MHOG Approved Procedure for Disinfecting Water Main

This Standard Operating Procedure (SOP) is based on the requirements of AWWA Standard C651-14, Disinfecting Water Mains, and describes the essential procedures necessary to ensure sanitary conditions are achieved and documented prior to connection of newly installed main to the existing MHOG Potable Water System.

Pre Chlorination Flushing Procedure:

Prior to disinfection, the main shall be pigged and flushed to remove particulate material from the main that can contain bacteria. Following pigging of the main, the main shall be filled with potable water to eliminate air pockets and remove small size particulate matter remaining after pigging. The flushing velocity in the main shall not be less than 3.0 ft/sec unless site conditions do not allow for discharge to waste at that velocity. The table below shows the required flow and inlet and outlet opening sizes to flush pipelines at 3 ft/sec.

Pipe Diameter	Flow Required to Produce 3 ft / sec	Size of Tap Used (in)			Number of Hydrant Outlets	
		1 in	1.5 in	2 in		
(in)	(gpm)	Number & Size of Taps Required on Pipe			2.5 in	4.5 in
4	120	1	-	-	1	1
6	260	-	1	-	1	1
8	470			1	1	1
10	730	MHOG can supply up to a 2-inch hydrant meter. For higher flows, work with the MHOG Utility Dept. to achieve necessary velocity			1	1
12	1,060				2	1
16	1,880				2	1

Please note that during flushing, each hydrant should be opened to fully remove any air pockets from the main starting with the hydrant nearest the tap or connection point first. Potable water can be obtain only by using a temporary hydrant backflow preventer and meter obtained from the MHOG Utility Department or by other means arranged with the MHOG utility Department. Following flushing, the water should run clear and not milky, which indicates the presence of entrained air in the main.

Chlorination Procedure

Only following pigging and flushing of the main, and prior to service lead installation, can chlorination occur. Note that sodium and calcium hypochlorite used for disinfection must conform to ANSI/AWWA B300. Do not use calcium hypochlorite intended for swimming pool disinfection as this material has been sequestered and is extremely difficult to eliminate from the pipe after the desired contact time has been achieved.

For main up to 16-inches in diameter, the continuous feed method of chlorination is required. The slug method may be utilized for mains 20-inches in diameter or larger. At the pointe of beginning of the new main, inject chlorine into the water at a constant rate such that the water will not have less than 25 mg/L of free chlorine. The free chlorine concentration shall be measured at regular time intervals using a chlorine test kit. To determine the amount of chlorine to place into the water main utilize the following formula:

$$Chlorine, lbs = (\text{Volume of Water, gal})(25\ \text{mg/L})(8.34\ \text{lbs/gal})$$

Chlorine application shall not cease until the entire main is filled with chlorinated water. The chlorinated water shall be retained in the main for at least a 24 hour period, during which time valves and hydrants in the treated section are operated to ensure disinfection of those appurtenances as well.

At the end of the 24 hour period, the treated water shall have a residual of not less than 10mg/L.

After the applicable chlorination period of 24 hours, heavily chlorinated water shall not remain in prolonged contact with the pipe. To prevent damage to the pipe, the heavily chlorinated water shall be flushed from the main, fittings, valves, and hydrants until chlorine concentration in the water leaving the main is no longer higher than that generally in the distribution system or below 2ppm (mg/L). Resident Professional Engineer shall be present for all flushing's.

The environment to which the highly chlorinated water is being discharged shall be inspected. If there is any possibility that the chlorinated discharge will cause damage to the environment, a neutralizing chemical and dechlorinating device shall be used. If a dechlorinating device is used, then the velocity of flushing shall not exceed the rated capacity of the device.

Note that if MHOG staff is on-site to take samples, and the chlorine residual is higher than 2ppm mg/L), the contractor will be responsible to re-flush the water main until the residual is at the acceptable level. The contractor will also be required to pay a re-trip fee of $25.00 which must be paid before re-scheduling the sampling.

1. A second sample will be collected 24 hours after the first sample and 48 hours after flushing of the highly chlorinated water. Additional information regarding sampling is presented below.

Other Sampling Notes:

1. MHOG does not obtain samples on the weekend. The contractor must schedule the first sample no later than Wednesday of any given week.
2. MHOG requires a minimum of 24 hour notice to schedule sampling.
3. MHOG will obtain two samples from the same location, 24 hours apart.
4. If the construction job has more than one tap, MHOG will sample all the taps during a single sampling event.
5. MHOG requires one sample site per every 1,500 linear feet of pipe, unless otherwise approved by MHOG.
6. Hydrants can be used as sample points and MHOG will supply the sample tap to attach to the hydrant.

MHOG will notify the site resident project representative when the samples have either passed or failed. If a sample fails, the disinfection procedure outlined above must be performed again.

Scheduling:

To schedule meter and backflow rental or bacteriological sampling; please call the MHOG Utility Department at 810.224.5835.