



Hurricane Helene: MSD Pretreatment & Industrial Coordination Response

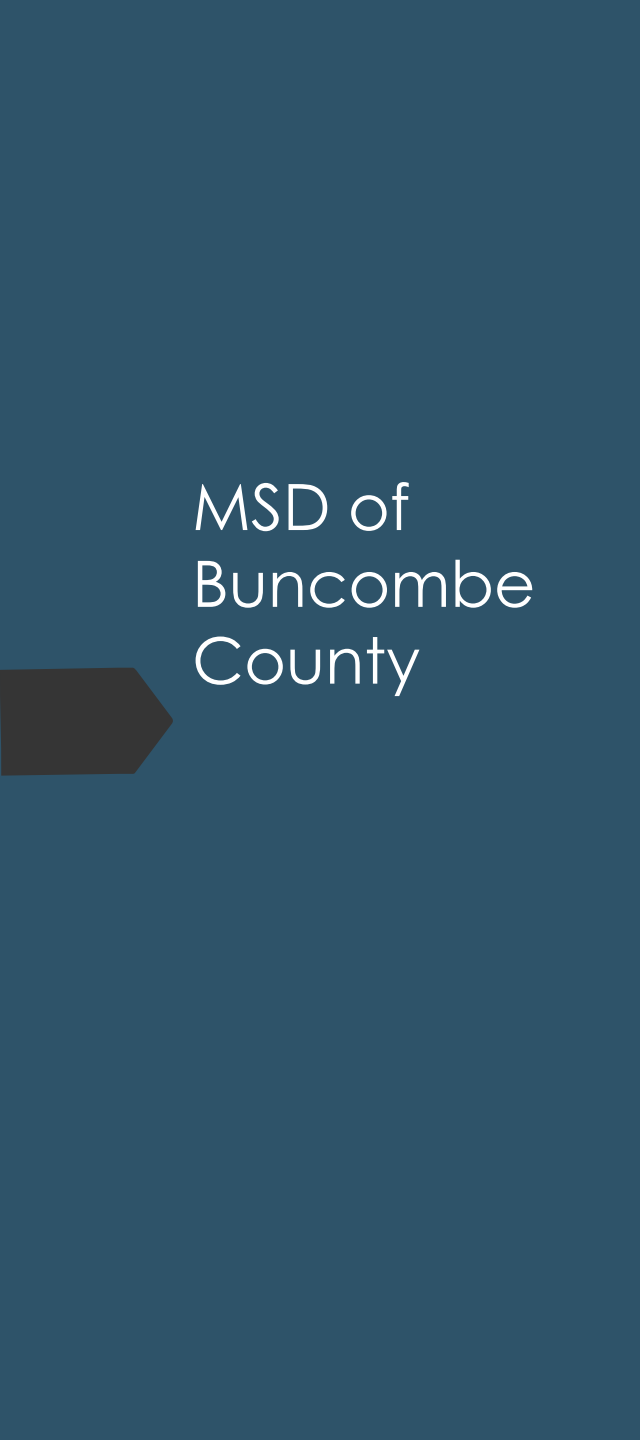
NC Pretreatment Consortium

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MSD of Buncombe County

Formed in 1962 to manage wastewater and sewage treatment for Buncombe County.

Headquarters: 2028 Riverside Drive, Asheville, NC.

Overseen by a Board of Directors with 14 members: 3 from Buncombe County, 3 from Asheville, among others.

Hurricane Helene General Info

Cat 4 storm. Tropical storm when impacting Asheville/Buncombe County.

