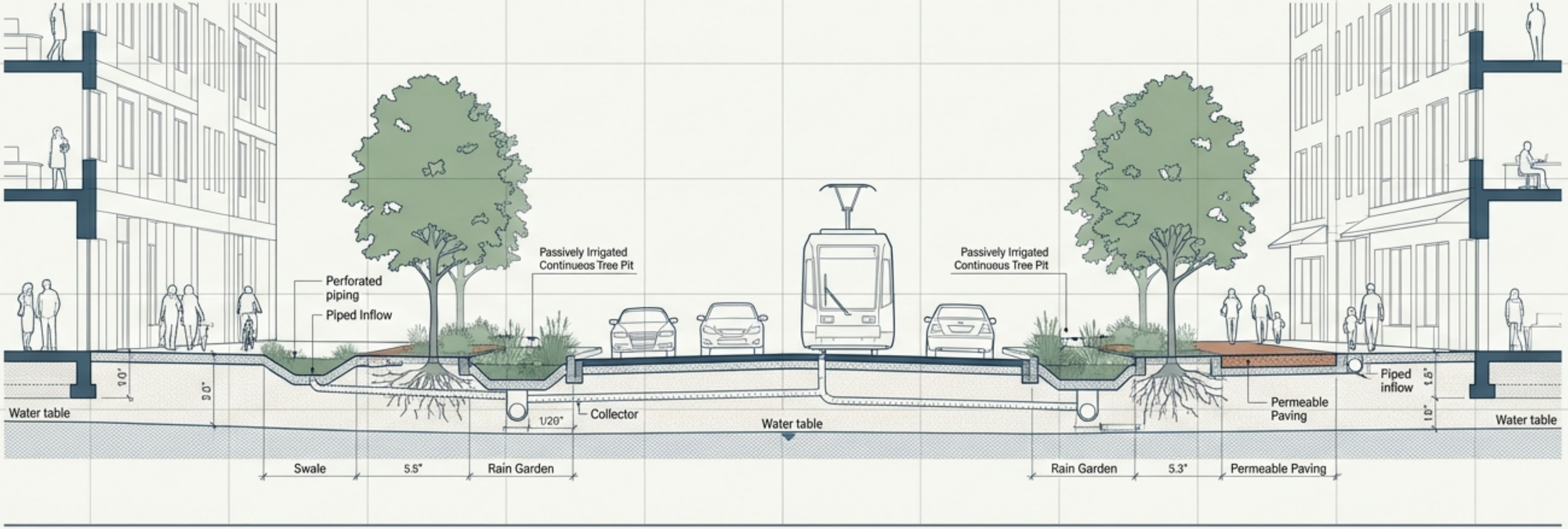


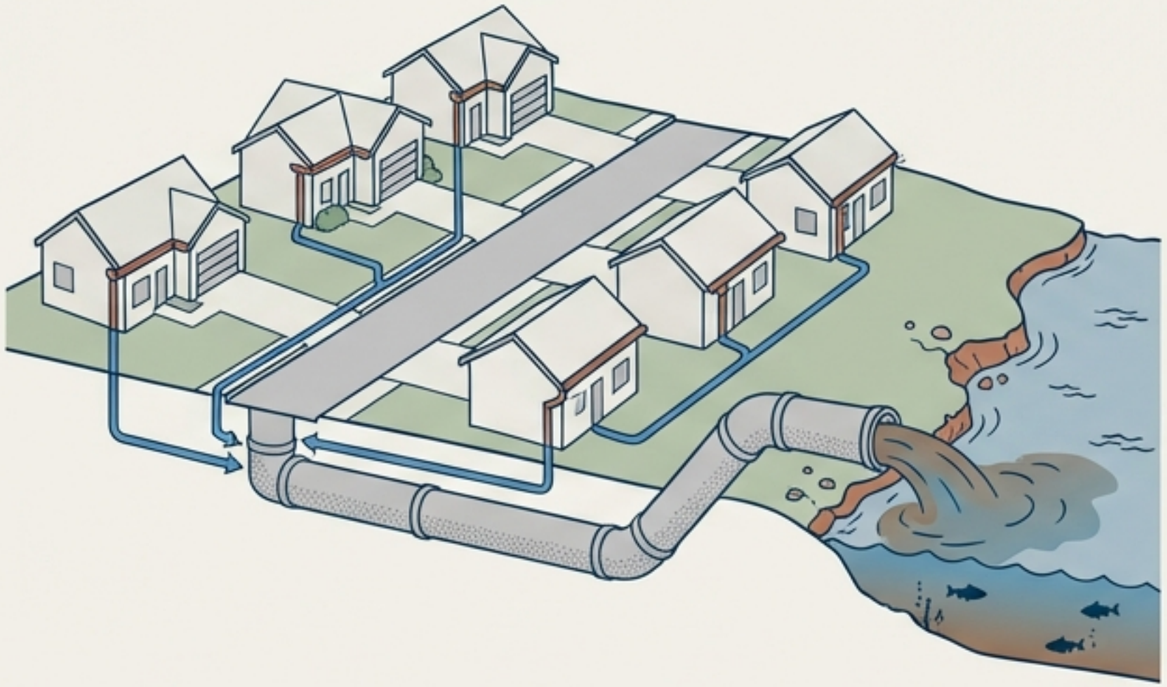
New Jersey Stormwater Management Rules

A Comprehensive Guide to N.J.A.C. 7:8, Green Infrastructure, and Climate Resilience

