Township of Southgate

Dundalk Wastewater Treatment Plant

2024 Annual Report

9.7.2 PW2025-006 Dundalk Wastewater 2024 Annual Report

No. 2025-103

Moved By Councillor Ferguson
Seconded By Councillor Shipston

Be it resolved that Staff Report PW2025-006 be received for information; and
That; Council approve the Dundalk Wastewater Treatment Plant 2024 Annual Report.

Carried

Cory Henry
Supervisor Water and Roads

Dundalk Wastewater Treatment Plant
2024 Annual Report

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Overview:
The Dundalk Wastewater Treatment Plant (WWTP) provided treatment in 2024 with an annual average influent daily flow of 1,419 m³/day, a 15.12% increase over the 2023 average influent daily flow of 1,237 m³/day.

Project Description:
The Dundalk WWTP is a four-cell waste stabilization pond facility flowing into an aeration cell pond with a chemical feed system and a flocculation tank with tertiary treatment consisting of sand filters.

Plant Facts:

Facilities: Waste Stabilization Ponds with Tertiary Treatment

Design Capacity: 1832 m³/day

Receiver Water: Foley Drain/Grand River

Environmental Compliance Approval: 5657-9D9LYE

Effluent Requirements:

	Ideal	Maximum	Maximum
Effluent Parameter	**Concentration Objective**	**Monthly Average Concentration (MAC)**	**Monthly Average Loading**
COBD5	5.0 mg/L	10.0 mg/L	18.32 kg/day
Total Suspended Solids (TSS)	5.0 mg/L	10.0 mg/L	18.32 kg/day
Total Phosphorous	0.30 mg/L + 5 degrees Celsius stream temperature 0.60 mg/L - 5 degrees Celsius stream temperature	0.40 mg/L + 5 degrees Celsius stream temperature 0.80 mg/L - 5 degrees Celsius stream temperature	0.73 kg/L + 5 degrees Celsius stream temperature 1.47 kg/L - 5 degrees Celsius stream temperature
Dissolved Oxygen	5.0 mg/L	4.0 mg/L	
Unionized Ammonia	0.05 mg/L	0.1 mg/L	
pH	6.5 to 8.5 at all times	6.0 to 9.5 at all times	

Sampling Requirements:

Sampling Criteria for this system is in accordance with Ministry Policy for the Environmental Compliance Approval (ECA) No. 5657-9D9LYE

Final Effluent:
A grab sample is taken twice a month and tested for CBOD, Suspended Solids, Total Phosphorus, Total Ammonia Nitrogen, Ecoli, pH and temperature.

On site testing is performed twice a week on final effluent for Total Ammonia to determine Unionized Ammonia through lab testing, pH, temperature, and Dissolved Oxygen.

Raw Sewage:
A grab sample is taken monthly and tested for BOD, Suspended Solids, Total Kjeldahl Nitrogen and Total Phosphorus.

Effluent Flows:
The total effluent flow treated in 2024 was 498,096 m^3. The annual average daily flow was 1,727 m^3/day, which results in a 29.49% increase of total effluent over 2023.

Raw Sewage Quality:
- Annual average raw sewage BOD concentration to the lagoon system was 154.3 mg/l.
- Annual average raw sewage suspended solids (TSS) concentration to the lagoon system was 271.4 mg/l.
- Annual average raw total phosphorus was 4.64 mg/l concentration to the lagoon system.
- Annual average Total Kjeldahl Nitrogen (TKN) concentration was 54.1 mg/l.

Plant Performance and Effluent Quality:
- Annual average effluent CBOD concentration was 3.2 mg/l.
- Annual average effluent total suspended solids (TSS) concentration was 5.67 mg/l day with a removal efficiency of 97.24% with an annual monthly average loading of 11.3 kg/day.
- Annual average effluent total phosphorus concentration was 0.05 mg/l day with a removal efficiency of 98.65% with an annual monthly average loading of 0.10 kg/day.
- Annual average effluent concentration for Ammonia-nitrogen was 5.20 mg/l.
- Annual average Unionized Ammonia was 0.063026 mg/l.
- Annual average pH was 8.00.
- Annual monthly average Ecoli was 38 with the low being 2 and the high being 160.
- The summary for 2024 of the data for the systems plant operation performance is enclosed in this report.

