**CATION EXCHANGE SOFTENING CHECKLIST**

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| Project Name: |       |
| Reviewed By: |       | Date: |       |

Describe cation exchange softening system, including controls:

Describe feed water quality

Hardness (mg/L):

Iron (mg/L):

Manganese (mg/L):

pH (SU):

Turbidity (NTU):

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| **General (12 VAC 5-590-900)**  |
| The softening design selected shall be based upon the mineral qualities of the source water and the desired finished water quality in conjunction with requirements for disposal of sludge or brine water, cost of the plant, cost of the chemicals, and the plant location. | Yes [ ]  No [ ]  |
| Iron, manganese, or a combination of the two, in the oxidized state or unoxidized state, does not exceed 0.3 mg/L in the water applied to the cation exchange material? | Yes [ ]  No [ ]   |
| The units are of pressure or gravity type of either an upflow or downflow design, using automatic or manual regeneration. | Yes [ ]  No [ ]  |
| The design capacity for hardness removal does not exceed 20,000 grains/ft3 when the resin is regenerated with 0.3 pounds of salt per kilograin of hardness removed? | Yes [ ]  No [ ]  |
| The depth of the cation exchange material is not less than three feet. | Yes [ ]  No [ ]  |
| The hydraulic loading rate does not exceed seven gpm/ft2 and the backwash rate is six to eight gpm/ft2 (design guideline)?  | Yes [ ]  No [ ]  |
| The required freeboard specified based upon the specific gravity of the media and the direction of the water flow (provide documentation)? | Yes [ ]  No [ ]  |
| The bottoms, strainer systems, and support for the cation exchange material conforms to criteria provided for rapid rate gravity filters? See also 12VAC5-590-874. | Yes [ ]  No [ ]  |
| Facilities are included for even distribution of brine over the entire surface of both upflow and downflow units? Backwash, rinse, and air relief discharge pipes are installed in a manner as to prevent any possibility of backsiphonage? | Yes [ ]  No [ ]   |
| A bypass is provided around the cation exchange units to produce a blended water of desirable hardness. Meters are installed to measure total water delivered to the distribution system and on each softener unit. An automatic proportioning or regulating device and shutoff valve should be provided on the bypass line. In some installations, it may be necessary to treat the bypassed water to obtain acceptable levels of iron and manganese in the finished water. | Yes [ ]  No [ ]   |
| Feed water to cation exchange softener has turbidity less than five NTUs?Silica gel materials are used for water having a pH above 8.4 and are not used when iron is present (design guideline)? When the applied water contains a chlorine residual, the cation exchange material is a type that is not damaged by the chlorine residual. Phenolic resin is not used. | Yes [ ]  No [ ]  Yes [ ]  No [ ]  Yes [ ]  No [ ]  Yes [ ]  No [ ]   |
| Sampling taps are provided for the collection of representative samples for both bacteriological and chemical analyses? The taps are located to provide for sampling of the softener influent, softener effluent, and the blended water? The sampling taps for the blended water are at least 20 feet downstream from the point of blending? | Yes [ ]  No [ ]  Yes [ ]  No [ ]  Yes [ ]  No [ ]   |
| Brine measuring or salt-dissolving tanks and wet salt storage facilities are covered? The makeup water inlet has a free fall discharge of two pipe diameters but not less than two inches above the maximum liquid level of the unit or be protected from backsiphonage? Water for filling the tank is distributed over the entire surface by pipes above the maximum brine level in the tank (design guideline)?. The salt issupported on graduated layers of gravel under which is a suitable means of collecting the brine?. Wet salt storage basins are equipped with manhole or hatchway openings having raised curbs and watertight covers with overhanging edges similar to those required for finished water reservoirs? Overflows, where provided, are turned down, have a proper free fall discharge and are protected with noncorrodible screens or self-closing flap valves? | Yes [ ]  No [ ]  Yes [ ]  No [ ]  Yes [ ]  No [ ]  Yes [ ]  No [ ]  Yes [ ]  No [ ]   |
| Wet salt storage basins has sufficient capacity to store at least a 30-day operating supply? | Yes [ ]  No [ ]   |
| Stabilization of the finished water for corrosion control was considered? | Yes [ ]  No [ ]   |
| Suitable disposal is provided for the brine waste?Describe: | Yes [ ]  No [ ]   |
| Pipes and contact materials are resistant to the aggressiveness of the salt? | Yes [ ]  No [ ]   |