



# **GMP**

Growth Management Plan

# **Stormwater & Aquifer Recharge**

**CITY OF ORLANDO**  
PLANNING & DEVELOPMENT  
*GROWTH MANAGEMENT*

Approved  
August 12, 1991  
Amended March 9, 2000

**STORMWATER AND AQUIFER RECHARGE**  
**GOALS, OBJECTIVES AND POLICIES**

**GOAL 1**

*ECFRPC 60.20  
9J-5.011(2)(a)*

To provide efficient and economic stormwater management which will protect the public and property from flooding and which will maintain and improve water resource quality.

**Objective 1.1** The City shall annually evaluate existing flooding areas within the city and formulate a five-year program, for input into the Capital Improvement Element, outlining the appropriate retrofit or development strategies to alleviate flooding problems.

*State Plan 187.201(17)(b)7  
ECFRPC 39.03, 59.01, 59.04,  
60.21, 60.23  
9J-5.011(2)(b)1  
9J-5.015(3)(b)1*

**Policy 1.1.1** The City shall continue to accept existing conditions as the pre-OUSWMM LOS standard and shall comply with requirements of the National Pollution Discharge Elimination System (NPDES) permit to outline deficiencies, to schedule needed capital improvements and to include a water quality component for existing development which is in compliance with the State Water Policy, Chapter 60-40 F.A.C., as applied by FDEP and the Water Management Districts.

*ECFRPC 60.05  
9J-5.011(2)(c)1, 2c  
9J-5.015(3)(c)1  
OUSWMM adopted by City  
Council 12/12/83  
Capital Improvements  
1.1.6, 1.2.11  
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**Policy 1.1.2** The City shall apply all criteria contained within OUSWMM as the post-OUSWMM LOS standard including:

*State Plan 187.201(8)(b)7,8  
ECFRPC 38.05, 39.01, 39.02,  
39.10, 60.06, 60.18, 60.19,  
60.22, 60.25, 60.28, 60.31,  
60.38  
9J-5.011(2)(c)2c1  
Capital Improvements 1.2.7*

<u>Facility</u>	<u>LOS</u>
City Primary	Design Storm: 25 year / 24 hour Max. Flood Stage: 100 yr / 3 day below floor elevations Max. Hydraulic Grade Line (HGL): at gutter elevation for 25 year / 6 hour storm
City Secondary	Design Storm: 10 year /6 hour Max. HGL: 1' below gutter elevation Check Storm: 25 year/6 hour Max HGL: at gutter elevation
City Tertiary	Design Storm: 10 year/6 hour Max. HGL: 1' below gutter elevation Check Storm: 25 year/6 hour Max. HGL: at gutter elevation

*Amended November 16, 1992  
Effective Date Jan. 15, 1993  
Doc. No. 26150*

*Amended June 29, 1998  
Effective Date July 30, 1998  
Doc. No. 31329*

Arterial Road	Roadway Section and Inlet Design: 10 year/6 hour storm Minimum 2' between seasonal high water table and bottom of base course.
Collector Road	Roadway Section and Inlet Design: 5 year /6 hour storm Minimum 1' between seasonal high water table and bottom of base course.
Minor Road	Roadway Section and Inlet Design: 3 year /6 hour storm Minimum 1' between seasonal high water table and bottom of base course.
Travel Lane Spread:	12 feet for all roads; roads with parking lane, width measured from face to curb to centerline outermost travel lane; clearance between design water surface and top of curb - 1".
Maximum Run Distance	400 feet to first inlet
Retention Ponds	Retain the greater of: - first 1/2 inch of runoff, or - runoff from the first 1 inch of rain; separate from detention system.
Detention Ponds	Design Storm: 25 year / 24 hour Detain the volume necessary to restrict post-development peak runoff to pre-development peak runoff.
Detention Ponds (landlocked basins)	Same as above plus storage on-site for the 100 year / 24 hour storm.
Floodprone Areas	Development allowed in 100 year floodplain with compensatory storage loss and floodstage increases less than one foot from the base elevation.

Policy 1.1.3 The City shall maintain up to date data on the cost and effectiveness of stormwater facilities to facilitate future stormwater management strategies.

*State Plan 187.201(8)(b)8  
ECFRPC 59.05, 60.13, 60.14,  
60.27*

Policy 1.1.4 The City shall upgrade and retrofit stormwater facilities with roadway reconstruction wherever feasible.