Maintenance and Calibration Activities:

Regular monthly preventative maintenance and calibration of test equipment and flow meters are performed by municipal staff and outside certified suppliers.

Third party annual calibrations were performed on October 30, 2024.

There was 1 by-pass event to report – By-pass event occurred for Cells 1 & 4 from April 19th to 26th, 2024. Additionally, there was a MECP approved emergency discharge event due to lagoon cell capacities beginning April 12 and ending on May 29, 2024.

Details of these events are as follows:

An Emergency Discharge Event (EDE), through the filters, was initiated on April 12, 2024, prompted by alarmingly high-water levels across all Lagoon Cells, coupled with an inability to discharge due to effluent not meeting prescribed limits stipulated in the ECA for: Un-ionized ammonia (UIA), limit of 0.1 mg/L and Total Suspended Solids (TSS) limit of 10 mg/L.

Observations on April 18 at 11:30am, revealed an overflow of raw sewage from the Cell 1 inlet structure.

To reduce/eliminate this overflow and mitigate the risks of berm breaching or structural compromise on the lagoons, discharge from Cell 4 commenced on April 19.

By April 23, the spill had stopped, with an estimated spill volume of 1,294m3.

Persistently high-water levels justified the continued discharge from Cell 4 until April 26 in an estimated total volume of 23,949m3, bypassing Cell 5 and the filtration system.

In the beginning of May, consultations with OCWA, GRCA and WaterIQ Technologies yielded the idea of deploying an ultrasonic device in Cell 4 to mitigate algae growth, thereby modulation pH, implemented on May 3.

Concurrently, a subsequent application of alum in Cells 3 and 4 demonstrated promising results, with effluent parameter showing favorable trend towards compliance.

Upon ending the EDE, normal operations resumed at the Dundalk WWTF, with effluent parameters consistently meeting the ECA requirements.

The EDE concluded on May 29, due to concerns regarding reduced effluent receiver flows and higher ambient temperatures.

Duration of EDE: 41 days

A total volume of 144,456m3 was discharged, inclusive of the 23,949m3 from Cell 4.

The Township and Triton Engineering have developed a mitigation plan including enhanced monitoring and reporting to the MECP.

There were 6 operator shutdowns in 2024.

Please reference below table for shutdowns and limit exceedances for 2024.

2024 Wastewater effluent parameters compliance exceedances and shutdowns

	Monthly Average Effluent Concentration					Monthly Average Effluent Loading (kg/d)				
	COBD5	TSS	TP	Unionized Ammonia	pH	COBD5	TSS	TP	Lagoon Shutdown Duration	Comments
	Limit	Limit	Limit	Limit	Limit	Limit	Limit	Limit		
	10.0 mg/day	10.0 mg/L	0.4 mg/L - > 5 C 0.8 mg/L - < 5 C	0.05 mg/L = daily testing 0.13 mg/L = proactive shutdown 0.15 mg/L = shutdown	< 6.0 or > 9.5	18.32 kg/day	18.32 kg/day	0.4 kg/L - > 5 C 0.8 kg/L - < 5 C		
JAN				0.056			21.3		27	4 days over 0.05mg/L UIA 23 days over 10mg/L TSS 4 days TSS Loading
FEB				0.07			17.6		23	9 days over 10mg/L TSS 7 days <0.1mg/L UIA 7 days >0.1 mg/L UIA
MAR				0.142			21.8		30	14 days over 0.1mg/L 1 days TSS loading
APR				0.185			16.3		7	2 days over 0.15mg/L 5 days over 0.15mg/L
MAY				0.171						15 days over 0.15mg/L
JUN										
JUL										
AUG										
SEP										
OCT										
NOV										
DEC										

Note: If daily testing for unionized ammonia occurs on a Friday we shut down for the weekend.

- Shutdown due to exceedance.

- Shutdown as a proactive measure due to approching an exceedance.

Note: April 12, 2025, MECP approval to emergency discharge due to zero capacity. Emergency discharge ended May 29, 2025.
Note: MECP inspector interpretation of C of A, unioized ammonia limit, allows discharge of effluent with <0.15mg/L.

There were loading exceedances in January and March for effluent suspended solids. We discharged for 4 days in January and 1 day in March.

Discussion:

The Dundalk Wastewater Treatment upgrades are awaiting Ministry approval of the ECA amendment for the Dundalk Sewage Works.

