APPENDIX A:

Reponses to Comments on the AIR MONITORING NETWORK RESULTS FOR 2014 VOLUME 4

Comment Number	Comment	Response	Action
1.	**From CRLAF, NRDC, PANNA, & CEH:** **Report's focus on negative sampling results conveys a false sense of security and is based on a skewed analysis –** The statement in the report that 91.7% of analyses had no detectable pesticide concentrations is highly misleading because it ignores the realities of pesticide use patterns. In order to reach 100% detections, every pesticide tested for would have to be found on each of the 157 days at each of the three air monitoring sites. In reality, use of most pesticides is concentrated in certain months. As pesticide use varies between crops and regions, not all of the pesticides monitored for are used near all of the monitoring sites. Therefore, using the total number of samples for all pesticides at all locations as the denominator does not provide a meaningful context. Detection frequency should be calculated based on what pesticides were used in the vicinity and in the time-frame being sampled.	DPR disagrees with this comment. All obtained results are included in the Results section of the report and in Raw Data file located in our Web Site <http://www.cdpr.ca.gov/docs/emon/airinit/air_network_results.htm> Every attempt is made by staff to convey the obtained results in clear and unbiased manner. Report format and presentation is consistent with previously released DPR study publications. DPR is in the process of conducting a comprehensive evaluation of pesticide air concentration in relation to pesticide use patterns and meteorological conditions for various pesticides included in the Air Monitoring Network (AMN). The evaluation will include analysis of pesticide use data, such as the amount, date, and location of applications, as well as analysis of wind speed, wind direction, and other weather conditions during the 2011 – 2014 AMN sampling periods. This evaluation will be included in a separate report.	*No changes to report are needed.* *Suggestions were taken into consideration by DPR*

Reponses to Comments on the AIR MONITORING NETWORK RESULTS FOR 2014 - VOLUME 4

Comment Number	Comment	Response	Action
2.	**From CRLAF, NRDC, PANNA, & CEH:** **DPR makes overly broad conclusions drawn from limited air monitoring data –** We strongly disagree with the Department's statements announcing AMN results: "Once again, air monitoring results released from the California Department of Pesticide Regulation (DPR) show that most of the monitored pesticides, in various rural agricultural communities, were found well below levels that indicate a health concern or need for further evaluation." And "DPR's Air Monitoring Program, which is based on good scientific data, shows our overall approach is working to protect Californians as pesticides are used to grow food for the nation." The Department has an obligation to communicate to the public the significance of the sampling results in terms of what <u>was</u> found and how the results correlate with weather and pesticide use patterns. In the press release, scientific context should be given, i.e., that air samples taken once a week tell us what is in the air on the day that the sample is taken, for specific analytes. This explanation is consistently missing from the press releases for AMN data, and yet is a key point when discussing the limitations of any air sampling plan. Another important detail not highlighted in DPR press releases is that the sampling is meant to provide *some* insight into exposures in areas of heavy pesticide use. The press release should <u>not</u> have stated that the air monitoring program shows that DPR's approach is protecting Californians because it is not valid to extrapolate from several air monitoring stations to the whole state.	Comment is directed towards the Department's press release and not towards the "Air Monitoring Network Results for 2014 – Volume 4" draft document. Comment acknowledged by the Department. No response required.	*No changes to report are needed.*

Reponses to Comments on the AIR MONITORING NETWORK RESULTS FOR 2014 - VOLUME 4

Comment Number	Comment	Response	Action
3.	**From CRLAF, NRDC, PANNA, & CEH:** **The press release includes inaccurate and misleading statements –** The press release incorrectly stated that 32 pesticides and 5 breakdown products were monitored by ARB in Oxnard, Santa Maria, and Watsonville. Only 3 pesticides (1,3 D, methyl bromide and chloropicrin) were monitored at these ARB sites and chloropicrin was only monitored for 3 months of the year. The press release was very misleading in stating that the average 1,3-dichloropropene (1,3-D) level at only one site (Shafter) was above the DPR target level for cancer risk because this gives the appearance that this is the only site at risk. But if results are averaged over the past 4 years, the target level was also exceeded at Oxnard and Santa Maria sites, which should have been reported. On a related note, while it is true that in February of 2014 DPR stopped granting exceedances to the 1,3-D township cap and this may have reduced use in some areas, it is misleading to characterize this move to enforce an existing use limit as lowering the amount of 1,3-D that could be used. Under findings it is misleading to only report that chloropicrin level at the Santa Maria ARB site slightly exceeded the chloropicrin seasonal screening level, which again gives the appearance that this is the only site at risk. In fact, the air level at the Salinas site was only slightly below this screening level in 2014 and exceeded the screening level in 2013, which should have also been reported.	Comment is directed towards the Department's press release and not towards the "Air Monitoring Network Results for 2014 – Volume 4" draft document. Comment acknowledged by the Department. No response required.	*No changes to report are needed.*
4.	**From CRLAF, NRDC, PANNA, & CEH:** **Evaluation of pesticide air concentration in relation to pesticide use patterns and meteorological conditions is long overdue –** One of the stated goals of the AMN, reiterated in the 2014 report, is to attempt to correlate (air) concentrations with (pesticide) use and weather patterns. However, this is the 4th year the network has been operating and to date no correlation has been conducted. Data are now available for 2011, 2012 and 2013 so this comprehensive analysis should be completed without further delay. The analysis should examine both weather patterns and use of all monitored pesticides within 1.5 miles and 5 miles of each Air Monitoring Site and report on the distance to the closest agricultural fields. This analysis is critical in order to understand how pesticide use levels in close proximity to the air monitoring sites compare to pesticide use levels in other areas of these communities and other agricultural communities.	DPR is in the process of conducting a comprehensive evaluation of pesticide air concentration in relation to pesticide use patterns and meteorological conditions for various pesticides included in the Air Monitoring Network (AMN). The evaluation will include analysis of pesticide use data, such as the amount, date, and location of applications, as well as analysis of wind speed, wind direction, and other weather conditions during the 2011 – 2014 AMN sampling periods. This evaluation will be included in a separate report.	*No changes to report are needed.* *A separate report will be released by DPR once the described analysis is completed.*

