



Enhancing our communities



Strada Shelburne (Melancthon, Ont.)

ANNUAL COMPLIANCE REPORT 2024

Strada Aggregates Inc.

Document Control

File:

123016

Date:

March
17, 2025

Prepared by:

Tatham Engineering Limited

115 Sandford Fleming Drive, Suite 200
Collingwood, Ontario L9Y 5A6

T 705-444-2565
tathameng.com

Prepared for:

Strada Aggregates Inc.

30 Floral Parkway
Vaughan, Ontario L4K 4R1

Authored by:	Reviewed by:
 Alyssa Flaherty, B.Sc. Geoscience Intern - Hydrogeology and Geoenvironmental	 Alicia Kimberley, M.Sc., P.Geo. Manager - Hydrogeology and Geoenvironmental

Disclaimer	Copyright
The information contained in this document is solely for the use of the Client identified on the cover sheet for the purpose for which it has been prepared and Tatham Engineering Limited undertakes no duty to or accepts any responsibility to any third party who may rely upon this document.	This document may not be used for any purpose other than that provided in the contract between the Owner/Client and the Engineer nor may any section or element of this document be removed, reproduced, electronically stored or transmitted in any form without the express written consent of Tatham Engineering Limited.

Issue	Date	Description
0	February 5, 2025	Draft Report (Issued for Client Review)
1	March 17, 2025	Final Report

Document Contents

1 Introduction1

1.1 Site Description1

2 Regulatory Requirements.....2

2.1 Water Taking2

2.2 Groundwater and Surface Water Monitoring Requirements.....2

3 2024 Compliance Monitoring Results6

3.1 Water Taking6

3.2 Groundwater Monitoring6

3.3 Surface Water14

4 Conclusions 17

Tables

Table 1: Monitoring Details 3

Table 2: 2024 Water Takings 8

Table 3: Manual Groundwater Elevations 11

Table 4: Groundwater Sampling Locations and Parameters 13

Table 5: Surface Water Elevations..... 15

Figures

Figure 1: Site Location Plan 18

Figure 2: Groundwater and Surface Water Monitoring Locations 19

Figure 3: Series A 2024 groundwater levels..... 20

Figure 4: Shallow Groundwater Contour Map – Spring 2024 21

Figure 5: Shallow Groundwater Contour Map – Fall 2024 22

Figure 6: Series B 2024 groundwater levels 23

Figure 7: Series C 2024 groundwater levels 24

Figure 8: Deep Groundwater Contours – Spring 2024 25

Figure 9: Deep Groundwater Contours – Fall 2024..... 26



Appendices

Appendix A: PTTW

Appendix B: Integrated Monitoring Plan

Appendix C: Borehole Logs

Appendix D: Hydrographs

Appendix E: Water Quality Results

Appendix F: Domestic Water Monitoring Program Results



1 Introduction

Tatham Engineering Limited (Tatham) was retained by Strada Aggregates Inc. (Strada) to complete the 2024 compliance monitoring and reporting for the Strada Shelburne pits comprising the Bonnefield/Prince Pits, Melancthon Pit #1, and Melancthon Pit #2, all located at Part Lot 11-14, Concession 3, in the Township of Melancthon.

1.1 SITE DESCRIPTION

The Strada Shelburne aggregate pits, hereafter referred to as the “site”, are located northwest of Shelburne, north of Dufferin 17 between Line 4 and Line 3. The site is 152 ha in size and is surrounded by rural residential properties and agricultural lands with a separate aggregate operation located immediately west of the site. The site is licensed for aggregate extraction under the Ministry of the Natural Resources and Forestry (MNR) Aggregate Resources Act (ARA) for extraction of aggregate above the water table. The Class “A” Pit Above Water Licenses are licensed to extract sand and gravel within 1.5 m of the water table. The location of the Strada Shelburne aggregate pits are shown on Figure 1.



2 Regulatory Requirements

The Strada Shelburne pits are comprised of the Bonnefield/Prince properties, Melancthon Pit #1, and Melancthon Pit #2. Each property has been integrated into one all-encompassing operation, which includes a closed loop washing facility regulated under the Melancthon Pits #2 Ontario Water Resources Act, Section 34, Permit to Take Water (PTTW) No.: 3210-AKRL9C, attached in Appendix A.

Melancthon Pit #1 is located on the West Half of Lot 13, Concession 3, and has been licensed under MNRF ARA License No. 12253 since 2004. Melancthon Pit #2 is located on the West Half of Part Lot 11 and 12, Concession 12, and has been licensed under MNRF ARA License No. 625155 since 2012.

The proposed Bonnefield and Prince properties, which are located at Part of West Half of Lots 12 and 13, Concession 3, have not yet been licensed, but the expectation is these extensions will be fully integrated with existing aggregate operations.

To monitor the groundwater and surface water conditions throughout extraction, an integrated monitoring plan was developed by Whitewater Hydrogeology (2018) to effectively identify and characterize any cumulative influences on the groundwater and surface water regimes as a result of any extraction and/or washing operations on-site. A copy of the integrated monitoring plan is provided in Appendix B.

This report has been prepared to comply with both the PTTW and integrated monitoring plan requirements.

2.1 WATER TAKING

Strada is required to monitor daily water takings in accordance with PTTW 3210-AKRL9C. This data is required to be reported every year to the Ministry's Water Taking Reporting System on or before March 31. PTTW 3210-AKRL9C allows for the taking of 4,000 L/min for a maximum of 10 hours per day while ensuring water takings do not exceed 2,400,000 L/day for a maximum of 230 days between April 1 and November 16 of each year.

The permitted water taking is for the purposes of washing gravel in a closed loop system and does not include dust suppression.

2.2 GROUNDWATER AND SURFACE WATER MONITORING REQUIREMENTS

The required groundwater and surface water monitoring program is summarized in Table 1, and the monitoring locations are shown on Figure 2.



Table 1: Monitoring Details

MONITORING LOCATION ¹	PARAMETER	FREQUENCY
INTEGRATED MONITORING PLAN REQUIREMENTS		
OW2A, OW2B, OW3B, OW4A, OW4B, OW5A, OW5B, OW6A, OW7A, OW7C ² , OW8A, OW9A, OW10A ³ , OW11A, OW11B, OW12A, OW13A, OW13C ² , OW14C ² , OW15B, OW16C ² , OW17A, OW17B, OW18A, OW18C ² , OW19A ³ , OW19C ² , OW20C ² , OW21C ² , OW22C ² , OW23C ²	Water Level	Continuous data logger
OW2A, OW2B, OW3B, OW4A, OW4B, OW5A, OW5B, OW6A, OW7A, OW7C ² , OW8A, OW9A, OW10A ³ , OW11A, OW11B, OW12A, OW13A, OW13C ² , OW14C ² , OW16C ² , OW18A, OW18C ² , OW19C ² , OW20C ² , OW21C ² , OW22C ² , OW23C ²	pH, Conductivity, Alkalinity, Bicarbonate, Chloride, Calcium, Magnesium, Potassium, Sodium, Sulphate, Nitrate, Nitrite, Phosphorus, and dissolved Metals	Semi-Annual (spring and fall)
OW5A, OW6A, OW7A, OW8A, OW9A, OW10A ³ , OW11A, OW12A, OW14C ² , OW16C ² , OW18A, OW20C ² , OW21C	Oil and Grease, Petroleum Hydrocarbons (PHC) Fraction F1-F4, Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX)	Annual
Wetland (SW1) and Vernal Pool (SW2)	Water Level	Continuous data logger
PTTW REQUIREMENTS		
Wash Pond ⁴ , OW2A, OW2B, OW2C, OW3A ³ , OW3B, OW4A, OW4B, OW4C ⁵ , OW5A, OW5B, OW5C, OW6A, OW7A, OW7C, OW8A, OW8B, OW9A, OW10A ³ , OW10B, OW11A, OW11C, OW12A, OW13A, North Pond, South Pond	Water Level	Continuous data logger



MONITORING LOCATION ¹	PARAMETER	FREQUENCY
ADDITIONAL DUE DILIGENCE MONITORING		
North Pond, South Pond	pH, Conductivity, Alkalinity, Bicarbonate, Chloride, Calcium, Magnesium, Potassium, Sodium, Sulphate, Nitrate, Nitrite, Phosphorus, and dissolved Metals	Semi-Annual (spring and fall)
DW1, DW2, DW3, DW4, DW5	Water Levels	Continuous data logger
DW1, DW2, DW3, DW4, DW5	pH, Conductivity, Alkalinity, Bicarbonate, Chloride, Calcium, Magnesium, Potassium, Sodium, Sulphate, Nitrate, Nitrite, Phosphorus, and dissolved Metals	Semi-Annual (spring and fall)
Note: - OW2A, OW2B, OW2C, OW8B, OW11A, OW11B, OW15B, OW17A and OW17B have been destroyed. - OW7B, OW13B, OW14B, OW16B, OW18B, OW19B, OW20B, OW21C, OW22C, and OW23C are now referred to as OW7C, OW13C, OW14C, OW16C, OW18C, OW19C, OW20C, OW21C, OW22C, and OW23C, respectively. - Monitoring of OW3A, OW10A, OW19A, and OW20A were discontinued as the monitors were consistently dry through the summer months. - Monitoring of OW4C was discontinued in 2016. - Monitoring of OW21A was discontinued because the monitor was plugged. - Monitoring of OW22A and OW23A were discontinued as the deep and shallow groundwater levels were very similar. It is suspected the well seal between the deep and shallow is not sufficient.		

All three of the pits have an extensive history of groundwater monitoring, which have been a part of the development of the site's integrated monitoring plan. The PTTW requires water levels to be monitored at 23 groundwater monitoring wells and two surface water locations, and the integrated monitoring plan requires water levels to be monitored at 31 groundwater monitoring wells and two surface water locations. The integrated monitoring plan also requires groundwater quality to be monitored semi-annually at 27 locations and annually at 13 locations. In addition to both the PTTW and integrated monitoring plan, water levels and semi-annual water quality is monitored in five off-Site domestic water wells and an additional two surface water locations.

Monitors labelled with an "A" as the suffix are screened at the base of the sand and gravel unit (water table aquifer). Monitors labelled with a "B" as the suffix are screened at the base of the Tavistock Till (just above the bedrock contact). Monitors labelled with a "C" as the suffix are constructed within the bedrock aquifer. Borehole records are provided in Appendix C.



The groundwater monitoring program focuses on the on-going monitoring of background conditions (upgradient locations) in both the overburden and bedrock aquifers as well as the monitoring of potential influences from the aggregate operation on down-gradient locations.



3 2024 Compliance Monitoring Results

3.1 WATER TAKING

In 2024, water was taken on 140 days between April 11 and Nov 19, 2024. The maximum reported daily taking was 2,392,380.25 L. The reported water takings for 2024 remain within the permitted volumes in accordance with PTTW 3210-AKRL9C. The 2024 daily water takings are summarized in Table 2.

3.2 GROUNDWATER MONITORING

Groundwater levels from the on-site and off-site monitoring wells were collected over the 2024 monitoring period, and the highest and lowest groundwater levels observed are summarized in Table 3. The monitoring wells are equipped with continuously recording dataloggers to allow for a detailed analysis of the groundwater conditions at the site. This is to allow for the assessment of the seasonal trends as well as the response to local precipitation events. The data logger values have been calibrated with manual measurements and the 2024 hydrographs are provided in Appendix D.

3.2.1 Overburden Groundwater Elevations (Series A)

The groundwater elevations in the vicinity of the Strada properties are strongly influenced by the bedrock topography and the buried bedrock valley system reported in the southeast portion of the study area. This feature has created a primarily downward gradient from the shallow overburden aquifer to the bedrock aquifer. As a result, the overburden is dry in the north and northwestern portion of Melancthon Pit #1 as well as beneath the Prince property. Permanent unsaturated conditions in the overburden are reported at OW3A, OW10A, OW14A, OW19A, and OW20A, where the first water-bearing zone is found beneath the bedrock contact (bedrock aquifer).

Generally, the groundwater level trends within the overburden aquifer (Series A) are seasonal, with water levels peaking in the spring and decreasing over the warmer and drier summer months. A summary graph with all Series A water levels is provided in Figure 3. The groundwater elevations on-site within the overburden aquifer ranged across the site from 499.00 to 485.11 metres above sea level (m asl), with the highest groundwater levels noted between April and May, due to the spring melt. In general, the groundwater levels observed on-site in 2024 are consistent with groundwater levels and trends historically observed on-site.



Groundwater contour maps have been prepared for the shallow aquifers, based on the April and December (spring and fall) site visits. The general groundwater flow direction appears to be towards the east central portion of the site and the southeastern corner of the site, respectively, as shown on Figures 4 and 5.

3.2.2 Bedrock/Till Contact Groundwater Elevations (Series B and C)

Like the overburden water levels, the water levels in the Till contact unit and weathered bedrock aquifer (bedrock contact) show muted seasonal trends where water level highs are reached during the spring, followed by a slight decrease during the summer, fall, and winter months. Water levels in the bedrock aquifer are less influenced by seasonal trends and remain relatively stable over the monitoring period.

The groundwater elevations on-site at the Till contact (Series B) ranged across the site from 498.11 to 487.73 m asl, and the groundwater elevations on-site within the bedrock aquifer (Series C) ranged across the site from 498.50 to 477.86 m asl, with the highest groundwater levels noted between April and May due to the spring melt. A summary graph with all Series B and C water levels are provided on Figures 6 and 7 respectively.

Groundwater contour maps have been prepared for the bedrock aquifer based on the March and September (spring and fall) site visits. The general groundwater flow direction appears to be towards the east as shown on Figures 8 and 9.



Table 2: 2024 Water Takings

DATE	TOTAL DAILY TAKING (L)	DATE	TOTAL DAILY TAKING (L)	DATE	TOTAL DAILY TAKING (L)	DATE	TOTAL DAILY TAKING (L)
4/11/2024	2,087,654.60	5/2/2024	1,586,087.54	5/23/2024	605,665.89	6/12/2024	1,071,271.53
4/16/2024	2,087,654.60	5/3/2024	991,777.89	5/24/2024	1,926,774.60	6/13/2024	1,302,181.65
4/17/2024	1,143,194.36	5/6/2024	416,395.30	5/27/2024	1,472,525.18	6/14/2024	1,483,881.42
4/18/2024	1,775,358.13	5/7/2024	1,086,413.18	5/29/2024	1,756,431.07	6/18/2024	1,432,778.36
4/19/2024	916,069.65	5/8/2024	1,256,756.71	5/30/2024	1,525,520.95	6/19/2024	1,432,778.36
4/22/2024	1,256,756.71	5/9/2024	938,782.12	5/31/2024	976,636.24	6/20/2024	1,215,117.18
4/23/2024	878,215.53	5/11/2024	859,288.47	6/3/2024	1,968,414.13	6/21/2024	1,230,258.83
4/24/2024	1,252,971.30	5/13/2024	1,457,383.54	6/4/2024	1,828,353.89	6/22/2024	878,215.53
4/25/2024	738,155.30	5/14/2024	1,449,812.71	6/5/2024	1,646,654.13	6/24/2024	1,968,414.13
4/26/2024	878,215.53	5/15/2024	1,442,241.89	6/6/2024	1,881,349.66	6/25/2024	1,858,637.19
4/27/2024	897,142.59	5/16/2024	1,090,198.59	6/7/2024	927,425.89	26-Jun-24	1,972,199.54
4/30/2024	2,055,478.60	5/17/2024	772,224.00	6/10/2024	1,748,860.24	6/27/2024	2,021,409.89
5/1/2024	1,332,464.95	5/21/2024	1,358,962.83	6/11/2024	1,896,491.30	6/28/2024	916,069.65

DATE	TOTAL DAILY TAKING (L)	DATE	TOTAL DAILY TAKING (L)	DATE	TOTAL DAILY TAKING (L)	DATE	TOTAL DAILY TAKING (L)
7/2/2024	1,938,130.83	7/22/2024	2,165,255.54	8/9/2024	711,657.42	8/29/2024	1,972,199.54
7/3/2024	2,006,268.25	7/23/2024	2,165,255.54	8/12/2024	2,364,368.19	9/4/2024	2,389,856.64
7/4/2024	2,206,895.07	7/24/2024	2,085,761.89	8/13/2024	2,364,368.19	9/5/2024	2,389,856.64
7/5/2024	1,453,598.13	7/25/2024	2,365,882.37	8/14/2024	2,364,368.19	9/6/2024	2,389,856.64
7/8/2024	2,152,385.14	7/26/2024	1,245,400.48	8/15/2024	2,364,368.19	9/9/2024	2,377,995.68
7/9/2024	2,152,385.14	7/27/2024	1,245,400.48	8/16/2024	2,364,368.19	9/10/2024	2,377,995.68
7/10/2024	2,152,385.14	7/28/2024	1,907,847.54	8/19/2024	2,272,004.15	9/11/2024	2,377,995.68
7/11/2024	2,152,385.14	7/29/2024	1,907,847.54	8/20/2024	2,272,004.15	9/12/2024	2,377,995.68
7/12/2024	2,152,385.14	7/31/2024	1,279,469.18	8/21/2024	2,272,004.15	9/13/2024	2,377,995.68
7/15/2024	1,201,868.24	8/1/2024	859,288.47	8/22/2024	2,272,004.15	9/16/2024	1,377,889.89
7/16/2024	1,587,980.24	8/2/2024	1,347,606.60	8/23/2024	2,272,004.15	9/17/2024	1,377,889.89
7/17/2024	1,877,564.24	8/6/2024	2,392,380.25	8/26/2024	2,320,457.42	9/20/2024	912,284.24
7/18/2024	1,389,246.13	8/7/2024	1,741,289.42	8/27/2024	2,127,401.42	9/24/2024	1,071,271.53
7/19/2024	1,389,246.13	8/8/2024	2,381,024.01	8/28/2024	1,972,199.54	9/25/2024	919,855.06

DATE	TOTAL DAILY TAKING (L)	DATE	TOTAL DAILY TAKING (L)	DATE	TOTAL DAILY TAKING (L)	DATE	TOTAL DAILY TAKING (L)
9/26/2024	1,400,602.36	10/29/2024	1,381,675.30				
9/27/2024	946,352.95	10/30/2024	1,510,379.30				
10/1/2024	1,135,623.54	10/31/2024	643,520.00				
10/2/2024	1,287,040.01	11/1/2024	647,305.42				
10/15/2024	1,506,593.89	11/2/2024	764,653.18				
10/16/2024	1,245,400.48	11/4/2024	1,343,821.18				
10/17/2024	757,082.36	11/5/2024	1,480,096.01			-	-
10/18/2024	1,146,979.77	11/6/2024	1,559,589.66			-	-
10/21/2024	965,280.00	11/7/2024	1,461,168.95				
10/22/2024	1,298,396.24	11/8/2024	972,850.83				
10/23/2024	1,052,344.48	11/9/2024	1,143,194.36				
10/24/2024	806,292.71	11/11/2024	1,404,387.77				
10/25/2024	401,253.65						
10/26/2024	601,880.47						

Table 3: Manual Groundwater Elevations

WELL IDENTIFICATION	LOCATION (UTM NAD83)	GROUND ELEVATION (m asl)	WELL DEPTH (m bgs)	GROUNDWATER LEVEL ELEVATION (m asl)	
				HIGH	LOW
OW3-B	17T 561273E, 4886844N	504.47	12.80	493.94	491.10
OW4-A	17T 561355E, 4886425N	505.52	7.92	498.47	497.88
OW4-B	17T 561355E, 4886425N	505.52	13.72	498.16	497.48
OW5-A	17T 561738E, 4886523N	493.51	5.70	490.42	488.93
OW5-B	17T 561738E, 4886523N	493.51	10.05	492.55	489.44
OW5-C	17T 561738E, 4886520N	493.61	13.10	492.49	489.25
OW6-A	17T 561663E, 4886939N	494.13	7.80	493.28	490.87
OW7-A	17T 561771E, 4886674N	497.18	10.05	491.33	490.21
OW7-C	17T 561773E, 4886668N	496.98	30.60	492.25	489.14
OW8-A	17T 561282E, 4887057N	504.93	12.00	497.22	497.08
OW9-A	17T 561798E, 4887451N	496.51	6.40	493.51	491.39
OW10-A	17T 561632E, 4887297N	495.45	3.0	Dry	
OW10-B	17T 561632E, 4887297N	495.45	19.20	490.48	487.73
OW12-A	17T 561882E, 4887192N	495.70	7.62	493.58	492.61
OW13-A	17T 561140E, 4887598N	506.78	14.34	499.04	492.33



WELL IDENTIFICATION	LOCATION (UTM NAD83)	GROUND ELEVATION (m asl)	WELL DEPTH (m bgs)	GROUNDWATER LEVEL ELEVATION (m asl)	
				HIGH	LOW
OW13-C	17T 561140E, 4887598N	506.78	18.94	496.31	491.96
OW14-C	17T 561763E, 4887841N	496.82	20.00	483.41	480.34
OW16-C	17T 561726E, 4887993N	497.11	27.30	481.67	477.86
OW18-A	17T 561653E, 4887685N	501.21	19.80	488.90	487.66
OW18-C	17T 561653E, 4887685N	501.21	23.70	487.11	485.11
OW19-C	17T 561036E, 4888192N	510.32	35.50	484.23	482.47
OW20-C	17T 561544E, 4888333N	509.30	26.40	485.83	485.15
OW21-C	17T 561593E, 4888680N	511.41	25.30	487.67	487.17
OW22-C	17T 561384E, 4888890N	513.66	27.50	498.50	497.29
OW23-C	17T 560938E, 4888787N	510.31	29.50	497.96	496.62
DW1	17T 562951E, 4886286N	479.67	11.60	479.17	496.70
DW2	17T 562704E, 4888248N	482.36	44.80	473.81	472.43
DW3	17T 562373E, 4887677N	493.92	-	475.20	473.20
DW4	17T 562197E, 4890008N	486.02	24.40	483.33	480.50
DW5	17T 559538E, 4889095N	517.26	-	512.24	508.50



3.2.3 Groundwater Quality

To monitor groundwater conditions, representative groundwater samples were collected for the spring event on April 24 and April 25, 2024, and the fall event on September 10 to 12, 2024. A summary of the sampled locations and parameters tested are summarized in Table 4.

Table 4: Groundwater Sampling Locations and Parameters

SAMPLING EVENT	SAMPLING TYPE	LOCATIONS SAMPLED	PARAMETERS TESTED
On-Site Monitoring Wells			
April 24 and 25, 2024	Semi-Annual	OW3B, OW4A, OW4B, OW5A, OW5B, OW6A, OW7A, OW7C, OW8A, OW9A, OW10B, OW12A, OW13A, OW13C, OW14C, OW16C, OW18A, OW18C, OW19C, OW20C, OW21C, OW22C, OW23C	pH, Conductivity, Alkalinity, Bicarbonate, Chloride, Calcium, Magnesium, Potassium, Sodium, Sulphate, Nitrate, Nitrite, Phosphorus, and dissolved Metals
September 5, 10, 11, 2024	Semi-Annual	OW3B, OW4A, OW4B, OW5A, OW5B, OW6A, OW7A, OW7C, OW8A, OW9A, OW10B, OW12A, OW13A, OW13C, OW14C, OW16C, OW18A, OW18C, OW19C, OW20C, OW21C, OW22C, OW23C	pH, Conductivity, Alkalinity, Bicarbonate, Chloride, Calcium, Magnesium, Potassium, Sodium, Sulphate, Nitrate, Nitrite, Phosphorus, and dissolved Metals
	Annual	OW5A, OW6A, OW7A, OW8A, OW9A, OW10B, OW12A, OW14C, OW16C, OW18A, OW20C, OW21C	Oil and Grease, PHC (F1-F4), BTEX
Domestic Water Wells			
September 10, 2024	Domestic	DW1, DW2, DW3, DW4, DW5	pH, Conductivity, Alkalinity, Bicarbonate, Chloride, Calcium, Magnesium, Potassium, Sodium, Sulphate, Nitrate, Nitrite, Phosphorus, and dissolved Metals

Each sample was collected using dedicated waterra tubing and was placed directly into pre-cleaned laboratory supplied vials and bottles with analytical test group specific preservatives.



Dedicated nitrile gloves were used during sampling and non-dedicated equipment was sanitized between monitoring wells.

Samples were analyzed by Caduceon Environmental Laboratories (Caduceon), a CALA accredited lab, in Barrie. Groundwater chemistry results are included in the laboratory Certificates of Analysis provided in Appendix E.

The results were compared to the applicable Ontario Drinking Water Standards (ODWS) for due diligence purposes. Groundwater on-site generally met the applicable ODWS with the exception of:

- Hardness in the majority of the on-site monitors, which is typical for till and bedrock aquifers in southern Ontario.
- Nitrate in OW4A, 4B, 5A, 6A, and 8A, which are assumed to be a result of the neighboring agricultural activities.
- Nitrite in OW4A, 4B and 5A, which is assumed to be a result of the neighbouring agricultural activities.
- Aluminum in OW12A, 14C, and 18C, which is an ODWS Operational Guideline rather than an environmental or health related limit.
- Sodium in OW5A and 5B, which is assumed to be a result of the de-icing substances applied to County Road 17 located immediately to the south of these monitors.
- Manganese in OW5A, 7C, and 12A, which is an ODWS Aesthetic Objective rather than an environmental or health related limit.
- Iron in OW12A, which is typical for a bedrock aquifer in southern Ontario.
- Fluoride in OW5A, which are assumed to be a result of the neighboring agricultural activities.

The results from 2024 are comparable to the historical ranges in concentrations reported at the monitoring wells. Further, no PHCs were noted in any of the tested wells.

The domestic water wells were also sampled and the individual homeowner letters for both the spring and fall sampling events are provided in Appendix F. The groundwater was generally in compliance with the applicable Ontario Drinking Water Standards (ODWS) with the exception of hardness, which is considered typical for bedrock water wells in southern Ontario.

3.3 SURFACE WATER

Surface water levels at the four on-site monitoring locations were collected over the 2024 monitoring period, and the highest and lowest surface levels observed are summarized in Table 4.



The surface water locations are equipped with continuously recording dataloggers to allow for a detailed analysis of the water conditions at the site. This is to allow for the assessment of the seasonal trends as well as the response to local precipitation events. The data logger values have been calibrated with manual measurements and the 2024 hydrographs are provided in Appendix D.

Table 5: Surface Water Elevations

LOCATION	COORDINATES	WATER LEVEL DEPTH (m)	
		High	Low
North Pond	17T 561630E, 4887268N	493.45	491.51 (Dry)
South Pond	17T 561778E, 4887155N	492.50	491.30
SW1 (Wetland)	17T 561767E, 4887622N	100.43 ¹	99.76 ¹
SW2 (Vernal Pool)	17T 561734E, 4887538N	100.74 ¹	99.83 ¹

Note:
1. For SW1 and SW2 a relative elevation of 100 m asl was assumed in order to assess seasonal changes in the surface water levels.

3.3.1 North and South Ponds

The North Pond and South Pond were measured using a datalogger tied to a string and a tree. The logger was thrown into the middle of the pond, and not removed throughout the year to try and keep results consistent.

Generally, the surface water level trends within the North and South Ponds are seasonal, with water levels peaking in the spring and decreasing over the warmer and drier summer months. The surface water elevations at the North and South Ponds ranged from 493.45 to 491.30 m asl, with the highest surface water levels noted between April and May, due to the spring melt. The North Pond dried out in October, and dataloggers were removed in the late fall to limit damage to the devices. Hydrographs for the North and South Ponds are provided in Appendix D. Based on historical groundwater level monitoring it is assumed both the North and South Ponds are perched above the overburden aquifer.

In general, the surface water levels observed on-site in 2024 are consistent with surface water levels and trends historically observed on-site.



3.3.2 SW1 and SW2

SW1 and SW2 are located within the forested area approximately 100 m from the proposed extraction boundary for the Bonnefield Pit. Both features are perched above the water table and therefore isolated from the groundwater regime.

SW1 and SW2 were constructed by driving a steel, screened well point approximately 1 m into the ground. A steel pipe was attached to the top of this drive point so it could be easily located. These monitors are subject to freeze/thaw cycles and ice movement since they stay in all year round. As such, the data from year to year may vary slightly.

Generally, the surface water level trends at SW1 and SW2 are seasonal, with water levels peaking in the spring and decreasing over the warmer and drier summer months. The surface water elevations at SW1 and SW2 ranged from an elevation of 100.74 to 99.83 m, with the highest surface water levels noted between April and May, due to the spring melt. SW1 experienced high water levels from January to March, with sharp peaks and short duration. This is likely caused by rainfall or rapid snowmelt. SW1 and SW2 both dried out in the fall of 2024. Dataloggers were removed in the late fall to limit damage to the devices. Hydrographs for the North and South Ponds are provided in Appendix D.

In general, the surface water levels observed on-site in 2024 are consistent with surface water levels and trends historically observed on-site.

3.3.3 Surface Water Chemistry

To monitor surface conditions, representative surface water samples were collected from the North and South Pond on April 24 and September 10, 2024, and submitted for chemical analysis of pH, Conductivity, Alkalinity, Bicarbonate, Chloride, Calcium, Magnesium, Potassium, Sodium, Sulphate, Nitrate, Nitrite, Phosphorus, and dissolved Metals.

The samples were collected and placed directly into pre-cleaned laboratory supplied vials and bottles with analytical test group specific preservatives. Dedicated nitrile gloves were used during sampling.

Samples were analyzed by Caduceon, a CALA accredited lab, in Barrie. Surface water chemistry results are included in the laboratory Certificates of Analysis provided in Appendix E.

The results were compared to the applicable Provincial Water Quality Objectives (PWQO) for due diligence purposes. Surface water on-site generally met the applicable PWQO with the exception of phosphorous during the spring sampling round at both the North and South Pond. The 2024 water quality results are similar to previous years.



4 Conclusions

The compliance monitoring in support of the Bonnefield/Prince properties, Melancthon Pit #1 and Melancthon Pit #2 in 2024 was completed in accordance with the integrated monitoring plan developed for the aggregate operation and PTTW No. 3210-AKRL9C. The monitoring included surface and groundwater level monitoring and quality sampling at 25 groundwater monitoring wells, 4 surface water locations, and 5 domestic wells in 2024.

In addition, the daily water takings were monitored and recorded for submission to the MECP via the Ministry's Water Taking Reporting System.

The results of the 2024 monitoring program are summarized as follows:

- The maximum recorded water taking was 2,392,380.25 L in 2024 and the water takings remained in compliance with the conditions of PTTW No. 3210-AKRL9C;
- The overburden groundwater elevations are seasonal, peaking in the spring and decreasing over the summer months, and the 2024 monitoring results are consistent with historic trends;
- The bedrock/till groundwater elevations show muted seasonal trends, with highs in the spring followed by slight declines through the summer, and the 2024 monitoring results are consistent with historic trends;
- The groundwater quality on-site generally met the applicable ODWQS with a few noted exceptions, however, the 2024 results are comparable to the historic trends and no PHCs were noted in any of the tested wells;
- The water levels in the north and south ponds varied seasonally over the year, with highs in the spring and drying out in the summer or fall, and the 2024 monitoring results are consistent with historic trends;
- The water levels at SW1 and SW2 varied seasonally in 2024, with highs in the spring and drying out in the fall. SW1 experienced sharp peaks in water level from January to March, likely caused by precipitation or rapid snowmelt. The 2024 monitoring results are consistent with the historic trends; and
- The surface water quality on-site generally met the applicable PWQO, with the exception of phosphorous in the north and south pond during the spring sampling round, but the results are consistent with trends.

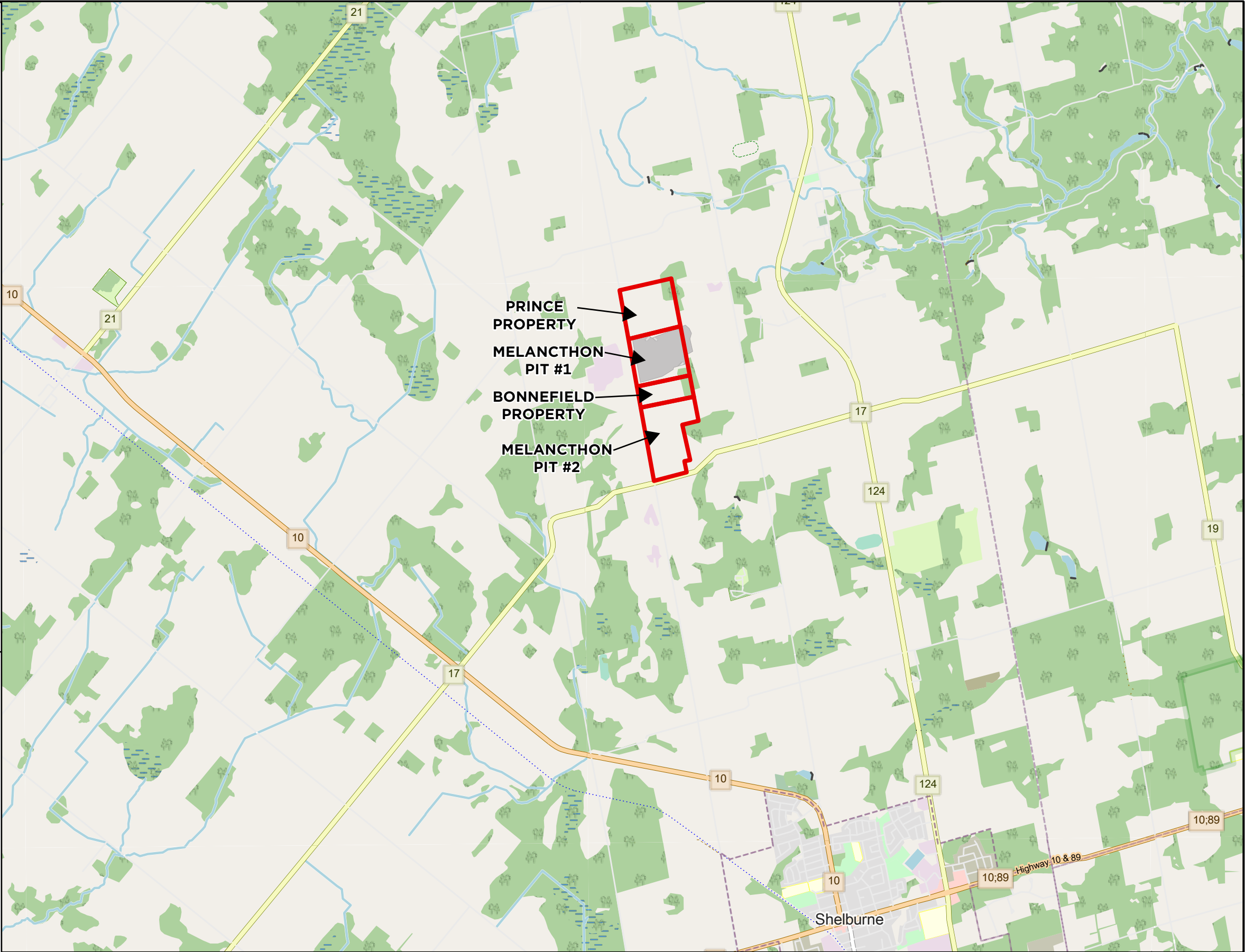




NOTES:
1. COORDINATE SYSTEM: NAD 1983 UTM
ZONE 17N
2. CONTAINS INFORMATION LICENSED
UNDER THE OPEN GOVERNMENT LICENSE -
ONTARIO.

LEGEND

 SITE



**STRADA PIT, SHELBURNE
ANNUAL COMPLIANCE REPORT
SITE LOCATION PLAN**

DWG. No.
FIG-1

SCALE: 1:50,000 DRAWN: AO DATE: MAR. 2025 JOB NO. 123016

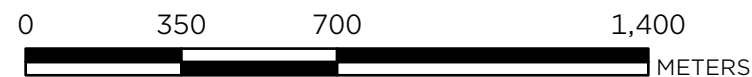
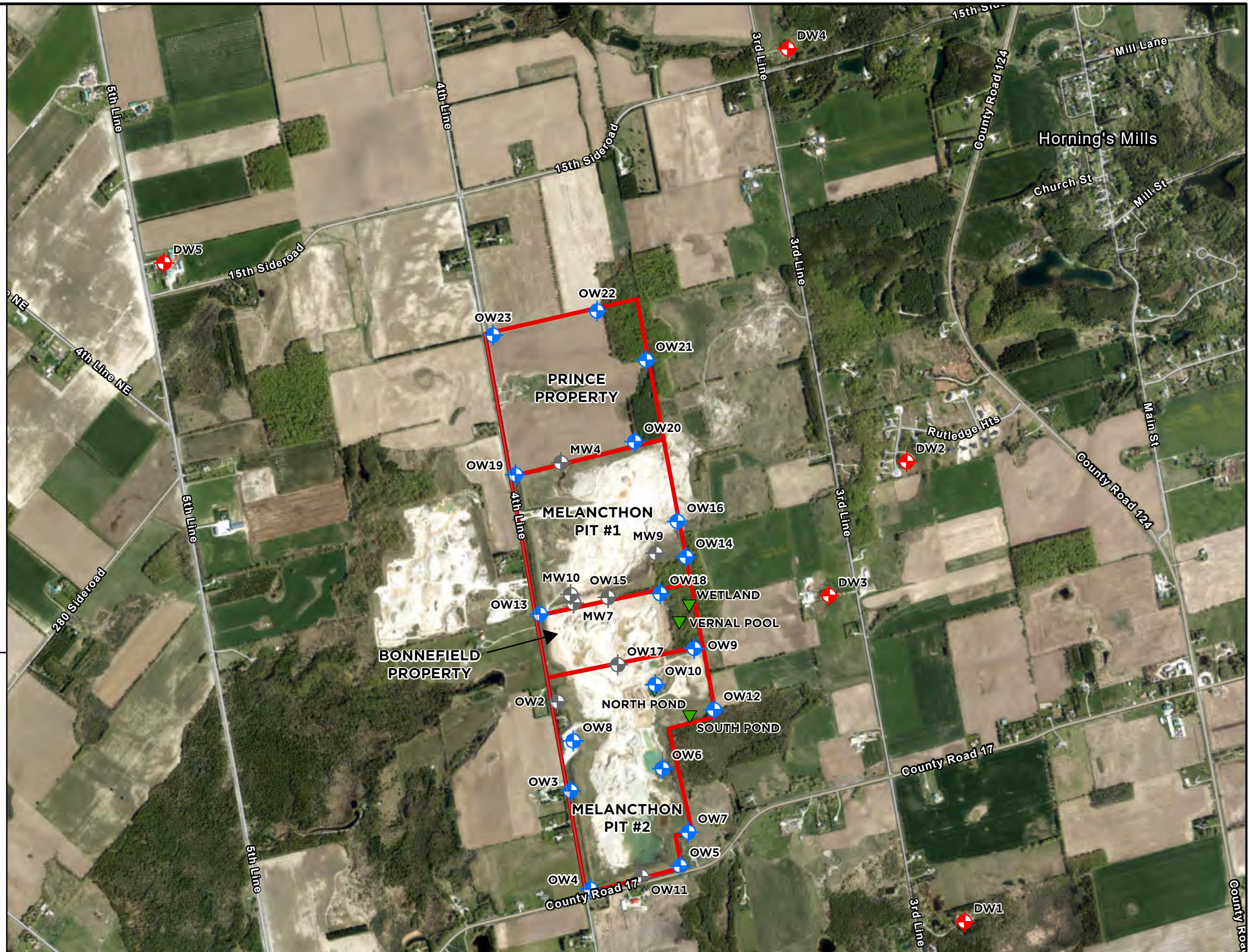


NOTES:

1. COORDINATE SYSTEM: NAD 1983 UTM ZONE 17N
2. CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENSE - ONTARIO.

LEGEND

- SITE
- MONITORING WELL LOCATIONS
- DOMESTIC WELLS
- DESTROYED WELLS
- SURFACE WATER LOCATIONS



**STRADA PIT, SHELBURNE
ANNUAL COMPLIANCE REPORT
GROUNDWATER AND SURFACE
WATER MONITORING LOCATIONS**

DWG. No.

FIG-2

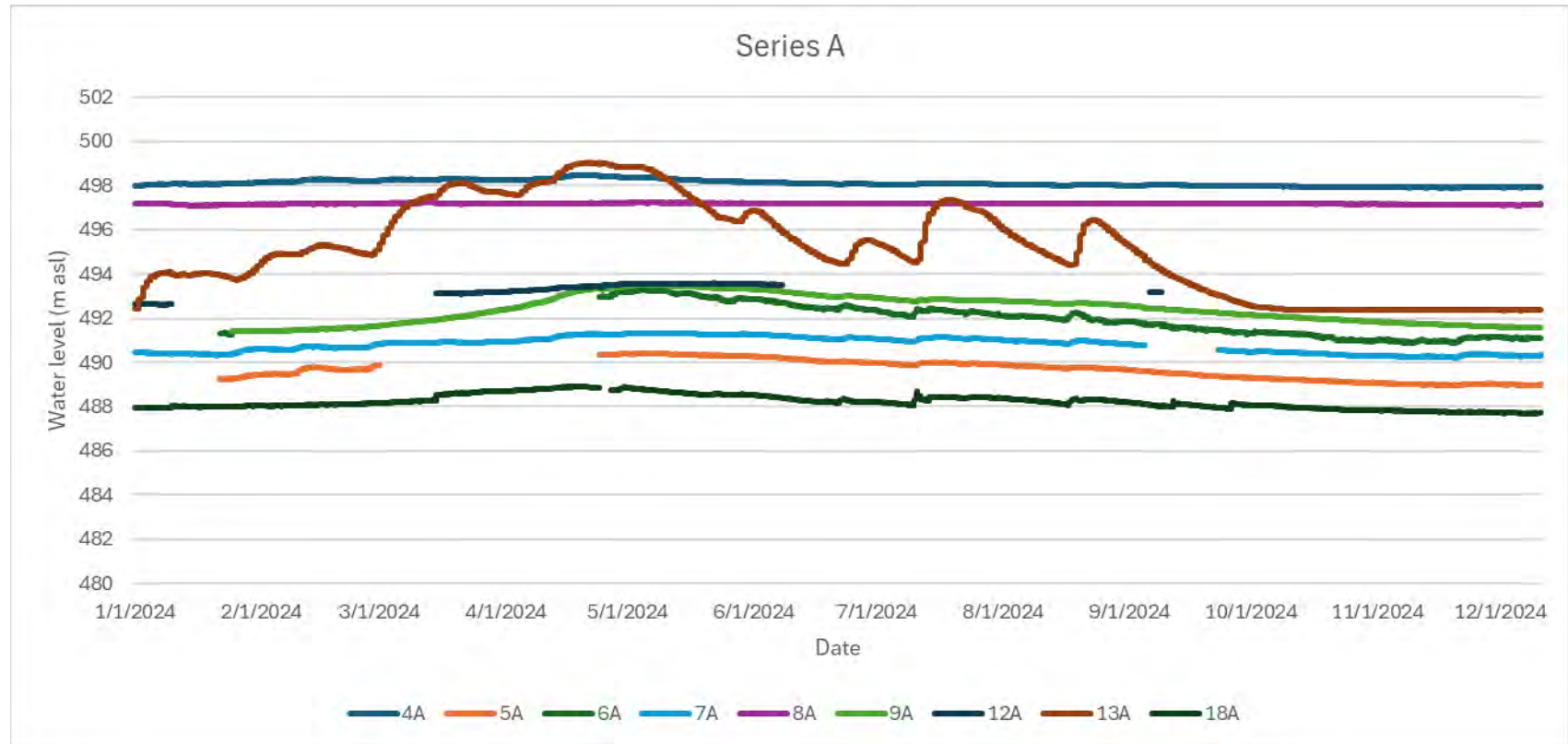
SCALE: 1:17,000

DRAWN: AO

DATE: MAR. 2025

JOB NO. 123016

Figure 3: Series A 2024 groundwater levels

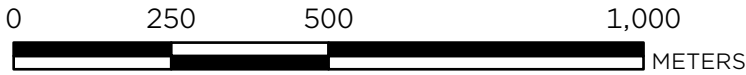
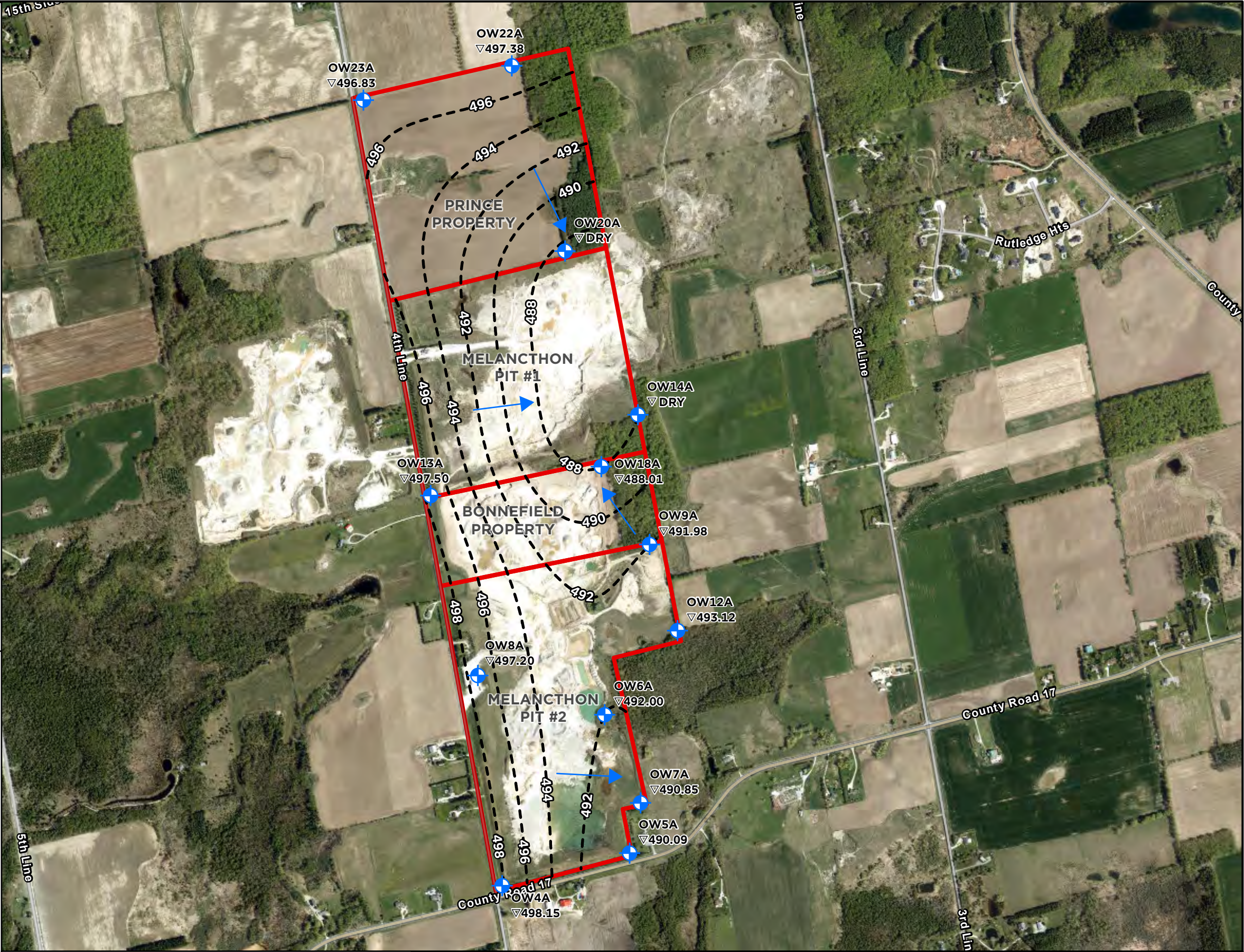




NOTES:
1. COORDINATE SYSTEM: NAD 1983 UTM
ZONE 17N
2. CONTAINS INFORMATION LICENSED
UNDER THE OPEN GOVERNMENT LICENSE -
ONTARIO.

