

**Columbus – Bartholomew County Planning Department  
Conditional Use Application**

Planning Department Use Only:

Jurisdiction: Columbus Bartholomew County

Zoning: \_\_\_\_\_

Docket No.: \_\_\_\_\_

Hearing Procedure: Hearing Officer Board of Zoning Appeals



**Conditional Use Application:**

**Applicant Information** (the person or entity that will own and/or execute what is proposed):

Name: Jeff Shoaf

Address: 15793 East 800 North, Hope, IN 47246

(number) (street) (city) (state) (zip)

Phone No.: 812-546-6015 Fax No.: \_\_\_\_\_ E-mail Address: \_\_\_\_\_

**Property Owner Information** (the "owner" does not include tenants or contract buyers):

Name: Jeff Shoaf

Address: 15793 East 800 North, Hope, IN 47246

(number) (street) (city) (state) (zip)

Phone No.: 812-546-6015 Fax No.: \_\_\_\_\_ E-mail Address: \_\_\_\_\_

**Notification Information** (list the person to whom all correspondence regarding this application should be directed):

Name: Landmark Enterprises, LLC - Kristin Whittington

Address: 5522 West 900 South, Edinburgh, IN 46124

(number) (street) (city) (state) (zip)

Phone No.: 317-407-6021 Fax No.: \_\_\_\_\_ E-mail Address: \_\_\_\_\_

How would you prefer to receive information (please check one):  E-mail  Phone  Fax  Mail

**Property Information:**

Address: 11420 East 800 North, Hope, IN 47246

(number) (street) (city) (state) (zip)

or General Location (if no address has been assigned provide a street corner, subdivision lot number, or attach a legal description): Jeff Shoaf is applying for a conditional use for the construction of a swine Concentrated Animal Feeding Operation (CAFO) Type II (as defined by the Bartholomew County Ordinance<sup>1</sup>) on property zoned as Agricultural General (AG). The livestock facility will be located in Haw Creek Township of Bartholomew County. The legal description of the property is W 1/2 of SW 1/4 of Section 7, Twp 10 N R 7 E. The confinement building will be constructed approximately 325 feet east of the on-site residence near the north edge of the of the south-east crop production field of the 74.74 acre tract of land.

<sup>1</sup> Note: Bartholomew County defines CAFO as a regulated livestock operation having more than 600 swine. The regulations under IDEM define a swine CFO as housing 601-2,499 swine while a CAFO is defined as housing 2,500 swine or greater.

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**Conditional Use Requested:**

**I am requesting a conditional use as listed by Section 3.5 of the Zoning Ordinance to allow the following:**

Jeff Shoaf is applying for a conditional use for the construction of a swine Concentrated Animal Feeding Operation (CAFO) Type II (as defined by the Bartholomew County Ordinance<sup>2</sup>) on property zoned as Agricultural General (AG). The livestock facility will be located in Haw Creek Township of Bartholomew County. The legal description of the property is W ½ of SW ¼ of Section 7, Twp 10 N R 7 E. The confinement building will be constructed approximately 325 feet east of the on-site residence.

We intend to construct one tunnel ventilated swine confinement building to house 2,000 head of “wean-to-finish” swine. The engineering drawings<sup>3</sup> (See Exhibit 1) show the building will have outer detentions of 81’10” wide x 205’0” long with an 8’ concrete pit directly below the area where the animals are housed. Manure will be managed and stored in the concrete pit beneath the building until time for land application. Importantly, there are no lagoons proposed as a part of this project.

Design, construction, and operation of the confinement building will be in specific accordance with regulations set forward by the Indiana Department of Environmental Management’s (IDEM) Confined Feeding Operation (CFO) Regulations, 327 IAC 19. Mandated construction standards include specifics for concrete strength, wall and floor thicknesses, and column spacing set by the USDA Natural Resources Conservation Service and Mid-West Plan Service Technical Standards. IDEM’s Confined Feeding Operation (CFO) Regulations also set out very specific requirements for the continued operation, management, and agency inspections of those operations requiring a state permit.

The building will be oriented at an angle from southwest-to-northeast near the north edge of the of the south-east crop production field of the 74.74 acre tract of land. Wean-to-finish is a designated term within the swine industry indicating that pigs will be delivered to the building immediately following being weaned from the sow (aka. mother) at an average weight of approximately 12 pounds. Pigs will be delivered in two (2) groups of 1000 head each, approximately 2 weeks apart, to populate each of the two (2) rooms within the building. Each group of pigs will remain in the building for approximately six (6) months until they are ready for market, or “finished” with their growing cycle. The room will then be emptied and pigs taken to market weighing an average of 275-280 pounds. Rooms are then cleaned and washed and the cycle repeated. An average of 2 groups of pigs will be raised in each room per year.

The proposed building location maximizes the distance from the waste management system, in this case the pit below the building, to the closest off-site residence. Bartholomew County Zoning

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<sup>2</sup> Note: Bartholomew County defines CAFO as a regulated livestock operation having more than 600 swine. The regulations under IDEM define a swine CFO as housing 601-2,499 swine while a CAFO is defined as housing 2,500 swine or greater.

<sup>3</sup> Note: Engineering and drawings were completed by Michael Veenhuizen of Livestock Engineering Solutions. A copy of the drawings is attached and also included as a part of the projects CFO application submitted to IDEM on April 24, 2014.

Ordinance under section 6.3 Farm-Related Animal Standards, set forth the requirements for applications regarding CFO/CAFOs as follows:

1. Required Lot Size: No farm (CFO / CAFO type II) shall be located on any lot of less than 5 acres.
2. Required Setbacks: All structures used in association with a farm (CFO / CAFO type II) operation, including waste disposal facilities, shall be setback a minimum of 100 feet from all property lines.
3. Minimum Distance from Residential Zoning: No farm (CFO /CAFO type II) operation shall be located closer than ½ mile to any Single-family Residential or Multi-family Residential zoning district (measured at the nearest boundary line of the zoning district and the nearest property line of the CFO / CAFO operation).

Mr. Shoa's proposed building site clearly meets requirements 1 and 2.

1. Required Lot Size: The tract of land for the proposed CFO site is 74.74 acres. This complies with the required lot size requirement of greater than 5 acres.
2. Required Setbacks: The proposed building location within the land tract is 1515 feet from the northern border, 212 feet from the eastern border, 1144 feet from the southern border, and 857 feet from the western border of the property line. This complies with the required setbacks of a minimum of 100 feet from the property line.
3. Minimum Distance from Residential Zoning: There are three (3) houses zoned as Single-family Residential or Multi-family Residential within the ½ mile set-back distance (See Exhibit 2). Residences to the southeast of the proposed building site (intersection of county roads 800 North and 670 East) are zoned Residential: Single Family 3 (RS3) as a part of the area referred to as Old Saint Louis. The closest off-site residence zoned as RS3, is 1445 feet from the building site. Owners of this house also own and operate the swine CFO that is approximately ¾ mile to the east of the proposed site and another CAFO approximately 3 miles from the site. We have talked with Mr. Gary Dodd, owner, directly and he is not opposed to the construction of this swine CFO or the reduction of the set-back. The other two (2) houses are 2579 feet and 2605 feet south-east of the proposed construction site. These distances have them approximately 35 feet to 61 feet or 1.3%-2.3% short of the ½ mile set-back requirement. A map showing the distances from the proposed building site to off-site residences is attached (See Exhibit 3). As stated in the Bartholomew County Ordinance and confirmed by Bartholomew County Planning Staff, we have applied to the Bartholomew County Planning Department for a reduction of the Minimum Distance from Residential Zoning. The Development Standards Variance Application was submitted to on May 20, 2014.

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**Conditional Use Criteria:**

The Columbus & Bartholomew County Zoning Ordinance establishes specific criteria that each must be met in order for a conditional use to be approved. Describe how the conditional use requested meets each of the following criteria.

**The approval of the conditional use will not be injurious to the public health, safety, and general welfare of the community.**

The construction of this confined feeding barn will further protect the environment, the animals, and utilize modern technology to raise livestock in a rural community. Construction of this barn is a way to help ensure the health, safety, and general welfare of the public and community verses the

way swine have commonly been raised in the past, and could be now be raised without special permission of the county or the state.

Prior to the 1980's swine were mostly raised outside on pasture type systems. (See Exhibit 4) The animals were fenced into a field or pasture or rotated onto crop fields once the crops were harvested. They were fed on the ground and/or rooted around finding the left-over fallen corn following harvest. Swine used the creek for drinking water and to lay in as a means of cooling themselves (as swine do not have the ability to sweat), some animals were provided a small hut as shelter and the manure was deposited whenever and wherever the animal was at the time. In this scenario typically more than half of the animals died due to the elements, weather extremes, or were killed by predator animals.

Developments in technology and response to consumer demand, pork production has continued to progress over the past 40 years. Consumers of meat products, including pork, want their meat to be as lean as possible. Through genetic selection, the swine industry has responded by reducing the amount of back fat (viewed by the consumer as the amount of fat around the edge of a pork chop). (See Exhibit 5) from an average of 3.61" to 0.8" between the 1950's and early 2000's. (See Exhibit 6) While being housed outside the pig needed that "fat covering" (or coat) to help protect it from the elements. Today we have buildings designed to keep the animals at a comfortable temperature, regardless of the outside conditions. The animals no longer have to glean the fields for left-over grains or food. They are provided with balanced diets to meet their metabolic needs delivered via stainless steel feeders to ensure maximum feed quality and intake. From an environmental protection standpoint these modern buildings provide containment for the animals and all of the animal waste. Storage space is designed to allow the manure to be land applied at the time of year most suited to optimum ground conditions and planned crop needs. Land application rates can be calculated based on agronomic rates including the nutrient content of the manure and the needs of the planned crop prior to application. Application of manure can then be done in an environmentally friendly manner to maximize the use of an organic source of nutrients for enhanced crop production. Mr. Shoaf currently injects all of his manure at the crop root zone approximately 3-6 inches below the soil surface using a tractor and pull type tanker spreader. He intends to continue that practice on the adjacent 189 acres needed to agronomically apply the 6,497,000 gallons per year that the wean-to-finish barn would generate.

Regulations regarding the land application of manure in Indiana are based on the number of animals raised in confinement. Those animals raised on a pasture system are not regulated by the Indiana Department of Environmental Management (IDEM). The construction, operational, and management requirements imposed by IDEM apply solely to CFO's applicants, not owners of pasture raised and/or unconfined swine. The proposed application requires the applicant to comply with the substantial "zero tolerance" federal and state regulations for all permitted operations.

It is critical to note that no other area of agriculture requires the level of oversight that is required of the proposed CFO. Applicant must comply with "zero tolerance" federal and state oversight, substantial paperwork and inspection requirements, as well as risks of massively punitive fines for violations of the same. These are requirements that no other farmers presently face, despite application of chemicals in and around waterways and watersheds; and, despite participating in animal agriculture. Truly the risks associated with CFOs are obviated by the level of oversight.

Since 1994, Jeff Shoaf has owned and operated a 4,000 head swine nursery CFO in Haw Creek Township of Bartholomew County. The nursery building is approximately 2 miles east of State Road 9 on the north side of County Road 800 North. Pigs are delivered to the building at an average weight of approximately 12 pounds and are fed until they reach approximately 40 pounds. These pigs are

then transferred to a grow-finish barn in another Indiana county to be fed to market weight. Mr. Shoaf empties the swine nursery pit approximately one time each year for land application to his crop fields. Land application rates on a per acre are basis are calculated based on manure nutrient content, soil fertility levels, crop type, and crop production levels. During the past 20 years, the existing nursery operation has been inspected on a routine basis by IDEM and never had a violation. IDEM inspectors review the farms operating records, specifics regarding manure storage, handling, and application to ensure compliance with environmental regulations. Construction of this new 2,000 head wean-to-finish swine confinement building allows for the expansion and growth of an existing swine farm and crop farming operation in northeastern Bartholomew County.

The producer intends to continue to utilize the experience and outside oversight of local Agricultural Environmental consultant, Landmark Enterprises LLC, to ensure the facility is managed and maintained properly. The increased construction and use of specialized housing and confinement buildings gave farmers more control over livestock, protecting them from predation and exposure to extreme weather conditions.

Per IDEM records presently in Indiana, there are approximately 2,000 IDEM approved confined feeding operations (CFO), presently, of which approximately 628 are designated (based on size) as concentrated animal feeding operations (CAFO). Seven (7) CFOs exist presently in Bartholomew County, two (2) of which are presently classified by IDEM as CAFOs. In addition, there are at least seven (7) animal feeding operations (AFO), dairy and beef farms currently in Bartholomew County, which do not require IDEM approval for operation, waste management, or manure application.

Based on this information regarding regulated operations and knowledge of history in Bartholomew County that most farms raised livestock we can deduct, that farms do not pose a threat to the public health, safety, and welfare of the community regardless of size (AFO, CFO, CAFO). As pointed to in the Bartholomew County Ordinance, agriculture is considered one of the most important parts of our history, as well as for the economic success of Bartholomew County. This is so much the case that past Governor Mitch Daniels targeted, as one of his gubernatorial goals, the expansion of CFO agriculture. In addition, the present administration, under Governor Mike Pence, has continued to pursue the expansion (and protection) of agricultural activities. The state supports this policy to such an extent that the "Right to Farm" legislation has been expanded in Indiana, requiring that all laws in this State be interpreted to support agriculture.

The construction, maintenance and management of the building will be regulated by the Confined Feeding Operation Regulations (327 IAC 19) set-forth and updated by IDEM on July 1, 2012. These regulations provide specific requirements for the design, construction, and management of such CFOs. All producers are required to follow standards and requirements set forth by these regulations. Containment of the swine in the purpose-built facility greatly reduces any risk of negative impact. This is supported by the fact that only 0.2% of manure spills (15 out of 2,682 as reported to IDEM in 2013) are related to CFOs or CAFOs (See Exhibit 7). The containment facility itself is a concrete box designed to federal and state specifications. Note that there were zero complaints related to the failure of a CFO building. The risk, at worst, is historically 0.2% (please note that this does not imply that there was any negative impact of those CFO related spills simply the presence of a complaint related to that class of operations).

Since construction of his first barn, Mr. Shoaf has been working with an Indiana based conglomerate to supply him nursery pigs. This same group will also be supplying the weaned pigs for the new building. This group, back by many generations of experience in the swine industry provide not only

the animals but up-to-date information on best management practices including feed and animal health. For both his buildings, Mr. Shoaf has also employed the experience and outside oversight of local Agricultural Environmental consultant, Landmark Enterprises LLC, to ensure the facility is managed and maintained properly.

With regard to specific topics, the following additional items support the position that this project will not adversely impact the public health, safety and welfare of the community:

**Building Location including Manure Storage:**

Based on IDEM's Confined Feeding Operation (CFO) Regulations (327 IAC 19-12-3) a liquid manure storage structure (i.e. the concrete pit beneath the building) must be a minimum of 300 feet from surface waters of the state or utilize an Alternative Design or Compliance Approach. This project utilizes such an alternative design. As seen in IDEM application, a diversion berm will be constructed along the northern edge of the building. This berm will act as a barrier in the event there would ever be a breach of manure from the building. As a part of the review and approval process, engineers at IDEM verify that this type berm will meet standards set forth in the CFO Regulations in order to protect water quality. This closest point of building (including waste storage structure) is approximately 150 feet south of Little tough Creek Fork Creek.

The manure generated will be stored in the concrete pit until land applied. This operation including manure storage is a totally enclosed system and does not include a lagoon. The concrete pit provides storage sufficient for 507 days of manure generation. IDEM places a minimum storage capacity of 180 days. Our proposal provides more than 1.38 times the capacity which allows flexibility for timing application so as to apply when conditions are best suited.

Manure generated from the animals will be utilized as an organic source of macro & micro nutrients for the existing row crop operation. Doing so reduces the needs for petroleum based chemical applications. Mr. Shoaf currently does all of his own land application and intends to do so with the new building. He has and maintains a valid manure applicators license (CAT 14) with the Office of the Indiana State Chemist.

**Truck Traffic:**

Truck traffic going to and from the farm will likely utilize Country Road 800 North to the west from State Road 9 approximately 2 ½ miles. County Road 800 North is a collector road, which means it carries more than local traffic. The general speed limit is 55 mph. Between the proposed CFO construction site and State Road 9 is a small collection of houses known as Old St. Louis. Another small collection of houses known as St. Louis Crossing is approximately 2 ½ miles further to the east. The speed limit on this section of the road is 30 mph.

Average trucks per year will be approximately 65-75 trucks (calculations show 69.2 trucks)<sup>4</sup>  
***The industry norm is for the majority of deliveries being during non peak hours which is for the welfare of the animals.***

Information provided by Bartholomew County Purdue Extension Educator, Kris Medic, compared the truck traffic generated by a CAFO to its equivalent in crop production. It takes 1 semi to transport the grain produced for every 5 acres of corn at 200 bu/acre.

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<sup>4</sup> Each truck assumed to be of a registered DOT weight of 80,000# total weight -- therefore approximately 50,000# of cargo per truck load

Calculations for the average number of trucks needed to support this CFO on a per year basis are as follows<sup>5</sup>:

**Wean pigs delivered<sup>6</sup>: 1 truck /year**

2,000 head @ 12 pounds each = 24,000 pounds

\* 2 cycles per year = 48,000 pounds/year / 50,000#/truck load = 1 truck / year

**Feed delivered<sup>7</sup>: 57.86 trucks/year**

Growth needed (275# mkt – 12# start weight = 263# gain

263# gain \* 2.75 # feed/# gain = 723.25 # feed/pig \* 2,000 pigs = 1,446,500 # feed

\* 2 cycles per year = 2,893,000 # feed / 50,000#/truck load = 57.86 trucks/year

**Market Pigs removed<sup>8</sup>: 10.34 trucks/year**

2,000 head \* 6% death loss = 120 pigs (6%) death loss = 1,880 head marketed

\* 275# avg. mkt. wt. = 517,000# pork mkted / 50,000#/truck load = 10.34 trucks/year

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**The development of the property will be consistent with the intent of the development standards established by the Zoning Ordinance for similar uses.**

As stated in 3.5 of Bartholomew County's Zoning Ordinance, the Direct Intent is: The "AG" Agricultural General zoning district is intended to provide an area suitable for agriculture and agriculture-related uses. This district is further intended to preserve the viability of agricultural operations, and limit non-agricultural development in areas with minimal, incompatible infrastructure. Residential development in this zoning district is intended to be limited. In no instance shall this zoning district be considered a large-lot residential zone. This district is further intended to protect the use and value of both agricultural and non-agricultural property within the community."

The development of the property will be consistent with the intent of the development standards of zoning ordinance Section 6.3. The ordinance requires CAFO Type II operations to be on a tract of land of greater than 5 acres, located 100 feet from all property lines and a minimum of 1/2 mile from residential zoning districts. These setbacks are more restrictive than those for other agricultural uses. This project currently meets requirements 1 and 2. We have applied to Bartholomew County Zoning and Planning for a reduction of the minimum distance from residential zoning via a Development Standards Variance Application submitted on May 20, 2014

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<sup>5</sup> Calculations are done using an industry standard average for each category – Actual count may vary based on outside factors

<sup>6</sup> Assumes a 12 pound wean pig delivered to the farm and 6% death loss over 6 month cycle which results in an average pig marketed weight of 275 lbs..

<sup>7</sup> Feed consumption can vary greatly depending on temperature, water consumption, time of year, and pig health. A change in consumption within the group could change the overall amount of feed consumed therefore the amount of feed needed to be delivered.

<sup>8</sup> An increase or decrease in death loss or average market weight of 275# could cause a variation in this number

The proposed swine confinement building will be constructed within an area of properties currently zoned as Agricultural General (AG). The construction site is within acreage that is currently tilled for grain production purposes but where animal agriculture is presently allowed. Approximately ¾ mile to the east is an existing 1,200 head swine CFO. The north-east corner of Bartholomew County currently houses six (6) of the seven (7) currently existing IDEM regulated CFOs and CAFOs, and most of the non-regulated livestock operations. It is this part of the county with its largely agricultural ground that is best suited for livestock facilities.

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**Granting the conditional use will not be contrary to the general purposes served by the Zoning Ordinance, and will not permanently injure other property or uses in the same zoning district and vicinity.**

This new swine confinement building is being constructed within an area of properties currently zoned as Agricultural General (AG). The construction site is within acreage that is currently tilled for grain production purposes. The buildings will be constructed within the confines of a currently operating grain farm. The intent of swine production buildings is to enhance the production of grain and provide a source of organic fertilizer for the increase of soil fertility.

Design and construction of the confinement buildings will be in accordance with regulations set forward by the Indiana Department of Environmental Management (IDEM) Confined Feeding Regulations IAC 327 19 and construction standards set forth by the USDA Natural Resources Conservation Service and Mid-West Plan Service Technical Standards. The location of these buildings is prime to aid in the minimal impact of the building to neighbors or the community. The closest residence to the construction site is that of the producer's family. Surrounding neighbors have been contacted regarding the potential construction. Owners of the closest house have no objection and are swine producers themselves, owning the finishing barn approximately ¾ mile to the east. In accordance to IDEM regulations adjacent land owners and surrounding neighbors as well as County Commissioners will be contacted in writing when the official application is submitted to the agency for approval.

The proposed development is located in the Agricultural General ("AG") zone. Presently the property consists of farmland, including some woodlands. There are some residential uses located to the in the area the attached map (See Exhibit 10) shows the distances to each residence from the proposed operation. There are wooded areas to the east and north buffer the proposed barn from sight. The applicant will be required to comply with IDEM's standards for construction of a CFO and will be required to file an application and receive approval from IDEM prior to construction. An application for this project was submitted to IDEM for review and approval on April 24, 2014.

In addition, Applicant has proposed a location for the barn which takes advantage of naturally occurring buffers, including tree lines, which are well-established best practices for management of odor. This site selection will maintain a tree line buffer even if the neighboring property owners remove all trees. As shown in on the map in Exhibit 11, a significant tree buffer exists on the Applicant's side of the property line and can be maintained even if the neighboring property is timbered. The tree line existing consists of both deciduous trees as well as cedar trees (which are one of the preferred trees for buffering CFO operations). While there are no regulations requiring a tree buffer, Applicant is committed to best practices.

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The conditional use will be consistent with the character of the zoning district in which it is located and the recommendations of the Comprehensive Plan.

### Bartholomew County General Land Use Principles

#### **Preserve productive farmland for farming.**

The committee found that over half of the land in county planning jurisdiction is prime farmland according to a definition developed by the committee (see “Area Definitions”). Farming is an important part of Bartholomew County’s history and economy. Farmland preservation is becoming a greater concern in the county, and in the state overall, as more and more prime farmland is lost to development. The committee found that the county should develop a plan for preserving prime farmland.

