

CLR-34 Neighborhoods Assn.

# VI. Addendum A: Response to Stewart Environmental

USR-15-0027

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8/5/2015

6681 Apache Road  
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Board of County Commissioners  
P.O. Box 758  
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Re: Response to Stewart Environmental Consultants LLC comments regarding the Air Emissions Report Analysis that was submitted to the Weld County Commissioners on June 18, 2015.

Commissioners:


In their July 20th response (actually submitted DURING the Planning Commission hearing on the USR15-0027 case) (Exhibit 1011) to the report that we submitted on June 18<sup>th</sup> as well as during the Planning Commission hearing itself, Dr. David R. Stewart asserts several claims relating to our report, and argues that those points diminish the significance of our report.

By necessity, some of this discussion is somewhat technical. However, the concepts are not especially difficult so I hope that you will find this document to be reasonably accessible.

Although we have no interest in entering into a “expert vs. expert” confrontation, we feel that in several respects, Dr. Stewart has misrepresented or minimized our major points inappropriately. As a result, we have prepared this brief response. Note that we do NOT plan to spend significant time at the BOCC hearing on this topic, but if the Commissioners have concerns, we will be prepared to discuss them.

Finally, we wish to apologize for the lateness of this submission. We recognize the burden that it places on you as Commissioners. We had expected that any comments provided by Stewart would have been available long before the PC Hearing, and as a result of our preparation for the BOCC hearing, this submission has been delayed.

Respectfully submitted,



David W. Kisker, Ph.D.

## **Response to Stewart Environmental Consultants LLC comments regarding the Air Emissions Report Analysis**

Prepared by David W. Kisker, Ph.D. on behalf of the Indianhead Estates West Homeowners Assn.

In their correspondence, dated 7/20/15, (Planning Exhibit #1101) and presented at the recent Planning Commission Hearing on 7/21/15 for USR15-0027, Dr. David R. Stewart of Stewart Environmental made several assertions that were intended to negate and/or minimize the significance of the report that we previously submitted to the County as part of the USR review process. In addition, at the PC Hearing itself, during the rebuttal period, he asserted that our contribution should be ignored because of what he claimed were flaws or irrelevant information.

Although in the response itself, Stewart generally acknowledged that our analysis was correct, and actually made several adjustments to their own analysis as a result, they nonetheless make several misleading claims.

### **1. Stewart asserts that we used only “worst case assessments” for all scenarios.**

This is correct. We based our analysis on the words of Mr. David Hagerman at the June 9<sup>th</sup>, 2015 public meeting:

**“So these models that we’re going to be talking about in just a moment—we model the worst case. We model the plant running 24/7. We model the plant with the least efficient equipment from an emissions standpoint. We model the worst case. We use a CDPHE approved model and we compare those results against acute and chronic standards.” D. Hagerman, June 9, 2015**

The entirety of his comments can be reviewed here: <https://youtu.be/AzYLnehHmZo>  
Furthermore, Figure 1 shows one of the slides that he used during that presentation, emphasizing their claim that they do the modeling with the worst case scenario.

### **2. Stewart asserts that the hourly production rate has nothing to do with the CDPHE permitting process, which will be based on the annual production limit of 450,000 tons per year.**

- a. This statement, while true, is clearly intended to mislead. As Dr. Stewart well knows, the hourly rate is a REQUIRED element of the dispersion analysis. In order to perform a suitable AERSCREEN analysis of the pollutants that are transported away from the stack, it’s necessary to use the hourly production rate, which coupled with the EPA’s tabulated “emission factors” (AP-42 tables)

allow the estimation of the pollutant concentrations at the property line as well as nearby “sensitive receptors”.

- b. The use of the MAXIMUM possible hourly production is clearly claimed by Mr. Hagerman to be the procedure that was used. However, we found that this was not the case. When we reported this fact, Stewart responded by asserting that it’s not appropriate. Apparently, Mr. Hagerman does not agree!!