LEGEND

- SITE
- MARCH MONITORING WELLS -
SHALLOW
- GROUNDWATER CONTOUR
- GROUNDWATER FLOW DIRECTION
- GROUNDWATER ELEVATION
(TAKEN MARCH 2024)



**STRADA PIT, SHELBURNE
ANNUAL COMPLIANCE REPORT
GROUNDWATER CONTOUR MARCH 2024
SHALLOW WELLS**

SCALE: 1:12,000 DRAWN: AO DATE: MAR. 2025 JOB NO. 123016

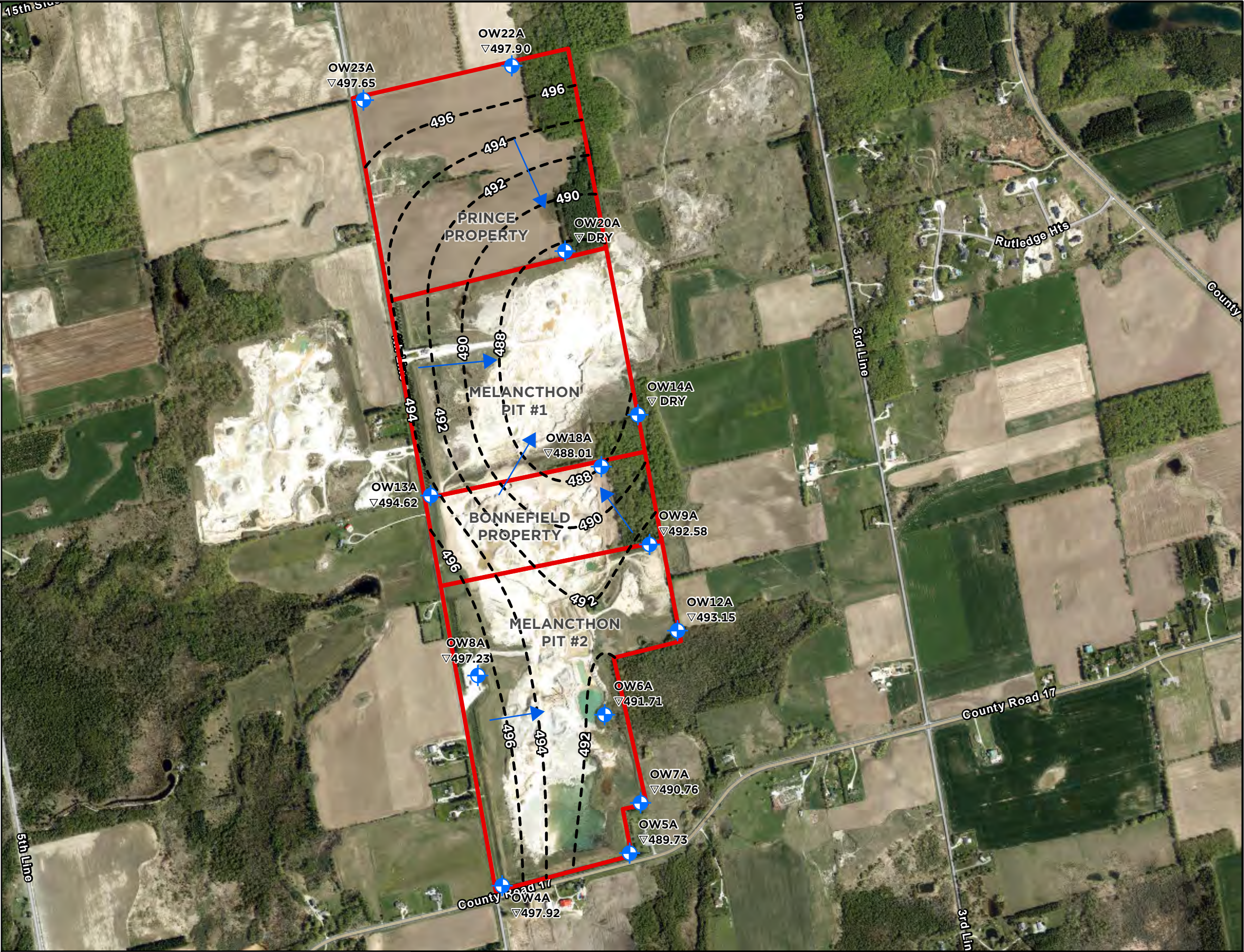
DWG. No.
FIG-4



NOTES:
1. COORDINATE SYSTEM: NAD 1983 UTM
ZONE 17N
2. CONTAINS INFORMATION LICENSED
UNDER THE OPEN GOVERNMENT LICENSE -
ONTARIO.

LEGEND

- SITE
- SEPTEMBER MONITORING WELLS
- SHALLOW
- GROUNDWATER CONTOUR
- GROUNDWATER FLOW DIRECTION
- GROUNDWATER ELEVATION
(TAKEN SEPTEMBER 2024)



		STRADA PIT, SHELBURNE ANNUAL COMPLIANCE REPORT GROUNDWATER CONTOUR SEPTEMBER 2024 SHALLOW WELLS			DWG. No. FIG-5
		SCALE: 1:12,000	DRAWN: AO	DATE: MAR. 2025	JOB NO. 123016

Figure 6: Series B 2024 groundwater levels

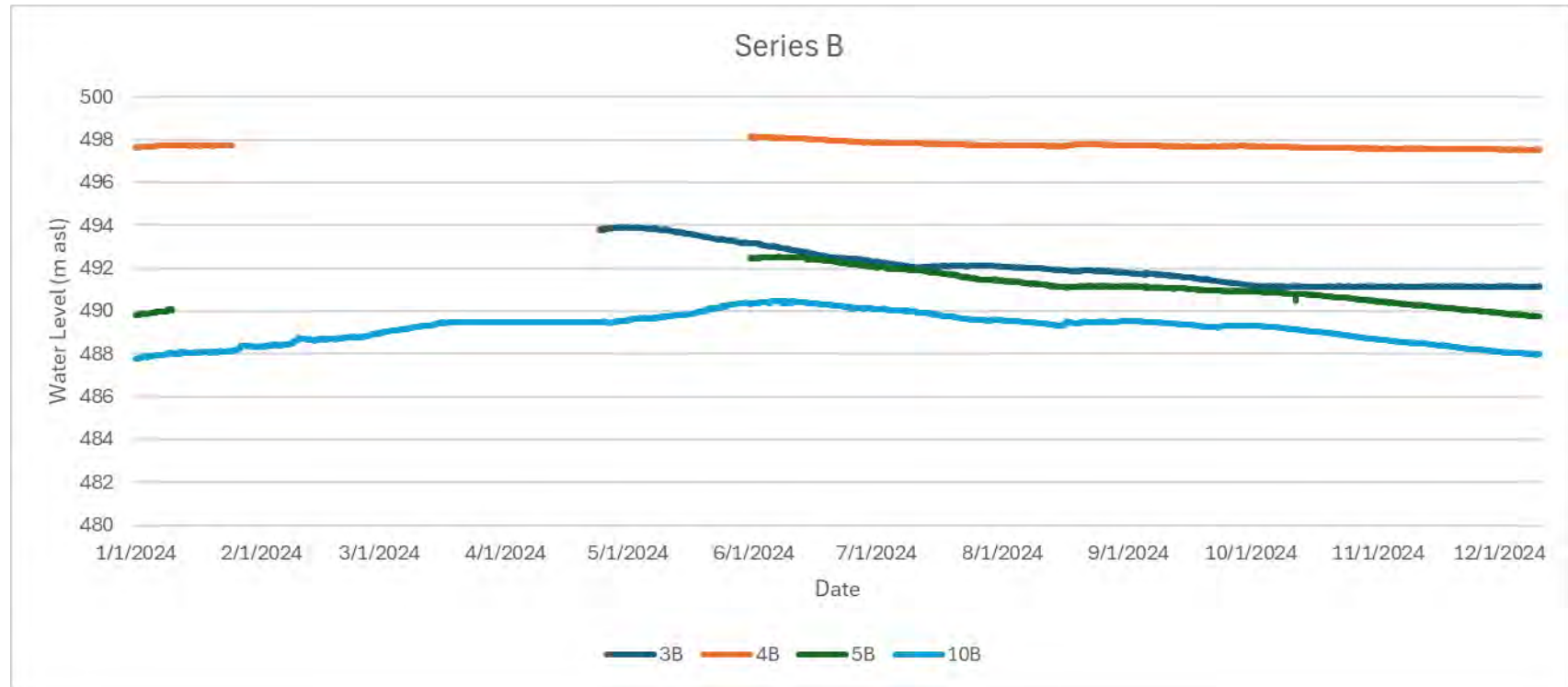
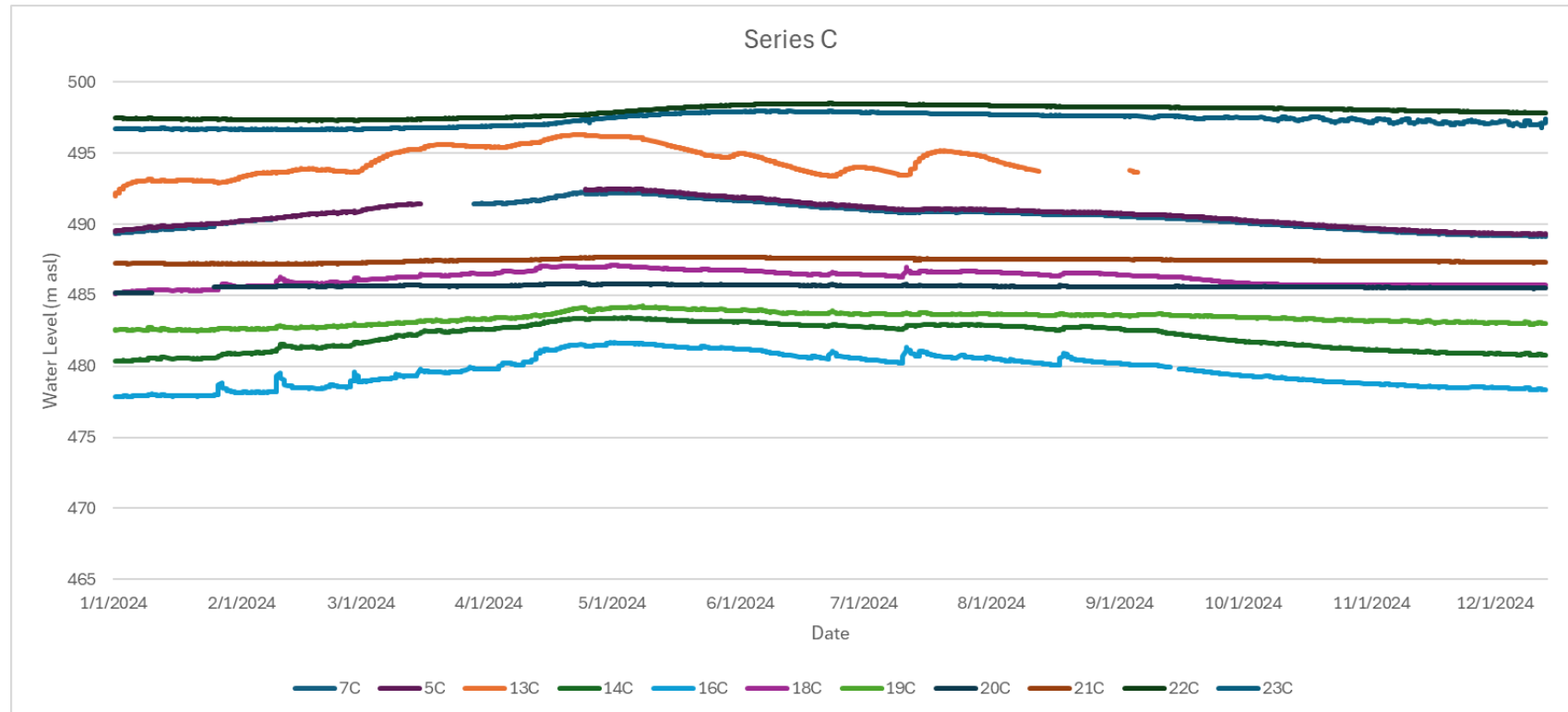


Figure 7: Series C 2024 groundwater levels

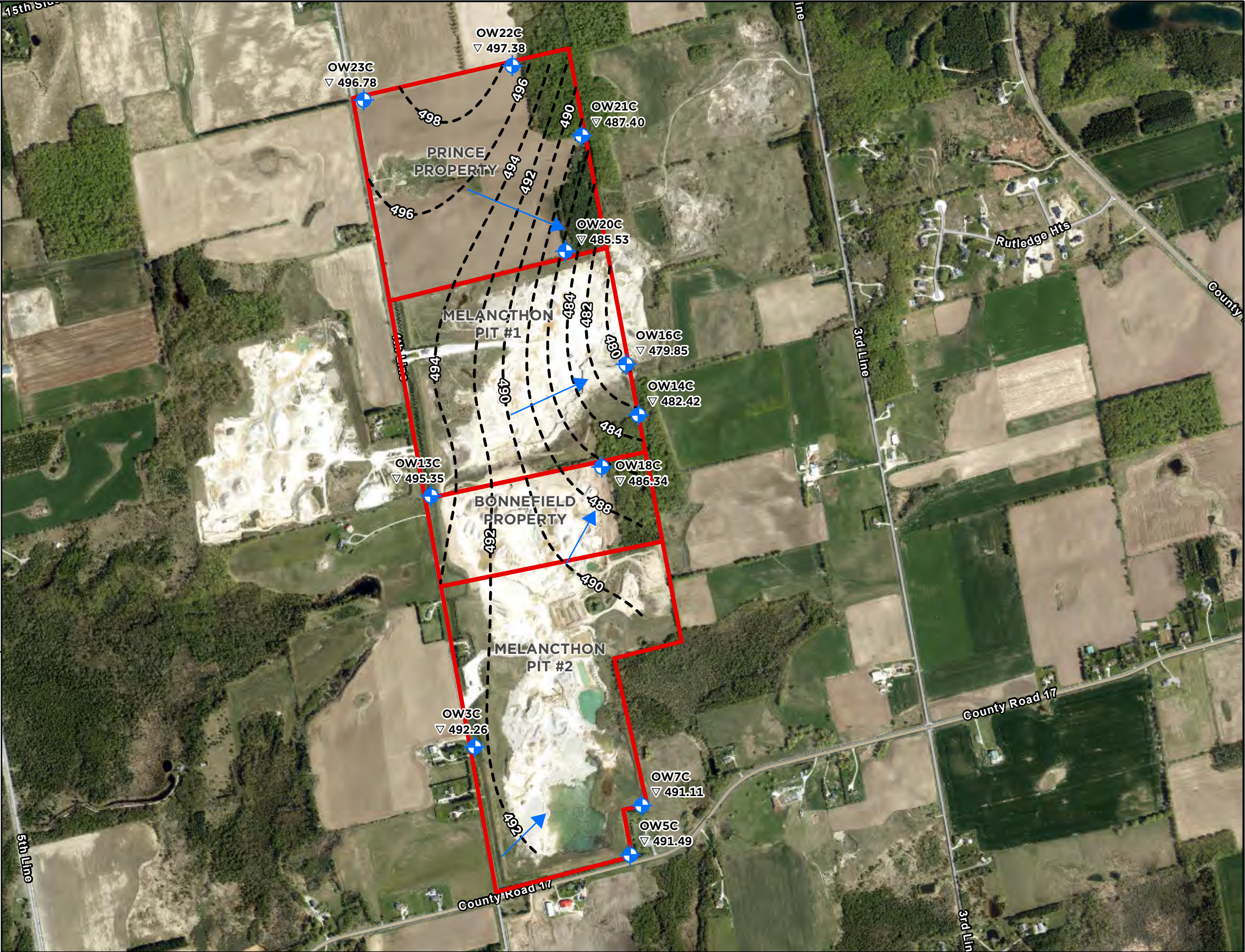




NOTES:
1. COORDINATE SYSTEM: NAD 1983 UTM
ZONE 17N
2. CONTAINS INFORMATION LICENSED
UNDER THE OPEN GOVERNMENT LICENSE -
ONTARIO.

LEGEND

- SITE
- MARCH MONITORING WELLS -
DEEP
- GROUNDWATER CONTOUR
- GROUNDWATER FLOW DIRECTION
- GROUNDWATER ELEVATION
(TAKEN MARCH 2024)

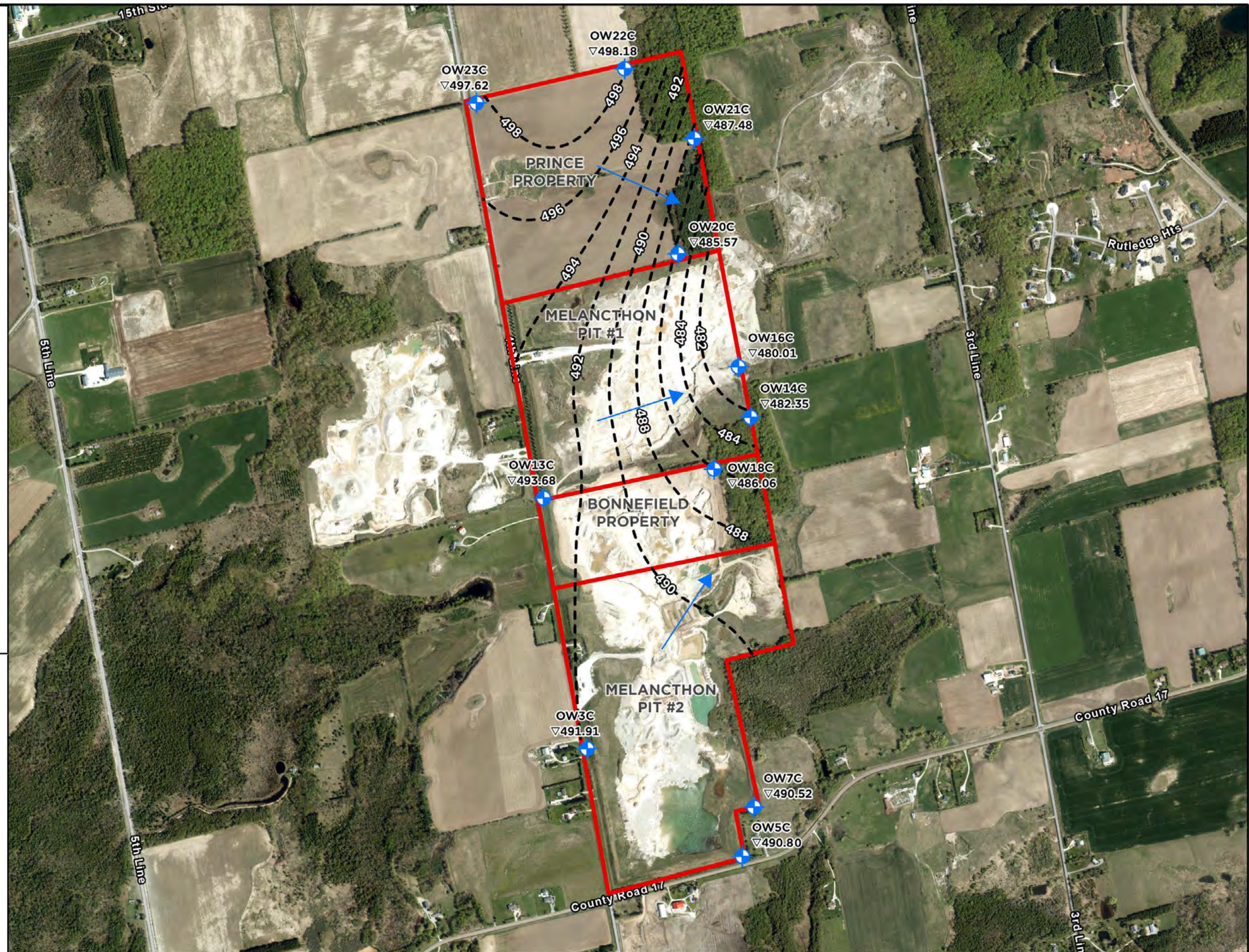


		STRADA PIT, SHELBURNE ANNUAL COMPLIANCE REPORT GROUNDWATER CONTOUR MARCH 2024 DEEP WELLS			DWG. No. FIG-8
		SCALE: 1:12,000	DRAWN: AO	DATE: MAR. 2025	JOB NO. 123016

NOTES:
1. COORDINATE SYSTEM: NAD 1983 UTM
ZONE 17N
2. CONTAINS INFORMATION LICENSED
UNDER THE OPEN GOVERNMENT LICENSE -
ONTARIO.

LEGEND

- ▮ SITE
- ⊕ SEPTEMBER MONITORING WELLS
- DEEP
- GROUNDWATER CONTOUR
- ➔ GROUNDWATER FLOW DIRECTION
- ▽ GROUNDWATER ELEVATION
(TAKEN SEPTEMBER 2024)



0 250 500 1,000
METERS

TATHAM
ENGINEERING

STRADA PIT, SHELBURNE
ANNUAL COMPLIANCE REPORT
GROUNDWATER CONTOUR SEPTEMBER 2024
DEEP WELLS

SCALE: 1:12,000 DRAWN: AO DATE: MAR. 2025

DWG. No.
FIG-9
JOB NO. 123016

Appendix A: PTTW

PERMIT TO TAKE WATER

Ground Water

NUMBER 3210-AKRL9C

Pursuant to Section 34.1 of the Ontario Water Resources Act, R.S.O. 1990 this Permit To Take Water is hereby issued to:

Strada Aggregates Inc.
30 Floral Parkway
Vaughan, Ontario
L4K 4R1

For the water taking from: Shelburne South Pit - Wash Pond

Located at: Lot 11 and 12, Concession 3, Geographic Township of Melancthon
Melancthon, County of Dufferin

For the purposes of this Permit, and the terms and conditions specified below, the following definitions apply:

DEFINITIONS

- (a) "Director" means any person appointed in writing as a Director pursuant to section 5 of the OWRA for the purposes of section 34.1, OWRA.
- (b) "Provincial Officer" means any person designated in writing by the Minister as a Provincial Officer pursuant to section 5 of the OWRA.
- (c) "Ministry" means Ontario Ministry of the Environment and Climate Change.
- (d) "District Office" means the Guelph District Office.
- (e) "Permit" means this Permit to Take Water No. 3210-AKRL9C including its Schedules, if any, issued in accordance with Section 34.1 of the OWRA.
- (f) "Permit Holder" means Strada Aggregates Inc..
- (g) "OWRA " means the *Ontario Water Resources Act*, R.S.O. 1990, c. O. 40, as amended.

You are hereby notified that this Permit is issued subject to the terms and conditions outlined below:

TERMS AND CONDITIONS

1. Compliance with Permit

- 1.1 Except where modified by this Permit, the water taking shall be in accordance with the application for this Permit To Take Water, dated September 18, 2016 and signed by Grant C. Horan, and all Schedules included in this Permit.
- 1.2 The Permit Holder shall ensure that any person authorized by the Permit Holder to take water under this Permit is provided with a copy of this Permit and shall take all reasonable measures to ensure that any such person complies with the conditions of this Permit.
- 1.3 Any person authorized by the Permit Holder to take water under this Permit shall comply with the conditions of this Permit.
- 1.4 This Permit is not transferable to another person.
- 1.5 This Permit provides the Permit Holder with permission to take water in accordance with the conditions of this Permit, up to the date of the expiry of this Permit. This Permit does not constitute a legal right, vested or otherwise, to a water allocation, and the issuance of this Permit does not guarantee that, upon its expiry, it will be renewed.
- 1.6 The Permit Holder shall keep this Permit available at all times at or near the site of the taking, and shall produce this Permit immediately for inspection by a Provincial Officer upon his or her request.
- 1.7 The Permit Holder shall report any changes of address to the Director within thirty days of any such change. The Permit Holder shall report any change of ownership of the property for which this Permit is issued within thirty days of any such change. A change in ownership in the property shall cause this Permit to be cancelled.

2. General Conditions and Interpretation

- 2.1 Inspections
The Permit Holder must forthwith, upon presentation of credentials, permit a Provincial Officer to carry out any and all inspections authorized by the OWRA, the *Environmental Protection Act*, R.S.O. 1990, the *Pesticides Act*, R.S.O. 1990, or the *Safe Drinking Water Act*, S. O. 2002.
- 2.2 Other Approvals
The issuance of, and compliance with this Permit, does not:
 - (a) relieve the Permit Holder or any other person from any obligation to comply with any other applicable legal requirements, including the provisions of the *Ontario Water Resources Act*, and the *Environmental Protection Act*, and any regulations made thereunder; or
 - (b) limit in any way any authority of the Ministry, a Director, or a Provincial Officer, including the authority to require certain steps be taken or to require the Permit Holder to furnish any further information related to this Permit.

2.3 Information

The receipt of any information by the Ministry, the failure of the Ministry to take any action or require any person to take any action in relation to the information, or the failure of a Provincial Officer to prosecute any person in relation to the information, shall not be construed as:

(a) an approval, waiver or justification by the Ministry of any act or omission of any person that contravenes this Permit or other legal requirement; or

(b) acceptance by the Ministry of the information's completeness or accuracy.

2.4 Rights of Action

The issuance of, and compliance with this Permit shall not be construed as precluding or limiting any legal claims or rights of action that any person, including the Crown in right of Ontario or any agency thereof, has or may have against the Permit Holder, its officers, employees, agents, and contractors.

2.5 Severability

The requirements of this Permit are severable. If any requirements of this Permit, or the application of any requirements of this Permit to any circumstance, is held invalid or unenforceable, the application of such requirements to other circumstances and the remainder of this Permit shall not be affected thereby.

2.6 Conflicts

Where there is a conflict between a provision of any submitted document referred to in this Permit, including its Schedules, and the conditions of this Permit, the conditions in this Permit shall take precedence.

3. **Water Takings Authorized by This Permit**

3.1 **Expiry**

This Permit expires on **March 31, 2027**. No water shall be taken under authority of this Permit after the expiry date.

3.2 Amounts of Taking Permitted

The Permit Holder shall only take water from the source, during the periods and at the rates and amounts of taking specified in Table A. Water takings are authorized only for the purposes specified in Table A.

Table A

	Source Name / Description:	Source: Type:	Taking Specific Purpose:	Taking Major Category:	Max. Taken per Minute (litres):	Max. Num. of Hrs Taken per Day:	Max. Taken per Day (litres):	Max. Num. of Days Taken per Year:	Zone/ Easting/ Northing:
1	Wash Pond	Pond Dugout	Aggregate Washing	Industrial	4,000	10	2,400,000	230	17 561589 4887164
						Total Taking:	2,400,000		

- 3.3 Water taking under the authorization of this Permit shall only occur to a maximum of 230 days between April 1 and November 16 of each year from date of issue to March 31, 2027.
- 3.4 This Permit is issued for the sole purpose of washing gravel in a closed loop system where the majority of the water is recirculated and does not include dust suppression.
- 3.5 Prior to taking of water under this Permit, the Permit Holder shall ensure that any and all applicable permits or authorizations are obtained from Federal and Provincial Agencies having legislative mandates in water resources management.

4. Monitoring

- 4.1 Under section 9 of O. Reg. 387/04, and as authorized by subsection 34(6) of the *Ontario Water Resources Act*, the Permit Holder shall, on each day water is taken under the authorization of this Permit, record the date, the volume of water taken on that date and the rate at which it was taken. The daily volume of water taken shall be measured by a flow meter or calculated in accordance with the method described in the application for this Permit, or as otherwise accepted by the Director. The Permit Holder shall keep all records required by this condition current and available at or near the site of the taking and shall produce the records immediately for inspection by a Provincial Officer upon his or her request. The Permit Holder, unless otherwise required by the Director, shall submit, on or before March 31st in every year, the records required by this condition to the ministry's Water Taking Reporting System.
- 4.2 The Permit Holder shall monitor water levels at the following monitoring points as described below:

Well No. /Pond Name	Water Level Elevations	
	Continuous Datalogger (4-hour intervals)	Monthly Manuals

Wash Pond (during unfrozen conditions)	X	X
OW2-A	X	X
OW2-B	X	X
OW2-C	X	X
OW3-A	X	X
OW3-B	X	X
OW4-A	X	X
OW4-B	X	X
OW4-C	X	X
OW5-A	X	X
OW5-B	X	X
OW5-C	X	X
OW6-A	X	X
OW7-A	X	X
OW7-C	X	X
OW8-A	X	X
OW8-B	X	X
OW9-A	X	X
OW10-A	X	X
OW10-B	X	X
OW11-A	X	X
OW11-C	X	X
OW12-A	X	X
OW13-A	X	X
North Pond	X	X
South Pond	X	X

- 4.3 The Permit Holder shall submit to the Director by March 31, 2019, a report with the monitoring data collected under Sections 4.1 and 4.2 of this Permit during the first two years of the aggregate washing operation, along with its interpretation; the report should include an assessment of the impact of the water taking, if any, on the surface water features (wetland) adjacent to the Wash Pond. The report should also include recommendations on modifications to the water taking and/or to the monitoring program as described in this Permit.

5. Impacts of the Water Taking

5.1 Notification

The Permit Holder shall immediately notify the local District Office of any complaint arising from the taking of water authorized under this Permit and shall report any action which has been taken or is proposed with regard to such complaint. The Permit Holder shall immediately notify the local District Office if the taking of water is observed to have any significant impact on the surrounding waters. After hours, calls shall be directed to the Ministry's Spills Action Centre at 1-800-268-6060.

5.2 For Groundwater Takings

If the taking of water is observed to cause any negative impact to other water supplies obtained from any adequate sources that were in use prior to initial issuance of a Permit for this water taking, the Permit Holder shall take such action necessary to make available to those affected, a supply of water equivalent in quantity and quality to their normal takings, or shall compensate such persons for their reasonable costs of so doing, or shall reduce the rate and amount of taking to prevent or alleviate the observed negative impact. Pending permanent restoration of the affected supplies, the Permit Holder shall provide, to those affected, temporary water supplies adequate to meet their normal requirements, or shall compensate such persons for their reasonable costs of doing so.

If permanent interference is caused by the water taking, the Permit Holder shall restore the water supplies of those permanently affected.

6. Director May Amend Permit

The Director may amend this Permit by letter requiring the Permit Holder to suspend or reduce the taking to an amount or threshold specified by the Director in the letter. The suspension or reduction in taking shall be effective immediately and may be revoked at any time upon notification by the Director. This condition does not affect your right to appeal the suspension or reduction in taking to the Environmental Review Tribunal under the *Ontario Water Resources Act* , Section 100 (4).

The reasons for the imposition of these terms and conditions are as follows:

1. Condition 1 is included to ensure that the conditions in this Permit are complied with and can be enforced.
2. Condition 2 is included to clarify the legal interpretation of aspects of this Permit.
3. Conditions 3 through 6 are included to protect the quality of the natural environment so as to safeguard the ecosystem and human health and foster efficient use and conservation of waters. These conditions allow for the beneficial use of waters while ensuring the fair sharing, conservation and sustainable use of the waters of Ontario. The conditions also specify the water takings that are authorized by this Permit and the scope of this Permit.

*In accordance with Section 100 of the Ontario Water Resources Act, R.S.O. 1990, you may by written notice served upon me, the Environmental Review Tribunal and the Environmental Commissioner, **Environmental Bill of Rights**, R.S.O. 1993, Chapter 28, within 15 days after receipt of this Notice, require a hearing by the Tribunal. The Environmental Commissioner will place notice of your appeal on the Environmental Registry. Section 101 of the Ontario Water Resources Act, as amended provides that the Notice requiring a hearing shall state:*

1. The portions of the Permit or each term or condition in the Permit in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

In addition to these legal requirements, the Notice should also include:

- a. The name of the appellant;
- b. The address of the appellant;
- c. The Permit to Take Water number;
- d. The date of the Permit to Take Water;
- e. The name of the Director;
- f. The municipality within which the works are located;

This notice must be served upon:

*The Secretary
Environmental Review Tribunal
655 Bay Street, 15th Floor
Toronto ON
M5G 1E5
Fax: (416) 326-5370
Email:
ERTTribunalsecretary@ontario.ca*

AND

*The Environmental Commissioner
1075 Bay Street
6th Floor, Suite 605
Toronto, Ontario M5S 2W5*

AND

*The Director, Section 34.1,
Ministry of the Environment and
Climate Change
12th Floor
119 King St W
Hamilton ON L8P 4Y7
Fax: (905) 521-7820*

Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal:

by Telephone at

(416) 212-6349

Toll Free 1(866) 448-2248

by Fax at

(416) 326-5370

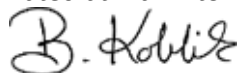
Toll Free 1(844) 213-3474

by e-mail at

www.ert.gov.on.ca

*This instrument is subject to Section 38 of the **Environmental Bill of Rights** that allows residents of Ontario to seek leave to appeal the decision on this instrument. Residents of Ontario may seek to appeal for 15 days from the date this decision is placed on the Environmental Registry. By accessing the Environmental Registry, you can determine when the leave to appeal period ends.*

Dated at Hamilton this 8th day of May, 2017.



Belinda Koblik

Director, Section 34.1

Ontario Water Resources Act , R.S.O. 1990

Schedule A

This Schedule "A" forms part of Permit To Take Water 3210-AKRL9C, dated May 8, 2017.

1. Hydrogeological Assessment in Support an OWRA Sec 34 PTTW, Shelburne South Pit, dated December, 2016, prepared by Whitewater Hydrogeology Ltd. for Strada Aggregates.
2. 2016 Compliance Groundwater Monitoring Report, Shelburne South Pit, dated January 2017, prepared by Whitewater Hydrogeology Ltd. for Strada Aggregates.

Appendix B: Integrated Monitoring Plan

Strada Aggregates Melancthon Pits – Integrated Monitoring Plan

February 2018

Background

The Strada Melancthon Pits consist of:

- Pit #1 (Licence # 129167) located at West Half of Lot 13, Concession 3 O.S., licenced in 2004;
- Pit #2 (Licence # 625155) located at West Half of Part Lot 11 and 12, Concession 3 O.S., licenced in 2012; and
- The proposed Bonnefield and Prince extension lands located at Part of West Half of Lots 12 and 14, Concession 3 O.S.

The proposed Prince and Bonnefield extensions will be fully integrated with existing aggregate operations at Melancthon Pits #1 and #2. The existing operations require monitoring and annual reporting with respect to the water table, water quality and the natural environment. Hydrogeological and natural environment investigations for the proposed extension have recommended expansion of the monitoring programs to include the additional lands. The Ministry of Natural Resources and Forestry (MNRF) has requested an Integrated Monitoring Plan to consolidate the existing and proposed monitoring requirements.

Natural Environment

Amphibian Monitoring

Annual monitoring of the wetlands for the presence of breeding amphibians was originally recommended in the Level 2 Natural Environment Assessment (NEA) report for Melancthon Pit #2, as well as surface and groundwater monitoring to assess water level fluctuations (NRSI 2010). The implementation of an amphibian monitoring program was further requested by the Nottawasaga Valley Conservation Authority (NVCA) and Michalski Nielson in their review of the Level 2 NEA report.

NRSI has undertaken annual amphibian monitoring at the wetlands located adjacent to Melancthon Pit #2 since 2013. Initial amphibian call surveys were undertaken in 2009.

Of the two proposed pit areas, only the Bonnefield Pit property contains wetland habitat (outside the extraction area). Surveys completed in 2016 recorded the presence of breeding amphibians. To ensure that the proposed pit does not negatively impact the wetland and its amphibian breeding habitat function it was recommended that the existing amphibian monitoring program for Melancthon Pit #2 be expanded to include the Bonnefield Pit to maximize efficiencies, and achieve consistency in methodology and data comparability.

Annual amphibian call surveys that were initiated at Melancthon Pit #2 will continue for the duration of the lifespan of the pit, as was originally proposed. Beginning in 2018, NRSI will initiate annual monitoring of the Bonnefield property wetland which will also be undertaken for the lifespan of that pit. Annual monitoring of the Bonnefield Pit wetland will build on NRSI's 2016 amphibian call surveys on the property

to inform the NEA report. See **Map 1** for the location of the existing monitoring stations at Melancthon Pit #2 in addition to the single monitoring station at the Bonnefield Pit wetland. Since no amphibian calling activity was documented within the Bonnefield property vernal pool during 2016 surveys, despite the presence of standing water, additional long-term monitoring of the vernal pool is not included in this plan. However, if amphibian calling activity is heard within the vernal pool during future monitoring years, an additional monitoring station will be established at this location and will be monitored annually.

Proposed monitoring at the Bonnefield Pit wetland will document additional baseline data on breeding amphibian species presence and relative abundance prior to aggregate extraction, followed by multiple years of operational-stage monitoring. As has been completed for Melancthon Pit #2, long-term data will be collected to identify trends or other indicators that will be used to assess any negative occurrences to amphibian breeding activity that may be the result of pit activities. The amphibian survey data collected at the Bonnefield and Melancthon Pit #2 sites will also be compared to look for spatial trends, or any similarities or differences in survey results over time that may indicate presence of localized or widespread pit operation effects.

In accordance with survey methodology completed to date, the monitoring program will utilize the Marsh Monitoring Program methodology (BSC 2009), which records amphibian call activity during 3-minute call counts. Counts will be conducted once per month during each of April, May and June in conjunction with appropriate night time air temperatures and wind speeds. If the provincial Species of Conservation Concern Western Chorus Frog (*Pseudacris triseriata*) is detected during any monitoring event, additional monitoring events may be added to fully document the abundance and distribution of this species within the surveyed wetlands.

A brief summary report, combining the results collected from the Melancthon Pit #2 site with the Bonnefield Pit site, will be prepared each year which outlines the findings of the annual monitoring. This will include an assessment of the surface water and groundwater monitoring data to be collected by Whitewater Hydrogeology within both properties (Whitewater Hydrogeology 2017) as it relates to amphibian breeding conditions. Each annual report will be provided to Strada for their review, and then to the NVCA and the Township of Melancthon.

Woodland Buffer

The deciduous woodland communities within the Bonnefield and Prince extension lands will be retained outside the proposed limit of extraction. 10 metre woodland buffers have been recommended to protect these features and mitigate impacts from adjacent extraction activities. The woodland buffers will be allowed to re-naturalize and will be supplemented with targeted native species plantings.

The woodland buffers will be inspected during pit operations to ensure disturbances are not occurring. The health and survival of buffer planting will also be inspected.

Hydrogeology

Compliance groundwater and surface water monitoring has been occurring at both Melancthon Pit #1 and #2 since 2001 and 2007, respectively. In addition, baseline groundwater monitoring commenced in

2017 at the Bonnefield and Prince properties. In total, there are currently 28 groundwater well nests that monitor 52 discrete aquifer intervals in the overburden and bedrock aquifers. The Melancthon Pit #1 and #2 groundwater monitoring programs were developed to characterize the local groundwater conditions at each individual property and were based on two operating pits (two scale houses, two fuel storage areas, and multiple crushing and processing operations). The proposed licensing of the Bonnefield and Prince properties provides an opportunity to not only streamline operations by eliminating the need to operate as individual pits but to develop a revised groundwater monitoring program. The revision would remove redundancies in the monitoring network and reporting allowing for an opportunity to complete an accumulative impact assessment from the Strada properties.

The revised groundwater monitoring program is shown on **Map 2**. The revised program consists of 22 groundwater well nests that monitor 36 discrete aquifer intervals in the overburden and bedrock aquifers.

The proposed program focuses on the on going monitoring of background conditions (up gradient locations) in both the overburden and bedrock aquifers and the monitoring of potential influences from the aggregate operation on down gradient locations. The proposed groundwater monitoring program is provided in **Table 1**. Selected up gradient and down gradient wells will be sampled for water quality. The water quality parameters for the semi annual (spring and fall) and annual (spring) sampling programs are provided in **Table 2**.

Surface water elevation monitoring has been on-going at the North and South Ponds (Map 2), since 2007. Two additional surface water monitoring stations to monitor the hydro-period in the wetland and vernal pool (Map 2) will commence in 2018. This monitoring will consist of the collection of continuous water level data during non-frozen conditions. Data will be assessed in conjunction with the groundwater monitoring data as part of the annual reporting requirement.

Table 1 – Proposed Groundwater Monitoring Network

Well ID	Water Levels	Water Quality	
	Monthly Manual Water	Semi-Annual	Annual
OW2-A	X	X	
OW2-B	X	X	
OW3-B	X	X	
OW4-A	X	X	
OW4-B	X	X	
OW5-A	X	X	X
OW5-B	X	X	
OW6-A	X	X	X
OW7-A	X	X	X
OW7-B	X	X	
OW8-A	X	X	X
OW9-A	X	X	X
OW10-A	X	X	X
OW11-A	X	X	X
OW11-B	X	X	
OW12-A	X	X	X

Well ID	Water Levels	Water Quality	
	Monthly Manual Water	Semi-Annual	Annual
OW13-A	X	X	
OW13-B	X	X	
OW14-B	X	X	X
OW15-B	X		
OW16-B	X	X	X
OW17-A	X		
OW17-B	X		
OW18-A	X	X	X
OW18-B	X	X	
OW19-A	X		
OW19-B	X	X	
OW20-B	X	X	X
OW21-B	X	X	x
OW22-B	X	X	
OW23-B	X	X	

Note: the collection of continuous water levels at selected groundwater monitoring locations is recommended.

Table 2 – Proposed Water Quality Parameters

Semi-Annual Groundwater Quality Parameters	Annual Groundwater Quality Parameters
General Water Quality Parameters: pH, Conductivity, Alkalinity, Bicarbonate, Chloride, Calcium, Magnesium, Potassium, Sodium, Sulphate, Nitrate, Nitrite, Phosphorous, and Metals (dissolved).	Total Petroleum Hydrocarbons (F1-F4) BTEX, Total Oil and Grease

It is recommended that a single annual groundwater monitoring report for the Melancthon Pits #1 and 2, as well as the proposed Bonnefield and Prince Pits be prepared and submitted to the MNRF, Township of Melancthon and NVCA prior to March 31st of each year and include the monitoring data for the 12 month period ending December 31st of the previous year. The report shall include, but not be limited to, the following:

1. Monitoring data collected as per Table 1 and Table 2;
2. Data in tabulated and graphical formats;
3. Interpretation of the collected data including discussions of any observed trends in groundwater levels and groundwater quality (analytical) results;
4. Recommendations on and justification for the need for make changes to monitoring locations, monitoring frequency, type of monitoring, pumping patterns and/or the need for mitigation, and
5. Summary and documentation of any water well complaint(s) and their resolution(s).

561400 561500 561600 561700 561800 561900 562000

Map 1

Melanchthon #2 and Bonnefield Pits Anuran Monitoring Stations

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Date: November 7, 2017
Project: NRSI-1748
Scale: 1:3,000
NAD83 - UTM Zone 17

Proposed Bonnefield Pit

ANR-009

ANR-003

ANR-002

ANR-001

Melanchthon Pit #2

ANR-004

ANR-005

ANR-006

ANR-007a

ANR-007b

ANR-008a

Legend

- Subject Property
- Anuran Monitoring Station (ANR)
- Direction of Survey
- Surveyed Wetland Boundary
- Wetland (Boundaries Approximate)

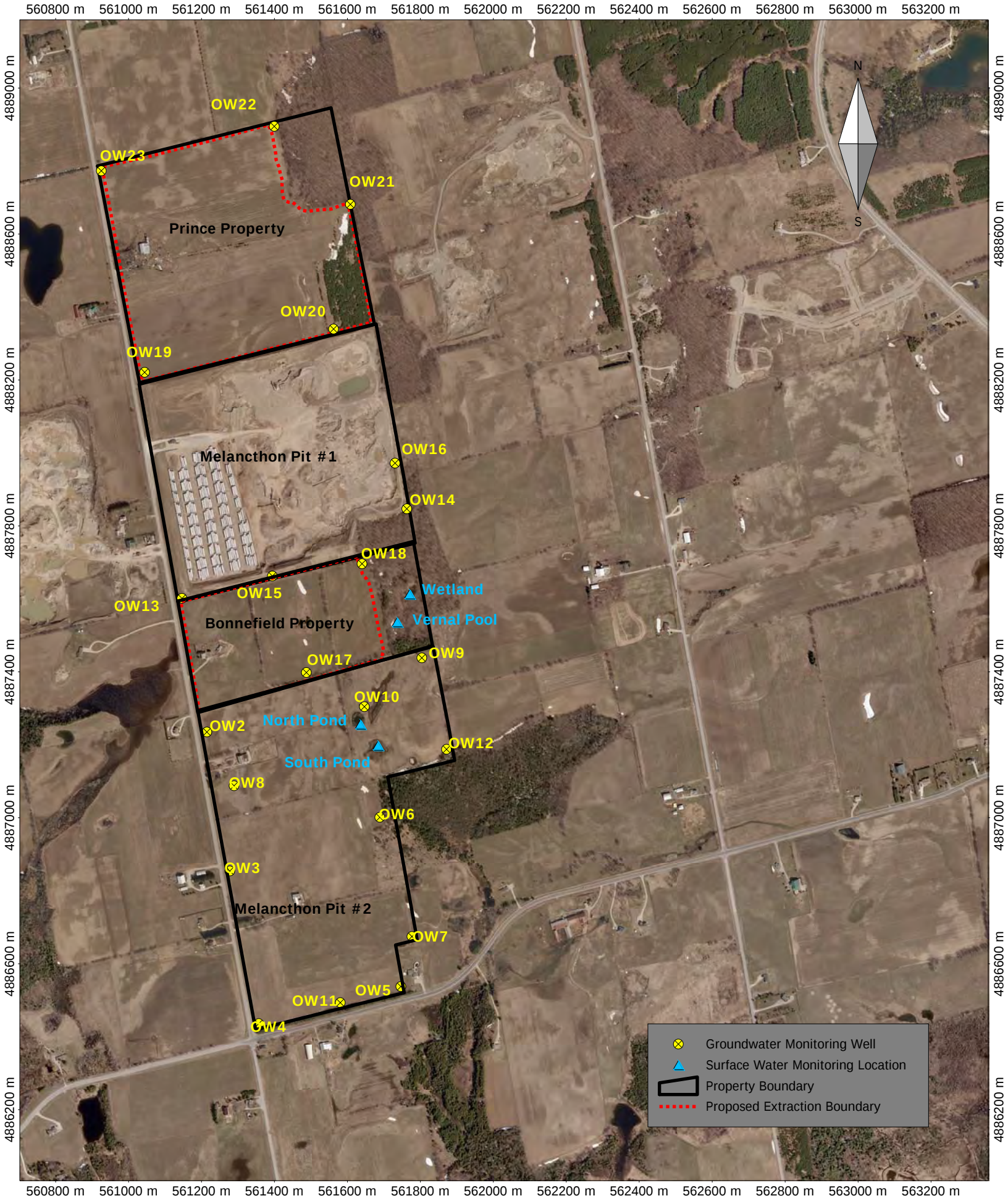
Map Produced by Natural Resource Solutions Inc.
This map is proprietary and confidential and must not be duplicated or distributed by any means without express written permission of NRSI.

Produced using information provided under license by the Ministry of Natural Resources, copyright the Queen's Printer of Ontario and Strada Aggregates. Imagery: ESRI (2015).



0 100 200 Metres

561400 561500 561600 561700 561800 561900 562000



Appendix C: Borehole Logs

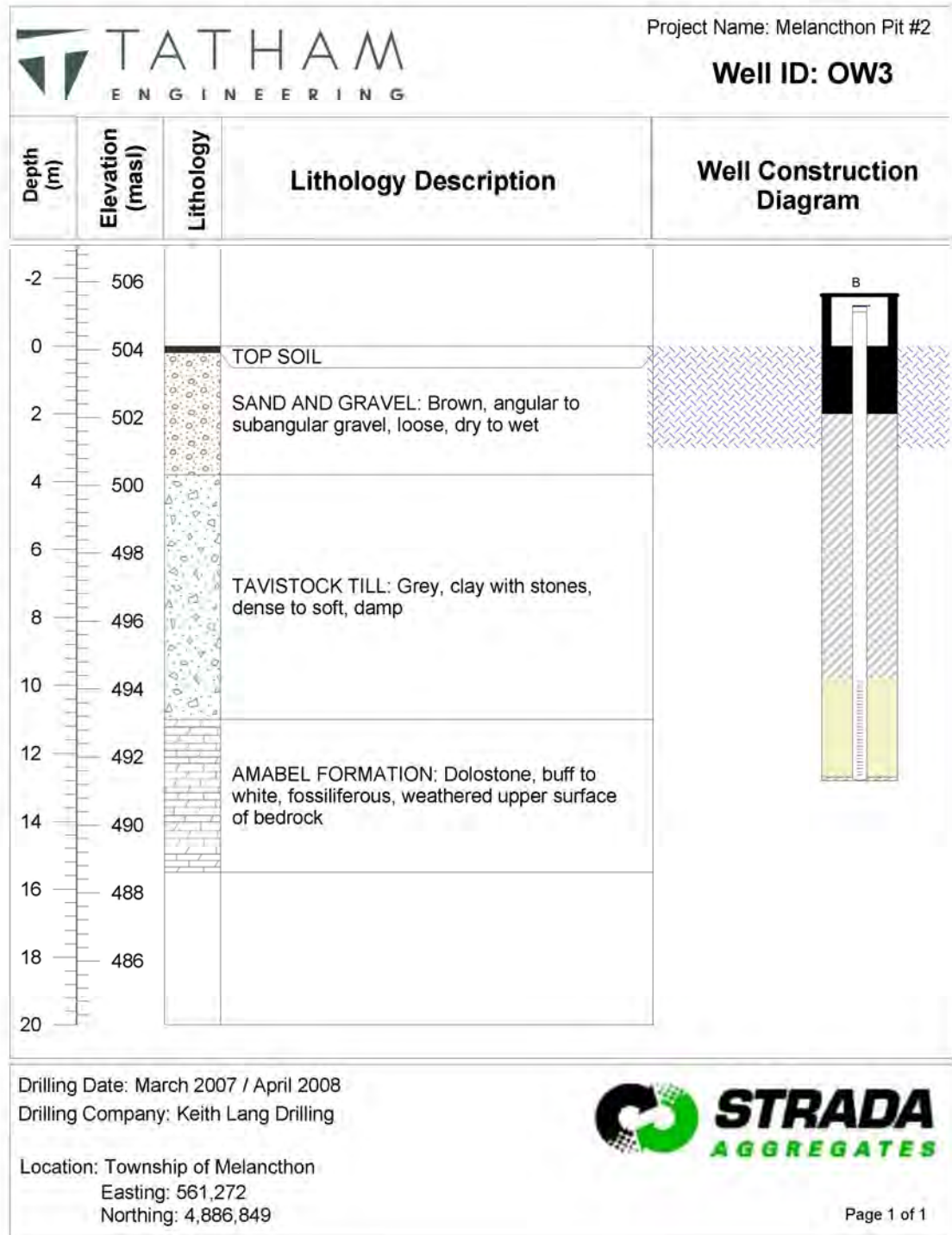


Figure A.17: New Borehole log for Well OW3.

