

WATER SYSTEM START-UP PROCEDURE (2019 revisions)

A water system that drains/depressurizes any part of their water distribution system or a storage tank must complete start-up activities and collect a safe 'preseason' bacteriological sample before opening to the public. These preseason activities are designed to help identify potential contamination problems so they can be addressed before water is available to your customers.

A completed copy of the start-up procedure and the safe 'preseason' bacteriological sample must be submitted to me by mail, email or fax to DENR-Drinking Water Program **before this facility opens to the public**. Questions and the completed startup form can be directed to Barb Friedeman, DENR, 523 E. Capitol Avenue, Pierre, SD. 57501, phone 605-773-4052, SDDrinkingWater@state.sd.us, Barbara.friedeman@state.sd.us, fax 605-773-5286. Please keep a copy for files.

Name of Water System and EPA ID#: _____

Address and Phone Number: _____

Date Opening to the Public This Year: _____

Date Closing to the Public This Year: _____

Print Name of Person Completing this Document: _____

Signature of Person Certifying this Document: _____

Date Form Signed/Submitted: _____

Review each item below. Identify and correct any issues and indicate when each accomplished.

Pumphouse (if present)

- | | | | |
|--|-----|----|----|
| ~Is the pumphouse locked? | Yes | No | NA |
| ~Are walls, windows, door, floor and roof intact to prevent entry of rodents, snakes, birds, etc. and is it clean (no leaves, pinecones, rodent droppings, etc)? | Yes | No | NA |
| ~Have gas, pesticides, paint and other chemicals been removed from the pumphouse? | Yes | No | NA |
| ~If present, has the water meter been read? Reading: _____ | Yes | No | NA |

Comments: _____

Well

- | | | | |
|--|-----|----|----|
| ~Are all openings in the wellcap, exposed casing and conduit plugged/closed/screened? | Yes | No | |
| ~Is the well cap intact and firmly affixed to top of well casing? | Yes | No | |
| ~Has the well been shock chlorinated? | Yes | No | |
| ~If wellhead terminates in an underground vault, has vault been cleaned out and dry? (We recommend that a wellhead not terminate in an underground vault). | Yes | No | NA |
| ~Is a functioning raw water tap present at wellhead? (If not, have one installed.) | Yes | No | NA |

Comments: _____

Continuous Chlorination (if present)

- | | | | |
|--|-----|----|----|
| ~Is the chlorine pump/feeder injecting the proper dosage of chlorine? | Yes | No | NA |
| ~Do you have a DPD type field test kit to measure chlorine residual? (Chlorinated water will turn pink if using a DPD type kit and will turn yellow if using an OT type kit. An OT type kit is not acceptable.) | Yes | No | NA |
| ~If you continuously chlorinate, can you measure at least 0.3 ppm free chlorine residual at all water access points at all times? (Measure free chlorine residual prior to collecting bacteria samples and a couple of times each week to confirm the chlorinator is functioning properly.) | Yes | No | NA |

Comments: _____

Treatment Other Than Chlorination (if present)

- | | | | |
|--|-----|----|----|
| ~Is device injecting at the proper rate or removing the target element properly? | Yes | No | NA |
|--|-----|----|----|

Comments: _____

Pressure Tanks (if present)

- | | | | |
|--|-----|----|----|
| ~Is an operating pressure gauge present? | Yes | No | NA |
| ~Has it been shock chlorinated? | Yes | No | NA |

Comments: _____

Storage Tank/Reservoir/Cistern (if present)

- | | | | |
|---|-----|----|----|
| ~Has the tank been cleaned and shock/super chlorinated? | Yes | No | NA |
| ~Is the access hatch secured and locked and does it exclude contaminants? | Yes | No | NA |
| ~Are vents/overflows/drains screened? (Screen these openings to exclude contaminants.) | Yes | No | NA |
| ~Is the structure intact? (Seal cracks and holes. Make necessary repairs.) | Yes | No | NA |
| ~Is the manhole riser elevated at least 24 inches above top of tank or above the covering material? | Yes | No | NA |

Comments: _____

Distribution System/Piping

- | | | | |
|---|-----|----|----|
| ~Have water pipes been shock chlorinated and flushed? | Yes | No | |
| ~Have water pipes been checked for leaks and repairs made? | Yes | No | |
| ~If you continuously chlorinate, can you measure at least 0.3 ppm free chlorine residual at all water access points? (Measure free chlorine residual prior to collecting bacteria samples and a couple of times each week to confirm the chlorinator is functioning properly.) | Yes | No | NA |

Comments: _____

Sampling

~Date and specimen/lab # of safe preseason bacteria sample: _____ (Collect in the distribution system, not directly from the well. Attach a copy of it to this startup procedure and submit all to DENR.)

~If the preseason bacteria sample was positive, have you collected recheck samples until a safe sample is obtained? Yes No NA

~Do you know where your approved, routine, repeat and GWR triggered sample sites are? Yes No
(If no, please call Barb Friedeman, 605-773-4052.)

~Do any changes/updates to the sample site plan need to be made? Yes No
(If yes, please call Barb Friedeman, 605-773-4052.)

