MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM

MULTIPLE-DISCHARGER VARIANCE (MDV) APPLICATION

1. GENERAL INFORMATION			
OWNER NAME		PERMIT NUMBER (s) #MO-	
FACILITY NAME		COUNTY	
MAILING ADDRESS	CITY	STATE	ZIP CODE

2. GENERAL INFORMATION	
2.1 Is this facility a Municipal Publicly Owned Treatment Works? ☐ Yes ☐ No *If No, this facility does not qualify for the multiple-discharger variance. If necessary, please apply for a site-specific variance.*	
2.2 Population served:	
2.3 Design Flow in gallons per day:	
2.4 Actual Flow in gallons per day:	
2.5 Wastewater Treatment Facility Type: *To qualify for the multiple-discharger variance, the current treatment type must be a multi-cell lagoon.*	☐ Lagoon: ☐ Single Cell (not eligible) ☐ Multi-Cell, # of cells _____
2.6 Age(s) of current Wastewater Treatment Facility Infrastructure(s):	
2.7 Receiving Stream at the point of discharge from the wastewater treatment facility:	
2.8 Does your municipality currently own land adjacent to your lagoon? If yes, how many acres?	☐ Yes ☐ No _____ acres
2.9 Please attach a listing of sludge depth measurements for each lagoon cell.	☐ Attached
2.10 Please attach a statement describing the economic and social conditions of your community. *(e.g., condition of schools, city buildings, presence of grocery stores, and any other relevant information. Can include visual aids where appropriate)*	☐ Attached
3. CURRENT NPDES PERMIT INFORMATION	
3.1 Does your municipality currently have an application for renewal of your NPDES permit submitted to the Department of Natural Resources? *(If No, please submit an application for renewal 180 days before the expiration date of your current permit along with the completed financial questionnaire and this multiple-discharger variance application)*	☐ Yes ☐ No
3.2 Does your site-specific NPDES permit currently contain final effluent limits for Ammonia as N? If yes, how many more years of the schedule of compliance are left on your current NPDES permit? *(If Yes, answer 3.3, If No, skip to 4.1)*	☐ Yes ☐ No # of years left on SOC:_____
3.3 Is the municipality currently working toward meeting the NPDES permitted schedule of compliance to comply with the final effluent requirements for Ammonia as N? *(If Yes, please attach a document that includes the steps taken to meet these requirements)*	☐ Yes ☐ No

4. FINANCIAL INFORMATION

4.1 Please complete and submit the EPA spreadsheet; Uses and Variances – Evaluating Substantial and Widespread Economic and Social Impacts: Public Sector Entities (WESI). Does the Substantial Impacts Matrix indicate the pollution control options are likely to impose a substantial and economic and social impact on the residents of the municipality? Projected cost information from the most recent draft of the CAFCom/Affordability Analysis can be used to complete this form.

EPA spreadsheet can be found at:
http://water.epa.gov/scitech/swguidance/standards/economics/upload/usespublic.xlsx

☐ Yes ☐ No

5. THREATENED OR ENDANGERED SPECIES

5.1 Provide an attached list of all federally and state-listed threatened or endangered species (designated or proposed) and/or the critical habitats of those species (designated or proposed) that are known to occur on or near the site of discharge. *(Please see Fact Sheet below titled; Natural Heritage Review Report. Attach additional sheets as necessary and include the response letter from the Missouri Department of Conservation)*

☐ Attached

5.2 Provide justification about how the multiple-discharger variance will not cause an impact to the federally-listed and/or stated-listed threated or endangered species (designated or proposed) or their critical habitat that are known to be present at the point of discharge for your facility. *(Please see Fact Sheet below titled; Natural Heritage Review Report. Attach additional sheets as necessary and include the response letter from the Missouri Department of Conservation)*

☐ Attached ☐ N/A

6. ALTERNATIVES ANALYSIS

6.1 Provide an attached analysis of the alternative effluent controls examined, including but not limited to; discharge relocation alternative, wastewater irrigation or decentralization of the utility (or other no discharge options), and regionalization of the utility. *(Please see Fact Sheet below titled; Alternatives Analysis. Please include an aerial map outlining the current location of the outfall, the potential wastewater treatment facility (WWTF) effluent line, the potential WWTF discharge location and the mileage of line)*

☐ Attached

7. LAGOON DESIGN PROFILE

7.1 Complete Attachment A – Lagoon Design Profile and submit with the completed application.

☐ Attached

8. CERTIFICATION

FACILITY CONTACT	OFFICIAL TITLE
EMAIL ADDRESS	TELEPHONE NUMBER WITH AREA CODE

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that 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 that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

