BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

Staff of the Missouri Public Service Commission Complainant, v. Moore Bend Water Utility, LLC Respondent.	)	File No. WC-2015-0010

ANSWER TO STAFF COMPLAINT

COME NOW Respondent MOORE BEND WATER UTILITY, LLC, Respondent in the above Staff Complaint, and hereby answers and affirmatively responds to the Complainant Staff of the Missouri Public Service Commission's Staff Complaint as follows:

Introduction:

1. (a) Respondent admits that this matter concerns the alleged failure of Respondent to provide safe and adequate service and its alleged violation of statutes, Commission rules and Commission orders relating to (1) the alleged bacterial contamination of its water supply; and (2) its acquisition of the system from the former proprietor. Respondent denies each and every other allegation contained in paragraph 1 of the Staff Complaint including Complainant's allegation that this matter involves bacterial contamination of its water supply.

(b) Respondent affirmatively states that during its ownership of the system, the system has **never** shown any sign or indication that there was any bacterial or other contamination of its water supply. In support of this fact, Respondent submits to the Complainant **Exhibit "A,"** the Public Water System Bacteriological Report dated October 15, 2013 provided to Respondent (but addressed to the former owner) shows that the distribution system showed no presence of coliform at any collection location. In addition, attached as **Exhibit**

"B" are Lakeland Laboratory Reports from the month of September, 2013 through August of 2014, which never show any coliform presence. Lakeland Laboratories is a certified testing lab. Respondent affirmatively claims that the water supply was **never** compromised or showed any signs of bacterial contamination during its ownership or operation.

Complainant:

2. Respondent admits the allegations of paragraph 2 of the Staff Complaint.

Respondent:

3. Respondent admits the allegations of paragraph 3 of the Staff Complaint.

4. Respondent admits the allegations of paragraph 4 of the Staff Complaint.

Jurisdiction:

5. Respondent admits the allegations of paragraph 5 of the Staff Complaint.

6. Respondent admits the allegations of paragraph 6 of the Staff Complaint.

7. Respondent admits the allegations of paragraph 7 of the Staff Complaint.

8. Respondent admits the allegations of paragraph 8 of the Staff Complaint.

9. Respondent admits the allegations of paragraph 9 of the Staff Complaint.

Count I:

Unauthorized Transfer of Utility Assets,
Unauthorized Operation of a Public Utility, and
Violations of Commissions Orders:

10. Respondent admits the allegations of paragraph 10 of the Staff Complaint.

11. Respondent admits the allegations of paragraph 11 of the Staff Complaint.

12. (a) Respondent admits the allegations of paragraph 12 of the Staff Complaint.

(b) Respondent affirmatively states that the *Order Authorizing transfer of Assets* issued on April 24, 2013, also states as follows:

(1) " . . . Transferor has been progressively irresponsible in its administrative duties."

(2) "Given that Transferor is an administratively dissolved corporation and is progressively lacking in its administrative duties, the Commission finds that it would be detrimental to the public interest to allow Transferor to continue providing service to the public.

Conversely, it is in the public interest to immediately authorize the transfer of assets to Transferee, who is better able and apparently willing to provide such service."

13. Respondent admits the allegations of paragraph 13 of the Staff Complaint.

14. Respondent does not know the exact date the acquisition of Moore Bend Water Company, Inc.'s assets was closed, but will admit for purposes of this Answer that Respondent commenced operating Moore Bend Water Company, Inc.'s system somewhere around August 27, 2013. As its owner had abandoned the operation at approximately that time, having lost interest in its water company as a result of the lengthy acquisition process, and even before that, as shown by the portions cited in paragraph 12 hereof in the *Order Authorizing transfer of Assets* issued on April 24, 2013 and in Paragraph 26 of the Staff Complaint. The approval of Respondent's acquisition of Moore Bend Water Company, Inc.'s water system was a protracted procedure made complicated by the Public Counsel's insistence that, despite the fact that Moore Bend Water Company, Inc. had operating the water system for decades without formal and recorded rights to the land upon which its wells and some of the system sat upon, there needed to be a formalization of the rights of the operator, either in the form of recorded easements or an outright acquisition of the property. Knowing this, the owner of the ground, Plummer, negotiated from a strong position, and demanded an unreasonable price for the ground. This extended delay in obtaining the approval for the acquisition made Moore Bend Water Company, Inc. lose further interest in the operation of the water company to the point that, in late August, 2013, it had essentially abandoned the system. For the betterment of the customers and Respondent, it had little choice other than to operate the system for the short period of time until the CNN could be finally granted by the Commission. The parties operating Respondent held other CNNs for other water companies, and, as the many Commission orders in Case No. WM-2012-0335 so held, Respondent knew how to operate a system, and there was no harm to any customer, but only a benefit to them. Had Respondent not taken over operating the system, its customers would have been harmed. Further, staff of the PSC was well aware that Respondent has commenced operating the system at this time, and voiced no objection thereto, until the filing of this Staff Complaint.

15. As with the assertions contained in paragraph 14 of is Answer, although Respondent does know the exact date it commence operating the system, it was approximately September 1, 2013.

16. Respondent denies the allegations of paragraph 16 of the Staff's Complaint.

17. Respondent denies the allegations of paragraph 17 of the Staff Complaint.

WHEREFORE, Respondent requests that this matter be mediated and/or that the parties enter into a "facilitated negotiation" with the aid of a neutral third-party mediator, or, in the alternative, that the Commission determine that Respondent has not violated Missouri statutes and Commission rules and orders as set out in the Staff Complaint, and not authorized the General Counsel to seek in Circuit Court the penalties allowed by law for the alleged violations, and grant Respondent such other and further relief as is just in the premises.

Count II:

Failure to Provide Safe and Adequate Service and Violations of Commission Regulations:

18. Respondent repeats its responses to the allegations contained in paragraph 1 through 17 hereof.

19. Not owning the water system on July 9, 2012, Respondent is without sufficient knowledge or information to for a belief as to the truth of the allegations in paragraph 19 of the Staff Complaint, and must therefore deny the same.

20. Not owning the water system at the times referred to in paragraph 20 of the Staff Complaint, Respondent is without sufficient knowledge or information to for a belief as to the truth of the allegations in paragraph 20 of the Staff Complaint, and must therefore deny the same.

21. Not owning the water system at the times referred to in paragraph 21 of the Staff Complaint, Respondent is without sufficient knowledge or information to for a belief as to the truth of the allegations in paragraph 21 of the Staff Complaint, and must therefore deny the same.

22. Not owning the water system at the times referred to in paragraph 22 of the Staff Complaint, Respondent is without sufficient knowledge or information to for a belief as to the truth of the allegations in paragraph 22 of the Staff Complaint, and must therefore deny the same.

23. Not owning the water system at the times referred to in paragraph 23 of the Staff Complaint, Respondent is without sufficient knowledge or information to for a belief as to the truth of the allegations in paragraph 23 of the Staff Complaint, and must therefore deny the same.

24. Not owning the water system at the times referred to in paragraph 24 of the Staff Complaint, Respondent is without sufficient knowledge or information to for a belief as to the truth of the allegations in paragraph 24 of the Staff Complaint, and must therefore deny the same.

25. Not owning the water system at the times referred to in paragraph 25 of the Staff Complaint, Respondent is without sufficient knowledge or information to for a belief as to the truth of the allegations in paragraph 25 of the Staff Complaint, and must therefore deny the same.

26. Not owning the water system at the times referred to in paragraph 26 of the Staff Complaint, Respondent is without sufficient knowledge or information to for a belief as to the truth of the allegations in paragraph 26 of the Staff Complaint, and must therefore deny the same.

27. Not owning the water system at the times referred to in paragraph 27 of the Staff Complaint, Respondent is without sufficient knowledge or information to for a belief as to the truth of the allegations in paragraph 27 of the Staff Complaint, and must therefore deny the same.

28. Not owning the water system at the times referred to in paragraph 28 of the Staff Complaint, Respondent is without sufficient knowledge or information to for a belief as to the truth of the allegations in paragraph 28 of the Staff Complaint, and must therefore deny the same.

29. Respondent admits the allegations of paragraph 29 of the Staff's Complaint.

30. Respondent admits the allegations of paragraph 30 of the Staff's Complaint, and affirmatively states that its reason for having failed to take corrective action was its lack of knowledge regarding the February 5, 2013 order, which occurred before Respondent's ownership of the water system.

31. Respondent admits the allegations of paragraph 31 of the Staff's Complaint.

32. Respondent states that it has made material progress in meeting its obligations under the BCA, as evidenced by the attached Exhibit "C," the Rozell Engineering Co. report dated June 17, 2014, which includes plans and specifications and an engineering report for the addition of chlorine feed systems to the two wells that serve the water system. Further, the Department of Natural Resources has approved those plans, as evidenced by the attached Approval on Plans, Specifications, and an Engineering Report For Chlorine Disinfection Systems, attached hereto as Exhibit "D."

33. Respondent denies the allegations of paragraph 33 of the Staff's Complaint.

34. Respondent denies the allegations of paragraph 34 of the Staff's Complaint.

WHEREFORE, Respondent requests that this matter be mediated and/or that the parties enter into a "facilitated negotiation" with the aid of a neutral third-party mediator, or, in the alternative, that the Commission determine that Respondent has not violated Missouri statutes and Commission rules and orders as set out in the Staff Complaint, and not authorized the

General Counsel to seek in Circuit Court the penalties allowed by law for the alleged violations, and grant Respondent such other and further relief as is just in the premises.

