

MS4 Programs: Quality, the Other Stormwater “Q”

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MS4 Rule and Regulations

- MS4 – Municipal Separate Storm Sewer System
- A conveyance or system of conveyances (catch basins, curbs, gutters, ditches, man-made channels, or storm drains, including roads with drainage systems and municipal streets)
- Owned/operated by public body (State, City, County, etc.)
- Designed or used for collecting and conveying stormwater,
- Not a combined sewer or part of a publicly owned treatment works (POTW)



MS4 Rule and Regulations

- 1990 Phase I Rule - large and medium community MS4s
 - Industrial stormwater and construction sites larger than 5 acres
- 1999 Phase II Rule - small community MS4s
 - Construction sites 1 to 5 acres of disturbance
- Authorizes discharge of stormwater
- Authorizes non-stormwater discharges to MS4
 - Hydrant flushing, irrigation water, fire fighting flows, residential car washing
- Authorizes controlled construction site stormwater runoff
- Requires best management practices (BMP) to be implemented to the maximum extent practicable (MEP) to prevent or reduce pollutant discharges from the MS4



MS4 Rule and Regulations

- Illinois EPA administers the MS4 program in Illinois
- Phase II general MS4 permit
 - ILR40 general permit
- Over 440 agencies in Illinois covered
- 5 year duration



Program Implementation

- Municipalities are taking different approaches to implementing MS4 requirements
 - Unique programs tailored to specific water quality concerns
 - Countywide approach, with a county agency taking the lead
 - Watershed approach, pooling resources and developing program goals specific to the watershed



Minimum Control Measures (Program Areas)

- Six Minimum Control Measures have been established
 - Public Education and Outreach on Storm Water Impacts
 - Public Involvement / Participation
 - Illicit Discharge Detection and Elimination
 - Construction Site Storm Water Runoff Control
 - Post-Construction Storm Water Management in New Development and Redevelopment
 - Pollution Prevention/Good Housekeeping for Municipal Operations
- BMPs with measurable goals must be developed for each minimum control



Post-Construction Stormwater Management

- Develop and implement an ordinance to address post-construction runoff from new development and redevelopment projects
- Require all regulated construction sites to have post-construction management plans that meet or exceed the requirements of MS4 Permit, at least as protective as the Illinois Urban Manual, 2014.
- Implement a process to assess the water quality impacts in the design of all new and existing flood management projects
 - Include consideration of controls that can be used to minimize the impacts to site water quality and hydrology while still meeting the project objectives
 - Assess any potential impacts and effects on flood management projects due to climate change

Post-Construction Stormwater Management

- Develop and enforce a program to minimize the volume and pollutant load from new development and redevelopment projects that disturb greater than or equal to one acre
 - Less than one acre if part of a larger common plan of development
- Adopt strategies that incorporate infiltration, reuse, and evapotranspiration into a project to the maximum extent practicable
- Require a long term operation and maintenance plan for projects
- Develop and implement procedures for public input



Post-Construction Stormwater Management

- Develop and implement strategies which include a combination of structural and/or non-structural BMPs that will reduce the discharge of pollutants and the volume and velocity of storm water to the maximum extent practicable
 - Include effective water quality and watershed protection elements and be amenable to modification due to climate change



Post-Construction Stormwater Management

- Implement strategies in order of the following preference:
 - Preservation, including natural storage and infiltration
 - Preservation of existing natural streams, channels, and drainage ways
 - Minimization of new impervious surfaces
 - Conveyance of storm water in open vegetated channels
 - Construction of structures that provide quantity and quality control, structures serving multiple sites being preferable
 - Construction of structures that provide only quantity control



Post-Construction Stormwater Management

- Implement a program to minimize the volume of storm water runoff and pollutants from public highways, streets, roads, parking lots, and sidewalks that results in pollutant load reduction, increased infiltration, evapotranspiration, and reuse of stormwater
 - Annual training for all employees who manage or are directly involved in the routine maintenance, repair, or replacement of public surfaces in current green infrastructure or low impact design techniques
 - Annual training for all contractors retained, contractors may provide training to their employees for projects