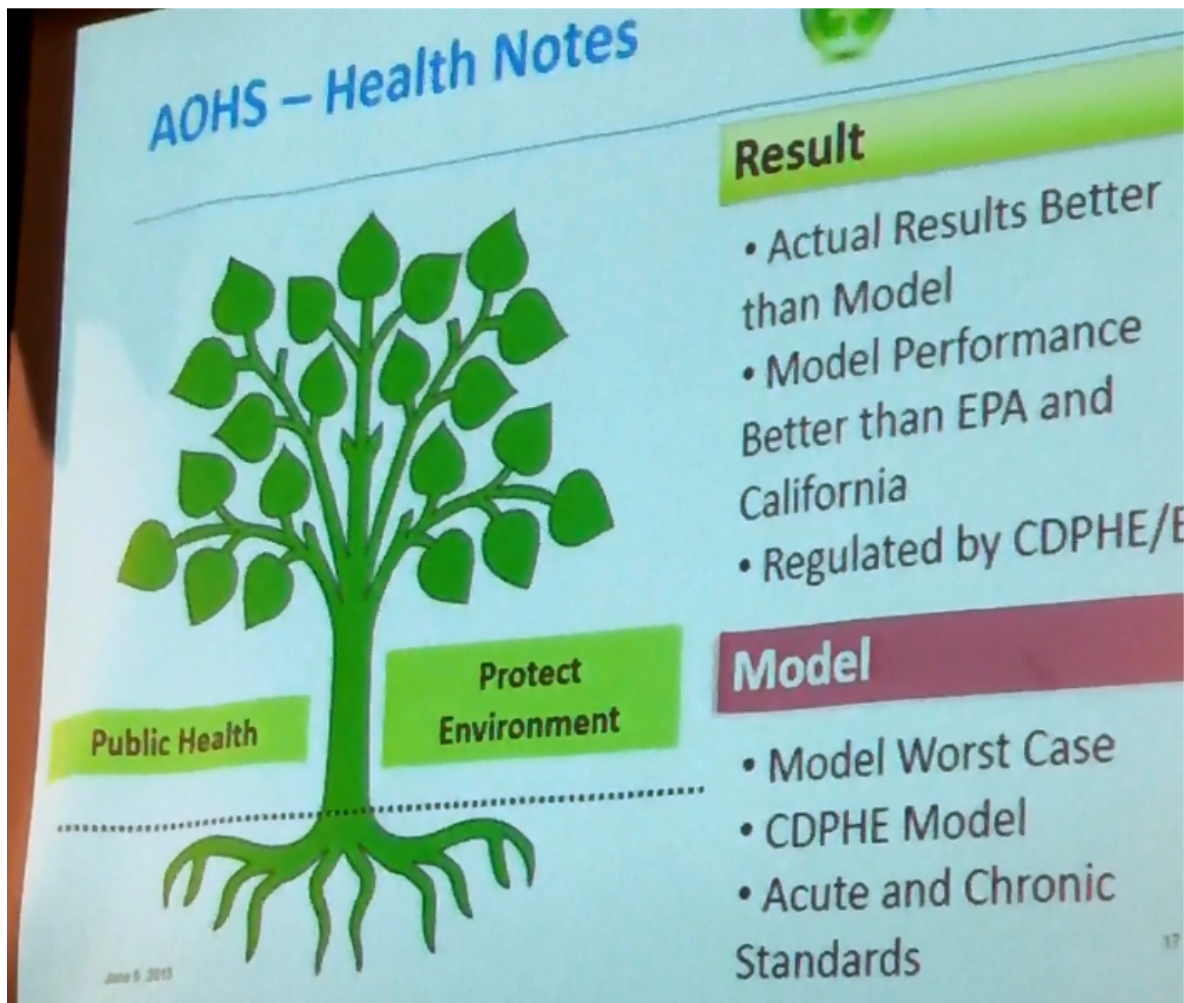


Figure 1. Slide from D. Hagerman’s presentation at Public Meeting, June 9, 2015

3. **Stewart responds to our criticism of the improper use of the CO emission factor from the asphalt plant by stating that this is allowed by CDPHE.**
  - a. This may well be true. However, its use in the original report is not documented as it should have been. Again, we were taking Mr. Hagerman at his word that they always use the EPA models. Apparently, this is only sometimes true.
  - b. Furthermore, in Table 2 of the response, Stewart actually shows that if the proper, EPA recommended AP-42 emission factor would have been used for the

Taft Hill site stack test, that facility would have actually EXCEEDED the estimated emission (41.0 tons per year vs. 29.3 tons per year). The question is why it is necessary to deviate from the recommended value since other facilities are being permitted using the tabulated AP-42 emission factor.

