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March 4, 2024

California Air Resources Board
1001 I Street
Sacramento, CA 95814
Attn: Jonathan Bluffer

Dear Mr. Jonathan Bluffer:

The California Independent Petroleum Association (CIPA) appreciates the opportunity to comment on the SNAPS Lost Hills Draft Final Report. We appreciate the time the California Air Resources Board (CARB) took in preparing this report that summarizes and analyzes the results of air quality monitoring conducted from May 2019 to April 2020 in the vicinity of the Lost Hills Oil Field.

Based on our review of the published report and results overview document, we appreciate that the body of the report recognizes that the study found no adverse environmental impacts from operations at the Lost Hills oil field. Therefore, CIPA strongly objects to false and misleading statements made in the Executive Summary of the report that are unsubstantiated by CARB's own data in the body of the report. We recommend that CARB revise the SNAPS report to clearly indicate that the monitoring conducted did not identify any air emissions of concern from the Lost Hills Oil Field and that for all other findings, there is no clear indication that the oil field is the source of the emissions given the numerous other industrial operations and major highways that exist in the immediate area. Further, CIPA is calling for the following revisions to CARB's key conclusions listed in the overview document:

- Regional pollution levels in Lost Hills are similar to the levels throughout the Central Valley.
- Air quality indices indicate that air quality was generally good or moderate for the entire study period, except for the period that was directly affected by the 2019 forest fires.
- The concentration of diesel particulate matter detected are similar to many other areas in California, including those without oil and gas production.
- Concentrations of criteria pollutants measured met ambient air quality standards for the entire duration of the study.

The remainder of this letter provides our detailed comments and suggested revisions to the report and associated overview document and executive summary to ensure the final report presents an accurate and unbiased analysis and conclusion statements.

The Substantial Uncertainty Acknowledged in the Report Appendices is Ignored in its Presentation of the Results in the Report

Our primary concern with the report is the numerous unsubstantiated statements found throughout the main report and executive summary attributing increases in emissions to oil field activities, and which clearly conflict with the key conclusion lists above. We agree with the statement found on page 71 of Appendix C, that *“all information presented in the source apportionment report should be used with caution and all caveats should be considered prior to interpretation of the results.”* We suggest that this same sentence be added to the main report and its abstract, as well as the executive summary and overview document to make it clear to the reader that even after nearly a year of continuous monitoring and three years of post-monitoring analysis, CARB was not able to find any clear results that indicate oil and gas activities at the Lost Hills oil field were the source of measured pollutants; in fact the report states that all results be used with caution and be subject to numerous caveats. Yet, the unsubstantiated statements and conclusions do not follow this simple rule specified by the report.

