Jefferson County Land & Water Conservation Committee Agenda
"Working Together to Protect & Enhance the Environment"

Jefferson County Courthouse
311 S Center Ave, Rm 112
Jefferson, WI 53549-1701

Wednesday, May 15, 2019 @ 8:30 am

Committee Members: Matt Foelker (Chair), Walt Christensen (Vice-Chair), Ed Morse (Secretary), Dan Herbst (UWEX Member), Mike Kelly (UWEX Member), Frank Anfang (FSA Rep), and Margaret Burlingham (Public Member)

1. Call to Order
2. Roll Call (Establish a Quorum)
3. Certification of Compliance with the Open Meetings Law
4. Review of the May Agenda
5. Approval of the April 17, 2019 Meeting Minutes
6. Public Comment (members of the public who wish to address the Committee on specific agenda items must register their request at this time)
7. Communications
    - Department of Agriculture, Trade & Consumer Protection (DATCP) May 2019 Report
8. Discussion on Departmental Updates
9. Discussion on Natural Resources Conservation Service (NRCS) Report
10. Discussion on Farm Technology Days - LaVern Georgson
11. Discussion and Presentation on Rock Lake Management Plan - Nathan Pyles, Rock Lake Improvement Association (RLIA)
12. Discussion and Possible Action on Notices of Noncompliance - Farmland Preservation Program (FPP)
13. Discussion and Possible Action on Cancellation of Notices of Noncompliance - FPP
14. Review of the Monthly Financial Report (March)
15. Discussion and Possible Action on Purchase of Agriculture Conservation Easement (PACE) Applications & Baseline Documentation
16. Discussion on Items for the Next Agenda
17. Next Scheduled Meeting:
    - June 19, 2019 @ 8:30 am in Room 112
18. Adjournment

A quorum of any Jefferson County Committee, Board, Commission or other body, including the Jefferson County Board of Supervisors, may be present at this meeting.

Individuals requiring special accommodations for attendance at this meeting should contact the County Administrator 24 hours prior to the meeting at (920) 674-7101 so appropriate arrangements can be made.

Land & Water Conservation Committee Minutes
April 17, 2019

1. **Call to Order:**
   The monthly meeting was called to order by Matt Foelker at 8:30 am. Committee members Matt Foelker (Chairperson), Walt Christensen (Vice-Chairperson), Ed Morse (Secretary), Dan Herbst (UWEX Member), Mike Kelly (UWEX Member), Frank Anfang (FSA Rep), and Margaret Burlingham (Public Member) were present. Also in attendance were Patricia Cicero, Interim Director, Land & Water Conservation Department (LWCD); Kim Liakopoulos, LWCD; Gerry Kokkonen, LWCD; Cody Calkins, Natural Resource Conservation Service (NRCS).
   - Members of the Public in Attendance: Anita Martin, Dyan Pasono, Frankie Fuller, Kirk Lund

2. **Roll Call (Establish a Quorum):**
   A quorum was established.

3. **Certification of Compliance with the Open Meetings Law:**
   It was determined that the committee was in compliance with the Open Meetings Law.

4. **Introduction of Interim Director:**
   Patricia Cicero is the LWCD Interim Director.

5. **Review of the April Agenda:**
   The April agenda was reviewed by the committee members. No changes were proposed.

6. **Approval of the March 20, 2019 Meeting Minutes:**
   Anfang made a motion to approve the March 20, 2019 meeting minutes as written, Herbst seconded. Motion passed 7/0.

7. **Public Comment:**
   Martin asked for clarification on WI Land+Water Resolution #5. Cicero will address the clarification during Item #11.

8. **Communications:**
   - Department of Agriculture, Trade & Consumer Protection April 2019 Report.

9. **Discussion on Department Updates:**
   Tree Sale distribution May 7-8, 2019, manure spreader calibrations are taking place, tile work on the County Farm is complete.

10. **Natural Resources Conservation Service (NRCS) Report:**
    Cody Calkins gave an NRCS update. Calkins discussed a spring sign up with a due date of May 17, 2019.

11. Discussion on WI Land+Water Annual Conference Resolutions:
The five WI Land+Water resolutions that were passed at the annual conference were discussed.

12. Discussion on 4th Grade Farm Tour:
The 4th Grade Farm Tour will be at Kutz Dairy May 1, 2019 8:30 am - 2:30 pm. Burlingham and Christensen will attend and perform the "Apple as the Earth" demonstration.

13. Discussion and Possible Action on Notices of Noncompliance - Farmland Preservation Program (FPP): James & Barbara Reek (Voluntary Notice)

Christensen made a motion to accept the notices, Herbst seconded. Motion passed 7/0.

14. Discussion and Possible Action on Cancellation of Notices of Noncompliance - FPP:
There were no cancellations.

15. Review of the Monthly Financial Report (February):
The most recent statement of revenues and expenditures was distributed.

16. Discussion and Possible Action on Purchase of Agriculture Conservation Easement (PACE) Applications & Baseline Documentation:
Kokkonen submitted a full PACE application to NRCS, it's been reviewed, and we are awaiting confirmation of acceptance.

17. Discussion on Items for the Next Agenda:

- Rock Lake Management Plan - Rock Lake Improvement Association

Possible agenda items include: Farm Technology Days

18. Next Scheduled Meeting:

- May 15, 2019 @ 8:30 am in Room 112

19. Adjournment:
Anfang made a motion to adjourn at 9:05 am, Herbst seconded. Motion passed 7/0.

Kim Liakopoulos
Administrative Specialist I ~ LWCD

DATCP REPORT
Bureau of Land and Water Resources
May 2019

Soil and Water Resource Management Grants

- The 2020 SWRM grant application review report was emailed to the counties in late April to verify the application data that was submitted to DATCP.
- Counties should receive their 2019 SWRM schedule of awards in late May.

