

CITY OF HAMILTON'S DRINKING WATER SYSTEMS (DWS)  
SUMMARY REPORT FOR MUNICIPALITIES

2017

Safe Drinking Water Act, Ontario Regulation, 170/03,  
Schedule 22



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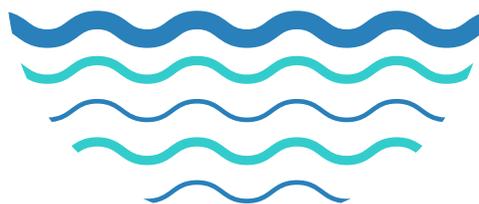
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# 1 - INTRODUCTION



This summary report for municipalities has been prepared in accordance with the Safe Drinking Water Act, Ontario Regulation, 170/03, Schedule 22. The City of Hamilton is the Owner of the following five Drinking Water Systems (DWS):

Licence Number	Drinking Water System
005-101	Hamilton DWS
005-102	Freelton DWS
005-103	Greenville DWS
005-104	Carlisle DWS
005-105	Lynden DWS

For each of the City of Hamilton's five DWSs, the following information is provided for the 2017 reporting period:

- A summary of quantities and flow rate of the water supplied
- Monthly average and maximum daily flows (in comparison to approved flow rates)
- A summary of 2017 capital upgrades, as well as those to be initiated in 2018

There were no Provincial Officer's Orders issued. All confirmed Adverse Water Quality Incidents were reported to the Ontario Ministry of Environment and Climate Change's (MOECC) Spills Action Centre (SAC) and Public Health Services (PHS) and are provided in the report. All water taking quantities and flow rates were within approved rated capacities and provincial water taking limits.



## 2 - HAMILTON DWS, WOODWARD SUB-SYSTEM



### 2.1 Capital Projects Update - 2017

#### 2.1.1 Projects Completed 2017 - Woodward Water Treatment System and Water Outstations

- Ben Nevis Reservoir (HDR1C) & Fifty Road Pumping Station/Reservoir (HD009/HDR10) Upgrades (Construction)
- Hillcrest Water Reservoir (HDR02) Upgrades (Construction)
- Kelly Street Standpipe (HDT01) Restraint (Construction)
- Osler Pumping Station (HD011) Process Upgrades (Construction)

The above water treatment and water station upgrades and modifications were completed at a cost of approximately \$11.7 million.

#### 2.1.2 Projects Initiated 2017 and/or ongoing - Woodward Water Treatment System and Water Outstations

- Ben Nevis & Dewitt Pumping Station (HD08A) Upgrades (Design)
- Greenhill & Summercrest Pumping Station (HD04B & HD05A) Upgrades, Capacity Expansion and Standby Power (Consulting Services)

- High Lift Pumping Station Improvements (Investigation)
- Highland Gardens Park Pumping Station Site (HGPPS) Security Gate (Design)
- Lee Smith Reservoir (HDR00) New Valve (Construction)
- Osler Drive Pumping Station (HD011) Upgrades (Design)
- Security System Upgrades - High Priority Water Outstations (Design)
- Water Distribution System Control Valves (Construction)
- Woodward Water Treatment Facility - Condition Upgrades (Design)
- Woodward Water Treatment Facility - Travelling Screen Replacement (Design)
- Woodward Water Treatment Facility - Corrosion Control Building (Construction)

The above water treatment and water station upgrades and modifications are being undertaken at a cost of approximately \$12.2 million.

## 2.2 Distribution System - Pipes

As part of the City's Linear Asset Management Program, the following water upgrades and rehabilitations were completed in 2017:

- Approximately 7.3 km of watermain was replaced as a stand-alone project and/or in coordination with roadwork at a cost of \$6.5 million.
- Approximately 6.6 km of watermain was rehabilitated using structural and/or cement mortar lining at a cost of \$8.7 million.

## 2.3 Capital Projects to be Initiated in 2018

### 2.3.1 Woodward Water Treatment System and Water Outstations

- Ben Nevis & Dewitt Water Pumping Station (HD08A) Upgrades (Construction)
- Ferguson Avenue Pumping Station (HD002) Pumping Station Upgrades (Design and Construction)
- Governors Road Pumping Station (HD12A) Capacity Upgrade & Standby Power Installation (Design)
- Greenhill & Summercrest Pumping Station (HD04B & HD05A) Upgrades, Capacity Expansion and Standby Power Upgrades (Consulting, Design and Construction)

- Kenilworth Reservoir HDR01 (Design and Construction)
- High Priority Water Outstations Security System Upgrades (Design and Construction)
- Highland Gardens Park Pumping Station Site (HGPPS) Security Gate (Construction)
- Highland Road Reservoir Upgrades HDR07 (Design)
- Kenilworth Pumping Station (HD005) Upgrades (Construction)
- Osler Drive Pumping Station (HD011) Upgrades (Construction)
- Stone Church and Garth Reservoir (HDR05) Cells and Valve House Upgrades (Construction)
- Woodward Water Treatment Facility - Condition Upgrades (Construction)
- Woodward Water Treatment Facility - High Lift Pumping Station Improvements (Construction)
- Woodward Water Treatment Plant - Fluoride Building and Highlift Pumping Station VFD Room HVAC (Design and Construction)
- York and Valley Roads Water Pumping Station (HD016) Capacity Upgrade, Standby Power & Building Expansion (Design)

The above upgrades and modifications will be undertaken at a cost of approximately \$58.8 million.



## 2.4 Corrosion Control Program

The City of Hamilton updated the MOECC of Council's approval of the Corrosion Control Program (CCP) in January 2016 and is moving forward with the implementation of the CCP as outlined in Report 15-015.

The corrosion control building is under construction and operations will commence in November 2018. As per the implementation plan, the industrial, commercial and institutional customers have been notified of the upcoming changes and the potential impacts on their processes. A complete baseline study of the Hamilton Drinking Water System was completed in June 2017 and the data was analyzed and the results show a stable system with little seasonal variation. The stable conditions of the drinking water system will assist when monitoring the progress of the Corrosion Control Program once the chemical addition has begun.



## 2.5 Adverse Water Quality Incidents (AWQI) - Hamilton DWS

The following AWQIs were reported to the MOECC SAC and PHS.

Notification Date (m-d-y)	Location of Adverse	AWQI	Resolution
04-05-2017	Fire Station Fleet Maintenance, 177 Bay St. N.	Total Coliforms = 6 CFU/100mL	→ Resampled adverse location, one upstream and one downstream hydrant. All results passed. The adverse was not confirmed.
07-26-2017	Ancaster Sampling Station A	Total Coliforms = 3 CFU/100mL	→ Resampled adverse location, one upstream and one downstream hydrant. Result failed at upstream hydrant which resulted in another AWQI July 27th. The adverse was confirmed.
07-27-2017	Hydrant AN15H006, Jerseyville Rd.	Total Coliforms = 2 CFU/100mL	→ Flushing was done to get the chlorine residual to 1.0 mg/L or higher. Two consecutive sets of samples were taken 24 to 48 hours apart at the original adverse location, the adverse hydrant, one upstream and one downstream hydrant. Results for the both sets of samples passed.

## 2.6 Self-Declared Non-Compliances

The following self-declared non-compliance was reported to the MOECC in 2017:

#	Finding:	Status
1	Commissioning of a portion of new watermain on Wilson Street. On Monday, October 23, 2017, approximately 12.4m (40.7') of 150 Dia. PVC pipe was installed and commissioned in front of 143-154 Wilson Street West. The pipe was hand swabbed and all appurtenances were sprayed with hypo solution, however no bacteriological samples were collected after recharge and no official chlorine residual was recorded by Construction. This work was not part of the original scope of the project; however, the Construction Inspector saw this as a system modification/ improvement to eliminate a dead end in the distribution system.	→ Corrective and Preventive Actions In Progress.

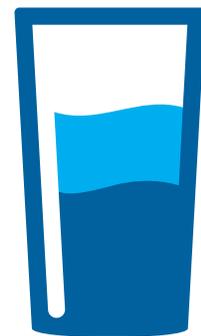


## 2.7 MOECC Drinking Water System (DWS) Inspection Findings

No MOECC inspections were conducted at the Woodward DWS in the 2017 calendar year. The inspection is taking place during January and February 2018.

## 2.8 Water Production Reports - Summary

The following provides a summary of daily flow rates and instantaneous peak flow rates in comparison to the capacity of the water works as identified in the Permit to Take Water. This information is tabulated in the accompanying tables.



