

# Large-Scale Mortalities Disposal

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*Illinois Swine Day 2019*

# Local Planning for Depopulation and Disposal Has Merit

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Owners and employees

Animal care

Public relations

Aftermath



# Carcass Disposal: How, Where

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1. Agency guidance as to method: burial, thermal, landfill, other
2. Screening for selection of local site, based on method(s) and time of year
3. Final site selection may have to be further screened at time of event (e.g. seasonal high water table)

# Methods Considered Today:

## Type III Event (virus)

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- Burial
- Composting
- Burning—air curtain
- Rendering
- Landfilling



# Method 1: Burial

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- Where
- How deep
  - Also consider “surface burial”
- Site footprint
- Logistics and equipment

Before any excavation: Call JULIE!

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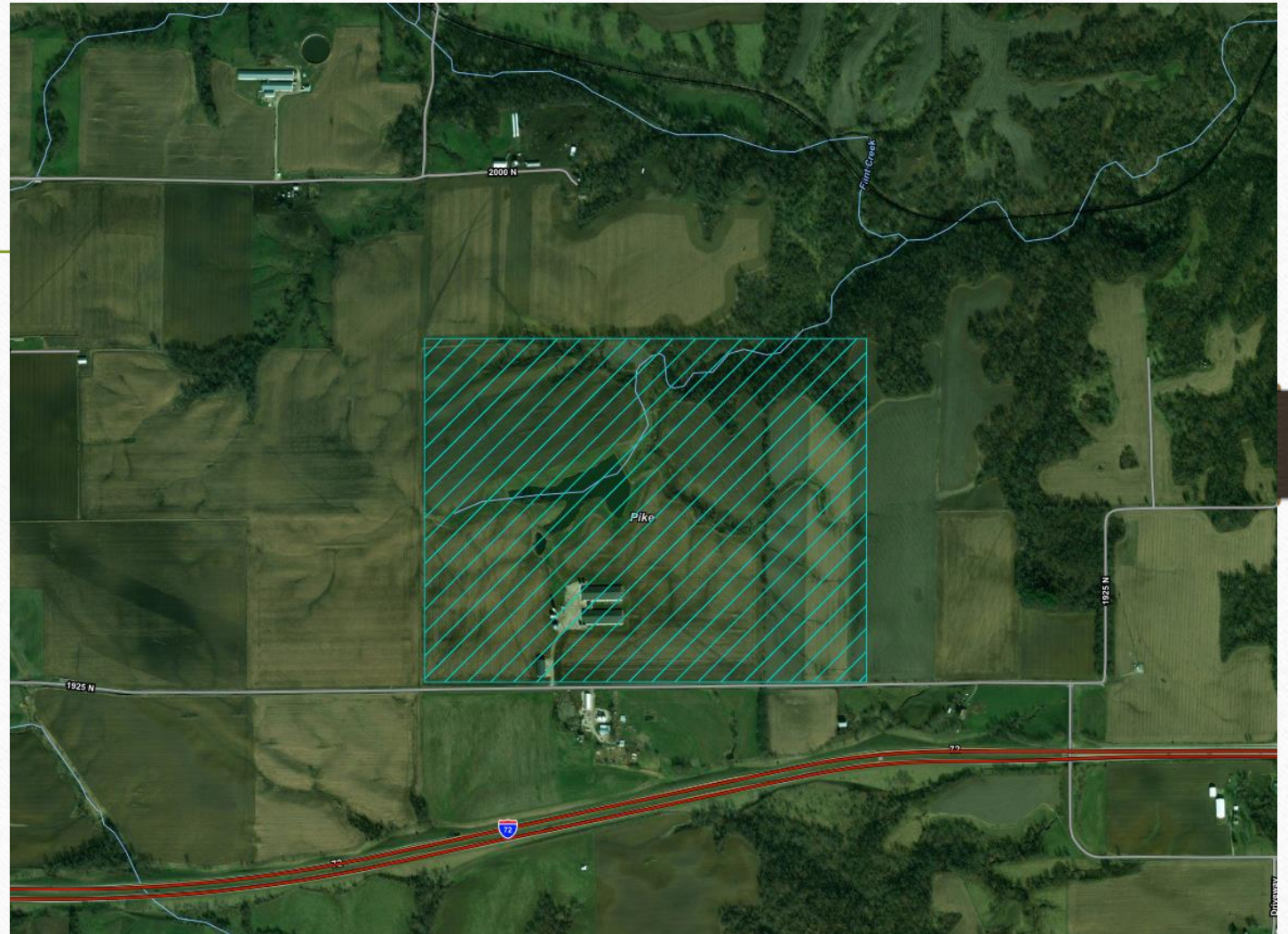


