BULLET POINTS

From DNR website two maps.
First one shows 100 to 200 ft of decline in the Aquifer in this area of McDonald County. Your own webstie states NOWHERE IN MO. HAS WATER SUPPLY IN GENERAL AND SPECIFICALLY GROUNDWATER USE AND AVAILABILITY BECOME SUCH AN IMPORTANT ISSUE AS IN SOUTHWESTERN MISSOURI.

Second showing where the Ozark Aquifer is unconfined due to the greatest ground water decline, which is accentuated by multiple, closely spaced pumping wells. McDonald County is 90% unconfined already.

Third is a diagram from your own website showing the deeper wells Mr. Renner is going to drill will decrease the water level in our residential wells to the point where it is below our pump intake or even below the bottom of the well, rendering it unusable. WE CANNOT EVEN PURCHASE INSURANCE TO COVER OUR WELLS GOING DRY DUE TO THIS OPERATION.

Now, regarding his Permit:

I realize he applied for it on line and was already granted a ground breaking permit which allows up to 125,000 birds, without this operating permit and that was done without anyone from DNR coming to look at the site. So my concern is:

His Nutrient Management Plan states he will have 372,056 birds which allows him a permit with 1000 ft buffer. Only 368 more birds per house would require a 2000 ft buffer which he cannot make. He doesn't even have the 1000 ft buffer without using his neighbor's property.
His plan states 46,507 birds per house which comes out to .68 sq ft per bird. The National Chicken Council states on their website for Animal Welfare for Broiler Chickens " Birds need .8 or 8/10ths of a sq. ft per bird. Mr. Renner is already going against the National Chicken Council. What is to stop him from adding 368 more birds per house, giving them .67 sq. ft instead of the .68 his plan states? Is someone from DNR going to come and count the birds? I seriously doubt it.

Roger Renner, your desire to make money does not give you the right to destroy the lives of all of us who live here by taking our water. You turned down the offer to buy the property, before you started breaking ground. You ignored Mo. Dept of Revenue recommendations to not build your CAFO near a town or cluster of homes. You ignored that the semi trucks need 55 ft wide roads when ours are 18 ½ to 20 so you are endangering the lives of our Children getting on and off the bus. I'm asking you to stop, now.

Connie Brown
13925 Spruce Dr.
Goodman, Mo. 64843

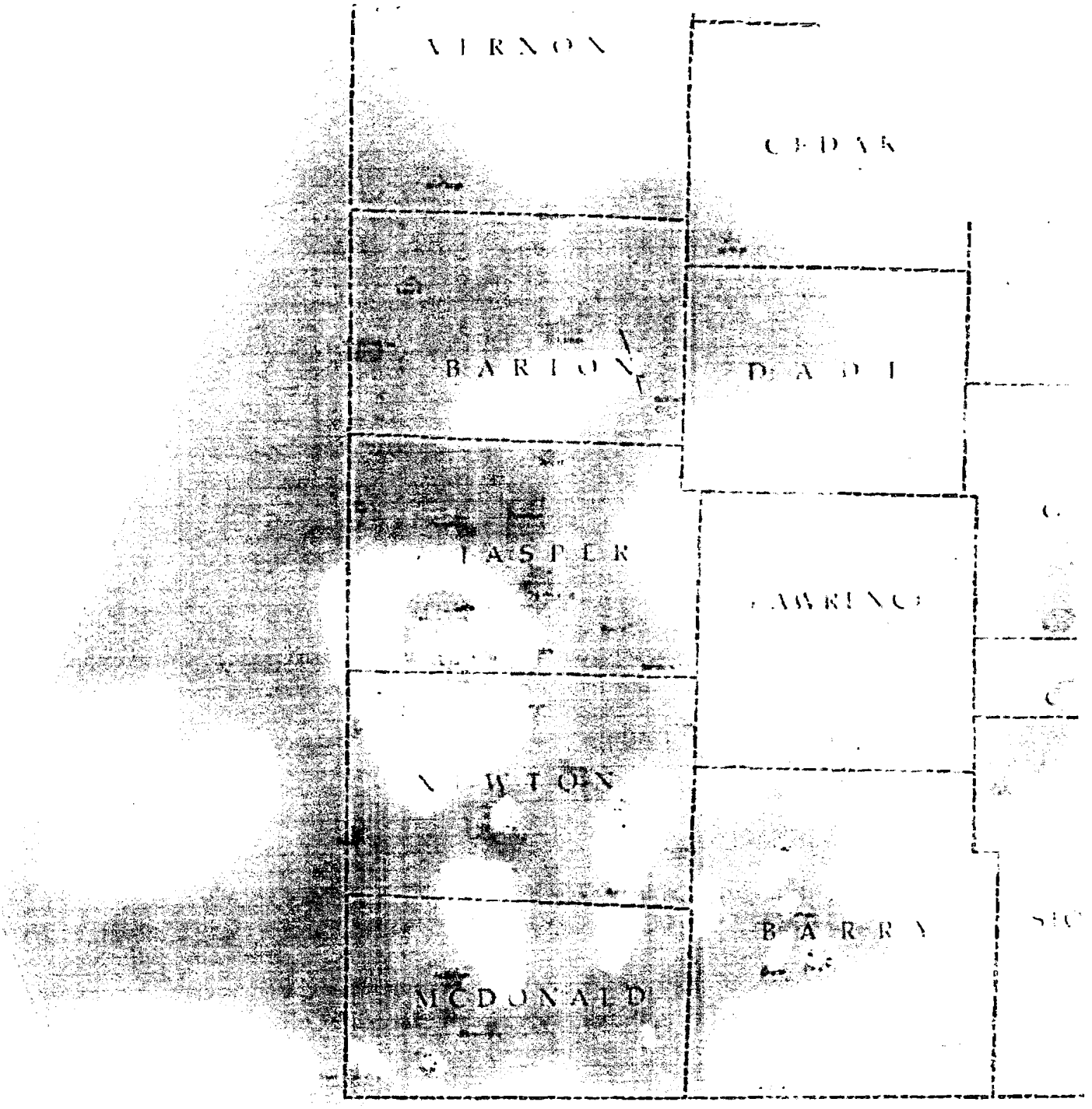


Figure 9. Green areas in Southwestern Missouri with 100 to 200 feet of water level decline in the Ozark Aquifer. The effects of well interference, which is created by multiple closely spaced pumping wells, accentuate the problems of groundwater level decline in Southwestern Missouri. This Map and info is from DNR's own website.

where faulting may have affected the Ozark confining unit. Also, there is an area in McDonald County where the Ozark confining unit is locally missing due to faulting and erosion.

