

# Small AFO Open Lot Experiences

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# Pasture-Based or AFO?

- EPA's CAFO rule intent: AFO's "can be effectively addressed by state programs...focused on the elimination of the conditions that pose a threat to water quality"
- Implementing these voluntary or regulatory non-NPDES programs can help ensure that medium and small operations implement proper practices and are not designated as CAFO's"
- BUT EPA/SRA still can designate an AFO a CAFO

# State Regulations

## Kansas

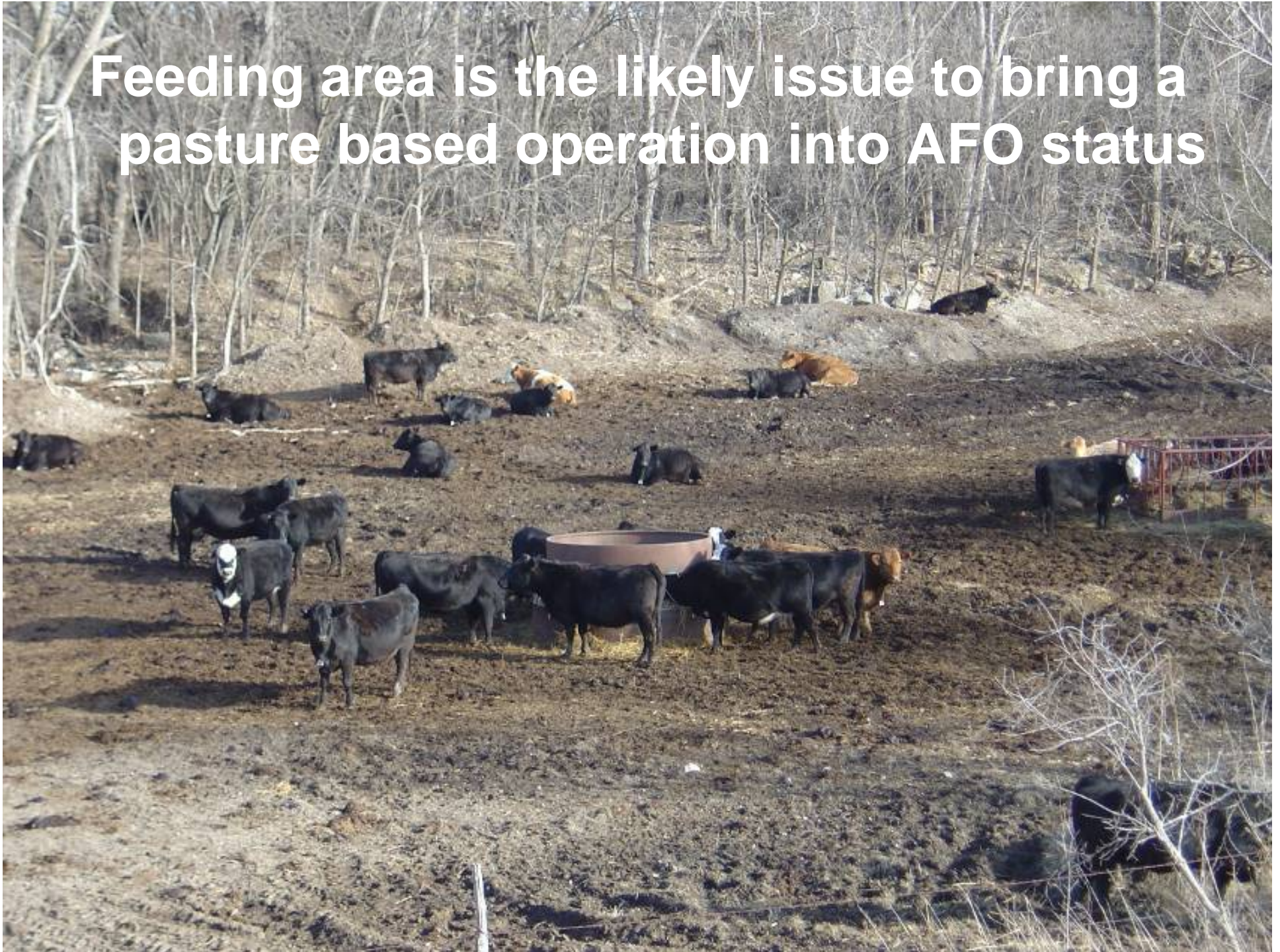
- KDHE does a regulatory review of proposed practice that eliminate the condition(s) that pose a risk to water quality

## Nebraska

- Manage AFO's under a "conditional exemption" with a practice that maintains them as exempt from permit process or elimination of the condition(s) that pose a risk to water quality