Reponses to Comments on the AIR MONITORING NETWORK RESULTS FOR 2014 - VOLUME 4

Comment Number	Comment	Response	Action
5.	**From CRLAF, NRDC, PANNA, & CEH:** **DPR Monitoring sites should be relocated without further delay –** Even without correlation with pesticide use and weather data, air monitoring data collected in the past four years of monitoring suggest that the monitoring sites were not appropriately chosen. While each of the communities selected has a high level of pesticide use overall, the sites chosen were not sufficiently close to areas of high pesticide use to reflect average, let alone maximum exposures for each community. The Ripon site is in the center of town, the Salinas site is near the airport and the Shafter site is located next to a residential area with no pesticide use reported in the same section in 2011-2013. Examples of more appropriately located sites where other air monitoring is done are three sites monitored by California ARB, located at Ohlone Elementary School in Santa Cruz County, Rio Mesa High School in Ventura County, and in Santa Maria, in localized areas where pesticides are known to be intensively used. The comparison with other monitoring in Table 38 of this report shows that most pesticides have been detected at much higher levels in other California air monitoring studies. This finding illustrates that the DPR Air Monitoring Network sites were not appropriately chosen to accurately capture high end exposures and thus would underestimate such exposures in rural California. Table 38 should be updated to include results for ARB air monitoring for fumigants at the Ventura, Santa Barbara and Monterey county sites between 2011 and 2014 as well as 1,3-dichloropropene monitoring conducted by Dow in Merced county in 2010 and 2011. Air monitoring should be continued in the future but alternate sites located in communities with high pesticide use ratings should be selected. Selection of new monitoring sites should include consideration of the likelihood of collecting data useful for characterizing human exposures. Selection of sites could be aided by public health researchers or the California Department of Public Health. Targeted sampling several times a week at several sites in a community when pesticide use is heaviest is a preferable monitoring strategy. Seasonal sampling was recommended by DPR PREC members from the ARB and SWRCB at the August 16, 2013 PREC meeting. Sampling could be conducted in different months for fumigants and other pesticides since different monitoring methods are used. This will allow substantially more air monitoring data to be collected for the same analytical costs.	DPR reevaluated community data in 2013 (Segawa, et. Al, 2014) and expanded the number of candidate communities to 1,267. Using the same methodology as in 2010, the current three communities continued to remain areas of high use for many of the monitored pesticides and DPR staff recommended that monitoring should continue at the same three monitoring sites. DPR will take this comment along with other comments made by interested stakeholders into consideration before making a final decision on the future of the air monitoring network. Table 38 lists the highest 24-hour concentrations of the pesticides monitored in Salinas, Shafter, and Ripon from 2011 to 2014 compared to previous ARB, DPR, and PANNA monitoring studies in California. Twenty-four (24) hour maximum concentrations from ARB's air monitoring at Ventura, Santa Barbara, and Monterey counties are considered for inclusion in this table. However, since only the highest 24-hour concentration from all non-AMN studies are included in the respective "Other Studies" column, only the highest single concentration from any of the above mentioned studies is listed. Between October 2010 to December 20111, Dow AgroSciences (DAS) sponsored a study to estimate concentrations of 1,3-dichloropropene (1,3-D) in a 9 township region of Merced County for verification of the SOFEA/ISCST3 air dispersion modeling system. DAS collected 72-hour air samples using sorbent tubes. All studies included on Table 38 represent results from 24-hour samples. Interpolating the 72-hour concentrations from the DAS study into usable 24-hour concentration for inclusion on Table 38 could artificially inflate the data and provide an estimated highest 24-hour concentration with unknown accuracy.	*No changes to report are needed.* *Suggestions were taken into consideration by DPR.*

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Comment Number	Comment	Response	Action
6.	**From CRLAF, NRDC, PANNA, & CEH:** **Method for Describing Health Risks is Inadequate –** We disagree with the statement in the report (see page 7) that measured air concentrations below DPR screening or reference levels or regulatory target concentrations would not be considered a significant health concern and do not need to undergo further evaluation. As described in the "Pesticide Levels of Concern" section below, for some pesticides OEHHA, including methyl bromide and chloropicrin recommends more health protective reference levels or regulatory target concentrations. This should be acknowledged in the report. FQPA adjusted hazard quotients should be included in this report as they were in the Parlier report. Similarly, for pesticides under review by DPR or USEPA, like chlorpyrifos, the report must acknowledge that current screening levels may not be adequate to protect against health impacts for vulnerable populations. The report accurately states (see page 14) that maximum acute pesticide exposures are likely much higher than AMN results and that network monitoring better characterize sub-chronic and chronic exposures. The report also points out that acute exposures are best assessed by application site monitoring. Unfortunately little application site monitoring is being conducted. ARB has been contracted to conduct application monitoring for chlorpyrifos since last year but has reportedly had difficulty finding a monitoring site.	DPR developed health screening levels for the monitored pesticides to place the results in a health-based context. The health screening level is the calculated air concentration based on a chemical's toxicity that is used to evaluate the possible health effects of exposure to the chemical. Although screening levels are not regulatory standards, they can be used to evaluate air monitoring results and determine if a more detailed assessment is warranted. Additionally, pesticides that have a risk management directive, regulatory goals are used instead of screening levels. Methyl bromide and chloropicrin are two pesticides for which the risk management directives specify air concentration goals for developing regulatory requirements. Data from the air network is used in part to determine the effectiveness of regulatory requirements. Therefore, it is more appropriate to compare the detected concentrations to the regulatory goals instead of screening levels. The manner in which pesticide air concentrations are stated in this Report, are consistent with previous DPR study publications. Pesticide concentrations measured in all three of our monitoring locations are listed in various tables throughout the Report, and described in the Report's text and in the Report's conclusion and Executive Summary. DPR believes that Report's results are clearly and effectively presented and thus no changes are required.	*No changes to report are needed.* *Suggestions were taken into consideration by DPR*

Reponses to Comments on the AIR MONITORING NETWORK RESULTS FOR 2014 - VOLUME 4

Comment Number	Comment	Response	Action
7.	**From CRLAF, NRDC, PANNA, & CEH:** **Pesticide Levels of Concern Detected at Air Monitoring Sites – 1,3-Dichloropropene** We are very concerned that if annual average levels of 1,3-D averaged over 2011-2014 at each DPR AMN site are sustained; the cancer risk will exceed DPR's designated level of concern at the Shafter site and will exceed the 1 in one million bystander risk level at all three sites. We note that the level averaged over 2011-2013 at the Ripon site also exceeded DPR's level of concern. None of these sites are located within townships with the most intensive 1,3 D use where cap exceedances were granted, illustrating that additional mitigations are needed. In fact, the Shafter site is about 40 miles away from the Arvin township, the only Kern county township where cap exceedances were granted. While annual average 1,3-D levels dropped at the ARB Oxnard and Santa Maria monitoring sites, which are in townships where cap exceedances have been granted, the 4 year average air levels remain above DPR's level of concern for cancer risk.	DPR is in the process of conducting a comprehensive evaluation of 1,3-D use, detections, and new toxicological studies as part of the Department's update to the 1,3-D risk assessment. Final decision on regulatory goals and mitigation procedures will be taken after the updated risk assessment is complete.	*No changes to report are needed.*
8.	**From CRLAF, NRDC, PANNA, & CEH:** **Pesticide Levels of Concern Detected at Air Monitoring Sites – *Chlorothalonil*** The carcinogenic fungicide chlorothalonil was detected in 52% of samples overall and 77% of Shafter samples at low or trace levels, an increase from 60% detections in 2013. The draft report contains an error where it states (page 43) that 1,3-D was the only known human carcinogen with quantifiable detections. The highest 24 hour level of chlorothalonil measured was 117 ng/m^3 and highest 4 week average level was 76.6 ng/m^3. No use of chlorothalonil or any other pesticide was reported in the one square mile section where the Shafter monitor is located in 2011-2013. In areas of more concentrated pesticide use, levels would be expected to be higher. In this draft, DPR again uses an acute and sub-chronic screening level of 34,000 ng/m^3 based on an oral toxicity study in 2007. DPR developed a much more health protective screening level of 560 ng/m^3 based on an inhalation toxicity study in 2003. In 2012, U.S. EPA proposed using an acute inhalation study as a basis for their level of concern, which would give an inhalation-based reference exposure level (equivalent to DPR's screening level) of 260 ng/m^3. The health standards for chlorothalonil have shifted several times over the past few years, indicating that DPR should prioritize and develop a proper evaluation of inhalation toxicity of chlorothalonil—including consideration of low doses.	Changes to text on Page 43 of the draft Report were made to list chlorothalonil as a chemical that was detected at quantifiable concentrations and is considered a human carcinogen under the U.S. EPA B2 list. The manner in which pesticide air concentrations are stated in this Report, are consistent with previous DPR study publications. Although DPR will take this comment along with other comments received by interested stakeholder into consideration, DPR believes that Report's results are clearly and effectively presented and thus no changes are required.	*Changes to report were made.* *Suggestions were taken into consideration by DPR*