Count III:

Protective of the Public Health:

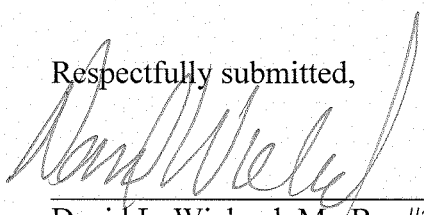
35. Respondent repeats its responses to the allegations contained in paragraph 1 through 34 hereof.

36. Respondent admits the allegations of paragraph 36 of the Staff's Complaint.

37. Respondent denies the allegations of paragraph 37 of the Staff's Complaint.

WHEREFORE, Respondent requests that this matter be mediated and/or that the parties enter into a "facilitated negotiation" with the aid of a neutral third-party mediator, or, in the alternative, that the Commission determine that Respondent has not violated Missouri statutes and Commission rules and orders as set out in the Staff Complaint, and not authorized the General Counsel to seek in Circuit Court the penalties allowed by law for the alleged violations, and grant Respondent such other and further relief as is just in the premises.

Respectfully submitted,



David L. Wieland, Mo Bar #29041
Wieland & Condry, LLC
ATTORNEY FOR MOORE BEND UTILITY, LLC
1548 E. Primrose
Springfield, MO 65804
T: (417) 447-2222
F: (417) 447-0903
Email: dlw@wielandlaw.com

LIST OF EXHIBITS TO ANSWER
OF
RESONDENT MOORE BEND WATER UTILITY, LLC

Exhibit "A" The Public Water System Bacteriological Report dated October 15, 2013

Exhibit "B" Lakeland Laboratory Reports from the months of September, 2013 through August of 2014

Exhibit "C" Rozell Engineering Co. report dated June 17, 2014,

Exhibit "D" – Approval on Plans, Specifications, and an Engineering Report For Chlorine Disinfection Systems

Missouri Department Of Natural Resources
Public Drinking Water Branch
P.O. Box 176
Jefferson City, MO 65102
(573)751-5331

Public Water System Bacteriological Report

PWS Name : MOORE BEND SUBD
PWS ID : MO5036117
Mail to : TOM TYRE
872 PAINTER RD
PO BOX 6640
BRANSON, MO 65615
County : TANEY

Please notify us of any name and address changes

Date Collected :	Collector :		Sample Type :
10/15/2013	CWC/DNR		Routine
Lab Sample ID :	**Location Name:**	**Location ID:**	**Lab Results :**
42042	163 COX	12	A

Coliform absent. Sample considered safe.

Date Collected :	Collector :		Sample Type :
10/15/2013	CWC/DNR		Routine
Lab Sample ID :	**Location Name:**	**Location ID:**	**Lab Results :**
42054	TOTAL COLIFORM RULE	TCR	A

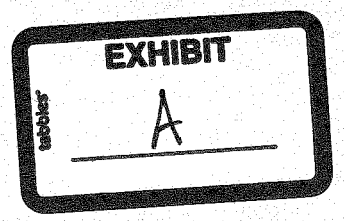
Coliform absent. Sample considered safe.

Date Collected :	Collector :		Sample Type :
10/15/2013	CWC/DNR		Routine
Lab Sample ID :	**Location Name:**	**Location ID:**	**Lab Results :**
42043	163 COX	12	A

Coliform absent. Sample considered safe.

Date Collected :	Collector :		Sample Type :
10/15/2013	CWC/DNR		Routine
Lab Sample ID :	**Location Name:**	**Location ID:**	**Lab Results :**
42055	TOTAL COLIFORM RULE	TCR	A

Coliform absent. Sample considered safe.



Note to Public Water Systems:
Routine samples must be taken from the distribution system. Routine samples collected at the well will be invalidated, possibly resulting in your system receiving a monitoring violation for failure to collect enough valid routine samples.

Tuesday, October 22, 2013

Missouri Department Of Natural Resources
Public Drinking Water Branch
P.O. Box 176
Jefferson City, MO 65102
(573)751-5331

Public Water System Bacteriological Report

PWS Name : MOORE BEND SUBD
Mail to : TOM TYRE
872 PAINTER RD
PO BOX 6640
BRANSON, MO 65615

PWS ID : MO5036117
County : TANEY
Please notify us of any name and address changes

Date Collected :	Collector :		Sample Type :
10/15/2013	CWC/DNR		Routine
Lab Sample ID :	**Location Name:**	**Location ID:**	**Lab Results :**
42150	WELL #1	WL 12978	A

Coliform absent. Sample considered safe.

Date Collected :	Collector :		Sample Type :
10/15/2013	CWC/DNR		Routine
Lab Sample ID :	**Location Name:**	**Location ID:**	**Lab Results :**
42149	WELL #1	WL 12978	A

Coliform absent. Sample considered safe.

Date Collected :	Collector :		Sample Type :
10/15/2013	CWC/DNR		Routine
Lab Sample ID :	**Location Name:**	**Location ID:**	**Lab Results :**
42148	WELL #1	WL 12978	A

Coliform absent. Sample considered safe.

Date Collected :	Collector :		Sample Type :
10/15/2013	CWC/DNR		Routine
Lab Sample ID :	**Location Name:**	**Location ID:**	**Lab Results :**
42147	WELL #1	WL 12978	A

Coliform absent. Sample considered safe.

LAKELAND LABORATORIES

786 Croley Blvd. • P.O. Box 1080 • Nixa, MO 65714 • 417 725-2670

Missouri Department of Natural Resources
Division of Environmental Quality
Microbiological Analysis Report

Public Water System Name		Laboratory Name
Moore Bend 10409		Lakeland Laboratories
Street Address		
City	Zip	Certification Number
		00400
County	ID Number	
Taney	MO5036117	

Sample Date Mo/Day/Yr	Time	Sample Type	Collection Point	Sample Location ID	Sample Results		Chlorine (mg/l)	
					Total Colform	E.Coli	Total	Free
09-12-13	14:15	R	140 Cox	L-03	A	A		2.02

Total Routine Samples Analyzed: 1

Signed: Mark D. Smith

Date: 9/16/13

Monitoring Violation		Yes	x	No	
MCL Violation		Yes	x	No	

ENZYME SUBSTRATE COLIFORM TEST
SM 9223 ESM21 (Colilert®)

EXHIBIT
tabbies
B

LAKELAND LABORATORIES

786 Croley Blvd. • P.O. Box 1080 • Nixa, MO 65714 • 417 725-2670

Missouri Department of Natural Resources
Division of Environmental Quality
Microbiological Analysis Report

Public Water System Name		Laboratory Name
Moore Bend 10552		Lakeland Laboratories
Street Address		
City	Zip	Certification Number 00400
County Taney	ID Number MO5036117	

Sample Date Mo/Day/Yr	Time	Sample Type	Collection Point	Sample Location ID	Sample Results Total Colform	E.Coli	Chlorine (mg/l) Total	Free
10-08-13	14:00	R	242 Gregory	L-08	A	A		1.13

Total Routine Samples Analyzed: 1

Signed: Marla D. Smith

Date: 10/10/13

Monitoring Violation		Yes	x	No	
MCL Violation		Yes	x	No	

ENZYME SUBSTRATE COLIFORM TEST
SM 9223 ESM21 (Colilert®)

LAKELAND LABORATORIES

786 Croley Blvd. • P.O. Box 1080 • Nixa, MO 65714 • 417 725-2670

Missouri Department of Natural Resources
Division of Environmental Quality
Microbiological Analysis Report

Public Water System Name		Laboratory Name
Moore Bend	10623	Lakeland Laboratories
Street Address		
City	Zip	Certification Number
		00400
County	ID Number	
Taney	MO5036117	

Sample Date Mo/Day/Yr	Time	Sample Type	Collection Point	Sample Location ID	Sample Results		Chlorine (mg/l)	
					Total Colform	E.Coli	Total	Free
11-05-13	13:15	R	242 Gregory	L-08	A	A		1.07

Total Routine Samples Analyzed: 1

Signed: Marla P. Smith

Date: 11/7/13

Monitoring Violation		Yes	x	No	
MCL Violation		Yes	x	No	

ENZYME SUBSTRATE COLIFORM TEST
SM 9223 ESM21 (Colilert®)

LAKELAND LABORATORIES

786 Croley Blvd. • P.O. Box 1080 • Nixa, MO 65714 • 417 725-2670

Missouri Department of Natural Resources
Division of Environmental Quality
Microbiological Analysis Report

Public Water System Name		Laboratory Name
Moore Bend 10770		Lakeland Laboratories
Street Address		
City	Zip	Certification Number 00400
County Taney	ID Number MO5036117	

Sample Date Mo/Day/Yr	Time	Sample Type	Collection Point	Sample Location ID	Sample Results Total Colform	E.Coli	Chlorine (mg/l) Total	Free
11-19-13	10:15	R	Well #2	S	A	A		.51

Total Routine Samples Analyzed: 1

Signed: Mark P. Smith Date: 11/20/13

Monitoring Violation		Yes	x	No	
MCL Violation		Yes	x	No	

ENZYME SUBSTRATE COLIFORM TEST
SM 9223 ESM21 (Colilert®)