*Construction of this confined livestock building helps to achieve these goals. By developing modern agricultural practices, the application increases the probability of a successful and sustainable agricultural operation.*

#### **Agricultural General**

The Agricultural General district includes prime farmland in Bartholomew County outside developed areas. Prime farmland in our county includes most of the eastern and northern parts of the county. There are a few areas of prime farmland in the south and west. Element 1 of the comprehensive plan includes the goal of preserving productive farmland, as well as 18 policies directly relating to farmland preservation (Goal 1, Policies 1-A through 1-R).

Goal 1: Preserve productive farmland and maintain the productive capacity for a strong county agricultural industry.

*Construction of this confined livestock building helps to achieve these goals. It continues the agricultural use of this property.*

Policy 1-M: Develop farmland protection tools acceptable to the community such as multiple agricultural zoning districts, exclusive agricultural zones, voluntary agricultural zones, agricultural protection areas, and neighborhood farm districts.

*This project is in line with this policy, as well as the State of Indiana’s renewed commitment to prioritize agriculture in any and all of the laws of the State. This property is in an area devoted to agriculture.*

Policy 1-Q: Promote development of businesses such as value-added agricultural industries that enhance agriculture and agribusiness while protecting the character and environmental quality of the county. *Construction of this confined livestock building helps to achieve these goals.. It continues the agricultural use of this property in the context of modern farming techniques. Furthermore, research confirms the positive economic impact of CFO farms on the region. (See Exhibit 12), as well as on the State of Indiana as a whole.*

Policy 2-B: Ensure that development occurs in a manner that preserves farmland, wildlife habitat, woodland, and significant natural features.

*Construction of this confined livestock building helps to achieve these goals. The proposal places the building 150 feet from any waterway. It is important to note that IDEM's baseline rules (less which requires a setback of 300' for the storage of liquid manure<sup>9</sup>) are specifically drafted so as to accomplish IDEM's mandate of protection of Indiana's waterways. Furthermore, it is critical to note that the 300' setback applies to lagoons (which will not be used here). The interior building storage proposed protects the waste from rainfall and flood events which are contemplated by IDEM's 300' setback or approved alternative design.*

*Applicant's plan for land application of manure is also more conservative than allowed by IDEM. IDEM allows manure application within 25' of a surface water.<sup>10</sup> Our proposal is to stay 400-500' further away. Due to the terrain in this land tract land application can not be done closer than 100 feet from the creek. During land application we are staying further away than IDEM's regulations require for land which has a 6% slope toward the creek. Again, these rules are water protection rules which establish safe distances. Applicant has proposed substantially exceeding all regulations.*

*In addition, the IDEM complaint data gathered by staff confirms that virtually no CFOs have been connected to any spills in Indiana.*

Policy 2-C: Protect from development unique areas of the county with special natural features, for open space, parks, and wildlife habitat, for the benefit of present and future generations, while avoiding competition with private property ownership. *Construction of this confined livestock building helps to achieve these goals. This project is far and above beyond any requirements of IDEM which requirements are specifically designed with this goal in mind. The evidence from IDEM bears out that their processes are working to prevent problems related to all CFOs. The risk of any harm to any waterways is approaching zero and is, in fact, less than other agricultural uses due to IDEM's regulation and oversight.*

Policy 7-C: Ensure, to the extent possible, that new development does not cause deterioration in water quality or quantity for existing development.

*Construction of this confined livestock building helps to achieve these goals.*

Policy 7-IG: Meet or exceed federal and state water quality standards.

*Construction of this confined livestock building helps to achieve these goals. Unlike most proposed developments, these referenced agencies (e.g. IDEM) provide actual regulation and oversight which applicant must comply with.*

Policy 7-LJ: Ensure that human and animal waste disposal is carried out in accordance with applicable environmental regulations.

*Construction of this confined livestock building helps to achieve these goals. Unlike most proposed developments, IDEM & Office of Indiana State Chemist provide actual regulation and oversight*

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<sup>9</sup> Note: Under the CFO Rules (327 IAC 19-12-3(e)) IDEM permits liquid manure storage structures to be constructed at shorter distances if an alternative method of is put place and approved by the agency.

<sup>10</sup> Note: Under the CFO Rules (327 IAC 19-14-6) IDEM permits the application of liquid manure storage via injection up to 25' setback from surface waters.

*which applicant must comply with. Goal 12: Improve Water Quality and Ensure an Ample Supply of Potable Water.*

*Policy 12-A: Protect ground and surface water from contamination by chemicals, industrial waste, septic systems, animal waste, human waste, and sludge.*

*Construction of this confined livestock building helps to achieve these goals. Unlike most proposed developments, IDEM & Office of Indiana State Chemist provide actual regulation and oversight which applicant must comply with. Goal 18: Promote economic growth in the county by encouraging the location and expansion of businesses and industries that are compatible with their surroundings and provided with adequate services.*

*Policy 25-D: Encourage cooperation between county and state agencies, such as the Indiana Department of Transportation, the Indiana Department of Natural Resources, and the Indiana Department of Environmental Management.*

*Applicant: Again, this project does precisely this. Unlike most proposed developments, these referenced agencies (e.g. IDEM) provide actual regulation and oversight which applicant must comply with. Our local county Board of Zoning Appeals should accept their regulation and oversight as being sufficient and far more effective in permitting, regulating and overseeing applications such as this. In addition, the State of Indiana has renewed Indiana's commitment to supporting agriculture with the recent adoption of the more expansive right to farm laws.*

This project adds a swine operation on land that has always been agricultural. Mr. Shoaf has an existing regulated swine operation and row crop operation in Bartholomew County. The facts show that the risks are so minimal as to border on statistical insignificance. This type of operation is (per IDEM and Farm Bureau) one of the most heavily regulated businesses in the State, certainly far and above other agricultural operations. Given this county's heritage and commitment to agriculture, as well as the State of Indiana's recent mandate in support of operations just like this, we think this project should be approved. We would respectfully ask that the Bartholomew County Board of Zoning Appeals approve this conditional use application and allow the federal and state regulations serve the purpose for which they were enacted.

**Applicant's Signature:**

The information included in and with this application is completely true and correct to the best of my knowledge and belief.

Jeff Shoop 5-14-14  
(Applicant's Signature) (Date)

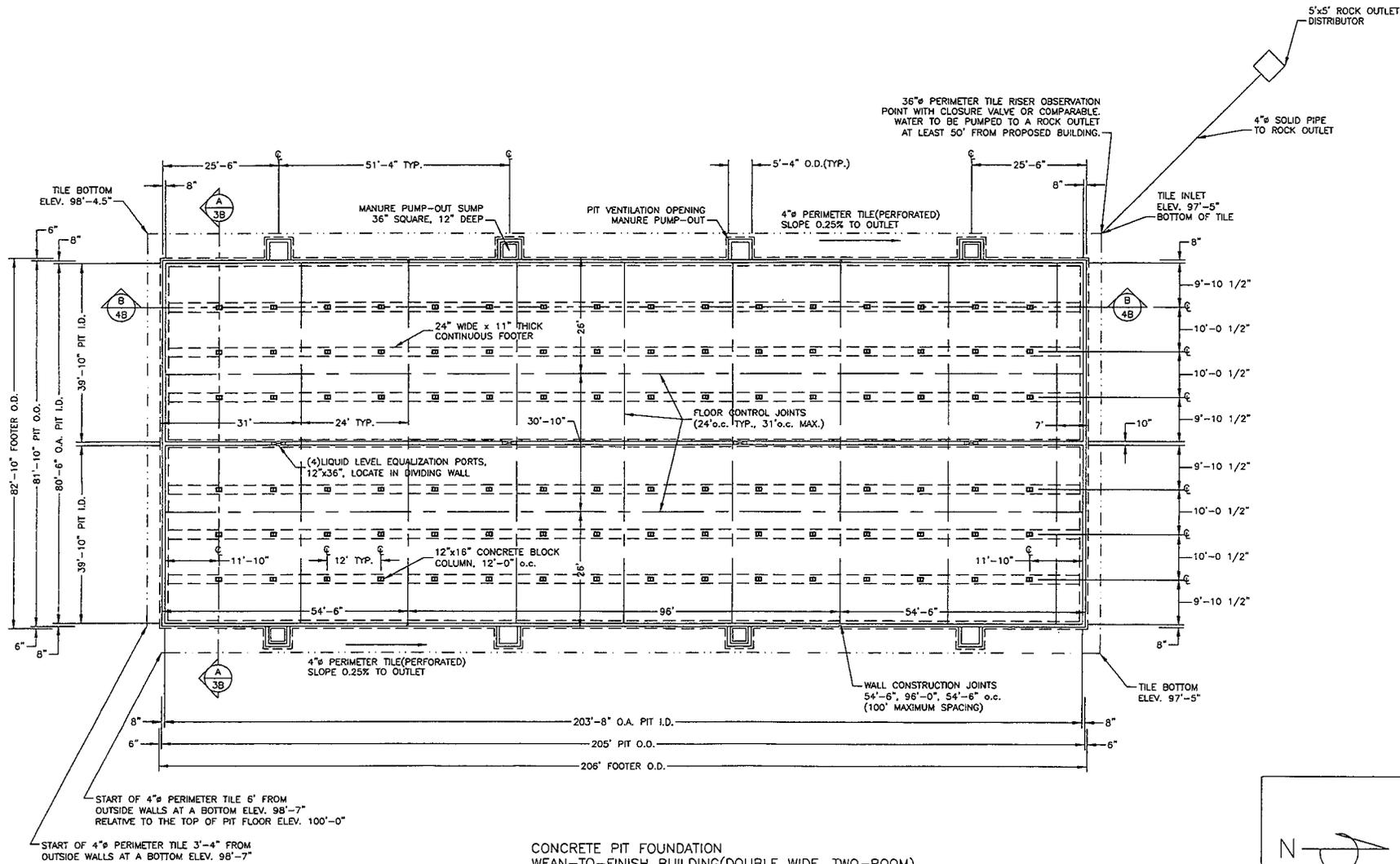
**Property Owner's Signature** (the "owner" does not include tenants or contract buyers):

I authorize the filing of this application and will allow the Planning Department staff to enter this property for the purpose of analyzing this request. Further, I will allow a public notice sign to be placed and remain on the property until the processing of the request is complete.

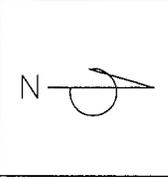
Jeff Shoop 5-14-14  
(Owner's Signature) (Date)

\_\_\_\_\_  
(Owner's Signature) (Date)

Exhibit 1



CONCRETE PIT FOUNDATION  
WEAN-TO-FINISH BUILDING (DOUBLE WIDE, TWO-ROOM)  
2,000-HEAD CAPACITY  
PLAN VIEW



DATE: 01/05/14 DRAWN BY: DL SHEET: 1B of 13B DRAWING NO: JSF0114-01B

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CONCRETE PIT FOUNDATION PLAN

JEFF SHOAF  
17793 E 800 N  
HOPE, IN 47246  
2014 CFO PERMIT

# Shoaf CFO Roads, Creek, and Residential Zones

## Exhibit 2



89° 48' 30" W



Map Scale: 1:111,000 if printed on A landscape (11" x 8.5") sheet.

0 150 300 600 900 Meters

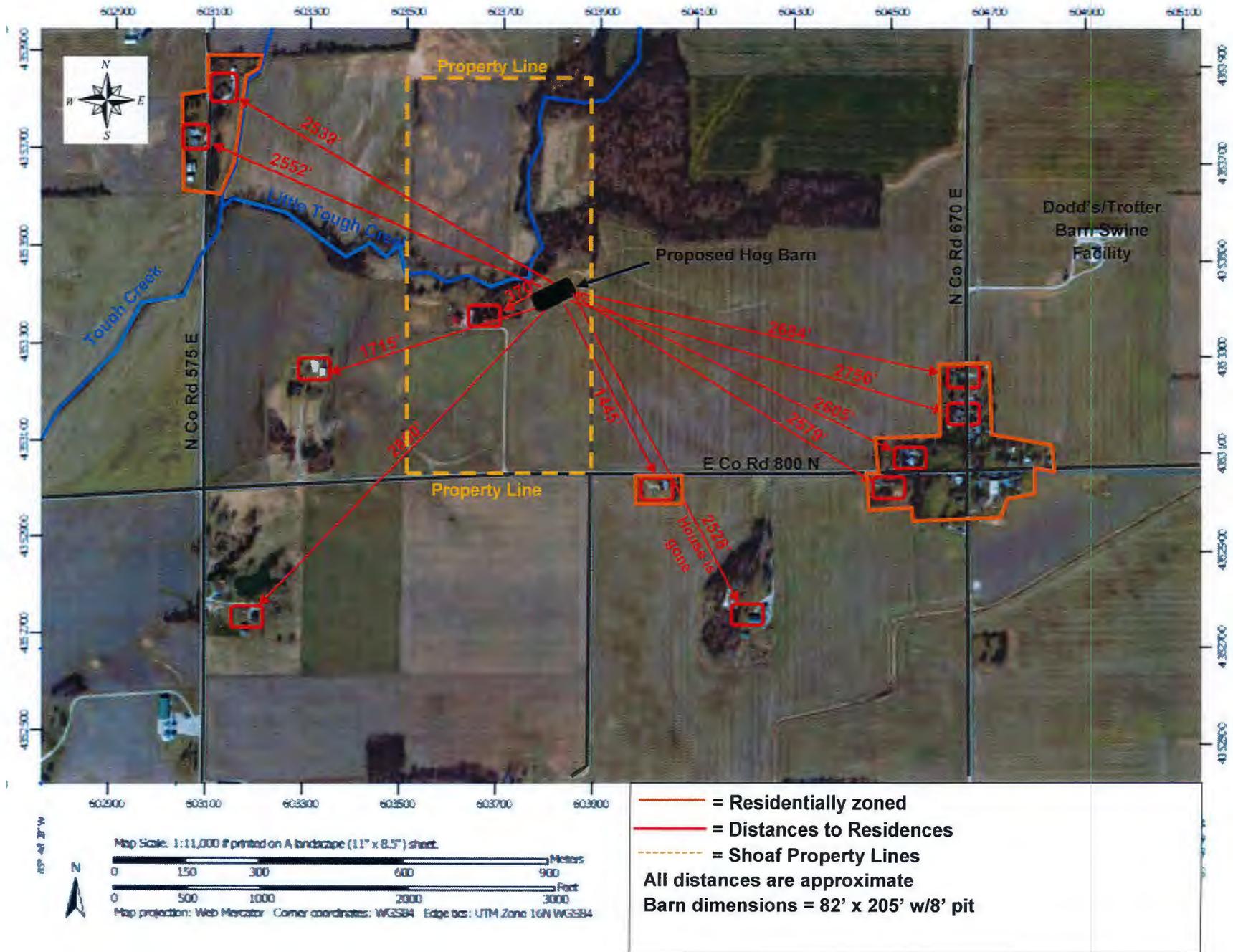
0 500 1000 2000 3000 Feet

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

- = Distances to Roads
  - = Distances to Residential Zone
  - = Distances to Water
  - = Distance to Property Lines
- All distances are approximate  
 Barn dimensions = 82' x 205' w/8' pit

# Shoaf CFO Distance to Residences

## Exhibit 3



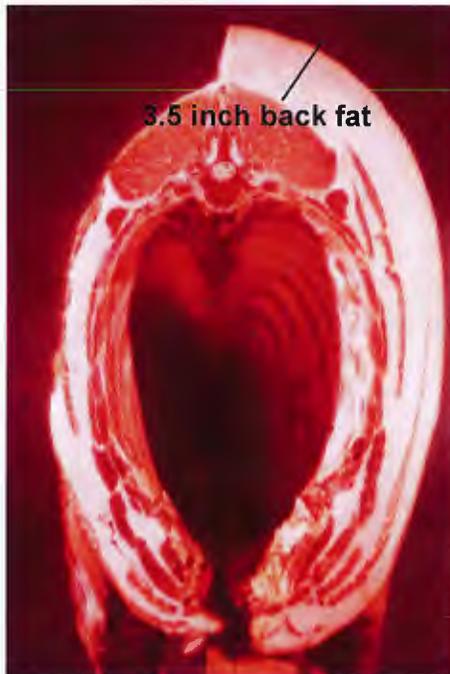
## Exhibit 4

- ▶ Pre-1960 Outside lots/pasture
- ▶ Runoff issues
- ▶ Environmental pollution
  - ▶ Steams used for water source & cooling mechanism
- ▶ No control of temperature or environment
- ▶ Predator issues
- ▶ Land/space constraints

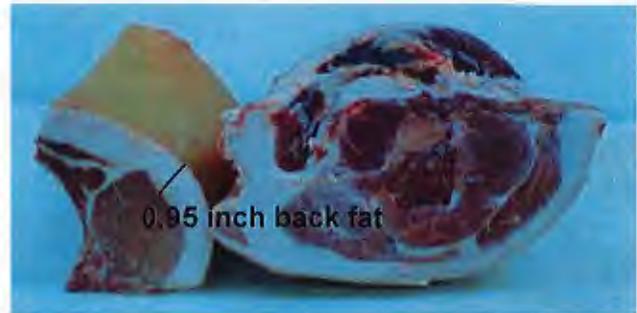


# Reduction in Swine Back Fat Over 50 Years

## Exhibit 5



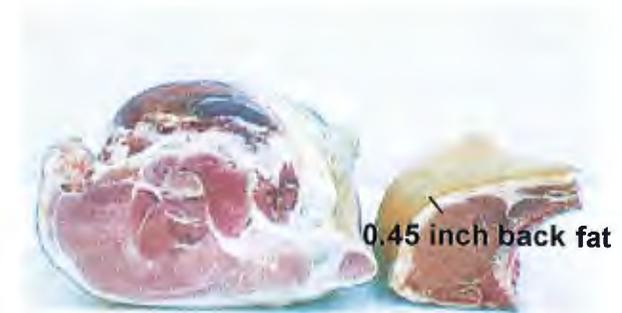
1960's



1980's



1990's



2010's

Note: All measurements of back fat are done at the 10<sup>th</sup> rib.

## Exhibit 6

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**TABLE 2.2**  
**Changes in Muscling (Loin Eye Area) and Carcass Backfat,**  
**1956–1999**

Year	Loin Eye Area (cm <sup>2</sup> )	Backfat (cm)	Average Slaughter Weight (kg)
1956	26.2	3.61 <sup>a</sup>	98.4
1960	28.8	3.56 <sup>a</sup>	96.3
1966	32.0	3.23 <sup>a</sup>	98.4
1970	34.2	2.97 <sup>a</sup>	99.8
1975	34.2	3.17 <sup>a</sup>	107.0
1980	29.6	2.64 <sup>b</sup>	96.6
1985	30.2	2.92 <sup>b</sup>	103.0
1990	31.8	2.79 <sup>b</sup>	104.3
1995	43.2	1.80 <sup>b</sup>	109.1
1999	42.1	1.48 <sup>b</sup>	108.2

<sup>a</sup> Average of 3 measurements (first rib, last rib, last lumbar).

<sup>b</sup> Tenth rib backfat measurement.

*Source: Hormel Farmer and National Barrow Show™ magazines. With permission.*

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## Exhibit 7



FY 2013

### LEGISLATIVE REPORT ON CFO/CAFO ACTIVITIES

Senate Resolution 2512-2007

The Indiana Department of Environmental Management's (IDEM) Office of Land Quality administers the animal feeding operation regulatory program in Indiana. This program includes permitting, compliance monitoring and enforcement activities for 1,204 Confined Feeding Operations (CFOs) and 658 Concentrated Animal Feeding Operations (CAFOs) for a total of 1,862 operations subject to permitting and inspection. In accordance with Senate Resolution 2512 the following information is being provided by the Indiana Department of Environmental Management for the time period July 1, 2012 through June 30, 2013.

#### CFO and CAFO Inspections Inspection Conducted from July 1, 2012 to June 30, 2013

Farm Size	Reason for Inspection <i>(definitions on following page)</i>	Number of Inspections
<b>CFO</b>	Paperwork (CoC) Follow-Up	6
	Compliance Assistance	35
	Construction	59
	Complaint Inspection	10
	Follow-Up Inspection	39
	Routine Inspection	175
	Spill Response Inspection	1
	Voidance	42
	Other (permit, enforcement, site status...)	41
	<b>Total</b>	<b>408</b>
<b>CAFO</b>	Paperwork (CoC) Follow-Up	9
	Compliance Assistance	17
	Construction	27
	Complaint Inspection	2
	Follow-Up Inspection	19
	Routine Inspection	154
	Spill Response Inspection	2
	Voidance	3
	Other (permit, enforcement, site status...)	12
	<b>Total</b>	<b>245</b>
<b>CFO/CAFO Totals</b>	<b>Paperwork (CoC) Follow-Up</b>	<b>15</b>
	<b>Compliance Assistance</b>	<b>52</b>
	<b>Construction</b>	<b>86</b>
	<b>Complaint Inspection</b>	<b>12</b>
	<b>Follow-Up Inspection</b>	<b>58</b>
	<b>Routine Inspection</b>	<b>329</b>
	<b>Spill Response Inspection</b>	<b>3</b>
	<b>Voidance</b>	<b>45</b>
	<b>Other (permit, enforcement, site status...)</b>	<b>53</b>

	<b>Total</b>	<b>653</b>
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**CFO and CAFO Violations**  
Violations Cited from July 1, 2012 to June 30, 2013

<b>Farm Size</b>	<b>Citation/Violation</b>	<b>Number of Violations</b>
<b>CFO</b>	Approval and Performance Standards	35
	Discharge and Spill Requirements	7
	Land Application Records	9
	Operating Records	211
	Operational Standards	70
	Land Application	38
	<b>Total</b>	<b>370</b>
<b>CAFO</b>	Approval and Performance Standards	12
	Discharge and Spill Requirements	1
	Land Application Records	10
	Operating Records	45
	Operational Standards	35
	Land Application	8
	<b>Total</b>	<b>111</b>
<b>CFO/CAFO Totals</b>	<b>Approval and Performance Standards</b>	<b>47</b>
	<b>Discharge and Spill Requirements</b>	<b>8</b>
	<b>Land Application Records</b>	<b>19</b>
	<b>Operating Records</b>	<b>256</b>
	<b>Operational Standards</b>	<b>105</b>
	<b>Land Application</b>	<b>46</b>
	<b>Total</b>	<b>481</b>

## Permitting Activities

### CFO and CAFO Application Details from July 1, 2012 to June 30, 2013

The following data reflects the July 1, 2012 rule changes repealing our General Permit NPDES Rule. At that time 509 CAFO sized non-discharging facilities previously holding NPDES General Permits were transitioned by rule into the state CFO Program and are maintaining CFO approvals. There are 1,851 farms operating under CFO Approvals and 11 farms operating under Individual NPDES CAFO Permits.

