

STATE OF MISSOURI
DEPARTMENT OF NATURAL RESOURCES

MISSOURI CLEAN WATER COMMISSION



CONSTRUCTION PERMIT

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

Jefferson County Public Sewer District
JCPSD Lower Big River WWTF
4197 Lower Byrnes Mills Road
Byrnes Mills, MO 63051

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.

April 18, 2024
Effective Date

April 17, 2026
Expiration Date



John Hoke, Director, Water Protection Program

CONSTRUCTION PERMIT

COLLECTION SYSTEM:

The proposed wastewater collection system will consist of a conventional gravity sewer system with lift stations and force mains, which will carry raw wastewater to the receiving wastewater treatment facility.

Construction and installation of approximately 289 linear feet of 6-inch, 3,674 linear feet of 8-inch, 12,822 linear feet of 12-inch, and 944 linear feet of 16-inch polyvinyl chloride (PVC) Standard Dimension Ratio (SDR)-26 and 35 gravity sewer with 104 manholes. Construction and installation of approximately 134 lf of 4-inch, 3,281 lf of 6-inch, 59 lf of 10-inch, and 3,900 12-inch HDPE SDR-21 and 26 force mains with cleanouts and air release valves. The construction of 2 duplex lift stations, and concrete housing, with pumps capable of operating at 1,160 gallons per minute (gpm) at 87.2 feet of total dynamic head (TDH) each and a backup onsite, 3-phase portable generator onsite, high water alarm system, and all necessary appurtenances to make a complete and usable wastewater collection system. The project will serve an estimated population equivalent of 1,611 people at the Byrnes Mill Mobile Home lift station and 3,192 people at the House Springs Lift Station for an estimated design average flow of 480,300 gallons per day heading to the plant. The project will also include general site work appropriate to the scope and purpose of the project.

These activities will be in the vicinity of House Springs and Byrnes Mills along Heads Creek and Bear Creek, Jefferson County and discharge to an existing sewer system to be treated at the JCPSD Lower Big River WWTF, Missouri State Operating Permit No. MO-0115428. Doug Bjornstad, Superintendent, with Jefferson County Public Sewer District provided an acceptance letter dated December 22, 2023.

PERMIT CONDITIONS:

1. This permit authorizes the activities and scope of work detailed in the plans and specifications submitted with the request.
2. The construction must be in accordance with the final plans and specifications approved by the Department and submitted by Horner & Shifrin, received on December 27, 2023 and signed and sealed by Ed Sewing, P.E. on December 21, 2023.
3. The department must be contacted in writing prior to making any changes to the 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(11).
4. If construction will incorporate minor changes from previously submitted plans and specifications (i.e., changes that do not affect the capacity, flow, or system layout), submit an electronic copy of the as-built plans and specifications in accordance with 10 CSR 20-8.110(11).

5. 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 St. Louis Regional Office per 10 CSR 20-7.015(9)(G) or through the Online Bypass/SSO Reporting service on the Missouri Gateway for Environmental Management (MoGEM) portal found at <https://dnr.mo.gov/data-e-services/missouri-gateway-environmental-management-mogem>.
6. Protection of drinking water supplies must meet the requirements of 10 CSR 20-8.120(5) and 10 CSR 23-3.010.
 - A. There shall be no physical connections between a public or private potable water supply system and a sewer or appurtenance that would permit the passage of any wastewater or polluted water into the potable supply.
 - B. Sewers shall be laid at least 50 feet in a horizontal direction from any existing or proposed public water supply well or other water supply sources or structures.
7. The variance approved under No. CWC-V-1-2024 on April 10, 2024, allows for the House Springs Pump Station to include only 29 minutes of peak flow storage at full buildout in exchange for several protective operating measures to ensure no compromise of human health.
8. Manholes shall be located with the top access at or above grade level.
9. In addition to the requirements for a construction permit, see 10 CSR 20-6.200 for land disturbance requirements 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 <https://dnr.mo.gov/data-e-services/missouri-gateway-environmental-management-mogem>.