Nutrient Management Farmer Education Grants

- For the 2020 grant cycle, twenty-four counties and/or tech colleges applied for the Nutrient Management Farmer Education (NMFE) grant, a 50% increase over the sixteen applications received per year in 2018 and 2019. The application funding requests totaled $350,117.60 for 2020—a 70% increase over 2018's funding requests and a 92% increase over 2019's funding requests. The counties and tech colleges are seeing NMFE as way to help more farmers complete nutrient management plans.

Farmland Preservation Program

- A text amendment was approved for the Town of Fond du Lac, Fond du Lac County Farmland Preservation Zoning Ordinance.
- The 2019 Agricultural Enterprise Area (AEA) Petition Cycle is now open. You can access petition materials on the Farmland Preservation Program's AEA webpage.[1] Petitions are due to Natalie.cotter@wisconsin.gov by June 21, 2019. Please contact DATCP for a preliminary review of petition materials.

Land and Water Conservation Board and LWRM Plans

- Burnett, Chippewa, and Calumet Counties will be presenting their LWRM plans to the board on June 4th. The June meeting will be held in Chippewa county and will include a presentation on ground water monitoring by Kevin Masarik, Groundwater Education Specialist from the UW Stevens Point and a presentation by Mark Borchardt, from the USDA-Agriculture Research Service.
- Thank you to all the counties for submitting their 2019 Annual Work Plans.

Conservation Engineering

- **Reminder on manure gas issues when providing farmstead assistance.** As the spring manure hauling season begins, be sure to be aware of potential hazards associated with the agitation of stored manure. Large quantities of trapped manure gases can be released during agitation of the manure storage. Depending on conditions, gas concentrations may reach levels hazardous to human and animal health. **Hydrogen Sulfide (H_2S)** is the manure gas of greatest concern as it has human health impacts including respiratory irritation, pulmonary edema and death at relatively low concentrations. At low concentrations, this gas has the smell of rotten eggs. At slightly higher concentrations, the nerve cells in the nose are desensitized, and the gas can no longer be smelled. Very high concentrations of hydrogen sulfide can soar in seconds after agitation begins. Concentrations can incapacitate or kill an individual after taking only one or two breaths. The University of Wisconsin Extension publication, *Reducing Risks from Manure Storage Agitation Gases",* is attached for your information.

[1] https://datcp.wi.gov/Pages/Programs_Services/AEAPetitionInfo.aspx

Livestock Facility Siting

- The Technical Expert Committee has completed its 2018 review of the livestock siting standards and submitted its report and recommendations to Secretary Pfaff. The report is available on the Livestock Facility Siting website.[2] The committee's report endorsed a number of key provisions in the ATCP 51 hearing draft rule presented to the ATCP Board in July 2017. For example, the committee generally approved of the use of setbacks and management plans to replace the existing odor score. It also offered recommendations to improve the effectiveness of siting standards such as the evaluation and construction of feed storage runoff control systems. DATCP will evaluate the full scope of the TEC recommendations and determine whether the 2017 draft rule should be modified based on any of these recommendations.

- The Livestock Facility Siting Review Board will meet on June 28th to review an appeal from a dairy farm in the Town of Ledgeview, Brown County. The farm is appealing the Town's decision to deny a siting permit for the second time. Among the issues raised on appeal are the credibility of information in the application due to issues of noncompliance and the town's authority to enforce a more stringent setback for manure storage that was recently revised in its ordinance.

Conservation Reserve Enhancement Program (CREP)

- FSA has not yet shared details regarding CREP administration and enrollment under the new Farm Bill. We expect the program to continue in Wisconsin, however, there will likely be some adjustments to the rental rates, federal incentives, and national acreage limitations. LCD offices can continue to promote CREP to landowners and to assist landowners interested in enrolling new acres by getting the State CREP application process started. Once we receive further information we will forward it to county offices.
- DATCP is working with county offices to schedule monitoring visits for perpetual easements that have expired federal contracts. A letter with corresponding easement maps will be sent from DATCP to each landowner in the upcoming months for easements with CRP1's that expired in 2018. If LCD offices would like DATCP assistance monitoring easements and re-establishing monuments, please contact melissa.gilmore@wisconsin.gov.

Drainage Districts

- The Jefferson County Circuit Court ordered the dissolution of five drainage districts that were in suspended in response to a petition from the department under a 2015 provision in drainage law that defined the process for either dissolving or reinstating suspended districts. Decisions on two other districts in the county are pending. Since 2015, DATCP has petitioned circuit courts to administratively dissolve suspended districts in the following counties: Columbia, Dane, Dodge, Kenosha, Oconto, Racine, Rock, Walworth, and Waukesha. The experience of the Jefferson County Drainage Board will inform how other drainage boards navigate this process.

[2] https://datcp.wi.gov/Pages/Programs_Services/LSTechExpertCom.aspx

University of Wisconsin-Extension

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Civil and Environmental Engineering,
University of Wisconsin-Madison

Kevin Erb
Environmental Resources Center,
University of Wisconsin-Madison

SUSTAINABLE DAIRY PARTNERS

UNIVERSITY OF WISCONSIN-MADISON

CORNELL UNIVERSITY

PENNSYLVANIA STATE UNIVERSITY

UNIVERSITY OF ARKANSAS

UNIVERSITY OF MARYLAND

UNIVERSITY OF MICHIGAN

UNIVERSITY OF WASHINGTON

NORTH CAROLINA AGRICULTURAL AND TECHNICAL STATE UNIVERSITY

INNOVATION CENTER FOR US DAIRY

USDA ARS DAIRY FORAGE RESEARCH CENTER

USDA ARS PASTURE AND WATERSHED MANAGEMENT

USDA ARS NATIONAL LABORATORY FOR AGRICULTURE AND ENVIRONMENT

USDA NATIONAL AGRICULTURE LIBRARY

Reducing Risks from Manure Storage Agitation Gases

Manure Agitation

Manure storage systems allow for flexibility in the timing of manure application in order to reduce operational and environmental issues. Manure can stratify during storage, forming a crust on the surface and causing a build-up of solids on the bottom of the storage system. Agitation mixes the stored manure to resuspend the solids, reducing pumping and other operational issues and providing a more uniform nutrient consistency for application. During storage, naturally occurring microorganisms in the manure degrade organic material in the absence of oxygen (anaerobic conditions) producing gases including carbon dioxide (CO_2), methane (CH_4), ammonia (NH_3), and hydrogen sulfide (H_2S). These gases are released from manure storage systems throughout the storage period. Larger quantities of these gases, which can be trapped within the manure, can be released during agitation. The gases released during agitation can cause concentrations to reach levels that are hazardous to human and animal health (Figure 1).