A similar comparison of the 2006-2007 potentiometric surface map with the base of the Ozark confining unit depicts the areas where the Ozark aquifer is currently unconfined (figure 19). Most of the areas currently unconfined are those where groundwater-level declines in the Ozark aquifer are the greatest, such as the Springfield/northern Christian County area, parts of northern and southwestern Barry County, McDonald County, and the Joplin area in southern Jasper and northern Newton counties.

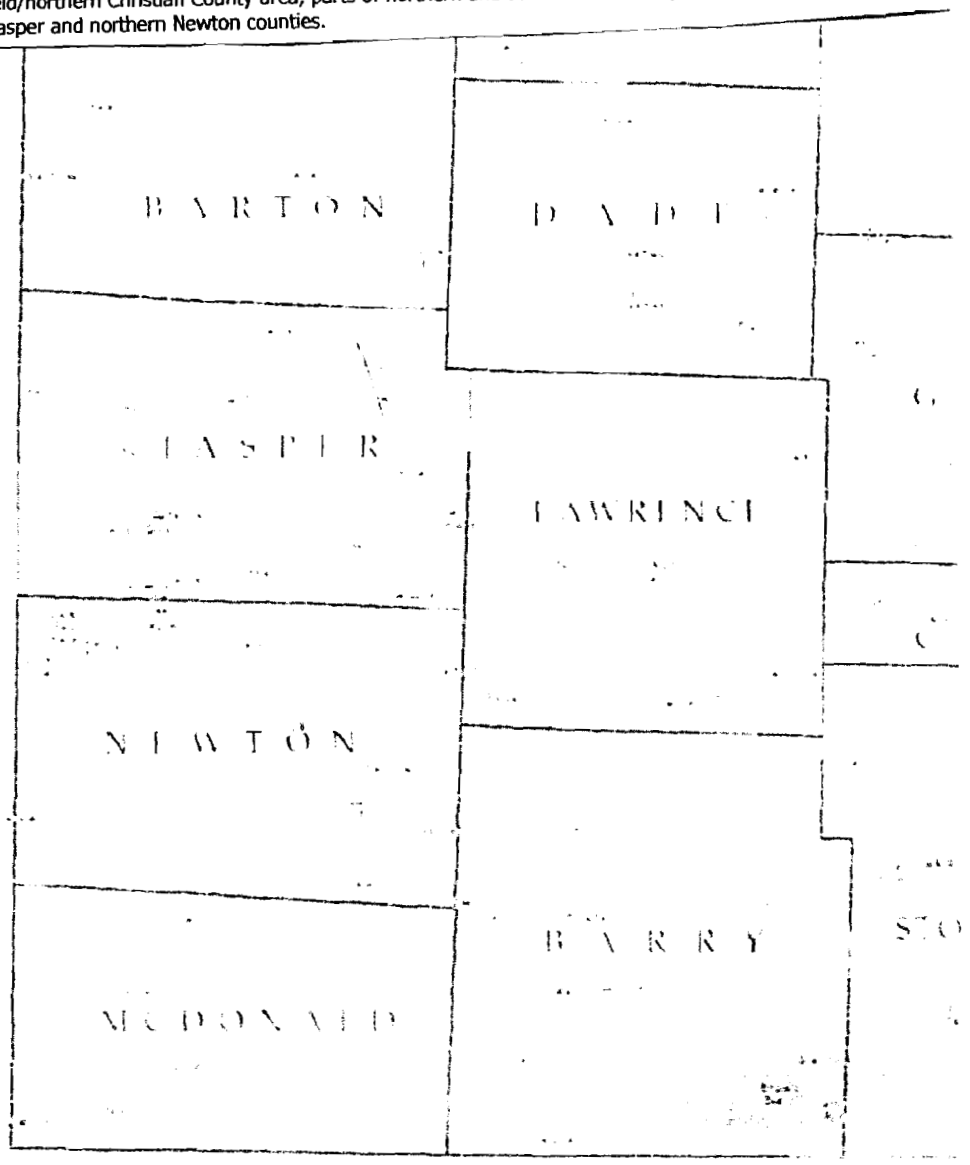


Figure 19. Current (2006-2007) confined (blue) versus unconfined (yellow) areas in the Ozark aquifer. Green depicts the outcrop area of formations comprising the Ozark aquifer.

The effects of well interference, which is created by multiple closely spaced pumping wells, accentuate the problems of groundwater-level decline in southwestern Missouri. The areas where more than 300 feet of groundwater-level decline have been documented are typically areas containing numerous high-yield wells that are relatively close together. When a well is pumped, the water level in the well drops to a lower level. It is the change in water level between the well and the adjacent aquifer that induces water to move toward the well. The greatest amount of drawdown is in the pumped well, and the drawdown decreases with distance away from the pumped well.

If the wells are drilled to similar depths, and their pumps are placed at similar depths, then neither well has an advantage. However, if two wells are drilled into the same aquifer and have greatly dissimilar depths, then the deepest well with the deepest pump setting may cause the water level in the shallower well to decrease to the point where it is below the pump intake or even the bottom of the well, rendering the shallower well unusable, at least while the deeper well is operating (figure 20).

