Ventura Countywide Stormwater Quality Program Land Development Technical Guidance Manual Revisions

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Background

2002 Technical Manual Approach

New Permit Requirements and Challenges

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Ventura Countywide Stormwater Quality Management Program

Technical Guidance Manual *for* Stormwater Quality Control Measures

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2002 Technical Guidance Manual Goals

- Ensure that new development and redevelopment projects reduce urban runoff pollution to the "**maximum extent practicable**"
- Ensure the implementation of measures in this manual are **consistent with MS4 Permit** and other State requirements
- **Provide guidance** to developers, design engineers, agency engineers, and planners on the selection and implementation of appropriate stormwater **site design, low impact development, source control, and treatment control measures**
- **Provide maintenance procedures** to ensure that the selected control measures will be maintained to provide effective, long-term pollution control

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2002 Technical Guidance Manual

- Been in use since 2002 to meet the Storm Water Quality Urban Impact Mitigation Plan (SQUIMP) requirements
- Has proven easy to use
- 2002 Manual is required and is needed to be revised to explain requirements for LID
  - Many of the site design BMPs are based on general LID principles
  - Has been used primarily to design treatment control BMPs

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STATE OF CALIFORNIA
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LOS ANGELES REGION
ORDER 09-0057
NPDES PERMIT NO. CAS004002
WASTE DISCHARGE REQUIREMENTS
FOR
STORM WATER (WET WEATHER) AND NON-STORM WATER (DRY WEATHER) DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS WITHIN THE VENTURA COUNTY WATERSHED PROTECTION DISTRICT, COUNTY OF VENTURA AND THE INCORPORATED CITIES THEREIN.

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Ventura County MS4 Permit
Stated Purpose (Section 4.E.1)

- Lessen water quality impacts of development
  - Promote Smart Growth, Compact Development, Infill, Redevelopment
- Minimize impacts on biological integrity of Natural Drainage Systems
- Minimize EIA to mimic predevelopment water balance
- Minimize pollutant loading from impervious surfaces through source control, LID, and treatment control BMPs
- Proper design of BMPs to address pollutants of concern and to ensure long-term adequate function

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Stated Purpose (continued)

- Prioritization of BMPs as follows:
  1. Infiltration BMPs
  2. Rainwater harvesting
  3. Multi-benefit vegetated BMPs
  4. Biofilters with an underdrain
  5. Modular/proprietary BMPs based on LID concepts that meet pollutant removal goals

Applicability

- All projects ≥ 1 acre disturbed area and >10,000 sf impervious area
- Industrial park ≥ 10,000 sf
- Commercial strip mall, roadway projects ≥ 10,000 sf impervious area
- Retail gasoline, restaurants, automotive service facilities ≥ 5,000 sf
- Parking lots 5,000 sf impervious area or 25 spaces
- Projects located in or directly adjacent to, or discharging directly to ESA and ≥ 2,500 sf impervious area

Applicability

- Roadway project performance standard
  - Implement USEPA guidance Managing Wet Weather with Green Infrastructure: Green Streets to the MEP
- Single family hillside home performance standard
  - Conserve natural areas
  - Protect slopes and channels
  - Provide storm drain stenciling and signage
  - Divert roof runoff / surface flows to vegetated areas
    - Consideration for infeasibility due to slope stability

Applicability

- Redevelopment projects
  - Create, add, or replace 5,000 sf of impervious area
  - Alteration to 50% or more of impervious surfaces not subject to control requirements, mitigate entire project
  - Routine maintenance projects are exempt
  - Existing single family homes and accessory structures are exempt unless they create, add, or replace 10,000 sf of impervious area

Integrated Water Quality / Flow Reduction / Resources Management Criteria

- Projects must reduce Effective Impervious Area to less than 5% of the total project area
- Impervious surface are rendered "ineffective" if water quality design storm runoff volume is fully retained onsite
  - 85th percentile, 24-hour event
  - 80 percent capture volume
  - 0.75 inch storm event
- Any remaining surface discharges must be treated

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Total Project Area: A_{total} = 10 acres