Since the early 1960s, nearly 150 people have died in the U.S. because of manure-related gas incidents in confined spaces (NCERA 2016). Of those cases, about half occurred on dairy operations. Almost 25% involved a young person under the age of 16. The most common activity at the time a person died was conducting repairs or maintenance on manure handling equipment (34% of the deaths) followed by actions associated with trying to rescue another person entrapped or overcome in a manure storage/reception pit (22% of the deaths) (Beaver and Field 2007).

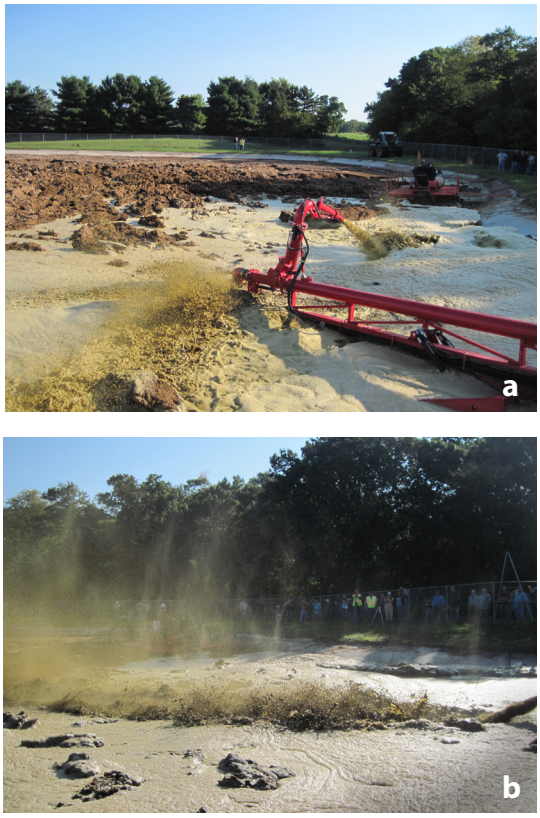

Figure 1. Agitation of a manure storage from: a) the view of the tractor, and b) the view of the spray that can be produced during agitation (note that spray is not a good indicator of gas release).

Common Gases Released During Manure Agitation

Gases are continuously released from manure storage systems as organic compounds degrade. A variety of gases can be released from manure based on the manure's characteristics and other compounds that may be added. The most common gases of concern are carbon dioxide (CO_2), methane (CH_4), ammonia (NH_3) and hydrogen sulfide (H_2S). Table 1 shows that concentrations of each gas carry different levels of risk based on toxicity and effect on the body. When outdoors, gases are typically dispersed into the atmosphere during agitation. This reduces the concentration of gases as they disperse, thereby reducing risks to humans and animals.

Odorless and colorless CO_2 and CH_4 have the potential to displace oxygen in confined spaces resulting in conditions that can cause asphyxiation. Displacement of oxygen to a point that would lead to human health impacts (less than 19.5% oxygen) is a greater concern in conditions where gas dispersion is impeded such as in a confined space. Without correct

safety monitoring, both CO_2 and CH_4 are impossible to detect. In addition, CH_4 can be explosive at concentrations of 5-15% by volume.

Other gases of concern include NH_3 and H_2S, which are toxic and have human health impacts at relatively low concentrations. NH_3 can be extremely irritating to the eyes, respiratory tract, and other mucous membranes (Table 2) and is released from manure during storage and agitation.

H_2S is the gas of greatest acute concern when agitating manure storage systems, as it can cause human health impacts (including respiratory irritation, pulmonary edema, and death) at low concentrations (Table 3). At concentrations as low as 0.001 ppm, H_2S can have a strong rotten egg odor. While this is a good indicator of the presence of H_2S at low levels, one should not rely on smell. At slightly higher concentrations, H_2S can begin to affect the olfactory nerve, which is responsible for the sense of smell, preventing humans from smelling this highly toxic gas. H_2S can build up in stagnant air that does not disperse, resulting in increased concentrations especially during times when there is little or no air movement. Children may encounter higher exposure levels due to their proximity to the source of H_2S. Children also have additional exposure risk since they have smaller diameter airways and a higher lung-surface-area-to-body-weight ratio (ATSDR 2014). Although H_2S does not build up in the body, low-level chronic exposure over time can lead to a variety of physical and neurological disorders, including significant potential for eye injury and damage (ATSDR 2014).

Conditions that Increase Risk Related to Manure Gases

Managing Risk

Risk to human or animal health from manure gases is dependent upon a number of factors. This includes but is not limited to the concentration of the gas and the duration of exposure. To manage the risk associated with manure gases, the first strategy should be to eliminate the hazard altogether. If the hazard cannot be completely eliminated then safeguards and warnings, including safety training and education, should be used to protect against the hazard. Lastly, use personal protective equipment to reduce personal risk (Figure 2). In the case of manure gases, it is critical to minimize the factors that increase gas production and concentration and therefore risk. While the risk may be reduced, it likely cannot be completely eliminated. Therefore, it is important to also incorporate safeguards (e.g., fences, monitoring equipment, etc.) and provide warnings and training to those that may be exposed to the gases. When this is not sufficient, also provide personal protective equipment for those entering confined spaces.

Table 1. Occupational Safety and Health Administration (OSHA) Occupational Standard.