**Feeding area is the likely issue to bring a pasture based operation into AFO status**



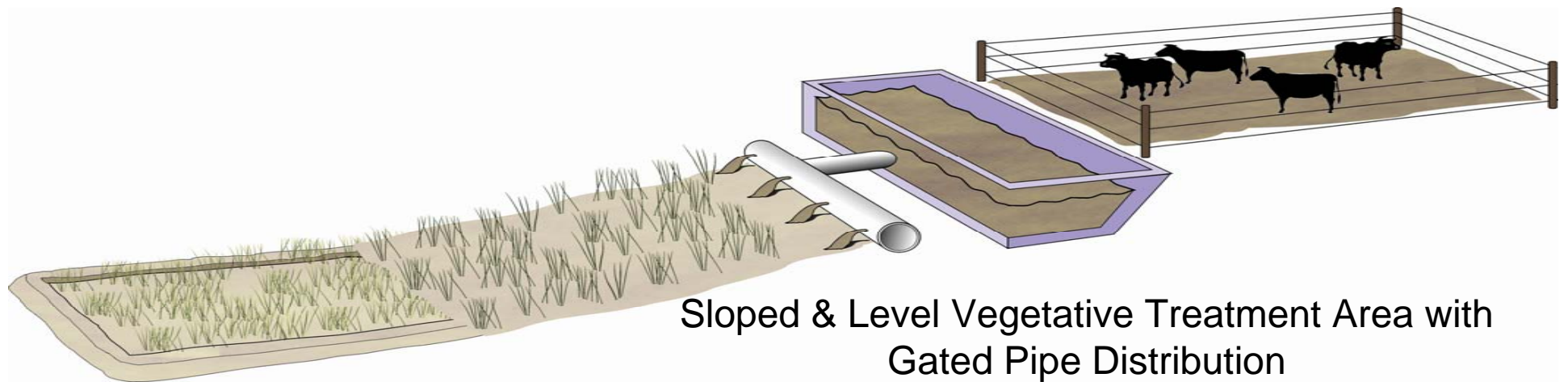
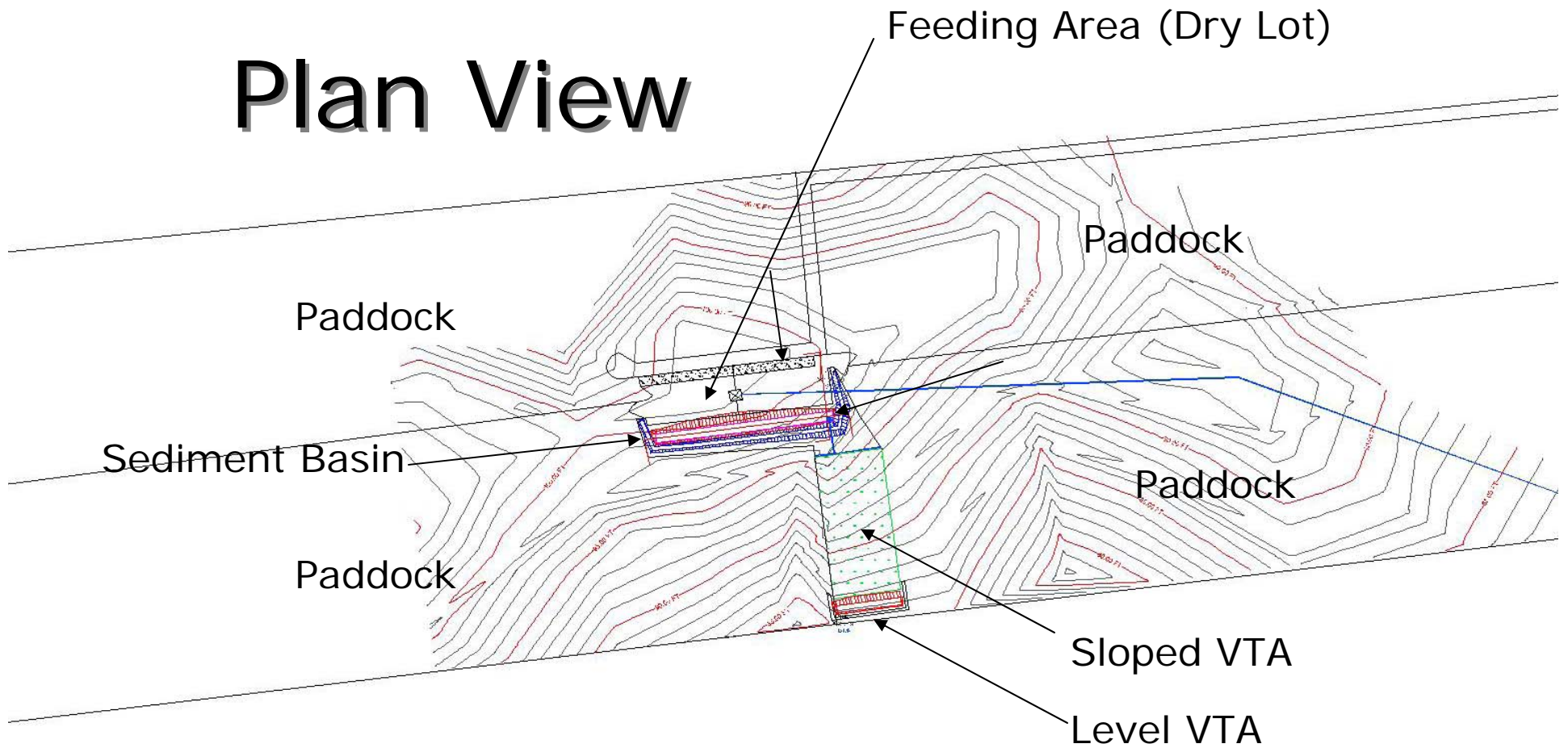


# Case Study 1: Possible Option for AFO that could be Pasture-Based Operation

- 200 Head cow/calf operation
- 40 acres grazing land
- Centralized “dry lot” feeding area with VTS



# Plan View





# Feeding Area after Construction





# Waiting for Grass to Grow

(Warm Season Species – Switchgrass)





# Basin Post Construction





# Trash Rack Connection to Outlet Pipe





**Cost: \$19,098**





# Portable Feeding Facilities





# Constantly Moving Feeding Facilities





# Case Study 2: Possible Option for AFO that could be Pasture-Based Operation





































# Costs

- Diversion Terrace
- New Fence
- Shaping
- Seeding

Total - \$3300



# Case Study 3: Options for AFO's that could be CAFO's

































# Costs

- Moving Fence & Waterer
- Shaping
- Seeding

Total - \$775



# Case Study 4: Options for AFO's that could be CAFO's

- 300 head Feedlot- wished to expand to 450 head
- 3.1 acres of open lot
- 0.1 intake family soils
- Bunkline located at lowest elevation in lot
- Groundwater > 100 ft from surface
- Lot runoff drained to farm pond 100 ft away