Application Type	Received	Issued	Denied	Withdrawn
<b>CFO Approval Applications</b>	<b>89</b>	<b>82</b>	<b>0</b>	<b>2</b>
<b>Individual NPDES CAFO Permit Construction Applications</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<i>Large CAFOs</i>	0	0	0	0
<i>Medium CAFOs</i>	0	0	0	0
<i>Small CAFOs</i>	0	0	0	0
<b>Total Construction Applications</b>	<b>0</b>	<b>82</b>	<b>0</b>	<b>2</b>
<b>Individual NPDES CAFO Permit Coverage Application</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<i>Large CAFOs</i>	0	0	0	0
<i>Medium CAFOs</i>	0	0	0	0
<i>Small CAFOs</i>	0	0	0	0
<b>Individual NPDES CAFO Permit Renewal Application</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<i>Large CAFOs</i>	0	0	0	0
<i>Medium CAFOs</i>	0	0	0	0
<i>Small CAFOs</i>	0	0	0	0
<b>Total Other NPDES Permit Applications</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>All Application Totals</b>	<b>89</b>	<b>82</b>	<b>0</b>	<b>2</b>

**CFO and CAFO Enforcement Actions and Penalties  
Enforcement Actions and Penalties from July 1, 2012 to June 30, 2013**

<b>Notice of Violation Issued</b>	
<b>CFO</b>	<b>4</b>
<b>CAFO</b>	<b>0</b>
<b>Total</b>	<b>4</b>

<b>Agreed Orders</b>			
	<b>Water Quality</b>	<b>Construction Requirements</b>	<b>Permit/Approval Conditions</b>
<b>CFO</b>	<b>3</b>	<b>2</b>	<b>3</b>
<b>CAFO</b>	<b>3</b>	<b>2</b>	<b>0</b>
<b>Totals</b>	<b>6</b>	<b>4</b>	<b>3</b>

<b>Civil Penalties</b>			
	<b>Water Quality</b>	<b>Construction Requirements</b>	<b>Permit/Approval Conditions</b>
<b>CFO</b>	<b>\$24,813</b>	<b>\$6,000</b>	<b>\$12,000</b>
<b>CAFO</b>	<b>\$26,250</b>	<b>\$4,800</b>	<b>0</b>
<b>Totals</b>	<b>\$51,063</b>	<b>\$10,800</b>	<b>\$12,000</b>

<b>Total Agreed Orders and Civil Penalties</b>		
<b>CFO</b>	<b>8</b>	<b>\$42,813</b>
<b>CAFO</b>	<b>5</b>	<b>\$31,050</b>
<b>Totals</b>	<b>13</b>	<b>\$73,863</b>

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**Date:** Thu, 6 Feb 2014 21:45:15 +0000 [02/06/2014 04:45:15 PM EST]

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**From:** Howell, Steven N. <Snhowell@idem.IN.gov>

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**To:** Kristin Whittington

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**Subject:** Manure spill numbers

---

- **2111 total spills reported to IDEM from July 1, 2012 to June 30, 2013**
- **15 total animal waste spills; 6 from regulated farms**
  - **2 CAFO's**
  - **4 CFO's**
  - **9 Spills from unregulated farms**

*Steven Howell*

*Director, Office of Government and Community Affairs*

*Indiana Department of Environmental Management*

*100 North Senate Avenue, MC 50-01*

*Indianapolis, IN 46204*

*317-232-8587*

CONFINED FEEDING OPERATIONS

- (2) Design and construction specifications that assure adequate structural integrity and environmental protection.
- (3) For manure storage facilities that are earthen, in addition to 327 IAC 19-7-1(c)(6), information from at least one (1) of the soil borings or test holes to the shallower of either:
  - (A) bedrock; or
  - (B) ten (10) feet below the lowest point of the proposed waste management system.
- (4) Other information that the commissioner deems necessary to ensure protection of human health and the environment.  
*(Water Pollution Control Division; 327 IAC 19-12-2; filed Feb 6, 2012, 2:58 p.m.: 20120307-IR-327090615FRA, eff Jul 1, 2012)*

**327 IAC 19-12-3 Setbacks**

Authority: IC 13-14-8-7; IC 13-15-2-1; IC 13-18-10-4  
Affected: IC 13-11-2; IC 13-14; IC 13-15; IC 13-18; IC 13-30

Sec. 3. (a) Waste management systems must be located to maintain the minimum setback distances from the following features that are known and identifiable at the time an application is submitted for approval:

- (1) One thousand (1,000) feet from a public water supply well or public water supply surface intake structure.
  - (2) Except for subsection (c), three hundred (300) feet from the following:
    - (A) Surface water.
    - (B) Drainage inlets, including water and sediment control basins.
    - (C) Sinkholes, as measured from the surficial opening or the lowest point of the feature.
    - (D) Off-site water wells.
  - (3) One hundred (100) feet from the following:
    - (A) On-site water wells.
    - (B) Property lines.
    - (C) Public roads.
  - (4) Four hundred (400) feet from existing off-site residential and public buildings.
- (b) A manure storage facility that contains solid manure must be maintained to have a minimum setback of one hundred (100) feet from the features in subdivision [subsection] (a)(2) but must comply with the setbacks in subdivisions [subsection] (a)(1) and (a)(3) through (a)(4).
- (c) If one (1) of the features in subsection (b) is constructed within the specified setback distances to an existing waste management system, a new waste management system may be constructed to maintain the same setback between the existing waste management system and the feature, providing that the feature was:
- (1) not under the control of the owner/operator of the CFO; and
  - (2) constructed after the application for original waste management system was submitted to the department.
- (d) The owner/operator may obtain a reduced setback under 327 IAC 19-5 by demonstrating to the commissioner that a different compliance approach meets the performance standards in 327 IAC 19-3-1.
- (e) The property line setback distances in this section may be waived in writing by the owner of the adjoining property.  
*(Water Pollution Control Division; 327 IAC 19-12-3; filed Feb 6, 2012, 2:58 p.m.: 20120307-IR-327090615FRA, eff Jul 1, 2012)*

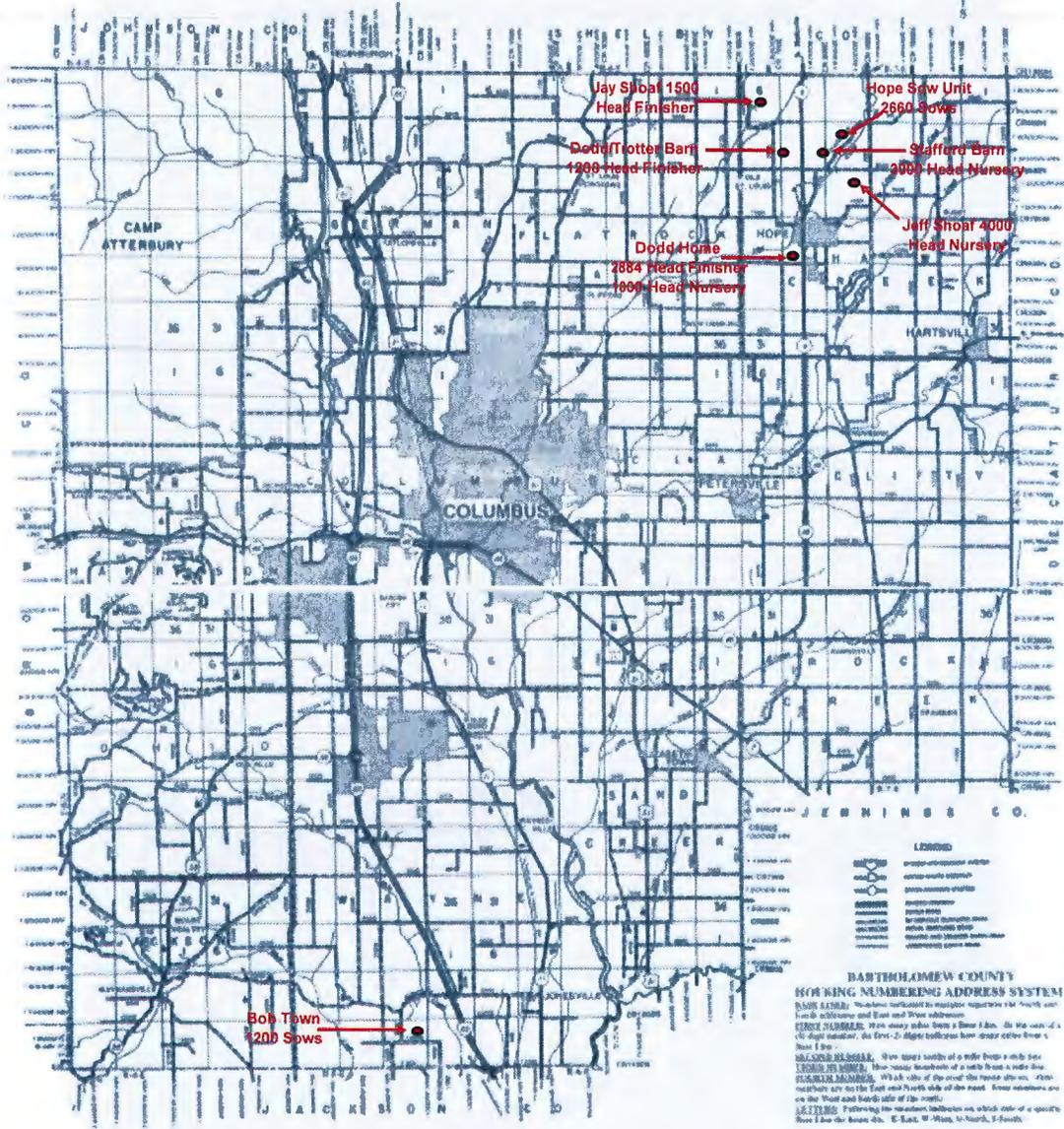
**327 IAC 19-12-4 Storage capacity and design requirements**

Authority: IC 13-14-8-7; IC 13-15-2-1; IC 13-18-10-4  
Affected: IC 13-11-2; IC 13-14; IC 13-15; IC 13-18; IC 13-30

Sec. 4. (a) An alternate design may be approved by the commissioner if it is shown to provide an equivalent amount of environmental protection.

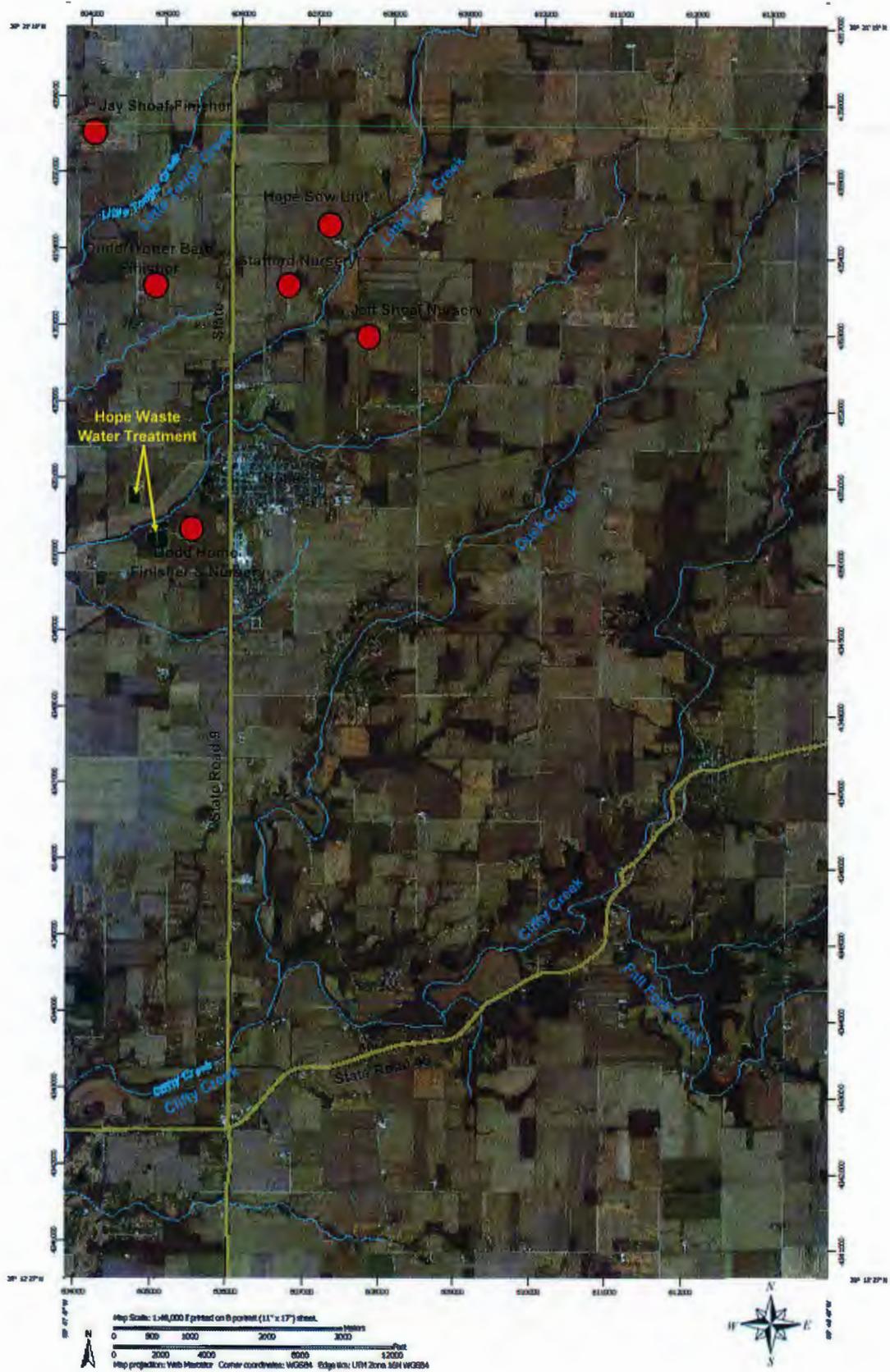
- (b) All waste management systems must be designed to not discharge to surface waters of the state. If a waste management system discharges or is designed to discharge, a NPDES CAFO permit under 40 CFR 122.23 is required.
- (c) All manure storage facilities for the CFO must be designed, constructed, and maintained with a combined storage capacity of at least one hundred eighty (180) days storage for the following:
  - (1) All materials entering the manure storage facility.

# BARTHOLOMEW COUNTY HIGHWAY MAP



Locations of all swine facilities in Bartholomew County

# Hog Sites / Creek Proximities





# Windbreak/Shelterbelt–Odor Control

Conservation Practice Information Sheet

(IS-MO380)

## Using Windbreaks to Reduce Odors Associated with Livestock Production Facilities <sup>1</sup>

### Introduction

Preliminary research and observations made by farmers suggest that windbreaks placed around livestock production facilities may effectively reduce movement of odors emitted by manure to neighboring properties. Essentially, trees can be 'put to work' to reduce the movement of livestock production odors off-site.

Although the idea of placing vegetative windbreaks and shelterbelts around agricultural buildings and farm fields is not new, additional benefits from farm windbreaks continue to be learned and tested. Windbreaks alone will not prevent odor problems associated with intensive livestock production but may provide farmers with one more tool to help reduce negative visual perceptions and detection of smell by neighbors and surrounding communities.



*Figure 1. A windbreak of maturing conifers can significantly change the appearance of livestock production facilities and help filter out odor particles.*

An odor-emitting source can include a livestock production barn, manure storage or a farm field where manure is being spread. Windbreaks have the ability to reduce odor concentrations significantly at or very near the source, which greatly improves the effectiveness of separation distances.

There are six ways that windbreaks and shelterbelts can reduce the effects of livestock odor and improve visual perception of production buildings:

1. Dilution and dispersion of gas concentrations of odor by a mixing effect created by windbreaks.
2. Deposition of odorous dusts and other aerosols (like snow fencing) to the windward and leeward sides of windbreaks.
3. Collection and storage (sinks) within tree wood of the chemical constituents of odor pollution.
4. Physical interception of dust and aerosols odor particles on leaves, needles and branches.
5. Containment of odor by placing windbreaks fore and/or aft of the odor source.
6. Aesthetic appearance:
  - Trees create a visual barrier to livestock barns
  - Trees can make cropped fields and pastures more pleasing to look at
  - Trees represent an 'environmental statement' to neighbors that the producer is making every effort to resolve odor problems in as many ways as possible.

<sup>1</sup> This information sheet is adapted from the following references: "Using Shelterbelts to Reduce Odors Associated with Livestock Production Barns" (January 2004) by Todd Leuty, Horticulture/Agroforestry Specialist, Ontario Ministry of Agriculture and Food. "Air Quality and Shelterbelts: Odor Mitigation and Livestock Production – A Literature Review" 1999. John Tyndall and Joe Colletti; Iowa State University. "Designs for Windbreak Walls for Mitigating Dust and Odor Emissions from Tunnel Ventilated Swine Buildings" 2000. R. Bottcher, R. Munilla, G. Baughman, and K. Keener. North Carolina State University.



# Windbreak/Shelterbelt–Odor Control

Conservation Practice Information Sheet

(IS-MO380)

## Dilution and dispersion

Without wind management, odors emitted from livestock facilities and manure storage areas tend to travel along the ground as a plume with air movement, especially during atmospheric inversions with little or no dilution of odor occurring.



Figure 2. Without windbreaks and without wind management, the odor plumes are picked up by passing air masses and travel near the ground with little or no dilution or filtration.

Windbreaks create an obstacle for moving air masses. When designed properly, windbreaks force turbulent fresh air up and over the tree row and will also moderate and evenly distribute a more gentle airflow through the

trees. Less air movement past barns will mean less pickup and movement of odor off site.

It is believed that windbreaks have the ability to lift some of the odor plume into the lower atmosphere where winds aloft mix and dilute the odor. The greatest dilution of odor occurs above and downwind from the quiet zone created by the action of wind passing over the windbreak. Beyond the quiet zone, more fresh air and less odorous air returns to the ground, thereby reducing movement of livestock odors off site.

Approximately 60 percent of the wind should be deflected up and over the windbreak and 40 percent should pass through the canopy of the trees. Two to three rows of trees can provide an ideal 60 percent density (or 40 percent porosity) through the tree canopy. Windbreaks are less effective for odor reduction when wind is minimal but the visual appearance remains in place.

Windbreaks create a 'quiet zone' of air that measures a distance of 8 to 10 times the height of the tree row downwind of the windbreak, and an additional moderation of wind speeds 10 to 25 times tree height, beyond the windbreak. Back-pressure created by the blocking effect of the tree row also creates a small quiet zone upwind of the tree line that is equal to 2 to 3 times the height of the trees.

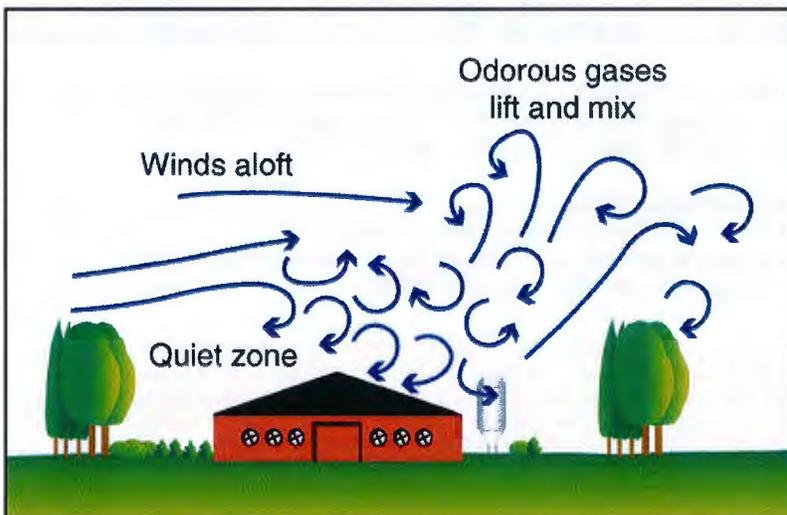


Figure 3. Windbreaks located upwind and downwind of livestock facilities will reduce and manipulate air flow around the facility to reduce the spread of odors. Overhead winds can lift particles and gases into the lower atmosphere to help dilute and disperse odors. Also, more clean air diverts up and over the source of odor.



# Windbreak/Shelterbelt–Odor Control

Conservation Practice Information Sheet

(IS-MO380)

Livestock barns and manure storage areas are best located in the quiet zone 50 to 100 feet downwind of windbreaks. In addition, windbreaks located downwind of the odor source are also important for filtering, absorption and trapping odors. Therefore, placing windbreaks around the entire perimeter of livestock production areas is ideal. Windbreaks should also be at least 75 to 100 feet from access roads and driveways to prevent snowdrifts from blocking farm vehicles during winter.

## Deposition of odorous dusts

Windbreaks create a physical barrier to wind and air movement. The trees absorb wind energy and reduce its speed near the ground. As a result, fewer dust particles and less odorous gases will be picked up by the air coming from livestock facilities. Also in calmer air, dusts and gases already caught up in the air will be more likely to settle back to the ground on the downwind side of the windbreak. This deposition effect is commonly seen with snow fencing where snow settles downwind of the fencing or trees due to reduced wind speed.

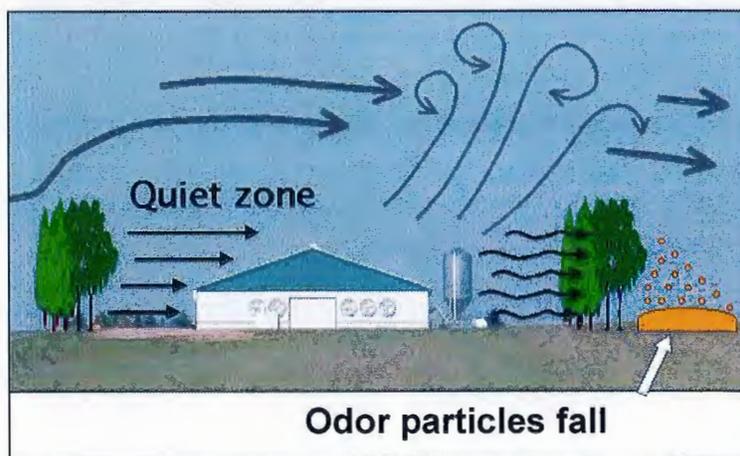
*Figure 4. Reduced wind speed in the quiet zone that is created downwind from a windbreak allows odorous dusts and particles to settle to the ground, similar to what happens with settling and drifting of snow.*



To be most effective for deposition of odorous dust, windbreaks need to be located upwind and downwind of odorous livestock facilities. Upwind windbreaks reduce the quantity of dust and odor that is picked up by wind, and windbreaks located downwind of the facilities will further reduce wind speeds to allow settling of odorous dusts that have become airborne.