OWNER OR AUTHORIZED REPRESENTATIVE	OFFICIAL TITLE
SIGNATURE	DATE SIGNED

MULTIPLE-DISCHARGER VARIANCE APPLICATION

1. Application form is complete.
2. Attach listing of sludge depth measurements for each lagoon cell. (2.9)
3. Attach statement describing social and economic conditions. (2.10)
4. Submit the EPA spreadsheet; Uses and Variances – Evaluating Substantial and Widespread Economic and Social Impacts: Public Sector Entities. (4)
5. Submit the Natural Heritage Review Report from Missouri Department of Conservation (5)
6. Submit the Alternatives Analysis (6)
7. Submit Completed Attachment A – Lagoon Design Profile found below (7)
8. This completed form and any attachments should be submitted electronically and by mail to:

Department of Natural Resources
Water Protection Program
ATTN: MDV Coordinator
P.O. Box 176
Jefferson City, MO 65102

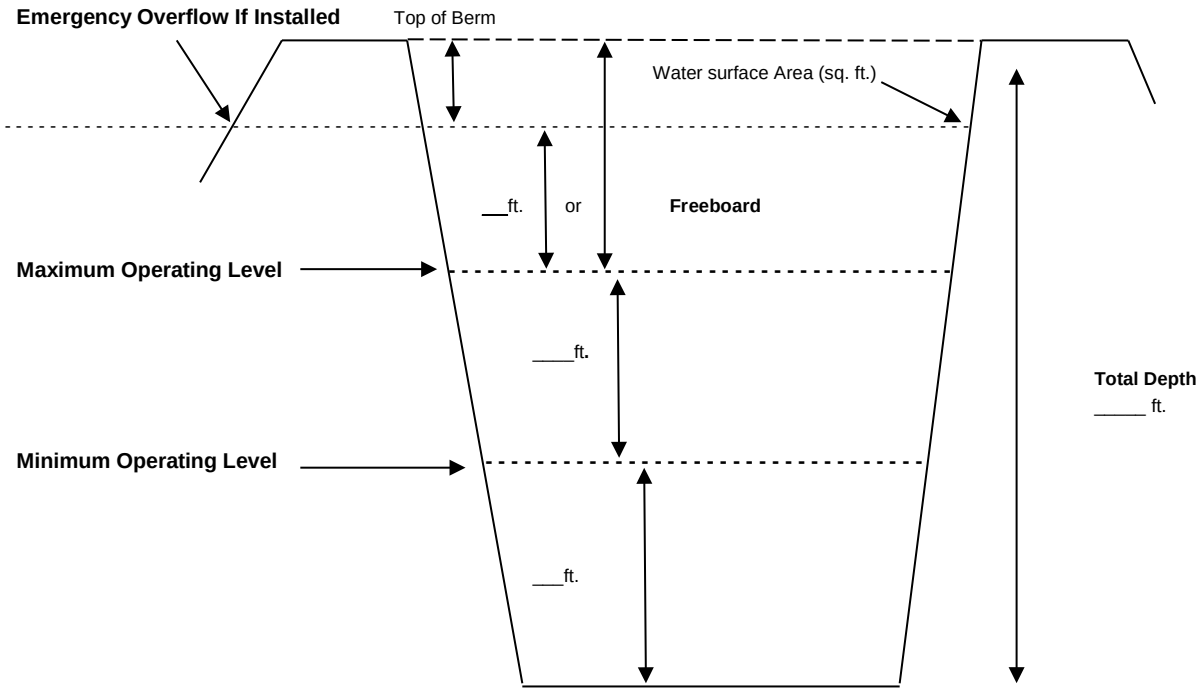
If there are any questions concerning this form, please contact the MDV Coordinator, by phone at 573-751-1300 or by email at mdv@dnr.mo.gov.

For additional guidance, see the following:

- 40 CFR 131.14 Water Quality Standards Variances: https://www.law.cornell.edu/cfr/text/40/131.14?qt-cfr_tabs=1#qt-cfr_tabs
- Discharger-specific Variances on a Broader Scale: Developing Credible Rationales for Variances that Apply to Multiple Dischargers: https://nepis.epa.gov/Exe/ZyPDF.cgi/P100IRYU.PDF?Dockey=P100IRYU.PDF
- Water Quality Standards Handbook, Chapter 5: General Policies: https://www.epa.gov/sites/production/files/2014-09/documents/handbook-chapter5.pdf
- Decentralized Systems Performance and Costs Fact Sheets: http://www.werf.org/i/c/DecentralizedCost/Decentralized_Cost.aspx

ATTACHMENT A
(To be included with the application)

Lagoon Design Profile*



DEFINITION OF TERMS (REFER TO THE PROFILE SKETCH ABOVE).

