

## Part I. Emissions of Interest Dairy Air Quality Task Force Homework

**A** = Recommendation to reduce emissions. **B** = Recommendation to study. **C** = Do both A and B. **D** = Recommend no action

*Please note that you will see varying numbers of responses in each box. Some responded with an answer for every box, some responded with answers for only some boxes only one (Wustenberg) responded with “?” and text, which required some interpretation, and finally, one (Hanson) responded with a global “for all Ds,” which is indicated in the footnote box, but not at every instance of a Hanson-D in the chart.*

Emissions	Potential Impacts						
	Animal Health	Worker Health	Neighbor Affect	Airshed Health (NAAQS, Air Toxics)	Regional Welfare (Visibility)	Global Affect (GHG)	AQ Permit
<b>Ammonia (NH<sub>3</sub>)</b>	<b>A</b> = 0 <b>B</b> = Kaye, Males, Myers <b>C</b> = 0 <b>D</b> = Bansen, Ginsburg, <sup>1</sup> Hanson, Johnson, Moore, Wustenberg	<b>A</b> = Moore <b>B</b> = Baumann, Kaye, Males, Myers Shibley <b>C</b> = Kendra <b>D</b> = Bansen, Ginsburg, <sup>2</sup> Hanson, Johnson, Wustenberg	<b>A</b> = 0 <b>B</b> = Ginsburg, <sup>3</sup> Shibley <b>C</b> = Kaye, Kendra <b>D</b> = Bansen, Hanson, Johnson, Males, Moore, Wustenberg	<b>A</b> = 0 <b>B</b> = Moore <b>C</b> = Kaye, Shibley <b>D</b> = Bansen, Ginsburg, Hanson, Johnson, Males, Wustenberg	<b>A</b> = Baumann, Ginsburg, Kendra, Myers <b>B</b> = Johnson <sup>4</sup> <b>C</b> = Hanson, <sup>5</sup> Kaye, Males, <sup>6</sup> <b>D</b> = Bansen, Moore, Shibley, <b>? = Wustenberg</b> <sup>7</sup>	<b>A</b> = Moore <b>B</b> = 0 <b>C</b> = Kaye <b>D</b> = Bansen, Ginsburg, Hanson, Johnson, Males, Shibley, Wustenberg	<b>A</b> = 0 <b>B</b> = Kaye <b>C</b> = 0 <b>D</b> = Bansen, Ginsburg, Hanson, Johnson, Males, <sup>8</sup> Moore, Shibley, Wustenberg

<sup>1</sup> However, we should note in the ammonia recommendation that any measures to reduce ammonia should not endanger animal health. (Ginsburg)

<sup>2</sup> However, we should note in the ammonia recommendation that any measures to reduce ammonia should not endanger worker health. We might also want to recommend that OR–OSHA conduct further studies of worker health, but I don’t think the TF should recommend a separate process outside of OSHA regarding worker health. This same comment applies to the other pollutants. (Ginsburg)

<sup>3</sup> We may want to recommend a monitoring component to the program. For example, if ambient concentrations at the nearest receptor is above a specified level, participation in the BMP program would be required if otherwise voluntary. (Ginsburg)

<sup>4</sup> Industry should take lead (Johnson)

<sup>5</sup> Make sure we account for any cross media and cross emissions potential in whatever recommendations we make. (Hanson)

<sup>6</sup> There should be voluntary implementation of BMPs while monitoring and research are being done in order to determine base line levels. (Males)

<sup>7</sup> Ammonia and regional visibility is something that is an issue and I think we need to try to help as we can. Again, It's unclear to me

that we really know what impact we can have on the overall problem or what other things we might impact through focused mitigation efforts. (Wustenberg)

<sup>8</sup> At this time, I do not think we have enough information to put in place an AQ Permit. We need the monitoring first (Males)

Hanson <sup>D</sup> For all columns marked “D” Oregon needs to continue to monitor the emerging science and apply new technologies to mitigate impacts. Simple example – consider feed rations that maintain production yet reduce emissions. (Hanson)