Moving from uncontrolled discharge to holistic watershed management. This guide outlines standards for "Major Development" as defined by the NJDEP, incorporating 2020 Green Infrastructure amendments and 2023 Climate Change adjustments.

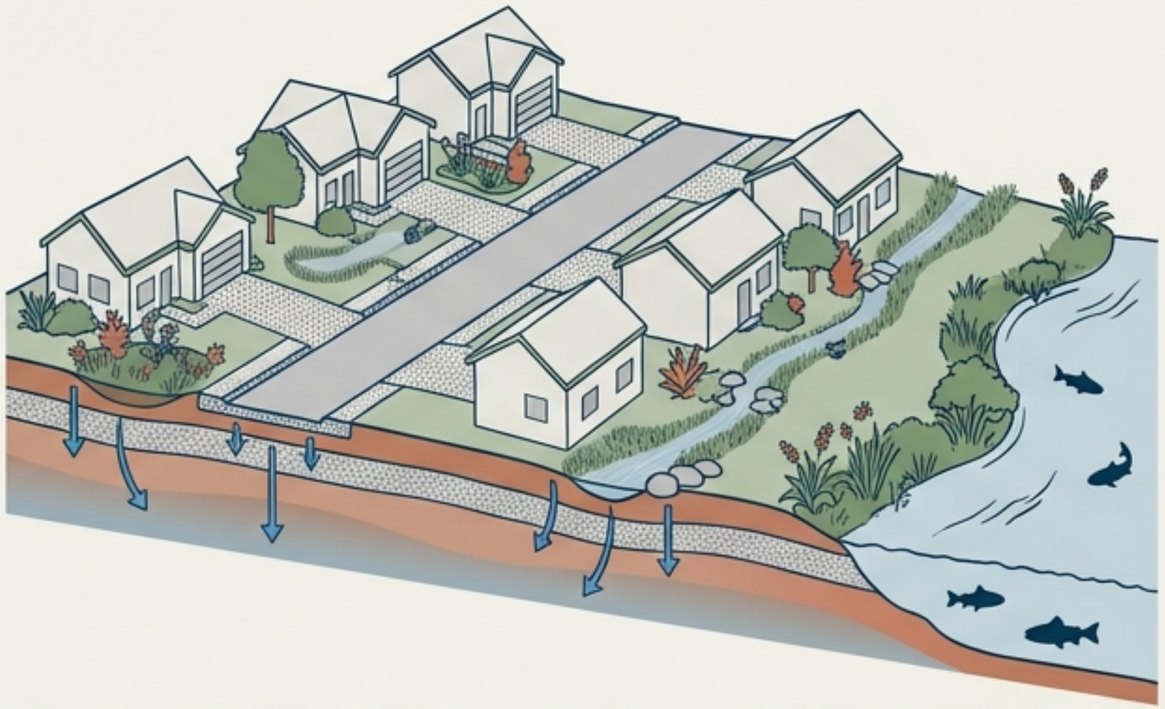
Moving from Site-Specific Disposal to Regional Resilience

Traditional Approach



The Old Paradigm: Site-by-site management resulting in downstream flooding, erosion, and pollution.