A. Freeboard is depth from the water level to the point on the lagoon where a discharge from the cell would occur. This could be a constructed emergency spill way or the lowest point of the lagoon berm;
B. Maximum Operating Level is at the top of outlet pipe or maximum weir setting.
C. Minimum Operating Level is at the lowest outlet pipe or weir setting.
D. Total Depth is from top of berm to bottom of basin berm to the bottom elevation.

* If the facility utilizes multiple cells, a separate lagoon design profile must be completed for each cell.

ALTERNATIVES ANALYSIS FACT SHEET

Each municipality must consider all viable treatment options available to meet water quality standards for total ammonia nitrogen. The Cost Analysis for Compliance (CAFCom) provided the estimated costs for a wastewater lagoon to upgrade to a wastewater irrigation system and/or a mechanical treatment plant based on the design flow (in some cases, if appropriate, the average flow) and the number of connections to the facility. The estimated costs provided within the CAFCom are the total present worth, capital cost of the project, annual cost of operation and maintenance, and the estimated resulting cost per household. Each CAFCom uses software to estimate the cost for reconstruction of the treatment plant titled CapDet. The CAFCom uses estimated costs from CapDet for the complete reconstruction of the following treatment types depending on flow:

- Wastewater Irrigation system – up to 0.15 million gallons per day (MGD)
- Extended Aeration basin – up to 10 MGD
- Sequencing Batch Reactor – 0.02 MGD to 10 MGD
- Oxidation Ditch – 0.02 MGD to 10 MGD
- Extended Aeration Package Plant – up to 0.05 MGD

All treatment technologies listed above are capable of meeting total ammonia nitrogen effluent limits of a 0.6 mg/L monthly average in the summer months and a 2.1 mg/L monthly average in the winter months. Based on the CAFCom, the Department has determined that the construction, installation and operation and maintenance of each of the treatment technologies listed above would cause a substantial and widespread economic and social impact for the residents of the municipality.

The alternatives analysis template below must be completed as part of the application process. The alternatives listed are: regional treatment, discharge relocation, and decentralization. Each municipality should use the estimated costs provided by the Department that most closely reflect how each alternative would be achieved for their facility. Each applicant can then determine if one or more of the treatment scenarios below are reasonable alternatives in order to achieve water quality standards for total ammonia nitrogen.

REGIONAL TREATMENT

Regional treatment is considered a reasonable alternative if the authority receiving the wastewater has adequate surplus treatment capacity available to receive the additional wastewater while remaining within its current permitted design capacities for both flow and loading. If the wastewater addition occurs within the design capacity of the receiving treatment plant then a separate antidegradation review is not required.

Select and complete one of the statements on this page. Estimated costs to include in the statement can be found in the Calculations and References Section of this analysis.

Select if UNDER 10 miles:

The City of ***(closest City or regional treatment facility with a facility capable of receiving your design flow)***'s treatment plant is the nearest facility that would be capable of accepting the City of ***(municipality name)***'s wastewater. The total present worth for the construction and operation of pipes, manholes, pump stations, and effluent forcemain to pump the City's entire wastewater flow are estimated to be ***(present worth costs from the matrix below, $X.XX)*** to pump effluent to ***(closest City or regional treatment facility with a facility capable of receiving your design flow)***. The total present worth costs assume a 5% interest rate over a 20-year loan term and include the capital cost plus the annual operation and maintenance cost. To implement this alternative, the wastewater from the City of ***(municipality name)*** would have to be pumped approximately ***(number of miles)*** miles. The higher cost of this alternative is primarily due to the lengthy forcemain and associated pumping costs that would be required. The estimated cost per user per month for this alternative is ***(user cost, see equation below, $X.XX)***. The estimated residential user cost as a percent of the median household income (MHI) is ***(user cost as a percent of MHI, see equation below, X.X %)***. According to EPA's financial capability assessment guidance, "Combined Sewer Overflows: Guidance for Financial Capability Assessment and Schedule Development," a residential user cost as a percent of MHI of over 2% will result in a "high financial impact." Therefore, regionalization is not a feasible alternative for the City of ***(municipality name)*** at this time. The inclusion of easement costs was not included in the estimated costs; however, it is known that the cost of easements can substantially raise the capital cost for a project. The estimates provided by the department anticipate the costs incurred from this alternative would result in a substantial and widespread economic and social impact for the residents of the City of ***(municipality name)***.