# NRCS Web Soil Survey

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- Locate your site
- Determine area of interest (AOI) for disposal (property boundary, neighbors, etc.)
- Soils map
- Soils information— “Disaster Recovery”

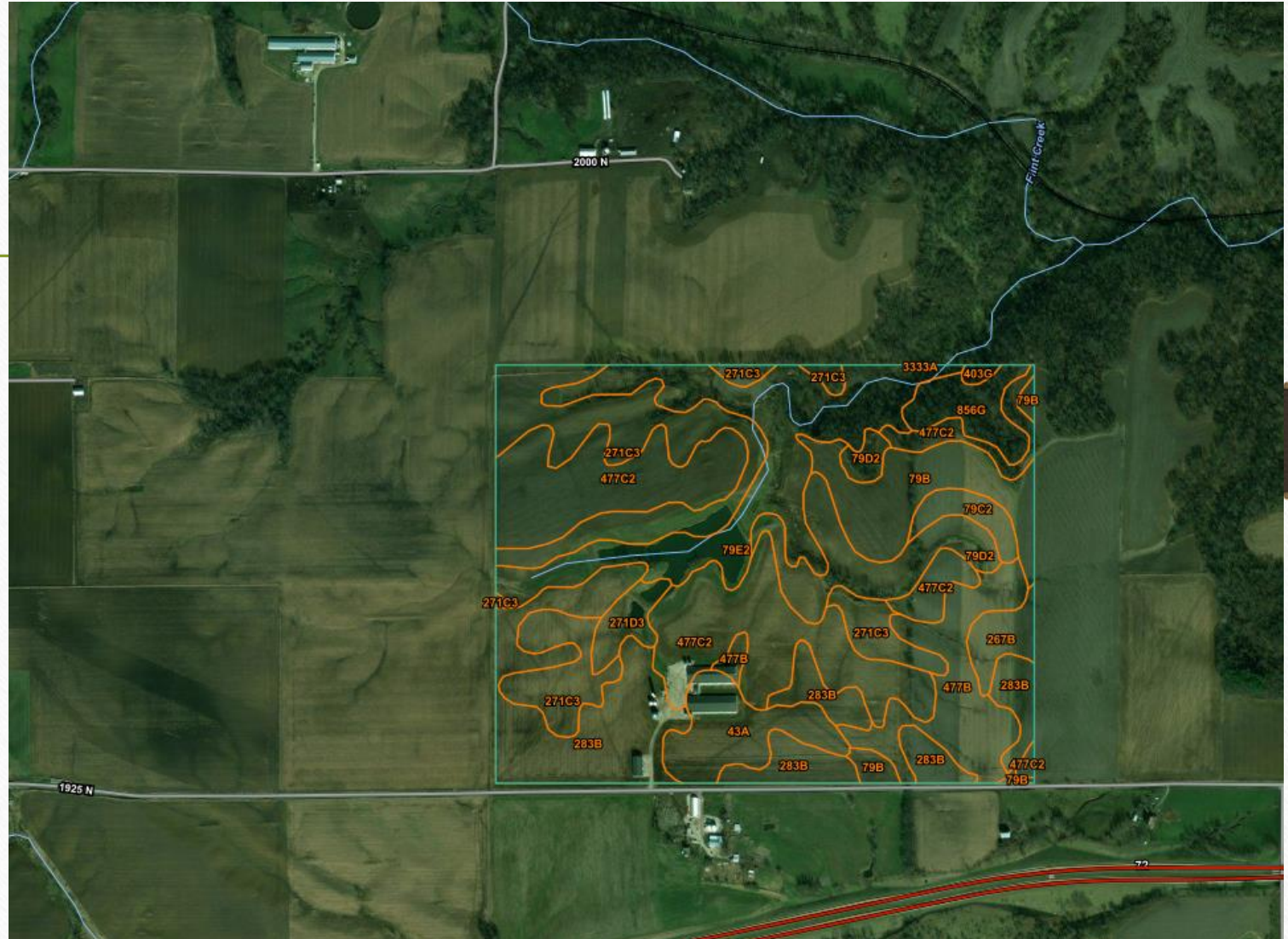
# Site Screening: NRCS Web Soil Survey





# Soils Map for AOI

Search			
Map Unit Legend			
Pike County, Illinois (IL149)			
Pike County, Illinois (IL149)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
43A	Ipava silt loam, 0 to 2 percent slopes	9.9	4.8%
79B	Menfro silt loam, 2 to 5 percent slopes	15.1	7.2%
79C2	Menfro silt loam, 5 to 10 percent slopes, eroded	3.2	1.5%
79D2	Menfro silt loam, 10 to 18 percent slopes, eroded	13.0	6.2%
79E2	Menfro silt loam, 18 to 25 percent slopes, eroded	29.4	14.1%
267B	Caseyville silt loam, 2 to 5 percent slopes	3.5	1.7%
271C3	Timula silt loam, 5 to 10	32.5	15.6%