Upon issuance of the ECA amendment, Triton Engineering will release the tender documents, followed by award of the contract by Southgate Council. Construction is anticipated for 2025 for the first phase of the upgrades.

Installation of a new influent sewage pumping station to manage increased flow effectively. Additionally, enhancements such as incorporation of additional aeration and a floating cover in the final cell of the lagoons, will aid in algae removal, thus improving overall treatment efficiency.

A major component of this project is the construction of a 22m x 5.5m concrete tank utilizing advanced Moving Bed Biofilm Reactor (MBBR) technology, which will optimize ammonia reduction.

Upgrading the tertiary media filter to a state-of-the-art disk filter system will ensure effective removal of Total Suspended Solids.

Finally, implementing a new Ultraviolet (UV) disinfection system will play a critical role in reducing E.coli levels, thereby enhancing the quality of treated wastewater.

This expansion is expected to increase the treatment capacity of the facility by over 65% form 1832m3/day to 3025m3/day.

The Township of Southgate received from the MECP a Consolidated Linear Infrastructure – Environmental Compliance Approval (CLI-ECA) for the Municipal Sewage Collection System, ECA Number 110-W601, issued March 2, 2023.

Township of Southgate - Village of Dundalk

2024 General Wastewater Information

Plant # : 0-101006-67

ECA # : 5657-9D9LYE

Population: 2,803 (Village of Dundalk)

Flows

	Design		2024	2023	2022	2021	2020	2019	2018	2017
Capacity:	208,500									
Influent Average Daily:	-	m^3	1,419	1,237	990	1,220	1,161	1,114	1,105	1,168
Annual Influent Flow:	668,600	m^3	518,945	450,793	360,770	446,719	425,922	405,664	401,279	424,727
Influent Maximum Daily:	-	m^3	5,736	4,017	3,247	6,740	4,510	3,989	9,022	6,362
Effluent Average Daily (days operating):	1,832	m^3	1,785	1,497	1,196	2,096	1,087	1,315	1,355	1,230
Annual Effluent Flow:	-	m^3	498,096	384,666	312,215	470,150	396,688	407,659	404,853	420,598
% Discharge vs. Total Capacity:	-		74.5%	57.5%	46.7%	70.3%	59.3%	61.0%	60.6%	62.9%
Influent Increase 2024 over 2023:	-		15.12%	24.95%	-19.24%	4.88%	4.99%	1.09%	-5.52%	17.94%
Effluent Increase 2024 over 2023:	-		29.49%	23.21%	-33.59%	18.52%	-2.69%	0.69%	-3.74%	25.67%

Township of Southgate
Loading Report - Dundalk Wastewater Plant

Municipality: Township of Southgate Year: 2024
Plant: Dundalk Wastewater Treatment Lagoons & Collection System
Plant # : 0-101006-67
Works # : 110001471
System Description : Faculative Lagoons & Sand Filters

	Loading Influent			Effluent Loading		
Month	BOD kg/day	SS kg/day	T Phos. kg/day	Effluent CBOD kg/day	Effluent SS kg/day	Effluent T Phos. kg/day
January	206.6	342.7	6.0	8.5	21.3	0.17
February	197.1	320.5	5.5	8.8	17.6	0.20
March	293.3	276.9	7.6	7.6	21.8	0.23
April	324.0	628.0	7.5	8.2	16.3	0.22
May	281.8	384.2	7.4	7.7	9.2	0.05
June	211.3	469.6	4.6	7.2	8.4	0.05
July	183.5	377.7	5.7	5.9	5.9	0.06
August	133.8	248.7	5.6	5.8	7.7	0.06
September	140.3	244.0	5.3	4.5	5.9	0.04
October	177.2	340.9	5.5	3.0	7.5	0.07
November	177.4	371.7	6.6	2.5	5.5	0.03
December	196.6	273.5	5.7	4.4	8.0	0.04
Total	2522.7	4278.4	72.8	74.1	135.3	1.22
Average	210.2	356.5	6.1	6.2	11.3	0.10
Maximum	324.0	628.0	7.6	8.8	21.8	0.23

PS = Plant Shutdown
= loading exceedance

Township of Southgate
Performance Report - Dundalk Wastewater Plant

Municipality: Township of Southgate
Plant: Dundalk Wastewater Treatment Lagoons & Collection System
Plant # : 0-101006-67
Works # : 110001471
System Description : Faculative Lagoons & Sand Filters

