

**STATE OF MISSOURI**  
**DEPARTMENT OF NATURAL RESOURCES**

MISSOURI CLEAN WATER COMMISSION



**CONSTRUCTION PERMIT**

The Missouri Department of Natural Resources hereby issues a permit to:

City of Hallsville  
ATTN: The Honorable Cheri Reisch  
P.O. Box 170  
Hallsville, MO 65255

for the construction of (described facilities):

See attached.

Permit Conditions:

See attached.

Construction of such proposed facilities shall be in accordance with the provisions of the Missouri Clean Water Law, Chapter 644, RSMo, and regulation promulgated thereunder, or this permit may be revoked by the Department of Natural Resources (Department).

As the Department does not examine structural features of design or the efficiency of mechanical equipment, the issuance of this permit does not include approval of these features.

A representative of the Department may inspect the work covered by this permit during construction. Issuance of a permit to operate by the Department will be contingent on the work substantially adhering to the approved plans and specifications.

This permit applies only to the construction of water pollution control components; it does not apply to other environmentally regulated areas.

December 4, 2014  
Effective Date

Sara Parker Pauley  
Sara Parker Pauley, Director, Department of Natural Resources

December 3, 2015  
Expiration Date

John Madros  
John Madros, Director, Water Protection Program

## CONSTRUCTION PERMIT

### **I. CONSTRUCTION DESCRIPTION**

This is the reissuance of Construction Permit Numbers CP0001507, which was issued on May 20, 2013 and expired on May 19, 2014, and CP0001545, which was issued on August 22, 2013 and expired on February 21, 2014. No changes in the projects; just delayed.

The Wastewater Treatment & Collection Improvements, Phase I project is to construct the following:

- New pumps, controls, valves, piping, and the building structure will be constructed at the existing pump station that transfers wastewater from the aerated lagoon to the storage basin. Duplex 75 horsepower self-priming pumps, each sized to pump 450 gallons per minute with 214 feet total dynamic head, will connect to the existing force main. The existing 6-foot diameter wet well will be utilized with a bottom at 828.9-foot elevation, a lagoon low water level at 833.9-foot, and a pipe up to self-priming pumps with the suction flange at approximately the 846.7-foot elevation.

The Wastewater Treatment & Collection Improvements, Phase II project is to construct the following:

- A headworks structure with a manual bar screen for the existing aerated lagoon.
- A new storage basin, Cell No. 3, with a volume of 4,659,625 gallons.
- Two force mains from the existing transfer pump station to Cell No. 3, each approximately 570 feet of 6-inch polyvinylchloride (PVC) pipe.
- Force main to the new Land Application Site No. 2, approximately 3350 feet of 12-inch PVC pipe.
- Force main at the current storage basin, Cell No. 2, to transfer wastewater to Cell No. 3, with a new section connecting to existing pipe that is approximately 1550 feet of 12-inch PVC pipe.
- Complete installation of rock blanket at Cell No. 2.
- Replace control panel and motor starters at existing irrigation pump house (near Cell 2).
- Install telemetry monitoring system at transfer pump station, existing irrigation pump house, and new Land Application Site No. 2.
- Install flow meters for all irrigation equipment.
- Purchase mobile influent flow meters for Capacity, Management, Operation, and Maintenance plan.
- Add manhole section and raise top to eliminate Sanitary Sewer Overflow at manhole south of aerated lagoon.
- Extend gravity sewer along Ricketts Road and eliminate pump station. The new sewer is approximately 525 feet of 8-inch PVC pipe.
- Improve creek crossing for improved access to aerated lagoon facility.
- Add a backup generator for the previously installed transfer pump station at the aerated lagoon.
- Appurtenances to the new storage basin, Cell No. 3, including (but not limited to) a spillway, warning signs, depth markers, and a gravel access road.
- A sewer connection for a nearby private residence and a stub line for future development, which includes a simplex pump and approximately 2400 feet of 3-inch PVC force main.

Construction and installation of all necessary appurtenances to make complete and usable components of the treatment facility are incorporated in this project. The project will also include general site work appropriate to the scope and purpose of the project.

These wastewater facilities will be in the vicinity the City of Hallsville in Boone County, for treatment at the Hallsville Land Application System located northwest of the intersection of Route U and highway MO 124. The Missouri State Operating Permit is MO-0104990.

## **II. FINDING OF AFFORDABILITY**

Pursuant to Section 644.145, RSMo, the Department is required to determine whether a permit or decision is affordable and make a finding of affordability for each permit or decision.

This is a construction permit for a project which will partly fulfill a requirement in Consent Judgment Case No. 11BA-CVO-3566 and contains no new or expanded conditions.