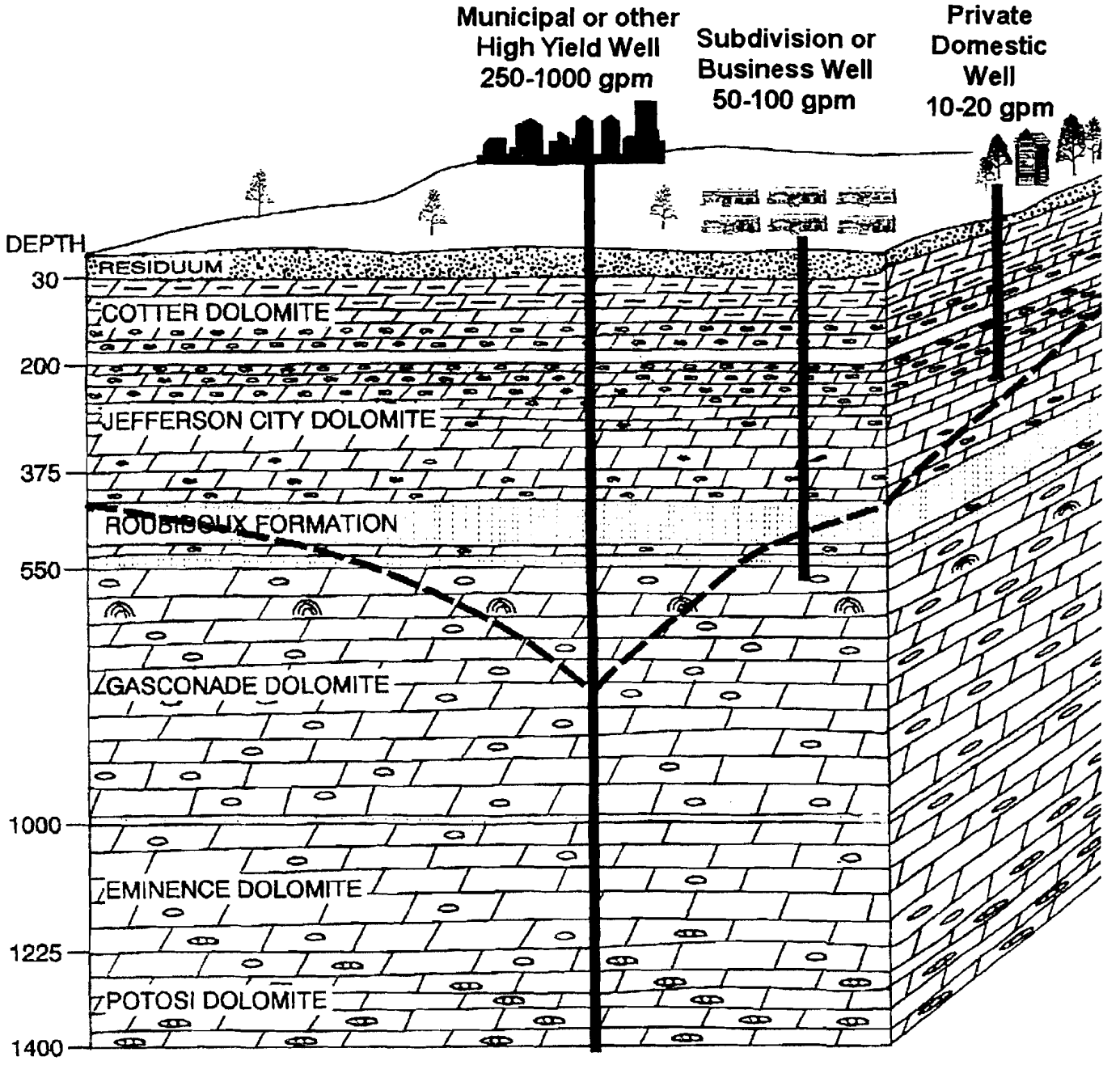


Figure 20. Diagrammatic cross-section of the Ozark aquifer showing how the pumping cone of a deep, high capacity well can affect shallower nearby wells.

A term that is sometimes used to describe the water removal rate that should not be exceeded from a particular aquifer is called its safe yield. Unfortunately, there is not a clear definition of safe yield. Terms like transmissivity, storage coefficient, porosity, and saturated thickness have technical definitions, but safe yield is somewhat philosophical. One definition of safe yield is the amount of water that can be removed from an aquifer annually without creating an undesirable effect. An undesirable effect could be many things including a change in water quality, a decline in aquifer water level, or well interference. Once again, scale plays an important factor. If the total volume of water produced from an aquifer in a certain area is not greater than the recharge to that aquifer in the same area, then in that sense the safe yield would not be exceeded. However, if all of the water were produced in a relatively small area, then there may be water-level decline in that area as well as problems with well interference. Since both of these are considered undesirable effects, then in that area the safe yield was exceeded.

gallons per minute in the Joplin area, to more than 2,000 gallons per minute. Most wells will yield between 600 and 800 gallons per minute and have moderate drawdowns. The principal water-producing zones are the Roubidoux, lower Gasconade Dolomite (and Gunter Sandstone Member) and Potosi Dolomite. Wells drilled into the upper part of the aquifer and producing from the Cotter and Jefferson City dolomites commonly yield 50 gallons per minute or less (figure 3).

Low-permeability units between the Ozark aquifer and the shallower Springfield Plateau aquifer form an aquitard and greatly limit the vertical interchange of water between the two aquifers. Throughout most of the region, the Compton Limestone and Northview Formation form the Ozark confining unit. Although these units have low hydraulic conductivities, they do allow some water to move through them. The volume of water that can move from one aquifer to the other depends on the hydraulic conductivity of the confining unit, and the water-level differences between the two aquifers. The volume of water movement is relatively small per unit area, but is a much larger amount when the size of the region is considered. The Chattanooga Shale is part of the confining unit in McDonald County and parts of adjacent Barry and Newton counties. Because of the very low hydraulic conductivity of the Chattanooga, the amount of water moving through the confining unit where the Chattanooga is present is likely much less than in other areas.

Mississippian-age strata comprise the Springfield Plateau aquifer, which is widely used as a private water-supply source in this province. Yields of wells producing from the Springfield Plateau aquifer are typically less than about 20 gallons per minute. Like in the Salem Plateau, dissolution of the limestone bedrock by slightly acidic groundwater has created numerous karst features such as sinkholes, losing streams, caves and springs. These karst features can create pathways for rapid groundwater movement. Losing streams and sinkholes are recharge features that rapidly funnel large quantities of surface water underground. The water follows well-defined flow paths through solution enlarged fractures, conduits, and cave openings. Springs provide the outlet points for much of this shallow groundwater. These features are particularly well developed in parts of Greene and Christian counties, so much so that private wells drilled in much of Greene and northern Christian counties since 1987 were constructed to exclude production from the Springfield Plateau aquifer. More recently, similar construction restrictions have been placed on private wells in parts of Jasper and Newton counties due to the widespread presence of excessive lead and cadmium concentrations in shallow groundwater associated with past mining or because of trichloroethylene contamination in a large area just south of Neosho.

Groundwater recharge in this province depends on location and aquifer. The Springfield Plateau aquifer is chiefly recharged by precipitation. Some of the recharge is the gradual downward infiltration of water from precipitation through the soil materials, into the shallow bedrock, until it reaches the water table. There are likely few areas left in the province where the water level in the Springfield Plateau aquifer is at a lower elevation than the potentiometric surface of the Ozark aquifer, so upward leakage of water from the Ozark aquifer into the Springfield Plateau aquifer is not a major source of recharge to the shallower zones.

Recharge to the Ozark aquifer is more complicated. It may seem logical that groundwater flowing through the Ozark aquifer beneath the Springfield Plateau could be provided by recharge to the east, where the Ozark aquifer is unconfined and can be recharged directly from precipitation. However, such is not the case. The direction of groundwater movement in an aquifer can be determined using a potentiometric map. A potentiometric map uses contours lines drawn at particular elevations to show the water-level elevation in an aquifer. In a confined aquifer like the Ozark aquifer in southwestern Missouri, the contour lines show the elevation to which water in a tightly cased well penetrating the aquifer will rise. Groundwater moves down gradient and at right angles to the potentiometric contours. Potentiometric maps of the area show that very little groundwater enters the Ozark aquifer in the Springfield Plateau from the Salem Plateau (figures 4 and 5). A notable exception is the Springfield area, where a large cone of depression created by pumping exists. Potentiometric maps show that some water in the Ozark aquifer in the Salem Plateau in Webster and northeastern Greene counties moves toward the Springfield pumping cone. However, north of the Springfield pumping cone, water in the Ozark aquifer moves northward

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bicarbonate to chloride. It is also where the total dissolved solids content reaches about 1,000 mg/L, the dividing line between brackish water and freshwater. North and west of this zone the St. Francois, Ozark, and Springfield plateau aquifers produce water that, without extensive treatment, is too mineralized to be considered potable.

