

Boone County Fairgrounds— Site and Space Analysis



Prepared by: The Department of Parks, Recreation and Tourism
University of Missouri - Columbia
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Disclaimer

The accuracy of data collected using Global Position System technology is within the specified contract parameter of ten meters. Every effort was made to ensure the correctness and future viability of the data. All data collected from the GPS unit has been corrected to meet the established parameters.

Some data was collected after lines had been located underground by SM&P the local cable locating service representing the Ameren UE (gas) and Verizon (telephone). Maps are attached for Ameren UE but Verizon did not provide maps. On-sight locators physically located all lines within the fairground property boundary. After the lines were located GPS data collection followed to establish a permanent record of their location.

Boone Electric Cooperative (BEC) provided both a map (attached) and GPS locations of all transformers, recreational vehicle (RV) hookups, and underground lines. Underground lines were also located either visually by observing the ditch line, (disturbed area) or using triangulation based on known points and the required straight lines to connect the points. Some RV hookups were not in the original plans provided by BEC and were located visually and recorded using GPS. The lines that feed the RV hookups were and remain the most difficult to locate. These were recorded based on input from Elra Sapp and others. Some RV hookups have been disabled from their original installation. Others have been modified since the original installation.

The city of Columbia provided the physical location of all underground water lines and marked and flagged them where necessary. After the lines were located GPS data collection followed to establish a permanent record of their location.

Sewer lines were located using a visual approach and then verified by Elra Sapp, the contractor that was on-sight during the initial construction. All sewer manholes were physically located throughout all county owned parcels.

All utilities that service the jail, Reality House and the Juvenile Justice Center were located to the security fence only. No access beyond those points was acquired. Locations of utilities within those security fences are based upon aerial images that show disturbances of the soil along lines entering the facilities.

History

The Boone County Fairgrounds, located at 5212 N. Oakland Gravel Road in Boone County, Missouri, now occurs between tall grass prairie on the west and forested prairie-savannas to the east. The land is seen as rolling - hilly and its parent material consists of loess and glacial till. The earliest documented landowners used the land for row crops and livestock raising, with wagon roads extended along the west and the Wabash Railroad bordered on the east. In the southwest corner of the property sits the O'Rear cemetery. This family owned the land from the late 1800's until the turn of the 20th century (Missouri Historical Society). The cemetery, originally located in the center of the property, was moved for the building of the fairgrounds. John H.H. Maxwell worked the land as a dairy farm until 1971. While Maxwell owned the land the regional airport moved on to a portion of the property. In 1952 construction went up for the E.W. "Cotton" Woods Memorial Airport. The airport operated until 1959 (Boone County Record of Deeds 2000), when it could no longer meet FAA requirements for runway length. Then the Aero Industrial Enterprises had possession from 1973 until the late 1980's. After selling his property, Mr. Maxwell resided on the property with a house on the north central portion off of Oakland Gravel Road. The zoning remained agricultural until the arrival of the Fairgrounds.

Boone County fair originated in 1835 in the eastern suburbs of Columbia. Now, 165 years old, it is the oldest fair west of the Mississippi (Harris, 1999). The Boone County Agricultural and Mechanical Society (established in May 1948) owned and operated the fairgrounds on Clinkscales Road and when the Society decided to move the fairgrounds to a larger site the Boone County Fair Board Inc. was

established in order to purchase the larger site. To buy the property for the new site, the Society worked out a trade with the owners of the new site (Vicky Shy Realtors). The Clinkscapes property was traded for the Oakland Gravel property plus \$250,000 in 1991. This made the Boone County Fair Board Inc. a year round operator of the Oakland Gravel property. In order to host year round activities, improvements needed to take place on the Oakland Gravel site. The Fair Board borrowed \$2.3 million from First National Bank to build the Coliseum and make improvements on other buildings for the increase in traffic. Boone Electric Corporation also made a one-time investment of \$200,000 in air-conditioning and heating improvements in the Coliseum for a 50-year lease which grants the company six free days of use per year (Harris, 1999).

These loans along with operating costs, maintenance costs, and a \$600 per day interest rate, led the Society into financial trouble. So that in May of 1999, with a \$2.6 million debt, the bank was ready to foreclose (Harris, 1999). The Boone County Commission saw the location as a valuable addition to the county. The Commission was prepared to purchase the site using \$800,000 from the general revenue fund and \$2 million from the Boone Hospital Center profits (Klepper 1999). The end purchase price was \$2.6 million. Sixty-five acres of this land is zoned as commercial use and the other 160 acres are as yet undecided on future plans.

Buildings

There are a number of structures (21) within the Boone County Fairgrounds. Many are special purpose type buildings in that they are used on a limited basis throughout the year. Several are related to livestock housing and show (9). Three buildings support the Special Events Track as restrooms and concessions. There are four buildings used specifically as equine stables. Four buildings provide concessions during the fair week. Some buildings are remnants of the Cottonwoods Airpark and are not integral to the operations of the fairground property. For example, the main hanger and office area provide storage for a variety of items including an old car, trailer and during the period of this study, a dog pen. Much of the interior is poorly maintained. In addition, the hangers located near the Cottonwoods RV Park are also poorly maintained, but do store some items germane to the operation of the fair. A portion of these hangers housed the old fairground office. This area is now an office for Balloon Stormers. Cottonwoods RV Park rents the southern section of the building as a meeting room. The multi-purpose coliseum, however, provides use opportunities on a regular schedule most weekends during the year. We have provided building sizes and square footages.

All buildings for the surveyed area were visually located and digitized using aerial images. Building lengths and widths were collected from previous building inventories. Heights were determined from two-foot intervals from the ground to the roof peak. These figures are included in the data files associated with the building of a Geographic Information Systems (GIS) layer. The data file also contains a Global Positioning System (GPS) generated corner for each building to verify the location.

Boone County Fairgrounds – Site and Space Analysis

Within the fairground area, buildings account for roughly four percent of the total acreage. Only permanent buildings were included.

Building Descriptions

Horse barns (4):	3 @ 60 ft x 120 ft 1 @ 72 ft x 120 ft Each with 56, 1-2 equine stalls ADA accessible: NO
Cow Palace:	60 ft x 120 ft ADA accessible: NO
Show Palace:	ADA accessible: NO
Sheep Shelter:	72 ft x 120 ft ADA accessible: NO
Hog Shelter-	60 ft x 120 ft ADA accessible: NO
Outside Arena:	150 ft x 100 ft 13 bleachers holding 300 people each General use: the rodeo ADA accessible: NO
Coliseum:	Total area: 88,000 square feet Amenities: heated dirt arena (115'x235'), 2 restrooms with showers, 5 public telephones, sound room, gift shop, concession stand, main office, show office, storage, a 22,000 sq.ft. multipurpose room facility is available for activities such as animal, antique, craft and gun shows, and concerts. ADA accessible: NO
4-H Foundation:	60 ft x 120 ft General Use: ADA accessible: NO
FFA Building:	58 ft x 71 ft General use: FFA storage ADA accessible: NO

Boone County Fairgrounds – Site and Space Analysis

Sunrise Optimist (2):	24 ft x 40 ft General Use: concession stand ADA accessible: NO
Midway Optimist:	24 ft x 40 ft General Use: concession stand ADA accessible: NO
Elks Concession:	Total Area: 30 ft x 50 ft General Use: concession ADA accessible: NO
General Concession:	Total Area: 30 ft x 50 ft ADA accessible: NO
Pork Producers:	Total Area: 30 ft x 50 ft General Use: concession stand ADA accessible: NO
Grandstands:	Total Area: 150 ft x 400 ft 2,400 person capacity Multiple use ADA accessible: NO
Shop/Helicopter Bldg:	100 ft x 120 ft General Use: general storage ADA accessible: NO
Shower House:	30 ft x 50 ft Amenities: 3 showers ADA accessible: NO
Restrooms (2):	24 ft x 40 ft Amenities: ADA accessible: NO
Hangar:	60ftx350ft General Use: storage and rental use ADA accessible: NO
MFA Building:	75 ft x 220 ft General Use: ADA accessible: NO

Boone County Fairgrounds – Site and Space Analysis

Managers Residence: Double-wide trailer home
General use: Housing
ADA accessible: NO

Source: Personal Communication with George Harris, Fairgrounds Manager
April, 2000

Buildings



Structures were constructed using GPS receivers and GIS digitizing
Dimensions of the buildings are located in the preceding document

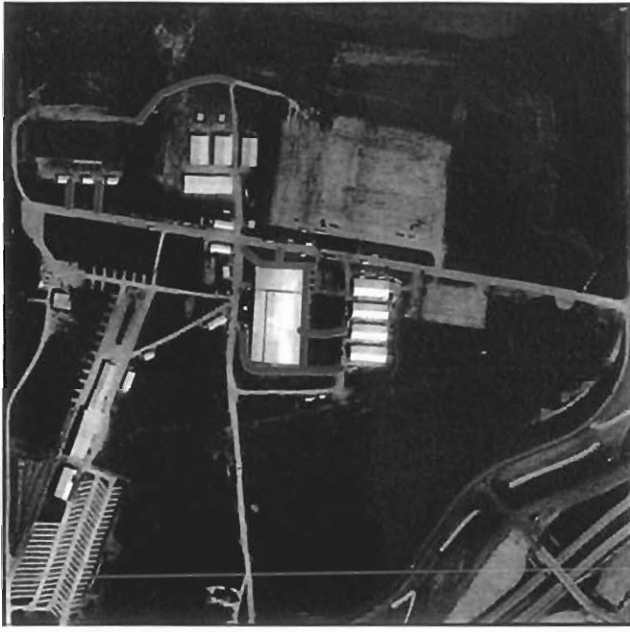
Roads, Walkways, Sidewalks, Paths and Parking

The roadways, sidewalks and paths in all of the surveyed areas were visually located and recorded. The surface types were also visually verified. The data tables associated with the roads and walkway files contain the description of each surface. The roadways comprise roughly six percent of the acreage within the fairgrounds area. The sidewalks and pathways only figure to be roughly four tenths of a percent of the fairgrounds total acreage. Acreages and percentages were determined using a variety of spatial analysis techniques.

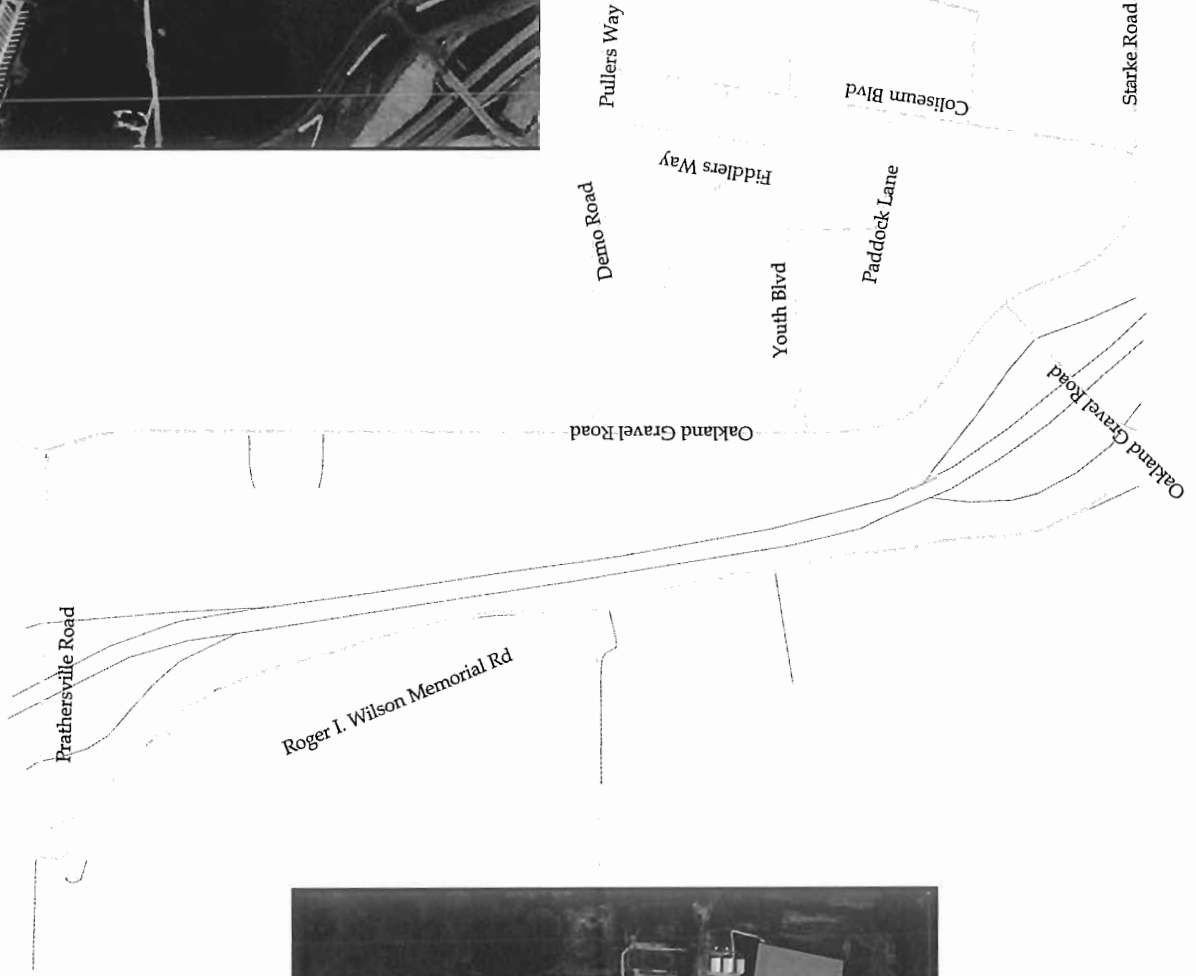
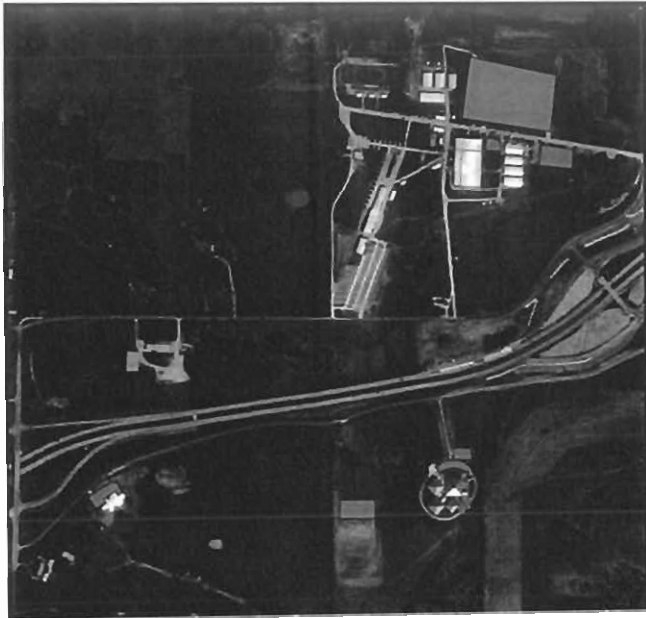
The parking lots were all located visually and then digitized. They are within the ten-meter accuracy. Only three percent of the ten acres of parking in the fairgrounds area is asphalt. The remaining ninety seven percent is a gravel/grass surface. Overall, parking takes up roughly seven percent of the fairground's one hundred and forty-one acre. Grass over-flow parking is not included in these figures

Transportation Routes

Walkways



Parking



Aboveground Electric

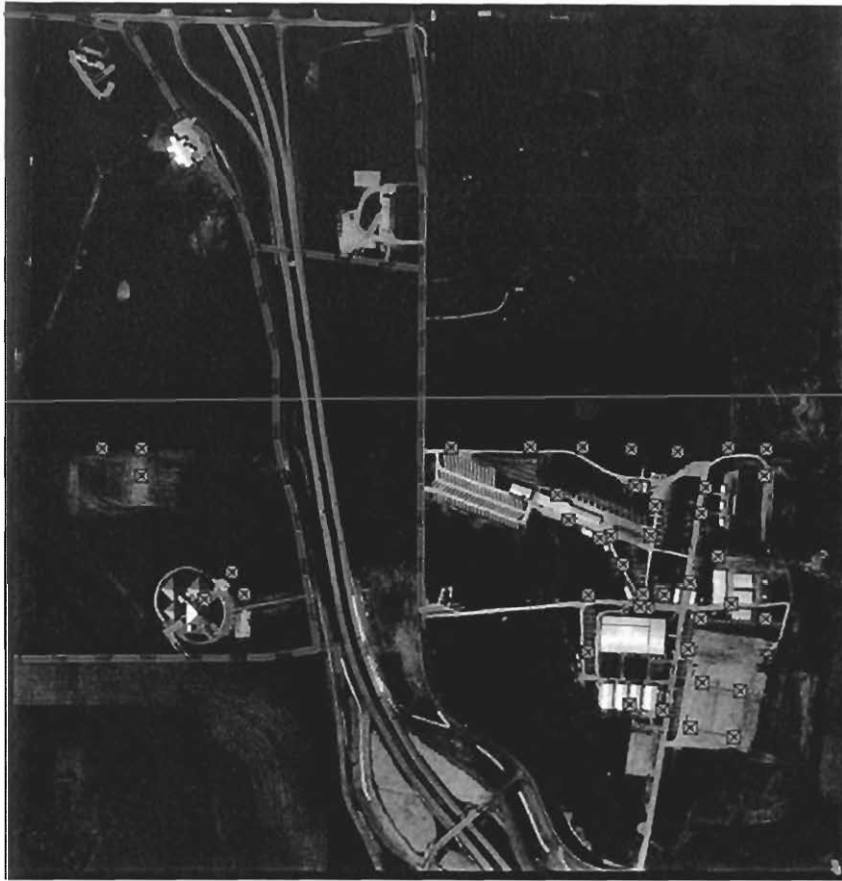
All existing overhead electrical lines were visually located and verified. The majority of these locations occur south of Highway 63. Few overhead utility lines exist on the fairground property. Lines that attach to the buildings are secondary lines. The lines that cross Highway 63 east of the Boone County Maintenance facility intersect lines that run along Roger Wilson Memorial Drive. These are referred to, as are primary lines.

