- Today's Discussion
- Review Recent Fatalities
  - Wisconsin
  - Michigan
  - Ohio
- Assessing Exposure
  - Manure Gases
  - Other Safety Measures

Wisconsin Fatality
Monday, August 15, 2016

- 29 year old farmer found by outdoor non-enclosed manure storage
- 16 head of cattle died (discovered after enforcement and coroner left the farm)
- Early morning started agitating manure
- Shortly after 6 am found by an employee and custom hauler came on site.
- Not a confined space
- Air inversion – factor or not?
- Waiting on results of blood samples and toxicology reports

Michigan Fatality
Friday, August 12, 2016

From news reports:

- Entered a manure pit – 8 ft X 8 ft X 12 ft deep
- 18 inches of slurry
- Entered numerous times before
- Weather factor?
- Safety:
  - Confined Space procedures
  - Air monitoring
  - Ventilation
  - Standby attendant

Ohio Fatality
October 31, 2015

From OSHA.gov

- Employee checking tanker level from on top
- Looking in hatch and overcome by hydrogen sulfide
  - Use of tank with vacuum pumping system (closed) to prevent open air release of H_2S from tank.
  - Use of gauge on tank so that fill line can be monitored from the ground rather than on top of the tank.

Administrative Controls:

- Use of appropriate truck for manure/sewage removal.
- Prohibiting access to open area of tank (hatch) during pumping/agitation of manure.
- Establishing a "No personnel" zone around and on top of the tank while manure is being pumped/agitated.
- Establishing a set amount of time before re-entering the "no personnel" zone after pump has been stopped.
- Training of all employees who work with manure regarding the hazards ofH2S.

Personal Protective Equipment (PPE).

Addressing Safety:
What's Your Exposure??

OSH Act General Duty Clause (5a1)

Section 5(a)(1) of the Act

"…that each employer shall furnish…employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees."

Applies when there is no specific standard

Consensus Standards

- ANSI/ASSE Z117.1-2009 Safety Requirements for Confined Spaces
- ASAE EP470.1 OCT2011 Manure Storage Safety
- NCRS Waste Storage Facility (No.) Code 313
- ANSI/NFPA 70, National Electrical Code
- ASAE EP270, Design of Ventilation Systems for Poultry and Livestock Shelters
- ASAE EP393, Manure Storages
- ASAE S412, Ladders, Cages, Walkways, and Stairs
- ASAE S441, Safety Signs
- ANSI/ASABE S607, Ventilating Manure Storages to Reduce Entry Risk

When you look at this surface, what risks do you see?

What risks do you see?

Manure in storage:

- Will undergo anaerobic decomposition process
- That process is more active in higher temperatures
- Produces gases:
  - Methane (Lighter than air, explosive)
  - Ammonia (Lighter than air, irritant)
  - Carbon Dioxide (Heavier than air, displaces oxygen)
  - Hydrogen Sulfide (Heavier than air, rapidly absorbed by lungs, looking for Escape from slurry and travels low and will collect in low lying areas.)

So we break the crust and start agitating…..

Look at your facilities:

- **Where are confined spaces**
- **Where will gases travel**
- **What weather/ventilation factors may influence where the gas travels or collects.**