**Groundwater-Level Decline and Water Use**

Nowhere in Missouri has water supply in general, and specifically groundwater use and availability, become such an important issue as in southwestern Missouri. If you consider that the Springfield Plateau groundwater province occupies an area of about 8,700 square miles, or about 12.5 percent of the state, but has nearly 25 percent of the groundwater resources, it would seem that water availability should not present a problem. However, water use in this area is relatively high, the competition for water is greater than in many areas of the state, and the demand for water is not evenly distributed. Depending on county, major groundwater users in southwestern Missouri include industry, agribusiness, municipalities, irrigation, and electrical generation. Major municipal groundwater use areas include the Springfield/northern Christian County area, the Joplin area, and Monett. Groundwater is used extensively for irrigation in northern Jasper, western Dade, and much of Barton counties. Agribusinesses in Barry and McDonald counties also use large quantities of groundwater, primarily for poultry production and processing. Likewise, electrical generation, principally in Jasper and Greene counties, is a major user of groundwater. The most recent water-use data reported for the southwestern Missouri counties show a groundwater use increase of about 37 percent between 2000 and 2006. Nearly all of this water is produced from the Ozark aquifer.

In areas such as southwestern Missouri where groundwater use is quite high and recharge is limited due to geologic conditions, groundwater-level declines have occurred. However, the magnitude of the declines varies greatly across the region. Groundwater-level changes have been documented and quantified two ways. Groundwater levels have been monitored in Missouri for many years using dedicated groundwater-level observation wells. The oldest stations, including several in southwestern Missouri, were installed in the late 1950s. Expansions to the network in 1999-2000 and again in 2007-2008 have increased the number of wells state-wide to more than 140. About 30 of these monitor groundwater levels in the Ozark aquifer in southwestern Missouri. Although the term "static water level" is commonly used, it does not mean that groundwater levels are stationary. It refers to the non-pumping water level in a well open to a particular aquifer. All of the groundwater-level observation wells are non-pumping wells, and continually measure "static water level" at the wells locations. Depending on location, water levels in the Ozark aquifer in southwestern Missouri can be expected to fluctuate as little as 15 feet per year, or more than 150 feet per year (figure 6). This is because groundwater use is heavily influenced by season as well as by weather. Most municipalities use far less water during winter months than during the summer. Industrial water use may be relatively constant or seasonal, depending on the industry. The irrigation season in southwestern Missouri typically lasts less than 3 months, beginning in early July and ending in early September. In a wet year, much less water is needed for optimum crop production than in a dry year, and different crop types have different water needs. Electrical generation, and thus the water needed for electrical production, also varies with season.

**(../../../../../geology/wrc/groundwater/education/provinces/images/figure6.gif)**

Figure 6. Typical yearly Ozark aquifer water-level fluctuations in feet measured from area groundwater-level observation wells. (Single values are wells with less than 2 years of record.)

Groundwater-level changes have also been documented using potentiometric maps. As previously mentioned, a potentiometric map is basically a contour map that shows the elevation to which water levels occur in an aquifer. These maps are constructed by measuring water levels from wells that penetrate the aquifer of interest. When dealing with confined aquifers like the Ozark aquifer in southwestern Missouri, it is very important to have good construction information for the wells whose water-level measurements are used to construct a potentiometric map. To be of the greatest value, the well should have tightly cemented casing set through the Ozark confining unit. Most wells used for potentiometric map measurements are production wells that are pumped at least periodically. The water-level measurement should not be taken until water level has, as much as possible, stabilized after a pumping period. The water-level measurements should all be made in as short a time period as possible. Unlike water-level measurements taken from dedicated observation wells which show water-level changes

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# Concentrated Animal Feeding Operations

## Background

**(https://public.govdelivery.com/accounts/MODNR/subscriber/new?topic_id=MODNR_51)**

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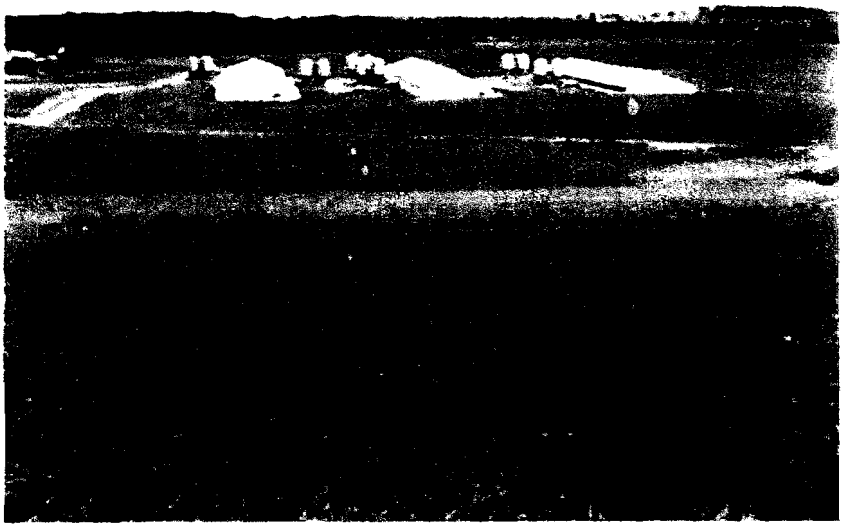

In just the past 20 years, there has been dramatic change in animal agricultural production in Missouri and the United States. These changes have included a significant increase in the overall size of individual operations, an increase in the number of animals raised per operation and a shift towards raising poultry and certain livestock within production barns. Concentrated animal feeding operations, frequently referred to as CAFOs, are large animal agricultural facilities that raise a specific number of animals in production barns or confinement pens.

The development and implementation of technology along with specialized production systems over the years has led to remarkable production efficiencies in raising animals, and has given farmers the capability of achieving precise control and management of animal manure and other farm- based nutrients as a fertilizer source on farm land.

While modern agricultural systems, including CAFOs, can help reduce the overall environmental impact of livestock and poultry production, the increase in animal concentration in barns has led to an increase in the environmental risk on an individual farm. Each one of these operations will generate a large amount of animal manure that must be managed properly. When this is accomplished, farmers will have a safe, reliable and sustainable fertilizer source for their farming operation. When it is not, the farm has the potential to negatively impact the state's water resources.

