

DEEP BAY IMPROVEMENT DISTRICT

ANNUAL WATER SYSTEM REPORT 2013

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, 2013 - December 31, 2013. 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 the Vancouver Island Health Authority (VIHA).

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 603 metered services.

District contacts are: Leslie Carter, Administrator 250-757-9312
 Don Buchner, Operator 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.

DBID Well Data:

| Well Name | Well 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 semi-monthly throughout the distribution system. There are 4 sample sites, as identified by VIHA. Each site is sampled on a monthly basis and samples are delivered to the Parksville Health Unit where they are sent on for testing.

Positive Results: none

| Date | Total coliform | E. Coli | Reason | Corrective Action |
|------|----------------|---------|--------|-------------------|
| | | | | |

Adverse Results: none

| Date | Total coliform | E. Coli | Reason | Corrective Action |
|------|----------------|---------|--------|-------------------|
| | | | | |

Attached to this report are the full test results from bacteriological monitoring for 2013. These results can also be viewed at:

http://www.healthspace.ca/Clients/VIHA/VIHA_Website.nsf/Water-Samples-Frameset?OpenPage

In November 2013, DBID undertook additional chemical analysis on all production wells and the reservoir. These samples were taken to North Island Labs for testing. All of the well and reservoir samples were within the chemical parameters listed in *The Guidelines for Canadian Drinking Water Quality*, with the following exceptions:

| Site | Test | Result | Units | Drinking Water Guidelines |
|---------|-----------------|--------|--------------|---------------------------|
| Well #1 | Colour–Apparent | 21 | Colour Units | 15 |
| Well #1 | Total Iron | 0.358 | mg/L | 0.3 mg/L AO |
| Well #3 | Total Coliform | 12.4 | mg/L | <1 |

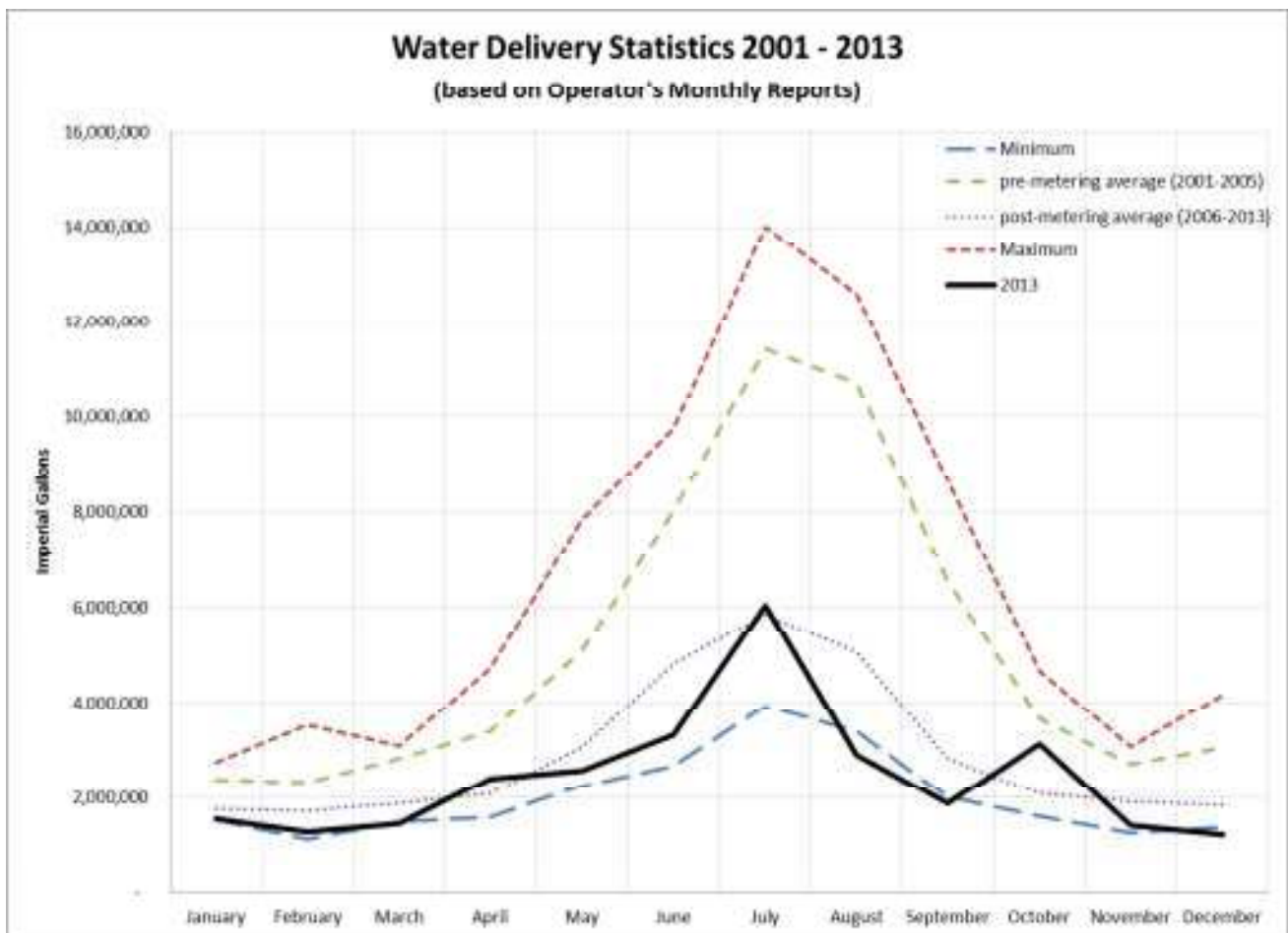
The results of the chemical analysis are available for viewing at the DBID office and are posted on the website at www.dbid.ca under "Water Quality Reports".