Gas	8-Hour Time Weighted Average (ppm)*	Acceptable Ceiling Concentration (ppm)**	Additional Notes
Ammonia (NH_3)[a]	50	--***	--
Carbon Dioxide (CO_2)[a]	5,000	--***	--
Hydrogen Sulfide (H_2S)[b]	--***	20	50 ppm acceptable maximum peak above ceiling concentration for 10 minutes if no other measurable exposure occurs
Methane (CH_4)	--***	--***	No OSHA exposure limits; simple asphyxiate; oxygen levels must be maintained above 19.5%

*Average concentration over an 8-hour period.
**Maximum concentration at any given moment.
***While there may not be an existing standard, there may still be a risk; standards for a specific gas do not always include each category.
[a]OSHA 2016.
[b]OSHA 2006.

Table 2. Ammonia Toxicity Progression (Michigan Department of Environmental Quality 2006).

Property	Ammonia Concentration in Air (ppm)
Detectable odor	0.04-53
Eye, nose irritation	50-100
Strong cough	50-150
Airway dysfunction	150
Lethal in 30 minutes	2,500-4,500*
Immediately lethal	5,000-10,000*

*As of 2006, the cited report did not find any incidents of death resulting from manure-related ammonia exposure at permitted livestock facilities.

Factors that increase gas production

As the temperature of manure increases, the microbial activity and gas production also increase. For H_2S, this increase can be significant when manure temperatures climb, resulting in concentrations that can be dangerous to health (Figure 3). It is likely that this risk will increase during warm periods, such as summer or a warm fall, when

Table 3. Hydrogen Sulfide Toxicity Progression (OSHA 2017).

Concentration (ppm)	Symptoms/Effects
0.00011-0.00033	Typical background concentrations.
0.01-1.5	Odor threshold (when rotten egg smell is first noticeable to some). Odor becomes more offensive at 3-5 ppm. Above 30 ppm, odor described as sweet or sickeningly sweet.
2-5	Prolonged exposure may cause nausea, tearing of the eyes, headaches or loss of sleep. Airway problems (bronchial constriction) in some asthma patients.
20	Possible fatigue, loss of appetite, headache, irritability, poor memory, dizziness.
50-100	Slight conjunctivitis ("gas eye") and respiratory tract irritation after 1 hour. May cause digestive upset and loss of appetite.
100	Coughing, eye irritation, loss of smell after 2-15 minutes (olfactory fatigue). Altered breathing, drowsiness after 15-30 minutes. Throat irritation after 1 hour. Gradual increase in severity of symptoms over several hours. Death may occur after 48 hours.
100-150	Loss of smell (olfactory fatigue or paralysis).
200-300	Marked conjunctivitis and respiratory tract irritation after 1 hour. Pulmonary edema may occur from prolonged exposure.
500-700	Staggering, collapse in 5 minutes. Serious damage to the eyes in 30 minutes. Death after 30-60 minutes.
700-1,000	Rapid unconsciousness, "knockdown" or immediate collapse within 1 to 2 breaths, breathing stops, death within minutes.
1,000-2,000	Nearly instant death.

gas production and concentration increases. Agitating when manure temperatures are lower will reduce this risk. Research shows that manure below 64°F (18°C) greatly reduces H_2S emissions (Andriamanohiarisoamanana et al. 2015), but low temperatures cannot guarantee safe conditions because there are many other factors affecting gas production including sulfur content and pH. While temperature is an important driver of H_2S emissions, manure pH is also a significant factor. As the pH of the manure decreases, more of the dissolved sulfide is in the form of H_2S (Figure 4). This increases concentrations in the surrounding air. While increasing pH may reduce H_2S emissions and therefore risk, in practice this would be difficult to achieve without significant cost.

Production of H_2S is related to the sulfur content in manure. In general, the higher the sulfur content in the manure storage, the higher the potential H_2S production. For liquid and slurry manures from all livestock and poultry animals, the median range from more than 22,000 samples was 0.6-3.2 pounds (0.3-1.5 kg) of total sulfur per thousand gallons (Laboski and Peters 2012). The maximum measured values were upward of 450 pounds (204 kg) per thousand gallons, indicating there is a wide possible range of sulfur in manure. Livestock require sulfur in their diets, but excess sulfur in the diet can be toxic to animals and results in more sulfur being excreted in the manure. Additional sulfur can find its way into a manure storage system through other farm byproducts, including silage runoff, spoiled feed, and bedding additives. For example, gypsum ($CaSO_4 \cdot 2H_2O$) contains high amounts of sulfur, and when added to animal bedding and then transferred to manure storages, has been shown to increase H_2S production (Hile and Fabian-Wheeler 2014). Laboratory analysis can determine the sulfur content in feed additives and in the total mixed rations to ensure recommended rates are not exceeded.

Ammonia (NH_3) is produced from ammonium (NH_4) during storage, therefore the higher the NH_4 concentration, the higher the NH_3 emissions. As the pH increases, the equilibrium shifts so that more of the NH_4/NH_3 present in the manure is in the form of NH_3, which can be released as a gas. In addition, as the temperature of the manure increases, the NH_3 emissions also increase.

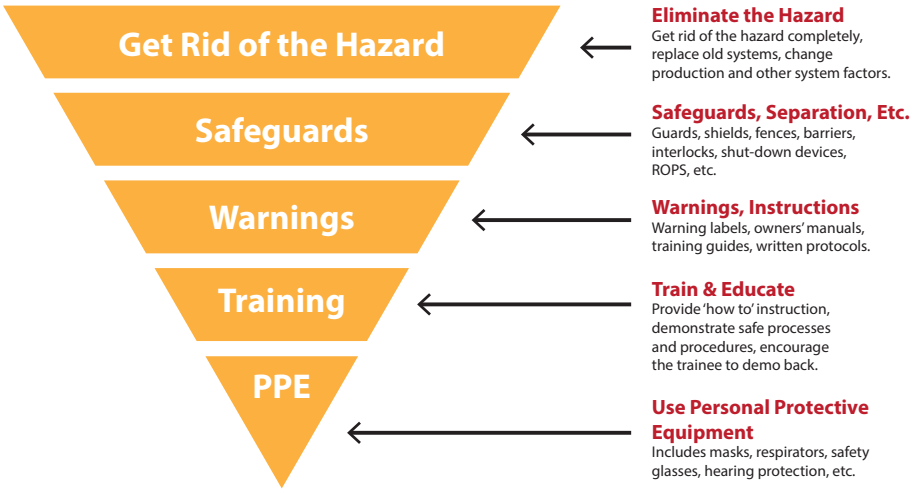

Figure 2. Safety Hierarchy.