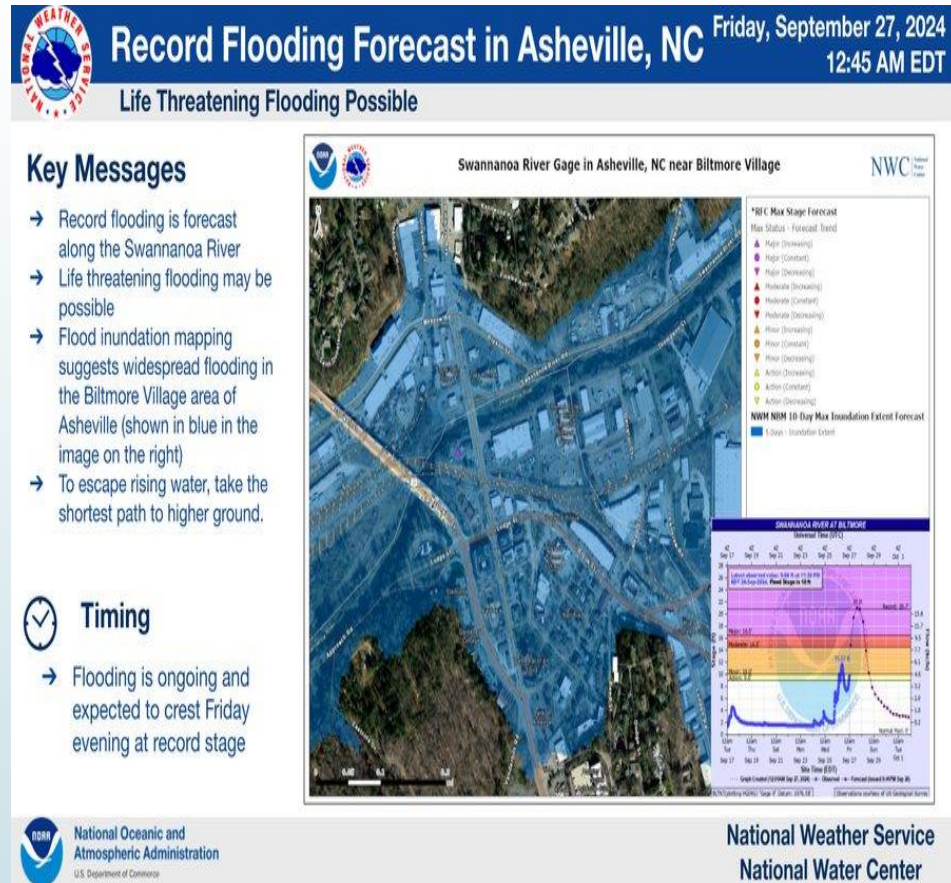
Asheville received 13.98 inches of rainfall from Sept 25–27, 2024.

Rivers in the French Broad basin crested several feet above all previous records.

Helene was especially destructive from rainfall and flooding, particularly in the Southeastern U.S. and the Appalachian region. Western North Carolina saw record rainfall.

Most weather stations in Buncombe County broke three-day rainfall records.

Helene caused the most widespread flooding Western NC has seen in decades, with severe impacts across the French Broad River basin.



Environmental Impacts

- Significant tree loss occurred, with ~40% of trees damaged or knocked down.
- Household and industrial chemicals flooded into river basin.
- Tremendous amounts of trash and debris in the river basin and aftermath of flooding.
- Debris removal is still occurring.



Early Damage

- Initially we had no contact with our industries.
- Our plant was faring well other than the power outage after the substation blast.
- Localized flooding submerged pump stations, sewer lines, and nearby industrial facilities, requiring rapid assessments to keep systems operational.
- 5,000 linear feet of pipe had to be repaired or replaced at MSD.



Loss of Communications

- Communications blackout, no cell/internet, limited radio.
- It is important to develop protocols for all staff on how to handle these situations.
- All MSD employees showed up for shifts, even with no cell service, internet, etc.
- Initially Industrial Pretreatment Staff drove to industrial sites to assess damage.





Commercial Impacts

Many restaurants, shops, and small businesses closed permanently.

Others were forced to shut down for extended periods due to flooding and utility outages.

Closures had ripple effects on wastewater and pretreatment coordination.

Emergency Procedures



Most pump stations on backup power; tag-in system for staff accountability.



We kept a whiteboard with known locations of all teams in the field.



It was crucial that all employees had food, water, and other basic needs cared for. Without these things your staff can't be effective.

NCDEQ Coordination & Regulatory Communication

NCDEQ issued
emergency guidance
and approvals

NCDEQ coordinated
closely with MSD,
providing regulatory
flexibility to allow
temporary discharges,
septic receiving, and
hauling support.



Temporary Compliance Flexibility

Just as NCDEQ granted flexibility to the treatment plants in the area, MSD granted flexibility to its industrial users.

All industries had to provide a compliance schedule that MSD Industrial Pretreatment Approved.

Continuous industrial reports were required and, in some cases, MSD granted extended (6 – 12) month compliance schedules.

Urgent Contact with Industrial Users



Industrial user contact information was maintained on paper. Local files on computers were accessible, but nothing connected to the internet or databases could be reached.



After restoration of communication, we started the process of determining industrial damage.



How many industries were still operational?



How many industries were importing water or using a well?



Industrial Coordination — Temporary Discharges

- Many industries and restaurants were allowed to rebuild without consulting MSD about potential changes in wastewater characteristics.
- This is an important issue to address with Planning and Development departments before disaster strikes as part of the recovery plan.
- MSD Pretreatment had to determine what types of wastewater could resume discharge without proper pretreatment.
 - Job impact
 - Community impact
 - Water Reclamation Facility impact



Industry Challenges — Breweries & Restaurants

- Many breweries and restaurants closed their doors permanently.
- Others were forced to shut down for significant periods of time without lights and water.
- A second wave of industrial decisions were made as breweries came back online and needed to discharge spoiled products.



