CASE STUDY

# Evaluating the Efficacy of NORIT® GAC 400 in PFAS Removal

## BACKGROUND

Per- and polyfluoroalkyl substances (PFAS), including perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS), are synthetic chemicals prevalent in consumer products.

Due to their persistence and potential health risks, the U.S. Environmental Protection Agency (EPA) had set a Health Advisory Limit (HAL) of 70 parts per trillion (ppt) with current limits down to 4 parts per trillion (ppt) for the combined concentration of PFOA and PFOS in drinking water.

**NORIT GAC 400** has been further designed to remove PFAS from water sources.

## OBJECTIVE

This case study conducted by the EPA examined the performance of **NORIT GAC 400** in removing PFOA and PFOS from contaminated water, aiming to reduce their concentrations below the EPA's HAL of 70 ppt.

## METHODOLOGY

Third-party and U.S. EPA research studies were conducted to evaluate the adsorption capabilities of these activated carbons. The studies involved small-scale column tests using surface water and groundwater samples.

The following characteristics and five different granular activated carbons (GACs), including **NORIT GAC 400**, were tested under a 10-minute empty bed contact time (EBCT).

- **Groundwater:** Total Organic Carbon (TOC) concentration of 0.8 ppm
- **Surface Water**: TOC concentration of 7.4 ppm
- **PFOA and PFOS Influent Concentration:** 209 ppt

The study also evaluated a potential increase in flow from 19 to 44 million gallons per day (MGD), adjusting EBCTs to match the utility's design plan of 20 minutes at 44 MGD.

Influent samples assessed PFAS concentrations, with total organic carbon (TOC) averaging 2.6 mg/L in raw water and 2.2 mg/L in post-biologically activated carbon (BAC) water. Most PFAS compounds had concentrations of 3–100 ng/L, with perfluoro-2-methoxyacetic acid (PFMOAA) exceeding 1 µg/L.

## KEY FINDINGS

### PFAS Removal Efficiency

The studies demonstrated that **NORIT GAC 400** effectively reduced PFOA and PFOS concentrations to non-detectable levels, well below the EPA's 2020 advisory limit of 70 ppt.

### Superior Performance

**NORIT GAC 400** exhibited superior performance compared to coconut-based carbons, even in surface water with higher TOC levels.

## CONCLUSION

**NORIT GAC 400** activated carbons are effective solutions for removing PFOA and PFOS from both groundwater and surface water sources. Their resilience against TOC interference and superior adsorption capabilities make them reliable options for water utilities aiming to meet or exceed EPA health advisory limits for PFAS.

**Modeling PFAS Removal Using Granular Activated Carbon for Full-Scale System Design >>** Read Here