*ECFRPC 59.05  
9J-5.011(2)(b)3*

Policy 1.1.5	The City shall periodically review revenue charges for the Stormwater Utility to ensure that all costs for implementing and maintaining the stormwater management plan of the City are met.	<i>State Plan 187.2101(17)(b) 3, 4, 5, 9 ECFRPC 60.12, 60.26, 60.35, 60.36</i>
Policy 1.1.6	The City shall meet State water quality standards in Chapters 62-302 and 62-520, F.A.C., as applied by FDEP and the Water Management Districts through compliance with OUSWMM for all development and redevelopment without exception for size or type of development.	<i>State Plan 187.201(8)(b)1 ECFRPC 39.03 9J-5.011(2)(c)4 9J-5.015(3)(c)1 Approved February 7, 2000 Effective Date March 9, 2000 Doc. No. 32636</i>
<b>Objective 1.2</b>	The City shall continue to update its stormwater inventory through its computerized Geographic Information System to include the International Airport, annexations and to verify the accuracy of the existing inventory of the stormwater system infrastructure.	<i>ECFRPC 60.30 9J-5.011(2)(b)2 Approved February 7, 2000 Effective Date March 9, 2000 Doc. No. 32636</i>
Policy 1.2.1	The City shall update its inventory of stormwater facilities as annexations occur.	<i>ECFRPC 60.30</i>
<b>Objective 1.3</b>	The City shall amend its regulatory and implementation documents by 2001 to resolve inconsistencies between the GMP, LDC, and OUSWMM. These amendments are intended to protect natural drainage features, such as lakes, wetlands and rivers. As part of these amendments, there will be unified wetland standards, urban design criteria, as well as written criteria for the approval of variances to OUSWMM standards. Post-construction monitoring for design effectiveness shall be required for innovative designs and shall include criteria for non-compliance.	<i>ECFRPC 43.08, 43.09, 58.01, 60.12, 60.17, 60.27 9J-5.015(3)(b)3 F.S. 163.3202(2)(d) Conservation 1.4 Approved February 7, 2000 Effective Date March 9, 2000 Doc. No. 32636</i>
Policy 1.3.1	The Land Development Code (LDC) and OUSWMM shall encourage reductions in impervious surfaces through reduced parking standards, where appropriate, and innovative stormwater and site design.	<i>State Plan 187.201(8)(b)11 ECFRPC 60.17, 60.27, 60.30 9J-5.011(2)(c)4</i>
Policy 1.3.2	The City shall allow the multiple use of stormwater management facilities for recreation, conservation and open space.	<i>State Plan 187.201(17)(b)2 ECFRPC 43.08, 59.07, 60.27, 60.30 9J-5.011(2)(c)4 Recreation 1.2.1</i>
Policy 1.3.3	The LDC and OUSWMM shall incorporate and use Best Management Practices (BMP), non-structural	<i>State Plan 187.201(8)(b)4, 11, 12 ECFRPC 39.02, 58.03, 60.179J-5.011(2)(c)3,4 Urban Design 8.1</i>