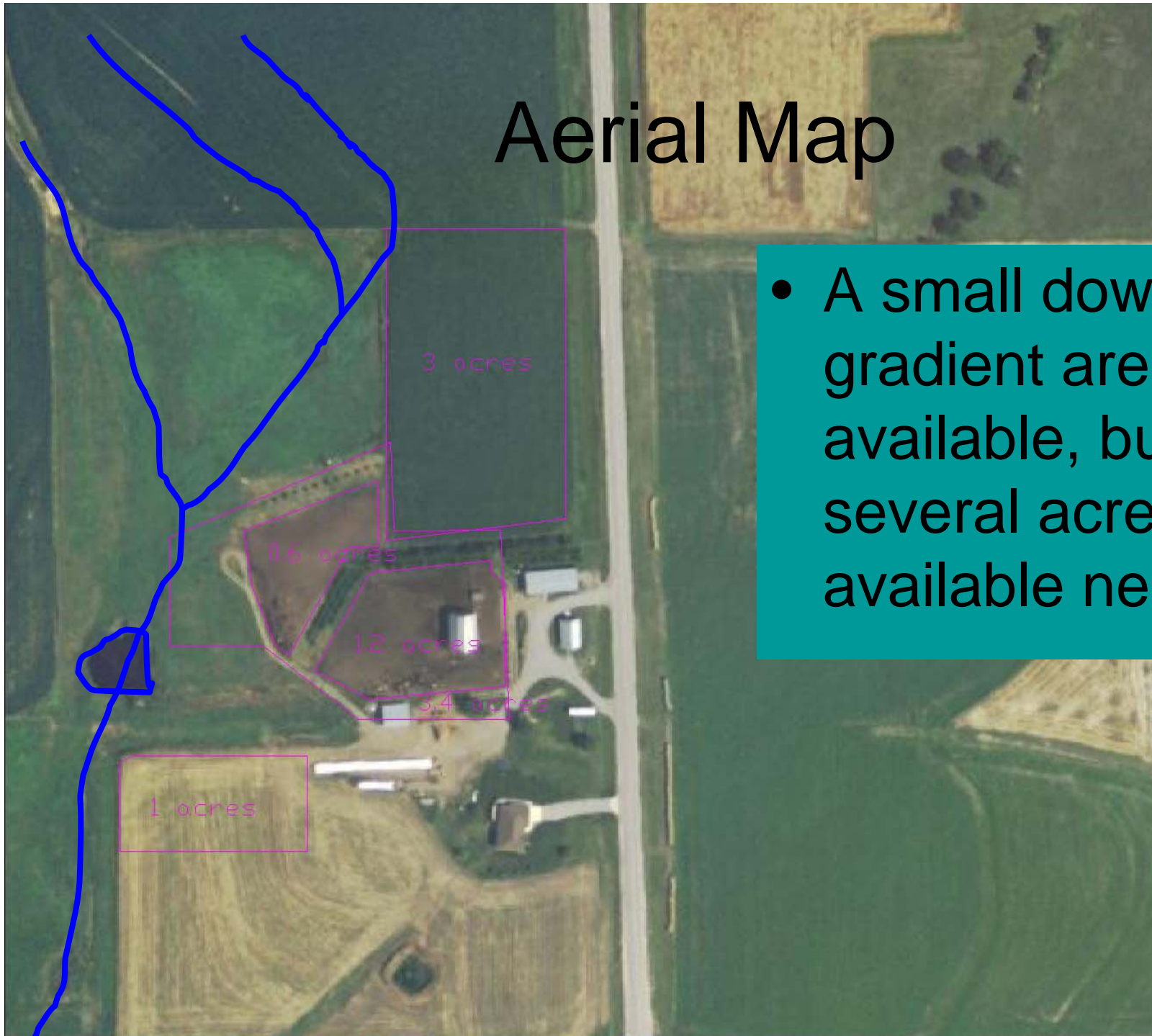






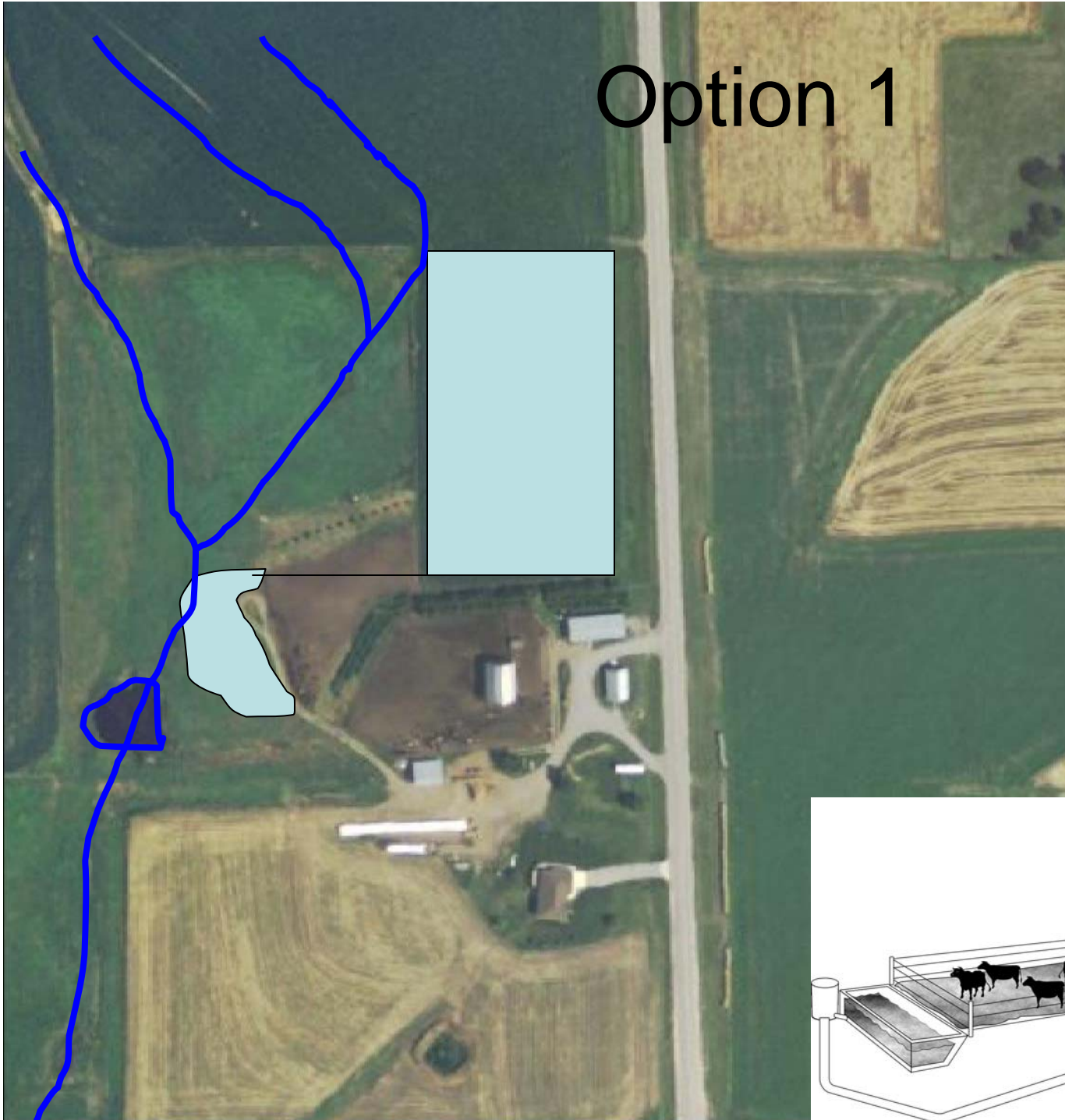
# Aerial Map

- A small down-gradient area available, but several acres available nearby

