DEEP BAY IMPROVEMENT DISTRICT

ANNUAL WATER SYSTEM REPORT 2024

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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, 2024 - December 31, 2024. 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 616 metered services.

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.

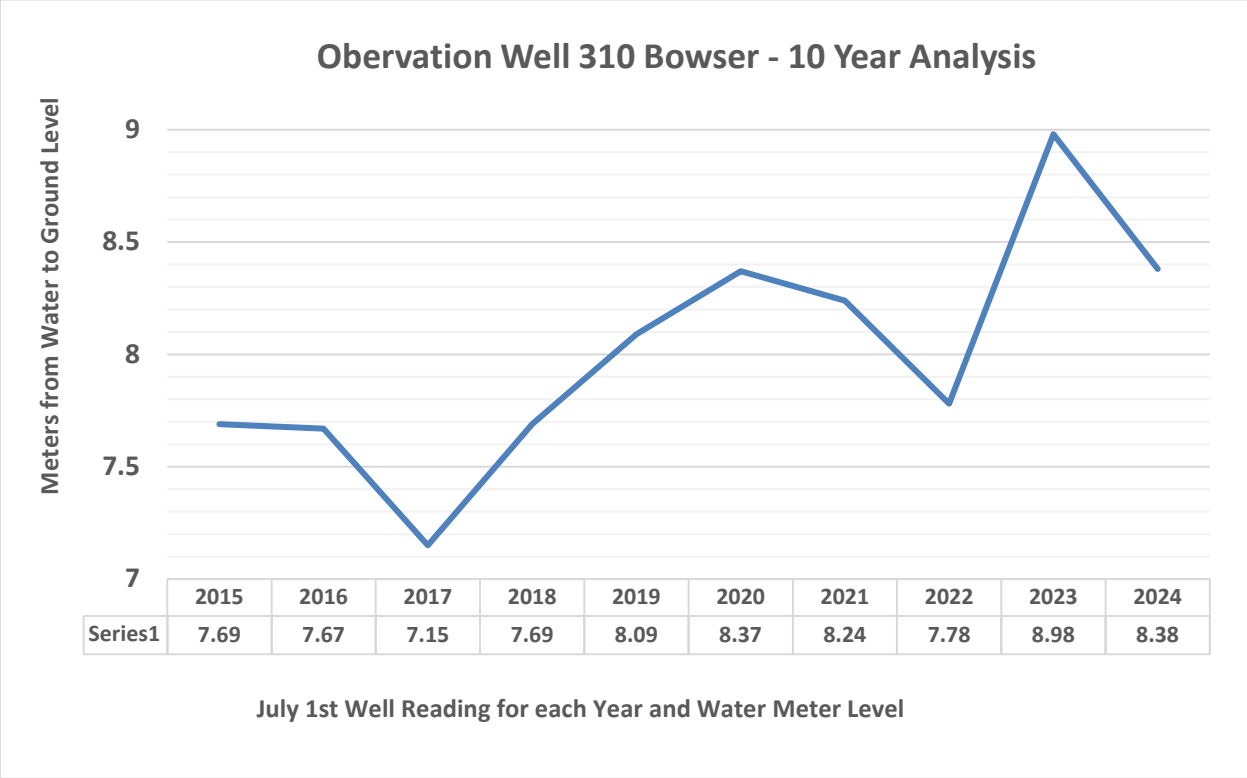
Currently Wells 4, 5, 6 & 8 are used for production supply. Wells 1, 2 & 3 are on standby for emergency use only.

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 Observation Well 310 Bowser

This is an observation well that is monitored by the provincial government to provide data showing the distance from the ground to the water level in the well. The meter number increasing is indicative that the well water level is lower than the previous year. This also indicates that the aquifer water level is dropping. Other than 2022, over the past seven years the aquifer is declining based on a 7.15 reading in 2017 and 8.38 reading in 2024.



2.3 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.

Herold Engineering completed a 2024 Water Tank Condition Assessment. This report provides a number of recommendations to maintain the Water Tank (Reservoir) and

Deep Bay continues to carry out these identified tasks. In the recommendation section of the Herold Engineering report it states:

> The water tank appears to be in a serviceable condition and can be expected to provide more years of service (10 – 15+ years).

This water tank recommendation was a factor in why the Board has not proceeded with reservoir replacement.

2.4 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 45 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. At least 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.

Full test results from bacteriological monitoring are included with this report as an attachment “Appendix A” at the back of this document. These test results are also available on the VIHA website and there is a link to the test results on the DBID website under the Water Reports tab.

