Exhibit G
Scope of Work Document as prepared by [CONTRACTOR]
Controlling Trace Organic Contaminants Using Alternative, Non-FAT Technology for Indirect Potable Water Reuse
(WateReuse-13-10)

Task 1: Literature Review

Through research conducted by the Project Team in WateReuse projects 03-014, 08-05, 08-08, 09-10, and 11-08 and involvement in the Water Research Foundation's Nitrosamine Focus Area Committee, there is already a significant amount of information and data that has been collected by the project team that can be used to support the development of a literature review specific to the objectives of this project. Thus, time will be devoted throughout the project to track and document the latest developments in this field.

Task 2: Pilot-Scale Demonstration (City of Hollywood, Florida)

IX, AOP and BAC biofiltration processes will be operated to treat the secondary effluent produced at SRWWTP. The pilot-scale system will be fed with sand-filtered tertiary effluent and the total treatment capacity is 60 gpm. The pilot system is set up as two parallel identical IX-AOP-BAC treatment trains, one of which is preceded by an MF membrane filtration process while the other is preceded by a deep bed filter. Parallel UV-AOP and O_3/AOP processes will be operated following the IX processes. Each of the UV-AOP process and O_3/AOP processes will be followed by a separate biofiltration process using BAC as filtration media. The BAC columns will be operated in parallel with 20 min total empty bed contact time (EBCT) per process train; biological activity will be confirmed using ATP and other biological activity assays.

The Project Team will monitor 102 primary drinking water contaminants, 14 secondary contaminants, 23 Florida-specific regulated groundwater contaminants and a suite of unregulated contaminants including NDMA. The formation and removal of multiple nitrosamines, and a suite of PFASs and a suite of low-level (RL<1 ng/L) will be included as additional analyses above those already part of the existing SRWWTP pilot. An additional suite of indicator trace organic contaminants (TOrCs) are being monitored at the pilot representing chemicals that are frequently detected in treated wastewater and have various sorption, oxidation and bioamenable characteristics to assess IX, oxidation or biotreatment performances. Organic matter characterization, including TOC, UV254, fluorescence, dissolved organic nitrogen (DON), and a nitrosamine precursor assay based on bench-scale batch ozonation experiments, will be performed on a limited subset of samples to assess the impact of treatment on these bulk surrogate parameters and develop potential correlations between the removal of TOrCs and reduction or changes in bulk parameter measurements.

Subtask 2a: Ion Exchange

Anion and cation exchange resin columns will be operated in series, where anion exchange (AIX) treatment will target TOC removal for improving UV transmittance of the secondary effluent to make any potential UV/AOP process more efficient and economically viable, and cation exchange (CIX) treatment will further remove ammonia present in the secondary effluent to meet nutrient removal criteria. At least three sampling events (before and after IX treatment) will be performed under stable AIX and CIX operation. Specifically, indicator TOrCs and PFASs will be measured and NOM will be characterized before and after each IX process.

Subtask 2b: AOP

Ozone alone, ozone/peroxide AOP and ozone/peroxide/UV AOP processes will be implemented at three different ozone to TOC ratios (e.g., 0.25, 0.5, and 1; existing pilot influent contains approximately 9 mg TOC/L while the IX effluent contains 5 to 6 mg TOC/L) to determine optimal conditions for TOrC removal. The UV/AOP system will be operated at a dose of 400 mJ/cm^2 assuming an 85% UV transmittance and a peroxide dose of 10 mg/L. NDMA and PFAS levels will be assessed before and after each AOP at each dose.

Subtask 2c: BAC

BAC treatment of the AOP effluent will be performed using fresh commercial activated carbon (Norit Hydrodarco 3000) that has developed a substantial biofilm during the preceding 6 months of pilot operation as the filtration media. The BAC filters will be evaluated at an EBCT of 20 minutes for DBP (NDMA/ total nitrosamines) and TOrC removal. Biofilter samples will be collected for each AOP dose scenario listed above in Subtask 2b at the same time that the AOP samples are collected.