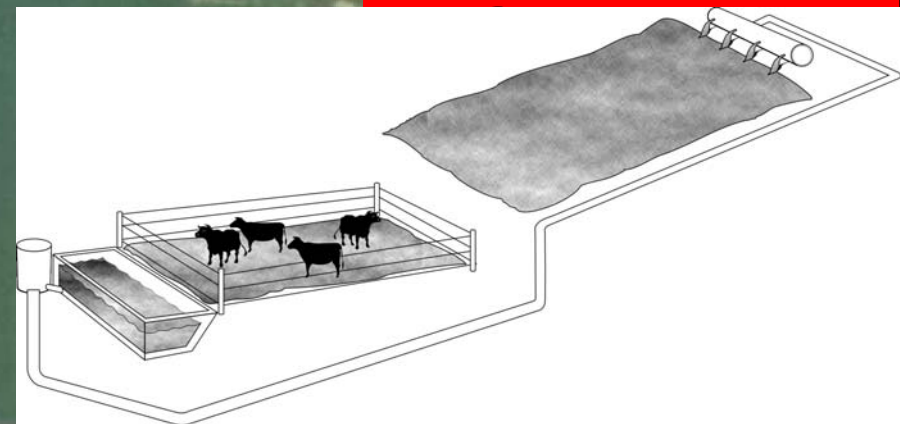




# Option 1

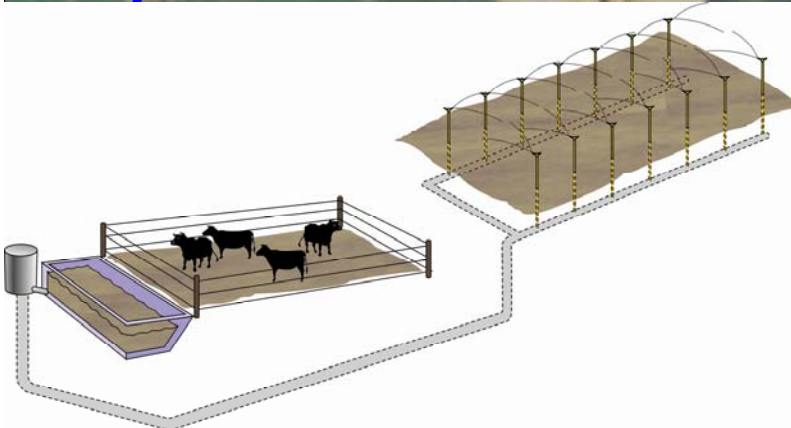
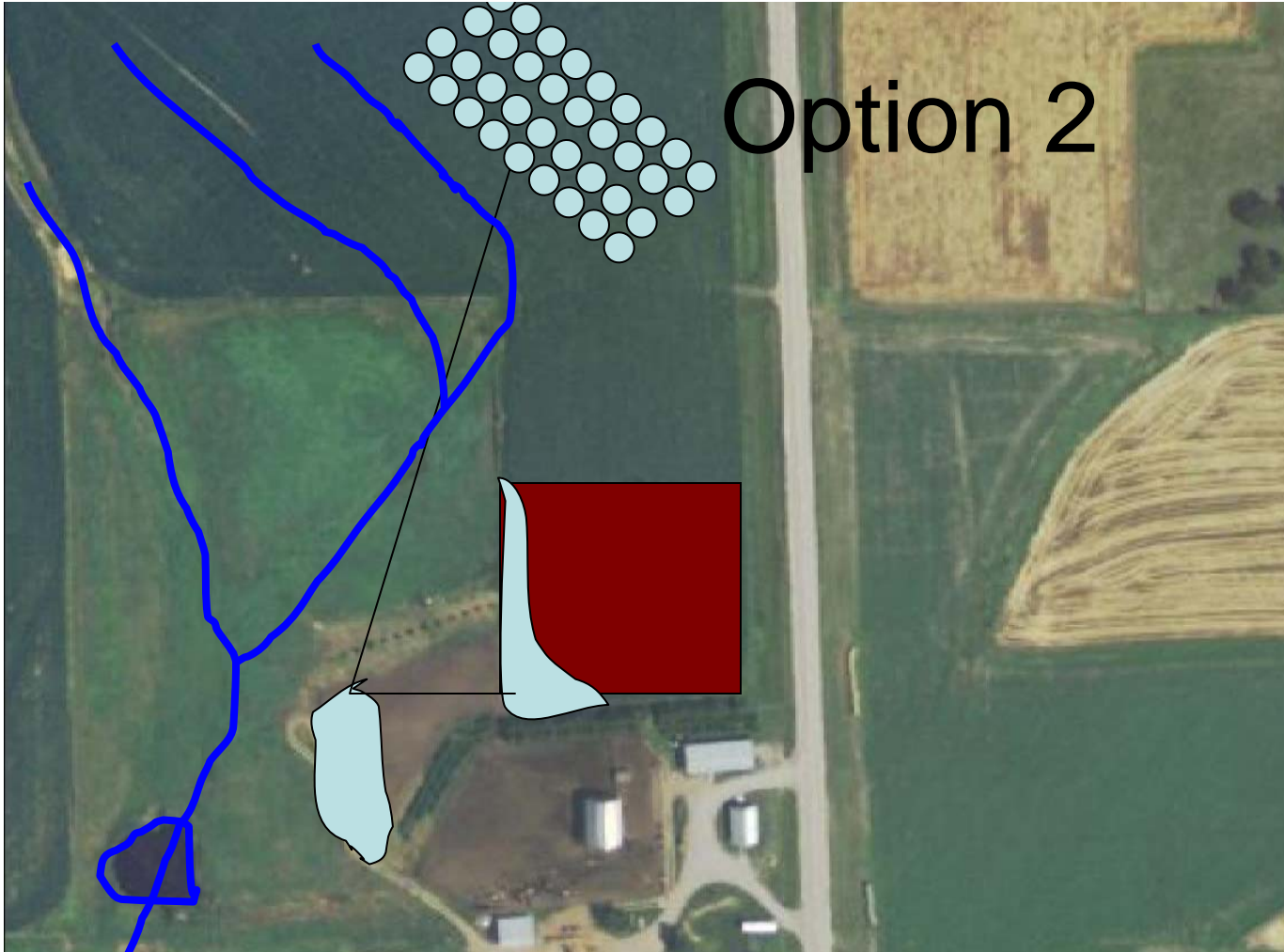