For cropland, the same may hold true for reduction of odor movement where manure is being spread onto farm fields. Windbreaks established around the full perimeter of farm fields should reduce movement of odor and can accommodate winds that are approaching the farm from any direction.

*Figure 5. Windbreaks located downwind of livestock production barns allow settling of odorous wind-borne dust particles. Windbreaks should be located 75 to 100 feet away from barns.*





# Windbreak/Shelterbelt–Odor Control

Conservation Practice Information Sheet

(IS-MO380)

Wind tunnel studies of mass transport have shown that windbreaks can remove 35 to 55 percent of dusts being carried in moving air which would provide a substantial reduction of offensive odors carried off-farm. The amount of dust that is picked up or allowed to settle will depend on wind speed, direction of the wind, density of windbreak trees, height of windbreak trees and number of windbreaks.



*Figure 6. Mature windbreaks around cropped fields may help lift and disperse odors during application of manure as nutrient soil amendment, in addition to sheltering crops from damaging wind.*

## Collection and storage of pollutant odors within trees (sink)

Scientific evidence of plant intake of livestock odors in field situations is limited, however there have been many studies done on the ability of plants to absorb air-polluting odors and chemicals. Trees and shrubs clean the air of micro-particles of all sizes by interception. Interception of air pollutants may be 20 times higher in treed or forested areas than non-forested cropped or barren lands. Conifers show a better ability to absorb air pollutants than deciduous trees.



*Figure 7. In air pollution research, odorous gases and particles can be absorbed into the foliage of conifers and deciduous trees during the growing season. Pollutants diffuse inside leaves and needles through tiny openings called stomata or adsorb into waxy coatings that naturally cover leaf surfaces.*

Odorous gases, chemicals and dust particles can become fixed to plant surfaces and can enter into the plant tissue in three ways: 1) gaseous diffusion through open stomata, 2) on wet leaves, soluble air pollutants can enter through stomata in a dissolved liquid form, 3) pollutants can absorb directly into plant tissues.



# Windbreak/Shelterbelt–Odor Control

Conservation Practice Information Sheet (IS-MO380)

Windbreak trees and shrubs absorb air pollutants when they are healthy and not under drought stress. Trees and shrubs absorb more air pollutants when leaf surfaces are wet. Higher humidity can increase uptake of air pollutants into trees, which is commonly measured within tree canopies.

Micro-organisms cover plant surfaces and there is evidence that these micro-organisms associated with windbreak trees also contribute to absorbing odorous chemicals. Forests are often referred to as pollutant air filters. This may also apply to windbreaks trees.

## Physical interception of odor particles

Trees are highly effective at physically intercepting dusts, gases and microbial particles that are carried in the wind. Windbreaks are commonly used to intercept and drop blowing snow, act as barriers to trap blowing sand and soil caused by wind erosion, catch spray drift of agricultural chemicals, and reduce and catch pollen drift from agricultural crops.



As leaf surface roughness increases, the capture ability of particles and odor increases. Leaves with complex shapes (large circumference to area ratios) collect particles most efficiently. Therefore, conifers may be more effective at intercepting livestock odors than deciduous tree and shrub species. Conifers also have leaves (needles) year around.

*Figure 8. Like the air filters of home furnaces, windbreak trees, especially conifers, physically catch wind-borne odorous particles. Conifers have foliage year-round.*

## Windbreak design and planting

Selecting the species of trees and shrubs to plant will vary at each livestock facility and farm field site. Species selection should be based on the characteristics of each site including: soil type, natural drainage, common wind conditions, annual precipitation, natural range of each tree and shrub species and site needs. In addition, to maximize particulate trapping, select species based on high leaf surface roughness (plants with leaf hairs, leaf veins, small leaf size), complex leaf shapes, large leaf circumference to area ratios and medium to rapid growth rates.

It is usually best to select several species of trees and shrubs for use in windbreaks to prevent loss or destruction of the entire windbreak if attacking insect pests or tree diseases occur. Having diversity also offers a better chance for tree survival during alternating seasons of drought and wet soil conditions.

Windbreaks should consist of one to three rows of alternating conifer and deciduous species while windbreaks may be wider with more tree rows. Shrubs are generally planted in the outside or inside rows, followed by conifers with deciduous hardwoods towards the middle or along the downwind side where they can grow more efficiently. Tree varieties and placement for the windbreak should be managed to maximize odor interception and dilution of air, and reduce odor leaving the source.



# Windbreak/Shelterbelt–Odor Control

Conservation Practice Information Sheet (IS-MO380)

Where site conditions allow, place plantings around the entire perimeter of the odor source.

Adjust windbreak porosities/densities to meet air movement needs for naturally ventilated livestock confinement systems.

Keep the inner row of windbreak plantings from all buildings and waste storage areas at least 10 times the exhaust fan diameter or 50 feet, whichever is farther.

Use wide “between row spacing” to increase particle surface area contact and foliage light levels.

Ideally once established, the tree barrier should have a density of about 60 percent for best results for wind management. Conifers such as spruce will provide uniform branch coverage from the ground level up. Tree rows should be spaced wide enough apart to allow access by a small tractor for mechanized management of vegetation.

Weed management is important during the first five years of tree establishment using herbicides, or plastic or organic mulch. Weed management is important until the young windbreak trees have overtopped most weed competition and are free to grow.

## Managing Odor

Odor management is a result of the overall management of the farm operation. General maintenance of the buildings and the nutrition of the feed ration are normal farm management needs that can influence odor emissions. Waste management plans have become a standard part of livestock operations in recent years. Livestock odor management techniques fall into three areas:

1. *Preventing the generation of odor*, including feed additives, aeration, manure additives, etc.
2. *Capturing and destroying the odor*, including biofilters, waste storage covers, organic mats, etc.
3. *Dispersing or disguising the odors*, including vegetative or structural windbreaks, setback distances, site selection, etc.

In particular, structural or vegetative windbreaks placed near exhaust fans on tunnel-ventilated livestock and poultry buildings appear promising, primarily because the air jets issuing from the exhaust fans are diverted



upward. This effect promotes mixing of the odorous, dusty airflow with the wind passing over the building, so that the plumes of air pollutants originating from the fans are made larger (extend higher) in addition to the physical trapping of odor particles on the windbreak.

*Figure 9. Relevant design considerations and low-cost designs using UV-resistant tarpaulin or plastic material, roofing, or wood fastened to anchored pipe frames or posts are potential options for windbreak walls.*

Windbreak structures may either be designed to withstand the same wind speeds as the buildings and be insured with the buildings, or lower wind speeds

at reduced cost. If the windbreaks are not designed for maximum design wind speeds, a method of ensuring non-catastrophic failure is needed, such as breakaway ties fastening material to frames. The location of the



# Windbreak/Shelterbelt–Odor Control

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windbreak affects the diversion of airflow from exhaust fans. Observations of windbreak action in several locations suggest that the windbreaks should be placed two to four fan diameters downwind from the fans to deflect fan airflow without back pressures, (Figure 11) and extend high enough to fully intercept the plumes of airflow issuing from the fans (e.g. 10-12 feet high for typical buildings).

Biofilters using biomass and microorganisms to treat ventilation air as it leaves the building have been used in the U.S. Some producers have installed windbreak walls using straw or other biomass. Windbreaks made from or incorporating straw have been installed on swine farms in North Dakota, Minnesota and Missouri and received favorable results. One facility in Minnesota with a biofilter achieved odor and H<sub>2</sub>S reduction of 80-90% and NH<sub>3</sub> reduction of 50-60%. Weed control and rodent control were the primary problems experienced. A critical element in the use of biofilters is their dependence on power ventilated buildings where fans push the air through the filter. They don't work on naturally ventilated buildings.

## Other benefits

In addition to odor management, vegetative windbreaks also act to reduce the seasonal cost of heating and cooling of farm buildings without disrupting ventilation in livestock barns.

Windbreaks may also reduce the spread of specific infectious disease of livestock by blocking, intercepting or diverting wind-borne infectious organisms away from buildings.

Windbreaks placed around farm fields reduce damage to forage and crops (preserve crop yield potential) caused by damaging turbulent winds while allowing normal air circulation to continue. Windbreaks reduce soil erosion by wind. Around pastures, mature windbreaks will relieve livestock of stress during hot summer days and cold windy winter conditions. Avoid planting trees and shrubs around livestock that are known to be poisonous.

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*Figure 10. Where barns are surrounded by solid forest plantation, it is important not to block ventilation fans with excessive tree growth. Thinning the plantation and pruning off lower branches can improve air circulation. Fifty to 100 feet is a good separation distance between trees and barn.*

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## Acknowledgements

References used in this information sheet:

"Using Shelterbelts to Reduce Odors Associated with Livestock Production Barns" (January 2004) by Todd Leuty, Horticulture/Agroforestry Specialist, Ontario Ministry of Agriculture and Food.

"Air Quality and Shelterbelts: Odor Mitigation and Livestock Production – A Literature Review" 1999. John Tyndall and Joe Colletti; Iowa State University.

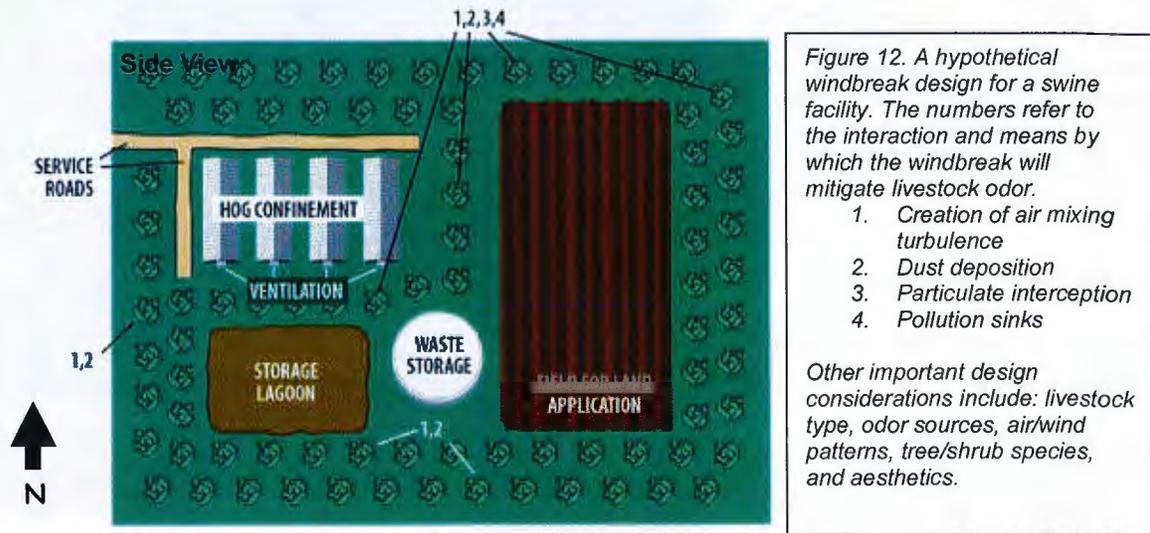
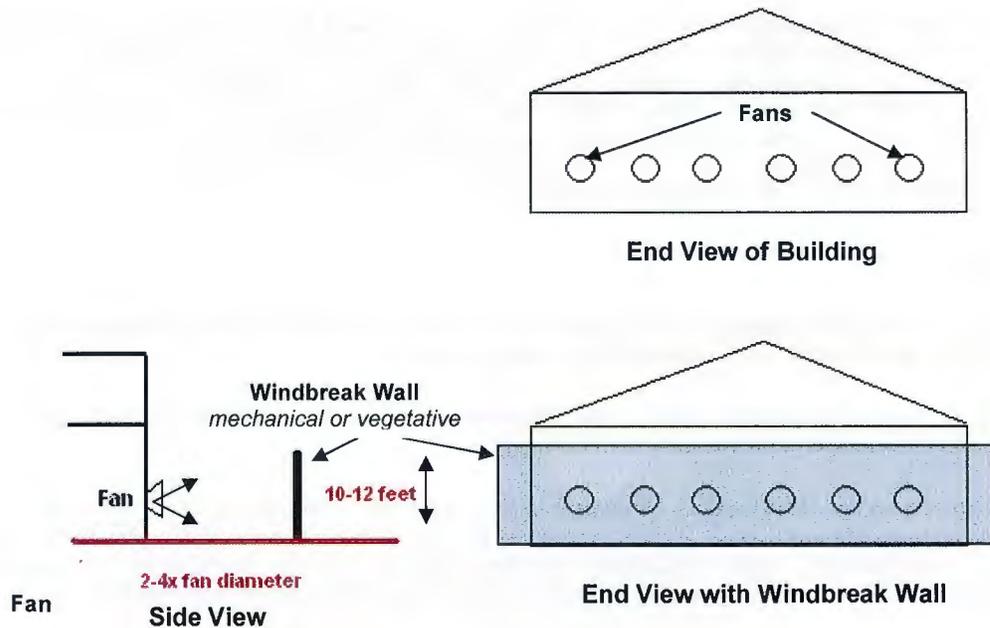
"Designs for Windbreak Walls for Mitigating Dust and Odor Emissions from Tunnel Ventilated Swine Buildings" 2000. R. Bottcher, R. Munilla, G. Baughman, and K. Keener. North Carolina State University.



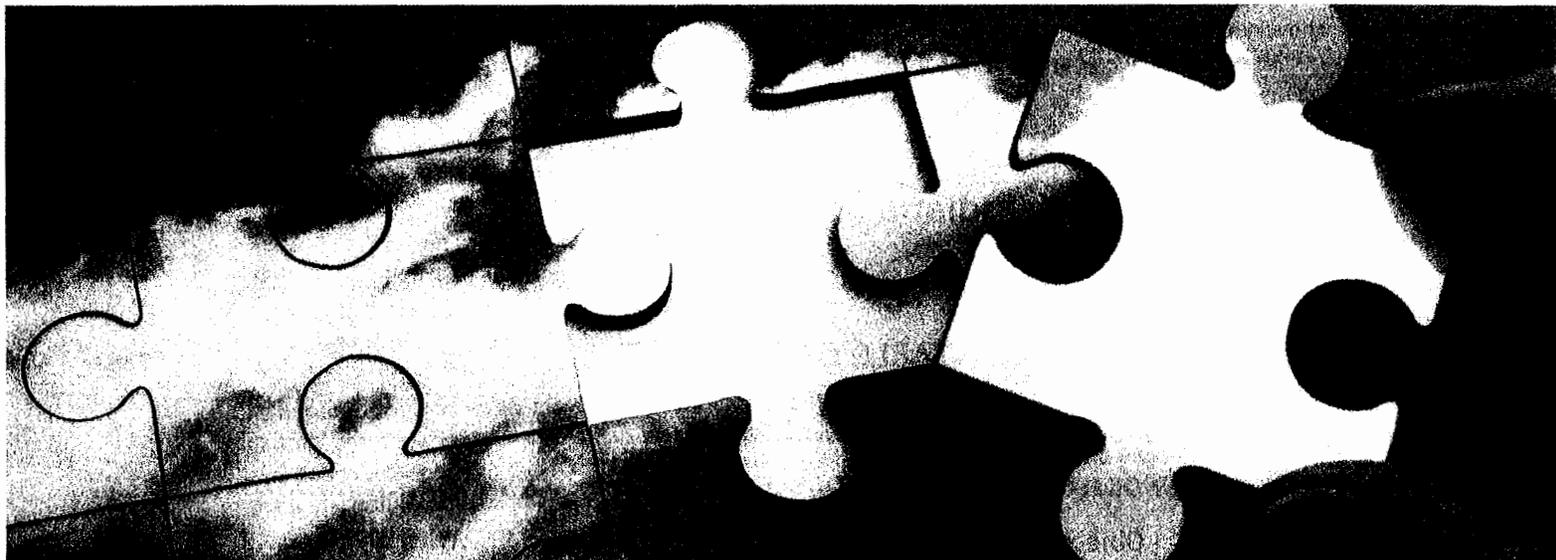
# Windbreak/Shelterbelt–Odor Control

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Figure 11. Example layout of windbreak wall or biofilter for typical tunnel ventilated building.



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# Indiana Animal Agriculture: Regional Economic Impact Report

A Report for  
Indiana Soybean Alliance

March 31, 2014



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There are two ways to think about the economic impact of animal agriculture at the local level in Indiana. First, there is a significant existing industry in most counties, whether it be in the form of poultry, egg, hog, cattle or dairy production. Second, there is the impact of adding a new facility - more business gets done, more people are employed, and incomes rise.

Here we consider the economic impact of existing industry (the impact of new facilities is analyzed later). We can use data on total livestock sales at the agricultural district level. The most recent figures published by the Indiana State Department of Agriculture, in cooperation with USDA's National Agricultural Statistics Service, are for 2010. The report provides total cash receipts from farm marketings for crops and livestock by county and aggregated for the nine agricultural districts. To get a more accurate view of current economic impacts, we adjusted the district livestock sales figures upward by the 22.5% increase for the state as a whole between 2010 and 2012.

Since the available multipliers are for individual species, or groups of species, one needs to calculate a weighted average of the multipliers to apply to the livestock sales number for each district.

To avoid conveying a false sense of precision, we calculated a single set of multipliers to use for all nine Indiana regions. This involved three basic steps:

1. Calculating a weighted average of the multipliers for the four animal product groups using state level sales as reported by NASS. This was done for the output, income and employment multipliers. The weights were 8.5% for cattle, 32.5% for poultry and eggs, 23.3% for dairy, and 35.7% for hogs and other species. This resulted in multipliers for all livestock sales of 2.36 for output, 0.40 for incomes, and 12.3 for jobs.
2. Calculating the average district level multipliers and determining how they compare to the state level multipliers. One expects them to be smaller because they do not capture economic impacts outside the district. The average district multipliers are 80.6% of the state output multiplier, 74.0% of the income multiplier, and 76.7% of the employment multiplier.
3. Multiplying the factors in the second step times the state all-livestock multipliers in the first step gives us district all-livestock multipliers of 1.90 for output, 0.30 for incomes, and 9.4 for employment. These are then applied to the estimated 2012 district livestock sales.

The following table shows the results of these calculations. To take an example, the estimated livestock sales in the Central district in 2012 were \$525 million. This resulted in total economic activity of just under \$1 billion, additional household incomes of \$158 million, and 4,935 jobs.

**Economic Impact of Animal Agriculture at the District Level**

	Estimated 2012 Sales \$million	Economic Impact on District		
		Output \$million	Incomes \$million	Jobs number
Northwest	628	1,193	188	5,903
North Central	756	1,436	227	7,106
Northeast	583	1,108	175	5,480
West Central	173	329	52	1,626
Central	525	998	158	4,935
East Central	296	562	89	2,782
Southwest	562	1,068	169	5,283
South Central	348	661	104	3,271
Southeast	92	175	28	865

### 3. ESTIMATING THE IMPACTS OF A NEW LIVESTOCK ENTERPRISE IN INDIANA

In this section we present estimates of the likely economic impacts of new animal agriculture facilities in each district. For each facility type, we list the underlying assumptions, then apply the relevant multipliers to indicate the expected impact in each district.

#### 3.1. Cattle: 500 head calf to finish feedlot

The assumptions used for a typical cattle feedlot (calf to finish) are shown in the table below.

Facility economics - Beef		Source
Facility capacity	500	ISA
Turns / year	1.5	ISA
Cattle / year	750	
Average liveweight (lbs)	1350	ISA
Production (lbs)	1,012,500	
Production value (\$/lb)	\$1.175	NASS cattle prices (2011, 2012 avg)
Revenue	\$1,189,688	

A new cattle feedlot would bring an annual increase of \$2.0 million to \$2.7 million in economic activity to the local region, expand incomes by \$300,000 to \$420,000, and add 10-14 jobs. The specific impact by region is shown in the table below.

**Estimated economic impacts of a new cattle feedlot in Indiana, by district**

Region	Counties	500 head cattle, calf to finish		
		Regional output \$ millions	Additional income \$	Jobs
NW	Benton, Jasper, Lake, La Porte, Newton, Porter, Pulaski, Starke, White	2.3	338,109	11
NC	Carroll, Cass, Elkhart, Fulton, Kosciusko, Marshall, Miami, St. Joseph, Wabash	2.4	356,906	12
NE	Adams, Allen, De Kalb, Huntington, Lagrange, Noble, Steuben, Wells, Whitley	2.7	422,101	14
WC	Clay, Fountain, Montgomery, Owen, Parke, Putnam, Tippecanoe, Vermillion, Vigo, Warren	2.0	296,351	10
C	Bartholomew, Boone, Clinton, Decatur, Grant, Hamilton, Hancock, Hendricks, Howard, Johnson, Madison, Marion, Morgan, Rush, Shelby, Tipton	2.1	336,325	12
EC	Blackford, Delaware, Fayette, Henry, Jay, Randolph, Union, Wayne	2.3	328,592	11
SW	Daviess, Dubois, Gibson, Greene, Knox, Martin, Pike, Posey, Spencer, Sullivan, Vanderburgh, Warrick	2.1	318,241	11
SC	Brown, Crawford, Floyd, Harrison, Jackson, Lawrence, Monroe, Orange, Perry, Washington	2.4	352,148	13
SE	Clark, Dearborn, Franklin, Jefferson, Jennings, Ohio, Piple, Scott, Switzerland	2.2	297,779	10

Source: Agralytica, using NASS data and custom multipliers from RIMS II

### 3.2. Hogs: 4,400 head grow to finish facility

The assumptions used for a typical hog (grow to finish) farm are shown in the table below.

Facility economics - Hogs		Source
Facility capacity	4,400	ISA
Turns / year	2.2	Indiana Pork
Hogs / year	9,680	
Average liveweight (lbs)	268.7	NASS Livestock slaughter summary
Production (lbs)	2,601,016	
Production value (\$/lb)	\$0.654	NASS hog prices (2011, 2012 avg)
Revenue	\$1,701,064	

A new hog farm would bring an annual increase of \$2.6 million to \$3.1 million in economic activity to the local region, expand incomes by \$380,000 to \$530,000, and add 12-17 jobs. The specific impact by region is shown in the table below.