Select if OVER 10 miles:

The City of ***(closest City or regional treatment facility with a facility capable of receiving your design flow)***'s treatment plant is the nearest facility that would be capable of accepting the City of ***(municipality name)***'s wastewater. To implement this alternative, the wastewater from the City of ***(municipality name)*** would have to be pumped approximately ***(number of miles)*** miles. The department has determined the total present worth associated with pipes, manholes, pump stations and effluent forcemain to pump the City's entire wastewater flow to a location farther than 10 miles is a cost that will result in substantial and widespread economic and social impact. Regionalization of the wastewater treatment facility is not a feasible alternative at this time.

DISCHARGE RELOCATION

A discharge relocation alternative should be considered by communities facing costly treatment upgrades. The alternative receiving stream will need to be a class P (river) water body or a lake in order to receive less stringent effluent limits for total ammonia nitrogen.

Select and complete one of the statements on this page. Estimated costs to include in the statement can be found in the Calculations and References Section of this analysis. Include an aerial map of the potential outfall relocation.

Select if UNDER 10 miles:

The map provided outlines a potential routing strategy for the City of ***(municipality name)***'s alternate discharge location. This proposed alternative would convey effluent ***(miles of necessary pipe)*** miles to the ***(new receiving stream)*** through the addition of a new pipes, manholes, pump station(s), and effluent forcemain. A 10% contingency cost has been assumed for this project; however, due to the high level planning of this alternative and the potential unknown impacts regarding the proposed general alignment of the force main, the department has observed contingency costs up to 30% for similar relocation projects. The department has provided an estimate for the total present worth of this project to be ***(present worth costs from the matrix below, $X.XX)***. The total present worth costs assume a 5% interest rate over a 20-year loan term and include the capital cost plus the annual operation and maintenance cost. In order for the City of ***(municipality name)*** to pipe effluent to the closest alternative stream it could cost up to ***(user cost, see equation below, $X.XX)*** per residential user per month. The estimated residential user cost as a percent of the median household income (MHI) is calculated to be ***(user cost as a percent of MHI, see equation below, X.X%)***. According to EPA's financial capability assessment guidance, "Combined Sewer Overflows: Guidance for Financial Capability Assessment and Schedule Development," a residential user cost as a percent of MHI of over 2% will result in a "high financial impact." Therefore, the outfall relocation to an alternate receiving stream is not a feasible alternative for the City of ***(municipality name)*** at this time. The inclusion of easement costs was not included in the estimated costs; however, it is known that the cost of easements can substantially raise the capital cost for the project. The estimates provided by the department anticipate the costs incurred from this alternative would result in a substantial and widespread economic and social impact for the residents of the City of ***(municipality name)***.

Select if OVER 10 miles:

The map provided outlines a potential routing strategy for the City of ***(municipality name)***'s alternate discharge location. This proposed alternative would convey effluent ***(miles of necessary pipe)*** miles to the ***(new receiving stream)*** through the addition of a new pipes, manholes, pump station(s), and effluent forcemain. The department has determined the total present worth associated with pipes, manholes, pump stations, and effluent forcemain to pump the City's entire wastewater flow to a location farther than 10 miles is a cost that will result in substantial and widespread economic and social impact. An alternate discharge location of the wastewater treatment facility is not a feasible alternative at this time.

Calculations and References for Regional Treatment and Discharge Relocation

Estimated Present Worth Cost Matrix: Chose the flow closest to the facility's design flow and pair with the distance. Please round up to the nearest design flow for the most accurate cost estimate.