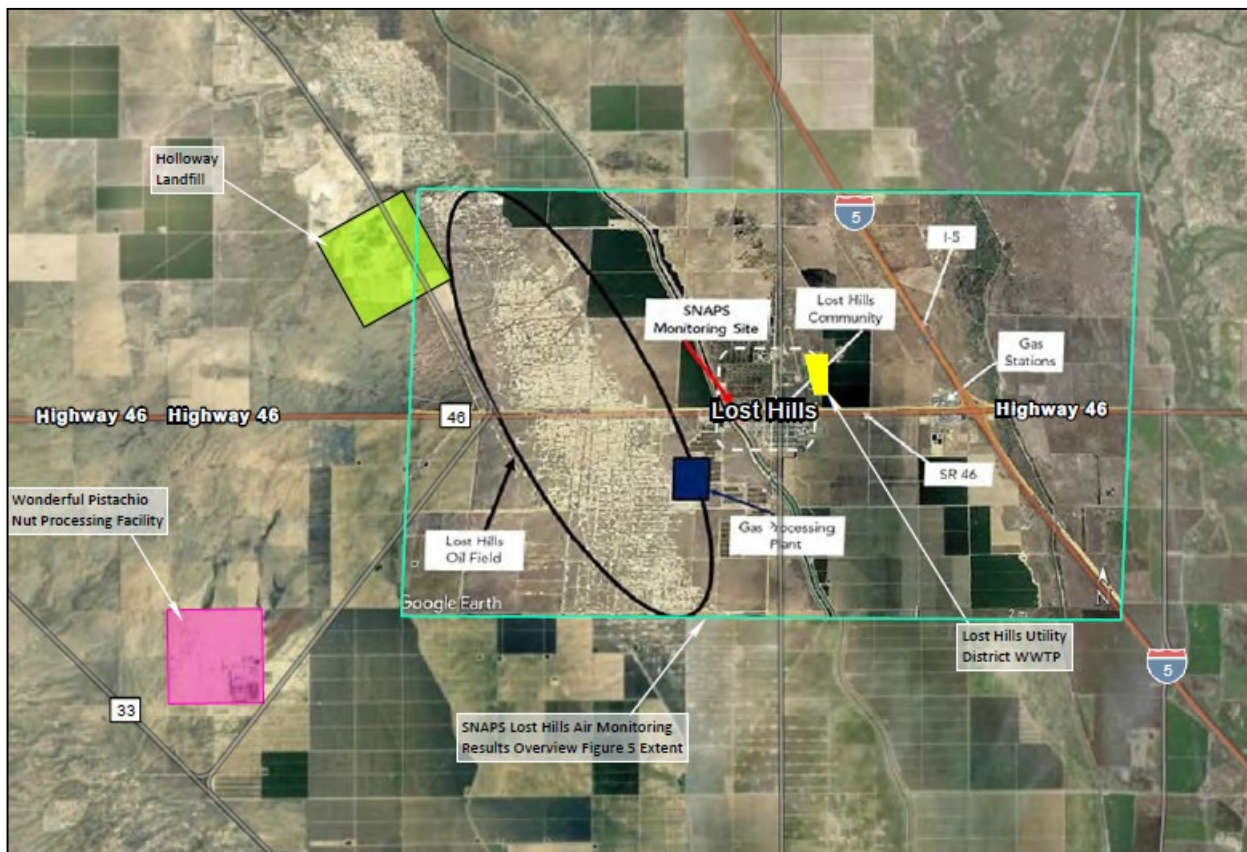
The presentation of CARB’s analysis in Appendix C demonstrates that there are many variables and most likely a mixing of emissions from various sources such that they cannot be reliably categorized, as stated on page 17 of the Appendix. This leads to residual uncertainties in the entire Positive Matrix Factorization that are nowhere further quantified. It is therefore appropriate to assume that all Positive Matrix Factorization-resolved factors are influenced by the background air in some way, and that the uncertainty in different inputs likely leads to a greater uncertainty than claimed effect. In fact, we assume the statement *“all information presented in the source apportionment report should be used with caution and all caveats should be considered prior to interpretation of the results”* is a reflection of the likelihood that claimed effects are likely well within the uncertainty of the Positive Matrix Factorization. **CARB should include these important caveats and notes throughout the report and in its executive summary to ensure that readers clearly understand that the results do not indicate any individual source of measured emissions is the Lost Hills Oil Field, and that the results of the Positive Matrix Factorization does not account for the substantial uncertainty in factors that Appendix C itself identifies.**

There are Many Sources of the Chemicals Detected in the SNAPS Data, Yet the Report Conclusions Continually Point to Oil and Gas, without any substantiation.

Several statements in the report point to the Lost Hills Oil Field as the source of emissions; **however**, in addition to the limits of analytical uncertainty rendering these findings unsubstantiated, the statements also ignore other obvious potential sources of such emissions. A prime example of an unsubstantiated statement is on page 21 and 23 of the Executive Summary which states that, *“SNAPS data indicates mobile sources and oil- and gas-related operations are substantial pollution sources with potential health impacts to the Lost Hills*

Community,” and “[o]il and gas-related sources are a major source category impacting Lost Hills”. However, the preceding 20 pages clearly describe that the SNAPS data **does not support** this statement. These inaccurate conclusory statements are misleading to stakeholders and the Lost Hills community and should be removed from the body of the report, the executive summary and the overview document. Further, these other known sources of emissions in Lost Hills that may have an impact on air quality should be listed and specifically named in the list on page 10 of the executive summary, and depicted in Figure 7 of the executive summary. Specific examples of these statements found in other areas of the report are discussed below.

