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UNL Air Quality Group
Rick Stowell, (402) 472-3912 Biological Systems Engineering
Pork Checkoff
The Nebraska Environmental Trust

Odor Footprint Tool

Odor Impact Assessment

And Setback Estimation for Livestock Facilities

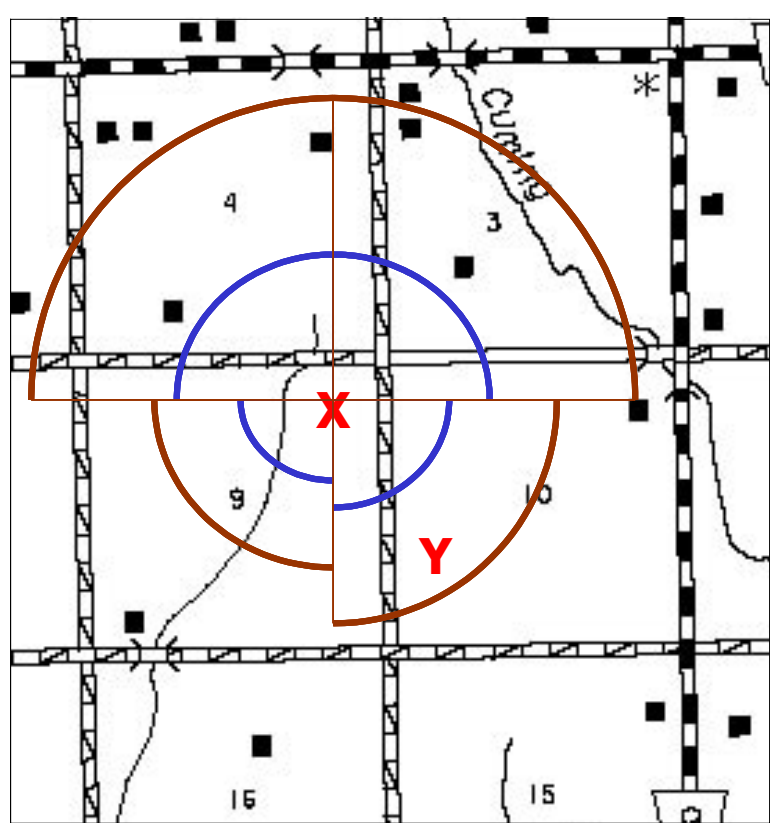
Objectives

- Increase the use of objective, science based information in decision-making related to livestock odor.
- Encourage voluntary implementation of proven odor control technologies.
- Control / decisions remain in hands of local communities and producers.

Odor Footprint Tool Results: Directional Setback Distances

Project title:	Example	Prepared for:	You		
Site location:	Southeast, NE	Prepared by:	Me		
		Date prepared:	Today		
Type of facility:	Source Facility 1 Swine, Finishing Bldg. Shallow pit (pull plug)	Source Facility 2 Manure Storage Earthen basin	Source Facility 3	Source Facility 4	Source Facility 5
Number of identical facilities:	1	1	1	1	1
Total plan area: (sq. ft.)	32,000	384,845			
Total number of animals:	4,000	4,000			
Base odor control:	No supplemental odor control implemented on the facility	No supplemental odor control implemented on the facility			
Alternate odor control:	No supplemental odor control implemented on the facility	Impermeable cover			
Terrain:	North Flat terrain	East Flat terrain	South Flat terrain	West Flat terrain	
BASE PLAN	Setback Distances				
	Odor Annoyance-Free Frequency				
	99%	98%	96%	94%	90%
North	4.43	2.48	1.30	0.93	0.65
East	1.43	0.83	0.44	0.30	0.10
South	4.14	2.14	1.09	0.77	0.43
West	1.82	1.09	0.70	0.46	0.25
ALTERNATE PLAN	Odor Annoyance-Free Frequency				
	99%	98%	96%	94%	90%
North	1.77	1.02	0.57	0.41	0.30
East	0.63	0.38	0.24	0.13	0.07
South	1.67	0.89	0.48	0.35	0.22
West	0.76	0.44	0.30	0.22	0.13

Common Use for Setback Distances: Improved Siting of Livestock Facilities



No residences within 94% annoyance-free setbacks
Four or five within 98% annoyance-free setbacks
Seems site Y may have advantage.

