The Corporation of the City of Kawartha Lakes

Agenda

Lindsay-Ops Landfill Public Review Committee Meeting

2021-003

Wednesday, April 21, 2021

Virtual participation will commence at 3:00pm. For access to the Zoom link contact ksnoddy@kawarthalakes.ca

Public Works and Engineering Boardroom

322 Kent Street West

Lindsay, ON K9V 4T7

Members:

Councillor Pat Dunn
Chris Appleton
Barry Hodgson
Lloyd Robertson
Larry Scrivens
David Webb

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The Corporation of the City of Kawartha Lakes

Minutes

Lindsay-Ops Landfill Public Review Committee Meeting

2021-002
Wednesday, March 10, 2021
3:00 P.M.
Public Works and Engineering Boardroom
322 Kent Street West
Lindsay, ON K9V 4T7

Members:
Councillor Pat Dunn
Chris Appleton
Barry Hodgson
Lloyd Robertson
Larry Scrivens
David Webb

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1. Call to Order

David Kerr called the meeting to order at 3:05pm.

2. Election of Officers

David Kerr made the first call for nominations to the Chair position. Lloyd Robertson was nominated. Lloyd Robertson accepted the nomination.
A second call for Chair nominations was made. No nominations were put forward.

The final call for Chair nominations was made. No nominations were put forward.
Lloyd Robertson accepted the position of Chair.

Lloyd Robertson made the first call for nominations to the Vice-Chair position.
Chris Appleton was nominated. Chris Appleton accepted the nomination.
A second call for Vice-Chair nominations was made. No nominations were put forward.
The final call for Vice-Chair nominations was made. No nominations were put forward.
Chris Appleton accepted the position of Vice-Chair.

Moved By Councillor Dunn
Seconded By C. Appleton

Resolved that Lloyd Robertson will accept the position of Chair of the Lindsay Ops Landfill Public Review Committee for the 2021 Term.

Carried

Moved By Councillor Dunn
Seconded By L. Scrivens

Resolved that Chris Appleton will accept the position of Vice-Chair of the Lindsay Ops Landfill Public Review Committee for the 2021 Term.

Carried

3. Adoption of Agenda

Two additional items were added to the Agenda under Other New Business:

9.3. David Webb's Presentation on Congestion at the Lindsay Ops Landfill; and

9.4 Meeting Date Discussion

Moved By L. Scrivens
Seconded By C. Appleton

Resolved that the PRC adopts the Agenda as amended.

Carried

4. Disclosures of Pecuniary Interest

There were no declarations of pecuniary interest disclosed.

5. Approval of the Minutes of the Previous Meeting

Moved By C. Appleton
Seconded By Councillor Dunn

Resolved that the PRC approves the minutes from the previous meeting.

Carried

6. Reports

6.1 PRC Activity Summary Spreadsheet

Staff and the PRC reviewed each item on the spreadsheet.

A brief summary of the history of the generator at the Lindsay Ops landfill was discussed. Director of Public Works Bryan Robinson noted that we are currently seeing a small amount of revenue each year and that staff hope to continually improve this. Staff will continue to review options for improved performance.

Chris Appleton inquired about whether mailing out the calendars was approved by council during budget deliberations. Staff confirmed that it was not approved. Chris Appleton expressed disappointment at this decision.

7. Landfill Complaints

No complaints.

8. Leachate Outbreaks

No leachate outbreaks.

9. Other New Business

9.1 Lindsay Ops Landfill MECP Inspection Report

Kerri Snoddy briefly read through the highlights of the Ministry of Environment inspection of the site from November of 2020.

Lloyd Robertson inquired about the PFAS sampling mentioned in the inspection report. Kerri confirmed that all of this sampling was completed in 2019. Staff are waiting for MECP review of these results.

David Webb suggested that staff look into options for having a smaller camera used in the next CCTV inspection to resolve areas where the camera cannot pass through the leachate collection pipes.

The PRC commended staff for not having any issues or action items of non compliance noted as a result of the inspection.

9.2 Bulky Plastic Recycling Initiative

Kerri Snoddy provided a summary of a memo to the PRC on a Bulky Plastics Pilot Program which is one of the updated Integrated Waste Management Strategy Initiatives. The PRC was supportive of this initiative. Lloyd Robertson asked if residents would be charged tipping fees for drop off of bulky plastics. Staff confirmed that tipping fees would apply.