Temporary Water Issues & Low Flows

- Potable water outages, boil-water advisories, low plant flows.
- Operations had to adapt to low flows. This was considered as well as we industries came back online without full pretreatment.
- The recovery of normal flow took months with the City of Asheville not having potable water for 53 days. Some areas took even longer.

Septic & FEMA Hauling Surge

- For two weeks, MSD opened the gates of septic receiving at no cost to haulers. We were extremely unprepared to handle the explosion of FEMA haulers arriving to haul wastewater.
- Typically, only 1 employee worked on septic permitting and this was a small portion of their job.
- After the first 2 weeks we were facing the need to permit over 100 septic/FEMA haulers.



Septic & FEMA Hauling (Cont)

- The Pretreatment Supervisor, Lab Analyst, and both FOG Inspectors had to shift focus to the Septic/FEMA hauling program.
- We also had to permit and manage larger hauling trucks that did not fit in our Septic Receiving Area.
- MSD designated and monitored 3 manholes for Septic Discharge. We had to quickly adapt as issues arose.



Example Industry Case Studies

- A large brewery needed extensive compliance flexibility to rebuild pretreatment.
- A defense contractor hauled in water and needed to resume operations urgently. They also drilled a temporary well which had high Zinc levels. MSD had to ensure lines were clear for them to begin discharge.
- A metal finisher completely flooded and did not resume production for 4 months.



Employee Support



All employees had to be ready to step into any role necessary, beyond their normal responsibilities.



Staff faced significant personal stress, balancing storm damage to their own homes and families while still reporting for duty.



The municipality had to be prepared to support employees and operations beyond what is normally expected.



Flexible scheduling for staff is essential for months after the disaster to balance recovery, operations, and personal needs.



Lessons Learned

- Redundant communication systems are essential
- Cross-training & flexibility keep operations running
- Support for staff (basic needs, flexible scheduling) is critical
- Regulatory flexibility enabled rapid recovery
- Industrial coordination must be planned before disasters
- Strength of hauled wastewater needs to be considered



Action items

Establish redundant communication systems (radio, satellite phones, local alert channels)

Maintain paper copies of industrial contacts and critical protocols

Develop a cross-training program so staff can step into multiple roles

Create an employee support plan (emergency food/water, housing assistance, mental health support) Implement flexible scheduling policies for long-term recovery periods

Formalize regulatory emergency coordination protocols with NCDEQ

Pre-plan with industries and planning departments for post-disaster rebuilding and wastewater changes

Expand septic/hauler management capacity (permits, infrastructure, staff) for surge events

Improve the field accountability system (tag-in, whiteboard tracking, etc.) for staff safety



Restoration Timeline

Immediate Response (Sept 25–30, 2024)

- Hurricane landfall and 13.98" rainfall recorded.
- Substation blast → major power outage.
- Pump stations submerged; 5,000 ft of sewer pipe needing repair.
- Complete communications blackout (cell/internet).
- Staff accountability maintained via whiteboards and tag-in system.
- Industrial pretreatment staff drove to sites to assess damage.

First 2 Weeks (Oct 2024)

- Most pump stations switched to backup power.
- Emergency food, water, and shelter provided to staff.
- Two-week free septic receiving for FEMA haulers → surge overwhelmed staff.
- NCDEQ issued emergency guidance for temporary discharges and regulatory flexibility.
- Breweries/restaurants shut down due to flooding, boil water notices, and outages.

Weeks 3–6 (Oct–Nov 2024)

- Over 100 FEMA haulers permitted; 3 manholes designated for septic discharge.
- Pretreatment, FOG, and Lab staff reassigned to manage hauling.
- Temporary discharges from industries allowed with compliance schedules.
- Initial brewery discharges of spoiled product begin.
- Potable water partially restored; industries begin limited restart.



Restoration Timeline (Cont)

3–6 Months (Dec 2024 – Mar 2025)

- Extended compliance schedules (6–12 months) in place.
- Ongoing brewery and restaurant reopening; many permanently closed.
- Low wastewater flows continued due to population/business displacement.
- Industrial coordination on rebuilding pretreatment systems without prior consultation.

6–12 Months (Apr – Sept 2025)

- Continued staggered industrial restarts.
- Long-term repairs to sewer infrastructure finalized.
- Staff flexible scheduling ongoing to balance recovery and personal storm impacts.
- Some industries still under extended compliance agreements.

1 Year + (Late 2025 and beyond)

- Full restoration of industrial compliance expected.
- Long-term economic effects (loss of ~40 downtown businesses).
- Permanent program updates: redundant communications, disaster protocols, FEMA hauler permitting system, industry coordination with Planning & Development.