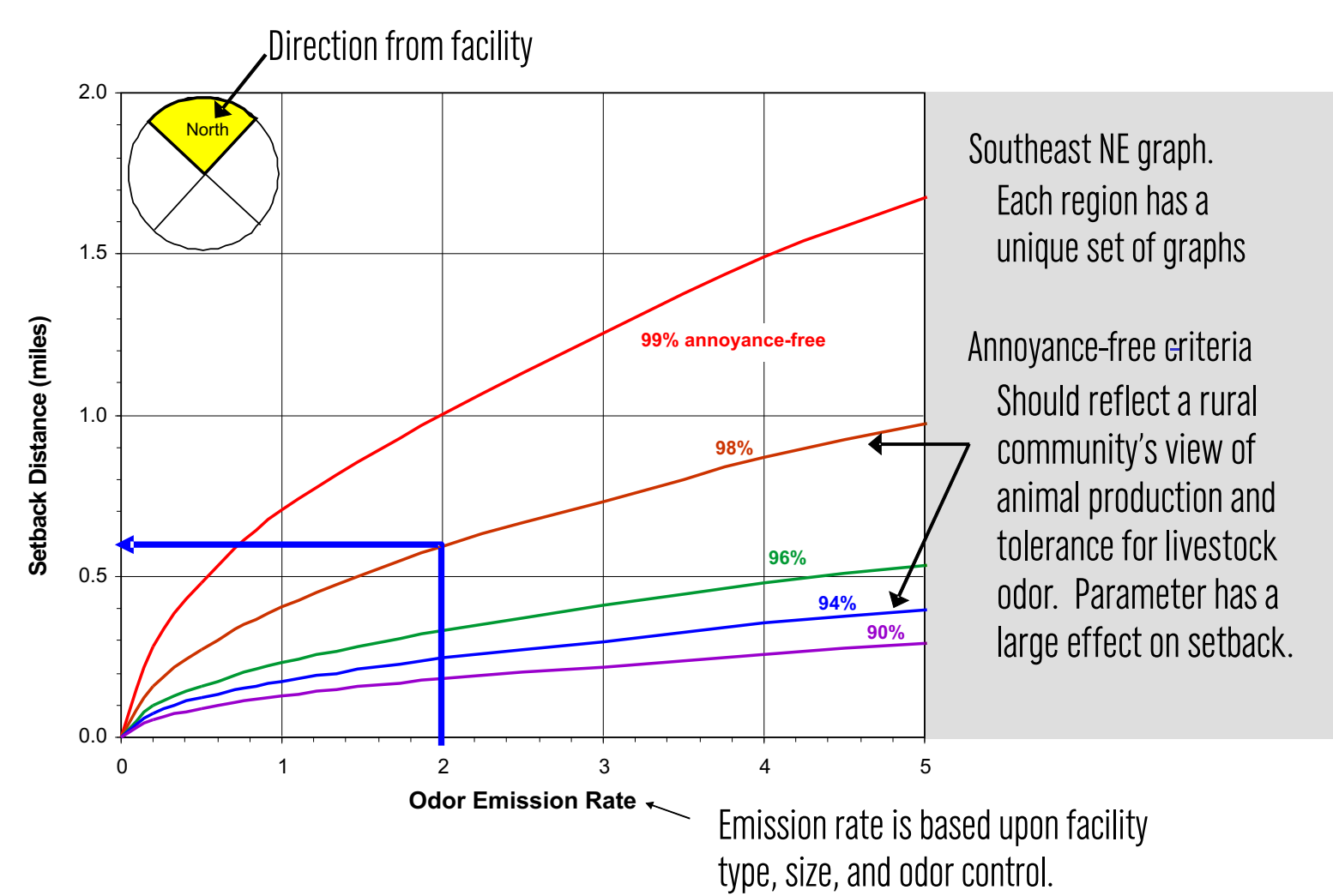
Basis for OFT Setback Distances

- Site location → OFT region
- Direction from site
- Terrain around site
- Type of facilities
- Size of facilities (~herd size)
- Odor control alternatives

Users work with a spreadsheet or worksheet to obtain/calculate needed information.

- Annoyance-free criteria (odor tolerance level)
90-99% odor annoyance-free frequencies
Each 1% is about 1 hour every four days

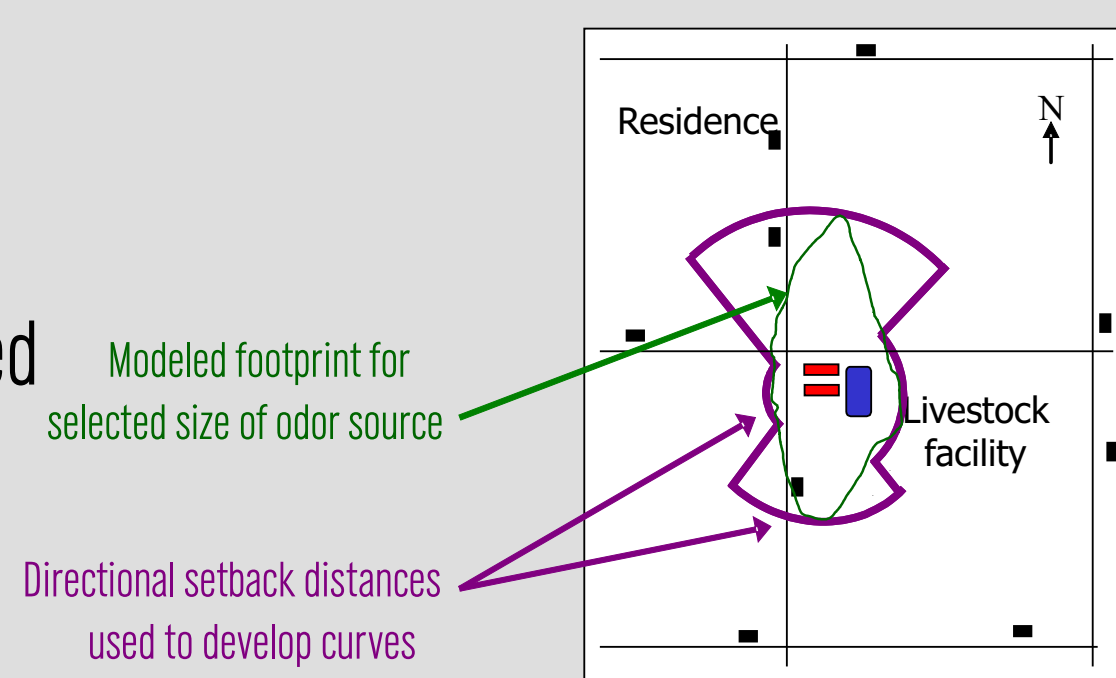
Directional Setback Distance Curves



Regional Odor Footprints

- Result of dispersion modeling over a range of odor emission rates
- Shows extent of an odor source expected odor impact around

Directional setback distance curves are determined by taking the furthest modeled distance in each of four primary directions over the range of modeled emission rates.



Nebraska OFT Regions