Intro to Soils

Suitabilities and Limitations for Use

Soil Properties and Qualities

Ecological Site Assessment

Soil Report

Search

Suitabilities and Limitations Ratings

Open All

Close All



Building Site Development



Construction Materials



Disaster Recovery Planning



Catastrophic Event, Large Animal Mortality, Burial



Catastrophic Event, Large Animal Mortality, Incinerate



Catastrophic Mortality, Large Animal Disposal, Pit



Catastrophic Mortality, Large Animal Disposal, Trench



Clay Liner Material Source



Composting Facility - Subsurface



Composting Facility - Surface



Composting Medium and Final Cover



Rubble and Debris Disposal, Large-Scale Event



Land Classifications



Land Management



Military Operations



Recreational Development



Sanitary Facilities



Soil Health



Vegetative Productivity



Waste Management



Water Management



Soil Map

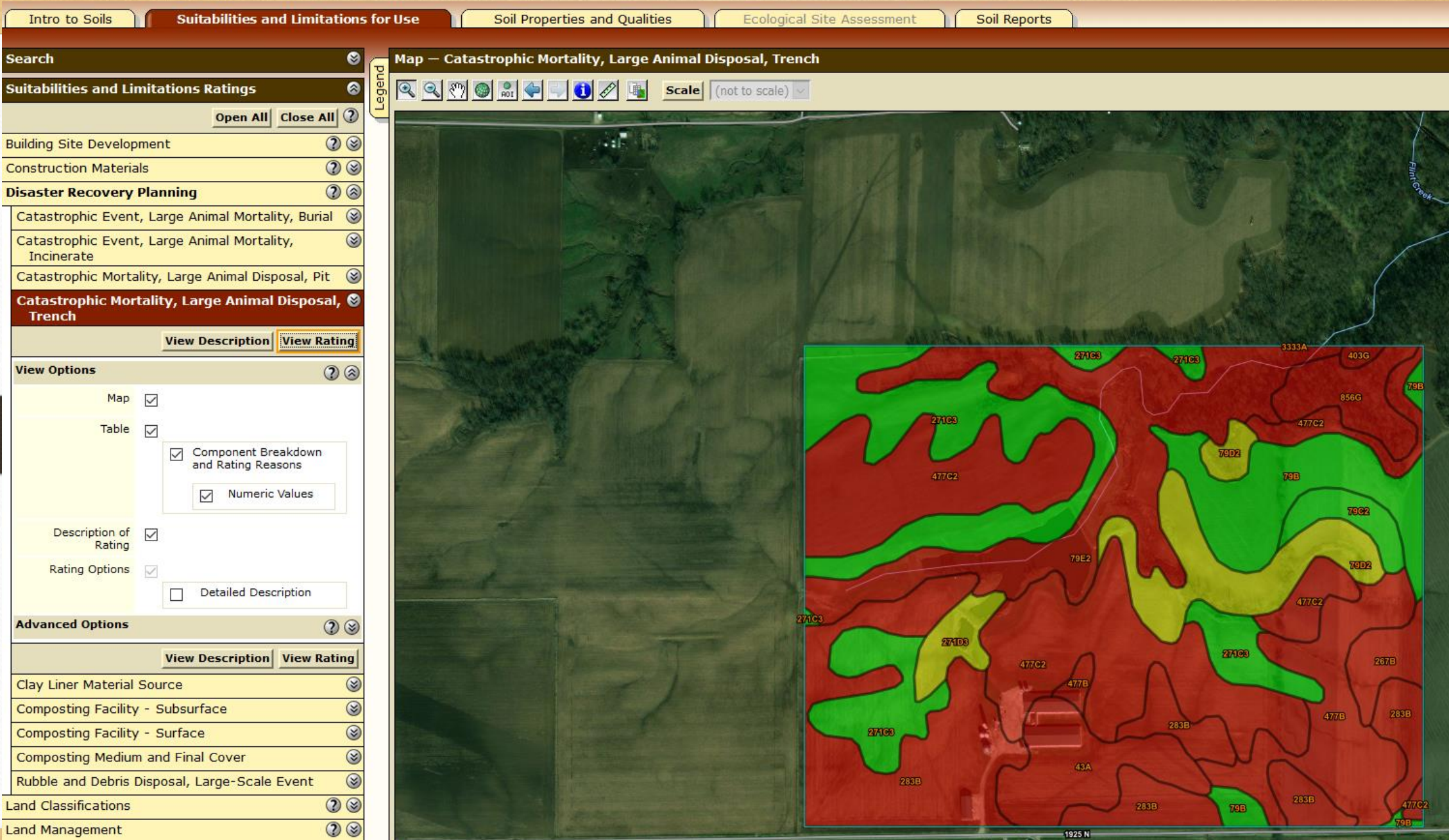


Scale

(not to scale)









# Description of Soils Limitations

Tables — Catastrophic Mortality, Large Animal Disposal, Trench — Summary By Map Unit

Summary by Map Unit — Pike County, Illinois (IL149)						
Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Per
43A	Ipava silt loam, 0 to 2 percent slopes	Very limited	Ipava (85%)	Wetness (1.00)	9.9	
				Clay content (0.03)		
			Denny (5%)	Ponding (1.00)		
				Wetness (1.00)		
				Water gathering surface (0.50)		
				Clay content (0.16)		
			Sable (5%)	Ponding (1.00)		
				Wetness (1.00)		
				Water gathering surface (0.33)		
				Clay content (0.00)		
			Viriden (5%)	Ponding (1.00)		
				Wetness (1.00)		
				Clay content (0.17)		
79B	Menfro silt loam, 2 to 5 percent slopes	Not limited	Menfro (90%)		15.1	
79C2	Menfro silt loam, 5 to 10 percent slopes, eroded	Not limited	Menfro (90%)		3.2	
79D2	Menfro silt loam, 10 to 18 percent slopes, eroded	Somewhat limited	Menfro (90%)	Slope (0.96)	13.0	
79E2	Menfro silt loam, 18 to 25 percent slopes, eroded	Very limited	Menfro (100%)	Slope (1.00)	29.4	



# Geological Investigation Still Required

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- Soil survey is typically to 6 or 7 feet deep
- You may want trench deeper than that
- Geological investigation needs to be trench depth plus 2 feet (minimum)!
- Seasonal high water table, other limitations, critical

# Types of Soils Limitations

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- Wetness, ponding
- Slope
- Bedrock, gravel layers
- Soil plasticity or stickiness
- Etc.
- NOTE: Some limitations will only be evident after a site geological investigation

