

DARRYL M. ROBINS
CONSULTING INC.
CIVIL & ENVIRONMENTAL ENGINEERING

M09010

February 6, 2026

Mr. Troy Cameron, Public Works Manager
The Municipality of Northern Bruce Peninsula
56 Lindsay Road 5, RR # 2
Lion's Head, ON N0H 1W0

Mr. Leo-Paul Frigault, Cluster Manager
Ontario Clean Water Agency
PO Box 310
315 George Street
Warton, ON N0H 2T0

**Re: 2024 Annual Report for Lakewood Subdivision Sewage System
Municipality of Northern Bruce Peninsula**

Dear Mr. Cameron & Mr. Frigault,

Darryl M. Robins Consulting Inc. (DMRC) is pleased to provide the following Annual Report for 2025. The following report outlines key elements of the sewage system and provides a brief discussion of the Consultant's observations at the site inspection. Please find attached to this report, the Inspection Report dated November 12, 2025 and Table No's. 1 and 3.

The Ontario Clean Water Agency (OCWA) is the responsible authority for the operation and maintenance duties of the sewage system under contract to the Municipality of Northern Bruce Peninsula (Municipality). OCWA began these duties on July 1, 2009.

Sewage System Capacity:

Based on the email dated January 7, 2026 from the Municipality, it is understood that, there are currently 42 dwellings connected to the Lakewood Subdivision Sewage System. The original Certificate of Approval specified that each dwelling would be allotted a daily sewage flow of 1,200L/day for a maximum of 48 lots; therefore, the ultimate design daily sewage flow for the sewage system is 57,600L/day. With 42 dwellings online at present, the calculated daily sewage flow should be 50,400L/day.

OCWA has been maintaining records of the readings on the elapsed hour meters of the sewage dosing pumps for the tile field (See Table 1).

A pump flow test was completed on November 12, 2025 which resulted in the following sewage flow rates for the effluent pumps (See Table 2 below).