Year: 2024
Receiver: Foley Drain - Grand River
Design Average Day Flow (m3): 1832

	Flows				Discharge	Bio-Chemical Oxygen Demand			Suspended Solids			Phosphorus			E Coli	Temperature	Nitrogen Series			Loading		
	Raw			Effluent	Duration	Avg. Raw	Avg Effluent	Percent	Avg. Raw	Avg. Effluent	Percent	Avg. Raw	Avg. Effluent	Percent	average	< 5 C.	TKN	Avg. Effluent	Unionized	Effluent	Effluent	Effluent
Month	Total Flow m3	Avg. Flow m3	Max. Flow m3	Total Flow m3	Days	BOD mg/l	CBOD mg/l	Removal	SS mg/l	SS mg/l	Removal	T. Phos mg/l	T. Phos mg/l	Removal	Effluent Count	or > 5 C.	mg/l	$NH_3 + NH_4$ mg/l	Ammonia mg/l	CBOD kg/day	SS kg/day	T Phos. kg/day
January	47422	1530.00	2400.00	8523	4	135.0	4.0	97.04%	224.0	10.0	95.54%	3.90	0.08	97.95%	90	2.5	40.5	9.84	0.056067	8.5	21.3	0.2
February	49695	1714.00	2952.00	12545	5.7	115.0	4.0	96.52%	187.0	8.0	95.72%	3.20	0.09	97.19%	5	3.2	30.1	10.84	0.070844	8.8	17.6	0.2
March	63590	2051.0	2557.0	1894	1	143.0	4.0	97.2%	135.0	11.5	91.5%	3.7	P/S	96.8%	43	4.9	38.5	14.75	0.142809	7.6	21.8	0.2
April	74745	2492.00	5736.00	55963	23.3	130.0	3.4	97.38%	252.0	6.8	97.30%	3.00	0.09	97.00%	54	7.8	33.9	13.42	0.185293	8.2	16.3	0.2
May	49617	1601.00	3018.00	79545	31	176.0	3.0	98.30%	240.0	3.6	98.50%	4.60	0.02	99.57%	8	16.6	43.3	9.21	0.171087	7.7	9.2	0.1
June	35214	1174.00	1636.00	72384	30	180.0	3.0	98.33%	400.0	3.5	99.13%	3.90	0.02	99.49%	79	20.3	61.2	2.06	0.051982	7.2	8.4	0.0
July	33252	1073.00	2284.00	61351	31	171.0	3.0	98.25%	352.0	3.0	99.15%	5.30	0.03	99.43%	9	23.0	70.0	0.61	0.004138	5.9	5.9	0.1
August	32408	1045.00	1553.00	59878	31	128.0	3.0	97.66%	238.0	4.0	98.32%	5.40	0.03	99.44%	4	21.5	56.4	0.43	0.002573	5.8	7.7	0.1
September	25505	850.00	1025.00	44535	30	165.0	3.0	98.18%	287.0	4.0	98.61%	6.20	0.03	99.52%	2	18.9	78.7	0.05	0.001687	4.5	5.9	0.0
October	24853	802.00	949.00	31111	31	221.0	3.0	98.64%	425.0	7.5	98.24%	6.80	0.07	98.97%	4	11.6	87.4	0.80	0.012730	3.0	7.5	0.1
November	31866	1062.00	1403.00	25216	30	167.0	3.0	98.20%	350.0	6.5	98.14%	6.20	0.04	99.35%	2	5.9	74.7	3.6	0.027533	2.5	5.5	0.0
December	50778	1638.00	3615.00	45151	31	120.0	3.0	97.50%	167.0	5.5	96.71%	3.50	0.03	99.14%	160	1.0	35.3	6.33	0.029574	4.4	8.0	0.0
Total	518945			498096	279.0																	
Average	43245	1419		41508		154.3	3.3	97.77%	271.4	6.2	97.24%	4.64	0.05	98.65%	38	11.4	54.1	6.00	0.063026	6.2	11.3	0.1
Maximum	74745	2492	5736	79545		221.0	4.0		425.0	11.5		6.80	0.09		160	23.0	87.4	14.75	0.185293	8.8	21.8	0.2