Regional Planning



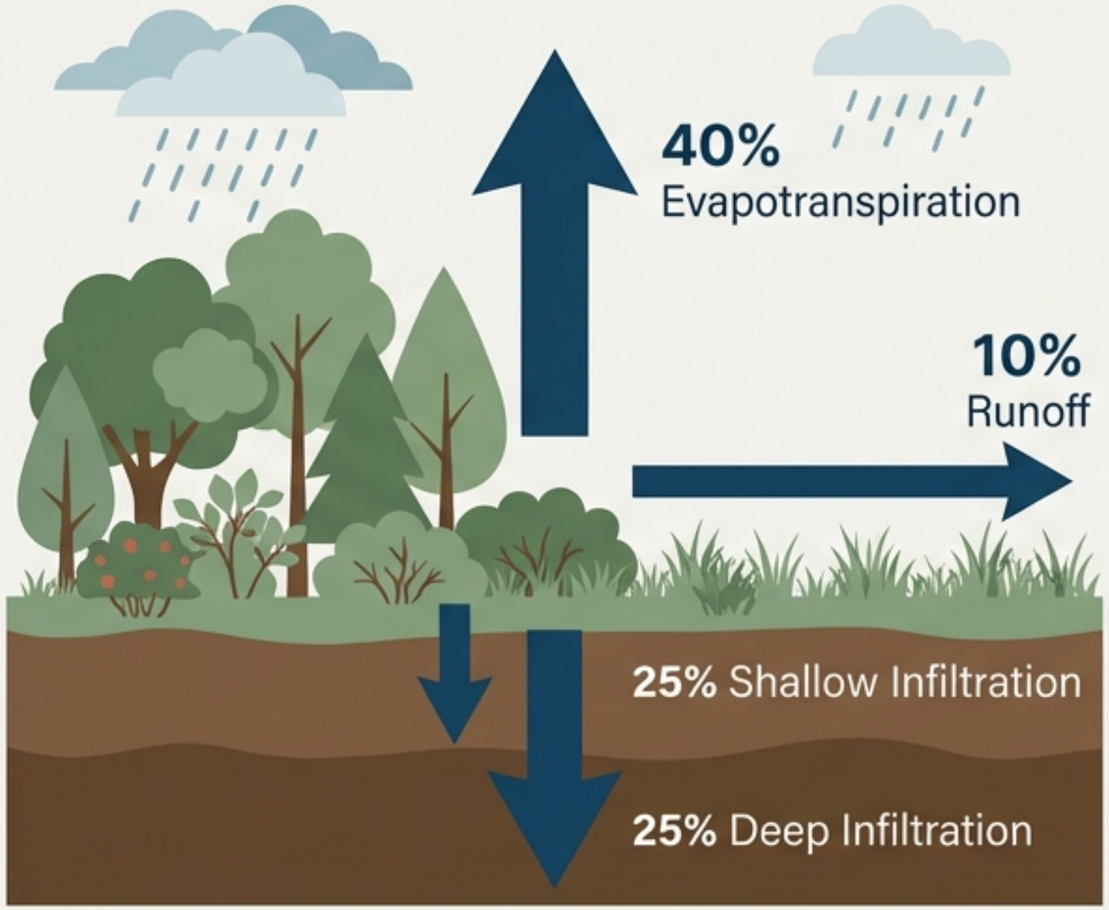
The New Standard: Watershed-based planning restoring natural hydrology through Green Infrastructure.

Core Transformations:

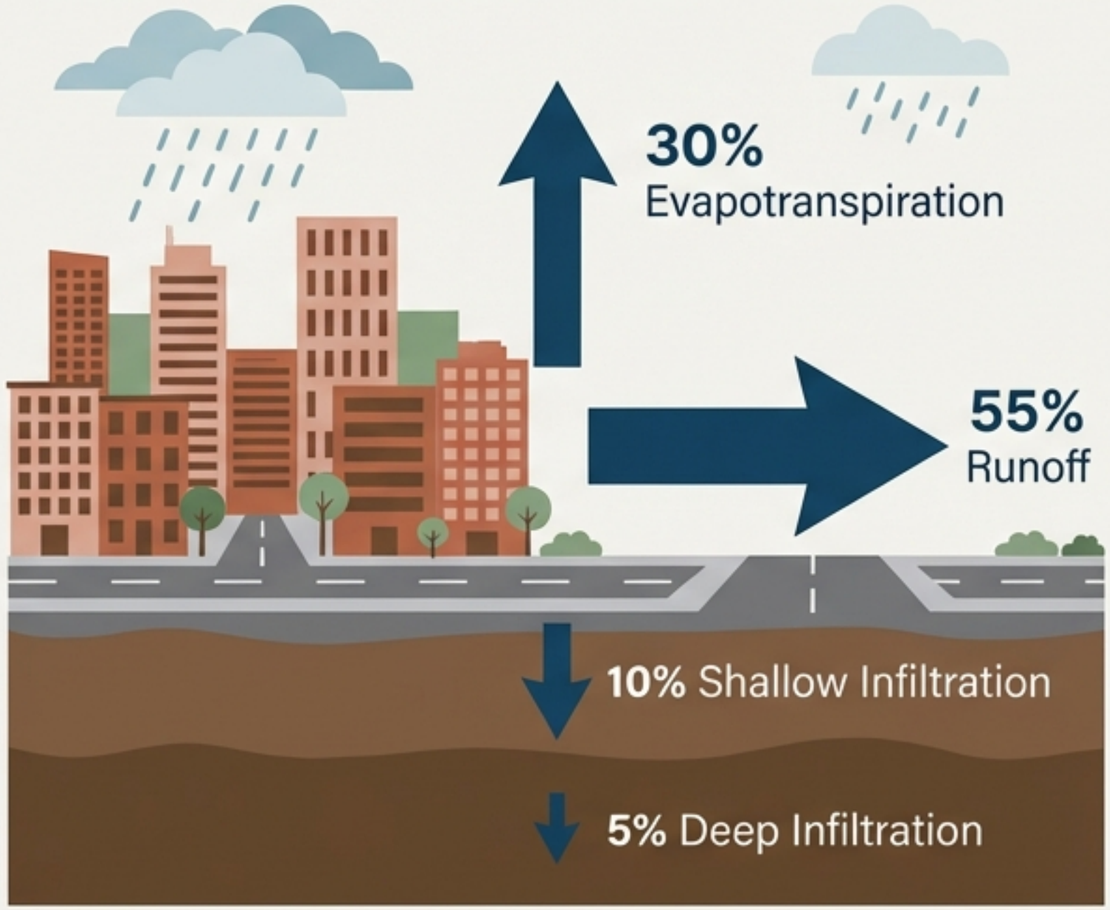
1. From Uncontrolled Development → Planned Development.
2. From Direct Pipe Discharge → Management through Green Infrastructure.