Within the fairground property there are very few overhead utility lines. The line located to the east of the outdoor arena was placed after an underground electric line failed. Another line runs from the Coliseum to the Optimist concession and then to the Show Palace. Within that overhead lines are telephone connections for the Optimist concession and communication cable (speakers) for the Show Palace. From the Optimist concession to the Show Palace the line run underground.

The only other line located above ground is from the old fairgrounds office to a pole located west of the Coliseum. This line is not in operation and was placed for use during the National Balloon Festival.

The lighting in the area was also located by visual inspection. For the most part, the lighting is standard street type light poles/fixtures. Within the fairgrounds the lighting varies to provide lighting in the parking lot and stadium lighting.

Aboveground Electric



High Voltage Transformers



Primary Lines



Secondary Lines



Trailer Connections



Electric Poles



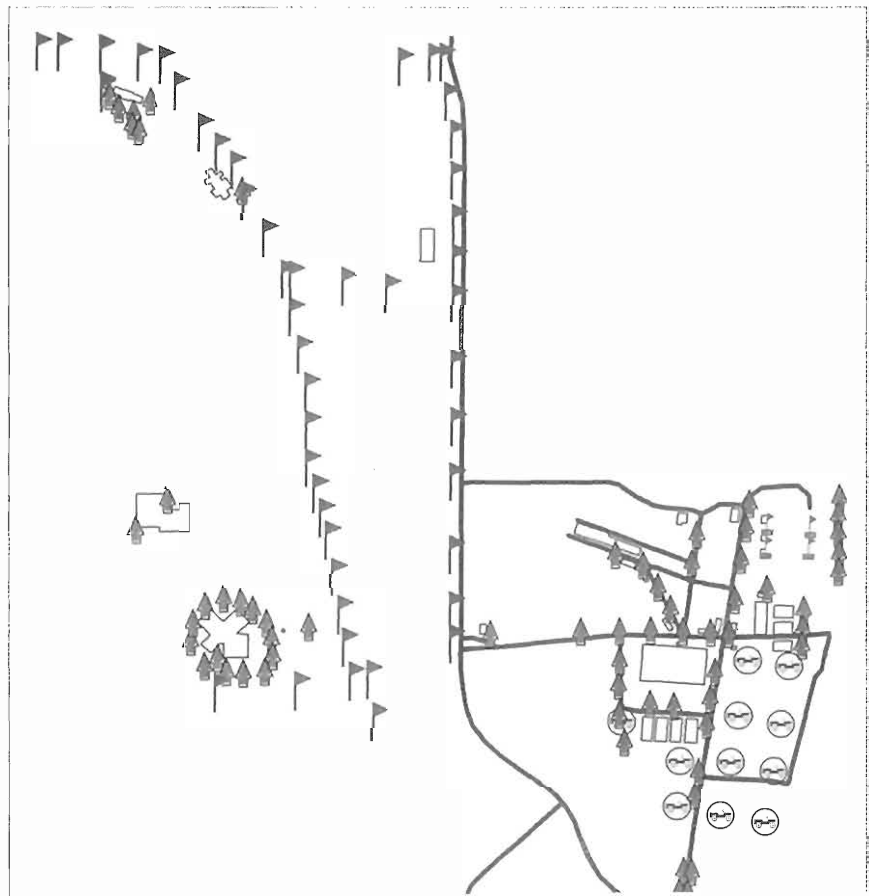
General Lighting



Parking Lights



Stadium Lighting



Underground Electric

The underground electrical lines within the fairground property represent the largest encumbrance of open space. The placement of underground utilities from a visual viewpoint is a benefit. The negative for this site is any development that may occur in the future could impact existing underground electric utilities. In some areas there are underground electric lines that feed light poles as secondary services that are in close proximity to primary lines. This congestion increases the difficulty of any development near these lines. The RV hook-ups also consume a considerable portion of the largest parking lot and any open space west of the coliseum. Generally, the only areas that are not crisscrossed by underground electric lines are the areas south of Bear Creek, north of the livestock barns and north of the parking lot.

Boone Electric Cooperative (BEC) provided both a map (attached) and GPS locations of all transformers and poles, but provided a map only for underground lines. Underground lines were located either visually by observing the ditch line (disturbed area) or using triangulation based on known points and the required straight lines to connect the points.

Boone Electric Cooperative also assisted with locating and verifying the recreational vehicle (RV) hookups. Some RV hookups were not in the original plans provided by BEC and were located and recorded using GPS. The lines that feed the RV hookups were and remain the most difficult to locate. These were recorded based on input from Elra Sapp and others. Some RV hookups have been disabled from their original installation. Others have been modified since the original installation.

Boone County Fairground – Site and Space Analysis

The ground source heat pump loops were also located on the maps provided by the Boone County Electric Cooperative. Using computer-generated points, the location of the ground source heat pump is provided. It was not possible to visually locate the location of the loops.

Underground Electric



Primary Lines

Secondary Lines

Ground Source Heat Pump



Boone County Electric Cooperative assisted in locating all underground sources.

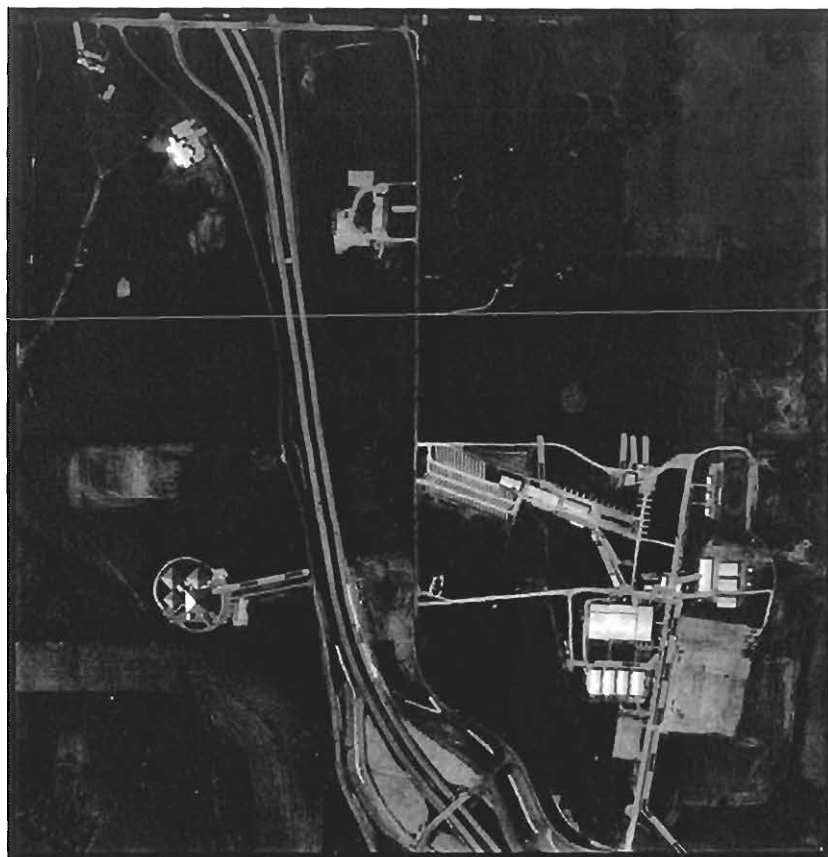
Overhead Telephone Lines

The overhead telephone lines were visually located. The overhead lines are the only three overhead utilities in the fairgrounds area. They were installed for communication purposes within the fairgrounds. The northwestern line is currently abandoned. All three lines are within ten-meter accuracy.

Underground Telephone Lines

Underground telephone lines were identified after meeting with Verizon officials and reviewing their maps. These maps are not available for distribution and therefore are not included as an attachment. Again, SM&P provided the physical location of all the underground telephone lines. Immediately afterwards, the lines were logged using GPS receivers and recorded for permanent storage. Large cables (multiple pairs) were also located based on utility pedestals. Much of the telephone service comes from the western edge of the fairground property. For properties south of Highway 63, the telephone cables lay along the southern edge of Roger Wilson Memorial Drive. All buildings on those county parcels are serviced with underground telephone cable.

Telephone Lines



Overhead

Underground



Water Sources

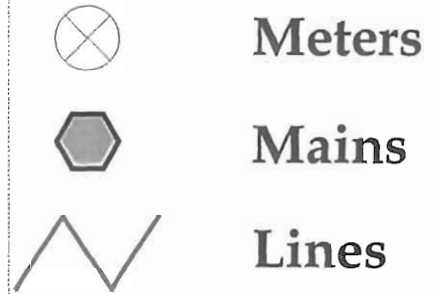
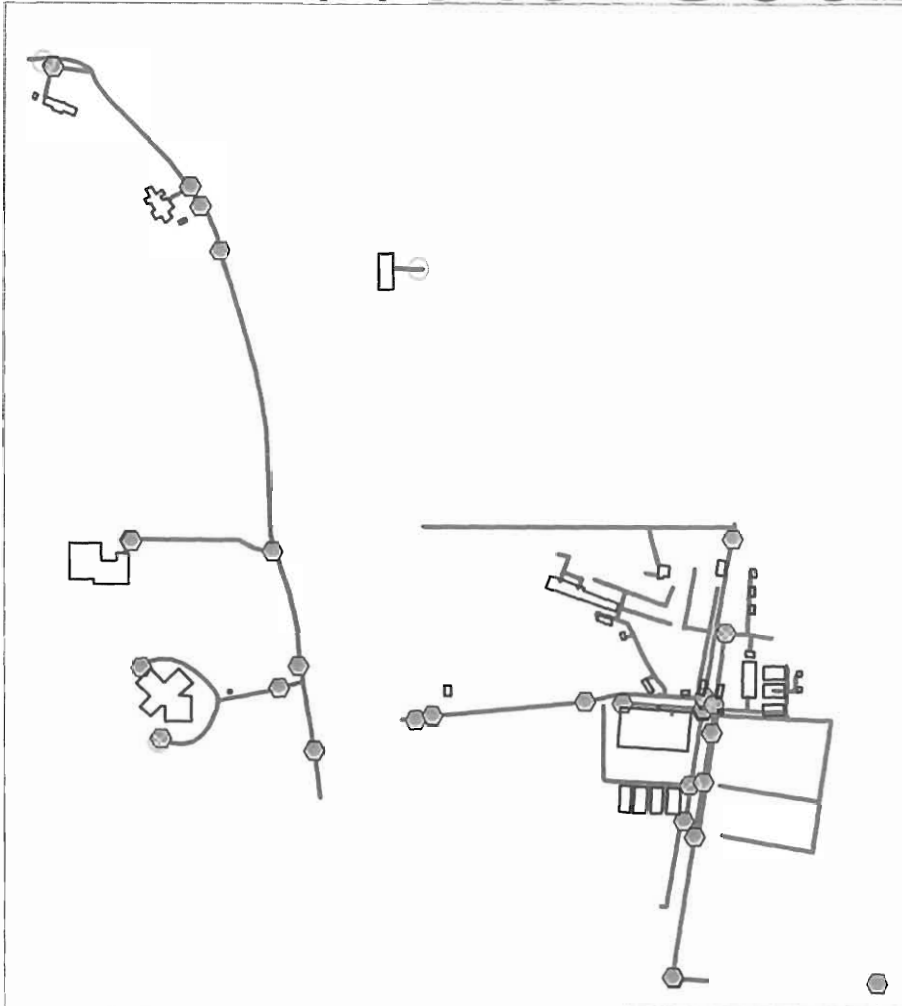
Water lines within the fairground property are under the jurisdiction of the City of Columbia. With their help the water lines were located. Two lines feed the fairground. One enters from the west along the southern edge of the main drive (Coliseum Boulevard) and the other is along the western edge of the gravel service road that exits south of the fairgrounds.

The property is divided into four quadrants for distribution of water. The intersection of this quadrant is the main road and the north south gravel road to the livestock barns. Each quadrant has a 2” meter that is surrounded by a steel guardrail. The northwest quadrant has a meter located just south of the Youth Building (Shower house) that provides water for the Special Events Arena and associated concession buildings, restrooms and the Youth building. A meter located just south of the Helen Beckett 4-H Foundation building serves the northeast quadrant. This meter provides water to the Show Palace (disconnected and buried), the livestock barn and the wash-down area. This meter also provides the water to all the RV hookups in the main parking lot. A meter located just north of the equine stables services the southeast quadrant. This meter provides water for the stables and the tank fill valve located just south of the stables. The last meter is located in front of the Pork Producers concession. This meter provides the greatest share of water to the fairground property. The Coliseum and all buildings west of the coliseum are serviced from this line.

Water for the old hanger and airpark office comes from the property line to the west. The water for the old fairground office and the hanger comes from a line located on the Cottonwoods RV park property.

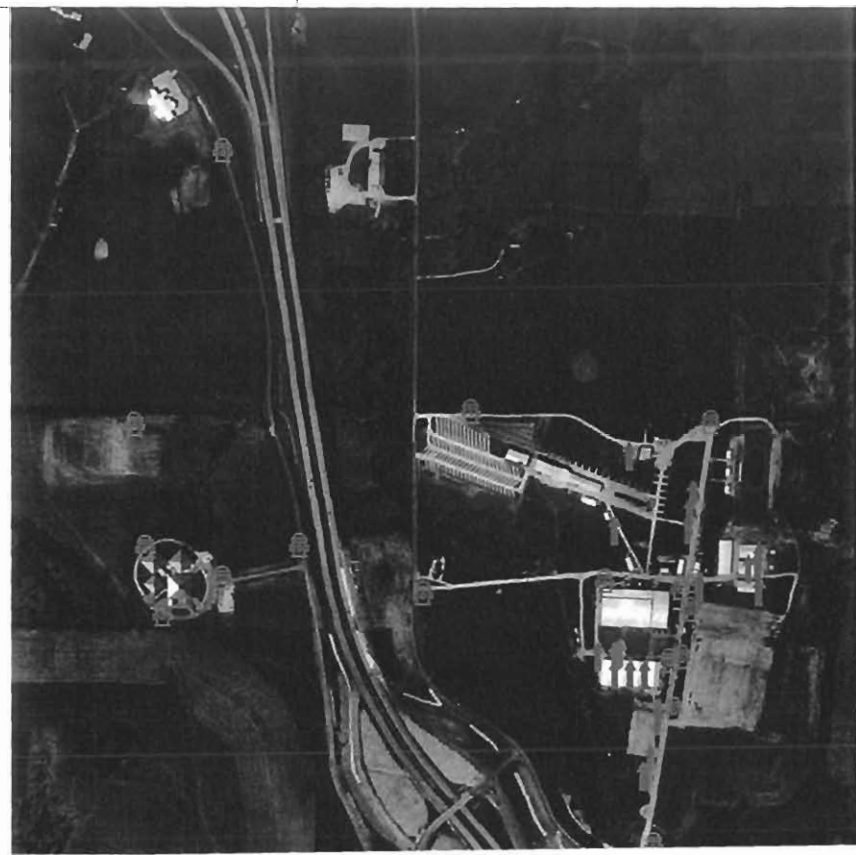
All water spigots, fire hydrants and water valves are also located and provided for permanent record.

Water Sources



↑ Freeze Proof Spigots

🔧 Fire Hydrants



Sewer Lines and Drainage

The sewer lines were located by maps and information provided by the Boone County Regional Sewer District, the City of Columbia and Elra Sapp. Sewer mains were located visually and by locating the sewer manholes and identifying the routes that connect the manholes. Most of the lines had some type of disturbance of the soil overhead and were not difficult to locate. Others required our asking the original contractor to come on site and make the location for us.

