

**CITY OF CAVE SPRINGS WASTEWATER TREATMENT PLANT
WASTE MANAGEMENT PLAN FOR THE
SUBSURFACE DISPOSAL OF MUNICIPAL WASTEWATER**

1. This waste management plan is prepared on behalf of the City of Cave Springs by McClelland Consulting Engineers, Inc. of Fayetteville, Arkansas. The design and implementation of this plan shall be in accordance with all applicable State and Federal regulations and Department of Environmental Quality guidelines and policies and describes the collection, treatment, and disposal of wastewater collected from local subdivisions. Final effluent generated from the treatment plant is disposed of via subsurface drip irrigation underneath The Creek Golf Course in Cave Springs, Arkansas.

2. This plan has been developed in accordance with the guidelines provided by the ADEQ. Design information, operational recommendations, calculations and other items presented herein are based on plans, verbal representations by the system operators and information provided by others and are therefore subject to the interpretations of the waste management plan engineer. Engineering documents created by others which may be used as the basis for calculations remain the sole responsibility and liability of the original design professional and in no way shall the waste management plan engineer accept any liability or responsibility for their use or interpretation.

- 3a. Waste Generating Process – The city of Cave Springs owns and operates a wastewater treatment plant. The wastewater treatment system consists of two separate package treatment plants which dispose of effluent via subsurface drip irrigation. Treatment Plant #1 (TP1) was designed to treat a maximum daily load of 97,000 GPD, while Treatment Plant #2 (TP2) has a much higher capacity of 320,000 GPD. TP1 is currently undergoing system repairs and is being kept on standby for future treatment needs of the city. Therefore, only TP2 is available for Cave Springs’s wastewater treatment needs but has ample flow capacity for the near future. At the time when system repairs to TP1 have been completed, the City plans on making a permit modification to add the additional treatment plant into the permit as well as the Waste Management Plan.

The purpose of the treatment facility is to take in septic tank waste through utilization of a Septic Tank Effluent Pumping (STEP) system. The STEP system collects septic tank effluent from individual lots located around the City of Cave Springs. Five separate lift stations pump the septic tank effluent to the treatment plant through a sanitary sewer force main. Currently there are 1774 lots platted for eventual connection to the treatment system, however, to date, only 733 of these lots have been built out or issued a construction permit. *Table 1* shows information available on current and future lots proposed to be hooked up to the system.

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**Table 1
Current and Future Connections to the Plant**

Subdivision	Reserved Capacity				Current Flows (gal/day)	Final Plat Approved (Date)	Special Improvement District
	Total Platted Lots	Lots Built Out to Date*	Remaining Lots	Equivalent Capacity (gal/day)**			
Fairway Valley PH 1	27	26	1	5,616	5,408	7/7/2011	Yes
Fairway Valley PH 2	33	13	20	6,864	2,704	3/3/2016	Yes
Fairway Valley PH 3	25	0	25	5,200	-	PP 6/13/17	Yes
Fairway Townhomes	8	0	8	1,664	-	6/13/2017	Yes
Osage Vistas	10	0	10	2,080	-	7/14/2017	
Brown Road Condos	12	0	12	2,496	-		
Extra Capacity - Hash	37	0	37	7,696	-		
Duffer's Ridge	8	1	7	1,664	208	3/8/2015	No
Sand Springs	118	83	35	24,544	17,264	11/6/2014	Yes
Mountain View	40	36	4	8,320	7,488	10/16/2007	Yes
Hickory Hills	65	29	36	13,520	6,032	8/7/2015	Yes
Otter Creek	205	61	144	42,640	12,688	9/22/2006	Yes
Brentwood	220	159	61	45,760	33,072	6/21/2007	Yes
Hamton Estates	60	56	4	12,480	11,648		No
Hyde Park	292	211	81	60,736	43,888	9/28/2006	Yes
Marbella - Phase 1	72	37	35	14,976	7,696	7/2/2014	Yes
Marbella - Phase 2	66	0	66	13,728	-		Yes
Marbella - Phase 3	70	0	70	14,560	-		Yes
Mandalea	141	0	141	29,328	-		
Buffington - Shores	220	0	220	45,760	-	6/6/2017	
Downtown Cave Springs	45	21	24	9,360	4,368	1/9/2009	Yes
Total	1774	733	1041	368,992	152,464		

* Includes homes that have been issued building permits.