LAKELAND LABORATORIES

786 Croley Blvd. • P.O. Box 1080 • Nixa, MO 65714 • 417 725-2670

Missouri Department of Natural Resources
Division of Environmental Quality
Microbiological Analysis Report

Public Water System Name		Laboratory Name
Moore Bend 10776		Lakeland Laboratories
Street Address		
City	Zip	Certification Number 00400
County Taney	ID Number MO5036117	

Sample Date Mo/Day/Yr	Time	Sample Type	Collection Point	Sample Location ID	Sample Results Total Colform	E.Coli	Chlorine (mg/l) Total	Free
11-19-13	10:40	R	Well #1	S	A	A		1.76

Total Routine Samples Analyzed: 1

Signed: Mark P. Smith

Date: 11/20/13

Monitoring Violation		Yes	x	No	
MCL Violation		Yes	x	No	

ENZYME SUBSTRATE COLIFORM TEST
SM 9223 ESM21 (Colilert®)

LAKELAND LABORATORIES

786 Croley Blvd. • P.O. Box 1080 • Nixa, MO 65714 • 417 725-2670

Missouri Department of Natural Resources
Division of Environmental Quality
Microbiological Analysis Report

Public Water System Name		Laboratory Name
Moore Bend 10729		Lakeland Laboratories
Street Address		
City	Zip	Certification Number
		00400
County	ID Number	
Taney	MO5036117	

Sample Date Mo/Day/Yr	Time	Sample Type	Collection Point	Sample Location ID	Sample Results Total Colform	E.Coli	Chlorine (mg/l) Total	Free
12-03-13	11:00	R	Well #1		A	A		1.15

Total Routine Samples Analyzed: 1

Signed: Mabel P. Smith

Date: 12/5/13

Monitoring Violation		Yes	x	No	
MCL Violation		Yes	x	No	

ENZYME SUBSTRATE COLIFORM TEST
SM 9223 ESM21 (Colilert®)

LAKELAND LABORATORIES

786 Croley Blvd. • P.O. Box 1080 • Nixa, MO 65714 • 417 725-2670

Missouri Department of Natural Resources
Division of Environmental Quality
Microbiological Analysis Report

Public Water System Name		Laboratory Name
Moore Bend 10733		Lakeland Laboratories
Street Address		
City	Zip	Certification Number 00400
County Taney	ID Number MO5036117	

Sample Date Mo/Day/Yr	Time	Sample Type	Collection Point	Sample Location ID	Sample Results		Chlorine (mg/l)	
					Total Colform	E.Coli	Total	Free
12-03-13	10:15	R	Well #2		A	A		.91

Total Routine Samples Analyzed: 1

Signed: Mark P Smith Date: 12/5/13

Monitoring Violation		Yes	x	No	
MCL Violation		Yes	x	No	

ENZYME SUBSTRATE COLIFORM TEST
SM 9223 ESM21 (Colilert®)

LAKELAND LABORATORIES

786 Croley Blvd. • P.O. Box 1080 • Nixa, MO 65714 • 417 725-2670

Missouri Department of Natural Resources
Division of Environmental Quality
Microbiological Analysis Report

Public Water System Name		Laboratory Name
Moore Bend 10843		Lakeland Laboratories
Street Address		
City	Zip	Certification Number 00400
County Taney	ID Number MO5036117	

Sample Date Mo/Day/Yr	Time	Sample Type	Collection Point	Sample Location ID	Sample Total Colform	Results E.Coli	Chlorine (mg/l) Total	Free
12-03-13	10:45	R	242 Gregory		A	A		1.09

Total Routine Samples Analyzed: 1

Signed: Marla P Smith Date: 12/5/13

Monitoring Violation		Yes	x	No	
MCL Violation		Yes	x	No	

ENZYME SUBSTRATE COLIFORM TEST
SM 9223 ESM21 (Colilert®)

LAKELAND LABORATORIES

786 Croley Blvd. • P.O. Box 1080 • Nixa, MO 65714 • 417 725-2670

Missouri Department of Natural Resources
Division of Environmental Quality
Microbiological Analysis Report

Public Water System Name		Laboratory Name
Moore Bend	10967	Lakeland Laboratories
Street Address		
City	Zip	Certification Number 00400
County: Taney	ID Number: MO5036117	

Sample Date Mo/Day/Yr	Time	Sample Type	Collection Point	Sample Location ID	Sample Results Total Coliform	E.Coli	Chlorine (mg/l) Total	Free
01-25-14	11:45	R	226 Rogers	L-06	A	A		1.2

Total Routine Samples Analyzed: 2

Signed: Mark L. Smith

Date: 2/4/14

Monitoring Violation		Yes	x	No	
MCL Violation		Yes	x	No	

ENZYME SUBSTRATE COLIFORM TEST
SM 9223 ESM21 (Colilert®)

LAKELAND LABORATORIES

786 Croley Blvd. • P.O. Box 1080 • Nixa, MO 65714 • 417 725-2670

Missouri Department of Natural Resources
Division of Environmental Quality
Microbiological Analysis Report

Public Water System Name		Laboratory Name
Moore Bend 10964		Lakeland Laboratories
Street Address		
City	Zip	Certification Number 00400
County Taney	ID Number MO5036117	

Sample Date Mo/Day/Yr	Time	Sample Type	Collection Point	Sample Location ID	Sample Results Total Coliform	E.Coli	Chlorine (mg/l) Total	Free
01-25-14	11:30	R	140 Cox	L-03	A	A		1.2

Total Routine Samples Analyzed: 2

Signed: Marilyn Smith

Date: 2/4/14

Monitoring Violation		Yes	x	No	
MCL Violation		Yes	x	No	

ENZYME SUBSTRATE COLIFORM TEST
SM 9223 ESM21 (Colilert®)

LAKELAND LABORATORIES

786 Croley Blvd. • P.O. Box 1080 • Nixa, MO 65714 • 417 725-2670

Missouri Department of Natural Resources
Division of Environmental Quality
Microbiological Analysis Report

Public Water System Name		Laboratory Name
Moore Bend (on # 2 well) 11004		Lakeland Laboratories
Street Address		
City	Zip	Certification Number 00400
County: Taney	ID Number: MO5036117	

Sample Date Mo/Day/Yr	Time	Sample Type	Collection Point	Sample Location ID	Sample Results Total Colform	E.Coli	Chlorine (mg/l) Total	Free
02-25-14	1630	R	265 Creed	L-	A	A		1.4

Total Routine Samples Analyzed: 2

Signed: Mark D. Smith

Date: 3/3/14

Monitoring Violation		Yes	x	No	
MCL Violation		Yes	x	No	

ENZYME SUBSTRATE COLIFORM TEST
SM 9223 ESM21 (Colilert®)

LAKELAND LABORATORIES

786 Croley Blvd. • P.O. Box 1080 • Nixa, MO 65714 • 417 725-2670

Missouri Department of Natural Resources
Division of Environmental Quality
Microbiological Analysis Report

Public Water System Name					Laboratory Name			
Moore Bend (on # 1 well) 11008					Lakeland Laboratories			
Street Address								
City		Zip			Certification Number 00400			
County Taney		ID Number MO5036117						
Sample Date Mo/Day/Yr	Time	Sample Type	Collection Point	Sample Location ID	Sample Total Colform	Results E.Coli	Chlorine Total	(mg/l) Free
02-25-14	1625	R	265 Creed	L-	A	A		2.01
Total Routine Samples Analyzed: 2					Signed: Mark D. Smith		Date: 3/3/14	
Monitoring Violation		Yes	x	No				
MCL Violation		Yes	x	No				

ENZYME SUBSTRATE COLIFORM TEST
SM 9223 ESM21 (Colilert®)

LAKELAND LABORATORIES

786 Croley Blvd. • P.O. Box 1080 • Nixa, MO 65714 • 417 725-2670

Missouri Department of Natural Resources
Division of Environmental Quality
Microbiological Analysis Report

Public Water System Name				Laboratory Name			
Moore Bend (on # 2 well) 11078				Lakeland Laboratories			
Street Address							
City		Zip		Certification Number 00400			
County Taney		ID Number MO5036117					

Sample Date Mo/Day/Yr	Time	Sample Type	Collection Point	Sample Location ID	Sample Results Total Colform	E.Coli	Chlorine (mg/l) Total	Free
03-08-14	1500	R	226 Rogers Rd.	L-06	A	A		1.8

Total Routine Samples Analyzed: 2

Signed: Mark P. Smith

Date: 3/12/14

Monitoring Violation		Yes	x	No	
MCL Violation		Yes	x	No	

ENZYME SUBSTRATE COLIFORM TEST
SM 9223 ESM21 (Colilert®)

LAKELAND LABORATORIES

786 Croley Blvd. • P.O. Box 1080 • Nixa, MO 65714 • 417 725-2670

Missouri Department of Natural Resources
Division of Environmental Quality
Microbiological Analysis Report

Public Water System Name			Laboratory Name
Moore Bend (on # 1 well) 11028			Lakeland Laboratories
Street Address			
City	Zip		Certification Number 00400
County: Taney	ID Number: MO5036117		

Sample Date Mo/Day/Yr	Time	Sample Type	Collection Point	Sample Location ID	Sample Results Total Colform	E.Coli	Chlorine (mg/l) Total	Free
03-08-14	1455	R	140 Cox Rd.	L-03	A	A		2.0