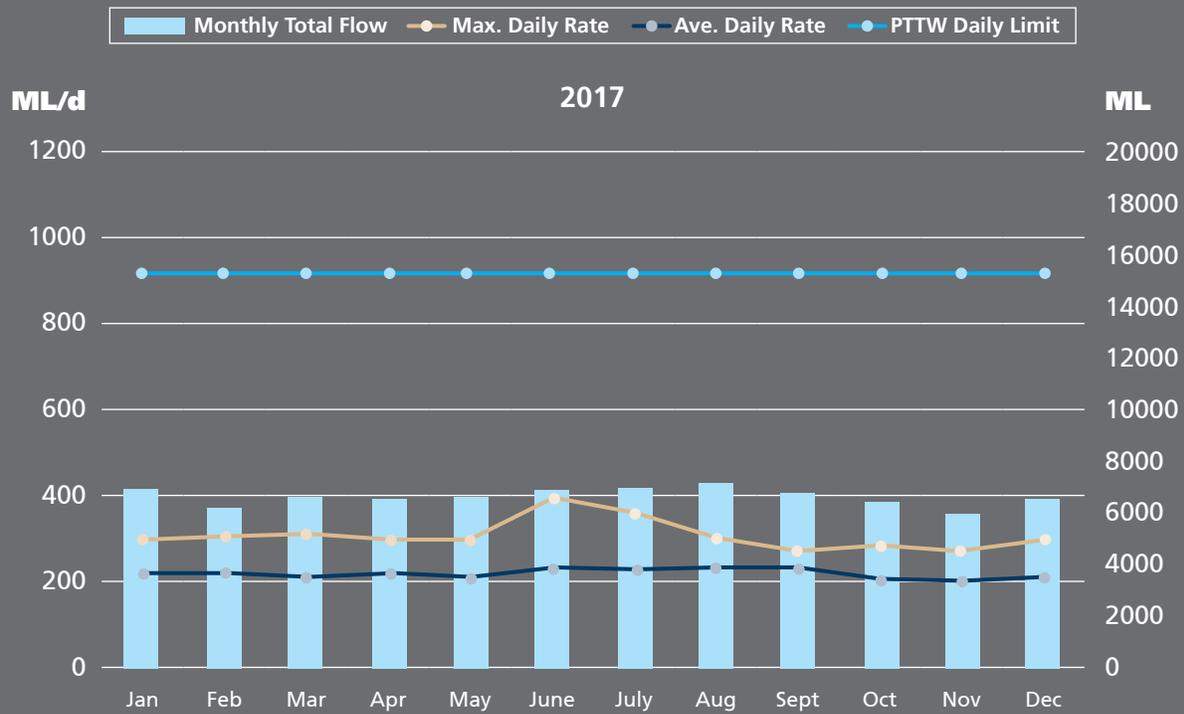


**TABLE 2-1: WOODWARD TREATMENT PLANT - 2017 DAILY PRODUCTION**

DATE	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
	ML/day											
1	269	196	208	285	166	241	279	232	165	272	198	196
2	185	200	199	272	172	184	244	245	266	181	206	269
3	169	204	169	167	208	291	166	297	242	179	197	272
4	178	277	299	173	204	285	201	271	240	271	267	187
5	220	267	290	206	177	187	224	242	179	202	163	161
6	220	140	168	205	287	172	173	241	160	166	167	189
7	276	214	187	202	247	204	236	242	245	265	194	168
8	271	235	206	281	168	205	347	185	131	226	188	198
9	190	200	205	253	174	220	280	243	241	165	163	271
10	169	201	205	169	204	360	256	244	255	169	193	270
11	196	270	292	175	206	317	249	243	253	206	267	177
12	213	288	285	203	203	150	199	249	265	194	231	143
13	215	205	161	206	283	257	227	241	184	225	170	174
14	277	204	196	207	265	234	193	166	181	265	157	209
15	277	201	177	288	140	226	190	242	254	223	198	126
16	210	200	212	213	210	225	252	188	255	166	197	287
17	184	217	212	178	209	372	182	188	256	194	194	286
18	186	279	276	206	210	286	181	201	185	192	268	202
19	205	252	231	194	217	146	226	288	186	193	261	200
20	197	166	168	192	293	221	259	237	250	189	164	199
21	283	178	172	196	289	232	220	164	250	230	169	199
22	283	206	202	285	195	234	281	251	252	277	195	200
23	191	209	220	223	201	222	212	197	250	199	195	268
24	169	220	203	174	207	290	210	243	240	163	195	267
25	203	300	252	197	205	234	174	245	235	195	266	171
26	185	287	280	206	207	176	217	241	248	194	255	169
27	207	190	152	207	275	228	202	243	267	194	168	197
28	292	176	203	206	239	221	203	243	189	264	191	196
29	279		205	285	171	209	280	190	229	254	168	197
30	189		204	255	205	207	279	253	269	160	195	265
31	197		206		206		209	211		165		265
Total	6,786	6,180	6,645	6,510	6,645	7,036	7,050	7,169	6,821	6,440	6,042	6,579
Average	219	221	214	217	214	235	227	231	227	208	201	212
Min	169	140	152	167	140	146	166	164	131	160	157	126
Max	292	300	299	288	293	372	347	297	269	277	268	287
PTTW	909	909	909	909	909	909	909	909	909	909	909	909

Note: Municipal Drinking Water Licence (005-101) Rated Capacity 926,000 m<sup>3</sup>/ day

FIGURE 2-1: WOODWARD TREATMENT PLANT - 2017 MONTHLY PRODUCTION (SUMMARY)



**7,169m<sup>3</sup>**  
**August**  
  
**November**  
**6,042m<sup>3</sup>**

TABLE 2-2: WOODWARD TREATMENT PLANT - 2017 MONTHLY PRODUCTION (SUMMARY)

WOODWARD	UNITS	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
Total	ML	6,786	6,180	6,645	6,510	6,645	7,036	7,050	7,169	6,821	6,440	6,042	6,579
Average	ML/d	219	221	214	217	214	235	227	231	227	208	201	212
Maximum	ML/d	292	300	299	288	293	372	347	297	269	277	268	287
PTTW	ML/d	909	909	909	909	909	909	909	909	909	909	909	909



## 3 - HAMILTON DWS, FIFTY ROAD SUB-SYSTEM

### 3.1 Operational Upgrades

The Fifty Road Pumping Station and Reservoir (HD009 and HDR10) Upgrades (Construction) were completed in 2017 at a cost of \$600,000.

### 3.2 Adverse Water Quality Incidents (AWQI) - Fifty Road DWS

There were no AWQI's in 2017.

### 3.3 MOECC Drinking Water System (DWS)

#### Inspection Findings

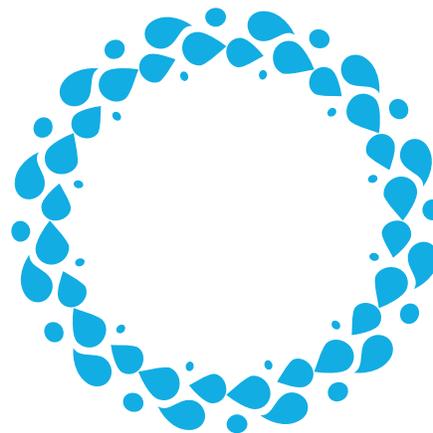
The following finding was issued during the MOECC inspection completed in the 2017 calendar year.

Inspection - August 2, 2017

#	Finding:	Status
1	<p>Recommendation - It is recommended that sampling locations for Trihalomethanes (THM) and Haloacetic acids (HAA) be reviewed to ensure samples are collected at the appropriate locations. HAAs will generally form at the beginning of the distribution system. However, if there is rechlorination, high HAAs may be found just past the rechlorination point if the right humic acids are present. Drinking water systems should use this time (results not reportable until January 2020) to figure out the place of highest potential for elevated HAAs by sampling in different spots in the distribution system to characterize the HAAs in their system.</p>	<p>→ Sampling location meeting held on January 29, 2018.</p>

### 3.4 Water Production Reports - Summary

The Fifty Road DWS receives treated water from the Town of Grimsby Water Distribution System.



## 4 - CARLISLE DWS

### 4.1 Operational Upgrades

In 2015, a community water conservation committee called the Carlisle Conservation Committee (C3) was formed. Hamilton Water, in partnership with the C3, have developed community-based programs and education targeted to Carlisle residents and the local irrigation industry. Carlisle is the first community in Hamilton to have Advanced Meter Infrastructure in place for real time water use data. This project was completed in December 2017 and will assist in water conservation outreach efforts. Monitoring and assessment of the community and C3 efforts will continue through the 2018 irrigation season.

### 4.2 Capital Projects to be initiated in 2018

- Carlisle Wells HDT01 (FDC01 & FDC05) Closed System Operation Upgrades (Design and Construction)
- The above upgrades will be undertaken at a cost of approximately \$850,000.

### 4.3 Adverse Water Quality Incidents (AWQI) - Carlisle DWS

The following AWQIs were reported to the MOECC SAC and PHS.

Notification Date (m-d-y)	Location of Adverse	AWQI	Resolution
08-22-2017	Carlisle Sampling Station A	Total Coliforms = 1 CFU/100mL	→ Resampled adverse location, upstream and downstream hydrants. All results passed. The adverse was not confirmed.

### 4.4 MOECC Drinking Water System (DWS) Inspection Findings

The following findings were issued during the MOECC inspection completed in the 2017 calendar year.

Inspection - July 11, 2017

#	Findings:	Status
1	<b>Non-Compliance</b> - Ensure that the review and revisions currently underway for UV maintenance and documentation continue by both Operator in Charge (OIC)/Operations and SCADA departments and documents clearly demonstrate to the OIC/Overall Responsible Operator (ORO) that maintenance work and corresponding frequency are completed. Please submit a spreadsheet/report how records will demonstrate that maintenance was completed as required by manufacturer and/or Licence and any processes implemented as a result of such review.	→ The documentation for this NC was sent to the MOECC on December 18, 2017 by the Water Treatment ORO.
2	<b>Recommendation</b> - An on-site alarm testing frequency by SCADA with operators should also be reviewed upon completion of updating alarm setting in SCADA.	→ Rejected: We may look at undertaking this work at a future date.
3	<b>Recommendation</b> - The condition of the air vents and the presence of any overflow screens is unknown at this time.	→ Check as-builts for Carlisle Tower and Well to see if screens were specified on the vents.
4	<b>Recommendation</b> - It is recommended that the City review all water storage facilities within the city to confirm the presence of vents and screens.	→ The next step will be to field verify.
5	<b>Recommendation</b> - It is recommended during the next Above Ground Well Inspection that well venting be reviewed and documented.	→ Check as-builts for Carlisle Tower and Well to see if screens were specified on the vents. The next step will be to field verify.