**4. Stewart attempts to minimize the importance of using a proper model to analyze the site emissions when there are multiple sources.**

- a. In fact, the original report by Stewart was fundamentally incomplete. The fact that AERSCREEN was used and represented as a meaningful result is just not appropriate. In the original report, there was no mention of the fact that a more complete study using AERMOD would be required because of the site complexity. Instead, that study was represented by both Stewart and Mr. Hagerman as a useful analysis from which sound conclusions could be drawn, each of them even emphasizing how “good” their results were since they supposedly even exceeded the tougher California standards. (At least they emphasized this until we pointed that this was not, in fact true...)

**5. Stewart acknowledged the discrepancy between the APEN for the concrete plant and emissions report. The truck mix capability was not considered in the Stewart report.**

- a. While acknowledging the discrepancy between their original report and the APEN permit application, Stewart now says that MMM has agreed to reduce the requested production in their APEN. This would need to be confirmed in writing. Furthermore, Stewart explained that MMM did not inform Stewart that the concrete plant was capable of both central mix and the higher emission truck mix plant. In our analysis, we again used the “Worst case” of 100% truck mix because of the claims by Mr. Hagerman. Now, Stewart says that only 10% of the capacity will be truck mix. While this may or may not be factual, it’s clear that the 100% truck mix case must be used if “worst case” analysis is to be done because the emissions from the “truck mix” version are about 2X as high as from the “central mix” operation.
- b. Stewart also acknowledges that they did the calculation for the emission from the hopper loading, mixer loading and truck loading were done incorrectly. However, by including only 10% truck mix, the assertion that this represents a true worst case scenario is false. In fact, unless the permit were to impose such a limit, the calculated emissions would be completely inappropriate. We stand by our original analysis that the emissions (PM and PM10) may be MUCH higher than Stewart asserts in their response. Because of the extreme health risk of particulates, this is one of the most hazardous operations on the entire site.

**6. Stewart explains that the dust generation due to traffic was not in the original scope of the report that they prepared.**

- a. We are gratified to learn that Stewart was proactive on this issue. In fact, fugitive emissions from truck traffic on the site will be one of the largest contributors to the emissions. We have confirmed in general terms Stewart’s calculations that were included in the original documents that they provided (we arrived at particulate emission rates that were slightly higher than the Stewart calculations.)
- b. In their response, Stewart has done new calculations of the fugitive emissions from the site traffic. There is inadequate information to validate their calculations. However, the fact that the emission factors have been reduced by about 10X is problematic. It appears that this has been accomplished by assuming that the “silt loading” is reduced by 90% for some indeterminate reason. Without further details, we cannot be sure, but the EPA’s AP-42 document does not support this level of reduction on the paved roads due solely to the street sweeper. If instead, a reduction in silt loading of 30% is used, as Stewart indicated would be appropriate, substantially higher EF values are obtained.