- Gravity Distributed VTA
- Lift station from DB to VTA





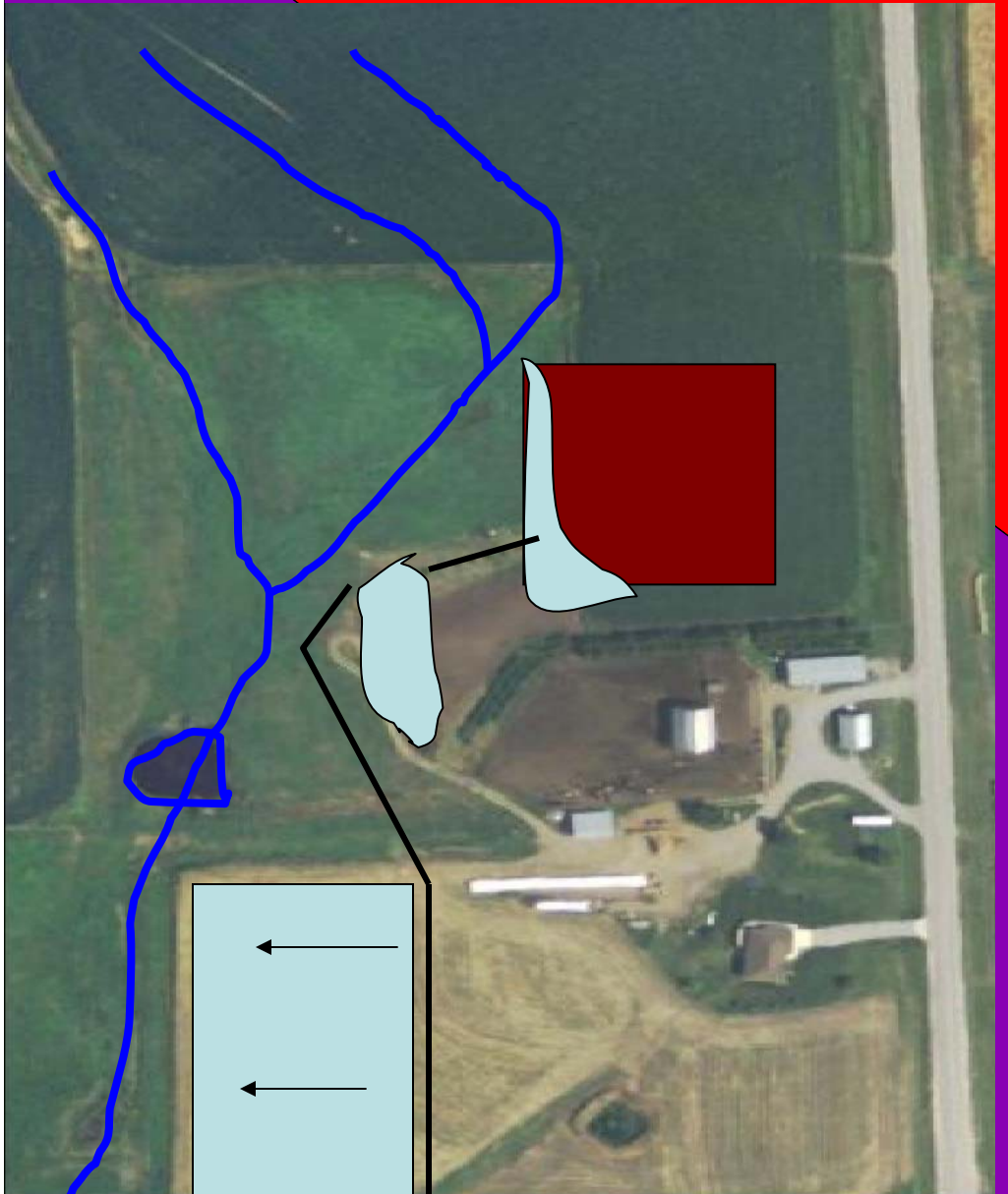
## Option 2



- Abandon west lot
- Pump station to sprinkler VTA
- Build new lot, 2 DB, upper drain into lower