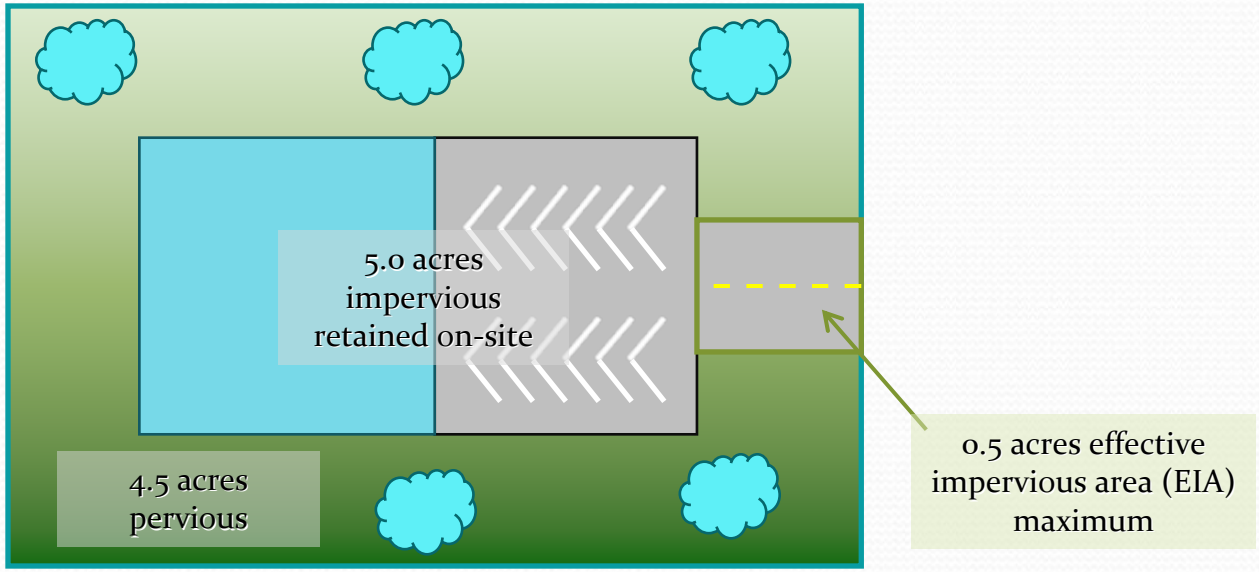
Maximum allowed EIA = A_{total} * 0.05 = 0.5 acres

$A_{impervious}$ = 5.5 acres (building, parking lot, driveway)

$A_{pervious}$ = 4.5 acres (surrounding landscaping)

$A_{retained}$ = 5.5 – 0.5 = 5 acres retained onsite (minimum)

$A_{treated}$ = 0.5 + 4.5 = 5 acres treated



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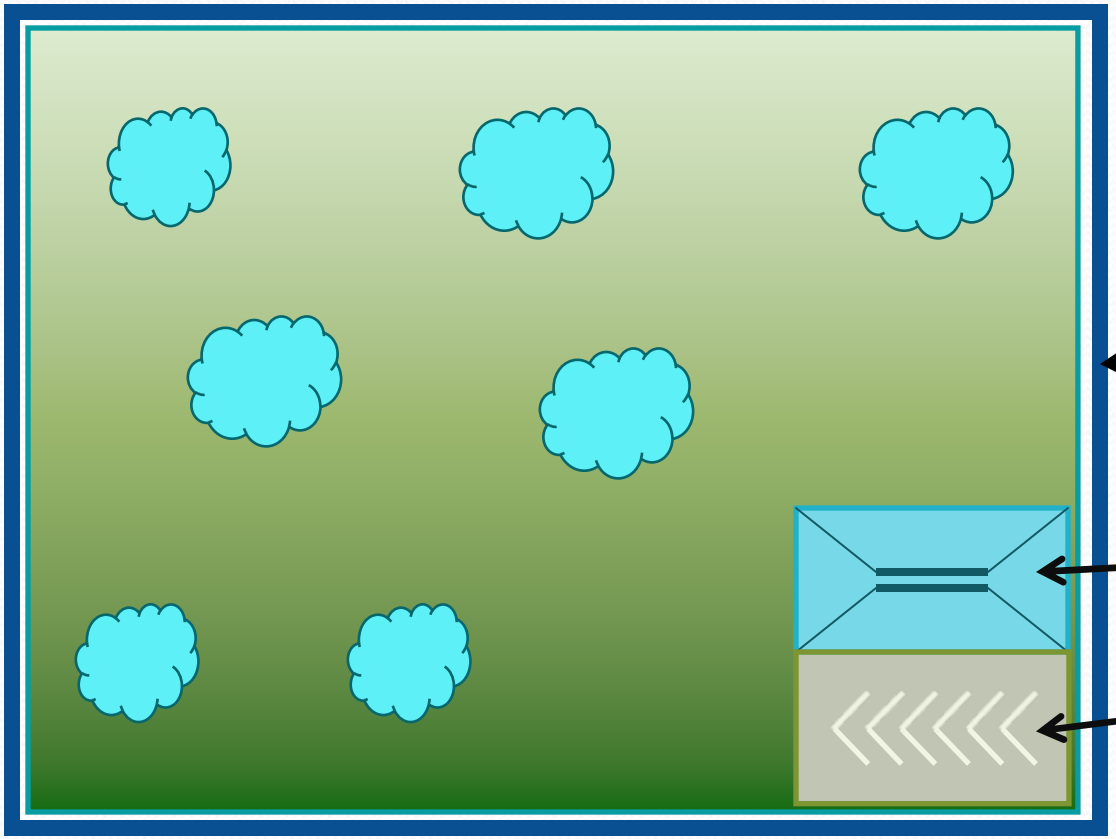
Total Project Area = 10 acres; Developed area = 1 acre

