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
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

- 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
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.
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
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
Total Project Area: \( A_{\text{total}} = 10 \text{ acres} \)

Maximum allowed EIA = \( A_{\text{total}} \times 0.05 = 0.5 \text{ acres} \)

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

\( A_{\text{pervious}} = 4.5 \text{ acres (surrounding landscaping)} \)

\( A_{\text{retained}} = 5.5 - 0.5 = 5 \text{ acres retained onsite (minimum)} \)

\( A_{\text{treated}} = 0.5 + 4.5 = 5 \text{ acres treated} \)
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
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
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
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
Section 1 – Background and Goals

- Goals
- Regulatory Background
- Stormwater Management Principals
- Applicability
- Use and Organization of the Manual
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
Section 3 – Site Assessment and BMP Selection

- Assessing Site Conditions and Other Constraints
- Addressing Pollutants of Concern
- BMP Selection Process and Technical Feasibility Criteria
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
Section 7 and Section 8

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