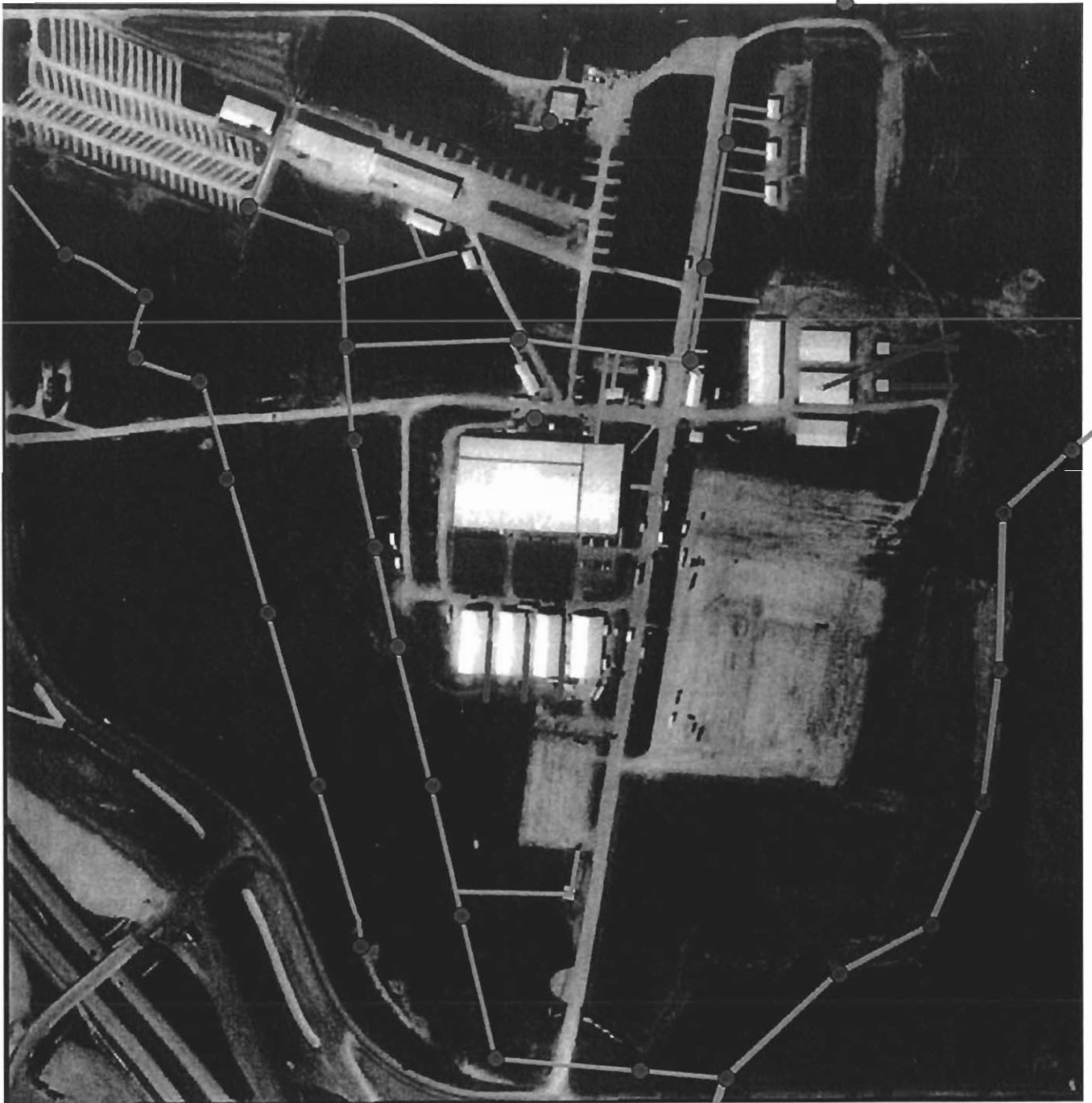
Lateral connections to buildings from the main sewer lines were more difficult to locate. Some laterals were visually located, but others required a determination of the most obvious route to the building. The only buildings that were unclear even after having the original contractor on site were the Elks concession and the southernmost restroom building near the Elks concession. Most buildings have some type of clean-out near the building that identified the placement of the sewer. Other buildings required our entry to determine the likely point of entry for the sewer lateral.

Second, only to the underground electric, the sewer lines encumber a considerable portion of the property by a sectional transverse of the three largest open areas of the fairgrounds. There are sewer lines located north of the parking lot across the rugby field, south of Bear creek through the open space between the creek and Oakland Gravel road and east of the Cottonwoods RV Park. The latter, transverses northeast across the open space southwest of the Coliseum, and then across the service road toward Starke Lane immediately south of the Coliseum. From an open space perspective, few areas exist that are not encumbered by one or another form of underground utility. As is the case with

underground electric lines, any development over these sewer lines may require relocation at substantial expense.

In several places there are also drainage lines that are not attached to any sewer line. These are located north of the livestock barns as an animal wash-dawn area and east of the stables. Three lines exit between the stable buildings and flow upon the ground. These locations were determined visually by noting the point at which the water ran out of the pipes. This wastewater eventually enters Bear creek.

Sewer & Drainage



 ManHole Covers

 Sewer Lines

 Washing Stations

 Gravity Fed
Drainage

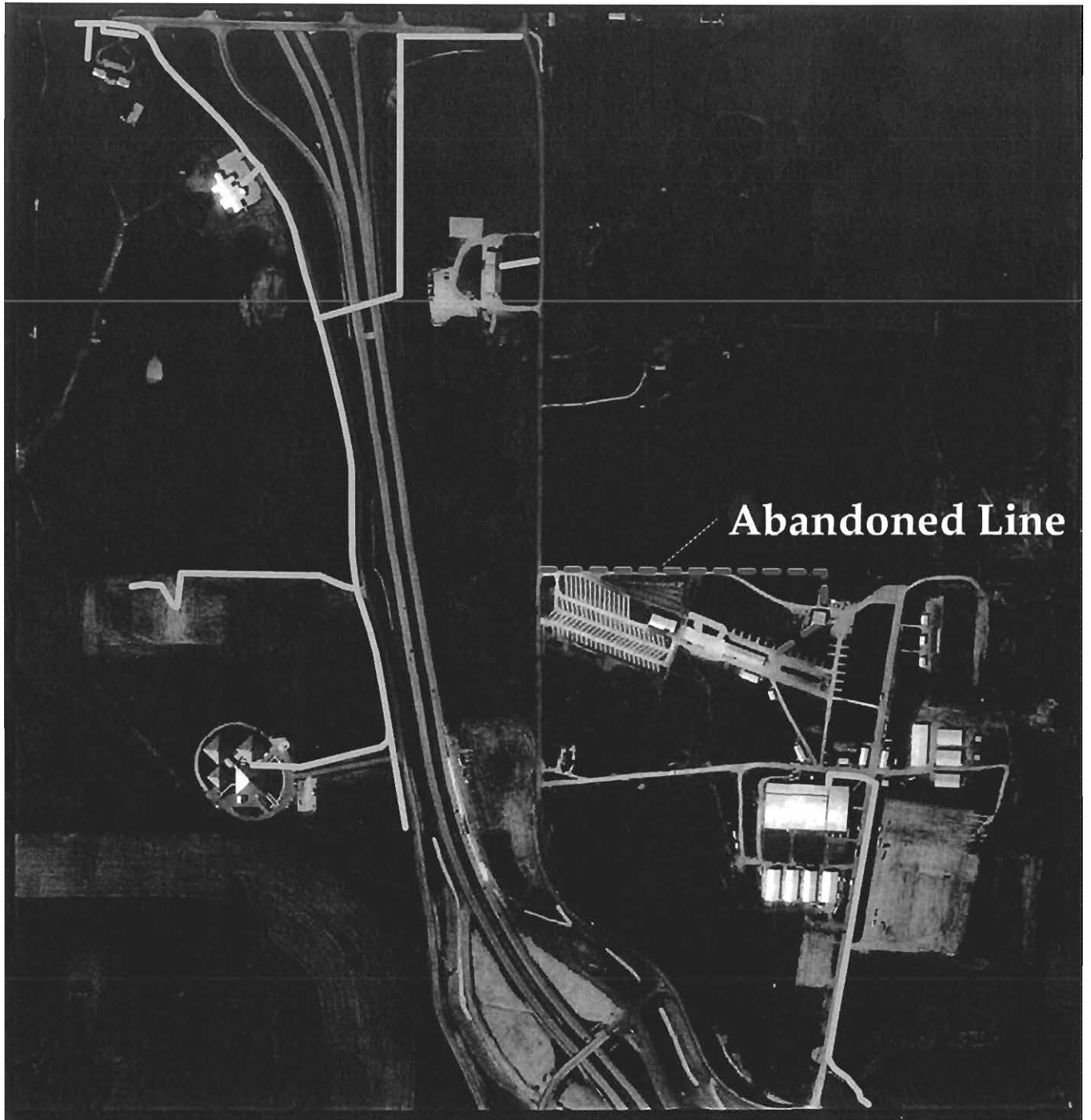


Gas Lines

Gas lines were located and verified by SM & P using electronic underground sensing equipment. Ameren UE was contacted and actual installation drawings are provided as attachments. From the installation drawings, SM&P located the underground gas line. Global Positioning System data for the gas lines was collected and recorded for permanent storage. The fairground property has only one gas service and that is for the Coliseum. An additional liquid petroleum (LP) tank is located west of the coliseum. The use of and reason for placing two different types of gas in the same building is unknown.

Gas lines are also located along the western edge of the property. The old hanger has been disconnected from gas service. The hanger has a line that runs toward the new buildings, but it was disconnected when electric lines were installed. Two lines run from the Cottonwoods RV Park and are routed behind the new buildings. One line was for a corporate hanger that has been abandoned and the other line services the southern portion of the building rented to Cottonwoods RV Park.

Gas Lines



All lines were located with the help of SM&P. As indicated lines by the old Cotton Woods hanger are abandoned.

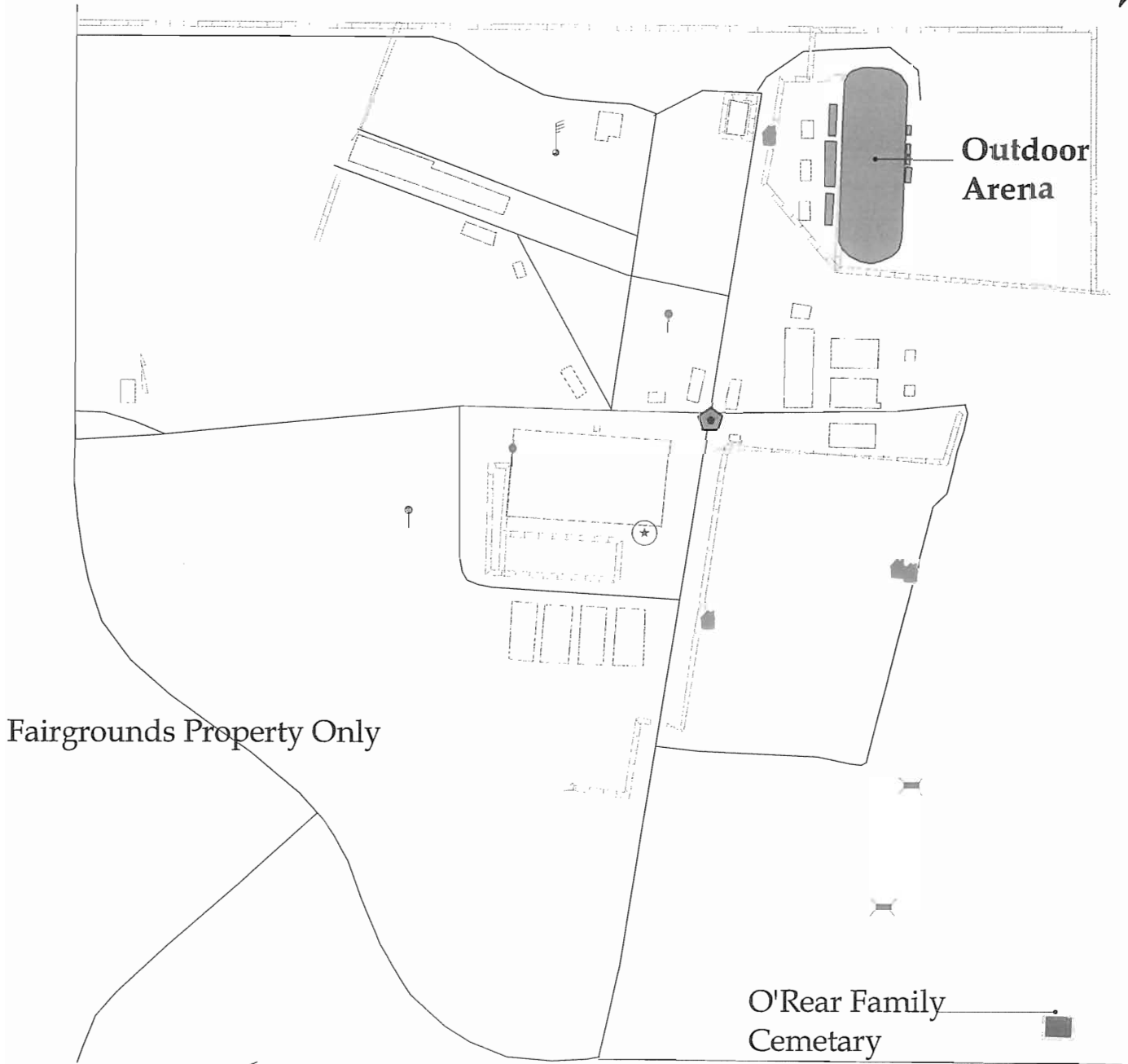








Fire District & Miscellaneous Points

The Boone County Volunteer Fire Department is responsible for the said tracts of land in this site analysis. Fairgrounds, Jail, Juvenile Justice, Reality House and Armory all fall into the county fire district. The address for Station 5 is 1675 Prathersville Road, Columbia, MO 65202. A visual layer will be provided in the GIS/ArcView program.

Other categories important to the site analysis, but not in any groups of layouts include a flagpole, propane tanks, a spot light tower, ticket booths, etc. This layout also includes the O’Rear family cemetery and fence lines in the area.

Miscellaneous Fixtures



-  **Flag Pole**
-  **Ticket Booths**
-  **Rugby Goal Posts**
-  **Satelite Dish**
-  **Gazebo**
-  **Speakers**
-  **Fencing**

The Fairgrounds, Reality House, Juvenile Justice Center, National Guard Armory, and the Boone County Jail are all within the responsibility of the Boone County Fire District. The nearest station is on Prathersville Rd. Information received by Jeff Scott of the Boone County Fire Department.



Vegetation Inventory

(Note – this information is reproduced from documents prepared for the county in 2000 and include portions of the Atkins and Newton tracts.)

A forest inventory was conducted to determine tree species and relative density of the forested portions within the boundaries of the Boone County Fairgrounds and associated tracts of land. A total of 43.4 acres of the fairgrounds are forested. The following inventory methods were used to inventory timber resources on the fairground.

- 1) The Boone County fairgrounds were divided into two stands: Bear Creek, Hinkson Creek.
- 2) The forest inventory was conducted using a 100 percent tally system. This system recorded the count of every tree that was at least 4 inches in diameter at breast height (4.5 feet). The inventory concluded when the foresters conducting the inventory were confident the composition of the stand was sufficiently represented. Therefore, not every tree was counted within the fairgrounds.

Relative density was estimated for each species by dividing the number of individuals of one species by the total number of individuals of all species. The forest along Bear Creek is comprised of tree species commonly found in Missouri floodplains. The most abundant tree species include river birch (*Betula nigra*-34% relative density), green ash (*Fraxinus pennsylvanica*- 15%), and sugar maple (*Acer saccharum*-13%). Woody species found in the floodplain included hackberry (*Celtis occidentalis*-30% relative density), shingle oak (*Quercus imbricaria*-27%), American elm (*Ulmus americana*-12%), and silver maple (*Acer saccharinum*-9%). The southern half of the Adkins tract is comprised of eastern red cedar (*Juniperus virginiana*-23%), hackberry (6%), and black locust (*Robinia pseudoacacia*-6%). The northern half of the Adkins tract is comprised of hackberry (22%),

northern red oak (*Quercus rubra*- 12%), white ash (*Fraxinus americana*- 11%), and American elm (10%). The remaining species were primarily oaks (*Quercus spp*). The Newton tract contained honey locust (*Gleditsia triacanthos* 29%), osage orange (*Maclura pomifera*-25%), sycamore (*Platanus occidentalis*- 15%) and eastern red cedar. The forest inventory analysis in Appendix C depicts the results in charts segregated by stand location in order of relative density.

Appendix C. Forest Inventory

Note: The following data are sorted in order of relative density.

Stand A –Eastern Tributary of Bear Creek

Common name	Scientific name	Count	Relative density
River birch	<i>Betula nigra</i>	70	34.1%
Green ash	<i>Fraxinus pennsylvanica</i>	31	15.1%
Sugar maple	<i>Acer saccharum</i>	27	13.2%
Northern catalpa	<i>Catalpa speciosa</i>	23	11.2%
American elm	<i>Ulmus americana</i>	15	7.3%
Eastern Red cedar	<i>Juniperus virginiana</i>	8	3.9%
Sycamore	<i>Platanus occidentalis</i>	6	2.9%
Honey locust	<i>Gleditsia triacanthos</i>	5	2.4%
Osage orange	<i>Maclura pomifera</i>	5	2.4%
Shingle oak	<i>Quercus imbricaria</i>	4	2.0%
Hackberry	<i>Celtis occidentalis</i>	4	2.0%
Black cherry	<i>Prunus serotina</i>	3	1.5%
Cottonwood	<i>Populus deltoides</i>	2	1.0%
Eastern redbud	<i>Cercis canadensis</i>	1	0.5%
Shagbark hickory	<i>Carya ovata</i>	1	0.5%
Total		205	100.0%

Stand B - Bear Creek Tributary

Common name	Scientific name	Count	Relative density
Hackberry	<i>Celtis occidentalis</i>	183	29.9%
Shingle oak	<i>Qercus imbricaria</i>	165	27.0%
American elm	<i>Ulmus americana</i>	75	12.3%
Silver maple	<i>Acer saccharinum</i>	54	8.8%
Black walnut	<i>Juglans nigra</i>	33	5.4%
Black cherry	<i>Prunus serotina</i>	20	3.3%
Bitternut hickory	<i>Carya cordiformis</i>	18	2.9%
Sycamore	<i>Platanus occidentalis</i>	15	2.5%
Honey locust	<i>Gleditsia triancanthos</i>	11	1.8%
Green ash	<i>Fracinus pennsylvanica</i>	10	1.6%
Chinkapin oak	<i>Quercus meuhlenbergii</i>	5	0.8%
Black locust	<i>Robinia pseudoacacia</i>	4	0.7%
Slippery elm	<i>Ulmus rubra</i>	4	0.7%
Cottonwood	<i>Populis deltoides</i>	3	0.5%
Sugarberry	<i>Celtis laevigata</i>	3	0.5%
Persimmon	<i>Diospnyos virginiana</i>	2	0.3%
Eastern Red cedar	<i>Juniperus virginiana</i>	2	0.3%
Eastern redbud	<i>Cercis canadensis</i>	1	0.2%
Shagbark hickory	<i>Carya ovata</i>	1	0.2%
Swamp white oak	<i>Quercus bicolor</i>	1	0.2%
Sugar maple	<i>Acer saccharum</i>	1	0.2%
Boxelder	<i>Acer negundo</i>	1	0.2%
	Total	612	100.0%

Plant Inventory

A list of grasses and legumes likely to be planted in a Missouri pasture was compiled (Barnes et al 1995), also, a list of broadleaf and grass weeds common to Missouri was obtained from the MU Agronomy Extension web page (Fishel 1997) (Appendix B). Species on both lists were marked as present when a specimen was positively identified. Data was randomly collected while surveying the property for other site analysis information. Emerging vegetative structures were used in identification as well as reproductive structures remaining from the last growing season.