TABLE 1
 DOSING PUMP RECORDS
 (ELAPSED TIME METER READINGS)
 LAKEWOOD SUBDIVISION
 November 13, 2024 - November 18, 2025

DATE	TIME	Time (dec)	diff in hours	PUMP NO. 1					PUMP NO. 2					COMBINED AVERAGE DAILY FLOW (L/d)	OPERATOR'S NOTES
				RECORDED RUN TIME (hrs)	ELAPSED PUMP TIME (hr)	VOLUME PUMPED (L)	ELAPSED TIME (days)	AVERAGE DAILY FLOW (L/d)	RECORDED RUN TIME (hrs)	ELAPSED PUMP TIME (hr)	VOLUME PUMPED (L)	ELAPSED TIME (days)	AVERAGE DAILY FLOW (L/d)		
13-Nov-24	11:15:00 AM	11.25	-0.42	1851.25	2.21	29,072	7.90	3,679	1692.42	2.24	23,941	7.90	3,029	6,708	
19-Nov-24	9:40:00 AM	9.67	-1.58	1853.06	1.81	23,810	5.93	4,012	1694.30	1.88	20,094	5.93	3,386	7,399	
26-Nov-24	10:00:00 AM	10.00	0.33	1855.25	2.19	28,809	7.01	4,107	1696.76	2.46	26,293	7.01	3,749	7,856	Test high level alarm inspection
3-Dec-24	11:05:00 AM	11.08	1.08	1856.91	1.66	21,837	7.05	3,100	1698.68	1.92	20,521	7.05	2,913	6,012	
10-Dec-24	9:15:00 AM	9.25	-1.83	1858.72	1.81	23,810	6.92	3,439	1700.68	2.00	21,376	6.92	3,087	6,526	
17-Dec-24	10:15:00 AM	10.25	1.00	1860.57	1.85	24,336	7.04	3,456	1702.90	2.22	23,728	7.04	3,370	6,826	
23-Dec-24	1:30:00 PM	13.50	3.25	1863.39	2.82	37,096	6.14	6,046	1704.78	1.88	20,094	6.14	3,275	9,321	
31-Dec-24	8:15:00 AM	8.25	-5.25	1865.25	1.86	24,468	7.78	3,144	1707.81	3.03	32,385	7.78	4,162	7,306	
7-Jan-25	12:55:00 PM	12.92	4.67	1868.07	2.82	37,096	7.19	5,156	1710.69	2.88	30,782	7.19	4,279	9,435	
14-Jan-25	8:45:00 AM	8.75	-4.17	1869.87	1.80	23,678	6.83	3,469	1712.89	2.20	23,514	6.83	3,445	6,913	
21-Jan-25	11:26:00 AM	11.43	2.68	1872.03	2.16	28,414	7.11	3,995	1714.90	2.01	21,483	7.11	3,021	7,016	
28-Jan-25	10:00:00 AM	10.00	-1.43	1873.68	1.65	21,705	6.94	3,127	1716.78	1.88	20,094	6.94	2,895	6,023	
4-Feb-25	9:00:00 AM	9.00	-1.00	1875.23	1.55	20,390	6.96	2,930	1718.37	1.59	16,994	6.96	2,442	5,373	
11-Feb-25	11:05:00 AM	11.08	2.08	1876.96	1.73	22,758	7.09	3,211	1720.13	1.76	18,811	7.09	2,654	5,866	
19-Feb-25	12:50:00 PM	12.83	1.75	1878.98	2.02	26,572	8.07	3,292	1722.49	2.36	25,224	8.07	3,125	6,416	
25-Feb-25	9:15:00 AM	9.25	-3.58	1880.55	1.57	20,653	5.85	3,530	1723.90	1.41	15,070	5.85	2,576	6,106	
4-Mar-25	11:55:00 AM	11.92	2.67	1882.06	1.51	19,864	7.11	2,793	1725.52	1.62	17,315	7.11	2,435	5,228	
11-Mar-25	12:00:00 PM	12.00	0.08	1883.59	1.53	20,127	7.00	2,874	1727.09	1.57	16,780	7.00	2,396	5,270	
18-Mar-25	12:35:00 PM	12.58	0.58	1885.64	2.05	26,967	7.02	3,839	1729.28	2.19	23,407	7.02	3,332	7,171	
26-Mar-25	10:20:00 AM	10.33	-2.25	1887.87	2.23	29,335	7.91	3,710	1731.61	2.33	24,903	7.91	3,150	6,860	
2-Apr-25	9:50:00 AM	9.83	-0.50	1889.67	1.80	23,678	6.98	3,393	1733.50	1.89	20,201	6.98	2,894	6,287	
8-Apr-25	11:15:00 AM	11.25	1.42	1891.48	1.81	23,810	6.06	3,930	1735.30	1.80	19,239	6.06	3,175	7,105	
15-Apr-25	11:20:00 AM	11.33	0.08	1893.27	1.79	23,547	7.00	3,362	1737.45	2.15	22,980	7.00	3,281	6,643	
22-Apr-25	11:35:00 AM	11.58	0.25	1895.78	2.51	33,018	7.01	4,710	1739.91	2.46	26,293	7.01	3,751	8,460	
1-May-25	11:55:00 AM	11.92	0.33	1897.99	2.21	29,072	9.01	3,225	1742.18	2.27	24,262	9.01	2,692	5,917	