	<b>Animal Health</b>	<b>Worker Health</b>	<b>Neighbor Affect</b>	<b>Airshed Health (NAAQS, Air Toxics)</b>	<b>Regional Welfare (Visibility)</b>	<b>Global Affect (GHG)</b>	<b>AQ Permit</b>
<b>Hydrogen sulfide (H<sub>2</sub>S)</b>	A = 0 B = 0 C = 0 D = Bansen, Ginsburg, Hanson, Johnson, Males, Moore, Myers, Wustenberg	A = 0 B = Baumann, <sup>1</sup> Kaye C = Kendra, Shibley D = Bansen, Ginsburg, Hanson, Johnson, Males, Moore, Myers, Wustenberg	A = 0 B = Shibley C = Kendra D = Bansen, Ginsburg, Hanson, Johnson, Males, Moore, Wustenberg	A = 0 B = 0 C = 0 D = Bansen, Ginsburg, Hanson, Johnson, Males, Moore, Shibley, Wustenberg	A = 0 B = 0 C = 0 D = Bansen, Ginsburg, Hanson, Johnson, Males, Moore, Myers, Shibley, Wustenberg	A = 0 B = 0 C = 0 D = Bansen, Ginsburg, Hanson, Johnson, Males, Moore, Shibley, Wustenberg	A = 0 B = 0 C = 0 D = Bansen, Ginsburg, Hanson, Johnson, Males, Moore, Shibley, Wustenberg

<sup>1</sup> I know Mitloehner said there's no hydrogen sulfide from cows. Is there any evidence contradicting? If not, I could drop my B (Baumann)

Hanson <sup>D</sup> For all columns marked “D” Oregon needs to continue to monitor the emerging science and apply new technologies to mitigate impacts. Simple example – consider feed rations that maintain production yet reduce emissions. (Hanson)

	<b>Animal Health</b>	<b>Worker Health</b>	<b>Neighbor Affect</b>	<b>Airshed Health (NAAQS, Air Toxics)</b>	<b>Regional Welfare (Visibility)</b>	<b>Global Affect (GHG)</b>	<b>AQ Permit</b>
<b>Volatile Organic Compounds (VOCs)</b>	A = 0 B = 0 C = 0 D = Bansen, Ginsburg, Hanson, Johnson, Males, Moore, Wustenberg	A = Kaye B = Shibley C = 0 D = Bansen, Ginsburg, Hanson, Johnson, Males, Moore, Myers, Wustenberg	A = 0 B = Shibley C = 0 D = Bansen, Ginsburg, Hanson, Johnson, Males, Moore, Wustenberg	A = 0 B = 0 C = 0 D = Bansen, Ginsburg, Hanson, Johnson, Males, Moore, Shibley, Wustenberg	A = 0 B = 0 C = 0 D = Bansen, Ginsburg, Hanson, Johnson, Males, Moore, Shibley, Wustenberg	A = 0 B = 0 C = 0 D = Bansen, Ginsburg, Hanson, Johnson, Males, Moore, Shibley, Wustenberg	A = Kaye, Kendra B = Baumann, Hanson <sup>1</sup> , Johnson <sup>2</sup> , Myers C = 0 D = Bansen, Ginsburg, Males, Moore, Shibley, Wustenberg <sup>3</sup> ? = Wustenberg <sup>3</sup>
<p><sup>1</sup> Make sure we account for any cross media and cross emissions potential in whatever recommendations we make. (Hanson)</p> <p><sup>2</sup> Industry should take lead, need more study (Johnson)</p> <p><sup>3</sup> I don't think we have enough information to understand our impact on VOC footprint, so further study is all I think we need here although I'm open to thinking about mitigation. (Wustenberg)</p> <p>Hanson D For all columns marked "D" Oregon needs to continue to monitor the emerging science and apply new technologies to mitigate impacts. Simple example – consider feed rations that maintain production yet reduce emissions. (Hanson)</p>							

	<b>Animal Health</b>	<b>Worker Health</b>	<b>Neighbor Affect</b>	<b>Airshed Health (NAAQS, Air Toxics)</b>	<b>Regional Welfare (Visibility)</b>	<b>Global Affect (GHG)</b>	<b>AQ Permit</b>
<b>Methanol (CH<sub>3</sub>OH)</b>	<b>A</b> = 0 <b>B</b> = 0 <b>C</b> = 0 <b>D</b> = Bansen, Ginsburg, Hanson, Johnson, Males, Moore, Wustenberg	<b>A</b> = Kendra <b>B</b> = Shibley <b>C</b> = 0 <b>D</b> = Bansen, Ginsburg, Hanson, Johnson, Males, Moore, Wustenberg	<b>A</b> = 0 <b>B</b> = Shibley <b>C</b> = 0 <b>D</b> = Bansen, Ginsburg, Hanson, Johnson, Males, Moore, Wustenberg	<b>A</b> = 0 <b>B</b> = Moore, Shibley <b>C</b> = 0 <b>D</b> = Bansen, Ginsburg, Hanson, Johnson, Males, Shibley, Wustenberg	<b>A</b> = 0 <b>B</b> = 0 <b>C</b> = 0 <b>D</b> = Bansen, Ginsburg, Hanson, Johnson, Males, Moore, Shibley, Wustenberg	<b>A</b> = Moore <b>B</b> = Males <b>C</b> = 0 <b>D</b> = Bansen, Ginsburg, Hanson, Johnson, Shibley, Wustenberg	<b>A</b> = Kaye, Kendra <b>B</b> = Baumann, Ginsburg, <sup>1</sup> Hanson, <sup>2</sup> Johnson, <sup>3</sup> Myers <b>C</b> = 0 <b>D</b> = Bansen, Males, <sup>4</sup> Moore, Shibley,