Moved By C. Appleton
Seconded By L. Scrivens

Resolved that the Lindsay Ops Landfill Public Review Committee supports the two-year bulky plastic recycling pilot program at the Lindsay Ops landfill.

Carried

9.3 David Webb's Presentation on Congestion at the Lindsay Ops Landfill

David Webb provided a PowerPoint presentation on some data analysis that he had completed from scale house data from the Lindsay Ops landfill and provided suggestions on how to reduce congestion.

Chris Appleton asked if this information should be provided to WSP before finalizing the Future Infrastructure and Operations Study. David Kerr suggested that this information could be received and considered separately from the WSP study.

Lloyd Robertson asked that a copy of this presentation be distributed to the PRC for review before discussion and that it is added as an Agenda item at a future meeting with a lighter agenda to allow time to discuss it.

9.4 Meeting Date Discussion

A discussion was held on moving the meetings back to the third Wednesday of every month. This was agreeable for everyone's schedule.

Moved By Councillor Dunn
Seconded By C. Appleton

Resolved that the PRC meetings are held on the third Wednesday of each month.

Carried

10. Public Comment Period

No comments.

11. Next Meeting

The next meeting will be Wednesday, April 21st at 3:00pm on Zoom.

12. Adjournment

Moved By Councillor Dunn
Seconded By L. Scrivens

Resolved that the meeting adjourn at 5:00pm.

Carried

Lindsay Ops Landfill Public Review Commitee
Action List

Meeting Date of Activity	Action	Responsilibity	Action Item Date:	Status
17-Jun-15	MECP Comments	CKL	As Available	**April 21 Meeting:** No comments.
21-Jan-15	Provide update on quarterly PCB testing (SW3/ SW13)	CKL	Quarterly	**April 21 Meeting:** No sampling completed yet in 2021. Will likely occur in late April/May.
23-Nov-16	Biomonitoring	CKL	As Available	**April 21 Meeting:** Biomonitoring work for 2021 awarded to Cambium. Field work successfully completed February 22nd. Report to PRC at May or June meeting.
21-Jan-19	Leachate Water Quality Results	CKL	As Available	**April 21 Meeting:** See attached spreadsheet.
15-May-13	Generator, Wellfield, Flare Operations	CKL	Monthly	**April 21 Meeting**: Generator has been running consistently so far in 2021. Leak in compressor line-looking into cost effective repair solutions. More landfill staff being trained on restarts in April for trips.
20-Jun-18	Lindsay Ops EA Process Update	CKL	As Available	**April 21 Meeting:** Dillon awarded work. Future Options Study to be completed by June 30, 2021.
15-Jan-14	That the PRC is copied on Staff Reports to Council regarding the Lindsay Ops Landfill	CKL	As Available	**April 21 Meeting:** Bulky Plastic Pilot Program Report May 4th, Mattress Recycling and C&D Reports June 1st
17-May-17	Waste Management Advisory Committee Update	CKL	As Available	**April 21 Meeting:** Meeting held April 19th. Reviewed a presentation by UR One Inc. on a carbon capture technology, memos on mattress recycling, and C&D recycling.
17-Jan-17	Updates on Blue Box markets and Legislation	CKL	As Available	**April 21 Meeting:** Draft regulation comment period ended. Final regulation expected any time. AMO reports final regulation will be very similar to draft, especialy in regards to transition dates for each municipality.
16-May-18	Construction and Demolition Update	CKL	As Available	**April 21 Meeting:** Pilot program to continue in 2021 with report back to council by the end of June. Our goal is to increase to 1000 tonnes. As of April 5th we have diverted 260 tonnes.
8-Jan-20	Update on Implementation of Waste Strategy Iniatives	CKL	As Available	**April 21 Meeting:** Work proceeding on schedule. Textile contractor awarded. Bulky plastic program to council in May. Research beginning on other initiatives as waste operating budget approved.