The Hydrologic Impact of Urbanization

Natural Environment

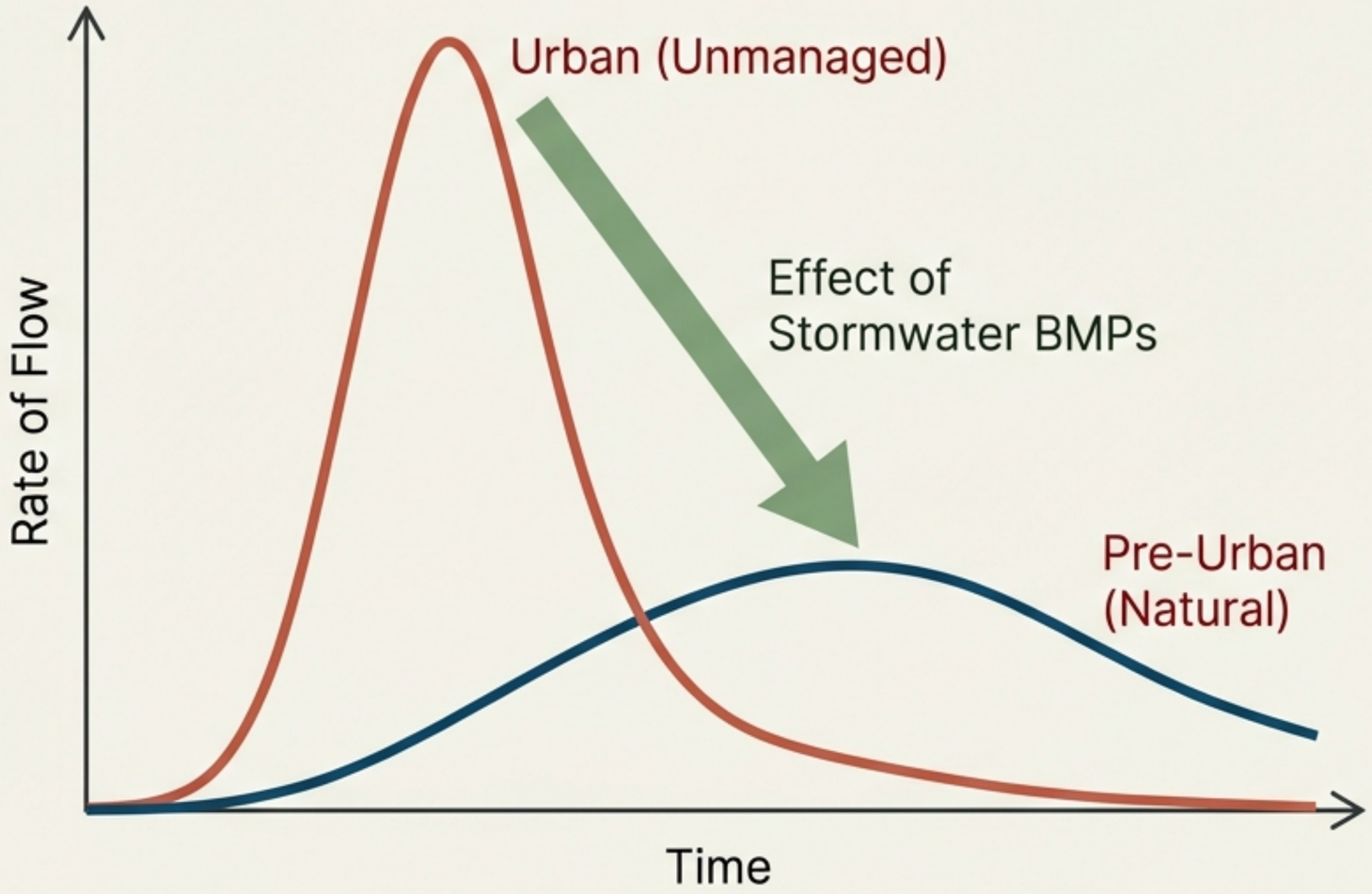


Urban Environment



As land development increases, impervious coverage prevents water from soaking into the ground. This reverses the hydrologic balance, creating a volume problem: runoff discharges to surface waterbodies more quickly, causing downstream flooding and reduced aquifer recharge.