4 Water Quality Inquiries and Complaints

Over the course of the year, there was one inquiry regarding water stains on home plumbing fixtures. The DBID operator followed up with the homeowner 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. 2013 was at or below average in comparison to the years since the installation of meters (2006) with the exception of October. The extra water pumped in October is due to aquifer testing that was conducted at that time.



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 average difference for 2013 was 10.47%. 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%.

The table below shows the **percentage of users who met specified consumption figures** for 2013. For example: in the 1st quarter, January - March 2013, 70% of users consumed between 1 - 40 cubic meters.

| Cubic Meters (m³) | Jan - Mar 2013 | Apr - Jun 2013 | Jul - Sep 2013 | Oct - Dec 2013 | 2013 Overall |
|---|---------------------------|---------------------------|---------------------------|---------------------------|-------------------------|
| 0 | 10% | 4% | 3% | 9% | 7% |
| 1 - 40 | 70% | 50% | 33% | 69% | 55% |
| 41 - 75 | 17% | 28% | 28% | 17% | 23% |
| 76 - 100 | 1% | 8% | 9% | 2% | 5% |
| Over 100 | 2% | 10% | 27% | 3% | 10% |
| Average Consumption | 28.93 m ³ | 47.00 m ³ | 87.61 m ³ | 36.07 m ³ | |

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.

7 Water System Projects

7.1 2013 Completed Studies & Projects

- Completed radio path study - \$1925 (confirmed that radio technology could be used for SCADA installation to upgrade well monitoring and operating capability)
- Completed Phase 1 of SCADA installation - \$44,416 (established radio link between reservoir and office, installed main electrical panel in office)

7.2 2014 Proposed Projects & Upgrades

- Complete SCADA installation, estimated cost \$110,000 (supply and installation of new electrical panels at wells)

8 Emergency Response Plan

The Emergency Response Plan (ERP) was reviewed and updated in 2013. 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 VIHA.