Lindsay Ops Leachate 2019

Exceeds Bylaw Value
Exceeds PWQO Value

Parameters	CKL Sewer Bylaw Limits (mg/L)	Provincial Water Quality Objectives (mg/L)	Jan. Results (mg/L)	Feb. Results (mg/L)	Mar. Results (mg/L)	April. Results (mg/L)	April. Results (mg/L) new cell	May Results (mg/L)	June Results (mg/L)	July Results (mg/L)	August Results (mg/L)	September Results (mg/L)	October. Results (mg/L) new cell	Oct Results (mg/L)	Nov Results (mg/L)	Dec Results (mg/L)
Hardness (CaCO3)	N/A	N/A	593	596	544	653	925	557	475	628	649	664	1090	666	610	580
Alkalinity (CaCO3)	N/A	N/A	609	599	601	482	1270	528	531	693	773	759	2380	731	610	543
Biochemical Oxygen Demand (BOD)	300	N/A	<3	19	8	7	262	4	3	5	4	n/a	62	< 3	5	5
TDS	N/A	N/A	991	1005	972	928	1550	796	743	1045	1144	1258	4318	1226	1017	868
Dissolved Organic Carbon	N/A	N/A	13.1	13.4	13.5	12.9	207	14.8	12.1	16.1	18.5	1.3	130	11.4	10	8.2
COD	N/A	N/A	73	62	63	56	644	40	38	76	78	112	692	87	59	50
Chloride	N/A	N/A	176	199	198	127	27.5	107	106	138	202	307	887	278	201	146
Ammonia (N) - Total	N/A	**1.11**	17.6	17.6	16.9	14.1	10	9.71	10.5	20.9	26.6	28.4	350	27.9	17.4	11.8
Fluoride	**10**	N/A	0.2	0.1	< 0.1	< 0.1	0.8	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 3	< 0.1	< 0.1	< 0.1
Phenolic, 4AAP	**1**	**0.001**	0.012	<0.002	< 0.002	< 0.002	0.14	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Sulphate	N/A	N/A	45	42	48	139	10	38	34	33	22	15	121	17	49	50
Nitrite	N/A	N/A	<0.05	<0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 1	< 0.05	< 0.05	< 0.05
Nitrate	N/A	N/A	0.08	0.15	0.18	0.16	< 0.05	0.42	0.32	< 0.05	< 0.05	< 0.05	< 1	< 0.05	0.21	0.49
Kjeldahl Nitrogen - Total	**50**	N/A	19.7	20.5	20.8	17.6	104	10.9	10.5	25.2	30.7	35.8	364	35.3	18	14.9
Aluminum - Total	**50**	**0.075***	0.27	0.12	0.12	0.68	0.13	0.1	0.08	0.15	0.1	0.07	0.62	0.1	0.11	0.11
Antimony - Total	**5**	**0.02**	<0.0005	<0.0001	< 0.0005	0.0006	0.0022	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.002	< 0.0005	< 0.0005	< 0.0005
Arsenic - Total	**1**	**0.1**	0.0024	0.0013	0.0008	0.0013	0.0107	0.0013	0.0009	0.0026	0.0012	0.0014	0.0189	0.0013	0.0015	0.0012
Barium	N/A	N/A	0.331	0.297	0.253	0.245	0.362	0.211	0.159	0.394	0.382	0.471	0.82	0.462	0.313	0.226
Beryllium	N/A	**1.1****	<0.002	<0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Boron	N/A	0.2	0.382	0.426	0.37	0.299	2.95	0.281	0.278	0.509	0.54	0.632	9.68	0.605	0.411	0.3
Cadmium - Total	**0.7**	**0.0002**	<0.00007	<0.000015	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070
Calcium	N/A	N/A	179	175	160	211	273	184	154	184	186	180	267	182	184	185
Chromium - Total	**2.8**	**0.0099**	0.017	0.011	0.012	0.161	0.013	0.004	0.001	0.013	< 0.001	0.004	0.037	0.003	0.01	0.004
Cobalt - Total	**5**	**0.0009**	0.0013	0.007	0.0013	0.0025	0.0052	0.0009	0.0011	0.0015	0.001	0.0011	0.0159	0.0013	0.001	0.0008
Copper - Total	**2**	**0.005**	0.0042	0.0011	0.0011	0.0062	0.011	0.001	0.0015	0.0021	< 0.0005	< 0.0005	0.008	< 0.0005	0.0006	0.0011
Iron	N/A	**0.3**	27.7	11	5.64	21	7.96	20.9	10.8	45.5	14.4	15.1	59.6	11.8	13.9	13
Lead - Total	1	**0.005**	0.0025	0.00012	0.0002	0.0016	0.0016	0.0004	0.0001	0.0005	< 0.0001	< 0.0001	0.0013	0.0002	0.0005	0.0002
Magnesium	N/A	N/A	35.3	38.6	35.1	30.6	59.1	23.6	21.9	40.9	44.8	52	104	51.3	36.6	28.5
Manganese - Total	5	N/A	0.45	0.363	0.355	0.618	0.63	0.439	0.35	0.447	0.379	0.299	0.837	0.272	0.404	0.416
Mercury - Total	**0.01**	**0.0002**	<0.00002	<0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Molybdenum - Total	**5**	**0.04**	<0.0005	0.0002	< 0.0005	0.0022	0.0009	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0021	< 0.0005	0.0007	< 0.0005
Nickel - Total	**2**	**0.025**	0.01	0.01	0.01	0.07	0.03	< 0.01	< 0.01	0.01	< 0.01	0.01	0.09	0.01	0.01	< 0.01
Potassium	N/A	N/A	18.1	21.3	19.1	14.5	139	11.7	10.8	24	27.4	28.9	260	31.5	19	12.8
Phosphorus	N/A	N/A	<0.1	<0.1	< 0.1	0.1	0.3	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	3.3	< 0.1	< 0.1	< 0.1
Phosphorus - Total	**10**	**0.01**	0.05	0.03	0.03	0.1	0.29	0.05	0.02	0.05	0.03	0.03	3.21	0.06	0.02	0.04
Selenium - Total	**1**	**0.1**	<0.005	<0.0001	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.012	< 0.005	< 0.005	< 0.005
Silver - Total	**0.4**	**0.0001**	<0.0001	<0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.0002	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Sodium	N/A	N/A	121	136	123	97.6	257	81.6	73	136	149	168	740	179	124	91.6
Strontium	N/A	**10 bq/L**	0.64 mg/L	0.715 mg/L	0.622	0.678	1.35	0.572	0.515	0.774	0.732	0.794	2.73	82.80%	0.679	0.6
Thallium	N/A	**0.0003**	<0.0003	<0.00005	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003
Vanadium	N/A	**0.006**	0.0018	0.0009	0.0008	0.0025	0.0074	0.0009	0.0005	0.0018	0.0007	0.001	0.0239	0.001	0.001	0.0007
Zinc - Total	**2**	**0.03**	0.023	0.009	0.03	0.035	0.034	0.009	< 0.005	0.006	< 0.005	0.005	0.185	< 0.005	0.018	< 0.005
Benzene	**0.01**	**0.1**	0.0023	0.0007	0.0006	< 0.5	0.0007	< 0.0005	<0.0016	0.0006	< 0.0005	0.0018		0.0017	0.0015	0.0019
Toluene	**0.02**	**0.0008**	<0.0005	<0.0005	<0.0005	< 0.0005	0.0126	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005		< 0.0005	< 0.0005	< 0.0005
Ethylbenzene	**0.06**	**0.008**	0.0027	<0.0005	<0.0005	< 0.0005	0.0006	< 0.0005	<0.0011	< 0.0005	< 0.0005	< 0.0005		< 0.0005	< 0.0005	0.0008
Xylene, m, p -	N/A	N/A	0.0042	<0.001	<0.001	< 0.001	0.0012	<0.001	<0.0011	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001
Xylene, o -	N/A	**0.04**	0.0005	<0.0005	<0.0005	<0.0005	0.0006	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.0005	<0.0005	<0.0005
Xylene, m, p, o -	N/A	N/A	0.0042	<0.0011	<0.0011	<0.0011	0.0018	<0.0011	<0.0011	<0.0011	<0.0011	<0.0011		<0.0011	<0.0011	<0.0011

