New Mexico Environment Department
Drinking Water Bureau

Certification of Virus Inactivation by Chlorination

The New Mexico Drinking Water Regulations allow a certified operator to install a hypochlorination system in a water system that is supplied by ground water that is not under the direct influence of surface water. The certified operator must be certified at the level required in the Utility Operator Certification Regulations, 20.7.4 NMAC. The certified operator is responsible for the project. The certified operator must certify the inactivation ratio achieved by the hypochlorination system, and document that calculation on a form that the Drinking Water Bureau provides. This is the form that should be used to comply with the provision of the New Mexico Drinking Water Regulations at 20.7.10.200.C(2) NMAC.

Inactivation of viruses using a chemical disinfectant is based on the "CT" concept, where "C" is the measured concentration of the chemical disinfectant residual and "T" is the contact time between the point of application of the disinfectant and the point where the disinfection residual is measured. The point where the residual is measured must be before or at the first customer or first connection providing water to the public. The contact time of the disinfectant in minutes (T) is determined by dividing the total volume (in gallons) of system components (pipe, storage tank) by the flow, in gallons per minute (gpm), of the system. Once C is measured and T is determined from the flow and size of the system components, the product C x T (CT) is compared to the EPA developed tables of CT values shown below that are required to achieve 2-log, 3-log or 4-log inactivation of viruses.

CT Values for Inactivation of Viruses by Free Chlorine, pH 6.0 – 9.0

Temperature																									
°C	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
°F*	33	35	37	39	41	42	44	46	48	50	51	53	55	57	59	60	62	64	66	68	69	71	73	75	77
*truncated conversions to ensure conservative values																									
Log Inactivation																									
2	5.8	5.3	4.9	4.4	4.0	3.8	3.6	3.4	3.2	3.0	2.8	2.6	2.4	2.2	2.0	1.8	1.6	1.4	1.2	1.0	1.0	1.0	1.0	1.0	1.0
3	8.7	8.0	7.3	6.7	6.0	5.6	5.2	4.8	4.4	4.0	3.8	3.6	3.4	3.2	3.0	2.8	2.6	2.4	2.2	2.0	1.8	1.6	1.4	1.2	1.0
4	11.6	10.7	9.8	8.9	8.0	7.6	7.2	6.8	6.4	6.0	5.6	5.2	4.8	4.4	4.0	3.8	3.6	3.4	3.2	3.0	2.8	2.6	2.4	2.2	2.0

From Table 4-4 in the GWR Implementation Guidance EPA 816-R-09-004 January 2009

If your system **does not provide** 4-log inactivation of viruses by chlorination and chooses to perform "triggered source water monitoring" you may complete and submit this application for each entry point on the system to New Mexico Environment Department Drinking Water Bureau (Department) to document your level of inactivation.

A. System Information			
System Name			
System Type	Community ☐ Non-Transient Non-Community ☐ Transient Non-Community ☐		
System Population	Less Than 3300 ☐ Greater Than 3300 ☐		
PWS Number			
System Owner			
System Representative			
System Address			
Email Address			
Phone Number		Fax Number	

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B. Flows (in Millions of Gallons a Day, MGD)	
Minimum Flow	
Monthly Average	
Peak Hourly Flow	
Maximum Flow Possible	

C. Contact Chamber Information

Submit drawings of the contact time chambers/storage tank. The drawings shall show any baffling associated with the chamber/storage tank including the configuration of the inlet and outlet. Include each pipe segment as a separate contact chamber.

Contact Chamber Name	Maximum Volume (Gallons)	Minimum Volume (Gallons)	Baffling Factor
1.			
2.			
3.			
4.			
5.			
6.			

D. Primary Disinfectant	

E. Disinfection Schematic

Submit drawings which show the location of injection points, residual sample points, and raw water taps. The drawings shall also indicate the location and size of contact chambers/storage tank and each pipe segment used to calculate log inactivation.

F. Chemical Feed Pumps

(Submit the specifications for chemical feed pump including dosing rates)

G. Contact Time Calculations

These calculations must provide enough detail to demonstrate to the Department that the system can achieve 4-log inactivation/filtration of viruses. If these calculations include contact chambers (other than pipe segments), storage tanks, disinfectant systems other than sodium hypochlorite, or filtration systems, the calculations must be performed by a State Certified Operator at a Level 3 or higher certification, or a Professional Engineer licensed in the State of New Mexico.

H. Chemical Dosing Rate Calculations

These calculations must specify the chemical pumping rate and concentration of the primary disinfectant.

I. Sampling (attach additional sheets as necessary)	
Proposed Sampling Location	
Proposed Sampling Method	
Proposed Minimum Residual	

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Project and System Information	
System Name	
PWSID	
Entry Point Name/Number	

I (name), _____ certify that the _____Public Water System achieves the level of virus inactivation using chlorine disinfection that is reflected in this submittal.

Please submit your completed Application that documents your level of virus inactivation to NMENV-DWBPlanReview <NMENV-DWBPlanReview@state.nm.us>. Please make submittals electronically. Please email a link to an FTP site with attachments posted as Adobe Acrobat files (pdf). For submittals smaller than 50 MB, an email message with attachments is acceptable.

Signature of System Representatives

Role	Date	Printed Name	Signature
[1]Owner			
[1]The owner is an individual, corporation, partnership, association, state or political subdivision thereof, municipality, or other legal entity.			
[2]Applicant/System Legal Representative			
[2]The system legal representative is the legally responsible agent and decision-making authority for a public water system (e.g. mayor, president of a board, public works director). The Designer or Consulting Engineer is not the legal representative.			

Signature of NMED Representative / Reviewer

Position	Date	Typed Name	Signature
Entry Point number:			
Department Approved Residual (mg/L):			
Department Approved Sampling Location:			