# WELLHEAD TREATMENT FOR VOC AND EMERGING CONTAMINANTS AT STATION 57

Water Authority of Western Nassau County

H2M water

**Village of New Hyde Park**
**May 4th, 2020**
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# Overview

- History of Contamination at Station 57
- What is a VOC?
- What is an Emerging Contaminant?
- NYS Drinking Water Quality Council & New Regulation
- What is 1,4-dioxane? Sources and Treatment
- What are PFOA and PFOS? Sources and Treatment
- Proposed Treatment Facility at Station 57

# History of Station 57

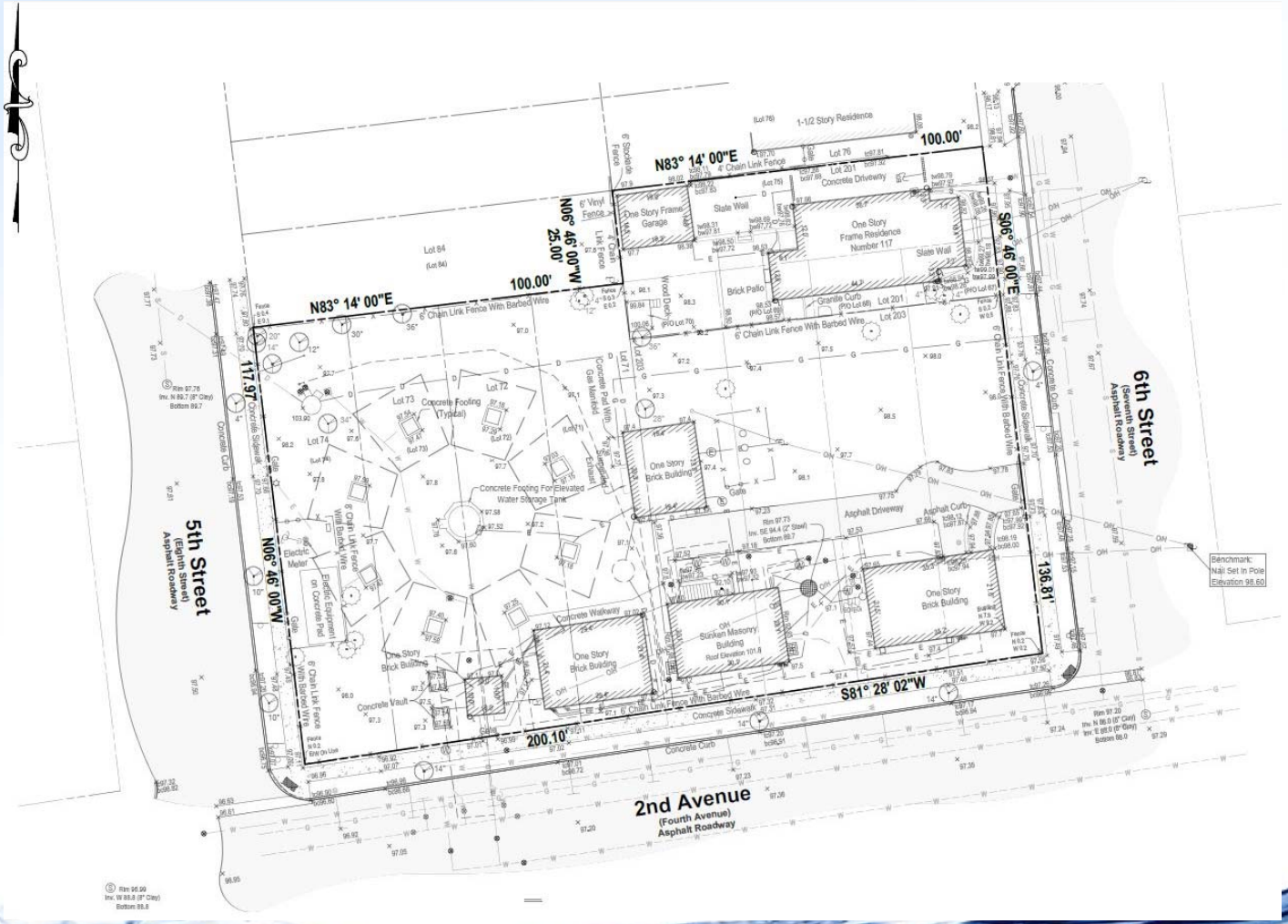
- Station No. 57 is situated in the north central portion of the Water Authority at 2nd Ave and S. 6th St.
- This site contains five (5) one-story buildings which includes the well building, the booster building, the VOC treatment building, the tank valve building, and the generator building.
- Station No. 57 is a critical base load station that maintains the elevated tank levels and resulting distribution pressures in the high zone. Produces nearly 4 MGD of potable drinking water.
- Water Authority must keep Station No. 57 in operation due to its importance to the high zone service and provide upgraded treatment for VOCs and emerging contaminants.
- Need for additional treatment combined with the age and condition of most infrastructure of Station No. 57 is over 50 years old requires that the scope of the project to be a complete replacement of the mechanical, electrical and building structures at this site.