Non-forested areas of the property currently used for the Boone County Fair and other events were mostly covered with tall fescue mowed during the growing season.

Weeds, forbs, and other grass species were also present.

Table 2: Grasses commonly found in Missouri pastures. Shading indicates positive identification of BCFG (Barnes et al 1995)

Grasses		
Scientific Name	Common Name	Comments
<i>Phleum pratense</i> L.	Timothy	cool season grass; not drought tolerant
<i>Bromus inermis</i>	Smooth Bromegrass	cool season grass
<i>Dactylis glomerata</i> L.	Orchard grass	cool season grass; perennial
<i>Phalaris arundinacea</i> Schreb	Reed Canarygrass	cool season grass; habitat is poorly drained sites; not for grazing
<i>Festuca arundinacea</i> Schreb	tall Fescue	cool season grass; perennial; forms dense sod; endophyte infected
<i>Poa pratensis</i> L.	Kentucky Bluegrass	cool season grass
<i>Andropogon gerardii</i> Vitman	Big Bluestem	native warm season grass
<i>Schizachyrium scoparium</i> (Michx.) Nash	Little Bluestem	native warm season grass
<i>Panicum virgatum</i> L.	Switchgrass	native warm season grass
<i>Sorghastrum nutans</i> (L.) Nash	Indiangrass	native warm season grass

LEGUMES		
Scientific Name	Common Name	Comments
<i>Trifolium pratense</i> L.	red clover	
<i>Trifolium repens</i> L.	white clover	habitat is moist soils
<i>Lotus Corniculatus</i>	birdsfoot trefoil	rhizobial and non-rhizobial varieties
<i>Kummerowia striata</i> (Thumb.) Schindler	annual lespedeza	warm season legume
<i>K. stipulacea</i> (Maxim.) Makino	Korean lespedeza	warm season legume
<i>Lepedeza cuneata</i> (Dum.-Cours.) G. Don	sericea lespedeza	warm season legume; perennial; does well on poor quality sites
<i>Medicago sativa</i> L.	alfalfa	warm season legume

Wildlife Inventory

The wildlife assessment of the Boone County Fairgrounds was conducted using scent stations, a Wildlife Habitat Appraisal Guide (WHAG), track identification in muddy areas on the property, and a list of possible species from the Missouri Fish and Wildlife Information Systems (MOFWIS) (Appendix C) (MDC 2000). Ten scent stations were set up using sooted, corrugated metal sheets and sooted tin foil strips placed in the bottom of wooden enclosures. We placed sardines on the metal to attract wildlife. The stations were placed in various areas around the property on February 19, 2000 between the hours of 1600 and 1730 (Figure 4). On February 20 between 1300 and 1500, the stations were collected. Three stations showed evidence of wildlife. The first set of tracks identified belonged to a woodchuck (*Marmota monax monax*), the second tracks were those of a Virginia opossum (*Didelphis virginiana virginiana*); the third station contained a shed snakeskin, and however the species of snake was unidentifiable. Tracks found in the mud near a pond showed evidence of raccoon (*Procyon lotor hirtus*), Canada geese (*Branta canadensis*), and white-tailed deer (*Odocoileus virginianus*). On these visits to the fairgrounds several animals were spotted as well. On February 19 eleven white tailed deer, one red fox (*Vulpes vulpesfulva*), and two mourning doves (*Zenaida macroura carolinensis*) were seen. On February 20 we saw five European starlings (*Sturnus vulgaris vulgaris*) and two dozen wild turkeys (*Meleagris gallopavo silvestris*) on the northeast corner. We found evidence of a beaver (*Castor canadensis carolinensis*) in Bear Creek near the Cottonwood RV Park, and evidence of an eastern cottontail rabbit (*Silvilagus floridanus alacer*) in an open field area. On February 21, around 7:00 am, we saw a northern cardinal (*Cardinalis cardinalis cardinalis*), a downy woodpecker

(*Picoides pubescens pubescens*), a blue jay (*Cyanocitta cristata cristata*), and a white-breasted nuthatch (*Sitta carolinensis carolinensis*).

The quality of wildlife habitat has been raised in the planning process of the Boone County Fairgrounds and the adjacent properties. Using WHAG we conducted a habitat appraisal of the area to better understand the quality of the habitat available for wildlife. This type of assessment is commonly used by the Missouri Department of Conservation and the Natural Resources Conservation Service. This assessment involves walking the area and breaking up the different habitat types into categories such as cropland or woodland. The WHAG process uses checklists which list different habitat characteristics needed by a particular species found in Missouri. Based on presence and abundance of habitat features, a numerical value is assigned. The sum of these numbers is divided by the maximum value. This value then gives a percentage that corresponds to a range designated to a habitat quality category. The habitat quality is then determined using four categories: Excellent 0.75-1.0, Good 0.50-0.75, Fair 0.25-0.50, and Poor 0-0.25.

Five species habitats were assessed in our site analysis (Figure 5). Habitat quality for white-tailed deer, eastern wild turkey, and fox squirrel were found to be good with WHAG values of .61, .52, and .53, respectively. Habitat quality for bobwhite quail and eastern gray squirrel was found to be fair with WHAG scores of .49 and .34 respectively.

To further support the habitat assessment, we used MOFWIS, which contains information on life history and distribution of Missouri's vertebrates. In addition, habitat associations were further identified and verified through the use of web resources and publication resources such as the Breeding Bird Atlas 1986-1992 (1997), Amphibians and Reptiles of Missouri (1997), Handbook of Amphibians and Reptiles of Kansas (1950),

represent the frequency of an occurrence. The larger numbers represent the higher frequency of an occurrence, while the smaller numbers represent a lesser frequency of an occurrence (MO GAP Analysis 1999).

Mammals:

Mammals found on the Boone County Fairgrounds are listed in Appendix A. They are typical species of Ozark borderlands comprised mainly of pasture, suburban landscape, and small stream woodlots. Most of the species are small mammals like mice, voles, and other rodents. There were also ten different species of bats that could be found on the property. Several species of note, including the Least Weasel, Meadow Vole, and both Indiana and Gray Bats (Federally Endangered) are possibly found on the fairgrounds.

Birds:

Over 100 species of birds could be found on the Boone County Fairgrounds and are listed in Appendix B. Several species of note include the Sharp Shinned Hawk, Cooper's Hawk, Bewick's Wren, and the Henslow's sparrow. These species are all listed as "State Rare" or on the Federal Watch list.

Reptiles:

The reptiles found on the Boone County Fairgrounds are listed in Appendix C. Twenty-six species of snakes are possibly found on the property along with various species of lizards and turtles.

Amphibians:

Amphibians found on the fairgrounds are listed in Appendix D. Most of the amphibians found are associated with Bear Creek. Ten species of frogs and four species of

salamanders are among the amphibians that may be found on the Boone County Fairgrounds.

Fish:

On March 2, 2000 fish were sampled in Bear Creek from 3:30 to 4:00 p.m. The seine used to sample the fish had a 1/8" mesh and was 4'x 6'. Four different fish species were found which include: Green Sunfish (*Lepomis cyanellus*), Orangethroat Darter (*Etheostoma spectabile*), Redfin Shiner (*Etheostoma nigrum*), and Johnny Darter (*Lythrurus umbratilis*), (Appendix E, Table 1). Other species of fish that were not found that day may appear in Bear Creek according to Pflieger (1997) are located in Appendix E (Table 2).

Invertebrates:

Invertebrates were sampled from three different locations (Figure 4) on March 12, 2000 between 1:00 p.m. and 2:00 p.m. and on March 13, 2000 at 4:30 p.m. Locations of these samples were above upper lagoon (Site 1, Figure 4), at discharge of upper lagoon (Site 3, Figure 4), and below western service bridge (Site 5, Figure 4). Samples taken above and far below the lagoons were found to have a higher diversity than the sample taken at the discharge of upper lagoon. The sample below the western service bridge, below the lagoons, contained species of invertebrates that were intolerant to poor water quality conditions. This indicated that this area had good water quality by the presence of these species. The other two samples contained species that were tolerant to a variety of conditions. The list of invertebrates sampled is located in Appendix F

Birds of Missouri (1992), The Wild Mammals of Missouri (1981), Wild Mammals of North America (1982), journal articles and other scientific works.

Information from MOFWIS comes from the Gap Analysis Program (GAP). This program summarizes species distribution based on land cover types at the state, regional, and national levels (National GAP 2000). Spatial data was taken from the Missouri Spatial Data Information Service (MSDIS 2000). Each species was given a number that quantified the likelihood of a species presence or absence at a particular site. The number indicates how much of the species range is found at the location. A number of seven or above means that the location overlaps the species range so the species is likely to be found there. The higher the number, the greater the probability of presence on the site (Haithcoat 2000). The final list of species compiled by the GAP for the BCFG area contains 66 mammals, 164 birds, 74 reptiles, and 44 amphibians (Appendix E).

We concluded that there are very few available soil types suitable for building site construction. Construction of roads or structures is further impeded by factors such as wetness, high shrink-swell potential, and low strength. These factors affect the traffic supporting capacity of the soils in this area (Bowne 2000).

Fauna Analysis:

The Missouri GAP analysis was used for determining the species found on the Boone County Fairgrounds. The GAP analysis is a comprehensive list of mammals, reptiles, amphibians, and birds that are possibly found in a given habitat type. The fairgrounds are located in Township 49, Range 12, in Sections 19, 20, 30, and 29. It is important to note that not all species listed for an area are not always found there. Many species are seasonal or use the area as a travel corridor. Numbers given in the GAP analysis

Watershed:

The Boone County Fairgrounds are located within the drainage of Bear Creek, a tributary to Perche Creek in Boone County (Figure 5). The section of Bear Creek that flows through the fairgrounds is third order and runs north-south through the eastern side of the fairgrounds. The stream has been channelized along the southeastern edge of the fairgrounds, which has lead directly to the steepening of the stream banks and increased erosion. The watershed drains land that is either agriculture (grazing pasture) or urban (residential, highways, and the fairgrounds). Four ponds are also found within the watershed of the fairgrounds.

Surface Waters

The management area is within the Cedar Creek watershed, the Prairie Faunal Region, and the Hydrologic Unit 10300102110005 (Appendix C-V). Bear Creek, a first order stream, runs through the northern halves of both the Newton and Atkins tracts as well as the whole western side of the Boone County Fairgrounds. Bear Creek is supplied with runoff water from agricultural and residential development near the management area and commercial development farther downstream of the management area. Annual precipitation is about 38 inches with precipitation fairly distributed throughout the year. Large amounts of rainfall usually occur in June and September, with summer and fall being the wettest seasons (Soil Survey, 195 1).

Watershed characteristics include rare to occasional flooding, occurring during winter to spring. Soils in this region generally show limitations for pond and reservoir

areas, embankments, and aquifer-fed excavated ponds. Slow percolation and high erosion rates are also factors effecting the watershed (Appendix C-VI and C-V111).

Several Missouri Stream Teams performed visual and chemical stream surveys, which showed that downstream of the Boone County Fairgrounds to Perche Creek from November 1995 to May 1998, the water quality was good. During times of low discharge (below 2 cu. ft/sec), high levels of benthic algae relative to the stream volume were produced. In areas of poor water quality there was low macroinvertebrate species richness (less than a rating of 11).

The Stream Teams also collected fecal coliform samples. There was no measurable flow at the time of either test. These tests showed counts of 3000 bacteria/ 100ml and 1800 bacteria/ 100 ml respectively. Tom Johnson, a microbiologist with the Columbia Environmental Research Center, states that levels above 200 bacteria/ 100ml is unacceptable. (Tom Johnson, personal communication 2000). At these same two sites, visible benthic alga counts in situ were 90% and 75% coverage respectively.

Bear Creek, within the Boone Country Fairgrounds was sampled on March 12 and 13, 2000 by the Missouri Independent Conservation Consultants. The following parameters were recorded: temperature, dissolved oxygen, conductivity, pH, alkalinity, hardness, ammonia as NH₄, ammonia as N₃-N, turbidity, and flow rate (Appendix CIX). Temperature readings were observed ranging between 22.6°C and 24.0°C. This is an acceptable range for the presence of macroinvertebrates (Nile Kemble, personal communication 2000). Dissolved oxygen readings were taken in the field and seen to range from 3.9 to 13.3. All dissolved oxygen readings were acceptable with the exception of Site 2. (Nile Kemble, personal communication 2000).

The previously discussed parameters were measured at the Columbia Environmental Research Center (CERC) using samples, which were put on ice and stored at 4°C for <48 hours before reading. Prior to reading these parameters, sample temperatures were allowed to warm to room temperature (approximately 23°C). Conductivity readings were seen to be similar for all sites sampled and within an acceptable range (Nile Kemble, personal communication 2000). Conductivity readings were compared to CERC well water as a standard.

The pH, alkalinity, hardness, ammonia as NH₄, ammonia as N₃-N, and turbidity at each site was also measured from the preserved samples. All readings were well within acceptable ranges with the exception of the ammonia as NH₄ from Site 2 where it was high or low according to the permit and all of the turbidity readings, with the exception of Site 3, were within limit.

Mammals in which range includes Boone County Fairgrounds.

Mammals	Township	49	49	49	49	Special Status
	Range	12	12	12	12	
	Section	19	20	30	29	
<i>Blarina brevicauda</i>	Northern Short-Tailed Shrew	9	11	9	9	
<i>Canis latrans</i>	Coyote	7	8	9	7	
<i>Corynorhinus rafinesquii</i>	Rafinesque's Big-Eared Bat	6	8	6	6	
<i>Cryptotis parva</i>	Least Shrew	10	10	10	8	
<i>Didelphis virginiana</i>	Virginia Opossum	10	12	10	9	
<i>Eptesicus fuscus</i>	Big Brown Bat	15	20	15	15	
<i>Geomys bursarius</i>	Plains Pocket Gopher	9	8	8	8	
<i>Glaucomys volans</i>	Southern Flying Squirrel	7	12	8	8	
<i>Lasionycteris noctivagans</i>	Silver-Haired Bat	7	10	7	8	
<i>Lasiurus borealis</i>	Eastern Red Bat	10	13	9	9	
<i>Lasiurus cinereus</i>	Hoary Bat	6	9	6	5	
<i>Marmota monax</i>	Woodchuck	14	13	14	12	
<i>Mephitis mephitis</i>	Striped Skunk	13	12	14	10	
<i>Microtus ochragaster</i>	Prairie Vole	10	10	9	8	
<i>Microtus pinetorum</i>	Woodland Vole	10	13	10	9	
<i>Mustela frenata</i>	Long Tailed Weasel	7	12	8	7	State Rare
<i>Mustela nivalis</i>	Least Weasel	8	7	8	6	Watch list
<i>Mycrotus pennsylvanicus</i>	Meadow Vole	8	6	7	6	
<i>Myotis lucifugus</i>	Little Brown Bat	11	12	10	10	
<i>Myotis sodalis</i>	Indiana Bat	8	8	9	8	Federal Endangered
<i>Myotis grisescens</i>	Gray myotis	7	8	7	7	Federal Endangered
<i>Myotis keenii</i>	Keen's Myotis	12	13	12	12	
<i>Nycticeius humeralis</i>	Evening bat	7	9	6	6	
<i>Ondatra zibethicus</i>	Muskrat	7	7	7	8	
<i>Odocoileus virginianus</i>	White-Tailed Deer	11	11	12	9	
<i>Peromyscus leucopus</i>	White-Footed Mouse	10	13	10	9	
<i>Peromyscus maniculatus</i>	Deer Mouse	11	10	11	12	
<i>Pipistrellus subflavus</i>	Eastern pipistrelle	16	17	15	16	
<i>Procyon lotor</i>	Common raccoon	8	10	8	8	
<i>Reithrodontomys flutescens</i>	Fulvous Harvest Mouse	7	6	7	6	
<i>Reithrodontomys megalotis</i>	Western Harvest Mouse	9	7	9	7	
<i>Reithrodontomys montanus</i>	Plains Harvest Mouse	8	5	7	4	State Rare
<i>Scalopus aquaticus</i>	Eastern Mole	14	13	14	12	
<i>Sciurus carolinensis</i>	Eastern Gray Squirrel	8	11	9	8	
<i>Sciurus niger</i>	Eastern Fox Squirrel	8	13	9	8	
<i>Sigmodon hispidus</i>	Hispid Cotton Rat	8	8	9	8	
<i>Spermophilus tridecemlineatus</i>	Thirteen-Lined Ground Squirrel	9	8		8	7
<i>Sylvilagus floridanus</i>	Eastern cottontail	10	01	10	9	
<i>Synaptomys cooperi</i>	Southern Bog Lemming	8	8	8	8	
<i>Urocyon cinereargenteus</i>	Common Gray Fox	9	10	9	9	
<i>Vulpes vulpes</i>	Red Fox	10	12	13	10	
<i>Zapus hudsonius</i>	Meadows Jumping Mouse	9	8	8	8	
	Mammal richness	23	33	24	18	