## **III. CONSTRUCTION PERMIT CONDITIONS**

The permittee is authorized to construct subject to the following conditions:

1. This construction permit does not authorize discharge.
2. All construction shall be in accordance with the plans and specifications submitted by Allstate Consultants on April 19, 2013 (Phase I) and June 21, 2013 (Phase II).
3. The Department must be contacted in writing prior to making any changes to the approved plans and specifications that would directly or indirectly have an impact on the capacity, flow, system layout, or reliability of the proposed wastewater treatment facilities or any design parameter that is addressed by 10 CSR 20-8, in accordance with 10 CSR 20-8.110(8).
4. State and Federal Law does not permit bypassing of raw wastewater, therefore steps must be taken to ensure that raw wastewater does not discharge during construction. If a sanitary sewer overflow or bypass occurs, report the appropriate information to the Department's Northeast Regional Office per 10 CSR 20-7.015(9)(E)2.
5. This Construction Permit is invalid for projects required to comply with the requirements contained in 10 CSR 20-4, "Grants and Loans"
6. Protection of drinking water supplies shall be in accordance with 10 CSR 20-8.120(10). "There shall be no physical connections between a public or private potable water supply system and a sewer, or appurtenance thereto which would permit the passage of any wastewater or polluted water into the potable supply. No water pipe shall pass through or come in contact with any part of a sewer manhole."
7. Sewers in relation to water works structures shall meet the requirements of 10 CSR 23-3.010 with respect to minimum distances from public water supply wells or other water supply sources and structures.
  - A. Sewer mains shall be laid at least ten feet horizontally from any existing or proposed water main. The distances shall be measured edge-to-edge. In cases where it is not practical to maintain a ten foot separation, the Department may allow a deviation on a case-by-case basis, if supported by data from the design engineer. Such a deviation may allow installation of the sewer closer to a water main, provided that the water main is in a separate trench or on an undisturbed earth shelf located on either side of the sewer and at an elevation so the bottom of the water main is at least 18 inches above the top of the sewer. If it is impossible to obtain proper horizontal and vertical separation as described above for sewers, the sewer must be constructed of slip-on or mechanical joint pipe or continuously encased and be pressure tested to 150 pounds per square inch to assure water tightness.
  - B. Manholes should be located at least ten feet horizontally from any existing or proposed water main.

- C. Sewers crossing water mains shall be laid to provide a minimum vertical distance of 18 inches between the outside of the water main and the outside of the sewer. This shall be the case where the water main is either above or below the sewer. The crossing shall be arranged so that the sewer joints will be equidistant and as far as possible from the water main joints. Where a water main crosses under a sewer, adequate structural support shall be provided for the sewer to maintain line and grade. When it is impossible to obtain proper vertical separation as stipulated above, one of the following methods must be specified:
  - a. The sewer shall be designed and constructed equal to the water pipe and shall be pressure tested to assure water tightness prior to backfilling; or
  - b. Either the water main or sewer line may be continuously encased or enclosed in a watertight carrier pipe which extends ten feet on both sides of the crossing, measured perpendicular to the water main. The carrier pipe shall be of materials approved by the Department for use in water main construction.
8. In addition to the requirements for a construction permit, 10 CSR 20-6.200 requires land disturbance activities of one acre or more to obtain a Missouri State Operating Permit to discharge stormwater. The permit requires Best Management Practices sufficient to control runoff and sedimentation to protect waters of the state. Land disturbance permits will only be obtained by means of the Department's ePermitting system available online at [www.dnr.mo.gov/env/wpp/epermit/help.htm](http://www.dnr.mo.gov/env/wpp/epermit/help.htm). See [www.dnr.mo.gov/env/wpp/stormwater/sw-land-disturb-permits.htm](http://www.dnr.mo.gov/env/wpp/stormwater/sw-land-disturb-permits.htm) for more information.
9. A United States (U.S.) Army Corps of Engineers (COE) permit (404) and a Water Quality Certification (401) issued by the Department or permit waiver may be required for the activities described in this permit. This permit is not valid until these requirements are satisfied. If construction activity will disturb any land below the ordinary high water mark of Jurisdictional Waters of the U.S. then a 404/401 will be required. Since the COE makes determinations on what is jurisdictional, you must contact the COE to determine permitting requirements. You may call the Department's Water Protection Program at 573-751-1300 for more information. See [www.dnr.mo.gov/env/wpp/401/](http://www.dnr.mo.gov/env/wpp/401/) for more information.
10. Upon completion of construction;
  - A. The City of Hallsville will become the continuing authority for operation, maintenance, and modernization of these facilities;
  - B. Submit the enclosed form Statement of Work Completed to the Department In accordance with 10 CSR 20-6.010(5)(D);
  - C. Submit an electronic copy of the as built with the Statement of Work Completed; and
  - D. Verify that the operating permit renewal incorporates the construction work including changes to the facility description.

#### **IV. REVIEW SUMMARY**

##### **1. AMMONIA**

The Water Protection Program is providing this notice to inform permittees that EPA's published ammonia criteria for aquatic life protection is lower than the current Missouri criteria. The department has initiated stakeholder discussions on this topic and at this time, there is no firm target date for starting the rulemaking to adopt new standards. More information can be found at <http://dnr.mo.gov/pubs/pub2481.pdf>.

The proposed facility is no-discharge with irrigation; effluent limitations for ammonia are not applicable.

##### **2. CONSTRUCTION PURPOSE**

The facility is permitted a no-discharge system pursuant to MO-0104990, effective October 1, 2008. The facility was found to be discharging wastewater, in violation of the permit (re: Notice of Violation, March 29, 2010). The Ricketts Road lift station had only one pump, in violation of the construction permit.

Consent Judgment, Case No. 11BA-CVO 3566, entered August 24, 2011, requires a plan and construction to prevent any discharge from the facility in case of inability to land apply the wastewater and the elimination of the Ricketts Road lift station.

##### **3. FACILITY DESCRIPTION**

The wastewater treatment facility consists of a single aerated lagoon, a storage basin, and land application of wastewater with a design flow of 212,622 gallons per day (147.7 gallons per minute) and a design population equivalent of 2,085. Sludge is retained in the lagoon. This construction will add a second storage basin, along with the other construction projects. The existing aerated lagoon, storage basin and land application site will remain in use.