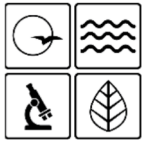
See <https://dnr.mo.gov/data-e-services/water/electronic-permitting-epermitting> for more information.
10. A United States (U.S.) Army Corps of Engineers (COE) permit (404) and a Water Quality Certification (401) issued by the Department or permit waiver may be required for the activities described in 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 <https://dnr.mo.gov/water/business-industry-other-entities/permits-certification-engineering-fees/section-401-water-quality> for more information.

11. If this project eliminates a wastewater treatment facility under the jurisdiction of the department, then a full closure plan shall be submitted with a Facility Closure Request Form, Form – MO 780-2512 to the department's St. Louis regional office for review and approval. In accordance with 10 CSR 20-6.010(12), the closure plan must meet the requirements outlined in Standard Conditions Part III, of the Missouri State Operating Permit. Closure shall not commence until the submitted closure plan is approved by the Department.

12. If this project is part of a project to resolve an enforcement action or is receiving funding from the department, submit a statement of work complete following the completion of construction

Alex Bielefeldt
Engineering Section
alex.bielefeldt@dnr.mo.gov

Cailie Carlile, P.E.
Engineering Section
cailie.carlile@dnr.mo.gov



MISSOURI DEPARTMENT OF NATURAL RESOURCES
 WATER PROTECTION PROGRAM
**APPLICATION FOR CONSTRUCTION PERMIT –
 SEWER EXTENSION**

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

NOTE ► Please Read the accompanying instructions before completing this form

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: Rural Development Project #: N/A

1.2 Has the Department of Natural Resources approved the proposed project's engineering report*?
 YES Date of Approval: 10/11/2020 NO N/A

1.3 Is a copy of the appropriate plans* and specifications* included with this application? YES NO
 If the project is using standard specifications, name of community: N/A

1.4 Is a summary of design* included with this application? YES NO

1.5 Is the appropriate fee or JetPay confirmation included with this application? YES NO
 See Section 7.0

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

2.0 PROJECT INFORMATION

2.1 NAME OF PROJECT
 Lower Big River Regionalization Project - Collection System Improvements

ADDRESS	CITY	STATE	ZIP CODE	COUNTY
Varies	Byrnes Mill & House Springs	MO	63051	Jefferson

2.2 Legal Description: ¼, ¼, ¼, Sec. , T , R

2.3 Project Components (check all that apply):
 Gravity sewers Pumping stations Force mains Alternative sewer system Other (Describe below.)

2.4 PROJECT DESCRIPTION
 See Attachment 2.4

2.5 DESIGN INFORMATION

A. Population or number of lots to be served by this extension: See Attachment 2.4 for Items A, B and D

B. Estimated flow to be contributed by this extension: Design Average Flow: gpd Design Peak Hourly Flow: gph

C. Industrial Wastes: Type: N/A Flow: N/A gpd

D. Receiving Sewer: Size: inches Capacity: gpm

E. Does this project (check all that apply):
 Connect to an existing treatment plant Resolve enforcement issue Eliminate or consolidate an existing treatment plant

F. Estimated number of onsite systems being removed: 4 - WWTF's, 3 - Grinder PS's, and 24 - Septic Tanks

G: Estimated costs associated with piping: \$ 7,500,000 Estimated costs associated with lift station(s): \$ 1,000,000

3.0 PROJECT OWNER

NAME	TELEPHONE NUMBER WITH AREA CODE	EMAIL ADDRESS	
Jefferson County Public Sewer District	636-797-9900	dbjornstad@jeffcopsd.org	
ADDRESS	CITY	STATE	ZIP CODE
4629 Yeager Road, PO Box 632	Hillsboro	MO	63050
CHARTER NUMBER (SECRETARY OF STATE) or REGISTERED AGENT			

4.0 CONTINUING AUTHORITY: A continuing authority is a company, business, entity, or person(s) that will be legally responsible for ensuring compliance with the permit requirements and provide continuous stable oversight of the permitted facility or activity. The Continuing authority should be a relatively permanent entity responsible for the ongoing operation, maintenance and modernization, when needed, of the permitted facility or activity. A continuing authority is not, however, an entity or individual that is contractually hired by the permittee to sample or operate and maintain the system for a defined time period, such as a certified operator or analytical laboratory. To access the regulatory requirement regarding continuing authority, 10 CSR 20-6.010(2), please visit [Clean Water Commission Chapter 6](#). A continuing authority's name must be listed exactly as it appears on the Missouri Secretary of State's (SoS's) webpage: [Missouri Secretary of State](#), unless the continuing authority is an individual(s), government entity, or otherwise not required to register with the SoS.