Boone County Fairgrounds — Site and Space Analysis

Birds	Township	49	49	49	49	Special Status
	Range	12	12	12	12	
	Section	19	20	30	29	
<i>Accipiter cooperil</i>	Cooper's Hawk	7	8	7	7	State rare
<i>Accipiter striatus</i>	SharpShinned hawk	9	9	9	9	State rare
<i>Agelius phoeniceus</i>	Red-Winged Blackbird	11	9	11	9	
<i>Aimophial aestivalis</i>	Bachman's Sparrow	7	7	7	7	Federal Canidate
<i>Aix sponsa</i>	Wood Duck	7	9	7	8	
<i>Ammodramus henslowil</i>	Henslow's Sparrow	8	7	8	6	State Rare
<i>Ammodramus svannarum</i>	Grasshopper sparrow	10	9	10	8	
<i>Anas platrhyngchos</i>	Mallard	7	7	7	8	
<i>Bartramia longicauda</i>	Upland Sandpiper	7	7	7	6	Watch list
<i>Bonasa umelus</i>	Ruffed grouse	6	7	6	7	
<i>Bratnta canadensis</i>	Canada Goose	9	7	9	7	
<i>Bratnta canadensis</i>	Savannah Sparrow	10	10	9	9	
<i>Bubo virginianus</i>	Great horned Own	11	12	10	10	
<i>Buteo jamaicensis</i>	Red-tailed Hawk	11	12	10	10	
<i>Caprimulgus carolinensis</i>	Chuck-Wills-Widow	6	7	7	7	
<i>Caprimulgusvociferus</i>	Whip-Poor-Will	8	10	8	8	
<i>Cardinalis cardinalis</i>	Northern cardinal	11	13	13	10	
<i>Carduelis tristis</i>	American Goldfinch	12	14	12	11	
<i>Carpodacus mexicanus</i>	House Finch	8	7	8	8	
<i>Cthartes auara</i>	Turkey vulture	11	13	10	10	
<i>Ceryle aclyon</i>	Belted Kingfisher	8	10	8	11	
<i>Charadrius vociferus</i>	Killdeer	12	9	12	9	
<i>Cistohrous platensis</i>	Sedge Wren	7	7	6	6	
<i>Coccyzus americanus</i>	Yellow-Billed Cuckoo	9	10	8	8	
<i>Coccyzus erythrophthalmus</i>	Black-Billed Cuckoo	7	8	7	7	
<i>Colaptes auratus</i>	Northern Flicker	8	11	8	8	
<i>Colinus virginianus</i>	Northern Bobwhite	12	11	12	9	
<i>Columba l ivia</i>	Rock Dove	19	16	21	15	
<i>Common Grackle</i>	Lark Sparrow	9	9	8	8	
<i>Contopus viren</i>	Eastern Wood-Pewee	8	11	8	9	
<i>Cyanocitta cristata</i>	Blue Jay	14	16	14	13	
<i>Dendroica cerulea</i>	Cerulean warbler	5	7	5	5	
<i>Dendroica discolor</i>	Prarie warbler	7	8	7	8	
<i>Dendroica dominica</i>	Yellow-Throated warbler	5	7	5	5	Watch list
<i>Dendroica petechia</i>	Yellow Warbler	7	8	7	8	
<i>Dendroica pinus</i>	Pine warbler	8	8	8	8	
<i>Dolichonyx oryzivorus</i>	Boblink	8	7	7	6	
<i>Dryocopus pileatus</i>	Pileated Woodpecker	7	8	7	7	
<i>Dumetella carolinensis</i>	Gray Catbird	12	13	12	10	
<i>Empidonax trailli</i>	Willow Flycatcher	7	9	7	8	
<i>Empidonax virescens</i>	Acadian Flycatcher	6	8	6	6	
<i>Eremophila allpetris</i>	Horned Lark	13	9	14	10	
<i>Falco sparverius</i>	American Kestrel	8	9	9	7	
<i>Geothlypis trichas</i>	Common Yellowthroat	12	12	12	11	
<i>Guiraca caerulea</i>	Blue Grosbeak	9	10	9	8	
<i>Hirundo rustica</i>	Barn Swallow	15	12	15	13	
<i>Hylocichla mustelina</i>	Wood Thrush	7	8	7	7	
<i>Icteria virens</i>	Yellow-Breasted Chat	8	9	8	8	
<i>Icterus galbula</i>	Baltimore Oriole	8	10	8	8	
<i>Ictrus spurius</i>	Orchard Oriole	7	9	7	7	
<i>Lanius ludovicianus</i>	Loggerhead Shrike	10	9	9	9	Federal Canidate
<i>Melanerpes carolinus</i>	Red-Bellied woodpecker	8	9	8	8	
<i>Melanerpes erythrocephthalmus</i>	Red-Headed Woodpecker	9	10	9	8	

Boone County Fairgrounds — Site and Space Analysis

Birds	Township	49	49	49	49	Special Status
	Range	12	12	12	12	
	Section	19	20	30	29	
<i>Mimus polyglottos</i>	Northern Mockingbird	9	9	9	8	
<i>Molothrus ater</i>	Brown-Headed Cowbird	8	11	9	9	
<i>Myiarchus crinitus</i>	Great Crested Flycatcher	8	9	8	8	
<i>Oporomis formosus</i>	Kentucky Warbler	7	8	7	6	
<i>Otus asio</i>	Eastern Screech-Owl	8	11	9	8	
<i>Parula americana</i>	Northern Parula	8	9	8	8	
<i>Parus atricapillus</i>	Black-capped Chickadee	7	8	7	7	
<i>Parus bicolor</i>	Tufted titmouse	8	10	9	9	
<i>Passer domesticus</i>	How Sparrow	21	20	22	18	Exotic
<i>Passerina cyanea</i>	Indigo Bunting	11	14	11	12	
<i>Phasianus colchicus</i>	Ring-neck Pheasant	7	5	7	5	Exotic
<i>Picoides pubescens</i>	Whip-Poor-Will	8	10	8	8	
<i>Picoides villosus</i>	Hairy Woodpecker	7	8	7	7	
<i>Pipilo erythrophthalmus</i>	Eastern Towhee	8	9	8	8	
<i>Piranga rubra</i>	Summer Tanager	7	9	7	7	
<i>Poliophtila caerulea</i>	Blue-Gray Gnatcatcher	7	9	7	7	
<i>Poocetes gramineus</i>	Vesper Sparrow	7	6	7		5
<i>Progne subis</i>	Purple martin	15	14	15	12	
<i>Protonotaria citrea</i>	Prothonotary Warbler	6	8	6	7	
<i>Quiscalus quiscula</i>	Common Grackle	15	14	15	13	
<i>Sayornis phoebe</i>	Eastern Phoebe	7	10	7	7	
<i>Seiurus aurocapillus</i>	Ovenbir	6	7	6	6	
<i>Seiurus motacilla</i>	Louisiana Waterthrush	6	7	6	7	
<i>Setophaga ruticilla</i>	American Redstart	5	7	5	6	
<i>Sialia sialis</i>	Eastern Bluebird	9	10	9	8	
<i>Sitta carolinensis</i>	White-Breasted Nutchatch	9	10	9	9	
<i>Spiza ameridana</i>	Dickcissel	11	9	11	9	
<i>Spizella passerina</i>	Chipping Sparrow	9	12	9	9	
<i>Spizella pusilla</i>	Field Sparrow	12	13	11	11	
<i>Strix varia</i>	barred owl	6	8	6	6	
<i>Sturnella magna</i>	Eastern Meadowlark	12	10	12	9	
<i>Sturnella neglecta</i>	Western Meadowlark	8	6	7	5	
<i>Thryomanes bewickii</i>	Bewick's Wren	6	8	6	7	Watch list
<i>Thryothorus ludovicianus</i>	Carolina wren	7	9	7	7	
<i>Toxostoma rufum</i>	Brown Thrasher	17	19	17	17	
<i>Troglodytes aedon</i>	House Wren	10	9	10	9	
<i>Turdus migratorius</i>	American Robin	11	10	12	10	
<i>Tympanuchus cupido</i>	Greater Prairie-Chicken	7	6	6	6	State Rare
<i>Tyrannus tyrannus</i>	Eastern Kingbird	11	12	11	10	
<i>Tyto alba</i>	barn Owl	11	8	10	6	
<i>Vermivora pinus</i>	Blue-Winged Warbler	6	7	6	6	
<i>Vireo olivaceus</i>	Red-Eyed Vireo	7	8	7	7	
<i>Vireo flavifrons</i>	yellow-Throated Vireo	6	8	7	8	
<i>Zenaida macroura</i>	Mourning Dove	13	12	15	10	

Appendix B: Birds in which range includes Boone County Fairgrounds

APPENDIX C: Reptiles in which range includes Boone County Fairgrounds.

Reptiles	Township	49	49	49	49
	Range	12	12	12	12
	Section	19	20	30	29
<i>Agkistrodon contortrix</i>	Osage Copperhead	8	1	9	9
<i>Apalone mutica</i>	Smooth Softshell	15	17	15	21
<i>Apalone spinifera</i>	Spiny Softshell	18	20	17	22
<i>Carphophis amoenus vermis</i>	Western Worm Snake	9	12	9	10
<i>Chrysemys picta bellii</i>	Western Paint Turtle	13	12	13	13
<i>Cnemidophorus sexlineatus</i>	Prairie-lined Racerunner	8	9	8	8
<i>Coluber constrictor flaviventris</i>	eastern yellowbelly Racer	9	9	9	8
<i>Crotalus horridus</i>	Timber Rattlesnake	11	13	10	11
<i>Elaphe guttata emoryi</i>	Rat Snake	13	16	13	12
<i>Elaphe guttata emoryi</i>	Great Plains rat snake	9	10	9	9
<i>Eumeces fasciatus</i>	Five-lined Skink	9	11	9	9
<i>Eumeces laticeps</i>	Broadhead Skink	7	9	8	8
<i>Graptemys geographica</i>	Common Map Turtle	11	12	12	14
<i>Graptemys geographica kohnii</i>	Mississippi Map Turtle	13	13	14	16
<i>Graptemys pseudogeographica</i>	False Map Turtle	12	12	12	14
<i>Heterodon platirhinos</i>	Eastern hognose Snake	19	21	19	20
<i>Lampropeltis calligaster</i>	Prairie Kingsnake	9	11	9	9
<i>Lampropeltis triangulum</i>	Red Milk Snake	20	23	21	20
<i>Masticophis flagellum</i>	Coachwhip	8	8	8	8
<i>Nerodia Eerythrogaster transversa</i>	Blotched water snake	8	8	7	8
<i>Neorida rhombifer</i>	Diamondback Water Snake	10	10	10	11
<i>Opheodrys aestivus</i>	Rough Green Snake	7	9	8	8
<i>Opheodrys vernalis</i>	Smooth Green Snake	8	8	8	7
<i>Ophisauarus attenuatus</i>	Slender Glass Lizard	13	13	12	12
<i>Pituophis melanoleucus sayi</i>	Bullsnake	12	11	12	11
<i>Regina grahamii</i>	Graham's Crayfish Snake	12	12	12	13
<i>Sceloporus undulates hyacinthinus</i>	Northern Fence Lizard	7	9	8	8
<i>Scincella lateralis</i>	Ground Skink	7	8	7	7
<i>Sternotherus odoratus</i>	Common Must Turtle	7	8	8	9
<i>Storeria dekayi wrightorum</i>	Midland brown Snake	14	14	13	14
<i>Storeria occipitomaculata</i>	Redbelly Snake	7	9	8	7
<i>Terrapene Carolina triunguis</i>	Three-toed Box Turtle	9	11	9	9
<i>Terrapene ornate ornate</i>	ornate box Turtle	11	11	11	11
<i>Thamnophis proximus</i>	Western Ribbon Snake	19	21	19	22
<i>Thamnophis radix</i>	Plains Garter Snake	8	8	8	8
<i>Thamnophis radix haydenii</i>	Western Plains Garter Snake	9	8	9	9
<i>Thamnophis sirtalis</i>	Common Garter Snake	11	11	11	10
<i>Thamnophis sirtalis parietalis</i>	Red-sided Garter Snake	10	11	10	9
<i>Trachemys script elegans</i>	Red-eared Slider	11	13	10	11
<i>Tropidocionion lineatum</i>	Lined Snake	9	8	8	7
<i>Virginia stratula</i>	Rough Earth Snake	6	8	6	7
<i>Virginia valeriae elegans</i>	Western Earth Snake	9	12	10	10
	Reptile Richness	32	38	32	32

Appendix D: Amphibians in which range includes Boone County Fairgrounds.

Amphibians	Township	49	49	49	49
	Range	12	12	12	12
	Section	19	20	30	29
<i>Acris crepitans blanchardi</i>	Blanchard's Cricket Frog	8	9	7	10
<i>Ambystoma maculatum</i>	Spotted Salamander	8	10	9	9
<i>Ambystoma opacum</i>	Marbled Salamander	4	7	4	5
<i>Ambystoma texanum</i>	Smallmouth Salamander	12	12	12	12
<i>Ambystoma tigrinum</i>	Tiger Salamander	9	10	9	11
<i>Bufo americanus</i>	American Toad	7	9	8	7
<i>Bufo americanus charlesmithi</i>	Dwarf American Toad	5	8	6	6
<i>Bufo cognatus</i>	Great Plains Toad	7	6	6	6
<i>Gastrophryne carolinensis</i>	Eastern Narrowmouth Toad	7	8	7	7
<i>Gastrophryne olivacea</i>	Great Plains Narrowmouth Toad	9	9	8	7
<i>Hyla crucifer</i>	Northern Spring Peeper	9	11	9	10
	Gray Treefrog	8	10	8	9
<i>Hyla versicolor</i>					
<i>Necturus maculosus</i>	Mudpuppy	9	9	10	12
<i>Notophthalmus viridescens louisianensis</i>	Central Newt	12	13	12	13
<i>Plethodon glutinosus</i>	Slimy Salamander	8	9	8	8
<i>Pseudacris triseriata</i>	Western Chorus Frog	10	10	10	11
<i>Rana areolata</i>	Crawfish Frog	10	10	10	10
<i>Rana blairi</i>	Plains Leopard Frog	12	12	12	12
<i>Rana catesbeiana</i>	Bullfrog	17	18	17	19
<i>Rana catesbeiana melanota</i>	Green Frog	10	10	10	11
<i>Rana palustris</i>	Pickerel Frog	9	9	9	9
<i>Rana sphenoccephala</i>	Southern Leopard Frog	8	9	8	10
<i>Rana sylvatica</i>	Wood Frog	7	8	7	7
<i>Scaphiopus bombifrons</i>	Plains Spadefoot	9	8	8	8
	Amphibian Richness	14	19	12	16

Appendix E: Fish species occurring in Bear Creek.**Table 1: Fish sampled in Bear Creek on Boone County Fairgrounds.**

Scientific Name	Common Name	Number Sampled
<i>Lepomis cyanellus</i>	Green Sunfish	2
<i>Etheostoma spectabile</i>	Orangethroat Darter	1
<i>Etheostoma nigrum</i>	Johnny Darter	1
<i>Lythrurus umbraffis</i>	Redfin Shiner	1

Table 2: Fish that may occur in Bear Creek according to Pflieger, 1997.

Common Name	Scientific Name
Ameiurus melaas	Black Bullhead
Ameiurus natafis	Yellow Bullhead
Campostoma pullum	Central Stoneroller
Catostomus commersoni	White Sucker
Cyprinella lutrensis	Red Shiner
Etheostoma nigrum	Johnny Darter
Etheostoma spectabile	Orangethroat Darter
Fundulus notatus	Blackstripe Topminnow
Gambusia affinis	Western Mosquitofish
Lepomis cyanellus	Green Sunfish
Lepomis humilis	Orangespotted Sunfish
Lepomis macrochirus	Bluegill
Lepomis megalotis	Longear Sunfish
Luxilus comutus	Common Shiner
Lythrurus umbratilis	Redfin Shiner (Western)
Micropterus salmoides	Largemouth Bass
Notemigonus crysoleucas	Golden Shiner
Notropis dorsalis	Bigmouth Shiner
Notropis ludibundus	Sand Shiner
Notropis Topeka	Topeka Shiner
Noturus exilis	Slender Madtom
Noturus gyrinus	Tadpole Madtom
Percopsis omiscomaycus	Trout-perch
Phenacobius mirabilis	Suckermouth Minnow
Pimephales notatus	Bluntnose Minnow
Pimephales pormelas	Fathead Minnow
Semotilus atromaculatus	Creek Chub

Appendix F: Invertebrates sampled from three locations in Bear Creek on the Boone
County Fairgrounds

	INVERTEBRATES	
Family	Sample	Common Name
at discharge of lagoon	Chronomidae	midges
	Capniidae	snowflies
	Naididae	aquatic worms
above upper lagoon	Chronomidae	midges
	Capniidae	snowflies
	Tabanidae	horse and deer flies
	Physidae	pouch snails
	Tubificidae	aquatic worms
below western service bridge	Hydrophilidae	water scavenger beetles
	Rhyacophilidae	catisflies
	Hydrophilidae	water scavenger beetles
	Capniidae	snowflies
	Chronomidae	midges
	Polycentropodidae	catisflies
	Perlidae	spring flies
	Sphaeridae	finger nail clams
Elmidae	rifle beetles	

