

DEEP BAY IMPROVEMENT DISTRICT

ANNUAL WATER SYSTEM REPORT 2019

1 Introduction

This annual report describes the Deep Bay Improvement District (DBID) water system and summarizes the water quality and production data from January 1, 2019 - December 31, 2019. This report also includes a summary of: inquiries and complaints; completed and proposed maintenance activities; and the Emergency Response Plan.

The DBID operates under a permit issued by Island Health (Vancouver Island Health Authority).

2 Deep Bay Improvement District

The Deep Bay Improvement District was incorporated in 1972 (originally as the Deep Bay Waterworks District). The water source comes from 7 groundwater wells. Water supply is stored in an above ground concrete reservoir and is not treated. The DBID supplies water to 611 metered services.

District contacts are: Leslie Carter, Administrator 250-757-9312
 Don Buchner, Operator 250-951-8757
 (EOCP Operator #6464)

2.1 Groundwater Wells

Water supply for the DBID system is provided by seven wells that are located north and south of the Island Highway for a distance of 700 meters on either side of Gainsberg Road. Water from these wells is pumped directly into the distribution system.

Currently Wells 4, 5, 6 & 8 are used for production supply. Wells 1, 2 & 3 are on standby for emergency use only.

DBID Well Data:

Well Name	Completion Depth	Capacity	Treated/ Untreated	Year Drilled
#1	15.9 m (52 ft)	4.8 l/s (65 IGPM)	Untreated	1973
#2	11.6 m (38 ft)	3.0 l/s (40 IGPM)	Untreated	1973
#3	16.4 m (53.7 ft)	5.7 l/s (75 IGPM)	Untreated	1969
#4	19.3 m (63.5 ft)	5.3 l/s (70 IGPM)	Untreated	1977
#5	21.5 m (70.5 ft)	10.0 l/s (130 IGPM)	Untreated	1985
#6	23.2 m (76 ft)	9.0 l/s (120 IGPM)	Untreated	1990
#7	26.1 m (85.6 ft)	Not in production	Untreated	1996
#8	23 m (75.4 ft)	11.0 l/s (145 IGPM)	Untreated	1997

2.2 Reservoirs

Water storage for the DBID system is provided by an above ground concrete reservoir located on the hillside south of the Island Highway. This structure was built in 1975 and provides 545 cubic meters (120,000 Imperial Gallons) of storage. This reservoir is divided in half by a vertical wall and both sides can operate independently.

2.3 Distribution System

The DBID water distribution system serves an area of approximately 5 square kilometers. The system has been constructed over a period of more than 40 years. The original lines were built before the 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. The system has 58 fire hydrants.

3 Water Sampling and Testing Program

Bacteriological monitoring is carried out weekly throughout the distribution system. There are 4 sample sites, as identified by Island Health. Two samples are taken each week, alternating between sample sites. Samples are delivered to the Parksville Health Unit where they are sent on for testing. A total of 109 samples were taken in 2019.

Positive Results:

Date	Total coliform	E. Coli	Reason	Corrective Action
Mar 11/19	1	L1	Unknown	Retested, results L1
Apr 23/19	1	L1	Unknown	Retested, results L1
Jun 24/19	1	L1	Unknown	Retested, results L1
Jul 2/19	1	L1	Unknown	Retested, results L1
Aug 26/19	3	L1	Unknown	Retested, results L1
Sep 3/19	1	L1	Unknown	Retested, results L1
Nov 25/19	1	L1	Unknown	Retested, results L1

Adverse Results:

Date	Total coliform	E. Coli	Reason	Corrective Action
Sep 16/19	2	L1	Possible contamination from back flow event	Shock Chlorination of distribution system performed
Sep 16/19	12	L1		

In September, a shock chlorination was performed as a precaution after consultation with the Vancouver Island Health Authority due to background coliform counts in both of our regular water tests taken on September 16, 2019. DBID continues to investigate possible causes for these sporadic coliform counts.

Full test results from bacteriological monitoring are included with this report and are available for viewing at: <http://www.healthspace.ca/viha>

In November 2019, DBID undertook additional chemical analysis on all production and standby wells. These samples were sent to AGAT Laboratories for testing. All of the

samples were within the chemical parameters listed in *The Guidelines for Canadian Drinking Water Quality*.

The full results of the chemical analysis are available for viewing at the DBID office and are posted on the website at www.dbid.ca under "Water Quality Reports".

4 Water Quality Inquiries and Complaints

There was one complaint concerning a peculiar odour detected. The residence was visited and no odour was detected from outside taps. The water main was flushed out as a precaution and the owner was followed up with.

