

DEEP BAY IMPROVEMENT DISTRICT

ANNUAL WATER SYSTEM REPORT 2016

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, 2016 - December 31, 2016. 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
Oct 3/16	2	L1	Unknown, possible sample error	Shock chlorination of system undertaken Oct 14-16. System flushed and resampled Oct 17 & 18, all retests results L1
Oct 11/16	1	L1	Unknown, possible sample error	
Oct 11/16	1	L1	Unknown, possible sample error	

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 December 2016, DBID undertook additional chemical analysis on all production 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 #8	Iron	0.375	0.3 mg/L Aesthetic Objective
Well #2	Iron	0.417	0.3 mg/L Aesthetic Objective

It came to the attention of the DBID, subsequent to taking these water samples that Well #8 had malfunctioned and had in fact not been in use for 21 days prior to sampling. This resulted in insufficient flushing prior to testing which led to the high iron count. (If a well is in active, rust will naturally develop in the well casing. If flushing is not enough, this rust will result in a high iron reading.) Well #2 is not used on a regular basis which also contributed to the high iron count. Well #8 will be retested in spring 2017 for iron.

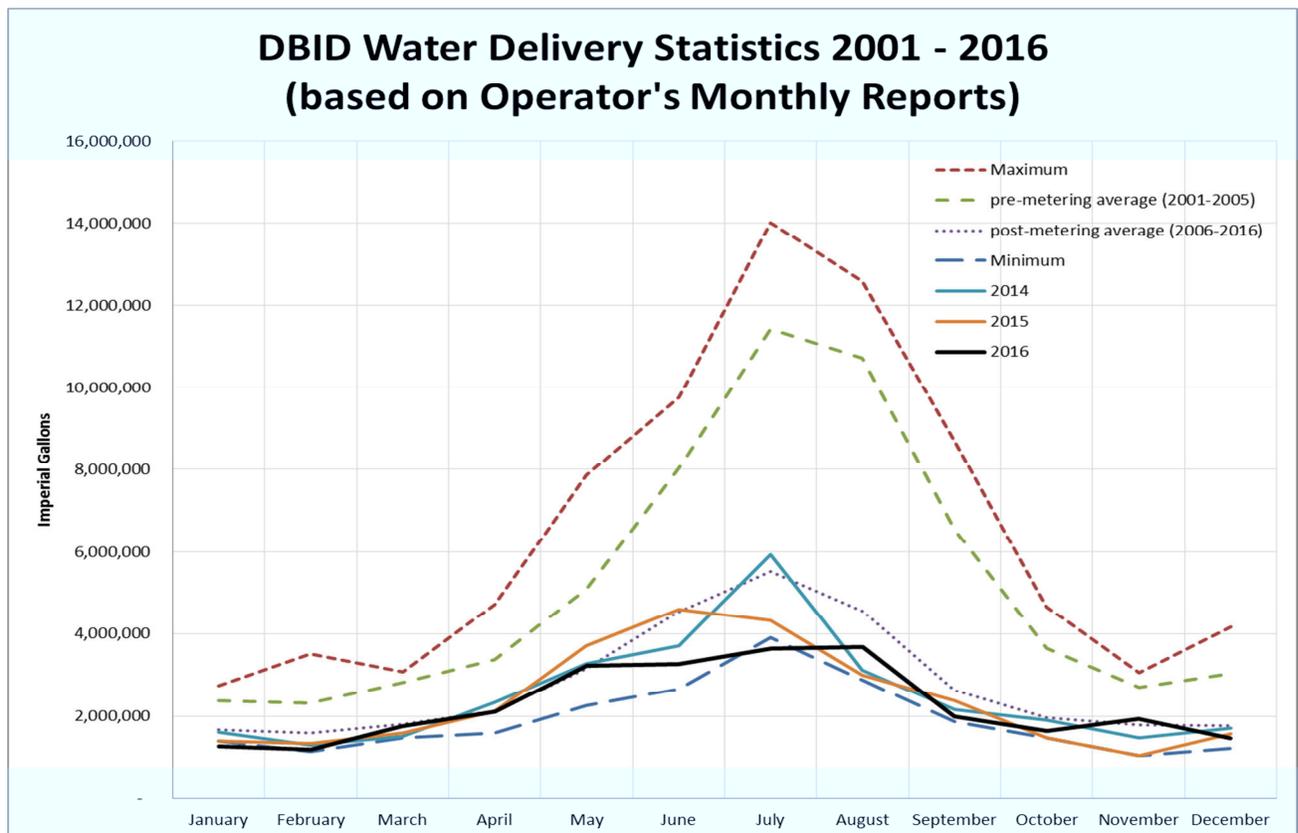
The full results of the chemical analysis are available for viewing at the DBID office and are posted on the website at www.dbid.ca under "Water Quality Reports".

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. Overall, water delivery for 2016 was below the post-metering average. Consumption in the summer quarter (July – September) was well below average due to higher than usual rainfall levels. The district has been experiencing a decrease in overall consumption over the past several years and 2016 continued this trend.



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 2016 was 13.01% down from 15.47% in 2015. 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. In the last quarter of 2016, extensive flushing was undertaken as part of the required shock chlorination. 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 2016 Completed Studies & Projects

- Final programming & testing for data loggers as part of SCADA project. (2016: \$2745, project total: \$161,295)
- Aquifer and Well Protection Plan completed (2016: \$9,000, project total: \$15,000)
- Replacement of failed valve at Well #5, valve upgraded to a Variable Frequency Drive valve (\$11,892)

7.2 2017 Proposed Projects & Upgrades

- Engineer and install a top feed line at reservoir. Estimated cost \$15,000
- Replace and upgrade valve at Well #8 to a Variable Frequency Drive valve. Estimated cost \$12,000.
- Drawings and planning for replacement of watermains on Seaview and Longview Drives. Project scheduled for 2018. \$75,000 set aside for preliminary work in 2017.