##### **4. COMPLIANCE PARAMETERS**

The construction is to meet the Missouri State Operating Permit requirement for no discharge to waters of the State of Missouri.

##### **5. REVIEW of MAJOR TREATMENT DESIGN CRITERIA**

This project does not increase design loading of the treatment facility. This construction is to increase storage capacity, provide additional land application sites, and improve the operability of the system.

##### **6. OPERATING PERMIT MODIFICATION**

Operating permit MO-0104990 should be modified with the ongoing reissuance to incorporate the changes to reflect these construction activities.

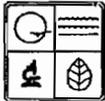
Review Engineer: Keith Forck, P.E.  
Unit Chief Approval: Cindy LePage, P.E.  
Date: November 2014

AP19843

RECEIVED

MO-0104990

CP0001693



MISSOURI DEPARTMENT OF NATURAL RESOURCES  
WATER PROTECTION PROGRAM  
APPLICATION FOR CONSTRUCTION PERMIT -  
WASTEWATER TREATMENT FACILITY

OCT 20 2014

WATER PROTECTION PROGRAM

FOR DEPARTMENT USE ONLY	
APP NO.	CP NO.
FEE RECEIVED	CHECK NO.
DATE RECEIVED	

150.00 22687  
10/20/14

APPLICATION OVERVIEW

The Application for Construction Permit - Wastewater Treatment Facility form has been developed in a modular format and consists of Part A and B. All applicants must complete Part A. Part B should be completed for applicants who currently land-apply wastewater or propose land application for wastewater treatment. Please read the accompanying instructions before completing this form. Submittal of an incomplete application may result in the application being returned.

PART A - BASIC INFORMATION

1.0 APPLICATION INFORMATION (Note - If any of the questions in this section are answered NO, this application may be considered incomplete and returned.)

- 1.1 Is this a Federal/State funded project?  YES  N/A Funding Agency: \_\_\_\_\_ Project #: AP15722
- 1.2 Has the Missouri Department of Natural Resources approved the proposed project's antidegradation review?  YES Date of Approval: 8/23/13 Construction Permit No. CP0001507 & CP0001545  
 Attached is the No Degradation Evaluation Conclusion of Antidegradation Review form
- 1.3 Has the department approved the proposed project's facility plan\*?  YES Date of Approval: \_\_\_\_\_  NO  N/A (If Not Applicable, complete No. 1.4.)
- 1.4 [Complete only if answered Not Applicable on No. 1.3.] Is a copy of the engineering report\* for wastewater treatment facilities with a design flow less than 22,500 gpd included with this application?  YES  NO
- 1.5 Is a copy of the appropriate plans\* and specifications\* included with this application?  YES Denote which form is submitted:  Hard copy  Electronic copy (See instructions.)  NO \* Application Renewal, Items Previously Submitted No Changes to Plans, Specs, & Design
- 1.6 Is a summary of design\* included with this application?  YES  NO \*
- 1.7 Has the appropriate operating permit application (A, B, or B2) been submitted to the department?  YES Date of submittal: 6/20/13  
 Enclosed is the appropriate operating permit application submittal. Denote which form:  A  B  B2  
 N/A Please explain: \_\_\_\_\_
- 1.8 Is the facility currently under enforcement with the department or the Environmental Protection Agency?  YES  NO
- 1.9 Is the appropriate fee included with this application?  YES  NO (See instructions for appropriate fee.)

\* Must be affixed with a Missouri registered professional engineer's seal, signature and date.

2.0 PROJECT INFORMATION

2.1 NAME OF PROJECT

Wastewater Treatment & Collection Improvements: Phase 1 & 2

2.2 PROJECT DESCRIPTION

Phase 1 - Transfer Pump Station Replacement, Phase 2 - Land Application, Storage Basin, & Ricketts Road Sewer Improvements. Project Consists of replacing the existing duplex transfer pump station at the aerate lagoon facility, construction of new storage basin, force main to new irrigation site, improvements to the aerated basin headworks, and improvements to the existing storage basin.

2.3 SLUDGE HANDLING, USE AND DISPOSAL DESCRIPTION

Sludge is retained in the lagoons.

2.4 DESIGN INFORMATION

- A. Current population: 1491 ; Design population: 2085
- B. Actual Flow: 149,568 gpd; Design Average Flow: 212,622 gpd;  
Actual Peak Daily Flow: 650,000 gpd; Design Maximum Daily Flow: 800,000 gpd

2.5 ADDITIONAL INFORMATION

- A. Is a topographic map attached?  YES  NO
- B. Is a process flow diagram attached?  YES  NO

**3.0 WASTEWATER TREATMENT FACILITY**

NAME Hallsville Land Application System	TELEPHONE NUMBER WITH AREA CODE (573) 353-3885	E-MAIL ADDRESS cityofhallsville@cs.com
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ADDRESS (PHYSICAL) P.O. Box 170	CITY Hallsville	STATE MO	ZIP CODE 65255	COUNTY Boone
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Wastewater Treatment Facility: Mo- 0104990 (Outfall 1 Of 2 ) Outfall 2 of 2

3.1 Legal Description: NE ¼, NE ¼, NW ¼, Sec. 15, T 50, R W NW 1/4, Sec. 22, T50N, R12W  
(Use additional pages if construction of more than one outfall is proposed.) (X) 564594, (Y) 4328888  
Kelley Branch