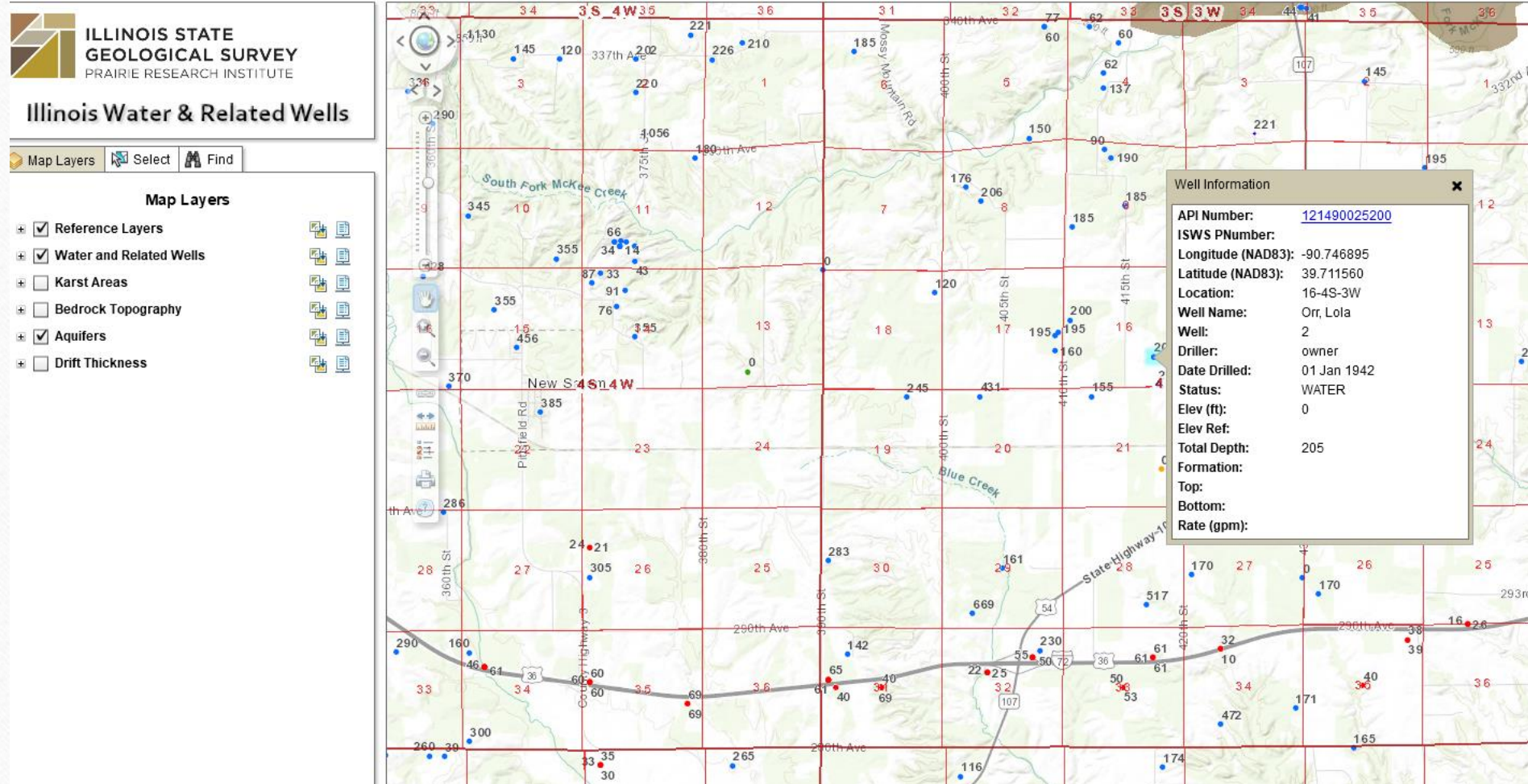
# Resources for the Producer

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- NRCS
- USDA/APHIS
- Maps of water wells, public and private
- IL Landfills map
- Equipment manufacturers, suppliers, dealers