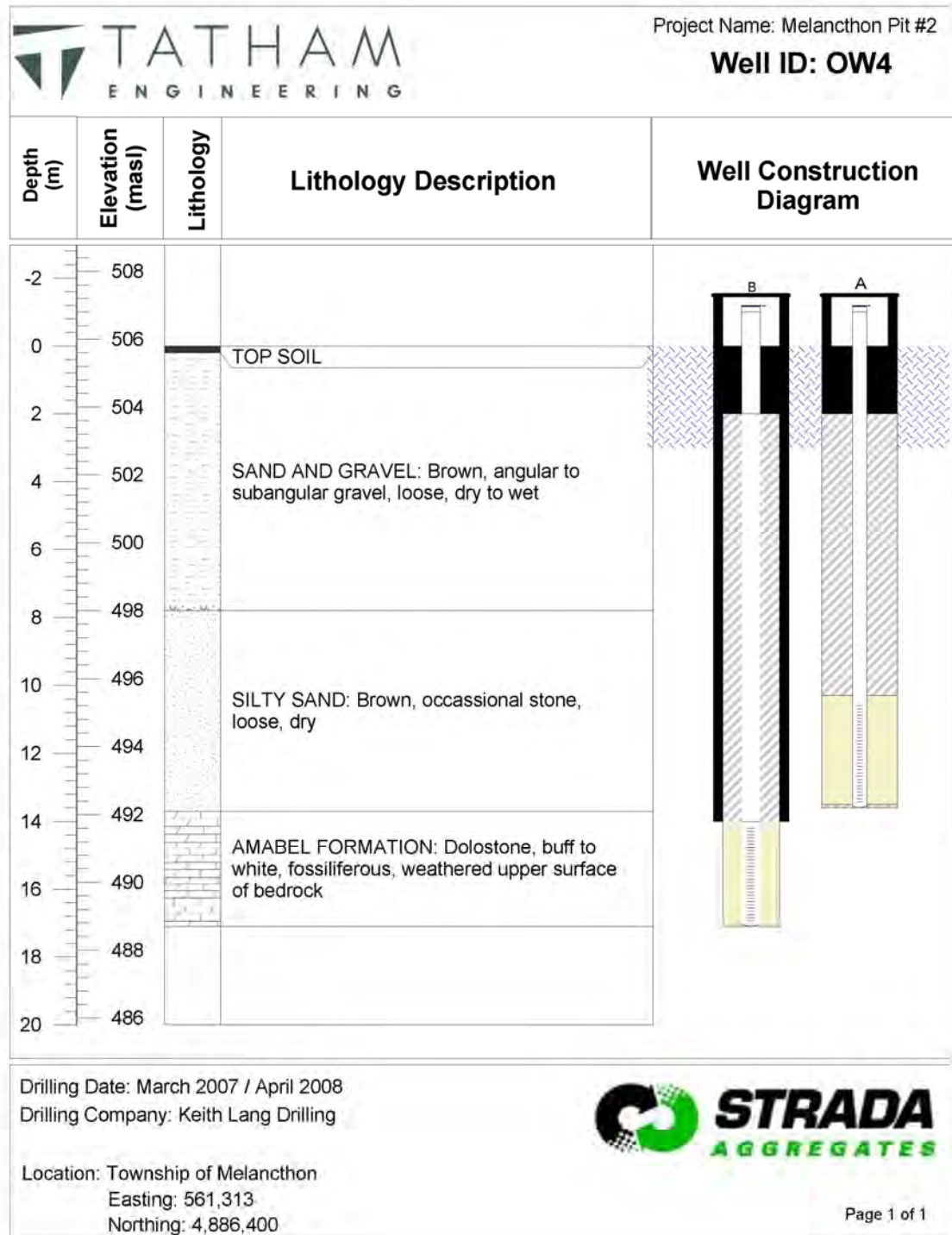


Figure A.19: New Borehole log for Well OW4.

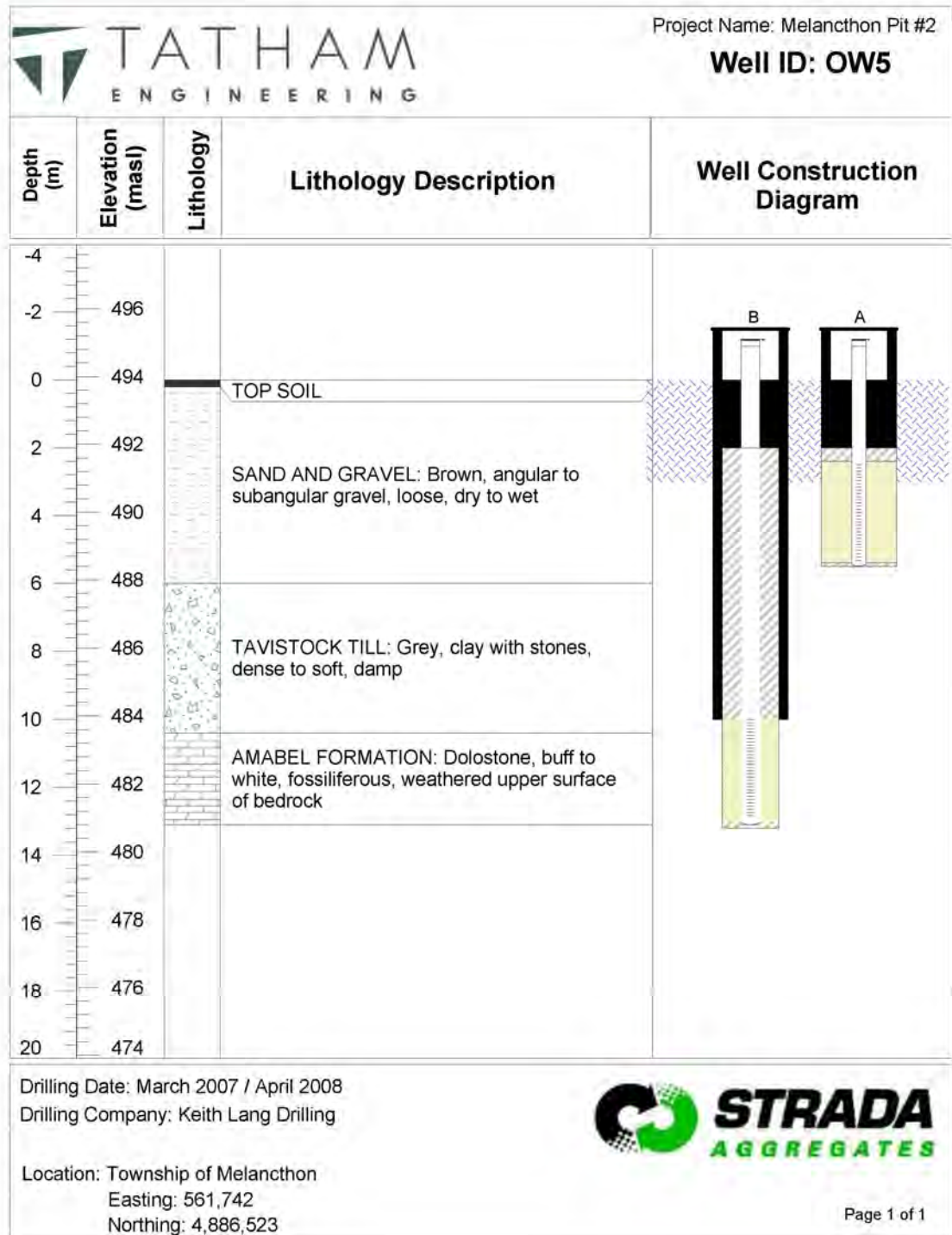


Figure A.21: Updated Borehole log for Well OW5.

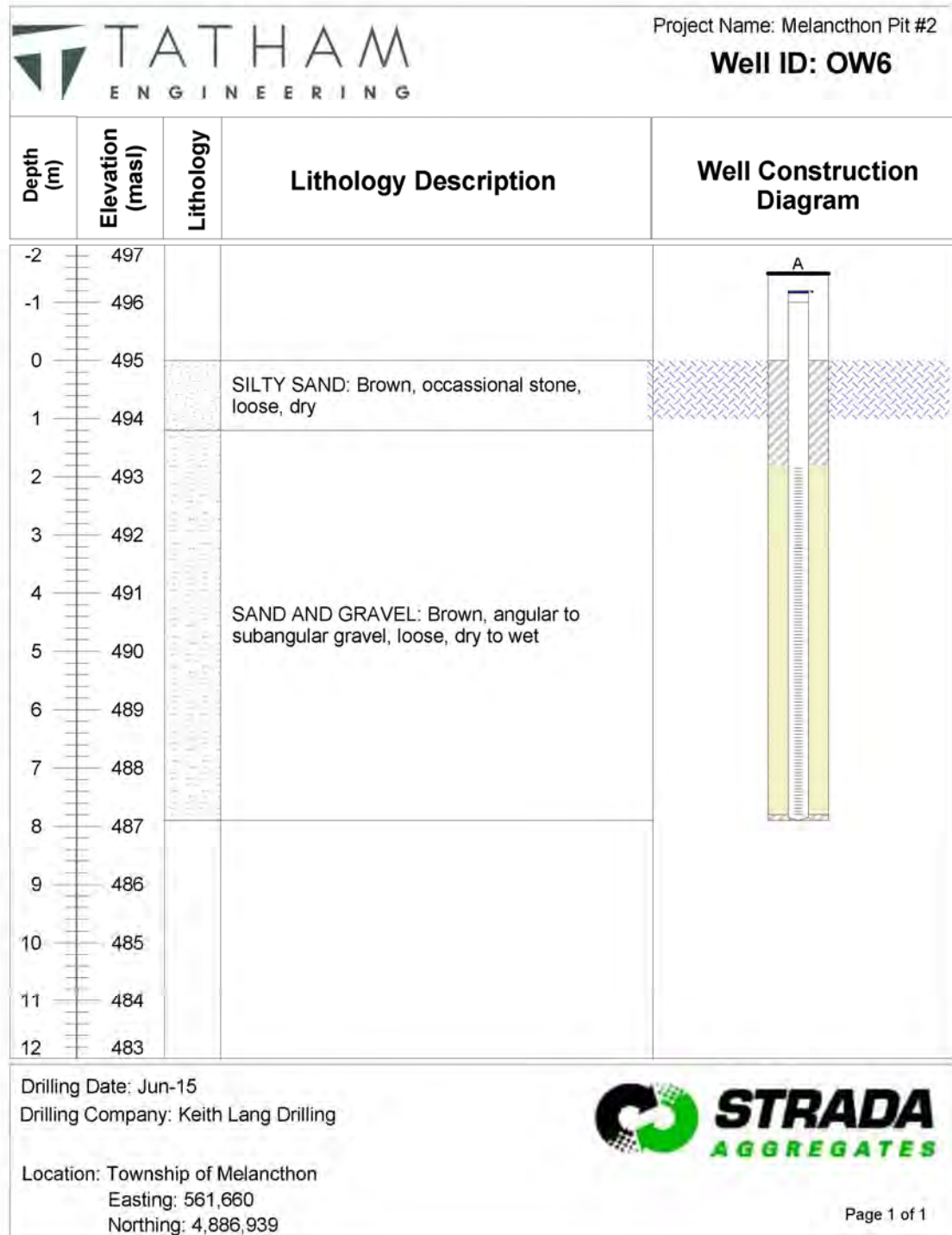


Figure A.22: Borehole log for Well OW6-A.

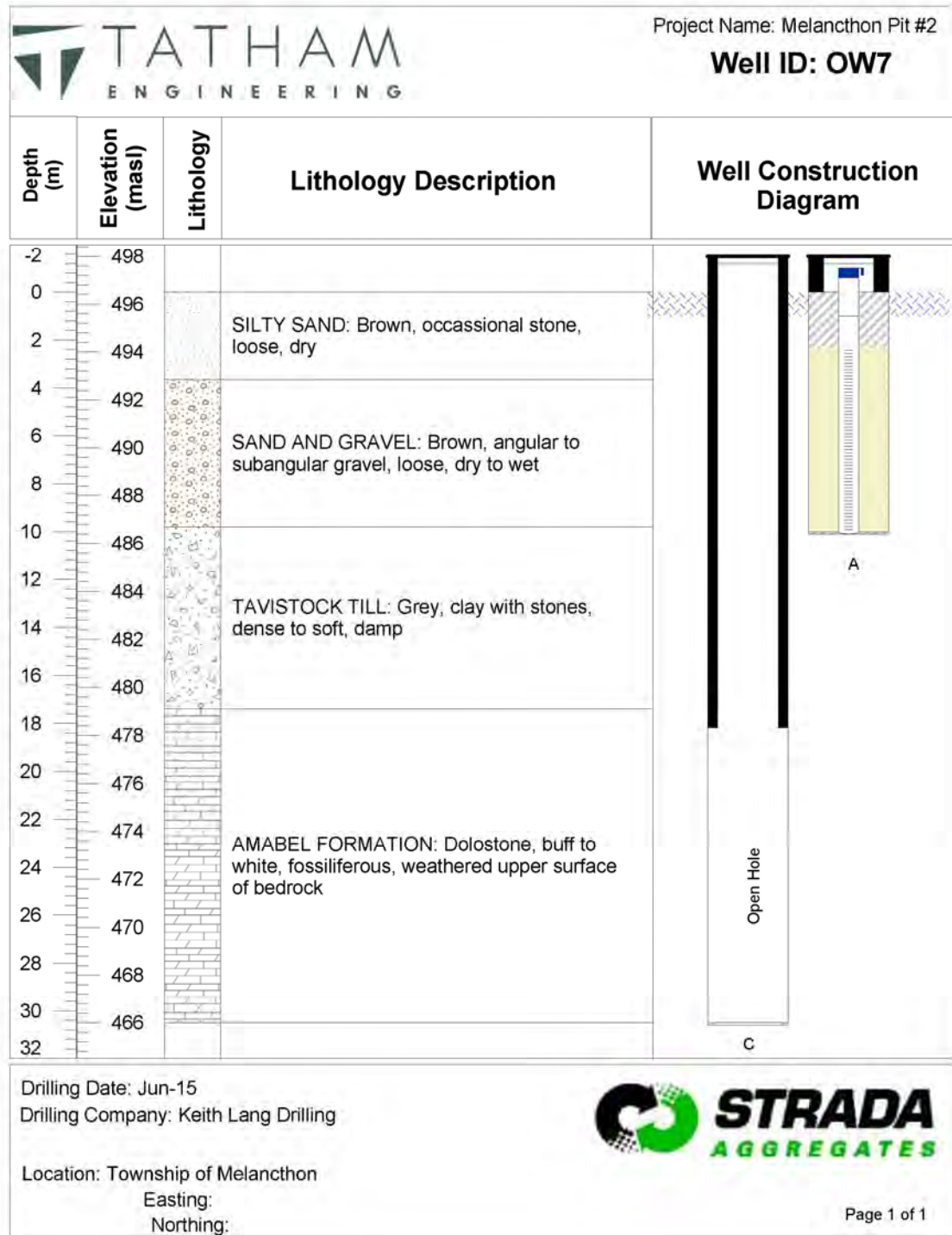


Figure A.23: Borehole log for Well OW7 A and C.

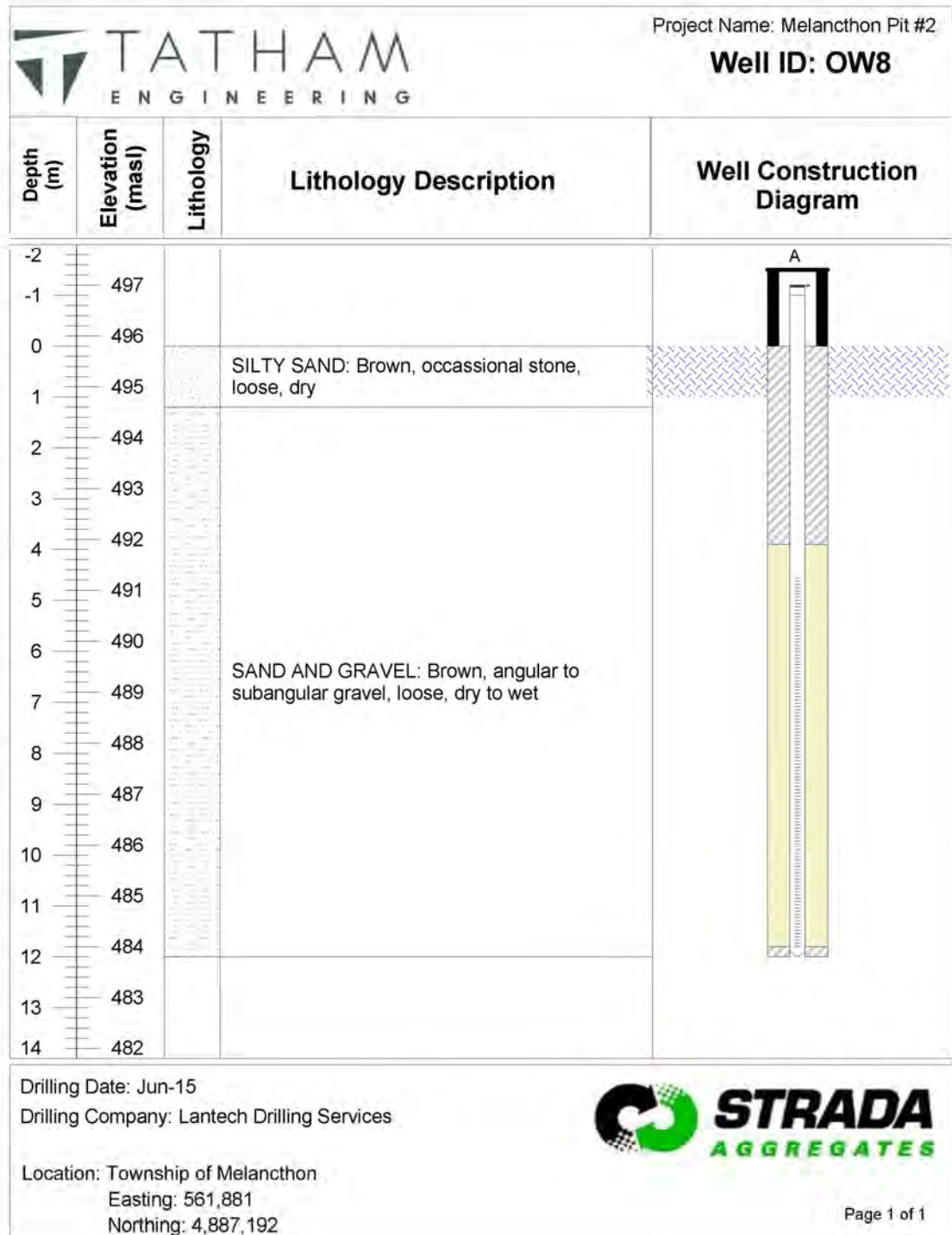


Figure A.24: Borehole log for Well OW8.

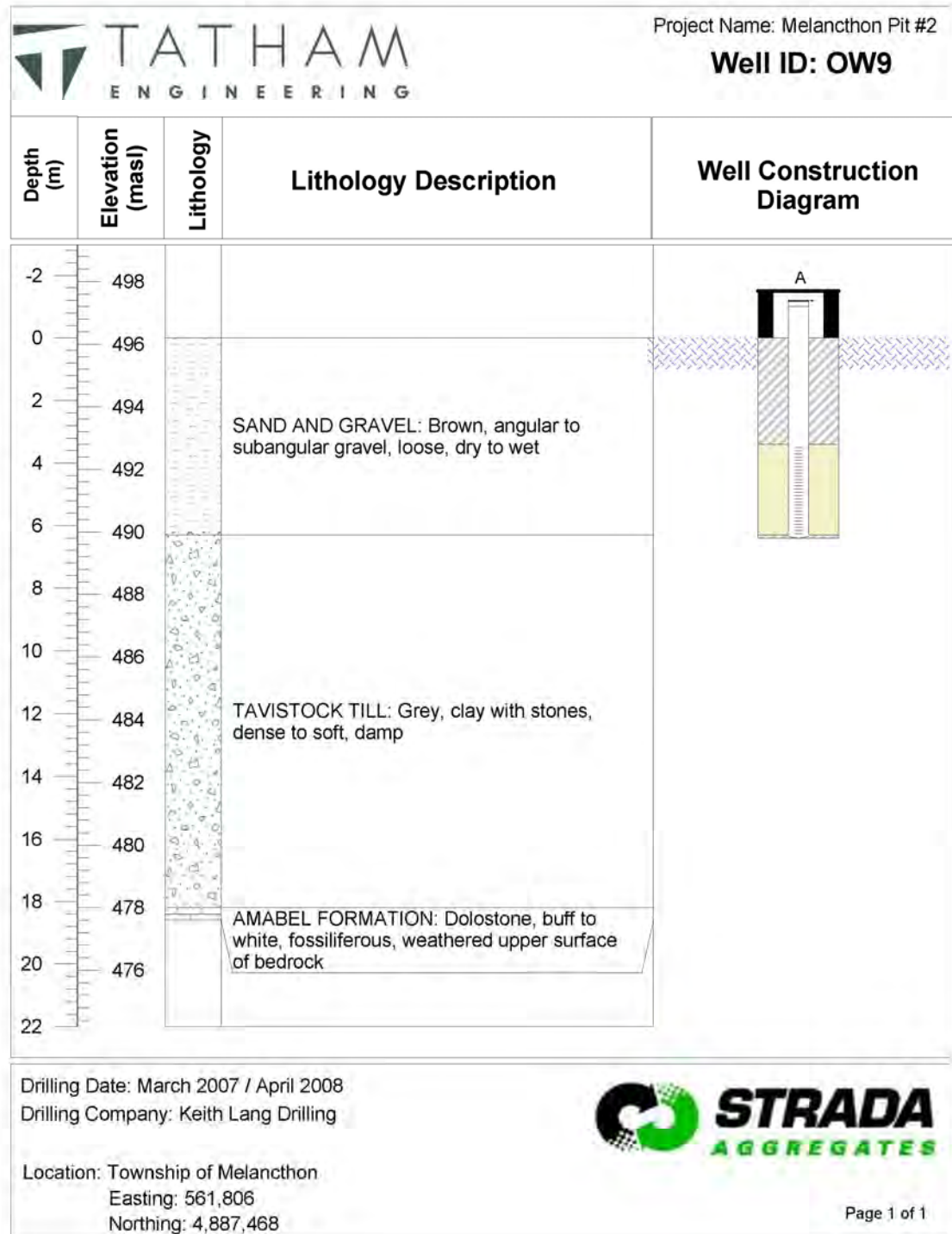


Figure A.26: New Borehole log for Well OW9-A.

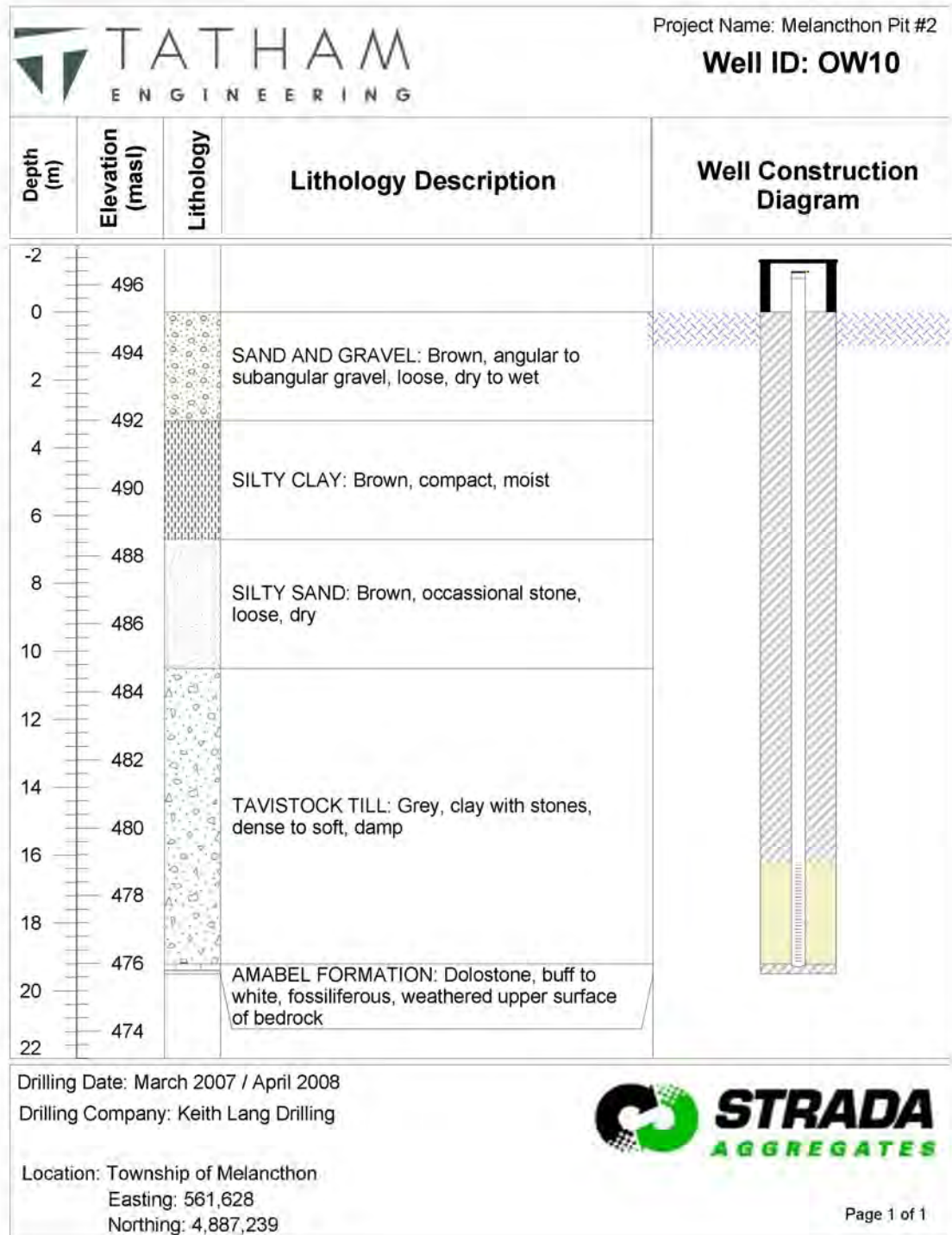


Figure A.28: New Borehole log for Well OW10.

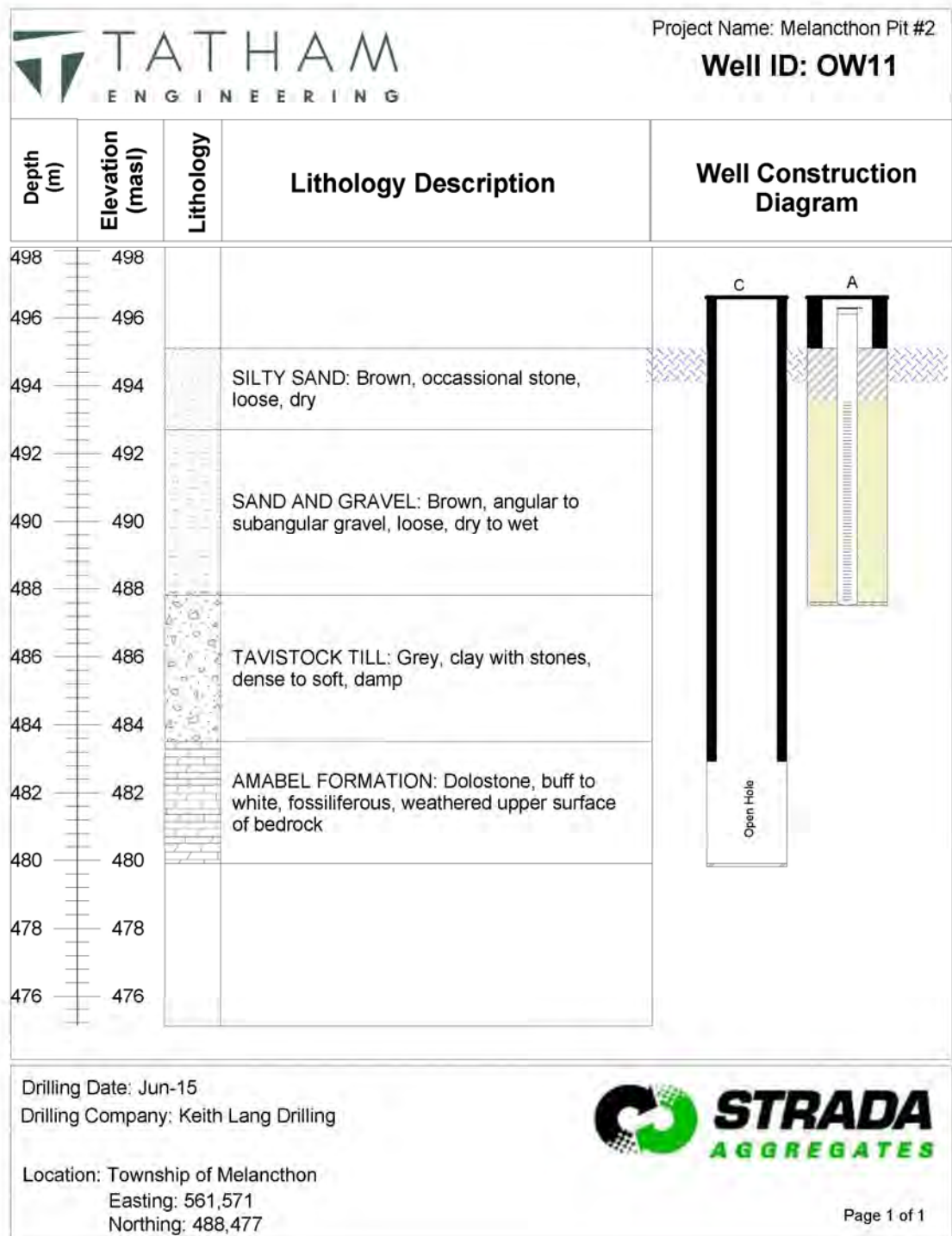


Figure A.29: Borehole log for Well OW11 A and C.

Ontario Ministry of the Environment

Well Tag No. (Place Sticker and/or Print Below)
#047149 A 047149

Well Record
Regulation 903 Ontario Water Resources Act
Page ____ of ____

Well Owner's Information
First Name: STRADA AGGREGATES Last Name: Mailing Address (Street Number/Name, RR): 30 FLORAL PARKWAY Municipality: CONCORD Province: ONT Postal Code: L4K 4R1 Telephone No. (inc. area code):
E-mail Address: ☐ Well Constructed by Well Owner

Part A Construction and/or Major Alteration of a Well
Address of Well Location (Street Number/Name, RR): Township: MELANCTON Lot: 1 Concession: 3
County/District/Municipality: DUFFERIN City/Town/Village: Province: Ontario Postal Code:
UTM Coordinates: Zone: 17 Easting: 561881 Northing: 4887189 GPS Unit Make: GARMIN Model: UTM Mode of Operation: ☒ Undifferentiated, ☐ Differentiated, specify: Averaged

Overburden and Bedrock Materials (see instructions on the back of this form)

General Colour	Most Common Material	Other Materials	General Description	Depth (Metres) From	Depth (Metres) To
BROWN	SAND & GRAVEL			0	25ft
BROWN	SILTY CLAY & STONE			25ft	37ft
GRAY	CLAY GRAVEL LAERS			37ft	69ft
GRAY	LIMESTONE			69	71ft
		2in PVC			
		10ft screen bottom 69ft			
		10ft screen bottom 25ft			

Annular Space/Abandonment Sealing Record

Depth Set at (Metres) From	To	Type of Sealant Used (Material and Type)	Volume Placed (Cubic Metres)
0	14ft	BENTONITE	

Results of Well Yield Testing

Check box if after test of well yield, water was: ☐ Clear and sand free ☐ Cannot develop to sand-free state If pumping discontinued, give reason:	Draw Down		Recovery	
	Time (Min)	Water Level (Metres)	Time (Min)	Water Level (Metres)
Pumping test method	1	1		
	2	2		
	3	3		
	4	4		
	5	5		
	10	10		
Pump intake set at (Metres)	15	15		
Pumping rate (Litres/min)	20	20		
Duration of pumping hrs * min	25	25		
Final water level end of pumping (Metres)	30	30		
Recommended pump type ☐ Shallow ☐ Deep	40	40		
Recommended pump depth (Metres)	50	50		
Recommended pump rate (Litres/min)	60	60		
If flowing give rate (Litres/min)				

Method of Construction
☒ Cable Tool ☐ Diamond ☐ Rotary (Conventional) ☐ Jetting ☐ Rotary (Reverse) ☐ Driving ☐ Rotary (Air) ☐ Digging ☐ Air percussion ☐ Boring ☐ Other, specify: _____

Water Use
☐ Public ☐ Commercial ☐ Not used ☐ Domestic ☐ Municipal ☐ Dewatering ☐ Livestock ☐ Test Hole ☒ Monitoring ☐ Irrigation ☐ Cooling & Air Conditioning ☐ Industrial ☐ Other, specify: _____

Status of Well
☐ Water Supply ☐ Dewatering Well ☒ Observation and/or Monitoring Hole ☐ Replacement Well ☐ Abandoned, Insufficient Supply ☐ Alteration (Construction) ☐ Test Hole ☐ Abandoned, Poor Water Quality ☐ Other, specify: _____ ☐ Recharge Well ☐ Abandoned, other, specify: _____

Location of Well
Please provide a map below showing:
- all property boundaries, and measurements sufficient to locate the well in relation to fixed points,
- an arrow indicating the North direction
- detailed drawings can be provided as attachments no larger than legal size (8.5" by 14")
- digital pictures of inside of well can also be provided

Water Details
Water found at Depth: _____ Metres ☐ Gas ☐ Fresh ☐ Salty ☐ Sulphur ☐ Minerals
Water found at Depth: _____ Metres ☐ Gas ☐ Fresh ☐ Salty ☐ Sulphur ☐ Minerals
Water found at Depth: _____ Metres ☐ Gas ☐ Fresh ☐ Salty ☐ Sulphur ☐ Minerals

Casing and Well Details
Casing Used: ☐ Galvanized ☐ Steel ☐ Fibreglass ☒ Plastic ☐ Concrete
Screen Used: ☐ Galvanized ☐ Steel ☐ Fibreglass ☒ Plastic ☐ Concrete
Diameter of the Hole (Centimetres): 6 in
Depth of the Hole (Metres): 71 ft
Well Thickness (Metres): _____
No Casing and Screen Used: ☐ Open Hole
Disinfected? ☐ Yes ☐ No
Inside Diameter of the Casing (Metres): _____
Depth of the Casing (Metres): _____

Ministry Use Only
Audit No: z69729
Date Received (yyyy/mm/dd): JUN 05 2008
Well Contractor No: _____
Date of Inspection (yyyy/mm/dd): _____
Remarks: _____

Well Contractor and Well Technician Information
Business Name of Well Contractor: KEITH LANG WELL DRILLING INC Well Contractor's Licence No: 7154
Business Address (Street No./Name, number, RR): 251 ELDON ST GODERICH ONT Municipality: _____
Province: ONT Postal Code: N7A 3R9 Business E-mail Address: _____
Bus Telephone No. (inc. area code): 519-524-8159 Name of Well Technician (Last Name, First Name): KEITH LANG
Well Technician's Licence No: T446 Signature: *Keith Lang* Date Submitted (yyyy/mm/dd): _____
(09062 (11/2006)) Ministry's Copy

Figure A.30: Borehole log for Well OW12.

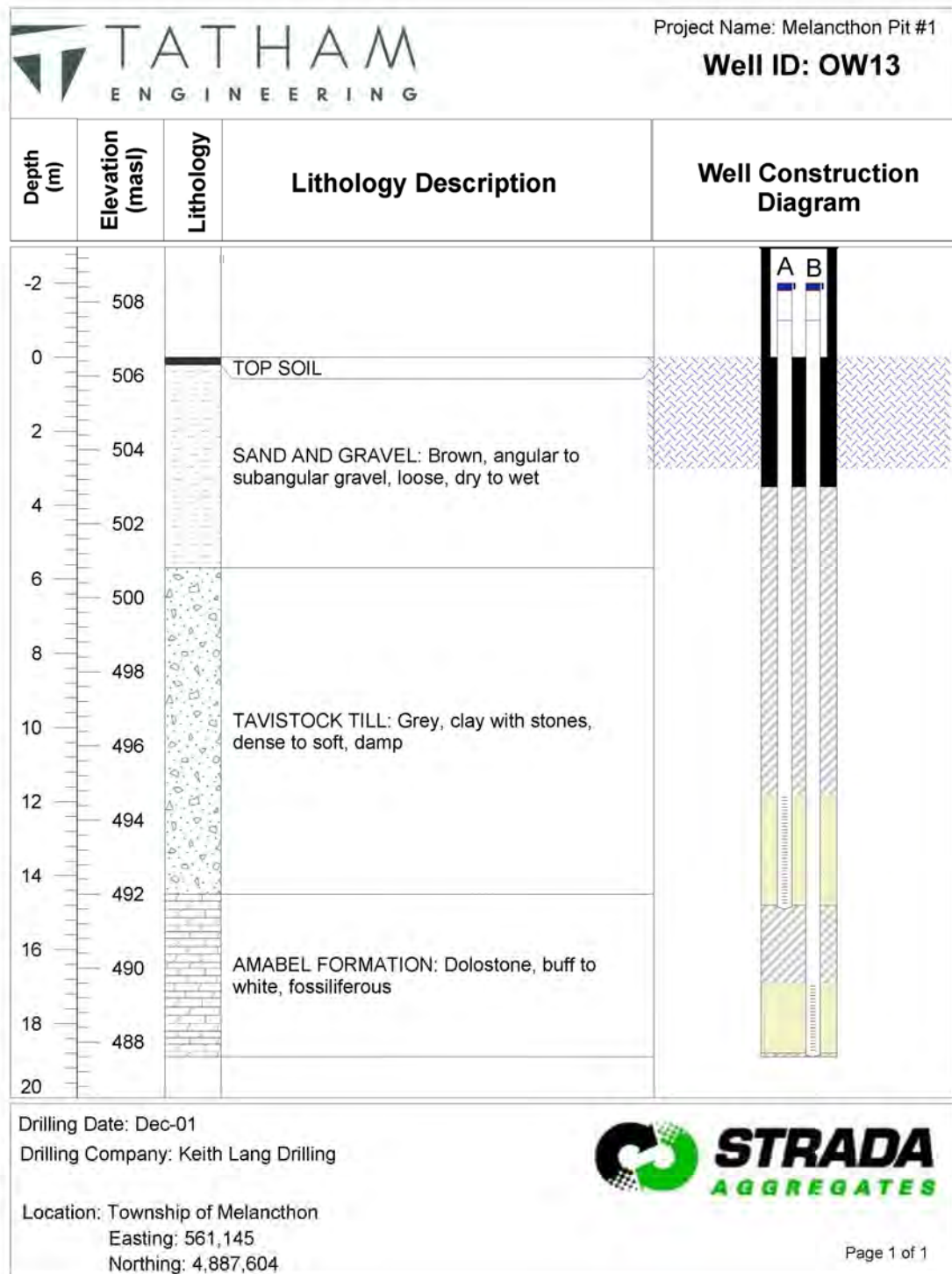


Figure A.31: Borehole log for Well OW13 A and B.

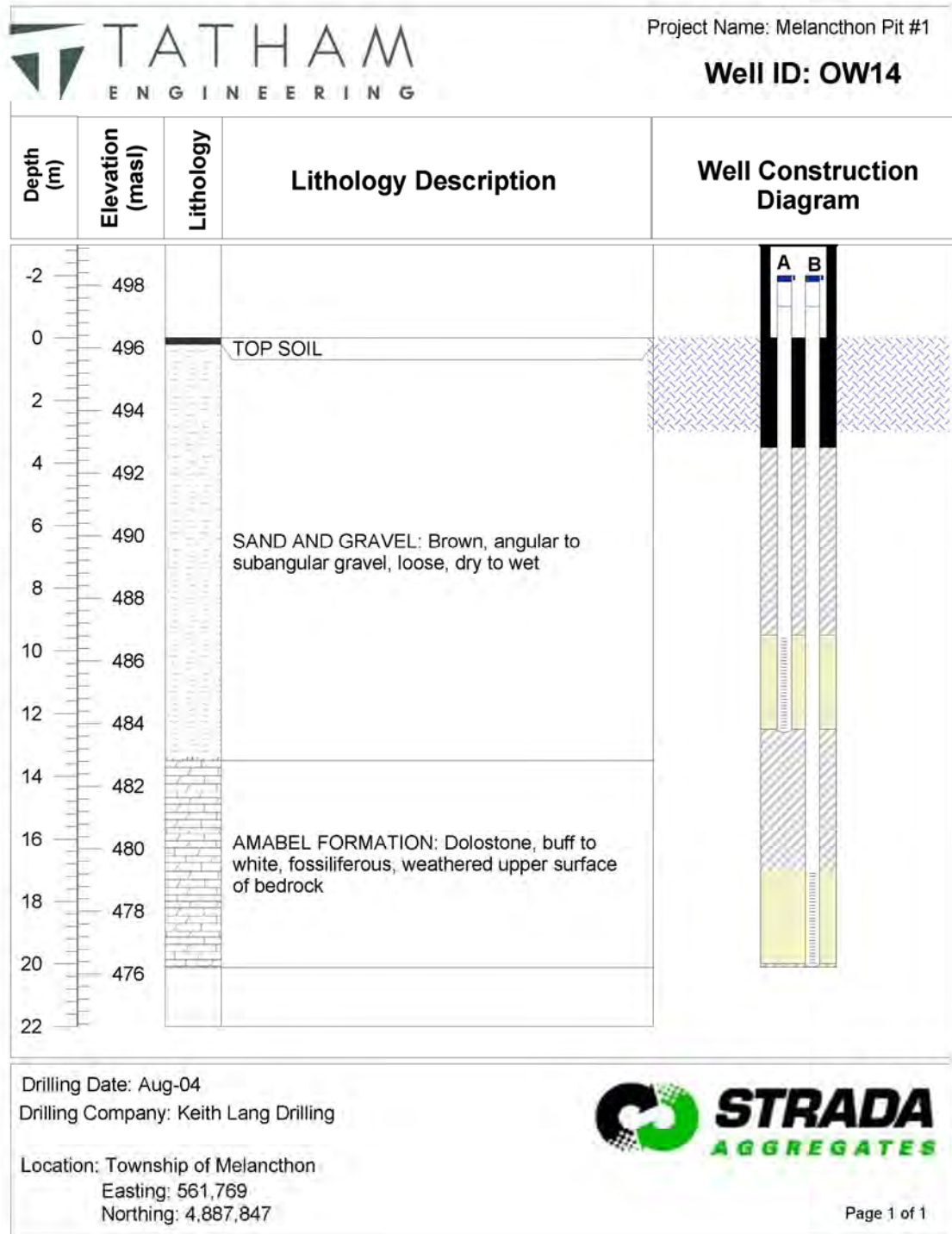


Figure A.32: Updated Borehole log for Well OW14 A and C.

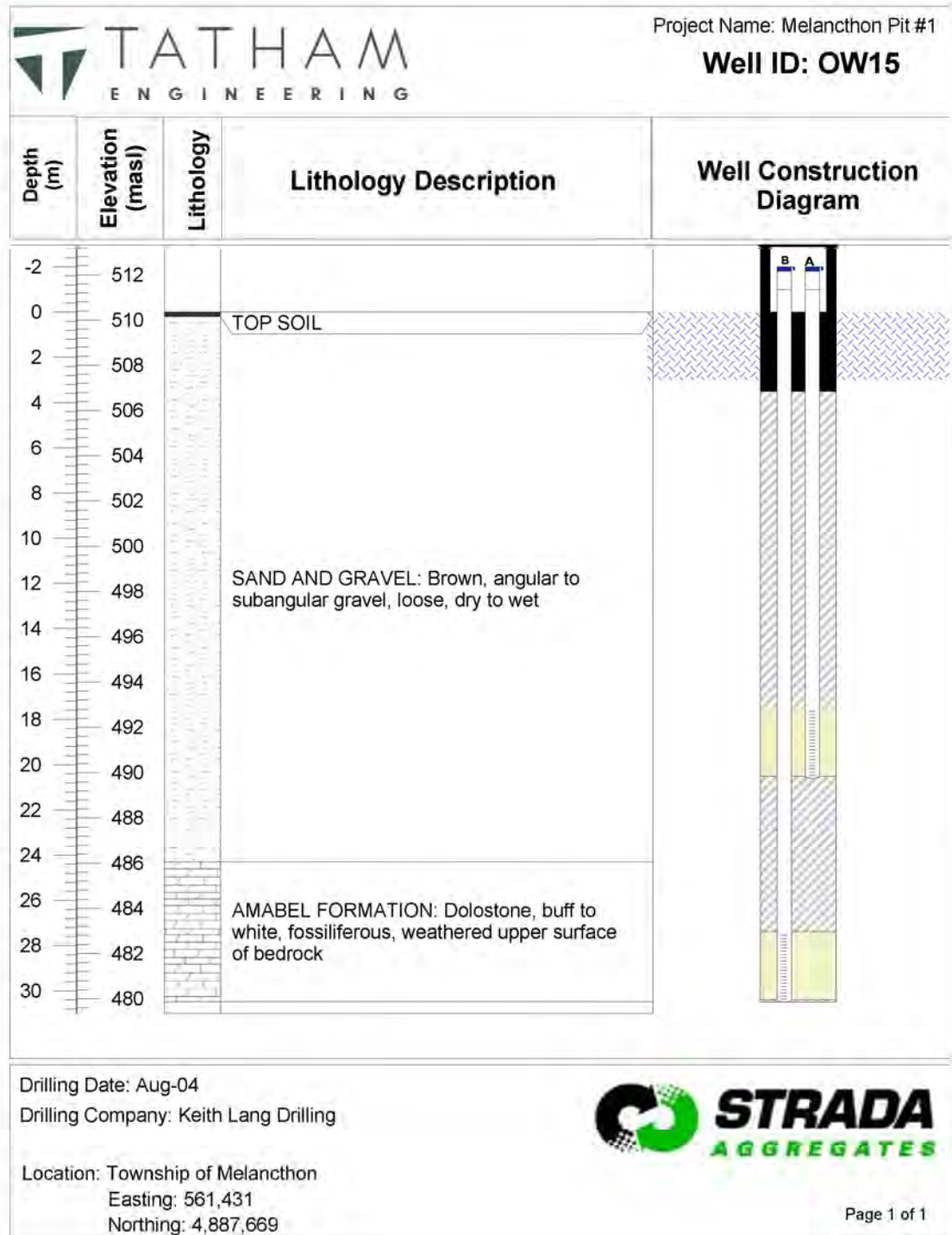


Figure A.33: Borehole log for Well OW15.