Reponses to Comments on the AIR MONITORING NETWORK RESULTS FOR 2014 - VOLUME 4

Comment Number	Comment	Response	Action
9.	**From CRLAF, NRDC, PANNA, & CEH:** **Pesticide Levels of Concern Detected at Air Monitoring Sites – *Chlorpyrifos and Chlorpyrifos oxon*** The brain-harming, neurotoxic pesticide chlorpyrifos and its oxon breakdown product were detected in 24% and 26% of samples overall and 56% and 62% of samples at the Shafter site. The maximum 24 hour concentrations detected at the Shafter site were 337.9 ng/m^3 (28.2% of acute screening level) for chlorpyrifos and 109.6 ng/m^3 (9.1% of acute screening level) for chlorpyrifos oxon. If the early-life vulnerability for the fetus and young children were to be taken into account in the acute and sub-chronic screening levels using the FQPA 10X factor (as it is in the chronic screening level), the highest one day level measured at the Shafter site was 2.8 times the screening level. Similarly, the highest 4-week rolling concentration exceeded the sub-chronic screening level adjusted for early-life vulnerability. It is troubling to note that in areas of more intensive pesticide use, levels would be expected to be higher. As shown in Table 38 of this report, the 2004 air monitoring conducted by PANNA in Lindsay, CA in close proximity to orange groves documented a peak 24 hour chlorpyrifos air level of 1,340 ng/m^3.	Comment acknowledged by DPR. Screening Levels included in the draft Report are consistent with previous DPR study publications. No changes to the report are needed.	*No changes to report are needed.*
10.	**From CRLAF, NRDC, PANNA, & CEH:** **Pesticide Levels of Concern Detected at Air Monitoring Sites – *Methyl Bromide*** Methyl bromide, a neurotoxicant and reproductive toxicant, was detected in 24% of samples overall, and 27% of samples at the Salinas airport and 30% of samples in Ripon. DPR's seasonal regulatory limit for methyl bromide of 19,400 ng/m^3 (5 ppb) is not considered adequately health protective by OEHHA. OEHHA supports a seasonal or sub-chronic limit of 3,880 ng/m^3 (1 ppb) to protect children. This was exceeded at the ARB monitoring site in Oxnard.	Comment acknowledged by DPR. Screening Levels included in the draft Report are consistent with previous DPR study publications. No changes to the report are needed.	*No changes to report are needed.*

Reponses to Comments on the AIR MONITORING NETWORK RESULTS FOR 2014 - VOLUME 4

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11.	**From CRLAF, NRDC, PANNA, & CEH:** **Pesticide Levels of Concern Detected at Air Monitoring Sites – *Chloropicrin*** The fact that the highest monthly average chloropicrin level reached 94% of seasonal screening level at the Salinas site in 2014 and was exceeded in 2013 at the Salinas site is especially troubling because there was no chloropicrin use reported in 2013 in the 1 square mile section containing the Salinas monitoring site. There are many areas of heavier chloropicrin use in Salinas and other areas of the central coast. The chloropicrin seasonal screening level was exceeded at the ARB Santa Maria site even though it appears that the three months of monitoring at the ARB monitoring sites may not have captured peak exposures. In future chloropicrin monitoring on the central coast should be expanded at least to July – November. At the Santa Maria site one of the higher chloropicrin levels was measured on the last monitoring date, October 30th, and methyl bromide, always formulated with chloropicrin, was found in November. At the Oxnard site fairly high levels of methyl bromide were measured in July. Of even greater concern, the average concentration of chloropicrin was 291.2 ng/m^3 in Salinas, 146.2 ng/m^3 in Ripon and 111 ng/m^3 in Shafter. If sustained over time, all these concentrations greatly exceeds the reference concentration of 1.6 ng/m^3 for controlling cancer risk to the 1 in a million level which was established in the DPR Chloropicrin Risk Characterization document and supported in review by OEHHA and the TAC Scientific Review Panel.	Comment acknowledged by DPR. No changes to the report are needed.	*No changes to report are needed.*
12.	**From CRLAF, NRDC, PANNA, & CEH:** **Air Monitoring Network Trend Analysis is Incomplete –** This draft report is incorrect in stating that all concentrations in 2014 were low relative to their screening levels because the highest 4 week average concentration of chloropicrin was 93% of the seasonal screening level and level of chlorpyrifos reached 28% of the acute screening level. The characterization of a decrease in quantifiable 4 week average concentrations over one year (2013-2014) as a trend (page 46) is not very useful, given that pesticide use patterns can vary from year to year.	DPR staff attempts to fully and clearly state the obtained results and to compare those results with our previously established health screening levels to determine if any exceedances have occurred. There were pesticides that exceeded any of their screening levels in 2014. Therefore, the statement made in the Report accurately represents the monitoring results. No changes to the report are needed.	*No changes to report are needed.*

Reponses to Comments on the AIR MONITORING NETWORK RESULTS FOR 2014 - VOLUME 4

Comment Number	Comment	Response	Action
13.	**From Dow AgroSciences:** **Results for 1,3-dichlropropene (1,3-D) –** DPR states in the draft AMN reports, "*A concentration greater than 100% of the screening level suggests the need for further evaluation.*" Dow AgroSciences (DAS) concurs that a comparison of 1,3-D monitoring results to acute, subchronic, and chronic screening levels over the past 4 years indicate no reason for concern, as all values were well below 100% of the pertinent screening levels. These data support a conclusion that no further evaluation of 1,3-D is necessary.	Comment acknowledged by DPR. No response required.	*No changes to the report are needed.*

Comment Number	Comment	Response	Action
14.	**From Dow AgroSciences:** **Cancer Risk Estimates –** DPR states that: "*1,3-D is classified as a probable human carcinogen by U.S.EPA and is listed as a carcinogen under Proposition 65*" (p. 40). DAS has chosen not to contest DPR's regulation of 1,3-D as a carcinogen given the current classification. We do note, however, that DPR's rationale for regulating 1,3-D as a carcinogen is based on a finding of benign tumors in one rodent species, one strain, and one sex after lifetime high-dose exposure. This is in contrast to numerous other lifetime cancer bioassays that have resulted in no tumors to exposed animals. The weight-of-evidence clearly indicates that a non-linear, threshold based approach is appropriate for 1,3-D risk assessment. …The draft AMN report further states that the cancer risk estimate: "*…assumes that the chronic exposure occurs every single day for a lifetime (70 years). However, this assumption is consistent with standard risk assessment procedures.*" (p. 40) While this assumption is used in some risk assessment procedures, it should not be applied when actual data to the contrary are available. The Department is assessing risk to 1,3-D with simple and conservative assumptions, especially regarding lifetime of exposure. Data exist to inform and refine those assumptions including a new study which was conducted specifically for determining the residency and mobility patterns of residents in areas with significant 1,3-D use (Kaplan, W. 2014). The results of that study were consistent with existing national data which show that residents of the U.S. are mobile and move frequently. In fact, the assumption of 70 years living in a single dwelling in a high use area represents the 99.99th percentile. The 95th percentile of residence time in a high use area is about 50 years, while the average residence time is less than 30 years. Furthermore, the average time spent at the very same residence was 5-6 years. These new data clearly indicate that the assumption that an individual is exposed at the same location for 70 years is unrealistic and inappropriately conservative. The study also showed that residents spend an average of 13% of their time completely outside of the high use area over the course of a year. While the highly conservative assumption of 70 years may be warranted in the absence of actual data, the residency and mobility study provides those data, specific to areas of 1,3-D use, to inform the assumptions made in the risk assessment regarding potential lifetime of exposure. The Department's AMN data corroborates what has been shown in multi-year simulation modeling over a multi-township region, which is that the location of the maximum annual average 1,3-D concentrations in air occur at different locations in each year, depending on the spatial and temporal dynamics of 1,3-D product use and the variability in weather. This is clearly shown by DPR's AMN data, where the annual average air concentration data for a single fixed location in space varies from year to year, and from location to location.	DPR's characterization of the 1,3-D cancer risk estimates are appropriate given the available reviewed information and are consistent with previous DPR study publications. As part of the Department's 1,3-D risk assessment update, a comprehensive evaluation of new available data is being conducted. DPR will not consider making any changes to 1,3-D cancer risk estimate determination method until the updated risk assessment is complete.	*No changes to the report are needed.*