	stormwater management strategies, and xeriscaping to manage stormwater and its environmental impacts.	
Policy 1.3.4	The City shall provide technical information and administrative support in any comprehensive surface water and groundwater basin management plan initiated by the Water Management Districts.	<i>ECFRPC 38.01, 60.11 9J-5.015(3)(c)3</i>
Policy 1.3.5	All land use planning and development approvals which impact water resources shall conform to or exceed the development practices within WMD comprehensive basin management plans.	<i>ECFRPC 38.02, 57.13 9J-5.015(3)(c)3</i>
<b>Objective 1.4</b>	The City shall continue its comprehensive maintenance plan for City maintained stormwater management facilities throughout the planning period, as required by the NPDES permit. This includes the periodic inspection of all pipes, canals, retention/detention facilities, inlets, drainwells and any other stormwater facility maintained by the City for general condition and pollution sources. The results of the inspections are to be included into the GIS update process.	<i>State Plan 187.201(8)(b)12 ECFRPC 38.04, 38.07, 59.06 9J-5.011(2)(b)2,3 Approved February 7, 2000 Effective Date March 9, 2000 Doc. No. 32636</i>
Policy 1.4.1	The City shall maintain its stormwater management facilities in such a manner that the impacts to natural systems shall be minimized.	<i>State Plan 187.201(8)(b)12 ECFRPC 38.04, 39.06, 57.13 9J-5.011(2)(c)4</i>
Policy 1.4.2	The City shall maintain its stormwater facilities based upon the LOS criteria in Policies 1.1.1 and 1.1.2.	<i>ECFRPC 60.30</i>
Policy 1.4.3	The City shall continue to enforce its regulations in Chapter 28, which prohibit the depositing of leaves and other yard wastes into City streets, and Chapter 31, which prohibit the depositing of leaves and other yard wastes into the City stormwater system.	<i>State Plan 187.201(8)(b)12 9J-5.011(2)(c)4 Approved February 7, 2000 Effective Date March 9, 2000 Doc. No. 32636</i>
<b>Objective 1.5</b>	The City shall continue to implement an inspection program for privately operated stormwater facilities, including pre-OUSWMM facilities within the City. Private facilities shall be inspected to verify effectiveness, and maintenance and shall be upgraded and retrofitted to meet OUSWMM requirements upon redevelopment.	<i>State Plan 187.201(8)(b)12 ECFRPC 38.04, 38.07, 59.06</i>
Policy 1.5.1	The City shall require that all private stormwater management facilities be maintained such that the	<i>State Plan 187.201(8)(b)12 ECFRPC 38.04</i>

effectiveness for stormwater abatement and water quality improvement are maximized.

- Policy 1.5.2      The City shall continue to provide incentives to multi-family, commercial, industrial and other business property owners to upgrade their stormwater management facilities such as those provided for in the Stormwater Utility Program.      *State Plan 187.201(8)(b)12  
9J-5.011(2)(c)4 Amended  
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- Objective 1.6**      Throughout the planning period, the City shall continue to enhance the stormwater education program to educate the public on aspects of stormwater management.      *ECFRPC 60.16  
Amended May 16, 1994  
Effective Date July 28, 1994  
Doc. No. 27538*
- Policy 1.6.1      The City's educational program shall include public service announcements, mail-outs, demonstrations and neighborhood meetings.
- Objective 1.7**      The City shall continue to propose interlocal agreements with Orange County and other appropriate agencies relating to flood control of Primary Conveyance Facilities and water quality of lakes partially contained within the City and other receiving waters.      *ECFRPC 59.02, 60.02, 60.32,  
60.33  
9J-5.011(2)(b)2,3  
9J-5.015(3)(b)1,3  
Approved February 7, 2000  
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- Policy 1.7.1      The City shall notify the downstream jurisdictional agency for any stormwater action undertaken by the City which will impact any Primary Control Facility.      *ECFRPC 59.06, 60.02, 60.32  
9J-5.015(3)(c)1,3*
- Policy 1.7.2      The City shall retrofit and/or repair drainwells or conveyance facilities which are jurisdictional in nature with the County, FDOT and any other appropriate agency. Costs will be shared among the appropriate agencies.      *State Plan 187.201(8)(b)12  
ECFRPC 38.04, 59.02,  
60.02, 60.32, 60.34  
9J-5.015(3)(c)1,3*
- Objective 1.8**      The City shall protect aquifer recharge areas to maintain suitable groundwater levels and to protect groundwater quality. Protection measures will address the impacts of groundwater withdrawals on water quality, sinkhole formation, and supply well protection. This objective will work in conjunction with the applicable Potable Water and Wastewater objectives.      *State Plan 187.201(8)(b)1, 9, 10  
ECFRPC 37.04  
9J-4.011(2)(b)4,5  
9J-5.015(3)(b)1,2,3  
F.S. 403  
F.A.C. 17-30  
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- Policy 1.8.1      The City shall require stormwater reuse systems and water reduction strategies to minimize water withdrawals. Lake water withdrawals shall be      *State Plan 187.201(8)(b)11  
State Plan 187.201(17)(b)2  
ECFRPC 59.03  
9J-5.011(2)(c)3  
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considered an appropriate form of stormwater reuse, subject to City oversight.