Post-Construction Stormwater Management

- Implement a program to minimize the volume of storm water runoff and pollutants from existing privately owned developed property
 - Source identification, establish an inventory of storm water and pollutants
 - Implementation of appropriate BMPs for the following:
 - Education on green infrastructure BMPs
 - Evaluation of existing flood control techniques to determine the feasibility of pollution control retrofits
 - Evaluation of existing flood control techniques to determine potential impacts and effects due to climate change
 - Implementation of additional controls for special events expected to generate significant pollution (fairs, parades, performances)
 - Implementation of appropriate maintenance programs or agreements for structural pollution control devices or systems
 - Management of pesticides and fertilizers
 - Street cleaning in targeted areas



TMDL Requirements

- Specific requirements for MS4s discharging to waterbodies where Total Maximum Daily Load (TMDL) analysis has been completed
 - Must review the TMDL to determine any requirements for control of storm water discharges
 - Must modify MS4 program to implement the TMDL within eighteen months of notification by the Agency
 - Determine if TMDL is for a pollutant likely to be found in stormwater discharges
 - Modify existing stormwater control measures and monitoring if necessary



Infiltration Restrictions

- Infiltration practices should not be implemented in any of the following circumstances:
 - Areas/sites where vehicle fueling and/or maintenance occur
 - Areas/sites with shallow bedrock which allow movement of pollutants into the groundwater
 - Areas/sites near Karst features
 - Areas/sites where contaminants in soil or groundwater could be mobilized by infiltration of storm water
 - Areas/sites within a delineated source water protection area for a public drinking water supply where there is potential for issues
 - Areas/sites within 400 feet of a community water supply well if there is not a wellhead protection delineation area or within 200 feet of a private water supply well



Evolution of Post-Construction Requirements

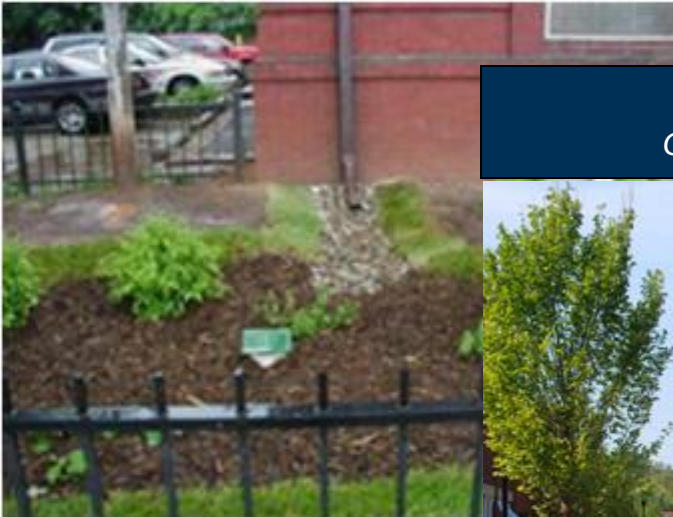
- Some states have been implementing the requirements on new development / re-development for years
- California example: LID BMPs must be designed to retain on-site
 - Infiltrate;
 - Harvest and use;
 - or evapotranspire
- Control stormwater runoff up to a percent average annual capture efficiency
- Water Quality Management Plan (WQMP) for each new development