Water Sample Range Report

Vancouver Island Health Authority

Central Island

Facility Name: DEEP BAY IMPROVEMENT DISTRICT
Facility Type: DWT
Date Range: Jan 1 2013 to Dec 31 2013
Date Created: Feb 21 2014

| <u>Sampling Site</u> | <u>Date Collected</u> | <u>Total Coliform</u> | <u>E. Coli</u> | <u>Fecal Coliform</u> |
|----------------------------|------------------------|-----------------------|----------------|-----------------------|
| <u>SAMPLE STATION,</u> | | | | |
| <u>4503 Maple Guard</u> | | | | |
| <u>Drv., Deep Bay BC,</u> | | | | |
| <u>4503 Maple Guard</u> | | | | |
| <u>Drive, Deep Bay,</u> | | | | |
| <u>Dist. site, Monthly</u> | | | | |
| | 1/23/2013 | L1 | L1 | |
| | 2/18/2013 | L1 | L1 | |
| | 3/27/2013 | L1 | L1 | |
| | 5/21/2013 | L1 | L1 | |
| | 6/26/2013 | L1 | L1 | |
| | 7/30/2013 | L1 | L1 | |
| | 8/7/2013 | L1 | L1 | |
| | 9/24/2013 | L1 | L1 | |
| | 10/8/2013 | L1 | L1 | |
| | 11/27/2013 | L1 | L1 | |
| | 12/11/2013 | <u>L1</u> | <u>L1</u> | |
| | Total Positive: | 0 | 0 | 0 |
| | | | | |
| <u>Deep Bay Drive,</u> | | | | |
| <u>Deep Bay BC, Deep</u> | | | | |
| <u>Bay Drive, Deep</u> | | | | |
| <u>Bay, Dist. site,</u> | | | | |
| <u>Monthly</u> | | | | |
| | 1/2/2013 | L1 | L1 | |
| | 2/26/2013 | L1 | L1 | |
| | 3/11/2013 | L1 | L1 | |
| | 4/9/2013 | L1 | L1 | |
| | 5/27/2013 | L1 | L1 | |
| | 6/12/2013 | L1 | L1 | |
| | 7/10/2013 | L1 | L1 | |
| | 8/26/2013 | L1 | L1 | |
| | 9/11/2013 | L1 | L1 | |
| | 10/28/2013 | L1 | L1 | |
| | 11/13/2013 | L1 | L1 | |
| | 12/18/2013 | <u>L1</u> | <u>L1</u> | |
| | Total Positive: | 0 | 0 | 0 |
| | | | | |
| <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>Monthly</u> | | | | |
| | 1/23/2013 | L1 | L1 | |
| | 2/18/2013 | L1 | L1 | |

| | | | |
|------------------------|-----------|-----------|----------|
| 5/21/2013 | L1 | L1 | |
| 6/26/2013 | L1 | L1 | |
| 7/30/2013 | L1 | L1 | |
| 8/7/2013 | L1 | L1 | |
| 9/24/2013 | L1 | L1 | |
| 10/8/2013 | L1 | L1 | |
| 11/27/2013 | L1 | L1 | |
| 12/11/2013 | <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,
Monthly

| | | | |
|------------------------|-----------|-----------|----------|
| 1/2/2013 | L1 | L1 | |
| 2/26/2013 | L1 | L1 | |
| 3/11/2013 | L1 | L1 | |
| 4/9/2013 | L1 | L1 | |
| 5/27/2013 | L1 | L1 | |
| 6/12/2013 | L1 | L1 | |
| 7/10/2013 | L1 | L1 | |
| 8/26/2013 | L1 | L1 | |
| 9/11/2013 | L1 | L1 | |
| 10/28/2013 | L1 | L1 | |
| 11/13/2013 | L1 | L1 | |
| 12/18/2013 | <u>L1</u> | <u>L1</u> | |
| Total Positive: | 0 | 0 | 0 |

Island Highway &
Gainsburg,
AUDIT-Deep Bay
Water Works, Dist.
site, Annually

| | | | |
|------------------------|-----------|-----------|----------|
| 9/17/2013 | <u>L1</u> | <u>L1</u> | |
| Total Positive: | 0 | 0 | 0 |

Result Values: E - estimated L - less than G - greater than

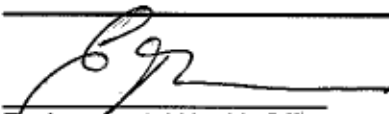
Interpreting Sample Reports

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: | 0 | 0.00% 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: | 0/4 | |
| Total number of samples: | 47 | |

Comments:



Environmental Health Officer
 Feb 25 2014

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

Operator

Deep Bay Improvement District
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 Bowser, BC
 V0R 1G0

(250) 757-9312