Page 17 of the report makes the following misleading statement regarding suitability of the SNAPS monitoring location, “This site is ideal for monitoring potential fugitive emissions from oil field activities with few other pollutant sources in close proximity.” In fact, there are several major pollutant sources in proximity to the monitoring location, including mobile sources on State Route 46 (SR-46) and Interstate 5 (I-5), Holloway Landfill, Wonderful Nut Processing Facility which has substantial diesel truck traffic, and the Lost Hills Utility Wastewater Treatment Facility. These additional potentially significant sources of pollution should be illustrated on Figure 2.2 of the main report, Figure 5 of the overview document, and Figure 7 of the executive summary and described clearly in the report. Provided below is our suggested revision for this figure.



This blatant lack of consideration of other sources of pollutants is most obvious in the analysis of hydrogen sulfide and methane detections for which the report points to oil field operations both generally, as well as the Gas Plant on the field. This is surprising considering that the the

Holloway Environmental Landfill is literally adjacent to the oil field and also upwind of the SNAPS monitors. This facility accepts up to **2,000 tons per day of material**, largely comprised of dewatered Class A, B, and Sub-Class B biosolids and fly ash. Emissions from landfill disposal of wastewater solids is difficult to avoid because the material is highly and quickly putrescible and prone to emitting methane and hydrogen sulfide. During that time, wastewater solids are highly likely to become anaerobic and to begin generating methane and hydrogen sulfide that cannot be captured. This is precisely why under Senate Bill 1383, landfills will begin banning most biosolids in 2025.¹ Similarly, biosolids are known to emit hydrogen sulfide, which may be adsorbed by fly ash. Fly ash produced from the breakdown of gypsum (fly ash disposed at Holloway Landfill is sourced from the nearby gypsum mine²) is known to emit hydrogen sulfide.³ In addition, the Lost Hills Wastewater Treatment Plant, located near the intersection of SR 46 and Lost Hills Road and therefore also upwind of the monitoring site is another source of hydrogen sulfide and methane that does not appear to be considered in the analysis. The report should clearly list these operations as likely potential sources of these pollutants.

In addition, we note that fall of 2019 was one of the worst fire seasons in California history⁴ and this overlaps directly with the timing of air monitoring conducted for this study and likely heavily influenced the concentration of measured emissions. Therefore, late October/early November 2019 did not just correspond with heavy winds as noted in the abstract and summary of the report, but major fire events that emitted significant volumes of dust and metal over the entire state of California⁵. This is the only time during the SNAPS study that dust and metals emissions exceeded thresholds and the air quality index indicated the air was unhealthy. The report should clearly identify these environmental occurrences as the source of these findings and state unequivocally that during the entire remaining duration of the monitoring air quality was good both upwind and downwind of the Lost Hills oil field. While the report does note the fires in some sections, such major events affecting air quality should be discussed in much greater detail and incorporated into the analysis and conclusions in the main body of the report, as well as the executive summary and overview document.

Periodicity in Emissions is Incorrectly Attributed to Oil and Gas

Instead, the analysis in the report focuses on the Gas Plant and oil field as the primary sources of methane and hydrogen sulfide. On page 34, the report states *“while not substantially different, the lowest average concentrations of hydrogen sulfide occurred on Sundays and highest average concentrations occurred on Tuesday, Wednesdays and Thursdays. This can potentially be attributed to a slight increase in activity on the Lost Hills Oil Field on weekdays.”* Similarly, page 38 of the report states, *“[w]hile not substantially different, the highest average concentrations of benzene occurred on Mondays, Tuesdays, and Wednesdays, possibly linked to greater vehicle traffic during the week in the region (Appendix C) or to a slight increase in activity on the Lost Hills Oil Field on weekdays.”* This correlation of increases occurring on