# Other Resources: Private Wells



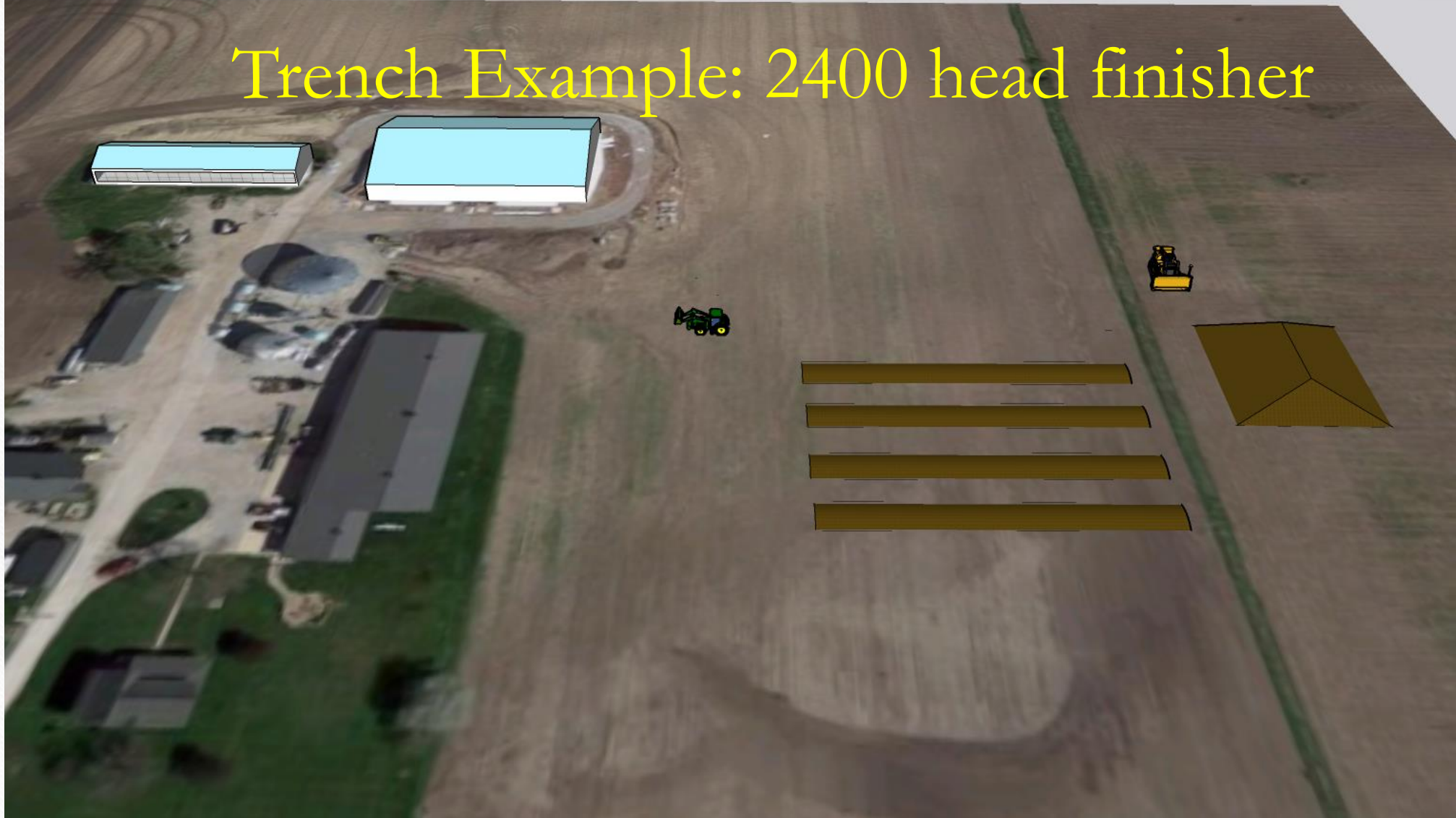
# Example: Trench Burial

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- Trench: Carcass volume ratio recommendations about 4:1 (USDA/APHIS)
- Single-width trench by bulldozer (“slot excavating”) most efficient excavation method
