DEEP BAY IMPROVEMENT DISTRICT

ANNUAL WATER SYSTEM REPORT 2017

5031 Mountainview Road
Bowser, BC V0R 1G0

Phone/Fax: 250-757-9312
www.dbid.ca

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, 2017 - December 31, 2017. 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 605 metered services.

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

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 57 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.

Positive Results:

Date	Total coliform	E. Coli	Reason	Corrective Action
Dec. 18/17	1	L1	Unknown, possible sample error	Retested, results L1

Adverse Results: none

Date	Total coliform	E. Coli	Reason	Corrective Action

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

In November 2017, 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*, with the following exceptions:

Site	Parameter	Result	Drinking Water Guidelines
Well #2	Iron	1.59	0.3 mg/L Aesthetic Objective
Well #2	Lead	0.0137	0.01 mg/L Max. Allowable Concentration
Well #2	Turbidity	17.8	5 NTUs Aesthetic Objective

Well #2 is maintained for emergency use only and not used as a regular production well. A lack of use has resulted in the high counts as noted. Well #2 would be thoroughly flushed and tested prior to being brought on line for use.

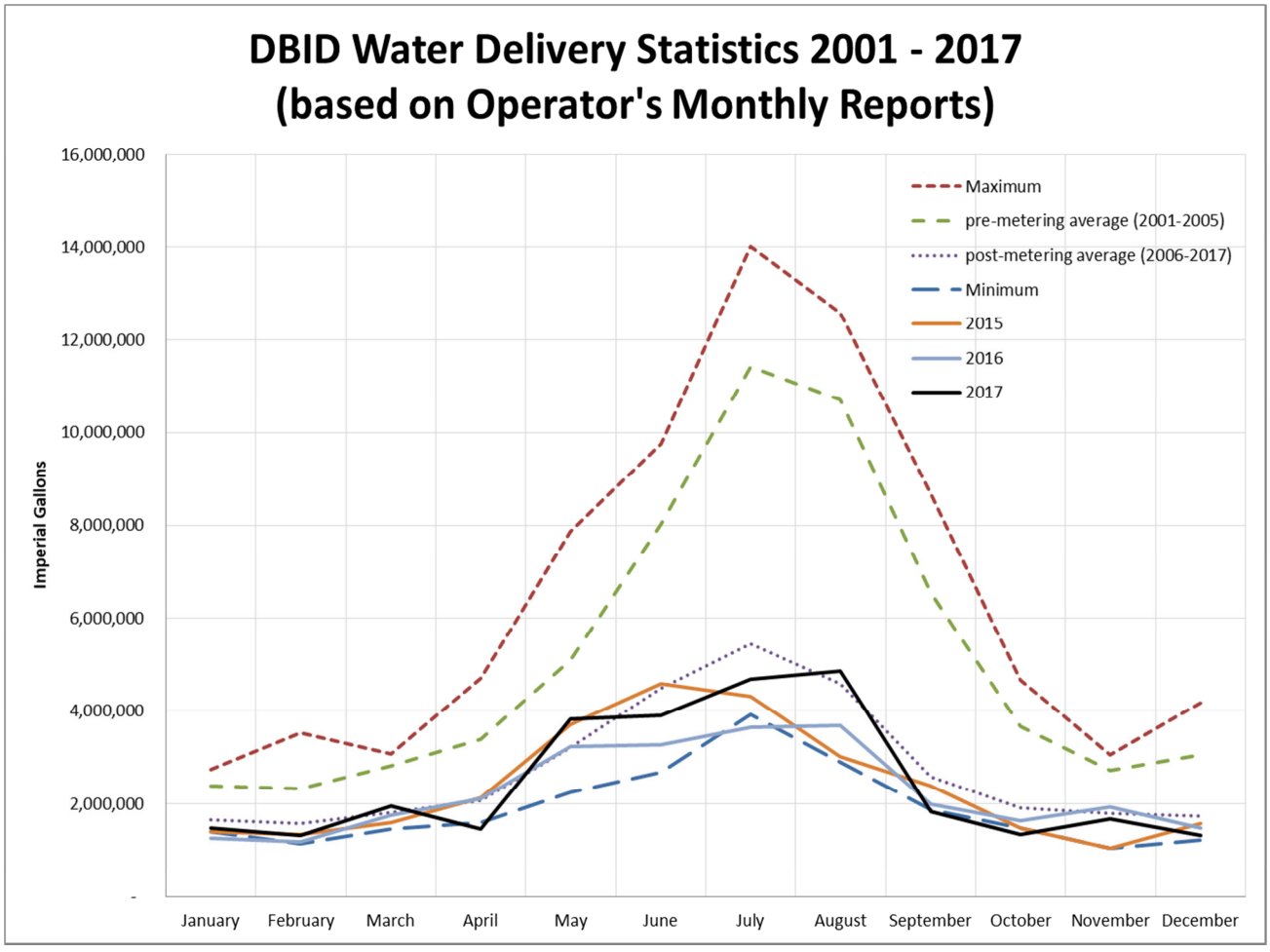
The full results of the chemical analysis are available for viewing at the DBID office and are posted on the website at www.dbid.ca under "Water Quality Reports".

4 Water Quality Inquiries and Complaints

Over the course of the year, there were a few inquiries regarding water stains and/or sediment on home plumbing fixtures. The DBID operator followed up with the homeowners and did an additional flush to ensure the system was clear.

5 Groundwater Production and Consumption

The following graph shows the monthly water delivery figures from the DBID wells. Water delivery for 2017 was marginally below the post-metering average and higher than 2016 due to the hot, very dry weather over the summer months. The district has been experiencing a decrease in overall consumption over the past several years and 2017 continued this trend with the exception of the peak summer usage.



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 2017 was 11.86% down from 13.01% in 2016. This difference is accounted for by water used for flushing (hydrants and reservoir), water used for fire protection purposes, and undetected water loss in the system. Typical loss in a water system is 10-15%.

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. 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 2017 Completed Studies & Projects

- Replace and upgrade valve at Well #6 and Well #8 to a Variable Frequency Drive valve. ($12,688 and $12,612 respectively)
- Drawings and planning for replacement of watermains on Seaview and Longview Drives. Drawings to be finalized in 2018. ($13,147 of $14,975 contract)

7.2 2018 Proposed Projects & Upgrades

- Seaview and Longview main replacement project. Estimated cost of $612,714 is in addition to drawings cost.
- Installation of 3 new hydrants (2 replacements & 1 new addition). To be included with bid for main replacement project. Estimated cost is $19,500

8 Emergency Response Plan

The Emergency Response Plan (ERP) was reviewed and updated in 2016. 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.