¹ <https://www.cwea.org/news/resource-recovery-on-a-deadline-in-2025-landfills-will-ban-most-organics-biosolids/>

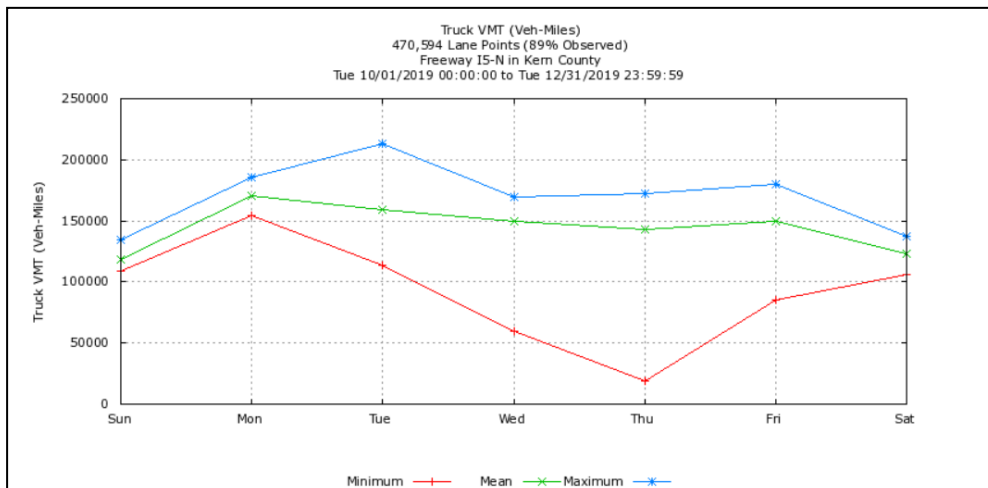
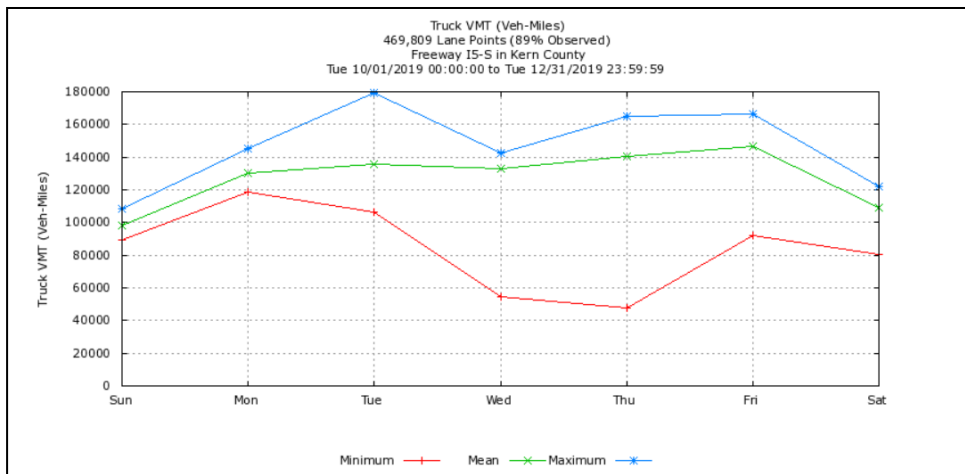
² <https://hollowayag.com/soil-amendments/gypsum/>

³³ <https://scdhec.gov/sites/default/files/Library/OR-1906.pdf>

⁴ <https://heavy.com/wp-content/uploads/2019/10/screen-shot-2019-10-30-at-10.43.27-am.jpg?quality=65&strip=all>