Flattening the Curve: Restoring Pre-Construction Hydrology



The Peak Flow Problem:

Urbanization increases both peak flows (height) and total runoff volumes (area under the curve).

The Regulatory Mandate:

N.J.A.C. 7:8 requires Best Management Practices (BMPs) to reduce post-construction peak flows to match or improve upon pre-construction levels, mimicking the land's natural storage.

Defining the Trigger: What is “Major Development”?

Disturbance:

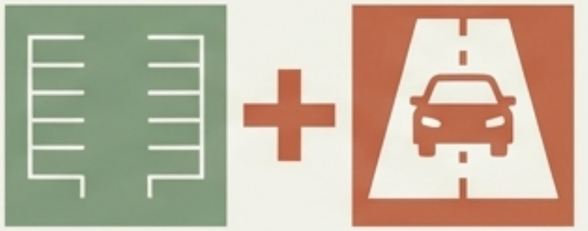
1 or more acres of land disturbance.

Impervious Surface:

Creation of 0.25 acres or more of regulated impervious surface.

Motor Vehicle Surface:

Creation of 0.25 acres or more of regulated motor vehicle surface (since March 2021).



Combination:

A combination of impervious and motor vehicle surface totaling 0.25 acres or more.

Critical Definition: “Regulated Motor Vehicle Surface” includes any surface (pervious or impervious) intended for use by vehicles (driveways, parking lots, roads) exposed to precipitation.

The Three Pillars of Performance Standards

Standard 1: Groundwater Recharge

Goal: Maintain 100% of average annual pre-construction recharge.

Purpose: Protect water supply and maintain stream baseflow.

Standard 2: Water Quality

Goal: 80% reduction in Total Suspended Solids (TSS).

Trigger: Applies specifically
Trigger: Applies specifically to motor vehicle surfaces.