3.2 UTM Coordinates Easting (X): 564696 Northing (Y): 4330767  
For Universal Transverse Mercator (UTM), Zone 15 North referenced to North American Datum 1983 (NAD83)

3.3 Name of receiving streams: Kelley Branch

**4.0 PROJECT OWNER**

NAME City of Hallsville, Missouri	TELEPHONE NUMBER WITH AREA CODE (573) 696-3885	E-MAIL ADDRESS cityofhallsville@cs.com
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ADDRESS 202 Hwy 124 East, P.O. Box 170	CITY Hallsville	STATE MO	ZIP CODE 65255
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**5.0 CONTINUING AUTHORITY: Permanent organization that will serve as the continuing authority for the operation, maintenance and modernization of the wastewater collection system.**

NAME City of Hallsville, Missouri	TELEPHONE NUMBER WITH AREA CODE (573) 696-3885	E-MAIL ADDRESS cityofhallsville@cs.com
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ADDRESS 202 Hwy 124 East, P.O. Box 170	CITY Hallsville	STATE MO	ZIP CODE 65255
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5.1 A letter from the continuing authority, if different than the owner, is included with this application.  YES  NO  N/A

5.2 COMPLETE THE FOLLOWING IF THE CONTINUING AUTHORITY IS A MISSOURI PUBLIC SERVICE COMMISSION REGULATED ENTITY.

A. Is a copy of the certificate of convenience and necessity included with this application?  YES  NO

5.3 COMPLETE THE FOLLOWING IF THE CONTINUING AUTHORITY IS A PROPERTY OWNERS ASSOCIATION.

A. Is a copy of the as-filed restrictions and covenants Included with this application?  YES  NO

B. Is a copy of the as-filed warranty deed, quitclaim deed or other legal instrument which transfers ownership of the land for the wastewater treatment facility to the association included with this application?  YES  NO

C. Is a copy of the as-filed legal instrument (typically the plat) that provides the association with valid easements for all sewers included with this application?  YES  NO

D. Is a copy of the Missouri Secretary of State's nonprofit corporation certificate included with this application?  YES  NO

**6.0 ENGINEER**

ENGINEER NAME / COMPANY NAME Chad W. Sayre, P.E. - Allstate Consultants LLC	TELEPHONE NUMBER WITH AREA CODE (573) 875-8799	E-MAIL ADDRESS chadsayre@allstateconsultants.net
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ADDRESS 3312 LeMone Industrial Blvd.	CITY Columbia	STATE MO	ZIP CODE 65201
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**7.0 PROJECT OWNER:** I hereby certify that I am familiar with the information contained in this application and to the best of my knowledge and belief such information is true, complete, and accurate, and if granted this permit, I agree to abide by the Missouri Clean Water Law and all rules, regulations, orders, and decisions, subject to any legitimate appeal available to applicant under Missouri Clean Water Law. I also understand the issuance of the construction permit does not guarantee the proposed wastewater treatment will meet the required effluent limitations of the issued Missouri State Operating Permit for this facility.

PROJECT OWNER SIGNATURE *Cheri J. Reisch*

PRINTED NAME Cheri Reisch	DATE 10/13/14
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TITLE OR CORPORATE POSITION Mayor	TELEPHONE NUMBER WITH AREA CODE (573) 696-3885	E-MAIL ADDRESS cityofhallsville@cs.com
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Mail completed copy to: MISSOURI DEPARTMENT OF NATURAL RESOURCES  
WATER PROTECTION PROGRAM  
P.O. BOX 176  
JEFFERSON CITY, MO 65102-0176

END OF PART A  
REFER TO THE APPLICATION OVERVIEW TO DETERMINE WHETHER PART B NEEDS TO BE COMPLETE.

**PART B - LAND APPLICATION ONLY**

(Submit only if the proposed construction project includes land application of wastewater.)

**8.0 FACILITY INFORMATION**

8.1 Type of wastewater to be irrigated:  Domestic  State/National Park  Seasonal business  
 Municipal  Municipal with a pretreatment program or significant industrial users  
 Other (explain) \_\_\_\_\_

8.2 Months when the business or enterprise will operate or generate wastewater:  
 12 months per year  Part of the year (list months): \_\_\_\_\_

8.3 This system is designed for:  
 No-discharge.  
 Partial irrigation when feasible and discharge rest of time.  
 Irrigation during recreational season, April - October, and discharge during November - March.  
 Other (explain) \_\_\_\_\_

**9.0 STORAGE BASINS**

9.1 Number of storage basins: 3 (Use additional pages if greater than three basins.)

9.2 Type of basins:  Steel  Concrete  Fiberglass  Earthen  Earthen with membrane liner

9.3 Storage basin dimensions at inside top of berm (feet). Report freeboard as feet from top of berm to emergency spillway or overflow pipe.