# History of Station 57

## EXISTING SITE AERIAL

# History of Station 57

## EXISTING SITE PLAN



# What is a VOC?

- **VOC stands for Volatile Organic Compound**
- VOCs have been used extensively in the United States since the 1940s and are common components or additives in many commercial and household products.
- Solvents—with consumer and industrial uses such as degreasers, paint removers, and cleaning agents—also are among the VOCs detected in groundwater.
- Years of improper disposal whether legal or illegal have contributed to the presence in groundwater.
- Surrounding area is industrial – makes sense that the water supply wells at Station 57 are impacted with VOCs
- Existing packed tower removes VOCs to non-detect (<0.5 ppb). Well below NYS and Federal regulations (5 ppb) by more than 10 times.

# What is an Emerging Contaminant?

- **No Legal Definition in Federal or State Regulations**
- **Interchangeable Terms of Use:**
  - **Emerging Contaminants, Contaminants of Emerging Concern**
- **Characterized by a perceived, potential or real threat to human health or the environment**
- **May also be characterized as "emerging" because a new source or new pathway to humans has been discovered**
- **May also be characterized as "emerging" because a new detection method, or improved analytical sensitivity, or new treatment technology has developed**
- **Or any combination of the above**

# *Emerging Contaminant Groups in Water**

"New" DBPs

PFASs

Pharmaceuticals and Personal Care Products

1,4 - dioxane

Pathogens

Prions

Algal Toxins (See UCMR4)

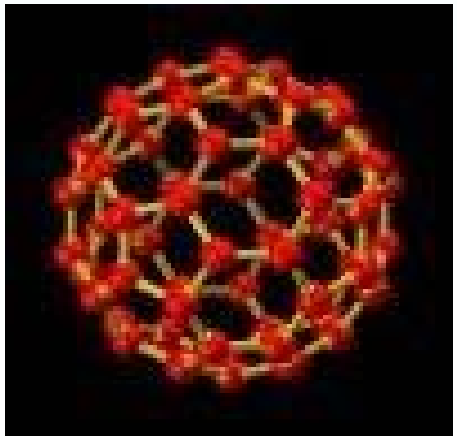
Nanomaterials

Pesticides

Endocrine Disrupting Compounds

Microplastics

PBDEs



*Not an exhaustive list.

# Differences Between ECs and Regulated Contaminant

## Regulated Contaminant

- IRIS Toxicology Data (EPA Integrated Risk Info. System)
- Accepted risk & science
- Analytical methods, tested and verified
- Remedial options available
- Published and accepted criteria

## Emerging Contaminants

- No data/unknown/ lacking peer review risk data
- Evolving risk & science
- Analytical methods in-development or not readily available
- Lack of remedial methods
- Criteria not available or variable

# EC Monitoring and Regulations

- EPA requires Water Suppliers to monitor for a new list of unregulated contaminants every 5 years to identify the frequency and a levels in drinking water.
- EPA has been slow to regulate ECs nationally. Have only issues health reference levels to date
- In 2017, based on the prevalence of some ECs in NYS identified during monitoring of an EPA contaminant list, the NYSDOH Developed its own Unregulated Contaminant Monitoring Requirements for public water suppliers
- Created a State Drinking Water Council to Provide Guidance to NYSDOH and NYSDEC as to Contaminant Selection for the Unregulated Contaminant Monitoring and the Establishment of New MCLs
- Council Directed to Address the Emerging Contaminants 1,4-Dioxane, PFOA and PFOS First

# Council Meetings/ Recommendations: Status

- **Council Met 5 times in 2017-18**
- **December 18, 2018 Meeting Recommended:**
  - **1 ppb MCL for 1,4-Dioxane**
  - **10 ppt MCL for PFOS, 10 ppt MCL or PFOA**
- **Recommendations Accepted by NYSDOH Commissioner**
- **Part 5 Amendments Proposed : July 24 2019 (60 day comment period)**
- **DOH has revised based on comments. Will become final when published in the State Register – June 2020**

# 1,4 Dioxane - Sources

- **Solvent Stabilizer for industrial cleaning solvents (TCA, TCE, PCE), personal care products, household cleaning products, and an "unintentional impurity" in de-icing and antifreeze.**
- **Highly miscible in water.**
- **Traditional treatment (packed tower, GAC, etc) in effective.**