Total Routine Samples Analyzed: 2

Signed: Mark D. Smith Date: 3/12/14

Monitoring Violation		Yes	x	No	
MCL Violation		Yes	x	No	

ENZYME SUBSTRATE COLIFORM TEST
SM 9223 ESM21 (Colilert®)

LAKELAND LABORATORIES

786 Croley Blvd. • P.O. Box 1080 • Nixa, MO 65714 • 417 725-2670

Missouri Department of Natural Resources
Division of Environmental Quality
Microbiological Analysis Report

Public Water System Name					Laboratory Name			
Moore Bend (on # 1 well) 11152					Lakeland Laboratories			
Street Address								
City			Zip		Certification Number 00400			
County Taney			ID Number MO5036117					
Sample Date Mo/Day/Yr	Time	Sample Type	Collection Point	Sample Location ID	Sample Results Total Colform	E.Coli	Chlorine (mg/l) Total	Free
04-06-14	1140	R	140 Cox Rd.	L-03	A	A		1.66
Total Routine Samples Analyzed: 2					Signed: Mark P. Smith		Date: 5/5/14	
Monitoring Violation		Yes	x	No				
MCL Violation		Yes	x	No				

ENZYME SUBSTRATE COLIFORM TEST
SM 9223 ESM21 (Colilert®)

LAKELAND LABORATORIES

786 Croley Blvd. • P.O. Box 1080 • Nixa, MO 65714 • 417 725-2670

Missouri Department of Natural Resources
Division of Environmental Quality
Microbiological Analysis Report

Public Water System Name		Laboratory Name
Moore Bend (on # 2 well) 11185		Lakeland Laboratories
Street Address		
City	Zip	Certification Number 00400
County: Taney	ID Number: MO5036117	

Sample Date Mo/Day/Yr	Time	Sample Type	Collection Point	Sample Location ID	Sample Results Total Colform	E.Coli	Chlorine (mg/l) Total	Free
04-06-14	1125	R	226 Rogers Rd.	L-06	A	A		1.71

Total Routine Samples Analyzed: 2

Signed: Mark T. Smith Date: 5/5/14

Monitoring Violation		Yes	x	No	
MCL Violation		Yes	x	No	

ENZYME SUBSTRATE COLIFORM TEST
SM 9223 ESM21 (Colilert®)

LAKELAND LABORATORIES

786 Croley Blvd. • P.O. Box 1080 • Nixa, MO 65714 • 417 725-2670

Missouri Department of Natural Resources
Division of Environmental Quality
Microbiological Analysis Report

Public Water System Name		Laboratory Name
Moore Bend (on # 1 well) 11319		Lakeland Laboratories
Street Address		
City	Zip	Certification Number 00400
County: Taney	ID Number: MO5036117	

Sample Date Mo/Day/Yr	Time	Sample Type	Collection Point	Sample Location ID	Sample Results Total Colform	E.Coli	Chlorine (mg/l) Total	Free
05-28-14	1200	R	140 Cox Rd.	L-03	A	A		1.50

Total Routine Samples Analyzed: 2

Signed: Mark D. Smith Date: 6/2/14

Monitoring Violation		Yes	x	No	
MCL Violation		Yes	x	No	

ENZYME SUBSTRATE COLIFORM TEST
SM 9223 ESM21 (Colilert®)

LAKELAND LABORATORIES

786 Croley Blvd. • P.O. Box 1080 • Nixa, MO 65714 • 417 725-2670

Missouri Department of Natural Resources
Division of Environmental Quality
Microbiological Analysis Report

Public Water System Name					Laboratory Name			
Moore Bend (on # 2 well) 11249					Lakeland Laboratories			
Street Address								
City			Zip		Certification Number 00400			
County Taney			ID Number MO5036117					
Sample Date Mo/Day/Yr	Time	Sample Type	Collection Point	Sample Location ID	Sample Total Colform	Results E.Coli	Chlorine Total	(mg/l) Free
05-28-14	1220	R	226 Rogers Rd.	L-06	A	A		1.6
Total Routine Samples Analyzed: 2					Signed: Mark D. Smith		Date: 6-2-14	
Monitoring Violation			Yes	x	No			
MCL Violation			Yes	x	No			

ENZYME SUBSTRATE COLIFORM TEST
SM 9223 ESM21 (Colilert®)

LAKELAND LABORATORIES

786 Croley Blvd. • P.O. Box 1080 • Nixa, MO 65714 • 417 725-2670

Missouri Department of Natural Resources
Division of Environmental Quality
Microbiological Analysis Report

Public Water System Name		Laboratory Name
Moore Bend (on # 1 well) 11356		Lakeland Laboratories
Street Address		
City	Zip	Certification Number 00400
County: Taney	ID Number: MO5036117	

Sample Date Mo/Day/Yr	Time	Sample Type	Collection Point	Sample Location ID	Sample Results Total Colform	E.Coli	Chlorine (mg/l) Total	Free
06-15-14	1130	R	432 Cox Rd.	L-11	A	A		1.45

Total Routine Samples Analyzed: 2

Signed: Michael Smith

Date: 6/19/14

Monitoring Violation		Yes	x	No	
MCL Violation		Yes	x	No	

ENZYME SUBSTRATE COLIFORM TEST
SM 9223 ESM21 (Colilert®)

LAKELAND LABORATORIES

786 Croley Blvd. • P.O. Box 1080 • Nixa, MO 65714 • 417 725-2670

Missouri Department of Natural Resources
Division of Environmental Quality
Microbiological Analysis Report

Public Water System Name					Laboratory Name			
Moore Bend (on # 2 well) 11361					Lakeland Laboratories			
Street Address								
City			Zip		Certification Number 00400			
County Taney			ID Number MO5036117					
Sample Date Mo/Day/Yr	Time	Sample Type	Collection Point	Sample Location ID	Sample Total Colform	Results E.Coli	Chlorine Total	(mg/l) Free
06-22-14	1200	R	336 Dallas	L-07	A	A		1.61
Total Routine Samples Analyzed: 2				Signed: Market Smith		Date: 7/3/14		
Monitoring Violation			Yes	x	No			
MCL Violation			Yes	x	No			

ENZYME SUBSTRATE COLIFORM TEST
SM 9223 ESM21 (Colilert®)

LAKELAND LABORATORIES

786 Croley Blvd. • P.O. Box 1080 • Nixa, MO 65714 • 417 725-2670

Missouri Department of Natural Resources
Division of Environmental Quality
Microbiological Analysis Report

Public Water System Name					Laboratory Name			
Moore Bend (on # 2 well) 11361					Lakeland Laboratories			
Street Address								
City			Zip		Certification Number			
					00400			
County			ID Number					
Taney			MO5036117					
Sample Date Mo/Day/Yr	Time	Sample Type	Collection Point	Sample Location ID	Sample Total Colform	Results E.Coli	Chlorine Total	(mg/l) Free
07-12-14	1055	R	242 Gregory	L-08	A	A		1.14
Total Routine Samples Analyzed: 2					Signed: Mark D. Smith		Date: 7/24/14	
Monitoring Violation		Yes	x	No				
MCL Violation		Yes	x	No				

ENZYME SUBSTRATE COLIFORM TEST
SM 9223 ESM21 (Colilert®)

LAKELAND LABORATORIES

786 Croley Blvd. • P.O. Box 1080 • Nixa, MO 65714 • 417 725-2670

Missouri Department of Natural Resources
Division of Environmental Quality
Microbiological Analysis Report

Public Water System Name		Laboratory Name
Moore Bend (on # 1 well) 11568		Lakeland Laboratories
Street Address		
City	Zip	Certification Number 00400
County: Taney	ID Number: MO5036117	

Sample Date Mo/Day/Yr	Time	Sample Type	Collection Point	Sample Location ID	Sample Results: Total Colform	E.Coli	Chlorine (mg/l): Total	Free
07-27-14	1100	R	140 Cox Rd.	L-03	A	A		1.90

Total Routine Samples Analyzed: 2

Signed: Mark P. Smith

Date: 7/29/14

Monitoring Violation		Yes	x	No	
MCL Violation		Yes	x	No	

ENZYME SUBSTRATE COLIFORM TEST
SM 9223 ESM21 (Colilert®)

LAKELAND LABORATORIES

786 Croley Blvd. • P.O. Box 1080 • Nixa, MO 65714 • 417 725-2670

Missouri Department of Natural Resources
Division of Environmental Quality
Microbiological Analysis Report

Public Water System Name					Laboratory Name			
Moore Bend (on # 2 well) 11625					Lakeland Laboratories			
Street Address								
City			Zip		Certification Number 00400			
County Taney			ID Number MO5036117					
Sample Date Mo/Day/Yr	Time	Sample Type	Collection Point	Sample Location ID	Sample Total Colform	Results E.Coli	Chlorine Total	(mg/l) Free
08-02-14	1200	R	432 Cox	L-11	A	A		1.52
Total Routine Samples Analyzed: 2				Signed: Mark E. Smith		Date: 8/5/14		
Monitoring Violation			Yes	x	No			
MCL Violation			Yes	x	No			

ENZYME SUBSTRATE COLIFORM TEST
SM 9223 ESM21 (Colilert®)

LAKELAND LABORATORIES

786 Croley Blvd. • P.O. Box 1080 • Nixa, MO 65714 • 417 725-2670

Missouri Department of Natural Resources
Division of Environmental Quality
Microbiological Analysis Report