Ontario Ministry of the Environment

Well Tag No. (P/A) 115091 **A115091** Regulation 903 Ontario Water Resources Act

Measurements recorded in: ☐ Metric ☐ Imperial

Page ____ of ____

Well Owner's Information

First Name: STRADA AGGERAGATES Last Name / Organization: E-mail Address: ☐ Well Constructed by Well Owner

Mailing Address (Street Number/Name): 30 FLORAL PARKWAY Municipality: CONCORD Province: ONT Postal Code: L4K4R1 Telephone No. (inc. area code):

Well Location

Address of Well Location (Street Number/Name): Township: MELANCTHON Lot: 13 Concession: 3

County/District/Municipality: DUFFERIN City/Town/Village: Province: Ontario Postal Code:

UTM Coordinates: Zone: 17 Easting: 561721 Northing: 4887995 Municipal Plan and Sublot Number: Other:

Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form)

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft)
				From To
BROWN	SAND & GRAVEL			0 20ft
BROWN	LIMESTONE SOFT			20ft 37ft

Annular Space

Depth Set at (m/ft)	Type of Sealant Used (Material and Type)	Volume Placed (m ³ /ft ³)
0 25ft	BENTONITE 07 BAGS	

Results of Well Yield Testing

After test of well yield, water was: ☐ Clear and sand free ☐ Other, specify:

If pumping discontinued, give reason:

Pump intake set at (m/ft):

Pumping rate (l/min / GPM):

Duration of pumping hrs + min:

Final water level end of pumping (m/ft):

If flowing give rate (l/min / GPM):

Recommended pump depth (m/ft):

Recommended pump rate (l/min / GPM):

Well production (l/min / GPM):

Disinfected? ☐ Yes ☐ No

Map of Well Location

Please provide a map below following instructions on the back.

44h SCALE House 1 STRADA RIT X WELL

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Culvert, Fiberglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft)
2in	plastic	40	0 26ft

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft)
2in	plastic	.10	26ft 36ft

Water Details

Water found at Depth (m/ft) Kind of Water: ☒ Fresh ☐ Untested ☐ Gas ☐ Other, specify:

Water found at Depth (m/ft) Kind of Water: ☐ Fresh ☐ Untested ☐ Gas ☐ Other, specify:

Water found at Depth (m/ft) Kind of Water: ☐ Fresh ☐ Untested ☐ Gas ☐ Other, specify:

Well Contractor and Well Technician Information

Business Name of Well Contractor: KEITH LANG WELL DRILLING INC Well Contractor's License No: 7154

Business Address (Street Number/Name): 251 ELDON ST GORDERICH Municipality:

Province: ONT Postal Code: N7A3R9 Business E-mail Address:

Bus. Telephone No. (inc. area code): Name of Well Technician (Last Name, First Name): KEITH LANG

Well Technician's License No: T446 Signature of Technician and/or Contractor: K. Lang Date Submitted:

Ministry's Copy

Well owner's information package delivered ☒ Yes ☐ No

Date Package Delivered: 2012 6 20

Date Work Completed: 2012 6 20

Ministry Use Only

Audit No: z142139

Approved: AUG 16 2012

Figure A.34: Borehole log for Well OW16C.

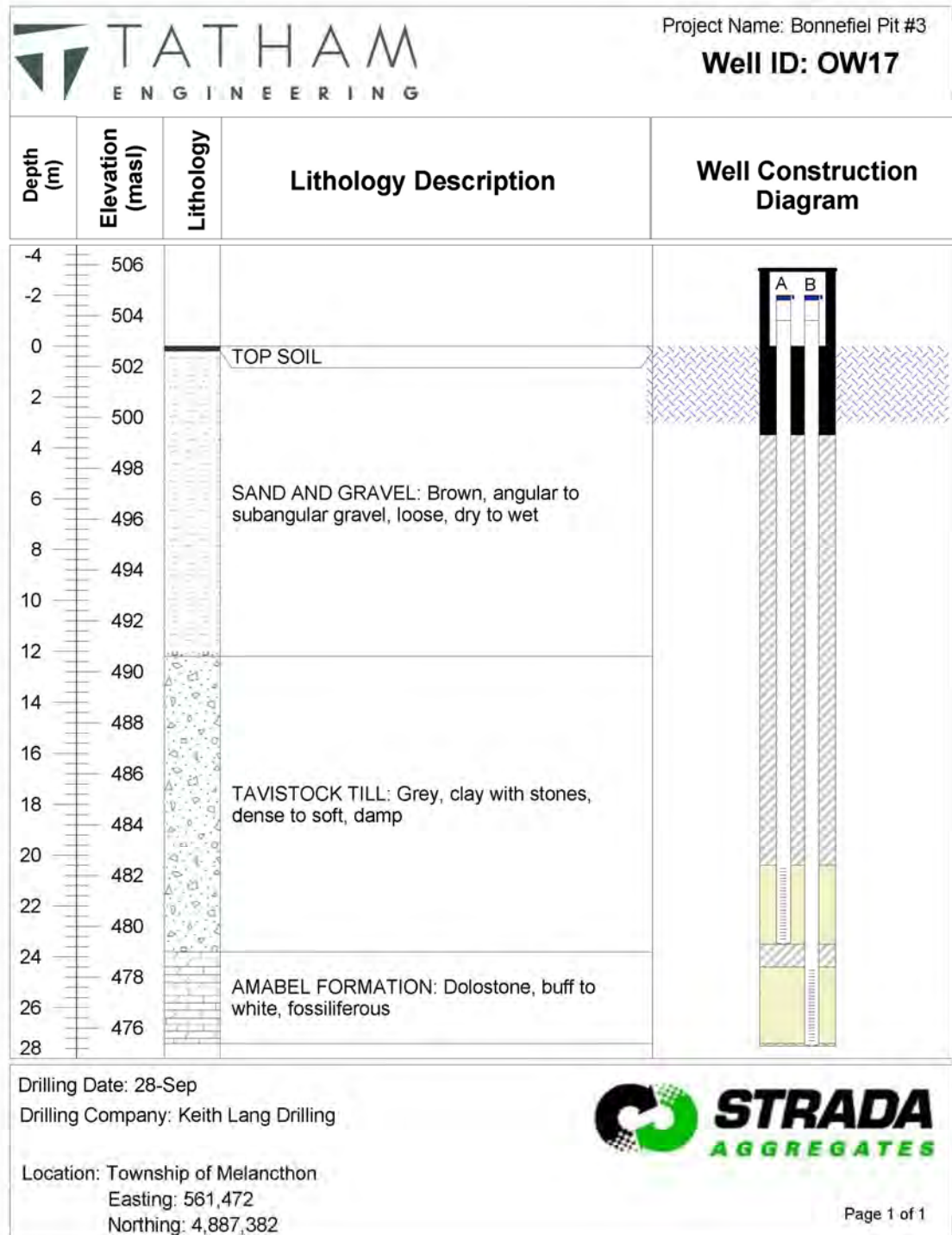


Figure A.35: Borehole log for Well OW17.

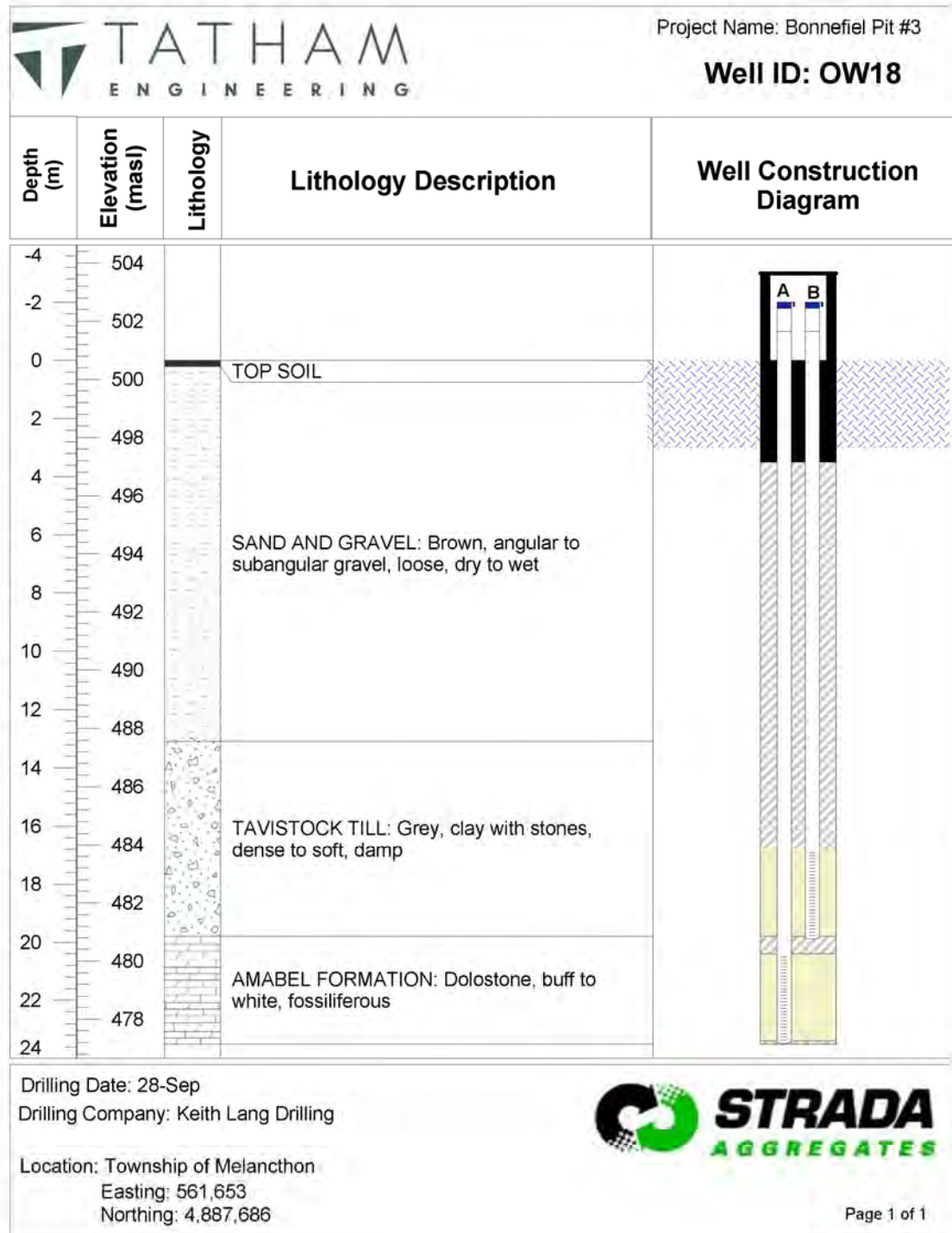


Figure A.36: Borehole log for Well OW18.

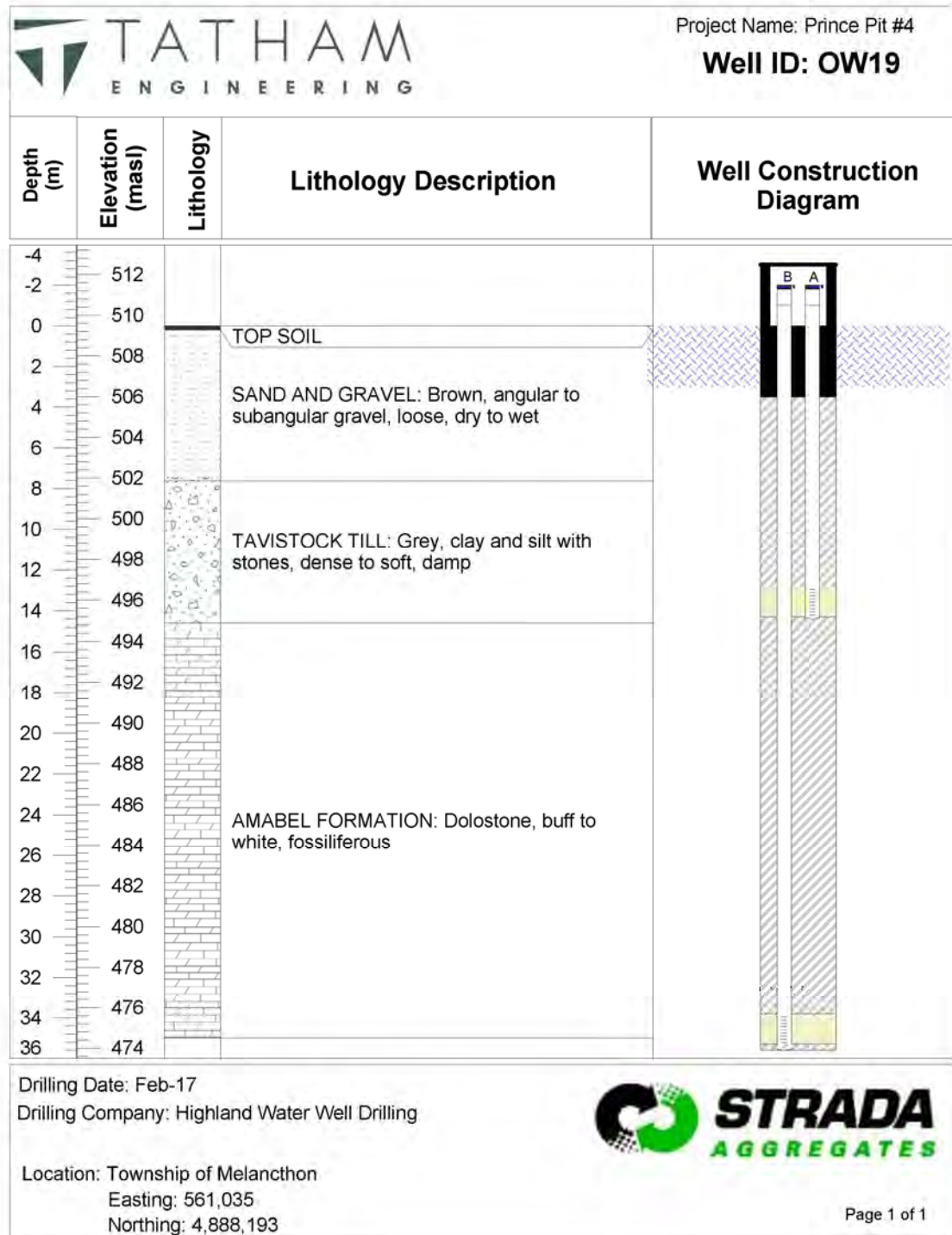


Figure A.37: Borehole log for Well OW19.

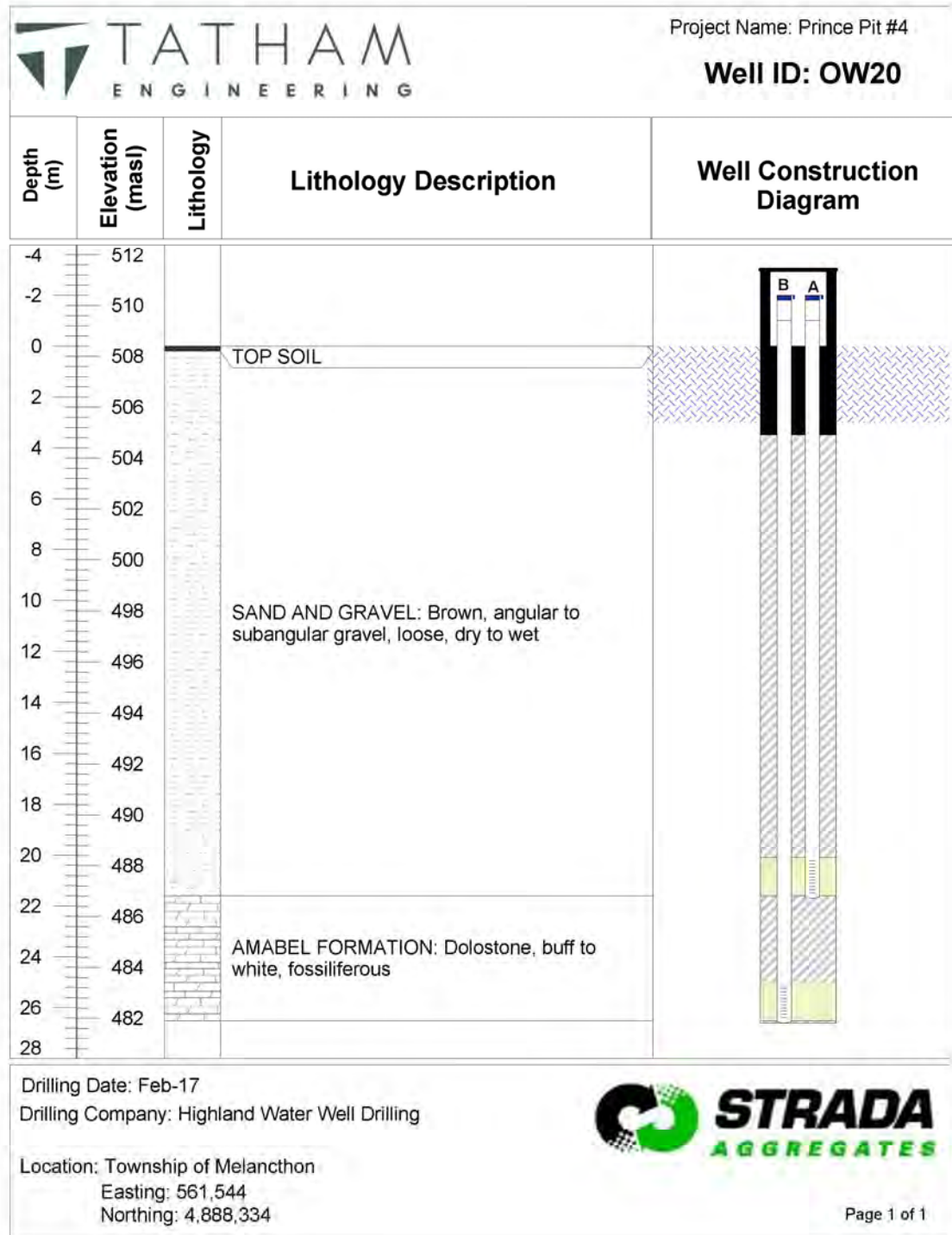


Figure A.38: Borehole log for Well OW20.

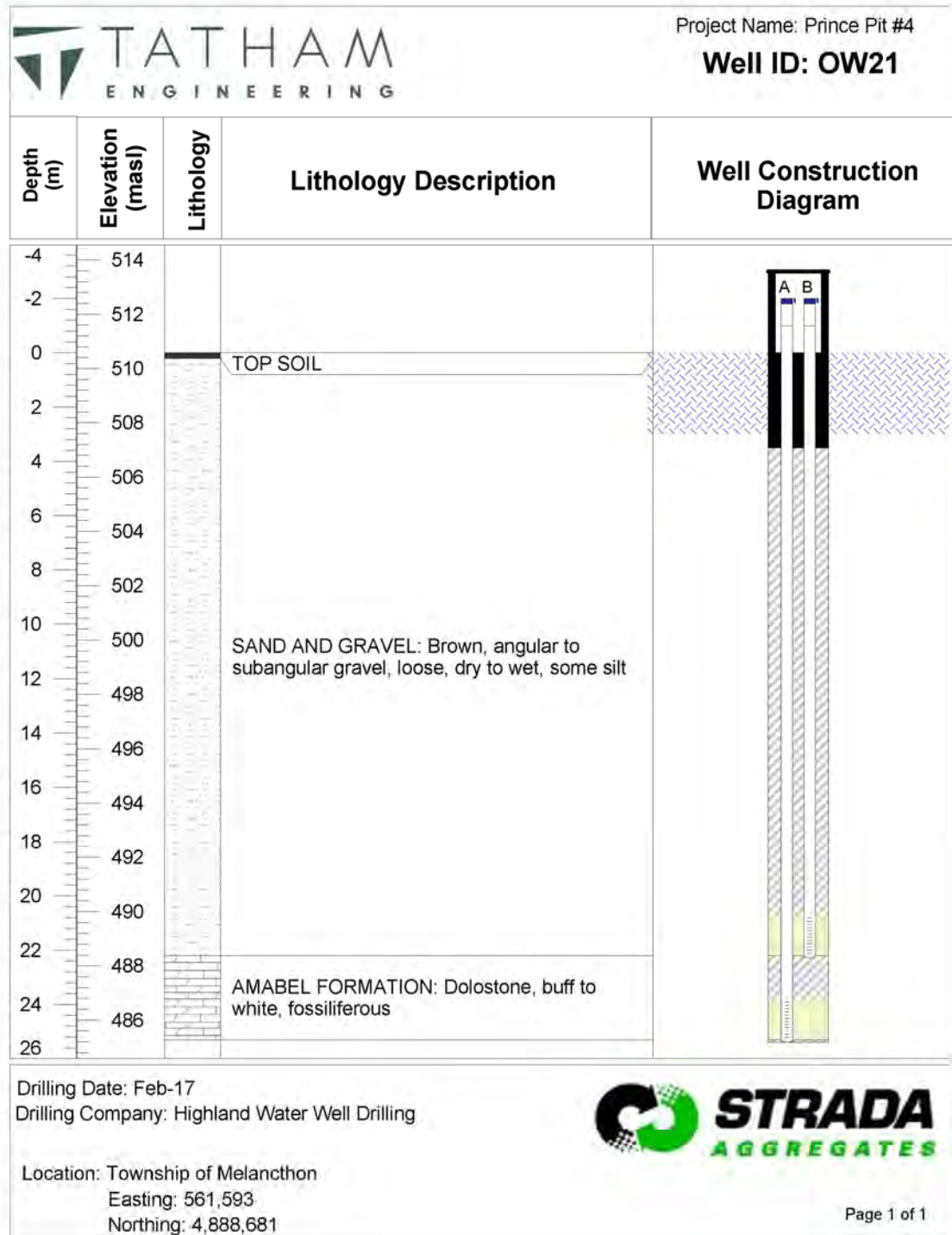


Figure A.39: Borehole log for Well OW21.

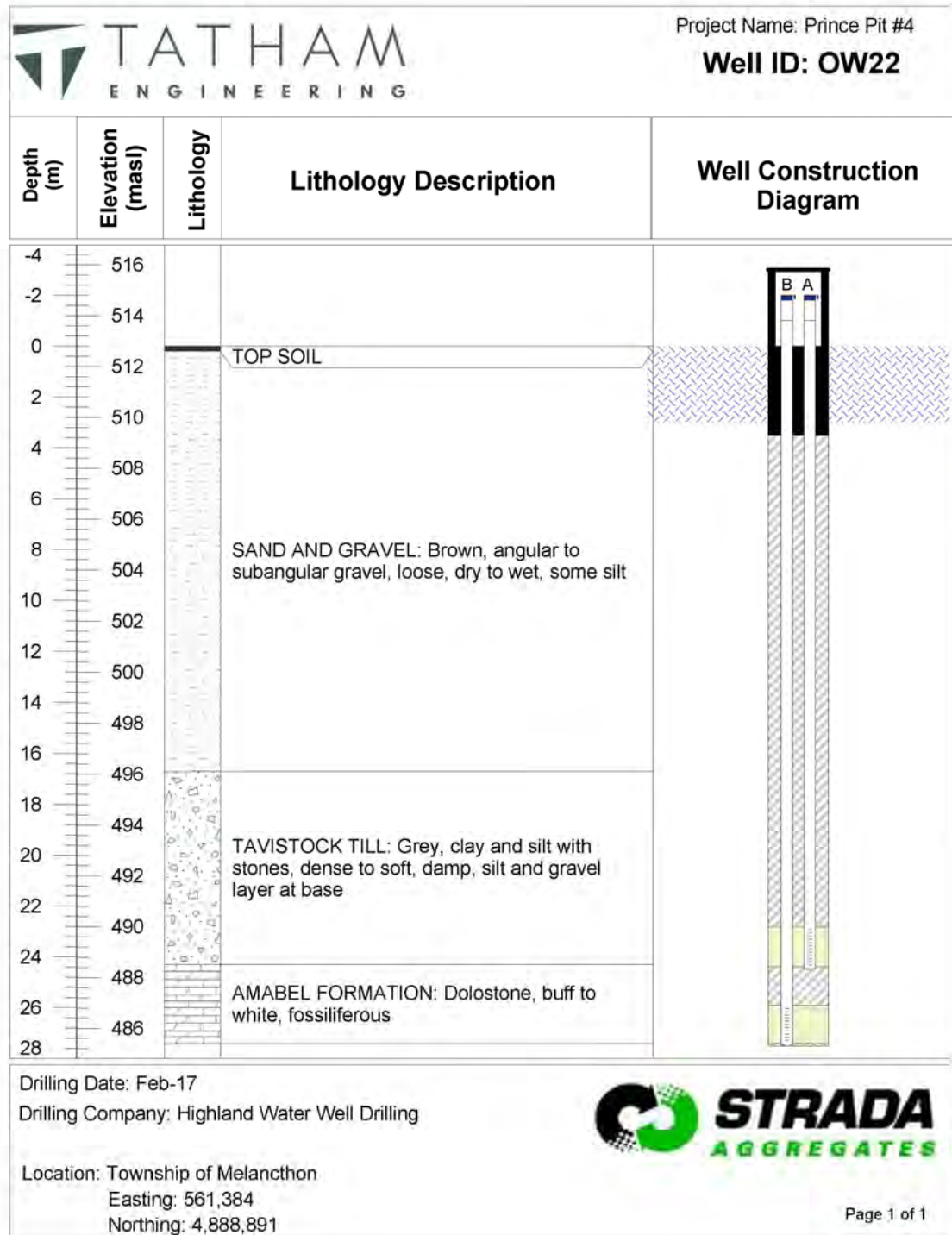


Figure A.40: Borehole log for Well OW22.

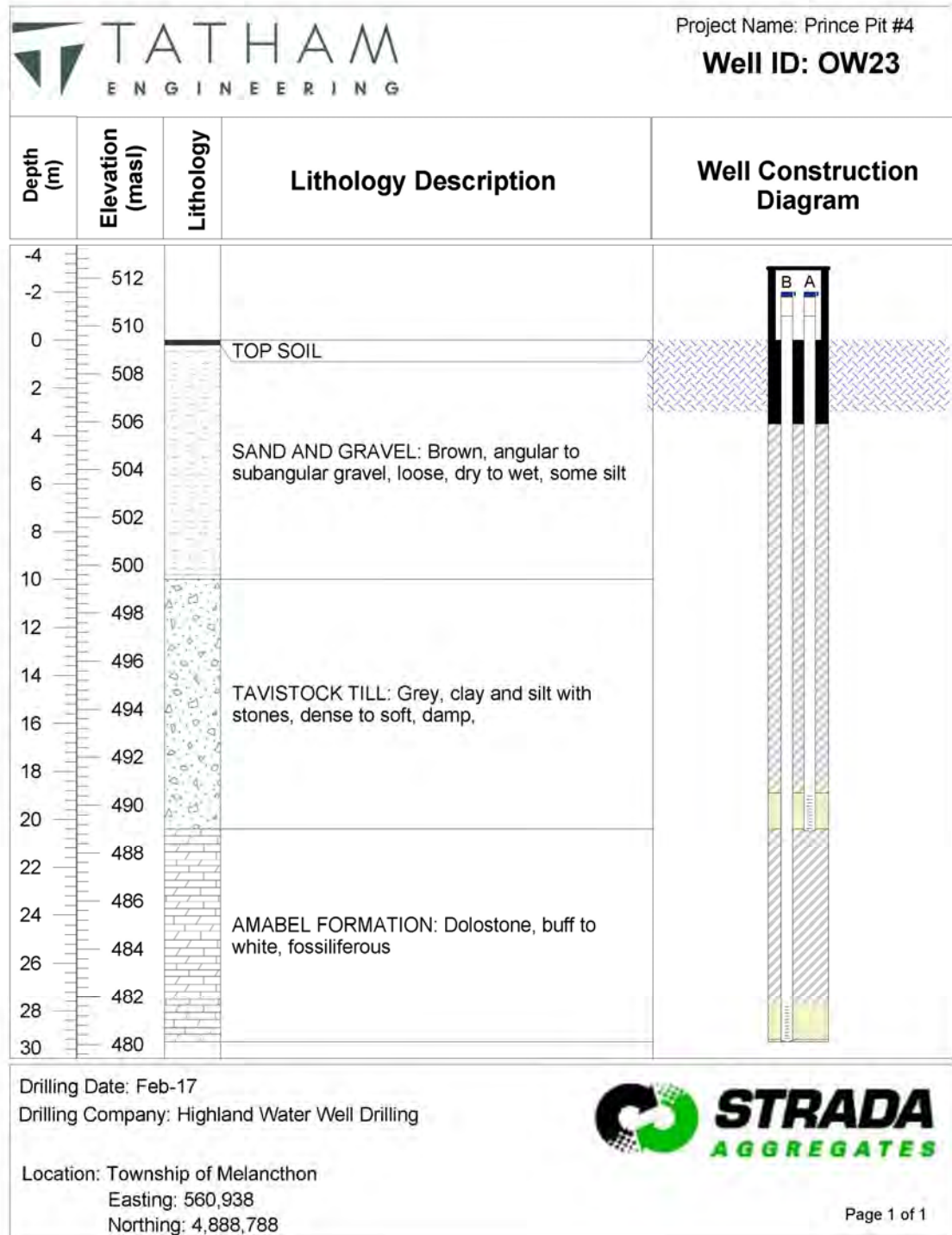
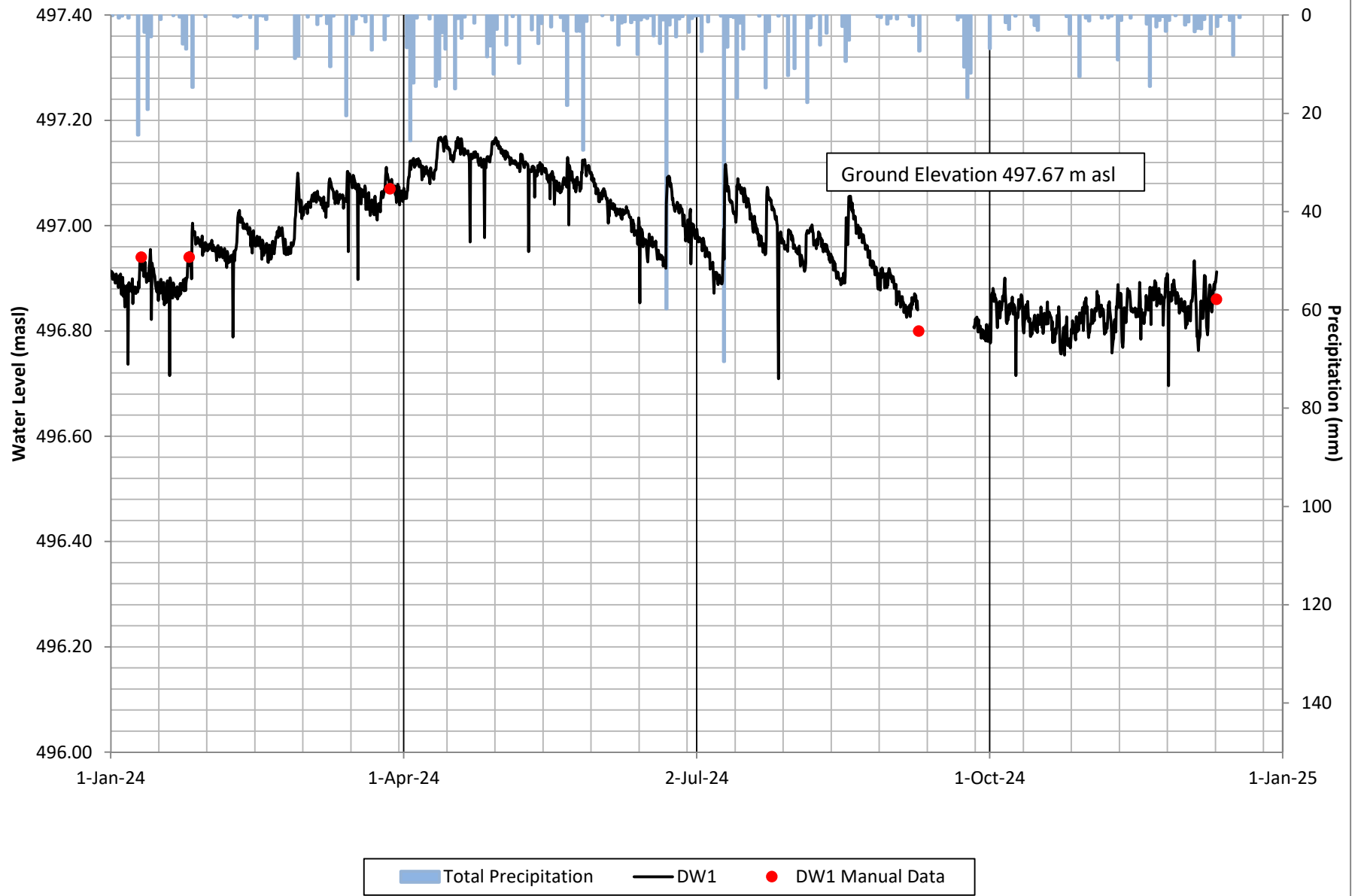


Figure A.41: Borehole log for Well OW23.

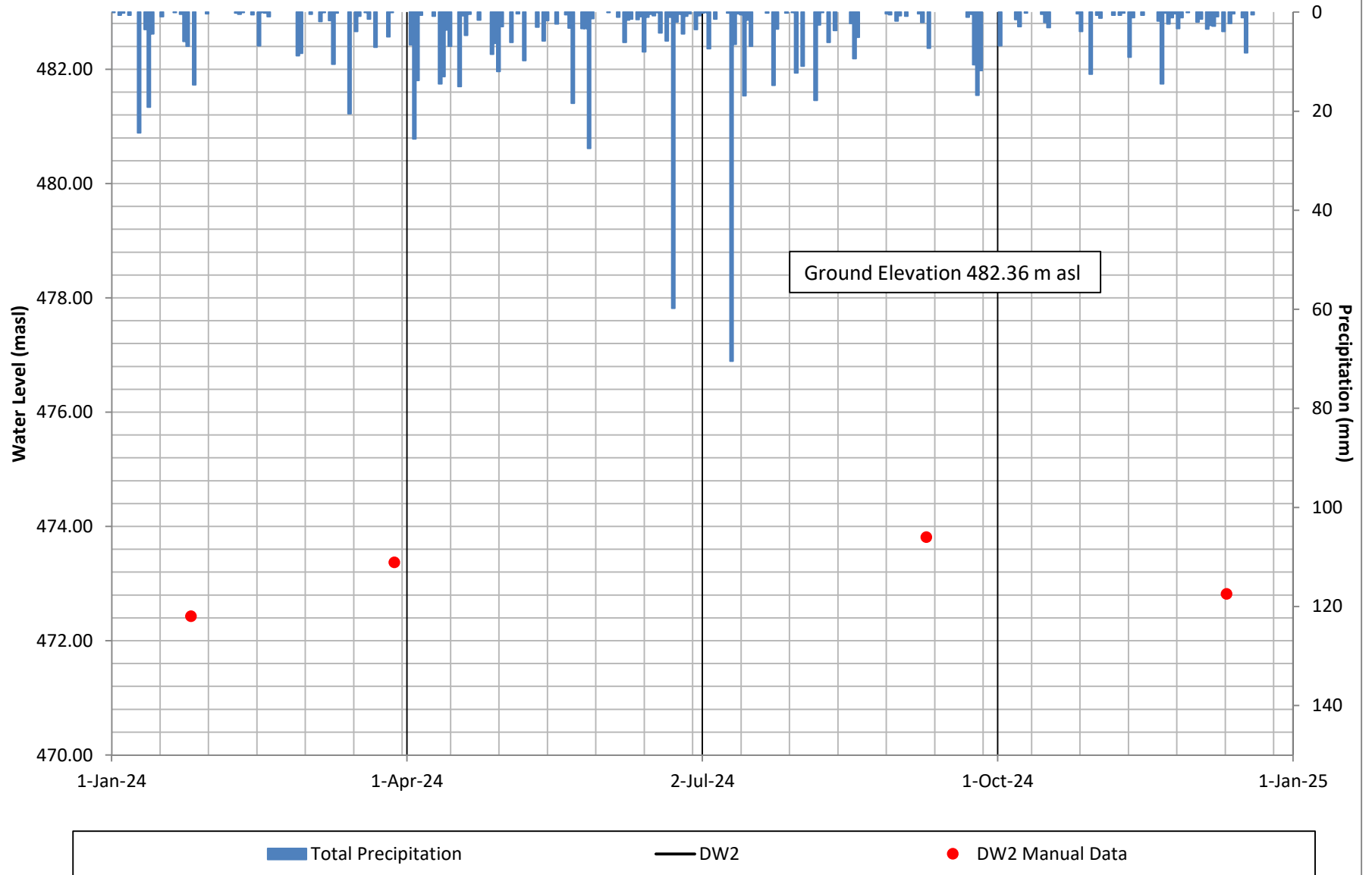
Appendix D: Hydrographs

DW1 Water Levels for 2024

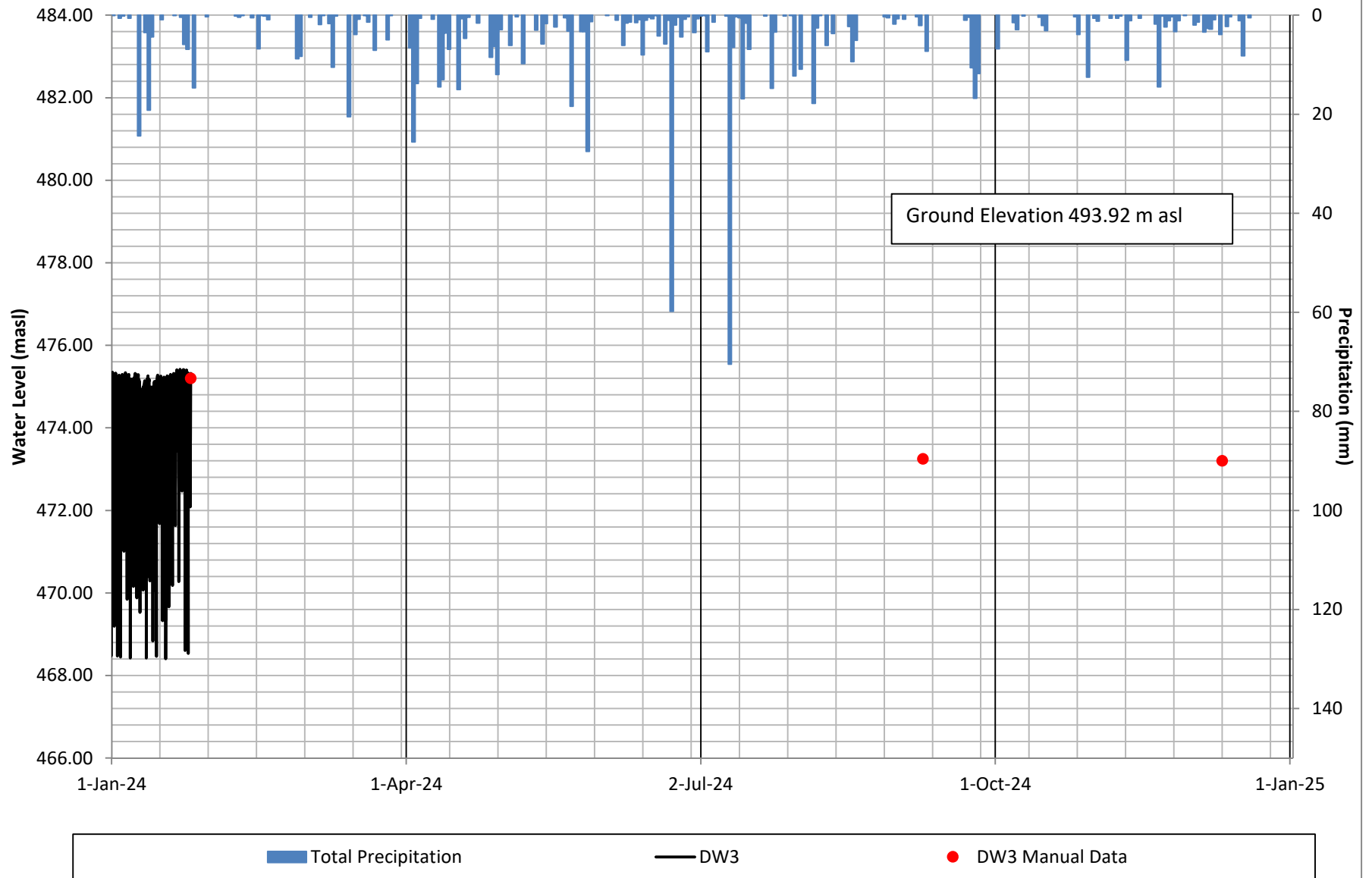


DW2

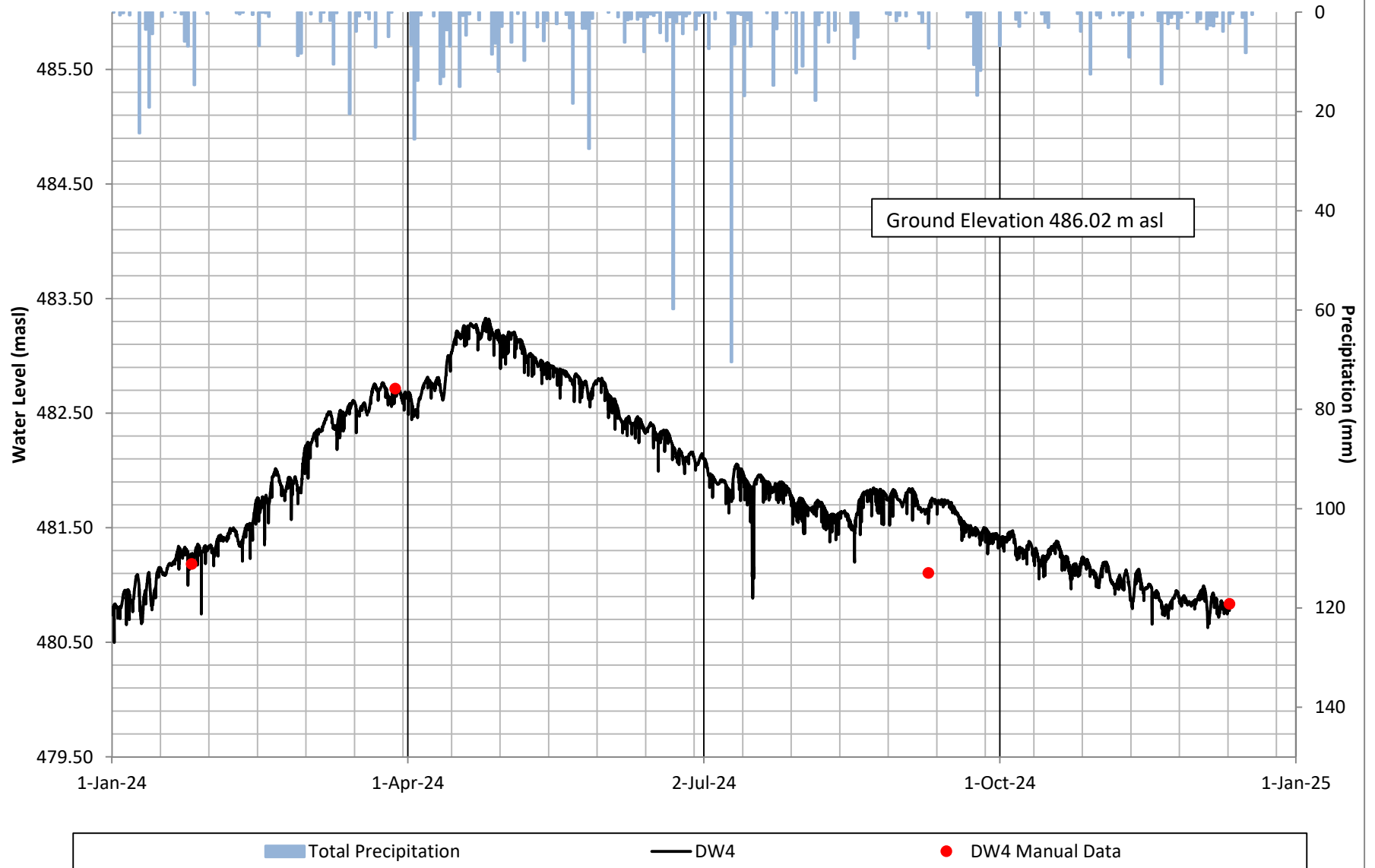
Water Levels for 2024



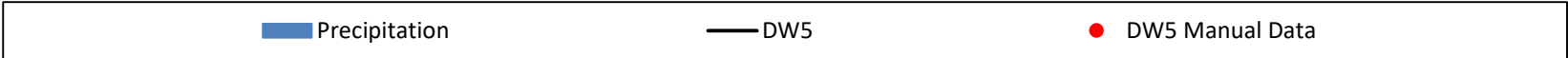
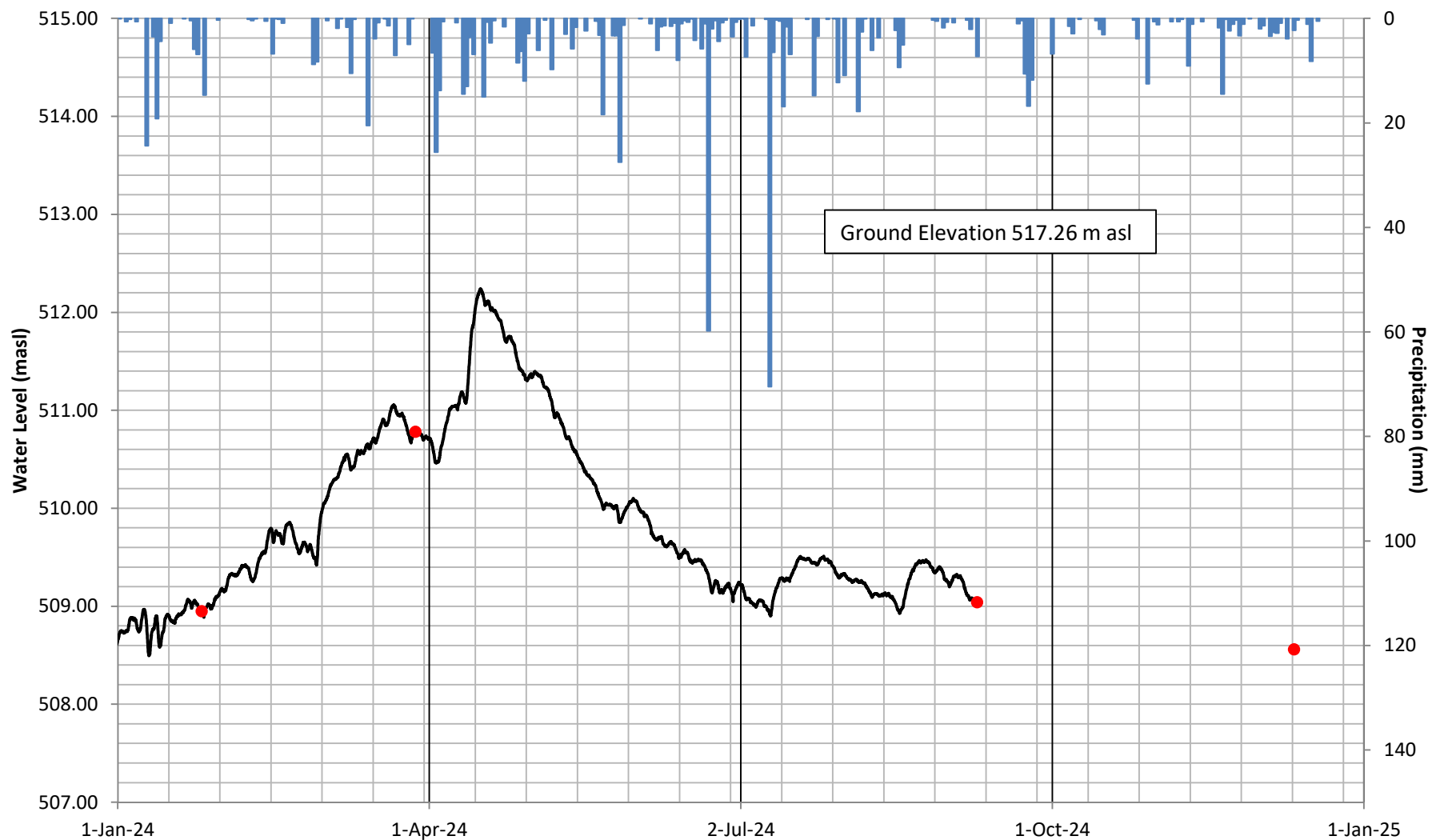
DW3 Water Levels for 2024