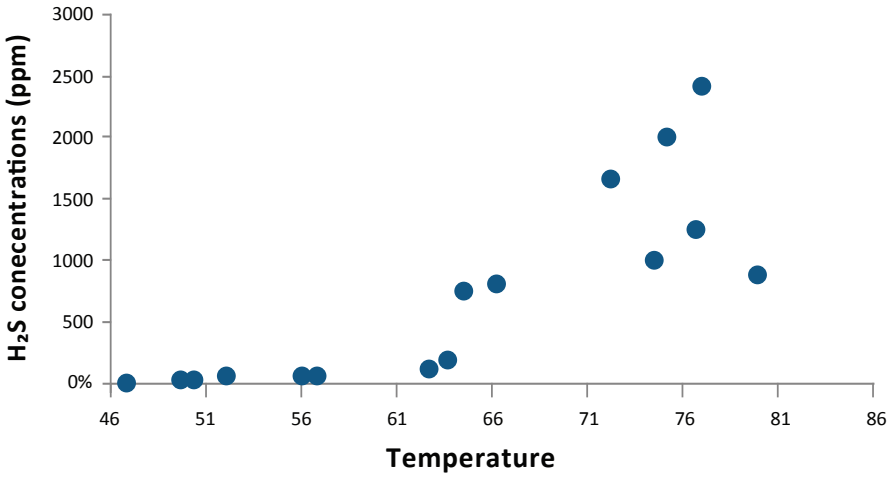

Figure 3. Temperature impacts on H_2S production (Andriamanohiarisoamanana et al. 2015). **NOTE:** this is an example for a specific system and concentrations may vary at different temperatures based on other influencing factors.

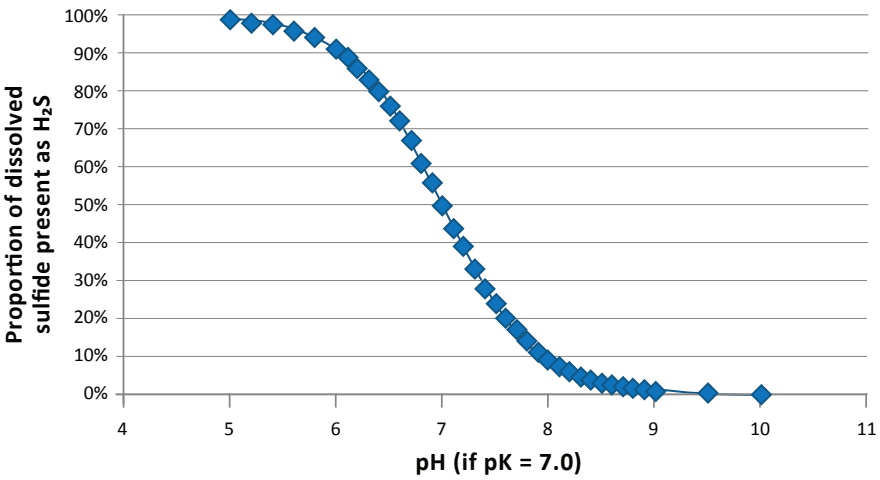

Figure 4. Proportion of dissolved sulfide present as H_2S (USEPA 1974).

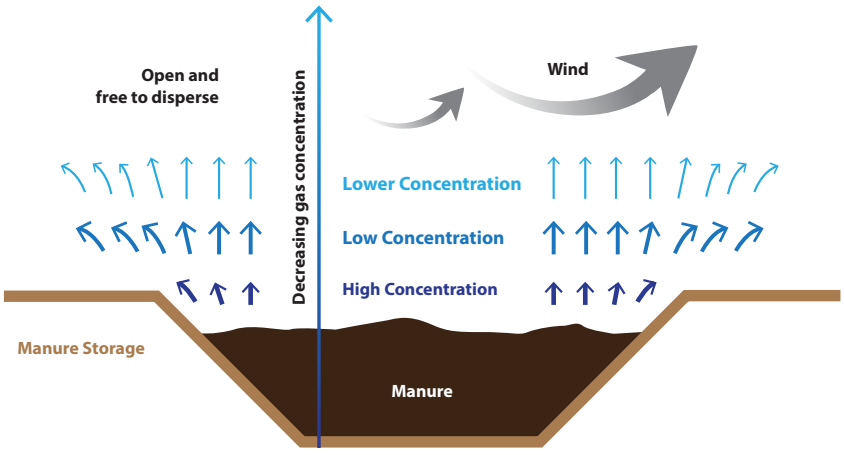

Figure 5. Open manure storage.

Factors that decrease gas dispersion

Gases are released throughout the duration of manure storage, and with proper dispersion into the atmosphere, concentrations are reduced to levels below those known to produce acute health impacts in most humans or animals (Figure 5). When dispersion is limited, the gases can become concentrated and may cause harm (Figure 6). There are many factors that can limit dispersion of gases. Never assume a no-risk situation, even when the conditions promote the greatest dispersion.

Manure storage covers can include impermeable (e.g. plastic) and permeable covers (including biomass covers and the natural crust that can form from manure solids). Covers can reduce the release of gases from manure storage systems. While valuable in retaining nitrogen and carbon in the manure and reducing gas losses, storage covers can result in a greater buildup of gases within the manure. These gases can be released during agitation, increasing human and animal exposure risks.

