



Air Quality Permitting Response to Public Comments

October 28, 2008

Permit to Construct No. P-2008.0093

**DF-AP#3, LLC
Double A Dairy Facility
Jerome, Idaho**

Facility ID No. 053-00018

Prepared by:
Darrin Pampaian, Permit Writer
AIR QUALITY DIVISION

D.P.

Final

1. BACKGROUND

As deemed appropriate by the Director, the Idaho Department of Environmental Quality (DEQ) provided for public comment the proposed installation of a new anaerobic digester which creates biogas to be used as fuel for six reciprocating IC engines used to power electrical generators Permit to Construct P-2008.0093 for DF-AP#3, LLC located in Jerome, Idaho.

An Opportunity for Public Comment was provided from June 26, 2008, through July 11, 2008. During this time, a member of the public requested a public comment period. DEQ provided the comment period from September 19, 2008, through October 20, 2008. Comments were provided via e-mail. Each comment and DEQ's response is provided in the following section. Comments with a common theme have been grouped together as one comment and responded to as one comment. All comments submitted in response to DEQ's proposed action are included as the appendix of this document.

2. PUBLIC COMMENT AND RESPONSES

Public comments regarding the permit analysis and air quality aspects of the proposed permit are summarized below. Due to the similarity of many of the comments received, the summary presented below combines and/or paraphrases some comments in order to eliminate duplication and to provide a more concise summary. Questions, comments, and/or suggestions received during the comment period that did not relate to the air quality aspects of the permit application, the Department's technical analysis, or the proposed permit are not addressed.

Comments Received via e-mail October 20, 2008

Comments Received

Comment 1: Idaho Conservation League: Anaerobic digesters can play an important role in reducing greenhouse gases, reducing odors associated with livestock waste, and providing a renewable energy source. The Idaho Conservation League is pleased that new engines are being installed on this project, assuring higher efficiency and lower post-combustion emissions. However, due to the number of engines on this facility, it is possible that the cumulative impact of the facility may further degrade regional air quality. Therefore, we are recommending additional emissions controls for NO_x.

Response: The proposed clean-burn IC engines meet all current state and federal regulations for NO_x emissions. Therefore, there will be no change made to the final permit.

Comment 2: Idaho Conservation League: The Department of Environmental Quality (DEQ) recently release a statewide greenhouse gas inventory¹ that shows large-scale animal operations are the second largest source of greenhouse gases in the state. Greenhouse gases are pollution that has been linked to global warming, and Idaho's emission rates are rising faster than those of the nation as a whole. Methane, the primary emission from large-scale animal operations, is considered by the US Environmental Protection Agency to be over 20 times as potent a greenhouse gas as carbon². Anaerobic digesters can play an important role in reducing methane.

Response: The support of the issuance of the permit has been noted.

Comment 3: Idaho Conservation League:

Particulate Matter:

The proposed permit to construct describes that six new, Guascor brand engines will be used to combust up to 1,754,640 cubic feet of biogas per day. Biogas contains methane, carbon dioxide, and trace levels of hydrogen sulfide. Emissions associated with the combustion of biogas include a number of air pollutants – the most notable of which are sulfur dioxide and nitrogen oxides. These particular pollutants are of regional importance due to known air quality concerns over PM_{2.5} levels within the Magic Valley.

¹ Idaho Greenhouse Gas Inventory and Reference Case Projections 1990-2020, Spring 2008.

² <http://www.epa.gov/methane/index.html>

Sulfur dioxide and nitrogen oxides are among the criteria pollutants emitted to the atmosphere as a result of biogas combustion. Sulfur dioxide and nitrogen oxides have been shown to contribute to PM_{2.5} pollution³, especially when ammonia is present in the atmosphere⁴. There is evidence to support that PM_{2.5} levels increase at a faster rate when high levels of ammonia are present among acid gases, such as SO₂ and NO_x⁵. Due to the level of residential and industrial growth in the Magic Valley, as well as existing agricultural activities, it is appropriate for the DEQ to limit local emissions that are considered PM_{2.5} precursors, such as NO_x and SO_x.

Response: New source review requirements for assuring compliance with PM_{2.5} emissions standards have not yet been completed and promulgated into regulation. Therefore, there will be no change made to the final permit.

Hydrogen Sulfide:

We are encouraged to see that hydrogen sulfide levels will be reduced prior to combustion, using a hydrogen sulfide (H₂S) bio-scrubber. Hydrogen sulfide is a toxic and potentially deadly gas as well as a highly corrosive compound⁶. Using scrubbing equipment to reduce hydrogen sulfide levels prior to combustion increases the life of the engine and limits potential human exposure. In addition, removal of H₂S prior to combustion reduces the elemental sulfur available in the biogas and, therefore, reduces post-combustion sulfur dioxide emissions.

Response: The support of the installation of the proposed scrubber has been noted.

Recommendation:

Sulfur dioxide and nitrogen oxides should be regulated to reduce PM_{2.5} levels and protect air quality in the Magic Valley. We are supportive of the use of a hydrogen sulfide bio-scrubber to reduce any potential exposure to this deadly gas prior to combustion, and to reduce sulfur dioxide levels after combustion. To further protect air quality in the Magic Valley, however, it is important to control all precursors to PM_{2.5}, where possible. Sulfur dioxide emissions will be reduced through the use of bio-scrubber. To control NO_x emissions, DEQ should also consider requiring NO_x control technology on the combustion units at this anaerobic digester.

Response: See the previous discussion regarding PM_{2.5} and NO_x emissions standards. Therefore, there will be no change made to the final permit.