## CAFO Permitting

Missouri's CAFO laws and regulations are designed to minimize these risks and are important for the long term protection of the environment. Laws and regulations are also important to preserve and maintain a strong and profitable agricultural industry for generations to come. Protecting the environment and the agricultural industry is a shared responsibility and doing so may have a positive impact on the environment, our food supply and local and state economies.

At the state level, water quality is protected through the department's permit application and approval process. Water pollution construction and operating permits are a requirement for all size and types of CAFOs. These permits typically have a list of very specific and stringent requirements to follow and operations are expected to keep detailed records of farm related activities and submit them to the state agency for review each year. In addition, the Missouri Department of Natural Resources has developed stringent state technical standards that CAFOs must follow and relate to the handling and land application of animal manure.

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# NUTRIENT MANAGEMENT SYSTEM PLAN

**For**

**Roger Renner**
**1600 May Road**
**Goodman, MO 64843**
**620-202-2912**

**FACILITIES:**

This system is to manage the wastes from a Broiler Growout facility consisting of **8** broiler houses with 1 dead bird composter and stack shed. The eight **55'x 575'** houses contain **46,507** per house. Total farm capacity is **372,056** birds. Mortalities will be composted in a roofed composter with impermeable concrete floors.

Water for this facility will be supplied by three new wells.

**PRODUCTION:**

This system will manage the waste from a broiler operation that has **8** houses with a total capacity of **372,056** birds. Annual production will be **7** flocks with approximately **2** weeks between flocks. Flock life is approximately **5** weeks. Average weight is estimated at **3.8** lb./bird. Average daily litter production (manure and bedding) is estimated at **0.63** cu.ft. per 1000 pounds of animal capacity or **1802** tons annually. Bedding used is rice hulls and or wood shavings. At **34** lb./cu.ft., volume of manure and bedding is approximately **120,548** cu.ft. annually. Houses are cleaned out about every 50 weeks. Cake material will be removed between flocks. No wash water or other freshwater enters the waste management system.

Death losses are expected to average **4%** for each flock, or about **327 tons** of carcasses annually. Loss percentage is average for industry.

**COLLECTION:**

Birds are confined in buildings at all times. Waterers are dry nipple type so litter remains dry. Buildings have compacted earth floors. Litter accumulates fairly uniformly on floors. All manure and litter from the operation is collected in the houses.

Dead birds will be removed daily to the composting facility.

# Missouri Revised Statutes

Chapter 640
Department of Natural Resources

←640.703

**Section 640.710.1**

640.715→

August 28, 2015

**Department to regulate facilities--rules--setback--exemption.**

640.710. 1. The department shall promulgate rules regulating the establishment, permitting, design, construction, operation and management of class I facilities. The department shall have the authority and jurisdiction to regulate the establishment, permitting, design, construction, operation and management of any class I facility. Such rules may require monitoring wells on a site-specific basis when, in the determination of the division of geology and land survey, class IA concentrated animal feeding operation lagoons are located in hydrologically sensitive areas where the quality of groundwater may be compromised. Such rules and regulations shall be designed to afford a prudent degree of environmental protection while accommodating modern agricultural practices.

2. Except as provided in subsections 3 and 4 of this section, the department shall require at least but not more than the following buffer distances between the nearest confinement building or lagoon and any public building or occupied residence, except a residence which is owned by the concentrated animal feeding operation or a residence from which a written agreement for operation is obtained:

(1) For concentrated animal feeding operations with at least one thousand animal units, one thousand feet;

(2) For concentrated animal feeding operations with between three thousand and six thousand nine hundred ninety-nine animal units inclusive, two thousand feet; and

(3) For concentrated animal feeding operations of seven thousand or more animal units, three thousand feet.

3. All concentrated animal feeding operations in existence as of June 25, 1996, shall be exempt from the buffer distances prescribed in subsection 2 of this section. Such distances shall not apply to concentrated animal feeding operations which have received a written agreement which has been signed by all affected property owners within the buffer distance.

4. The department may, upon review of the information contained in the site plan including, but not limited to, the prevailing winds, topography and other local environmental factors, authorize a distance which is less than the distance prescribed in subsection 2 of this section. The department's recommendation shall be sent to the governing body of the county in which such site is proposed. The department's authorized buffer distance shall become effective unless the county governing body rejects the department's recommendation by a majority vote at the next meeting of the governing body after the recommendation is received.

5. Nothing in this section shall be construed as restricting local controls.

(L. 1996 H.B. 1207)

Effective 6-25-96

Broilers (young meat chickens) are not raised in cages. They are raised in large, open structures known as growout houses. These houses are well-equipped with mechanical systems to deliver feed and water to the birds and have environmental systems to provide a comfortable and protective environment, including ventilation systems and heaters that function as needed, most often with micro-processor controls. The earthen floor of the house is covered with bedding material consisting of organic matter such as wood chips, rice hulls, or peanut shells. Because dry bedding helps maintain flock health, most growout houses have enclosed watering systems rather than open troughs, because enclosed systems ("nipple drinkers") reduce spillage and help keep the litter dry.

*Chickens get plenty of feed and all the water they can drink, delivered by automatic systems.*

Broiler breeding flocks that provide fertile eggs for the hatchery are also carefully managed. Since these hens lay the eggs that become the broilers for market, it is critically important that the flock be kept productive with minimum stress. Breeding hens are also kept in large, open houses, not in cages.

Keeping birds inside a house protects them from predators such as hawks and foxes. Some houses are equipped with curtain walls, which can be rolled up in good weather to admit natural light and fresh air. In that case, a fine mesh screen keeps insects, rodents and wild birds out of the house and away from the broilers. Such biosecurity measures are critical to ensuring the health of the flock.

Most growout houses built in recent years feature "tunnel ventilation," in which a bank of fans draws fresh air through the house. Tunnel ventilation significantly improves the bird's atmosphere and litter quality helping to maintain the health of the birds.

## Space

Renner's plan comes out to .68 ft² she adds 368 birds per house which is .67 sq ft per bird

Traditionally, a flock of broilers consist of about 20,000 birds in a growout house that measures 400 feet long and 40 feet wide, thus providing an area of about 16,000 square feet, or eight-tenths of a square foot per bird. As the birds age, they grow into this space. The Council for Agricultural Science and Technology (CAST) states that the minimum space is one-half square foot per bird, so industry practice is well in excess of this space requirement. By nature, as the old saying goes, the birds do tend to flock together.

More modern houses are often larger and contain more birds, but the floor space allotment still meets the needs of the birds. Extra feeding and watering equipment can be installed to accommodate the larger floor space.

