TO: SGWASA Board Members

FROM: Scott N. Schroyer, Executive Director SNS

TOPIC: Executive Summary - PFAS Pilot Study #1 – South Granville Water And Sewer Authority

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PURPOSE AND CONTEXT

South Granville Water and Sewer Authority (SGWASA) conducted a comprehensive pilot study to evaluate treatment options for per- and polyfluoroalkyl substances (PFAS) in its drinking water supply. This study was prompted by the U.S. Environmental Protection Agency's (EPA) April 2024 issuance of enforceable Maximum Contaminant Levels (MCLs) for six PFAS compounds, including perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS), both regulated at 4 nanograms per liter (ng/L).

Recent monitoring data indicate that SGWASA's finished water leaving the Water Treatment Plant (WTP) frequently exceeds the forthcoming MCLs for PFOA and PFOS. While the Authority's existing conventional treatment processes provide partial PFAS reduction, they are insufficient to ensure reliable long-term compliance. The pilot study was undertaken to identify effective PFAS treatment technologies, assess operational impacts, and inform future design and capital planning decisions.

SYSTEM OVERVIEW AND REGULATORY DRIVERS

SGWASA sources its drinking water from the R.D. Holt Reservoir and operates a 7.5 MGD surface water treatment facility. Average daily demand is approximately 2.5 MGD, with maximum daily demand of roughly 3.7 MGD. Long-range planning indicates that regional growth may require expansion of the plant to approximately 10 MGD within the next 7–10 years, with projected maximum daily demand reaching approximately 12.7 MGD over a 20-year planning horizon.

Under the EPA's 2024 PFAS regulations, SGWASA is required to begin compliance monitoring by 2027 and achieve full compliance by 2029. Among the regulated PFAS, PFOA is expected to control treatment design and media replacement frequency due to its persistence and relative

difficulty of removal. The potential for additional PFAS to be regulated in the future further underscores the need for a flexible and resilient treatment approach.

PILOT STUDY APPROACH

The pilot study evaluated three post-filtration PFAS treatment media under continuous, long-term operating conditions that reflect normal plant operations:

- Granular Activated Carbon (GAC) – Calgon Filtrasorb 400
- Anion Exchange Resin (AER) – DuPont Amberlite PSR2+
- Novel Sorbent (NS) – CETCO Fluorosorb 200

Each media was tested for PFAS removal effectiveness, operational stability, headloss development, fouling potential, startup water quality impacts, and effects on other water quality parameters such as total organic carbon (TOC) and disinfection byproduct formation. Because PFAS breakthrough occurred more slowly than initially projected, the pilot study was extended to better characterize long-term media performance.

KEY FINDINGS

PFAS REMOVAL PERFORMANCE

All three media types successfully reduced PFAS concentrations to below EPA MCLs for at least twelve months when operated with the recommended number of contactors. PFOA was confirmed as the primary driver for media changeout timing. PFOS and other regulated PFAS were consistently removed to concentrations well below their regulatory limits.

The existing powdered activated carbon (PAC) process used at the WTP was found to provide beneficial upstream PFAS reduction and to extend the service life of downstream media, particularly GAC.

MEDIA-SPECIFIC OBSERVATIONS

- Anion Exchange Resin provided the most consistent PFOA removal, with non-detect concentrations throughout the pilot to date.
- Granular Activated Carbon exhibited earlier PFOA breakthrough relative to AER but delivered additional benefits, including significant TOC reduction and reduction of disinfection byproduct precursors.

• Fluorosorb 200 effectively removed long-chain PFAS but showed limited effectiveness for short-chain PFAS and demonstrated elevated formation of certain unregulated disinfection byproducts during testing.

OPERATIONAL AND WATER QUALITY CONSIDERATIONS

All media required periodic backwashing or flow "fluffing" to manage headloss. Source water manganese was identified as a significant contributor to media fouling and will require careful upstream process control. Cartridge filtration is recommended upstream of AER and novel sorbent media to protect treatment performance.

Startup impacts—including temporary pH shifts, short-duration arsenic leaching from GAC, and transient chloride-to-sulfate ratio changes for AER—were manageable through established startup and filter-to-waste protocols.

DISINFECTION BYPRODUCTS

Granular Activated Carbon provided consistent reductions in regulated disinfection byproducts such as total trihalomethanes and haloacetic acids. Fluorosorb 200 and AER (under chloraminated conditions) demonstrated some formation of nitrosamines during simulated distribution system testing. While these compounds are currently unregulated, their presence must be considered in full-scale design and operational planning.

STRATEGIC RECOMMENDATIONS

Based on the pilot study results, the project team recommends:

- Proceeding with design of a hybrid PFAS treatment facility capable of accommodating multiple media types to provide long-term regulatory resilience and operational flexibility.
    - Status: In progress.
- Continuing PAC pretreatment to enhance PFAS removal and extend media life.
    - Status: In progress.
- Prioritizing manganese control to ensure reliable long-term operation of PFAS treatment systems.
    - Status: In progress.

- Advancing into preliminary engineering, detailed design, and lifecycle cost evaluation.
    - Status: In progress.

NEXT STEPS

The project team is currently advancing early design activities, including site evaluation, hydraulic assessment, and supporting investigations. A forthcoming Basis of Design Report and Pilot Study Addendum will present lifecycle cost comparisons, an Opinion of Probable Construction Cost, and final media recommendations once the pilot study is fully concluded.

These results position SGWASA to move forward confidently toward PFAS compliance while maintaining operational flexibility and preparing for future regulatory requirements.