NAME Same as owner.		TELEPHONE NUMBER WITH AREA CODE	EMAIL ADDRESS
ADDRESS	CITY	STATE	ZIP CODE
CHARTER NUMBER (SECRETARY OF STATE)			

4.1 Has appropriate continuing authority acceptance been provided as follows:
 A letter from the continuing authority accepting responsibility for continued maintenance of the sewer (if the continuing authority is different than the original owner of the construction), or a properly executed "Continuing Authority and Receiving Wastewater Treatment Facility Acceptance" Form 780-2584. YES NO N/A

5.0 ENGINEER

ENGINEER NAME / COMPANY NAME Gilbert Sewing / Horner & Shifrin, Inc.		TELEPHONE NUMBER WITH AREA CODE 314-335-8693	EMAIL ADDRESS gesewing@hornershifrin.com
ADDRESS 401 S. 18th Street, Suite 400	CITY St. Louis	STATE MO	ZIP CODE 63103

6.0 RECEIVING WASTEWATER TREATMENT FACILITY

NAME Lower Big River WWTP		TELEPHONE NUMBER WITH AREA CODE 636-797-9900	EMAIL ADDRESS dbjornstad@jeffcopsd.org
MISSOURI STATE OPERATING PERMIT # MO-0115428	COUNTY Jefferson	REMAINING CAPACITY (GPD) To be completed with facility expansion	

6.1 If different from the owner, has a letter been provided from the receiving treatment facility demonstrating that they agree to accept the expanded flow or has a properly executed Continuing Authority and Receiving Wastewater Treatment Facility Acceptance MO 780-2584 form been provided? YES NO N/A

6.2 A letter from the receiving wastewater treatment facility, if different than the continuing authority, is included with this application. YES NO N/A

6.3 If the receiving treatment plant or continuing authority is regulated by the Public Service Commission (PSC) for sewer activities, a Certificate of Convenience and Necessity has been received? Yes – Date: No N/A

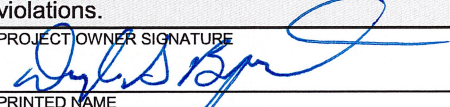
OPTIONAL QUESTIONS REGARDING MILITARY SERVICE

Have you or an immediate family member ever served in the U.S. Armed Forces?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
If yes, would you like information about military-related services in Missouri?	<input type="checkbox"/> Yes	<input type="checkbox"/> No

7.0 Application Fee

<input type="checkbox"/> Check Number	<input checked="" type="checkbox"/> JetPay Confirmation Number 20049688
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8.0 PROJECT OWNER: I certify under penalty of law this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

PROJECT OWNER SIGNATURE 		
PRINTED NAME Douglas S. Bjornstad, P.E.		DATE 12/22/23
TITLE OR CORPORATE POSITION District Manager / Engineer	TELEPHONE NUMBER WITH AREA CODE 636-797-9900	EMAIL ADDRESS dbjornstad@jeffcopsd.org