Flow (MGD)	Distance (miles)										
	0.5	1	2	3	4	5	6	7	8	9	10*
0.01	$405,141	$543,618	$919,871	$1,029,460	$1,641,143	$1,918,096	$2,195,050	$2,472,003	$2,748,957	$3,025,910	$3,302,863
0.02	$420,385	$558,861	$1,117,722	$1,394,676	$1,671,629	$1,948,583	$2,225,536	$2,502,489	$2,779,443	$3,056,396	$3,333,350
0.03	$830,934	$1,075,011	$1,563,164	$2,051,318	$2,539,471	$3,027,625	$3,515,778	$4,003,931	$4,492,085	$4,980,238	$5,468,392
0.04	$845,963	$1,090,040	$1,578,194	$2,066,347	$2,554,500	$3,042,654	$3,530,807	$4,018,961	$4,507,114	$4,995,267	$5,483,421
0.05	$857,952	$1,102,029	$1,590,182	$2,078,335	$2,566,489	$3,054,642	$3,542,796	$4,030,949	$4,519,102	$5,007,256	$5,495,409
0.06	$868,694	$1,112,771	$1,600,924	$2,089,078	$2,577,231	$3,065,384	$3,553,538	$4,041,691	$4,529,845	$5,017,998	$5,506,151
0.07	$880,689	$1,124,765	$1,612,919	$2,101,072	$2,589,226	$3,077,379	$3,565,532	$4,053,686	$4,541,839	$5,029,993	$5,518,146
0.08	$891,088	$1,135,165	$1,623,318	$2,111,472	$2,599,625	$3,087,778	$3,575,932	$4,064,085	$4,552,239	$5,040,392	$5,528,545
0.09	$899,512	$1,143,589	$1,631,742	$2,119,896	$2,608,049	$3,096,203	$3,584,356	$4,072,509	$4,560,663	$5,048,816	$5,536,970
0.1	$906,940	$1,151,016	$1,639,170	$2,127,323	$2,615,477	$3,103,630	$3,591,783	$4,079,937	$4,568,090	$5,056,244	$5,544,397
0.11	$913,918	$1,157,995	$1,646,149	$2,134,302	$2,622,455	$3,110,609	$3,598,762	$4,086,916	$4,575,069	$5,063,222	$5,551,376
0.12	$922,897	$1,166,974	$1,655,127	$2,143,281	$2,631,434	$3,119,587	$3,607,741	$4,095,894	$4,584,048	$5,072,201	$5,560,354
0.13	$929,627	$1,173,703	$1,661,857	$2,150,010	$2,638,164	$3,126,317	$3,614,470	$4,102,624	$4,590,777	$5,078,931	$5,567,084
0.14	$971,086	$1,215,162	$1,703,316	$2,191,469	$2,679,622	$3,167,776	$3,655,929	$4,144,083	$4,632,236	$5,120,389	$5,608,543
0.15	$977,317	$1,221,393	$1,709,547	$2,197,700	$2,685,853	$3,174,007	$3,662,160	$4,150,314	$4,638,467	$5,126,620	$5,614,774

*If your distance in greater than 10 miles it is assumed the projected cost associated with regionalization and/or diverting effluent to an alternative receiving stream will result in a substantial and widespread economic and social impact.

User Cost Equation:

Estimated monthly residential user cost = Present Worth / 20 years / 12 months / number of active connections to the facility

Note: The number of connections is specific to the community and can be found on the CAFCom written by the Department.

User Cost as a percent of MHI Equation:

Estimated monthly user cost as a percent of MHI = [Estimated monthly residential user cost / (MHI/12)] x 100

Note: The MHI is specific to the community and can be found in the CAFCom written by the Department.

Assumptions made by the Department to calculate the estimated costs:

- Construction Labor $32 per hour
- Operator $25 per hour
- 15 manholes per miles of pipe
- $2.50 per foot for cleaning/maintenance (annual inspection for complete line)
- 10-year pump replacement
- 1 pump station for 0.01 and 0.02 flows, everything else 2 pump stations
- $60 for 8 inch pipe (installation)
- $20 for 6 inch pipe (used for 0.01 and 0.02 flows)
- 5percent interest, 20 years
- 1 year construction period
- 0 percent profit
- 10 percent design fee
- 10 percent contingency

DECENTRALIZATION / ONSITE SYSTEMS

This section examines the approximate cost of subsurface soil dispersal (absorption) systems for a small community's domestic wastewater system. This is not intended to be an all-inclusive evaluation of the cost of these systems in the State of Missouri nor does the department endorse one type of dispersal system over another.

The primary costs discussed in this section were gathered from the Water Environment Research Foundation (WERF) Fact Sheets (D1, D2 & D3) for Decentralized Wastewater Systems, Performance & Cost of Decentralized Unit Processes, Dispersal Series found here: http://www.werf.org/i/c/DecentralizedCost/Decentralized_Cost.aspx. Costs given in the WERF Fact Sheets reflect 2009 estimate dollars. The Cost Estimation Tool developed by WERF was not used as part of the cost estimations shown below; however, this tool can be used to calculate the primary estimated cost to decentralize the sewer utility for a specific community. The following provides several examples of the estimated cost to install a variety of systems including; individual onsite wastewater treatment systems, large scale subsurface soil dispersal systems, and cluster with individual onsite wastewater treatment systems.

Estimated Cost of Land (By Region): In some cases, the municipality will be required to acquire land in order to decentralize the current sewer utility. Unfortunately, while the Cost Estimation Tool can aid in calculating the rough amount of land required for the soil treatment, it does estimate the cost of the land. Once the amount of soil treatment area is determined, the approximate cost of the land can be calculated using the estimated cost per acre which can be found in the annual Missouri Farm Land Values Opinion Survey compiled by the University of Missouri Extension: http://agebb.missouri.edu/mgt/landsurv/.