Risk increases when dispersion of gases is reduced, such as when natural wind conditions are still or during temperature inversions. When there is little air movement, gas concentrations can increase close to the point of release near the surface. In typical conditions, temperature decreases with increased distance from the Earth's surface. During temperature inversions, a layer of colder denser air is near the Earth's surface with a warmer layer of air above. Temperature inversions can greatly reduce convective air movement and trap pollutants near the Earth's surface. While temperature inversions and low wind increase risk, it is nearly impossible to specify the exact weather conditions that are sufficient to reduce concentrations below what is known to be damaging to human health. Even in windy conditions there may be situations where concentrations can be hazardous to health, therefore gas monitoring is always recommended regardless of the weather conditions.

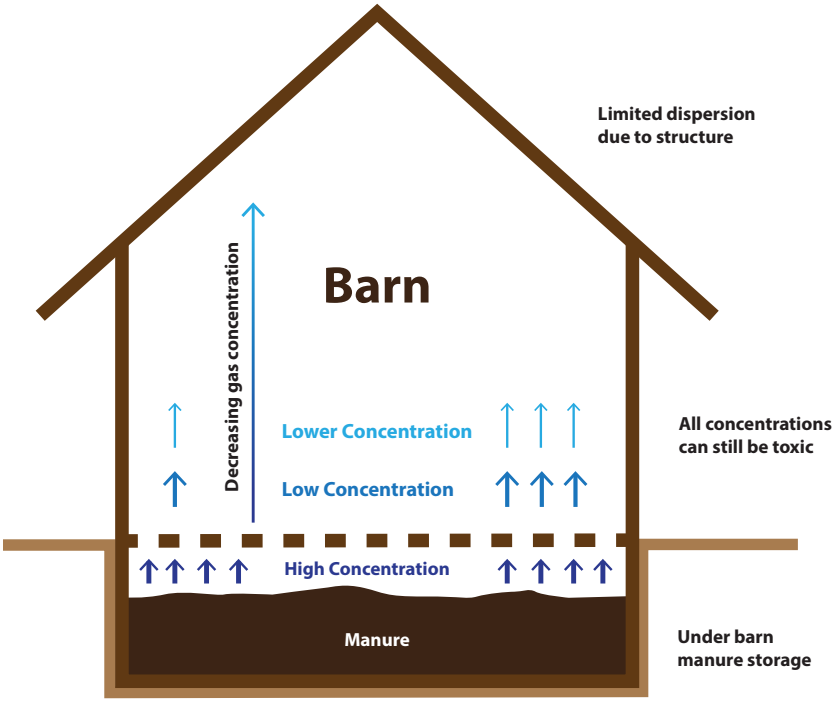

Figure 6. Under-barn manure storage with reduced gas dispersion.

Recommended Safety Practices

Predicting gas emissions for a given set of manure and onsite environmental conditions is difficult. Therefore, monitoring is recommended to alert workers or others of toxic conditions near manure storage facilities. Monitors should give an audible, visual, and vibrational alert. While asphyxiation is unlikely at the edge of a manure pit where air moves freely, monitoring for oxygen will alert workers when concentrations drop below safe levels (19.5% oxygen). Previous incidents suggest exposure of workers to toxic concentrations of H_2S is of greatest concern.

There are three general types of measurement systems: optical sensors, metal oxide sensors, and electrochemical sensors. Optical sensors generally change color to indicate the concentration of the gas and can be purchased very cheaply. Metal oxide sensors are commonly used as permanent sensors or for remote sensing. Electrochemical sensors are available in single and multi-gas monitors, have relatively quick response time, and are designed for ease of use.

Multi-gas monitors allow the operator to simultaneously monitor for oxygen, H_2S, CH_4, and NH_3. While monitoring for multiple gases simultaneously is desirable, these systems are more expensive than single-gas monitors that measure individual gases. Even when a multi-gas monitor is in use, additional personal single-gas monitors provide greater protection for individuals working in high-risk areas and for sites with multiple workers. Single-gas monitors can be purchased for $150 or more and are designed to attach to the individual near or just below breathing height. Additional multi-gas or single-gas monitors can be purchased and placed around the site at high risk areas or near the controls of an agitator or tractor.

If a monitor's alarm goes off, those in the area should immediately move away from the at-risk area and not return until measurements show there is no longer a health risk. When an alarm goes off repeatedly in one area, even after there is no longer a health risk, it is important to reevaluate the systems and try to again eliminate or reduce the hazard. For those working in high-risk areas, small self-contained respirators that contain a bottle of compressed breathable air are recommended. In the chance that an alarm alerts a worker to unsafe conditions, this escape respirator bottle will provide sufficient clean air while the worker moves to a safe area. Even if an escape respirator is available, it is recommended that workers leave the area immediately if a personal alarm is set off. Workers should not reenter the area until it is determined to be safe. It is important to note that any type of respirator worn to provide protection from airborne contaminants carries with it some risk. Individuals who might find themselves wearing a respirator need to be cleared by a qualified health professional, and the employer must fulfill other requirements of a respiratory protection program including fit testing, training, and proper respirator selection. Dust masks, pesticide cartridge respirators, and other **masks** that filter air contaminants from the air provide **no protection** from H_2S or oxygen-deficient situations.

Additional precautions should be used when a farm has under-barn manure storage, also known as a deep pit. This type of manure storage can produce dangerous gas concentrations in the barn, particularly when agitating. This increases health risks to animals and humans (Figure 6). It is highly recommended that animals and people be moved from the barn prior to agitating an under-barn manure storage for the duration of agitation. Additional ventilation is also recommended for these systems.