#### Estimated economic impacts of a new hog farm in Indiana, by district

Region	Counties	4,400 head swine grow to finish		
		Regional output \$ millions	Additional income \$	Jobs
NW	Benton, Jasper, Lake, La Porte, Newton, Porter, Pulaski, Starke, White	2.9	463,200	14
NC	Carroll, Cass, Elkhart, Fulton, Kosciusko, Marshall, Miami, St. Joseph, Wabash	2.8	449,932	14
NE	Adams, Allen, De Kalb, Huntington, Lagrange, Noble, Steuben, Wells, Whitley	3.0	488,376	15
WC	Clay, Fountain, Montgomery, Owen, Parke, Putnam, Tippecanoe, Vermillion, Vigo, Warren	2.8	432,411	14
C	Bartholomew, Boone, Clinton, Decatur, Grant, Hamilton, Hancock, Hendricks, Howard, Johnson, Madison, Marion, Morgan, Rush, Shelby, Tipton	3.1	526,990	17
EC	Blackford, Delaware, Fayette, Henry, Jay, Randolph, Union, Wayne	2.7	420,843	13
SW	Daviess, Dubois, Gibson, Greene, Knox, Martin, Pike, Posey, Spencer, Sullivan, Vanderburgh, Warrick	2.9	466,432	14
SC	Brown, Crawford, Floyd, Harrison, Jackson, Lawrence, Monroe, Orange, Perry, Washington	2.7	412,848	14
SE	Clark, Dearborn, Franklin, Jefferson, Jennings, Ohio, Piple, Scott, Switzerland	2.6	376,956	12

Source: Agralytica, using NASS data and custom multipliers from RIMS II

### 3.3. Turkeys: 29,000 head facility

The assumptions used for a typical turkey farm are shown in the table below.

Facility economics - Turkeys		Source
Turkeys - capacity	29,000	ISA
Turns per year	2.4	<i>Indiana Poultry Association</i>
Total animals	69,600	
Average weight (lbs)	36.7	<i>USDA reported avg weight, IN, 2012</i>
Total liveweight (lbs)	2,554,320	
Price (\$/lb, liveweight)	\$0.72	<i>USDA reported avg price, IN, 2012</i>
Total sales (\$)	\$1,839,110	

A new turkey farm would bring an annual increase of \$3.0 million to \$4.9 million in economic activity to the local region, expand incomes by \$410,000 to \$780,000, and add 13-22 jobs. The specific impact by region is shown in the table below.

**Estimated economic impacts of a new turkey farm in Indiana, by district**

Region	Counties	29,000 turkey grower		
		Regional output \$ millions	Additional income \$	Jobs
NW	Benton, Jasper, Lake, La Porte, Newton, Porter, Pulaski, Starke, White	4.9	753,116	22
NC	Carroll, Cass, Elkhart, Fulton, Kosciusko, Marshall, Miami, St. Joseph, Wabash	4.4	685,253	20
NE	Adams, Allen, De Kalb, Huntington, Lagrange, Noble, Steuben, Wells, Whitley	4.7	764,150	22
WC	Clay, Fountain, Montgomery, Owen, Parke, Putnam, Tippecanoe, Vermillion, Vigo, Warren	3.9	571,044	17
C	Bartholomew, Boone, Clinton, Decatur, Grant, Hamilton, Hancock, Hendricks, Howard, Johnson, Madison, Marion, Morgan, Rush, Shelby, Tipton	4.2	728,472	22
EC	Blackford, Delaware, Fayette, Henry, Jay, Randolph, Union, Wayne	4.1	599,366	18
SW	Daviess, Dubois, Gibson, Greene, Knox, Martin, Pike, Posey, Spencer, Sullivan, Vanderburgh, Warrick	4.9	778,128	22
SC	Brown, Crawford, Floyd, Harrison, Jackson, Lawrence, Monroe, Orange, Perry, Washington	3.1	458,306	15
SE	Clark, Dearborn, Franklin, Jefferson, Jennings, Ohio, Piple, Scott, Switzerland	3.0	411,593	13

Source: Agralytica, using NASS data and custom multipliers from RIMS II

**3.4. Layers: 2 million head facility**

The assumptions used for a typical egg farm are shown in the table below.

Facility economics - Layers		Source
No. of birds	2,000,000	ISA
Eggs / bird	265	American Egg Board
Eggs / year	530,000,000	
Eggs (dozens/year)	44,166,667	
Producer price (\$ / dozen)(2012 Indiana was \$0.835)	\$0.85	USDA egg prices, Midwest, bottom end of "large egg" range
Value of output (\$)	\$37,541,667	

A new layer farm would bring an annual increase of \$61.1 million to \$100.6 million in economic activity to the local region, expand incomes by \$8.4 million to \$15.9 million, and add 265-456 jobs. The specific impact by region is shown in the table below.

**Estimated economic impacts of a new layer farm in Indiana, by district**

Region	Counties	2 million layer facility		
		Regional output \$ millions	Additional income \$	Jobs
NW	Benton, Jasper, Lake, La Porte, Newton, Porter, Pulaski, Starke, White	99.1	15,373,313	447
NC	Carroll, Cass, Elkhart, Fulton, Kosciusko, Marshall, Miami, St. Joseph, Wabash	90.4	13,988,025	412
NE	Adams, Allen, De Kalb, Huntington, Lagrange, Noble, Steuben, Wells, Whitley	96.8	15,598,563	456
WC	Clay, Fountain, Montgomery, Owen, Parke, Putnam, Tippecanoe, Vermillion, Vigo, Warren	80.4	11,656,688	351
C	Bartholomew, Boone, Clinton, Decatur, Grant, Hamilton, Hancock, Hendricks, Howard, Johnson, Madison, Marion, Morgan, Rush, Shelby, Tipton	86.0	14,870,254	450
EC	Blackford, Delaware, Fayette, Henry, Jay, Randolph, Union, Wayne	82.7	12,234,829	367
SW	Daviess, Dubois, Gibson, Greene, Knox, Martin, Pike, Posey, Spencer, Sullivan, Vanderburgh, Warrick	100.6	15,883,879	451
SC	Brown, Crawford, Floyd, Harrison, Jackson, Lawrence, Monroe, Orange, Perry, Washington	63.6	9,355,383	300
SE	Clark, Dearborn, Franklin, Jefferson, Jennings, Ohio, Piple, Scott, Switzerland	61.1	8,401,825	265

Source: Agralytica, using NASS data and custom multipliers from RIMS II

### 3.5. Dairy: 1,000 head facility

The assumptions used for a typical egg farm are shown in the table below.

Facility economics - Dairy		Source
Number of animals	1,000	
Production / animal / year (lbs)	21,697	USDA / NASS, production/animal
Total production (lbs)	21,697,000	
Milk price (\$ / lb)	\$0.1822	CME - Oct 15 contract price 10/15/13
Total revenues	\$3,953,193	

A new dairy farm would bring an annual increase of \$5.9 million to \$7.6 million in economic activity to the local region, expand incomes by \$900,00 to \$1.4 million, and add 31-45 jobs. The specific impact by region is shown in the table below.

**Estimated economic impacts of a new dairy farm in Indiana, by district**

Region	Counties	1,000 head dairy		
		Regional output \$ millions	Additional income \$	Jobs
NW	Benton, Jasper, Lake, La Porte, Newton, Porter, Pulaski, Starke, White	7.4	1,211,258	39
NC	Carroll, Cass, Elkhart, Fulton, Kosciusko, Marshall, Miami, St. Joseph, Wabash	7.1	1,173,308	38
NE	Adams, Allen, De Kalb, Huntington, Lagrange, Noble, Steuben, Wells, Whitley	7.6	1,282,021	42
WC	Clay, Fountain, Montgomery, Owen, Parke, Putnam, Tippecanoe, Vermillion, Vigo, Warren	7.0	1,092,267	37
C	Bartholomew, Boone, Clinton, Decatur, Grant, Hamilton, Hancock, Hendricks, Howard, Johnson, Madison, Marion, Morgan, Rush, Shelby, Tipton	7.5	1,353,178	45
EC	Blackford, Delaware, Fayette, Henry, Jay, Randolph, Union, Wayne	6.8	1,072,501	36
SW	Daviess, Dubois, Gibson, Greene, Knox, Martin, Pike, Posey, Spencer, Sullivan, Vanderburgh, Warrick	7.3	1,219,165	39
SC	Brown, Crawford, Floyd, Harrison, Jackson, Lawrence, Monroe, Orange, Perry, Washington	6.1	972,486	34
SE	Clark, Dearborn, Franklin, Jefferson, Jennings, Ohio, Piple, Scott, Switzerland	5.9	886,306	31

Source: Agralytica, using NASS data and custom multipliers from RIMS II

### 3.6. Broilers: 72,000 head facility

The assumptions used for a typical egg farm are shown in the table below.

Facility economics - Broilers		Source
Number of animals	72,000	
Turns per year	6.5	Approximate average across facilities (Indiana Poultry Association)
Total number of birds	468,000	
Weight (lbs)	5.9	USDA NASS, national average 2012
Total weight	2,761,200	
Value (liveweight, \$/lb)	0.50	USDA NASS, national average 2012
Total value	\$1,380,600	

A new broiler farm would bring an annual increase of \$2.2 million to \$3.7 million in economic activity to the local region, expand incomes by \$310,000 to \$580,000, and add 10-17 jobs. The specific impact by region is shown in the table below.

#### Estimated economic impacts of a new broiler farm in Indiana, by district

Region	Counties	72,000 broiler grower		
		Regional output \$ millions	Additional income \$	Jobs
NW	Benton, Jasper, Lake, La Porte, Newton, Porter, Pulaski, Starke, White	3.6	565,356	16
NC	Carroll, Cass, Elkhart, Fulton, Kosciusko, Marshall, Miami, St. Joseph, Wabash	3.3	514,412	15
NE	Adams, Allen, De Kalb, Huntington, Lagrange, Noble, Steuben, Wells, Whitley	3.6	573,639	17
WC	Clay, Fountain, Montgomery, Owen, Parke, Putnam, Tippecanoe, Vermillion, Vigo, Warren	3.0	428,676	13
C	Bartholomew, Boone, Clinton, Decatur, Grant, Hamilton, Hancock, Hendricks, Howard, Johnson, Madison, Marion, Morgan, Rush, Shelby, Tipton	3.2	546,856	17
EC	Blackford, Delaware, Fayette, Henry, Jay, Randolph, Union, Wayne	3.0	449,938	13
SW	Daviess, Dubois, Gibson, Greene, Knox, Martin, Pike, Posey, Spencer, Sullivan, Vanderburgh, Warrick	3.7	584,132	17
SC	Brown, Crawford, Floyd, Harrison, Jackson, Lawrence, Monroe, Orange, Perry, Washington	2.3	344,046	11
SE	Clark, Dearborn, Franklin, Jefferson, Jennings, Ohio, Piple, Scott, Switzerland	2.2	308,978	10

Source: Agralytica, using NASS data and custom multipliers from RIMS II

#### 4. ANIMAL AGRICULTURE - ECONOMIC IMPACT SUMMARY, BY DISTRICT

In the pages that follow, we provide 1-page summaries of the impact of animal agriculture by district, including the estimated impacts that would result from the addition of a new facility.

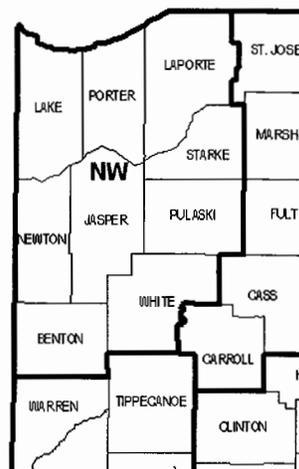
##### 4.1. Northwest Indiana

Animal agriculture has a significant impact on Northwest Indiana (Benton, Jasper, Lake, La Porte, Newton, Porter, Pulaski, Starke, and White counties).

The estimated impact of animal agriculture within the region for 2012 was

- \$628 million in direct sales;
- \$1.193 billion in total economic impact;
- \$188 million in personal income; and
- Over 5,900 jobs.

These totals include only the regional economic impact of local animal agriculture, which creates economic benefits *outside Northwest Indiana* as well.



There would be benefits to bringing new farms to the region. These are summarized in the table below.

**Estimated economic impact of new facilities, Northwest Indiana**

Farm type	Regional output \$ millions	Additional income \$	Jobs
<b>Beef cattle:</b> 500 head feedlot 500# to finish (1350#)	2.3	338,109	11
<b>Hogs:</b> 4,400 head swine grow to finish	2.9	463,200	14
<b>Turkeys:</b> 29,000 turkey grower	4.9	753,116	22
<b>Eggs:</b> 2 million layer facility	99.1	15,373,313	447
<b>Dairy:</b> 1,000 head dairy	7.4	1,211,258	39
<b>Broilers:</b> 72,000 broiler grower	3.6	565,356	16

Source: Agralytica, using NASS data and custom multipliers from RIMS II

In addition to the impacts identified above, new facilities will also generate property taxes; these usually flow to the local government. Tax rates vary by county and facility type, but typically range from 1%-2%.

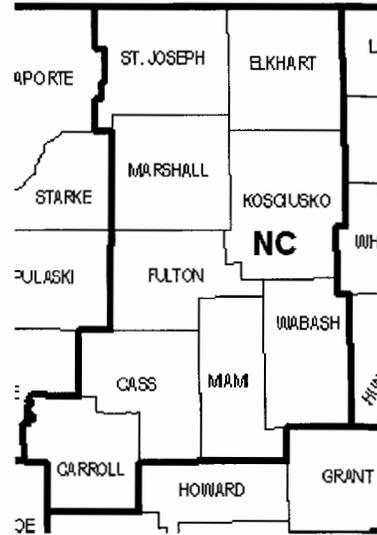
## 4.2. North Central Indiana

Animal agriculture has a significant impact on North Central Indiana (Carroll, Cass, Elkhart, Fulton, Kosciusko, Marshall, Miami, St. Joseph, and Wabash counties).

The estimated impact of animal agriculture within the region for 2012 was

- \$756 million in direct sales;
- \$1.436 billion in total economic impact;
- \$227 million in personal income; and
- Over 7,100 jobs.

These totals include only the regional economic impact of local animal agriculture, which creates economic benefits *outside North Central Indiana* as well.



There would be benefits to bringing new farms to the region. These are summarized in the table below.

Estimated economic impact of new facilities, North Central Indiana

Farm type	Regional output \$ millions	Additional income \$	Jobs
<b>Beef cattle:</b> 500 head feedlot 500# to finish (1350#)	2.4	356,906	12
<b>Hogs:</b> 4,400 head swine grow to finish	2.8	449,932	14
<b>Turkeys:</b> 29,000 turkey grower	4.4	685,253	20
<b>Eggs:</b> 2 million layer facility	90.4	13,988,025	412
<b>Dairy:</b> 1,000 head dairy	7.1	1,173,308	38
<b>Broilers:</b> 72,000 broiler grower	3.3	514,412	15

Source: Agralytica, using NASS data and custom multipliers from RIMS II

In addition to the impacts identified above, new facilities will also generate property taxes; these usually flow to the local government. Tax rates vary by county and facility type, but typically range from 1%-2%.

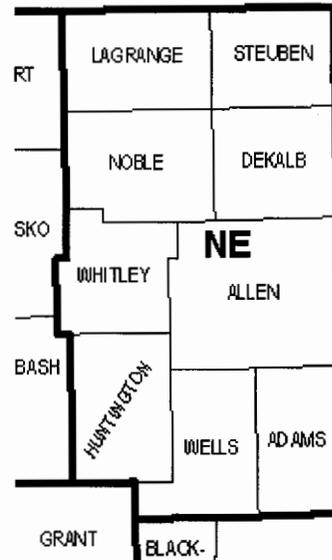
### 4.3. Northeast Indiana

Animal agriculture has a significant impact on Northeast Indiana (Adams, Allen, De Kalb, Huntington, Lagrange, Noble, Steuben, Wells, and Whitley counties).

The estimated impact of animal agriculture within the region for 2012 was

- \$583 million in direct sales;
- \$1.108 billion in total economic impact;
- \$175 million in personal income; and
- Over 5,400 jobs.

These totals include only the regional economic impact of local animal agriculture, which creates economic benefits *outside Northeast Indiana* as well.



There would be benefits to bringing new farms to the region. These are summarized in the table below.

**Estimated economic impact of new facilities, Northeast Indiana**

Farm type	Regional output \$ millions	Additional income \$	Jobs
<b>Beef cattle:</b> 500 head feedlot 500# to finish (1350#)	2.7	422,101	14
<b>Hogs:</b> 4,400 head swine grow to finish	3.0	488,376	15
<b>Turkeys:</b> 29,000 turkey grower	4.7	764,150	22
<b>Eggs:</b> 2 million layer facility	96.8	15,598,563	456
<b>Dairy:</b> 1,000 head dairy	7.6	1,282,021	42
<b>Broilers:</b> 72,000 broiler grower	3.6	573,639	17

Source: Agralytica, using NASS data and custom multipliers from RIMS II

In addition to the impacts identified above, new facilities will also generate property taxes; these usually flow to the local government. Tax rates vary by county and facility type, but typically range from 1%-2%.

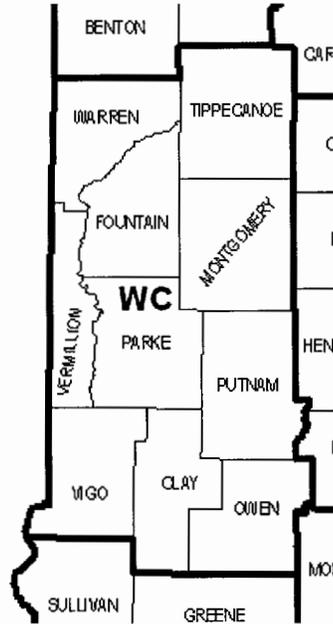
#### 4.4. West Central Indiana

Animal agriculture has a significant impact on West Central Indiana (Clay, Fountain, Montgomery, Owen, Parke, Putnam, Tippecanoe, Vermillion, Vigo, and Warren counties).

The estimated impact of animal agriculture within the region for 2012 was

- \$638 million in direct sales;
- \$1.193 billion in total economic impact;
- \$188 million in personal income; and
- Over 5,900 jobs.

These totals include only the regional economic impact of local animal agriculture, which creates economic benefits *outside West Central Indiana* as well.



There would be benefits to bringing new farms to the region. These are summarized in the table below.

**Estimated economic impact of new facilities, West Central Indiana**

Farm type	Regional output \$ millions	Additional income \$	Jobs
<b>Beef cattle:</b> 500 head feedlot 500# to finish (1350#)	2.0	296,351	10
<b>Hogs:</b> 4,400 head swine grow to finish	2.8	432,411	14
<b>Turkeys:</b> 29,000 turkey grower	3.9	571,044	17
<b>Eggs:</b> 2 million layer facility	80.4	11,656,688	351
<b>Dairy:</b> 1,000 head dairy	7.0	1,092,267	37
<b>Broilers:</b> 72,000 broiler grower	3.0	428,676	13

Source: Agralytica, using NASS data and custom multipliers from RIMS II

In addition to the impacts identified above, new facilities will also generate property taxes; these usually flow to the local government. Tax rates vary by county and facility type, but typically range from 1%-2%.

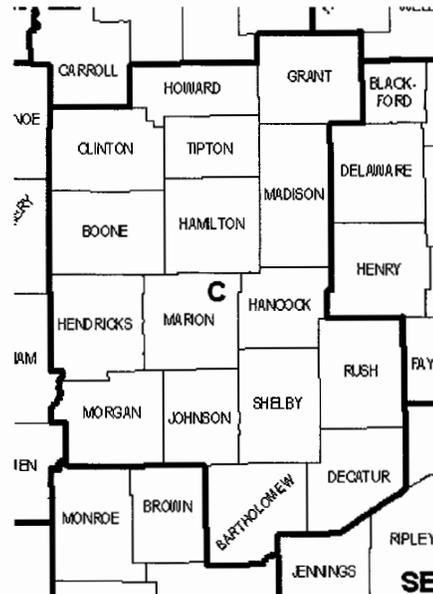
#### 4.5. Central Indiana

Animal agriculture has a significant impact on Central Indiana (Bartholomew, Boone, Clinton, Decatur, Grant, Hamilton, Hancock, Hendricks, Howard, Johnson, Madison, Marion, Morgan, Rush, Shelby, and Tipton counties).

The estimated impact of animal agriculture within the region for 2012 was

- \$525 million in direct sales;
- \$998 million in total economic impact;
- \$158 million in personal income; and
- Over 4,900 jobs.

These totals include only the regional economic impact of local animal agriculture, which creates economic benefits *outside Central Indiana* as well.



There would be benefits to bringing new farms to the region. These are summarized in the table below.

**Estimated economic impact of new facilities, Central Indiana**

Farm type	Regional output \$ millions	Additional income \$	Jobs
<b>Beef cattle:</b> 500 head feedlot 500# to finish (1350#)	2.1	336,325	12
<b>Hogs:</b> 4,400 head swine grow to finish	3.1	526,990	17
<b>Turkeys:</b> 29,000 turkey grower	4.2	728,472	22
<b>Eggs:</b> 2 million layer facility	86.0	14,870,254	450
<b>Dairy:</b> 1,000 head dairy	7.5	1,353,173	45
<b>Broilers:</b> 72,000 broiler grower	3.2	546,856	17

Source: Agralytica, using NASS data and custom multipliers from RIMS II

In addition to the impacts identified above, new facilities will also generate property taxes; these usually flow to the local government. Tax rates vary by county and facility type, but typically range from 1%-2%.

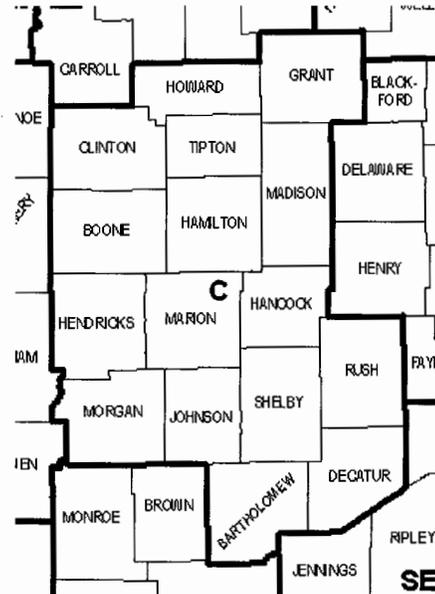
#### 4.5. Central Indiana

Animal agriculture has a significant impact on Central Indiana (Bartholomew, Boone, Clinton, Decatur, Grant, Hamilton, Hancock, Hendricks, Howard, Johnson, Madison, Marion, Morgan, Rush, Shelby, and Tipton counties).

The estimated impact of animal agriculture within the region for 2012 was

- \$525 million in direct sales;
- \$998 million in total economic impact;
- \$158 million in personal income; and
- Over 4,900 jobs.

These totals include only the regional economic impact of local animal agriculture, which creates economic benefits *outside* Central Indiana as well.



There would be benefits to bringing new farms to the region. These are summarized in the table below.