Public Water System Name			Laboratory Name
Moore Bend (on # 1 well) 11615			Lakeland Laboratories
Street Address			
City	Zip		Certification Number 00400
County: Taney	ID Number: MO5036117		

Sample Date Mo/Day/Yr	Time	Sample Type	Collection Point	Sample Location ID	Sample Results: Total Colform	Sample Results: E.Coli	Chlorine (mg/l): Total	Chlorine (mg/l): Free
08-02-14	1145	R	140 Cox Rd.	L-03	A	A		1.61

Total Routine Samples Analyzed: 2

Signed: Marla Smith

Date: 8/5/14

Monitoring Violation		Yes	x	No	
MCL Violation		Yes	x	No	

ENZYME SUBSTRATE COLIFORM TEST
SM 9223 ESM21 (Colilert®)

ROZELL ENGINEERING CO.
ENGINEERING SECTION, INC. P.C.
Wayne Diebold, P.E.
Consulting Engineer
2404 STATE HIGHWAY 248 SUITE 4 - BRANSON, MISSOURI 65616 - TELEPHONE (417) 334-4141 - FAX (417) 334-4181

June 17, 2014

Mr. Maher Jaafari, PE, Chief
Infrastructure Permits and Engineering Section
Public Drinking Water Branch
P.O. Box 176
Jefferson City, Missouri 65102

RE: MOORE BEND WATER UTILITY, LLC, TANEY COUNTY, MISSOURI.
PWS ID# MO5036117

Dear Mr. Jaafari:

Enclosed please find two sets of plans and specifications and two copies of an engineering report for the addition of chlorine feed systems to the two wells that serve Moore Bend Water Utility, LLC in Taney County, Missouri.

We ask that you review this material as soon as possible, so that we may resolve any comments you may have and secure the State's approval for construction of this project.

If you have any questions concerning this matter, please contact me.

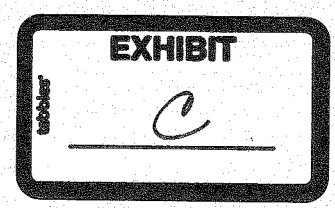
Sincerely,

Wayne Diebold, P.E.

WD/wd

Enclosure

c: Mr. Hollis H. Brower, Jr., Organizer, Moore Bend Water Utility, LLC



15256w11

MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM

CONSTRUCTION PERMIT APPLICATION

FOR OFFICE USE ONLY
REV. NO
DATE RECEIVED
DATE APPROVED

INSTRUCTIONS

A. Please type or print in ink
B. A completed and signed application form must accompany each set of plans and specifications submitted to the department for review and approval.
C. No fee is required for a construction permit.
D. If you have any questions contact the Missouri Department of Natural Resources at P.O. Box 176, Jefferson City, MO 65102-0176 or call 800-361-4827 or 573-751-5331.

NAME OF PROJECT (TYPE OF CONSTRUCTION, FOLLOWED BY EITHER THE NAME OF THE DEVELOPMENT, CITY, WATER DISTRICT OR OTHER)

Addition of chlorine feed systems to existing Moore Bend Water Utility, LLC wells, Taney County, Missouri

LIST OF DOCUMENTS SUBMITTED. TWO COPIES ARE REQUIRED FOR EACH DOCUMENT

- ■ Engineering Report* or Review # _____
- ■ Detailed Plans*
- ■ Technical Specifications*
- ☐ Layout Map*
- ■ Standard Specifications Review #_____
- ☐ Supervised Program Specifications Review # _____
- ☐ Hydraulic Analysis*
- ■ Product or Equipment Literature
- ☐ Letter of Acceptance from Supply Source
- ☐ Other (Specify)_____

*Must be affixed with the professional engineer's seal.

PROJECT IS FOR

- ☐ Development of new water supply system
  - ☐ TMF checklist ☐ TMF owner's acknowledgement form
- ■ Modification of existing water supply system
  - Name of system: Moore Bend Water Utility, LLC
  - Identification number: MO 5036117 (New systems will not have this number)

SCOPE OF THE PROJECT (DESCRIBE THE PROJECT COMPLETELY, ATTACH ADDITIONAL SHEETS OF PAPER IF NECESSARY)

Well No. 1: Addition of chemical feed pump and 55 gallon graduated chlorine solution tank along with four (4) 120 gallon retention tanks to serve an existing water system.
Well No. 2: Addition of chemical feed pump and 55 gallon graduated chlorine solution tank along with four (4) 120 gallon retention tanks to serve an existing water system.

LOCATION OF THE PROJECT

U.S. Geological Survey location _____ ¼, SW ¼, Section 34, T 23N, R 20W
County Taney

LOCATION OF PROJECT

36.59528 Latitude 93.09111 Longitude

PROPOSED WATER SUPPLY SOURCE

- ☑ Well or Wells
- ☐ Stream, river, lake or reservoir (two-state treatment is required)
- ☐ Purchase – Name of supplier _____

WATER LINES

- ☐ Complete distribution system
- ☐ Water line extension
  - Line size at point of connection _____
  - Available flow and pressure: Flow _____ Pressure _____
- ☐ Water line relocation
- ☐ Other (specify) _____

STORAGE

Dimension _____

- ☐ Ground-level storage tank
- ☐ Elevated storage tank
- ☐ Standpipe

Capacity 480 gals/well

- ☐ Pressure tank
- ☑ Others (specify) Retention tanks

PROPOSED TREATMENT PROVIDED

- ☐ Clarification
  - ☐ Pre-sedimentation
  - ☐ Chemical Rapid Mixing
  - ☐ Flocculation
  - ☐ Sedimentation
  - ☐ Filtration
  - ☐ Others (specify) _____
- ☐ Softening
  - ☐ Lime or lime-soda process
  - ☐ Ion exchange process
- ☐ Iron and Manganese removal
  - ☐ Oxidation-detention-filtration
  - ☐ Lime or lime-soda softening process
  - ☐ Ion exchange process
  - ☐ Manganese greensand filtration
  - ☐ Sequestration by chemicals
  - ☐ Others (specify) _____
- ☐ Radionuclide removal
- ☐ THM control
- ☐ VOC removal
- ☐ Tastes and odor control
- ☐ Stabilization
- ☑ Disinfection
  - Chemicals used 5% sod hypo
  - Contact time 21.8 ms/24ms
- ☐ Fluoridation
- ☐ Others (specify) _____

PUMPING

Number of Pumps _____
☐ Low service pumping
☐ Booster pumping

Capacity / pump _____
☐ High service pumping
☐ Others (specify) _____

WASTE DISPOSAL FACILITES

Number of units _____
☐ Pumps and piping
☐ Treatment unit
Final disposal of sludge _____

Capacity / unit _____
☐ Holding structures
☐ Other (specify) _____

OTHER WATER WORKS (SPECIFY)

Note for owner or official custodian:
For a sole proprietorship - the name of the proprietor.
For a corporation - the name of an officer of at least the level of a plant manager.
For a partnership - the name of a principal partner.
For a city, state, federal or other public facility - the name of either a principal executive officer or a ranking public official.

OWNER OR OFFICIAL CUSTODIAN		TELEPHONE NUMBER WITH AREA CODE	
Moore Bend Water Utility, LLC		(417) 725-4141	
ADDRESS	CITY	STATE	ZIP CODE
P.O. Box 1080	Nixa	MO	65714
SIGNATURE OF OWNER OR OFFICIAL CUSTODIAN		DATE	
X Hollis H. Brower Jr		X 6/20/14	
PRINT NAME OF OWNER OR OFFICIAL CUSTODIAN		OWNER OR OFFICIAL CUSTODIAN TITLE	
Hollis H. Brower, Jr.		Organizer	

Mail completed copy to:

Missouri Department of Natural Resources
Water Protection Program
Public Drinking Water Branch
P.O. Box 176
Jefferson City, MO 65102-0176
Phone: 800-361-4827 or 573-751-5331
FAX: 573-751-3110

ADDITION OF CHLORINE FEED SYSTEMS

FOR

MOORE BEND WATER UTILITY, LLC

TANEY COUNTY, MISSOURI

OWNER

MOORE BEND WATER UTILITY, LLC

P.O. BOX 1080

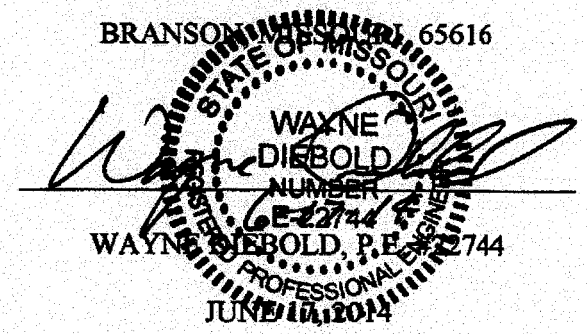
NIXA, MISSOURI 65714

ROZELL ENGINEERING COMPANY

ENGINEERING SECTION INC., PC

2404 STATE HIGHWAY 248, SUITE 4

BRANSON, MISSOURI 65616



WAYNE DIEBOLD, P.E. #2744

JUNE 11, 2014

WO# 15256EW5

TABLE OF CONTENTS

I. INTRODUCTION

II. FIELD SURVEY

III. DESIGN CRITERIA

IV. EXISTING FACILITY AND PROPOSED CHLORINE FEED SYSTEMS

Appendices

1. Vicinity Map

2. Chlorine Feed System Specifications

3. Retention Vessel Information

4. Detail Plans (Detached)

I. INTRODUCTION:

This one volume report is for the purpose of obtaining the approval of the State of Missouri for chlorine feed systems to be added to two existing wells at Moore Bend Water Utility, LLC in Taney, Missouri. The owner of the water system is Moore Bend Water Utility, LLC, P.O. Box 1080, Nixa, Missouri, 65714, Mr. Hollis H. Brower, Jr., Organizer. The development and well sites are located southeast of Forsyth, Missouri. The site can be accessed by traveling east and south on U.S. Route 160 approximately 11 miles from Forsyth to the intersection of MoDOT No. "M" and U.S. Route 160. From there follow "M" Highway south approximately 6.5 miles to MoDOT No. "KK" located on the west side of the road. Follow "KK" Highway west and north approximately 1.2 miles to Moore's Bend Road located on the west side of the highway. Follow Moore's Bend Road west approximately 5.3 miles to Cox Road. Follow Cox Road to the west approximately 0.7 miles to Well No. 1 which is located at the intersection of Cox and Dallas Roads. From here, Well No. 2 can be accessed by following Dallas Road to the west approximately 0.3 miles to the intersection of Dallas and Creed Roads. Well No. 2 is located just west of this intersection on the north side of Creed Road.