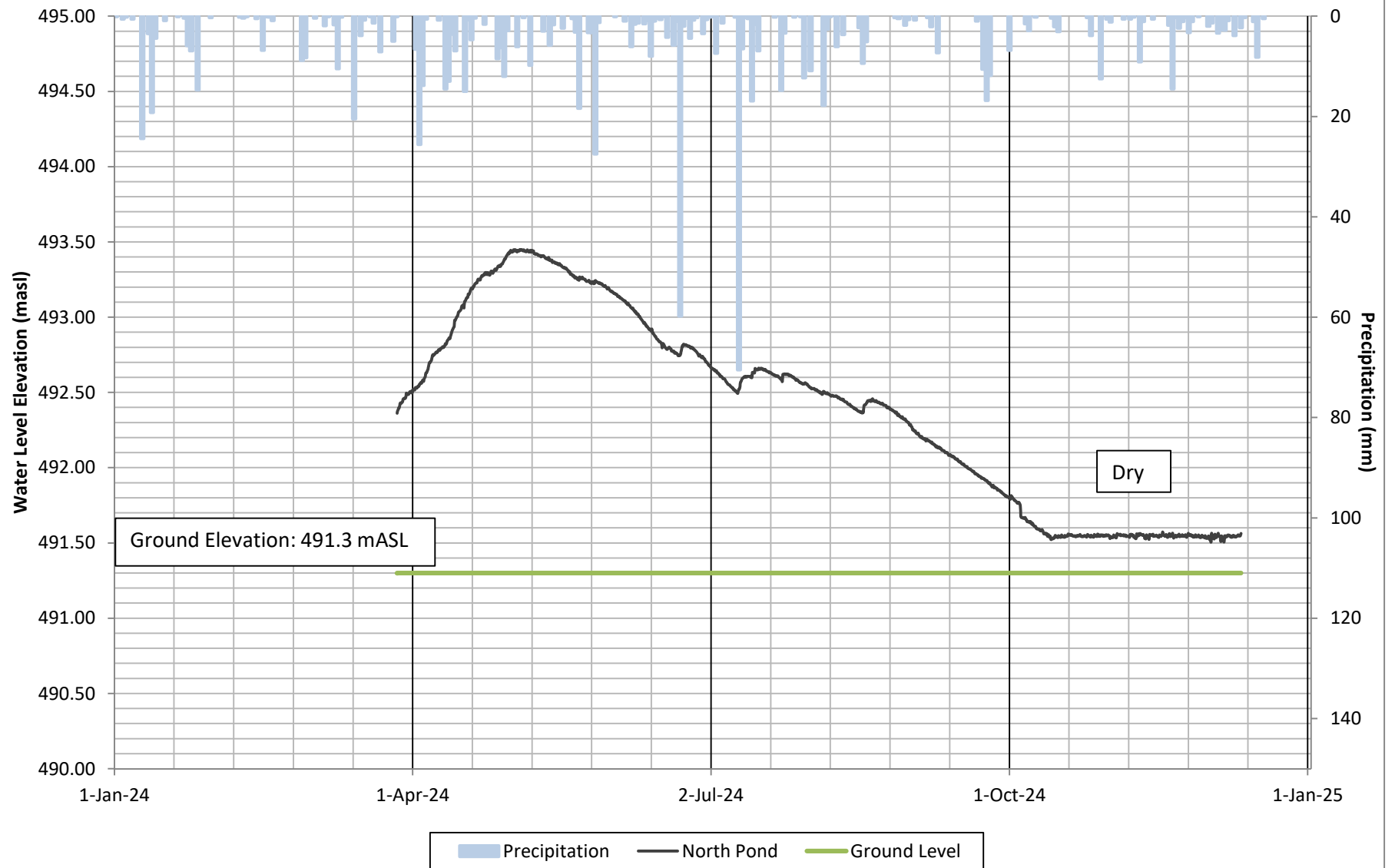
DW4 Water Levels for 2024



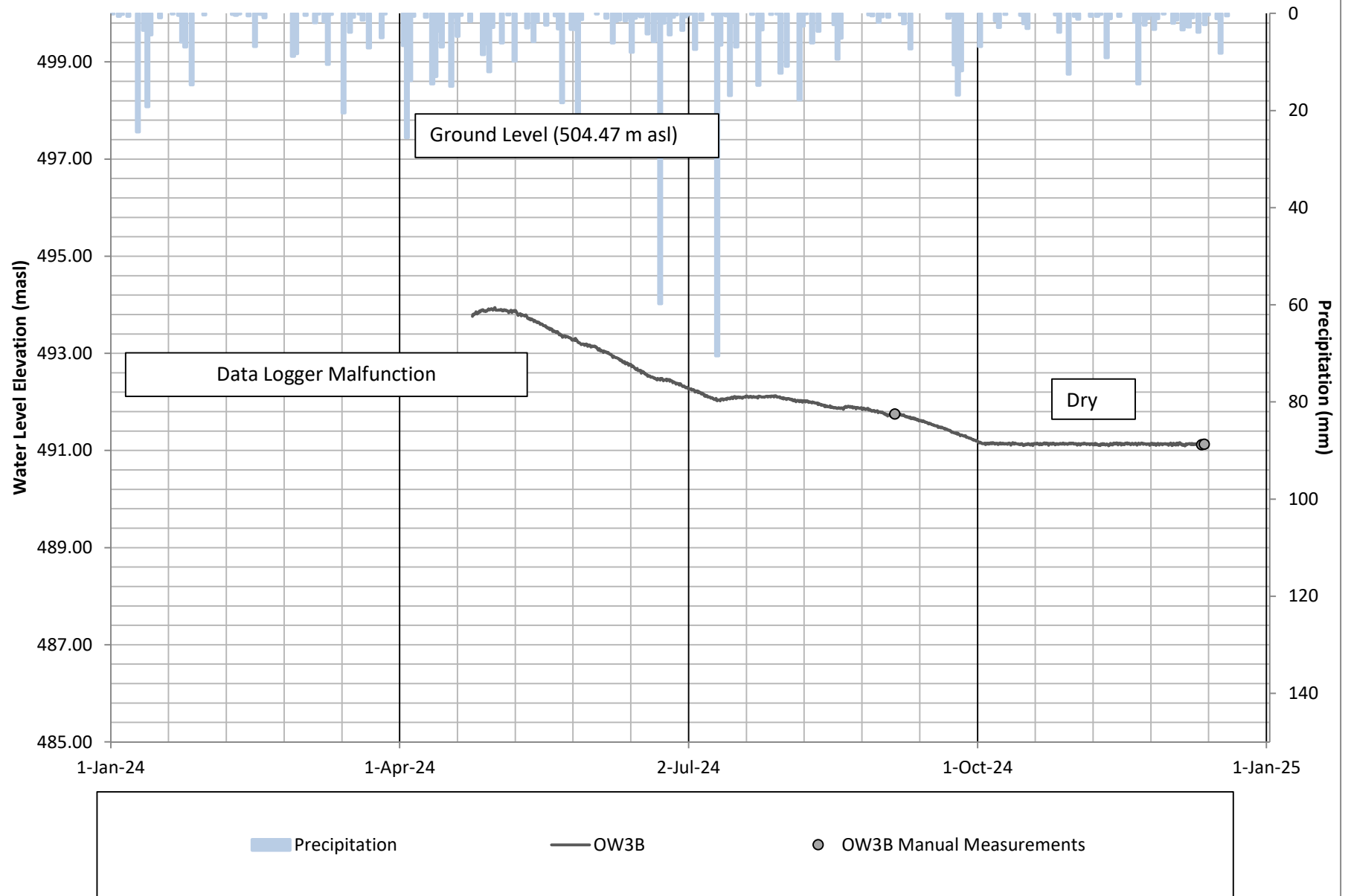
DW5 Water Levels for 2024



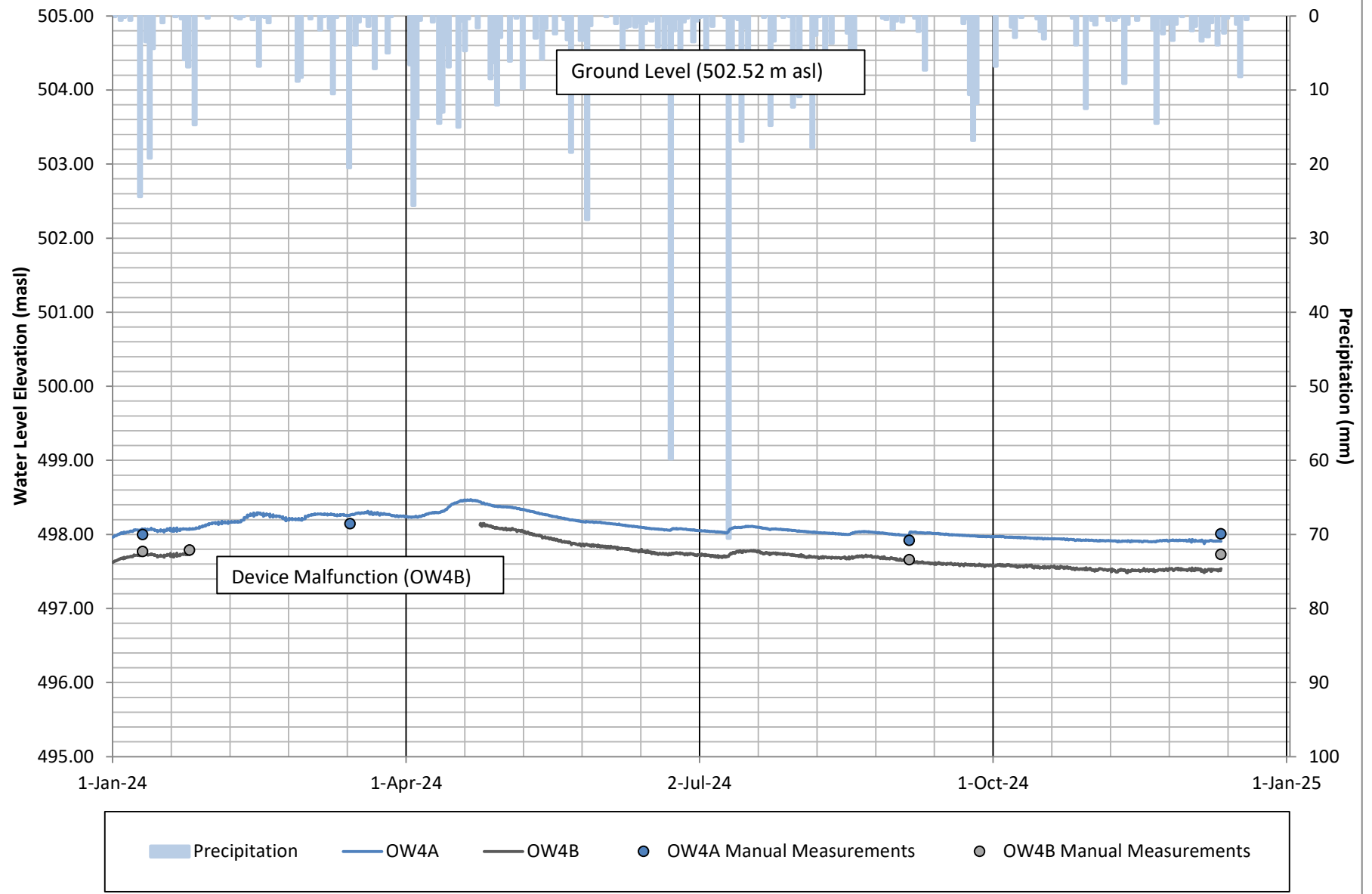
Surface Water Monitoring Station (North Pond) Water Levels for 2024



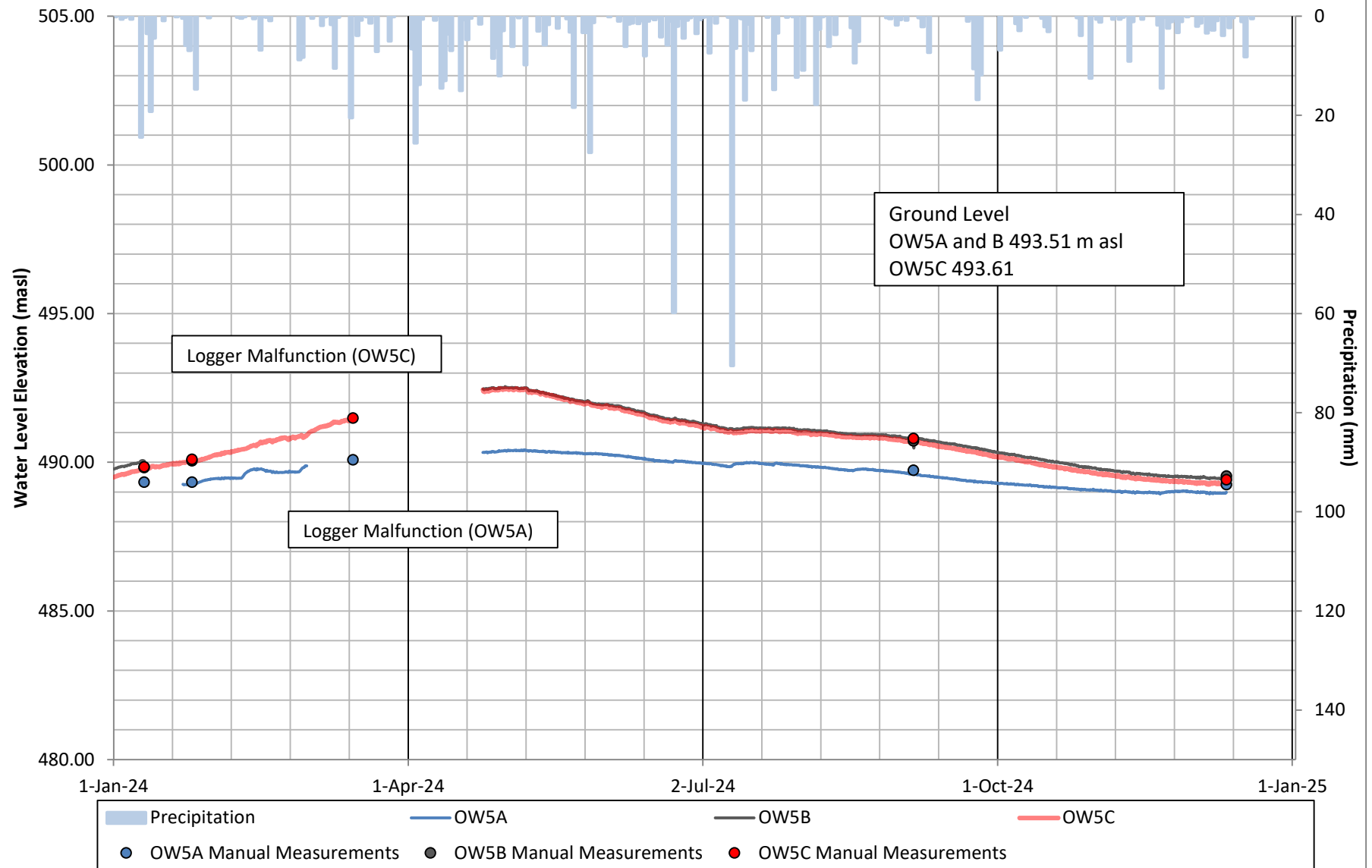
Observation Well Nest (OW3B) Water Levels for 2024



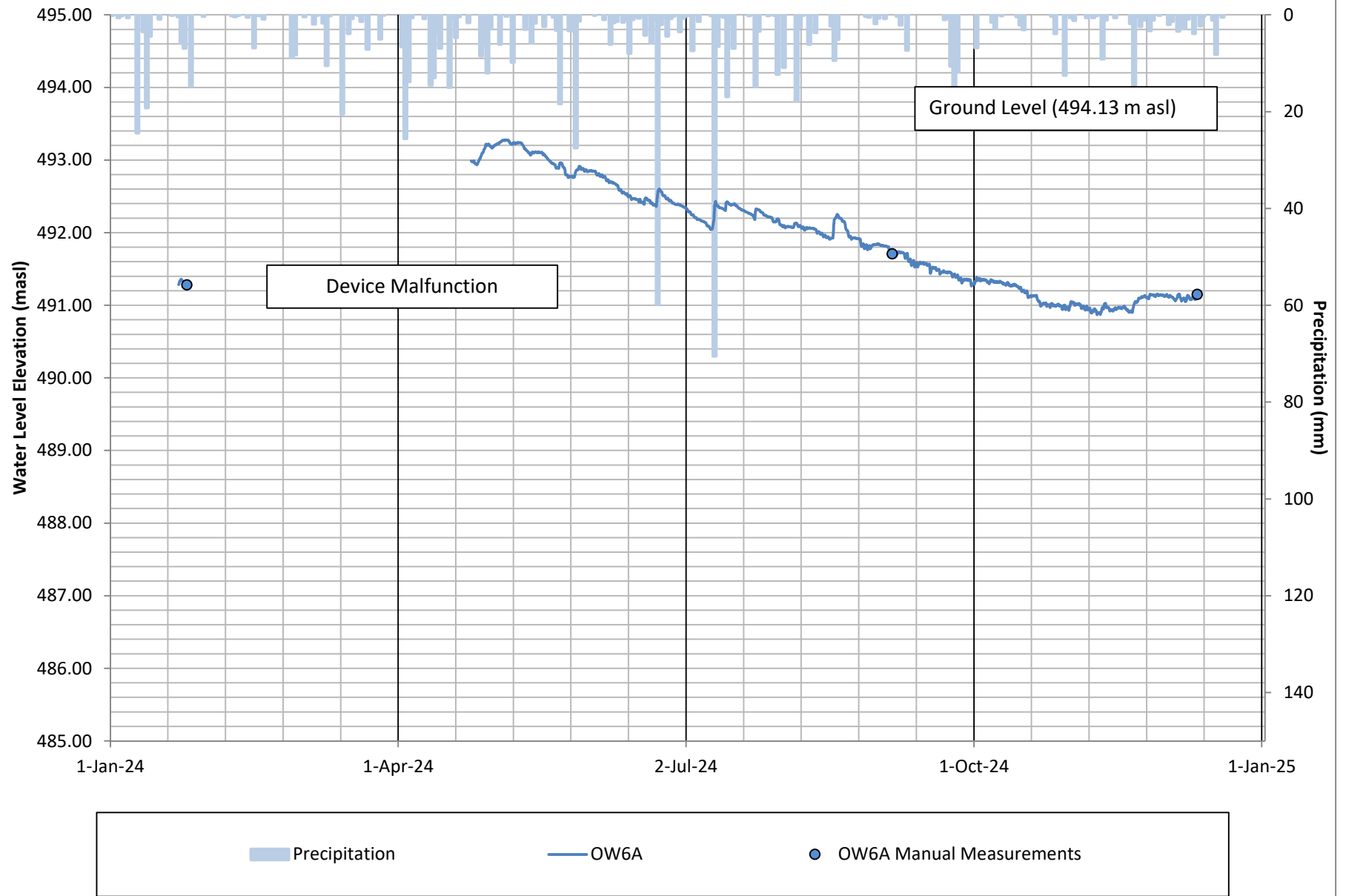
Observation Well Nest (OW4) Water Levels for 2024



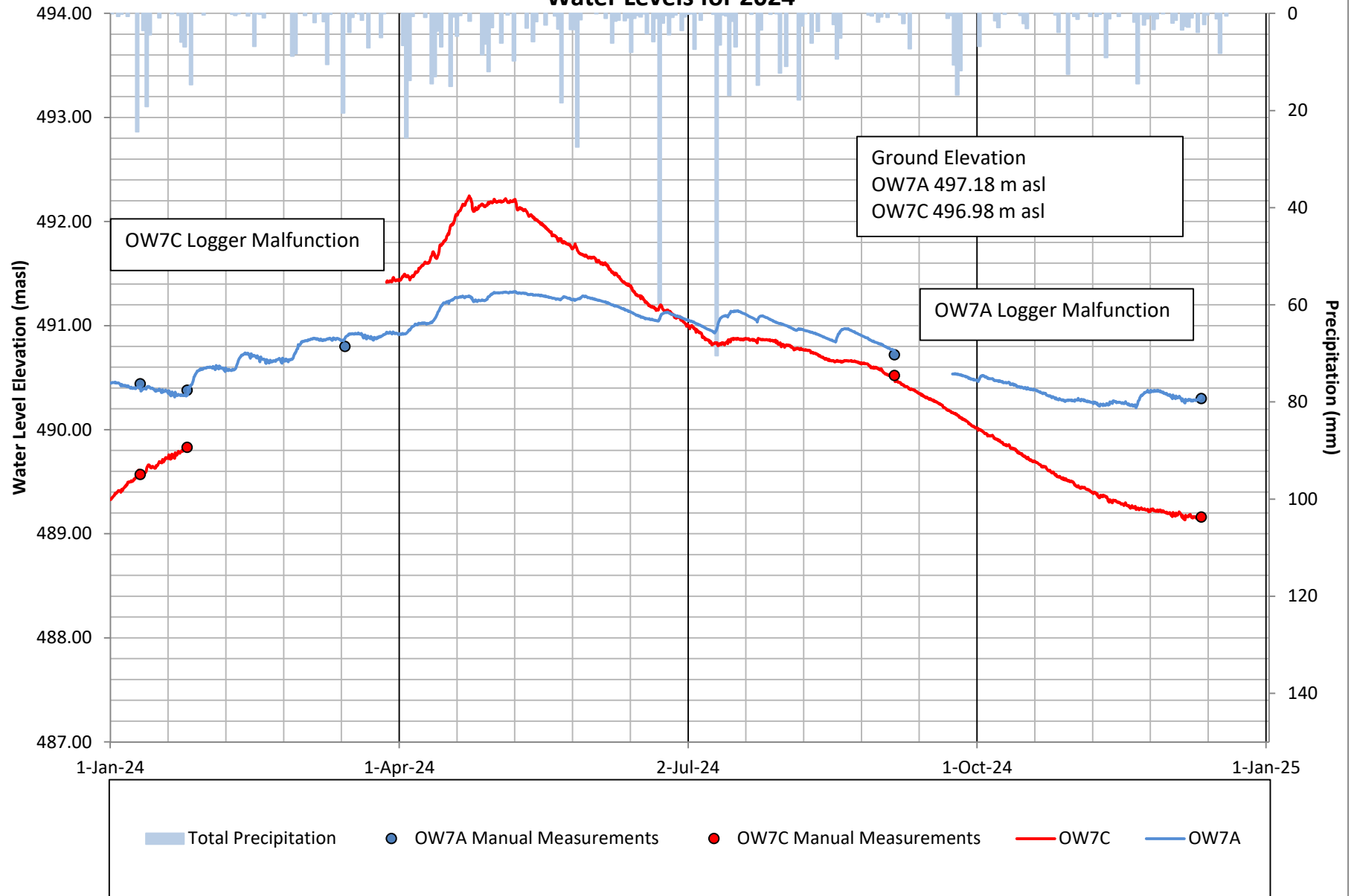
Observation Well Nest (OW5) Water Levels for 2024



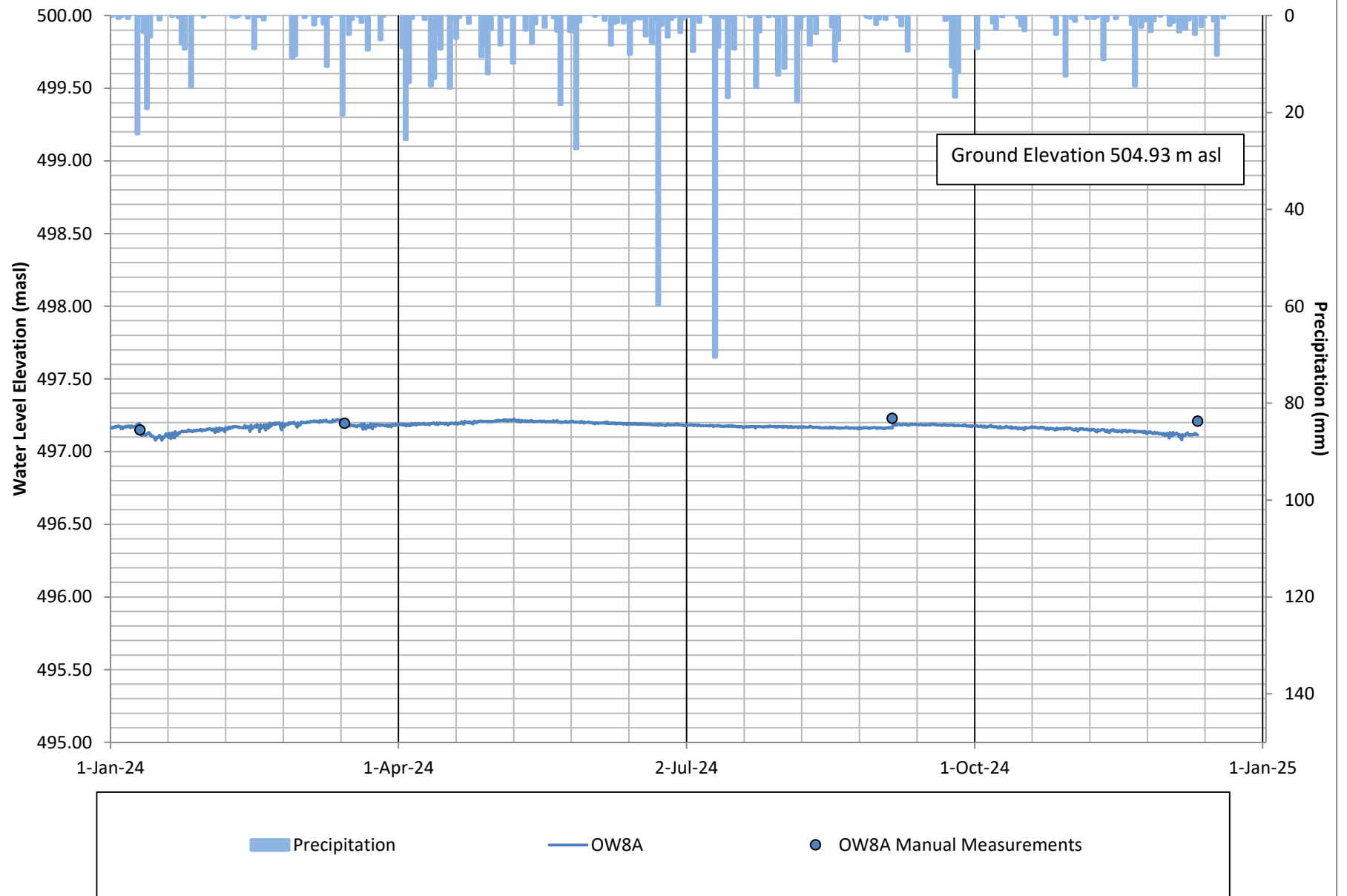
Observation Well Nest (OW6A) Water Levels for 2024



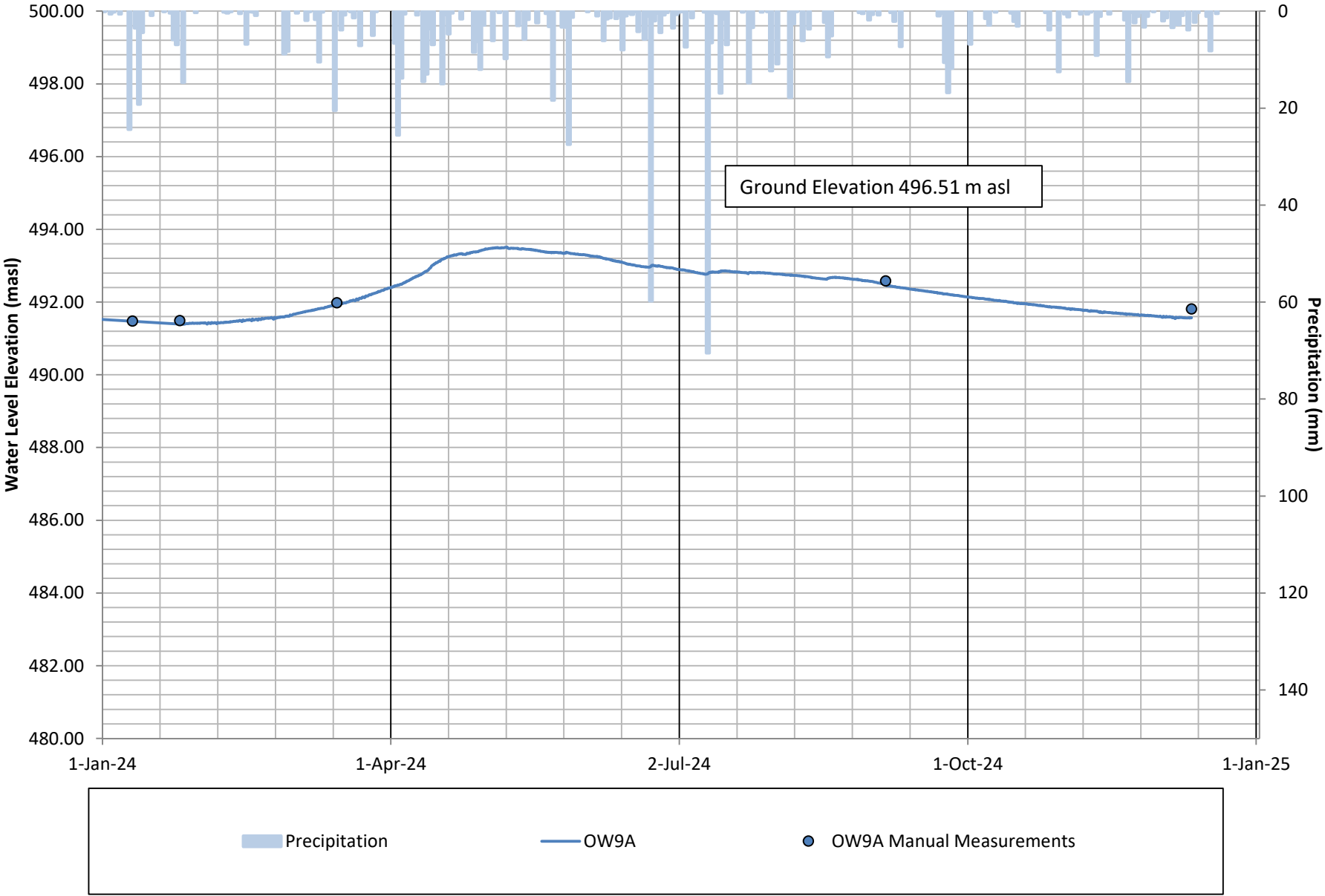
Observation Well Nest (OW7) Water Levels for 2024



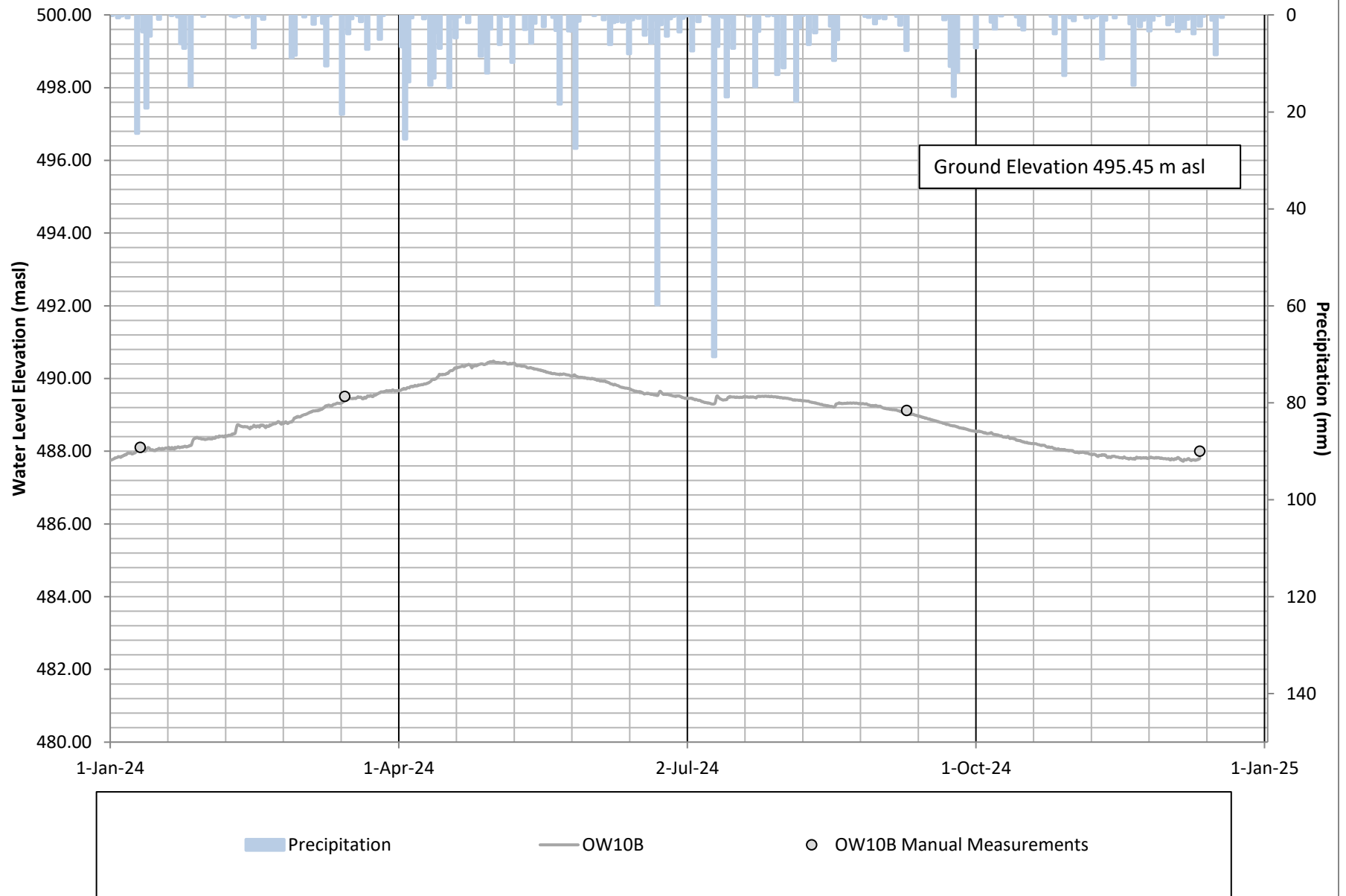
Observation Well Nest (OW8A) Water Levels for 2024



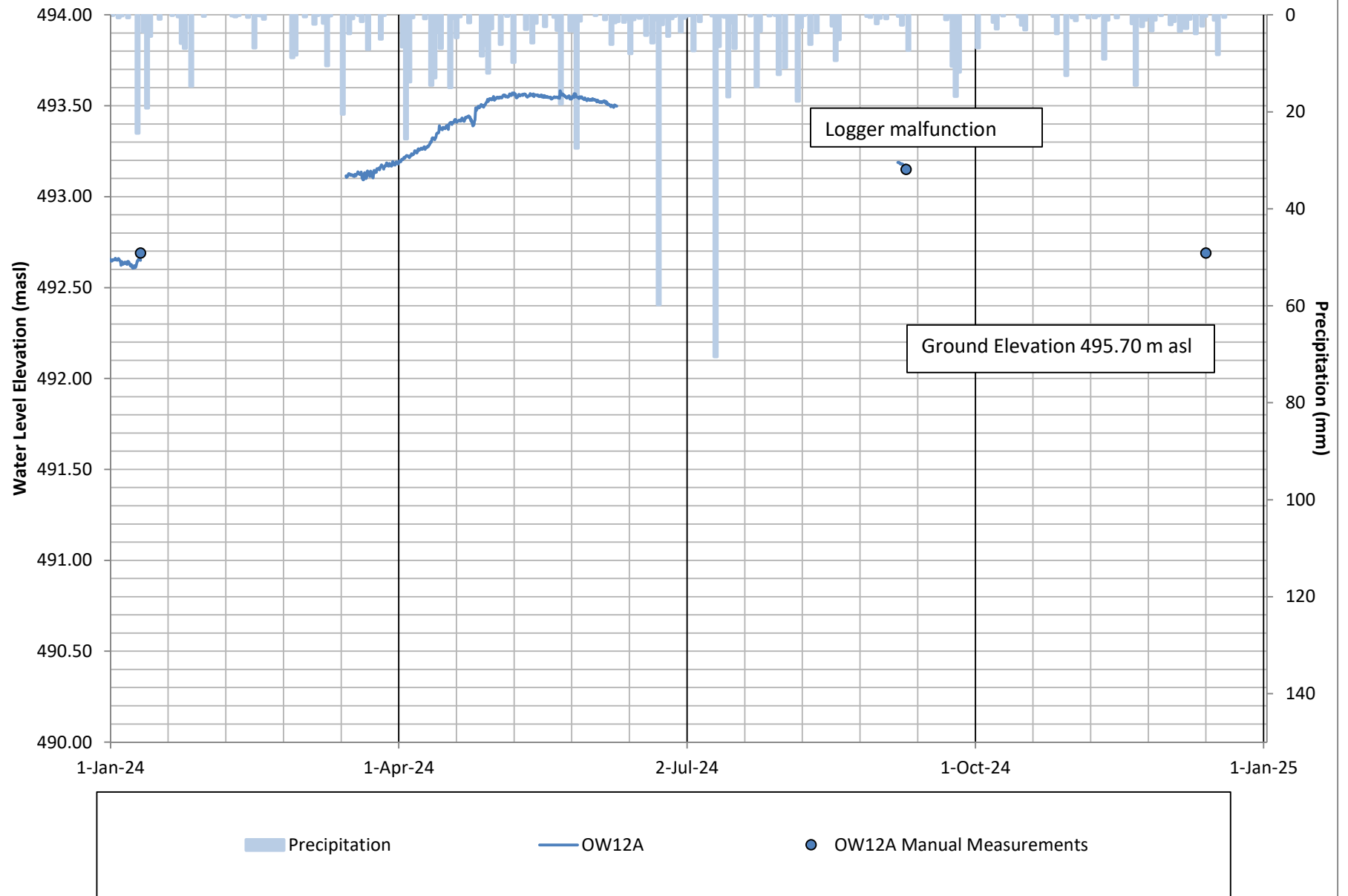
Observation Well Nest (OW9A)
Water Levels for 2024



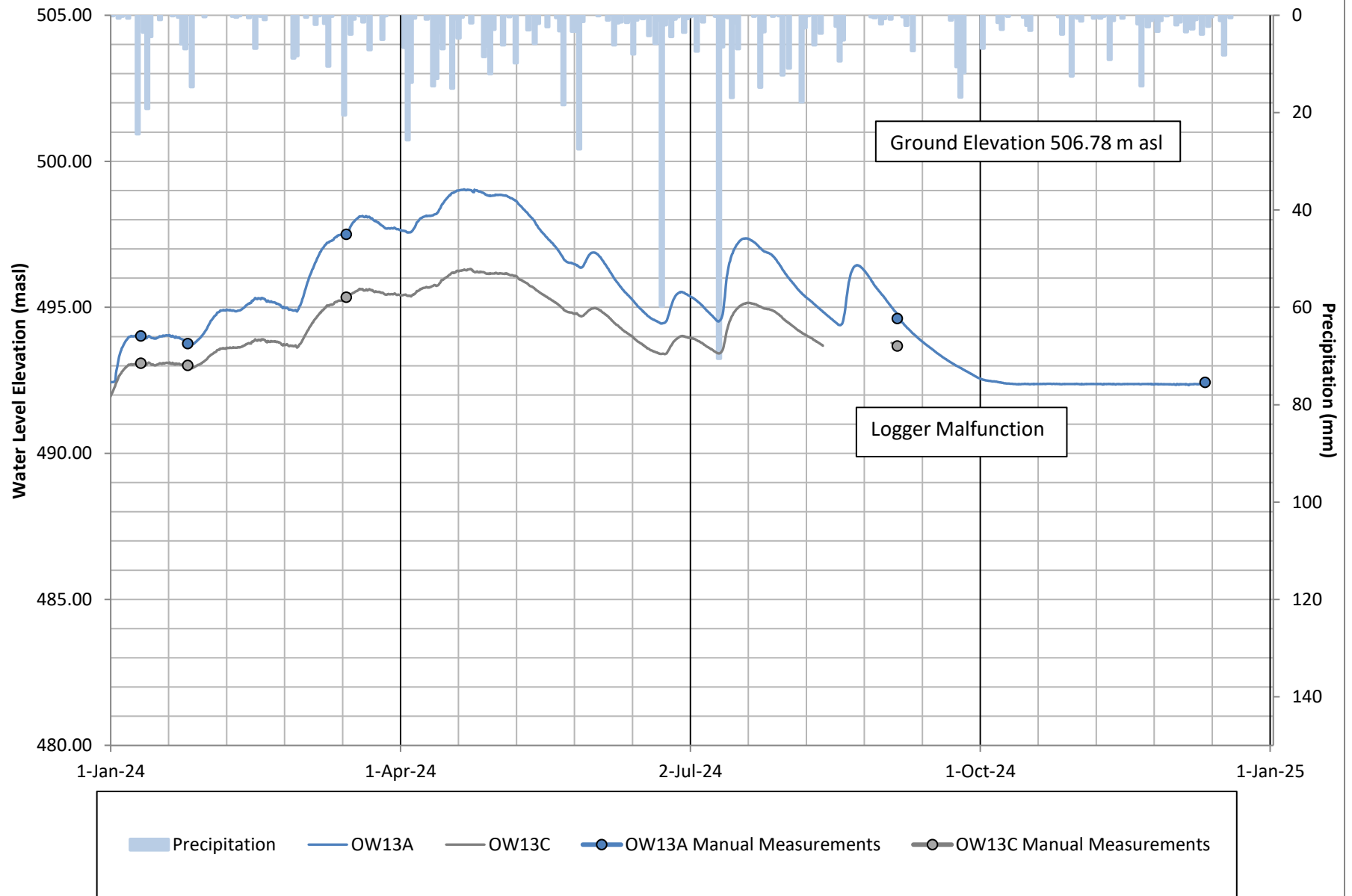
Observation Well Nest (OW10) Water Levels for 2024



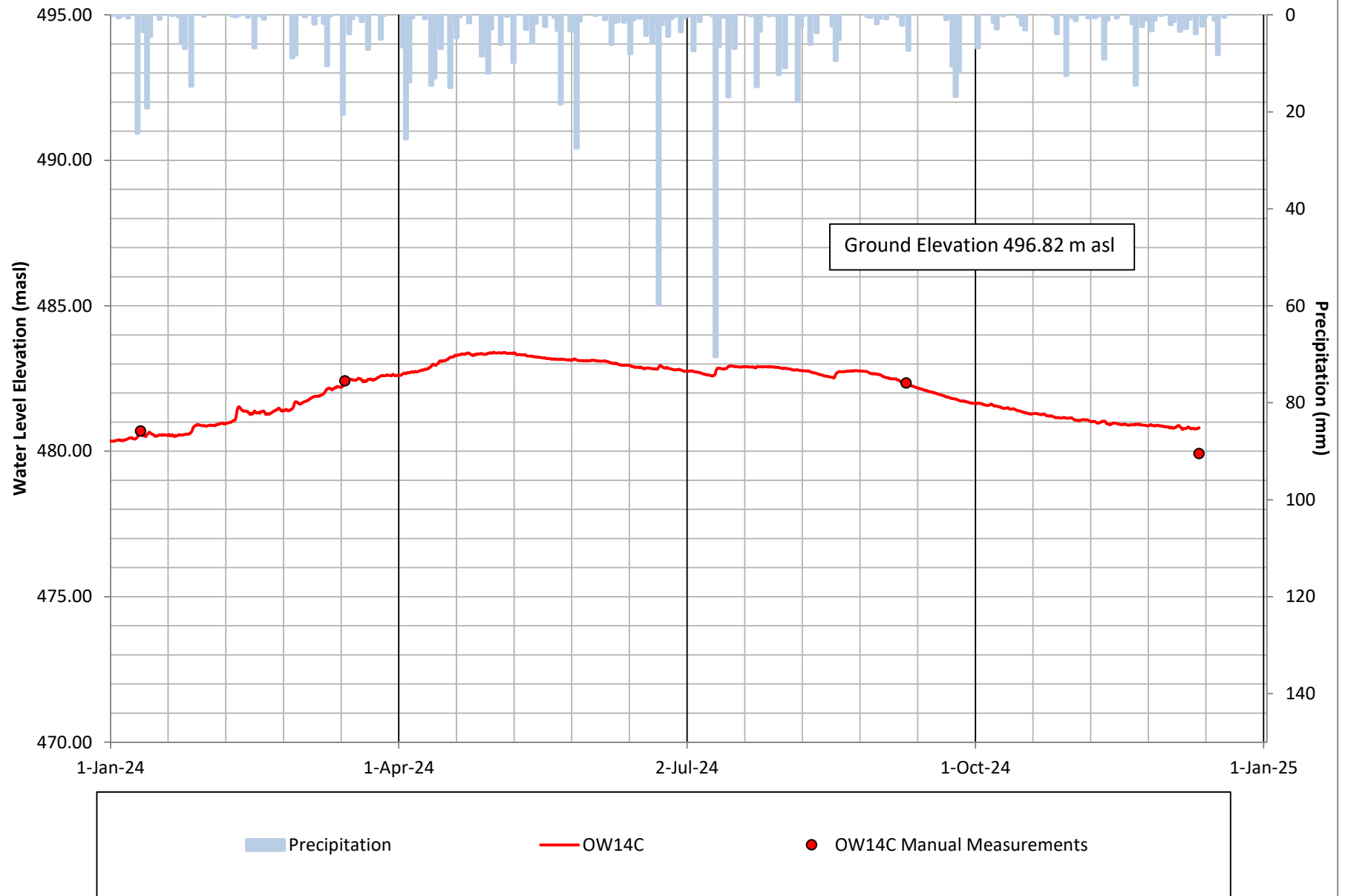
Observation Well Nest (OW12A) Water Levels for 2024



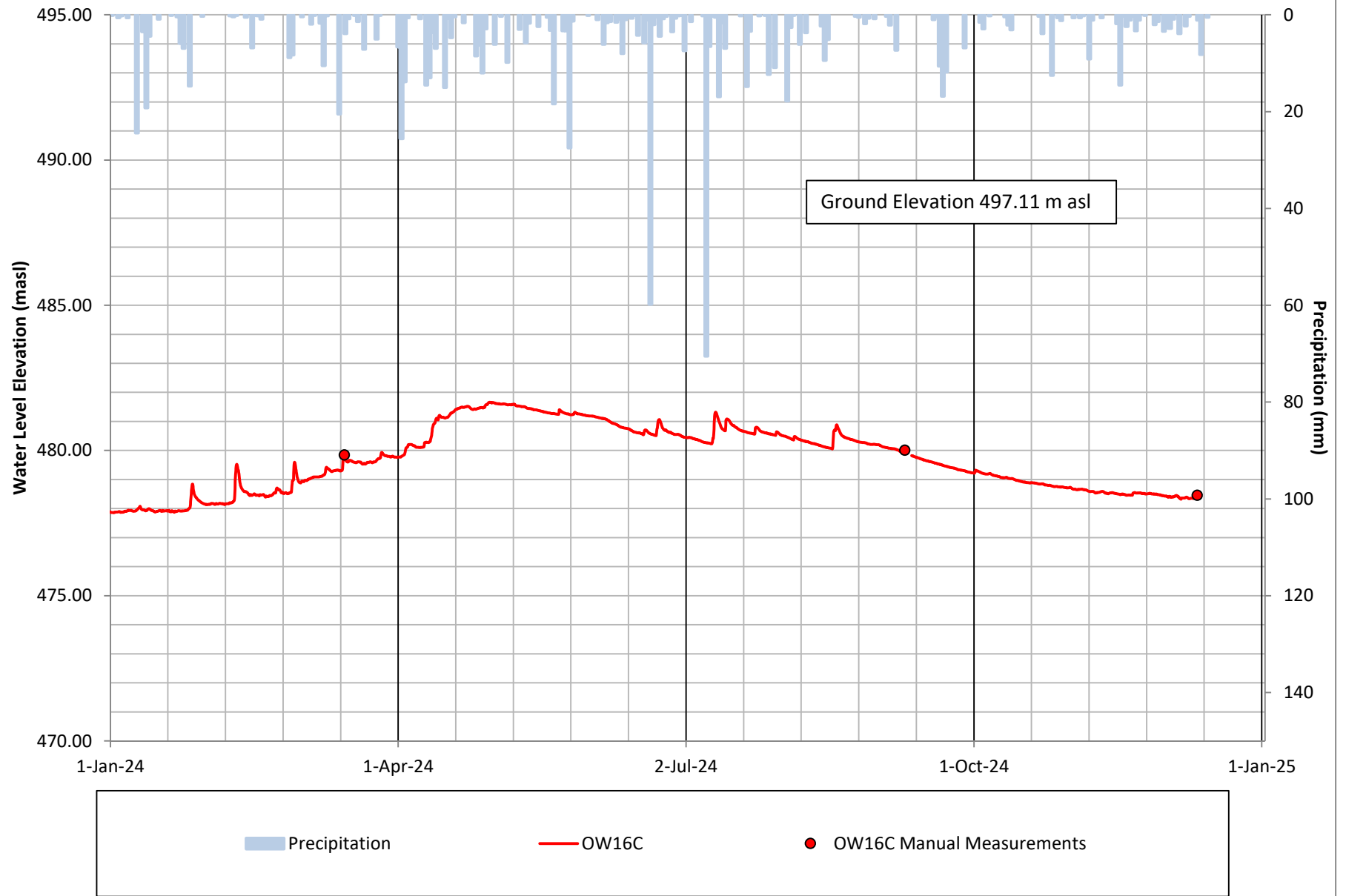
Observation Well Nest (OW13) Water Levels for 2024