Source of EF calc	PM2.5 E.F (lb/VMT)	PM 2.5 Emissions Asphalt (tpy)	PM 10 EF (lb/VMT)	PM10 Emissions (asphalt)(tpy)
Original Stewart <sup>1</sup>	1.07	9.94	4.57	42.4
New Stewart	0.14	1.3	0.56	5.2
Klitch/Kisker, New (30% control)	0.812	7.54	3.31	30.7

It must be noted that even with the corrected EF, these values are much lower than the original Stuart analysis. This is a result of the much lower values for total Vehicle Miles Traveled, VMT, which is a direct multiplier in the fugitive emissions equations found in the AP-42 document. Given the necessarily limited scope of this document, we won’t attempt to rationalize all of those details. However, even assuming that the mileage adjustment is appropriate, it would appear that all of the Paved Road fugitive emissions in the new Stewart analysis are potentially understated by about 5.75X, which would result in a corrected

<sup>1</sup> Calculation of Emissions using the current Stewart value for Vehicle Miles Travelled (VMT)

total from the paved roads only of about 56.9 tons of PM2.5 and 231 tons of PM10. To confirm this, it would be necessary to review the details of the new Stewart analysis, but because their response was submitted at the Planning Commission hearing itself, this was not possible.

**7. Stewart takes issue with our use of the maximum hourly production rate (500tph) that was provided to us by Mr. Hagerman. Furthermore, on page 9 of the Stewart response, it is stated that: “This [i.e. the hourly production] will be limited by the amount of asphalt that can leave the facility by truck.”**

- a. Again, we were analyzing the plant operation based on the maximum production rate because that’s what Mr. Hagerman said that they did. It’s now clear that is absolutely NOT the case, and, in fact, Dr. Stewart acknowledges this, and even claims that it should not be done. Obviously, MMM can’t have it both ways.
- b. The even more surprising point is the assertion that the production is limited by the truck shipping rate!! This is absurd, since this is a continuous drum mix plant, and will have 3 storage silos specifically so that the plant production is NOT limited by truck availability.

**8. Regarding the emissions of particulate matter from the asphalt and concrete plants, Dr. Stewart claims that our analysis was flawed, again because we looked at the “worst case” production rates that were reported by Mr. Hagerman and were originally in the APEN for the Ready Mix plant. He goes so far as to say (page 10, second paragraph) that: “Dr. Kisker overestimated the amount of particulate matter due to using longer hours than permitted, higher production rates than permitted, and uncontrolled emissions rather than the controlled emissions per the permit application”**

- a. Over estimate due to longer production. Not true. We used the exact same AERSCREEN calculation as did Stewart. We did use the higher production rates that were provided by Mr. Hagerman for the asphalt plant and were found in the APEN application for the concrete plant.
- b. Higher production rates than permitted. Not true. No application for the asphalt plant has been submitted. The APEN rate was used for the concrete plant.
- c. Used uncontrolled emissions. Not true. We used the same emission factors as did Stewart for the asphalt plant, and the correct ones for the concrete plant.
- d. Referring to table 9 on page 10 of the Stewart comment, we also point out that their OWN calculation shows that according to the corrected AERSCREEN calculation they will be in excess of the NAAQS value for PM2.5, and nearly

exceed it at the nearby residence. This is the same conclusion that we drew. Table 10 shows that they will also exceed the EPA's annual limits.

- e. Finally, their assertion that AERSCREEN will tend to overestimate the actual emissions is not supported by the experiences of others. Generally, it's found that a full analysis using AERMOD may show the situation to be either better or worse, once all sources are properly taken into account. The blanket statement that AERSCREEN will overestimate the impact is not correct.

**9. Stewart now acknowledges that the estimates of pollutants at the fence line and nearby properties were based on math errors, resulting in higher formaldehyde levels than previously estimated. He claims that the formaldehyde emission will be reduced by the presence of carbon filters on the AC tanks.**

- a. First of all, the carbon filters on the AC tanks are irrelevant since the emissions that are discussed are from the drum mix aggregate dryer!! The carbon filters on the AC tanks will have no controlling effect on the dryer. We are surprised that Dr. Stewart would assert this claim!
- b. Dr. Stewart suggests that the actual emissions will be less than estimated using the EPA emission factors. We have no way of knowing whether this statement is valid or not.