Comments: _____

Important points to remember:

- 1. Collect monthly routine samples from the approved routine sample sites. Repeat and GWR triggered sites are used only if a routine sample is positive.**
2. Collect a bacteriological sample once per month, during the months you serve water to or are open to the public.
3. If you do not continuously chlorinate but instead periodically batch hand feed chlorine into your water system, you must wait at least one week between adding the chlorine and collection of any bacteriological samples. Samples must be collected under normal operating conditions and representative of water that is consumed.
4. Collect samples early in the month so if repeat/replacement sampling is necessary, those samples can be collected within the same month.
5. On the sample submitter form, write the specific location AND the site # where your bacteriological samples are collected each time you collect a sample. For example, site #2 and RV camp pad 36, or site #4 and lodge, or site #1 and showerhouse.
6. Contaminants can enter the water system in water pipes or storage reservoirs/cisterns during the shut-down period and become stagnant. Water in the well that has been sitting for months without being used can also be stagnant. To help you address this, below are shock chlorination guidelines for wells and storage reservoirs.

Recommended Procedure for Shock Chlorinating a Well

AMOUNT OF CHLORINE NECESSARY PER 10 FEET OF WATER IN WELL

Inside	5.25%			65% calcium		
--------	-------	--	--	-------------	--	--

diameter of well casing	sodium hypochlorite (bleach)			hypochlorite		
	100 ppm for 2 hrs	50 ppm for 8 hrs	25 ppm for 24 hrs	100 ppm for 2 hrs	50 ppm for 8 hrs	25 ppm for 24 hrs
1 1/4 inches	1/8 fl oz	--	--	--	--	--
2 inches	1/2 fl oz	1/4 fl oz	1/8 fl oz	--	--	--
3 inches	1 fl oz	1/2 fl oz	1/4 fl oz	--	--	--
4 inches	1 1/2 fl oz	3/4 fl oz	3/8 fl oz	--	--	--
6 inches	4 fl oz	2 fl oz	1 fl oz	1/4 oz	1/8 oz	1/16 oz
8 inches	7 fl oz	3 1/2 fl oz	1 3/4 fl oz	1/2 oz	1/4 oz	1/8 oz
10 inches	10 fl oz	5 fl oz	2 fl oz	3/4 oz	3/8 oz	3/16 oz
12 inches	2 cups	1 cup	1/2 cup	1 oz	1/2 oz	1/4 oz
18 inches	4 1/2 cups	2 1/4 cups	1 1/8 cups	2 1/2 oz	1 1/4 oz	5/7 oz
24 inches	7 1/2 cups	3 3/4 cups	1 7/8 cups	4 1/2 oz	2 1/4 oz	1 1/8 oz
36 inches	17 1/2 cups	8 3/4 cups	4 3/8 cups	10 oz	5 oz	2 1/2 oz

*ppm = parts per million

1 heaping tablespoon of 65% chlorine powder = 1/2 oz.

8 fluid ounces = 1 cup

1. Determine chlorine dosage for the desired contact time from the table above.
2. Prepare a chlorine solution, lift well pump, and pour the chlorine solution into the well.
3. Lower the pump and operate until a chlorine odor is noticed at all discharge points.
4. Leave the chlorine solution in the well for the recommended contact time. Do not use the water.
5. At the end of the contact time, pump the well to waste until the chlorine odor cannot be detected. DO NOT ALLOW THE WATER TO ENTER A RIVER, LAKE OR STREAM.
6. Pump the well for a considerable period of time until the chlorine is all gone before collecting bacteriological water samples.
7. Do not use scented bleach or chlorine tablets that contain a chlorinated isocyanurate a.k.a. "stabilized chlorine" (check the label).

Recommended Procedure for Shock Chlorinating a Reservoir or Cistern

AMOUNT OF CHLORINE NECESSARY FOR DOSAGE AND TIME COMBINATIONS

Volume of Box, Basin,	5.25% sodium hypochlorite			65% calcium hypochlorite		

Reservoir or cistern	(bleach)			100 ppm for 2 hrs	50 ppm for 8 hrs	25 ppm for 24 hrs
	100 ppm for 2 hrs	50 ppm for 8 hrs	25 ppm for 24 hrs			
50 gal	1 1/2 cups	3/4 cup	3/8 cup	--	--	--
100 gal	3 cups	1 1/2 cups	3/4 cup	--	--	--
200 gal	6 cups	3 cups	1 1/2 cups	--	--	--
500 gal	1 gal	7 1/2 cups	3 3/4 cups	9 1/2 oz	--	--
1,000 gal	2 gal	1 gal	7 1/2 cups	1 lb 3 oz	9 1/2 oz	--
2,000 gal	4 gal	2 gal	1 gal	2 lb 6 oz	1 lb 3 oz	9 1/2 oz
5,000 gal	--	5 gal	2 1/2 gal	6 lb	3 lb	1 lb 8 oz
10,000 gal	--	--	5 gal	12 lb	6 lb	3 lb
20,000 gal	--	--	--	24 lb	12 lb	6 lb
50,000 gal	--	--	--	60 lb	30 lb	15 lb
100,000 gal	--	--	--	120 lb	60 lb	30 lb

*ppm = parts per million

1. The unit to be disinfected should be full of water.
2. Determine recommended chlorine disinfection dosage for the desired contact time from the table above.
3. Completely mix the chlorine dosage throughout the unit to be disinfected.
4. Leave the chlorine solution in the unit for the recommended contact time.
5. Do not use the heavily chlorinated water.
6. At the end of the contact time, remove the water from the unit and discharge to waste. DO NOT ALLOW THE WATER TO ENTER A RIVER, LAKE OR STREAM.
7. Fill the unit with clean water and collect a water sample for bacteriological testing after all the chlorine is gone.
8. Do not use scented bleach or chlorine tablets that contain a chlorinated isocyanurate a.k.a. "stabilized chlorine" (check the label).