Parameters	Limits	Provincial Water Quality Objectives	Jan. Results	Feb. Results	Mar. Results	April. Results	Apr. Results New Cell	May. Results	June. Results	July. Results	Aug. Results	Sept. Results	Oct. Results New Cell	Oct Results	Nov Results	Dec Results
pH (at 25 ºC)	6.0 - 9.5	6.5 - 8.5	7.34	7.68	7.6	7.34	7.74	7.13	7.35	6.95	7.4	7.28	7.87	7.66	7.6	7.37
Conductivity (at 25 ºC)	N/A	N/A	1750 µm ho/cm	1780 µm ho/cm	1790 µmho/cm	1590 µmho/cm	3490 µmho/cm	1370 µmho/cm	1350 µmho/cm	1860 µmho/cm	2000 µmho/cm	2160 µmho/cm	7050 µmho/cm	2110 µmho/cm	1750 µmho/cm	1540 µmho/cm
Conductivity (calculated)	N/A	N/A	1650 µm ho/cm	1720 µm ho/cm	1664 µmho/cm	1563 µmho/cm	2403 µmho/cm	1344 µmho/cm	1267 µmho/cm	1692 µmho/cm	1928 µmho/cm	2141 µmho/cm	6453 µmho/cm	2103 µmho/cm	1725 µmho/cm	1479 µmho/cm
Anion Sum	N/A	N/A	18.1 meq/L	18.5 meq/L	18.6 meq/L	16.1 meq/L	26.4 meq/L	14.4 meq/L	14.3 meq/L	18.4 meq/L	21.6 meq/L	24.1 meq/L	75.1 meq/L	22.8 meq/L	18.9 meq/L	16 meq/L
Cation Sum	N/A	N/A	20.3 meq/L	20.2 meq/L	18.2 meq/L	18.7 meq/L	34.4 meq/L	16.8 meq/L	14.3 meq/L	23 meq/L	22.8 meq/L	24.1 meq/L	88.5 meq/L	24.5 meq/L	20.1 meq/L	17.4 meq/L
% Difference	N/A	N/A	5.77%	4.51%	1.09%	7.29%	13.10%	7.78%	0.18%	11.00%	2.68%	0.02%	8.17%	3.55%	2.94%	415.00%
Ion Ratio (AS/CS)	N/A	N/A	0.891	0.914	1.02	0.864	0.769	0.856	1	0.801	0.948	1	0.849	0.931	0.943	0.92
Sodium Adsorption Ratio	N/A	N/A	2.16	2.42	2.29	1.66	3.68	1.5	1.46	2.36	2.54	2.84	9.73	3.02	2.18	1.66
TDS (calc.) / EC (actual)	N/A	N/A	0.567	0.565	0.542	0.585	0.444	0.58	0.551	0.561	0.572	0.582	0.612	0.581	0.582	0.562
Langelier Index (at 25ºC)	N/A	N/A	0.875	1.19	1.08	0.845	1.77	0.635	0.78	0.543	1.05	0.903	2.12	1.27	1.14	0.88

