



Extended Abstract Template

Increasing Stormwater Resiliency Through Innovative Codes & Ordinances

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Highlights

- The city of Pittsburgh was the first non-coastal city to revise their codes to include the effects of climate change.
- This multi-stakeholder project was an organization and forward-thinking change for the city.
- The question of how much additional storage is required for resiliency was analyzed.

Introduction

Over the past several years, the City of Pittsburgh has been experiencing a growing renaissance of new and redevelopment projects. However, at the same time stormwater management issues such as localized flooding, polluted waterways, and basement backups from climate change induced cloudburst rain events continue to plague much of the City. In 2021, the Pittsburgh Water and Sewer Authority in partnership with several departments in the City of Pittsburgh updated its stormwater codes and ordinances in an effort to:

1. Establish more concise regulations while streamlining the stormwater plan review process,
2. Create a more proactive code language towards encouraging successful green infrastructure practices, and
3. Ensure stormwater infrastructure is more resilient to future climate change impacts.

Methodology or Background (for case study)

Lessons Learned

This presentation will provide valuable lessons learned during this multi-stakeholder collaborative project.

Technical Elements

The presentation will also offer key technical elements from the newly developed accompanying City of Pittsburgh Stormwater Design Manual. The audience will learn innovative strategies for how their own municipality can go above and beyond the minimum state model ordinance language to ensure successful and climate resilient stormwater management as part future new and re-development.

Key Findings

The following were the new regulations and policies put into effect as a result of this study:

- Two-Step Review Process
- Better Coordination with Allegheny County Plumbing Permits
- Clarification of Filtration Requirements in Separate Sewer Areas
- Requirements to Reduce Sanitary Sewer Inflow
- Public Health and Safety Release Rates
- Addressing Climate Change
- Strengthening Pretreatment Requirements
- Limiting Right-of-Way Discharges
- Limiting Groundwater Discharge
- Addressing Non-Sewered Areas
- Controlling Discharges to Landslide Prone Areas
- Infiltration Testing Requirements
- Stronger Technical Infeasibility Criteria
- Consistent In-Lieu Fees
- Hardship Waivers for M/W/VBEs and Affordable Housing Developments
- Same Owner Banking and Trading
- Innovation Track for Approving New Technologies
- Incentives for Preferred Technologies and Additional Stormwater Management
- Enhanced construction inspection and long-term O&M enforcement resources

Recommendations

- Stakeholder engagement including multi-agency coordination and cooperation was critical to project success.
- Implementation of future climate change projections for the design of stormwater infrastructure.
- 1st non-coastal city in the U.S. to implement
- Proactive approaches to help flood prone areas.
- Balance of requiring the development community to do more while providing new tools and resources to make approval processes more predictable as well as new options for innovation and flexibility.

Touring America's NPDES Construction Stormwater Regulations by Rail

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Highlights

- Local and state stormwater regulations differ significantly across the United States.
- Key project metrics affecting applicability are the areas of earth disturbance and increase in impervious cover.
- Two projects with similar metrics may be subject to highly variable regulations depending on location.

Introduction

The United States Environmental Protection Agency (EPA), through the Code of Federal Regulations (CFR), requires National Pollution Discharge Elimination System (NPDES) permit coverage for stormwater discharges from construction activities that disturb one or more acres within regulated Municipal Separate Storm Sewer Systems (MS4s). These regulations are implemented by general NPDES permits issued by EPA and authorized by the states. Apart from EPA regulations, the various states, counties, and local governments may also require stormwater management compliance through local ordinances, building codes, and development plan requirements. Our client, a railroad corporation, is implementing accessibility improvements in compliance with the Americans with Disabilities Act (ADA) at its stations nationwide. Such improvements typically include the construction of new accessible walkways, platforms, and parking, and increase the percent of impervious coverage on typical sites. Depending on the proposed area of earth disturbance and increase in impervious coverage of these development (or redevelopment) projects, typically NPDES permit coverage is required, necessitating the submission of a stormwater management plan and compliance with various performance criteria to the agencies having jurisdiction. The authors present a summary of local municipal, county, and state NPDES stormwater and erosion and sediment control regulations encountered through their work in 20 states.

Key Findings

Local and state stormwater regulations vary significantly with respect to project locations where required, project size threshold of applicability, volume control requirements (i.e., retention and treatment), types of construction activities that are specifically exempted, and whether redevelopment standards differ from new development standards. Certain states and municipalities specifically exempt construction activities relating to the routine maintenance and/or repair or rebuilding of the tracks, rights-of-way, bridges, communication facilities and other related structures and facilities of a railroad company, while others do not. Two projects with identical key metrics in different locations around the country may be subject to highly differing regulations. Also, due to inconsistent local ordinances, a particular project may be exempt from certain standards but not other closely related standards, based solely on project type. For example, a railroad project may be exempt from a municipality's erosion and sedimentation control standards but not its stormwater management standards.

Recommendations

Consultants assisting railroad corporations with stormwater permits for their development or redevelopment projects should thoroughly research all local, state, and federal regulations for applicability. They should be aware that inconsistencies exist between and even within similar regulations in different localities. A comprehensive understanding of the differences and similarities should be performed by comparing and contrasting regulations across multiple states and municipalities, and a larger sample size of nationwide locations for similar projects is preferred.

References

- Water Permits Division. (2016, July). *Summary of State Post Construction Stormwater Standards*. Environmental Protection Agency. Office of Water, Office of Wastewater Management. https://www.epa.gov/sites/default/files/2016-08/documents/swstdsummary_7-13-16_508.pdf
- Water Permits Division. (2011, June). *Summary of State Stormwater Standards*. Environmental Protection Agency. Office of Water, Office of Wastewater Management. https://www3.epa.gov/npdes/pubs/sw_state_summary_standards.pdf



I don't remember it raining like this before, stormwater design and regulatory context

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Introduction

This presentation will provide a practitioner's view of recent intense rainfall events. The presentation will focus and highlight multiple recent storm events. All of the highlighted storms discussed will be storms which occurred within the local Mid-Atlantic region. Where available, measured rainfall intensity will be compared to NOAA Atlas 14 return-frequency relationships.

The presentation will also provide a brief overview of various efforts to update current intensity-duration-frequency relationships within the Mid-Atlantic region. These efforts include the Projected Intensity-Duration-Frequency (IDF) Curve Data Tool for the Chesapeake Bay Watershed and Virginia (MARISA) as well as recently released studies funded by the New Jersey Department of Environmental Protection (NJDEP). The two recent NJDEP studies focused on updating the current NOAA Atlas 14 data to present conditions and separately forecasting IDF relationships to the year 2099.

Potential stormwater design implications of changing IDF rainfall patterns will be discussed, including hydrologic modeling of various scenarios. These results will be discussed in context of recent pending emergency rules which rely on the future IDF forecasts.

References

DeGaetano, A. and Tran, H. (2021). Changes in Hourly and Daily Extreme Rainfall Amounts in NJ since the Publication of NOAA Atlas 14 Volume.

DeGaetano, A. (2021). Projected Changes in Extreme Rainfall in New Jersey based on an Ensemble of Downscaled Climate Model Projections.

MARISA a NOAA Mid-Atlantic RISA Team (2022). Projected Intensity-Duration-Frequency (IDF) Curve Data Tool for the Chesapeake Bay Watershed and Virginia, <https://midatlantic-idf.rcc-acis.org/> (accessed September 2022)