Basin #1:	Length <u>305</u>	Width <u>210</u>	Depth <u>14</u>	Freeboard <u>0</u>	Berm Width <u>10</u>	% Slope <u>33.3</u>
Basin #2:	Length <u>970</u>	Width <u>670</u>	Depth <u>16.7</u>	Freeboard <u>2</u>	Berm Width <u>10</u>	% Slope <u>33.3</u>
Basin #3:	Length <u>280</u>	Width <u>200</u>	Depth <u>23</u>	Freeboard <u>0</u>	Berm Width <u>10</u>	% Slope <u>33.3</u>

9.4 Storage Basin operating levels (report as feet below emergency overflow level).

Basin #1:	Maximum operating water level <u>8</u> ft	Minimum operating water level <u>8</u> ft
Basin #2:	Maximum operating water level <u>1</u> ft	Minimum operating water level <u>13</u> ft
Basin #3:	Maximum operating water level <u>3</u> ft	Minimum operating water level <u>21</u> ft

9.5 Design depth of sludge in storage basins.

Basin #1: 3 ft Basin #2: 2 ft Basin #3: 2 ft

9.6 Existing sludge depth, if the basins are currently in operation.

Basin #1: \_\_\_\_\_ ft Basin #2: \_\_\_\_\_ ft Basin #3: \_\_\_\_\_ ft

9.7 Total design sludge storage: 30 dry tons and \_\_\_\_\_ cubic feet

**10.0 LAND APPLICATION SYSTEM**

10.1 Number of irrigation sites 2 Total Acres 406 Maximum % field slopes 5

Location: \_\_\_\_\_ ¼, \_\_\_\_\_ ¼, \_\_\_\_\_ ¼, 22 Sec. 50 T 12 R Boon County 350 Acres

Location: \_\_\_\_\_ ¼, \_\_\_\_\_ ¼, \_\_\_\_\_ ¼, 10 Sec. 50 T 12 R Boon County 56 Acres

Location: \_\_\_\_\_ ¼, \_\_\_\_\_ ¼, \_\_\_\_\_ ¼, \_\_\_\_\_ Sec. \_\_\_\_\_ T \_\_\_\_\_ R \_\_\_\_\_ County \_\_\_\_\_ Acres

(Use additional pages if greater than three irrigation sites.)

10.2 Type of vegetation:  Grass hay  Pasture  Timber  Row crops  
 Other (describe) \_\_\_\_\_

10.3 Wastewater flow (dry weather) gallons per day: Average annual 149,568 Seasonal 98,756 Off-season 190,551

10.4 Land application rate (design flow including 1-in-10 year storm water flows):

Design:	_____ inches/year	<u>0.5</u> inches/hour	<u>1</u> inches/day	<u>3</u> inches/week	* 24 inches/year Site 1
Actual:	_____ inches/year	_____ inches/hour	_____ inches/day	_____ inches/week	36 inches/year Site 2

10.5 Total irrigation per year (gallons): Design: <sup>49,264,780</sup> \_\_\_\_\_ gal Actual: \_\_\_\_\_ gal

10.6 Actual months used for irrigation (check all that apply):

Jan  Feb  Mar  Apr  May  Jun  Jul  Aug  Sep  Oct  Nov  Dec

10.7 Land application rate is based on:

Hydraulic Loading  Other (describe) \_\_\_\_\_  
 Nutrient Management Plan (N&P) If N&P is selected, is the plan included?  YES  NO

FUTURE CENTER PIVOT NO. 4 (BY PROPERTY OWNER)

LAND APPLICATION SITE NO. 2

PROPOSED CENTER PIVOT NO. 3 (BY PROPERTY OWNER)

PROPOSED FORCE MAIN

TRANSFER PUMP STATION

STE. ROUTE V

PROPOSED STORAGE BASIN (CELL NO. 3)

EXISTING AERATED LAGOON (CELL NO. 1)

GRAVEL ACCESS

ROUTE U

PROPOSED GRAVITY MAIN

ELIMINATE PUMP STATION

RICKETS ROAD

HALLSVILLE, MO

HWY 124

EXISTING FORCE MAIN

EXISTING CENTER PIVOT NO. 1

PROPOSED FORCE MAIN

EXISTING STORAGE BASIN (CELL NO. 2)