6	<p><b>Recommendation</b> - It is recommended that sampling locations for Trihalomethanes (THM) and Haloacetic acids (HAA) be reviewed to ensure samples are collected at the appropriate locations. HAAs will generally form at the beginning of the distribution system. However, if there is rechlorination, high HAAs may be found just past the rechlorination point if the right humic acids are present. Drinking water systems should use this time (results not reportable until January, 2020) to figure out the place of highest potential for elevated HAAs by sampling in different spots in the distribution system to characterize the HAAs in their system.</p>	<p>→ Sampling location meeting held on January 29, 2018.</p>
7	<p><b>Recommendation</b> - The City continues to review with RV Anderson Associates Limited the CT calculations/engineers reports for all treatment facilities in the City. Once the review is completed, it is recommended that the SCADA Process Control Narratives (PCN)/Process Logic Control i.e. alarm settings, for all stations be reviewed, confirmed and updated with primary disinfection related tags (HIHI flow and LOLO chlorine residual) with appropriate locks on set points to prevent changes, unless ORO notified.</p>	<p>→ Completed February 8, 2018.</p>



#### 4.5 Water Production Reports - Summary

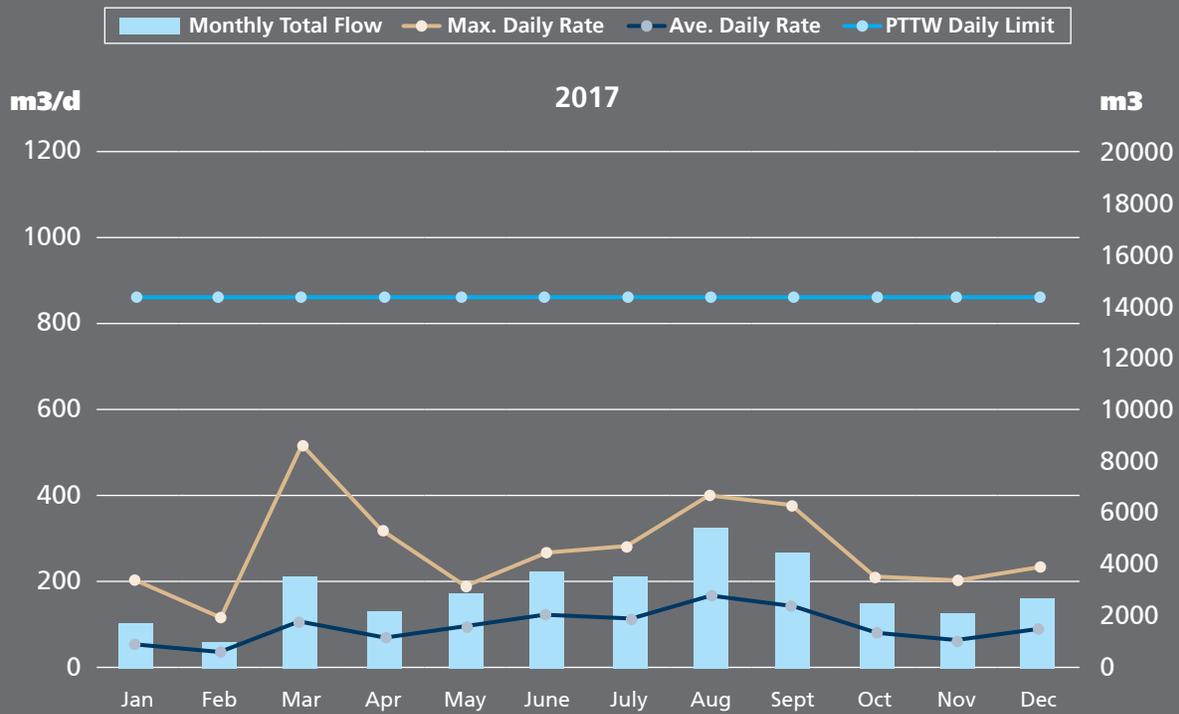
The following provides a summary of daily flow rates and instantaneous peak flow rates in comparison to the capacity of the water works as identified in the Permit to Take Water. This information is tabulated in the accompanying tables.

**TABLE 4-1: CARLISLE DWS (FDC01 & FDC02) - 2017 DAILY PRODUCTION**

DATE	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
	Amount											
	m <sup>3</sup> /day											
1	0	11	0	0	168	100	287	376	173	155	41	53
2	65	0	206	206	104	270	18	155	134	106	60	59
3	33	0	33	0	78	0	45	86	189	89	50	76
4	75	69	88	324	160	0	119	319	179	101	128	30
5	81	0	78	32	0	0	275	259	236	0	33	218
6	74	7	89	0	0	122	174	177	101	93	33	72
7	80	41	25	0	0	0	222	42	69	0	34	57
8	88	31	167	89	0	150	82	58	66	0	6	232
9	0	111	523	91	154	0	46	186	306	0	0	63
10	15	76	444	237	108	185	222	269	270	200	18	0
11	0	99	9	41	143	191	267	178	64	62	82	73
12	207	3	0	0	60	157	56	31	42	77	0	234
13	130	14	60	0	104	266	155	0	148	76	127	64
14	0	39	125	138	185	39	165	399	186	72	122	70
15	0	0	79	147	75	112	137	384	142	88	208	0
16	64	0	0	0	100	138	108	338	124	0	97	178
17	101	0	115	7	0	273	98	277	63	145	81	103
18	180	0	150	115	91	243	185	160	155	82	105	0
19	141	0	100	70	191	114	100	163	381	214	82	155
20	12	0	14	0	75	93	53	86	180	185	0	62
21	39	60	154	0	147	143	129	16	137	0	112	80
22	0	100	114	86	43	180	71	211	101	43	155	46
23	14	9	67	104	159	117	0	14	87	0	81	130
24	100	124	53	34	108	120	0	152	146	105	155	205
25	0	78	106	196	74	107	153	162	256	168	0	13
26	0	12	111	0	106	23	104	321	163	160	78	64
27	0	63	300	96	71	126	0	78	88	0	0	63
28	80	88	110	47	96	130	100	0	73	0	85	76
29	79		114	101	93	140	97	161	0	28	75	63
30	94		71	31	102	258	38	197	203	102	98	77
31	15		0		147		60	170		136		109
Total	1,769	1,035	3,506	2,192	2,941	3,794	3,567	5,428	4,462	2,486	2,145	2,723
Average	57	37	113	73	95	126	115	175	149	80	71	88
Min	0	0	0	0	0	0	0	0	0	0	0	0
Max	207	124	523	324	191	273	287	399	381	214	208	234
PTTW limit	851	851	851	851	851	851	851	851	851	851	851	851

Note: Municipal Drinking Water Licence (005-104) FDC01 and FDC02 Rated Capacity 851 m<sup>3</sup>/day

FIGURE 4-1: CARLISLE DWS (FDC01 & FDC02) - 2017 MONTHLY PRODUCTION (SUMMARY)



**5,428m<sup>3</sup>**  
**August**  
  
**February**  
**1,035m<sup>3</sup>**

TABLE 4-2: CARLISLE DWS (FDC01 & FDC02) - 2017 MONTHLY PRODUCTION (SUMMARY)

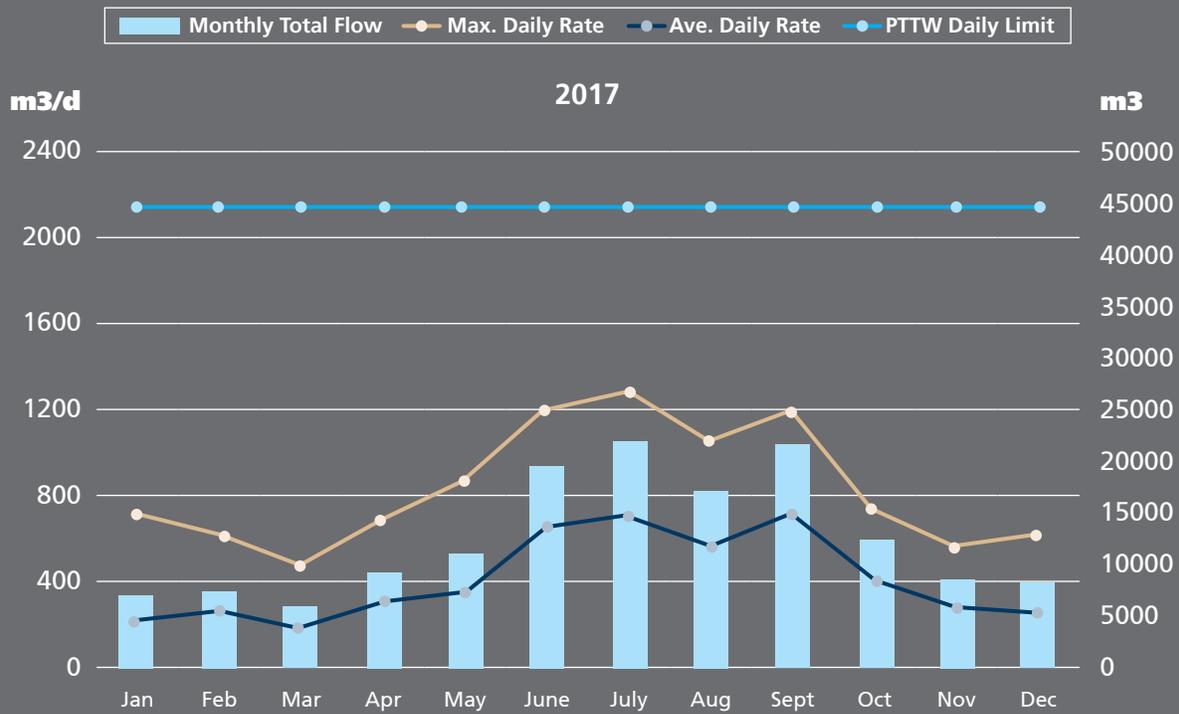
FDC01, FDC02	UNITS	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
Total	m <sup>3</sup>	1,769	1,035	3,506	2,192	2,941	3,794	3,567	5,428	4,462	2,486	2,145	2,723
Average	m <sup>3</sup> /d	57	37	113	73	95	126	115	175	149	80	71	88
Maximum	m <sup>3</sup> /d	207	124	523	324	191	273	287	399	381	214	208	234
PTTW	m <sup>3</sup> /d	851	851	851	851	851	851	851	851	851	851	851	851

