**Section 604.1140 Ammonia**

a) Ammonia for chloramine formation may be added to water either as a water solution of ammonium sulfate, or as aqua ammonia (ammonia gas in water solution), or as anhydrous ammonia (purified 100% ammonia in liquid or gaseous form). Special provisions required for each form of ammonia are listed in subsections (b) through (d).

b) Ammonium Sulfate

1. The water solution made by addition of ammonium sulfate solid to water must include agitation.
2. The tank and dosing equipment contact surfaces must be made of corrosion resistant non-metallic materials.

3) The submerged portion of the mixer shaft and propeller must be made of 304 or 316 stainless steel that is resistant to corrosion by ammonium sulfate solution.

c) Aqua Ammonia (ammonium hydroxide)

1) Aqua ammonia feed pumps and storage must be enclosed and separated from other operating areas.

2) The aqua ammonia room must be equipped as required in Section 604.1115, with the following changes:

A) A corrosion resistant, closed, unpressurized tank must be used for bulk storage, vented through an inert liquid trap to a high point outside.

B) The bulk liquid storage tank must be protected from excessive heat to prevent ammonia vaporization.

C) An exhaust fan must be installed to withdraw air from high points in the room and make-up air must be allowed to enter at a low point.

D) The aqua ammonia feed pump, regulators, and lines must be fitted with pressure relief vents discharging outside the building away from any air intake and with water purge lines leading back to the headspace of the bulk storage tank.

E) The aqua ammonia must be conveyed directly from storage to the treated water stream injector without the use of a carrier water stream unless the carrier stream is softened.

d) Anhydrous Ammonia

1) Anhydrous ammonia and storage feed systems (including heaters where provided) must be enclosed and separated from other work areas and constructed of corrosion resistant materials.

2) Any pressurized ammonia feed lines outside the ammonia room must be installed in air tight conduit.

3) An exhaust fan must be installed to withdraw air from high points in the room and make-up air must be allowed to enter at a low point.

4) Leak detection systems must be installed, operated and maintained in each area through which ammonia is piped.

5) Special vacuum breaker/regulator provisions must be installed to preventbackflow of water into cylinders or storage tanks.

6) Carrier water systems, where provided to convey anhydrous ammonia to the injection point, must use softened water.

7) Provisions must be made to chemically neutralize anhydrous ammonia, in the event of any anhydrous ammonia release.