<sup>1</sup> The permitting threshold for methanol is much lower than for criteria pollutants like VOC or particulate. A source with the potential to emit 10 tons/year of methanol could be subject to permitting. The TF may want to recommend further study of this in advance of the EPA process-based emission model because CAFOs – either funding for OSU to study or an outreach program to encourage CAFO operators to do their own assessments. (Ginsburg)

<sup>2</sup> Need to more fully understand the source of methanol on dairies and what can be done about it. Study regional air shed issues. (Hanson)

<sup>3</sup> Industry should take lead, need more study (Johnson)

<sup>4</sup> At this time, I do not think we have enough information to put in place an AQ Permit. We need the monitoring first (Males)

Hanson <sup>D</sup> For all columns marked “D” Oregon needs to continue to monitor the emerging science and apply new technologies to mitigate impacts. Simple example – consider feed rations that maintain production yet reduce emissions. (Hanson)

	<b>Animal Health</b>	<b>Worker Health</b>	<b>Neighbor Affect</b>	<b>Airshed Health (NAAQS, Air Toxics)</b>	<b>Regional Welfare (Visibility)</b>	<b>Global Affect (GHG)</b>	<b>AQ Permit</b>
<b>Particulate Matter (PM)</b>	A = 0 B = 0 C = 0 D = Bansen, Ginsburg, Hanson, Johnson, Males, Moore, Wustenberg	A = 0 B = Shibley C = Kaye D = Bansen, Hanson, Johnson, Males, Moore, Wustenberg	A = 0 B = Shibley C = Kaye D = Bansen, Ginsburg, Hanson, Johnson, Males, Moore, Wustenberg	A = 0 B = 0 C = Kaye D = Bansen, Ginsburg, Hanson, Johnson, Males, Moore, Shibley, Wustenberg	A = Kendra B = 0 C = Kaye D = Bansen, Ginsburg, Hanson, Johnson, Males, Moore, Shibley, Wustenberg	A = 0 B = 0 C = Kaye D = Bansen, Ginsburg, Hanson, Johnson, Males, Moore, Shibley, Wustenberg	A = 0 B = 0 C = Kaye D = Bansen, Ginsburg, Hanson, Johnson, Males, Moore, Shibley, Wustenberg
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	<b>Animal Health</b>	<b>Worker Health</b>	<b>Neighbor Affect</b>	<b>Airshed Health (NAAQS, Air Toxics)</b>	<b>Regional Welfare (Visibility)</b>	<b>Global Affect (GHG)</b>	<b>AQ Permit</b>
<b>Methane (CH<sub>4</sub>)</b>	A = 0 B = 0 C = 0 D = Bansen, Ginsburg, Hanson, Johnson, Males, Moore, Wustenberg	A = 0 B = 0 C = Kaye D = Bansen, Ginsburg, Hanson, Johnson, Males, Moore, Shibley, Wustenberg	A = 0 B = 0 C = 0 D = Bansen, Ginsburg, Hanson, Johnson, Males, Moore, Shibley, Wustenberg	A = 0 B = Moore C = 0 D = Bansen, Ginsburg, Hanson, Johnson, Males, Shibley, Wustenberg	A = 0 B = 0 C = 0 D = Bansen, Ginsburg, Hanson, Johnson, Males, Moore, Shibley, Wustenberg	A = Ginsburg, <sup>1</sup> Kendra, Moore B = Bansen, Johnson, <sup>2</sup> Males, Myers, Shibley, C = Baumann, Hanson, Kaye D = 0 ? = Wustenberg <sup>3</sup>	A = 0 B = 0 C = 0 D = Bansen, Ginsburg, Hanson, Johnson, Males, Moore, Shibley, Wustenberg
<p><sup>1</sup> This could be to reduce methane, or at least to ensure that it is not increased by measures taken to reduce ammonia. (Ginsburg)</p> <p><sup>2</sup> Industry should take lead (Johnson)</p> <p><sup>3</sup> Reducing our carbon footprint is a good thing to do if possible but I don't think we need regulated. More study might be nice. (Wustenberg)</p> <p><sup>Hanson D</sup> For all columns marked “D” Oregon needs to continue to monitor the emerging science and apply new technologies to mitigate impacts. Simple example – consider feed rations that maintain production yet reduce emissions. (Hanson)</p>							