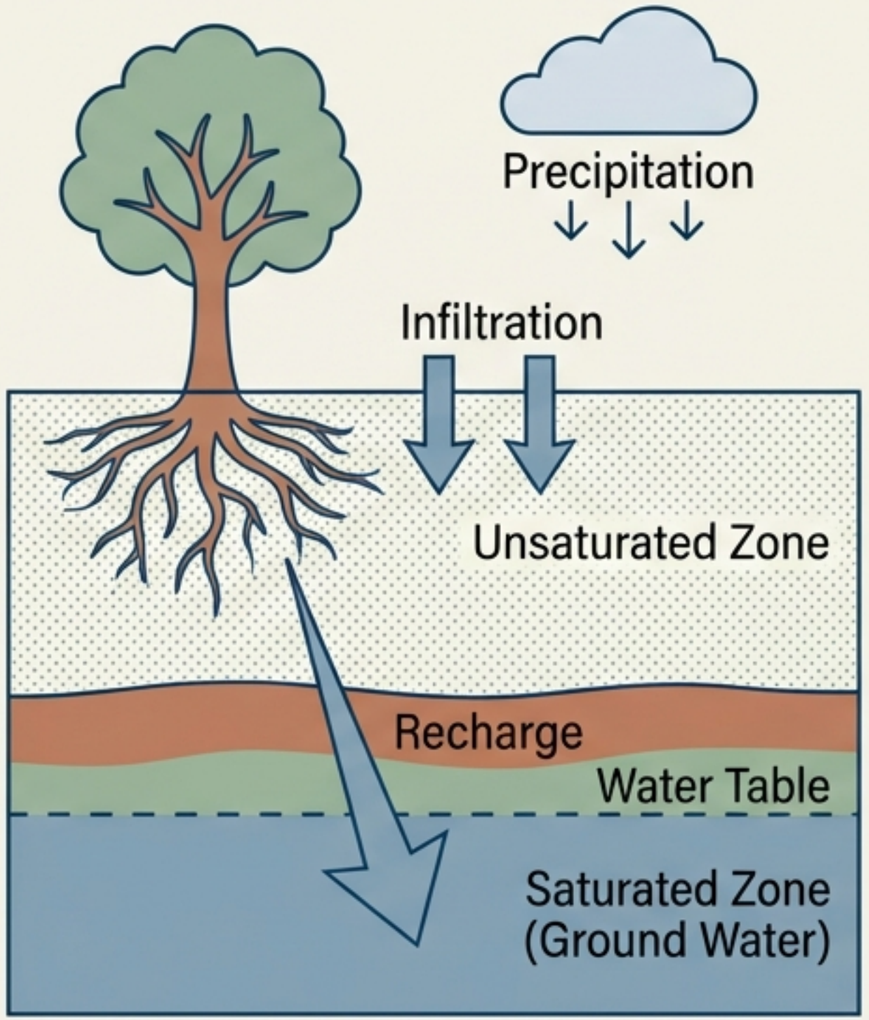
Standard 3: Water Quantity

Goal: Flood protection via peak rate reduction (50%, 75%, 80%).

Scope: Managing the 2, 10, and 100-year storm events.

Note: All major developments must address these three standards unless a specific exemption (e.g., linear utility projects) applies.

Standard 1: Groundwater Recharge



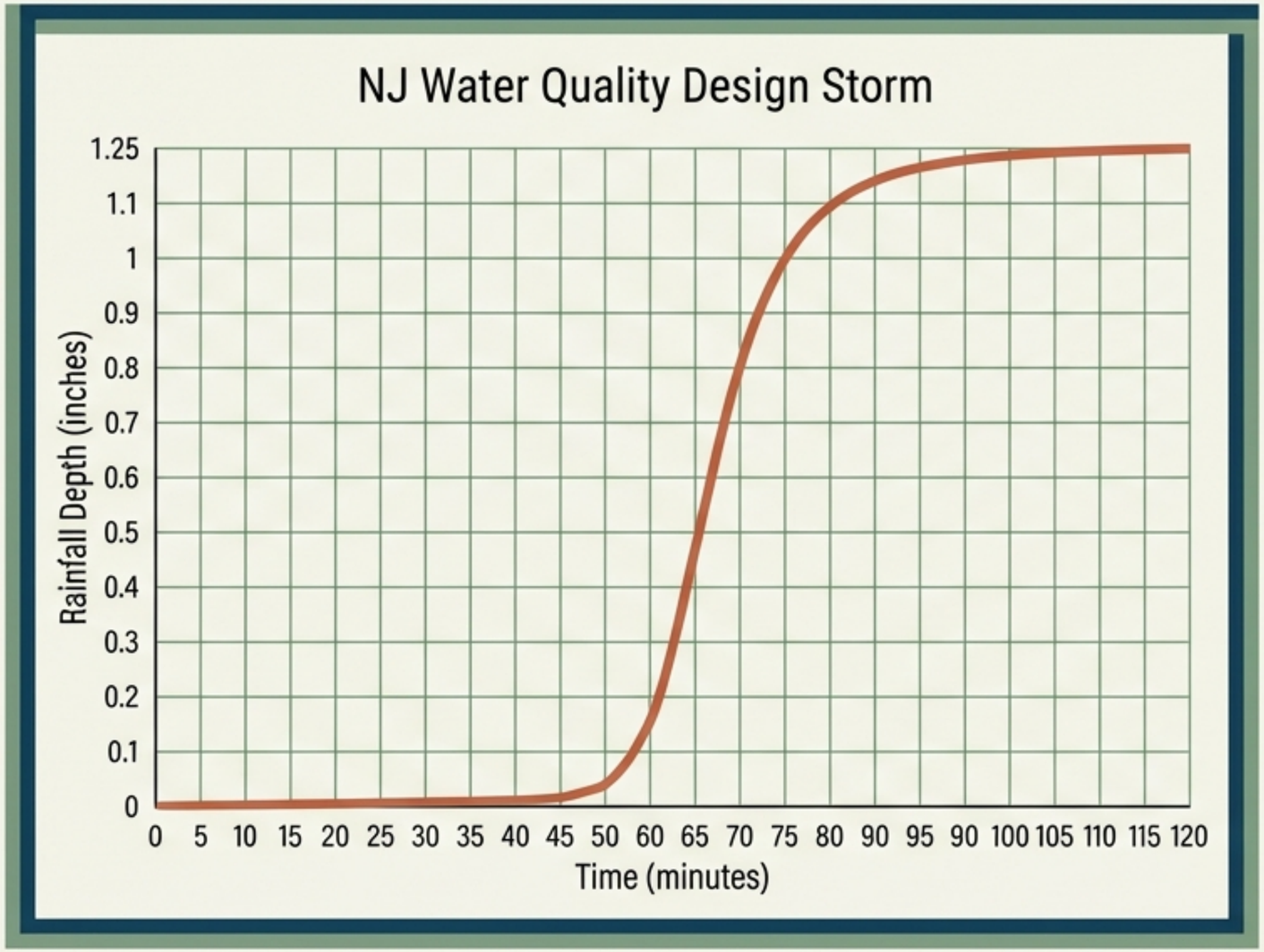
The Requirement:

- The design engineer must demonstrate compliance via one of two methods:
  1. Volume Approach: Maintain 100% of the average annual pre-construction groundwater recharge volume.
  2. Storm Approach: Infiltrate the increase in runoff volume from the pre-construction to post-construction 2-year storm.