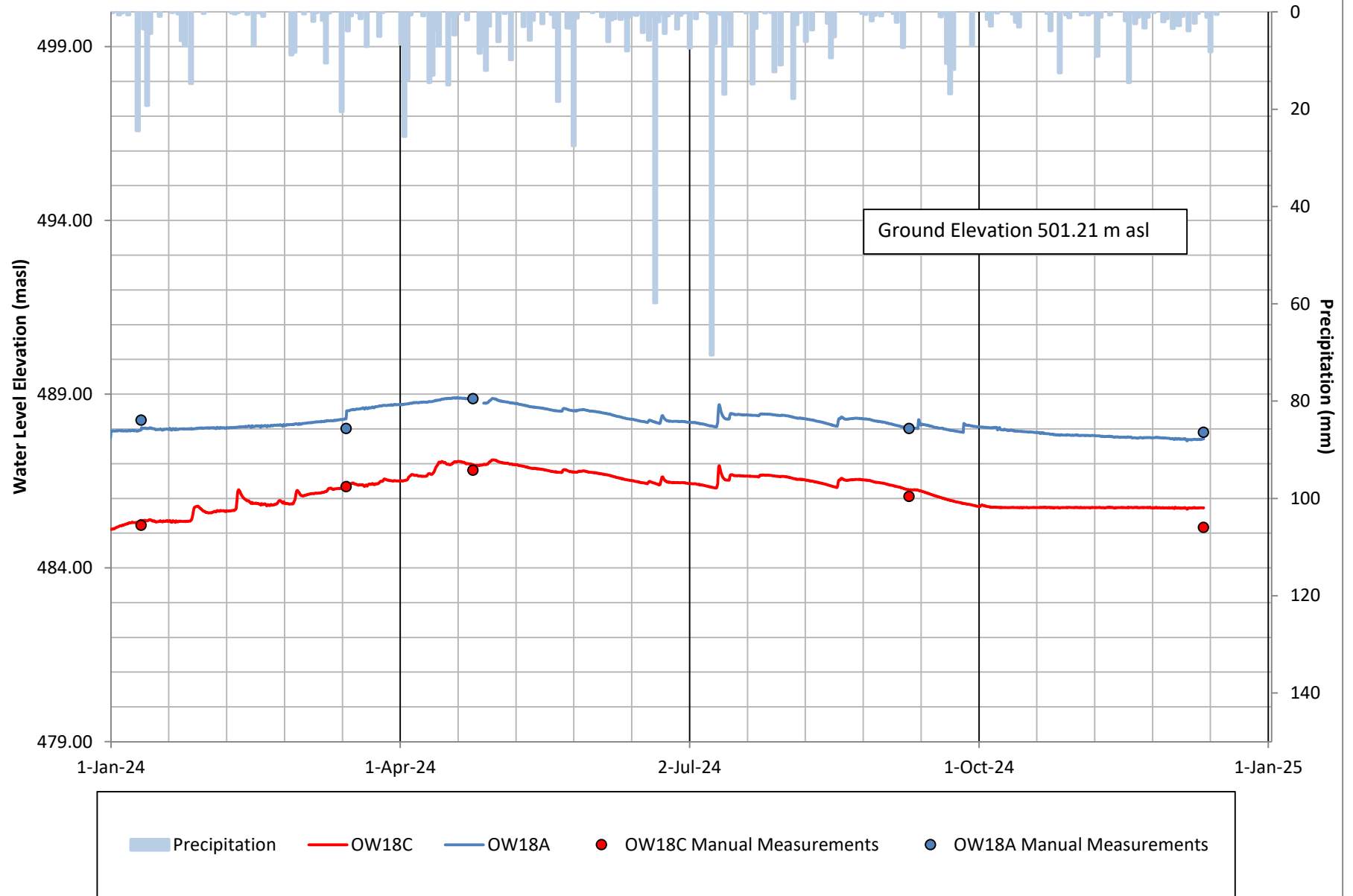
Observation Well Nest (OW14C) Water Levels for 2024



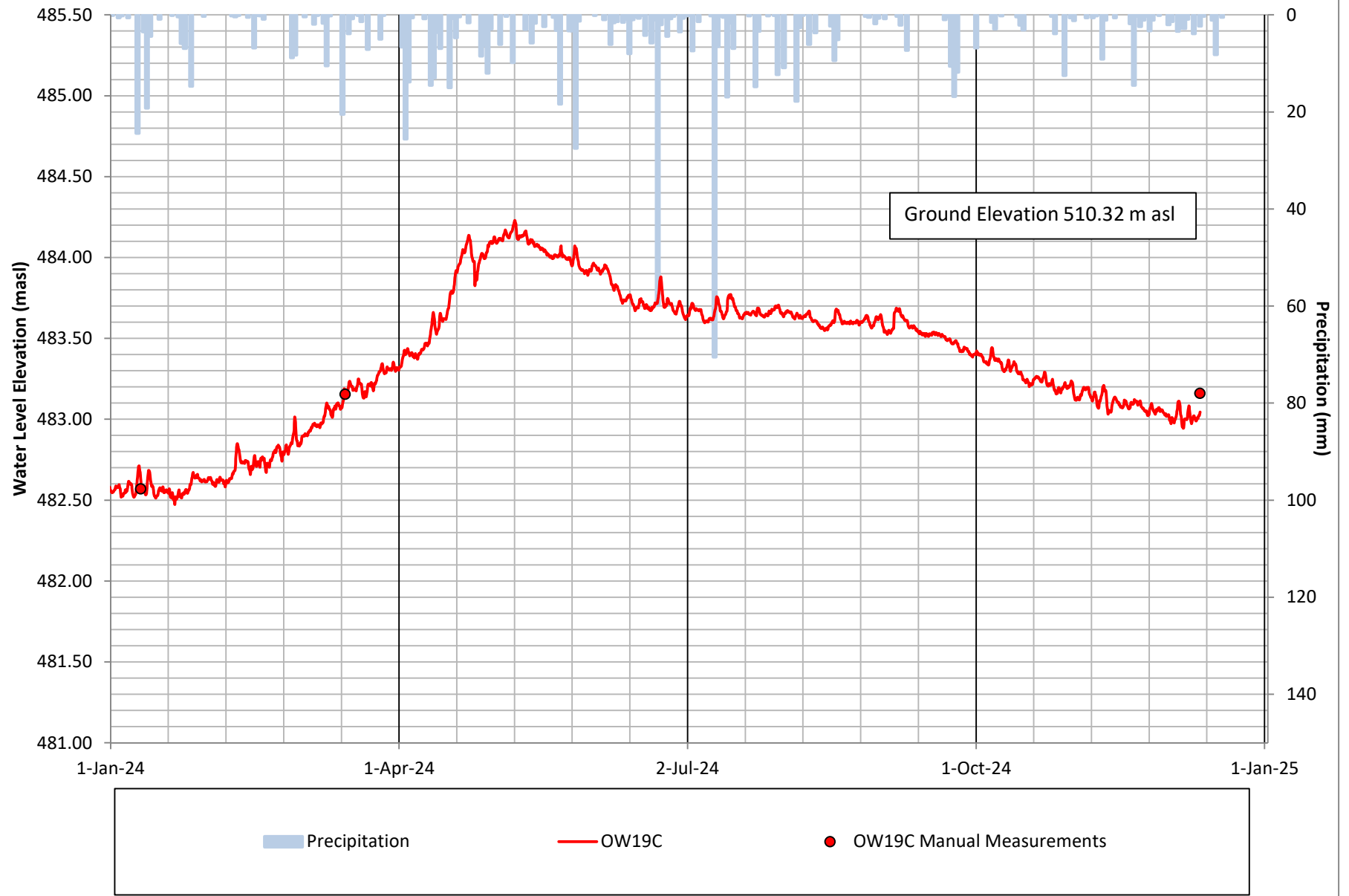
Observation Well Nest (OW16C) Water Levels for 2024



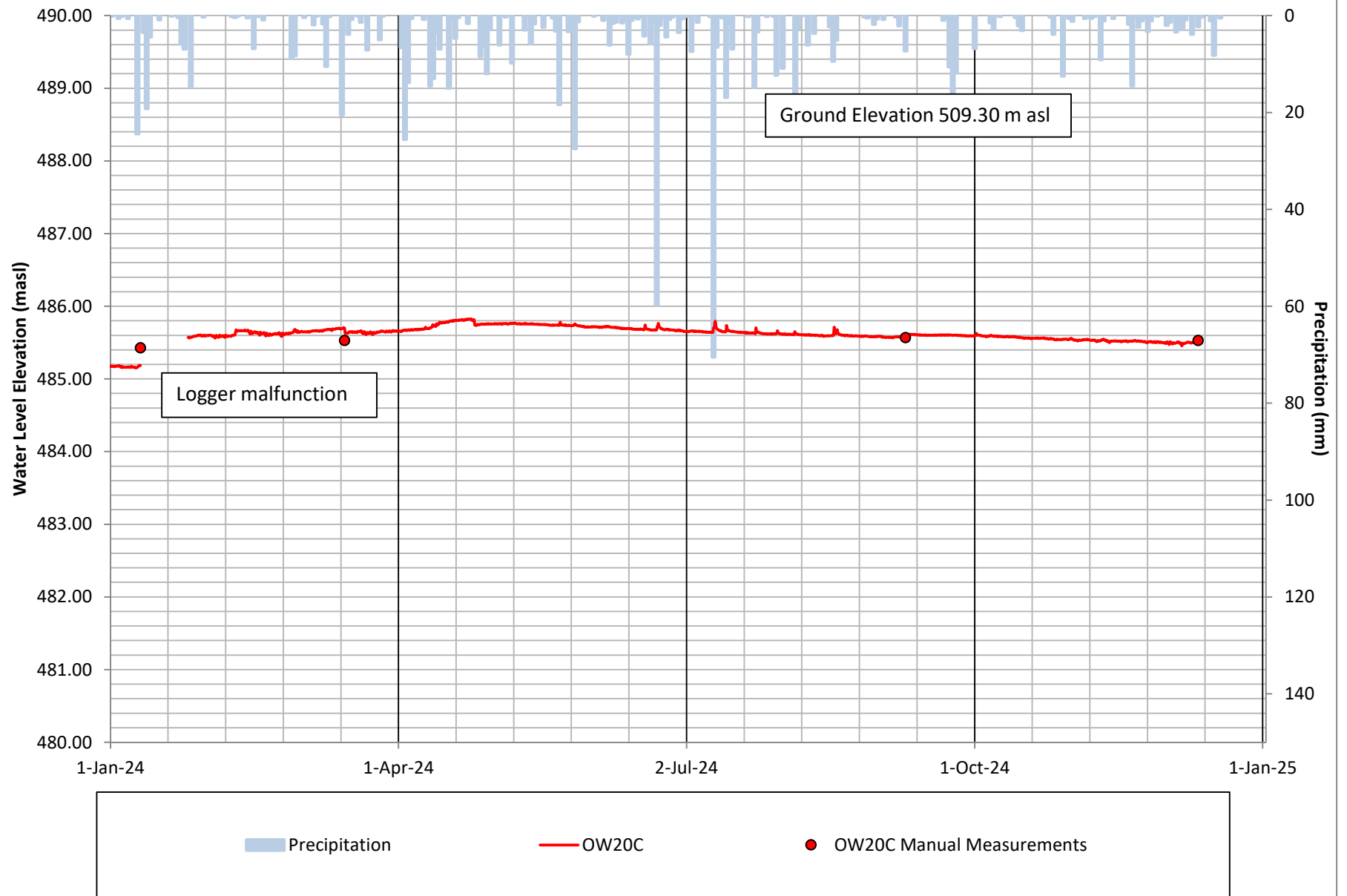
Observation Well Nest (OW18) Water Levels for 2024



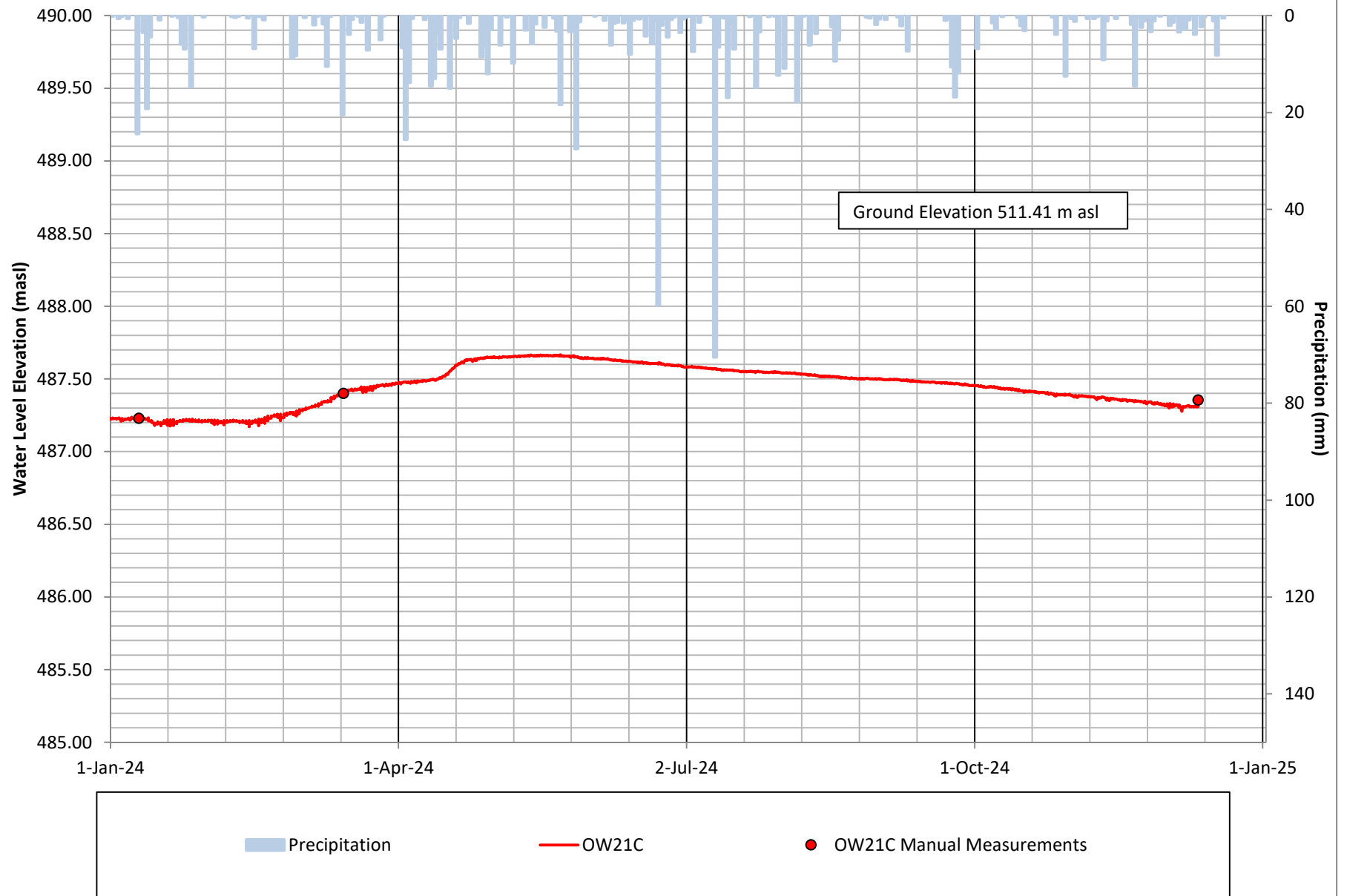
Observation Well Nest (OW19C) Water Levels for 2024



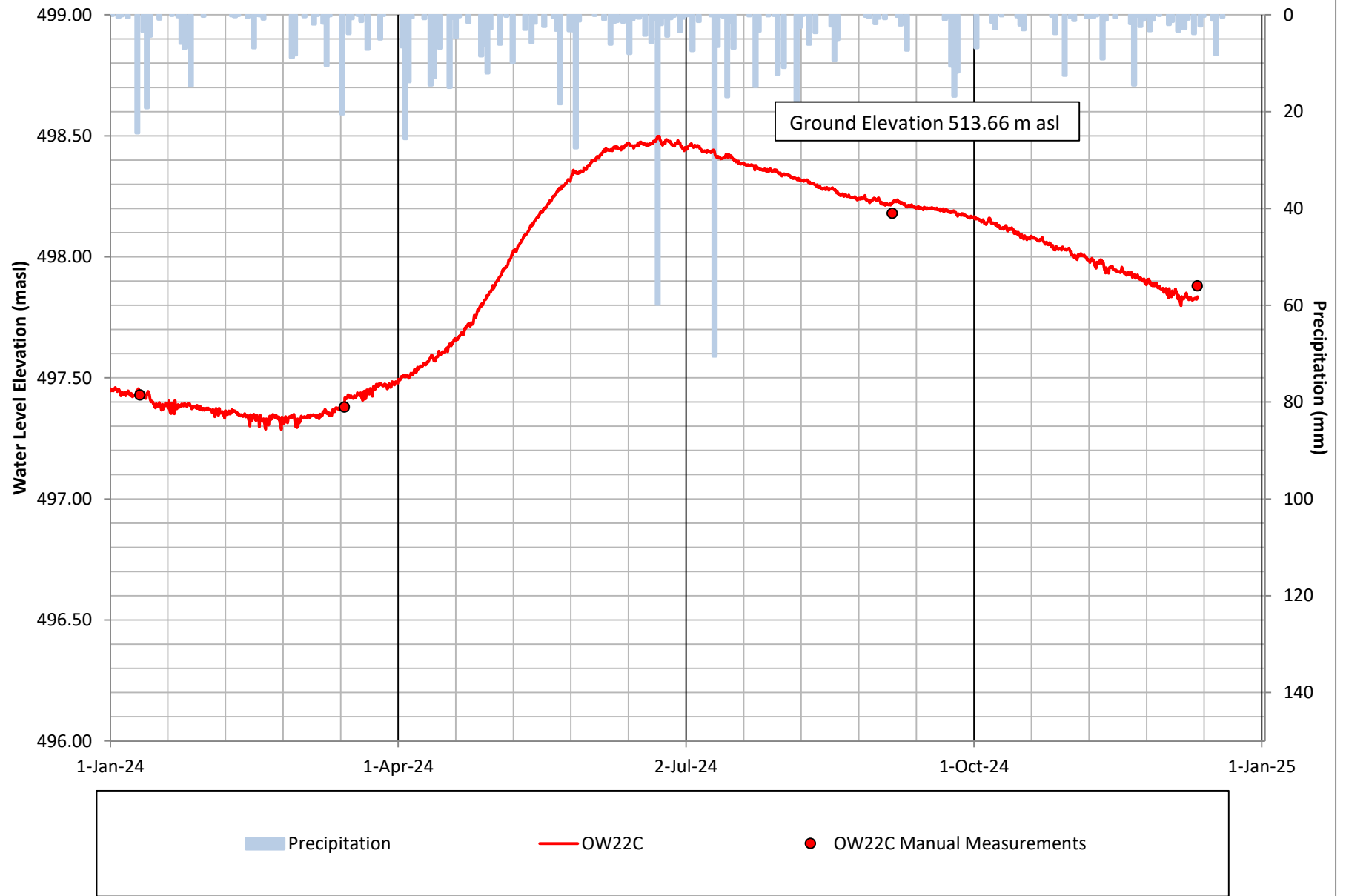
Observation Well Nest (OW20C) Water Levels for 2024



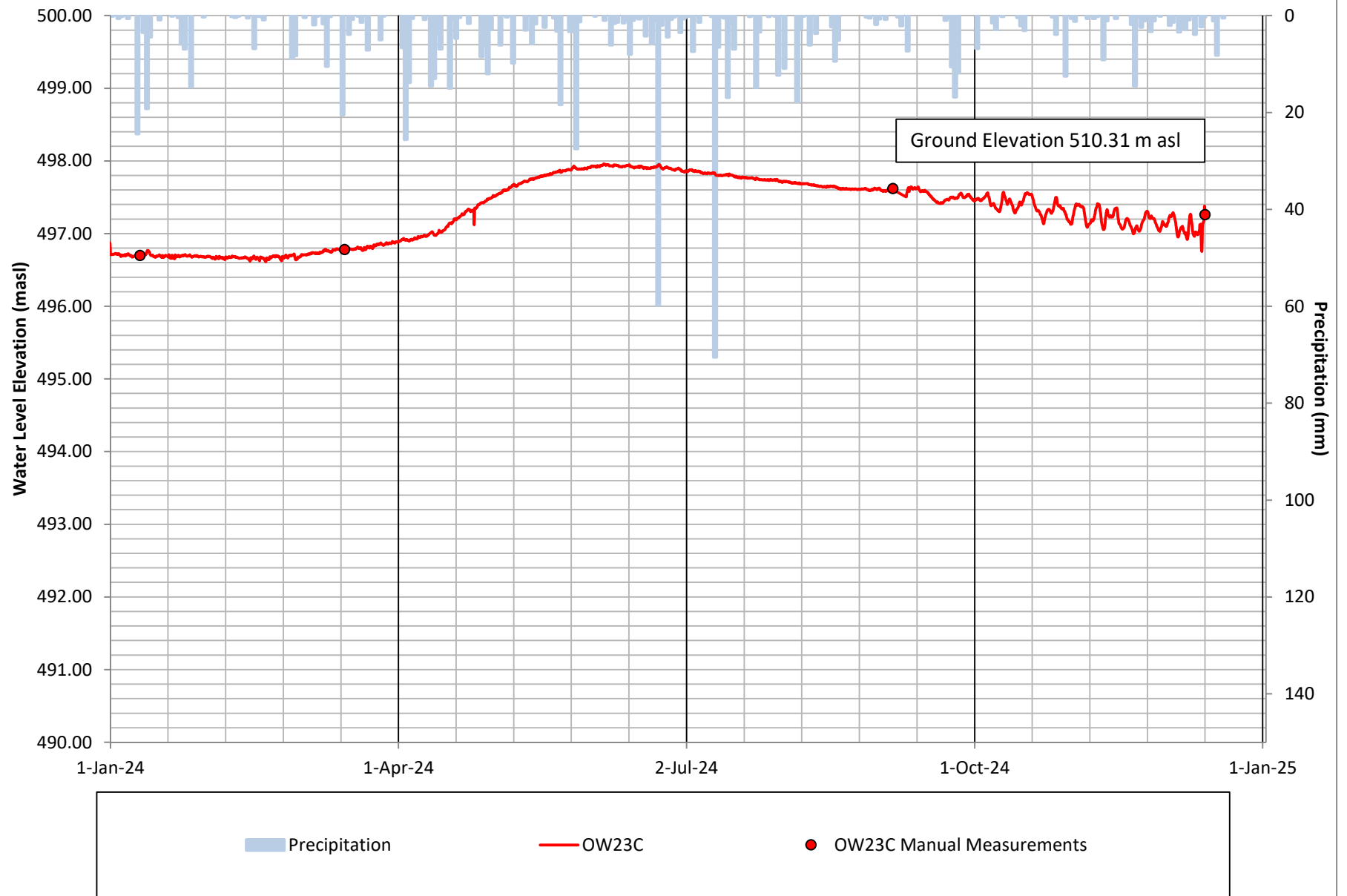
Observation Well Nest (OW21C) Water Levels for 2024



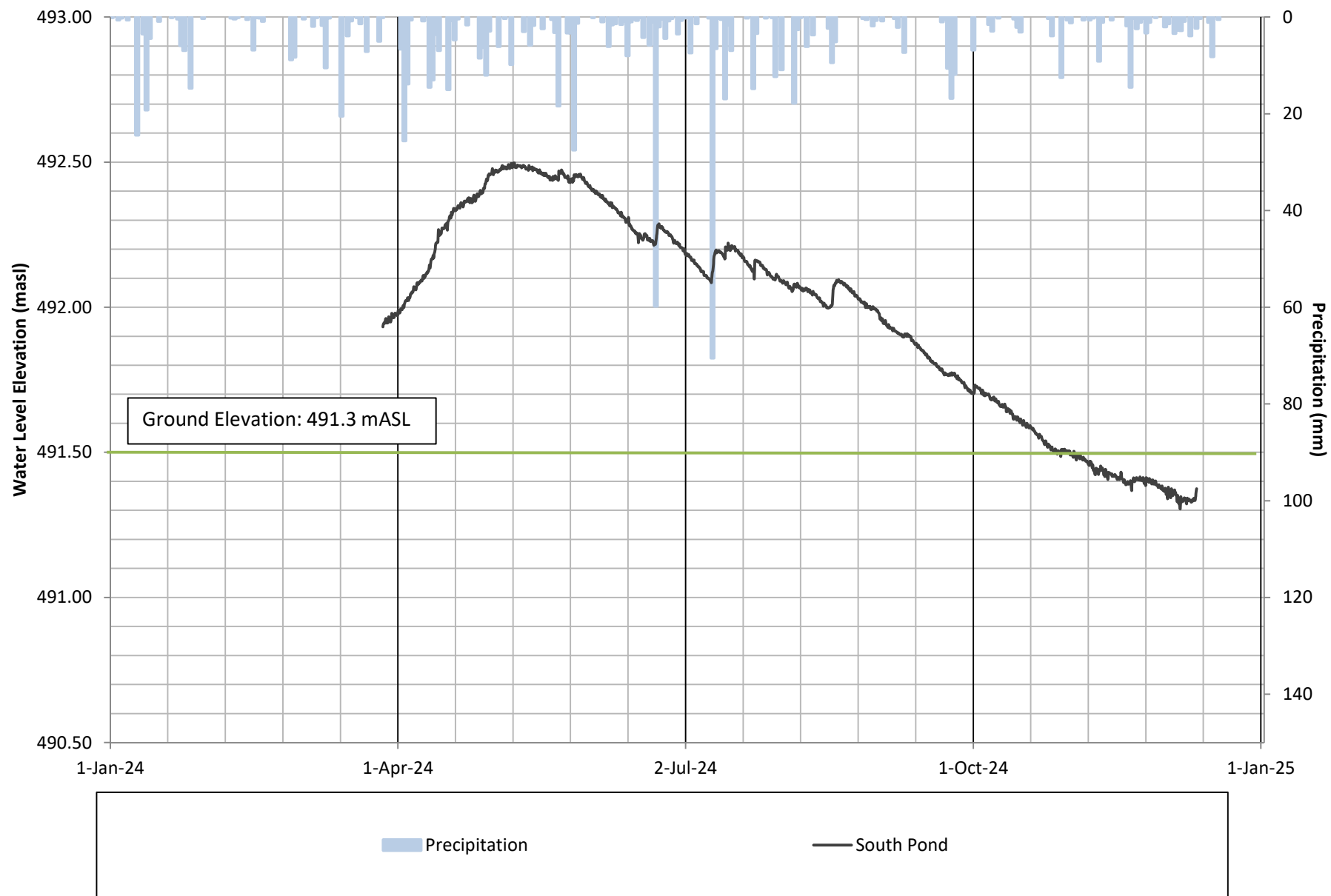
Observation Well Nest (OW22C) Water Levels for 2024



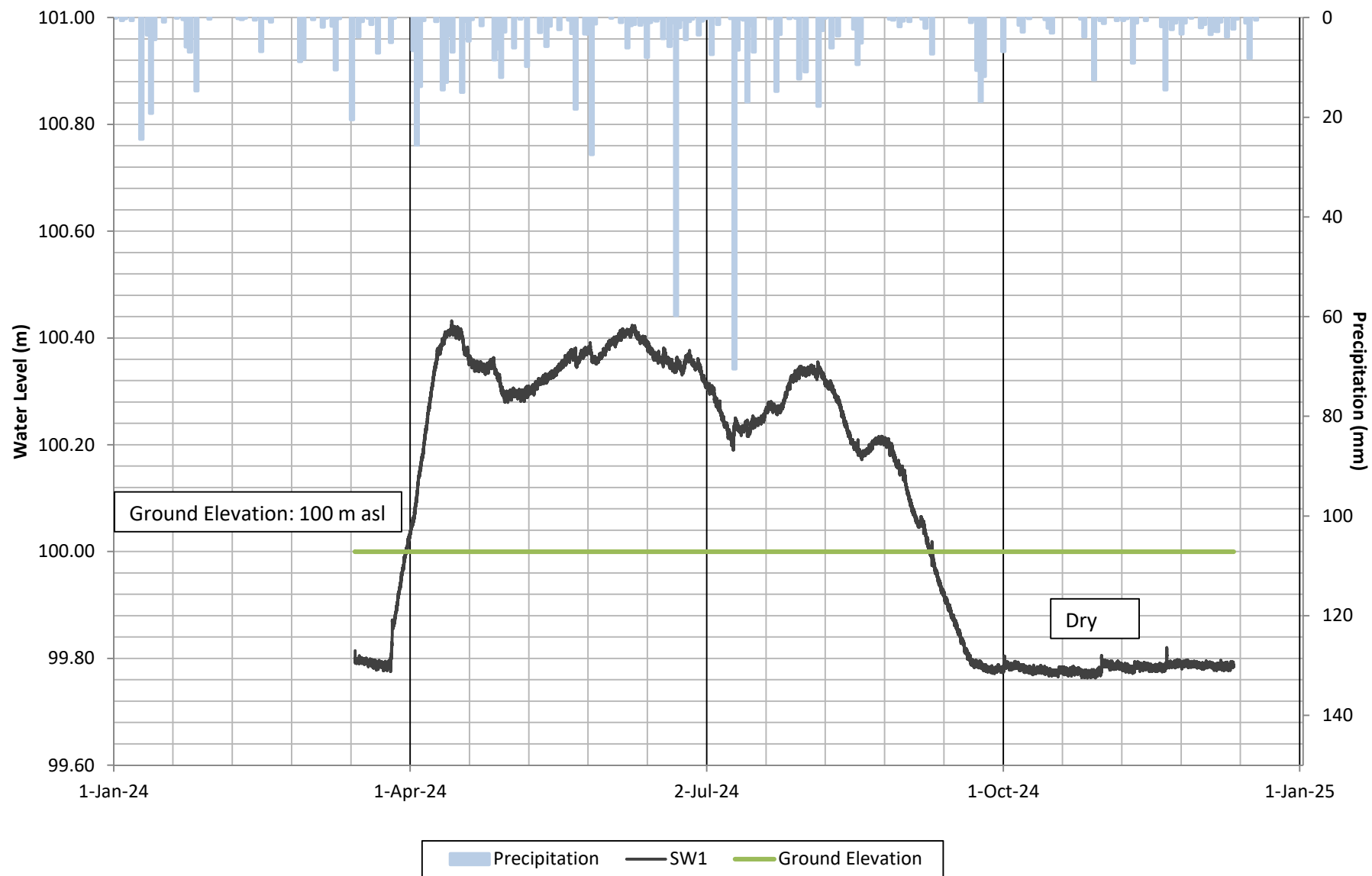
Observation Well Nest (OW23C) Water Levels for 2024



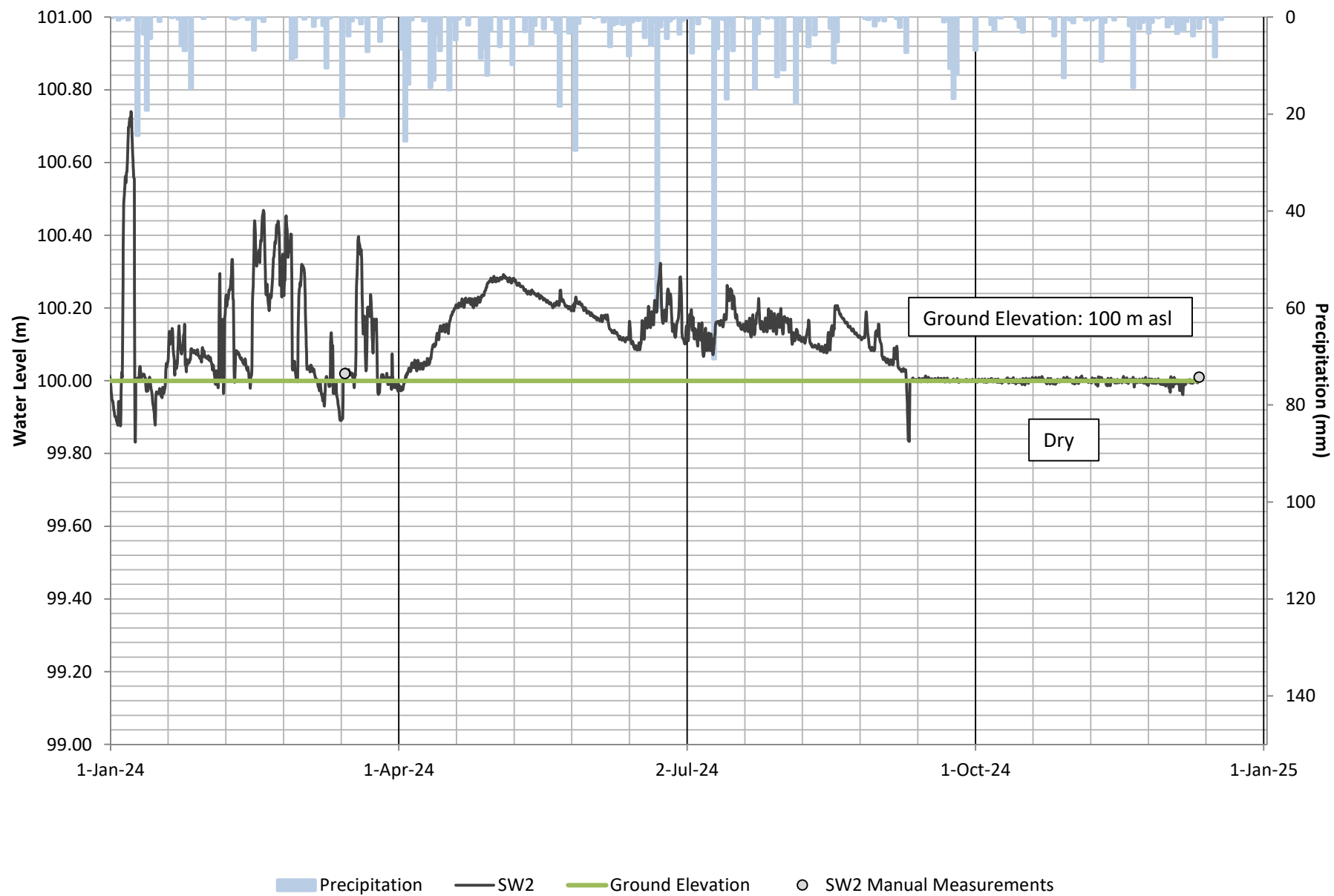
Surface Water Monitoring Station (South Pond) Water Levels for 2024



Surface Water Monitoring Station (SW1) Water Levels for 2024



Surface Water Monitoring Station (SW2) Water Levels for 2024



Appendix E: Water Quality Results

C.O.C.: G114941

REPORT No: 24-011538 - Rev. 0

Report To:

Tatham Engineering
115 Sandford Fleming Drive
Suite 200
Collingwood, ON L9Y 5A6

CADUCEON Environmental Laboratories

112 Commerce Park Dr Unit L
Barrie, ON L4N 8W8

Attention: Scott Patrick

DATE RECEIVED: 2024-Apr-26
DATE REPORTED: 2024-May-02
SAMPLE MATRIX: Surface Water

CUSTOMER PROJECT: 123016
P.O. NUMBER:

Analyses	Qty	Site Analyzed	Authorized	Date Analyzed	Lab Method	Reference Method
Anions (Liquid)	2	OTTAWA	PCURIEL	2024-Apr-29	A-IC-01	SM 4110B
Cond/pH/Alk Auto (Liquid)	2	OTTAWA	SBOUDREAU	2024-Apr-30	COND-02/PH-02/A LK-02	SM 2510B/4500H/ 2320B
ICP/MS Total (Liquid)	2	OTTAWA	AOZKAYMAK	2024-May-01	D-ICPMS-01	EPA 6020
ICP/OES Total (Liquid)	2	OTTAWA	APRUDYVUS	2024-Apr-30	D-ICP-01	SM 3120B
TP & TKN (Liquid)	2	KINGSTON	KDIBBITS	2024-May-02	TPTKN-001	MECP E3516.2

R.L. = Reporting Limit

NC = Not Calculated

Test methods may be modified from specified reference method unless indicated by an *



Michelle Dubien
Data Specialist

CADUCEON Environmental Laboratories Certificate of Analysis

Final Report

REPORT No: 24-011538 - Rev. 0

					Client I.D.	North Pond	South Pond
					Sample I.D.	24-011538-1	24-011538-2
					Date Collected	2024-Apr-24	2024-Apr-24
Parameter	Units	R.L.	Limits			-	-
Alkalinity(CaCO3) to pH4.5	mg/L	5				242	198
Bicarbonate (as CaCO3)	mg/L	5				242	198
Conductivity @25°C	uS/cm	1				495	378
pH @25°C	pH units	-	8.5	PWQO		8.03	7.86
Chloride	mg/L	0.5				6.0	1.3
Nitrate (N)	mg/L	0.05				<0.05	<0.05
Nitrite (N)	mg/L	0.05				<0.05	<0.05
Sulphate	mg/L	1				9	<1
Phosphorus (Total)	µg/L	10	10	INTERIM		20	60
Hardness (as CaCO3)	mg/L as CaCO3	-				256	194
Aluminum (Total)	µg/L	10				30	40
Barium (Total)	µg/L	1				35	9
Bismuth (Total)	µg/L	20				<20	<20
Boron (Total)	µg/L	5	200	INTERIM		11	10
Calcium (Total)	µg/L	20				80200	67000
Iron (Total)	µg/L	5	300	PWQO		137	149
Lithium (Total)	µg/L	5				<5	<5
Magnesium (Total)	µg/L	20				13500	6380
Manganese (Total)	µg/L	1				76	71
Phosphorus (Total)	µg/L	100				<100	<100
Potassium (Total)	µg/L	100				2600	2400



Michelle Dubien
Data Specialist

The analytical results reported herein refer to the samples as received and relate only to the items tested. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

CADUCEON Environmental Laboratories Certificate of Analysis

Final Report
REPORT No: 24-011538 - Rev. 0

					Client I.D.	North Pond	South Pond
					Sample I.D.	24-011538-1	24-011538-2
					Date Collected	2024-Apr-24	2024-Apr-24
Parameter	Units	R.L.	Limits			-	-
Silicon (Total)	µg/L	10				2660	460
Silica (Total)	µg/L	20				5690	990
Sodium (Total)	µg/L	200				2800	1200
Strontium (Total)	µg/L	1				119	93
Tin (Total)	µg/L	50				<50	<50
Tungsten (Total)	µg/L	10	30	INTERIM		20	<10
Zinc (Total)	µg/L	5	20, 30	INTERIM, PWQO		6	8
Zirconium (Total)	µg/L	3	4	INTERIM		<3	<3
Antimony (Total)	µg/L	0.1	20	INTERIM		<0.1	<0.1
Arsenic (Total)	µg/L	0.1	5, 5	INTERIM, PWQO		0.5	0.5
Beryllium (Total)	µg/L	0.1	11	PWQO		<0.1	<0.1
Cadmium (Total)	µg/L	0.015	0.1, 0.2	INTERIM, PWQO		0.041	0.053
Chromium (Total)	µg/L	1				<1	<1
Cobalt (Total)	µg/L	0.1	0.9	INTERIM		0.2	0.2
Copper (Total)	µg/L	0.1	5	INTERIM		1.6	1.4
Lead (Total)	µg/L	0.02	1, 5	INTERIM, PWQO		0.10	0.17
Molybdenum (Total)	µg/L	0.1	40	INTERIM		0.2	0.1
Nickel (Total)	µg/L	0.2	25	PWQO		0.6	1.0
Selenium (Total)	µg/L	1	100	PWQO		<1	<1
Silver (Total)	µg/L	0.1	0.1	PWQO		<0.1	<0.1
Thallium (Total)	µg/L	0.05	0.3, 0.3	INTERIM, PWQO		<0.05	<0.05



Michelle Dubien
Data Specialist

The analytical results reported herein refer to the samples as received and relate only to the items tested. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

CADUCEON Environmental Laboratories Certificate of Analysis

Final Report

REPORT No: 24-011538 - Rev. 0

					Client I.D.	North Pond	South Pond
					Sample I.D.	24-011538-1	24-011538-2
					Date Collected	2024-Apr-24	2024-Apr-24
Parameter	Units	R.L.	Limits			-	-
Uranium (Total)	µg/L	0.05	5	INTERIM		0.53	0.37
Vanadium (Total)	µg/L	0.1	6	INTERIM		<0.1	0.1

: PWQO Limits
 INTERIM: Interim PWQO
 PWQO: PWQO

Summary of Exceedances			
Interim PWQO			
North Pond	Found Value	Limit	
Phosphorus (Total)	20	10	
South Pond	Found Value	Limit	
Phosphorus (Total)	60	10	



Michelle Dubien
 Data Specialist

The analytical results reported herein refer to the samples as received and relate only to the items tested. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

C.O.C.: G114950, G114940

REPORT No: 24-011547 - Rev. 1

Report To:

Tatham Engineering
 115 Sandford Fleming Drive
 Suite 200
 Collingwood, ON L9Y 5A6

CADUCEON Environmental Laboratories

112 Commerce Park Dr Unit L
 Barrie, ON L4N 8W8

Attention: Scott Patrick

DATE RECEIVED: 2024-Apr-26
 DATE REPORTED: 2025-Jan-29
 SAMPLE MATRIX: Ground Water

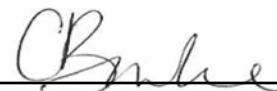
CUSTOMER PROJECT: 123016
 P.O. NUMBER:

Analyses	Qty	Site Analyzed	Authorized	Date Analyzed	Lab Method	Reference Method
Anions (Liquid)	13	OTTAWA	PCURIEL	2024-Apr-29	A-IC-01	SM 4110B
Cond/pH/Alk Auto (Liquid)	13	OTTAWA	SBOUDREAU	2024-Apr-30	COND-02/PH-02/A LK-02	SM 2510B/4500H/ 2320B
ICP/MS (Liquid)	13	OTTAWA	AOZKAYMAK	2024-May-01	D-ICPMS-01	EPA 200.8
ICP/OES (Liquid)	13	OTTAWA	APRUDYVUS	2024-Apr-30	D-ICP-01	SM 3120B

R.L. = Reporting Limit

NC = Not Calculated

Test methods may be modified from specified reference method unless indicated by an *



Christine Burke
Laboratory Manager

CADUCEON Environmental Laboratories Certificate of Analysis

Final Report

REPORT No: 24-011547 - Rev. 1

					Client I.D.	OW4A	OW5A	OW9A	OW5B
					Sample I.D.	24-011547-1	24-011547-2	24-011547-3	24-011547-4
					Date Collected	2024-Apr-24	2024-Apr-24	2024-Apr-24	2024-Apr-24
Parameter	Units	R.L.	Limits	DWG		-	-	-	-
Alkalinity(CaCO3) to pH4.5	mg/L	5	500	OG		387	261	292	283
Bicarbonate (as CaCO3)	mg/L	5				387	261	292	283
Conductivity @25°C	uS/cm	1				909	712	636	793
pH @25°C	pH units	-	8.5	OG		7.84	7.75	7.72	7.73
Chloride	mg/L	0.5	250	AO		15.7	51.4	10.9	66.7
Nitrate (N)	mg/L	0.05	10.0	MAC		17.0	3.36	5.25	3.91
Nitrite (N)	mg/L	0.05	1.0	MAC		<0.05	<0.05	<0.05	<0.05
Sulphate	mg/L	1	500	AO		11	20	9	15
Hardness (as CaCO3)	mg/L as CaCO3	0.02	100	OG		423	266	299	299
Aluminum	mg/L	0.01	0.1	OG		0.05	0.03	0.04	0.03
Barium	mg/L	0.001	1	MAC		0.048	0.036	0.050	0.037
Bismuth	mg/L	0.02				<0.02	<0.02	<0.02	<0.02
Boron	mg/L	0.005	5	MAC		0.010	0.010	0.008	0.010
Calcium	mg/L	0.02				125	76.1	92.5	84.3
Iron	mg/L	0.005	0.3	AO		<0.005	<0.005	<0.005	<0.005
Lithium	mg/L	0.005				<0.005	<0.005	<0.005	<0.005
Magnesium	mg/L	0.02				26.6	18.4	16.4	21.6
Manganese	mg/L	0.001	0.05	AO		0.001	0.002	0.004	<0.001
Phosphorus	mg/L	0.1				<0.1	<0.1	<0.1	<0.1
Potassium	mg/L	0.1				1.4	2.2	0.7	2.1
Silicon	mg/L	0.01				4.29	3.15	4.25	3.49


Christine Burke
Laboratory Manager

The analytical results reported herein refer to the samples as received and relate only to the items tested. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

CADUCEON Environmental Laboratories Certificate of Analysis

Final Report

REPORT No: 24-011547 - Rev. 1

					Client I.D.	OW4A	OW5A	OW9A	OW5B
					Sample I.D.	24-011547-1	24-011547-2	24-011547-3	24-011547-4
					Date Collected	2024-Apr-24	2024-Apr-24	2024-Apr-24	2024-Apr-24
Parameter	Units	R.L.	Limits	DWG		-	-	-	-
Silica	mg/L	0.02				9.18	6.74	9.10	7.47
Sodium	mg/L	0.2	200, 20, 20	AO, WL, MAC		10.0	23.4	2.2	33.6
Strontium	mg/L	0.001				0.235	0.129	0.151	0.145
Tin	mg/L	0.05				<0.05	<0.05	<0.05	<0.05
Titanium	mg/L	0.005				<0.005	<0.005	<0.005	<0.005
Tungsten	mg/L	0.01				<0.01	<0.01	<0.01	<0.01
Zinc	mg/L	0.005	5	AO		<0.005	<0.005	<0.005	0.023
Zirconium	mg/L	0.003				<0.003	<0.003	<0.003	<0.003
Antimony	mg/L	0.0001	0.006	MAC		<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	0.0001	0.01	MAC		0.0001	<0.0001	<0.0001	0.0001
Beryllium	mg/L	0.0001				<0.0001	<0.0001	<0.0001	<0.0001
Cadmium	mg/L	0.000015	0.005	MAC		<0.000015	<0.000015	<0.000015	0.000042
Chromium	mg/L	0.001	0.05	MAC		<0.001	<0.001	<0.001	<0.001
Cobalt	mg/L	0.0001				0.0002	0.0001	0.0002	0.0001
Copper	mg/L	0.0001	1	AO		0.0045	0.0013	0.0014	0.0014
Lead	mg/L	0.00002	0.010	MAC		0.00004	<0.00002	<0.00002	0.00014
Molybdenum	mg/L	0.0001				<0.0001	0.0002	<0.0001	0.0002
Nickel	mg/L	0.0002				<0.0002	0.0007	0.0008	0.0009
Selenium	mg/L	0.001	0.05	MAC		<0.001	<0.001	<0.001	<0.001
Silver	mg/L	0.0001				<0.0001	<0.0001	<0.0001	<0.0001
Thallium	mg/L	0.00005				<0.00005	<0.00005	<0.00005	<0.00005