IRRIGATION PUMP HOUSE

EXISTING FORCE MAIN

EAST KEMPER RD

TRAVELING GUN IRRIGATION

EXISTING CENTER PIVOT NO. 2

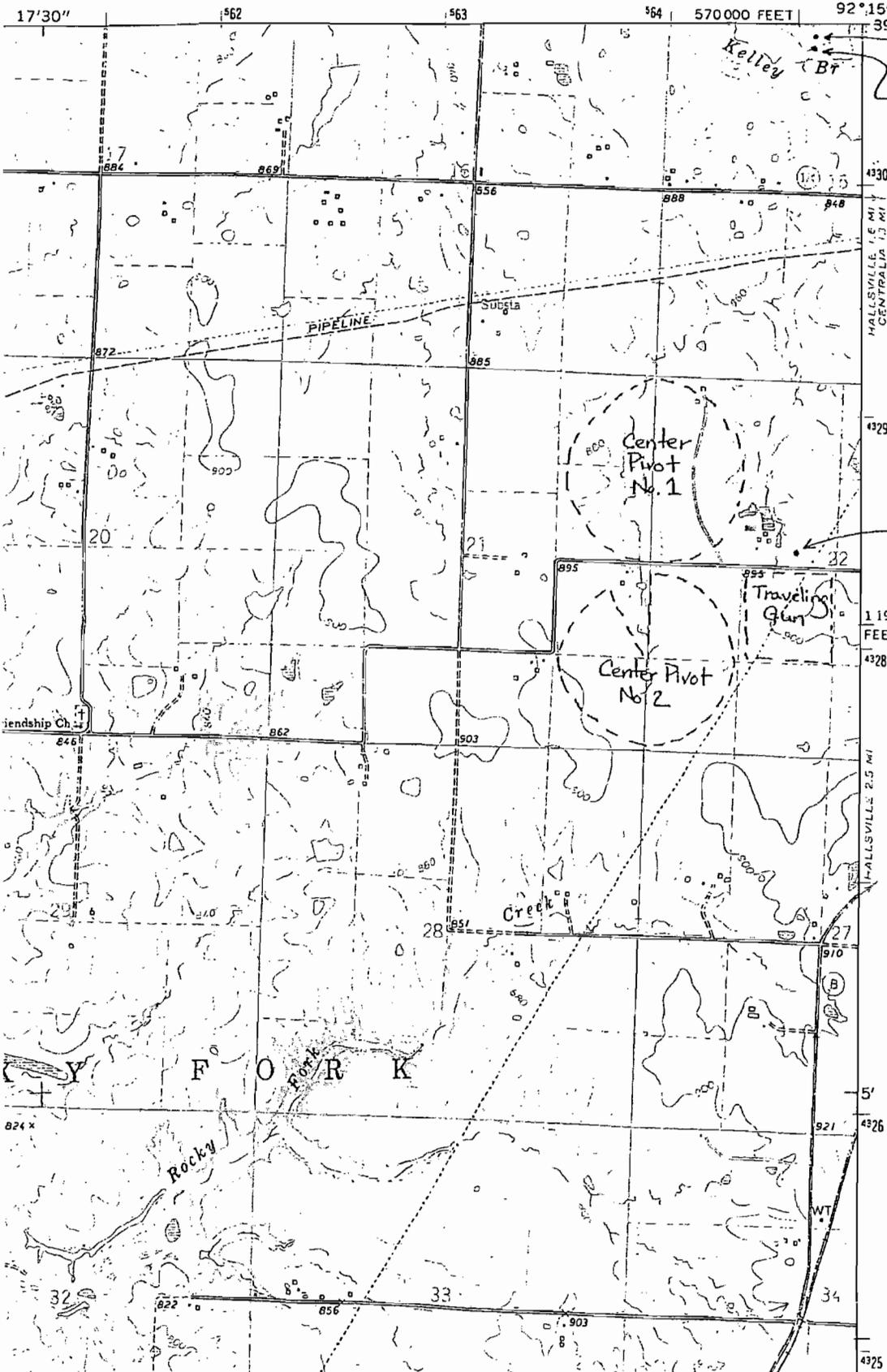
LAND APPLICATION SITE NO. 1



GENERAL LOCATION MAP

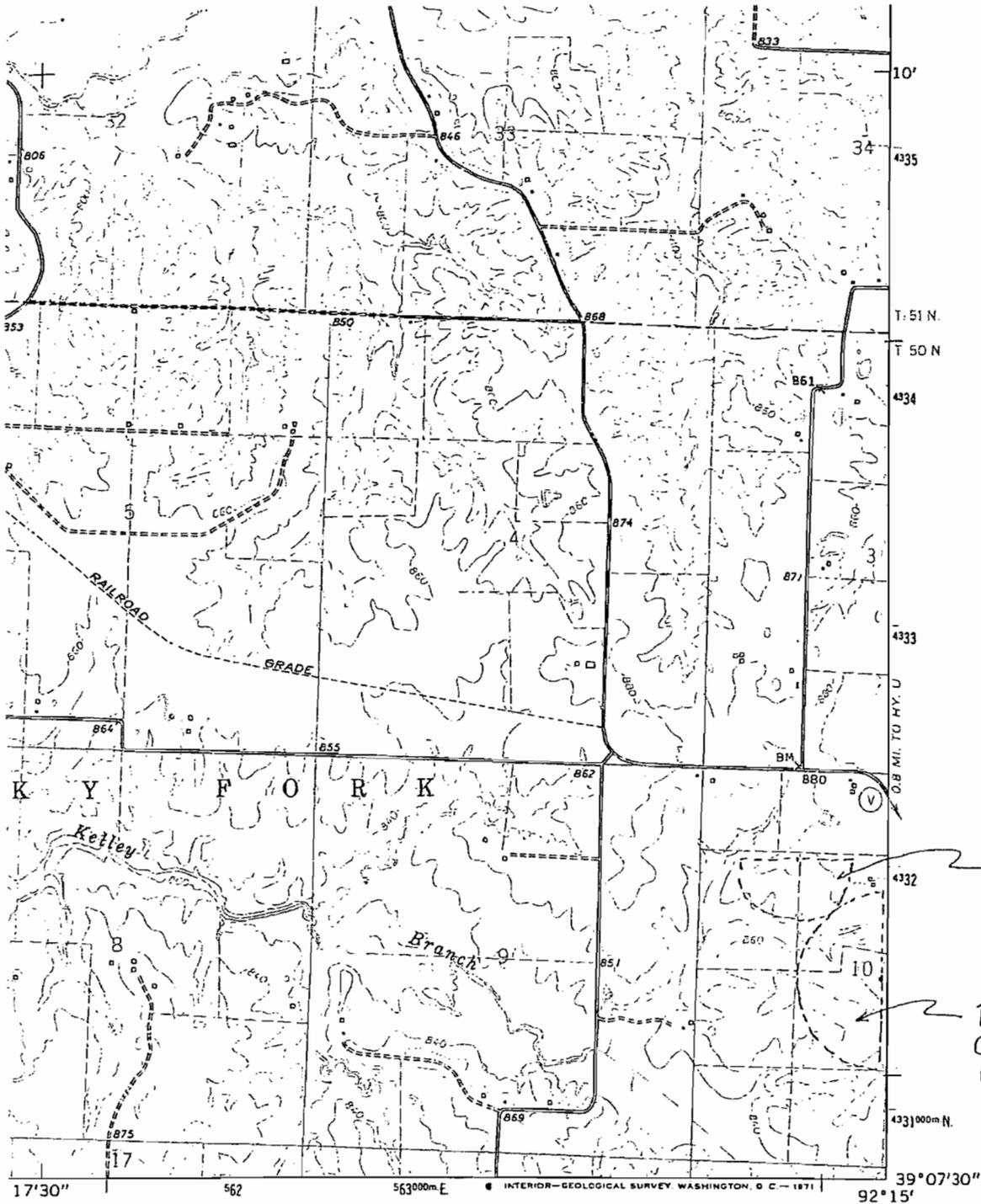
BROWNS QUADRANGLE  
MISSOURI-BOONE CO.  
7.5 MINUTE SERIES (TOPOGRAPHIC)

