Deep Bay Waterworks District

DBWD has been constructed in phases over a period of more than 4 decades. The original lines were built before the Improvement District was established in 1972. Approximately 80% of the system was constructed using Asbestos Cement (AC) pipe and the remainder is Polyvinyl Chloride (PVC) pipe. Since 1972 the customer base has grown at an historical rate of 3% per year to approximately 585 water connections. It is designated as a Level 1 Water Distribution facility and is managed as such by a certified Level 1 operator (contractor). Prior to the installation of residential meters in 2004/2005, water usage in the peak summer month of July was as high as 889 gallons per connection per day. I say “usage” as opposed to “consumption” because summer usage increases primarily because of outdoor activities such as tending lawns, gardening, decorative garden ponds, and the like. By 2006, with metering completed, that same high water usage for the month of July was down to 380 gallons per connection per day – a drop of more than 50%. This was due to a variety of factors including leak detection and weather conditions but most of all, customer awareness. One of the simplest ways to save water is to “pay attention to how much water you use”. The Improvement District’s toll structure is now based on a metered rate with revenue collected quarterly to fund operating costs, administration and maintenance that benefit current users. As well the Improvement District charges a Parcel Tax which collected funds for capital upgrades to the current system and a Fire Protection Tax which covers the operation of the Fire Department. Both Parcel and Fire Protection Taxes are on a flat rate as opposed to property assessments.

The service area extends from Henry Morgan Road in the east bordered by the Strait on the north, through Deep Bay area and including the large undeveloped portions of DL 86 in the west – approximately five square kilometers. Water supply is provided by 7 deep wells that are located north and south of Island Highway 19A - 2 west of Gainsburg Road and 5 east of Gainsburg Road. Water from these wells is pumped directly into the distribution system and is not treated. As instructed by the Vancouver Island Health Authority, the Improvement District submits water samples from the system for bacteriological indicators from 2 locations twice per month. Samples are also tested for chemical and physical parameters yearly with the next testing to be done this month. Test results have not raised concern and our water is pristine. Water storage is provided by an above ground concrete reservoir located on the hillside south of Island Highway 19A. Built in 1975, this structure provides 545 cubic meters (120,000 Imperial Gallons) of storage and is sufficient for our current needs.

Quality and Quantity – need for a study

In 2006, DBWD received an RDN study grant which enabled them to hire Pacific Hydrology Consultants Ltd. to do a study of the groundwater system which supplies our drinking water. Using data from two Provincial Observation Wells along with data collected monthly by our contractor, they interpreted and analyzed the geology of the aquifer system, its hydrology and how the Improvement District’s production wells relate to it. The analysis of these data and records of use, show that the shallow aquifer at Deep
Bay acts as a conduit for continuous groundwater flow from the recharge area to the discharge area and the sea. The well capacities depend on the available drawdown of each well but because the variation in the available drawdown is relatively small, the seasonal changes in well capacities are also quite small. Total capacity of the Improvement District wells can maintain flow through periods of drought. The pumping rates for the 7 operating wells, calculated from the data sheets were compared to the pumping capacities determined at the times of the wells constructions. They indicate that the capacities of the individual wells are about the same as they were at the time of installation. The total well capacity of the Improvement District wells is about 650 igpm.

The Hydrology Report concluded that:
1. The aquifer at Deep Bay is capable of supplying the current demands of DBWD with capacity to spare and it can do this in times of fairly severe drought.
2. The quality of the groundwater at Deep Bay is excellent.
3. The system is being managed very well.

Since Bowser Waterworks obtains water from the same aquifer as Deep Bay Waterworks District, Pacific Hydrology Consultants Ltd. recommended that DBWD establish an observation well close to Bowser. This is at the discussion stage within the Board of Trustees at present. This test well would be constructed such that it could become a production well in the future to provide redundancy in our system. The Pacific Hydrology Report, along with the Drought Management Plan and the McElhanney Engineering Reports are all available as resource material at the Bowser Public Library.