**TABLE 4-3: CARLISLE DWS (FDC03R) - 2017 DAILY PRODUCTION**

DATE	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
	Amount											
	m <sup>3</sup> /day											
1	168	407	487	360	60	512	365	763	306	746	476	252
2	203	328	340	190	33	0	632	784	950	340	0	311
3	201	379	0	305	425	927	274	495	493	675	0	393
4	203	412	237	705	0	809	1,007	0	385	705	16	228
5	216	624	217	188	534	571	448	372	326	714	561	0
6	201	217	288	536	390	491	1,016	447	596	730	555	0
7	214	322	340	0	413	565	745	430	444	507	0	0
8	519	384	327	244	264	140	1,172	698	378	702	386	0
9	174	0	0	242	236	915	1,300	823	0	377	411	335
10	442	322	0	334	227	668	972	950	981	485	365	622
11	443	0	270	192	232	1,209	984	882	749	413	429	241
12	0	398	289	613	263	641	700	606	510	400	576	345
13	0	108	268	142	272	664	479	835	949	439	67	359
14	0	473	0	355	450	996	703	374	776	494	159	358
15	135	511	276	0	235	960	362	265	832	504	350	322
16	239	96	0	647	294	1,137	744	95	1,089	64	49	0
17	129	379	242	46	877	922	545	0	881	248	305	461
18	30	518	332	269	638	1,013	363	459	858	454	517	203
19	0	505	0	314	575	836	917	434	463	0	451	0
20	0	73	23	545	500	879	658	471	992	0	84	245
21	378	399	326	512	510	540	660	694	788	627	413	463
22	726	0	0	439	360	648	758	636	580	477	0	508
23	61	0	350	0	261	595	888	704	1,212	178	184	410
24	232	42	0	115	336	229	838	269	959	419	0	0
25	515	218	75	276	475	808	604	453	1,151	0	565	226
26	281	303	293	349	338	398	577	749	802	0	393	347
27	207	61	47	528	497	312	775	425	1,030	352	189	414
28	210	0	395	237	805	585	272	1,065	1,163	316	329	408
29	211		0	179	444	368	790	620	549	378	479	357
30	418		338	256	209	414	1,110	1,052	581	263	290	306
31	242		12		0		415	499		322		47
Total	7,000	7,479	5,772	9,116	11,154	19,751	22,074	17,351	21,773	12,330	8,597	8,165
Average	226	267	186	304	360	658	712	560	726	398	287	263
Min	0	0	0	0	0	0	272	0	0	0	0	0
Max	726	624	487	705	877	1,209	1,300	1,065	1,212	746	576	622
PTTW	2,160	2,160	2,160	2,160	2,160	2,160	2,160	2,160	2,160	2,160	2,160	2,160

Note: Municipal Drinking Water Licence (005-104) FDC03R and FDC05 Rated Capacity 3,456 m<sup>3</sup>/day

FIGURE 4-2: CARLISLE DWS (FDC03R) - 2017 MONTHLY PRODUCTION (SUMMARY)



**22,074m<sup>3</sup>**  
**July**  
  
**March**  
**5,772m<sup>3</sup>**

TABLE 4-4: CARLISLE DWS (FDC03R) - 2017 MONTHLY PRODUCTION (SUMMARY)

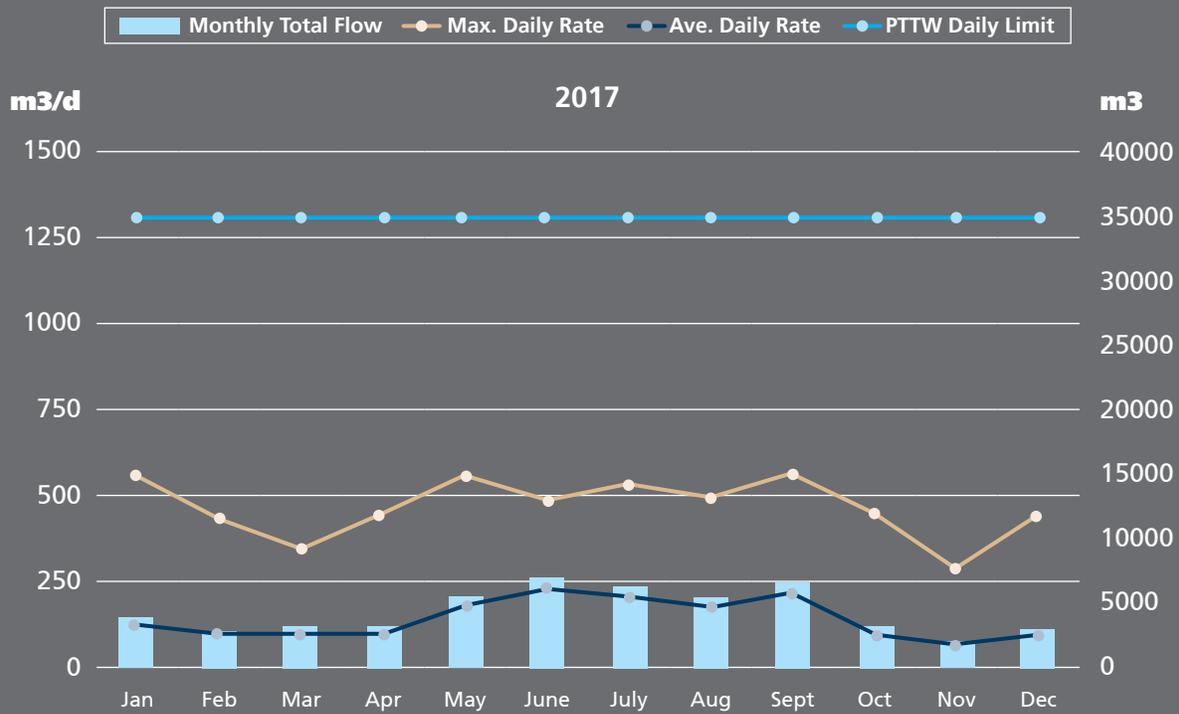
FDC03R	UNITS	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
Total	m <sup>3</sup>	7,000	7,479	5,772	9,116	11,154	19,751	22,074	17,351	21,773	12,330	8,597	8,165
Average	m <sup>3</sup> /d	226	267	186	304	360	658	712	560	726	398	287	263
Maximum	m <sup>3</sup> /d	726	624	487	705	877	1,209	1,300	1,065	1,212	746	576	622
PTTW	m <sup>3</sup> /d	2,160	2,160	2,160	2,160	2,160	2,160	2,160	2,160	2,160	2,160	2,160	2,160

**TABLE 4-5: CARLISLE DWS (FDC05) - 2017 DAILY PRODUCTION**

DATE	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
	Amount											
	m <sup>3</sup> /day											
1	0	29	0	69	238	0	312	174	338	448	0	0
2	233	0	0	79	281	485	0	483	0	350	224	35
3	132	0	0	164	0	0	313	153	131	374	163	0
4	115	1	128	422	479	0	38	497	306	0	294	29
5	123	0	122	167	0	54	452	175	112	0	30	344
6	113	4	169	0	0	0	339	218	0	0	30	440
7	121	57	0	0	0	0	307	208	195	0	263	170
8	132	68	0	136	27	449	218	152	188	0	0	174
9	29	345	0	132	312	0	229	97	547	62	0	0
10	0	86	0	123	222	267	252	0	0	0	0	0
11	119	306	0	0	237	281	159	61	37	0	0	278
12	215	33	0	0	9	313	334	96	116	0	1	0
13	277	24	256	0	153	384	205	0	155	0	217	0
14	558	0	240	203	266	485	129	320	115	0	140	0
15	4	0	114	444	560	350	200	276	153	0	0	23
16	242	29	0	0	154	263	211	420	261	48	0	293
17	236	0	199	35	0	411	51	484	306	91	0	0
18	294	0	258	37	135	399	210	0	374	0	0	47
19	219	0	292	147	286	237	350	110	563	342	0	364
20	53	297	59	0	215	78	175	151	157	305	39	0
21	74	0	85	0	223	295	0	117	445	0	0	0
22	0	313	347	0	58	261	204	134	285	164	253	0
23	59	149	0	319	315	188	0	0	429	233	140	0
24	132	430	154	122	165	178	29	216	302	0	270	331
25	0	120	179	0	0	323	209	324	265	287	0	45
26	0	171	0	0	159	204	160	194	291	261	0	0
27	0	208	167	0	143	375	250	210	321	0	31	0
28	120	183	0	12	122	133	151	149	128	0	0	0
29	119		334	341	183	205	264	109	108	120	0	0
30	165		38	221	111	379	532	0	0	76	0	81
31	0		21		450		226	21		22		344
Total	3,884	2,850	3,161	3,173	5,504	7,001	6,510	5,547	6,626	3,184	2,094	2,999
Average	125	102	102	106	178	233	210	179	221	103	70	97
Min	0	0	0	0	0	0	0	0	0	0	0	0
Max	558	430	347	444	560	485	532	497	563	448	294	440
PTTW	1,296	1,296	1,296	1,296	1,296	1,296	1,296	1,296	1,296	1,296	1,296	1,296

Note: Municipal Drinking Water Licence (005-104) FDC03R and FDC05 Rated Capacity 3,456 m<sup>3</sup>/day

FIGURE 4-3: CARLISLE DWS (FDC05) - 2017 MONTHLY PRODUCTION (SUMMARY)



**7,001m<sup>3</sup>**  
**June**  
  
**November**  
**2,094m<sup>3</sup>**

TABLE 4-6: CARLISLE DWS (FDC05) - 2017 MONTHLY PRODUCTION (SUMMARY)

FDC05	UNITS	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
Total	m <sup>3</sup>	3884	2850	3161	3173	5504	7001	6510	5547	6626	3184	2094	2999
Average	m <sup>3</sup> /d	125	102	102	106	178	233	210	179	221	103	70	97
Maximum	m <sup>3</sup> /d	558	430	347	444	560	485	532	497	563	448	294	440
PTTW	m <sup>3</sup> /d	1296	1296	1296	1296	1296	1296	1296	1296	1296	1296	1296	1296



## 5 - FREELTON DWS

### 5.1 Operational Upgrades

In 2018, the construction of upgrades to the Freelton Tower (HDT03) is expected to be initiated at an approximate cost of \$3.1 million. A study on the capacity of the well supply FDF01 (located on Fireside Drive) is being completed in 2018. If added well capacity can be secured from this well, the City can begin a process to increase the capacity of the water system and subsequently lift a development freeze that is currently in effect for this community.