⁵ <https://www.economist.com/graphic-detail/2022/10/19/one-year-of-wildfires-undid-decades-of-californias-emissions-policy>

specific days of the week and oil field operations is completely unsubstantiated. Not only are oil field operations 24/7 with increases only with specific activities such as drilling or reworks that would occur over an 8-10 day period versus regularly Tuesday-Thursday, but Figure 3.19 presents a comparison of well drilling, well workover, and WST events and oil- and gas-associated pollutant concentrations and clearly shows that the analysis finds no correlation between oil-field activities and oil- and gas-associated pollutants (i.e., methane, benzene, ethane, and toluene). Oil field-related benzene would only be expected to fluctuate during isolated events (e.g., during drilling), and would not be expected to track a consistent pattern during certain weekdays throughout the year. As illustrated in figure C.3 of Appendix C, drilling and WST activities were not recorded during the SNAPS study period of October 2019-April 2020. The trend of increasing benzene and VOCs actually tracks much more closely with traffic data provided on Caltrans PEMS database which demonstrates that maximum truck traffic on I-5 is often observed on Mondays, Tuesdays, Wednesdays, as illustrated in the screenshots of the PEMS database chart for the segments of I-5 through Kern County during the study period provided below. Several factors may contribute to an increase in roadway traffic during those particular days including the waste acceptance schedule at Holloway Landfill and transport schedule of Wonderful products to and from the nearby processing facility. The report makes no attempt to consider any other explanation for the periodicity of these emissions increases except for the unsupported suggestion of oil field activities.



CARB's Human Health Risk Assessment is Not Specific to Sources, But Characterizes the Entire Area with a Poor Characterization of Regional Background for Comparison

Another issue is found with the characterization of the report's Human Health Risk Assessment. Although the mathematical calculations of cancer risk and hazard quotients are technically correct, the characterizations that air concentrations and associated health risks are associated to any degree with Lost Hills oil field operations is highly inaccurate and misleading. Most importantly, as discussed in the main text of the report and in greater detail in Appendix E, only limited upwind (background) air monitoring was conducted at the same time as monitoring downwind of the oil fields. Importantly, methane was the only analyte measured during upwind (background) monitoring. In essence, the risk assessment risks and hazards presented in the Report represent total risks and hazards from all sources (such as the major highways through the study area, Holloway Landfill, the wastewater treatment facility, and the Wonderful nut processing facility, all of which are also upwind of the community of Lost Hills), not specifically Lost Hills oil field operations. This should be corrected in the main body of the report, as well as the stand-alone executive summary and overview document prior to publishing the final report.

Other Issues with CARB's Human Health Risk Assessment – Toxicity Values

Average air concentrations of 13 analytes were reported to correspond with excess cancer risks exceeding 1×10^{-6} . These are diesel PM, carbon tetrachloride, formaldehyde, benzene, chromium VI, acetaldehyde, arsenic, nickel, styrene, isoprene, ethylbenzene, naphthalene, and hexachloroethane. The average air concentration of only one analyte (acrolein) was reported to correspond with a chronic hazard quotient (HQ) exceeding the target HQ of 1. The maximum concentration of two analytes (acrolein and dimethyl disulfide [DMDS]) were reported to correspond with acute HQs exceeding the target HQ of 1. With the exception of DMDS, isoprene, and styrene, the applicable cancer and noncancer toxicity values for all analytes noted above were correctly taken directly from OEHHA's chemical database⁶. The three exceptions are discussed below.

In the case of DMDS, the basis for the Health Guideline Value used by CARB to calculate the acute HQ is a 90-day rat neurotoxicity study as reported by the European Chemicals Agency and European Food Safety Authority (ECFA 2019). Based on the information provided in ECFA (2019), it appears that this acute Health Guideline Value is based on a no-observable-adverse-effect-concentration of 5 ppm (19,000 $\mu\text{g}/\text{m}^3$) to which an uncertainty factor of 1,000 was applied to derive the acute Health Guideline Value of 19 $\mu\text{g}/\text{m}^3$. The raw data from this study was not provided in the ECFA (2019) report and the study does not appear to have been published in the peer-reviewed literature. We therefore question whether this study would normally be considered acceptable by OEHHA for deriving toxicity values for regulatory purposes. The uncertainty regarding this analysis should not be buried in an appendix but

⁶ <https://oehha.ca.gov/chemicals>

should be clearly described in all areas of the report where a discussion of DMDS and potential toxicity is included.