PS = Plant Shutdown

Township of Southgate
Annual Report - Dundalk Wastewater Plant

Plant: Dundalk Wastewater Treatment Lagoons & Collection System
Works: 110001471
Year: 2024
Location Type: Final Effluent Discharge Report

Month	Discharge Duration Days	Total Effluent m^3	Total Coagulant Used (kg)	Average Coagulant Dosage (mg/l)	Average CBOD mg/l	Average SS mg/l	Average T. Phos. mg/l	Average NH_3 + NH_4 as N (mg/l)	E Coli average Count	Average pH Reports	Average Temp. C	Average D.O. mg/l
January	4	8523	0.20	15.3	4.0	10.0	0.08	9.84	90	8.01	2.50	10.17
February	5.7	12545	0.29	14.8	4.0	8.0	0.09	10.84	5	8.01	3.20	9.53
March	1	1894	0.05	17.2	4.0	11.5	0.12	14.75	43	8.07	4.90	8.63
April	23.3	55963	1.17	13.5	3.4	6.8	0.09	13.42	54	8.08	7.80	10.30
May	31	79545	1.55	12.7	3.0	3.6	0.02	9.21	8	8.12	16.60	7.79
June	30	72384	1.50	13.5	3.0	3.5	0.02	2.06	79	7.88	20.30	7.02
July	31	61351	1.55	16.4	3.0	3.0	0.03	0.61	9	7.72	23.00	7.26
August	31	59878	1.55	16.8	3.0	4.0	0.03	0.43	4	8.06	21.50	7.40
September	30	44535	1.50	21.9	3.0	4.0	0.03	0.05	2	8.05	18.90	7.34
October	31	31111	1.55	32.4	3.0	7.5	0.07	0.80	4	8.02	11.60	8.80
November	30	25216	1.50	38.7	3.0	6.5	0.04	3.61	2	8.05	5.90	10.55
December	31	45151	1.55	22.3	3.0	5.5	0.03	6.33	160	8.04	1.00	12.69
Total	279	498096	13.95									
Average		45109	1.26	19.84	3.22	5.67	0.05	5.20	38	8.00	12.03	8.99
Maximum		79545			4	11.5	0.12	14.75	160	8.12	23.00	12.69

PS = Plant Shutdown

Township of Southgate - Village of Dundalk

Annual Report - Dundalk Wastewater Plant

Plant: Dundalk Wastewater Treatment Lagoons & Collection System
Works: 110001471
Classification: Class 1 Wastewater Collection & Class 1 Wastewater Treatment
Receiver Foley Drain to Grand River

Year: 2024
Population Served: 2803

Raw Sewage Parameters		January	February	March	April	May	June	July	August	September	October	November	December	Summary
	Average	135	116	143	136	223	180	171	123	165	220	167	120	158
BOD	Minimum	129	113	140	106	98	138	136	95	148	186	160	73	127
mg/l	Maximum	140	118	145	165	348	222	205	150	182	254	174	167	189
Suspended	Average	224	187	135	336	255	400	353	250	288	425	350	168	281
Solids	Minimum	158	186	124	122	164	250	235	170	280	415	330	110	212
mg/l	Maximum	290	188	146	550	345	550	470	330	295	435	370	225	350
	Average	40.5	30.1	38.5	37.9	40.1	61.2	70.0	47.5	78.7	87.4	74.7	35.3	53.5
TKN	Minimum	38.6	29.4	24.2	26.9	20.5	50.1	51.6	43.2	59.1	82.1	47.4	20.3	41.1
mg/l	Maximum	42.4	30.7	52.7	48.9	59.7	72.2	88.4	51.7	98.3	92.7	102.0	50.2	65.8
Total	Average	3.87	3.28	3.68	2.51	4.16	3.88	5.25	5.48	6.27	6.79	6.29	3.46	4.57
Phosphorus	Minimum	3.75	3.12	1.94	0.77	2.47	1.61	3.70	4.23	5.94	5.91	4.31	2.12	3.32
mg/l	Maximum	3.98	3.44	5.41	4.25	5.85	6.14	6.80	6.73	6.59	7.67	8.27	4.79	5.83

PS = Plant Shutdown

Township of Southgate - Village of Dundalk

Annual Report - Dundalk Wastewater Plant

Plant: Dundalk Wastewater Treatment Lagoons & Collection System
Works: 110001471
Classification: Class 1 Wastewater Collection & Class 1 Wastewater Treatment
Receiver Foley Drain to Grand River