6-May-25	12:35:00 PM	12.58	0.67	1899.21	1.22	16,049	5.03	3,192	1743.58	1.40	14,963	5.03	2,976	6,168	
13-May-25	11:45:00 AM	11.75	-0.83	1900.91	1.70	22,363	6.97	3,211	1745.37	1.79	19,132	6.97	2,747	5,957	
21-May-25	1:25:00 PM	13.42	1.67	1903.70	2.79	36,701	8.07	4,548	1748.09	2.72	29,072	8.07	3,603	8,151	
26-May-25	2:05:00 PM	14.08	0.67	1905.36	1.66	21,837	5.03	4,343	1749.86	1.77	18,918	5.03	3,763	8,106	
3-Jun-25	11:45:00 AM	11.75	-2.33	1907.36	2.00	26,309	7.90	3,329	1752.16	2.30	24,583	7.90	3,111	6,440	
10-Jun-25	11:45:00 AM	11.75	0.00	1909.71	2.35	30,913	7.00	4,416	1754.60	2.44	26,079	7.00	3,726	8,142	
17-Jun-25	12:10:00 PM	12.17	0.42	1911.92	2.21	29,072	7.02	4,143	1757.04	2.44	26,079	7.02	3,716	7,859	
23-Jun-25	11:10:00 AM	11.17	-1.00	1914.14	2.22	29,203	5.96	4,901	1759.57	2.53	27,041	5.96	4,538	9,440	
3-Jul-25	10:50:00 AM	10.83	-0.33	1917.74	3.60	47,357	9.99	4,742	1763.23	3.66	39,119	9.99	3,917	8,660	
7-Jul-25	8:15:00 AM	8.25	-2.58	1919.33	1.59	20,916	3.89	5,374	1764.80	1.57	16,780	3.89	4,311	9,685	
15-Jul-25	11:54:00 AM	11.90	3.65	1922.49	3.16	41,569	8.15	5,099	1768.11	3.31	35,378	8.15	4,340	9,439	
22-Jul-25	9:05:00 AM	9.08	-2.82	1924.86	2.37	31,176	6.88	4,530	1770.70	2.59	27,682	6.88	4,022	8,552	
29-Jul-25	11:00:00 AM	11.00	1.92	1927.08	2.22	29,203	7.08	4,125	1773.16	2.46	26,293	7.08	3,714	7,839	
6-Aug-25	8:25:00 AM	8.42	-2.58	1930.00	2.92	38,412	7.89	4,867	1776.29	3.13	33,454	7.89	4,239	9,106	
12-Aug-25	8:55:00 AM	8.92	0.50	1931.91	1.91	25,125	6.02	4,173	1778.54	2.25	24,048	6.02	3,994	8,167	
19-Aug-25	11:35:00 AM	11.58	2.67	1934.97	3.06	40,253	7.11	5,661	1781.66	3.12	33,347	7.11	4,689	10,350	
26-Aug-25	11:15:00 AM	11.25	-0.33	1937.35	2.38	31,308	6.99	4,481	1784.42	2.76	29,499	6.99	4,223	8,704	
4-Sep-25	12:10:00 PM	12.17	0.92	1940.71	3.36	44,200	9.04	4,890	1788.02	3.60	38,477	9.04	4,257	9,148	
11-Sep-25	11:00:00 AM	11.00	-1.17	1943.26	2.55	33,544	6.95	4,826	1790.64	2.62	28,003	6.95	4,028	8,854	
16-Sep-25	9:00:00 AM	9.00	-2.00	1944.51	1.25	16,443	4.92	3,344	1792.01	1.37	14,643	4.92	2,978	6,323	
24-Sep-25	11:55:00 AM	11.92	2.92	1946.58	2.07	27,230	8.12	3,353	1794.27	2.26	24,155	8.12	2,974	6,327	
29-Sep-25	10:50:00 AM	10.83	-1.08	1947.51	0.93	12,234	4.95	2,469	1795.49	1.22	13,040	4.95	2,632	5,101	
6-Oct-25	10:00:00 AM	10.00	-0.83	1949.26	1.75	23,021	6.97	3,305	1797.25	1.76	18,811	6.97	2,701	6,006	
14-Oct-25	9:20:00 AM	9.33	-0.67	1951.40	2.14	28,151	7.97	3,531	1799.62	2.37	25,331	7.97	3,177	6,709	
20-Oct-25	12:55:00 PM	12.92	3.58	1953.20	1.80	23,678	6.15	3,851	1801.57	1.95	20,842	6.15	3,389	7,240	
29-Oct-25	12:20:00 PM	12.33	-0.58	1955.36	2.16	28,414	8.98	3,166	1803.82	2.25	24,048	8.98	2,679	5,845	
4-Nov-25	9:10:00 AM	9.17	-3.17	1956.78	1.42	18,680	5.87	3,183	1805.55	1.73	18,490	5.87	3,151	6,334	
10-Nov-25	10:10:00 AM	10.17	1.00	1958.24	1.46	19,206	6.04	3,179	1807.29	1.74	18,597	6.04	3,078	6,257	
18-Nov-25	9:50:00 AM	9.83	-0.33	1960.21	1.97	25,915	7.99	3,245	1809.70	2.41	25,758	7.99	3,225	6,470	

