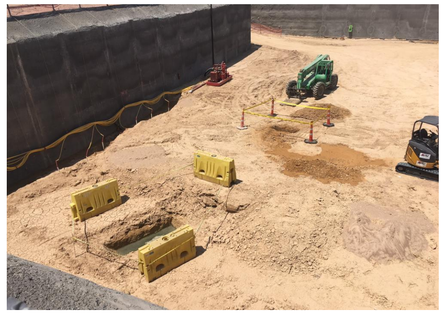
CASE STUDY: Lessons Learned
Perfluorinated Compounds and Groundwater Issues During Construction

Steve R. Nelson, P.G., Carrie Stefanelli, E.I.T. and Kane Carpenter, P.G. (City of Austin, Texas, USA)
Martha Montemayor-Rapier, P.E. (Zander Engineering and Consulting, Austin, Texas, USA)

Introduction

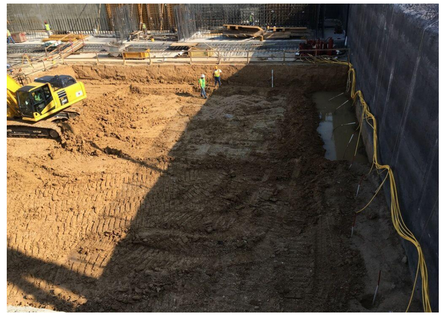
- Airport Terminal Expansion Project
- Relocation of Ramp's Stormwater / Deicing Pond to a Former Air Force Hangar and Aircraft Painting Facility
- Prior to Design/Construction Soil Testing Showed PFAS Below PCLs
- Contact with Groundwater Initially Expected to be Minimal
- Hangar was Demolished and Pond Construction began in Early 2016
- During Construction it was Determined a Confined Aquifer was Present and the Aquitard Undulated Throughout the Pond Footprint
- The Deepest Portion of the Pond would Penetrate the Aquitard
- A 20 Well Dewatering System was Installed Around the Perimeter of the Pond to Lower the Water Table
- Prior to Initiating Dewatering Activities, Groundwater was Tested and PFAS were Discovered (PFOA and PFOS)
- A Groundwater Treatment System was Designed and Installed, However it did not Lower Groundwater Levels Fast Enough to Meet Project Schedule
- 40 Targeted Vacuum Extraction Points were Added and the Treatment System was Redesigned for a Higher Flow Rate. Again, System was not able to lower Groundwater Levels Fast Enough.
- Approach was Changed to Over-Excavate and Install Flowable Fill to Seal the Aquifer and Support the Pond Foundation

Targeted Well Points/ GW Levels



Groundwater Treatment System

Over-Excavation of Pond Bottom



Flowable Fill Emplaced

Concrete Installed Over Flowable Fill

Pond Overview

Successful Alternative Approach

Instead of Lowering the Water Table, the Pond Bottom was Over-Excavated and Flowable Fill was used to Seal the Aquifer and Support the Pond Foundation

Groundwater Treatment System

- Zeolite and Granular Activated Carbon
- Phase I = 175gpm
- Initial Dewatering Attempts were Unsuccessful
- Aquifer Further Evaluated
- Added Targeted Vacuum Extraction Well Points
- Phase II = 500gpm
- Dewatering Efforts were Unsuccessful in Meeting Project Schedule

Totals

- 58 Million Gallons pumped
- 4,000 C.Y. of PFAS soil retained onsite
- $2.5M Construction Change Order

Lessons Learned

- Early Identification of PFAS in Soil and/or Groundwater is Critical
- Proper Evaluation of Aquifer before Developing the Dewatering System
- Consideration for Redesigning the Structure to Avoid Groundwater