

Flooded Sewage Plants Seek Ways to Keep Pumps Running in the Next Storm

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By Debra K. Rubin

The impact of Superstorm Sandy on the region's power, transportation and institutional infrastructure was clearly evident to millions of customers who suffered outages, delays and dislocations. The hurricane's effect on regional environmental infrastructure—drinking water and wastewater treatment plants—was less obvious to most people but amplified their vulnerability to wind and water threats.



Photo by Doug Kuntz

Overflow: Untreated or partially treated sewage flowed into Long Island waterways when a plant in East Rockaway, N.Y., was knocked out of service.

Sandy caused 11 billion gallons of partially treated and untreated sewage to flow from plants flooded by storm surges or rain into waterways in Washington, D.C., and eight East Coast states last October, according to a report by Climate Central, a Princeton, N.J., environmental group. More than 94% of the total Sandy-generated sewage overflow occurred in New York and New Jersey, with four wastewater treatment plants in the two states each reporting flows of more than 1 billion gallons. That is despite what the group said were "heroic" efforts by operations staff to reduce the impacts. Treatment plant recovery, damage repair and resiliency building already are costing the two states more than \$3.7 billion, and the tab is far from final.

"Sandy showed the extreme vulnerability of the region's sewage treatment plants to rising seas and intense coastal storms," says Alyson Kenward, Climate Central report author and senior scientist. She notes facilities' "expansive underground labyrinths of pipes, holding tanks and pumps that can remain waterlogged and incapacitated long after floodwaters recede."

Assessing the impacts

No facility was likely harder hit than the Passaic Valley Sewerage Commission (PVSC) wastewater treatment plant in Newark, N.J., the state's largest facility and the nation's fifth largest, serving 1.4 million customers. A 12-ft storm surge hit the plant, cutting power and sending 3.8 billion gallons of untreated and partially treated wastewater into Newark Bay before secondary treatment resumed two weeks later. Tunnels and underground process areas filled with more than 37 million gallons of salt water. "During the event, we lost the sump pumps," says PVSC Maintenance Superintendent Jerry Oselador, who says there is at least \$60 million in immediate damage, including electrical equipment corrosion, and "we're only half-done assessing it."

Noting the impracticality of raising the plant, PVSC Chief Engineer John Rotolo says there is a multi-dimension flood mitigation strategy that includes submersible pumps and flood barriers, elevated process controls, rehabbed dewatering centrifuges and new storm water pumping stations. Rotolo says the plant has submitted a FEMA funding request to build a \$25-million wall around the 160-acre facility as high as 19 ft, which could take as long as five years to complete. Future projects also are set to upgrade capacity to more than 700 million gallons per day and include a \$65-million, 30-MW onsite primary power plant, he says. FEMA already is funding 75% of a \$1.4-million project to restore critical documents lost in the flood, says N.J. Rep. Bill Pascrell (D).

Flooding at the Bay Park treatment plant in East Rockaway, N.Y, sent 100 million gallons of untreated sewage into Long Island waterways. It has energized environmentalists' efforts to modernize and storm-proof the nearly 60-year-old facility. According to a local report, parts of the facility took on more than 9 ft. of saltwater in the storm surge, with some processes still running on backup generators. Plans call for \$1.2 billion in plant upgrades and hardening measures, including extending an Atlantic Ocean outfall, but much depends on state and federal funds, county officials say.

New Jersey's Dept. of Environmental Protection (DEP) plans to allocate an estimated \$2.6 billion for some 370 water and wastewater plant projects, mostly for resiliency upgrades, but Gov. Chris Christie (R) won't likely approve new funding streams for the billions more needed, says a report in NJ Spotlight, an online news outlet. Sequestration has already cut into the U.S. Environmental Protection Agency's \$600-million post-Sandy funding for environmental infrastructure, mostly in the two states.

In April, Kevin F. Donnelly, assistant commissioner of the New York City DEP, told an American Society of Civil Engineers panel in Brooklyn, N.Y., that while the city "dodged a bullet" with minimal Sandy damage to its facilities, new long-term solutions will still be necessary and won't be cheap. "Ratepayers need to be convinced we need to take action," he said.