

# MARYLAND DEPARTMENT OF THE ENVIRONMENT

Land Management Administration • Resource Management Program

Summary of Sewage Sludge Plant Available Nitrogen (PAN) Calculations For CY- 2024  
 (Results of Sewage Sludge Analyses From 9/16/2021 to 9/15/2023 Used to calculate these rates)

Wastewater Treatment Plant	County	Sewage Sludge Type	Earliest Analysis	Latest Analysis	No. of Analyses	Organic Nitrogen	PAN K=1	PAN K=0.5	% P <sub>2</sub> O <sub>5</sub>	% K <sub>2</sub> O	% Solid Content	CCE
<b>Annapolis</b>	Anne Arundel											
Cake		LS	09/21/2021	05/15/2023	11	4.0818	26.93		4.2086	0.1787	25.33	23.54
<b>Back River</b>	Baltimore											
Cake		An Dig	09/30/2021	07/31/2023	22	4.4064	28.42		6.1977	0.1733	21.24	0.00
<b>Ballenger Creek</b>	Frederick											
Cake		LS	10/05/2021	08/01/2023	22	3.1839	20.35		3.0243	0.2510	28.77	23.62
<b>Bowie</b>	Prince George's											
Cake		LS	11/29/2021	04/26/2023	7	4.7377	29.39		4.9115	0.3382	19.00	23.59
<b>Broadneck</b>	Anne Arundel											
Cake		LS	09/22/2021	05/15/2023	10	4.2452	27.01		4.8617	0.2594	20.53	21.87
<b>Broadwater</b>	Anne Arundel											
Cake		LS	11/16/2021	05/18/2023	6	2.6403	17.20		2.8427	0.1246	31.35	31.93
<b>Cox Creek</b>	Anne Arundel											
Cake		LS	09/21/2021	03/21/2023	10	3.9452	25.15		4.0785	0.3328	25.01	25.85
<b>Damascus</b>	Montgomery											
Cake		LS	10/07/2021	07/05/2023	22	5.0952	33.66		6.9637	0.4963	19.10	53.75

Plant Available Nitrogen (PAN) is in terms of pounds of available nitrogen per dry ton of sewage sludge. LS (Lime Stabilized), An Dig (Anaerobically Digested), Ae Dig (Aerobically Digested), Organic nitrogen (NO) is expressed in percent of dry weight of sewage sludge, NO = TKN - NH<sub>4</sub> - NO<sub>3</sub>, TKN (Total Kjeldahl Nitrogen), NH<sub>4</sub> (Ammonium), NO<sub>3</sub> (Nitrate).

K=1 (Volatilization Factor for incorporated liquid and dewatered sewage sludge applied in any manner), K=0.5 (Volatilization Factor for surface applied liquid sewage sludge), P<sub>2</sub>O<sub>5</sub> (% Available Phosphate), K<sub>2</sub>O (% Water Soluble Potash), CCE (% Calcium Carbonate Equivalent, it is the neutralizing power per weight of material of the lime stabilized sewage sludge relative to pure calcium carbonate CaCO<sub>3</sub>). P<sub>2</sub>O<sub>5</sub> = [(%TP)\*2.29], while K<sub>2</sub>O = [(%TK)\*1.2], %TP (Percent Total Phosphorus), and %TK (Percent Total Potassium).

