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PLANT OVERVIEW

The City of Nevada gets its water from an alluvial aquifer near Interstate 35. The water is pumped about eight miles before reaching the treatment plant. Once the water reaches the treatment plant it flows through a forced draft aeration unit, where iron in the water is oxidized. The water then flows into the bottom of Claricones, these large cone shaped units act as a softener. Lime is also introduced at the bottom of the cones in a slurry form to remove the minerals that cause calcium hardness from the raw water. The entrance velocity of the raw water promotes mixing within the vessel's lower cylinder. The slower rotation in the middle section provides good particle contact and flocculation. There is very little turbulence in the top section of the Claricone, which makes for good settling of the particles and produces clarified water. The Claricones operate on what is called a sludge blanket principal; the water passes upward through a blanket of flocculated material called a sludge blanket, which entraps slowly settling particles that would otherwise pass through into the filters. This blanket is suspended below the water level at about 4-8 feet. Since the sludge is always accumulating from the iron and lime in the water, the sludge blow down system is designed so that it opens a valve to the Claricones. Sludge is drawn off the top of the blanket through the sludge concentrator; this is the cone shaped device in the center of the Claricone that is below the water level, this device can be raised and lower to determine the right height for the sludge blanket. The clarified water off the top of the Claricones goes to the re-carbonation tank. The water entering the re-carbonation tank has a high pH and a high concentration of calcium carbonate. Carbon dioxide gas is added to the tank to form soluble calcium bicarbonate and to reduce the pH to 8.8 or to a level at which the water is stabilized to prevent scale formation or corrosion of water mains or home piping. The water is then gravity fed into the filters. There are four dual media filters used to remove what little particulate was not removed in the claricones. Water leaving the filters goes into a water pipe where chlorine, fluoride, and polyphosphates are added. Chlorine is required by IDNR for disinfection purposes and we must maintain chlorine residual throughout the distribution system. Fluoride is added for dental protection for small children. The polyphosphates are added to aid in corrosion control and red water problems. After the water has been treated it enters the ground storage tank where the chlorine has time to disinfect the water. The water travels from the ground storage tank into the clear well. The treated water is then pumped into the distribution system and two elevated storage towers through one of two high service pumps. Once the water is in the elevated tanks the water is fed into your home by the head pressure created by the water being in the towers.