Successful Implementation of Interim Control Measures (ICMs) for PFAS Treatment from Surface Water at Selfridge Air National Guard Base, Michigan

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Background/Objectives. Selfridge Air National Guard Base (SANGB) is located ~20 miles north of Detroit and ~2 miles east of the City of Mount Clemens in Macomb County, Michigan. Due to its operational history, personnel of the SANGB have engaged in various activities that required the use, dispensing, and storage of aqueous film forming foam (AFFF) which contains per- and polyfluoroalkyl substances (PFAS). The drainage of storm water (SW) from SANGB is moved through a complex network of storm drain inlets and subsurface pipes that were mostly constructed over 70 years ago. The groundwater elevation is above the SW conveyance system during the rainy season (spring and early summer) and during heavy periods of precipitation, resulting in ground water infiltration into the SW conveyance system. The National Guard Bureau is assessing potential sources of PFAS at SANGB that may result in impacts to site SW and is evaluating alternatives to mitigate the discharge of PFAS into site SW that ultimately leads into the Clinton River and Lake St. Clair. Drainage Basin 507 and Drainage Basin 508 represent areas with the most significant mass contributions of PFAS. The SANGB is implementing this project to achieve NPDES compliance for SW that is discharging off base above the Michigan Department of Environment, Great Lakes, and Energy water quality standard. The objective of ICMs is to remove PFAS from SW as further investigation of remedial options are being evaluated.

Approach/Activities. Two ICMs for SW PFAS treatment have been successfully implemented for SANGB. These two ICMs have a sump pump to collect water from designated manholes, a settling tank, discharge pumps to send SW through the treatment units, cartridge filters, and PFAS treatment media/vessels. Treated water is sent back to the designated manhole.

The first ICM treatment system is sized for 100 gallons per minute (gpm) and was placed into operation on January 3, 2020 for the Drainage Basin 507. This pilot 507 ICM initially utilized three different types of PFAS treatment media: Two granular activated carbon (Calgon F400 and AC-PF Oxpure1240) and CETCO Fluorosorb. The three PFAS treatment media were successful in removing PFAS down to non-detect levels (typically <4 ppt depending on laboratory detection levels at time of analysis). Over the course of operation, it was determined that Calgon F400 was the most practical media. Thus the project has been using up the initial media and will change out with F400 media moving forward. The 507 ICM system has treated 38.5 million gallons of water as of September 2022.

The second ICM treatment system is sized for 150 gpm and was placed into operation on November 2, 2021 for the Drainage Basin 508. This 508 ICM utilizes F400 media based on the practical learnings from the 507 ICM system. The 508 ICM has been successfully removing PFAS and has not yet required a media changeout. The 508 ICM system has treated 22.3 million gallons of water as of September 2022.

Results/Lessons Learned. SW treatment could be a complex remedial approach. Flow volume is dependent on site conditions (i.e. drainage area, SW infrastructure, contaminant source, etc.). SW quality is also quite variable (i.e. solids/particulates, biological growth,

etc.). These factors can affect the sizing, design, and performance of pump and treat systems. The ICMs have been effective in removing PFAS at designated locations and will continue to be implemented for the site. In parallel, the project is continuing to evaluate other remedial options (i.e. source removal, source treatment, etc.) in addition to the ICMs. SANGB is conducting a PFAS Remedial Investigation to evaluate sources areas in soil, ground water, and SW. The project team continues to evaluate for the most effective and practical remedial option/s to address PFAS and SANGB.