Lindsay Ops Leachate 2020

Exceeds Bylaw Value
Exceeds PWQO Value

Parameters	CKL Sewer Bylaw Limits (mg/L)	Provincial Water Quality Objectives (mg/L)	Jan. Results (mg/L)	Feb. Results (mg/L)	Mar. Results (mg/L)	April. Results (mg/L)	April. Results (mg/L) new cell	May Results (mg/L)	June Results (mg/L)	July Results (mg/L)	August Results (mg/L)	September Results (mg/L)	October. Results (mg/L) new cell	Oct Results (mg/L)	Nov Results (mg/L)	Dec Results (mg/L)
Hardness (CaCO3)	N/A	N/A	609	616	556	574	370	602	654	694	684	620	875	864	571	672
Alkalinity (CaCO3)	N/A	N/A	579	560	529	603	442	626	697	710	719	688	1910	950	556	777
Biochemical Oxygen Demand (BOD)	300	N/A	5	5	< 3	4	4	3	5	5	7	6	80	< 3	< 10	< 10
TDS	N/A	N/A	896	927	791	906	1095	936	1076	1148	1178	1059	3296	1422	925	954
Dissolved Organic Carbon	N/A	N/A	11.1	12.9	10.9	10.6	34.4	12.4	11.6	15.8	17.5	12.5	67.5	13.4	9.5	17
COD	N/A	N/A	44	51	35	73	104	54	63	80	88	63	548	99	47	46
Chloride	N/A	N/A	135	162	116	136	274	142	185	215	241	199	705	149	185	87.1
Ammonia (N) - Total	N/A	**1.11**	13.6	12.8	10.6	16.6	0.31	16.2	21.2	25.4	29.6	21.6	250	31.6	14.7	20.8
Fluoride	**10**	N/A	< 0.1	0.4	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 1	< 0.1	< 0.1	< 0.1
Phenolic, 4AAP	**1**	**0.001**	< 0.002		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	0.036	< 0.002	< 0.002	< 0.002
Sulphate	N/A	N/A	46	44	42	45	94	39	34	29	19	21	58	9	34	17
Nitrite	N/A	N/A	< 0.05	< 0.05	< 0.05	< 0.05	0.07	0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.5	< 0.05	< 0.05	< 0.05
Nitrate	N/A	N/A	0.11	0.18	0.36	0.16	8.54	0.15	0.09	0.91	0.99	0.18	0.61	0.35	0.09	2.49
Kjeldahl Nitrogen - Total	**50**	N/A	15.8	15.8	13.2	18	4.1	19.1	27.8	33.3	38.2	25.1	309	31.8	19.6	25.7
Aluminum - Total	**50**	**0.075***	0.18	0.06	0.09	0.09	0.07	0.08	0.02	0.09	0.11	0.1	0.29	0.17	0.09	0.08
Antimony - Total	**5**	**0.02**	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0009	< 0.0005	0.0012	< 0.0005	< 0.0005	< 0.0005	0.0021	0.0008	< 0.0005	< 0.0005
Arsenic - Total	**1**	**0.1**	0.0022	0.0016	0.0014	0.0012	0.0018	0.001	0.0055	0.0012	0.0014	0.001	0.0171	0.0075	0.0011	0.0012
Barium	N/A	N/A	0.299	0.27	0.213	0.23	0.076	0.255	0.353	0.427	0.489	0.396	0.649	1.56	0.271	0.363
Beryllium	N/A	**1.1****	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Boron	N/A	0.2	0.336	0.327	0.258	0.334	2.74	0.324	0.519	0.559	0.668	0.484	6.5	1.28	0.344	0.635
Cadmium - Total	**0.7**	**0.0002**	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.000070	< 0.00010	< 0.000059	< 0.000070	< 0.000070	< 0.000070
Calcium	N/A	N/A	192	196	182	179	83.3	188	194	202	192	183	239	217	175	181
Chromium - Total	**2.8**	**0.0099**	0.023	0.048	0.001	0.004	0.004	0.001	0.003	0.001	0.001	0.001	0.025	0.005	0.001	0.001
Cobalt - Total	**5**	**0.0009**	0.0008	0.0009	0.001	0.0009	0.0039	0.0008	0.0046	0.0012	0.0012	0.0013	0.013	0.0041	0.001	0.0014