It is critical to identify an emergency response plan (including a route for escape) prior to agitating or working around any manure storage. This plan should be discussed with all those working at the facility, including outside contractors who might come onsite to provide services. If a worker becomes incapacitated during an emergency situation, procedures must be in place to safely remove the downed worker(s). The procedures should not involve another person entering the potentially dangerous area without a fully self-contained breathing apparatus, as this could result in additional persons being exposed. Appropriately designed warning signs should also be used to warn people to the risk of gases,

particularly when agitating. It is recommended to establish contact with the local fire department prior to agitating or emptying manure storages to ensure the department is aware of the potential risks and possesses the necessary training and equipment if a response is needed.

Confined Spaces

Because of the complexity and hazards associated with manure handling and storage equipment, especially within confined spaces, it is strongly recommended that repair, maintenance, fixing plugged systems, and other work be done from a safe location outside of the confined space. If that is impossible, work involving entry into a confined space must be done by persons with the relevant qualifications, technical training, and safety equipment to complete the job safely.

Safe confined space entry where manure gases or oxygen deficiency are known to be present or have the potential to be present (i.e., all manure storage structures) requires at least:

- Continuous air monitoring and testing equipment (a calibrated, four-gas electronic monitor is recommended).
- Ventilation fans, blowers, ducting, etc., to dilute or remove toxic gases and increase oxygen levels to a measured safe level.
- Personal retrieval equipment (harness, cables, winch systems, etc.).
- Respiratory protection equipment (a supplied-air respirator is required, such as a self-contained breathing apparatus for oxygen levels below 19.5% or gas levels that are immediately dangerous to life and health (IDLH). The IDLH level for hydrogen sulfide is 100 ppm.

Additional Information

Gypsum bedding impact to H_2S production – http://extension.psu.edu/animals/dairy/health/facilities/gypsum-bedding/safety-risk-from-manure-storages-of-dairy-cows-bedded-with-gypsum.

Manure Gas Webinar Recording – http://fyi.uwex.edu/agsafety/2016/09/13/manure-gas-safety-webinar/.

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FROM 2019 01 TO 2019 03

ACCOUNTS FOR: 100 General Fund	ORIGINAL APPROP	TRANFRS/ ADJSTMTS	REVISED BUDGET	ACTUALS	ENCUMBRANCES	AVAILABLE BUDGET	PCT USED
12401 Land Conservation							
12401 411100 General Property Taxes	-366,038	0	-366,038	-91,509.51	.00	-274,528.49	25.0%
12401 421001 State Aid	-183,500	0	-183,500	.00	.00	-183,500.00	.0%
12401 432099 Other Permits	-250	0	-250	.00	.00	-250.00	.0%
12401 451010 Sale Of Maps & Plat Books	-250	0	-250	.00	.00	-250.00	.0%
12401 451020 Other Fees	-100	0	-100	.00	.00	-100.00	.0%
12401 451421 Crep Cancellation Fee	-100	0	-100	-101.71	.00	1.71	101.7%
12401 458001 Tree Sales	-10,000	0	-10,000	-2,100.00	.00	-7,900.00	21.0%
12401 458005 Ag & Hortic Supply Revenue	-250	0	-250	.00	.00	-250.00	.0%
12401 458009 Livestock Siting App Review F	-1,500	0	-1,500	-750.00	.00	-750.00	50.0%
12401 458013 Farmland Cert Fee	-22,500	0	-22,500	-8,715.00	.00	-13,785.00	38.7%
12401 511110 Salary-Permanent Regular	99,040	0	99,040	55,549.08	.00	43,490.92	56.1%
12401 511210 Wages-Regular	310,512	0	310,512	76,610.72	.00	233,901.28	24.7%
12401 511220 Wages-Overtime	0	0	0	12.47	.00	-12.47	.0%
12401 511330 Wages-Longevity Pay	1,234	0	1,234	156.38	.00	1,077.62	12.7%
12401 512141 Social Security	31,425	0	31,425	9,907.05	.00	21,517.95	31.5%
12401 512142 Retirement (Employer)	26,906	0	26,906	6,558.11	.00	20,347.89	24.4%
12401 512144 Health Insurance	53,816	0	53,816	11,407.08	.00	42,408.92	21.2%
12401 512145 Life Insurance	132	0	132	12.56	.00	119.44	9.5%
12401 512150 FSA Contribution	9,000	0	9,000	.00	.00	9,000.00	.0%
12401 512151 HSA Contribution	0	0	0	8,000.00	.00	-8,000.00	.0%
12401 512173 Dental Insurance	5,904	0	5,904	1,071.79	.00	4,832.21	18.2%
12401 531301 Office Equipment	750	0	750	.00	.00	750.00	.0%
12401 531311 Postage & Box Rent	1,500	0	1,500	154.12	.00	1,345.88	10.3%
12401 531312 Office Supplies	1,200	0	1,200	4.26	.00	1,195.74	.4%
12401 531313 Printing & Duplicating	750	0	750	.00	.00	750.00	.0%
12401 531314 Small Items Of Equipment	1,750	0	1,750	.00	.00	1,750.00	.0%
12401 531321 Publication Of Legal Notice	50	0	50	.00	.00	50.00	.0%
12401 531324 Membership Dues	2,000	0	2,000	1,796.00	.00	204.00	89.8%
12401 531341 Agricultural & Hortic Suppli	6,000	0	6,000	.00	.00	6,000.00	.0%
12401 531348 Educational Supplies	150	0	150	.00	.00	150.00	.0%
12401 531351 Gas/Diesel	1,200	0	1,200	107.64	.00	1,092.36	9.0%
12401 532325 Registration	1,000	0	1,000	696.00	.00	304.00	69.6%
12401 532332 Mileage	200	0	200	.00	.00	200.00	.0%
12401 532335 Meals	200	0	200	44.16	.00	155.84	22.1%
12401 532336 Lodging	600	0	600	273.00	.00	327.00	45.5%
12401 533225 Telephone & Fax	500	0	500	27.07	.00	472.93	5.4%
12401 533236 Wireless Internet	1,850	0	1,850	278.64	.00	1,571.36	15.1%
12401 535242 Maintain Machinery & Equip	1,000	0	1,000	193.81	.00	806.19	19.4%

