Emergency PFAS Treatment at Well 7

ANTHONY EAGAN, P.E.
D&B ENGINEERS AND ARCHITECTS, D.P.C.
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Engineering Excellence Awards

Overview

- Introduction and Background
- Emerging Contaminations Regulations
- Project Sequence and Timeline
- Hardships
- Lessons Learned
- What's Next?
- Questions

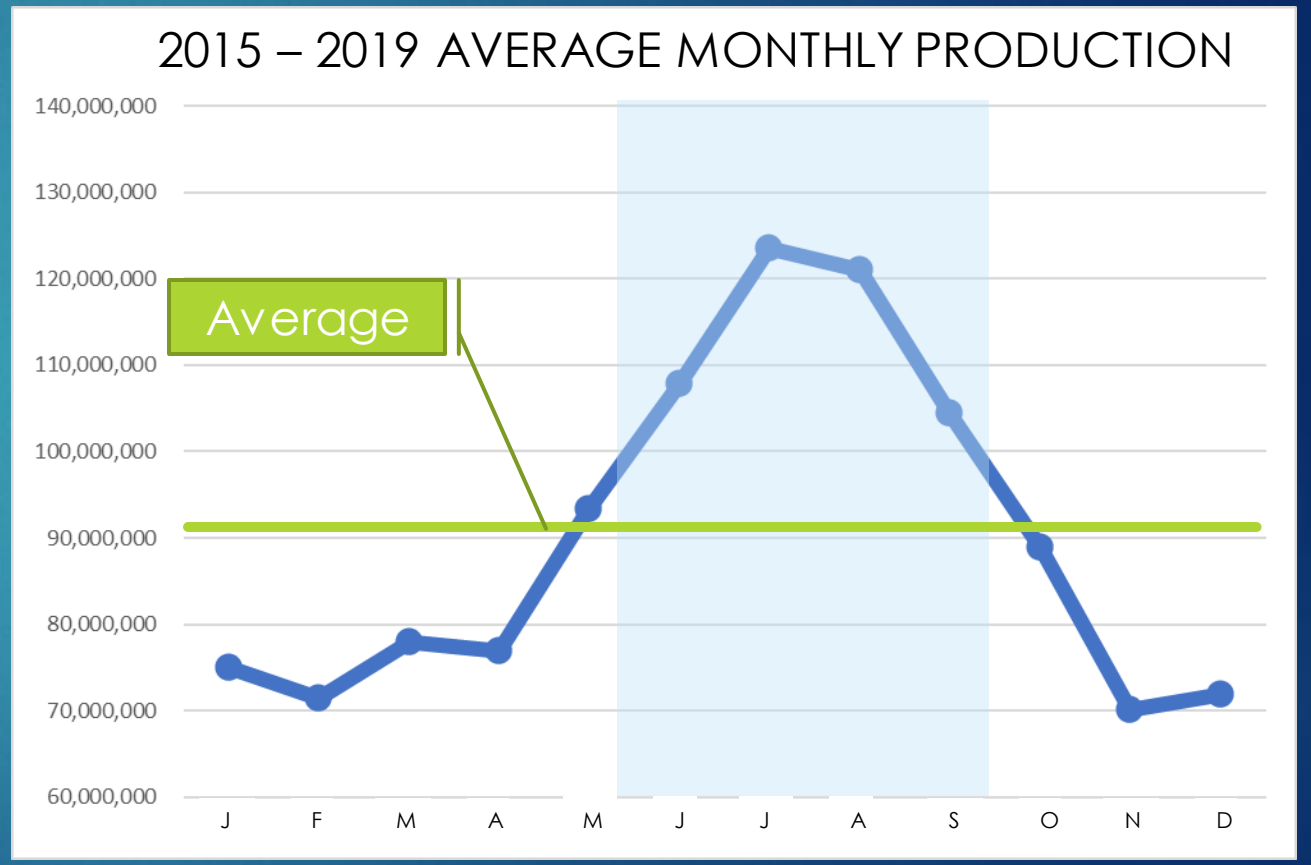
INTRODUCTION AND BACKGROUND

- Village of Mineola, Nassau County
- 1.9 square miles
- Population: ±21,000 persons
- 5,750 service connections
- 10.2 MGD permitted capacity – 7 Wells
- 6.62 MGD effective capacity – 5 Wells