Year: 2024
Population Served: 2803

Final Effluent Parameters		January	February	March	April	May	June	July	August	September	October	November	December	Summary
	Average	4.0	4.0	4.0	3.5	3.0	3.0	3.0	3.5	3.0	3.0	3.0	3.0	3.3
CBOD	Minimum	4.0	3.0	3	3	3.0	3.0	3	3.0	3.0	3.0	3.0	3.0	3.0
mg/l	Maximum	4.0	5.0	5	4	3.0	3.0	3	4.0	3.0	3.0	3.0	3.0	5.0
Suspended	Average	8.5	8.0	11.5	7.0	4.5	3.5	3.0	4.0	4.0	7.5	6.5	5.5	6.1
Solids	Minimum	3.0	6.0	11	3	3.0	3.0	3	3.0	3.0	5.0	3.0	3.0	3.0
mg/l	Maximum	14.0	10.0	12	11	6.0	4.0	3	5.0	5.0	10.0	10.0	8.0	14.0
	Average	9.4	10.8	14.8	13.4	9.0	2.1	0.6	0.5	0.1	0.8	3.6	6.3	5.95
NH3 + NH4	Minimum	7.54	6.88	14	12.5	5.75	0.40	0.37	0.11	0.05	0.47	3.03	4.89	0.05
mg/l	Maximum	11.30	14.80	15.5	14.2	12.30	3.71	0.85	0.90	0.05	1.13	4.19	7.78	15.50
	Average	11.85	12.95	19.00	16.50	9.45	2.60	1.50	1.85	1.15	2.65	5.00	9.15	7.80
TKN	Minimum	11.10	7.90	17.9	12.4	5.60	1.10	1.3	1.40	1.10	2.20	4.70	7.50	1.10
mg/l	Maximum	12.60	18.00	20.1	20.6	13.30	4.10	1.7	2.30	1.20	3.10	5.30	10.80	20.60
Total	Average	0.09	0.10	0.13	0.11	0.02	0.02	0.03	0.04	0.03	0.07	0.04	0.03	0.06
Phosphorus	Minimum	0.06	0.07	0.11	0.04	0.01	0.02	0.02	0.03	0.03	0.06	0.03	0.02	0.01
mg/l	Maximum	0.11	0.12	0.14	0.17	0.03	0.02	0.03	0.04	0.03	0.07	0.04	0.04	0.17
	Average	133.00	5.00	43.00	69.00	12.00	79.00	9.00	4.50	2.00	4.00	2.00	160.00	44
Ecoli	Minimum	2	4	2	2	2	2	2	3	2	2	2	2	2
	Maximum	264	6	84	136	22	156	16	6	2	6	2	318	318
pH Lab Results	Average	8.05	8.01	8.07	8.08	8.16	7.88	7.72	8.08	8.05	8.03	8.05	8.04	8.02
(In-house testing	Minimum	8.01	7.96	8.03	8.02	8.02	7.79	7.45	7.99	8.04	8.00	8.00	7.92	7.45
not included)	Maximum	8.08	8.05	8.1	8.13	8.29	7.97	7.98	8.16	8.06	8.06	8.09	8.16	8.29
	Average	11.55	9.80	8.85	10.10	7.80	7.05	7.20	7.30	7.10	8.55	10.15	10.75	8.85
DO	Minimum	9.10	5.80	6	8.8	6.90	6.00	5.8	6.00	5.50	5.80	7.20	7.59	5.50
mg/l	Maximum	14.00	13.80	11.7	11.4	8.70	8.10	8.6	8.60	8.70	11.30	13.10	13.90	14.00
Unionized	Average	0.076550	0.088350	0.148300	0.218650	0.235040	0.054700	0.004730	0.002650	0.002380	0.017740	0.034000	0.025185	0.075690
Ammonia	Minimum	0.040300	0.030000	0.016600	0.088900	0.045380	0.002300	0.000860	0.000500	0.000059	0.000080	0.013100	0.006900	0.000059
mg/l	Maximum	0.112800	0.146700	0.280000	0.348400	0.424700	0.107100	0.008600	0.004800	0.004700	0.035400	0.054900	0.043470	0.424700

PS = Plant Shutdown