Because broilers are relatively young and have not reached sexual maturity, they exhibit very little aggressive conduct and engage in little of the social interaction known as "pecking order." As one academic paper put it, "Broilers are very docile and are also marketed at such an early age that they have not yet formed a dominance hierarchy." (Joy Mench and Paul Siegel, "Animal Welfare Issues: Poultry")

## Feed

Chicken feed consists primarily of corn and soybean meal with the addition of essential vitamins and minerals. No hormones or steroids are allowed in raising chickens.

## Water

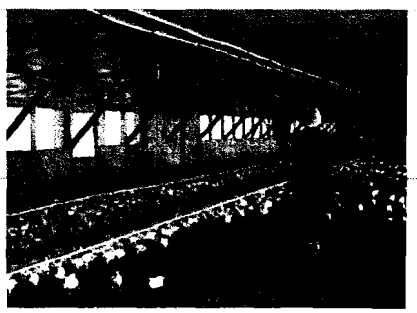
Water is usually drawn from a well on the farm or from a municipal water supply and is pumped into the house to be available to the chickens as desired.

## Veterinary Attention

Every broiler company employs or contracts with professional veterinarians to care for the health needs of the birds. The farmers and company service personnel monitor the birds for any health problems and promptly inform the company veterinary staff so that appropriate action can be taken. Several medications are approved by the U.S. Food and Drug Administration (FDA) to treat health problems in broiler chickens. A withdrawal period is provided before the birds are sent to the processing plant to make sure any medication residue is removed from the birds' systems.

## Proper Handling

Company personnel are required to handle the birds in an appropriate manner during pickup and arrival at the processing plant. Birds that display bruises are not allowed to have those bruised parts sold for human food, so the companies have a strong economic incentive to make sure that birds are handled properly.



*Bird health in American flocks is protected by trained personnel.*

## Humane Slaughter

After arrival at the plant, birds are anesthetized with a mild electric current and then humanely slaughtered. The stunning renders the birds insensitive to pain.

In a typical system, the anesthetized birds are passed by a device that severs the carotid and/or jugular arteries. This whole process takes place in seconds.

## Breeding

Today's broiler chicken is a combination of several breeds. Desirable characteristics include white feathers (to give the skin a clear appearance) and abundant breast meat. Breeding is done in the traditional manner. There is no "genetic engineering" or "genetic modification" in the chicken industry.

## Inoculation

Birds are subject to a variety of diseases, just as humans are. Just like humans, they receive inoculations against the diseases for which vaccines are available. Most broiler companies now use a machine which injects the vaccines into the egg during the incubation period. The chicken embryo absorbs the vaccine during its final three days of growth in the egg. After the chicks are hatched, they pass through another machine which sprays them with a light mist containing another inoculation against other diseases.

# Animal Welfare for Broiler Chickens

Consumers want to be sure that all animals being raised for food are treated with respect and are properly cared for during their lives. The people and companies involved in raising chickens for food share the public's concern. They recognize that they have an ethical obligation to make sure that the animals on their farms are well cared for.

The chicken industry has come together on a specific set of expectations that will ensure that the birds they raise are taken care of with the highest standards starting at hatch. Since healthy, top-quality animals are needed for food, proper treatment is not only an ethical obligation, but it just makes good business sense.

Carefully formulated feed, access to a plentiful supply of clean water, adequate room to grow, professional veterinary attention, and proper handling are all important factors in the management of young meat chicken flocks, also referred to as broilers, and the production of high-quality food products.

To assist the people and the companies who produce and process chickens for food, the National Chicken Council developed the NCC Animal Welfare Guidelines and Audit Checklist which have been widely adopted within the chicken industry. These guidelines cover every phase of the chicken's life and offers science-based recommendations for proper treatment. Among other things, it includes chapters on:

- Corporate commitment
- Hatchery operations
- Proper nutrition and feeding
- Appropriate comfort and shelter
- Health care and monitoring
- Ability to display most normal behaviors
- On-farm best practices
- Catching and transportation
- Processing
- Breeder operations (if present)

*Some key points include:*

- Top management must sign off on the program.
- Company must have a person or management group in charge of animal welfare throughout company.
- Those involved in handling live animals must be trained annually.
- Abuse of the animals is not tolerated under any circumstances.
- Stocking density is limited based on size of the individual bird.
- Ammonia in atmosphere and moisture in litter are limited.
- Humane handling required at catching.
- Wing and leg damage are limited and monitored.
- Birds protected from extremes of temperature in transportation and holding and provided with ventilation.
- All birds must be dead before entering the scalder.
- Culled birds to be humanely euthanized.
- "Major non-conformance" (live chicken in hatchery waste, abuse of birds, live bird in DOA bin, live bird through scalder) results in audit failure until problem is corrected.

NCC's Animal Welfare program is backed up by a detailed audit checklist that can be completed by the company itself, by a customer representative, or a third-party auditor. Click to download the complete audit checklist for Broilers and Broiler-Breeders.

The Professional Animal Auditor Certification Organization (PAACO) trains auditors to the NCC program, and use of PAACO-trained auditors is recommended.

The National Chicken Council represents companies that produce, process and market chickens for their meat. We do not represent companies that produce and sell eggs for human consumption. The egg industry has its own organization and its own welfare standards.

## Housing

## Releases, Statements, Resources

Expert Panel Examines New Broiler Farm Video

Chicken Council Supports Responsible Antibiotic Use, Veterinary Oversight

NCC Statement on McDonald's USA New Antibiotic Policy

Fusion Story Unfairly Portrays Realities of Modern Chicken Production

NCC Statement on Urban School Food Alliance Antibiotic Announcement

Archive →

*Chickens in the U.S. are raised in protected facilities to help keep them healthy.*

*Click for some of the basic facts about how chickens are raised for food:*

Housing Space
Feed
Water
Veterinary Attention
Proper Handling
Humane Slaughter
Breeding
Inoculation
Ventilation