PUMP 1
 YEARLY AVERAGE DAILY FLOW:
 MAX. DAILY FLOW RATE:
 COMBINED AVERAGE DAILY FLOW RATE:
 COMBINED MAXIMUM DAILY FLOW RATE:
 ASSUMED ERRONEOUS READINGS

3,871	L/d
6,046	L/d
7,249	L/d
10,350	L/d

0

PUMP 2
 YEARLY AVERAGE DAILY FLOW:
 MAX. DAILY FLOW RATE:

3,378	L/d
4,689	L/d

Table 2: Pump Test Flow Rates

Pump	Flow Rates (L/min)
1	219.24
2	178.14

During normal operation it appears that the pumps are dosing the tile field with an average volume of approximately 7,249 L/day based on the respective pumping rates determined by the pumping tests conducted by OCWA and DMRC at the site meeting of November 12, 2025. These pumping rates should be used by OCWA personnel in recording and evaluating flows at the facility. The results from the dosing pump records suggest that the actual sewage flows being received by the system are substantially less than the design and that the sewage system should have sufficient capacity for completion of Phases 1 and 2B of the subdivision. The average daily sewage flow for 2025 (7,249 L/day) is approximately 13% lower than the flows determined for 2024 (8,236 L/day).

The maximum daily sewage flow rate experienced in 2025 was 10,350 L/day which is lower than the theoretical daily sewage flow of 50,400 L/d for the 42 dwellings on-line in 2025. This maximum daily sewage flow rate for 2025 is lower than the maximum daily flow rate from 2024 (12,427L/d). Please see Table No. 1, which identifies the average daily flows for the year.

Sampling Results:

OCWA took a sample of the sewage effluent on November 10, 2025. The sample was analyzed by SGS Lakefield Research Limited and the results are shown on Table 3 (attached). The results of the Lakewood Subdivision sewage effluent sampling for the 2025 sampling event indicate that BOD and TSS appear to be low. But are in the typical ranges for this system and indicate adequate treatment.

Physical Conditions of the Sewage System:

DMRC's inspector walked around the tile field and septic tank area on November 12, 2025. There were no signs of rodent infestation this year and there appeared to be more vegetative cover on the tile bed. Milkweed and Sumac bushes are still present on the tile bed. Milkweed is an aggressive plant that can take over. We have assumed that milkweed has taken over the tile bed to the detriment of the grass. The milkweed root is not conducive with the tile bed (it could damage or plug the tiles). It is still recommended that the milkweed and sumac bushes be removed, and the tile bed be hydro-seeded. Please refer to the attached photos in the inspector's report.

There was no detectable septic odor encountered except within the vicinity of the access after opening of the dosing chamber. Both of the two (2) valve stem handles and brackets have disintegrated due to corrosion. It is recommended that the valve stems and brackets be replaced as soon as possible. The operator advised that they are able to make other arrangements to remove the pumps etc.

The pump control panel and the dosing chamber appeared to be in good working order.