Reponses to Comments on the AIR MONITORING NETWORK RESULTS FOR 2014 - VOLUME 4

Comment Number	Comment	Response	Action
15.	**From Dow AgroSciences:** **Uncertainty of Air Concentrations – Treatment of ND and Trace Samples** DAS has previously expressed concerns that areas where product use results in no detection, and especially areas where 1,3-D is not even used, are still included as contributing to the exposure assessments when non-detections (NDs) are counted as ½ the Maximum Detection Limit (MDL). Including NDs of 1,3-D to a risk assessment when it hasn't even been used, or used as such low levels as to be undetectable, artificially inflates the cancer risk calculations. DPR's Pesticide Use Reporting database clearly shows that there are long periods of time when no 1,3-D is used, thus values of zero for ND would be appropriate. An example from Shafter in 2013 (Figure 3) was provided in correspondence to the Department dated 31 October 2014 (Bret, B., 2014). Additional comparisons of pesticide application dates to 1,3-D monitoring dates would justify using zero for many of the monitoring results that are listed as ND. The treatment of all 0's to equal ½ MDL does not reflect reality and therefore results in an overestimation of cancer risk.	Consistent with previous DPR reports, samples with concentrations above the minimum detection limit but below the LOQ can be identified as containing a *trace* amount but the concentration cannot be measured reliably. When calculating average concentrations or other statistics, DPR assumes that samples with a trace concentration have a concentration at the midpoint between the MDL and the LOQ. As with the MDL, the LOQ is a characteristic of both the method and the chemical. Different methods can have different LOQs limits for the same chemical. The same method can have different LOQs for different chemicals. When calculating the highest 4-week rolling concentrations and 1-year average concentration for pesticides with at least one detectable concentration, comparisons of three different methods which treat samples with no detectable concentration and trace concentrations differently have been performed in the past and results have been presented in previous versions of the Air Monitoring Network Results Report. Results show that replacing DPR's standard method with any of the two alternative methods tested does not affect the "% Screening Levels" by a large enough margin to alter the report's findings. Therefore, current DPR's standard method for treating samples with no detectable concentration and trace concentrations will remain the same.	*No changes to the report are needed.*
16.	**From Dow AgroSciences:** **Calculation Corrections –** Some errors in the 2014 AMN report are noted and corrections proposed for DPR's standard method (½ MDL) calculations of average concentrations (Table 6). For example the 2011-2014 average concentration for Shafter was reported as 1135 ng/m^3. Using ND = 227 ng/m^3 the average of the four years for Shafter calculates to 1045 ng/m^3. Using these revised concentrations (from Table 6) the risk estimates using the standard approach have been updated (Table 7). For the Shafter site this corrects the risk to 161% of the cancer risk goal and not 192% as stated in the DPR draft report. The year-by-year data was not reported for the minimum and maximum method approaches and so the cancer risks using these methods could not be reviewed.	Cancer Risk calculations were reviewed and no error was determined. Average 1,3-D concentration (1,135 ng/m^3) for Shafter from 2011-2014 was reported accurately in the report. No changes to the report are needed.	*No changes to the report are needed.*

Attachments: Comments Correspondence

July 17, 2015

Edgar Vidrio
Department of Pesticide Regulations
P.O. Box 4015
Sacramento, CA 95812

Via Email: Edgar.Vidrio@cdpr.ca.gov

RE: Comments on 2014 DPR Draft Air Monitoring Network Report

Dear Dr. Vidrio:

Thank you for providing this opportunity to comment on the draft 2014 Air Monitoring Network Report. We have also included some comments on results of 2014 Air Resources Board (ARB) pesticide air monitoring[1] where relevant. We once again appreciate the clear and detailed manner in which the report presents the air monitoring results with key comparisons to previous air monitoring. However, we remain concerned that focus on negative sampling results conveys a false sense of security and that the Air Monitoring Network is inadequate and does not provide information on exposure conditions in the most highly impacted areas. DPR has failed, once again, to evaluate whether current air monitoring sites are located properly to capture pesticide use patterns, taking into account local geography and meteorological conditions. We were encouraged to hear that today at the PREC meeting that DPR is currently conducting a correlation of 1,3 Dichloropropene air concentrations and use and weather patterns to include in the 1,3 Dichloropropene

[1] Vidrio, E, Wofford, P, Segawa, R. DPR Memorandum: Methyl bromide, 1,3-dichloropropene, and Chloropicrin Monitoring for 2010-2014, May 22, 2015

risk assessment but a more comprehensive analysis is also urgently needed. We also have great concern about inaccurate and misleading statements in the press release for the report.

The Presentation of Results in DPR 2014 Draft Air Monitoring Network Report and Press Release is incomplete, inaccurate and misleading

AMN Report's focus on negative sampling results conveys a false sense of security and is based on a skewed analysis

We appreciate the clear and detailed manner in which the report presents the air monitoring results with key comparisons to previous air monitoring. However, as explained below, we think the report's focus on negative sampling results is misleading and conveys a false sense of security because it is based on a skewed presentation of the data and obscures the fact that health-based thresholds were exceeded in some locations.

The statement in the report that 91.7% of analyses had no detectable pesticide concentration is highly misleading because it ignores the realities of pesticide use patterns. In order to reach 100% detections (a total of 5,966 positive samples), every pesticide tested for would have to be found on each of the 157 days at each of the three air monitoring sites. In reality, use of most pesticides is concentrated in certain months. As pesticide use varies between crops and regions, not all of the pesticides monitored for are used near all of the monitoring sites. Therefore, using the total number of samples for all pesticides at all locations as the denominator does not provide a meaningful context. Detection frequency should be calculated based on what pesticides were used in the vicinity and in the time-frame being sampled.

DPR makes overly broad conclusions drawn from limited air monitoring data

We strongly disagree with the Department's statements announcing AMN results: "Once again, air monitoring results released from the California Department of Pesticide Regulation (DPR) show that most of the monitored pesticides, in various rural agricultural communities, were found well below levels that indicate a health concern or need for further evaluation." And "DPR's Air Monitoring Program, which is based on good scientific data, shows our overall approach is working to protect Californians as pesticides are used to grow food for the nation." The Department has an obligation to communicate to the public the significance of the sampling results in terms of what <u>was</u> found and how the results correlate with weather and pesticide use patterns. In the press release, scientific context should be given, i.e., that air samples taken once a week tell us what is in the air on the day that the sample is taken, for specific analytes. This explanation is consistently missing from the press releases for AMN data, and yet is a key point when discussing the limitations of any air sampling plan. Another important detail not highlighted in DPR press releases is that the sampling is meant to provide *some* insight into exposures in areas of heavy pesticide use. The press release should <u>not</u> have stated that the air monitoring program shows that DPR's approach is protecting

Californians because it is not valid to extrapolate from several air monitoring stations to the whole state.

The press release includes inaccurate and misleading statements

The press release incorrectly stated that 32 pesticides and 5 breakdown products were monitored by ARB in Oxnard, Santa Maria, and Watsonville. Only 3 pesticides (1,3 D, methyl bromide and chloropicrin) were monitored at these ARB sites and chloropicrin was only monitored for 3 months of the year.

The press release was very misleading in stating that the average 1,3-dichloropropene (1,3-D) level at only one site (Shafter) was above the DPR target level for cancer risk because this gives the appearance that this is the only site at risk. But if results are averaged over the past 4 years, the target level was also exceeded at Oxnard and Santa Maria sites, which should have been reported. On a related note, while it is true that in February of 2014 DPR stopped granting exceedances to the 1,3-D township cap and this may have reduced use in some areas, it is misleading to characterize this move to enforce an existing use limit as lowering the amount of 1,3-D that could be used.

