

Cottage Grove Municipal Treatment System Removes PFAS Compounds from Well Water Using Granular Activated Carbon

BACKGROUND

Located in the Twin Cities metro area, the city of Cottage Grove, Minnesota, needed to increase the capacity of its drinking water system. To meet demands for compliant water two additional wells were equipped with treatment systems designed to reduce PFAS. The city contracted consulting firm Stantec to provide engineering services for the design, during procurement, construction of the facilities and site infrastructure for the dual media granulated activated carbon (GAC) and/or Ion Exchange (IX) equipment systems.

In order to optimize operation expenditure and achieve a lower total cost of ownership for pumping and building requirements, an analysis was conducted considering the dual media capability. It was determined that the overall pressure drop should not surpass 3 pounds per square inch (psi) when media is not present. Additionally, the height of the 12-1340 vessels should not exceed 23 feet and 4 ½ inches. To accommodate the expansion of the carbon media during backwash of the GAC, the sidewall of the vessels was designed to provide sufficient space for the required bed expansion for the specified media.

PROJECT DETAILS

Following a detailed evaluation to determine the scope of supply for the GAC systems, the AV team provided three 12-foot diameter model 12-1340 GAC/IX (dual media capable) systems with using the Norit 1240PLUS GAC approved by the Minnesota Department of Health.

At one location, two systems would operate in parallel, with each system having two vessels (lead/lag) operating in series. The second location was to have one system with two vessels (lead/lag) operated in series. The systems use NSF 61-approved bituminous coal acid washed carbon to reduce the PFAS compounds to below the Minnesota Health Index discharge requirements.

The overall time of delivery from execution of contract to installation was six months. AV also provided an installation supervisor to work with the selected contractor throughout the system commission process.

PROJECT LOCATION

Cottage Grove, MN

PROJECT TIMEFRAME

May 2022 – June 2023

END USER

City of Cottage Grove, MN

DESIGN ENGINEER

Stantec

PROJECT TYPE

Design, Manufacture,
Supply

PROJECT PHASE

Complete

GENERAL CONTRACTOR

Rice Lake Construction

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KEY SYSTEM DESIGN & OPERATIONAL PARAMETERS	VALUE
PF 12-1340 GAC/IX (capable of either media) systems	
Number of Systems/Vessels per System	3/2
Operating Configuration	Parallel/Lead-Lag
Carbon Capacity/Volume per Vessel	1,456 ft ³
Resin Type	Bituminous Coal AW
Design Flow Rate (Overall/per Vessel)	1050 gpm
Hydraulic Loading	9.3 gpm/ft ²
Empty Bed Contact Time (per Vessel/per System)	10 minutes
Underdrain	Septa/External Ring Header
Overall system height to top of pipe	23' 4.5"