TABLE 3
LAB ANALYSIS RESULTS OF SEPTIC TANK EFFLUENT
LAKEWOOD SUBDIVISION SEWAGE SYSTEM
2025 ANNUAL INSPECTION REPORT

Date	BOD mg/L	Total Suspended Solids mg/L	pH pH units	Nitrate mg/L	Ammonia (N) Total mg/L	Total Kjeldahl Nitrogen mg/L	Phosphorus Total mg/L
May 30/03	155	76	7.38	0.20	58.80	75.80	10.70
Sept. 7/04	82	22	7.35	0.10	62.40	70.90	9.88
Sept. 19/05	53	44	7.41	<0.1	63.90	75.50	10.60
Sept. 22/06	93	90	7.47	0.10	63.40	74.60	9.65
Nov. 26/07	64	18	7.7	<0.1	59.10	67.40	9.49
Nov. 18/08	81	32	8.12	0.10	68.50	71.10	9.60
Nov. 24/09	62	44	N/A	<0.05	74.50	73.90	9.59
Oct. 19/10	74	23	7.77	<0.06	69.90	66.30	10.10
Nov. 15/11	74	10	7.85	<0.05	63.10	63.70	8.85
Oct. 16/12	89	98	8.00	<0.05	68.50	70.30	10.20
Nov. 1/13	46	26	7.88	<0.06	76.20	84.00	10.40
Nov. 17/14	57	18	7.49	<0.06	60.80	70.10	8.55
Dec. 15/15	72	19	7.59	<0.06	64.60	67.00	8.59
Nov. 14/16	53	26	7.59	<0.06	71.30	66.50	7.80
Dec. 13/17	70	26	7.62	<0.06	56.20	66.70	9.20
Dec. 18/18	69	35	7.56	<0.07	56.50	62.60	7.48
Dec. 12/19	26	53	7.62	<0.06	61.90	70.50	8.44
Dec. 9/20	68	32	7.58	<0.06	64.90	71.80	7.70
Nov. 15/21	24	25	7.63	<0.06	62.60	64.00	7.97
Oct. 18/22	44	26	8.11	<0.06	61.00	65.60	8.15
Oct. 30/23	73	21	7.46	<0.06	64.10	64.10	8.15
Nov. 25/24	53	25	7.45	<0.06	64.10	74.00	8.99
Nov. 10/25	54	31	7.4	<0.06	68.30	65.60	8.12
Typical Concentration Range for Septic Effluent	140 to 200	50 to 100				40 to 100	5 to 15

- Typical concentration range for septic tank effluent was obtained from the USEPA On-Site Wastewater Treatment Systems Manual
- Lab Analysis Conducted by Caduceon Environmental Laboratories Inc (2003-2008)
- Lab Analysis Conducted by SGS Lakefield Research (2009-2025)

An inspection of the splitter valve chamber was completed and appeared to be acceptable.

OCWA advised that the annual inspection of the collection system was completed and provided photos of the sanitary maintenance holes.

Annual Report Recommendations:

1. The Milkweed and Sumac bushes should be removed. The tile bed area should have new topsoil placed and be re-seeded.
2. OCWA and the Municipality should replace the effluent discharge control valve stems and brackets as soon as possible.
3. The "Dosing Pump Elapsed Time Weekly Record Sheets" provided in the Updated Operations and Maintenance Manual should continue to be used by operations staff. Operators should continue to keep a project-specific journal of their site visits, alarm conditions, maintenance, repairs and observations.
4. Operations staff should continue to monitor the air relief valve at SANMH2. There have been maintenance issues with the air relief valve in the past and the liquid contents of the chamber appear to be of a septic nature.
5. The hole in the dosing chamber lid for the safety chain attachment is corroded and the hole should be relocated and re-drilled to ensure that there is adequate strength to support the weight of the lid structure.

It is the writer's overall opinion that the system is in good working order, and that the housing development within Phases 1 and 2B of the subdivision should continue with regards to the available capacity of the subdivision's existing sewage system.

Should you have any questions or concerns with the above and enclosed, please do not hesitate to contact the writer.

Yours truly,

DARRYL M. ROBINS CONSULTING INC.



Laura Swanson, P.Eng.

Civil-Environmental Engineer

LAS/hs

Encl.

cc: lppnpc@gmail.com, Lakewood Subdivision Ratepayer's Association
Ms. Camille Leung, OCWA (via email)
Ms. Karla Young, OCWA (via email)