Copper - Total	**2**	**0.005**	0.0021	0.0006	0.0036	< 0.0005	0.0055	< 0.0005	0.0022	0.0006	0.0015	< 0.0005	0.0009	0.01	< 0.0005	0.0015
Iron	N/A	**0.3**	33.6	26	21.3	15.3	0.226	14.8	16.4	15.3	14.1	15.8	36.1	188	7.47	16.8
Lead - Total	1	**0.005**	0.0005	0.0004	0.0002	< 0.0001	0.0002	< 0.0001	0.0006	0.0001	0.0003	0.0002	0.00031	0.0115	0.0001	0.0006
Magnesium	N/A	N/A	31.4	30.7	24.5	30.9	39.4	32.1	41.2	45.9	49.6	39.5	86.7	78.3	32.5	53.5
Manganese - Total	5	N/A	0.487	0.44	0.424	0.431	0.026	0.463	0.408	0.361	0.29	0.322	0.519	0.472	0.416	0.35
Mercury - Total	**0.01**	**0.0002**	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	0.00013	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Molybdenum - Total	**5**	**0.04**	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0017	< 0.0005	0.0009	< 0.0005	< 0.0005	< 0.0005	0.0029	< 0.0005	< 0.0005	< 0.0005
Nickel - Total	**2**	**0.025**	< 0.01	0.01	< 0.01	< 0.01	0.03	< 0.01	0.01	0.01	< 0.01	0.01	0.06	0.02	< 0.01	< 0.01
Potassium	N/A	N/A	14.6	15.2	11.8	16.3	94.4	16.9	22.4	27.5	31.5	22.7	210	31.3	17.1	21.8
Phosphorus	N/A	N/A	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.04	< 0.1	< 0.1	1.1	1	< 0.1	0.1
Phosphorus - Total	**10**	**0.01**	0.03	0.03	0.02	0.01	0.05	0.02	0.02	< 0.1	0.04	0.04	2.29	0.61	0.03	0.18
Selenium - Total	**1**	**0.1**	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.006	< 0.005	< 0.005	< 0.001	0.005	< 0.005	< 0.005	< 0.005
Silver - Total	**0.4**	**0.0001**	< 0.0001	< 0.0001	< 0.0001	0.0001	0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0002	< 0.0001	< 0.0001	< 0.0001
Sodium	N/A	N/A	95.8	100	75.4	99.5	244	107	137	155	161	138	496	139	121	83
Strontium	N/A	**10 bq/L**	0.664	0.641	0.54	0.6	0.671	0.644	0.73	0.734	0.78	0.695	2.39	0.89	0.637	0.656
Thallium	N/A	**0.0003**	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0001	0.00006	< 0.0003	< 0.0003	< 0.0003
Vanadium	N/A	**0.006**	0.0015	0.0007	0.0008	0.0006	0.0017	0.0006	0.0036	0.0008	0.0011	0.0011	0.0155	0.0061	< 0.0005	0.0006
Zinc - Total	**2**	**0.03**	0.006	0.006	0.007	< 0.005	0.363	< 0.005	0.013	< 0.005	0.016	0.011	0.194	0.026	0.008	< 0.005
Benzene	**0.01**	**0.1**	0.0014	0.001	0.0012	0.0015	<0.0005	0.0016	0.0013	0.0014	0.0015	0.0012	n/a	0.025	0.011	0.0019
Toluene	**0.02**	**0.0008**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	n/a	<0.0005	<0.0005	<0.0005
Ethylbenzene	**0.06**	**0.008**	0.0003	0.0006	0.0007	0.0007	<0.0005	0.0007	0.0006	<0.0005	<0.0005	<0.0005	n/a	<0.0005	<0.0005	<0.0005
Xylene, m, p -	N/A	N/A	0.0019	<0.0001	<0.0001	0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	n/a	0.0037	<0.001	0.0035
Xylene, o -	N/A	**0.04**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	n/a	<0.0005	<0.0005	<0.0005
Xylene, m, p, o -	N/A	N/A	0.002	0.0011	<0.0011	<0.0011	<0.0011	<0.0011	<0.0011	<0.0011	<0.0011	<0.0011	n/a	0.0037	<0.0011	0.0035