FROM 2019 01 TO 2019 03

ACCOUNTS FOR: 100 General Fund	ORIGINAL APPROP	TRANFRS/ ADJSTMTS	REVISED BUDGET	ACTUALS	ENCUMBRANCES	AVAILABLE BUDGET	PCT USED
12401 535259 Tree Planter Service	100	0	100	.00	.00	100.00	.0%
12401 571004 IP Telephony Allocation	661	0	661	165.24	.00	495.76	25.0%
12401 571005 Duplicating Allocation	221	0	221	55.26	.00	165.74	25.0%
12401 571009 MIS PC Group Allocation	17,042	0	17,042	4,260.51	.00	12,781.49	25.0%
12401 571010 MIS Systems Grp Alloc(ISIS)	4,519	0	4,519	1,129.74	.00	3,389.26	25.0%
12401 591519 Other Insurance	3,276	0	3,276	819.00	.00	2,457.00	25.0%
12402 Wildlife Crop Damage							
12402 421001 State Aid	-20,000	0	-20,000	.00	.00	-20,000.00	.0%
12402 529299 Purchase Care & Services	20,000	0	20,000	925.57	.00	19,074.43	4.6%
12403 Nutrient Management							
12403 458012 Public Land Consv Fees	-250	0	-250	-40.00	.00	-210.00	16.0%
12403 535349 Other Supplies	250	0	250	20.52	.00	229.48	8.2%
12404 Local Cost Share Program							
12404 421001 State Aid	-3,300	0	-3,300	.00	.00	-3,300.00	.0%
12404 521219 Other Professional Serv	3,000	0	3,000	.00	.00	3,000.00	.0%
12404 529299 Puchase Care & Services	300	0	300	.00	.00	300.00	.0%
12405 DATCP Cost Share							
12405 421003 State Aid GPR	-14,000	0	-14,000	.00	.00	-14,000.00	.0%
12405 421004 State Aid Bonded	-35,000	0	-35,000	.00	.00	-35,000.00	.0%
12405 593701 Cost Share Payment	49,000	0	49,000	.00	.00	49,000.00	.0%
12406 Non-Metallic Mining							
12406 411100 General Property Taxes	10,995	0	10,995	2,748.75	.00	8,246.25	25.0%
12406 432005 Non-Metallic Annual Fee	-9,445	0	-9,445	.00	.00	-9,445.00	.0%
12406 474175 Highway Billed	-2,035	0	-2,035	.00	.00	-2,035.00	.0%
12406 531311 Postage & Box Rent	60	0	60	12.80	.00	47.20	21.3%
12406 531312 Office Supplies	50	0	50	.00	.00	50.00	.0%
12406 531348 Educational Supplies	25	0	25	.00	.00	25.00	.0%

FROM 2019 01 TO 2019 03

ACCOUNTS FOR: 100 General Fund	ORIGINAL APPROP	TRANFRS/ ADJSTMTS	REVISED BUDGET	ACTUALS	ENCUMBRANCES	AVAILABLE BUDGET	PCT USED
12406 532325 Registration	150	0	150	.00	.00	150.00	.0%
12406 532332 Mileage	50	0	50	.00	.00	50.00	.0%
12406 532335 Meals	50	0	50	.00	.00	50.00	.0%
12406 532336 Lodging	100	0	100	164.00	.00	-64.00	164.0%
12407 Farmland Easement							
12407 481001 Interest & Dividends	-400	0	-400	-1,068.10	.00	668.10	267.0%
12407 531311 Postage & Box Rent	15	0	15	.50	.00	14.50	3.3%
12407 531312 Office Supplies	300	0	300	.00	.00	300.00	.0%
12407 531313 Printing & Duplicating	18	0	18	.00	.00	18.00	.0%
12407 594960 Capital Reserve	125,201	32,329	157,530	.00	.00	157,530.20	.0%
12407 699800 Resv Applied Capital	-125,134	-32,329	-157,463	.00	.00	-157,463.20	.0%
12408 County Farm							
12408 411100 General Property Taxes	104,188	0	104,188	26,046.99	.00	78,141.01	25.0%
12408 482003 County Farm Land Rent	-105,688	0	-105,688	.00	.00	-105,688.00	.0%
12408 529170 Grounds Keeping Charges	785	0	785	139.36	.00	645.64	17.8%
12408 535249 Sundry Repair	715	1,000	1,715	.00	.00	1,715.00	.0%
12408 699999 Budgetary Fund Balance	0	-1,000	-1,000	.00	.00	-1,000.00	.0%

FROM 2019 01 TO 2019 03

	ORIGINAL APPROP	TRANFRS/ ADJSTMTS	REVISED BUDGET	ACTUALS	ENCUMBRANCES	AVAILABLE BUDGET	PCT USED
GRAND TOTAL	0	0	0	105,063.86	.00	-105,063.86	.0%

REPORT OPTIONS

	Field #	Total	Page Break
Sequence 1	1	N	Y
Sequence 2	9	N	N
Sequence 3	0	N	N
Sequence 4	0	N	N

Report title:

FLEXIBLE PERIOD REPORT

Includes accounts exceeding 0% of budget.
Print Full or Short description: F
Print full GL account: N
Sort by full GL account: N
Print Revenues-Version headings: N
Print revenue as credit: Y
Print revenue budgets as zero: N

From Yr/Per: 2019/ 1
To Yr/Per: 2019/ 3
Budget Year: 2019
Print totals only: N
Format type: 1
Double space: N
Suppress zero bal accts: Y
Amounts/totals exceed 999 million dollars: N
Roll projects to object: N
Print journal detail: N
From Yr/Per: 2019/ 1
To Yr/Per: 2019/ 1
Include budget entries: Y
Incl encumb/liq entries: Y
Sort by JE # or PO #: J
Detail format option: 1
Multiyear view: D