INTRODUCTION AND BACKGROUND

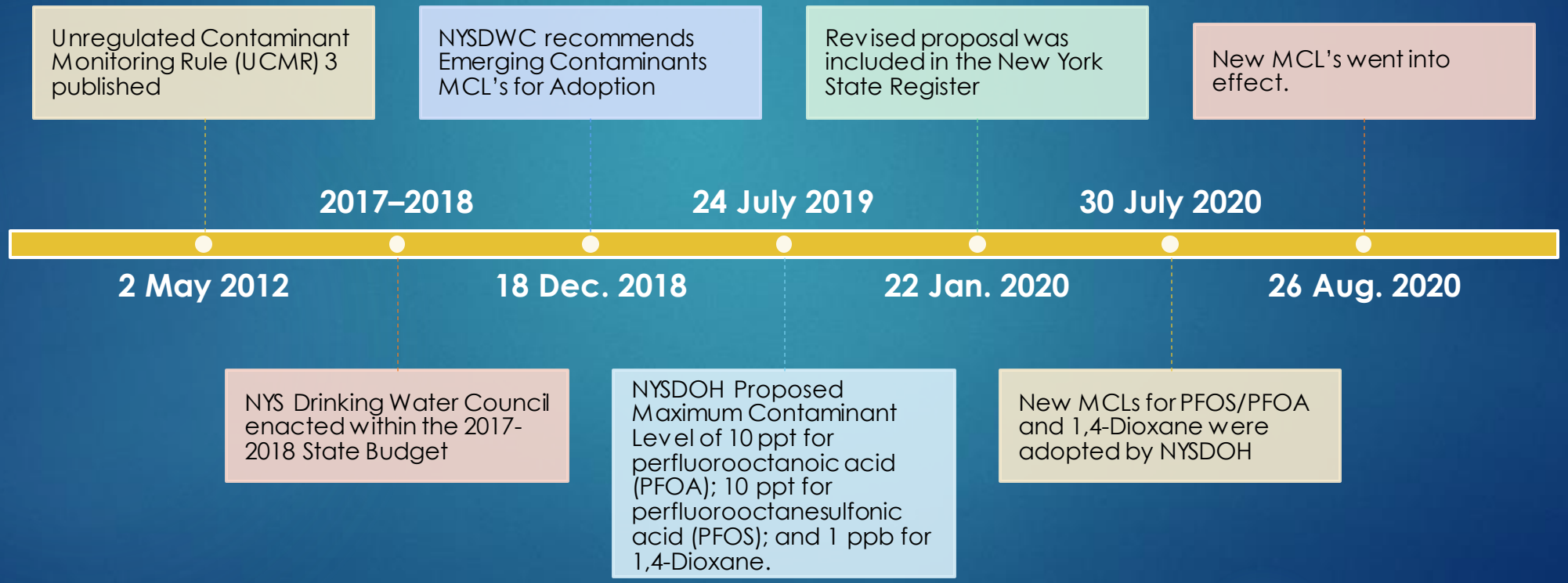
ANNUAL USAGE DATA

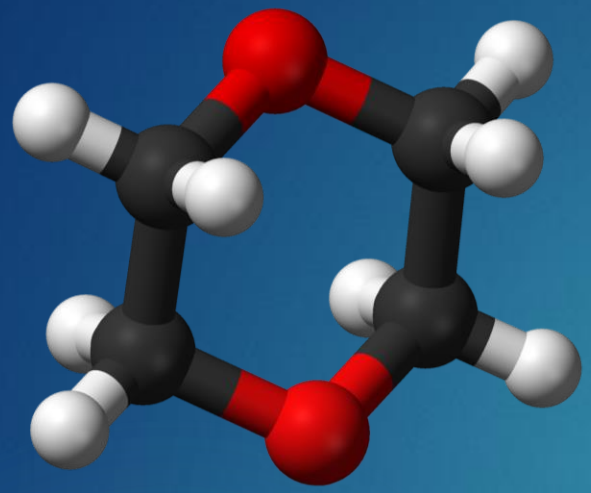
Year	Average Day (MGD)	Maximum Day (MGD)	Peak Hour (MGD)	Maximum Day + 3,500 GPM Fire Flow (MGD)[1]
2008	2.87	4.88	8.05	5.51
2009	2.87	5.10	8.42	5.73
2010	3.14	5.56	9.17	6.19
2011	2.99	5.24	8.65	5.87
2012	2.81	4.78	7.89	5.41
2013	2.98	5.06	8.35	5.69
2014	2.69	4.58	7.56	5.21
2015	3.02	4.90	8.09	5.53
2016	3.00	5.07	8.37	5.70
2017	2.96	4.85	8.00	5.48
2018	3.04	5.01	8.27	5.64
2019	2.95	4.80	7.20	5.43
Minimum	**2.69**	**4.58**	**7.20**	**5.21**
Average	**2.94**	**4.99**	**8.16**	**5.62**
Maximum	**3.14**	**5.56**	**9.17**	**6.19**