Under findings it is misleading to only report that chloropicrin level at the Santa Maria ARB site slightly exceeded the chloropicrin seasonal screening level, which again gives the appearance that this is the only site at risk. In fact, the air level at the Salinas site was only slightly below this screening level in 2014 and exceeded the screening level in 2013, which should have also been reported.

Evaluation of pesticide air concentrations in relation to pesticide use patterns and meteorological conditions is long overdue

One of the stated goals of the AMN, reiterated in the 2014 report, is to attempt to correlate (air) concentrations with (pesticide) use and weather patterns. However, this is the 4th year the network has been operating and to date no correlation has been conducted. Data are now available for 2011, 2012 and 2013 so this comprehensive analysis should be completed without further delay. The analysis should examine both weather patterns and use of all monitored pesticides within 1.5 miles and 5 miles of each Air Monitoring Site and report on the distance to the closest agricultural fields. This analysis is critical in order to understand how pesticide use levels in close proximity to the air monitoring sites compare to pesticide use levels in other areas of these communities and other agricultural communities

DPR Monitoring sites should be relocated without further delay

Even without correlation with pesticide use and weather data, air monitoring data collected in the past four years of monitoring suggest that the monitoring sites were not appropriately chosen. While each of the communities selected has a high level of pesticide use overall, the sites chosen were not sufficiently close to areas of high pesticide use to reflect average, let alone maximum exposures for each community. The Ripon site is in the center of town, the Salinas site is near the airport and the Shafter site is located next to a residential area with no pesticide use reported in the

same section in 2011-2013. Examples of more appropriately located sites where other air monitoring is done are three sites monitored by California ARB, located at Ohlone Elementary School in Santa Cruz County, Rio Mesa High School in Ventura County, and in Santa Maria, in localized areas where pesticides are known to be intensively used.

The comparison with other monitoring in Table 38 of this report shows that most pesticides have been detected at much higher levels in other California air monitoring studies. This finding illustrates that the DPR Air Monitoring Network sites were not appropriately chosen to accurately capture high end exposures and thus would underestimate such exposures in rural California. Table 38 should be updated to include results for ARB air monitoring for fumigants at the Ventura, Santa Barbara and Monterey county sites between 2011 and 2014 as well as 1,3-dichloropropene monitoring conducted by Dow in Merced county in 2010 and 2011.

Air monitoring should be continued in the future but alternate sites located in communities with high pesticide use ratings should be selected. Selection of new monitoring sites should include consideration of the likelihood of collecting data useful for characterizing human exposures. Selection of sites could be aided by public health researchers or the California Department of Public Health. Targeted sampling several times a week at several sites in a community when pesticide use is heaviest is a preferable monitoring strategy. Seasonal sampling was recommended by DPR PREC members from the ARB and SWRCB at the August 16, 2013 PREC meeting. Sampling could be conducted in different months for fumigants and other pesticides since different monitoring methods are used. This will allow substantially more air monitoring data to be collected for the same analytical costs.

Expanded monitoring for a broader range of pesticides should be considered at the current ARB Air Monitoring sites in Oxnard, Santa Maria and Watsonville which are located in areas of heavier agricultural pesticide use. However, monitoring at these sites should be conducted on randomized days rather than every 6th day to eliminate the possibility that local pesticide use could be altered to avoid known sampling days.

Method for Describing Health Risks is Inadequate

We disagree with the statement in the report (see page 7) that measured air concentrations below DPR screening or reference levels or regulatory target concentrations would not be considered a significant health concern and do not need to undergo further evaluation. As described in the "Pesticide Levels of Concern" section below, for some pesticides OEHHA, including methyl bromide and chloropicrin recommends more health protective reference levels or regulatory target concentrations. This should be acknowledged in the report. FQPA adjusted hazard quotients should be included in this report as they were in the Parlier report. Similarly, for pesticides under review by DPR or USEPA, like chlorpyrifos, the report must acknowledge that current screening levels may not be adequate to protect against health impacts for vulnerable populations.

The report accurately states (see page 14) that maximum acute pesticide exposures are likely much higher than AMN results and that network monitoring better characterize sub-chronic and chronic exposures. The report also points out that acute exposures are best assessed by application site monitoring. Unfortunately little application site monitoring is being conducted. ARB has been contracted to conduct application monitoring for chlorpyrifos since last year but has reportedly had difficulty finding a monitoring site.[2]

Pesticide Levels of Concern Detected at Air Monitoring Sites

1,3-Dichloropropene

We are very concerned that if annual average levels of 1,3-D averaged over 2011-2014 at each DPR AMN site are sustained, the cancer risk will exceed DPR's designated level of concern at the Shafter site and will exceed the 1 in one million bystander risk level at all three sites. We note that the level averaged over 2011-2013 at the Ripon site also exceeded DPR's level of concern. None of these sites are located within townships with the most intensive 1,3 D use where cap exceedances were granted, illustrating that additional mitigations are needed. In fact, the Shafter site is about 40 miles away from the Arvin township, the only Kern county township where cap exceedances were granted. While annual average 1,3-D levels dropped at the ARB Oxnard and Santa Maria monitoring sites, which are in townships where cap exceedances have been granted, the 4 year average air levels remain above DPR's level of concern for cancer risk.

Chlorothalonil

The carcinogenic fungicide chlorothalonil was detected in 52% of samples overall and 77% of Shafter samples at low or trace levels, an increase from 60% detections in 2013. The draft report contains an error where it states (page 43) that 1,3-D was the only known human carcinogen with quantifiable detections.[3] The highest 24 hour level of chlorothalonil measured was 117 ng/m^3 and highest 4 week average level was 76.6 ng/m^3. No use of chlorothalonil or any other pesticide was reported in the one square mile section where the Shafter monitor is located in 2011-2013[4]. In areas of more concentrated pesticide use, levels would be expected to be higher. In this draft, DPR again uses an acute and sub-chronic screening level of 34,000 ng/m^3 based on an oral toxicity study in 2007. DPR developed a much more health protective screening level of 560 ng/m^3 based on an inhalation toxicity study in 2003. In 2012, U.S. EPA proposed using an acute inhalation study as a basis for their level of concern, which would give an inhalation-based reference exposure level (equivalent to DPR's screening level) of 260 ng/m^3. The health standards for chlorothalonil have shifted several times over the past few years, indicating that

[2] Personal communication from Mary Lou Verder-Carlos and Sheryl Beauvais at a recent meeting.
[3] Both 1,3-D and chlorothalonil are listed on OEHHA's Prop 65 list and classified by U.S. EPA as Group B2, probable human carcinogens.
[4] DPR CalPIP database

DPR should prioritize and develop a proper evaluation of inhalation toxicity of chlorothalonil—including consideration of low doses.

Chlorpyrifos and Chlorpyrifos oxon

The brain-harming, neurotoxic pesticide chlorpyrifos and its oxon breakdown product were detected in 24% and 26% of samples overall and 56% and 62% of samples at the Shafter site. The maximum 24 hour concentrations detected at the Shafter site were 337.9 ng/m^3 (28.2% of acute screening level) for chlorpyrifos and 109.6 ng/m^3 (9.1% of acute screening level) for chlorpyrifos oxon. If the early-life vulnerability for the fetus and young children were to be taken into account in the acute and sub-chronic screening levels using the FQPA 10X factor (as it is in the chronic screening level), the highest one day level measured at the Shafter site was 2.8 times the screening level. Similarly, the highest 4-week rolling concentration exceeded the sub-chronic screening level adjusted for early-life vulnerability.
It is troubling to note that in areas of more intensive pesticide use, levels would be expected to be higher. As shown in Table 38 of this report, the 2004 air monitoring conducted by PANNA in Lindsay, CA in close proximity to orange groves documented a peak 24 hour chlorpyrifos air level of 1,340 ng/m^3.