Mail completed copy to: MISSOURI DEPARTMENT OF NATURAL RESOURCES WATER PROTECTION PROGRAM PO BOX 176 JEFFERSON CITY, MO 65102-0176	Submit completed electronic copy to: Missouri Department of Natural Resources at DNR.WPPEngineerSection@dnr.mo.gov
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9.0 SEWER EXTENSION CHECKLIST				
SEWER EXTENSION DESIGN CERTIFICATION: Answer all questions yes or N/A. Answer N/A only if the question is clearly not applicable to the design of the proposed sewer extension.				
	REGULATION		YES	N/A
1.	8.110(3)(A)	Is the design flow based on actual flow data for an existing system?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2.	8.110(3)(B)	Are average design flows, peak hourly flows and I&I contributions for new systems calculated?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3.	8.110(9)(B)	Is there a detailed plan showing tributary area, boundaries, pertinent elevations, topography, existing and proposed facilities?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4.	8.120(2)	Does the sewer exclude water from roofs, streets, groundwater from foundation drains and combined wastewater?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
5.	8.120(3)(A)	Is the pipe installation, embedment and backfill designed to prevent damage to the pipe and its joints?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
6.	8.120(3)(A)1	Is all sewer pipe constructed with a slope to obtain mean velocities of not less than 2 feet per second?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
7.	8.120(3)(A)2	Is the pipe covered with at least 36" of soil or sufficiently insulated to prevent freezing?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
8.	8.120(3)(B)	Is deflection testing specified to ensure no pipe exceeds a deflection of 5% of the inside diameter?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
9.	8.120(4)(A)	Are manholes located at the end of each line, at all changes in grade, size or alignment and at all intersections?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
10.	8.120(4)(C)	Are manholes at least 42 inches in diameter with a clear opening of 22 inches on sewer line larger than 8"?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
11.	8.120(4)(C)	Where cleanouts are used at the end of a lateral instead of a manhole, they are a minimum diameter of 8 inches or larger and equal to the diameter for pipes < 8"?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
12.	8.120(4)(E)	Are the manholes watertight, constructed and installed in accordance with the manufacturer's recommendations and procedures?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
13.	8.120(4)(F)	Do the specifications include a requirement for inspection and testing for manholes?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
14.	8.120(5)(A)	Is the sewer free from physical connections to a potable water supply system and no water pipes come in contact with a sewer manhole?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
15.	8.120(5)(B)	Are sewers and manholes located at least 50 feet horizontally from any existing or proposed water supply well, sources, structures?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
10.0 PRESSURE SEWERS, GRINDER PUMP, STEP AND STEG SEWER CHECKLIST				
	REGULATION		YES	N/A
16.	8.125(5)(A)1.	Does the cleaning velocity of ≥ 2 ft/s happen more than once per day?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
17.	8.125(5)(A)2.	Is the diameter of the pressure sewer main pipe at least 1.5"?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
18.	8.125(5)(B)	Are appurtenances compatible with the piping system?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
19.	8.125(5)(B)2.	Are isolation valves located: upstream of major pipe intersections; both sides of stream, bridge and RR crossings; at terminal end of system?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
20.	8.125(5)(C)	Do service line pipes have a minimum diameter of 1.25"?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
21.	8.125(5)(D)1.A .	Do simplex grinder pump stations service only a single equivalent dwelling unit (EDU)? i.e. 1 residence – 1 grinder pump.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
22.	8.125(5)(D)1.B .	Are multiple unit pump stations owned, operated and maintained by an approved continuing authority?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
23.	8.125(5)(D)3.	Is there at least 70 gallons of storage in the grinder pump unit?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
24.	8.125(5)(D)4.	Do grinder pump stations have shutoff valves, check valves and anti-siphon valves (where siphoning could occur) that are accessible from the ground surface?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
25.	8.125(5)(D)7., 8.130(3)(B)2.	Are units serviceable and replaceable under wet conditions without electrical hazard and is electrical equipment suitable for hazardous locations (National Electrical Code, Class I, Group D, Division 1 location)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
26.	8.125(5)(D)8., 8.125(2)(F)6.	Are provisions in place to avoid interruption of service due to mechanical or power failure by providing standby power, storage capacity, or interconnection with another disposal system?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
27.	8.125(6)(D)	In a STEP system is at least one septic tank (1,000 gallons or more) provided for each EDU with 20% of tank volume dedicated to freeboard and ventilation?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
28.	8.125(6)(F)	Are duplex pumps provided for the design flow of 1,500 gallons or greater?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

11.0 PUMP STATION CHECKLIST				
	REGULATION		YES	N/A
29.	8.125(7)(C)	Is the minimum diameter sewer main pipe and service line of STEG sewer at least 4"?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
30.	8.130(2)(A) 8.140(2)(B)	Is the pump station designed to withstand the 100-year flood?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
31.	8.130(3)(A)	Is the dry well completely separate from the wet well and is a suitable and safe means of access provided to each?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
32.	8.130(3)(B)	If the design flow is 1,500 gpd or more, are there at least 2 pumps or pneumatic ejectors provided?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
33.	8.130(3)(D)	Are valves located outside wet well unless integral to a pump or its housing?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
34.	8.130(3)(F) 8.140(8)(J)	Do wet and dry wells have separate ventilation systems?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
35.	8.130(3)(G)	Does all potable water brought to pump stations comply with 8.140(7)(D)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
36.	8.130(6)	Is an alarm system provided with uninterrupted power?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
37.	8.130(7)(A)	Is there 2 hours retention of the peak hourly flow for a design flow > 100,000 gpd or 4 hrs retention of the peak hourly flow for a design flow < 100,000 gpd?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
38.	8.130(7)(B)	Are there independent utility substations provided for emergency power capable of starting and operating the pump station at its rated capacity?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
39.	8.130(8)(A)	Is the force main velocity of ≥ 2 ft/s maintained?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
40.	8.130	Are there complete operation instructions for the pumping stations provided that include emergency procedures, maintenance schedules, special tools and spare parts that may be necessary?	<input checked="" type="checkbox"/>	<input type="checkbox"/>