**Estimated economic impact of new facilities, Central Indiana**

Farm type	Regional output \$ millions	Additional income \$	Jobs
<b>Beef cattle:</b> 500 head feedlot 500# to finish (1350#)	2.1	336,325	12
<b>Hogs:</b> 4,400 head swine grow to finish	3.1	526,990	17
<b>Turkeys:</b> 29,000 turkey grower	4.2	728,472	22
<b>Eggs:</b> 2 million layer facility	86.0	14,870,254	450
<b>Dairy:</b> 1,000 head dairy	7.5	1,353,173	45
<b>Broilers:</b> 72,000 broiler grower	3.2	546,856	17

Source: Agralytica, using NASS data and custom multipliers from RIMS II

In addition to the impacts identified above, new facilities will also generate property taxes; these usually flow to the local government. Tax rates vary by county and facility type, but typically range from 1%-2%.

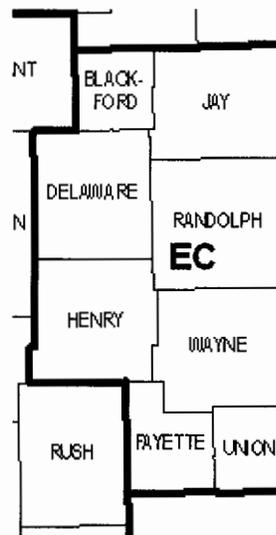
#### 4.6. East Central Indiana

Animal agriculture has a significant impact on East Central Indiana (Blackford, Delaware, Fayette, Henry, Jay, Randolph, Union, and Wayne counties).

The estimated impact of animal agriculture within the region for 2012 was

- \$296 million in direct sales;
- \$562 million in total economic impact;
- \$89 million in personal income; and
- Over 2,700 jobs.

These totals include only the regional economic impact of local animal agriculture, which creates economic benefits *outside East Central Indiana* as well.



There would be benefits to bringing new farms to the region. These are summarized in the table below.

**Estimated economic impact of new facilities, East Central Indiana**

Farm type	Regional output \$ millions	Additional income \$	Jobs
<b>Beef cattle:</b> 500 head feedlot 500# to finish (1350#)	2.3	328,592	11
<b>Hogs:</b> 4,400 head swine grow to finish	2.7	420,843	13
<b>Turkeys:</b> 29,000 turkey grower	4.1	599,366	18
<b>Eggs:</b> 2 million layer facility	82.7	12,234,829	367
<b>Dairy:</b> 1,000 head dairy	6.8	1,072,521	36
<b>Broilers:</b> 72,000 broiler grower	3.0	449,938	13

Source: Agralytica, using NASS data and custom multipliers from RIMS II

In addition to the impacts identified above, new facilities will also generate property taxes; these usually flow to the local government. Tax rates vary by county and facility type, but typically range from 1%-2%.

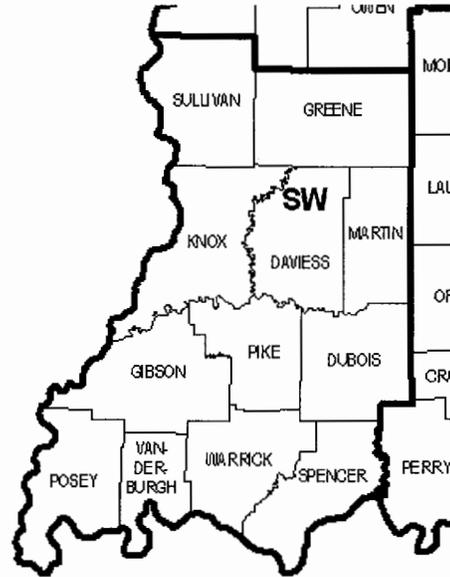
#### 4.7. Southwest Indiana

Animal agriculture has a significant impact on Southwest Indiana (Davies, Dubois, Gibson, Greene, Knox, Martin, Pike, Posey, Spencer, Sullivan, Vanderburgh, and Warrick counties).

The estimated impact of animal agriculture within the region for 2012 was

- \$562 million in direct sales;
- \$1.068 billion in total economic impact;
- \$169 million in personal income; and
- Over 5,200 jobs.

These totals include only the regional economic impact of local animal agriculture, which creates economic benefits *outside Southwest Indiana* as well.



There would be benefits to bringing new farms to the region. These are summarized in the table below.

**Estimated economic impact of new facilities, Southwest Indiana**

Farm type	Regional output \$ millions	Additional income \$	Jobs
<b>Beef cattle:</b> 500 head feedlot 500# to finish (1350#)	2.1	318,241	11
<b>Hogs:</b> 4,400 head swine grow to finish	2.9	466,432	14
<b>Turkeys:</b> 29,000 turkey grower	4.9	778,128	22
<b>Eggs:</b> 2 million layer facility	100.6	15,883,879	451
<b>Dairy:</b> 1,000 head dairy	7.3	1,219,165	39
<b>Broilers:</b> 72,000 broiler grower	3.7	584,132	17

Source: Agralytica, using NASS data and custom multipliers from RIMS II

In addition to the impacts identified above, new facilities will also generate property taxes; these usually flow to the local government. Tax rates vary by county and facility type, but typically range from 1%-2%.

#### 4.8. South Central Indiana

Animal agriculture has a significant impact on South Central Indiana (Brown, Crawford, Floyd, Harrison, Jackson, Lawrence, Monroe, Orange, Perry, and Washington counties).

The estimated impact of animal agriculture within the region for 2012 was

- \$348 million in direct sales;
- \$661 million in total economic impact;
- \$104 million in personal income; and
- Over 3,200 jobs.

These totals include only the regional economic impact of local animal agriculture, which creates economic benefits *outside South Central Indiana* as well.



There would be benefits to bringing new farms to the region. These are summarized in the table below.

**Estimated economic impact of new facilities, South Central Indiana**

Farm type	Regional output \$ millions	Additional income \$	Jobs
<b>Beef cattle:</b> 500 head feedlot 500# to finish (1350#)	2.4	352,148	13
<b>Hogs:</b> 4,400 head swine grow to finish	2.7	412,848	14
<b>Turkeys:</b> 29,000 turkey grower	3.1	458,306	15
<b>Eggs:</b> 2 million layer facility	63.6	9,355,383	300
<b>Dairy:</b> 1,000 head dairy	6.1	972,486	34
<b>Broilers:</b> 72,000 broiler grower	2.3	344,046	11

Source: Agralytica, using NASS data and custom multipliers from RIMS II

In addition to the impacts identified above, new facilities will also generate property taxes; these usually flow to the local government. Tax rates vary by county and facility type, but typically range from 1%-2%.

#### 4.9. Southeast Indiana

Animal agriculture has a significant impact on Southeast Indiana (Clark, Dearborn, Franklin, Jefferson, Jennings, Ohio, Piple, Scott, and Switzerland counties).

The estimated impact of animal agriculture within the region for 2012 was

- \$92 million in direct sales;
- \$175 million in total economic impact;
- \$28 million in personal income; and
- Over 850 jobs.

These totals include only the regional economic impact of local animal agriculture, which creates economic benefits *outside Southeast Indiana* as well.



There would be benefits to bringing new farms to the region. These are summarized in the table below.

**Estimated economic impact of new facilities, Southeast Indiana**

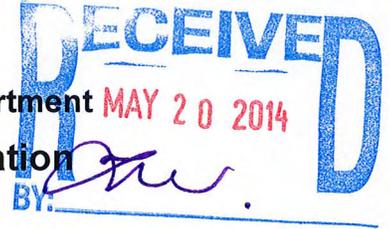
Farm type	Regional output \$ millions	Additional income \$	Jobs
<b>Beef cattle:</b> 500 head feedlot 500# to finish (1350#)	2.2	297,779	10
<b>Hogs:</b> 4,400 head swine grow to finish	2.6	376,956	12
<b>Turkeys:</b> 29,000 turkey grower	3.0	411,593	13
<b>Eggs:</b> 2 million layer facility	61.1	8,401,825	265
<b>Dairy:</b> 1,000 head dairy	5.9	886,306	31
<b>Broilers:</b> 72,000 broiler grower	2.2	308,978	10

Source: Agralytica, using NASS data and custom multipliers from RIMS II

In addition to the impacts identified above, new facilities will also generate property taxes; these usually flow to the local government. Tax rates vary by county and facility type, but typically range from 1%-2%.



Columbus – Bartholomew County Planning Department  
Development Standards Variance Application



Planning Department Use Only:

Jurisdiction:  Columbus  Bartholomew County

Zoning: \_\_\_\_\_

Docket No.: \_\_\_\_\_

Hearing Procedure:  Hearing Officer  Board of Zoning Appeals

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**Development Standards Variance Application:**

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**Applicant Information** (the person or entity that will own and/or execute what is proposed):

Name: Jeff Shoaf

Address 15793 E 800 N Hope IN 47246  
(number) (street) (city) (state) (zip)

Phone No.: 812-546-6015 Fax No.: \_\_\_\_\_ E-mail Address: \_\_\_\_\_

**Property Owner Information** (the "owner" does not include tenants or contract buyers):

Name: Jeff Shoaf

Address 15793 E 800 N Hope IN 47246  
(number) (street) (city) (state) (zip)

Phone No.: 812-546-6015 Fax No.: \_\_\_\_\_ E-mail Address: \_\_\_\_\_

**Notification Information** (list the person to whom all correspondence regarding this application should be directed):

Name: Landmark Enterprises, LLC

Address 5522 W 900 S Edinburgh IN 46124  
(number) (street) (city) (state) (zip)

Phone No.: 317-407-6021 Fax No.: \_\_\_\_\_ E-mail Address: landmarkent@lightbound.com

How would you prefer to receive information (please check one):  Email  Phone  Fax  Mail

**Property Information:**

Address 11420 E 800 N Hope IN 47246  
(number) (street) (city) (state) (zip)

or General Location (if no address has been assigned provide a street corner, subdivision lot number, or attach a legal description):

Nearest crossroads to operation: 800 N & 575 E

**Property Information:**

Address: Address: 11420 East 800 North , Hope, IN 47246  
(number) (street) (city) (state) (zip)

or General Location (if no address has been assigned provide a street corner, subdivision lot number, or attach a legal description):

Jeff Shoaf is applying for a conditional use for the construction of a swine Concentrated Animal Feeding Operation (CAFO) Type II (as defined by the Bartholomew County Ordinance<sup>1</sup>) on property zoned as Agricultural General (AG). The livestock facility will be located in Haw Creek Township of Bartholomew County. The legal description of the property is W ½ of SW ¼ of Section 7, Twp 10 N R 7 E. The confinement building will be constructed approximately 325 feet east of the on-site residence near the north edge of the of the south-east crop production field of the 74.74 acre tract of land.

**Variance Requested:**

I am requesting a conditional use as listed by Section 3.5 & 6.3 of the Zoning Ordinance to allow the following:

Jeff Shoaf is applying for a variance request for the construction of a swine Concentrated Animal Feeding Operation (CAFO) Type II (as defined by the Bartholomew County Ordinance<sup>2</sup>) on property zoned as Agricultural General (AG). The livestock facility will be located in Haw Creek Township of Bartholomew County. The legal description of the property is W ½ of SW ¼ of Section 7, Twp 10 N R 7 E. The confinement building will be constructed approximately 325 feet east of the on-site residence.

We intend to construct one tunnel ventilated swine confinement building to house 2,000 head of “wean-to-finish” swine. The engineering drawings<sup>3</sup> (See Exhibit 1) show the building will have outer detentions of 81’10” wide x 205’0” long with an 8’ concrete pit directly below the area where the animals are housed. Manure will be managed and stored in the concrete pit beneath the building until time for land application. Importantly, there are no lagoons proposed as a part of this project.

Design, construction, and operation of the confinement building will be in specific accordance with regulations set forward by the Indiana Department of Environmental Management’s (IDEM) Confined Feeding Operation (CFO) Regulations, 327 IAC 19. Mandated construction standards include specifics for concrete strength, wall and floor thicknesses, and column spacing set by the USDA Natural Resources Conservation Service and Mid-West Plan Service Technical Standards. IDEM’s Confined Feeding Operation (CFO) Regulations also set out very specific requirements for the continued operation, management, and agency inspections of those operations requiring a state permit.

The building will be oriented at an angle from southwest-to-northeast near the north edge of the of the south-east crop production field of the 74.74 acre tract of land. Wean-to-finish is a designated term within the swine industry indicating that pigs will be delivered to the building immediately

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<sup>1</sup> Note: Bartholomew County defines CAFO as a regulated livestock operation having more than 600 swine. The regulations under IDEM define a swine CFO as housing 601-2,499 swine while a CAFO is defined as housing 2,500 swine or greater.

<sup>2</sup> Note: Bartholomew County defines CAFO as a regulated livestock operation having more than 600 swine. The regulations under IDEM define a swine CFO as housing 601-2,499 swine while a CAFO is defined as housing 2,500 swine or greater.

<sup>3</sup> Note: Engineering and drawings were completed by Michael Veenhuizen of Livestock Engineering Solutions. A copy of the drawings is attached and also included as a part of the projects CFO application submitted to IDEM on April 24, 2014.

following being weaned from the sow (aka. mother) at an average weight of approximately 12 pounds. Pigs will be delivered in two (2) groups of 1000 head each, approximately 2 weeks apart, to populate each of the two (2) rooms within the building. Each group of pigs will remain in the building for approximately six (6) months until they are ready for market, or "finished" with their growing cycle. The room will then be emptied and pigs taken to market weighing an average of 275-280 pounds. Rooms are then cleaned and washed and the cycle repeated. An average of 2 groups of pigs will be raised in each room per year.

The proposed building location maximizes the distance from the waste management system, in this case the pit below the building, to the closest off-site residence. Bartholomew County Zoning Ordinance under section 6.3 Farm-Related Animal Standards, set forth the requirements for applications regarding CFO/CAFOs as follows:

1. Required Lot Size: No farm (CFO / CAFO type II) shall be located on any lot of less than 5 acres.
2. Required Setbacks: All structures used in association with a farm (CFO / CAFO type II) operation, including waste disposal facilities, shall be setback a minimum of 100 feet from all property lines.
3. Minimum Distance from Residential Zoning: No farm (CFO /CAFO type II) operation shall be located closer than ½ mile to any Single-family Residential or Multi-family Residential zoning district (measured at the nearest boundary line of the zoning district and the nearest property line of the CFO / CAFO operation).

Mr. Shoaf's proposed building site clearly meets requirements 1 and 2.

1. Required Lot Size: The tract of land for the proposed CFO site is 74.74 acres. This complies with the required lot size requirement of greater than 5 acres.
2. Required Setbacks: The proposed building location within the land tract is 1515 feet from the northern border, 212 feet from the eastern border, 1144 feet from the southern border, and 857 feet from the western border of the property line. This complies with the required setbacks of a minimum of 100 feet from the property line.
3. Minimum Distance from Residential Zoning: There are three (3) houses zoned as Single-family Residential or Multi-family Residential within the ½ mile set-back distance (See Exhibit 2). Residences to the southeast of the proposed building site (intersection of county roads 800 North and 670 East) are zoned Residential: Single Family 3 (RS3) as a part of the area referred to as Old Saint Louis. The closest off-site residence zoned as RS3, is 1445 feet from the building site. Owners of this house also own and operate the swine CFO that is approximately ¾ mile to the east of the proposed site and another CAFO approximately 3 miles from the site. We have talked with Mr. Gary Dodd, owner, directly and he is not opposed to the construction of this swine CFO or the reduction of the set-back. The other two (2) houses are 2579 feet and 2605 feet south-east of the proposed construction site. These distances have them approximately 35 feet to 61 feet or 1.3%-2.3% short of the ½ mile set-back requirement. A map showing the distances from the proposed building site to off-site residences is attached (See Exhibit 3). As stated in the Bartholomew County Ordinance and confirmed by Bartholomew County Planning Staff, we have applied to the Bartholomew County Planning Department for a reduction of the Minimum Distance from Residential Zoning & a Conditional Use Request. The Conditional Use Application was submitted to on May 20, 2014.

**Variance Request Justification:**

The Indiana Code and the Columbus & Bartholomew County Zoning Ordinance establishes specific criteria that each must be met in order for a conditional use to be approved. Describe how the variance request use requested meets each of the following criteria.

**The approval of the conditional use will not be injurious to the public health, safety, and general welfare of the community.**

The construction of this confined feeding barn will further protect the environment, the animals, and utilize modern technology to raise livestock in a rural community. Construction of this barn is a way to help ensure the health, safety, and general welfare of the public and community versus the way swine have commonly been raised in the past, and could be now be raised without special permission of the county or the state.

Prior to the 1980's swine were mostly raised outside on pasture type systems. (See Exhibit 4) The animals were fenced into a field or pasture or rotated onto crop fields once the crops were harvested. They were fed on the ground and/or rooted around finding the left-over fallen corn following harvest. Swine used the creek for drinking water and to lay in as a means of cooling themselves (as swine do not have the ability to sweat), some animals were provided a small hut as shelter and the manure was deposited whenever and wherever the animal was at the time. In this scenario typically more than half of the animals died due to the elements, weather extremes, or were killed by predator animals.

Developments in technology and response to consumer demand, pork production has continued to progress over the past 40 years. Consumers of meat products, including pork, want their meat to be as lean as possible. Through genetic selection, the swine industry has responded by reducing the amount of back fat (viewed by the consumer as the amount of fat around the edge of a pork chop). (See Exhibit 5) from an average of 3.61" to 0.8" between the 1950's and early 2000's. (See Exhibit 6) While being housed outside the pig needed that "fat covering" (or coat) to help protect it from the elements. Today we have buildings designed to keep the animals at a comfortable temperature, regardless of the outside conditions. The animals no longer have to glean the fields for left-over grains or food. They are provided with balanced diets to meet their metabolic needs delivered via stainless steel feeders to ensure maximum feed quality and intake. From an environmental protection standpoint these modern buildings provide containment for the animals and all of the animal waste. Storage space is designed to allow the manure to be land applied at the time of year most suited to optimum ground conditions and planned crop needs. Land application rates can be calculated based on agronomic rates including the nutrient content of the manure and the needs of the planned crop prior to application. Application of manure can then be done in an environmentally friendly manner to maximize the use of an organic source of nutrients for enhanced crop production. Mr. Shoaf currently injects all of his manure at the crop root zone approximately 3-6 inches below the soil surface using a tractor and pull type tanker spreader. He intends to continue that practice on the adjacent 189 acres needed to agronomically apply the 6,497,000 gallons per year that the wean-to-finish barn would generate.

Regulations regarding the land application of manure in Indiana are based on the number of animals raised in confinement. Those animals raised on a pasture system are not regulated by the Indiana Department of Environmental Management (IDEM). The construction, operational, and management requirements imposed by IDEM apply solely to CFO's applicants, not owners of pasture raised and/or unconfined swine. The proposed application requires the applicant to comply with the substantial "zero tolerance" federal and state regulations for all permitted operations.

It is critical to note that no other area of agriculture requires the level of oversight that is required of the proposed CFO. Applicant must comply with “zero tolerance” federal and state oversight, substantial paperwork and inspection requirements, as well as risks of massively punitive fines for violations of the same. These are requirements that no other farmers presently face, despite application of chemicals in and around waterways and watersheds; and, despite participating in animal agriculture. Truly the risks associated with CFOs are obviated by the level of oversight.

Since 1994, Jeff Shoaf has owned and operated a 4,000 head swine nursery CFO in Haw Creek Township of Bartholomew County. The nursery building is approximately 2 miles east of State Road 9 on the north side of County Road 800 North. Pigs are delivered to the building at an average weight of approximately 12 pounds and are fed until they reach approximately 40 pounds. These pigs are then transferred to a grow-finish barn in another Indiana county to be fed to market weight. Mr. Shoaf empties the swine nursery pit approximately one time each year for land application to his crop fields. Land application rates on a per acre are basis are calculated based on manure nutrient content, soil fertility levels, crop type, and crop production levels. During the past 20 years, the existing nursery operation has been inspected on a routine basis by IDEM and never had a violation. IDEM inspectors review the farms operating records, specifics regarding manure storage, handling, and application to ensure compliance with environmental regulations. Construction of this new 2,000 head wean-to-finish swine confinement building allows for the expansion and growth of an existing swine farm and crop farming operation in northeastern Bartholomew County.

The producer intends to continue to utilize the experience and outside oversight of local Agricultural Environmental consultant, Landmark Enterprises LLC, to ensure the facility is managed and maintained properly. The increased construction and use of specialized housing and confinement buildings gave farmers more control over livestock, protecting them from predation and exposure to extreme weather conditions.

Per IDEM records presently in Indiana, there are approximately 2,000 IDEM approved confined feeding operations (CFO), presently, of which approximately 628 are designated (based on size) as concentrated animal feeding operations (CAFO). Seven (7) CFOs exist presently in Bartholomew County, two (2) of which are presently classified by IDEM as CAFOs. In addition, there are at least seven (7) animal feeding operations (AFO), dairy and beef farms currently in Bartholomew County, which do not require IDEM approval for operation, waste management, or manure application.

Based on this information regarding regulated operations and knowledge of history in Bartholomew County that most farms raised livestock we can deduct, that farms do not pose a threat to the public health, safety, and welfare of the community regardless of size (AFO, CFO, CAFO). As pointed to in the Bartholomew County Ordinance, agriculture is considered one of the most important parts of our history, as well as for the economic success of Bartholomew County. This is so much the case that past Governor Mitch Daniels targeted, as one of his gubernatorial goals, the expansion of CFO agriculture. In addition, the present administration, under Governor Mike Pence, has continued to pursue the expansion (and protection) of agricultural activities. The state supports this policy to such an extent that the “Right to Farm” legislation has been expanded in Indiana, requiring that all laws in this State be interpreted to support agriculture.

The construction, maintenance and management of the building will be regulated by the Confined Feeding Operation Regulations (327 IAC 19) set-forth and updated by IDEM on July 1, 2012. These regulations provide specific requirements for the design, construction, and management of

such CFOs. All producers are required to follow standards and requirements set forth by these regulations. Containment of the swine in the purpose-built facility greatly reduces any risk of negative impact. This is supported by the fact that only 0.2% of manure spills (15 out of 2,682 as reported to IDEM in 2013) are related to CFOs or CAFOs (See Exhibit 7). The containment facility itself is a concrete box designed to federal and state specifications. Note that there were zero complaints related to the failure of a CFO building. The risk, at worst, is historically 0.2% (please note that this does not imply that there was any negative impact of those CFO related spills simply the presence of a complaint related to that class of operations).

Since construction of his first barn, Mr. Shoaf has been working with an Indiana based conglomerate to supply him nursery pigs. This same group will also be supplying the weaned pigs for the new building. This group, back by many generations of experience in the swine industry provide not only the animals but up-to-date information on best management practices including feed and animal health. For both his buildings, Mr. Shoaf has also employed the experience and outside oversight of local Agricultural Environmental consultant, Landmark Enterprises LLC, to ensure the facility is managed and maintained properly.