Methyl Bromide

Methyl bromide, a neurotoxicant and reproductive toxicant, was detected in 24% of samples overall, and 27% of samples at the Salinas airport and 30% of samples in Ripon. DPR's seasonal regulatory limit for methyl bromide of 19,400 ng/m^3 (5 ppb) is not considered adequately health protective by OEHHA. OEHHA supports a seasonal or sub-chronic limit of 3,880 ng/m^3 (1 ppb) to protect children. This was exceeded at the ARB monitoring site in Oxnard.

Chloropicrin

The fact that the highest monthly average chloropicrin level reached 94% of seasonal screening level at the Salinas site in 2014 and was exceeded in 2013 at the Salinas site is especially troubling because there was no chloropicrin use reported in 2013 in the 1 square mile section containing the Salinas monitoring site. There are many areas of heavier chloropicrin use in Salinas and other areas of the central coast.

The chloropicrin seasonal screening level was exceeded at the ARB Santa Maria site even though it appears that the three months of monitoring at the ARB monitoring sites may not have captured peak exposures. In future chloropicrin monitoring on the central coast should be expanded at least to July – November. At the Santa Maria site one of the higher chloropicrin levels was measured on the last monitoring date, October 30th, and methyl bromide, always formulated with chloropicrin, was found in November. At the Oxnard site fairly high levels of methyl bromide were measured in July.

Of even greater concern, the average concentration of chloropicrin was 291.2 ng/m^3 in Salinas, 146.2 ng/m^3 in Ripon and 111 ng/m^3 in Shafter. If sustained over time, all

these concentrations greatly exceeds the reference concentration of 1.6 ng/m^3 for controlling cancer risk to the 1 in a million level which was established in the DPR Chloropicrin Risk Characterization document and supported in review by OEHHA and the TAC Scientific Review Panel.

Air Monitoring Network Trend Analysis is Incomplete

This draft report is incorrect in stating that all concentrations in 2014 were low relative to their screening levels because the highest 4 week average concentration of chloropicrin was 93% of the seasonal screening level and level of chlorpyrifos reached 28% of the acute screening level. The characterization of a decrease in quantifiable 4 week average concentrations over one year (2013-2014) as a trend (page 46) is not very useful, given that pesticide use patterns can vary from year to year.

Conclusion

In conclusion, we again urge the Department to:

- Revise the draft report to present the results using clear and meaningful metrics and ensure that the conclusions clearly describe all health based thresholds that were approached (reached at least 70% of screening level) or were exceeded.
- Conduct a comprehensive analysis comparing pesticide concentrations with:
    - Pesticide use and weather patterns without further delay and publish this analysis within the next 6 months.
- Revise the Air Monitoring Program to improve the location of monitors including:
    - new monitoring sites located to capture high end exposures in rural communities
    - increased monitoring at schools
    - a scientifically valid rationale for site location which is based on localized pesticide use patterns within 1.5 miles and 5 miles and large acreage of agricultural fields in close proximity in multiple directions, meteorological conditions, geography, and land use patterns.
- Target monitoring individual pesticides to be done more frequently during times of the year when use of each pesticide is most frequent in order to assess peak air levels.

These actions are needed to provide information that is useful in assessing the true nature of risk in those communities where pesticide exposure is most likely to happen. Thank you for the opportunity to provide input on the draft report. We look forward to working with you to improve the Air Monitoring Program so that it can provide critical information needed to accurately assess pesticide exposures of all Californians and prevent pesticide health impacts.

Sincerely,

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24 July 2015

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DOW AGROSCIENCES COMMENTS ON AIR MONITORING NETWORK RESULTS FOR 2014

Dow AgroSciences is pleased to provide the enclosed comments on the Department's draft Air Monitoring Network (AMN) results for 2014. The report provides four years of weekly monitoring results from three different cities specifically selected by the Department for their proximity to high pesticide use areas.

It can be reasonably concluded that the low levels of 1,3-D detected in the AMN program pose low acute and chronic risks and do not pose a cancer risk.

Enclosed please find the following:

- Transmittal document (this letter)
- Brian B., J. Baxter, K. Hastings, Z. Yan, and I. van Wesenbeeck. 2015. Dow AgroSciences Comments on Air Monitoring Network Results for 2014. 24 July 2015. 9 pp.

Thank you for your consideration of these comments.

Sincerely,

Brian

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State Regulatory Manager

Cc: CA Correspondence File
Jim Baxter, US Regulatory Mgr

Title

Dow AgroSciences Comments on
Air Monitoring Network Results for 2014

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24 July 2015

Total Pages:
9

Executive Summary

DPR's Air Monitoring Network (AMN) provides four years of weekly monitoring results from three different cities specifically selected by the Department for their proximity to high pesticide use areas. These results demonstrate that the low levels of 1,3-D detected pose low public health risks. In each year of the monitoring program, 1,3-D detections were well below the Department's acute, subchronic, and chronic screening levels.

Although the Department speculates that detected levels of 1,3-D, if continued for 70 years, would exceed a DPR regulatory target for cancer risk, recent data on residency and mobility show this to be a very low probability. A 70 year continuous exposure scenario is highly unrealistic and thus such a conclusion is unnecessarily conservative. As detailed below, this conclusion is based on analysis of the Department's 4-year air monitoring data, the toxicological relevance of 1,3-D levels detected, and the consideration of realistic exposure scenarios based on data about population residency and mobility in areas where 1,3-D is used.

The Department's AMN data corroborates what has been shown in multi-year simulation modeling over a multi-township region, that the location of the maximum annual average 1,3-D concentration in air occurs at a different location each year depending on the spatial and temporal dynamics of 1,3-D product use and the variability in weather. This is shown in the AMN data, where the annual average air concentration data for a single fixed location in space varies widely from year to year, and from location to location.

It can be reasonably concluded that the low levels of 1,3-D detected in the AMN program pose low acute and chronic risks and do not pose a cancer risk.

Introduction

The California Department of Pesticide Regulation issued a press release on May 26, 2015, "DPR 2014 Air Monitoring Shows Most Pesticides Well Below Health Screening Levels." While the press release reported encouraging news that the majority of the monitored pesticides were found well below levels that indicate a health concern, it also contained a mischaracterization of risk to 1,3-dichloropropene (1,3-D). DPR wrote:

> *"1,3-D did not exceed a DPR screening level. However 1,3-D was detected at a level, that if continued for 70 years, would be above a DPR regulatory target.".*

Dow AgroSciences objects to this speculative characterization of 1,3-D exposures in light of the Department's own 4-year air monitoring data and the toxicological relevance of AMN detection levels. Further, DPR's exposure scenarios include the assumption that 2014 levels would continue for 70 years, which is not consistent with previous AMN data that prove otherwise, nor is 70 years even a realistic assumption given the robust new data on the mobility of populations in areas where 1,3-D is used.

The Department's draft report, "DRAFT AIR MONITORING NETWORK RESULT FOR 2014. Volume 4. May 2015. Report AIR 15-02" asserts the same mischaracterization of potential 1,3-D exposures and contains many contradictions. More detailed comments on the report follow.

Results for 1,3-Dichloropropene

Data from 2014 show that an average of only 20% of the air monitoring samples detected levels of 1,3-D above the limit of quantification, with a 4% detection rate in Salinas, 37% in Shafter, 19% in Ripon. In comparison with past monitoring results, 1,3-D detections can vary by year and by location ranging from zero detections in 2011 in Shafter and 2012 in Ripon, to 37% in 2014 in Shafter (Table 1).

Table 1. Percent detections of 1,3-D above the limit of quantification.

Year	Salinas	Shafter	Ripon	Average
2014	4%	37%	19%	20%
2013	16%	26%	17%	20%
2012	2%	6%	0%	3%
2011	6%	0%	4%	3%
Average	**7%**	**17%**	**10%**	**12%**

It is important to note that detection does not imply hazard or risk. The department appropriately compares actual levels detected with screening levels to determine relative risk. DPR's Air Monitoring Network (AMN) provides four years of weekly monitoring results that demonstrate a) low levels of 1,3-D being detected and b) low acute and chronic risks. In each year of the monitoring program, 1,3-D detections were well below the Department's acute and chronic screening levels.