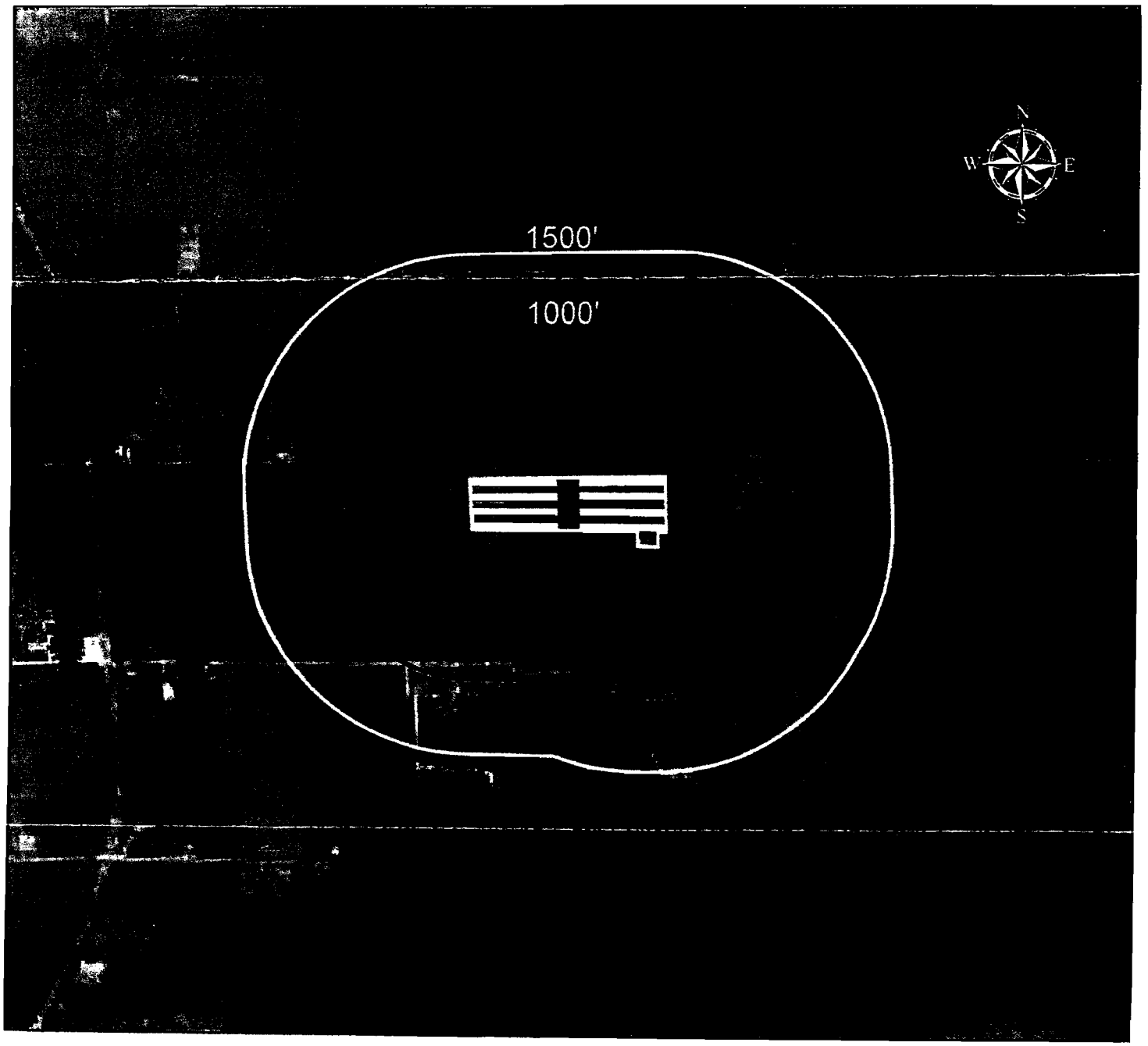
# New Poultry Houses

Date: 12/24/2015

Customer(s): ROGER RENNER
District: MCDONALD COUNTY SOIL & WATER CONSERVATION DISTRICT

Field Office: NEOSHO SERVICE CENTER
Agency: USDA - NRCS
Assisted By: NATHAN WITT

Legal Description: Twn 23N, Rng 32W, Sec 4




**Legend**

- 1500 ft. Buffer
- 1000 Buffer
- plannedwell
- stackingshedcomposter
- propertyboundary
- plannedpoultryhouses

1 inch = 1,000 feet

USDA

**Contents**



**Related publications**

- EQ219, Separation Distances for Livestock Manure Management Systems
- EQ379, Managed Grazing Systems and Fencing for Distribution of Beef
- EQ380, Pumps and Watering Systems for Managed Beef Grazing
- EQ381, Water Quality for Livestock Drinking
- G1155, Confined Feeding Facilities: Site Selection and Management
- MWPS18, Livestock Waste Facilities Handbook
- MWPS6, Beef Housing and Equipment Handbook

Use our feedback form for questions or comments about EQ378.

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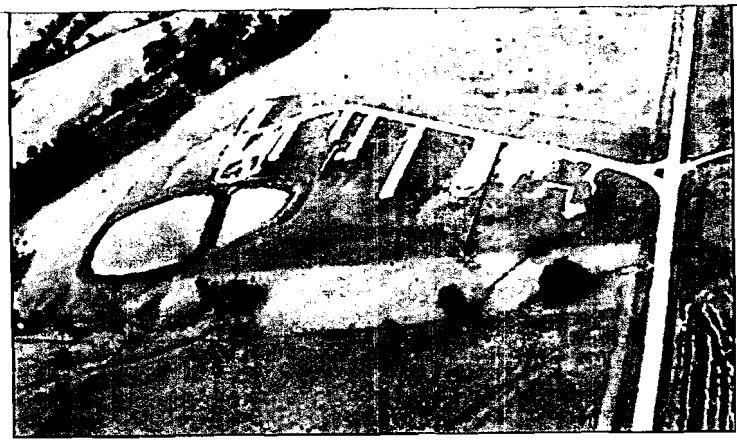

should be selected to minimize visual contact with neighbors and traffic and to separate odor-producing facilities from neighbors.

Biosecurity considerations should include isolation for incoming seedstock, proximity of neighboring livestock production units (especially for production of breeding stock), and, possibly, multiple-site production.

Very large livestock operations should be isolated from residential areas — such as villages and towns — by two miles or more, if possible.

## Space considerations

Plan for expansion 20 to 30 years into the future; consider doubling the size anticipated at present. Avoid locating facilities near property lines, streams, steep topography, porous geology, housing developments, public-use areas, or other features that will limit expansion. Additionally, buildings should be spaced at least 50 feet apart (75 feet is better for firetrucks) to reduce the spread of fire. Naturally ventilated buildings may need to be from 50 to 200 feet apart in the north-south direction for optimum summer airflow (Figure 2). Considerable space may be needed for isolating incoming traffic from the animal areas to prevent the spreading of diseases that may be brought in from the outside. The minimum radius for driveways used by semitrailers is approximately 55 feet.