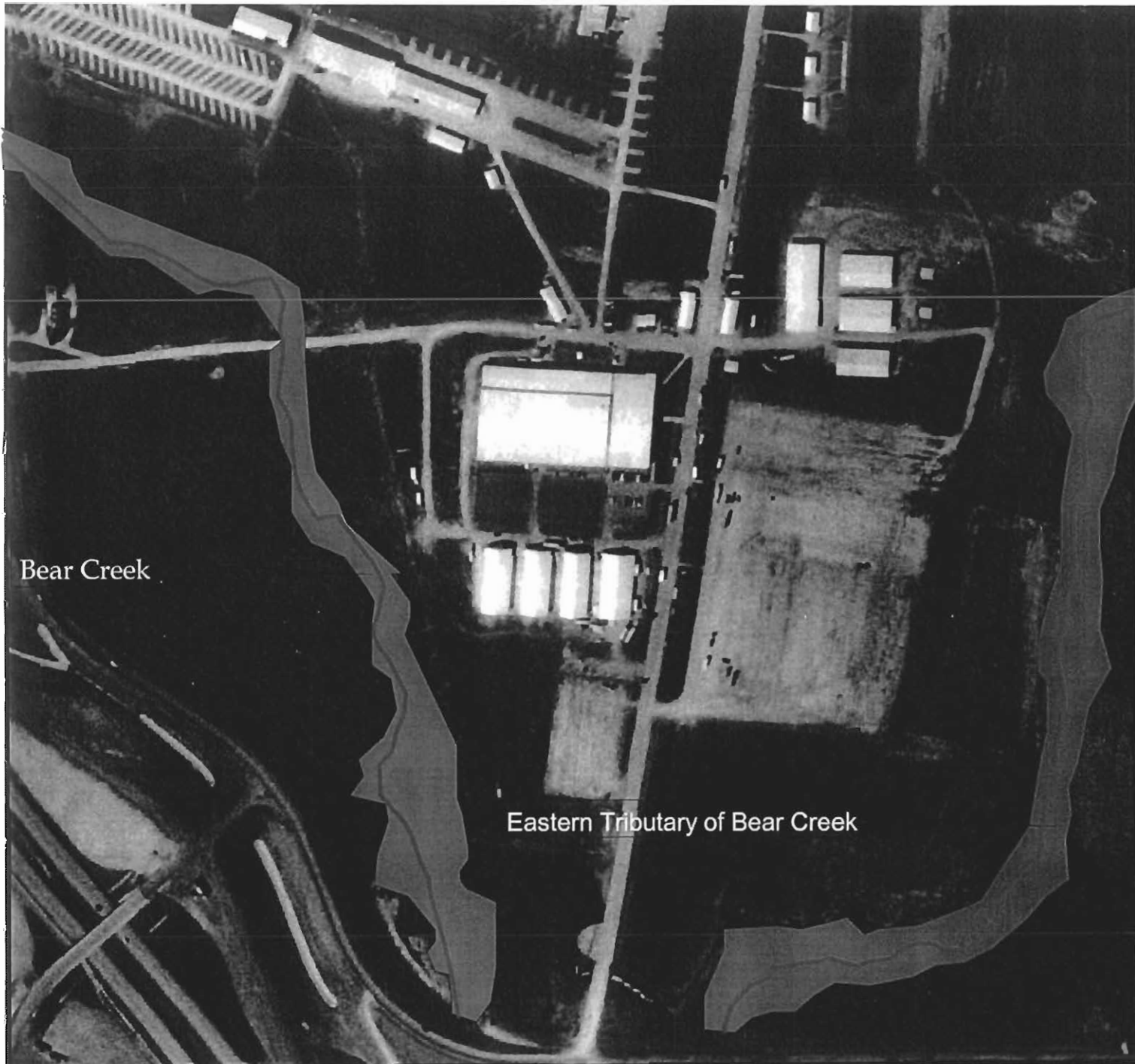
Effective January 14, 1999 the Final Rule to List the Topeka Shiner as Endangered, 50 CFR Part 17, DOI, Fish and Wildlife Service, was passed. Recovery of the species primarily involves the conservation of remaining populations and habitats, ensuring their continued survival, and rehabilitation of degraded habitat. Measures involving stream and riparian protection programs, including support from the Fish and Wildlife Service's Partners for Wildlife program, and conservation agreements with various governmental agencies, private entities, and landowners will be essential for the recovery of the species. Additional unoccupied habitat within the range of the Topeka shiner may eventually be considered for improvement and stabilization or possible reintroduction for the species, particularly in areas near isolated populations to create sustainable population complexes (Department of the Interior: Fish and Wildlife Service. Endangered and Threatened

Wildlife and Plants; Final Rule To List the Topeka Shiner as Endangered

<http://endangered.fws.gov/r/fr98654.html> February, 2000.).

Bear Creek may fit well into this plan. Available resources needed by the Topeka shiner are present yet degraded. However these can be improved. Additionally, remnant populations of Topeka shiners remain within Turkey Creek, also in Boone County, Missouri (citation).

Vegetation Coverage



Specific identification of tree species for Boone County are outlined in the report. Bird, mammal, amphibian, fish and invertebrates are also given.



Hazardous Waste and Trash






Throughout the fairground property a variety of discarded materials exist. Most of these materials would not be considered hazardous waste, however, a professional verification should be done to confirm the existence of any hazardous waste. For example, there are several piles of waste located in the northeast corner of the property that appear to have increased over the years. These areas tend to attract more refuse rather than degrading themselves. There are also various disposed items located along the western edge of the property near the old hanger. Most of these do not support the operations of the fairgrounds. Surrounding the hanger, there are also several items that may have been used at one time or another. These items have not been moved in several years. Items within the building also require inventory to determine their relationship to the fairgrounds. Several trucks and pieces of equipment are located behind the former fairground office along with discarded materials that also need to be inventoried.

Another item that could be determined as hazardous waste are the piles of livestock manure. Much of this is equine related and located near the stalls. It appears that over the years much of the waste has been piled up near the buildings as a matter of convenience and proximity. These piles of sawdust and manure may have been created assuming they would decay over time. This unfortunately has not occurred. The continual placement of new waste compacts the piles so air can no longer reach the center of the piles to assist in the decomposition process. These piles should be leveled to promote their breakdown.

Another area that should be addressed is the placement of equine waste in Bear Creek. At the time of the on-sight study, the waste was notable. Recent verification has not been made to determine if the practice is continuing.

Waste Sites



-  Buildings
-  Waste Piles
-  Streams
-  Forest Coverage
-  Roads



This is a map of the fairgrounds property only. All of the waste sites in the northern region of the fairgrounds are comprised of scrap metal and various equipment. In the southern region the sites consist mostly of non-scattered manure piles.

Contour Points

The Boone County Fairground ranges in elevation from 248 meters (758 feet) above sea level to 237 meters (724 feet) above sea level along Bear Creek. The changes in elevation are gradual resulting in gentle slopes. It may be characterized broadly as a flat to rolling plain, nearly as high in elevation as parts of the adjacent Ozark Region. That part of the Prairie Region north of the Missouri River has been subjected to the leveling action of glaciating. A flat plain, known as the Audrain Prairies, extends northward from Audrain County along the Missouri-Mississippi drainage divide, and breaks off abruptly into hilly country along streams to the east, south, and west. Much of northwestern Missouri has a gently rolling to undulating surface, while south of the Missouri River the prairie is nearly as level as the Audrain Prairies.

Contour points were collected using a variety of techniques. In areas with extreme terrain the data were collected on foot. Larger areas were collected using an all terrain vehicle and a four-wheel-drive vehicle. Collecting data points at the highest stream elevation and the lowest elevation generated stream elevation data. All points between these were generated assuming a consistent slope.

In total 5318 points were logged within a Precision Dilution of Position (PDOP) of no more than 8.7. The highest PDOP (8.7) recorded occurred only once. All other data remained below the acceptable threshold of 8.0 PDOP. Associated coordinates are also provided. This collection technique ultimately provided an average grid spacing of no more than 6.094 meters (20 feet).

Boone County Fairgrounds – Site and Space Analysis

Depictions of 3D models are provided. With the typical gentle slope of this type of topography, variations are slight. Further modeling may be done by the county with the provided data set. The data set is provided.

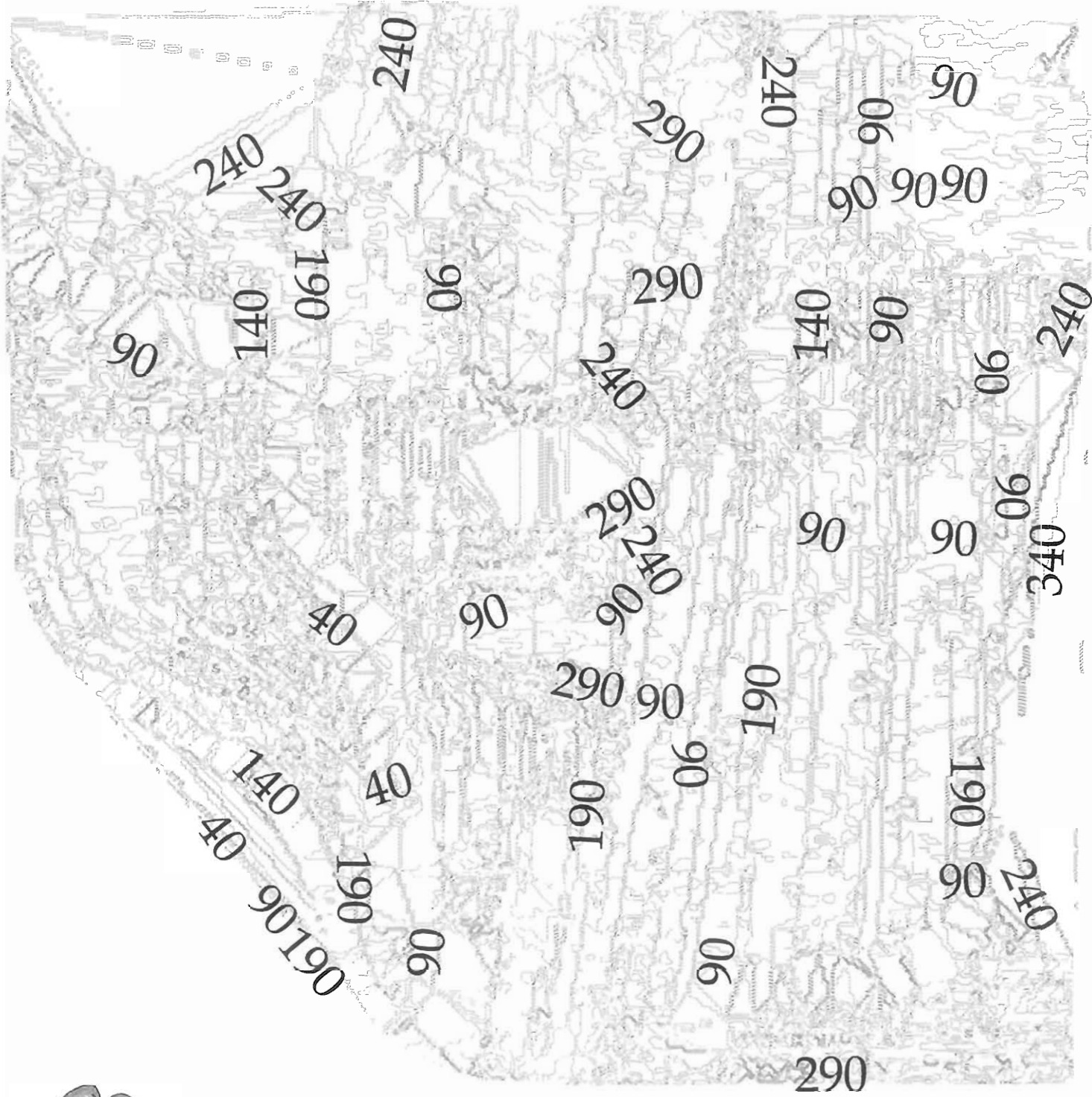


Contours



Contour points represent data collected on elevation in the fairgrounds site only. 3D models can be generated in the ArcView GIS program.

Contour Line Scale



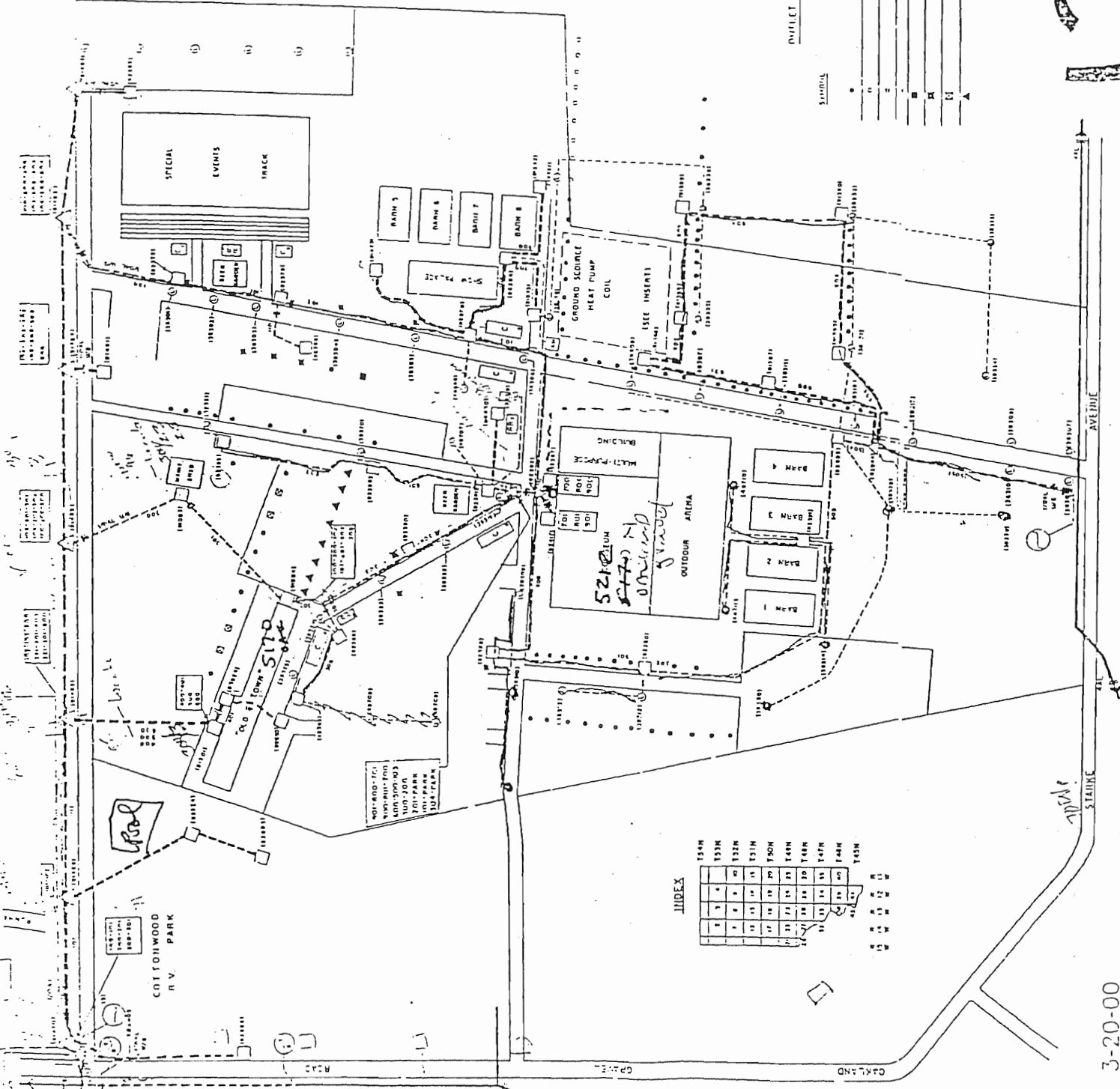
Contours were created at 50 meter intervals.

Location of Underground Electric
Information provided by Boone Electric Cooperative
Contact – Kirk Pickett
573-441-7238
Properties included:
Fairgrounds

2 Demarc
 where you run
 SIMITS 1
 F.C. STAIRS

OUTLET LEGEND

SYMBOL	120 VOLTAGE
(Symbol)	120 200W - 100 200W
(Symbol)	120 400W - 100 400W
(Symbol)	120 800W - 100 800W
(Symbol)	120 1600W - 100 1600W
(Symbol)	120 3200W - 100 3200W
(Symbol)	120 6400W - 100 6400W
(Symbol)	120 12800W - 100 12800W
(Symbol)	120 25600W - 100 25600W



INDEX

154W	153W	152W	151W	150W	149W	148W	147W	146W	145W
154N	153N	152N	151N	150N	149N	148N	147N	146N	145N

The points
 I track
 idea.