Examples - Hydrologic Source Controls

On-lot Rain Garden

Source: lowimpactdevelopment.org



Green Streets

Green Infrastructure Digest



Simple Downspout Dispersion



Examples - Infiltration BMPs

Infiltration Basin

Source: *Pennsylvania Stormwater BMP Manual*



Bioinfiltration



Infiltration Trench

Source: *www.dot.ca.gov*



Examples – Harvest, Use, Biotreatment BMPs

Underground Detention Tank

Source: www.webtecgeos.com

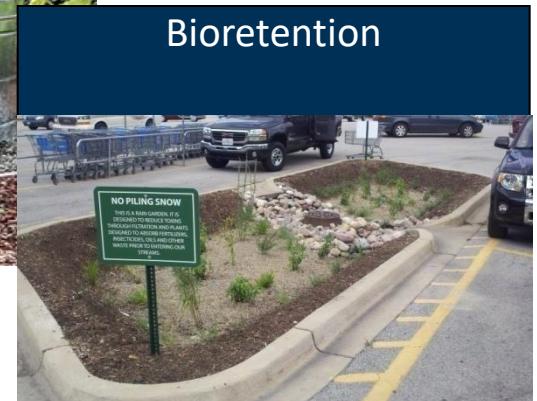


Above-Ground Cisterns

Source: *Sunset Publishing Corporation*



Bioretention

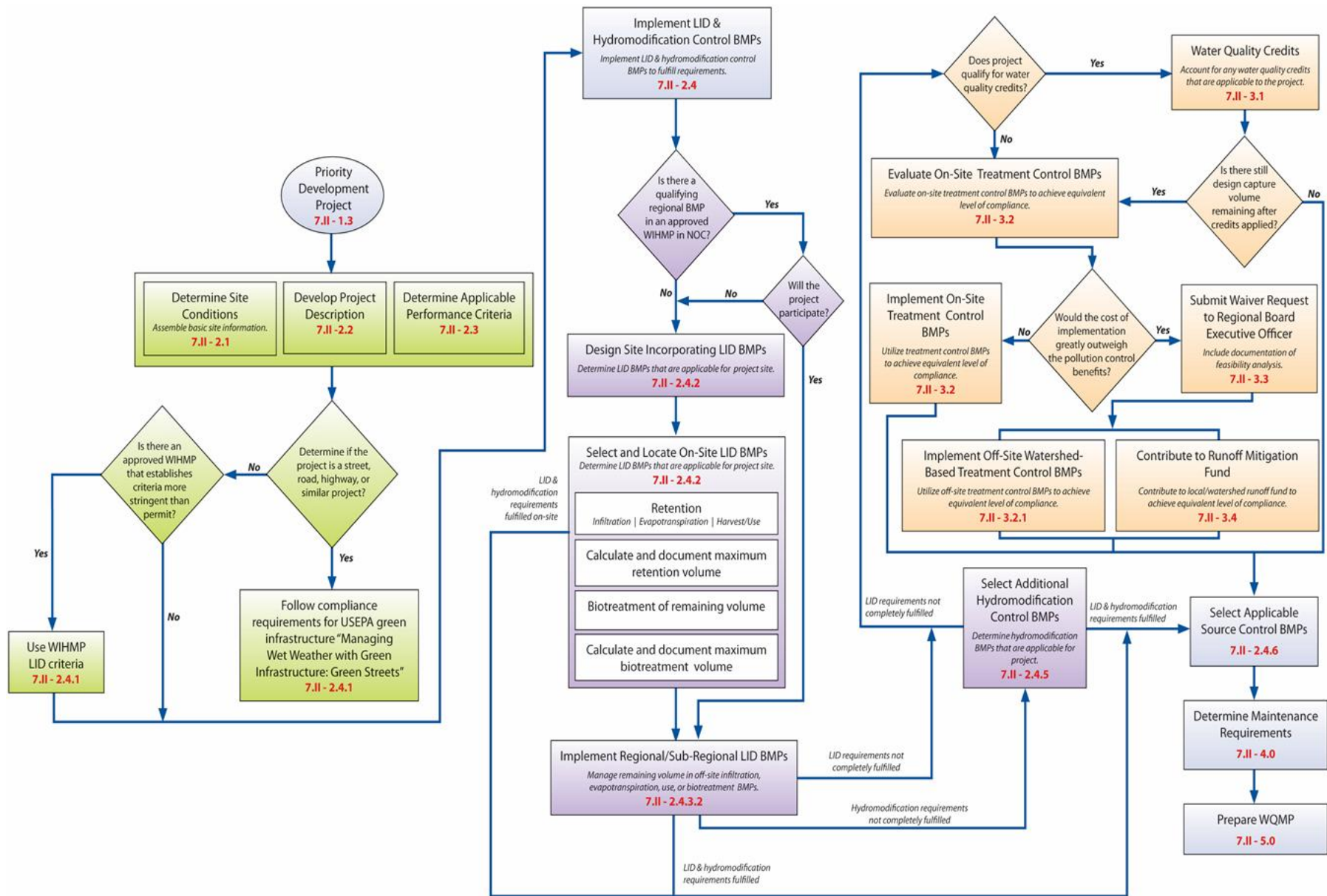


Projects Requiring a WQMP

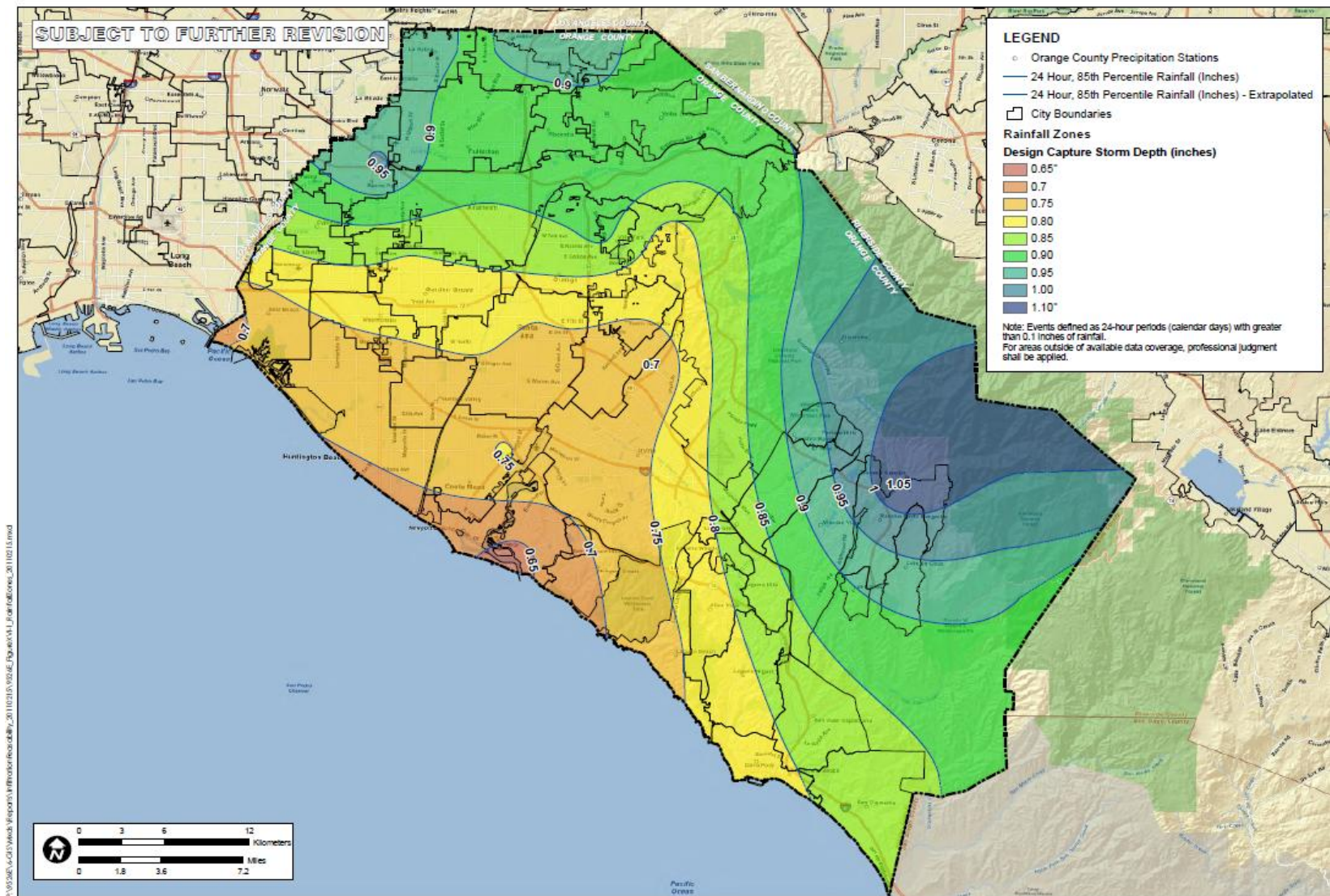
- Priority Projects
 - New Development
 - Creates 10,000 sf or more of new impervious surface on a previously undeveloped site
- Significant Redevelopment
 - Adds or replaces 5,000 sf or more impervious surface on an already-developed site
- Non-Priority Projects
 - Non-Priority Project Plan