**Drought Management Plan**

The Drought Management Plan was financed by a grant from Land and Water BC through the RDN to help local government with drought planning. A local team of residents, consisting of Bon Thorburn, a Civil Engineer and manager of Thorconsult Ltd., James Hooper a Physical Geographer, Richard Wahlgren owner/manager of Streamside Native Plants and Dianne Eddy, at the time a DBWD Trustee, produced the Drought Management Plan. The Plan outlines what steps need to be taken in the event of a drought as determined by our well logs with the goal being to reduce water shortage impacts. There are 5 Stages which can be imposed – from an Advisory (Stage 1) through to Emergency (Stage 5).

**Infrastructure needs – present and future**

In 2007, DBWD employed the engineering firm of McElhanney Consulting Services Ltd. to do a detailed Water System Evaluation.
1. We asked them to assess the existing system to identify a list of Capital Works that are required to upgrade the system to meet current customer needs and satisfy fire flows. This assessment identified a number of projects needed to improve the system at a (2008) cost of just over $1.5 million dollars. Funds for these projects
are being collected in a Renewal Reserve Fund over the next 11 years to finance these capital upgrades.

2. As well, they were to determine the Capital Works projects that will be triggered and financed by new development based on land now available within the Improvement District. The Capital Works that would serve future development were also identified at a (2008) cost of $3.4 million dollars. These projects are development driven and must be paid for entirely by the developers of land within the Improvement District.

**Development Costs and Implications**

Prior to the development of land, a developer must satisfy many conditions set out by Ministry of Highways, Regional District of Nanaimo and the Improvement District. The ID Board of Trustees is asked the question “Can you supply water for this development?” Our answer to the developer would depend on the information gleaned from the latest hydrology and engineering reports with consideration being given as to the number and type of residences in the proposed development. The McElhanney Engineering report recommended Capital Expenditure Charges (CEC’s) to be set at $6,500 per unit and is specified as such in Improvement District Bylaw # 201. These CEC’s are paid to the improvement district by the developer of land prior to construction along with subdivision application fees and appropriate paperwork completed. It is the Improvement District’s position that any development costs such as an additional well or the necessity to build additional storage must be borne by the developer. As mentioned earlier, new development must not impart costs on current users, but rather on future users of the system.

The McElhanney report estimates that approximately 30% of future growth will occur east of Gainsburg Road while 70% will occur west of Gainsburg Road which is largely undeveloped. Capital Expenditure Charges are based on the cost of infrastructure that would be necessary to support new development. Any applications for service are subject to the appropriate Improvement District bylaws and the charges stated therein.

**Fire Protection**

The Deep Bay Volunteer Fire Department is administered by DBWD and is provided for by a fire protection tax payable yearly by the ratepayers (currently 637 properties). Equipment is upgraded as required through a 12 year financial plan. Any development application to DBWD must also be approved by our Fire Chief to ensure that we can provide fire protection. It is critical for any development plan to be within the means of the Improvement District to provide fire protection. For example, a plan which would require buildings taller than the 2 storeys or single storey construction common to this area would not be feasible with the current fire protection equipment of the DBVFD. In order for such a development plan to proceed, compensation would be in order from the developer to cover the upgrading to a ladder truck or any other specific firefighting equipment. It is vital that the fire protection we are asked to ensure, is within our means to provide.
Concerns

DBWD is committed to providing ongoing quality and quantity of water to its ratepayers. We know that our water flows through an unconfined aquifer and thus is susceptible to contamination if stringent controls are not in place. Most of this unconfined aquifer is outside of the Improvement District’s boundaries – much of it is Crown land and some Forestry land. It is vital to protect this most valuable water resource by putting best land uses in place. The planning that this group is involved in is essential in maintaining that control. I appreciate being invited to give you some insight into the operations and maintenance of the Deep Bay Waterworks system and welcome any of you to our monthly Board of Trustees meetings which occur on the 3rd Wednesday of each month at 7 p.m. at the Fire Hall.