**Section 604.215 Surface Water Structures**

a) Design of intake structures must provide for:

1) withdrawal of water from more than one level if quality varies with depth;

2) separate facilities for release of less desirable water held in storage;

3) where frazil ice may be a problem, holding the velocity of flow into the intake structure to a minimum, generally not to exceed 0.5 feet per second;

4) inspection manholes every 1000 feet for pipe sizes large enough to permit visual inspection;

5) cleaning of the inlet line;

6) protection against rupture by dragging anchors, ice and other factors;

7) ports located above the bottom of the stream, lake or impoundment, but at sufficient depth to be kept submerged at low water levels;

8) where shore wells are not provided, a diversion device capable of keeping large quantities of fish or debris from entering an intake structure; and

9) when buried surface water collectors are used, sufficient intake opening area must be provided to minimize inlet head loss. Particular attention should be given to the selection of backfill material in relation to the collector pipe slot size and gradation of the native material over the collector system.

b) Raw water pumping station must:

1) be protected from flooding and, when feasible, located above grade;

2) be accessible;

3) be designed against flotation;

4) be equipped with a screen before the pump suction well;

5) provide for introduction of chlorine or other chemicals in the raw water transmission line if necessary for quality control;

6) have intake valves and provisions for backflushing or cleaning by a mechanical device and testing for leaks, where practical;

7) have provisions for withstanding surges when necessary; and

8) be constructed to prevent intrusion of contaminants.

c) Side Channel Raw Water Storage Reservoir

1) A side channel water storage reservoir is a facility into which water is pumped during periods of good quality and high stream flow for future release to treatment facilities.

2) Side channel raw water storage reservoirs must be constructed to assure that:

A) water quality is protected by controlling runoff into the reservoir;

B) dikes are structurally sound and protected against wave action and erosion;

C) intake structures and devices meet requirements of subsection (a);

D) point of influent flow is separated from the point of withdrawal;

E) separate pipes are provided for influent to and effluent from the reservoir; and

F) a bypass line is provided around the reservoir to allow direct pumping to the treatment facilities.