With regard to specific topics, the following additional items support the position that this project will not adversely impact the public health, safety and welfare of the community:

**Building Location including Manure Storage:**

Based on IDEM's Confined Feeding Operation (CFO) Regulations (327 IAC 19-12-3) a liquid manure storage structure (i.e. the concrete pit beneath the building) must be a minimum of 300 feet from surface waters of the state or utilize an Alternative Design or Compliance Approach. This project utilizes such an alternative design. As seen in IDEM application, a diversion berm will be constructed along the northern edge of the building. This berm will act as a barrier in the event there would ever be a breach of manure from the building. As a part of the review and approval process, engineers at IDEM verify that this type berm will meet standards set forth in the CFO Regulations in order to protect water quality. This closest point of building (including waste storage structure) is approximately 150 feet south of Little tough Creek Fork Creek.

The manure generated will be stored in the concrete pit until land applied. This operation including manure storage is a totally enclosed system and does not include a lagoon. The concrete pit provides storage sufficient for 507 days of manure generation. IDEM places a minimum storage capacity of 180 days. Our proposal provides more than 1.38 times the capacity which allows flexibility for timing application so as to apply when conditions are best suited.

Manure generated from the animals will be utilized as an organic source of macro & micro nutrients for the existing row crop operation. Doing so reduces the needs for petroleum based chemical applications. Mr. Shoaf currently does all of his own land application and intends to do so with the new building. He has and maintains a valid manure applicators license (CAT 14) with the Office of the Indiana State Chemist.

**The use and value of the area adjacent to the property included in the variance will not be affected in a substantially adverse manner.**

The proposed confined feeding building is being proposed in the farthest northern part of the southern field of the 74.74 acre tract of land. This location places where access from the road is

available without crossing the creek, and that any off-site residences are not located in a potential path of odors that may emanate from the building. (See Exhibit 1). Owners of the closest off-site residence are supportive of the project and are also producers in the swine industry.

**The strict application of the terms of the Zoning Ordinance will result in practical difficulties in the use of the property. This situation shall not be self-imposed; nor be based on a perceived reduction of, or restriction on economic gain.**

Ordinance under section 6.3 Farm-Related Animal Standards, set forth the requirements for applications regarding CFO/CAFOs as follows:

4. Required Lot Size: No farm (CFO / CAFO type II) shall be located on any lot of less than 5 acres.
5. Required Setbacks: All structures used in association with a farm (CFO / CAFO type II) operation, including waste disposal facilities, shall be setback a minimum of 100 feet from all property lines.
6. Minimum Distance from Residential Zoning: No farm (CFO /CAFO type II) operation shall be located closer than ½ mile to any Single-family Residential or Multi-family Residential zoning district (measured at the nearest boundary line of the zoning district and the nearest property line of the CFO / CAFO operation).

Mr. Shoaf's proposed building site clearly meets requirements 1 and 2.

4. Required Lot Size: The tract of land for the proposed CFO site is 74.74 acres. This complies with the required lot size requirement of greater than 5 acres.
5. Required Setbacks: The proposed building location within the land tract is 1515 feet from the northern border, 212 feet from the eastern border, 1144 feet from the southern border, and 857 feet from the western border of the property line. This complies with the required setbacks of a minimum of 100 feet from the property line.
6. Minimum Distance from Residential Zoning: There are three (3) houses zoned as Single-family Residential or Multi-family Residential within the ½ mile set-back distance (See Exhibit 2). Residences to the southeast of the proposed building site (intersection of county roads 800 North and 670 East) are zoned Residential: Single Family 3 (RS3) as a part of the area referred to as Old Saint Louis. The closest off-site residence zoned as RS3, is 1445 feet from the building site. Owners of this house also own and operate the swine CFO that is approximately ¾ mile to the east of the proposed site and another CAFO approximately 3 miles from the site. We have talked with Mr. Gary Dodd, owner, directly and he is not opposed to the construction of this swine CFO or the reduction of the set-back. The other two (2) houses are 2579 feet and 2605 feet south-east of the proposed construction site. These distances have them approximately 35 feet to 61 feet or 1.3%-2.3% short of the ½ mile set-back requirement. A map showing the distances from the proposed building site to off-site residences is attached (See Exhibit 3). As stated in the Bartholomew County Ordinance and confirmed by Bartholomew County Planning Staff, we have applied to the Bartholomew County Planning Department for a reduction of the Minimum Distance from Residential Zoning. The Development Standards Variance Application was submitted to on May 20, 2014.



# Shoaf CFO Field Map



# Shoaf CFO Build Site



Map Date: 12/14/18

Map Scale: 1:11,820 (printed on A landscape (11" x 8.5") sheet)



Map projection: Web Mercator; Corner coordinates: WGS84; Edge ties: ITM Zone 18N WGS84

**---> = Storm water runoff**

**All manure storage structures are more than 1000' from public water supplies.**

**All manure storage structures are more than 400' from non-farm residences.**

**Mortality will be handled by an off-site rendering company.**

**Barn will be 82' x 205' w/8' pit**

# RECEIPT

BARTHOLMEW COUNTY PLAN COMMISSION

No 3578

General. FUND

COLUMBUS IN., May 20 2014.

RECEIVED FROM Landmark Enterprises. \$ 175.00

THE SUM OF one hundred twenty five and 00/100 DOLLARS

ON ACCOUNT OF Jeff Shoaf.

PAYMENT TYPE & AMOUNT check \$ 175.00.

CASH \_\_\_\_\_ CHECK # 2670 M.O. \_\_\_\_\_  
E.F.T. \_\_\_\_\_ C.C./B.C. \_\_\_\_\_ OTHER \_\_\_\_\_

[Signature]  
AUTHORIZED SIGNATURE



## LANDMARK ENTERPRISES, LLC.

*Environmental Strategies for  
the Agricultural Community*

**TO:** Melissa Begley  
**FROM:** Kristin A. Whittington  
**DATE:** June 10, 2014  
**RE:** B/CU-14-08 & B/DS-14-06 (Jeff Shoaf)

Melissa,

Following are responses to your questions you posed regarding the application submitted to the Bartholomew County Board of Zoning Appeals for Jeff Shoaf. The application requests a conditional use request for the construction of a Type II Concentrated Animal Feeding Operation as defined by Bartholomew County.

Included in the "Memorandum" letter dated June 5, 2014, eight (8) items were identified. I will address each item in this attachment in the order they were listed.

1. The entrance to the barn from the road will use the existing driveway. A new driveway will split off from the existing driveway at the 90\* turn to go to the barn. A map showing the driveway is attached. (see Attachment 1)
2. Manure will be injected into the soil at the root zone approximately 3"-6" below the surface using a pull type tanker. Application rates will be determined based on agronomic rates of the soil, manure nutrient values, and crop to be grown. In the original application a typo was made in the amount of manure to be generated by the operation. The number should be 649,700 gallons per year (not 6,497,000 gallons per year) as reported. Following is the yearly calculation for actual manure calculation for the barn. The above number would also include wash water to be handled as manure. As explained below there are variations on expected values for manure production based on animal genetics, feed, feeder type, and building construction type. As more specifics of this information are known, a closer estimation can be made. These calculations show that manure production could be from 623,168 to 649,700 gallons per year. References for where the data was obtained from the MidWest Plan Service are attached (see Attachment 2) and additional explanations are referenced under #7 below. I apologize for my error in a comma placement in the original application.

Pig production phase	Average animal weight (bs)	Number of head	manure generated (gallons) /head/day	manure produced (gallons) /day	Days in production / growth cycle	Manure produced (gal.) /cycle	Manure produced (gal.) / year = 2 cycles / year
Nursery	10-40	2,000	0.23	460	56	25,760	51,520
Grower	40-180	2,000	0.777	1,554	56	87,024	174,048
Finisher	180-275	2,000	1.31	2,620	70	183,400	366,800
<b>Total</b>		<b>2,000</b>			<b>182</b>		<b>592,368</b>

Based on IDEM's CFO Rule the number of acres needed for manure application from this barn would be: 73.8 acres based on Nitrogen or 113 based on Phosphorus. Attached are two maps showing the fields to cover these acres where manure could be land applied. (see Attachments 3 & 4) Some of the fields are directly adjacent to the barn and some are a few miles away.

3. The Confined Feeding Operation (CFO) Rule (327 IAC 19) does require a minimum 300 foot setback from surface water unless demonstrating to the commissioner that a different compliance approach meets the performance standards in 327 IAC 19-3-1. The berm placed between the waste storage structure and the creek (surface water) does just that.

**Sec. 3.327 IAC 19-12-3 Setbacks**

(a) Waste management systems must be located to maintain the minimum setback distances from the following features that are known and identifiable at the time an application is submitted for approval:

(1) One thousand (1,000) feet from a public water supply well or public water supply surface intake structure.

(2) Except for subsection (c), three hundred (300) feet from the following:

(A) Surface water.

(B) Drainage inlets, including water and sediment control basins.

(C) Sinkholes, as measured from the surficial opening or the lowest point of the feature.

(D) Off-site water wells.

(3) One hundred (100) feet from the following:

(A) On-site water wells.

(B) Property lines.

(C) Public roads.

(4) Four hundred (400) feet from existing off-site residential and public buildings.

(b) A manure storage facility that contains solid manure must be maintained to have a minimum setback of one hundred (100) feet from the features in subdivision [subsection] (a)(2) but must comply with the setbacks in subdivisions [subsection] (a)(1) and (a)(3) through (a)(4).

(c) If one (1) of the features in subsection (b) is constructed within the specified setback distances to an existing waste management system, a new waste management system may be constructed to maintain the same setback between the existing waste management system and the feature, providing that the feature was:

(1) not under the control of the owner/operator of the CFO; and

(2) constructed after the application for original waste management system was submitted to the department.

(d) The owner/operator may obtain a reduced setback under 327 IAC 19-5 by demonstrating to the commissioner that a different compliance approach meets the performance standards in 327 IAC 19-3-1.

(e) The property line setback distances in this section may be waived in writing by the owner of the adjoining property.

4. An aerial map from the Indiana Geological Survey (IGS) Indiana Maps has been prepared by our engineer Mr. Mike Veenhuizen of Livestock Engineering Solutions, Inc. (see Attachment 5) that shows the building and diversion berm with specifications and reference to the provisions of 327 IAC 19-5 requesting approval of an alternate design or compliance approach. The berm will be covered with vegetation, primarily grass, maintained or mowed on a regular basis.
5. A new well will be drilled to provide water for the animals in the barn. An updated farmstead map is attached (see Attachment 1). The well is located approximately 150 feet southwest of the end of the proposed barn.
6. Based on the map that my office was able to pull from Bartholomew County's website (see Attachment 6) it shows properties in Old Saint Louis Zoned as Residential. My office then prepared a map showing the distances from the proposed building, not the property line, to those residences. (see Attachment 7) If we have done that in error, my apologies for not having a clearer understanding or diversified map. I will immediately follow-up with staff to obtain clearer instructions to promptly provide you with the information you require. The closest residence to the proposed barn, and property is owned by the Dodd Family. Mr. Shoaf and myself have spoken with Mr. Gary Dodd and received written permission for construction of the barn at its proposed location. (see Attachment 8). The Dodd family currently owns and operates the grow-to-finish swine barn located approximately  $\frac{3}{4}$  mile to the west of the proposed location and has been in the swine business since the early 1970's in Bartholomew County.
7. Manure storage for confined feeding operations (CFO) is calculated based on the animal type (species), animal size, and animal number. Mr. Shoaf's application is for a wean-to-finish barn, meaning these pigs will be delivered to the barn weighing an average of 12#-14# and raised to an average weight of 275#. The barn will be filled two (2) times per year.

IDEM CFO Rule Requirements: All CFOs permitted by IDEM after July 1, 2014 are required to be designed and constructed to have a minimum of 180 days of manure storage for the animals to be housed, unless an alternative design has been approved by the IDEM Commissioner to show equivalent environmental protection.

The Indiana Confined Feeding Regulations 327 IAC 19-12-4, states:

Sec. 4. Storage capacity and design requirements

(a) *An alternate design may be approved by the commissioner if it is shown to provide an equivalent amount of environmental protection.*

(b) *All waste management systems must be designed to not discharge to surface waters of the state. If a waste management system discharges or is designed to discharge, a NPDES CAFO permit under 40 CFR 122.23 is required.*

(c) *All manure storage facilities for the CFO must be designed, constructed, and maintained with a combined storage capacity of at least one hundred eighty (180) days storage for the following:*

(1) *All materials entering the manure storage facility.*

(2) *If applicable, the expected precipitation and runoff from a twenty-five (25) year, twenty-four (24) hour precipitation event that falls on the drainage area around the manure storage facility that contains liquid.*

Available Manure Storage Area: The inside dimensions of the building are 205 feet long by 82 feet wide with a 8 foot concrete basin. Manure storage area available is derived by multiplying length times width times depth.

**Avail. Manure Storage Area = 205 feet long \* 82 feet wide \* 8 feet deep = 134,480 cubic feet**

Total Manure Generated: To calculate the total manure generated we must look at the type, size, and number of animals in the building. The MidWest Plan Service<sup>1</sup>, MWPS-18 “Manure Characteristics” handbook<sup>2</sup> is most commonly used by the industry as it updated on a regular basis, to allow for differences in animal genetics, feeding programs, and available feeds. Data provided in MWPS-18, Table 6, “Daily manure production and characteristics, as-excreted (per head per day)” was used to calculate the amount of manure produced by the animals housed. (see Appendix 2)

The barn to be constructed by the Mr. Shoaf will be permitted to house 2,000 animals, so this is the number of animals used in the calculation. The barn will have 2 rooms with a group of animals in each. Each group will remain in the building for approximately 6 months each. Each group of animals will arrive at the barn as weaned pigs. Each pig being delivered will weigh approximately 14 pounds, the standard weight of a weaned pig. All the pigs in each group will be marketed at the end of the production cycle at approximately 180 days (6 months), and weigh an average of 275 pounds. Manure is produced each day by each animal. As the animals grow they produce more manure. The chart below tracks a pigs’ manure production over time, based on the data provided by MWPS-18 Table 6. Daily Manure Production and Characteristics, as-excreted (per head per day). An average of growth cycles and the corresponding manure production per animal per day were used to allow for easier calculations.

Pig production phase	Average animal weight (bs)	Number of head	manure generated (gallons) /head/day	manure produced (gallons) /day	Days in production / growth cycle	Manure produced (gal.) /cycle	Manure produced (gal.) / year = 2 cycles / year
Nursery	10-40	2,000	0.23	460	56	25,760	51,520
Grower	40-180	2,000	0.777	1,554	56	87,024	174,048
Finisher	180-275	2,000	1.31	2,620	70	183,400	366,800
<b>Total</b>		<b>2,000</b>			<b>182</b>		<b>592,368</b>

**Total manure produced over the year = 592,368 gallons**

<sup>1</sup> MidWest Plan Service (MWPS), is a university-based publishing cooperative dedicated to disseminating research-based, peer-reviewed, and un-biased publications that support the outreach missions of the 12 North Central Region land-grant universities plus the U.S. Department of Agriculture (USDA).

<sup>2</sup> MidWest Plan Service, MWPS-18 “Manure Characteristics”, 2012, Table 6. Daily manure production and characteristics, as-excreted (per head per day). Available at <https://www-mwps.sws.iastate.edu>

Addition of Wash-water and Waste-water: Wash-water and other waste water also ends up on the concrete basin beneath the pigs and therefore must be accounted for as manure.

According to Michigan State University publication, "Sizing Manure Storage", Table 21-4<sup>3</sup> Typical water usage rates for cleaning milking center facilities and swine production areas, wash water wastage is based on swine pig size. (see Appendix 9) Other publications provide this information based on time, or building size. For the purposes of the calculations, the Michigan State University data is used. This data, using larger values, potentially errors on the high side rather than the low.

Pig production phase	Number of animals	Water usage for cleaning (gallons) /head/day	Wash water usage (gallons) /day	Days in production / growth cycle	Wash water usage (gal.) /year= 2 cycles / year
Nursery	2,000	0.05	100	56	5,600
Grower	2,000	0.1	200	56	11,200
Finisher	2,000	0.1	200	70	14,000
<b>Total</b>	<b>2,000</b>				<b>30,800</b>

**Total wash-water and waste water produced over the year = 30,800 gallons**

Calculations used to figure days of manure storage: Days of storage is the ratio of manure (including wash-water produced) to the amount of storage available in relationship to number of days. The formula is as follows:

Days of Manure Storage = Avail. Manure storage area / (Manure + Wash-water produced) \*365

**Avail. Manure Storage Area = 134,480 cubic feet**

Total manure produced per year (gallons) = 592,368 gallons

Wash water added to the concrete basin = 30,800 gallons

**Total volume manure produced = 632,168 gallons per year**

To make the direct comparison both values need to be presented as either gallons or cubic feet. This conversion divides the number of gallons by 7.48 to convert to cubic feet.

**Total manure produced = 632,168 gallons / 7.48 gallons/cu. ft. = 84,514.43 cu. ft. /year**

**Days of Manure Storage = 134,480 cu.ft. / 84,514.43 cu.ft \* 365 days/year = 580.79 days**

- Manure is stored in the concrete pit below the building until it is land applied. As seen in the attached picture. (see Attachment 10) Pigs deposit their excrement into the pit where it is stored until land application. Design of the buildings allows for storage of the manure until it can be land applied when soil and land conditions are conducive for the planted or soon to be planted crop to utilize the manure as a fertilizer source. The manure is typically housed in the pit for approximately one year until land application in the late fall or early spring of the year. There are

<sup>3</sup> Table 21-4 Typical water usage rates for cleaning milking center facilities and swine production areas., footnoted: Adapted from MWPS-7, Dairy Freestall Housing and Equipment 2000, and University of Missouri CLEAN Program

microbial organisms in the manure that do breakdown most of the solids causing the manure to maintain a liquid state. Based on science the short answer to your question is that a complete composting process does not happen. Some pits get a crust over the top and some pits have a slight foaming action. There are several university and industry studies looking at these issues, but at this time no conclusive answers have been found as to why it happens one way or another. One theory suggests that a specific microbial population causes foaming in manure pits. Another theory suggests that filamentous microorganisms (bacteria, fungi, or algae) are the cause. Neither theory has been confirmed, and research into the causes of manure foaming continues. Possible triggers include a high content of manure solids resulting from water conservation practices; cool weather patterns; reduced antibiotic use; feeding or diet adjustments; changes in DDGS; changes in corn, including genetic modifications; moldy and/or lightweight corn; and changes in the type or quantity of fat fed to the animals.

If you have any further questions regarding this application please let me know. I will be happy to provide further assistance. I can be reached on my cell at 317-407-6021 or e-mail at [landmarkent@lightbound.com](mailto:landmarkent@lightbound.com) .

# Jeff Shoaf Zoning Board Application Update

## Attachments

1. Jeff Shoaf Proposed Buiding Site Map
2. MidWest Plan Service, MWPS-18 “Manure Characteristics”, 2012, Table 6. Daily manure production and characteristics, as-excreted (per head per day)
3. Jeff Shoaf Land Application Fields
4. Jeff Shoaf Land Application Fields at proposed barn site
5. Indiana Geological Survey Map – Berm location and dimensions
6. Bartholomew County Zoning Map
7. Jeff Shoaf Distance to Residence Map
8. Letter from Dodd Farms – Gary Dodd
9. Michigan State University publication, “Sizing Manure Storage”, Table 21-4<sup>1</sup> “Typical water usage rates for cleaning milking center facilities and swine production areas”
10. Drawings and Pictures showing Swine buildings and manure containment structures

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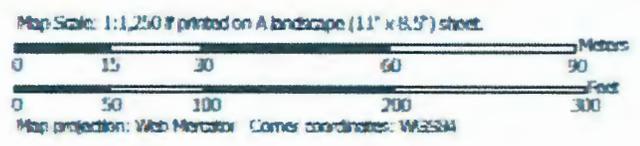
<sup>1</sup> Table 21-4 Typical water usage rates for cleaning milking center facilities and swine production areas., footnoted: Adapted from MWPS-7, Dairy Freestall Housing and Equipment 2000, and University of Missouri CLEAN Program

# Jeff Shoaf CFO Build Site



Attachment #1

Map Date: 10/2018



The drainage diversion berm satisfies the reduced setback to surface water (Little Tough Creek) under IDEM CFO Rule 327 IAC 19-12-3(d)



# Attachment # 2

**Table 6. Daily manure production and characteristics, as-excreted (per head per day)<sup>a</sup>.**

*Values are as-produced estimations and do not reflect any treatment.* Use these values only for planning purposes. The actual characteristics of manure for individual situations can vary  $\pm$  30% or more from table values due to genetics, dietary options and variations in feed nutrient concentration, animal performance, and individual farm management.