Location of Main Water Lines
Information provided by City of Columbia

Contact – Dave Mathon

573-874-7325

Properties included:

Maintenance Building

Realty House

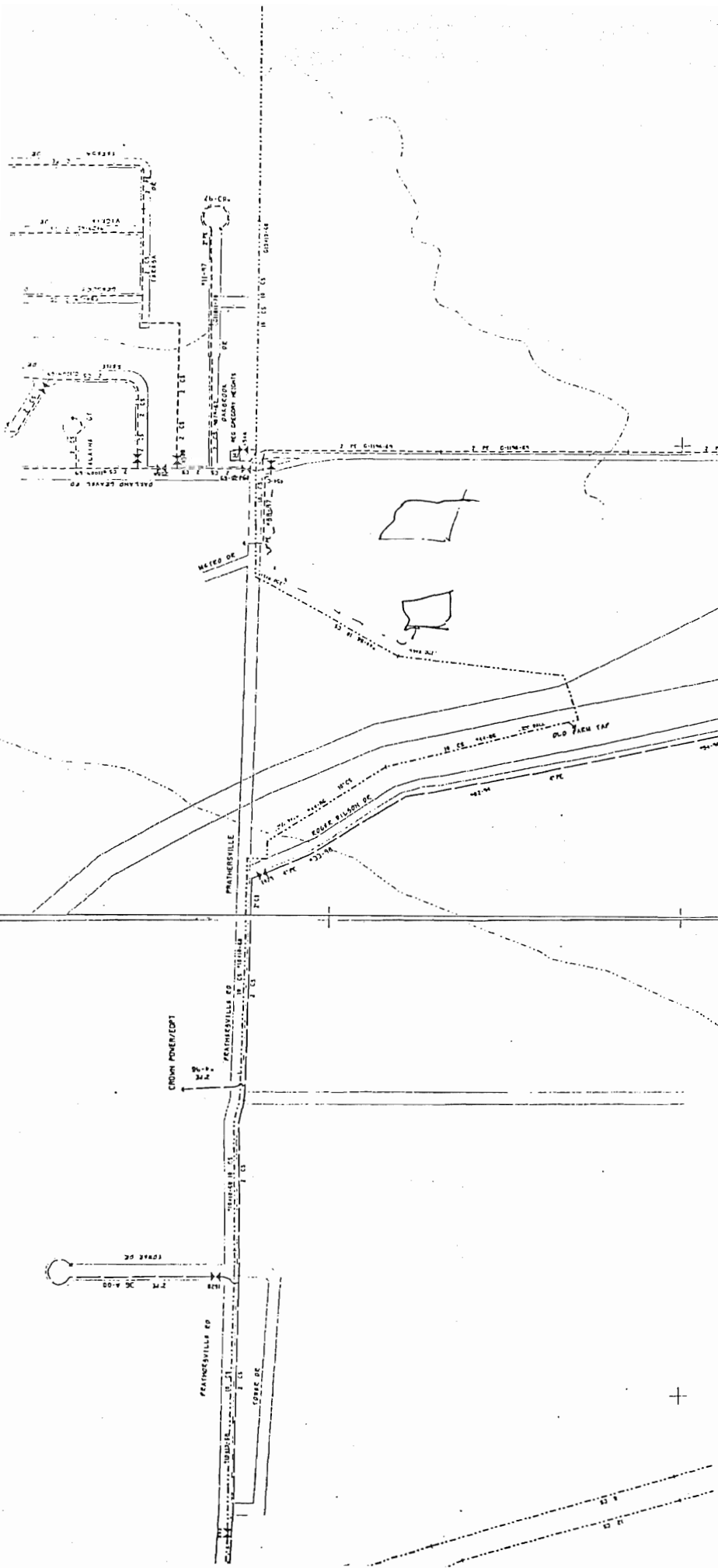
Coliseum

Former Office Building

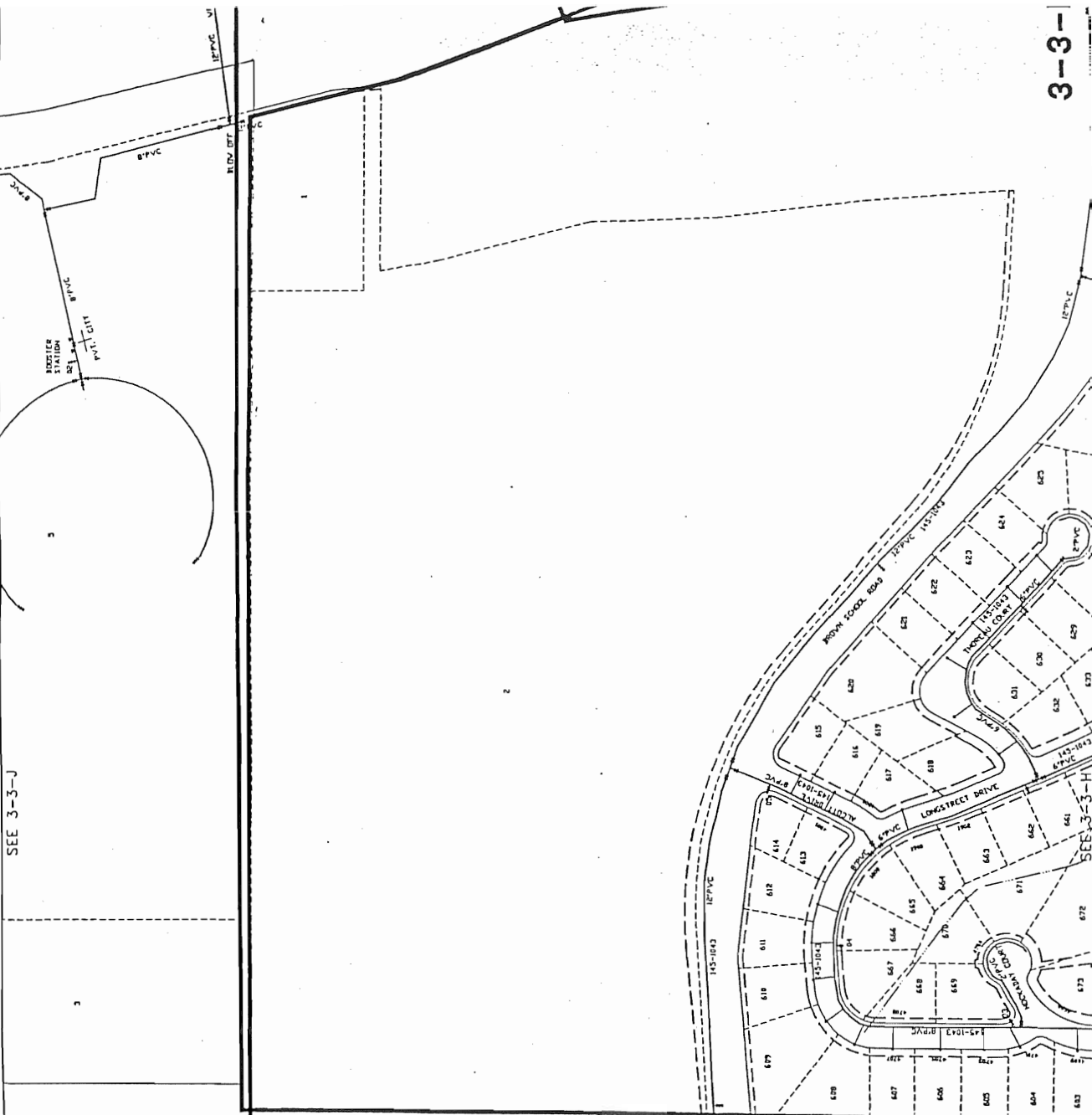
Juvenile Justice Center

Boone County Jail

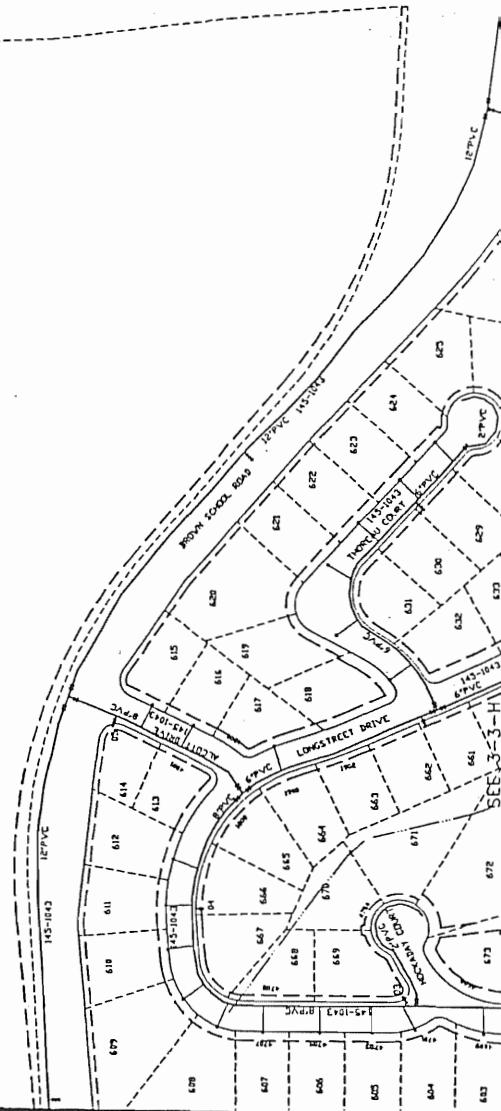
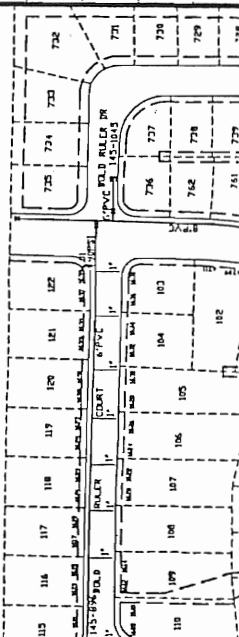
Armory

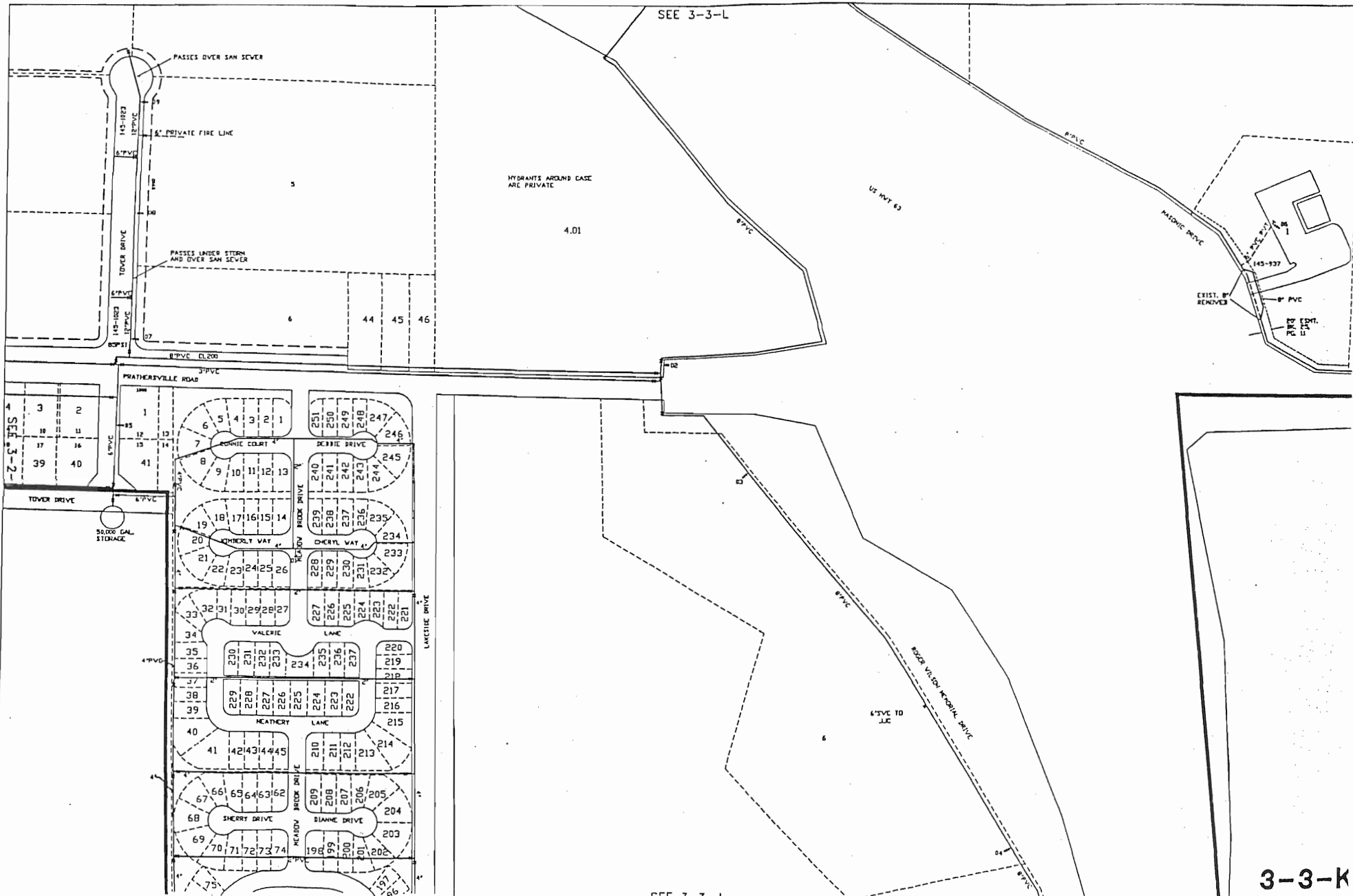


SEE 3-3-J



SEE 3-2-1



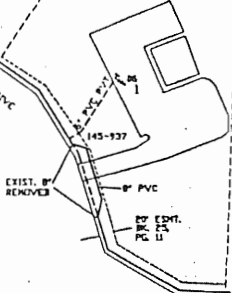


SEE 3-3-L

HYDRANTS AROUND CASE ARE PRIVATE

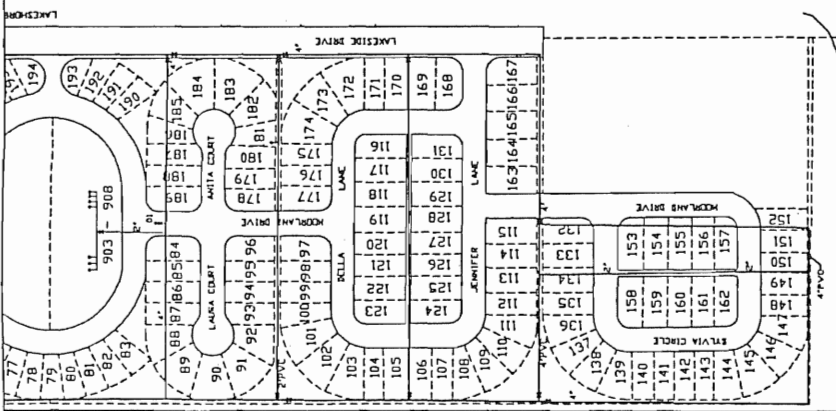
4.01

US HWY 63



SEE 3-2

SEE 3-3-K



SEE 3-2-J

STVC TO MS
WALL GAUGES

8" PVC

8" PVC

8"

U.S.

STE.

3-3-J

Location of sewer line
Information provided by Boone County Regional Sewer District
Contact – Tom Ratermann
573-443-2774
Properties included:
Maintenance Building
Realty House
Coliseum
Former Office Building
Juvenile Justice Center
Boone County Jail
Armory

Legend

- 00000 Air Release Valve
- 00000 Check Valve
- ⊕ 00000 Dual In-line Cleanout - FM
- ⊕ 00000 End-of-line Cleanout - FM
- ⊕ 00000 Triple In-line Cleanout - FM
- 00000 Cleanout
- 00000 Manhole
- ▲ 00000 Pump Station
- ⊕ 00000 Service Connection - FM
- ⊕ 00000 In-line Valve

□ Treatment Plant

○ Lagoon

● 8F137 City Manhole

● P0000 Private Manhole

- >—>—> 6" Sewer line
- >—>—> 8" Sewer line
- >—>—> 12" Sewer line
- >—>—> Abandoned sewer line
- - - - - Small diameter variable grade (SDVG)
- >>—>>—>> Pressure sewer
- >—>—> Private sewer line 8 in. and under
- >—>—> Private sewer line over 8 in.
- >>—>>—>> Private pressure sewer
- - - - - Private common collector (PCC)

1322 Address

Ⓜ Lot Number

— Property Line

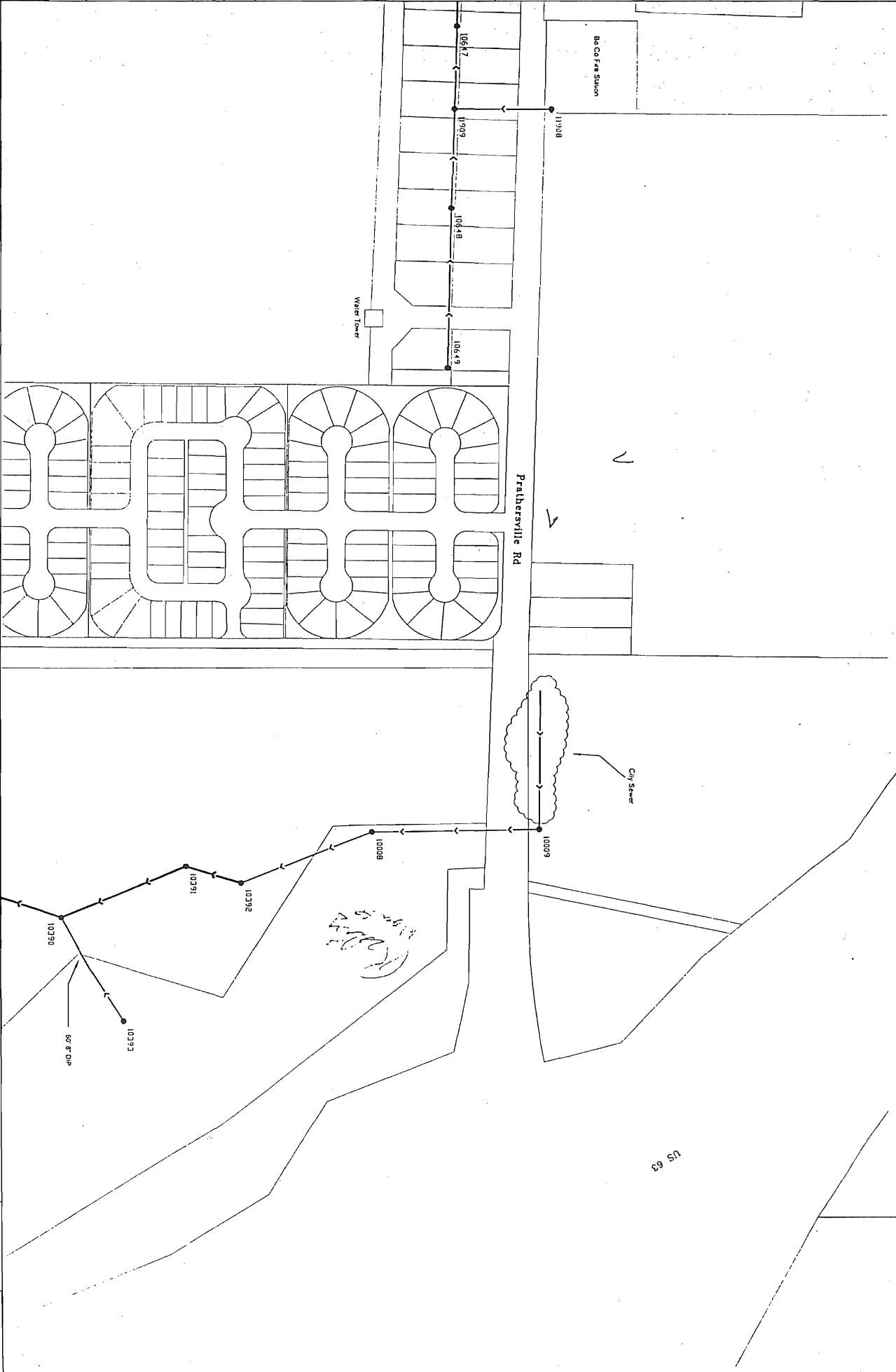
DOCUMENT NOT VALID. The existence, location, and location of facilities, as well as other information, on this map may be based upon unverified historic information and should not be relied upon for any purpose without actual field verification. The information on this map was prepared by the Boone County Regional Sewer District and is provided for informational purposes only. The user assumes all liability and responsibility for the verification of the accuracy of information shown on this map.