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.

Water Sample Range Report

Island Health

Facility Name: DEEP BAY IMPROVEMENT DISTRICT
Facility Type: DWT
Date Range: Jan 1 2016 to Dec 31 2016
Date Created: Jan 26 2017

Sampling Site	Date Collected	Total Coliform	E. Coli	Fecal Coliform
<u>Deep Bay WWD,</u>				
<u>Deep Bay BC, 4647</u>				
<u>Thompson Clarke</u>				
<u>Drive, East, Deep</u>				
<u>Bay, Dist. site,</u>				
<u>Bi-weekly</u>				
	19-Jan-2016	L1	L1	
	15-Feb-2016	L1	L1	
	07-Mar-2016	L1	L1	
	22-Mar-2016	L1	L1	
	12-Apr-2016	L1	L1	
	16-May-2016	L1	L1	
	13-Jun-2016	L1	L1	
	27-Jun-2016	L1	L1	
	18-Jul-2016	L1	L1	
	15-Aug-2016	L1	L1	
	06-Sep-2016	L1	L1	
	11-Oct-2016	1	L1	
	17-Oct-2016	L1	L1	
	17-Oct-2016	L1	L1	
	18-Oct-2016	L1	L1	
	14-Nov-2016	L1	L1	
	30-Nov-2016	L1	L1	
	12-Dec-2016	<u>L1</u>	<u>L1</u>	
	Total Positive:	1	0	0

SAMPLE STATION,
4503 Maple Guard
Drv., Deep Bay BC,
4503 Maple Guard
Drive, Deep Bay,
Dist. site, Bi-weekly

	19-Jan-2016	L1	L1
	15-Feb-2016	L1	L1
	07-Mar-2016	L1	L1
	22-Mar-2016	L1	L1
	25-Apr-2016	L1	L1
	16-May-2016	L1	L1
	30-May-2016	L1	L1
	11-Jul-2016	L1	L1
	02-Aug-2016	L1	L1
	19-Sep-2016	L1	L1
	03-Oct-2016	2	L1
	11-Oct-2016	1	L1
	17-Oct-2016	L1	L1
	18-Oct-2016	L1	L1
	07-Nov-2016	L1	L1
	21-Nov-2016	L1	L1

12-Dec-2016	<u>L1</u>	<u>L1</u>	
Total Positive:	2	0	0

Deep Bay Drive,
Deep Bay BC, Deep
Bay Drive, Deep
Bay, Dist. site,
Bi-weekly

04-Jan-2016	L1	L1	
01-Feb-2016	L1	L1	
29-Feb-2016	L1	L1	
14-Mar-2016	L1	L1	
04-Apr-2016	L1	L1	
09-May-2016	L1	L1	
24-May-2016	L1	L1	
20-Jun-2016	L1	L1	
18-Jul-2016	L1	L1	
09-Aug-2016	L1	L1	
12-Sep-2016	L1	L1	
11-Oct-2016	L1	L1	
07-Nov-2016	L1	L1	
21-Nov-2016	L1	L1	
05-Dec-2016	<u>L1</u>	<u>L1</u>	
Total Positive:	0	0	0

Deep Bay Fire Hall,
Deep Bay BC, Deep
Bay Fire Hall, Deep
Bay, Dist. site,
Bi-weekly

04-Jan-2016	L1	L1	
01-Feb-2016	L1	L1	
29-Feb-2016	L1	L1	
14-Mar-2016	L1	L1	
04-Apr-2016	L1	L1	
09-May-2016	L1	L1	
06-Jun-2016	L1	L1	
04-Jul-2016	L1	L1	
25-Jul-2016	L1	L1	
02-Aug-2016	L1	L1	
22-Aug-2016	L1	L1	
12-Sep-2016	L1	L1	
17-Oct-2016	L1	L1	
24-Oct-2016	L1	L1	
14-Nov-2016	L1	L1	
05-Dec-2016	L1	L1	
19-Dec-2016	<u>L1</u>	<u>L1</u>	
Total Positive:	0	0	0

Island Highway &
Gainsburg,
AUDIT-Deep Bay
Water Works, Dist.
site, No Regular
Sampling

Result Values:

E - estimated

L - less than

G - greater than

In VIHA, the results of drinking water sampling are reported using the following coding system:

- L1** Less than 1 (no detectable bacteria) - Meaning: No bacteria present
- OG** Overgrown - Meaning: Too many background bacteria to give an accurate count
- EST** Estimated Count
- and
- A** Sample not tested; Too long in transit
- C** Sample leaked/broken in transit
- D** Sample not tested; No collection date given
- T** Sample submitted unsatisfactory. Exceeded 30 hours holding time, please resample.
- NS** No sample received with requisition

Samples that contain total coliform:	3	4.48% of total
Samples that contain e. coli:	0	0.00% of total
Samples that contain fecal coliform:	0	0.00% of total
Number of positive samples in last 30 days:	0/0	
Total number of samples:	67	

Comments:

 Environmental Health Officer
 Jan 26 2017

FOR FURTHER INFORMATION PLEASE CALL: Thomson, Elizabeth (250) 947-8222 Parksville

Operator

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 Bowser, BC
 V0R 1G0

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