Individual On-site Wastewater Treatment Systems (Septic): While the use of individual on-site wastewater treatment systems (OWTS) can be considered as an option, it should be noted that a detailed evaluation of each lot must be conducted by a qualified individual to ensure all of the soil and site limitations are addressed in the specific design and installation. It should also be noted that because of the complexity of the soils/landscape model throughout the state, a one-size-fits-all design is not a practical solution whenever using OWTS within any community.

The methodology used within 10 CSR 20-6.030 Disposal of Wastewater in Residential Housing Developments for determining minimum lots size within a residential housing (subdivision) development can be used as a guide when initially investigating if OWTS are an alternative. Please note 10 CSR 20-6.030 (1)(D) states that, "For residential housing developments with lots less than forty thousand (40,000) square feet, (0.92 acres) only centralized sewage collection and treatment are acceptable…" In cases where the lots are less than 0.92 acres or have limited amount of available space with suitable soils/landscapes, a centralized or cluster system should be considered over an OWTS.

If individual OWTS are chosen as the method of wastewater treatment, a continuing authority (responsible management entity) must be established to ensure they are a sustainable solution. Construction permits, installation, and operation of the OWTS will require multiple agency cooperation to ensure the process proceeds in a timely manner. To understand what regulatory agencies may be involved in permitting OSTS, please see the Department's Fact Sheet, "Who Regulates Domestic Wastewater in Missouri?" found here: http://dnr.mo.gov/pubs/pub1296.pdf.

The costs in Table 1 should be used for cost estimation purposes only. As described in the WERF Fact Sheets, the costs are for materials, installation and maintenance of the dispersal system only. They do not include the cost of installation, maintenance, total life cycle of the septic tanks(s), advanced treatment components or disinfection devices. Cost presumed to include 20% overhead and profit for contractor with no sales taxes on materials. The actual costs can vary significantly depending upon site conditions and local economic factors.

Table 1: Single Family Dispersal System Capital Cost Estimates

FACTORS	Gravity Distribution Fact Sheet D1	Low Pressure Pipe Fact Sheet D2	Drip Distribution Fact Sheet D3
Wastewater Flows gallons/day (gpd)	450	450	450
Topography	Relatively Flat	Relatively Flat	Relatively Flat
Application Rate (gpd/sq. ft.)	0.4	0.2	0.3
Soil Treatment Area (sq. ft.)	1,125	2,250	1,500
Lateral Line (linear feet)	562	1,125	750
Material & Installation	$4,600 - $6,900	$9,000 - $14,000	$8,000 - $12,000
Annual O&M	$200 - $400	$540 - $800	$500 - $740

Note: It is extremely rare that a drip distribution system within the state is designed with an application rate of 0.3 gpd/sq. ft. A more common application rate is 0.15 gpd/sq. ft.

The costs in Table 2 should be used for cost estimation purposes only. The costs are presumed to include all components for an OWTS serving a single family home on an individual lot and were compiled as part of a cursory survey of professionals within the on-site wastewater industry within the state. No specific documentation was collected as part of that survey. The actual costs can vary significantly depending upon site conditions and local economic factors. Engineering fees and other professional services are not included. A single family residence in the state is designed at 120 gpd per bedroom (assuming 3 bedrooms).

Table 2: Individual Onsite Wastewater Treatment System Capital Cost Estimates

FACTORS	Gravity Distribution	Low Pressure Pipe	Drip Distribution
Wastewater Flows (gpd)	360	360	360
Application Rate (gpd/sq. ft.)	0.4	0.2	0.15
Soil Treatment Area (sq. ft.)	900	1,800	2,400
Lateral Line (linear feet)	450	900	1,200
Material & Installation	$5,000 - $8,000	$9,000 - $20,000	$15,000 - $25,000

Large Scale Subsurface Soil Dispersal System: The cost listed in Tables 3, 4, and 5 should be used for cost estimation purposes only. As described in the WERF Fact Sheets, the costs reflect only those associated with the dispersal system itself and do not include cost for any part of the wastewater treatment prior to the dispersal system. The estimated costs below do not include the cost of engineering, other professional fees, the cost to close the current wastewater treatment facility, or the cost of land acquisition. Cost presumed to include 20% overhead and profit for contractor with no sales taxes on materials. The actual costs can vary significantly depending upon site conditions and local economic factors.

