

Dickson Lake Water System Upgrades



Dickson Lake provides approximately 60% of the total drinking water to the City of Abbotsford and the District of Mission (up to 90 MLD). A floating pump station together with floating HDPE piping (3 x 450 mm, 340 m) was constructed in 1995 to draw additional water from Dickson Lake when the lake level drops below the elevation of the inlet channel. Several operational challenges triggered the recent upgrade: increasing summer demands require more volume to be released from the lake; the three HDPE 450 mm diameter pipes escape from their anchors and are then free to float and become vulnerable to shifting ice.

DESIGN SOLUTIONS:

- Anchored pipe connections at the floating pump station and modified concrete discharge box.
- 3 x 450 mm ϕ pipes were replaced with 3 x 600 mm ϕ pipes and a single 900 mm ϕ pipe within the channel to improve hydraulic efficiency and allow additional drawdown from the lake.
- The piping within the channel was secured every 4.5 meters with rock anchors and concrete pipe saddles which resist buoyancy forces and support the pipe in the dry, but also allow free longitudinal movement to account for thermal expansion and contraction.

PROJECT CHALLENGES:

- Complex design of HDPE pipe intake from floating pump station to discharge chamber.
- Pipe exposed to large temperature fluctuations and movement from seasonal variance in water levels.
- Project completion during short seasonal time window while keeping the water supply active during the entire construction period.
- Construction within environmentally sensitive waterway and drinking water source.
- Extreme conditions and unforeseen variables required immediate response between project team members and solutions during construction.