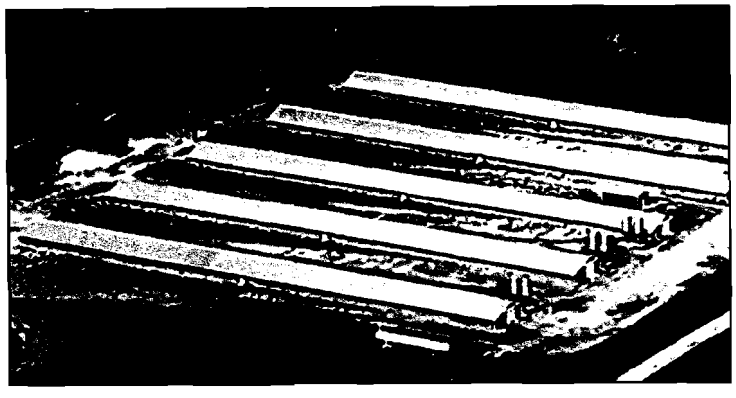

**Figure 2**
The naturally ventilated livestock buildings at this facility are spaced to allow for summertime air flow.

## Proximity of neighbors

Avoid placing livestock facilities near existing (or future) "non-owned residences" (residences not owned by the owners of the animal feeding operation), especially clusters of homes, built-up areas and parks. Preferably, livestock facilities should be out of your neighbors' sight. Consider having a tree windbreak or other visual barrier to shield the operation. Depending on the size of the facility, the minimum distance from non-owned residences should be from 1,000 to 3,000 feet, although this is no guarantee of immunity from complaints. A separation of at least a mile may be needed between large livestock operations and non-owned residences, depending on such considerations as topography and prevailing wind direction.

## Classification of animal feeding operations

The state of Missouri has passed an environmental law that establishes four classes of concentrated animal feeding operations (CAFOs) with buffer distances for each class, based on the number of animals that will occupy the operation (Table 1). These distances are for design and construction of new or modified concentrated animal feeding operations and are the minimum buffer distances required between the nearest confinement building or lagoon and any public building or occupied residence.

**Table 1**
Animal unit, size classification, buffer distances and permit requirements (permits required for all Class I CAFOs)

Shallow bedrock creates problems in the installation of underground utilities such as water, gas, or electric lines and may preclude the use of earthen storages for water or manure. A few hours of investigation with a backhoe or a drilling rig may be necessary to properly evaluate a site. All operations seeking a permit or a letter of approval must obtain a geologic evaluation of the site if an earthen manure storage is planned. A geologic evaluation of the site for any earthen manure storage is recommended. This service is provided by the Division of Geology and Land Survey, Missouri Department of Natural Resources, 573-368-2100.

## Streams and watercourses

Livestock facilities, especially open lots, should not be located close to streams and watercourses or on steep land along these areas. Runoff should be contained and applied to a soil/plant filter. Pastured livestock should be fenced out of streams along with a 50- to 300-foot wide grass, forest (or combination) filter strip. Limited access to the stream may be an alternative watering source for livestock

## Drainage

Good surface and subsurface drainage around livestock facilities is important, but polluted water must not leave the premises or enter the groundwater (Figure 3). Avoid building in a poorly drained site, on a flood plain or on sites with seeps, springs or a high water table.

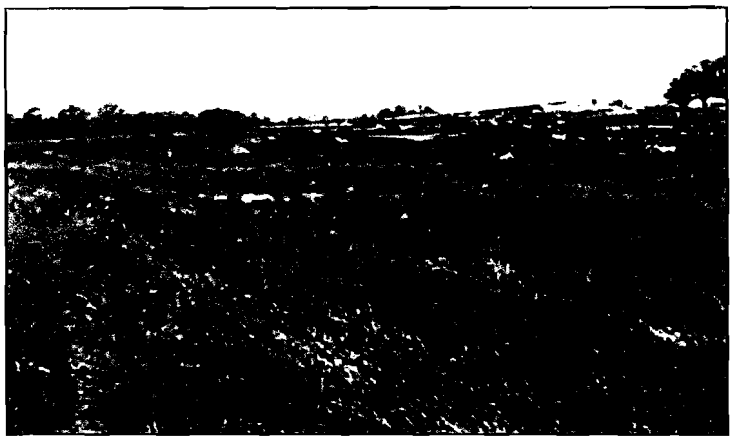

**Figure 3**
Open-lot systems should be located on well-drained sites and runoff should be controlled.

Dick Lee photo

Animal manure storage structures must be located above the 25-year flood level. The U.S. Army Corps of Engineers can supply data on 25-year flood levels. Additionally, the bottom of the storage structure must be located at least four feet above the water table.

Slopes of 2 to 5 percent will usually provide surface drainage without erosion, depending on the soil type. A 5 percent minimum slope away from building foundations is recommended, and south slopes are preferred for livestock feeding areas. Buildings built on high ground can take advantage of natural slopes for drainage and to obtain a 2 percent minimum slope on conduits to lagoons. On slopes it may be necessary to divert surface runoff from facilities. It is advisable to build roads along ridges to take advantage of drainage and reduce snow drifts.

## Accessibility

A livestock operation should have good access to markets, preferably by means of state-maintained, hard-surfaced highways with bridges permitting large trucks. Prompt snow removal is important. Avoid sites where the cost of constructing and maintaining the road from the livestock operation to the public road will be excessive because of distance, required bridges, snow drifting or other topographical or soils problems. This cost may be balanced against the need to provide setback or separation distance between the operation and potential odor receptors.

## Utilities

### Water

A year-round supply of water is essential for the animals, sanitation, workers and residences and fire protection. Water may be needed for animal manure dilution and flush-cleaning facilities. Public

Reviewed January 2009

**EQ378, Selecting a Site for Livestock and Poultry Operations**

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# Selecting a Site for Livestock and Poultry Operations



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**Department of Biological and Agricultural Engineering**

The first factor to consider in selecting a site for an animal feeding operation is state and local permitting requirements and ordinances. Consult local health and regulatory authorities and have all plans approved before constructing any manure handling system. Contact the Technical Assistance Program (TAP) at the Missouri Department of Natural Resources at 800-361-4TAP for information regarding permits. For assistance in planning manure management systems, see your local MU Extension center or the Natural Resources Conservation Service (NRCS). Consider seeking professional assistance for selection of a site for an animal feeding operation.

Other factors to consider in selecting a site for a new or expanded livestock operation include the following:

- Distance to neighboring residences
- Direction of prevailing winds in relation to neighbors
- An adequate source of water
- Access to land for manure application
- Topography
- Soil type
- Proximity to surface water bodies, sinkholes and flood plains
- Depth to groundwater

Likelihood of odor complaints by neighbors may be a major deterrent to siting large livestock operations in many locations.

Determine the attitude of neighbors toward a new or expanded livestock operation at the site you are considering. Documenting that adequate consideration has been given to siting the livestock operation in an environmentally responsible manner may help if litigation occurs.

Odors are inherent in livestock operations, especially when manure is being applied to the land. The larger the livestock operation, the more important it is to plan, design, construct and operate the facility in a manner that will minimize off-site (and on-site) odors. It is important to control sufficient land to provide an adequate buffer between neighbors and the more odoriferous locations at the livestock facility (Figure 1). Odors from large livestock production units may be noticeable a few miles away.

**Figure 1**
A livestock feeding operation site