** Equivalent capacity is based on 208 gallons per unit per day. (1 LEU=208 gpd)

Upon arrival at treatment plant 2, flow is first sent through a biological treatment unit comprised of two 19,000 gallon parallel Lotus aerobic moving bed biofilm reactors (MBBR). Rotary blowers are used to supply air to the biological units for oxygenation, which allows for the removal of BOD. Downstream of the MBBRs are two 26-foot diameter secondary clarifiers, effluent coming from the MBBRs is sent through a splitter box and the streams are routed to two Lakeside secondary clarifiers. The clarifiers allow for flow equalization and separation of liquid and sludge during retention. A chemical feed station is available for the addition of chemicals during the treatment process to add alkalinity for pH control and/or coagulant for use as a solids settling aid. The final liquid

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effluent is sent to separate dosing tanks where it will eventually be pumped through an underground leach field piping system and released via subsurface disposal. The resultant sludge, removed from the bottom of the clarifiers, is sent to the concrete sludge holding tank.

Effluent generated from TP2 is used to dose leach fields 3 through 5 (see *Engineering Drawings*) with each drip field containing many smaller sub-segments referred to as zones. Each leach field has a dedicated storage tank(s) which holds effluent prior to subsurface discharge through the leach lines. Effluent is pumped from the holding tanks at regular time intervals, dosing rates are based on the area of each zone and regulatory requirements contained within the No-Discharge Permit.

Dripfield 3 contains zones 5 through 12 and connects to pump dosing tank 3 with a volume of 25,000 gallons. Dripfield 4 contains zones 13 through 24, except for zone 18 which is not utilized, and connects to pump dosing tanks 4A and 4B, both with volumes of 20,000 gallons. Dripfield 5 contains zones 25 through 31 and connects pump dosing tank 5 with a volume of 20,000 gallons. In total TP2 has 3 separate leach fields supplying effluent to a total of 27 zones, with alternate fields available for use to allow for downtime of operational zones. Further analysis of the dosing rates can be seen in the *Design Calculation* portion of this report.

- 3b.** Engineering Drawings – Drawings showing dimensions and sizes of piping, septic tanks, and leach fields can be seen in *Appendix A*.
- 3c.** Design Calculations – Design calculations performed by the designing engineering consulting firm can be seen in the attached *Appendix B*. Since the time of the initial plant design, McClelland Consulting Engineers, Inc. (MCE) has been hired by the city of Cave Springs to work as the consulting engineers for the wastewater treatment plant.
- 3d.** Copies of 8-1/2 × 12” USGS Topographic Maps (see *Appendix C*) and county maps showing:
- The location of the treatment facilities and leach field areas
 - The nearest affected stream
 - The distance and direction to the nearest State Highway
 - Buildings near the site not labeled on the map
 - A legal description of the waste-generating facility
 - Location of the facility by longitude and latitude
 - Name of the USGS quad map (Bentonville South and Springdale)

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- 3e.** Nearest Stream – The nearest stream is Osage Creek thence to the Illinois River, located at a distance of approximately 600 feet from the treatment facility. Osage Creek and the Illinois River are currently listed on the 2008 List of Impaired Waterbodies (303d list) for Total Phosphorus.
- 3f.** Cover Crop – There are several different cover crops located on top of the leach fields, with the main crop consisting of Bermuda grass, with a nitrogen uptake rate of 300 lbs/acre. Bermuda is used for the fairways and rough on the golf course however in out-of-bounds regions, located further from the fairways, Fescue and Rye grasses can also be found but are less prevalent. PAN calculations are regularly submitted as part of the City’s MMR submittals.
- 4.** Soils Analysis – The soils analysis conducted prior to construction of the facilities can be is attached in *Appendix D*.
- 5.** Depth-to-Groundwater – The depth to groundwater is periodically checked at a location of average elevation through a monitoring well. In order to stay in compliance with their permit the city must have a minimum of 5-feet of soil depth between discharge and the groundwater. The actual depth-to-groundwater was measured at 65”.
- 6.** Proof of Ownership – A copy of the Warranty Deed is attached as *Appendix E*.
- 7.** Department of Health Notification – *Appendix F* provides a copy of the original letter notifying the Arkansas Department of Health (ADH) Division of Engineering that a permit was submitted to the ADEQ.
- 8.** Disclosure Statement – A Disclosure Statement is not applicable to this facility.

From: [McWilliams, Katherine](#)
To: [Deardoff, Amy](#)
Subject: FW: Cave Springs WMP Revisions
Date: Thursday, February 01, 2018 10:48:02 AM
Attachments: [Waste Management Plan_Cave Springs WWTP.pdf](#)

4893-WR-3_Revised WMP Pages

From: Barrett Knutson [mailto:bknutson@mce.us.com]
Sent: Thursday, February 01, 2018 10:35 AM
To: McWilliams, Katherine
Subject: Cave Springs WMP Revisions

Katherine,

Please see the attached document for revised information to the WMP. Please feel free to contact me at your earliest convenience if you have any additional questions or concerns.

Thanks,
Barret

Barret R. Knutson, E.I.
Project Designer



1810 N. College Ave. | Fayetteville, AR 72703
P.O. Box 1229 | Fayetteville, AR 72702
479.443.2377 office | 479.443.9241 fax
501.545.7115 cell
bknutson@mce.us.com