- 4’ depth limitation avoids trench safety complexities (OSHA) in most cases
- Stockpile topsoil for final cover



# Trench Example: 2400 head finisher



# Method 2: Composting

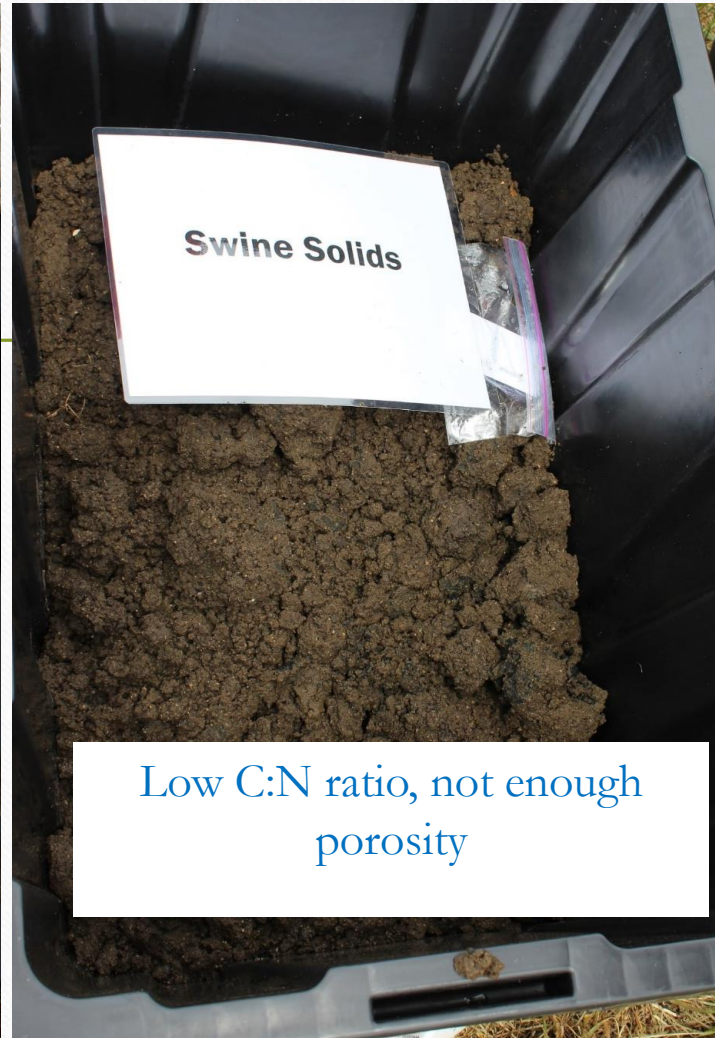
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- Where
- Carbon source needs
- Pile configuration
- Site footprint