**10. In Table 12, Stewart presents the "Annual" levels of exposure to the HAP compounds emitted from the asphalt plant. While he acknowledges that the formaldehyde levels at the property line and nearby residence will exceed the EPA "carcinogenic screening level", he claims that this is OK because the excess risk may only be 1 in 100,000.**

- a. First of all, it's important to understand that to arrive at the estimate of the annual exposure, the procedure that was properly used was to multiply the HOURLY exposure by 0.1, resulting in the estimate of  $2.07 \mu\text{g}/\text{m}^3$ . This factor is based on the hourly production rate of 380 tons per hour rather than the higher level of 500 tph provided by Mr. Hagerman.<sup>2</sup> If the maximum rate is used, then the hourly formaldehyde exposure at the residence is  $27 \mu\text{g}/\text{m}^3$ , rather than the 20.7 that the Stewart report implies.
- b. The EPA actually has various factors that are to be used to convert the hourly emission rate from AERSCREEN to other time periods<sup>3</sup>. These are shown in the table below:

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<sup>2</sup> Note that this fact is not stated and is arrived at only by "back calculating" the assumed production rate.

<sup>3</sup> Source: AERSCREEN Users Guide, US EPA.



Time period	1 hour	3 hour	8 hour	24 hour	Annual
Factor	1.0	1.0	0.9	0.6	0.1
Adjusted Formaldehyde ( $\mu\text{g}/\text{m}^3$ )	27	27	24.3	16.2	2.7

- c. The question of hazard level is important. There are several possible values that can be used to assess formaldehyde related risk. Clearly, an annual average is probably inappropriate, as the asphalt plant operation is seasonal. A more appropriate estimate of risk would be a daily estimate, since it's likely that a person in the surrounding neighborhood could be exposed for a full day of emissions if they were doing outdoor activities such as gardening when the plant was in operation.

As reported at the Planning Commission hearing, the National Institute of Occupational Safety and Health (NIOSH) specifies a Recommended Exposure Limit (REL) of  $20 \mu\text{g}/\text{m}^3$  for their TWA limit, which is a 10 hour exposure limit. Apparently, a person who was outdoors for a full workday, near the plant boundary could actually be exposed to a formaldehyde level that would exceed the REL published by NIOSH!!!

- d. At the Planning Commission meeting, we also pointed out that the estimated level of formaldehyde exposure does, in fact, far exceed the more stringent limit of  $9 \mu\text{g}/\text{m}^3$ . Referring back to Figure 1, although Mr. Hagerman apparently was happy to compare the AERSCREEN results to the California standards, at the Hearing Mr. Stewart devalued that comparison by saying that the CA limit was irrelevant because it was California. Again, you can't have it both ways. Eliminating the CA comparison because you don't like the results when the estimate is done correctly is not only invalid, but it also suggests that the entire approach to analyzing the emissions is not based on an honest assessment, but rather on a desired outcome.

**11. Finally, on page 13 of their comments, as well as at the Planning Commission hearing, Dr. Stewart asserts that the use of the Air Quality Index (AQI) to scale the PM2.5 concentration is not valid. He makes claims that it's only appropriate for large areas and populations and that it has multiple factors included which would make it impossible to assess the impact of the PM2.5 exposure.**

- a. Simply put, this is wrong. The EPA has individual formulas that relate the concentrations of individual criteria pollutants to the AQI hazard scale. This is

done so that an overall AQI hazard level can be reported, no matter which of the criteria pollutants is the most dangerous at a particular time. This does not in any way invalidate the EPA's published scaling factors for the purpose of assessing hazard levels due to individual components.

In conclusion, we are frankly disappointed that the pursuit of an honest assessment of the impact of the Martin Marietta Materials Highway 34 project continues to be so entwined with misinformation and misleading analyses. Frankly, we don't know whether MMM is an honest company or not. However, in assessing this question of the extent and risk of emissions, which is second only to traffic in its potential impact and incompatibility with the neighboring USES, it's become apparent that the ONLY way to even consider allowing this project to move forward would be if it were subject to extreme scrutiny at every step of the way.

Martin Marietta has no right to potentially subject the surrounding residences, properties and activities to what may well be unhealthy levels of pollution, whether it's from particulate contamination, hazardous air pollutants such as formaldehyde or other, yet to be determined risks.