- Well 2 – 850 gpm - Out of Service – Collapsed
- Well 3 – 1,000 gpm - Out of Service – Elevated Nitrates

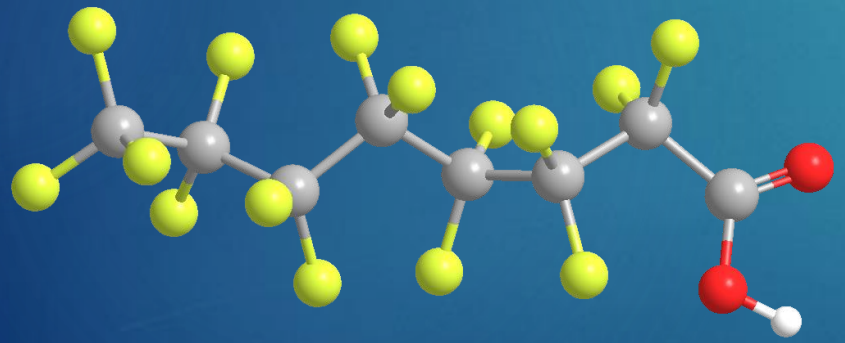
EMERGING CONTAMINENTS REGULATIONS





What is a Part Per Billion (PPB)?

- Equivalent of one second in 32 years
- Equivalent of one inch in 16,000 miles



What is a Part Per Trillion (PPT)?

- Equivalent of one second in 32,000 years
- Equivalent of one inch in 16,000,000 miles

Well	Permitted Flow	Contaminant	Sample Date		
			2/20/2019	8/21/2019	9/10/2019
1	1,100 gpm	PFOA	NS	NS	NS
		PFOS	NS	NS	NS
		1,4-Dioxane	NS	NS	NS
4	1,200 gpm	PFOA	24.5	21.2	21.9
		PFOS	ND	7.1	9.57
		1,4-Dioxane	0.84	1.6	1.7
5	1,200 gpm	PFOA	NS	ND	ND
		PFOS	NS	ND	ND
		1,4-Dioxane	NS	ND	0.033
6	1,075 gpm	PFOA	3.1	3.7	3.21
		PFOS	ND	3.6	4.09
		1,4-Dioxane	0.46	0.32	0.39
7	1,125 gpm	PFOA	4.5	4	4.25
		PFOS	10.4	8.6	11.5
		1,4-Dioxane	0.35	0.33	0.34
Total:	**5,700 gpm (8.21 MGD)**				