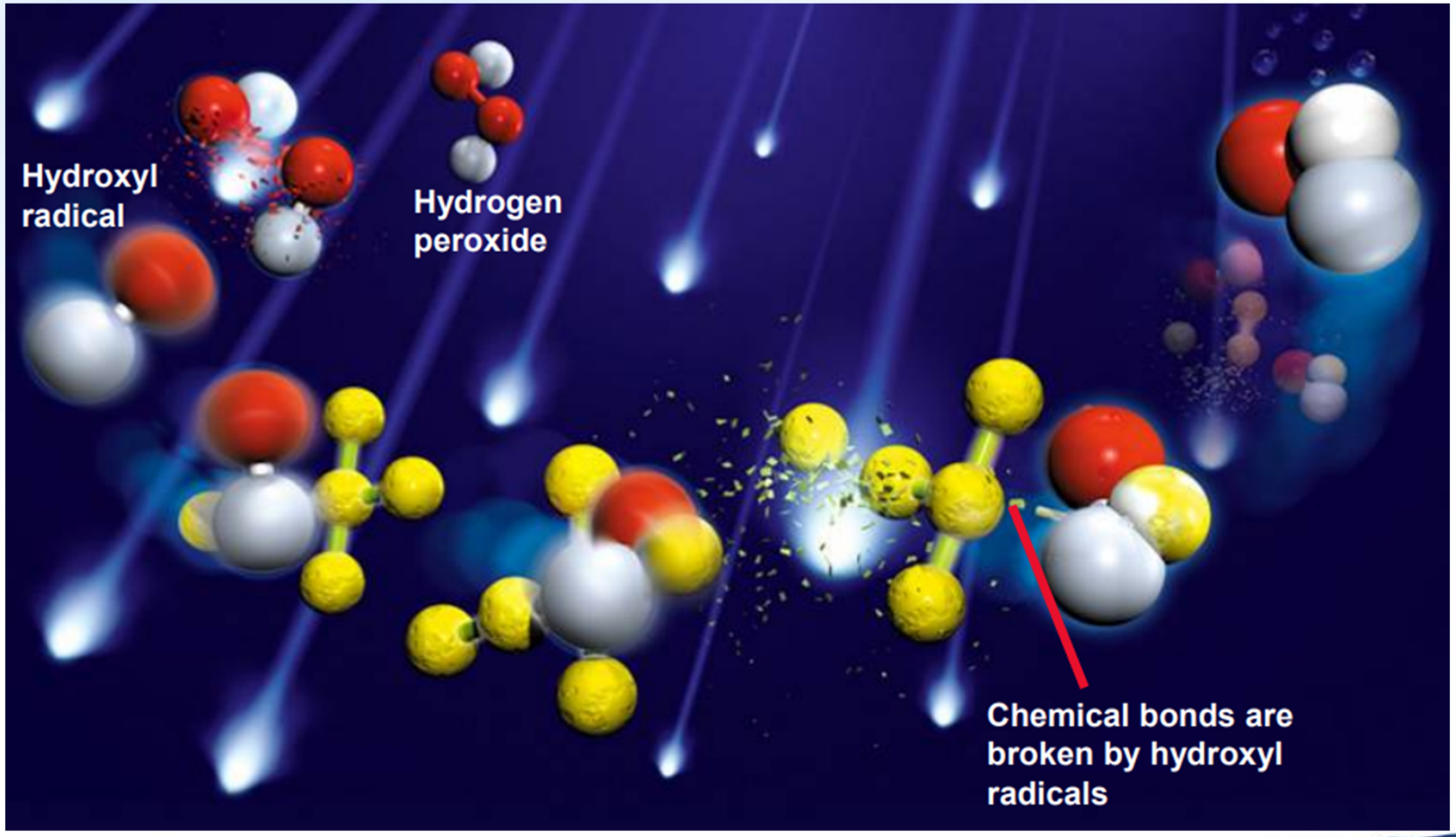

# 1,4 Dioxane - Treatment

- **Advanced Oxidation Process (AOP)** is the most promising method to remove 1,4-dioxane from groundwater resources.
- **How does AOP work?**
  - Common treatment compounds—typically hydrogen peroxide or chlorine—are added to raw water before it is run through a reactor full of ultraviolet lights.
  - UV light reacts with the additives to remove even the most miscible compounds in water.
  - Water must then run through granular activated carbon (GAC) to remove trace elements of additive chemicals.

- **WAWNC successfully piloted AOP technology at Station 57 in 2018**
- **Two AOP plants in operation producing drinking water on Long Island. There will be over 20 by the end of 2020.**

# 1,4 Dioxane - Treatment

- **Reaction Occurring Inside the Reactor**



# Per & Poly Fluoro Alkyl Substance Sources

- **Manufacturing- nonstick coating, water-repellent fabrics, microwave popcorn bags, carpet, PFOS fire-fighting foam (in US stopped in 2002)**
- **Class Action Suits in Ohio, W. Va.**
  - History of industrial contamination detailed in the movie *"Dark Waters (2019)"*
- **PFOA in blood of 98% of Americans**
- **History of Studies on PFAS workers which came out in Class Action discovery-phase means human health concerns well-supported; animal study consistency**


**DuPont Teflon Plant, Washington West Virginia**