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Jared Blumenfeld, Secretary for Environmental Protection  
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November 19, 2021

Robin Demma  
Air Quality Engineer  
Feather River Air Quality Management District  
541 Washington Ave.  
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Subject: Review of the Hot Spots Risk Assessment for **Chapel of the Twin Cities**

Dear Robin,

The Air Toxics Hot Spots Program Health Risk Assessment for airborne emissions from **Chapel of the Twin Cities** mortuary (facility) in the city of Yuba City has been reviewed by staff of the Office of Environmental Health Hazard Assessment (OEHHA), as required by Health and Safety Code Section 44361.

The Health Risk Assessment (HRA) includes HARP inputs/outputs and assorted documents prepared by the Feather River AQMD Staff. An HRA summary report with a description of the facility and tables of cancer risk and noncancer hazard results were not included, so OEHHA staff used the enclosed HARP files and documents to review the facility impacts on the surrounding community.

The facility is a mortuary/crematory (human remains only) with a single natural gas-fired retort incinerator. The hours of operation is stated to be 12 hours per day, and 2000 hours per year (two hours per charge, 1000 charges per year) Facility emissions appear to be based on proposed increase of 1000 charges per year. The modeling of cancer risk and noncancer hazards were determined at about 440 grid receptors, 160 census receptors three sensitive receptors, and 17 property boundary receptors. Grid receptor spacing of 150 meters was used. Near the facility, where the MEIR and MEIW are usually located, 50-100 meter spacing of grid receptors is recommended. The apparent closest sensitive receptor (Bridge Street Elementary School) is indicated to be 1270 feet (387 meters) from the mortuary. The closest residence is 25 meters away, and closest business is 40 meters away.

The HARP files indicate emissions of 18 Hot Spots substances. For mercury emissions, a conservative estimate of mercury emissions was applied by the Feather River AQMD, using the CATEF 1992 emission factor of 2.26 g Hg/charge.

The HARP PolDB Excel file shows that PAH emissions were based on Chemical Abstracts code (CAS) #1150, which has no cancer health values associated with it. The District should confirm that this is the correct CAS number to use for PAHs. PAHs with CAS #1151 is the code to use that has the cancer risk health values associated with it. Likewise, the code entered for dioxins was #1085, which has no health values associated with it and should be confirmed by the District. Code #1086 has the health values associated with dioxins.

### **Cancer Risk Assessment**

A summary table with the cancer risks at the PMI, MEIR and MEIW were not enclosed. A map showing the  $0.1 \times 10^{-6}$  30-year residential cancer risk isopleth is included. Based on examination of the HARP Residential "RiskSumbyRec" Excel file and associated Google Earth KML file by OEHHA staff, property receptor #619 with a cancer risk of  $0.32 \times 10^{-6}$  is the PMI. The facility shares a border with residences to the east. No discrete receptors were placed over these residences, and no grid receptors are nearby. Thus, property receptor #617 with a cancer risk of  $0.19 \times 10^{-6}$  appears to be the best choice for the MEIR.

The PMI property receptor #619 shares a border with a next-door business, Bill Edick Insurance Agency. Since there is no discrete receptor placed over this business, and no nearby grid receptor, the PMI is also the MEIW. Examination of the HARP worker "RiskSumbyRec" Excel file and associated Google Earth KML file by OEHHA staff finds that the MEIW cancer risk at this receptor is  $0.036 \times 10^{-6}$ . The HARP worker output file shows a Worker Adjustment Factor (WAF) of 4.2 was used for the MEIW. This is the maximum value for a WAF, and assumes complete overlap of worker hours with facility emissions of 8 hours/day, 5 days/week. Therefore, a health protective approach was used in describing the MEIW cancer risk.

The pollutant(s) contributing the greatest cancer risk at the receptors was not identified in the HRA. OEHHA staff review of the HARP Excel files shows that arsenic contributes over 90% of the risk at the PMI, MEIW and MEIR. A cancer burden and a 70-year residential cancer risk isopleth map was not determined in this HRA. However, based on the 30-year residential  $1 \times 10^{-6}$  cancer risk isopleth map supplied in the HRA, few or no residences would be in or near the 70-year  $1 \times 10^{-6}$  risk isopleth and the cancer burden would be negligible.