Coarse sawdust, ideal cover material



Low C:N ratio, not enough porosity



Up to 50% of cover material





Long pieces inside, mix with a cover material with smaller particle size





Commonly used, they make good cover material





Grinding of  
coarse material  
is essential!





Glanville et al. used unground corn stalks to compost cattle mortalities in Iowa, which led to bridging, poor heat retention, downwind odor, and heavy fly infestation

# Method 2: Composting

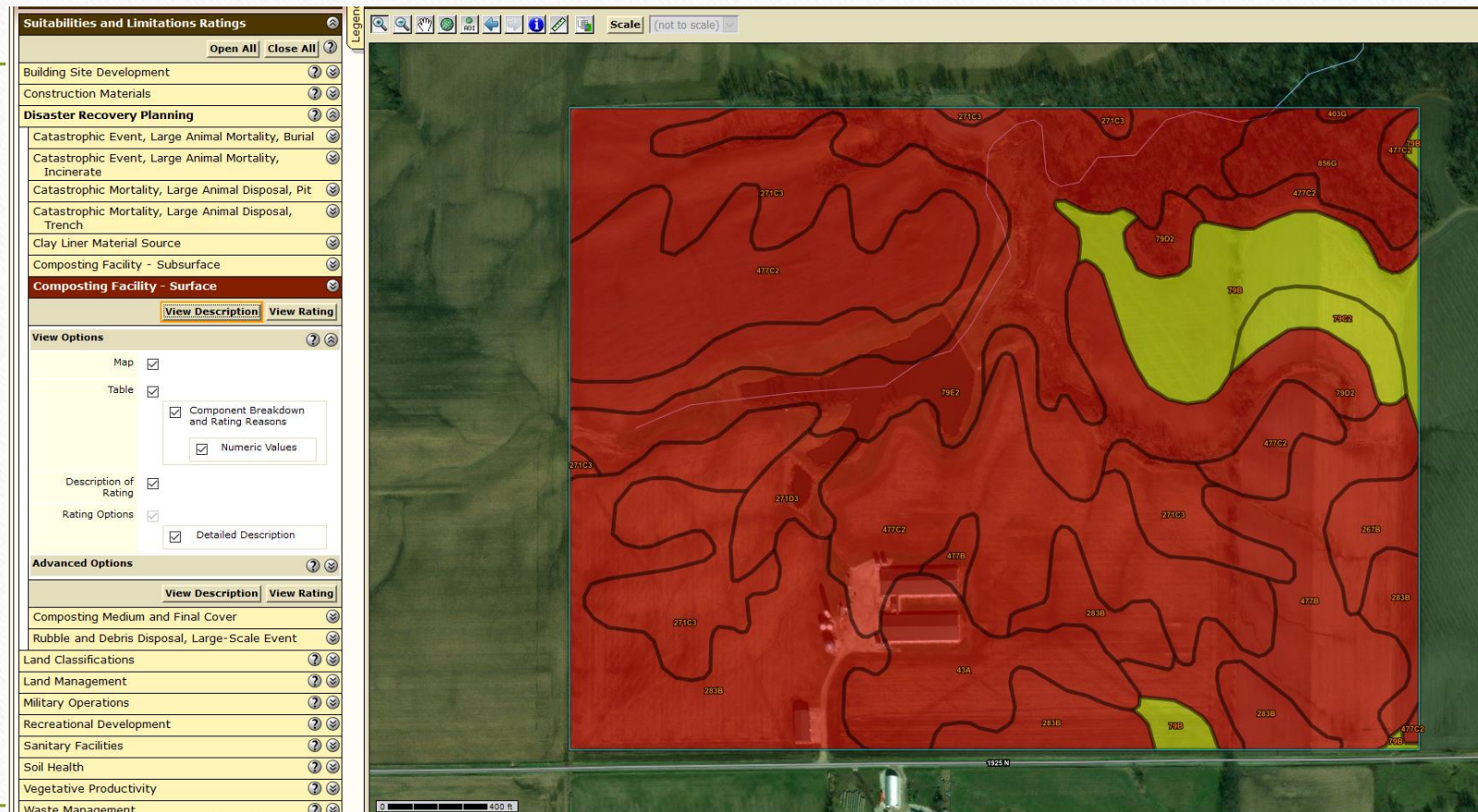
- Logistics and equipment (including grinding/not grinding)
- Site protection
- Monitoring
- Turning?
- Aftermath



Photo: Morbark, Inc.