II. FIELD SURVEY:

This is an existing development that is being served by two wells that are both part of a State approved water system being operated under PWS ID No. MO-5036117. In total, the two wells currently serve approximately 102 connections.

III. DESIGN CRITERIA:

Water Demand:

102 connections x 3.0 people/con. x 100 gpcd		=	30,600 gpd
		=	1,275 gph
		=	21.25 gpm
Peak Daily Demand:	30,600 gpd x 2	=	61,200 gpd
		=	2,550 gph
		=	42.50 gpm
Peak Hourly Demand:	1,275 gph x 6	=	7,650 gph
		=	127.50 gpm

IV. EXISTING FACILITY AND PROPOSED CHLORINE FEED SYSTEM:

WELL NO. 1:

Well No. 1 is an existing six inch diameter well that presently contains a 3 H.P. pump that produces 22 gpm. Pressure for this system is maintained by use of six bladder type pressure tanks. These tanks will continue to serve the system but will be relocated in the well house and plumbed as shown on the detailed drawings in order to accommodate the retention tanks that will be needed for disinfection. The existing well house has adequate heating, ventilation, and lighting. All doors and windows are provided with locks to prevent unauthorized access.

The chemical feed pump that will serve this system is a Blue-White Flexflo Peristaltic metering pump Model A1N20F-6T with a 55 gallon translucent graduated chlorine solution tank to allow the operator to measure the amount of solution being used. The solution tank will be vented to the outside of the structure, above grade, and remote from air intakes. The vent will be constructed of material compatible with the chemical being vented and screened to prevent insects from building nests that may plug the vent. The feed line from the chemical feed pump is connected to the water line running from the well to the retention tanks. The calculations for the sizing of the chemical feed pump and the feed rate are as follows:

Well Flow Rate: 22 gpm

Concentration of Chlorine Solution: 5 %

Daily Chlorine Solution Required:

$$\frac{22 \text{ gpm} \times 1440 \text{ min/day} \times 1.0 \text{ ppm}}{50{,}000 \text{ ppm}} = 0.63 \text{ gpd}$$

The feed pump is rated for 24 gpd with adjustable flow rate settings. To deliver 0.63 gpd of solution the flow rate will be set on 2.7%. The resulting solution feed rate will be as follows:

24 gpd x 0.027 flow rate = 0.65 gpd

Detention storage for this system will be provided by the use of four 120 gallon retention tanks. The tanks will be plumbed into the existing piping in the well house so that the flow from the well will be directed through all four tanks. The tanks will be plumbed in series in order to maximize the chlorine contact time. Each tank will be 24 inches in diameter and 70 inches in length. Since the tanks will operate in series the length to width ratio, as it relates to the baffling factor, will be 11.67 to 1. Since this ratio is greater than 3 to 1, the baffling factor for this installation will be 1 based on the Missouri Guidance Manual for Inactivation of Viruses in Groundwater; Baffling Factor Method. The calculated CT value for this installation, based on a baffling factor of 1.0, would be as follows:

480 gallons x 1.0 = 480 gallons

480 gallons/22 gpm = 21.8 minutes

Calculated CT value = 21.8 minutes x 1.0 mg/l = 21.8

The CT 4-log requirement for this well, based on the pH of the water being 7.6 and a temperature of 5 degrees Celsius, would be 8. The calculated CT value of 21.8 is adequate for this system. A second chemical feed pump, as well as spare parts that commonly fail due to wear or breakage, will be kept on hand. Existing and proposed sampling taps have been shown on the detailed plans to allow for sampling from the water source and from each unit operation of treatment. The owner will monitor the residual chlorine levels by use of an Advantage Controls Megatron Controller remote monitor Model No. WG-CP-H5. This controller will allow the operator to monitor the residual chlorine levels via the internet and will also allow the operator to adjust the dosing rate from the chemical feed pump remotely if needed.

WELL NO. 2:

Well No. 2 is an existing six inch diameter well that presently contains a 2 H.P. pump that produces 20 gpm. Pressure for this system is maintained by use of six bladder type pressure tanks. These tanks will continue to serve the system but will be relocated in the well house and plumbed as shown on the detailed drawings in order to accommodate the retention tanks that will be needed for disinfection. The existing well house has adequate heating, ventilation, and lighting. All doors and windows are provided with locks to prevent unauthorized access.

The chemical feed pump that will serve this system is a Blue-White Flexflo Peristaltic metering pump Model A1N20F-6T with a 55 gallon translucent graduated chlorine solution tank to allow the operator to measure the amount of solution being used. The solution tank will be vented to the outside of the structure, above grade, and remote from air intakes. The vent will be constructed of material compatible with the chemical being vented and screened to prevent insects from building nests that may plug the vent. The feed line from the chemical feed pump is connected to the water line running from the well to the retention tanks. The calculations for the sizing of the chemical feed pump and the feed rate are as follows:

Well Flow Rate: 20 gpm

Concentration of Chlorine Solution: 5 %

Daily Chlorine Solution Required:

$$\frac{20 \text{ gpm} \times 1440 \text{ min/day} \times 1.0 \text{ ppm}}{50{,}000 \text{ ppm}} = 0.58 \text{ gpd}$$

The feed pump is rated for 24 gpd with adjustable flow rate settings. To deliver 0.58 gpd of solution the flow rate will be set on 2.5%. The resulting solution feed rate will be as follows:

24 gpd x 0.025 flow rate = 0.60 gpd

Detention storage for this system will be provided by the use of four 120 gallon retention tanks. The tanks will be plumbed into the existing piping in the well house so that the flow from the well will be directed through all four tanks. The tanks will be plumbed in series in order to maximize the chlorine contact time. Each tank will be 24 inches in diameter and 70 inches in length. Since the tanks will operate in series the length to width ratio, as it relates to the baffling factor, will be 11.67 to 1. Since this ratio is greater than 3 to 1, the baffling factor for this installation will be 1 based on the Missouri Guidance Manual for Inactivation of Viruses in Groundwater; Baffling Factor Method. The calculated CT value for this installation, based on a baffling factor of 1.0, would be as follows:

480 gallons x 1.0 = 480 gallons

480 gallons/20 gpm = 24 minutes

Calculated CT value = 24 minutes x 1.0 mg/l = 24

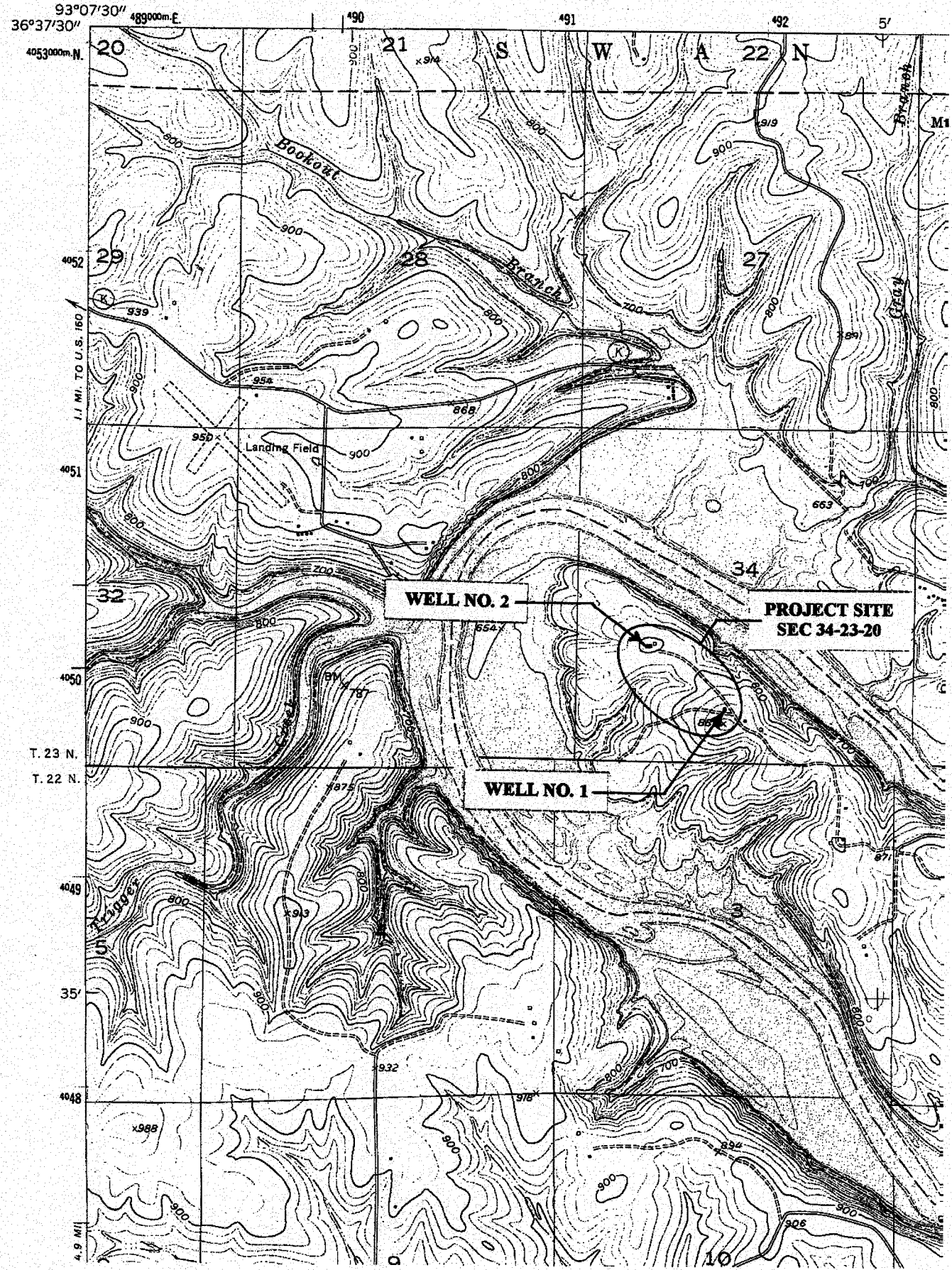
The CT 4-log requirement for this well, based on the pH of the water being 7.6 and a temperature of 5 degrees Celsius, would be 8. The calculated CT value of 24 is adequate for this system. A second chemical feed pump, as well as spare parts that commonly fail due to wear or breakage, will be kept on hand. Existing and proposed sampling taps have been shown on the detailed plans to allow for sampling from the water source and from each unit operation of treatment. The owner will monitor the residual chlorine levels by use of an Advantage Controls Megatron Controller remote monitor Model No. WG-CP-H5. This controller will allow the operator to monitor the residual chlorine levels via the internet and will also allow the operator to adjust the dosing rate from the chemical feed pump remotely if needed.

In the case of both wells, the well house piping, as shown on the detailed plans, is valved to ensure all water will flow from the well, to the chlorine feed point and then to the retention tanks in order to receive the required amount of chlorine contact time. The retention volume provided for each well has been oversized at the owners request in order to accommodate higher pumping rates in the future, if necessary. The owner understands that approval must be granted by the Missouri Department of Natural Resources before either well pump could be increased in size.

Moore Bend Water Utility, LLC employs licensed operators to oversee the operation of this and several other systems it owns. Moore Bend Water Utility, LLC also has the required chlorine residual testing equipment which meets the requirements of 10 CSR 60-5.010 and is capable of measuring residuals to the nearest 0.2 milligram per liter.

APPENDICES

VICINITY MAP
FOR
MOORE BEND WATER UTILITY, LLC
TANEY COUNTY, MISSOURI



SECTION 17 - CHLORINE FEED PUMP:

17-1. SCOPE: This section covers the furnishing and installation of the chlorine feed pump and accessories for a complete installation.

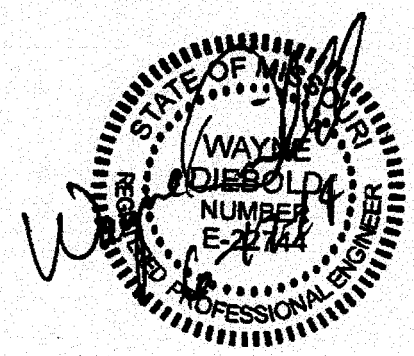
17-2. FEED PUMP: The feed pump shall be a Blue-White FlexFlo Peristaltic metering pump Model A1N20F-6T chemical feed pump or approved equal. The contractor shall wire the controls for the on and off operation of the feed pump so that it will coincide with the operation of the well pump.

17-3. CHLORINE SOLUTION RESERVOIR: The chlorine solution reservoir shall be of sufficient size to hold 55 gallons of chlorine solution and shall be made of material approved for such use. The solution reservoir shall be graduated to allow the operator to measure the volume of solution used. The reservoir shall be properly vented to the outside of the structure, above grade and remote from air intakes with vents constructed of material compatible with the chemical being vented and screened to prevent insects from buildings nests that may plug the vent. The reservoir shall be secured in such a manner to the floor and/or wall of the building as to prevent spills.

17-4. INSTALLTION: The feed pump, suction line, feed line, and chlorine solution reservoir shall be installed and tested by the well contractor.

17-5. DRAWINGS AND DATA: Complete assembly installation and wiring drawings with detailed specifications shall be submitted in accordance with the procedures set forth in the General conditions.

END OF SECTION

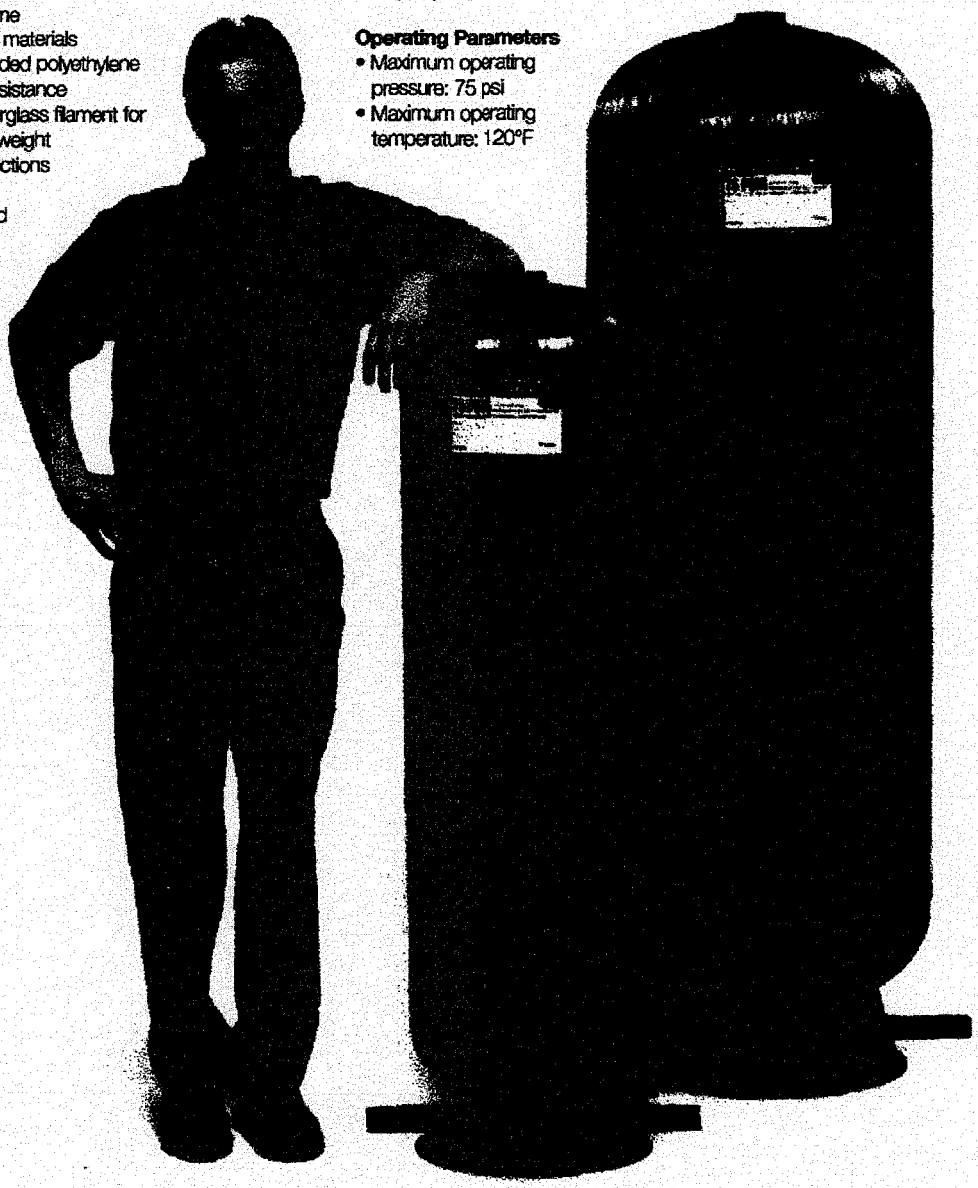


Retention Vessels

Product Features
- The vessel of choice for chemical treatment
- Provides optimal contact time
- FDA and/or NSF-approved materials
- Seamless inner shell of molded polyethylene for impact and corrosion resistance
- Miles of epoxy covered fiberglass filament for superior strength and light weight
- Inlet/outlet PVC pipe connections offer application flexibility
- Adaptable for both new and replacement installation
- Additional drain port
- Factory-backed five-year warranty

