DIRECT ASSISTANCE PROGRAM

CASE STUDY

NYSP2I Assists Paper Manufacturer with Removal of Tannins in Process Water

Challenge

A paper manufacturer located in the north country of New York State currently uses 300,000 pounds per year of hypochlorite chemicals. This is used to remove the color in their process water at a cost of approximately $500,000 per year, and around 40,000 pounds per year of sodium bisulfite at $34,000 per year to remove residual chlorine in the water prior to discharge. The paper manufacturer wanted to identify the most cost-effective method to both remove color from their process water and reduce the need for toxic and hazardous chemicals.

Solution

The New York State Pollution Prevention Institute (NYSP2I) at the Rochester Institute of Technology (RIT) worked with the paper manufacturer and Clarkson University to determine practical, cost-effective options to remove tannins and suspended solids from the river water and reduce the use of chlorine.

Through a series of on-site visits, NYSP2I worked with the paper manufacturer to better understand their process and evaluate the river water quality. Additionally, NYSP2I supported a Dissolved Air Flotation (DAF) pilot and performed a series of experimentations to find a cost-effective method to remove color from their process water and reduce the need for toxic and hazardous chemicals.

Results

Various options were considered and pilot-tested for river water treatment. For the DAF testing, a several week pilot was conducted. This pilot did not provide satisfactory results and it was determined that additional treatment steps would be required, rendering this approach impractical. While testing with nanofiltration membrane technology provided satisfactory water quality, installation of a production-scale membrane system would exceed $1.5 million and was considered cost-prohibitive. Ultrafiltration membrane technology may be less costly but water quality could potentially be sacrificed.

A settling tank filter bed system, which is currently utilized by municipalities to pretreat river water, was also evaluated. Testing was performed on this approach and the results indicated that a successful cost-effective system can be constructed and used to remove tannins and suspended solids. The paper manufacturer plans to move forward with implementation and expects to have this system in operation in Fall 2017.

CHALLENGE

- The paper manufacturer wanted to identify the most cost-effective method to remove color from their process water and reduce the need for toxic and hazardous chemicals

SOLUTION

- NYSP2I and Clarkson University worked together to determine practical, cost-effective options to remove tannins and solids from the river water and reduce use of chlorine
- Dissolved Air Flotation (DAF) pilot test conducted
- Experiments were conducted to find cost-effective methods to remove color from process water and reduce the need for toxic and hazardous chemicals

RESULTS

- A settling tank filter bed system was tested and the results indicated a cost-effective system that would remove tannins and suspended soils

NYSP2I PARTNERS

New York Manufacturing Extension Partnership

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