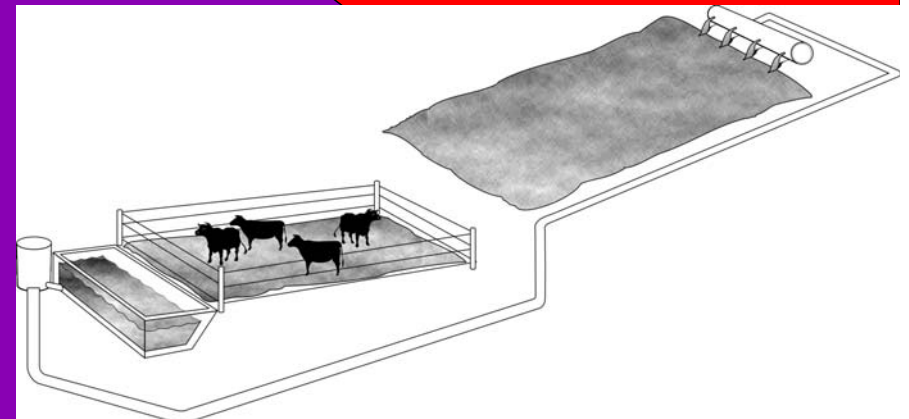
# Option 3



Abandon west lot and construct a new lot to the east

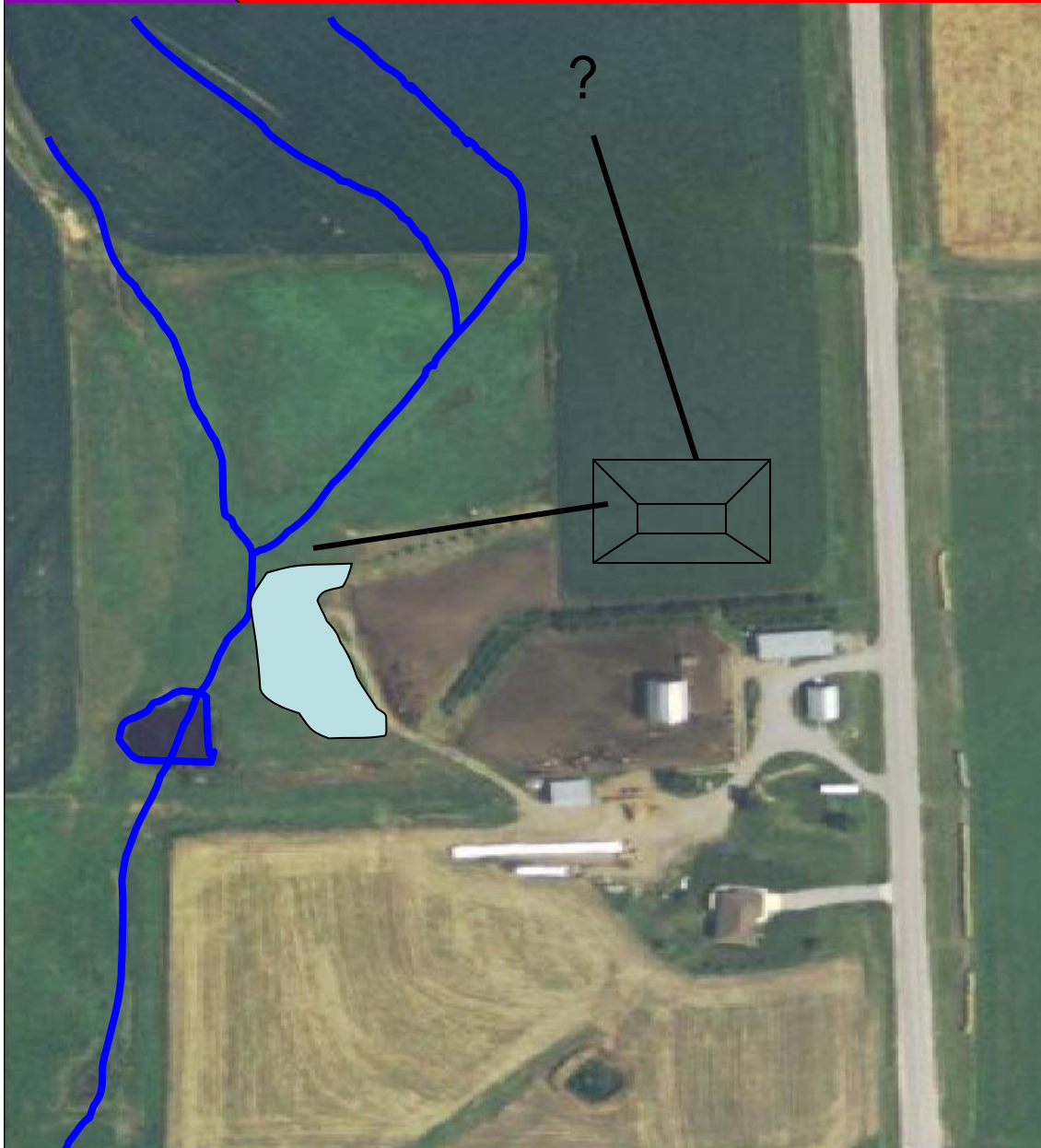
Use a 2 basin system with lift station

Flood South field (6% slope)