Exemptions:

- This standard does not apply to projects within the "Urban Redevelopment Area" or sites with high pollutant loading (e.g., gas stations) where recharge poses a contamination risk.

Standard 2: Stormwater Runoff Quality



The Requirement:

- Reduce Total Suspended Solids (TSS) load by 80% (annual average) for runoff generated from the net increase in motor vehicle surface.

The Design Storm:

1.25 inches of rainfall over 2 hours.

Why 1.25 inches?

Approximately 90% of NJ storm events are this size or smaller. These small, frequent storms carry the majority of pollutant loads (the "first flush") and require treatment before discharge.

Standard 3: Stormwater Runoff Quantity (Flood Control)

2-Year Storm	Reduce peak flow to 50% of pre-construction rates.
10-Year Storm	Reduce peak flow to 75% of pre-construction rates.
100-Year Storm	Reduce peak flow to 80% of pre-construction rates.

Purpose: To prevent downstream flooding and erosion by holding back runoff and releasing it slowly.

Alternative Compliance: Strictly match pre-construction hydrographs (no exceedance at any point in time) or demonstrate via hydraulic analysis that increased rates will not cause downstream damage.

The Green Infrastructure (GI) Mandate

Pervious Paving

Bioretention Basin

Green Roof

The Paradigm Shift (2020 Amendments):

- Green Infrastructure is no longer optional. It is the required primary method for meeting Recharge, Quality, and Quantity standards.

Definition:

GI refers to methods that treat stormwater at its source by infiltrating into the subsoil, treating runoff through vegetation/soil, or storing for reuse. Traditional “grey” infrastructure (detention basins) can now only be used if a waiver is granted.

Selecting the Right BMP: A Hierarchy of Solutions

Table 5-1: The Green List (Go-To Solutions)

Can satisfy Recharge, Quality, and Quantity. Limited to small drainage areas.

- Pervious Paving, Small-Scale Bioretention, Cisterns, Dry Wells, Grass Swales

Table 5-2: Table 5-2: The Yellow List (Quantity Focused)

Primarily for Quantity; can do Recharge/Quality with design specifics.

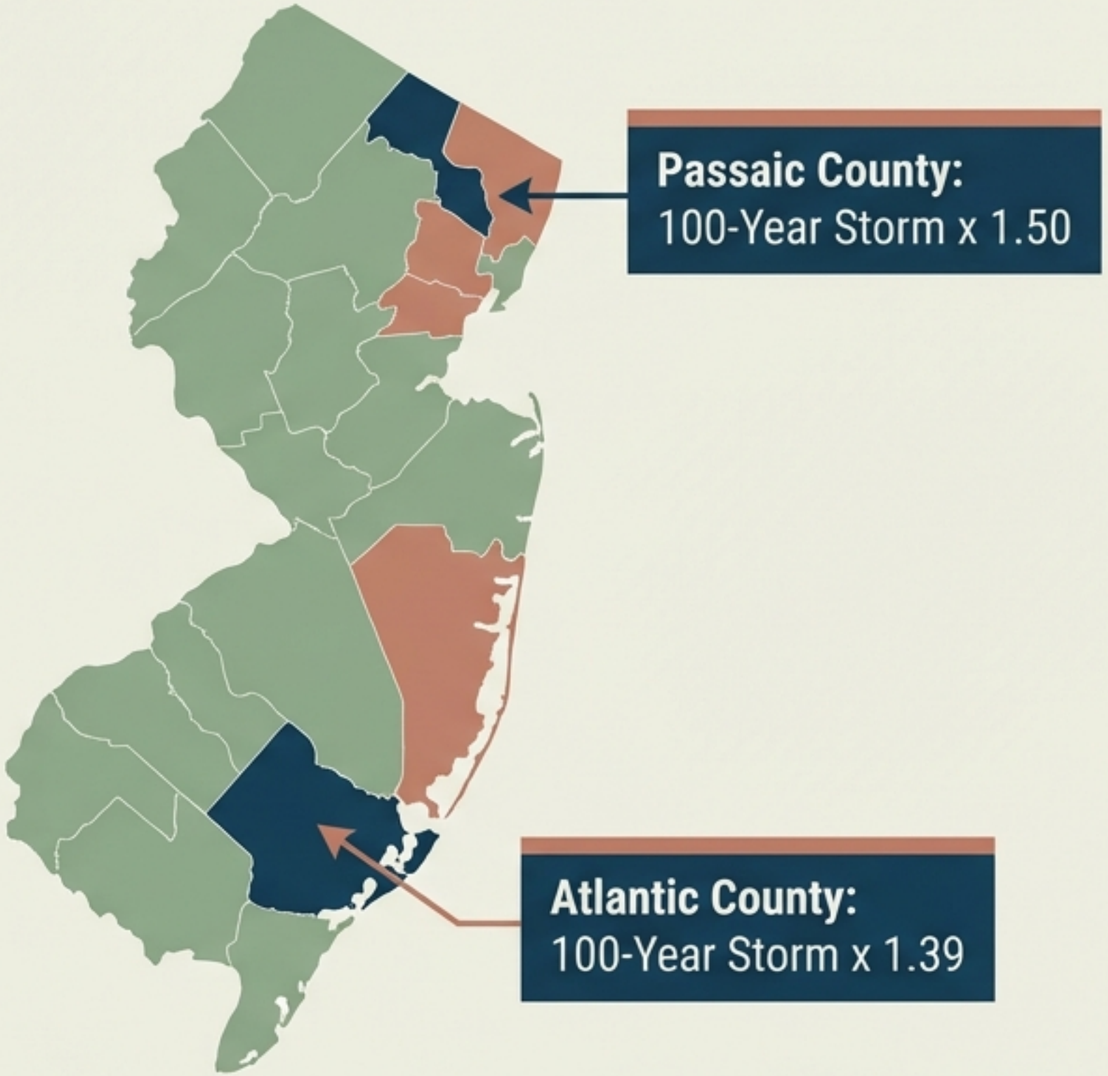
- Bioretention Systems, Infiltration Basins, Standard Constructed Wetlands

