

# Dewatering Treatment Systems

by AdEdge Water Technologies, LLC



Construction activity involving dewatering or shallow groundwater extraction often requires complimentary on-site treatment of the extracted water prior to reuse or discharge to meet specific local and state water quality requirements. A host of different contaminants such as arsenic, iron, manganese, heavy metals, VOCs and other natural or anthropogenic parameters can be found in shallow groundwater which when removed typically via a series of extraction wells or well point dewatering systems must be treated in temporary or permanently installed above ground treatment. EPA and State requirements for direct or NPDES discharges continue to tighten.

AdEdge has designed and implemented multiple such systems using a variety of processes including oxidation/filtration, adsorption, coagulation/filtration, ion exchange and other methods for achieving the final water quality or final permit requirements. AdEdge specializes in the design, selection of the right combination of processes, and integration of those processes or treatment steps with the appropriate amount of automation, controls and simplicity of operation.

The complete water system which AdEdge can supply often involves multiple treatment steps and can be packaged as skid mounted, pre-piped and instrumented equipment or within an AdEdge WaterPOD fully containerized transportable system for simple plug & play at the job site. AdEdge's proven H2Zero Backwash Recycle system is often employed to manage backwash water and minimize any liquid or solid residuals from the process for a complete turnkey and environmentally sound solution.

With experience in treating over 20 different contaminants, the AdEdge team can work closely with the end user, General Contractor, or Clients' Engineer in a design/build fashion to design and supply the appropriate treatment solution that will meet the project requirements in a cost effective manner.



Skid-mounted treatment system



WaterPOD containerized treatment system



## 29th Street Residences - Colorado

In October 2010, AdEdge Water Technologies, LLC was contacted by JVA Incorporated to provide an iron and manganese dewatering system for the 29th Street Residences located in Boulder, Colorado. The raw groundwater contains iron levels between 4.6 and 7.4 mg/L and a manganese level of 4.5 mg/L, well above the EPA secondary maximum contaminant levels of 0.3 mg/L and 0.05 mg/L respectively. The iron and manganese levels need to comply with the EPA MCLs in order to be able to discharge into the sanitary sewer and meet applicable discharge criteria. The AdEdge treatment system features a skid-mounted AD26 oxidation and filtration package unit sized for a maximum design flow of 50 gpm. The model APU26-3060CS-4-AVH utilizes AdEdge AD26 media in a four vessel carbon steel configuration in series. AdEdge also provided a recycle backwash system that reclaims 100% of the settled backwash water. The settled iron, manganese and suspended solids form a low-percent-solids sludge that can be dewatered and disposed of in a solid waste landfill. The system was started up and commenced in March 2011. Since system start up, the iron and manganese levels have lowered below the EPA secondary MCLs of 0.3 mg/L and 0.05 mg/L respectively.

## **3100 Pearl Street - Colorado**

AdEdge Water Technologies was contacted by Reylenn Construction to design, manufacture, and commission a permanent dewatering water treatment system for the 3100 Pearl Project. Two separate buildings A/B and C/D were constructed by Reylenn Construction. JVA Inc, provided the up-front engineering as well as Phase 1 and Phase 2 permitting for this project. Adedge Water Technologies was selected to provide a water treatment system to treat the mentioned groundwater to meet the required discharge permit. The groundwater requiring treatment contains very high levels of iron and manganese which needs to be eliminated in order to be able to discharge to the storm sewer, and meet applicable discharge criteria. The treatment goals for the system are to reduce the levels of iron below 0.3 mg/L and manganese below 0.05 mg/L. AdEdge provided two skid-mounted and pre-packaged units in series: an AD26 oxidation/filtration primary treatment unit, followed by a GAC Granular Activated Carbon adsorption secondary treatment unit for each buildings A/B and C/D. The AD26 treatment unit is composed of four (4) 30-inch diameter vessels, while the activated carbon unit is composed of two (2) 42-inch diameter vessels. The AD26 system is the workhorse of the system, and is backwashed approximately twice a day; for this reason it is automatically operated by a PLC. In contrast, the activated carbon system functions as a polishing filter and does not require regular backwashing; for this reason it is manually operated. In order to aid in the oxidation/filtration through the AD26 system, a sodium hypochlorite (chlorine) module is installed upstream of the AD26 system. A sodium hydroxide pump is also included upstream of the AD26 System used for pH adjustment. In addition to treatment of the raw water, AdEdge provided a backwash recycle system that reclaims 100% of the settled backwash water. The settled iron, manganese and suspended solids form a low-percent-solids sludge that will be dewatered in four cone bottom tanks. A small sludge pump is used to transfer the solids to a dewatering box and disposed of in a solid waste landfill. The treatment system was commissioned and began operation in May 2013 and has consistently met treatment goals.



## **Depot Square - Colorado**

The Depot Square project is located in Boulder Colorado and is being developed by 3001 Pearl LLC. 3001 Pearl LLC contracted with AdEdge Water Technologies to design, manufacture, and commission a water treatment system to reduce selenium levels in the discharge water. 3001 Pearl LLC have contracted with JVA, Incorporated as design engineers for the project. The raw water, which has elevated levels of selenium above discharge standards, is being generated from a dewatering process and collected in a sump. It is then pumped by submersible pumps and will be treated through the treatment system supplied by AdEdge. Raw water selenium levels are reported to be as high as 13 parts per billion (ppb) and the treatment goal is established as 4 ppb. AdEdge is providing an APUIX ion exchange treatment system using strong base anionic (SBA) resin. The resin/technology effectively removes selenium (present as selenite or selenite ion) as the water passes through the fixed bed of media without the aid of chemicals, or additives. The treatment system began operation in 2015.