Maximum EIA = 10 acres * 0.05 = 0.5 acres

Retain runoff volume from: total impervious area – 0.5 acres = 0.5 acres

Treatment is required for remaining 0.5 acres of developed area



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Infiltration BMPs

- Bioretention without Underdrains
- Retention Swales
- Retention Grading
- Infiltration Trenches
- Infiltration Basins
- Drywells
- Subsurface Infiltration Galleries
- French Drains
- Permeable Asphalt
- Permeable Concrete
- Permeable Concrete Pavers

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Rainwater Harvesting

- Storage options:
  - Above-ground Rain Barrels
  - Above-ground Cisterns
  - Underground Tanks

- Potential Uses:
  - Irrigation
  - Toilet flushing
  - Vehicle washing
  - Evaporative cooling
  - Industrial processes
  - Dilution water for recycled water systems
  - Other non-potable uses

Evapotranspiration (ET)

- BMPs providing primary benefit through ET:
  - Green roofs
  - Brown roofs
  - Blue roofs
  - Downspout dispersion in tight soils
  - Amended soils over tight underlying soils
  - Street trees, canopy interception
- All vegetated BMPs provide part of their volume reduction benefits through ET
- Rainwater harvesting practices can rely on evaporation, which may overlap with ET volume reduction potential

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Treatment BMPs

- Vegetated BMPs that Integrate Multiple Uses
  - Detention Basins
  - Constructed Wetlands
- BMPs that Percolate Through Soil
  - Bioretention with underdrains
  - Planter Boxes with underdrains
  - Vegetated Swales
  - Vegetated Filter Strips
- Proprietary (ready-to-install) LID-like BMPs

Additional Challenges

- Alternative Compliance
  - Infill and redevelopment in existing urban centers
    - Technical infeasibility criteria
  - Analysis requirements
  - Alternative measures
    - On-site EIA limited to 30%
    - Offsite mitigation volume
    - Offsite mitigation location
    - Watershed equivalence
- Hydromodification Control

Draft Manual Outline

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Section 1 – Background and Goals

- Goals
- Regulatory Background
- Stormwater Management Principals
- Applicability
- Use and Organization of the Manual

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Section 2 – Stormwater Management Standards

- Introduction
- Performance Criteria
  - Effective Impervious Area
  - Design Volume/Flow
  - Hydromodification
- Calculating Effective Imperviousness and Design Volume/Flow
- Alternative Compliance
- Single Family Hillside Homes
- Roadway Projects

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Section 3 – Site Assessment and BMP Selection

- Assessing Site Conditions and Other Constraints
- Addressing Pollutants of Concern
- BMP Selection Process and Technical Feasibility Criteria

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Section 4 – Site Design Principles and Techniques

- Introduction
- Site Planning and Layout (techniques to minimize impervious cover)
- Vegetative Protection, Revegetation, and Maintenance
- Slopes and Channel Buffers
- Techniques to Minimize Land Disturbance
- LID Measures at Scales from Single Parcels to Watershed
- Integrated Water Resource Management Practices (including coordination with flood control measures)

Section 5 – Source Control Measures

- Introduction
- Description
  - S-1: Storm Drain Message and Signage
  - S-2: Outdoor Material Storage Area Design
  - S-3: Outdoor Trash Storage Area Design
  - S-4: Outdoor Loading/Unloading Dock Area Design
  - S-5: Outdoor Repair/Maintenance Bay Design
  - S-6: Outdoor Vehicle/Equipment/Accessory Washing Area Design
  - S-7: Fueling Area Design

Section 6 – LID BMPs and Treatment Control Measure Design

- Introduction
- BMP Effectiveness
- Infiltration BMPs
- Rainwater Harvesting
- Evapotranspiration BMPs
- Bioretention/Biofiltration BMPs
- Proprietary LID BMPs
- Other Treatment BMPs
- Pretreatment/Gross Solids Removal

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Section 7 and Section 8

- **Section 7 – Operation and Maintenance Planning**
  - General Considerations
  - Maintenance Plan
  - Maintenance Agreement
    - Municipal Projects
    - Private Projects
- **Section 8 - References**

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Appendices

- A: Glossary of Terms
- B: Watershed Delineation Maps (consistent with Basin Plan sub-basins)
- C: Alternative Compliance Form
- D: Site Soil Type and Infiltration Testing
- E: BMP Sizing Worksheets
- F: Design Criteria Checklists for Stormwater Runoff BMPs
- G: Stormwater Control Measure Access and Maintenance Agreements
- H: Stormwater Control Measure Maintenance Plan Guidelines and Checklists

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Break Time!

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