From 2011-2014, the highest single monitoring result at each of the 3 locations ranged from 2-25% of the Department's screening level of 160,000 ng/m^3 (Table 2), while the majority of samples resulted in no detection (ND).

It is also important to note that these are single monitoring events and do not represent an annual distribution of 1,3-D concentrations. In 2014, the highest level of 9,250 ng/m^3 in Shafter was a single peak not representative of the rest of the results throughout the year, with over 60% of the other samples below the limit of detection. This is also seen in the 2013 data for Shafter where only 14 of 53 samples were above the limit of detection. Only two of those 14 could be considered peak detections, a high of 39,969 ng/m^3 and another of 32,574 ng/m^3. The remaining detections were 3-100 fold less than the highest one-day concentration. This is a consistent trend for each site for each sampling year, where two or three "peaks" may occur in the course of a year, all well below acute screening levels, with remaining monitoring results much lower and most are non-detectable.

Table 2. Highest one-day concentration for 1,3-dichloropropene. (from 2011-2014 AMN reports).

Year	Highest 1-day concentration (ng/m^3)	1-day acute screening level (ng/m^3)	% of screening level
2011	12,250	160,000	7.66
2012	3,643	160,000	2.28
2013	39,969	160,000	24.98
2014	9,250	160,000	5.87
4 yr Avg	**16,278**		**10.20**

The 4-week average results are also well below the subchronic screening level of 120,000 ng/m^3. The 2014 monitoring results are consistent with data from the prior 3 years indicating no risk from short term exposures based on four years of monitoring (Table 3).

Table 3. Highest of rolling 4 week average air concentrations of 1,3-dichloropropene. (from 2011-2014 AMN reports).

Year	Highest 4-wk rolling concentration (ng/m^3)	Subchronic screening level (ng/m^3)	% of screening level
2011	4,020	120,000	3.35
2012	1,135	120,000	0.95
2013	18,022	120,000	15.02
2014	4,077	120,000	3.40
4 yr Avg	**6,814**	120,000	**5.68**

Likewise, four years of data from 3 different cities show annual average air concentrations of 1,3-D are well below the Department's chronic screening level of 120,000 ng/m^3 (Table 4).

Table 4. Overall average annual air concentration for 1,3-dichloropropene. (from 2011-2014 AMN reports).

Year	Overall average concentration (ng/m^3)	Chronic screening level (ng/m^3)	% of screening level
2011	630.0	120,000	0.52
2012	370.6	120,000	0.31
2013	1,488.7	120,000	1.24
2014	414.0	120,000	0.34
4 yr Avg	**726.0**	**120,000**	**0.60**

DPR states in the draft AMN reports, *"A concentration greater than 100% of the screening level suggests the need for further evaluation."* Dow AgroSciences (DAS) concurs that a comparison of 1,3-D monitoring results to acute, subchronic, and chronic screening levels over the past 4 years indicate no reason for concern, as all values were well below 100% of the pertinent screening levels. These data support a conclusion that no further evaluation of 1,3-D is necessary.

Table 5. Overall air concentrations relative to the screening levels for 1,3-D. (from 2011-2014 AMN reports).

Year	% of acute screening level	% of subchronic screening level	% of chronic screening level
2011	7.62	3.35	0.52
2012	2.28	0.95	0.31
2013	24.98	15.02	1.09
2014	5.78	3.40	0.34

Cancer Risk Estimates

DPR states that:

> *"1,3-D is classified as a probable human carcinogen by U.S.EPA and is listed as a carcinogen under Proposition 65"* (p. 40).

DAS has chosen not to contest DPR's regulation of 1,3-D as a carcinogen given the current classification. We do note, however, that DPR's rationale for regulating 1,3-D as a carcinogen is based on a finding of benign tumors in one rodent species, one strain, and one sex after lifetime high-dose exposure. This is in contrast to numerous other lifetime cancer bioassays that have resulted in no tumors to exposed animals. The weight-of-evidence clearly indicates that a non-linear, threshold based approach is appropriate for 1,3-D risk assessment. This is supported by the following evidence:

(1) 1,3-D is operating through a non-genotoxic mode of action. All GLP guideline-compliant/higher tier mammalian *in vivo* genotoxicity studies were negative including studies in which the lung, the tumor target organ, was assessed;

(2) Animal toxicology studies for 1,3-D demonstrate that there is a clear threshold (5 ppm) at which no systemic toxicity and no tumors were observed (Figure 1). Concentrations that elicited increased incidences of tumors are more than 140,000 times higher than DPR lifetime regulatory target concentration (Figure 2). It is therefore, highly conservative to regulate 1,3-D based on a linear, low dose, extrapolation risk assessment approach.

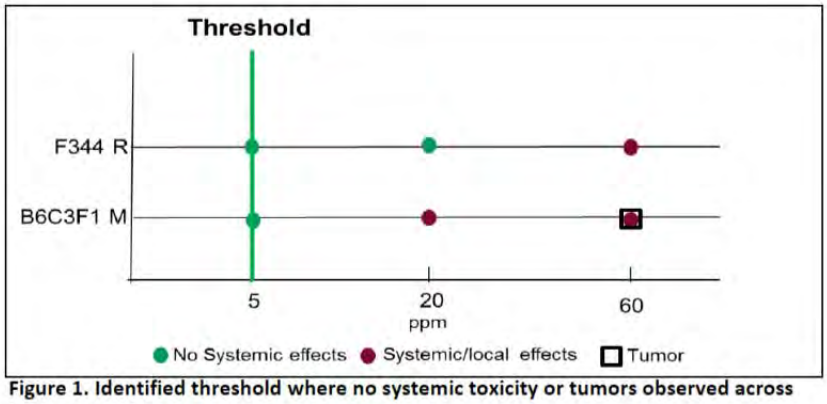

Figure 1. Identified threshold where no systemic toxicity or tumors observed across two cancer bioassays

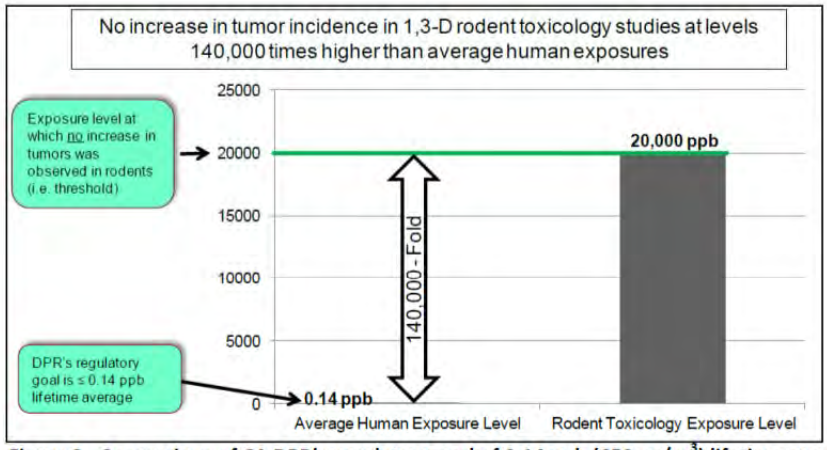

Figure 2. Comparison of CA DPR's regulatory goal of 0.14 ppb (650 ng/m^3) lifetime average vs. threshold exposure level of 20,000 ppb at which no increase in tumors was observed.