Table 5-3: The Red List (Waiver Required)

Only allowed if a waiver or variance is granted.

- Blue Roofs, Extended Detention Basins, Subsurface Gravel Wetlands

Designing for a Warmer Future (2023 Amendments)



The Reality:

Higher temperatures cause greater evaporation and moisture retention in clouds, leading to heavier rain events. We cannot design for tomorrow using yesterday's weather data.

New Requirement:

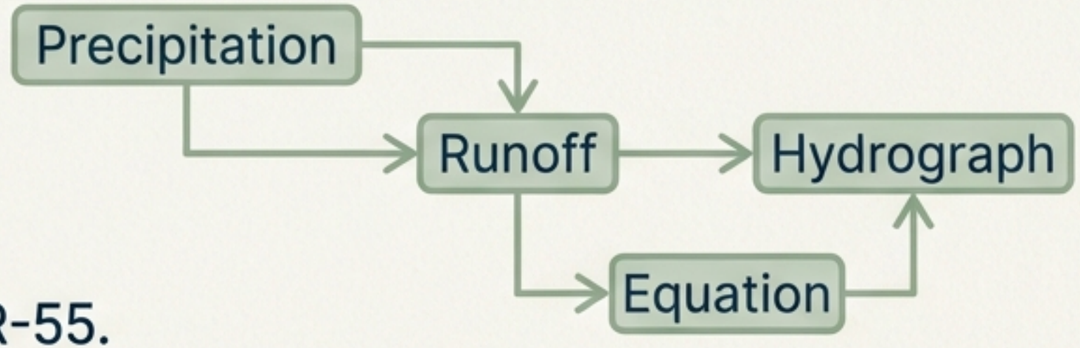
Designers must calculate runoff using both **Current** and **Projected** precipitation. NOAA Atlas 14 values must be multiplied by county-specific factors (up to 1.5x) to ensure infrastructure is resilient to future climate conditions.

Calculation Methodologies

Approved Method: USDA NRCS Methodology

Includes:

- NRCS Runoff Equation and
- Dimensionless Unit Hydrograph.



Sources:

National Engineering Handbook Part 630 or TR-55.

Warning: Limitation of the Rational Method

The Rational Method (Q=cia) calculates only peak flow, not volume. It is NOT appropriate for sizing BMPs that require volume determination (like detention basins), though it may be used for pipe sizing.

Baseline Assumption

Pre-Construction conditions must assume “Wooded Land with Good Hydrologic Condition” unless proven otherwise.

Ensuring Performance: Maintenance Requirements

1. The Plan:

Must include specific preventative/corrective tasks, schedules, cost estimates, and contact info for the responsible party.

2. The Deed:

If the responsible party is not a public agency, the maintenance plan must be recorded on the deed for each each property. The obligation runs with the land.

3. The Logs:

A detailed log of all inspections and work orders must be kept and evaluated annually to ensure the plan's effectiveness.

Path to Compliance: A Summary Checklist