Materials of Construction
- Polyethylene inner shell

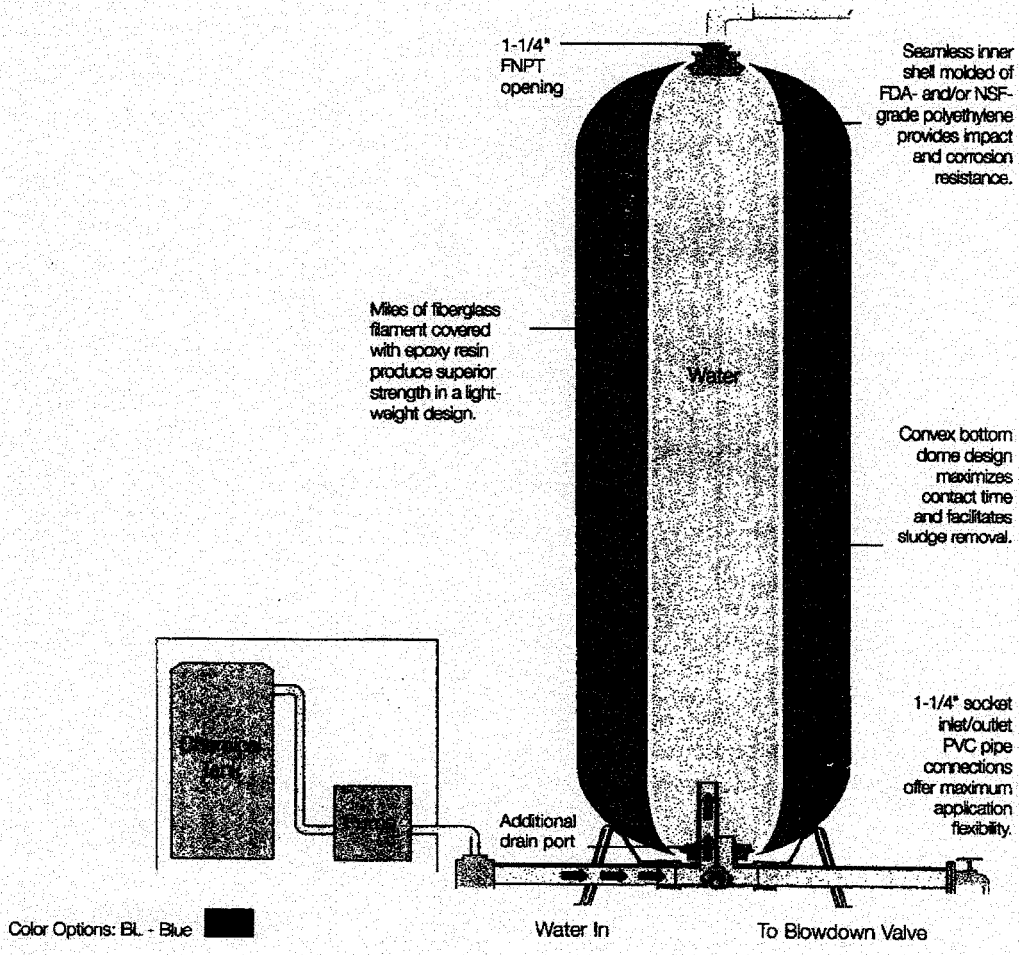
Operating Parameters
- Maximum operating pressure: 75 psi
- Maximum operating temperature: 120°F



Part no. 40847
Rev 9/05

Specifications

Part No.	Model	Size (Inches)	System Connections (PVC) Top	Bottom	Height Capacity Inches / mm	Gallons / Liters	Cubic Feet Nominal
31534	CT-30	16 x 40	1-1/4" female NPT	1-1/4" male	44.0 / 1112.0	30.0 / 113.5	4.0 NPT
31533	CT-40SQ	21 x 32	1-1/4" female NPT	1-1/4" male	35.0 / 889.0	40.0 / 151.2	5.3 NPT
31608	CT-40	16 x 53	1-1/4" female NPT	1-1/4" male	56.0 / 1422.0	40.0 / 151.2	5.3 NPT
30957	CT-80	24 x 50	1-1/4" female NPT	1-1/4" male	67.0 / 1702.0	80.0 / 302.4	10.7 NPT
31057	CT-120	24 x 70	1-1/4" female NPT	1-1/4" male	73.0 / 1854.2	120.0 / 454.0	16.0 NPT



STATE OF MISSOURI
Jeremiah W. (Jay) Nixon, Governor • Sara Parker Pauley, Director
DEPARTMENT OF NATURAL RESOURCES
www.dnr.mo.gov

CI

Moore Bend Subdivision
Review No.5052088-14
PWS ID No. MO5036117

July 16, 2014

Mr. Hollis Brower Jr., Organizer
Moore Bend Utilities
P.O. Box 1080
Nixa, MO 65714

Dear Mr. Brower Jr.:

Enclosed is the Approval on Plans and Specifications for liquid hypochlorite injection systems for Moore Bend Water Utility, LLC, Taney County, Missouri, which I believe, is self-explanatory.

Please be advised this facility may be required to obtain other permits from the department. It is your responsibility to insure that any and all necessary permits for this facility have been obtained.

NOTE: You, as the applicant, should be aware that you will need to obtain final construction approval from the department for this project, once it has been constructed and completed. In order to do this, you will need to have your engineer complete the enclosed "Statement of Work Completed" form. This may require you to make additional arrangements with your engineer to provide this service to you. Once your engineer has completed this form for you, you should return it to this office. We will then make arrangements with our regional office staff to conduct a final inspection and issue a final construction approval.

Should you have any questions please contact Kimberly Potter at 573-751-5924 or Deborah Arant at 573-526-4661. Thank you.

Sincerely,

WATER PROTECTION PROGRAM

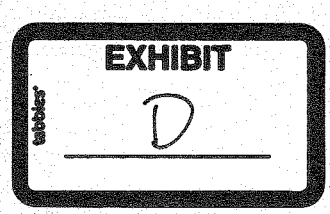
Maher Jaafari

Maher Jaafari, P. E., Chief
Permits and Engineering Section
Public Drinking Water Branch

MJ:lgk

Enclosure

c: Engineering Firm
Regional Office
Wellhead Protection



DEPARTMENT OF NATURAL RESOURCES OF MISSOURI

APPROVAL ON PLANS, SPECIFICATIONS, AND AN ENGINEERING REPORT FOR CHLORINE DISINFECTION SYSTEMS

Moore Bend Water Utility, LLC
Taney County, Missouri

July 16, 2014

Review No. 5052088-14

INTRODUCTION

Plans and specifications for chlorine disinfection systems for Moore Bend Water Utility, LLC, Taney County, Missouri were submitted for review and approval by Rozell Engineering Company, Branson, Missouri.

BRIEF DESCRIPTION

In general these plans and specifications provide for chlorine disinfection systems to be installed at the two existing wells at Moore Bend Water Utility, LLC, Taney County, Missouri. The chemical feed pumps will be installed with 55 gallon graduated solution tanks that will allow the operator to measure the amount of solution being used. The chemical feed equipment for both systems will be located within the well houses which have adequate heating, ventilation, and lighting.

WELL NO. 1 CONTACT TIME

With a pH between 6-9 and a temperature greater than 5°C, the required CT to achieve 4-log inactivation of viruses is 8.0. Based on the lowest available volume of 480 gallons provided by the retention tanks, a peak flow rate of 22 gpm, a baffling factor of 0.7, and a chlorine concentration of at least 1.0 mg/L, the calculated CT is 15.3. 4-log inactivation of viruses is provided under these conditions.

WELL NO. 2 CONTACT TIME

With a pH between 6-9 and a temperature greater than 0.5°C, the required CT to achieve 4-log inactivation of viruses is 8.0. Based on the lowest available volume of 480 gallons provided by the retention tanks, a peak flow rate of 20 gpm, a baffling factor of 0.7, and a chlorine concentration of at least 1.0 mg/L, the calculated CT is 16.8. 4-log inactivation of viruses is provided under these conditions.

CONDITION

This approval is valid only if the following condition is incorporated in the final construction of the above-described work:

1. The plans and specifications shall be in accordance with Section 5.0.1 of the "Minimum Design Standards for Missouri Community Water Systems (effective December 10, 2013)." The well house must have eye washes and showers and the plans must show the operator safety equipment. Two copies of the revised plans must be submitted to this office for our records.

Lauren Graessle

Lauren Graessle, E.I.
Permits and Engineering Section
Public Drinking Water Branch

APPROVAL TO CONSTRUCT

The engineering plans and specifications described above were examined as to sanitary features of design which may affect the operation of the sanitary works, including size, capacities of the units, and factors which may affect the efficiency and ease of operation. Approval as regards these points is hereby given.

Approval is given with the understanding that final inspection and approval of the completed work shall be made by the Department of Natural Resources before same is accepted and placed in operation. If construction is not commenced two (2) years after the date of issue or there is a halt in construction of more than two years, the approval to construct will be void unless an extension of time has been granted by the department.

In the examination of plans and specifications, the Department of Natural Resources, Public Drinking Water Program does not examine the structural features of design or efficiency of mechanical equipment. This approval does not include approval of these features.

The Department of Natural Resources, Public Drinking Water Program reserves the right to withdraw the approval of plans and specifications at any time it is found that additional treatment or alterations are necessary to assure reasonable operating efficiency and to afford adequate protection to public health.