One of three sensitive receptors identified in the HRA, Bridge Street Elementary School, has a 30-year residential cancer risk at the school was  $0.0046 \times 10^{-6}$  at grid receptor #158. This sensitive receptor had the highest risk of the three found.

## **Noncancer Hazard Assessment**

For the noncancer chronic hazard, examination of the HARP residential “RiskSumbyRec” chronic Excel file and associated Google Earth KML file by OEHHA staff found that the HI at the PMI is 0.067 at property boundary receptor #619, the same location of the cancer risk PMI/MEIW. The MEIW is also at the same receptor; the HARP worker “RiskSumbyRec” chronic Excel file shows this receptor to have an HI of 0.071. HARP chronic residential runs (also used for the PMI) often have slightly higher HIs than the HARP chronic worker runs. However, this wasn’t the case here.

The likely MEIR identified by OEHHA staff was boundary receptor #617, with an HI of 0.038. This is the same location as the cancer risk MEIR. Although not specified in the HRA, mercury and arsenic represents over 90% of the chronic HI at the receptors, with the reproductive system/development and the central nervous system system as the target organ systems.

An 8-hour HI at the MEIW was not calculated in this HRA. The 8-hour MEIW is primarily designed to address worker chronic exposure to facility emissions that are discontinuous (e.g., 8 hours/day, 5 days/week). Because the main chronic hazard is mercury and arsenic, it would be expected that it would also be the main 8-hour MEIW hazard at the facility. Both metals have an 8-hour Reference Exposure Level (REL), so an 8-hour HI should be determined at the MEIW. However, even if there were significant overlap of the MEIW work hours and the facility emissions, the 8-hour HI would probably not reach 0.5.

For the noncancer acute hazard, examination of the HARP “RiskSumbyRec” acute Excel file and associated Google Earth KML file by OEHHA staff found that the HI at the PMI/MEIW is 0.358 at property boundary receptor #619, the same location of the cancer risk and chronic PMI/MEIW. The likely MEIR was identified by OEHHA staff to be boundary receptor #616, with an acute HI of 0.211. A residence appears to be up against the facility fence line at this receptor. Although not specified in the HRA, mercury contributes more than 90% of the acute HI at the receptors. The reproductive system/development and the central nervous system system are the target organ systems.

## **Summary of Findings and Recommendations**

The Hot Spots HRA did not contain a summary of the findings. Please refer to the OEHHA Summary Review Checklist that notes what is expected. For this HRA, the main points are:

- A detailed description of the facility and its surroundings are usually included. Grid receptor spacing 50-100 meters apart near the facility and in the location of the MEIR and MEIW is recommended. Discrete receptors can be placed over residences and off-site businesses that may be locations for the MEIR and MEIW
- Tables summarizing the cancer risk and acute/chronic noncancer hazard at the PMI, MEIR and MEIW are the main part of the HRA report and should be included. The substance(s) mainly responsible for the cancer risk should be identified. The substances primarily responsible for the HI values, and the organ system affected, should also be identified.
- Tables showing the annual average (in lbs/year) and maximum hourly (in lbs/hour) emissions for each substance (all sources combined) were missing. The annual average and maximum hourly emissions of each substance by emission source should also be included, but does not concern this particular HRA with one emission source.
- Reported emissions for PAHs and dioxins used codes that do not have Hot Spots cancer and noncancer risk values associated with them. The District should confirm that these are the correct CAS number to use. Usually, all PAH emissions are grouped under CAS#1151, and dioxins grouped under CAS#1086, which do have risk and hazards values associated with them.
- An 8-hour HI for the MEIW was not included in the HRA. There are REL values for the metals (mercury and arsenic) mainly responsible for the noncancer risk at the MEIW, so an 8-hour HI should be determined in this case.

Our analysis of the risks depends on the accuracy of the emissions estimates and the appropriateness of the air dispersion modeling. The intent of this letter is to confirm or reevaluate the results of the risk assessment; it should not be construed to imply that OEHHA agrees with any editorial comments or statements contained in the text of the risk assessment that do not impact the results. We hope that our comments are useful to the District and will help in any risk management decisions. If you would like to discuss the review, please call Dr. John Budroe at (510) 622-3150.

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November 19, 2021  
Page 5

Sincerely,

*Daryn Dodge*

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Air Toxicology and Risk Assessment Section