### 5.2 Capital Projects to be initiated in 2018

- Freelton Well (FDF01) Capacity Increase

The above project will be undertaken at a cost of approximately \$150,000.

### 5.3 Adverse Water Quality Incidents (AWQI) - Freelton DWS

There were no AWQI's in 2017.

### 5.4 Self-Declared Non-Compliances

The following self-declared non-compliance was reported to the MOECC in 2017:

#	Finding:	Status
1	<p>March 2017 - Freelton DWS: As required by 15.1-9 (1) of Schedule 15.1 of O. Reg. 170/03 Drinking Water Systems, if the operating authority for a drinking water system or the owner of a drinking water system receives a report of a test result for a test conducted on any sample referred to in subsection (2.1), the operating authority or owner shall, within seven days after receiving the report, give the following to the occupant of the premises served by the tap from which the sample was taken. As a result of a snowstorm on March 14th, Canada Post was unable to deliver all of the notices to the occupants where a sample was taken from their tap and the results received on March 7th.</p>	<p>→ Letters were hand delivered by March 18, 2017.</p>



### 5.5 MOECC Drinking Water System (DWS) Inspection Findings

The following findings were issued during the MOECC inspection completed in the 2017 calendar year.

Inspection - May 15, 2017

#	Findings:	Status
1	<b>Recommendation</b> - The City is proposing to calculate treated water flow based on SCADA/valve positioning with raw water flow data. The City is proposing to write a procedure to calculate treated water flow based on SCADA/valve positioning with raw water flow data .	→ Under investigation. Due March 31, 2018.
2	<b>Recommendation</b> - The on-site Maintenance and Visitor Log Book did not contain the time of entry and/or exit by maintenance operations staff when reviewed with alarm listings. It is recommended that the Log Book and Record Keeping procedure be reviewed and updated, with subsequent training.	→ Rejected: The Maintenance logbooks are not for licensed operators and therefore they do not need to meet the requirements of O. Reg 128. The operator logbook meets these requirements.
3	<b>Recommendation</b> - It is recommended that sampling locations for Trihalomethanes (THM) and Haloacetic acids (HAA) be reviewed to ensure samples are collected at the appropriate locations. HAAs will generally form at the beginning of the distribution system. However, if there is rechlorination, high HAAs may be found just past the rechlorination point if the right humic acids are present. Drinking water systems should use this time (results not reportable until January 2020) to figure out the place of highest potential for elevated HAAs by sampling in different spots in the distribution system to characterize the HAAs in their system.	→ Sampling location meeting held on January 29, 2018.
4	<b>Recommendation</b> - The City continues to review with RV Anderson Associates Limited engineering firm the CT calculations/engineers reports for all treatment facilities in the City. Once this review is completed, it is recommended that the SCADA Process Control Narratives (PCN)/Process Logic Control, i.e. alarm settings, for all stations be reviewed and all alarm settings be reviewed, confirmed and updated with primary disinfection related tags (HI HI flow and LO LO chlorine residual) with appropriate locks on set points to prevent changes, unless ORO notified. Alarm testing frequency by SCADA with operators should also be reviewed.	→ Completed February 8, 2018

### 5.6 Water Production Reports - Summary

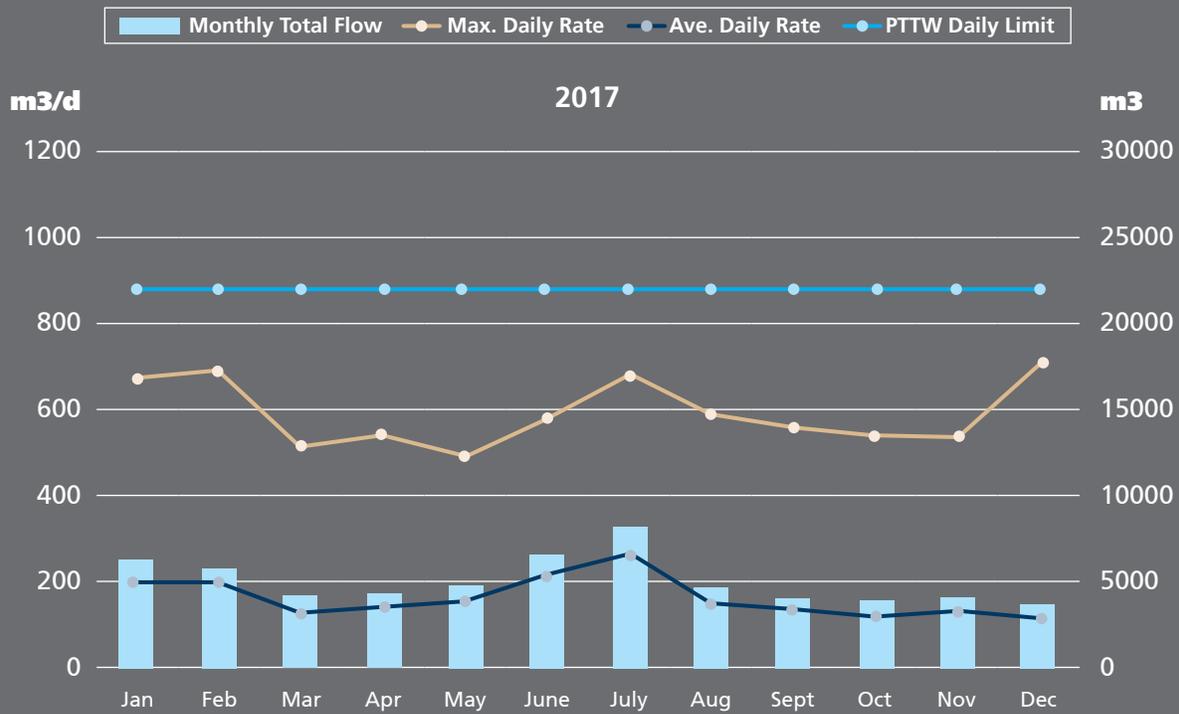
The following provides a summary of daily flow rates and instantaneous peak flow rates in comparison to the capacity of the water works as identified in the Permit to Take Water. This information is tabulated in the accompanying tables.

**TABLE 5-1: FREELTON DWS (FDF01) - 2017 DAILY PRODUCTION**

DATE	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
	Amount											
	m <sup>3</sup> /day											
1	0	485	0	0	17	108	0	378	0	0	0	106
2	519	13	0	0	0	461	581	213	480	0	0	0
3	457	0	396	471	236	0	78	30	95	70	253	0
4	16	0	119	11	310	373	0	586	54	0	0	13
5	31	348	0	0	0	365	635	0	551	0	18	0
6	634	676	18	0	0	0	33	1	26	0	18	0
7	605	285	277	405	346	0	340	25	0	0	0	0
8	0	0	320	133	172	357	250	0	559	0	15	0
9	16	9	0	0	35	243	36	0	53	265	455	0
10	0	200	0	23	0	0	639	0	148	43	54	0
11	551	686	266	495	361	534	0	0	416	5	0	159
12	666	537	257	62	198	377	202	0	17	292	135	0
13	43	12	31	0	0	10	408	0	191	280	450	0
14	0	0	0	84	226	167	138	10	435	0	0	277
15	0	0	0	482	411	479	674	308	0	226	0	295
16	369	355	496	0	0	0	676	136	475	20	284	0
17	671	621	0	74	363	463	265	0	161	540	276	49
18	284	0	0	384	61	335	0	390	265	0	0	532
19	0	0	36	81	0	21	359	207	238	0	159	0
20	0	459	496	22	401	457	315	7	0	530	355	0
21	0	159	16	13	204	119	0	482	0	0	0	0
22	0	0	0	354	40	34	427	93	0	0	0	0
23	500	0	11	206	393	527	222	0	0	389	540	97
24	0	360	514	32	63	0	31	130	0	353	0	69
25	0	133	0	254	0	28	523	490	0	0	0	471
26	0	0	0	171	382	576	140	0	0	0	307	0
27	368	387	414	0	81	0	0	301	0	416	431	0
28	449	4	69	0	0	0	584	377	0	128	0	572
29	127		0	535	494	508	48	0	0	0	0	696
30	20		0	70	81	71	295	331	0	388	438	403
31	0		503		0		321	295		20		92
Total	6,325	5,728	4,239	4,361	4,872	6,614	8,221	4,788	4,162	3,964	4,187	3,833
Average	204	205	137	145	157	220	265	154	139	128	140	124
Min	0	0	0	0	0	0	0	0	0	0	0	0
Max	671	686	514	535	494	576	676	586	559	540	540	696
PTTW	878	878	878	878	878	878	878	878	878	878	878	878

Note: Municipal Drinking Water Licence (005-102) FDF01 Rated Capacity 878 m<sup>3</sup>/day

FIGURE 5-1: FREELTON DWS (FDF01) - 2017 MONTHLY PRODUCTION (SUMMARY)



**8,221m<sup>3</sup>**  
**July**  
  
**December**  
**3,833m<sup>3</sup>**

TABLE 5-2: FREELTON DWS (FDF01) - 2017 MONTHLY PRODUCTION (SUMMARY)