	<b>Animal Health</b>	<b>Worker Health</b>	<b>Neighbor Affect</b>	<b>Airshed Health (NAAQS, Air Toxics)</b>	<b>Regional Welfare (Visibility)</b>	<b>Global Affect (GHG)</b>	<b>AQ Permit</b>
<b>Oxides of nitrogen (NO<sub>x</sub>)</b>	A = 0 B = 0 C = 0 D = Bansen, Ginsburg, Hanson, Johnson, Males, Moore, Wustenberg	A = 0 B = Shibley C = 0 D = Bansen, Ginsburg, Hanson, Johnson, Males, Moore, Wustenberg	A = 0 B = 0 C = 0 D = Bansen, Ginsburg, Hanson, Johnson, Males, Moore, Shibley, Wustenberg	A = 0 B = 0 C = 0 D = Bansen, Ginsburg, Hanson, Johnson, Males, Moore, Shibley, Wustenberg	A = Kendra B = Shibley C = 0 D = Bansen, Ginsburg, Hanson, Johnson, Males, Moore, Wustenberg	A = 0 B = Johnson <sup>1</sup> C = 0 D = Bansen, Ginsburg, Hanson, Males, Moore, Shibley, ? = Wustenberg <sup>2</sup>	A = 0 B = 0 C = 0 D = Bansen, Ginsburg, Hanson, Johnson, Males, Moore, Shibley, Wustenberg

<sup>1</sup> Industry should take lead (Johnson)

<sup>2</sup> Reducing our carbon footprint is a good thing to do if possible but I don't think we need regulated. More study might be nice. (Wustenberg)

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<b>Odors</b>	A = 0 B = 0 C = 0 D = Bansen, Ginsburg, Hanson, Johnson, Males, Moore, Wustenberg	A = Kendra B = 0 C = Kaye D = Bansen, Ginsburg, Hanson, Johnson, Males, Moore, Shibley, Wustenberg	A = Kendra, Males <sup>1</sup> B = Bansen, Hanson, <sup>2</sup> Shibley, C = Baumann, <sup>3</sup> Kaye, Myers D = Ginsburg, Johnson, <sup>4</sup> Moore ? = Wustenberg <sup>5</sup>	A = 0 B = 0 C = 0 D = Bansen, Ginsburg, Hanson, Johnson, Males, Moore, Shibley, Wustenberg	A = 0 B = 0 C = 0 D = Bansen, Ginsburg, Hanson, Johnson, Males, Moore, Shibley, Wustenberg	A = 0 B = 0 C = 0 D = Bansen, Ginsburg, Hanson, Johnson, Males, Moore, Shibley, Wustenberg	A = 0 B = 0 C = 0 D = Bansen, Ginsburg, Hanson, Johnson, Males, Moore, Shibley, Wustenberg

<sup>1</sup> The Dairy industry should be encouraged to implement BMPs to try to reduce odors. (Males)

<sup>2</sup> Look for ways to mitigate the impacts of odors on neighbors and community. (Hanson)

<sup>3</sup> I'd been inclined to say that odor problems are mostly the result of people moving "to the country" who don't know that farms tend to have strong odors associated with. But, the gentleman who testified at the last meeting made me want to at least discuss this more, as the situation of an exponential increase in the size of an operation creating problems for neighbors who were already there seems different. (Baumann)

<sup>4</sup> Industry should take the lead (Johnson)

<sup>5</sup> I think that the odor issue is one that in some areas (Tillamook for example) we are going to have to address this over the next few years or we risk a PR nightmare. We don't necessarily need to study it more to know we have a problem and we have a number of ways already available to mitigate. If we need more study to find more alternatives or to better understand the impacts that odor mitigation has on other issues then that's OK. (Wustenberg)

Hanson D For all columns marked "D" Oregon needs to continue to monitor the emerging science and apply new technologies to mitigate impacts. Simple example – consider feed rations that maintain production yet reduce emissions. (Hanson)