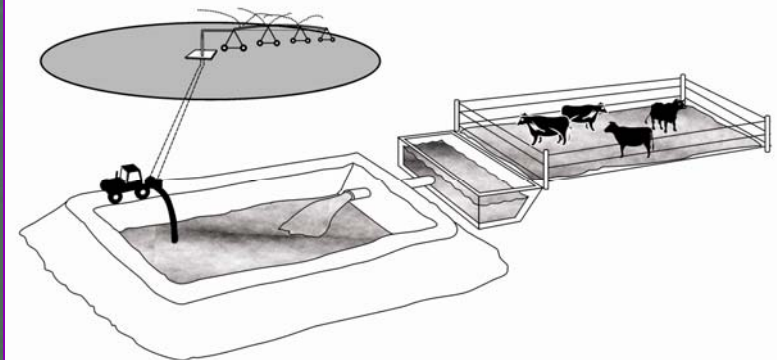
# Option 4



Single Sediment Basin with Holding Pond

Must have Lift Station

Dorn's have no pivot to apply runoff. Must install an application system





# Option 5

Regrade  
and seed  
buffer





## Which option do you think would work best?

1. One sediment basin,  
pump to top of hill, flood  
distribution across VTA  
(east)
2. Two sediment basins,  
pump, to sprinkler VTA  
(NE)
3. Two sediment basins,  
pump to flood  
distribution VTA to south
4. Holding pond
5. Ok, establish buffer



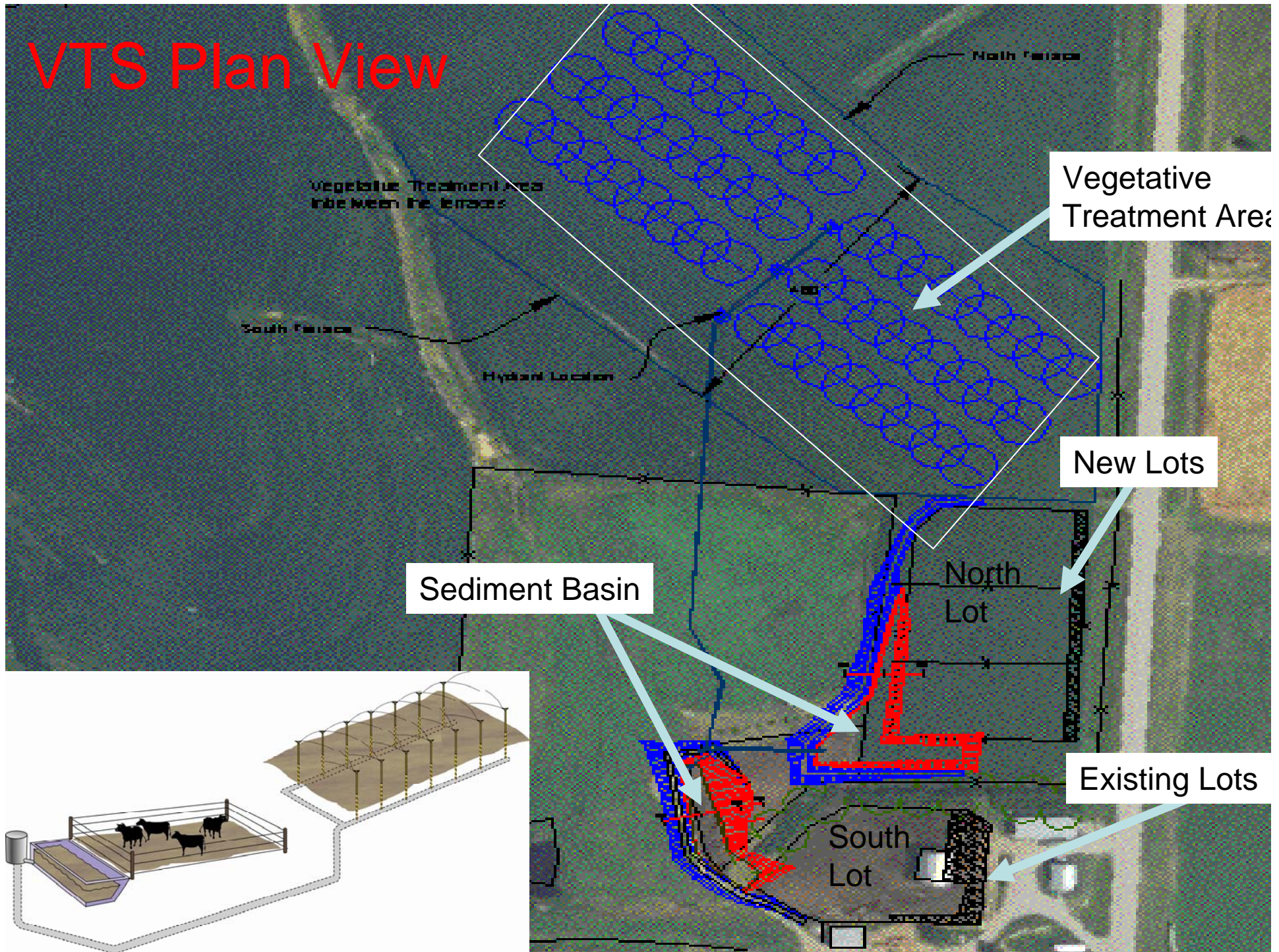
# Wes Dorn Solution

- **Dual sediment basin system**
- **Diesel powered pump station**
- **Lot runoff distributed using K-line distribution system**