Parameters	Limits	Provincial Water Quality Objectives	Jan. Results	Feb. Results	Mar. Results	April. Results	Apr. Results New Cell	May. Results	June. Results	July. Results	Aug. Results	Sept. Results	Oct. Results New Cell	Oct Results	Nov Results	Dec Results
pH (at 25 ºC)	6.0 - 9.5	6.5 - 8.5	7.27	7.6	7.29	8.00	8.54	7.53	7.31	7.36	7.5	7.34	7.80	7.07	7.36	7.61
Conductivity (at 25 ºC)	N/A	N/A	1590	1590	1430	1600	2010	1650	1840	2010	2080	1870	5620	2230	1700	1730
Conductivity (calculated)	N/A	N/A	1448	1557	1309	1530	1852	1584	1814	1954	2024	1803	5181	1962	1609	1597
Anion Sum	N/A	N/A	16.3	16.7	14.7	16.8	19.1	17.3	19.9	20.9	21.6	19.8	59.2	23.4	17	18.5
Cation Sum	N/A	N/A	18.5	19.4	15.8	18.2	20.5	19.1	22	23.9	24.3	21.3	65.5	36.5	18.6	20
% Difference	N/A	N/A	6.32%	7.33%	3.62%	3.96%	3.34%	4.76%	5.07%	671.00%	5.84%	3.75%	5.02%	21.80%	4.23%	3.74%
Ion Ratio (AS/CS)	N/A	N/A	0.881	0.863	0.93	0.924	0.935	0.909	0.903	0.874	0.89	0.928	0.904	0.642	0.919	0.928
Sodium Adsorption Ratio	N/A	N/A	1.69	1.75	1.39	1.81	5.52	1.9	2.33	2.56	2.68	2.41	6.99	2.06	2.2	1.39
TDS (calc.) / EC (actual)	N/A	N/A	0.564	0.582	0.554	0.568	0.545	0.567	0.584	0.571	0.566	0.568	0.587	0.638	0.544	0.551
Langelier Index (at 25ºC)	N/A	N/A	0.823	1.14	0.791	1.53	1.59	1.1	0.929	1	1.13	0.928	1.93	0.872	0.846	1.26