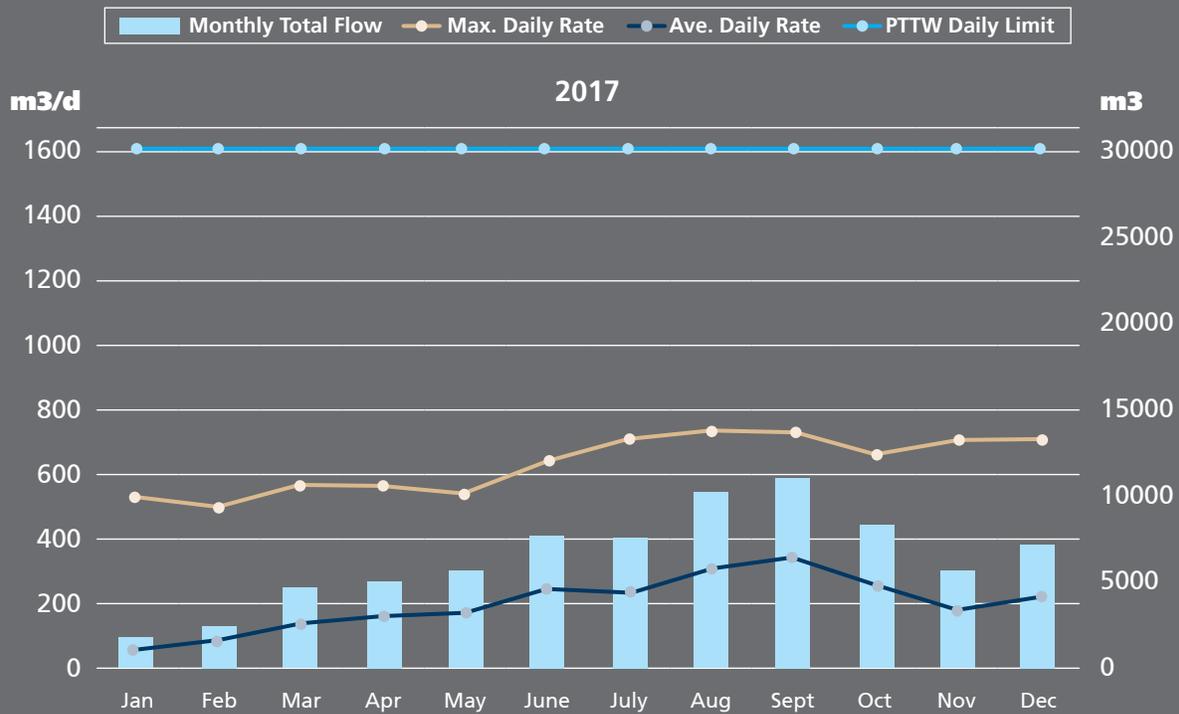
FDF01	UNITS	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
Total	m <sup>3</sup>	6,325	5,728	4,239	4,361	4,872	6,614	8,221	4,788	4,162	3,964	4,187	3,833
Average	m <sup>3</sup> /d	204	205	137	145	157	220	265	154	139	128	140	124
Maximum	m <sup>3</sup> /d	671	686	514	535	494	576	676	586	559	540	540	696
PTTW	m <sup>3</sup> /d	878	878	878	878	878	878	878	878	878	878	878	878

**TABLE 5-3: FREELTON DWS (FDF03) - 2017 DAILY PRODUCTION**

DATE	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
	Amount											
	m <sup>3</sup> /day											
1	0	505	0	0	0	115	0	453	0	470	316	116
2	0	19	0	0	99	514	635	224	528	444	290	588
3	48	20	376	509	239	0	18	0	110	446	261	89
4	0	0	126	40	338	421	34	655	0	509	0	516
5	0	27	0	0	0	69	685	0	604	64	0	173
6	0	32	0	0	0	171	38	464	32	665	0	441
7	0	48	194	449	359	0	402	739	0	123	18	287
8	0	0	346	153	166	396	283	245	596	561	62	318
9	0	19	0	0	61	275	37	36	59	183	715	385
10	16	0	0	0	0	0	712	706	161	128	59	276
11	0	0	283	541	337	592	25	710	466	0	0	369
12	57	0	284	72	220	409	218	501	31	317	138	87
13	6	19	0	0	22	112	458	0	206	309	488	0
14	0	30	118	88	251	178	16	242	480	0	117	292
15	0	0	0	541	223	529	0	732	0	239	0	338
16	0	19	545	0	43	0	0	131	509	0	301	0
17	54	273	0	0	417	490	35	26	179	646	291	49
18	0	0	0	436	41	358	193	423	257	0	0	561
19	329	0	35	95	0	16	361	223	419	0	171	50
20	81	130	490	36	444	507	342	6	421	559	378	173
21	0	183	17	0	183	136	0	425	734	0	91	720
22	0	0	0	383	0	0	455	533	475	0	0	353
23	531	0	12	234	433	572	239	0	490	402	583	0
24	15	361	569	0	239	0	0	142	739	368	0	71
25	0	146	0	305	0	29	560	545	713	0	0	504
26	0	0	0	192	395	647	176	0	459	0	320	34
27	51	403	322	0	92	28	0	321	482	419	196	0
28	330	39	102	0	0	0	663	399	493	141	12	0
29	0	0	0	570	542	549	56	90	356	0	0	1
30	0	0	0	78	123	79	324	360	440	450	470	0
31	53	0	544	0	0	0	212	312	0	421	0	0
Total	1,571	2,274	4,364	4,720	5,267	7,193	7,174	9,641	10,439	7,864	5,275	6,790
Average	51	81	141	157	170	240	231	311	348	254	176	219
Min	0	0	0	0	0	0	0	0	0	0	0	0
Max	531	505	569	570	542	647	712	739	739	665	715	720
PTTW	1,607	1,607	1,607	1,607	1,607	1,607	1,607	1,607	1,607	1,607	1,607	1,607

Note: Municipal Drinking Water Licence (005-102) FDF03 Rated Capacity 1,607 m<sup>3</sup>/day

FIGURE 5-2: FREELTON DWS (FDF03) - 2017 MONTHLY PRODUCTION (SUMMARY)



**10,439m<sup>3</sup>**  
**September**  
  
**January**  
**1,571m<sup>3</sup>**

TABLE 5-4: FREELTON DWS (FDF03) - 2017 MONTHLY PRODUCTION (SUMMARY)

FDF03	UNITS	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
Total	m <sup>3</sup>	1,571	2,274	4,364	4,720	5,267	7,193	7,174	9,641	10,439	7,864	5,275	6,790
Average	m <sup>3</sup> /d	51	81	141	157	170	240	231	311	348	254	176	219
Maximum	m <sup>3</sup> /d	531	505	569	570	542	647	712	739	739	665	715	720
PTTW	m <sup>3</sup> /d	1,607	1,607	1,607	1,607	1,607	1,607	1,607	1,607	1,607	1,607	1,607	1,607



## 6 - GREENSVILLE DWS

### 6.1 Operational Upgrades

In 2017, the Municipal Class Environmental Assessment (EA), Schedule C for the New Greensville Well commenced. The EA study is well underway and recommendations of the study are expected to be presented to Council in 2018.

## 6.2 Self-Declared Non-Compliances

The following self-declared non-compliance was reported to the MOECC in 2017:

#	Finding:	Status
1	March 2017 - Greensville DWS: As required by 15.1-9 (1) of Schedule 15.1 of O. Reg. 170/03 Drinking Water Systems, if the operating authority for a drinking water system or the owner of a drinking water system receives a report of a test result for a test conducted on any sample referred to in subsection (2.1), the operating authority or owner shall, within seven days after receiving the report, give the following to the occupant of the premises served by the tap from which the sample was taken. As a result of a snowstorm on March 14th, Canada Post was unable to deliver all of the notices to the occupants where a sample was taken from their tap and the results received on March 7th.	→ Letters were hand delivered by March 2017.

## 6.3 Adverse Water Quality Incidents (AWQI) - Greensville DWS

There were no AWQI's in 2017.

## 6.4 MOECC Drinking Water System (DWS) Inspection Findings

The following findings were issued during the MOECC inspections completed in the 2017 calendar year.

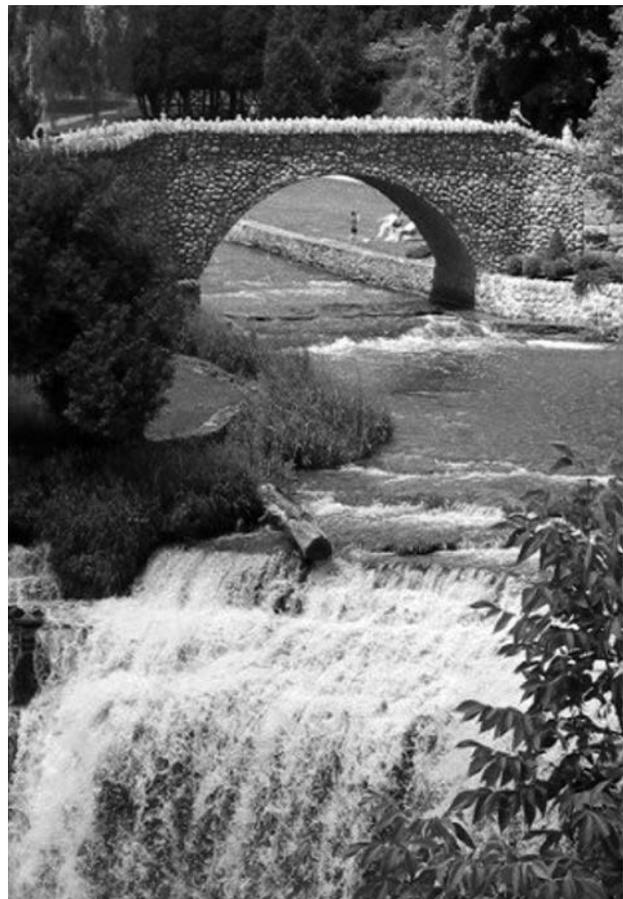
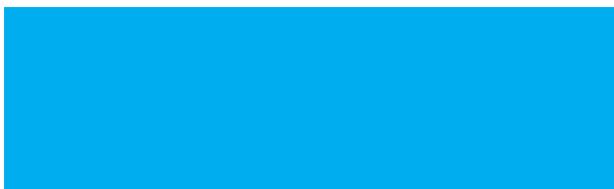
Inspection - January 26, 2017:

#	Finding:	Status
1	<b>Non-Compliance</b> - Ensure records demonstrate all maintenance, service and/or calibration of all equipment in accordance with the manufacturers manual, operations manual/SOP and licence and permit, as required. It is recommended that a review be conducted, of documentation processes and equipment maintenance frequencies, to better demonstrate maintenance and calibration.	→ Documents were submitted on December 18, 2017 as required and are under review.

2

**Recommendation** - It is recommended that the Well Pump Station, Daily Chart-Report include identification if any data gaps, volume of water taken and sent to the distribution system and Differential Pressure readings.