Some inquiries and concerns were raised during the required shock chlorination event relating to test results (coliform levels) and detectable chlorine taste and odour. The office addressed these inquiries, explaining the shock chlorination procedure including the required residual chlorine amounts that need to be detectable throughout the distribution system. Ratepayers were also provided with links to Health Link BC drinking water chlorination facts and *Guideline for Canadian Drinking Water Quality*.

5 Groundwater Production and Consumption

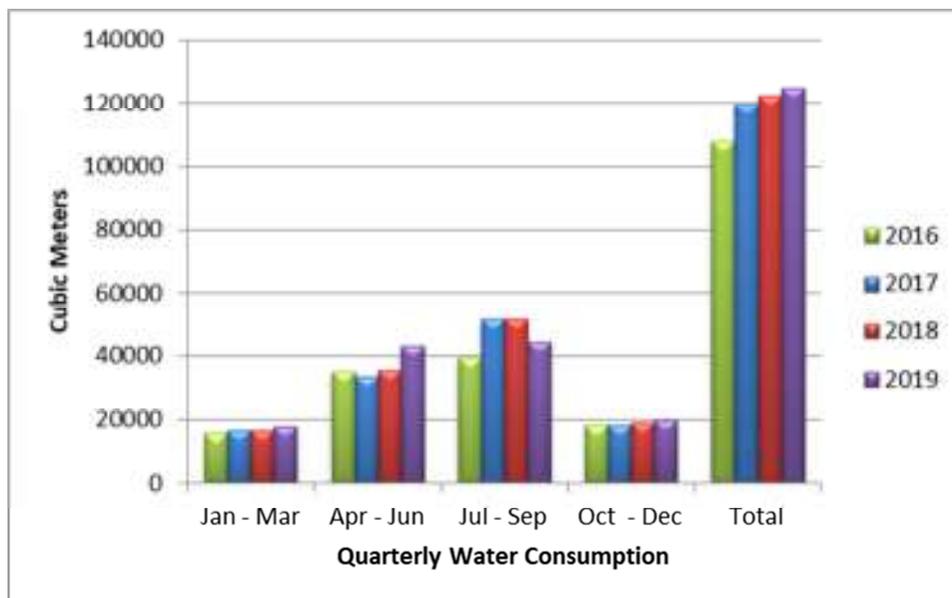
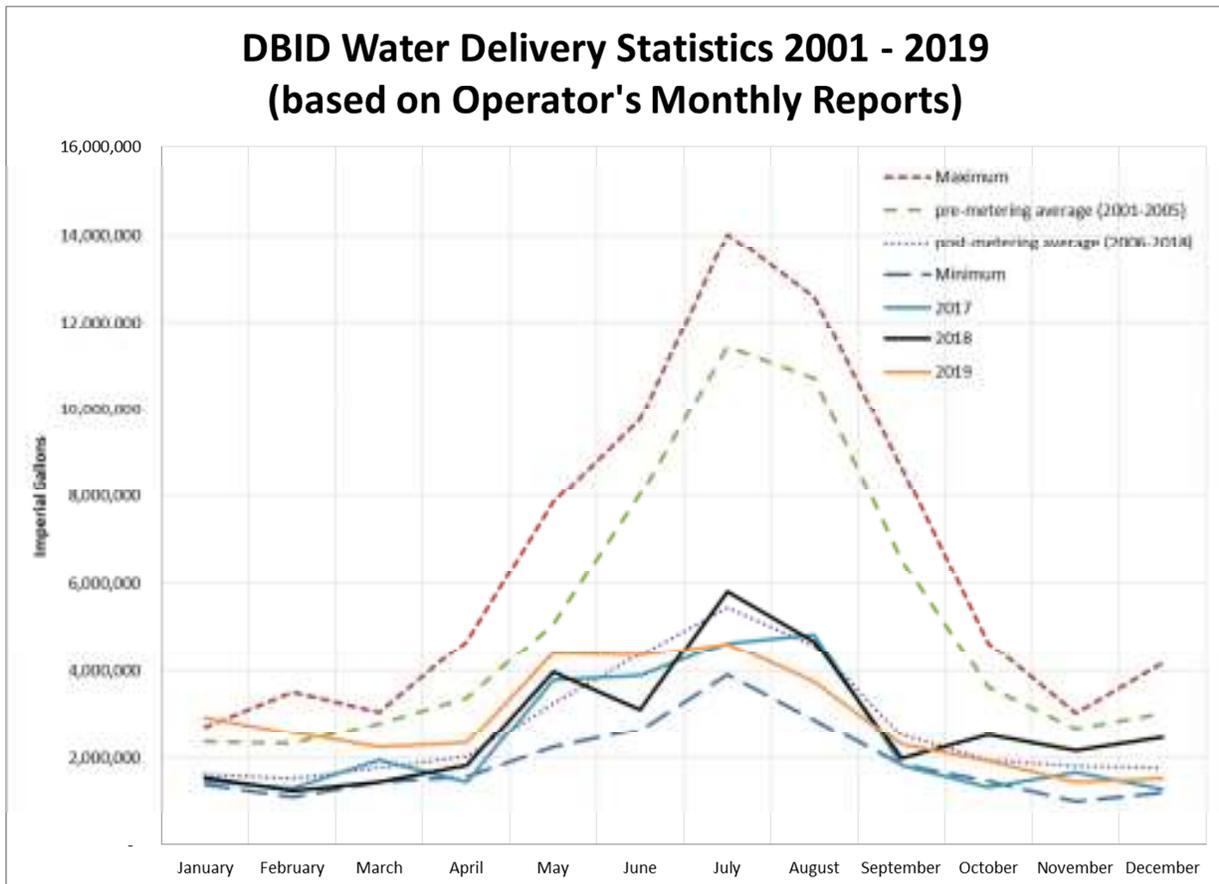
The following graph shows the monthly water delivery figures (a measure of water pumped from the DBID wells) and quarterly water consumption numbers.