12.0 SUCTION LIFT PUMP AND SUBMERSIBLE PUMP STATION CHECKLIST				
	REGULATION		YES	N/A
41.	8.130(4)	Are the suction lift pumps of the self priming or vacuum priming type?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
42.	8.130(4)(A)	Is the combined total of dynamic suction lift at the "pump off" elevation and required net positive suction head at design operating conditions less than or equal to 22 feet?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
43.	8.130(4)(B)	Are there dual vacuum pumps capable of removing air from the suction lift pump?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
44.	8.130(5)(A)	Are submersible pumps readily removable and replaceable without personnel entering, or disconnecting any pipe in the wet well?	<input checked="" type="checkbox"/>	<input type="checkbox"/>

13.0 SEWER EXTENSION CHECKLIST -- CERTIFICATION STATEMENT

For any questions answered "N/A" provide an explanation. Also provide any useful general comments regarding design for review engineer.

The project includes the construction and installation of gravity sewers, pump stations, and force main to connect the Byrnes Mill MHP WWTF (MO-), Woodridge Estates WWTF (MO-0103438), House Springs Intermediate School WWTF (MO-0100374), and Northwest Valley Middle WWTF (MO-0044580) to the JCPSD Lower Big River WWTF. No pressure sewers will be installed as part of this project. The existing House Springs Pump Station and Byrnes Mill MHP Pump Station will be replaced as part of the project. Submersible pumps will be installed at the pump stations. See Attachment 2.4 for additional project details.

An application for a variance from storage required per 10 CSR 20-8.130(7)(A) at the new House Springs Pump Station was submitted to DNR on 12/12/2023.



Missouri Professional Engineer's seal, signature and date:

Name: Gilbert Sewing

Address: 401 S. 18th Street, Suite 400

City: St. Louis State: MO ZIP Code: 63103

Telephone Number with Area Code: 314-335-8693 Email: gesewing@hornershifrin.com

ATTACHMENT 2.4 – Project Description:

The project consists of the following four (4) collection system projects:

1. Byrnes Mill Mobile Home Park Pump Station & Forcemain:

- a. Sanitary gravity sewer extension consisting of 2,549' of 8" pipe, 30' of 12" pipe, and 21 manholes.
- b. Sanitary forcemain consisting of 3,306' of 6" pipe, and 3 air/vacuum valve manholes.
- c. Location Legal Description: Landgrant 03059, Landgrant 03205 and Landgrant 03059.
- d. Duplex submersible pump stations for both dry weather and wet weather flow. The existing WWTF lagoon will be converted into a wet weather storage facility.
- e. Project will eliminate a WWTF, pump station with SSO, a grinder pump station, and 8 septic tanks.

i. Design Flows:

1. Design P.E. (a+b+c+d): 1,611 PERSONS
 - a. MHP (current): 738 PERSONS
 - b. MHP (future): 285 PERSONS
 - c. Echo Lake: 303 PERSONS
 - d. Silverstone: 285 PERSONS
2. Dry Weather Pump Station:
 - a. Average Daily Flow (ADF): 0.143 MGD (100 GPM)
 - b. Peaking Factor ^[1] (P.F.): 4.00
 - c. Peak Hourly Flow (PHF): 0.571 MGD (396 GPM)
 - d. Pump Capacity (CSR): 0.576 MGD (400 GPM)
 - e. Pump Quantity: (1) Duty + (1) Installed Spare
 - f. Station Firm Capacity: 0.576 MGD (400 GPM)
3. Wet Weather Pump Station:
 - a. Peaking Factor ^[2] (P.F.): 11.3±
 - b. Peak Hourly Flow (PHF): 1.61 MGD (1,118 GPM)
 - c. Pump Capacity (CSR): 2.02 MGD (1,400 GPM)
 - d. Pump Quantity: (1) Duty + (1) Installed Spare
 - e. Station Firm Capacity: 2.02 MGD (1,400 GPM)
 - f. Wet-Weather Detention Volume: 1.6± mGAL