Christine Burke
Laboratory Manager

The analytical results reported herein refer to the samples as received and relate only to the items tested. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

CADUCEON Environmental Laboratories Certificate of Analysis

Final Report

REPORT No: 24-011547 - Rev. 1

					Client I.D.	OW4A	OW5A	OW9A	OW5B
					Sample I.D.	24-011547-1	24-011547-2	24-011547-3	24-011547-4
					Date Collected	2024-Apr-24	2024-Apr-24	2024-Apr-24	2024-Apr-24
					DWG	-	-	-	-
Parameter	Units	R.L.	Limits						
Uranium	mg/L	0.00005	0.02		MAC	0.00023	0.00037	0.00011	0.00043
Vanadium	mg/L	0.0001				0.0001	<0.0001	0.0001	0.0001



Christine Burke
Laboratory Manager

The analytical results reported herein refer to the samples as received and relate only to the items tested. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

CADUCEON Environmental Laboratories Certificate of Analysis

Final Report

REPORT No: 24-011547 - Rev. 1

					Client I.D.	OW13C	OW3B	OW10B	OW7C
					Sample I.D.	24-011547-5	24-011547-6	24-011547-7	24-011547-8
					Date Collected	2024-Apr-24	2024-Apr-24	2024-Apr-24	2024-Apr-24
Parameter	Units	R.L.	Limits	DWG		-	-	-	-
Alkalinity(CaCO3) to pH4.5	mg/L	5	500	OG		283	283	215	80
Bicarbonate (as CaCO3)	mg/L	5				283	283	215	80
Conductivity @25°C	uS/cm	1				576	767	489	153
pH @25°C	pH units	-	8.5	OG		7.93	7.82	7.83	7.79
Chloride	mg/L	0.5	250	AO		9.6	44.8	11.0	3.1
Nitrate (N)	mg/L	0.05	10.0	MAC		1.68	9.57	2.33	0.07
Nitrite (N)	mg/L	0.05	1.0	MAC		<0.05	<0.05	<0.05	<0.05
Sulphate	mg/L	1	500	AO		7	12	17	<1
Hardness (as CaCO3)	mg/L as CaCO3	0.02	100	OG		273	331	244	69.4
Aluminum	mg/L	0.01	0.1	OG		0.06	0.03	0.02	<0.01
Barium	mg/L	0.001	1	MAC		0.034	0.057	0.057	0.001
Bismuth	mg/L	0.02				<0.02	<0.02	<0.02	<0.02
Boron	mg/L	0.005	5	MAC		0.009	0.010	0.013	0.011
Calcium	mg/L	0.02				76.0	97.0	67.4	5.30
Iron	mg/L	0.005	0.3	AO		0.016	<0.005	<0.005	0.007
Lithium	mg/L	0.005				<0.005	<0.005	<0.005	<0.005
Magnesium	mg/L	0.02				20.3	21.6	18.3	13.7
Manganese	mg/L	0.001	0.05	AO		<0.001	<0.001	0.011	0.045
Phosphorus	mg/L	0.1				<0.1	<0.1	<0.1	<0.1
Potassium	mg/L	0.1				1.2	1.6	1.3	0.8
Silicon	mg/L	0.01				3.47	4.02	3.65	0.10


Christine Burke
Laboratory Manager

The analytical results reported herein refer to the samples as received and relate only to the items tested. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

CADUCEON Environmental Laboratories Certificate of Analysis

Final Report

REPORT No: 24-011547 - Rev. 1

					Client I.D.	OW13C	OW3B	OW10B	OW7C
					Sample I.D.	24-011547-5	24-011547-6	24-011547-7	24-011547-8
					Date Collected	2024-Apr-24	2024-Apr-24	2024-Apr-24	2024-Apr-24
Parameter	Units	R.L.	Limits	DWG		-	-	-	-
Silica	mg/L	0.02				7.43	8.61	7.81	0.22
Sodium	mg/L	0.2	200, 20, 20	AO, WL, MAC		6.1	14.1	4.3	2.1
Strontium	mg/L	0.001				0.115	0.178	0.132	0.009
Tin	mg/L	0.05				<0.05	<0.05	<0.05	<0.05
Titanium	mg/L	0.005				<0.005	<0.005	<0.005	<0.005
Tungsten	mg/L	0.01				<0.01	<0.01	<0.01	<0.01
Zinc	mg/L	0.005	5	AO		0.013	<0.005	0.029	<0.005
Zirconium	mg/L	0.003				<0.003	<0.003	<0.003	<0.003
Antimony	mg/L	0.0001	0.006	MAC		<0.0001	<0.0001	0.0004	<0.0001
Arsenic	mg/L	0.0001	0.01	MAC		0.0002	<0.0001	0.0003	<0.0001
Beryllium	mg/L	0.0001				<0.0001	<0.0001	<0.0001	<0.0001
Cadmium	mg/L	0.000015	0.005	MAC		<0.000015	<0.000015	0.000025	<0.000015
Chromium	mg/L	0.001	0.05	MAC		<0.001	<0.001	<0.001	<0.001
Cobalt	mg/L	0.0001				0.0001	0.0002	0.0001	<0.0001
Copper	mg/L	0.0001	1	AO		0.0042	0.0009	0.0008	0.0007
Lead	mg/L	0.00002	0.010	MAC		0.00008	<0.00002	0.00005	<0.00002
Molybdenum	mg/L	0.0001				<0.0001	<0.0001	0.0003	0.0032
Nickel	mg/L	0.0002				0.0008	0.0009	0.0010	0.0004
Selenium	mg/L	0.001	0.05	MAC		<0.001	<0.001	<0.001	<0.001
Silver	mg/L	0.0001				<0.0001	<0.0001	<0.0001	<0.0001
Thallium	mg/L	0.00005				<0.00005	<0.00005	<0.00005	<0.00005


Christine Burke
Laboratory Manager

The analytical results reported herein refer to the samples as received and relate only to the items tested. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

CADUCEON Environmental Laboratories Certificate of Analysis

Final Report

REPORT No: 24-011547 - Rev. 1

					Client I.D.	OW13C	OW3B	OW10B	OW7C
					Sample I.D.	24-011547-5	24-011547-6	24-011547-7	24-011547-8
					Date Collected	2024-Apr-24	2024-Apr-24	2024-Apr-24	2024-Apr-24
					DWG	-	-	-	-
Parameter	Units	R.L.	Limits						
Uranium	mg/L	0.00005	0.02		MAC	0.00018	0.00019	0.00039	<0.00005
Vanadium	mg/L	0.0001				0.0001	<0.0001	<0.0001	<0.0001



Christine Burke
Laboratory Manager

The analytical results reported herein refer to the samples as received and relate only to the items tested. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

CADUCEON Environmental Laboratories Certificate of Analysis

Final Report

REPORT No: 24-011547 - Rev. 1

					Client I.D.	OW13A	OW8A	OW4B	OW7A
					Sample I.D.	24-011547-9	24-011547-10	24-011547-11	24-011547-12
					Date Collected	2024-Apr-24	2024-Apr-24	2024-Apr-24	2024-Apr-24
Parameter	Units	R.L.	Limits	DWG		-	-	-	-
Alkalinity(CaCO3) to pH4.5	mg/L	5	500	OG		261	284	367	273
Bicarbonate (as CaCO3)	mg/L	5				261	284	367	273
Conductivity @25°C	uS/cm	1				548	791	852	635
pH @25°C	pH units	-	8.5	OG		7.84	7.92	7.87	7.92
Chloride	mg/L	0.5	250	AO		8.2	41.0	25.2	21.6
Nitrate (N)	mg/L	0.05	10.0	MAC		1.47	16.0	10.4	1.97
Nitrite (N)	mg/L	0.05	1.0	MAC		<0.05	<0.05	<0.05	<0.05
Sulphate	mg/L	1	500	AO		11	9	13	24
Hardness (as CaCO3)	mg/L as CaCO3	0.02	100	OG		248	385	382	293
Aluminum	mg/L	0.01	0.1	OG		0.02	0.03	0.04	0.03
Barium	mg/L	0.001	1	MAC		0.028	0.106	0.065	0.064
Bismuth	mg/L	0.02				<0.02	<0.02	<0.02	<0.02
Boron	mg/L	0.005	5	MAC		0.009	0.007	0.009	0.012
Calcium	mg/L	0.02				69.3	96.8	111	87.0
Iron	mg/L	0.005	0.3	AO		<0.005	<0.005	<0.005	<0.005
Lithium	mg/L	0.005				<0.005	<0.005	<0.005	<0.005
Magnesium	mg/L	0.02				18.3	34.9	25.6	18.4
Manganese	mg/L	0.001	0.05	AO		<0.001	<0.001	<0.001	<0.001
Phosphorus	mg/L	0.1				<0.1	<0.1	<0.1	<0.1
Potassium	mg/L	0.1				1.1	1.2	0.7	1.6
Silicon	mg/L	0.01				3.22	5.50	4.11	3.25


Christine Burke
Laboratory Manager

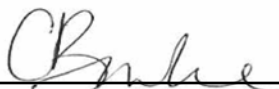
The analytical results reported herein refer to the samples as received and relate only to the items tested. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

CADUCEON Environmental Laboratories Certificate of Analysis

Final Report

REPORT No: 24-011547 - Rev. 1

					Client I.D.	OW13A	OW8A	OW4B	OW7A
					Sample I.D.	24-011547-9	24-011547-10	24-011547-11	24-011547-12
					Date Collected	2024-Apr-24	2024-Apr-24	2024-Apr-24	2024-Apr-24
Parameter	Units	R.L.	Limits	DWG		-	-	-	-
Silica	mg/L	0.02				6.90	11.8	8.80	6.96
Sodium	mg/L	0.2	200, 20, 20	AO, WL, MAC		6.3	11.3	13.4	5.6
Strontium	mg/L	0.001				0.109	0.197	0.184	0.150
Tin	mg/L	0.05				<0.05	<0.05	<0.05	<0.05
Titanium	mg/L	0.005				<0.005	<0.005	<0.005	<0.005
Tungsten	mg/L	0.01				<0.01	<0.01	<0.01	<0.01
Zinc	mg/L	0.005	5	AO		<0.005	<0.005	<0.005	<0.005
Zirconium	mg/L	0.003				<0.003	<0.003	<0.003	<0.003
Antimony	mg/L	0.0001	0.006	MAC		<0.0001	<0.0001	0.0001	<0.0001
Arsenic	mg/L	0.0001	0.01	MAC		0.0003	<0.0001	0.0001	<0.0001
Beryllium	mg/L	0.0001				<0.0001	<0.0001	<0.0001	<0.0001
Cadmium	mg/L	0.000015	0.005	MAC		<0.000015	<0.000015	<0.000015	<0.000015
Chromium	mg/L	0.001	0.05	MAC		<0.001	0.001	<0.001	<0.001
Cobalt	mg/L	0.0001				0.0001	0.0002	0.0002	0.0001
Copper	mg/L	0.0001	1	AO		0.0020	0.0007	0.0012	0.0011
Lead	mg/L	0.00002	0.010	MAC		0.00003	<0.00002	<0.00002	<0.00002
Molybdenum	mg/L	0.0001				0.0002	<0.0001	<0.0001	<0.0001
Nickel	mg/L	0.0002				0.0007	0.0009	<0.0002	0.0008
Selenium	mg/L	0.001	0.05	MAC		<0.001	<0.001	<0.001	<0.001
Silver	mg/L	0.0001				<0.0001	<0.0001	<0.0001	<0.0001
Thallium	mg/L	0.00005				<0.00005	<0.00005	<0.00005	<0.00005


Christine Burke

Laboratory Manager

The analytical results reported herein refer to the samples as received and relate only to the items tested. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

CADUCEON Environmental Laboratories Certificate of Analysis

Final Report

REPORT No: 24-011547 - Rev. 1

					Client I.D.	OW13A	OW8A	OW4B	OW7A
					Sample I.D.	24-011547-9	24-011547-10	24-011547-11	24-011547-12
					Date Collected	2024-Apr-24	2024-Apr-24	2024-Apr-24	2024-Apr-24
					DWG	-	-	-	-
Parameter	Units	R.L.	Limits						
Uranium	mg/L	0.00005	0.02		MAC	0.00021	0.00022	0.00016	0.00030
Vanadium	mg/L	0.0001				0.0001	0.0001	<0.0001	<0.0001



Christine Burke
Laboratory Manager

The analytical results reported herein refer to the samples as received and relate only to the items tested. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

CADUCEON Environmental Laboratories Certificate of Analysis

Final Report
REPORT No: 24-011547 - Rev. 1

					Client I.D.
					OW6A
					Sample I.D.
					24-011547-13
					Date Collected
					2024-Apr-24
Parameter	Units	R.L.	Limits	DWG	
Alkalinity(CaCO3) to pH4.5	mg/L	5	500	OG	121
Bicarbonate (as CaCO3)	mg/L	5			121
Conductivity @25°C	uS/cm	1			346
pH @25°C	pH units	-	8.5	OG	7.56
Chloride	mg/L	0.5	250	AO	190
Nitrate (N)	mg/L	0.05	10.0	MAC	10.7
Nitrite (N)	mg/L	0.05	1.0	MAC	<0.40
Sulphate	mg/L	1	500	AO	229
Hardness (as CaCO3)	mg/L as CaCO3	0.02	100	OG	141
Aluminum	mg/L	0.01	0.1	OG	0.01
Barium	mg/L	0.001	1	MAC	0.030
Bismuth	mg/L	0.02			<0.02
Boron	mg/L	0.005	5	MAC	0.015
Calcium	mg/L	0.02			38.0
Iron	mg/L	0.005	0.3	AO	<0.005
Lithium	mg/L	0.005			<0.005
Magnesium	mg/L	0.02			11.2
Manganese	mg/L	0.001	0.05	AO	<0.001
Phosphorus	mg/L	0.1			<0.1
Potassium	mg/L	0.1			1.5
Silicon	mg/L	0.01			1.52


Christine Burke
Laboratory Manager

The analytical results reported herein refer to the samples as received and relate only to the items tested. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

CADUCEON Environmental Laboratories Certificate of Analysis

Final Report

REPORT No: 24-011547 - Rev. 1

					Client I.D.
					OW6A
					Sample I.D.
					24-011547-13
					Date Collected
					2024-Apr-24
Parameter	Units	R.L.	Limits	DWG	
Silica	mg/L	0.02			3.26
Sodium	mg/L	0.2	200, 20, 20	AO, WL, MAC	5.4
Strontium	mg/L	0.001			0.100
Tin	mg/L	0.05			<0.05
Titanium	mg/L	0.005			<0.005
Tungsten	mg/L	0.01			<0.01
Zinc	mg/L	0.005	5	AO	<0.005
Zirconium	mg/L	0.003			<0.003
Antimony	mg/L	0.0001	0.006	MAC	<0.0001
Arsenic	mg/L	0.0001	0.01	MAC	<0.0001
Beryllium	mg/L	0.0001			<0.0001
Cadmium	mg/L	0.000015	0.005	MAC	<0.000015
Chromium	mg/L	0.001	0.05	MAC	<0.001
Cobalt	mg/L	0.0001			<0.0001
Copper	mg/L	0.0001	1	AO	0.0010
Lead	mg/L	0.00002	0.010	MAC	<0.00002
Molybdenum	mg/L	0.0001			0.0004
Nickel	mg/L	0.0002			0.0004
Selenium	mg/L	0.001	0.05	MAC	<0.001
Silver	mg/L	0.0001			<0.0001
Thallium	mg/L	0.00005			<0.00005



Christine Burke
Laboratory Manager

The analytical results reported herein refer to the samples as received and relate only to the items tested. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

CADUCEON Environmental Laboratories Certificate of Analysis

Final Report

REPORT No: 24-011547 - Rev. 1

				Client I.D.	OW6A
				Sample I.D.	24-011547-13
				Date Collected	2024-Apr-24
Parameter	Units	R.L.	Limits	DWG	-
Uranium	mg/L	0.00005	0.02	MAC	0.00012
Vanadium	mg/L	0.0001			<0.0001

Sample #7 filtered from unpreserved for metals analysis due to sediment in metals bottle.
Revised report to update sample ID as per client request

DWG - Drinking Water Guidelines

ODWS - Ontario Drinking Water Standards

AO - Aesthetic Objectives

IMAC - Interim Maximum Acceptable Concentration

MAC - Maximum Acceptable Concentration

ODWO - D-5-5 Objective

OG - Operational Guidelines

WL - Warning Level - Sodium Restricted Diets



Christine Burke
Laboratory Manager

The analytical results reported herein refer to the samples as received and relate only to the items tested. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

Summary of Exceedances		
Maximum Acceptable Concentration		
OW4A	Found Value	Limit
Nitrate (N)	16.4	10.0
Nitrate (N)	17.0	10.0
OW5A	Found Value	Limit
Sodium	23.4	20
OW5B	Found Value	Limit
Sodium	33.6	20
OW8A	Found Value	Limit
Nitrate (N)	16.0	10.0
OW4B	Found Value	Limit
Nitrate (N)	10.1	10.0
Nitrate (N)	10.4	10.0
OW6A	Found Value	Limit
Nitrate (N)	10.7	10.0
Operational Guidelines		
OW4A	Found Value	Limit
Hardness (as CaCO ₃)	423	100
OW5A	Found Value	Limit
Hardness (as CaCO ₃)	266	100
OW9A	Found Value	Limit
Hardness (as CaCO ₃)	299	100
OW5B	Found Value	Limit
Hardness (as CaCO ₃)	299	100
OW13C	Found Value	Limit
Hardness (as CaCO ₃)	273	100
OW3B	Found Value	Limit
Hardness (as CaCO ₃)	331	100
OW10B	Found Value	Limit
Hardness (as CaCO ₃)	244	100
OW13A	Found Value	Limit
Hardness (as CaCO ₃)	248	100
OW8A	Found Value	Limit
Hardness (as CaCO ₃)	385	100
OW4B	Found Value	Limit
Hardness (as CaCO ₃)	382	100
OW7A	Found Value	Limit
Hardness (as CaCO ₃)	293	100



Christine Burke
Laboratory Manager

CADUCEON Environmental Laboratories Certificate of Analysis

Final Report
REPORT No: 24-011547 - Rev. 1

OW6A	Found Value	Limit
Hardness (as CaCO ₃)	141	100
Warning Level - Sodium Restricted Diets		
OW5A	Found Value	Limit
Sodium	23.4	20
OW5B	Found Value	Limit
Sodium	33.6	20



Christine Burke
Laboratory Manager

The analytical results reported herein refer to the samples as received and relate only to the items tested. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

C.O.C.: G114937

REPORT No: 24-011608 - Rev. 0

Report To:

Tatham Engineering
115 Sandford Fleming Drive
Suite 200
Collingwood, ON L9Y 5A6

CADUCEON Environmental Laboratories

112 Commerce Park Dr Unit L
Barrie, ON L4N 8W8

Attention: Noah Trembley

DATE RECEIVED: 2024-Apr-26
DATE REPORTED: 2024-May-02
SAMPLE MATRIX: Ground Water

CUSTOMER PROJECT: 123016
P.O. NUMBER:

Analyses	Qty	Site Analyzed	Authorized	Date Analyzed	Lab Method	Reference Method
Anions (Liquid)	10	OTTAWA	PCURIEL	2024-Apr-29	A-IC-01	SM 4110B
Cond/pH/Alk Auto (Liquid)	10	OTTAWA	SBOUDREAU	2024-Apr-30	COND-02/PH-02/A LK-02	SM 2510B/4500H/ 2320B
ICP/MS (Liquid)	10	OTTAWA	AOZKAYMAK	2024-May-01	D-ICPMS-01	EPA 200.8
ICP/OES (Liquid)	10	OTTAWA	APRUDYVUS	2024-Apr-30	D-ICP-01	SM 3120B

R.L. = Reporting Limit

NC = Not Calculated

Test methods may be modified from specified reference method unless indicated by an *



Michelle Dubien
Data Specialist

CADUCEON Environmental Laboratories Certificate of Analysis

Final Report

REPORT No: 24-011608 - Rev. 0

					Client I.D.	OW 14-C	OW 16-C	OW 18-A	OW 18-C
					Sample I.D.	24-011608-1	24-011608-2	24-011608-3	24-011608-4
					Date Collected	2024-Apr-25	2024-Apr-25	2024-Apr-25	2024-Apr-25
Parameter	Units	R.L.	Limits	DWG		-	-	-	-
Alkalinity(CaCO3) to pH4.5	mg/L	5	500	OG		462	205	194	192
Bicarbonate (as CaCO3)	mg/L	5				462	205	194	192
Conductivity @25°C	uS/cm	1				897	432	404	397
pH @25°C	pH units	-	8.5	OG		7.77	7.81	7.92	7.91
Chloride	mg/L	0.5	250	AO		2.8	7.1	6.2	5.7
Nitrate (N)	mg/L	0.05	10.0	MAC		5.24	1.30	1.35	1.35
Nitrite (N)	mg/L	0.05	1.0	MAC		<0.05	<0.05	<0.05	<0.05
Sulphate	mg/L	1	500	AO		7	8	9	7
Hardness (as CaCO3)	mg/L as CaCO3	0.02	100	OG		497	201	201	190
Aluminum	mg/L	0.01	0.1	OG		0.14	0.02	0.02	0.34
Barium	mg/L	0.001	1	MAC		0.101	0.030	0.036	0.021
Bismuth	mg/L	0.02				<0.02	<0.02	<0.02	<0.02
Boron	mg/L	0.005	5	MAC		0.010	0.007	0.008	0.006
Calcium	mg/L	0.02				134	55.7	58.1	53.6
Iron	mg/L	0.005	0.3	AO		0.106	<0.005	<0.005	0.174
Lithium	mg/L	0.005				<0.005	<0.005	<0.005	<0.005
Magnesium	mg/L	0.02				39.2	14.9	13.5	13.7
Manganese	mg/L	0.001	0.05	AO		0.014	<0.001	<0.001	0.006
Phosphorus	mg/L	0.1				<0.1	<0.1	<0.1	<0.1
Potassium	mg/L	0.1				0.9	0.8	0.8	0.8
Silicon	mg/L	0.01				5.31	2.72	2.99	3.11



Michelle Dubien
Data Specialist

The analytical results reported herein refer to the samples as received and relate only to the items tested. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

CADUCEON Environmental Laboratories Certificate of Analysis

Final Report

REPORT No: 24-011608 - Rev. 0

					Client I.D.	OW 14-C	OW 16-C	OW 18-A	OW 18-C
					Sample I.D.	24-011608-1	24-011608-2	24-011608-3	24-011608-4
					Date Collected	2024-Apr-25	2024-Apr-25	2024-Apr-25	2024-Apr-25
Parameter	Units	R.L.	Limits	DWG		-	-	-	-
Silica	mg/L	0.02				11.4	5.81	6.40	6.66
Sodium	mg/L	0.2	200, 20, 20	AO, WL, MAC		2.8	3.7	2.2	1.8
Strontium	mg/L	0.001				0.213	0.091	0.085	0.077
Tin	mg/L	0.05				<0.05	<0.05	<0.05	<0.05
Titanium	mg/L	0.005				<0.005	<0.005	<0.005	0.009
Tungsten	mg/L	0.01				<0.01	<0.01	<0.01	<0.01
Zinc	mg/L	0.005	5	AO		0.098	0.006	<0.005	0.016
Zirconium	mg/L	0.003				<0.003	<0.003	<0.003	<0.003
Antimony	mg/L	0.0001	0.006	MAC		<0.0001	<0.0001	0.0002	<0.0001
Arsenic	mg/L	0.0001	0.01	MAC		0.0001	0.0001	<0.0001	0.0002
Beryllium	mg/L	0.0001				<0.0001	<0.0001	<0.0001	<0.0001
Cadmium	mg/L	0.000015	0.005	MAC		0.000105	0.000027	<0.000015	<0.000015
Chromium	mg/L	0.001	0.05	MAC		<0.001	<0.001	<0.001	<0.001
Cobalt	mg/L	0.0001				0.0003	<0.0001	<0.0001	0.0002
Copper	mg/L	0.0001	1	AO		0.0009	0.0010	0.0007	0.0011
Lead	mg/L	0.00002	0.010	MAC		0.00068	0.00014	<0.00002	0.00050
Molybdenum	mg/L	0.0001				<0.0001	0.0001	0.0002	0.0001
Nickel	mg/L	0.0002				0.0005	0.0006	0.0006	0.0007
Selenium	mg/L	0.001	0.05	MAC		<0.001	<0.001	<0.001	<0.001
Silver	mg/L	0.0001				<0.0001	<0.0001	<0.0001	<0.0001
Thallium	mg/L	0.00005				<0.00005	<0.00005	<0.00005	<0.00005



Michelle Dubien
Data Specialist

The analytical results reported herein refer to the samples as received and relate only to the items tested. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

CADUCEON Environmental Laboratories Certificate of Analysis

Final Report

REPORT No: 24-011608 - Rev. 0

					Client I.D.	OW 14-C	OW 16-C	OW 18-A	OW 18-C
					Sample I.D.	24-011608-1	24-011608-2	24-011608-3	24-011608-4
					Date Collected	2024-Apr-25	2024-Apr-25	2024-Apr-25	2024-Apr-25
					DWG	-	-	-	-
Parameter	Units	R.L.	Limits						
Uranium	mg/L	0.00005	0.02		MAC	0.00023	0.00015	0.00021	0.00013
Vanadium	mg/L	0.0001				0.0002	<0.0001	0.0001	0.0002



Michelle Dubien
Data Specialist

The analytical results reported herein refer to the samples as received and relate only to the items tested. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

CADUCEON Environmental Laboratories Certificate of Analysis

Final Report

REPORT No: 24-011608 - Rev. 0

					Client I.D.	OW 19-C	OW 20-C	OW 21-C	OW 22-C
					Sample I.D.	24-011608-5	24-011608-6	24-011608-7	24-011608-8
					Date Collected	2024-Apr-25	2024-Apr-25	2024-Apr-25	2024-Apr-25
Parameter	Units	R.L.	Limits	DWG		-	-	-	-
Alkalinity(CaCO3) to pH4.5	mg/L	5	500	OG		296	217	254	253
Bicarbonate (as CaCO3)	mg/L	5				296	217	254	253
Conductivity @25°C	uS/cm	1				696	521	507	647
pH @25°C	pH units	-	8.5	OG		7.90	8.04	8.11	8.03
Chloride	mg/L	0.5	250	AO		13.6	4.5	3.1	15.3
Nitrate (N)	mg/L	0.05	10.0	MAC		8.77	9.89	0.39	9.05
Nitrite (N)	mg/L	0.05	1.0	MAC		<0.05	<0.05	<0.05	<0.05
Sulphate	mg/L	1	500	AO		19	12	14	35
Hardness (as CaCO3)	mg/L as CaCO3	0.02	100	OG		327	243	244	310
Aluminum	mg/L	0.01	0.1	OG		0.10	0.02	0.03	0.03
Barium	mg/L	0.001	1	MAC		0.130	0.061	0.052	0.070
Bismuth	mg/L	0.02				<0.02	<0.02	<0.02	<0.02
Boron	mg/L	0.005	5	MAC		0.016	0.014	0.006	0.008
Calcium	mg/L	0.02				86.4	63.3	61.4	74.3
Iron	mg/L	0.005	0.3	AO		0.095	<0.005	<0.005	<0.005
Lithium	mg/L	0.005				<0.005	<0.005	<0.005	<0.005
Magnesium	mg/L	0.02				27.0	20.7	22.0	30.1
Manganese	mg/L	0.001	0.05	AO		0.013	<0.001	<0.001	<0.001
Phosphorus	mg/L	0.1				<0.1	<0.1	<0.1	<0.1
Potassium	mg/L	0.1				5.8	0.6	0.6	0.9
Silicon	mg/L	0.01				4.30	3.64	4.03	4.74



Michelle Dubien
Data Specialist

The analytical results reported herein refer to the samples as received and relate only to the items tested. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

CADUCEON Environmental Laboratories Certificate of Analysis

Final Report

REPORT No: 24-011608 - Rev. 0

					Client I.D.	OW 19-C	OW 20-C	OW 21-C	OW 22-C
					Sample I.D.	24-011608-5	24-011608-6	24-011608-7	24-011608-8
					Date Collected	2024-Apr-25	2024-Apr-25	2024-Apr-25	2024-Apr-25
Parameter	Units	R.L.	Limits	DWG		-	-	-	-
Silica	mg/L	0.02				9.20	7.78	8.62	10.2
Sodium	mg/L	0.2	200, 20, 20	AO, WL, MAC		3.6	1.4	3.2	3.3
Strontium	mg/L	0.001				0.157	0.110	0.113	0.158
Tin	mg/L	0.05				<0.05	<0.05	<0.05	<0.05
Titanium	mg/L	0.005				<0.005	<0.005	<0.005	<0.005
Tungsten	mg/L	0.01				<0.01	<0.01	<0.01	<0.01
Zinc	mg/L	0.005	5	AO		0.019	<0.005	<0.005	<0.005
Zirconium	mg/L	0.003				<0.003	<0.003	<0.003	<0.003
Antimony	mg/L	0.0001	0.006	MAC		<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	0.0001	0.01	MAC		0.0002	<0.0001	<0.0001	0.0001
Beryllium	mg/L	0.0001				<0.0001	<0.0001	<0.0001	<0.0001
Cadmium	mg/L	0.000015	0.005	MAC		0.000022	<0.000015	0.000015	<0.000015
Chromium	mg/L	0.001	0.05	MAC		<0.001	<0.001	<0.001	<0.001
Cobalt	mg/L	0.0001				0.0003	0.0001	0.0001	0.0001
Copper	mg/L	0.0001	1	AO		0.0012	0.0003	0.0007	0.0008
Lead	mg/L	0.00002	0.010	MAC		0.00253	<0.00002	0.00013	0.00003
Molybdenum	mg/L	0.0001				<0.0001	<0.0001	<0.0001	0.0001
Nickel	mg/L	0.0002				0.0004	0.0006	0.0006	0.0008
Selenium	mg/L	0.001	0.05	MAC		<0.001	<0.001	<0.001	<0.001
Silver	mg/L	0.0001				<0.0001	<0.0001	<0.0001	<0.0001
Thallium	mg/L	0.00005				<0.00005	<0.00005	<0.00005	<0.00005



Michelle Dubien
Data Specialist

The analytical results reported herein refer to the samples as received and relate only to the items tested. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

CADUCEON Environmental Laboratories Certificate of Analysis

Final Report

REPORT No: 24-011608 - Rev. 0

					Client I.D.	OW 19-C	OW 20-C	OW 21-C	OW 22-C
					Sample I.D.	24-011608-5	24-011608-6	24-011608-7	24-011608-8
					Date Collected	2024-Apr-25	2024-Apr-25	2024-Apr-25	2024-Apr-25
					DWG	-	-	-	-
Parameter	Units	R.L.	Limits						
Uranium	mg/L	0.00005	0.02		MAC	0.00034	0.00019	0.00023	0.00043
Vanadium	mg/L	0.0001				0.0002	0.0001	<0.0001	0.0001



Michelle Dubien
Data Specialist

The analytical results reported herein refer to the samples as received and relate only to the items tested. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

CADUCEON Environmental Laboratories Certificate of Analysis

Final Report

REPORT No: 24-011608 - Rev. 0

Parameter	Units	R.L.	Limits	Client I.D.	OW 23-C	OW 12-A
				Sample I.D.	24-011608-9	24-011608-10
				Date Collected	2024-Apr-25	2024-Apr-25
				DWG	-	-
Alkalinity(CaCO3) to pH4.5	mg/L	5	500	OG	254	156
Bicarbonate (as CaCO3)	mg/L	5			254	156
Conductivity @25°C	uS/cm	1			615	291
pH @25°C	pH units	-	8.5	OG	8.00	7.89
Chloride	mg/L	0.5	250	AO	15.5	0.9
Nitrate (N)	mg/L	0.05	10.0	MAC	8.00	0.26
Nitrite (N)	mg/L	0.05	1.0	MAC	<0.05	<0.05
Sulphate	mg/L	1	500	AO	19	<1
Hardness (as CaCO3)	mg/L as CaCO3	0.02	100	OG	289	186
Aluminum	mg/L	0.01	0.1	OG	0.03	0.31
Barium	mg/L	0.001	1	MAC	0.021	0.008
Bismuth	mg/L	0.02			<0.02	<0.02
Boron	mg/L	0.005	5	MAC	0.008	<0.005
Calcium	mg/L	0.02			69.5	64.6
Iron	mg/L	0.005	0.3	AO	<0.005	0.422
Lithium	mg/L	0.005			<0.005	<0.005
Magnesium	mg/L	0.02			28.2	6.02
Manganese	mg/L	0.001	0.05	AO	0.002	0.117
Phosphorus	mg/L	0.1			<0.1	<0.1
Potassium	mg/L	0.1			1.2	0.4
Silicon	mg/L	0.01			3.84	2.19



Michelle Dubien
Data Specialist

The analytical results reported herein refer to the samples as received and relate only to the items tested. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

CADUCEON Environmental Laboratories Certificate of Analysis

Final Report
REPORT No: 24-011608 - Rev. 0

Parameter	Units	R.L.	Limits	Client I.D.	Sample I.D.	Date Collected	DWG	OW 23-C	OW 12-A
								24-011608-9	24-011608-10
								2024-Apr-25	2024-Apr-25
								-	-
Silica	mg/L	0.02						8.22	4.69
Sodium	mg/L	0.2	200, 20, 20	AO, WL, MAC				3.2	1.6
Strontium	mg/L	0.001						0.102	0.120
Tin	mg/L	0.05						<0.05	<0.05
Titanium	mg/L	0.005						<0.005	<0.005
Tungsten	mg/L	0.01						<0.01	<0.01
Zinc	mg/L	0.005	5	AO				<0.005	<0.005
Zirconium	mg/L	0.003						<0.003	<0.003
Antimony	mg/L	0.0001	0.006	MAC				<0.0001	<0.0001
Arsenic	mg/L	0.0001	0.01	MAC				0.0004	0.0003
Beryllium	mg/L	0.0001						<0.0001	<0.0001
Cadmium	mg/L	0.000015	0.005	MAC				<0.000015	0.000020
Chromium	mg/L	0.001	0.05	MAC				<0.001	0.001
Cobalt	mg/L	0.0001						0.0001	0.0015
Copper	mg/L	0.0001	1	AO				0.0005	0.0069
Lead	mg/L	0.00002	0.010	MAC				<0.00002	0.00277
Molybdenum	mg/L	0.0001						0.0003	<0.0001
Nickel	mg/L	0.0002						0.0010	0.0022
Selenium	mg/L	0.001	0.05	MAC				<0.001	<0.001
Silver	mg/L	0.0001						<0.0001	<0.0001
Thallium	mg/L	0.00005						<0.00005	<0.00005



Michelle Dubien
Data Specialist

The analytical results reported herein refer to the samples as received and relate only to the items tested. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

CADUCEON Environmental Laboratories Certificate of Analysis

Final Report

REPORT No: 24-011608 - Rev. 0

					Client I.D.	OW 23-C	OW 12-A
					Sample I.D.	24-011608-9	24-011608-10
					Date Collected	2024-Apr-25	2024-Apr-25
					DWG	-	-
Parameter	Units	R.L.	Limits				
Uranium	mg/L	0.00005	0.02	MAC	0.00032	0.00011	
Vanadium	mg/L	0.0001			<0.0001	0.0011	

Sample #3 filtered from unpreserved for metals analysis due to sediment in metals bottle.

DWG - Drinking Water Guidelines

ODWS - Ontario Drinking Water Standards

AO - Aesthetic Objectives

IMAC - Interim Maximum Acceptable Concentration

MAC - Maximum Acceptable Concentration

ODWO - D-5-5 Objective

OG - Operational Guidelines

WL - Warning Level - Sodium Restricted Diets



Michelle Dubien

Data Specialist

The analytical results reported herein refer to the samples as received and relate only to the items tested. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

Summary of Exceedances		
Aesthetic Objectives		
OW 12-A	Found Value	Limit
Iron	0.422	0.3
Manganese	0.117	0.05
Operational Guidelines		
OW 14-C	Found Value	Limit
Hardness (as CaCO ₃)	497	100
Aluminum	0.14	0.1
OW 16-C	Found Value	Limit
Hardness (as CaCO ₃)	201	100
OW 18-A	Found Value	Limit
Hardness (as CaCO ₃)	201	100
OW 18-C	Found Value	Limit
Hardness (as CaCO ₃)	190	100
Aluminum	0.34	0.1
OW 19-C	Found Value	Limit
Hardness (as CaCO ₃)	327	100
OW 20-C	Found Value	Limit
Hardness (as CaCO ₃)	243	100
OW 21-C	Found Value	Limit
Hardness (as CaCO ₃)	244	100
OW 22-C	Found Value	Limit
Hardness (as CaCO ₃)	310	100
OW 23-C	Found Value	Limit
Hardness (as CaCO ₃)	289	100
OW 12-A	Found Value	Limit
Hardness (as CaCO ₃)	186	100
Aluminum	0.31	0.1



Michelle Dubien
Data Specialist

C.O.C.: -

REPORT No: 24-027597 - Rev. 0

Report To:

Tatham Engineering
115 Sandford Fleming Drive
Suite 200
Collingwood, ON L9Y 5A6

CADUCEON Environmental Laboratories

112 Commerce Park Dr Unit L
Barrie, ON L4N 8W8

Attention: Alicia Kimberley

DATE RECEIVED: 2024-Sep-06
DATE REPORTED: 2024-Sep-16
SAMPLE MATRIX: Ground Water

CUSTOMER PROJECT: 123016
P.O. NUMBER:

Analyses	Qty	Site Analyzed	Authorized	Date Analyzed	Lab Method	Reference Method
Anions (Liquid)	12	OTTAWA	LMACGREGOR	2024-Sep-09	A-IC-01	SM 4110B
Cond/pH/Alk Auto (Liquid)	12	OTTAWA	SBOUDREAU	2024-Sep-09	COND-02/PH-02/A LK-02	SM 2510B/4500H/ 2320B
ICP/MS (Liquid)	12	OTTAWA	AOZKAYMAK	2024-Sep-11	D-ICPMS-01	EPA 200.8
ICP/OES (Liquid)	12	OTTAWA	APRUDYVUS	2024-Sep-09	D-ICP-01	SM 3120B
Oil & Grease (Liquid)	3	KINGSTON	DCHAUDHARI	2024-Sep-09	O&G-001	SM 5520
PHC F1 (Liquid)	3	RICHMOND_HILL	FLENA	2024-Sep-10	C-VPHW-01	MECP E3421
PHC F2-4 (Liquid)	3	KINGSTON	STHOMPSON	2024-Sep-10	PHC-W-001	MECP E3421
VOC-Volatiles Full (Water)	3	RICHMOND_HILL	FLENA	2024-Sep-10	C-VOC-02	EPA 8260

µg/g = micrograms per gram (parts per million) and is equal to mg/Kg

F1 C6-C10 hydrocarbons in µg/g, (F1-btex if requested)

F2 C10-C16 hydrocarbons in µg/g, (F2-naph if requested)

F3 C16-C34 hydrocarbons in µg/g, (F3-pah if requested)

F4 C34-C50 hydrocarbons in µg/g

This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.

Any deviations from the method are noted and reported for any particular sample.

nC6 and nC10 response factor is within 30% of response factor for toluene:

nC10, nC16 and nC34 response factors within 10% of each other:

C50 response factors within 70% of nC10+nC16+nC34 average:

Linearity is within 15%:

All results expressed on a dry weight basis.

Unless otherwise noted all chromatograms returned to baseline by the retention time of nC50.

R.L. = Reporting Limit

NC = Not Calculated

Test methods may be modified from specified reference method unless indicated by an *

Unless otherwise noted all extraction, analysis, QC

requirements and limits for holding time were met.

If analyzed for F4 and F4G they are not to be summed

but the greater of the two numbers are to be used in

application to the CWS PHC

QC will be made available upon request.


Christine Burke

Laboratory Manager

CADUCEON Environmental Laboratories Certificate of Analysis

Final Report

REPORT No: 24-027597 - Rev. 0

					Client I.D.	OW7A	OW13C	OW23C	OW22C
					Sample I.D.	24-027597-1	24-027597-2	24-027597-3	24-027597-4
					Date Collected	2024-Sep-05	2024-Sep-05	2024-Sep-05	2024-Sep-05
Parameter	Units	R.L.	Limits	DWG		-	-	-	-
Alkalinity(CaCO3) to pH4.5	mg/L	5	500	OG		247	296	255	258
Bicarbonate (as CaCO3)	mg/L	5				247	296	255	258
Carbonate (as CaCO3)	mg/L	5				<5	<5	<5	<5
TDS (Calc. from Cond.)	mg/L	3	500	AO		285	301	313	339
Conductivity @25°C	uS/cm	1				549	580	604	652
pH @25°C	pH units	-	8.5	OG		7.99	7.97	7.98	7.99
Bromide	mg/L	0.4				0.4	<0.4	<0.4	<0.4
Fluoride	mg/L	0.1	1.5	MAC		<0.1	<0.1	<0.1	<0.1
Chloride	mg/L	0.5	250	AO		19.4	11.1	16.0	16.2
Nitrate (N)	mg/L	0.05	10.0	MAC		1.99	1.90	8.19	8.82
Nitrite (N)	mg/L	0.05	1.0	MAC		<0.05	<0.05	<0.05	<0.05
Sulphate	mg/L	1	500	AO		22	8	19	35
Hardness (as CaCO3)	mg/L as CaCO3	0.02	100	OG		303	326	338	369
Aluminum	mg/L	0.01	0.1	OG		0.03	0.03	0.03	0.03
Barium	mg/L	0.001	1	MAC		0.067	0.044	0.027	0.089
Bismuth	mg/L	0.02				<0.02	<0.02	<0.02	<0.02
Boron	mg/L	0.005	5	MAC		0.013	0.007	0.008	0.007
Calcium	mg/L	0.02				92.1	94.8	85.6	93.4
Iron	mg/L	0.005	0.3	AO		<0.005	<0.005	<0.005	<0.005
Lithium	mg/L	0.005				<0.005	<0.005	<0.005	<0.005
Magnesium	mg/L	0.02				17.7	21.7	30.3	32.9


Christine Burke
Laboratory Manager

The analytical results reported herein refer to the samples as received and relate only to the items tested. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

CADUCEON Environmental Laboratories Certificate of Analysis

Final Report

REPORT No: 24-027597 - Rev. 0

					Client I.D.	OW7A	OW13C	OW23C	OW22C
					Sample I.D.	24-027597-1	24-027597-2	24-027597-3	24-027597-4
					Date Collected	2024-Sep-05	2024-Sep-05	2024-Sep-05	2024-Sep-05
Parameter	Units	R.L.	Limits	DWG		-	-	-	-
Manganese	mg/L	0.001	0.05	AO		<0.001	<0.001	<0.001	<0.001
Phosphorus	mg/L	0.1				<0.1	<0.1	<0.1	<0.1
Potassium	mg/L	0.1				1.6	1.2	1.3	0.9
Silicon	mg/L	0.01				3.28	3.68	4.15	5.03
Silica	mg/L	0.02				7.02	7.86	8.87	10.8
Sodium	mg/L	0.2	200, 20, 20	AO, WL, MAC		6.2	6.9	3.6	3.7
Strontium	mg/L	0.001				0.140	0.124	0.110	0.164
Tin	mg/L	0.05				<0.05	<0.05	<0.05	<0.05
Titanium	mg/L	0.005				<0.005	<0.005	<0.005	<0.005
Tungsten	mg/L	0.01				<0.01	<0.01	<0.01	<0.01
Zinc	mg/L	0.005	5	AO		<0.005	0.015	<0.005	<0.005
Zirconium	mg/L	0.003				<0.003	<0.003	<0.003	<0.003
Antimony	mg/L	0.0001	0.006	MAC		<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	0.0001	0.01	MAC		<0.0001	0.0001	0.0004	0.0001
Beryllium	mg/L	0.0001				<0.0001	<0.0001	<0.0001	<0.0001
Cadmium	mg/L	0.000015	0.005	MAC		<0.000015	<0.000015	<0.000015	<0.000015
Chromium	mg/L	0.001	0.05	MAC		<0.001	<0.001	<0.001	<0.001
Cobalt	mg/L	0.0001				0.0005	0.0005	0.0005	0.0005
Copper	mg/L	0.0001	1	AO		0.0008	0.0006	0.0003	0.0003
Lead	mg/L	0.00002	0.010	MAC		<0.00002	<0.00002	<0.00002	<0.00002
Molybdenum	mg/L	0.0001				0.0001	0.0001	0.0003	0.0002


Christine Burke

Laboratory Manager

The analytical results reported herein refer to the samples as received and relate only to the items tested. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

CADUCEON Environmental Laboratories Certificate of Analysis

Final Report

REPORT No: 24-027597 - Rev. 0

					Client I.D.	OW7A	OW13C	OW23C	OW22C
					Sample I.D.	24-027597-1	24-027597-2	24-027597-3	24-027597-4
					Date Collected	2024-Sep-05	2024-Sep-05	2024-Sep-05	2024-Sep-05
					DWG	-	-	-	-
Parameter	Units	R.L.	Limits						
Nickel	mg/L	0.0002				0.0008	0.0007	0.0009	0.0008
Selenium	mg/L	0.001	0.05	MAC		<0.001	<0.001	<0.001	<0.001
Silver	mg/L	0.0001				<0.0001	<0.0001	<0.0001	<0.0001
Thallium	mg/L	0.00005				<0.00005	<0.00005	<0.00005	<0.00005
Uranium	mg/L	0.00005	0.02	MAC		0.00036	0.00018	0.00033	0.00041
Vanadium	mg/L	0.0001				<0.0001	<0.0001	<0.0001	0.0001



Christine Burke
Laboratory Manager

The analytical results reported herein refer to the samples as received and relate only to the items tested. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

CADUCEON Environmental Laboratories Certificate of Analysis

Final Report

REPORT No: 24-027597 - Rev. 0

					Client I.D.	OW7C	OW13A	OW4A	OW3B
					Sample I.D.	24-027597-5	24-027597-6	24-027597-7	24-027597-8
					Date Collected	2024-Sep-05	2024-Sep-05	2024-Sep-05	2024-Sep-05
Parameter	Units	R.L.	Limits	DWG		-	-	-	-
Alkalinity(CaCO3) to pH4.5	mg/L	5	500	OG		86	277	342	276
Bicarbonate (as CaCO3)	mg/L	5				86	277	342	276
Carbonate (as CaCO3)	mg/L	5				<5	<5	<5	<5
TDS (Calc. from Cond.)	mg/L	3	500	AO		88	295	433	343
Conductivity @25°C	uS/cm	1				174	569	822	661
pH @25°C	pH units	-	8.5	OG		7.77	8.04	7.98	7.96
Bromide	mg/L	0.4				<0.4	<0.4	<0.4	<0.4
Fluoride	mg/L	0.1	1.5	MAC		<0.1	<0.1	<0.1	<0.1
Chloride	mg/L	0.5	250	AO		3.8	9.7	19.2	31.8
Nitrate (N)	mg/L	0.05	10.0	MAC		<0.05	1.14	16.3	6.13
Nitrite (N)	mg/L	0.05	1.0	MAC		<0.05	<0.05	<0.05	<0.05
Sulphate	mg/L	1	500	AO		1	20	13	12
Hardness (as CaCO3)	mg/L as CaCO3	0.02	100	OG		90.7	328	457	351
Aluminum	mg/L	0.01	0.1	OG		<0.01	0.03	0.06	0.03
Barium	mg/L	0.001	1	MAC		0.002	0.038	0.058	0.055
Bismuth	mg/L	0.02				<0.02	<0.02	<0.02	<0.02
Boron	mg/L	0.005	5	MAC		0.011	0.010	0.009	0.011
Calcium	mg/L	0.02				8.12	92.8	139	105
Iron	mg/L	0.005	0.3	AO		0.180	<0.005	<0.005	<0.005
Lithium	mg/L	0.005				<0.005	<0.005	<0.005	<0.005
Magnesium	mg/L	0.02				17.1	23.2	26.5	21.4


Christine Burke
Laboratory Manager

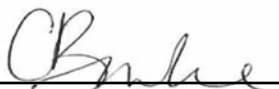
The analytical results reported herein refer to the samples as received and relate only to the items tested. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