Table 3: 5,000 Gallons per Day or 20 Home Capital Cost Estimates

FACTORS	Gravity Distribution Fact Sheet D1	Low Pressure Pipe Fact Sheet D2	Drip Distribution Fact Sheet D3
Topography	Relatively Flat	Relatively Flat	Relatively Flat
Application Rate (gpd/sq. ft.)	0.4	0.2	0.15
Soil Treatment Area (sq. ft.)	12,500	25,000	33,332
Lateral Line (linear feet)	6,250	12,500	16,666
Material & Installation	$54,000 - $81,000	$84,000 - $127,000	$74,000 - $112,000
Annual O&M	$2,300 - $3,400	$4,900 - $7,400	$3,000 - $5,000

TABLE 4: 10,000 Gallons per Day or 40 Home Capital Cost Estimates

FACTORS	Gravity Distribution Fact Sheet D1	Low Pressure Pipe Fact Sheet D2	Drip Distribution Fact Sheet D3
Topography	Relatively Flat	Relatively Flat	Relatively Flat
Application Rate (gpd/sq. ft.)	0.4	0.2	0.15
Soil Treatment Area (sq. ft.)	25,000	50,000 or 1.1 ac*	66,666
Lateral Line (linear feet)	12,500	25,000	33,332
Material & Installation	$105,000 - $158,000	$184,000 - $275,000	$170,000 - $254,000
Annual O&M	$4,400 - $6,600	$10,000 - $15,000	$6,900 - $10,000

TABLE 5: 50,000 Gallons per Day or 200 Home Capital Cost Estimates

FACTORS	Gravity Distribution Fact Sheet D1	Low Pressure Pipe Fact Sheet D2	Drip Distribution Fact Sheet D3
Topography	Relatively Flat	Relatively Flat	Relatively Flat
Application Rate (gpd/sq. ft.)	0.4	0.2	0.15
Soil Treatment Area (acres)	2.9	5.7	7.6
Lateral Line (linear feet)	62,500	125,000	166,666
Material & Installation	$517,000 - $776,000	$1,365,000 - $2,047,000	$658,000 - $988,000
Annual O&M	$21,000 - $31,000	$66,000 - $98,000	$31,000 - $47,000

Note: There are no known gravity distribution systems within the state of the size represented in Tables 3, 4, or 5.

Centralized: When estimating the cost of converting an existing centralized domestic wastewater collection and treatment system from a point discharge to a subsurface soil dispersal system, refer to Table 3, 4, or 5 for the different systems and daily wastewater flow they service. These costs will be used to determine the predicted cost to decentralize, as the costs will be similar because they are based on flow.

Current Wastewater System Closures: If the municipality chooses to proceed with decentralizing the wastewater treatment utility, the current lagoon will need to be properly closed according to Standard Conditions Part III in the operating permit. The department has estimated the cost of a lagoon closure to be approximately $30,000. The cost of sludge removal varies, depending on the total amount of sludge in the lagoon; however, the equation found in the Calculations and References section of this analysis can be used to estimate the cost of sludge removal.

Complete the statement below using the cost estimates from the tables above. Include the estimated cost to properly close your current wastewater treatment system. Equations can be found in the Calculations and References section of this analysis.

The City of ***(municipality name)*** has considered the cost to decentralize/install a subsurface soil dispersal system in place of the current discharging system. Based on the estimates provided by the department, the City has determined the cost to properly close the current lagoon to be ***(cost to remove sludge, see equation below, $X.XX)***. With the City's current flow of ***(design flow)*** gallons per day, the estimated capital cost to install a subsurface soil dispersal system is ***(capital cost from table 3, 4, or 5 depending on the design flow of the facility, $X.XX)***. The estimated cost of land to decentralize/install a subsurface soil dispersal system is ***(total cost of land, see equation below, $X.XX)***. This cost would result in residential user costs of ***(user costs, see equation below, $X.XX)*** per residential user per month. The estimated residential user cost as a percent of the median household income (MHI) is calculated to be ***(user cost as a % of MHI, see equation below, X.X%)***. According to EPA's financial capability assessment guidance, "Combined Sewer Overflows: Guidance for Financial Capability Assessment and Schedule Development," a residential user cost as a percent of MHI of over 2% will result in a "high financial impact." Therefore, decentralization of the sewer utility is not a feasible alternative for the City of ***(municipality name)*** at this time. The estimates provided by the department anticipate the costs incurred from this alternative would result in a substantial and widespread economic and social impact for the residents of the City of ***(municipality name)***.