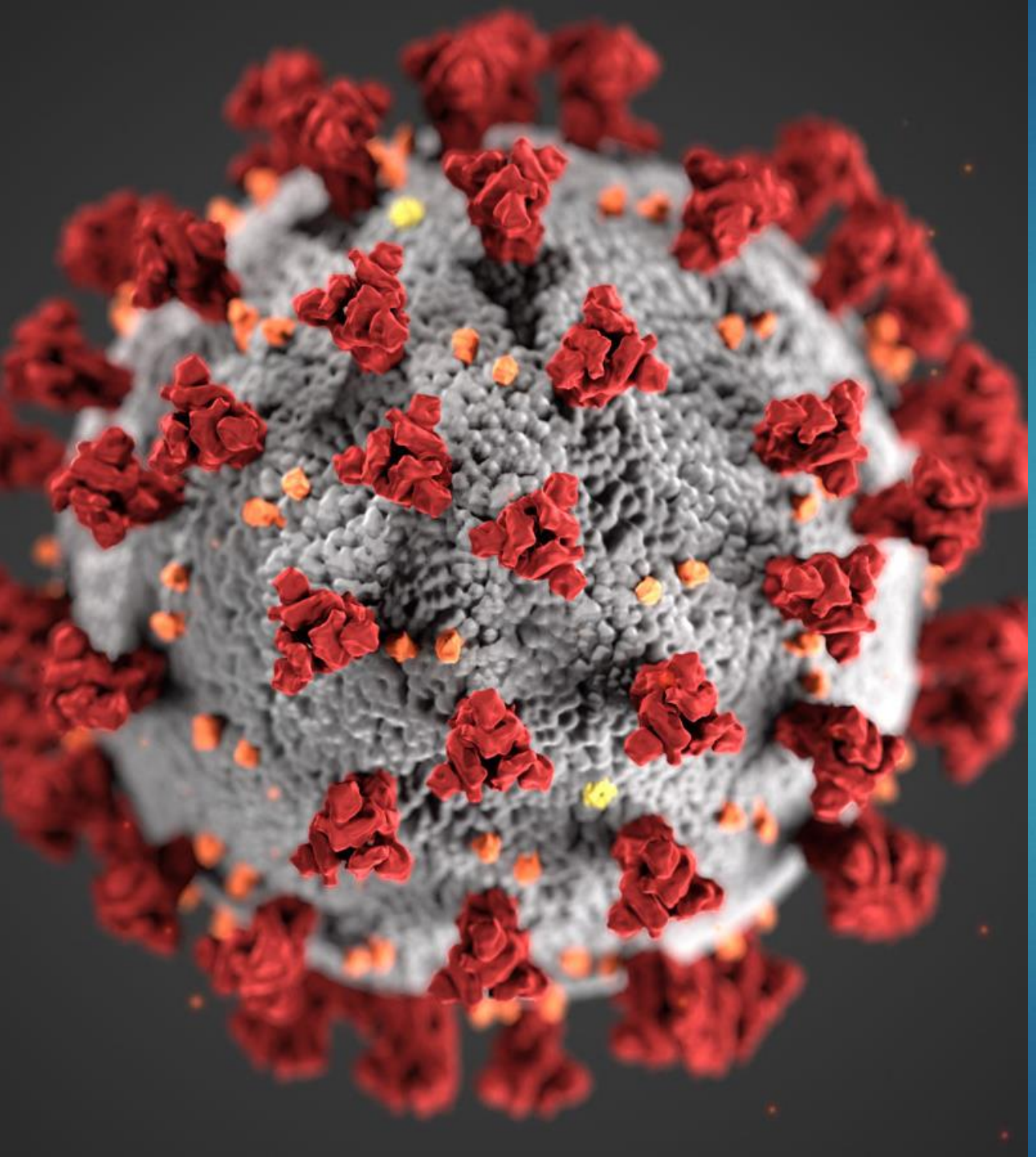
Sample Results

- Well 4 – Out of Service – 1,4-D, PFOA
- Well 7 – Out of Service - PFOS

Fast-Tracked Project

- Three Phases/Contracts:
  - Procurement of GAC Equipment
  - Installation of GAC Equipment
  - Construction of Building Enclosure

Project Timeline



COVID-19

- March 20, 2020

State of New York

Executive Chamber

No. 202.8

EXECUTIVE ORDER

- Reduce In-person Workforce by 100%

Project Timeline

Contract 2 - Installation

Contract 2 - Installation

Contract 3 - Enclosure

Hardships

- Multiple on-going contracts
- Five contracts – four different contractors
- Phased implementation
- Operation of equipment while under construction
- COVID-19 staff reductions
- Regulatory approvals delayed
- Supply chain disruptions

Lessons Learned

- Don't rely on the way we've always done it, or what's worked in the past
- Ensure definition of contracts is clear
- Be Flexible, allow for changes
- Ensure the pumps have sufficient design capacity including contingency
- Continue to coordinate

What's Next?