Task 3: Pilot-Scale Biofilter Media Investigations (Las Vegas, Nevada)

Existing biofiltration columns will be operated to treat tertiary filtered effluent that has undergone pilot-scale ozone treatment at an O_3:TOC dose of 1 at the CCWRD's Main Facility in Las Vegas, Nevada. Biofiltration columns containing readily available Jaeger Tri-Pack hollow plastic media, floating beads, commercially-available biochar, virgin commercial BAC and exhausted BAC used in treatment for at least 5 years. The biologically-active anthracite and BAC columns will provide benchmarks that can be compared against.

The columns have a diameter of 6 inches and a total height of 15 feet, and will be operated with a media height of 10 feet for a total bed volume (BV) of 14.7 gallons. The columns will be fed with a progressive cavity pump at a flow rate of 0.74 gallons per minute (GPM), for an empty bed contact time (EBCT) of 20 minutes. The columns will be fitted with head loss monitors to measure the loss in pressure as biomass builds up on the media. The columns will be backwashed when head loss accumulation is observed.

Biofilter performance will be evaluated by measuring the contaminants and parameters presented in the proposal document. The removal of unknown AOP byproducts will be evaluated by measuring baseline non-specific toxicity (using the *V. fischeri* bioassay) before and after ozonation and biofiltration. Estrogenicity will be measured using the E-screen bioassay. Biofiltration performance will also be periodically assessed by measuring AOC removal. The pilot scale investigation will proceed in two phases: Acclimation and Demonstration Phases.

Subtask 3a: Acclimation Phase

The objective during the acclimation phase is to perform an accurate and complete characterization of biomass growth behavior during biofilter startup. During the acclimation phase, biomass will be growing on the media and will be acclimating to the water quality. The development of biomass will be monitored using the ATP method described in the proposal with a LuminUltra PhotonMaster instrument. TOC/DOC and ozone byproduct (i.e., carboxylic acids, ketoacids, aldehydes) removal across the columns will also be monitored as measurements of biological activity. In addition, indicator TOrCs will be monitored to assess biomass acclimation to specific TOrCs. This Task will provide insight into how long a biofilter must be operated before mature biomass is present for full performance. It is anticipated that 2-3 months of continuous operation will be required for full biomass development, and that analysis of the full suite

of analytes will be performed 3 times at equal intervals during this period. ATP biomass measurement and basic water quality and NOM parameters will be monitored more frequently (approximately weekly).

Subtask 3b: Demonstration Phase

During this phase, the columns will be operated under constant conditions over the course of several months while their performances are monitored to gain insight into long-term treatment capabilities. Also, long-term head loss will be measured and backwashing and biogrowth control requirements will be assessed. It is anticipated that the long-term demonstration will be conducted for approximately six months and that 4-5 full sampling events will be performed during this time. A comparison of backwashing frequency and performance will also be quantified to better illustrate the potential benefits of alternative biological treatment media. The analysis will also be used during the cost comparison described in the following section.

Task 4: *Cost Comparison of Alternative Non-FAT and FAT-RO/AOP Technologies*: A full cost analysis will be performed by Hazen and Sawyer. The cost of the non-FAT technologies employed in this study will be compared with cost analyses of FAT technologies employed at other reuse sites. Additionally, the nitrosamine and other TOrC treatment performance of the pilot plant studies will be compared with previously reported performances of FAT systems. The calculated costs and observed effectiveness comparisons will be considered to determine if IX, AOP and/or biofiltration processes are viable alternatives to FAT (AOP with RO or NF) systems for planned indirect potable reuse.

Task 5: *Final Report*: The procedures performed and the results obtained will be reported and analyzed in the form of a WateReuse Report. The report's target audience will be water reuse agencies interested in options, such as IX-AOP-BAC, for wastewater treatment for IPR and sustainable treatment trains using biofiltration as an alternative to the FAT treatment of RO or NF for post-AOP polishing in general. The resulting information will also be pertinent to U.S. EPA and state regulatory agencies who are concerned about TOrCs, AOP byproducts and baseline non-specific toxicity in IPR.

In order to disseminate and communicate the project outcome as widely as possible, the final report will be supplemented by conference presentations at the annual WateReuse Symposium and/or other relevant industry and academic conferences and meetings and by manuscript submissions to internationally-recognized, peer-reviewed journals. In addition, the project team will present our findings to the industry via a webinar format.