Animal	Size <sup>a</sup> (lbs)	Total manure <sup>b</sup>			Water <sup>c</sup> (%)	Density <sup>c</sup> (lb/ft <sup>3</sup> )	TS <sup>d</sup> (lb/day)	VS <sup>c</sup> (lb/day)	BOD <sub>5</sub> (lb/day)	Nutrient content		
		(lbs)	(cu ft)	(gal)						(lbs N) <sup>d</sup>	(lbs P <sub>2</sub> O <sub>5</sub> ) <sup>d</sup>	(K <sub>2</sub> O)
<b>Dairy</b>												
Calf	150	12	0.18	1.38	88	65	1.4	1.2	0.19	0.06	0.01 <sup>c</sup>	0.05
	250	20	0.31	2.30	88	65	2.4	2.0	0.31	0.11	0.02 <sup>c</sup>	0.09
Heifer	750	45	0.70	5.21	88	65	6.7	5.7	0.69	0.23	0.08 <sup>c</sup>	0.23
	1,000	60	0.93	6.95	88	65	8.9	7.6	0.92	0.30	0.10 <sup>c</sup>	0.31
Lactating cow	1,000	111	1.79	13.36	88	62	14.3	12.1	1.67	0.72	0.37 <sup>c</sup>	0.40
	1,400	155	2.50	18.70	88	62	20.0	17.0	2.34	1.01	0.52 <sup>c</sup>	0.57
Dry cow	1,000	51	0.82	6.14	88	62	6.5	5.5	0.75	0.30	0.11 <sup>c</sup>	0.24
	1,400	71	1.15	8.60	88	62	9.1	7.7	1.04	0.42	0.15 <sup>c</sup>	0.33
	1,700	87	1.40	10.45	88	62	11.0	9.3	1.27	0.51	0.18 <sup>c</sup>	0.40
Veal	250	6.6	0.11	0.79	96	62	0.26	0.11	0.04	0.03	0.02	0.05 <sup>d</sup>
<b>Beef</b>												
Calf (confinement)	450	48	0.76	5.66	92	63	3.81	3.20	1.06	0.20	0.09	0.16
	650	69	1.09	8.18	92	63	5.51	4.63	1.54	0.29	0.13	0.23
Finishing	750	37	0.59	4.40	92	63	2.97	2.42 <sup>d</sup>	0.60	0.27	0.08	0.17
	1,100	54	0.86	6.46	92	63	4.35	3.55 <sup>d</sup>	0.89	0.40	0.12	0.25
Cow (confinement)	1,000	92	1.46	10.91	88	63	11.0	9.38	2.04	0.35	0.18	0.29
<b>Swine</b>												
Nursery	25	1.9	0.03	0.23	89	62	0.21	0.17	0.06	0.02	0.01	0.01
	40	3.0	0.05	0.37	89	62	0.33	0.27	0.10	0.03	0.01	0.02
Finishing	150	7.4	0.12	0.89	89	62	0.82	0.65	0.23	0.09	0.03	0.04
	180	8.9	0.14	1.07	89	62	0.98	0.78	0.28	0.10	0.04	0.05
	220	10.9	0.18	1.31	89	62	1.20	0.96	0.34	0.13	0.05	0.06
	260	12.8	0.21	1.55	89	62	1.41	1.13	0.41	0.15	0.05	0.08
	300	14.8	0.24	1.79	89	62	1.63	1.30	0.47	0.17	0.06	0.09
Gestating	300	6.8	0.11	0.82	91	62	0.61	0.52	0.21	0.05	0.03	0.04
	400	9.1	0.15	1.10	91	62	0.82	0.70	0.28	0.06	0.04	0.05
	500	11.4	0.18	1.37	91	62	1.02	0.87	0.35	0.08	0.05	0.06
Lactating	375	17.5	0.28	2.08	90	63	1.75	1.58	0.58	0.17	0.11	0.13
	500	23.4	0.37	2.78	90	63	2.34	2.11	0.78	0.22	0.15	0.18
	600	28.1	0.45	3.33	90	63	2.81	2.53	0.93	0.27	0.18	0.21
Boar <sup>c</sup>	300	6.2	0.10	0.74	91	62	0.57	0.51	0.20	0.04	0.03	0.03
	400	8.2	0.13	0.99	91	62	0.75	0.67	0.26	0.06	0.05	0.05
	500	10.3	0.17	1.24	91	62	0.94	0.84	0.33	0.07	0.06	0.06
<b>Poultry</b>												
Broiler	2	0.19	0.003	0.023	74	63	0.050	0.038	0.011	0.0021	0.0014	0.0010
Layer	3	0.15	0.002	0.017	75	65	0.037	0.027	0.008	0.0026	0.0008	0.0012
Turkey (female)	10	0.47	0.007	0.056	75	63	0.117	0.088	0.034	0.0078	0.0051	0.0034
Turkey (male)	20	0.74	0.012	0.088	75	63	0.186	0.139	0.054	0.0111	0.0074	0.0048
Duck	4	0.44	0.007	0.053	73	62	0.118	0.089	0.016	0.0043	0.0034	0.0026
<b>Sheep</b>												
Feeder lamb <sup>c</sup>	100	4.1	0.06	0.5	75	63	1.05	0.91	0.10	0.04	0.02	0.04
<b>Horse</b>												
Sedentary	1,000	54.4	0.88	6.56	86 <sup>d</sup>	62	7.61	6.5	1.52	0.18	0.06	0.06 <sup>d</sup>
Intense exercise	1,000	55.5	0.90	6.70	86 <sup>d</sup>	62	7.78	6.6	1.56	0.30	0.15	0.23 <sup>d</sup>

TS = total solids; VS = volatile solids; BOD<sub>5</sub> = the oxygen used in the biochemical oxidations of organic matter in five days at 68 F, which is an industry standard that shows wastewater strength.

<sup>a</sup> Use linear interpolation to obtain values for weights not listed in the table.

<sup>b</sup> Calculated using TS divided by the solids content percentage.

<sup>c</sup> Based on MWPS historical data.

<sup>d</sup> Values calculated or interpreted using diet based formulas being considered for the ASAE Standards D384: *Manure Production and Characteristics*.

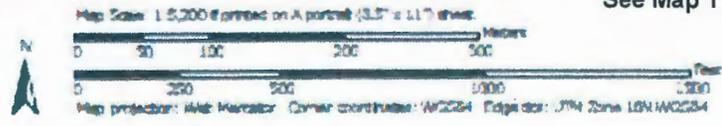
# Attachment #3

## Jeff Shoaf Available Spreadable Acres

### Map 2

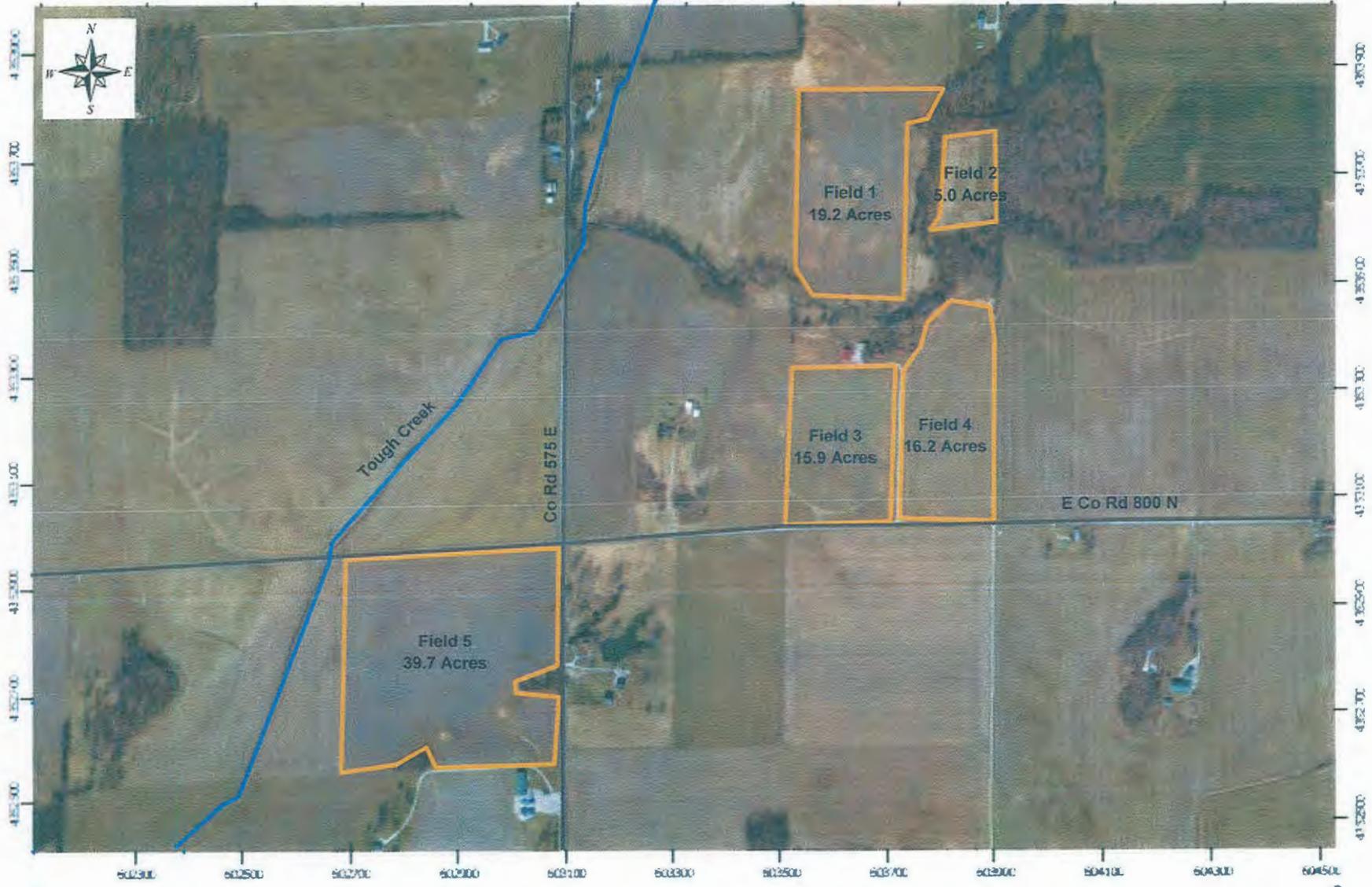


Fields 6-8 = 49.2 acres for manure application  
See Map 1 for remainder of spreadable acres



# Jeff Shoaf Available Spreadable Acres

Map 1



Attachment #4

Map Scale: 1:11,100 if printed on A landscape (11" x 8.5") sheet.

0 150 300 600 900 Meters

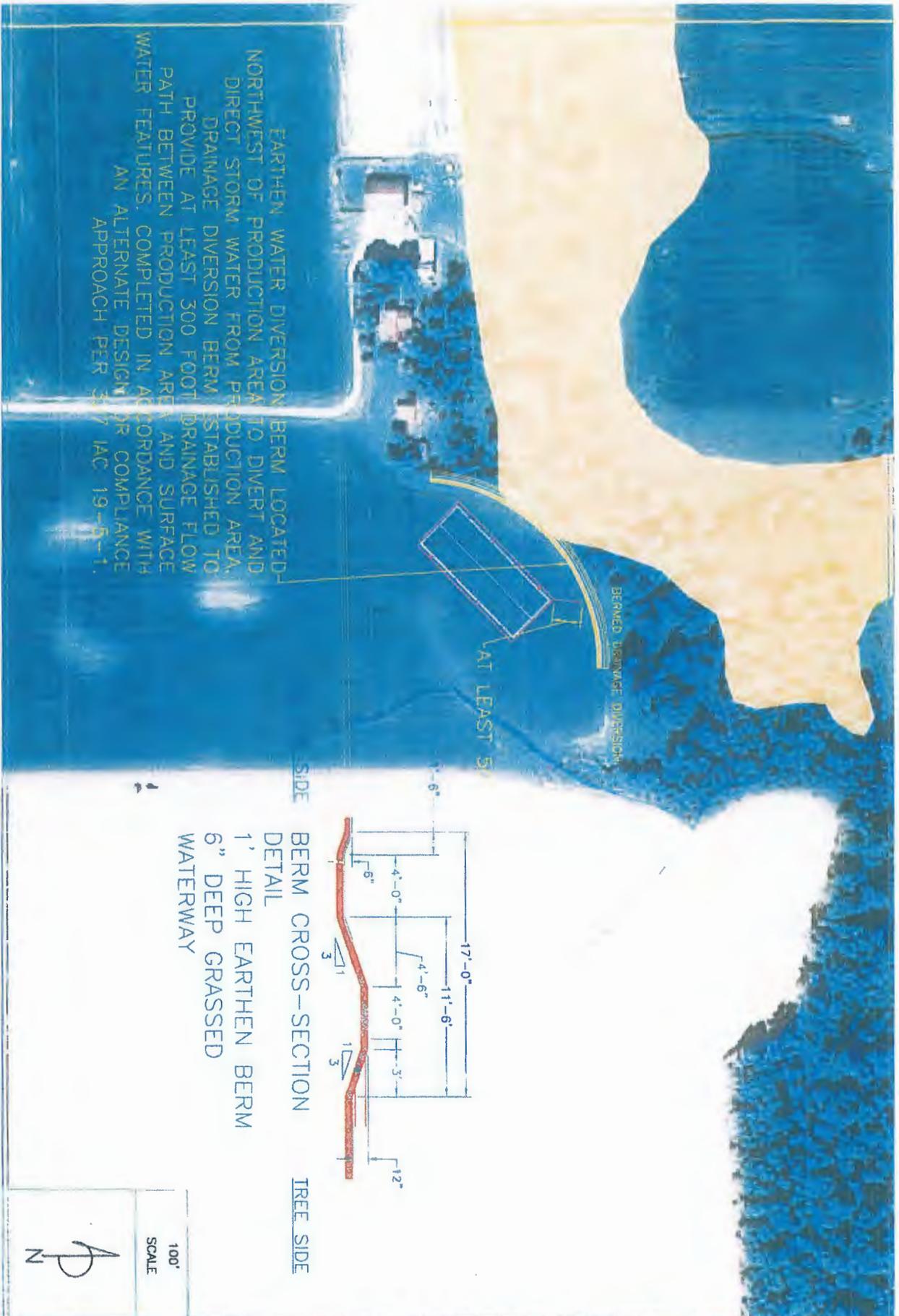
0 500 1000 2000 3000 Feet

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

**Fields 1-5 = 96 acres for manure application**  
**See Map 2 for remainder of spreadable acres**

# Attachment #5

EARTHEN WATER DIVERSION BERM LOCATED NORTHWEST OF PRODUCTION AREA TO DIVERT AND DIRECT STORM WATER FROM PRODUCTION AREA. DRAINAGE DIVERSION BERM ESTABLISHED TO PROVIDE AT LEAST 300 FOOT DRAINAGE FLOW PATH BETWEEN PRODUCTION AREA AND SURFACE WATER FEATURES. COMPLETED IN ACCORDANCE WITH AN ALTERNATE DESIGN FOR COMPLIANCE APPROACH PER 307 IAC 19-5-1.



JEFF SHOAF  
15793 E 800 N  
HOPE, INDIANA 47245  
2014 CFO PERMIT

SITE DETAILS  
EARTHEN DIVERSION BERM  
PERIMETER TILE OUTFALL  
TILLABLE SURFACE DRAINAGE

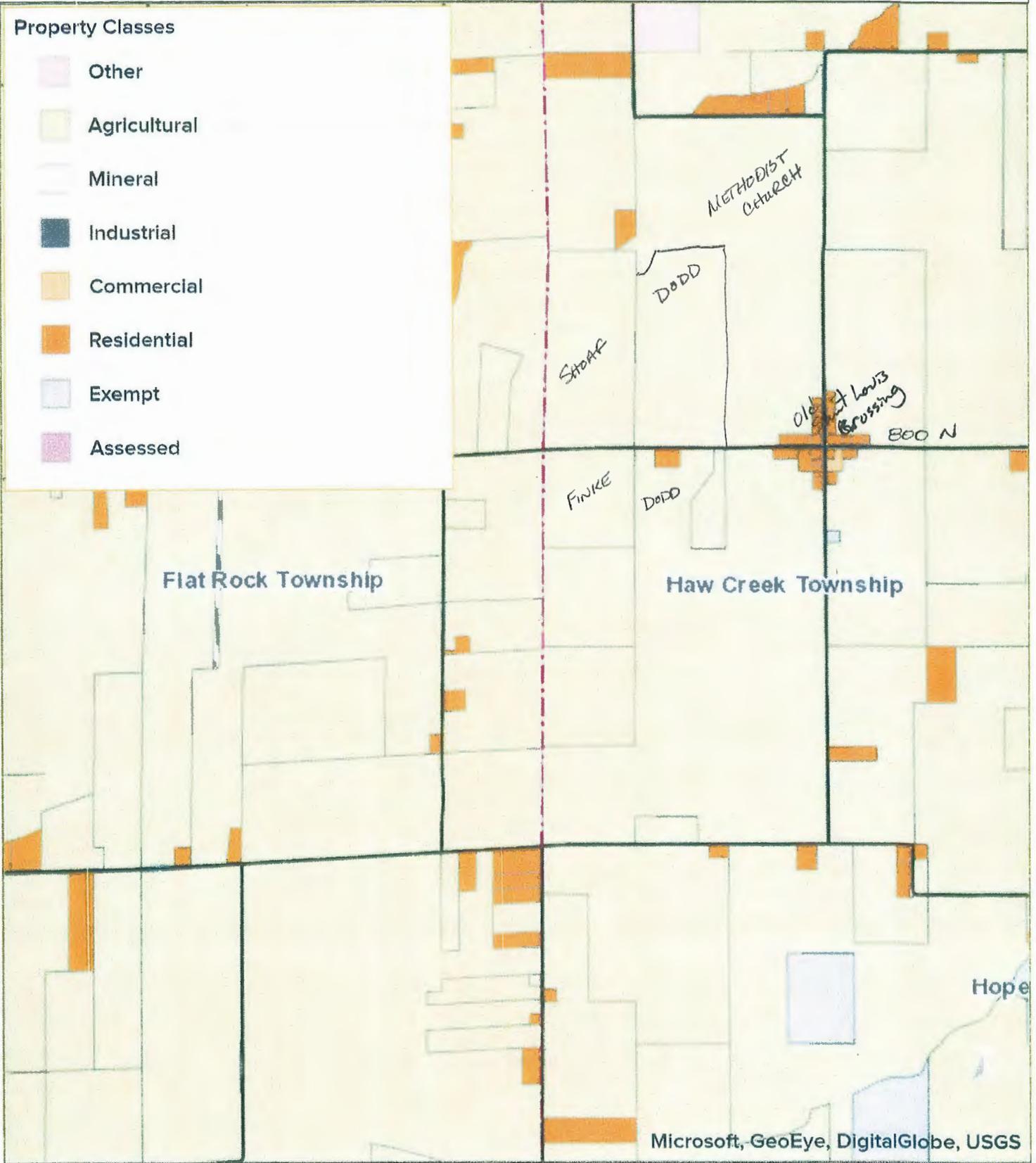
DATE: 5/29/2014 DRAWN BY: MAV  
LIVESTOCK ENGINEERING SOLUTIONS, INC.  
MICHAEL A. VEENHUIZEN  
2967 S. HONEY CREEK ROAD, GREENWOOD, IN 46143

SHEET: 12 of 1 DRAWING NO: JSF0214- 01Z  
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Bartholomew County, IN

Property Classes

-  Other
-  Agricultural
-  Mineral
-  Industrial
-  Commercial
-  Residential
-  Exempt
-  Assessed



Microsoft, GeoEye, DigitalGlobe, USGS

# Shoaf CFO Roads, Creek, and Residential Zones

Attachment #1



87° 43' 37" W



Map Scale: 1:11,800 if printed on A landscape (11" x 8.5") sheet

0	150	300	450	600	750	900
0	500	1,000	1,500	2,000	2,500	3,000

Map projection: Web Mercator Corner coordinates: WGS84 Edge ties: UTM Zone 16N WGS84

- = Distances to Roads
  - = Distances to Residential Zone
  - = Distances to Water
  - = Distance to Property Lines
- All distances are approximate  
 Barn dimensions = 82' x 205' w/8' pit

Attachment #8

**Dodd Farms, Inc.**

May 30, 2014

Bartholomew County Planning Department  
Attn: Bartholomew County Board of Zoning Appeals  
123 Washington Street  
Columbus, Indiana 47201

Re: Bartholomew County Zoning Setback Reduction

Bartholomew County Board of Zoning Appeals;

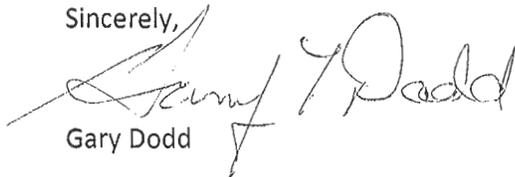
This letter is in support of Mr. Jeff Shoaf's application for construction of a 2,000 head swine confined feeding operation on County Road 800 North in Bartholomew County.

Our family are the owners of the property and house located at 11931 East 800 North Hope, Indiana. We understand that Mr. Jeff Shoaf has applied with Bartholomew County Board of Zoning Appeals to construct a 2,000 head swine Confined Feeding Building on his property located adjacent to our land to the north. We realize the building to be constructed at 11420 East 800 North is within Bartholomew Counties ½ mile set-back from a Residential Zoning District.

We currently own and operate the existing 1,200 head swine building located approximately ¼ mile to the east of the proposed construction site. We also raise corn and soybeans on the fields directly adjacent to the eastern edge of the proposed construction site. Our family has been in the swine business in Bartholomew County for 3 generations. We fully understand, appreciate and support all parts of swine production in our local community.

Thank you for your consideration of Mr. Shoaf's application and support of expansion of local agriculture.

Sincerely,



Gary Dodd

**102 Main Street Hope, Indiana 47246**

Attachment #9

**Washwater and other wastewater**

Water used in cleaning animal production facilities is a volume component in manure storage facilities. Examples include fresh water (not recycled) used for flushing, water used to clean milking systems and cow udder preparation, and water used to wash down confinement rooms in swine operations. The amount of water used for a given activity or operation is usually specific to that operation and management scheme, and thus must be determined specifically in each case. Often a comparison of systems similar in size and management is the best way to estimate the amount of washwater used. Experience has shown that water use is often significantly greater than anticipated, and a water meter can be a useful tool in determining actual water use patterns. Table 21-4 outlines typical water usage for cleaning swine and dairy facilities.

**Table 21-4. Typical water usage rates for cleaning milking center facilities and swine production areas.**

Production Area	Typical Water Usage
Milking center	8-12 gallons per cow per day
Swine breeding/gestation	0.1 gallons per head per day
Swine farrowing	1.0 gallons per crate per day
Swine nursery	0.05 gallons per head per day
Swine grow/finish	0.1 gallons per head per day

Adapted from MWPS-7, Dairy Freestall Housing and Equipment 2000, and University of Missouri CLEAN Program.

Water used to clean and wash livestock facilities can require significant volume in a manure storage structure. Minimize your use of fresh water by making cleaning operations as efficient as possible.

**EXAMPLE 3**

**Estimate the annual volume of washwater used in a 500-sow farrowing/nursery operation. Assume there are 80 farrowing crates and 1,800 nursery pig spaces. Use data in Table 21-4.**

**Breeding/Gestation**

$$0.1 \text{ gal/6hd-d} \times 420 \text{ hd} \times 365 \text{ d} = 15,330 \text{ gallons}$$

**Farrowing**

$$1.0 \text{ gal/crate-d} \times 80 \text{ crate} \times 365 \text{ d} = 29,200 \text{ gallons}$$

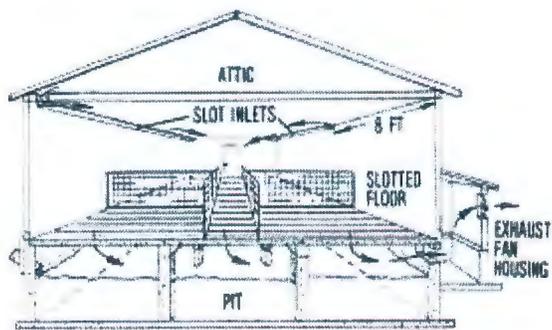
**Nursery**

$$0.05 \text{ gal/hd-d} \times 1,800 \text{ hd} \times 365 \text{ d} = 32,850 \text{ gallons}$$

$$\text{Total gallons} = 15,330 + 29,200 + 32,850 = 77,380 \text{ gallons}$$

$$\text{Total cubic feet} = 77,380 \text{ gal} / 7.48 \text{ gal/ft}^3 = 10,345 \text{ ft}^3$$

# Attachment #10



Swine Building Outline Drawing



Concrete Basin being built under ground



Slats being installed above the pit



Swine standing on the slats inside the barn