7502 1 NW  
(CENTRALIA)



Proposed  
Storage Basin  
Aerated Lagoon  
and Transfer  
Pump Station  
Outfall No. 1

Irrigation  
Storage Basin  
and Pump  
House  
Outfall No. 2



Future Center Pivot No. 4

Proposed Center Pivot No. 3

**ROAD CLASSIFICATION**

Primary highway, all weather, hard surface	Light-duty road, all weather, improved surface
Secondary highway, all weather, hard surface	Unimproved road, fair or dry weather

□ U. S. Route      ○ State Route



QUADRANGLE LOCATION

**STURGEON, MO.**

NE/4 STURGEON 15' QUADRANGLE  
N3907.5—W9215/7.5

1969

AMS 7562 III NE—SERIES V879

(HALLSVILLE)  
7502 11 SW

11LE

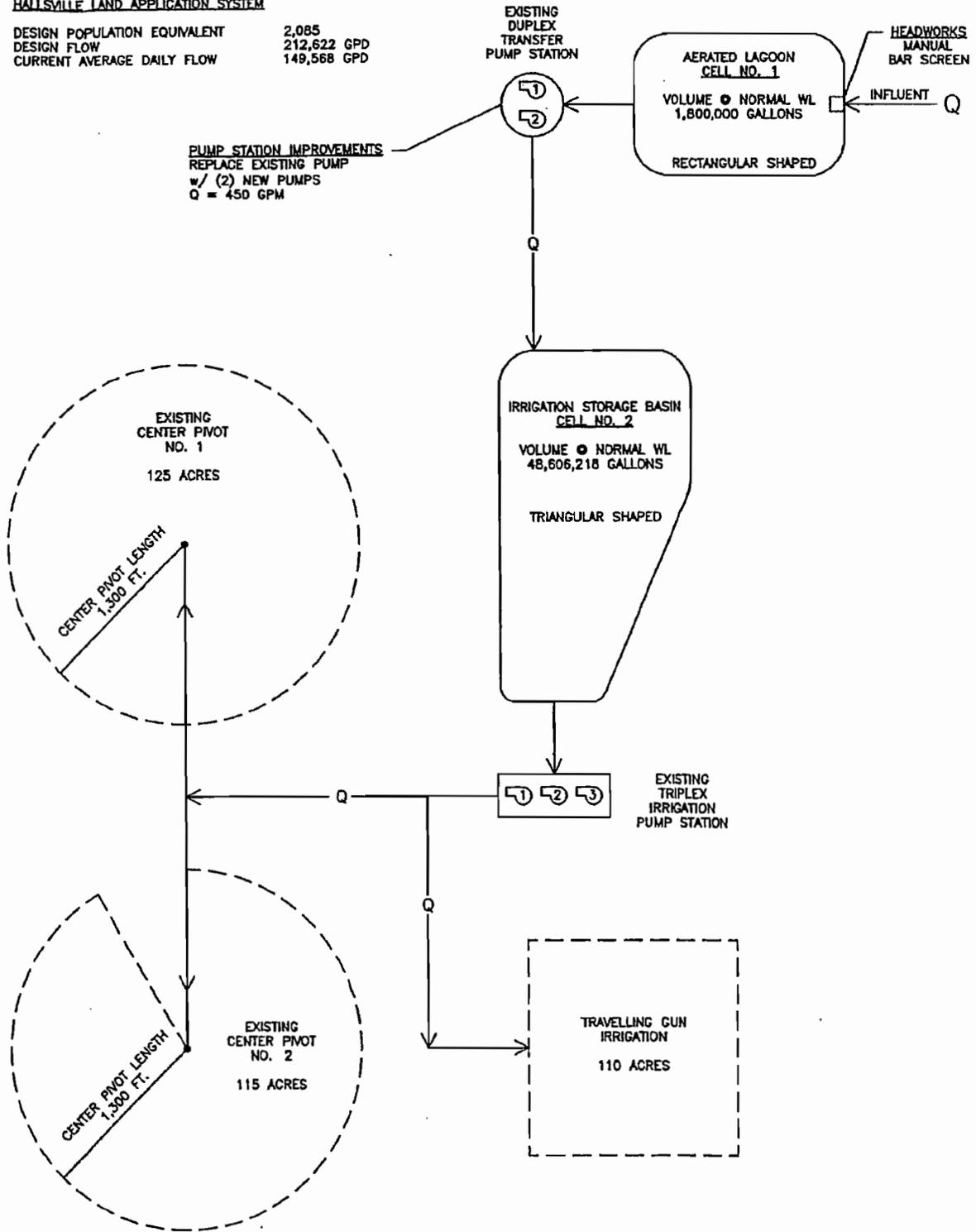
1242