Regarding isoprene, this pollutant was listed by OEHHA as a carcinogen in 1996, but there is no inhalation unit risk value (IUR) in the OEHHA chemical database. This is important since the SNAPS study is predicated on air emissions and potential health risks from inhalation. The Health Guideline Value footnote for isoprene states, "*[d]raft value undergoing the formal process for adoption, including review by Scientific Review Panel on Toxic Air Contaminants.*" Given that the underlying data and IUR derivation method for isoprene is under review and not available to the public for review, any conclusions related to the health risks of isoprene in this SNAPS study are tenuous and preliminary, at best. At worst, they are completely wrong. Therefore, it would only be appropriate for another draft of this entire SNAPS report to be released for a 60-day public comment period once this report is updated following the formal review process of the Health Guideline Value for isoprene.

Similar to isoprene, styrene was listed by OEHHA as a carcinogen in 2016, but there is no IUR in the OEHHA chemical database. The Health Guideline Value footnote for styrene states, "*[cancer potency factor] derived for Public Health Goal (OEHHA 2010); IUR calculated from [cancer potency factor] assuming 20 m³/day ventilation and 70 kg body weight.*" While this is a common practice, there should be some discussion of the underlying data used to derive the cancer potency factor to confirm that such route-to-route extrapolation is justified in this particular case. Without the addition of this discussion, there is no basis for any conclusions regarding the health risks of the measured concentrations of styrene in the report.

In addition to the analytes for which cancer risk was quantitatively evaluated, the report called out acrolein as a carcinogen, but did not calculate cancer risks as **no regulatory agency has yet derived a cancer potency factor or IUR for acrolein**. As stated on page 78 of the Report, "*[a]crolein, a recently identified carcinogen, was not included in the cancer risk assessment due to lack of a cancer potency value. OEHHA is exploring the development of a cancer potency value for acrolein, which would facilitate assessment of acrolein in future SNAPS risk assessments.*" Not only is there not an adopted cancer potency value for acrolein but USEPA does not even concur with OEHHA that acrolein is a human carcinogen. According to USEPA (2003), "Under the Draft Revised Guidelines for Carcinogen Risk Assessment (U.S. EPA, 1999), the potential carcinogenicity of acrolein cannot be determined because the existing data are inadequate for an assessment of human carcinogenic potential for either the oral or inhalation route of exposure. There are no adequate human studies of the carcinogenic potential of acrolein. Collectively, experimental studies provide inadequate evidence that acrolein causes cancer in laboratory animals.⁷" Given this, **it is completely inappropriate to describe acrolein as a carcinogen in the report and the text should be updated accordingly**. Further, the report should clearly describe the acrolein is a very common ingredient in pesticides used on agricultural fields, and is also used in wastewater treatment plants as an herbicide, as well as application in land disposal of biosolids, and is also a primary constituent of mobile source emissions and forest fires as is noted by the CDC.⁸ Given that all three common sources of

⁷ https://iris.epa.gov/ChemicalLanding/&substance_nmbr=364

⁸ <https://www.atsdr.cdc.gov/toxprofiles/tp124-c6.pdf>

acrolein (i.e. agricultural fields, wastewater treatment plant, and landfill that accepts biosolids) are present upwind of the Lost Hills Community, which is located between two major transportation highways (I-5 and SR-46), and that the study coincided with one of the largest years for forest fires, it is not at all surprising that CARB observed elevated concentrations of this pollutant during the SNAPS study. This should be clearly and explicitly described in the final report.

Closing

We appreciate CARB's careful consideration of our comments and recommendations. In closing, we strongly advocate that CARB revise the SNAPS report to clearly indicate that the monitoring conducted for the SNAPS program did not identify any air emissions of concern from the Lost Hills Oil Field and that for all other findings, there is no clear indication that the oil field is the source of the emissions given the numerous other industrial operations and major highways that exist in the immediate area.

Sincerely,

A handwritten signature in black ink, appearing to read 'Rock Zierman', with a long horizontal flourish extending to the right.

Rock Zierman
CEO

cc: Rajinder Sahota
Matt Botill
Carolyn Lozo