# Previous example: Composting limitations





# Composter Example: 2400 head finisher





# Method 3: Air Curtain Burning

- Permit: IEPA Bureau of Air
- Where
- Fuel source and amounts
- Combustion rates per device (4-8 tons/hour?)
- Other considerations—e.g. ash disposal



Photo: USDA/APHIS

# Method 4: Rendering

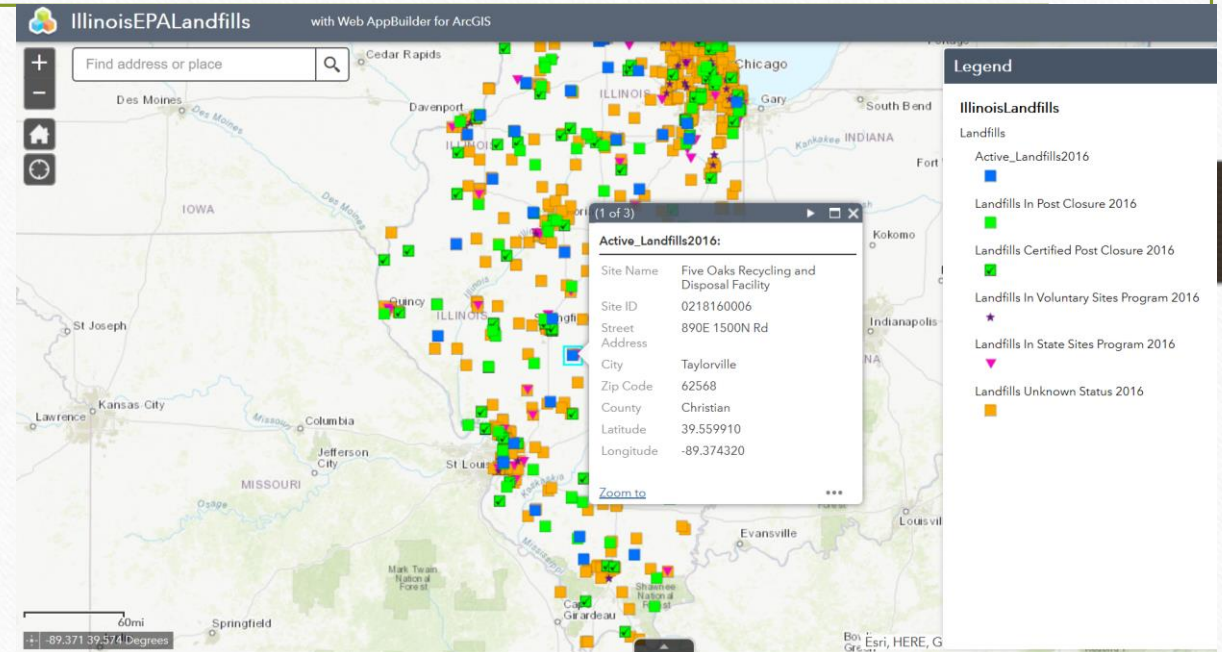
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- Not likely an acceptor for very large quantities of carcass material
- Logistics farm-to-renderer may be complex (biosecurity concerns)



# Method 5: Landfilling

- EPA Subtitle D Landfills (i.e. Municipal Solid Waste) should be safe for disposal...
- ...However, accepting carcasses is up to the owner (not the local operator)
- Advance agreement in writing would be essential for this method
- Logistics may be complex





# Other Considerations

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- Restricting site and activity views to fly-overs by press (i.e. drones)
- Perimeter fencing
- See IL NRCS Conservation Practice Standard 368, *Emergency Animal Mortality Management*



# Free Mortalities Disposal Planning Services Available Now through IPPA

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- Private planning meeting with producer or integrator
- Ag engineering consultant and UIUC faculty
- Schedule meeting through the engineer



# Questions or comments?

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**Funkti**neering  
Form follows function.