**HALLSVILLE LAND APPLICATION SYSTEM**

DESIGN POPULATION EQUIVALENT 2,085  
 DESIGN FLOW 212,622 GPD  
 CURRENT AVERAGE DAILY FLOW 149,568 GPD

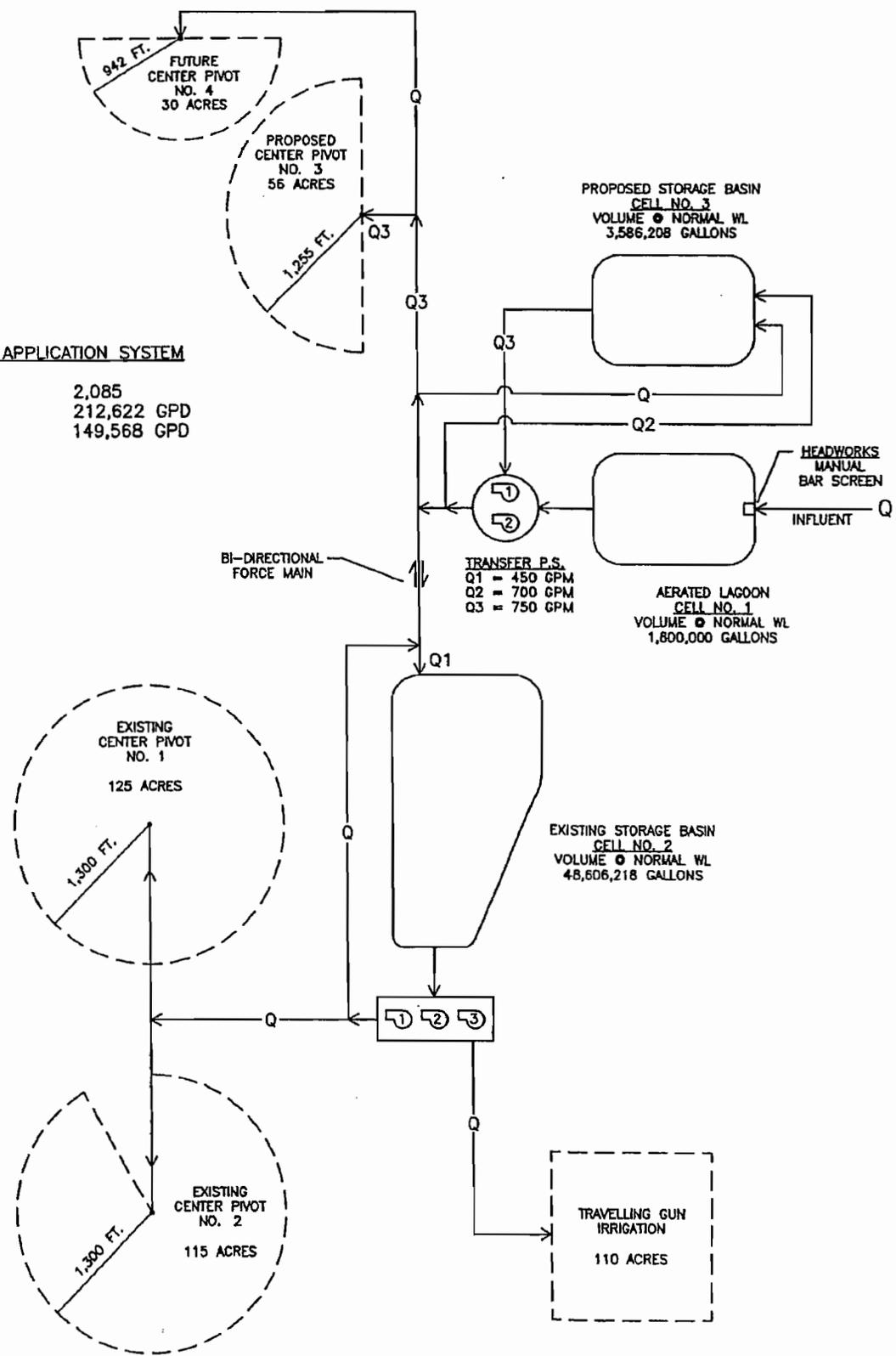
**PUMP STATION IMPROVEMENTS**  
 REPLACE EXISTING PUMP  
 w/ (2) NEW PUMPS  
 Q = 450 GPM



**WASTEWATER TREATMENT FACILITY IMPROVEMENTS  
 PHASE 1 - TRANSFER PUMP STATION IMPROVEMENTS  
 PROCESS FLOW DIAGRAM  
 HALLSVILLE, MISSOURI**

**HALLSVILLE LAND APPLICATION SYSTEM**

DESIGN P.E. 2,085  
 DESIGN FLOW 212,622 GPD  
 CURRENT ADF 149,568 GPD



**WASTEWATER TREATMENT AND COLLECTION IMPROVEMENTS  
 PHASE 2 - LAND APPLICATION, STORAGE, AND RICKETTS ROAD SEWER IMPROVEMENTS  
 PROCESS FLOW DIAGRAM  
 HALLSVILLE, MISSOURI**