Drinking Water Case History:
THM Prevention & DOC Removal

Background

Cuf was sole sourced for a drinking water facility as it had unmatched purification performance and was the only viable solution for the trend of stricter regulations for reductions in color, THMs, and liquid waste. Cuf achieves all of these water purification requirements and provides an essentially Zero Liquid Discharge solution.

A 1 MGD well has been brought online to reduce the demand on its existing potable well which is declining in capacity. The new well has high THM & HAA formation potential due to its DOC levels and has an amber color (150 cu). Operationally this new well is blended with the existing well which contains 1,000 ppb iron and 480 ppm TDS. The DOC, color and iron all need to be purified (removed) from the source water.

Solution

The 1 MGD Cuf system was commissioned and brought online October 2015. The two ground waters are gravity fed to the Cuf system, with the blend ratio and flow rate controlled over the full range to resolve TDS issues. A small amount of common coagulant is dosed at the inlet of the Cuf for DOC coagulation. The DOC coagulation and iron oxidation occurs rapidly in the Cuf and is filtered and concentrated in real time. The need and cost of large coagulation basins, mixers, clarifiers and the EDR are eliminated.

The palletized Cuf above is the entire water plant and operates on demand removing Color, Fe and the majority of DOC which significantly reduces chlorine demand. Accordingly, once the Cuf system was brought on-line chlorine addition was reduced by 75%. Reduction in DOC and chlorine residual solves THM & HAA formation problems. Purified water is discharged directly to the clear well.

Performance

Parameters	Inlet	Outlet
Blend Ratio	50/50	Clear Well
Color	85 CU	5 CU
DOC	3.3 ppm	< 1.0 ppm
Iron	400 ppb	< 10 ppb
Flux	480 GFD	5 psi TMP
THMs	N/A	38 ppb
HAAs	N/A	18 ppb
Coagulant	14 ppm	Non-detect
TMP Maintenance	Monthly	

Raw **Concentrate** **Finished**

Zero Liquid Discharge (ZLD)

Concentrated DOC and Iron is filtered by Cuf and further dewatered by the integration of the DeWatering Recovery System (DeWRS). The integrated process eliminates liquid waste, creating zero liquid discharge that results in a wet sludge which can be sent to a digestor or landfill. The process can produce approximately 400lbs/day at >20% solids.

Recovered DOC & Fe

Reference Documents

- DOC3019 Cuf Continuous Ultra Filtration
- DOC2015 Technical Briefing: THM (& HAA) Prevention & Color Removal
- DOC2029 On-Site Pilot Testing
- DOC4030 DeWRS Case History: Drinking Water with Zero Liquid Discharge

Facility Tours

Tours of this Vicksburg, MS facility are offered every Thursday from 10:00AM – 12:00PM. Contact Purifics at least one week in advance to arrange a site tour.

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