Evolution of Post-Construction Requirements

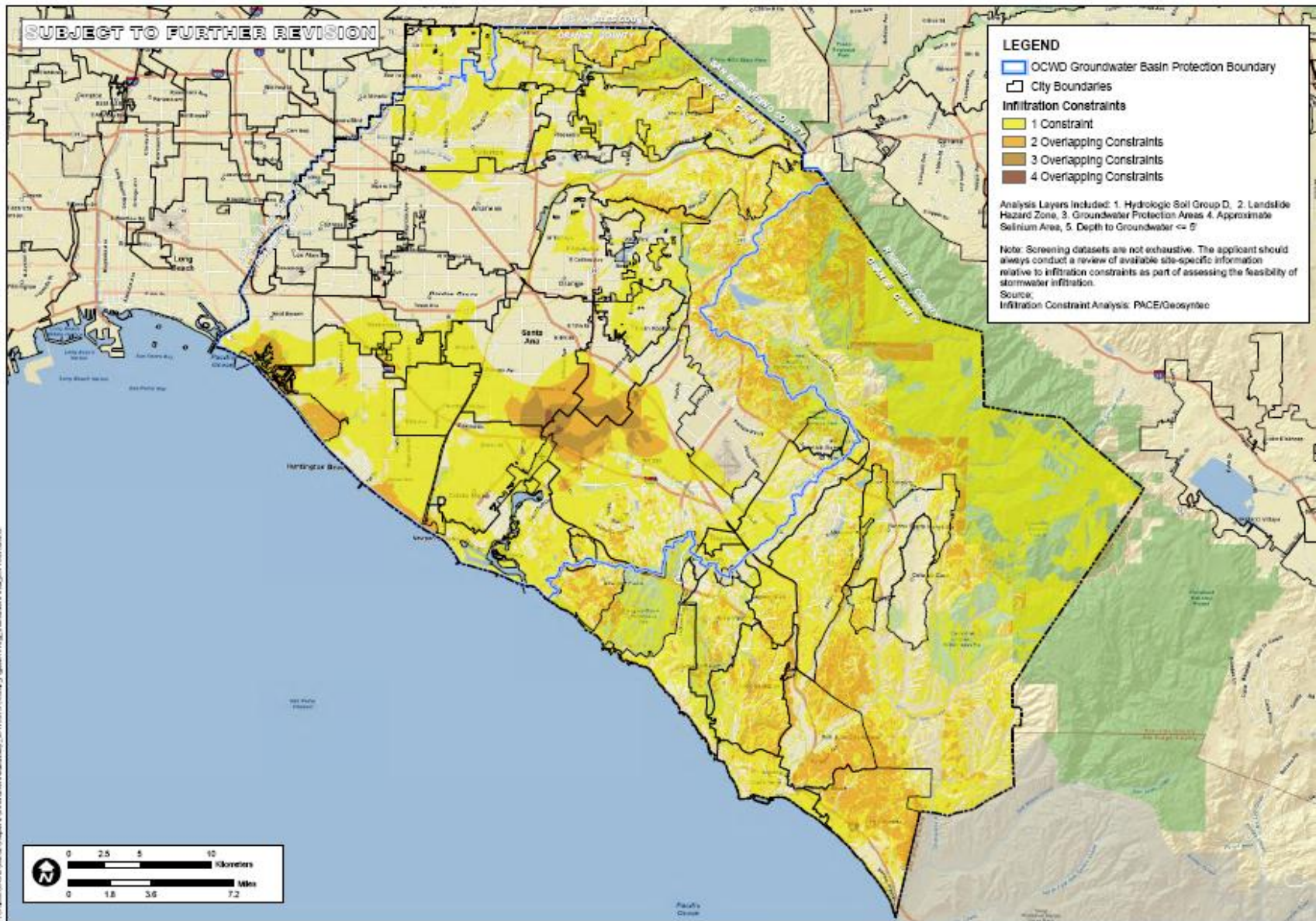
- Project WQMPs shall minimize effects of urbanization on:
 - Site hydrology
 - Hydromodification
 - Runoff flow rates or velocities
 - Pollutant loads
 - Urbanization effects minimized through one or more approaches:
 - Project-based controls and LID BMPs
 - Regional/subregional BMPs
 - Alternative compliance programs