CADUCEON Environmental Laboratories Certificate of Analysis

Final Report

REPORT No: 24-027597 - Rev. 0

					Client I.D.	OW7C	OW13A	OW4A	OW3B
					Sample I.D.	24-027597-5	24-027597-6	24-027597-7	24-027597-8
					Date Collected	2024-Sep-05	2024-Sep-05	2024-Sep-05	2024-Sep-05
Parameter	Units	R.L.	Limits	DWG		-	-	-	-
Manganese	mg/L	0.001	0.05	AO		0.094	<0.001	0.001	<0.001
Phosphorus	mg/L	0.1				<0.1	<0.1	<0.1	<0.1
Potassium	mg/L	0.1				0.9	1.2	1.5	2.5
Silicon	mg/L	0.01				0.37	3.80	4.41	3.90
Silica	mg/L	0.02				0.79	8.13	9.43	8.34
Sodium	mg/L	0.2	200, 20, 20	AO, WL, MAC		2.3	6.9	9.9	10.0
Strontium	mg/L	0.001				0.010	0.129	0.234	0.160
Tin	mg/L	0.05				<0.05	<0.05	<0.05	<0.05
Titanium	mg/L	0.005				<0.005	<0.005	<0.005	<0.005
Tungsten	mg/L	0.01				<0.01	<0.01	<0.01	<0.01
Zinc	mg/L	0.005	5	AO		<0.005	<0.005	<0.005	<0.005
Zirconium	mg/L	0.003				<0.003	<0.003	<0.003	<0.003
Antimony	mg/L	0.0001	0.006	MAC		<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	0.0001	0.01	MAC		<0.0001	0.0002	<0.0001	<0.0001
Beryllium	mg/L	0.0001				<0.0001	<0.0001	<0.0001	<0.0001
Cadmium	mg/L	0.000015	0.005	MAC		<0.000015	<0.000015	<0.000015	<0.000015
Chromium	mg/L	0.001	0.05	MAC		<0.001	<0.001	<0.001	<0.001
Cobalt	mg/L	0.0001				0.0004	0.0005	0.0005	0.0005
Copper	mg/L	0.0001	1	AO		<0.0001	0.0009	0.0007	0.0004
Lead	mg/L	0.00002	0.010	MAC		<0.00002	0.00002	<0.00002	<0.00002
Molybdenum	mg/L	0.0001				0.0028	0.0002	<0.0001	<0.0001


Christine Burke

Laboratory Manager

The analytical results reported herein refer to the samples as received and relate only to the items tested. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

CADUCEON Environmental Laboratories Certificate of Analysis

Final Report

REPORT No: 24-027597 - Rev. 0

					Client I.D.	OW7C	OW13A	OW4A	OW3B
					Sample I.D.	24-027597-5	24-027597-6	24-027597-7	24-027597-8
					Date Collected	2024-Sep-05	2024-Sep-05	2024-Sep-05	2024-Sep-05
Parameter	Units	R.L.	Limits	DWG		-	-	-	-
Nickel	mg/L	0.0002				0.0007	0.0007	0.0010	0.0007
Selenium	mg/L	0.001	0.05	MAC		<0.001	<0.001	<0.001	<0.001
Silver	mg/L	0.0001				<0.0001	<0.0001	<0.0001	<0.0001
Thallium	mg/L	0.00005				<0.00005	<0.00005	<0.00005	<0.00005
Uranium	mg/L	0.00005	0.02	MAC		<0.00005	0.00031	0.00016	0.00020
Vanadium	mg/L	0.0001				<0.0001	0.0001	<0.0001	<0.0001



Christine Burke
Laboratory Manager

The analytical results reported herein refer to the samples as received and relate only to the items tested. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

CADUCEON Environmental Laboratories Certificate of Analysis

Final Report

REPORT No: 24-027597 - Rev. 0

					Client I.D.	OW8A	OW5A	OW4B	OW5B
					Sample I.D.	24-027597-9	24-027597-10	24-027597-11	24-027597-12
					Date Collected	2024-Sep-05	2024-Sep-05	2024-Sep-05	2024-Sep-05
Parameter	Units	R.L.	Limits	DWG		-	-	-	-
Alkalinity(CaCO3) to pH4.5	mg/L	5	500	OG		288	282	381	290
Bicarbonate (as CaCO3)	mg/L	5				288	282	381	290
Carbonate (as CaCO3)	mg/L	5				<5	<5	<5	<5
TDS (Calc. from Cond.)	mg/L	3	500	AO		404	381	467	395
Conductivity @25°C	uS/cm	1				772	730	883	755
pH @25°C	pH units	-	8.5	OG		7.96	7.94	7.92	7.98
Bromide	mg/L	0.4				<0.4	31.5	<0.4	<0.4
Fluoride	mg/L	0.1	1.5	MAC		<0.1	7.7	<0.1	<0.1
Chloride	mg/L	0.5	250	AO		43.9	81.5	32.3	59.5
Nitrate (N)	mg/L	0.05	10.0	MAC		13.1	15.9	12.1	4.12
Nitrite (N)	mg/L	0.05	1.0	MAC		<0.05	3.99	<0.05	<0.05
Sulphate	mg/L	1	500	AO		10	80	11	15
Hardness (as CaCO3)	mg/L as CaCO3	0.02	100	OG		412	351	480	354
Aluminum	mg/L	0.01	0.1	OG		0.03	0.04	0.05	0.03
Barium	mg/L	0.001	1	MAC		0.119	0.051	0.080	0.044
Bismuth	mg/L	0.02				<0.02	<0.02	<0.02	<0.02
Boron	mg/L	0.005	5	MAC		0.006	0.009	0.008	0.008
Calcium	mg/L	0.02				109	102	145	102
Iron	mg/L	0.005	0.3	AO		<0.005	0.129	<0.005	<0.005
Lithium	mg/L	0.005				<0.005	<0.005	<0.005	<0.005
Magnesium	mg/L	0.02				34.2	23.4	28.4	24.0


Christine Burke
Laboratory Manager

The analytical results reported herein refer to the samples as received and relate only to the items tested. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

CADUCEON Environmental Laboratories Certificate of Analysis

Final Report

REPORT No: 24-027597 - Rev. 0

					Client I.D.	OW8A	OW5A	OW4B	OW5B
					Sample I.D.	24-027597-9	24-027597-10	24-027597-11	24-027597-12
					Date Collected	2024-Sep-05	2024-Sep-05	2024-Sep-05	2024-Sep-05
Parameter	Units	R.L.	Limits	DWG		-	-	-	-
Manganese	mg/L	0.001	0.05	AO		<0.001	0.114	<0.001	<0.001
Phosphorus	mg/L	0.1				<0.1	<0.1	<0.1	<0.1
Potassium	mg/L	0.1				1.2	2.5	0.9	2.3
Silicon	mg/L	0.01				5.79	3.74	4.33	3.68
Silica	mg/L	0.02				12.4	8.01	9.27	7.88
Sodium	mg/L	0.2	200, 20, 20	AO, WL, MAC		13.3	31.0	17.7	32.4
Strontium	mg/L	0.001				0.194	0.155	0.215	0.155
Tin	mg/L	0.05				<0.05	<0.05	<0.05	<0.05
Titanium	mg/L	0.005				<0.005	<0.005	<0.005	<0.005
Tungsten	mg/L	0.01				<0.01	<0.01	<0.01	<0.01
Zinc	mg/L	0.005	5	AO		<0.005	<0.005	<0.005	0.028
Zirconium	mg/L	0.003				<0.003	<0.003	<0.003	<0.003
Antimony	mg/L	0.0001	0.006	MAC		<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	0.0001	0.01	MAC		<0.0001	0.0001	<0.0001	0.0001
Beryllium	mg/L	0.0001				<0.0001	<0.0001	<0.0001	<0.0001
Cadmium	mg/L	0.000015	0.005	MAC		<0.000015	<0.000015	<0.000015	0.000037
Chromium	mg/L	0.001	0.05	MAC		0.001	<0.001	<0.001	<0.001
Cobalt	mg/L	0.0001				0.0005	0.0006	0.0005	0.0001
Copper	mg/L	0.0001	1	AO		0.0003	0.0007	0.0008	0.0008
Lead	mg/L	0.00002	0.010	MAC		<0.00002	<0.00002	<0.00002	0.00017
Molybdenum	mg/L	0.0001				<0.0001	0.0002	<0.0001	0.0003


Christine Burke

Laboratory Manager

The analytical results reported herein refer to the samples as received and relate only to the items tested. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

CADUCEON Environmental Laboratories Certificate of Analysis

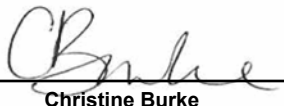
Final Report

REPORT No: 24-027597 - Rev. 0

					Client I.D.	OW8A	OW5A	OW4B	OW5B
					Sample I.D.	24-027597-9	24-027597-10	24-027597-11	24-027597-12
					Date Collected	2024-Sep-05	2024-Sep-05	2024-Sep-05	2024-Sep-05
Parameter	Units	R.L.	Limits	DWG		-	-	-	-
Nickel	mg/L	0.0002				0.0007	0.0009	0.0007	0.0009
Selenium	mg/L	0.001	0.05	MAC		<0.001	<0.001	<0.001	<0.001
Silver	mg/L	0.0001				<0.0001	<0.0001	<0.0001	<0.0001
Thallium	mg/L	0.00005				<0.00005	<0.00005	<0.00005	<0.00005
Uranium	mg/L	0.00005	0.02	MAC		0.00022	0.00043	0.00015	0.00045
Vanadium	mg/L	0.0001				0.0001	<0.0001	<0.0001	0.0001

					Client I.D.	OW7A	OW8A	OW5A
					Sample I.D.	24-027597-1	24-027597-9	24-027597-10
					Date Collected	2024-Sep-05	2024-Sep-05	2024-Sep-05
Parameter	Units	R.L.	Limits	DWG		-	-	-
Benzene	µg/L	0.5	1	MAC		<0.5	<0.5	<0.5
Ethylbenzene	µg/L	0.5	140, 1.6	MAC, AO		<0.5	<0.5	<0.5
Toluene	µg/L	0.5	60	MAC		<0.5	0.5	<0.5
Xylene, m,p-	µg/L	1				<1	<1	<1
Xylene, m,p,o-	µg/L	1.1	90, 20	MAC, AO		<1.1	<1.1	<1.1
Xylene, o-	µg/L	0.5				<0.5	<0.5	<0.5
PHC F1 (C6-C10)	µg/L	25				<25	<25	<25
PHC F2 (>C10-C16)	µg/L	50				<50	<50	<50
PHC F3 (>C16-C34)	µg/L	400				<400	<400	<400
PHC F4 (>C34-C50)	µg/L	400				<400	<400	<400
Oil & Grease (Total)	mg/L	1.0				<1.0	<1.0	<1.0

Revised report to change guidelines as per client request



Christine Burke
Laboratory Manager

The analytical results reported herein refer to the samples as received and relate only to the items tested. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

DWG - Drinking Water Guidelines

ODWS - Ontario Drinking Water Standards

AO - Aesthetic Objectives

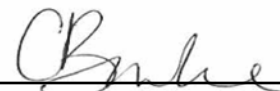
IMAC - Interim Maximum Acceptable Concentration

MAC - Maximum Acceptable Concentration

ODWO - D-5-5 Objective

OG - Operational Guidelines

WL - Warning Level - Sodium Restricted Diets



Christine Burke
Laboratory Manager

Summary of Exceedances		
Aesthetic Objectives		
OW7C	Found Value	Limit
Manganese	0.094	0.05
OW5A	Found Value	Limit
Manganese	0.114	0.05
Maximum Acceptable Concentration		
OW4A	Found Value	Limit
Nitrate (N)	16.3	10.0
OW8A	Found Value	Limit
Nitrate (N)	13.1	10.0
OW5A	Found Value	Limit
Fluoride	7.7	1.5
Nitrate (N)	15.9	10.0
Nitrite (N)	3.99	1.0
Sodium	31.0	20
OW4B	Found Value	Limit
Nitrate (N)	12.1	10.0
OW5B	Found Value	Limit
Sodium	32.4	20
Operational Guidelines		
OW7A	Found Value	Limit
Hardness (as CaCO ₃)	303	100
OW13C	Found Value	Limit
Hardness (as CaCO ₃)	326	100
OW23C	Found Value	Limit
Hardness (as CaCO ₃)	338	100
OW22C	Found Value	Limit
Hardness (as CaCO ₃)	369	100
OW13A	Found Value	Limit
Hardness (as CaCO ₃)	328	100
OW4A	Found Value	Limit
Hardness (as CaCO ₃)	457	100
OW3B	Found Value	Limit
Hardness (as CaCO ₃)	351	100
OW8A	Found Value	Limit
Hardness (as CaCO ₃)	412	100
OW5A	Found Value	Limit
Hardness (as CaCO ₃)	351	100



Christine Burke
Laboratory Manager

OW4B	Found Value	Limit
Hardness (as CaCO ₃)	480	100
OW5B	Found Value	Limit
Hardness (as CaCO ₃)	354	100
Warning Level - Sodium Restricted Diets		
OW5A	Found Value	Limit
Sodium	31.0	20
OW5B	Found Value	Limit
Sodium	32.4	20


Christine Burke

Laboratory Manager

C.O.C.: -

REPORT No: 24-028228 - Rev. 0

Report To:

Tatham Engineering
115 Sandford Fleming Drive
Suite 200
Collingwood, ON L9Y 5A6

CADUCEON Environmental Laboratories

112 Commerce Park Dr Unit L
Barrie, ON L4N 8W8

Attention: Alicia Kimberley

DATE RECEIVED: 2024-Sep-11
DATE REPORTED: 2024-Sep-13
SAMPLE MATRIX: Surface Water

CUSTOMER PROJECT: 123016
P.O. NUMBER:

Analyses	Qty	Site Analyzed	Authorized	Date Analyzed	Lab Method	Reference Method
Anions (Liquid)	2	OTTAWA	PCURIEL	2024-Sep-13	A-IC-01	SM 4110B
Cond/pH/Alk Auto (Liquid)	2	OTTAWA	SBOUDREAU	2024-Sep-12	COND-02/PH-02/A LK-02	SM 2510B/4500H/ 2320B
ICP/MS Total (Liquid)	2	OTTAWA	AOZKAYMAK	2024-Sep-13	D-ICPMS-01	EPA 6020
ICP/OES Total (Liquid)	2	OTTAWA	APRUDYVUS	2024-Sep-13	D-ICP-01	SM 3120B

R.L. = Reporting Limit

NC = Not Calculated

Test methods may be modified from specified reference method unless indicated by an *



Michelle Dubien
Data Specialist

CADUCEON Environmental Laboratories Certificate of Analysis

Final Report

REPORT No: 24-028228 - Rev. 0

Parameter	Units	R.L.	Limits	Client I.D.	Sample I.D.	Date Collected	North Pond	South Pond
							24-028228-1	24-028228-2
							2024-Sep-10	2024-Sep-10
							-	-
Alkalinity(CaCO3) to pH4.5	mg/L	5					212	160
Bicarbonate (as CaCO3)	mg/L	5					212	160
Conductivity @25°C	uS/cm	1					408	318
pH @25°C	pH units	-	8.5	PWQO			8.05	7.95
Chloride	mg/L	0.5					6.7	1.7
Nitrate (N)	mg/L	0.05					<0.05	<0.05
Nitrite (N)	mg/L	0.05					<0.05	<0.05
Sulphate	mg/L	1					4	<1
Hardness (as CaCO3)	mg/L as CaCO3	0.02					218	162
Aluminum (Total)	µg/L	10					30	20
Barium (Total)	µg/L	1					25	16
Bismuth (Total)	µg/L	20					<20	<20
Boron (Total)	µg/L	5	200	INTERIM			14	13
Calcium (Total)	µg/L	20					66000	55300
Iron (Total)	µg/L	5	300	PWQO			240	188
Lithium (Total)	µg/L	5					<5	<5
Magnesium (Total)	µg/L	20					12800	5700
Manganese (Total)	µg/L	1					34	61
Phosphorus (Total)	µg/L	100					<100	<100
Potassium (Total)	µg/L	100					3000	2500
Silicon (Total)	µg/L	10					3620	1430



Michelle Dubien
Data Specialist

The analytical results reported herein refer to the samples as received and relate only to the items tested. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

CADUCEON Environmental Laboratories Certificate of Analysis

Final Report
REPORT No: 24-028228 - Rev. 0

					Client I.D.	North Pond	South Pond
					Sample I.D.	24-028228-1	24-028228-2
					Date Collected	2024-Sep-10	2024-Sep-10
Parameter	Units	R.L.	Limits			-	-
Silica (Total)	µg/L	20				7750	3070
Sodium (Total)	µg/L	200				2700	1100
Strontium (Total)	µg/L	1				105	100
Tin (Total)	µg/L	50				<50	<50
Titanium (Total)	µg/L	5				<5	<5
Tungsten (Total)	µg/L	10	30	INTERIM		20	30
Zinc (Total)	µg/L	5	20, 30	INTERIM, PWQO		10	13
Zirconium (Total)	µg/L	3	4	INTERIM		<3	<3
Antimony (Total)	µg/L	0.1	20	INTERIM		0.1	0.4
Arsenic (Total)	µg/L	0.1	5, 5	INTERIM, PWQO		0.6	0.4
Beryllium (Total)	µg/L	0.1	11	PWQO		<0.1	<0.1
Cadmium (Total)	µg/L	0.015	0.1, 0.2	INTERIM, PWQO		<0.015	0.017
Chromium (Total)	µg/L	1				<1	<1
Cobalt (Total)	µg/L	0.1	0.9	INTERIM		0.2	0.2
Copper (Total)	µg/L	0.1	5	INTERIM		0.2	0.3
Lead (Total)	µg/L	0.02	1, 5	INTERIM, PWQO		0.02	0.02
Molybdenum (Total)	µg/L	0.1	40	INTERIM		<0.1	<0.1
Nickel (Total)	µg/L	0.2	25	PWQO		0.8	0.5
Selenium (Total)	µg/L	1	100	PWQO		<1	<1
Silver (Total)	µg/L	0.1	0.1	PWQO		<0.1	<0.1
Thallium (Total)	µg/L	0.05	0.3, 0.3	INTERIM, PWQO		<0.05	<0.05



Michelle Dubien
Data Specialist

The analytical results reported herein refer to the samples as received and relate only to the items tested. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

CADUCEON Environmental Laboratories Certificate of Analysis

Final Report

REPORT No: 24-028228 - Rev. 0

					Client I.D.	North Pond	South Pond
					Sample I.D.	24-028228-1	24-028228-2
					Date Collected	2024-Sep-10	2024-Sep-10
Parameter	Units	R.L.	Limits			-	-
Uranium (Total)	µg/L	0.05	5	INTERIM		0.23	0.12
Vanadium (Total)	µg/L	0.1	6	INTERIM		<0.1	<0.1

TP / TKN not required as per previous submissions

: PWQO Limits
 INTERIM: Interim PWQO
 PWQO: PWQO



Michelle Dubien
Data Specialist

The analytical results reported herein refer to the samples as received and relate only to the items tested. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

C.O.C.: -

REPORT No: 24-028235 - Rev. 1

Report To:

Tatham Engineering
115 Sandford Fleming Drive
Suite 200
Collingwood, ON L9Y 5A6

CADUCEON Environmental Laboratories

112 Commerce Park Dr Unit L
Barrie, ON L4N 8W8

Attention: Alicia Kimberley

DATE RECEIVED: 2024-Sep-11
DATE REPORTED: 2025-Jan-29
SAMPLE MATRIX: Ground Water

CUSTOMER PROJECT: 123016
P.O. NUMBER:

Analyses	Qty	Site Analyzed	Authorized	Date Analyzed	Lab Method	Reference Method
Anions (Liquid)	5	OTTAWA	PCURIEL	2024-Sep-12	A-IC-01	SM 4110B
Cond/pH/Alk Auto (Liquid)	5	OTTAWA	SBOUDREAU	2024-Sep-12	COND-02/PH-02/A LK-02	SM 2510B/4500H/ 2320B
ICP/MS (Liquid)	5	OTTAWA	AOZKAYMAK	2024-Sep-13	D-ICPMS-01	EPA 200.8
ICP/OES (Liquid)	5	OTTAWA	APRUDYVUS	2024-Sep-13	D-ICP-01	SM 3120B
Oil & Grease (Liquid)	5	KINGSTON	DCHAUDHARI	2024-Sep-12	O&G-001	SM 5520
PHC F1 (Liquid)	5	RICHMOND_HILL	FLENA	2024-Sep-14	C-VPHW-01	MECP E3421
PHC F2-4 (Liquid)	5	KINGSTON	STHOMPSON	2024-Sep-13	PHC-W-001	MECP E3421
VOC-Volatiles Full (Water)	5	RICHMOND_HILL	FLENA	2024-Sep-14	C-VOC-02	EPA 8260

µg/g = micrograms per gram (parts per million) and is equal to mg/Kg

F1 C6-C10 hydrocarbons in µg/g, (F1-btex if requested)

F2 C10-C16 hydrocarbons in µg/g, (F2-naph if requested)

F3 C16-C34 hydrocarbons in µg/g, (F3-pah if requested)

F4 C34-C50 hydrocarbons in µg/g

This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.

Any deviations from the method are noted and reported for any particular sample.

nC6 and nC10 response factor is within 30% of response factor for toluene:

nC10, nC16 and nC34 response factors within 10% of each other:

C50 response factors within 70% of nC10+nC16+nC34 average:

Linearity is within 15%:

All results expressed on a dry weight basis.

Unless otherwise noted all chromatograms returned to baseline by the retention time of nC50.

R.L. = Reporting Limit

NC = Not Calculated

Test methods may be modified from specified reference method unless indicated by an *

Unless otherwise noted all extraction, analysis, QC requirements and limits for holding time were met.

If analyzed for F4 and F4G they are not to be summed but the greater of the two numbers are to be used in application to the CWS PHC

QC will be made available upon request.


Christine Burke

Laboratory Manager

CADUCEON Environmental Laboratories Certificate of Analysis

Final Report

REPORT No: 24-028235 - Rev. 1

					Client I.D.	OW14C	OW20C	OW6A	OW10B
					Sample I.D.	24-028235-1	24-028235-2	24-028235-3	24-028235-4
					Date Collected	2024-Sep-10	2024-Sep-10	2024-Sep-10	2024-Sep-10
Parameter	Units	R.L.	Limits	DWG		-	-	-	-
Alkalinity(CaCO3) to pH4.5	mg/L	5	500	OG		485	229	160	219
Bicarbonate (as CaCO3)	mg/L	5				485	229	160	219
Conductivity @25°C	uS/cm	1				876	533	424	467
pH @25°C	pH units	-	8.5	OG		7.87	7.98	7.95	7.99
Chloride	mg/L	0.5	250	AO		2.8	6.3	24.4	9.7
Nitrate (N)	mg/L	0.05	10.0	MAC		2.48	9.72	0.97	1.90
Nitrite (N)	mg/L	0.05	1.0	MAC		<0.05	<0.05	<0.05	<0.05
Sulphate	mg/L	1	500	AO		7	12	21	15
Hardness (as CaCO3)	mg/L as CaCO3	0.02	100	OG		550	299	219	268
Aluminum	mg/L	0.01	0.1	OG		0.04	0.02	0.02	0.02
Barium	mg/L	0.001	1	MAC		0.126	0.080	0.060	0.057
Bismuth	mg/L	0.02				<0.02	<0.02	<0.02	<0.02
Boron	mg/L	0.005	5	MAC		0.008	0.012	0.024	0.010
Calcium	mg/L	0.02				155	81.4	62.3	77.8
Iron	mg/L	0.005	0.3	AO		<0.005	<0.005	<0.005	<0.005
Lithium	mg/L	0.005				<0.005	<0.005	<0.005	<0.005
Magnesium	mg/L	0.02				39.5	23.2	15.3	17.8
Manganese	mg/L	0.001	0.05	AO		<0.001	0.001	<0.001	<0.001
Phosphorus	mg/L	0.1				<0.1	<0.1	<0.1	<0.1
Potassium	mg/L	0.1				1.0	0.7	2.7	1.3
Silicon	mg/L	0.01				5.53	3.95	2.52	3.38


Christine Burke
Laboratory Manager

The analytical results reported herein refer to the samples as received and relate only to the items tested. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

CADUCEON Environmental Laboratories Certificate of Analysis

Final Report

REPORT No: 24-028235 - Rev. 1

					Client I.D.	OW14C	OW20C	OW6A	OW10B
					Sample I.D.	24-028235-1	24-028235-2	24-028235-3	24-028235-4
					Date Collected	2024-Sep-10	2024-Sep-10	2024-Sep-10	2024-Sep-10
Parameter	Units	R.L.	Limits	DWG		-	-	-	-
Silica	mg/L	0.02				11.8	8.46	5.39	7.22
Sodium	mg/L	0.2	200, 20, 20	AO, WL, MAC		2.4	2.7	6.0	3.7
Strontium	mg/L	0.001				0.216	0.117	0.149	0.119
Tin	mg/L	0.05				<0.05	<0.05	<0.05	<0.05
Titanium	mg/L	0.005				<0.005	<0.005	<0.005	<0.005
Tungsten	mg/L	0.01				0.03	0.02	0.03	0.02
Zinc	mg/L	0.005	5	AO		0.054	<0.005	<0.005	0.053
Zirconium	mg/L	0.003				<0.003	<0.003	<0.003	<0.003
Antimony	mg/L	0.0001	0.006	MAC		<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	0.0001	0.01	MAC		0.0002	<0.0001	<0.0001	0.0003
Beryllium	mg/L	0.0001				<0.0001	<0.0001	<0.0001	<0.0001
Cadmium	mg/L	0.000015	0.005	MAC		0.000060	<0.000015	<0.000015	0.000038
Chromium	mg/L	0.001	0.05	MAC		<0.001	<0.001	<0.001	<0.001
Cobalt	mg/L	0.0001				0.0002	0.0001	0.0004	0.0001
Copper	mg/L	0.0001	1	AO		0.0002	0.0003	0.0005	0.0002
Lead	mg/L	0.00002	0.010	MAC		0.00010	<0.00002	<0.00002	0.00006
Molybdenum	mg/L	0.0001				<0.0001	0.0002	0.0004	0.0002
Nickel	mg/L	0.0002				0.0003	0.0006	0.0007	0.0007
Selenium	mg/L	0.001	0.05	MAC		<0.001	<0.001	<0.001	<0.001
Silver	mg/L	0.0001				<0.0001	<0.0001	<0.0001	<0.0001
Thallium	mg/L	0.00005				<0.00005	<0.00005	<0.00005	<0.00005


Christine Burke
Laboratory Manager

The analytical results reported herein refer to the samples as received and relate only to the items tested. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

CADUCEON Environmental Laboratories Certificate of Analysis

Final Report

REPORT No: 24-028235 - Rev. 1

					Client I.D.	OW14C	OW20C	OW6A	OW10B
					Sample I.D.	24-028235-1	24-028235-2	24-028235-3	24-028235-4
					Date Collected	2024-Sep-10	2024-Sep-10	2024-Sep-10	2024-Sep-10
					DWG	-	-	-	-
Parameter	Units	R.L.	Limits						
Uranium	mg/L	0.00005	0.02		MAC	0.00020	0.00032	0.00017	0.00034
Vanadium	mg/L	0.0001				0.0001	0.0001	<0.0001	<0.0001



Christine Burke
Laboratory Manager

The analytical results reported herein refer to the samples as received and relate only to the items tested. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

CADUCEON Environmental Laboratories Certificate of Analysis

Final Report
REPORT No: 24-028235 - Rev. 1

					Client I.D.
					OW21C
					Sample I.D.
					24-028235-5
					Date Collected
					2024-Sep-10
Parameter	Units	R.L.	Limits	DWG	
Alkalinity(CaCO3) to pH4.5	mg/L	5	500	OG	262
Bicarbonate (as CaCO3)	mg/L	5			262
Conductivity @25°C	uS/cm	1			494
pH @25°C	pH units	-	8.5	OG	8.03
Chloride	mg/L	0.5	250	AO	2.6
Nitrate (N)	mg/L	0.05	10.0	MAC	0.52
Nitrite (N)	mg/L	0.05	1.0	MAC	<0.05
Sulphate	mg/L	1	500	AO	11
Hardness (as CaCO3)	mg/L as CaCO3	0.02	100	OG	292
Aluminum	mg/L	0.01	0.1	OG	0.02
Barium	mg/L	0.001	1	MAC	0.066
Bismuth	mg/L	0.02			<0.02
Boron	mg/L	0.005	5	MAC	0.006
Calcium	mg/L	0.02			77.7
Iron	mg/L	0.005	0.3	AO	<0.005
Lithium	mg/L	0.005			<0.005
Magnesium	mg/L	0.02			23.9
Manganese	mg/L	0.001	0.05	AO	<0.001
Phosphorus	mg/L	0.1			<0.1
Potassium	mg/L	0.1			0.6
Silicon	mg/L	0.01			4.26


Christine Burke
Laboratory Manager

The analytical results reported herein refer to the samples as received and relate only to the items tested. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

CADUCEON Environmental Laboratories Certificate of Analysis

Final Report
REPORT No: 24-028235 - Rev. 1

					Client I.D.
					OW21C
					Sample I.D.
					24-028235-5
					Date Collected
					2024-Sep-10
Parameter	Units	R.L.	Limits	DWG	
Silica	mg/L	0.02			9.11
Sodium	mg/L	0.2	200, 20, 20	AO, WL, MAC	2.2
Strontium	mg/L	0.001			0.118
Tin	mg/L	0.05			<0.05
Titanium	mg/L	0.005			<0.005
Tungsten	mg/L	0.01			0.03
Zinc	mg/L	0.005	5	AO	<0.005
Zirconium	mg/L	0.003			<0.003
Antimony	mg/L	0.0001	0.006	MAC	<0.0001
Arsenic	mg/L	0.0001	0.01	MAC	<0.0001
Beryllium	mg/L	0.0001			<0.0001
Cadmium	mg/L	0.000015	0.005	MAC	<0.000015
Chromium	mg/L	0.001	0.05	MAC	<0.001
Cobalt	mg/L	0.0001			0.0001
Copper	mg/L	0.0001	1	AO	0.0002
Lead	mg/L	0.00002	0.010	MAC	0.00007
Molybdenum	mg/L	0.0001			<0.0001
Nickel	mg/L	0.0002			0.0006
Selenium	mg/L	0.001	0.05	MAC	<0.001
Silver	mg/L	0.0001			<0.0001
Thallium	mg/L	0.00005			<0.00005


Christine Burke
Laboratory Manager

The analytical results reported herein refer to the samples as received and relate only to the items tested. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

CADUCEON Environmental Laboratories Certificate of Analysis

Final Report

REPORT No: 24-028235 - Rev. 1

					Client I.D.	OW21C			
					Sample I.D.	24-028235-5			
					Date Collected	2024-Sep-10			
Parameter	Units	R.L.	Limits	DWG					
Uranium	mg/L	0.00005	0.02	MAC		0.00021			
Vanadium	mg/L	0.0001				<0.0001			

					Client I.D.	OW14C	OW20C	OW6A	OW10B
					Sample I.D.	24-028235-1	24-028235-2	24-028235-3	24-028235-4
					Date Collected	2024-Sep-10	2024-Sep-10	2024-Sep-10	2024-Sep-10
Parameter	Units	R.L.	Limits	DWG					
Benzene	µg/L	0.5	1	MAC		<0.5	<0.5	<0.5	<0.5
Ethylbenzene	µg/L	0.5	140, 1.6	MAC, AO		<0.5	<0.5	<0.5	<0.5
Toluene	µg/L	0.5	60	MAC		<0.5	0.6	<0.5	<0.5
Xylene, m,p-	µg/L	1				<1	<1	<1	<1
Xylene, m,p,o-	µg/L	1.1	90, 20	MAC, AO		<1.1	<1.1	<1.1	<1.1
Xylene, o-	µg/L	0.5				<0.5	<0.5	<0.5	<0.5
PHC F1 (C6-C10)	µg/L	25				<25	<25	<25	<25
PHC F2 (>C10-C16)	µg/L	50				<50	<50	<50	<50
PHC F3 (>C16-C34)	µg/L	400				<400	<400	<400	<400
PHC F4 (>C34-C50)	µg/L	400				<400	<400	<400	<400
Oil & Grease (Total)	mg/L	1.0				1.5	2.9	2.9	2.6


Christine Burke
Laboratory Manager

The analytical results reported herein refer to the samples as received and relate only to the items tested. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

CADUCEON Environmental Laboratories Certificate of Analysis

Final Report
REPORT No: 24-028235 - Rev. 1

					Client I.D.
					OW21C
					Sample I.D.
					24-028235-5
					Date Collected
					2024-Sep-10
Parameter	Units	R.L.	Limits	DWG	-
Benzene	µg/L	0.5	1	MAC	<0.5
Ethylbenzene	µg/L	0.5	140, 1.6	MAC, AO	<0.5
Toluene	µg/L	0.5	60	MAC	<0.5
Xylene, m,p-	µg/L	1			<1
Xylene, m,p,o-	µg/L	1.1	90, 20	MAC, AO	<1.1
Xylene, o-	µg/L	0.5			<0.5
PHC F1 (C6-C10)	µg/L	25			<25
PHC F2 (>C10-C16)	µg/L	50			<50
PHC F3 (>C16-C34)	µg/L	400			<400
PHC F4 (>C34-C50)	µg/L	400			<400
Oil & Grease (Total)	mg/L	1.0			3.0

Revised report to update sample ID as per client request

DWG - Drinking Water Guidelines

ODWS - Ontario Drinking Water Standards

AO - Aesthetic Objectives

IMAC - Interim Maximum Acceptable Concentration

MAC - Maximum Acceptable Concentration

ODWO - D-5-5 Objective

OG - Operational Guidelines

WL - Warning Level - Sodium Restricted Diets



Christine Burke
Laboratory Manager

The analytical results reported herein refer to the samples as received and relate only to the items tested. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

Summary of Exceedances		
Operational Guidelines		
OW14C	Found Value	Limit
Hardness (as CaCO ₃)	550	100
OW20C	Found Value	Limit
Hardness (as CaCO ₃)	299	100
OW6A	Found Value	Limit
Hardness (as CaCO ₃)	219	100
OW10B	Found Value	Limit
Hardness (as CaCO ₃)	268	100
OW21C	Found Value	Limit
Hardness (as CaCO ₃)	292	100


Christine Burke

Laboratory Manager

C.O.C.: -

REPORT No: 24-028368 - Rev. 0

Report To:

Tatham Engineering
115 Sandford Fleming Drive
Suite 200
Collingwood, ON L9Y 5A6

CADUCEON Environmental Laboratories

112 Commerce Park Dr Unit L
Barrie, ON L4N 8W8

Attention: Alicia Kimberley

DATE RECEIVED: 2024-Sep-12
DATE REPORTED: 2024-Sep-17
SAMPLE MATRIX: Ground Water

CUSTOMER PROJECT: 123016
P.O. NUMBER:

Analyses	Qty	Site Analyzed	Authorized	Date Analyzed	Lab Method	Reference Method
Anions (Liquid)	5	OTTAWA	PCURIEL	2024-Sep-13	A-IC-01	SM 4110B
Cond/pH/Alk Auto (Liquid)	5	OTTAWA	SBOUDREAU	2024-Sep-13	COND-02/PH-02/A LK-02	SM 2510B/4500H/ 2320B
ICP/MS (Liquid)	5	OTTAWA	AOZKAYMAK	2024-Sep-17	D-ICPMS-01	EPA 200.8
ICP/OES (Liquid)	5	OTTAWA	NHOGAN	2024-Sep-16	D-ICP-01	SM 3120B
Oil & Grease (Liquid)	4	KINGSTON	DCHAUDHARI	2024-Sep-13	O&G-001	SM 5520
PHC F1 (Liquid)	4	RICHMOND_HILL	FLENA	2024-Sep-14	C-VPHW-01	MECP E3421
PHC F2-4 (Liquid)	4	KINGSTON	STHOMPSON	2024-Sep-14	PHC-W-001	MECP E3421
VOC-Volatiles Full (Water)	4	RICHMOND_HILL	FLENA	2024-Sep-14	C-VOC-02	EPA 8260

µg/g = micrograms per gram (parts per million) and is equal to mg/Kg

F1 C6-C10 hydrocarbons in µg/g, (F1-btex if requested)

F2 C10-C16 hydrocarbons in µg/g, (F2-naph if requested)

F3 C16-C34 hydrocarbons in µg/g, (F3-pah if requested)

F4 C34-C50 hydrocarbons in µg/g

This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.

Any deviations from the method are noted and reported for any particular sample.

nC6 and nC10 response factor is within 30% of response factor for toluene:

nC10, nC16 and nC34 response factors within 10% of each other:

C50 response factors within 70% of nC10+nC16+nC34 average:

Linearity is within 15%:

All results expressed on a dry weight basis.

Unless otherwise noted all chromatograms returned to baseline by the retention time of nC50.

R.L. = Reporting Limit

NC = Not Calculated

Test methods may be modified from specified reference method unless indicated by an *

Unless otherwise noted all extraction, analysis, QC

requirements and limits for holding time were met.

If analyzed for F4 and F4G they are not to be summed

but the greater of the two numbers are to be used in

application to the CWS PHC

QC will be made available upon request.



Michelle Dubien
Data Specialist

CADUCEON Environmental Laboratories Certificate of Analysis

Final Report

REPORT No: 24-028368 - Rev. 0

					Client I.D.	OW9A	OW12A	OW16C	OW18A
					Sample I.D.	24-028368-1	24-028368-2	24-028368-3	24-028368-4
					Date Collected	2024-Sep-11	2024-Sep-11	2024-Sep-11	2024-Sep-11
Parameter	Units	R.L.	Limits	DWG		-	-	-	-
Alkalinity(CaCO3) to pH4.5	mg/L	5	500	OG		344	160	262	178
Bicarbonate (as CaCO3)	mg/L	5				344	160	262	178
Conductivity @25°C	uS/cm	1				696	333	517	369
pH @25°C	pH units	-	8.5	OG		7.91	7.93	8.02	7.98
Chloride	mg/L	0.5	250	AO		10.2	4.5	5.6	6.5
Nitrate (N)	mg/L	0.05	10.0	MAC		5.66	2.50	1.60	1.22
Nitrite (N)	mg/L	0.05	1.0	MAC		<0.05	<0.05	<0.05	<0.05
Sulphate	mg/L	1	500	AO		8	5	9	7
Hardness (as CaCO3)	mg/L as CaCO3	0.02	100	OG		386	182	279	197
Aluminum	mg/L	0.01	0.1	OG		0.07	0.04	0.04	0.04
Barium	mg/L	0.001	1	MAC		0.069	0.005	0.050	0.038
Bismuth	mg/L	0.02				<0.02	<0.02	<0.02	<0.02
Boron	mg/L	0.005	5	MAC		<0.005	<0.005	0.005	<0.005
Calcium	mg/L	0.02				127	64.4	83.5	61.7
Iron	mg/L	0.005	0.3	AO		<0.005	<0.005	<0.005	<0.005
Lithium	mg/L	0.005				<0.005	<0.005	<0.005	<0.005
Magnesium	mg/L	0.02				16.7	5.14	17.0	10.5
Manganese	mg/L	0.001	0.05	AO		0.015	<0.001	<0.001	<0.001
Phosphorus	mg/L	0.1				<0.1	<0.1	<0.1	<0.1
Potassium	mg/L	0.1				0.5	1.0	0.6	0.3
Silicon	mg/L	0.01				4.11	2.52	3.34	2.37



Michelle Dubien
Data Specialist

The analytical results reported herein refer to the samples as received and relate only to the items tested. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

CADUCEON Environmental Laboratories Certificate of Analysis

Final Report

REPORT No: 24-028368 - Rev. 0

					Client I.D.	OW9A	OW12A	OW16C	OW18A
					Sample I.D.	24-028368-1	24-028368-2	24-028368-3	24-028368-4
					Date Collected	2024-Sep-11	2024-Sep-11	2024-Sep-11	2024-Sep-11
Parameter	Units	R.L.	Limits	DWG		-	-	-	-
Silica	mg/L	0.02				8.80	5.39	7.15	5.07
Sodium	mg/L	0.2	200, 20, 20	AO, WL, MAC		2.6	0.8	3.0	2.0
Strontium	mg/L	0.001				0.145	0.120	0.105	0.066
Tin	mg/L	0.05				<0.05	<0.05	<0.05	<0.05
Titanium	mg/L	0.005				<0.005	<0.005	<0.005	<0.005
Tungsten	mg/L	0.01				<0.01	<0.01	<0.01	<0.01
Zinc	mg/L	0.005	5	AO		<0.005	<0.005	0.028	<0.005
Zirconium	mg/L	0.003				<0.003	<0.003	<0.003	<0.003
Antimony	mg/L	0.0001	0.006	MAC		<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	0.0001	0.01	MAC		<0.0001	<0.0001	<0.0001	<0.0001
Beryllium	mg/L	0.0001				<0.0001	<0.0001	<0.0001	<0.0001
Cadmium	mg/L	0.000015	0.005	MAC		<0.000015	<0.000015	0.000039	<0.000015
Chromium	mg/L	0.001	0.05	MAC		<0.001	<0.001	<0.001	<0.001
Cobalt	mg/L	0.0001				0.0003	0.0003	0.0002	0.0002
Copper	mg/L	0.0001	1	AO		0.0004	0.0005	0.0004	0.0005
Lead	mg/L	0.00002	0.010	MAC		<0.00002	<0.00002	<0.00002	<0.00002
Molybdenum	mg/L	0.0001				<0.0001	<0.0001	0.0002	0.0001
Nickel	mg/L	0.0002				0.0003	0.0004	0.0004	0.0003
Selenium	mg/L	0.001	0.05	MAC		<0.001	<0.001	<0.001	<0.001
Silver	mg/L	0.0001				<0.0001	<0.0001	<0.0001	<0.0001
Thallium	mg/L	0.00005				<0.00005	<0.00005	<0.00005	<0.00005



Michelle Dubien
Data Specialist

The analytical results reported herein refer to the samples as received and relate only to the items tested. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

CADUCEON Environmental Laboratories Certificate of Analysis

Final Report

REPORT No: 24-028368 - Rev. 0

					Client I.D.	OW9A	OW12A	OW16C	OW18A
					Sample I.D.	24-028368-1	24-028368-2	24-028368-3	24-028368-4
					Date Collected	2024-Sep-11	2024-Sep-11	2024-Sep-11	2024-Sep-11
					DWG	-	-	-	-
Parameter	Units	R.L.	Limits						
Uranium	mg/L	0.00005	0.02		MAC	0.00012	0.00006	0.00023	0.00014
Vanadium	mg/L	0.0001				<0.0001	0.0002	<0.0001	0.0001



Michelle Dubien
Data Specialist

The analytical results reported herein refer to the samples as received and relate only to the items tested. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

CADUCEON Environmental Laboratories Certificate of Analysis

Final Report
REPORT No: 24-028368 - Rev. 0

					Client I.D.
					OW18C
					Sample I.D.
					24-028368-5
					Date Collected
					2024-Sep-11
Parameter	Units	R.L.	Limits	DWG	
Alkalinity(CaCO3) to pH4.5	mg/L	5	500	OG	221
Bicarbonate (as CaCO3)	mg/L	5			221
Conductivity @25°C	uS/cm	1			438
pH @25°C	pH units	-	8.5	OG	8.01
Chloride	mg/L	0.5	250	AO	6.3
Nitrate (N)	mg/L	0.05	10.0	MAC	0.98
Nitrite (N)	mg/L	0.05	1.0	MAC	<0.05
Sulphate	mg/L	1	500	AO	6
Hardness (as CaCO3)	mg/L as CaCO3	0.02	100	OG	231
Aluminum	mg/L	0.01	0.1	OG	0.04
Barium	mg/L	0.001	1	MAC	0.029
Bismuth	mg/L	0.02			<0.02
Boron	mg/L	0.005	5	MAC	0.009
Calcium	mg/L	0.02			71.1
Iron	mg/L	0.005	0.3	AO	<0.005
Lithium	mg/L	0.005			<0.005
Magnesium	mg/L	0.02			13.0
Manganese	mg/L	0.001	0.05	AO	<0.001
Phosphorus	mg/L	0.1			<0.1
Potassium	mg/L	0.1			0.5
Silicon	mg/L	0.01			2.67



Michelle Dubien
Data Specialist

The analytical results reported herein refer to the samples as received and relate only to the items tested. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

CADUCEON Environmental Laboratories Certificate of Analysis

Final Report
REPORT No: 24-028368 - Rev. 0

					Client I.D.
					OW18C
					Sample I.D.
					24-028368-5
					Date Collected
					2024-Sep-11
Parameter	Units	R.L.	Limits	DWG	
Silica	mg/L	0.02			5.71
Sodium	mg/L	0.2	200, 20, 20	AO, WL, MAC	1.9
Strontium	mg/L	0.001			0.072
Tin	mg/L	0.05			<0.05
Titanium	mg/L	0.005			<0.005
Tungsten	mg/L	0.01			<0.01
Zinc	mg/L	0.005	5	AO	0.012
Zirconium	mg/L	0.003			<0.003
Antimony	mg/L	0.0001	0.006	MAC	<0.0001
Arsenic	mg/L	0.0001	0.01	MAC	0.0001
Beryllium	mg/L	0.0001			<0.0001
Cadmium	mg/L	0.000015	0.005	MAC	<0.000015
Chromium	mg/L	0.001	0.05	MAC	<0.001
Cobalt	mg/L	0.0001			0.0002
Copper	mg/L	0.0001	1	AO	0.0011
Lead	mg/L	0.00002	0.010	MAC	0.00003
Molybdenum	mg/L	0.0001			0.0001
Nickel	mg/L	0.0002			0.0004
Selenium	mg/L	0.001	0.05	MAC	<0.001
Silver	mg/L	0.0001			<0.0001
Thallium	mg/L	0.00005			<0.00005



Michelle Dubien
Data Specialist

The analytical results reported herein refer to the samples as received and relate only to the items tested. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

CADUCEON Environmental Laboratories Certificate of Analysis

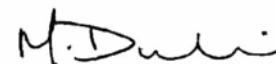
Final Report
REPORT No: 24-028368 - Rev. 0

					Client I.D.
					OW18C
					Sample I.D.
					24-028368-5
					Date Collected
					2024-Sep-11
Parameter	Units	R.L.	Limits	DWG	
Uranium	mg/L	0.00005	0.02	MAC	0.00012
Vanadium	mg/L	0.0001			<0.0001

					Client I.D.	OW9A	OW12A	OW16C	OW18A
					Sample I.D.	24-028368-1	24-028368-2	24-028368-3	24-028368-4
					Date Collected	2024-Sep-11	2024-Sep-11	2024-Sep-11	2024-Sep-11
Parameter	Units	R.L.	Limits	DWG					
Benzene	µg/L	0.5	1	MAC	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	µg/L	0.5	140, 1.6	MAC, AO	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene	µg/L	0.5	60	MAC	<0.5	<0.5	<0.5	<0.5	<0.5
Xylene, m,p-	µg/L	1			<1	<1	<1	<1	<1
Xylene, m,p,o-	µg/L	1.1	90, 20	MAC, AO	<1.1	<1.1	<1.1	<1.1	<1.1
Xylene, o-	µg/L	0.5			<0.5	<0.5	<0.5	<0.5	<0.5
PHC F1 (C6-C10)	µg/L	25			<25	<25	<25	<25	<25
PHC F2 (>C10-C16)	µg/L	50			<50	<50	<50	<50	<50
PHC F3 (>C16-C34)	µg/L	400			<400	<400	<400	<400	<400
PHC F4 (>C34-C50)	µg/L	400			<400	<400	<400	<400	<400
Oil & Grease (Total)	mg/L	1.0			2.2	1.0	1.4	4.1	

DWG - Drinking Water Guidelines

ODWS - Ontario Drinking Water Standards
AO - Aesthetic Objectives
IMAC - Interim Maximum Acceptable Concentration
MAC - Maximum Acceptable Concentration
ODWO - D-5-5 Objective
OG - Operational Guidelines
WL - Warning Level - Sodium Restricted Diets



Michelle Dubien
Data Specialist

The analytical results reported herein refer to the samples as received and relate only to the items tested. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

Summary of Exceedances		
Operational Guidelines		
OW9A	Found Value	Limit
Hardness (as CaCO ₃)	386	100
OW12A	Found Value	Limit
Hardness (as CaCO ₃)	182	100
OW16C	Found Value	Limit
Hardness (as CaCO ₃)	279	100
OW18A	Found Value	Limit
Hardness (as CaCO ₃)	197	100
OW18C	Found Value	Limit
Hardness (as CaCO ₃)	231	100



Michelle Dubien
Data Specialist