Calculations and References for Decentralization

Cost of Land:
Total cost of land = (amount of land in acres) x (cost of land per acre from the annual Missouri Farm Land Values Opinion Survey compiled by the University of Missouri Extension: http://agebb.missouri.edu/mgt/landsurv/.)

Sludge Removal Equation:
Estimated cost for sludge removal = [(dry tons of sludge per year) x (life span of lagoon in years) x ($750 per dry ton of sludge)] + $25,000 mobilization fee.

Primary Rate Equation: (using Table 3, 4, or 5 depending on the design flow of the facility)
Estimated primary rate = (annual O&M x 20 years) + material and installation costs

User Cost Equation:
Estimated monthly residential user cost = (primary rate + total cost of land + estimated cost for sludge removal + $30,000 for lagoon closure) / 20 years / 12 months / number of active connections to the facility
Note: The number of connections is specific to the community and can be found on the CAFCom written by the Department.

User Cost as a percent of MHI Equation:
Estimated monthly user rate as a percent of MHI = [Estimated monthly residential user cost / (MHI/12)] x 100
Note: The MHI is specific to the community and can be found of the CAFCom written by the Department.

Definitions:

Present Worth: The total costs necessary for constructing a new treatment plant and implementing corresponding operation and maintenance over the facility's life span, and is calculated using a 5% annual interest rate.

Capital Cost of Project: Includes project costs, design, inspection, and contingency costs.

Annual cost of Operation and Maintenance: Includes operations, maintenance, materials, chemical, and electrical costs for the facility on an annual basis. It also includes items that are expected to replace during operations such as pumps. Operation and maintenance is estimated between 15% and 45% of the user cost.

Estimated resulting user cost per household: Composed of two factors: Operation & Maintenance (O&M) and Debt Retirement Costs.

NATURAL HERITAGE REVIEW REPORT FACT SHEET

Each applicant is required to provide justification using the Natural Heritage Review Report detailing how the Multiple Discharger Variance (MDV) will not cause an impact to federally-listed and/or state-listed threated or endangered species (designated or proposed) or their critical habitat that are known to be present at the point of discharge.
Central Office staff will query for records of species and natural communities of conservation concern using the Missouri Department of Conservation's Natural Heritage Review website: https://naturalheritagereview.mdc.mo.gov. A report will be generated with one of the following responses:

- Level One – There are no known records of species and natural communities of conservation concern within the project area. No further coordination with the Missouri Department of Conservation is necessary.
- Level Two – Records of state-listed species and natural communities of conservation concern occur within or near the project area. Please contact the Missouri Department of Conservation for further coordination and information.
- Level Three – Records of federal, and possibly state-listed, species and natural communities of conservation concern occur within or near the project area. Please contact the Missouri Department of Conservation for further coordination and information. In addition, further coordination and consultation with the U.S. Fish and Wildlife Service (USFWS) for USFWS trust resources including Endangered Species Act species, is necessary. Please visit the U.S. Fish and Wildlife Website – Information for Planning and Conservation at https://ecos.fws.gov/ipac/ for additional information or contact the USFWS.

Staff of the Missouri Department of Conservation may be contacted by phone at (573) 522-4115 ext 3182 or at:
Attn: Environmental Review Coordinator
Resource Science Division
Missouri Department of Conservation
2901 West Truman Blvd.
Jefferson City, MO 65102
NaturalHeritageReview@mdc.mo.gov

Staff of the USFWS may be contacted by phone at 573-234-2132 or by mail at:
U.S. Fish and Wildlife Service
Ecological Services Field Office
101 Park Deville Drive, Suite A
Columbia, Missouri 65203-0057

If needed, use the letter template provided below to complete the inquiry request for the Natural Heritage Review Report and mail or email to the Missouri Department of Conservation address provided above. Include an aerial map of the outfall location.

To Whom It May Concern:

The Missouri Department of Natural Resources Water Protection Program is requesting a Natural Heritage Review Report (NHRR) be completed at City of *(municipality name)*'s wastewater treatment plant outfall. The type of project being completed is a variance of the water quality standards for Total Ammonia Nitrogen at the point of discharge from the city's domestic wastewater treatment facility. The location of the outfall is ***(Township/Section/Range or the Latitude/Longitude in decimal degrees of the outfall).*** The facility is currently permitted to discharge to ***(name of receiving stream)***. Please see the attached map for an aerial view of the location.

If you have any questions concerning this inquiry for the NHRR, please do not hesitate to contact me by phone at ***(Department staff that is assisting with application - phone number)*** or by my email at ***(Department staff that is assisting with application - email address)***.

_____ _____

Department Contact Signature *Date*