→ Rejected: The current 72 hour report identifies data gaps which are uploaded by SCADA after it's been reviewed and a revised 72 hour report is created. The volume of water taken a day is measured in litres per second that are reported in the Annual Permit to Take Water Report. The amount of water loss is negligible. Differential pressure is monitored by SCADA alarm settings and the amount of daily fluctuation is minimal, if any.



#	Findings:	Status
1	<p><b>Non-Compliance</b> - Non-Compliance - Documentation did not clearly demonstrate that maintenance was completed as per the manufacturers requirements and section 1.6.3 of Schedule C, Licence No. 005-104, Issue No. 2 dated May 30, 2014 and subsequent new Licence No. 005-104 – Issue No. 3 which provided clarification under Schedule E of each Treatment Component and the corresponding Log Removal/Inactivation Credit Assignment Criteria that must be met for the Duty Senior Checks, Calibrations and Operational Requirements sections. Records did show quarterly and monthly reference sensor checks as required.</p> <p>At the time of this inspection the City was reviewing the documentation records to demonstrate the UV maintenance program as per the “Carlisle Drinking Water System Inspection Report” and email entitled “UV Unit Maintenance in the City” dated November 16, 2017 from the MOECC. O.Reg. 128/04 26(2) (d) states: “26. (2) An operator-in-charge shall, (d) ensure that all equipment used in the processes within his or her responsibility is properly monitored, inspected, tested and evaluated and that records of equipment operating status are prepared and available at the end of every operating shift.”</p> <p>Action(s) Required:</p> <p>Ensure that the review and revisions currently underway for UV maintenance and documentation continue by both OIC/ Operations and SCADA departments. Documents need to clearly demonstrate to the OIC/ORO and MOECC that maintenance work and corresponding frequency are completed as per the manufacturer recommendations, outlined in the Operations and Maintenance Manual’s (part # 794330) Maintenance Schedule and Maintenance Logs, including the new requirements of the Licence. An extension to the previous due date was granted to December 15, 2017 for the City to submit a spreadsheet/report to the undersigned officer of how records will demonstrate to the OIC, ORO and MOECC that maintenance was completed as required by manufacturer and/or Licence and any processes implemented as a result of such review.</p>	<p>→ Documents were submitted as required and are under review.</p>

2	<p><b>Recommendation</b> - 72 hour trend review reports should indicate if there are any data losses so that data can be retrieved and reviewed, as required.</p>	<p>→ Rejected: The current 72 hour report identifies data gaps which are uploaded by SCADA after it's been reviewed and a revised 72 hour report is created.</p>
3	<p><b>Recommendation</b> - It is recommended that sampling locations for THMs and HAA be reviewed to ensure samples are collected at the appropriate locations. HAAs will generally form at the beginning of the distribution system. However, if there is rechlorination, high HAAs may be found just past the rechlorination point if the right humic acids are present. Drinking water systems should use this time (results not reportable until January, 2020) to figure out the place of highest potential for elevated HAAs by sampling in different spots in the distribution system to characterize the HAAs in their system.</p>	<p>→ Sampling location meeting held on January 29, 2018.</p>
4	<p><b>Recommendation</b> - An on-site alarm testing frequency by SCADA with operators should be reviewed upon completion of RV Anderson CT calculation review.</p>	<p>→ Rejected: We may look at undertaking this work at a future date.</p>

### 6.5 Water Production Reports - Summary

The following provides a summary of daily flow rates and instantaneous peak flow rates in comparison to the capacity of the water works as identified in the Permit to Take Water. This information is tabulated in the accompanying tables.

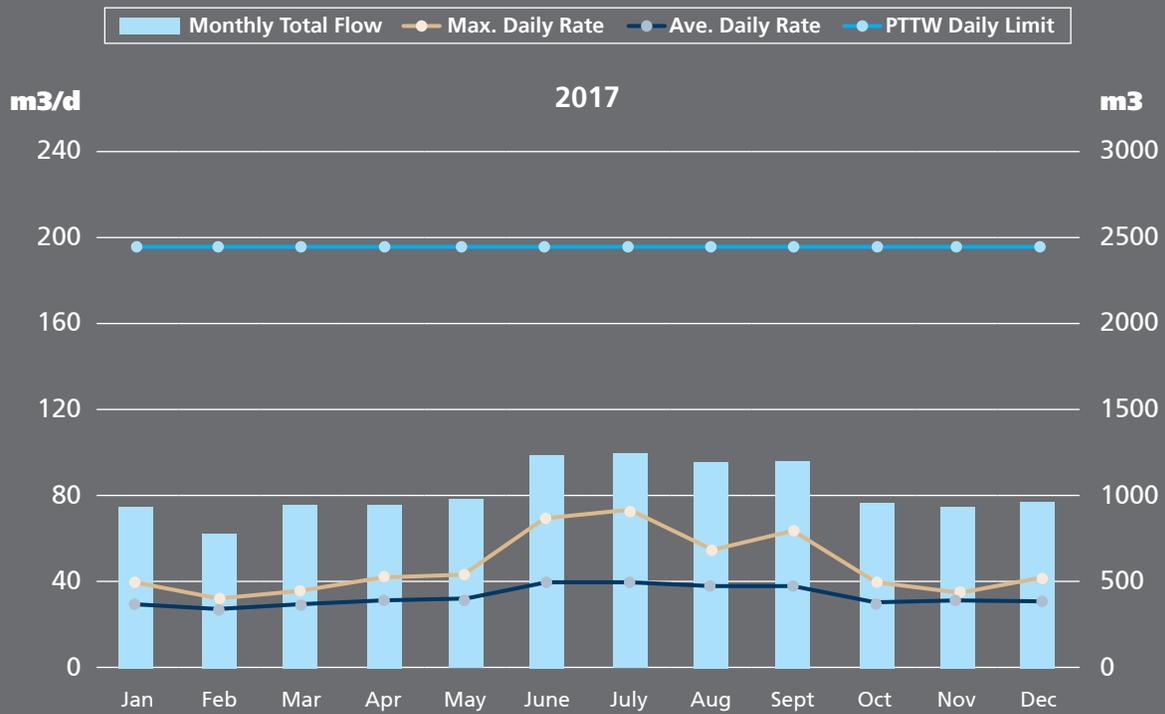


**TABLE 6-1: GREENSVILLE DWS (FDG01) - 2017 DAILY PRODUCTION**

DATE	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
	Amount											
	m <sup>3</sup> /day											
1	37	31	29	33	28	55	35	48	35	38	30	29
2	31	27	30	35	30	70	29	55	25	33	29	35
3	27	29	30	31	30	62	44	39	34	41	31	33
4	32	31	34	27	28	46	31	53	33	33	32	31
5	30	29	36	27	27	28	56	37	28	31	29	30
6	30	25	31	30	30	27	49	39	29	31	29	31
7	39	27	29	28	44	33	54	44	29	30	28	30
8	33	25	30	30	41	31	49	42	29	36	29	31
9	28	24	31	32	33	29	73	35	29	35	33	33
10	29	23	31	28	28	54	42	49	33	26	31	36
11	26	27	30	30	27	65	38	37	43	27	33	30
12	29	29	33	30	30	49	53	29	29	27	35	29
13	27	26	29	33	33	59	28	37	63	27	34	28
14	29	26	30	42	42	36	31	46	29	29	31	28
15	32	24	27	38	29	53	30	31	49	32	31	27
16	27	25	26	38	27	53	42	44	34	30	31	30
17	26	25	31	34	37	58	30	28	46	28	32	31
18	25	30	33	33	38	39	32	27	43	28	33	28
19	25	31	33	27	33	29	41	26	48	30	35	26
20	27	30	30	30	32	29	31	35	52	34	31	27
21	31	27	28	30	30	34	35	29	49	34	28	29
22	33	28	29	30	29	29	27	38	46	30	31	28
23	26	29	30	36	35	30	38	33	46	31	30	33
24	28	28	29	30	32	36	33	35	41	28	30	30
25	32	32	35	30	25	34	30	39	55	29	33	42
26	28	32	34	32	29	29	35	50	54	31	32	42
27	30	27	28	32	28	26	43	35	56	28	30	30
28	32	26	30	28	36	33	43	48	42	30	28	29
29	39		27	31	31	38	41	36	29	32	31	29
30	26		30	31	26	41	46	47	31	30	30	31
31	29		29		31		53	28		28		32
Total	924	773	941	945	978	1,232	1,243	1,197	1,189	957	932	958
Average	30	28	30	31	32	41	40	39	40	31	31	31
Min	25	23	26	27	25	26	27	26	25	26	28	26
Max	39	32	36	42	44	70	73	55	63	41	35	42
PTTW limit	197	197	197	197	197	197	197	197	197	197	197	197

Note: Municipal Drinking Water Licence (005-103) FDG01 Rated Capacity 199 m<sup>3</sup>/ day

FIGURE 6-1: GREENSVILLE DWS (FDG01) - 2017 MONTHLY PRODUCTION (SUMMARY)



**1,243m<sup>3</sup>**  
**July**  
  
**January**  
**924m<sup>3</sup>**

TABLE 6-2: GREENSVILLE DWS (FDG01) - 2017 MONTHLY PRODUCTION (SUMMARY)

FDG01	UNITS	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
Total	m <sup>3</sup>	924	773	941	945	978	1,232	1,243	1,197	1,189	957	932	958
Average	m <sup>3</sup> /d	30	28	30	31	32	41	40	39	40	31	31	31
Maximum	m <sup>3</sup> /d	39	32	36	42	44	70	73	55	63	41	35	42
PTTW	m <sup>3</sup> /d	197	197	197	197	197	197	197	197	197	197	197	197



## 7 - LYNDEN DWS



### 7.1 Operational Upgrades

A project to upgrade the chlorine and electrical systems at the Pumping Station (HD05B) was completed in 2017. A new location for a municipal well has been identified on the same property where the existing production well and treatment building reside. In 2017, the design for the new well pumping station and treatment facility was initiated.