"NO ONE WANTS TO LEARN FROM MISTAKES, BUT WE CANNOT LEARN ENOUGH FROM SUCCESSES TO GO BEYOND THE STATE OF THE ART."

– HENRY PETROSKI

Costs and Financial Impacts for PFOA & PFAS Treatment

- NYSDOH estimates that 645 community water systems will be required to implement treatment for PFOA/PFOS based on 10 ppt MCL. This translates to an estimated capital cost of $855,000,000 and an annual operating cost of $45,000,000 according to NYSDOH data.

- The Combined capital cost for removing the aforementioned emerging contaminants will be an astonishing $1,569,000,000.

- It should be noted that costs are projected to escalate in the foreseeable future due to inflation, supply chain issues and interest rate increases.

UCMR 5

Published
December 27, 2021

What contaminants are in UCMR 5?

UCMR 5 specifies monitoring for 29 per- and polyfluoroalkyl substances (PFAS) and lithium listed in the table below.

Contaminant	CASRN[1]	MRL[2] (µg/L)	Additional Information
25 PFAS: EPA Method 533			
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	763051-92-9	0.005	PFAS are a group of synthetic chemicals used in a wide range of consumer products and industrial applications including: non-stick cookware, water-repellent clothing, stain-resistant fabrics and carpets, cosmetics, firefighting foams, electroplating, and products that resist grease, water, and oil. PFAS are found in the blood of people and animals and in water, air, fish, and soil at locations across the United States and the world.
1*H*,1*H*, 2*H*, 2*H*-perfluorodecane sulfonic acid (8:2FTS)	39108-34-4	0.005	
1*H*,1*H*, 2*H*, 2*H*-perfluorohexane sulfonic acid (4:2FTS)	757124-72-4	0.003	
1*H*,1*H*, 2*H*, 2*H*-perfluorooctane sulfonic acid (6:2FTS)	27619-97-2	0.005	
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	0.003	
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	0.002	
hexafluoropropylene oxide dimer acid (HFPO-DA)(GenX)	13252-13-6	0.005	
nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	151772-58-6	0.02	
perfluoro (2-ethoxyethane) sulfonic acid (PFEESA)	113507-82-7	0.003	
perfluoro-3-methoxypropanoic acid (PFMPA)	377-73-1	0.004	
perfluoro-4-methoxybutanoic acid (PFMBA)	863090-89-5	0.003	
perfluorobutanesulfonic acid (PFBS)	375-73-5	0.003	
perfluorobutanoic acid (PFBA)	375-22-4	0.005	
perfluorodecanoic acid (PFDA)	335-76-2	0.003	
perfluorododecanoic acid (PFDoA)	307-55-1	0.003	
perfluoroheptanesulfonic acid (PFHpS)	375-92-8	0.003	
perfluoroheptanoic acid (PFHpA)	375-85-9	0.003	
perfluorohexanesulfonic acid (PFHxS)	355-46-4	0.003	
perfluorohexanoic acid (PFHxA)	307-24-4	0.003	
perfluorononanoic acid (PFNA)	375-95-1	0.004	
perfluorooctanesulfonic acid (PFOS)	1763-23-1	0.004	
perfluorooctanoic acid (PFOA)	335-67-1	0.004	
perfluoropentanesulfonic acid (PFPeS)	2706-91-4	0.004	
perfluoropentanoic acid (PFPeA)	2706-90-3	0.003	
perfluoroundecanoic acid (PFUnA)	2058-94-8	0.002	
4 PFAS: EPA Method 537.1			
N-ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	2991-50-6	0.005	See above for PFAS information.
N-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	2355-31-9	0.006	
perfluorotetradecanoic acid (PFTA)	376-06-7	0.008	
perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.007	

Additional Emerging Contaminants

- NYS Drinking Water Council met on December 22, 2021 and established a list of contaminants for further testing and public notification for systems that serve more than 3,300 people.

- The NYS Senate adopted the list on January 15, 2021 and the Governor signed legislation to expand the list of 29 PFAS contaminants from UCMR5 to establish a list of 41 contaminants, plus additional pesticides and metals.

Questions

Anthony Eagan, P.E.

D&B Engineers and Architects

aeagan@db-eng.com

516-364-9890 ext 4014

American Water Works Association

New York Section