of California Office of Environmental Health Hazard Assessment (OEHHA) risk assessment methodology. Health risk assessments were only estimated for residential receptors.

In addition to the residential receptors, the Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments (OEHHA, 2003) calls for evaluation of sensitive receptors such as schools and daycare centers as well as offsite workers (school employees). To estimate the cancer risk posed to school children that attend nearby schools, the HRA did not estimate the cancer risk posed to children over an exposure period of 9 years.

July 29, 2008

Page 2

Also, OEHHA recently released their revisions to the Technical Support Document for Noncancer Risks (OEHHA, 2008). The new noncancer risk methodology calls for an assessment of eight-hour exposure instead of one-hour exposure. Exposure duration for children and offsite workers will vary, but an eight-hour exposure duration assumption would be reasonable, particularly if children and offsite workers are exposed to the proposed power plant emissions at their school or place of work and not at their residential locations.

Because the proposed project would emit toxic air contaminants (TACs) to the nearby schools (i.e., Otay Elementary, Orange Avenue Preschool, Loma Verde Elementary, Castle Park Middle, and Montgomery School) that most likely have a higher risk than the place of residence, a health risk impact may result. The magnitude of the health risk impact would depend on a variety of factors, including the frequency and duration of a children's attendance, the children's exertion level (i.e., breathing rate) during the attendance, the amount of power plant activity occurring during the school year, and the meteorological conditions (wind speed, wind direction, and atmospheric stability level) during the operational events. While most residential receptors would probably receive a relatively slight health risk impact, the possibility exists that school children could accumulate a significant long-term cancer or non-cancer impact. The possibility also exists that any school children could receive a significant short-term (acute) impact. Therefore, the proposed project could expose school children and off-site workers (i.e., school employees) to significant health risk impacts associated with air pollutants from other sources.

One of the most difficult questions of risk management planning is: How much risk is acceptable for school children? While it would be ideal to completely eliminate all exposure to the toxic air contaminants, it is usually not possible or feasible to remove all traces of a TAC once it has been released into the atmosphere. The goal of most air quality regulators is to reduce the health risks associated with exposure to toxic air pollutants to a negligibly low level.

In 2003, the Senate Bill 352, Chapter 668, Statutes of 2003, expanded the requirements school districts must follow in identifying and reviewing the impacts of hazardous air emitters and hazardous material handlers within 1/4 mile of a school site. The Chula Vista Elementary School District would expect to find the HRA information in the AFC, PSA, and PDOC reports. Based on the information about the locations of the sensitive receptors in Figure 5.1-D2 and Table 5.1D-6, the AFC report has identified several schools that are located within 6 miles of the proposed project site. The AFC, PSA, and PDOC reports failed to indicate that the Otay Elementary School is located within 1/4 mile from the proposed project site. These reports also failed to include information about the assessment of the health risks on school children.

In 2005, the California Air Resources Board published the Air Quality and Land Use Handbook: A Community Health Perspective (CARB, 2005). This document considers the potential health impacts associated with proximity of sensitive receptors to various categories of air pollution sources so planners can explicitly consider this issue in the land use planning process. According to the Handbook, sensitive land uses deserve special attention because children, pregnant women, the elderly, and those with existing health problems are especially vulnerable to the non-cancer effects of air pollution. Examples of non-cancer effects are asthma attacks,

July 29, 2008

Page 3

heart attacks, and increases in daily mortality and hospitalization for heart and respiratory diseases. There is also substantial evidence that children are more sensitive to cancer-causing chemicals (CARB, 2005).

Conclusion

With the passage of Children's Environmental Health Protection Act (Senate Bill 25) in 1998, the health impacts of TACs on school children from the Chula Vista Power Plant Upgrade project need to be assessed. The OEHHA has prepared a methodology for performing an air toxics health risk analysis on school children. Therefore, it is my recommendation that the Chula Vista Elementary School District shall request that the Project Applicant, CEC, and San Diego County APCD use OEHHA guidance for HRA parameters including the risk assessment exposures on school children in the Final Assessment.

References

- California Air Resources Board (CARB). 2005. Air Quality and Land Use Handbook: A Community Health Perspective. (<http://www.arb.ca.gov/ch/landuse.htm>).
- California Energy Commission (CEC). 2008. Preliminary Staff Assessment for the Chula Vista Energy Upgrade Project. Section 4.1 Air Quality and Section 4.9 Public Health. Docket Number 07-AFC-4. Received April 29, 2008. (<http://www.energy.ca.gov/sitingcases/chulavista/documents/index.html>).
- California Office of Environmental Health Hazard Assessment (OEHHA). 2003. Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments. October. (http://oehha.ca.gov/air/hot_spots/HRAguidefinal.html)
- California Office of Environmental Health Hazard Assessment (OEHHA). 2008. Air Toxics Hot Spots Program, Revisions to the Technical Support Document for Noncancer Risk Assessment. July. (http://oehha.ca.gov/air/hot_spots/crn071808.html)
- MMC Energy Inc. 2007. Application for Certification for the Chula Vista Energy Upgrade Project. Section 5.1 Air Quality and Section 5.9 Public Health prepared by Atmospheric Dynamics as subcontractor to CH2M Hill. Submitted to CEC on August 10, 2007.
- San Diego County Air Pollution Control District (APCD). 2008. Preliminary Determination of Compliance MMC Chula Vista Power Plant Facility. Letter dated March 6, 2008.