

CASE STUDY / CITY OF PACIFIC, MISSOURI

HISTORIC FLOOD EVENTS LEAD TO WASTEWATER TREATMENT PLANT IMPROVEMENTS

When major flooding caused widespread damage in Pacific, Missouri, the city's wastewater treatment plant required a repair for not only immediate infrastructure issues but an adaptable solution for the flood-prone area.



INNOVATIVE WASTEWATER PLANT DESIGN APPROACH MITIGATES FUTURE FLOOD IMPACTS

With the wastewater treatment plant located near the Meramec River, the city of Pacific needed improved flood resiliency incorporated into the repair of its plant to limit damage from future catastrophic floods.

PROJECT STATS

CLIENT

City of Pacific, Missouri

LOCATION

Pacific, Missouri

COMPLETION DATE

June 2019

7K+

PEOPLE SERVED

2

MAJOR FLOODS IN THE
LAST FIVE YEARS

126

PER 100 ML E. COLI
MONTHLY AVERAGE LIMIT

CHALLENGE

Flooding in Pacific, Missouri, created a need for innovative repairs to the city's wastewater treatment plant. Located at the area's lowest elevation and bordered on three sides by the Meramec River, the plant experienced significant flooding after heavy precipitation events in 2015 and 2017. The plant is also located within the 100-year flood hazard zone and partially in the regulated floodway, making the infrastructure vulnerable to flood damage.

The two major flood events caused significant equipment damage. While nearby railroad tracks had been blocking rising floodwaters for years, they gave way under sustained pressure from the Meramec — sending

a torrent of water over the plant and associated infrastructure, damaging the plant's aeration system, ultraviolet (UV) disinfection system and associated electrical equipment that had become partially submerged.

To stay in compliance with the regulations set by the U.S. Environmental Protection Agency, the wastewater plant is required to monitor E. coli levels and disinfect wastewater during the recreational season, which runs April to October. While the plant only fell into noncompliance a few times during the flooding, city officials knew they needed a long-term solution for mitigating the flood-prone layout. They called for a new approach to the UV system and electrical equipment, and to the aeration system





layout, as well as the repair of the baffle and floating cover.

SOLUTION

The team of engineers developed a plan that would improve the wastewater treatment plant layout to reduce the damage from future floods. The project included installation of a new aeration system, that was supplied by Triplepoint Environmental, complete with retrievable aerators that add oxygen and mixing for biological digestion of waste. Because new aeration units are self-weighted, they are designed to sit on the bottom of the lagoons and, therefore, will not be affected by rising floodwaters.

Retrievable aeration units give plant employees the ability to periodically inspect units and maintain diffuser elements to promote system efficiency. A new platform was installed based on the Federal Emergency Management Agency (FEMA) flood plain elevation. Pacific officials wanted a platform that would sit above the flood plain elevation to better protect the electrical equipment during a future flood. The new UV modules, supplied by Calgon Carbon, have the ability to be temporarily submerged. However, the modules can also be unplugged, which allows plant employees to remove the modules in the event of a major flood.

RESULTS

Completed in June 2019, the innovative design with a new aeration system, UV technology and electrical platform gave Pacific's wastewater treatment plant the flexibility to proactively respond before floodwaters hit. The plant will continue to be susceptible to flooding due to its low elevation, but the environment and city will benefit greatly from the flexibility of a new plant design. The plant can now operate with limited disruption and minimize impacts from future flood events.



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