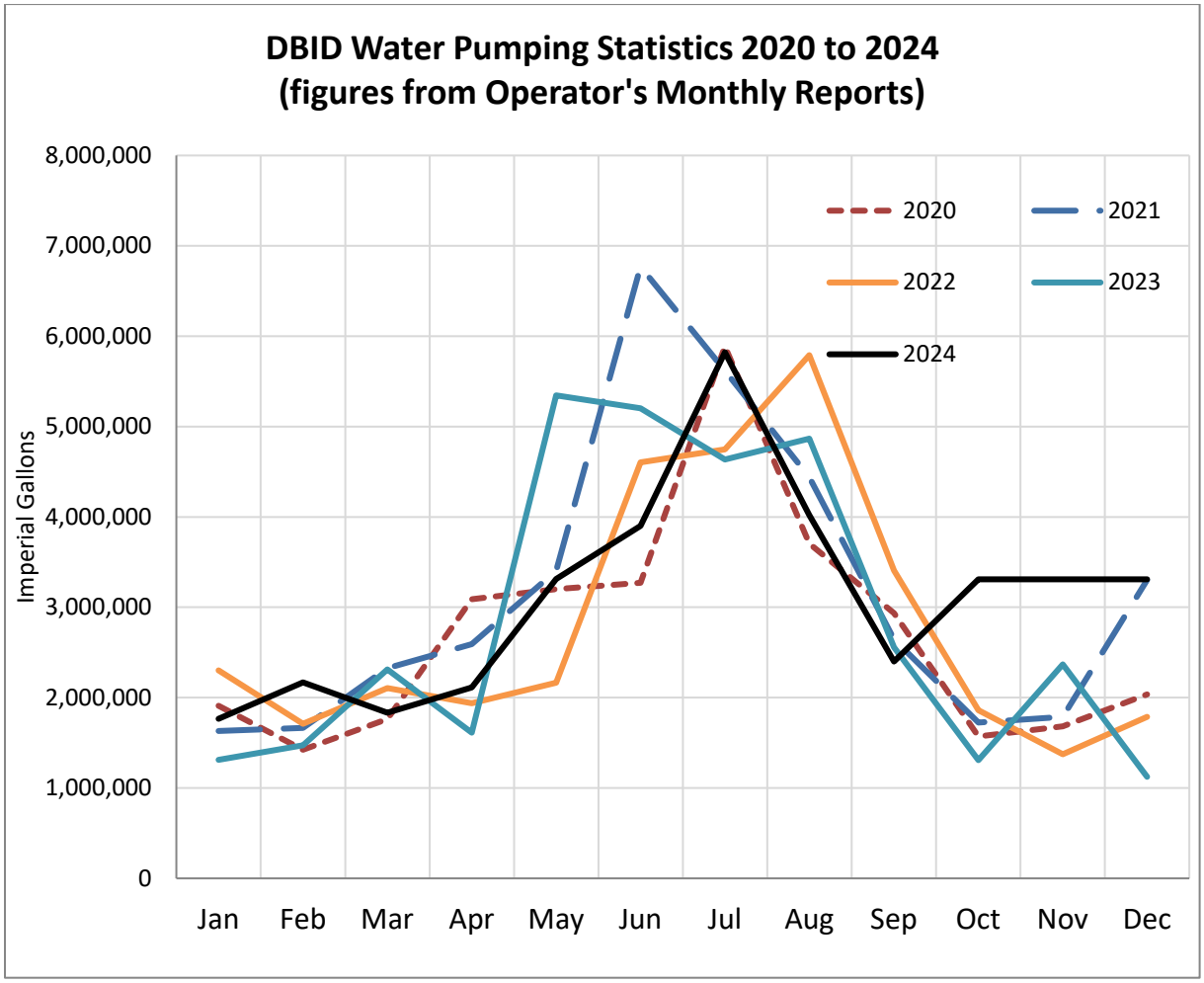
4 Water Quality Inquiries and Complaints

DBID receives water quality inquiries throughout the year. There are several detailed engineering studies available for review on the DBID website under the Technical/Operational Documents tab and the Water Reports tab.