The draft AMN report further states that the cancer risk estimate:

> *"...assumes that the chronic exposure occurs every single day for a lifetime (70 years). However, this assumption is consistent with standard risk assessment procedures."* (p. 40)

While this assumption is used in some risk assessment procedures, it should not be applied when actual data to the contrary are available. The Department is assessing risk to 1,3-D with simple and conservative assumptions, especially regarding lifetime of exposure. Data exist to inform and refine those assumptions including a new study which was conducted specifically for determining the residency and mobility patterns of residents in areas with significant 1,3-D use (Kaplan, W. 2014). The results of that study were consistent with existing national data which show that residents of the U.S. are mobile and move frequently. In fact, the assumption of 70 years living in a single dwelling in a high use area represents the 99.99th percentile. The 95th percentile of residence time in a high use area is about 50 years, while the average residence time is less than 30 years. Furthermore, the average time spent at the very same residence was 5-6 years. These new data clearly indicate that the assumption that an individual is exposed at the same location for 70 years is unrealistic and inappropriately

conservative. The study also showed that residents spend an average of 13% of their time completely outside of the high use area over the course of a year. While the highly conservative assumption of 70 years may be warranted in the absence of actual data, the residency and mobility study provides those data, specific to areas of 1,3-D use, to inform the assumptions made in the risk assessment regarding potential lifetime of exposure.

The Department's AMN data corroborates what has been shown in multi-year simulation modeling over a multi-township region, which is that the location of the maximum annual average 1,3-D concentrations in air occur at different locations in each year, depending on the spatial and temporal dynamics of 1,3-D product use and the variability in weather. This is clearly shown by DPR's AMN data, where the annual average air concentration data for a single fixed location in space varies from year to year, and from location to location.

Uncertainty of Air Concentrations – Treatment of ND and Trace Samples

DAS has previously expressed concerns that areas where product use results in no detection, and especially areas where 1,3-D is not even used, are still included as contributing to the exposure assessments when non-detections (NDs) are counted as ½ the Maximum Detection Limit (MDL). Including NDs of 1,3-D to a risk assessment when it hasn't even been used, or used as such low levels as to be undetectable, artificially inflates the cancer risk calculations. DPR's Pesticide Use Reporting database clearly shows that there are long periods of time when no 1,3-D is used, thus values of zero for ND would be appropriate. An example from Shafter in 2013 (Figure 3) was provided in correspondence to the Department dated 31 October 2014 (Bret, B., 2014). Additional comparisons of pesticide application dates to 1,3-D monitoring dates would justify using zero for many of the monitoring results that are listed as ND.

The treatment of all 0's to equal ½ MDL does not reflect reality and therefore results in an overestimation of cancer risk.

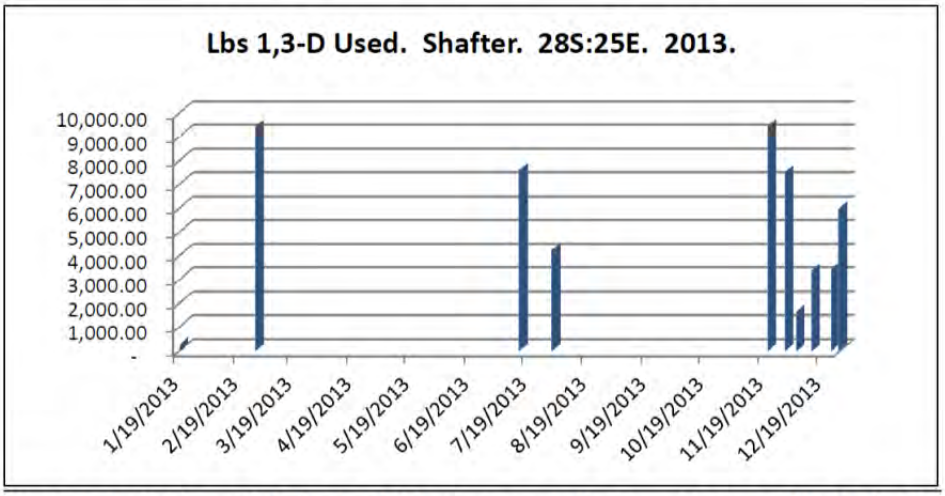

Figure 3. Pesticide use data for 1,3-dichloropropene in the township:range 28S:25E for Shafter, CA

Calculation Corrections

Some errors in the 2014 AMN report are noted and corrections proposed for DPR's standard method (1/2 MDL) calculations of average concentrations (Table 6). For example the 2011-2014 average concentration for Shafter was reported as 1135 ng/m^3. Using ND = 227 ng/m^3 the average of the four years for Shafter calculates to 1045 ng/m^3. Using these revised concentrations (from Table 6) the risk estimates using the standard approach have been updated (Table 7). For the Shafter site this corrects the risk to 161% of the cancer risk goal and not 192% as stated in the DPR draft report. The year-by-year data was not reported for the minimum and maximum method approaches and so the cancer risks using these methods could not be reviewed.

Table 6 Year-by-year and 2011-2014 average air concentration (standard method) for 1,3-D. (from Table 33. AMN Report for 2014 results.)

Sampling Location	Air concentration (ng/m^3)†				2011-2014 Average concentration (ng/m^3)‡	REVISED 2011-2014 Average concentration (ng/m^3)‡
	2011	2012	2103	2014		
Salinas	760#	360	407	33	311	390
Shafter	**ND*#**	453	2,589	**909**	**1135**	**1045**
Ripon	851#	**ND**	914	**302**	**516**	**573**

† Air concentrations were calculated using ½ MDL for samples with no detectable concentrations (standard method).
‡ 4 year average concentration
# Average concentration for 6 month period
ND calculated as ½ LOQ i.e. 454/2 = 227ng/m^3

Table 7. 2011 – 2014 average minimum, standard and maximum cancer risk estimates for 1,3-D for all three AMN sampling locations (from Table 32. AMN Report.)

Sampling Location	Minimum (ND = 0*MDL)	Standard (ND = ½ MDL)	REVISED Standard (ND = ½ MDL)	Maximum (ND = MDL)
Salinas	2.71E-06	4.96E-06	6.01E-06	7.20E-06
Shafter	1.69E-05	1.92E-05	1.61E-05	2.14E-05
Ripon	5.54E-06	7.89E-06	8.8.3E-06	1.02E-05

Application of empirical values for residency and mobility to replace the conservative assumption of a 70 year lifetime of exposure with realistic exposure scenarios, the theoretical lifetime cancer risk would be less than 1.00E-05 for all three cities.

Summary

DPR's Air Monitoring Network (AMN) provides four years of weekly monitoring results from three different cities specifically selected by the Department for their proximity to high pesticide use areas. These results demonstrate that the low levels of 1,3-D detected pose low acute and low chronic public health risks. In each year of the monitoring program, 1,3-D detections were well below the Department's acute, subchronic, and chronic screening levels.

Although the Department speculates that detected levels of 1,3-D, if continued for 70 years, would exceed a DPR regulatory target for cancer risk, recent data on residency and mobility show this to be a very low probability. A 70 year continuous exposure scenario is highly unrealistic and thus such a conclusion is unnecessarily conservative. As detailed above, this objection is based on analysis of the Department's 4-year air monitoring data, the toxicological relevance of 1,3-D levels detected, and the consideration of realistic exposure scenarios based on data about population residency and mobility in areas where 1,3-D is used.

The Department's AMN data corroborates what has been shown in multi-year simulation modeling over a multi-township region, that the location of the maximum annual average 1,3-D concentration in air occurs at a different location each year depending on the spatial and temporal dynamics of 1,3-D product use and the variability in weather. This is shown in the AMN data, where the annual average air concentration data for a single fixed location in space varies widely from year to year, and from location to location.

It can be reasonably concluded that the low levels of 1,3-D detected in the AMN program pose low acute and chronic risks and do not pose a cancer risk.

References:

Bret, B.L. 2014. Dow AgroSciences Comments on Air Monitoring Network Results for 2013. Correspondence to DPR. 31 October 2014. 7 pp.

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