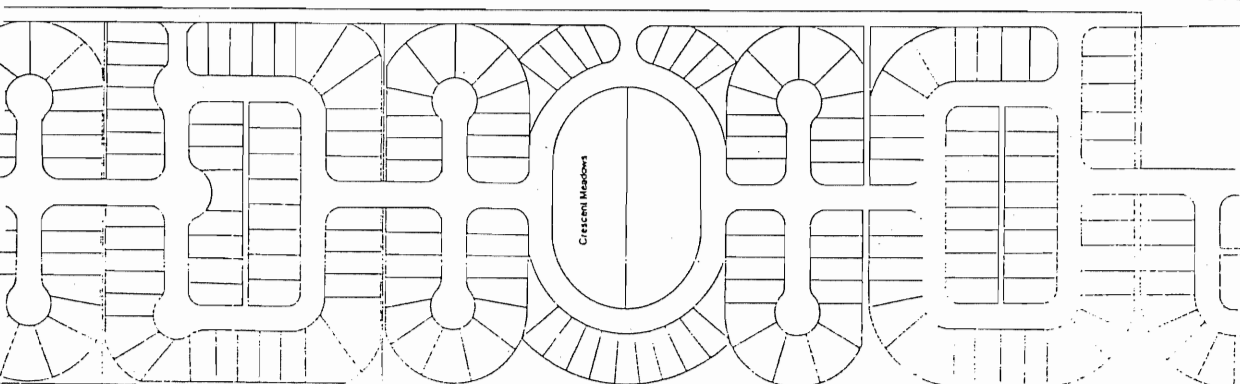
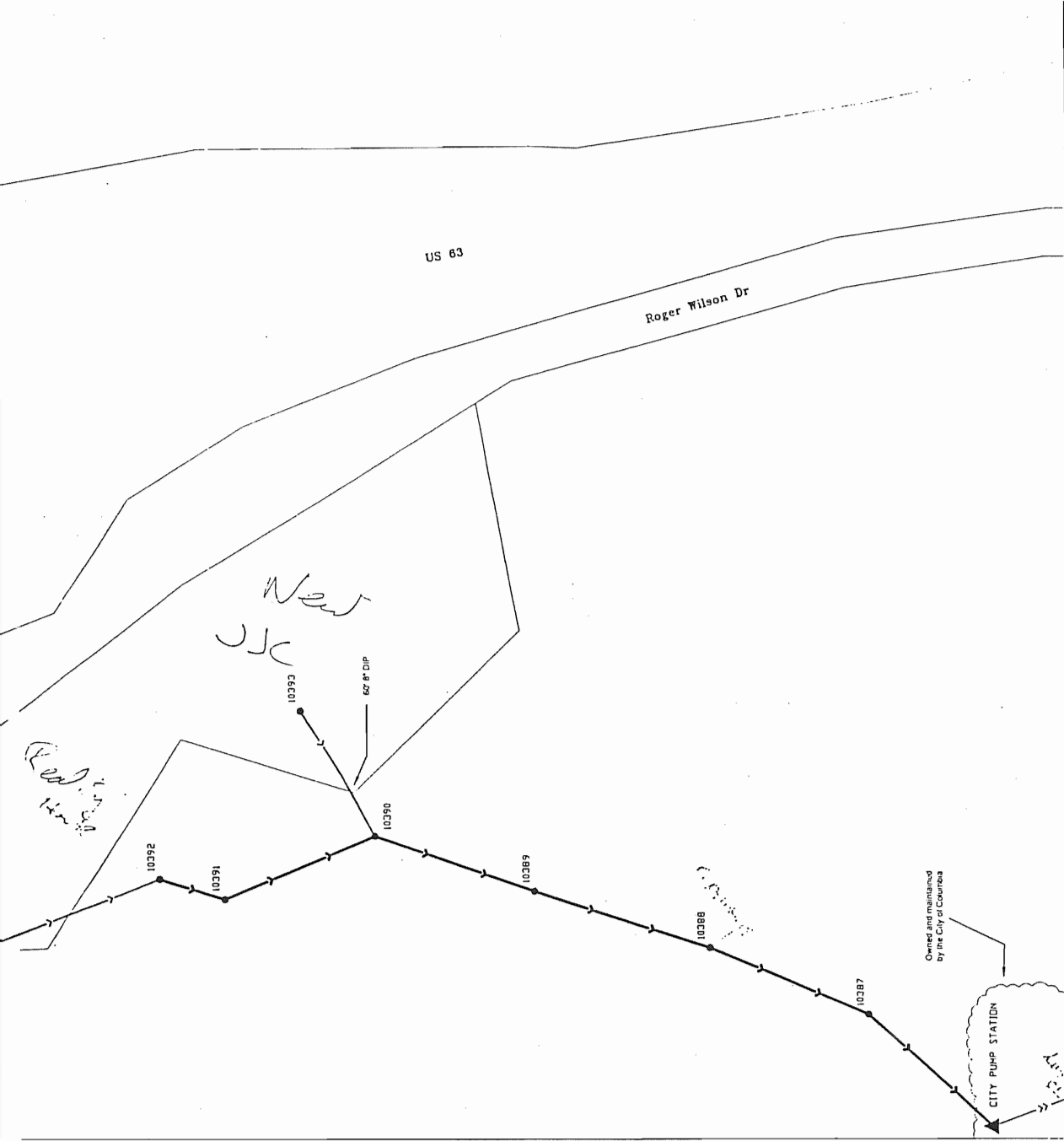
DISCLAIMER: READ CAREFULLY. The existence, dimension, and location of facilities, as well as other information, on this map may be based upon unverified historic information and should not be relied upon for any purpose without actual field inspection. No liability or warranty should be performed based upon this map without first obtaining field location information concerning underground utilities as required by law. The Boone County Regional Sewer District makes no warranty of any kind, nor does it assume the responsibility for the use or misuse of this map by persons not affiliated with the District. Use of this map by any person not affiliated with the District constitutes agreement by the user to assume full liability and responsibility for the verification of the accuracy of information shown on this map.



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Boone County Regional Sewer District | By: RBL | Date: June 30, 2000 | Scale: 1" = 200' | Sheet: Crown Power | Version: 1.00 | Page: -





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Boone County Fairgrounds – Site and Space Analysis

Location of Sewer Lines
Information provided by City of Columbia
Contact – Dave Mathon
573-874-7325
Properties included:
Fairgrounds

Location of gas meters and lines
Information provided by AmerenUE

Contact – Tom Miles

573-499-1843

Properties included:

Maintenance Building

Reality House

Coliseum

Former Office Building

Juvenile Justice Center

Boone County Jail

Armory

SERVICE REPORT

Union Electric Co. Part of Service

Customer Part of Service

Size of Pipe 1 1/2" S Size of Tap 3/4"

Size of Pipe _____

Length of Line Steel _____ Plastic _____

Length of Line Steel _____ Plastic _____

Tap is _____ Feet from Meter Location

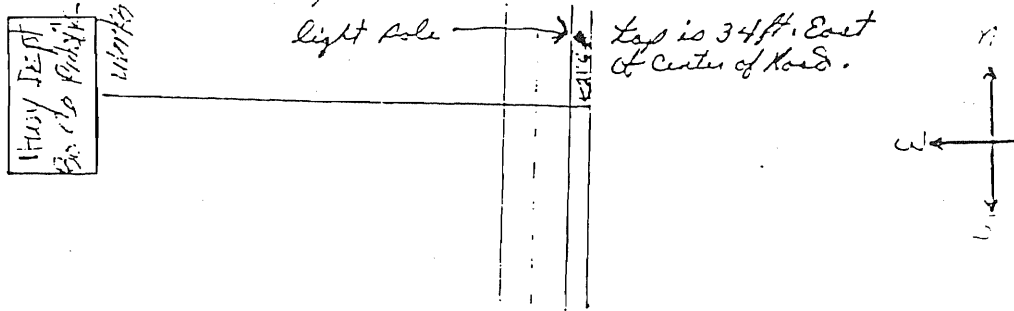
Meter is on the M _____ E S _____ W _____ Side of Building

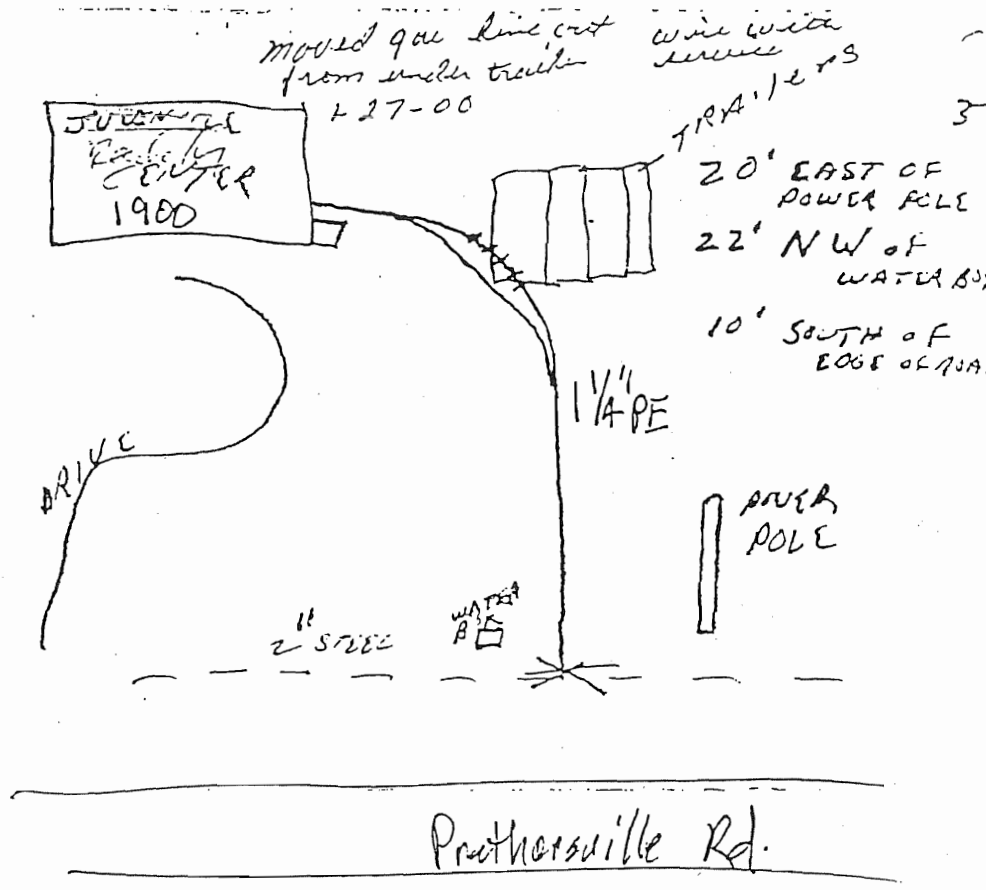
Anode Installed on Riser? Yes _____ No Anode Installed on Service? Yes _____

New Service _____ Replaced Service Repaired Existing Service _____ Service Abandoned _____

Service Depth 3 ft. Test Pressure 100 lbs. Length of Test 30 min.

Results of Test Good, wire with service.





SERVICE REPORT

Union Electric Co. Part of Service	Customer Part of Service
Size of Pipe <u>2"</u> Size of Tap _____	Size of Pipe _____
Length of Line Steel _____ Plastic <input checked="" type="checkbox"/>	Length of Line Steel _____ Plastic _____
Tap is <u>30'</u> Feet from Meter Location	
Meter is on the <u>M</u> <input checked="" type="checkbox"/> <u>E</u> _____ <u>S</u> _____ <u>W</u> _____ Side of Building	
Anode Installed on Riser? Yes _____ No _____ Anode Installed on Service? Yes _____ No _____	
New Service <input checked="" type="checkbox"/> Replaced Service _____ Repaired Existing Service _____ Service Abandoned _____	
Service Depth <u>30"</u>	Test Pressure <u>100lbs</u> Length of Test <u>18 HRS.</u>
Results of Test <u>OK</u>	

5212 N. Oakland Gravel

C-RAVEL DRIVE

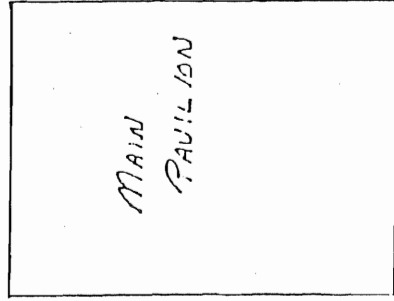
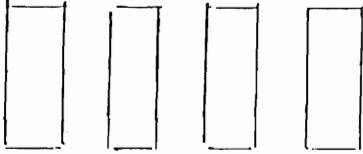
5170

SERVICE REPORT

Union Electric Co. Part of Service <u>11</u>	Customer Part of Service
Size of Pipe <u>1"</u> Size of Tap <u>2 x 1" pl</u>	Size of Pipe <u>1" pl with 11"</u>
Length of Line Steel _____ Plastic _____	Length of Line Steel _____ Plastic _____
Tap is 43' <u>22'</u> 34' Feet from Meter Location	
Meter is on the <u>M</u> <input checked="" type="checkbox"/> <u>E</u> _____ <u>S</u> _____ <u>W</u> _____ Side of Building	
Anode Installed on Riser? Yes _____ No <u>L</u> Anode Installed on Service? Yes _____ No _____	
New Service <input checked="" type="checkbox"/> Replaced Service _____ Repaired Existing Service _____ Service Abandoned _____	
Service Depth <u>2'</u>	Test Pressure <u>100psi</u> Length of Test <u>30 MIN Each</u>
Results of Test <u>(Good Both) * wire on Services & MAIN</u>	

N

BOONE COUNTY FAIRGROUNDS



MAIN GATE

2" SERVICE

4" YELLOW PIPER

INSTALL 2" TEE

26'

4" YELLOW PIPER

19'

20'

2" TEE AND STUB

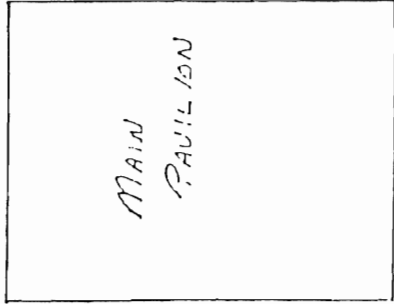
ALL MAIN INSTALLATIONS TO BE 2" P.L.A.

INSTALL 2"

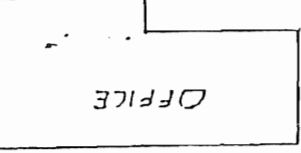
ESTIMATE # 80535
WMO # B-830
PROJECT LOCATION Boone, VA.

INSTALLED
1975' OF 2"
PLASTIC MAIN

BOONE COUNTY FAIRGROUNDS



OFFICE



TO
DARK
GRAV.

YELLOW MARKER

INSTALL
2" TEE

2" SERVICE

YELLOW MARKER

2" TEE
AND STUB

26'

19'

20'

ALL MAIN
INSTALLATIONS
TO BE 2" PUA.

ESTIMATE # 80535 W.R. 1A
 WAO # B-830 ESTR B.A.D.
 PROJECT LOCATION BOONE COUNTY FAIRGROUNDS
 STARRIE LANE
 UNION ELECTRIC COMPANY

ALL
OF 2"
TIC MAIN

J.J.C.

SERVICE REPORT

Union Electric Co. Part of Service

Customer Part of Service

Size of Pipe 4" PVC Size of Tap _____

Size of Pipe _____

Length of Line Steel _____ Plastic

Length of Line Steel _____ Plastic

Tap is 125' Feet from Meter Location

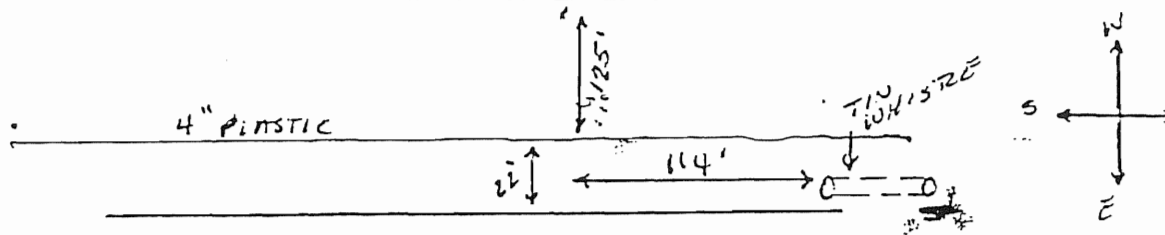
Meter is on the M _____ E S _____ W _____ Side of Building

Anode Installed on Riser? Yes _____ No _____ Anode Installed on Service? Yes _____ No _____

New Service Replaced Service _____ Repaired Existing Service _____ Service Abandoned _____

Service Depth 2' Test Pressure 100 lbs. Length of Test 15 MIN.

Results of Test OK J.J.C.



J.H.C.