## 7.2 Adverse Water Quality Incidents (AWQI) - Lynden DWS

The following AWQIs were reported to the MOECC SAC and PHS.

Notification Date (m-d-y)	Location of Adverse	AWQI	Resolution
07-14-2017	Lynden Sampling Station B	Total Coliforms = 1 CFU/100mL	→ Resampled adverse location, sampling station A and sampling station D. All results passed. The adverse was not confirmed.

## 7.3 MOECC Drinking Water System (DWS) Inspections

The following findings were issued during the MOECC inspections completed in the 2017 calendar year.

Inspection - January 16, 2017

#	Finding:	Status
1	<p><b>Non-Compliance</b> - There was not sufficient monitoring of flow as required by the Municipal Drinking Water Licence (MDWL) or Drinking Water Works Permit (DWWP).</p> <p>Action 1) Ensure that the treated water flow meter is replaced and spanned appropriately by April 31, 2017.</p> <p>Action 2) Also included in the capital upgrades to Lynden station are modifications to the reservoir levels to ensure that reservoir levels will be recorded in the data logger during power outages.</p>	<p>→ Action 1) The flow meter was replaced on April 18, 2017 and has a new span of 0 to 15 L/s.</p> <p>Action 2) This work was completed as of November 10, 2017. Refer to email from Richard Fletcher to the MOECC Inspector – Shelley Yeudall dated December 6, 2017.</p> <p>→</p>
2	<p><b>Recommendation</b> - Monitor the station discharging and surface water accumulation on the east side of the pump house.</p>	<p>Rejected: The Wells Operator checks the grounds during the weekly inspection / monthly PM. If there are drainage issues they would be identified and addressed.</p> <p>→</p>

3	<p><b>Recommendation</b> - It is recommended that the City consider including m3/day data in the Well Pump Daily Chart-Report.</p>	<p>→ Rejected: Out reporting is based on a rate of flow (litre per second) which is monitored by a SCADA alarm and is reviewed during the 72 hour Report review.</p>
4	<p><b>Recommendation</b> - It is recommended that the specifications of the existing equipment and replaced equipment be recorded on the Form 2 to demonstrate that equipment was replaced with like equipment as per the Permit.</p>	<p>→ Rejected: We follow the requirements for completing Form 2's and capture any changes to the applicable License and Permit.</p>
5	<p><b>Recommendation</b> - It is recommended that the Well Pump Station, Daily Chart-Report include identification if any data gaps are present.</p>	<p>→ Rejected: The current 72 hour report identifies data gaps which are uploaded by SCADA after it's been reviewed and a revised 72 hour report is created.</p>
6	<p><b>Recommendation</b> - At the time of the inspection the City had retained RV Anderson Associates Limited engineering firm to review the CT calculations/engineers reports for all treatment facilities in the City. Once this review is completed, it is recommended that the SCADA Process Control Narratives (PCN) for all stations be reviewed and all alarm settings be reviewed, confirmed and updated with primary disinfection related tags (LO LO reservoir level, HI HI flow and LO LO chlorine residual) with appropriate locks on set points to prevent changes, unless ORO notified. Alarm testing frequency by SCADA with operators should also be reviewed.</p>	<p>→ Completed February 8, 2018.</p>

There was a second inspection December 7, 2017 and there were no findings.

#### 7.4 Water Production Reports - Summary

The following provides a summary of daily flow rates and instantaneous peak flow rates in comparison to the capacity of the water works as identified in the Permit to Take Water. This information is tabulated in the accompanying tables.



**TABLE 7-1: LYNDEN DWS (FDL01) - 2017 DAILY PRODUCTION**

DATE	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
	Amount											
	m <sup>3</sup> /day											
1	89	89	76	78	115	70	124	78	75	95	83	75
2	106	70	71	97	67	78	85	77	80	80	74	88
3	96	86	83	68	85	97	125	76	96	80	77	93
4	85	81	70	89	66	92	83	81	88	76	103	80
5	87	88	93	69	65	66	100	78	73	78	91	75
6	83	75	69	73	93	64	97	76	80	71	91	80
7	84	80	70	83	83	75	90	77	82	80	78	77
8	86	68	81	99	74	71	118	79	75	81	80	79
9	96	75	73	85	76	73	121	75	78	91	64	67
10	69	73	68	71	70	83	110	74	102	75	74	109
11	84	90	93	72	73	68	87	92	78	74	103	79
12	78	73	78	75	65	117	100	78	88	78	79	81
13	79	83	65	81	82	81	71	83	78	70	95	85
14	76	66	86	76	96	85	75	72	83	81	74	79
15	97	71	71	93	97	95	107	84	84	84	74	82
16	84	80	63	72	82	110	78	77	94	81	76	90
17	76	74	85	96	104	117	77	69	87	72	70	90
18	79	76	88	135	95	85	76	68	82	77	85	92
19	106	89	82	115	86	84	80	79	84	75	88	85
20	78	79	72	89	100	78	73	99	79	77	74	83
21	75	65	90	62	92	72	99	80	79	82	73	85
22	109	84	77	94	84	106	78	77	87	81	77	105
23	73	68	67	72	101	75	75	71	91	71	77	102
24	72	65	84	83	63	96	78	72	92	83	78	104
25	88	91	82	73	74	88	78	78	82	90	92	106
26	79	77	90	73	65	87	78	80	93	74	92	96
27	71	84	69	70	96	73	75	87	86	71	73	88
28	89	68	82	70	93	82	77	97	84	87	80	87
29	81		78	69	69	77	133	86	75	92	77	88
30	78		67	85	77	92	93	78	84	80	76	90
31	72		82		75		101	89		79		88
Total	2,608	2,167	2,405	2,466	2,562	2,539	2,842	2,470	2,517	2,466	2,429	2,709
Average	84	77	78	82	83	85	92	80	84	80	81	87
Min	69	65	63	62	63	64	71	68	73	70	64	67
Max	109	91	93	135	115	117	133	99	102	95	103	109
PTTW	327	327	327	327	327	327	327	327	327	327	327	327

Note: Municipal Drinking Water Licence (005-105) FDL01 Rated Capacity 327 m<sup>3</sup>/day

FIGURE 7-1: LYNDEN DWS (FDL01) - 2017 MONTHLY PRODUCTION (SUMMARY)

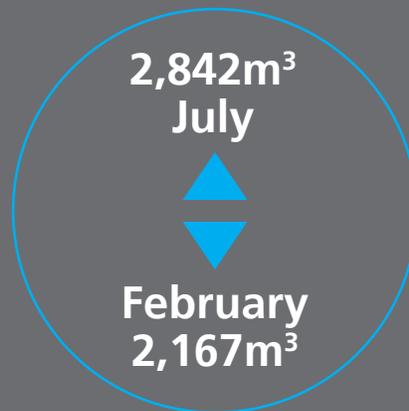
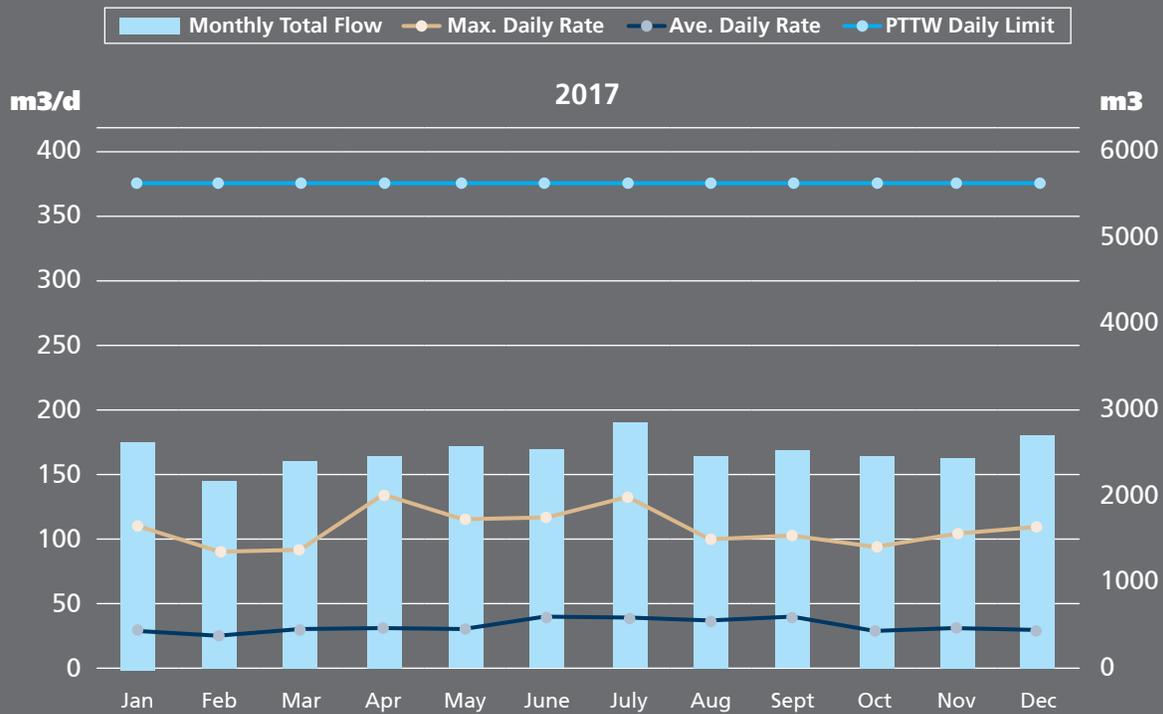


TABLE 7-2: LYNDEN DWS (FDL01) - 2017 MONTHLY PRODUCTION (SUMMARY)

FDL01	UNITS	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
Total	m <sup>3</sup>	2,608	2,167	2,405	2,466	2,562	2,539	2,842	2,470	2,517	2,466	2,429	2,709
Average	m <sup>3</sup> /d	84	77	78	82	83	85	92	80	84	80	81	87
Maximum	m <sup>3</sup> /d	109	91	93	135	115	117	133	99	102	95	103	109
PTTW	m <sup>3</sup> /d	327	327	327	327	327	327	327	327	327	327	327	327