DBID Water Delivery Statistics (first graph on next page) show the water pumped from the wells each month. This does not correlate directly to water consumption measured at the meters as it also includes all distribution system flushing, hydrant use and water used during routine repairs and maintenance.

Water production was higher in 2019 than 2018 due to a number of reasons. Early in 2019, a major leak was suspected based on high pumping numbers. The leak was found (a break on a 6" main) and repaired in March. In September, DBID performed a shock chlorination. Procedures for this involve partially emptying and refilling the reservoir and pulling water throughout the distribution system through systematic flushing of hydrants. Additionally water consumption, as recorded by the quarterly meter reads, has also been increasing.

Quarterly Water Consumption (second graph on next page) reflects usage measured by the quarterly meter reads and shows a slow but steady increase in consumption over the last few years.

DBID conducts a **water audit** after each quarterly meter reading to compare the amount of water pumped, as measured at the wells, vs. the amount of water delivered through the water meters. The difference for 2019 was 20.79% which is higher than previous year's averages. The difference is due primarily to the first quarter where a major leak was discovered and subsequently repaired. The difference, once the repair was complete, was reduced to 14%. Typical loss in a water system is 10-15% and is accounted for by water used for flushing (hydrants and reservoir), water used for fire protection purposes, and undetected water loss in the system.



6 Maintenance Program

Production wells and the reservoir are inspected on a weekly basis to reduce or eliminate the risk of contamination and system failure. All meters have dual check valves that are tested annually to prevent backflow into the system. Isolation valves are exercised bi-annually and air valves are inspected annually. Flushing program includes: flushing dead ends regularly, particularly during periods of low demand. Fire hydrants are serviced annually or more frequently if required.

7 Water System Projects

7.1 2019 Completed Studies & Projects

- Seaview and Longview main replacement project. (\$457,858)
- 3 hydrant installations (2 replacements & 1 new addition). (\$30,134)
- Deep Bay Drive main (10 m. of 6" pipe due to tree root intrusion) (\$6,517)

7.2 2020 Proposed Projects & Upgrades

- There are no proposed projects or upgrades scheduled for 2020

8 Emergency Response Plan

The Emergency Response Plan (ERP) was reviewed and updated in 2019. The DBID ERP includes:

- Emergency Phone Contact Lists
 - Personnel,
 - Government Agencies,
 - Contractors/Repair Services,
 - Technical Resources,
 - Parts Supply,
 - Bulk Water Suppliers, and
 - Media Contacts.
- Emergency Procedures
 - Unsafe Water Guidelines (Contamination of Well Space/s),
 - Loss of Source, Water Shortage, Broken Water Main, Pump Failure, Power Failures,
 - Flooding, Backflow or Back Siphonage,
 - Earthquake, and
 - Fire.
- Maps of System & Electrical Schematics

9 Report Distribution

Residents are notified by direct mail-out in the Pipeline Newsletter each year regarding the availability of this report. Annual Water System reports are available from the DBID office and on the website at www.dbid.ca under "Water Quality Reports". Copies will be mailed upon request. There is no charge for a copy of this report.

A copy of this report is submitted to Island Health.