Lindsay Ops Leachate 2020

Exceeds Bylaw Value
Exceeds PWQO Value

Parameters	CKL Sewer Bylaw Limits (mg/L)	Provincial Water Quality Objectives (mg/L)	Jan. Results (mg/L)	Feb. Results (mg/L)	Mar. Results (mg/L)	April. Results (mg/L)	April. Results (mg/L) new cell	May Results (mg/L)	June Results (mg/L)	July Results (mg/L)	August Results (mg/L)	September Results (mg/L)	October. Results (mg/L) new cell	Oct Results (mg/L)	Nov Results (mg/L)	Dec Results (mg/L)
Hardness (CaCO3)	N/A	N/A	612	563												
Alkalinity (CaCO3)	N/A	N/A	578	518												
Biochemical Oxygen Demand (BOD)	300	N/A	6	<10												
TDS	N/A	N/A	927	841												
Dissolved Organic Carbon	N/A	N/A	13.7	8.8												
COD	N/A	N/A	42	25												
Chloride	N/A	N/A	155	147												
Ammonia (N) - Total	N/A	**1.11**	14.2	10.1												
Fluoride	**10**	N/A	< 0.1	< 0.1												
Phenolic, 4AAP	**1**	**0.001**	< 0.002	< 0.002												
Sulphate	N/A	N/A	34	44												
Nitrite	N/A	N/A	< 0.05	0.06												
Nitrate	N/A	N/A	0.27	0.64												
Kjeldahl Nitrogen - Total	**50**	N/A	18	14.4												
Aluminum - Total	**50**	**0.075***	0.1	0.08												
Antimony - Total	**5**	**0.02**	< 0.0005	< 0.0005												
Arsenic - Total	**1**	**0.1**	0.0013	0.0005												
Barium	N/A	N/A	0.286	0.241												
Beryllium	N/A	**1.1****	< 0.002	< 0.002												
Boron	N/A	0.2	0.336	0.273												
Cadmium - Total	**0.7**	**0.0002**	< 0.000070	< 0.000070												
Calcium	N/A	N/A	192	179												
Chromium - Total	**2.8**	**0.0099**	0.003	<0.001												
Cobalt - Total	**5**	**0.0009**	0.0008	0.0007												
Copper - Total	**2**	**0.005**	< 0.0005	0.0005												
Iron	N/A	**0.3**	19.4	8.86												
Lead - Total	1	**0.005**	0.0002	0.0001												
Magnesium	N/A	N/A	32.2	28.1												
Manganese - Total	5	N/A	0.517	0.461												
Mercury - Total	**0.01**	**0.0002**	< 0.00002	< 0.00002												
Molybdenum - Total	**5**	**0.04**	< 0.0005	< 0.0005												
Nickel - Total	**2**	**0.025**	< 0.01	< 0.01												
Potassium	N/A	N/A	16.3	11.5												
Phosphorus	N/A	N/A	< 0.1	< 0.1												
Phosphorus - Total	**10**	**0.01**	0.02	0.02												
Selenium - Total	**1**	**0.1**	< 0.005	< 0.005												
Silver - Total	**0.4**	**0.0001**	< 0.0001	< 0.0001												
Sodium	N/A	N/A	112	98.5												
Strontium	N/A	**10 bq/L**	0.679	0.657												
Thallium	N/A	**0.0003**	< 0.0003	< 0.0003												
Vanadium	N/A	**0.006**	0.0006	< 0.0005												
Zinc - Total	**2**	**0.03**	< 0.005	0.013												
Benzene	**0.01**	**0.1**	0.012	0.001												
Toluene	**0.02**	**0.0008**	<0.0005	<0.0005												
Ethylbenzene	**0.06**	**0.008**	<0.0005	0.0006												
Xylene, m, p -	N/A	N/A	<0.001	<0.001												
Xylene, o -	N/A	**0.04**	<0.0005	<0.0005												
Xylene, m, p, o -	N/A	N/A	<0.0011	<0.0011												

Parameters	Limits	Provincial Water Quality Objectives	Jan. Results	Feb. Results	Mar. Results	April. Results	Apr. Results New Cell	May. Results	June. Results	July. Results	Aug. Results	Sept. Results	Oct. Results New Cell	Oct Results	Nov Results	Dec Results
pH (at 25 ºC)	6.0 - 9.5	6.5 - 8.5	7.29	7.35												
Conductivity (at 25 ºC)	N/A	N/A	1640	1540												
Conductivity (calculated)	N/A	N/A	1578	1453												
Anion Sum	N/A	N/A	16.7	15.5												
Cation Sum	N/A	N/A	19.6	17												
% Difference	N/A	N/A	8.05	4.81%												
Ion Ratio (AS/CS)	N/A	N/A	0.851	0.908												
Sodium Adsorption Ratio	N/A	N/A	1.97	1.81												
TDS (calc.) / EC (actual)	N/A	N/A	0.565	0.545												
Langelier Index (at 25ºC)	N/A	N/A	0.833	0.824												