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<b>Deep Creek Lake</b>	Garrett											
Cake		Ae Dig	10/06/2021	10/12/2022	2	3.2094	24.67		16.0415	0.3588	19.10	0.00
<b>Dorsey Run Advanced</b>	Anne Arundel											
Cake		LS	10/22/2021	04/26/2023	7	2.4775	17.14		3.2214	0.1920	24.26	30.31
<b>Frederick</b>	Frederick											
Cake		An Dig	11/04/2021	07/05/2023	11	5.2229	38.87		9.1683	0.2769	18.40	4.57
<b>Freedom District</b>	Carroll											
Cake		LS	10/19/2021	04/05/2023	7	3.6002	24.97		4.4459	0.2863	26.21	29.74
<b>Grantsville</b>	Garrett											
Liquid		Ae Dig	04/20/2022	04/25/2023	3	5.8390	51.05	44.47	5.2899	0.5684	1.33	0.00
<b>Havre de Grace</b>	Harford											
Cake		Ae Dig	11/04/2021	04/19/2023	7	3.7220	31.04		5.2801	0.4097	20.63	23.10
<b>Leonardtown</b>	St. Mary's											
Cake		Ae Dig	03/01/2022	03/29/2023	2	2.4850	26.21		5.4960	0.3600	34.70	3.50
Liquid		Ae Dig	10/05/2021	10/26/2022	2	3.7955	53.86	38.36	9.3890	0.5760	14.00	6.00
<b>Little Patuxent</b>	Howard											
Cake		An Dig	09/01/2022	04/12/2023	5	4.6559	36.95		8.3264	0.2527	65.08	7.24
<b>Marlay-Taylor Water Reclamation Facility</b>	St. Mary's											
Cake		An Dig	10/05/2021	04/19/2023	7	3.7662	35.17		5.4862	0.1697	19.91	0.00
<b>Maryland City Water Reclamation Facility</b>	Anne Arundel											
Cake		LS	11/15/2021	05/15/2023	7	4.9881	31.11		4.5473	0.4027	21.17	25.83

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<b>Maryland Correctional Institution (MCI)</b>	Washington											
Cake		LS	10/05/2021	07/25/2023	8	3.2142	22.86		4.6458	0.2468	20.95	28.24
<b>Mattawoman</b>	Charles											
Cake		LS	01/24/2022	07/11/2023	10	3.4332	26.63		2.3221	0.1114	40.76	29.60
<b>Mount Airy</b>	Carroll											
Cake		LS	11/04/2021	05/08/2023	7	4.8811	34.21		4.8875	0.5182	25.32	31.32
<b>Mount Saint Mary's University</b>	Frederick											
Liquid		Ae Dig	01/19/2022	04/10/2023	2	2.5640	93.50	90.69	4.1106	0.7716	0.80	0.00
<b>Ocean City</b>	Worcester											
Cake		LS	09/27/2021	04/17/2023	19	2.4473	17.75		2.0916	0.1935	44.13	54.65
<b>Parkway</b>	Prince George's											
Cake		LS	11/16/2021	07/18/2023	11	4.8281	30.82		5.3857	0.1298	26.52	39.56
<b>Patuxent</b>	Anne Arundel											
Cake		LS	09/21/2021	05/16/2023	10	5.2111	32.66		4.2869	0.3309	20.97	25.00
<b>Piscataway</b>	Prince George's											
Cake		LS	09/21/2021	07/18/2023	45	4.8115	29.97		4.1724	0.1060	25.83	26.83
<b>QA 1-Kent Island</b>	Queen Anne's											
Cake		Ae Dig	11/08/2021	06/30/2023	7	4.6184	33.06		7.9725	0.5395	18.46	0.00
<b>Rock Hall</b>	Kent											
Cake		Ae Dig	09/20/2022	09/20/2022	1	1.1800	7.08		6.0374	0.2509	22.00	0.00

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<b>Seneca Creek</b>	Montgomery											
Cake		LS	09/21/2021	07/18/2023	42	5.6661	38.31		5.9011	0.4957	24.40	38.51
<b>Sod Run</b>	Harford											
Cake		An Dig	10/04/2021	08/07/2023	23	4.5272	32.71		7.8577	0.1480	21.35	0.00
<b>Taneytown</b>	Carroll											
Cake		Ae Dig	03/21/2022	07/27/2023	2	4.5999	36.40		7.3967	0.4806	19.45	0.00
<b>Upper Potomac River Commission/Westernport</b>	Allegany											
Cake		Ae Dig	11/15/2021	11/15/2021	1	2.0497	15.30		2.0610	0.0828	24.90	0.00
<b>Valley Forge Sewage Authority</b>	Outside of Maryland											
Cake		LS	10/07/2021	12/06/2022	15	4.1553	27.63		1.6595	0.1432	31.34	28.85
<b>Wicomico Shores</b>	St. Mary's											
Cake		Ae Dig	04/14/2023	04/14/2023	1	3.7100	26.06		1.1450	0.1560	69.80	0.00
Liquid		Ae Dig	07/25/2022	07/25/2022	1	4.8000	50.80	39.80	2.5190	2.8800	12.30	0.00

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