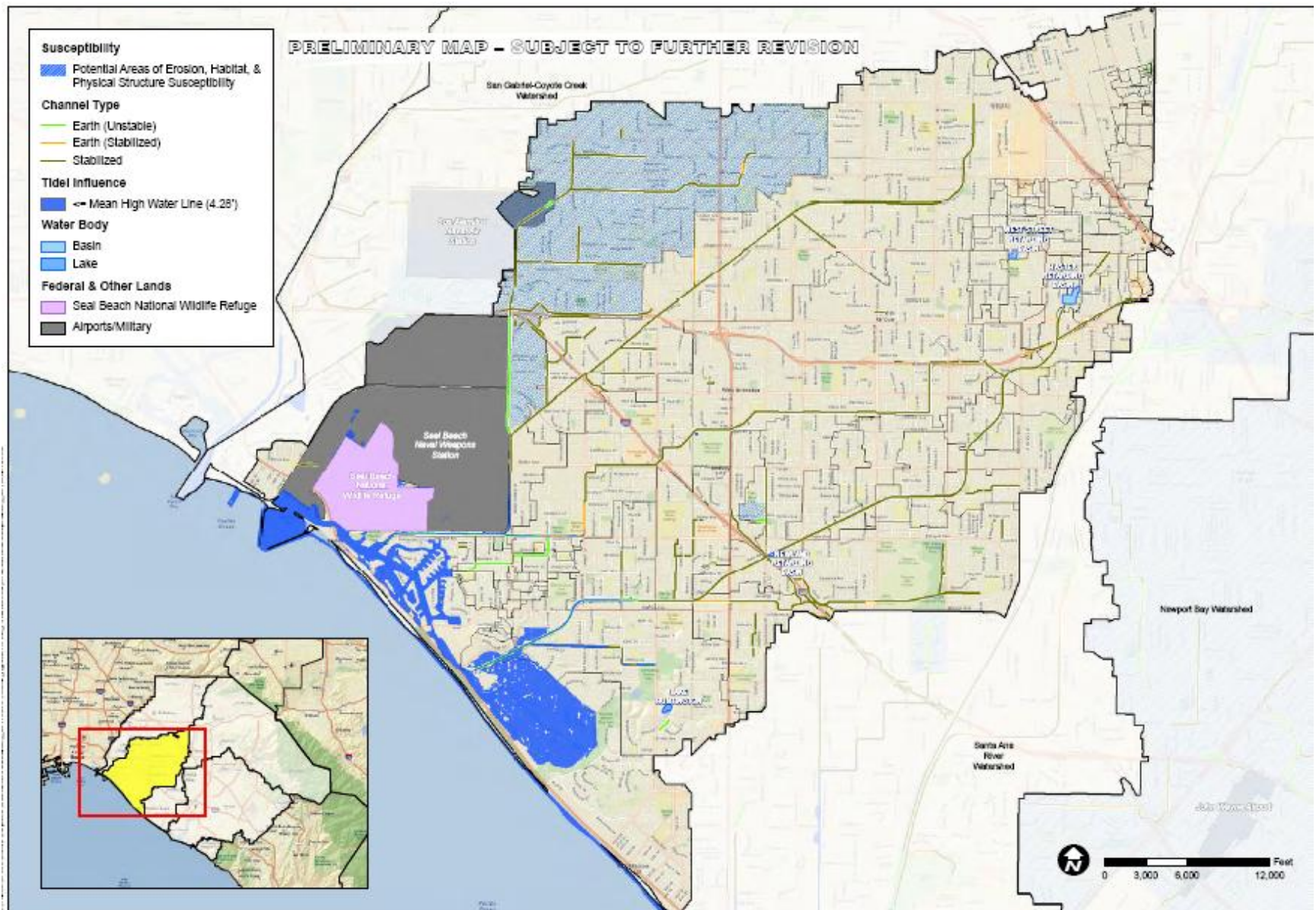
Performance Criteria - Design Capture Storm Depth



Infiltration Feasibility Constraints



Hydromodification Susceptibility



MS4 Program Audits and Enforcement

- Not a direct focus on this program elements in most audits
- Common post-construction issue:
 - Lack of developing a post-construction requirement program
 - Not performing construction site inspections
 - Lack of on-site BMP implementation, SWPPP compliance
 - Not enforcing pollutant discharge events



Questions and Discussion

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