# VTS Plan View



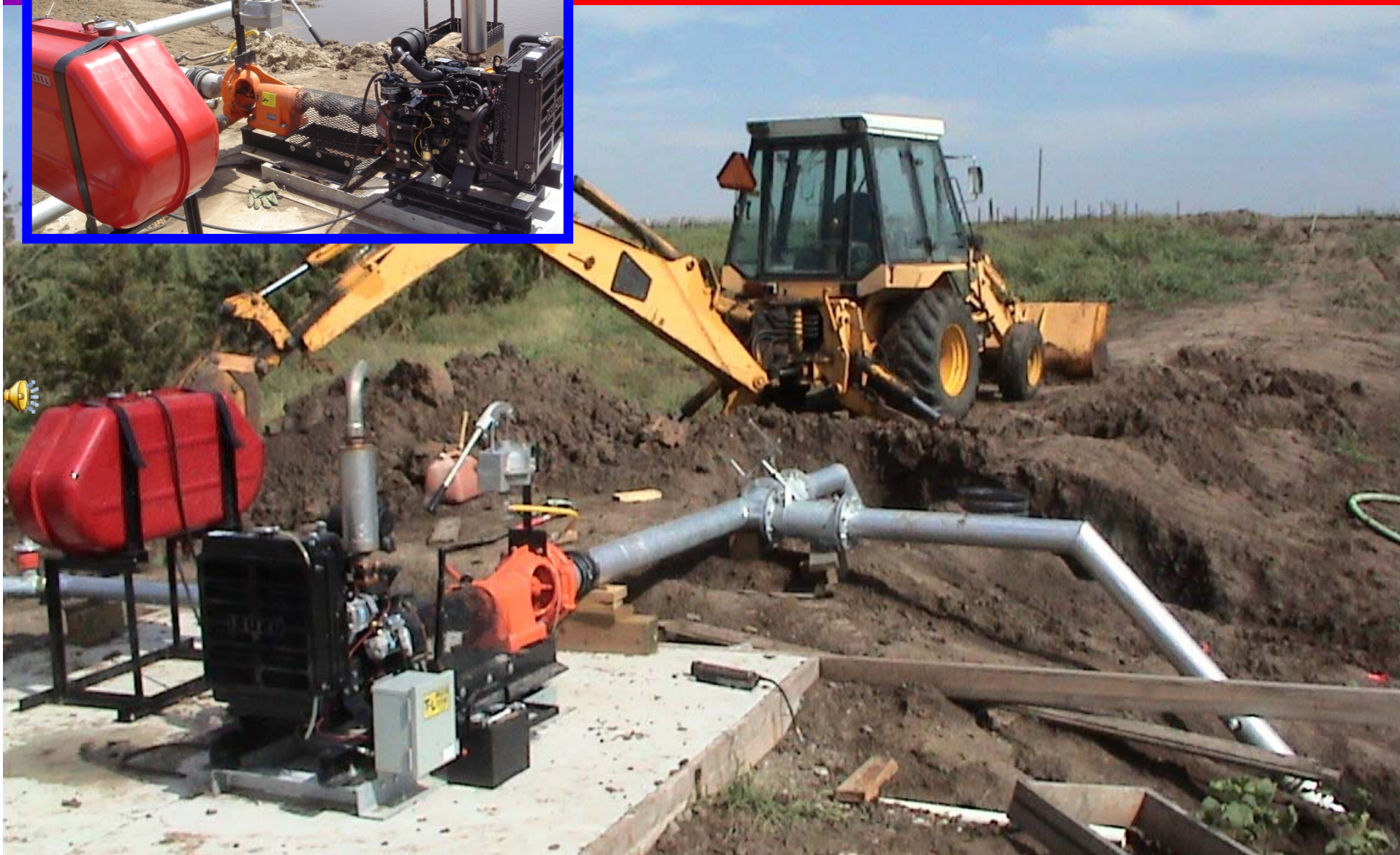
















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# Cost

- \$35,000 total construction cost
- About \$77/ Head
- This 2 basin system with a power unit with a clutch, low infiltration soils, and some weather delays added considerably to the cost



# VTS Lessons Learned

- Use large sediment basin and valve to distribution
- Need to “teach” producer how to manage system
- Vegetation takes time to establish allow for at least 2 years





# Cost to move a Feedlot

Apron	\$50-\$60/ft
Gates	\$100+ each
Fence	\$1.75/ft - \$12/ft
Bunks and bunk line fence	\$10-50/ft
Dirtwork for Feedlot	Varies (\$3-\$20/hd estimated)
Engineering and Permits	\$5,000 - \$50,000+
Groundwater monitoring	\$10,000 plus bi-annual analysis
Roads, water, lighting	?
LWCF	\$30-\$170/hd

300 hd Feedlot Relocation Project, \$160/hd total, \$30/hd VTS  
 300 hd Feedlot Relocation Project, \$369/hd, \$60/hd VTS



## Cost data for 1-3 acre open lot Feedlots

System	Cost per AU (head)	Explanation
Pump & Sprinkler VTS <sup>1</sup>	\$31-\$63	Actual Cost Data
Gravity VTS <sup>1</sup>	\$17-\$30	Gravity sloped VTS, for all components
Conventional Holding Pond with in-situ liner material <sup>2*</sup>	\$44-\$51	\$19,500 for 3 acre lot (450 head)
Conventional Holding Pond System with synthetic liner <sup>2*</sup>	\$70	\$0.45-\$0.50 per sq ft for HDPE (High Density Polyethylene) Assumes pond is 100' by 140' by 9' Additional
Conventional Holding Pond with in-situ liner material and Pump Station <sup>2*</sup>	\$151	\$15,000 for a lift station, typically required and installed
Conventional Holding Pond with synthetic liner and Pump Station <sup>2*</sup>	\$170	

1 UNL Extension cost data

2\* NE NRCS cost data, no land application equipment included



# Lessons Learned

- No two sites are alike, so cookie cutter approach does not work
- Even the small stuff costs major \$
- Do not put money into environmentally unfriendly facilities
- Sprinkler VTS show promise.
- Close collaboration between program and SRA is key to success of voluntary program