^[1] As proposed in previously-submitted report Preliminary Engineering Study & Report - Byrnes Mill Mobile Home Park Sewer Service Area Jefferson County Public Sewer District (April 2019).

^[2] Based on evaluation of historic pump station flow records developed and retrieved by the District's "Omni-Site" station monitoring and alarming system.

2. House Springs Pump Station & Forcemain

- a. Sanitary gravity sewer consisting of 69' of 8" pipe, 140' of 12" pipe, 910' of 16" pipe, and 11 manholes.
- b. Sanitary forcemain consisting of 3,894' of 12" pipe, and 4 air/vacuum valve manholes.

- c. Location Legal Description: Landgrant 00666 and Landgrant 03059
- d. Quadraplex wet well pump station with 2 submersible non-clog pumps installed under Phase I regionalization. Single pump capacity is equal to Phase I design peak hourly inflow (PHF). Wet well includes two (2) spare parallel pump bays to accommodate future installation of two (2) additional pumps for Phase II regionalization (future). Capacity of (future) three (3) pumps in parallel equal to Phase II design peak hourly inflow (PHF) to effect Pump Station firm capacity equal to or greater than (future) design PHF.

- i. Phase I Design Flows:

- 1. Population Equivalent: 3,192 PERSONS
- 2. Average Daily Flow: 0.347 MGD
- 3. Peak Hourly Flow: 1.39 MGD (964 GPM)
- 4. Total Peaking Factor (a+b): 4.00
 - a. As calc'd. from P.E. ^[3] : 3.42
 - b. Add'tl. I&I Allowance ^[4] : 0.58
- 5. Pump Capacity (CSR): 1.44 MGD (1,000 GPM)
- 6. Pump Quantity: (1) Duty + (1) Installed Spare
- 7. Station Firm Capacity: 1.44 MGD (1,000 GPM)

- ii. Phase II Design Flows (future):

- 1. Population Equivalent: 7,748 PERSONS
- 2. Average Daily Flow: 0.760 MGD
- 3. Peak Hourly Flow: 3.04 MGD (2,110 GPM)
- 4. Total Peaking Factor (a+b): 4.00
 - a. As calc'd. from P.E. ^[3] : 3.06
 - b. Add'tl. I&I Allowance ^[4] : 0.90
- 5. Pump Capacity (CSR): 1.02 MGD (710 GPM)
- 6. Pump Quantity (3) Duty + (1) Installed Spare
- 7. Station Firm Capacity: 3.06 MGD (2,130 GPM)

^[3] Peaking Factor as calculated from Population Equivalent in accordance with 10 CSR 20-8.110(3)(B)(1)(B)]

^[4] House Springs PS peak instantaneous design inflow as used for pump sizing is increased to 4.0 to reflect I/I issues within existing system and observed P.F. of 4.63 from historic WWTP DMR data. P.F. calculated from P.E. alone is 3.1.

- e. Project will replace the existing House Springs pump station and forcemain and eliminate a grinder pump station.

3. Northwest Valley Middle Interceptor Sewer

- a. Sanitary gravity sewer extension consisting of 204' of 6" pipe, 209' of 8" pipe, 4,560' of 12" pipe, and 30 manholes. Project will eliminate a WWTF, 2 grinder pump stations, and 6 septic tanks.
- b. Location Legal Description: T43N R04E S35, T42N R04E S03, T42N R04E S04 and Landgrant 00666

4. House Springs Interceptor Sewer

- a. Sanitary gravity sewer extension consisting of 775' of 8" pipe, 8,210' of 12" pipe, and 40 manholes. Project will eliminate 2 WWTF's, a grinder pump station, and 8 septic tanks.
- b. Location Legal Description: T42N R04E S03 and Landgrant 00666