³ http://www.epa.gov/ttn/naaqs/pm/pm25_2006_techinfo.html

⁴ Policies for Addressing PM_{2.5} Precursor Emissions, June 2007, www.epa.gov/ttn/naaqs/pm/presents/policies_for_pm25_precursors-rich_damberg.ppt

⁵ Bok Haeng Baek, Viney P. & Quansong Tong, May 2004. Chemical coupling between ammonia, acid gases, and fine particles. Environmental Pollution, 129 (1), pg 89-98.

⁶ Department of Energy EERE Factsheet of consumer level information on methane and anaerobic digestion, 2000.

Appendix
Public Comments Submitted for
Permit to Construct
P-2008.0093



www.idahoconservation.org

Idaho Conservation League
PO Box 864, Elmore, ID 83701
208.245.6933

October 20, 2008

Idaho Department of Environmental Quality
Darrin Pampaian
Air Quality Division
1410 North Hilton
Boise, Idaho 83706

RE: Idaho Conservation League Comments on proposed air quality permit to construct for DF-AP #3, LLC/Double A Dairy, Jerome

Dear Mr. Pampaian:

Thank you for the opportunity to comment on the proposed on the proposed air quality permit to construct for DF-AP #3, LLC/Double A Dairy, Jerome. For thirty-four years, the Idaho Conservation League has been Idaho's voice for clean water, clean air, and wilderness—values that are the foundation to Idaho's extraordinary quality of life. The Idaho Conservation League works to protect these values through citizen action, public education, and professional advocacy. As Idaho's largest state-based conservation organization we represent over 9,500 members, many of whom have a deep personal interest in protecting air quality.

Anaerobic digesters can play an important role in reducing greenhouse gases, reducing odors associated with livestock waste, and providing a renewable energy source. The Idaho Conservation League is pleased that new engines are being installed on this project, assuring higher efficiency and lower post-combustion emissions. However, due to the number of engines on this facility, it is possible that the cumulative impact of the facility may further degrade regional air quality. Therefore, we are recommending additional emissions controls for NO_x.

Greenhouse Gases

The Department of Environmental Quality (DEQ) recently release a statewide greenhouse gas inventory¹ that shows large-scale animal operations are the second largest source of greenhouse gases in the state. Greenhouse gases are pollution that has been linked to global warming, and Idaho's emission rates are rising faster than those of the nation as a whole. Methane, the primary emission from large-scale

¹ Idaho Greenhouse Gas Inventory and Reference Case Projections 1990-2020, Spring 2008

animal operations, is considered by the US Environmental Protection Agency to be over 20 times as potent a greenhouse gas as carbon². Anaerobic digesters can play an important role in reducing methane.

Particulate Matter

The proposed permit to construct describes that six new, Guasco brand, engines will be used to combust up to 1,754,640 cubic feet of biogas per day. Biogas contains methane, carbon dioxide, and trace levels of hydrogen sulfide. Emissions associated with the combustion of biogas include a number of air pollutants - the most notable of which are sulfur dioxide and nitrogen oxides. These particular pollutants are of regional importance due to known air quality concerns over PM_{2.5} levels within the Magic Valley.

Sulfur dioxide and nitrogen oxides are among the criteria pollutants emitted to the atmosphere as a result of biogas combustion. Sulfur dioxide and nitrogen oxides have been shown to contribute to PM_{2.5} pollution,³ especially when ammonia is present in the atmosphere.⁴ There is evidence to support that PM_{2.5} levels increase at a faster rate when high levels of ammonia are present among acid gases, such as SO₂ and NOx.⁵ Due to the level of residential and industrial growth in the Magic Valley, as well as existing agricultural activities, it is appropriate for the DEQ to limit local emissions that are considered PM_{2.5} precursors, such as NOx and SOx.

Hydrogen Sulfide

We are encouraged to see that hydrogen sulfide levels will be reduced prior to combustion, using a hydrogen sulfide (H₂S) bio-scrubber. Hydrogen sulfide is a toxic and potentially deadly gas as well as a highly corrosive compound.⁶ Using scrubbing equipment to reduce hydrogen sulfide levels prior to combustion increases the life of the engine and limits potential human exposure. In addition, removal of H₂S prior to combustion reduces the elemental sulfur available in the biogas and, therefore, reduces post-combustion sulfur dioxide emissions.

Recommendation

Sulfur dioxide and nitrogen oxides should be regulated to reduce PM_{2.5} levels and protect air quality in the Magic Valley. We are supportive of the use of a hydrogen sulfide bio-scrubber to reduce any potential exposure to this deadly gas prior to combustion, and to reduce sulfur dioxide levels after combustion. To further protect air quality in the Magic Valley, however, it is important to control all precursors to PM_{2.5}, where possible. Sulfur dioxide emissions will be reduced through the use of

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³ http://www.epa.gov/ttn/oaqgp/pn/pm25_2006_schmfa.html

⁴ "Policies for Addressing PM_{2.5} Precursor Emissions, June 2007"

www.epa.gov/ttn/oaqgp/pn/present/policies_for_pm25_precursors-rich_danzberg.pdf

⁵ Bok Heung Baik, Virey P. & Quansong Toeg, May 2004. Chemical coupling between ammonia, acid gases, and fine particles. *Environmental Pollution*, 129 (1), pp 39-58

⁶ Department of Energy EERE Factbook of consumer level information on methane and anaerobic digestion, 2009

bio-scrubber. To control NOx emissions, DEQ should also consider requiring NOx control technology on the combustion units at this anaerobic digester.

Please do not hesitate to contact me with any questions or comments at (208) 345-6942 ex. 23.

Sincerely,



Sara Cohn
Community Conservation Associate