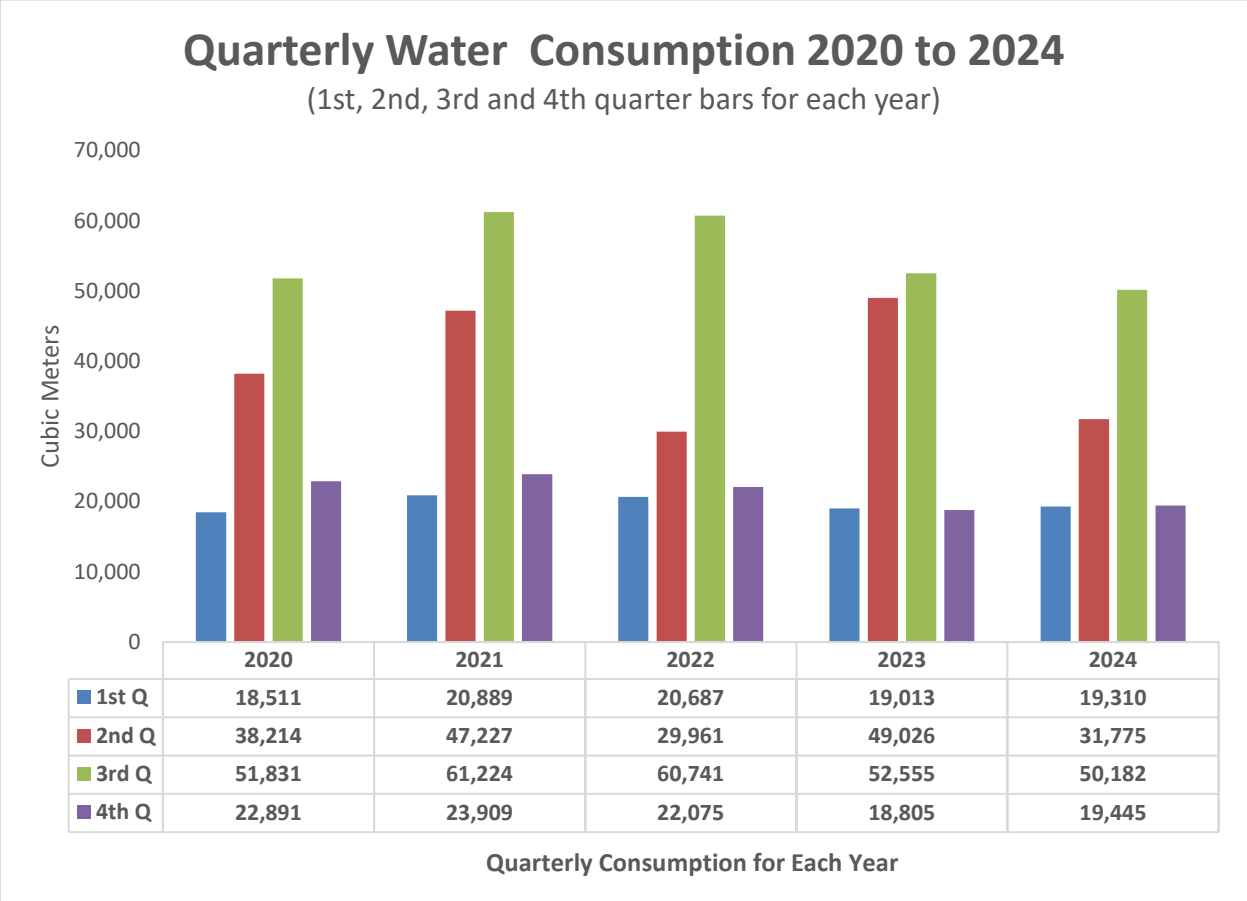
5 Groundwater Production and Consumption

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 Pumping Statistics 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 pumping statistics were not available for October and November 2024, resulting in the final three months of 2024 being averaged.



Quarterly Water Consumption reflects usage measured by the quarterly meter reads. Water consumption has decreased slowly but steadily over the last few years, except for higher usage during the Spring of 2023. Mandatory watering restrictions have not been implemented but all water users are asked to continue to use our resource responsibly.



	2020	2021	2022	2023	2024
1st Q	18,511	20,889	20,687	19,013	19,310
2nd Q	38,214	47,227	29,961	49,026	31,775
3rd Q	51,831	61,224	60,741	52,555	50,182
4th Q	22,891	23,909	22,075	18,805	19,445

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, particularly during periods of low demand. Fire hydrants are inspected and serviced as required annually or more frequently if required.

7 Water System Projects

7.1 2024 Completed Studies

Herold Engineering provide a report on a Water Tank (reservoir) Assessment. This report is available on the DBID website under the Water Information tab. As mentioned earlier in this Annual Water System Report document, the Herold Engineering report provides a number of recommendations to maintain the Water Tank (Reservoir) and Deep Bay continues to carry out these identified tasks. The Herold Engineering report also states:

> The water tank appears to be in a serviceable condition and can be expected to provide more years of service (10 – 15+ years). This recommendation was a factor in why the Board has not proceeded with reservoir replacement.

7.2 2024 Completed Projects

DBID completed the Thompson Clarke West Watermain Replacement project. The final cost was approximately $550,000. This cost was less than expected as outlined in the Thompson Clarke West, Watermain Review, McElhanney Engineering June 2013 (This document is also on DBID website). This project was identified as the highest priority project for asbestos pipe replacement as shown in the Asbestos Pipe Replacement Report, McElhanney Engineering (This document is also on DBID website). This Asbestos Pipe report identified the project at an estimated cost of $587,000 based on 2023 cost.

8 Emergency Response Plan

The Emergency Response Plan (ERP) was reviewed and updated in 2021. 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".

A copy of this report is submitted to Island Health.