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| Policy 1.8.2         | The LDC shall prohibit land uses which have a high potential risk for water contamination in primary groundwater recharge areas. Existing development in primary groundwater recharge areas shall be required to retrofit on-site storage areas to contain 120% of any stored regulated substance or generated waste in case of an emergency. Land uses with high potential risk include any uses or activities which are considered large or small quantity hazardous waste generators under the Resource Conservation and Recovery Act. | <i>State Plan 187.201(8)(b)3<br/>ECFRPC 38.13<br/>9J-5.011(2)(c)4<br/>Future Land Use Map Series<br/>LU-2<br/>Approved February 7, 2000<br/>Effective Date March 9, 2000<br/>Doc. No. 32636</i> |
| Policy 1.8.3         | The City shall protect the groundwater supplies both upgradient and downgradient of Orlando through intergovernmental cooperation.  | <i>State Plan 187.201(8)(b)3<br/>ECFRPC 60.34<br/>9J-5.011(2)(c)4<br/>9J-5.015(3)(c)1</i>   |
| Policy 1.8.4         | The City shall protect its groundwater resources by not allowing increases in post-development runoff volumes in prime groundwater recharge areas   | <i>State Plan 187.201(8)(b)1,5<br/>9J-5.011(2)(c)4</i>  |
| Policy 1.8.5         | The City shall consider prime recharge areas as having high priority in the retrofitting of stormwater facilities to protect groundwater resources.   | <i>State Plan 187.201(8)(b)1<br/>9J-5.011(2)(c)1</i>  |
| Policy 1.8.6         | The City shall coordinate with the OUC and the appropriate Water Management Districts to determine the extent to which groundwater withdrawals can be made without resulting in harm to the water resources and associated natural systems, and shall cooperate in the management of groundwater withdrawals to avoid withdrawals which would result in such harm.  | <i>State Plan 187.201(8)(b)3,<br/>6, 14<br/>9J-5.011(2)(c)3<br/>9J-5.015(3)(c)1<br/>Amended May 16, 1994<br/>Effective Date July 28, 1994<br/>Doc. No. 27538</i>                                |
| <b>Objective 1.9</b> | Throughout the planning period, all City departments shall explore and implement procedures to reduce their use of pesticides, herbicides and artificial fertilizers.   | <i>State Plan 187.201(8)(b)1<br/>State Plan 187.201(13)(b)11<br/>9J-5.011(2)(b)4,5<br/>Approved February 7, 2000<br/>Effective Date March 9, 2000<br/>Doc. No. 32636</i>                        |
| Policy 1.9.1         | Any Department using substances which have the potential to contaminate water resources shall review and change, where appropriate, their use and need for these substances. In accordance with the City's NPDES permit, the City shall document by February 2000 the   | <i>State Plan 187.201(8)(b)12<br/>9J-5.011(2)(c)5<br/>Approved February 7, 2000<br/>Effective Date March 9, 2000<br/>Doc. No. 32636</i>   |

program and procedures implemented to minimize the use of pesticides, herbicides, and artificial fertilizers.

- Policy 1.9.2      The City shall incorporate xeriscape design into publicly maintained land to minimize water withdrawals, reduce the use of chemicals and reduce the cost of labor.      *State Plan 187.201(8)(b)4, 11  
9J-5.011(2)(c)5  
Urban Design 1.8*
- Policy 1.9.3      The City shall utilize natural fertilizers and biological controls for pest and weed control wherever possible.
- Objective 1.10**      Throughout the planning period, the City shall maintain a continuous program for identifying high risk drainage wells and taking corrective action to upgrade these drainage wells. The installation of pollution and control devices, rerouting of stormwater runoff and, in some cases, creating alternative methods of discharge and closing wells, are examples of the type of remedial measures which would be undertaken.      *State Plan 187.201(8)(b)12  
9J-5.011(2)(b)4,5  
9J-5.015(3)(b)1,3  
Amended May 16, 1994  
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- Policy 1.10.1      The City shall continue its involvement in the Orange County Drainage Well Task Force.      *ECFRPC 59.02  
9J-5.015(3)(c)1*
- Policy 1.10.2      The City shall use lakes to abate the water quality aspects of stormwater runoff otherwise disposed of by drainwells:
- (a) if other structural and non-structural alternatives have been studied and found to be prohibitively expensive and/or inefficient, and
  - (b) the water quality LOS will not be lowered.
- Policy 1.10.3      Recognizing the groundwater recharge benefits of drainwells, the City shall address water quality concerns through retrofitting and upgrading of drainage wells where necessary.      *State Plan 187.201(8)(b)1  
ECFRPC 38.04, 39.06  
9J-5.011(2)(c)5  
Conservation 1.3*

## **GOAL 2**

To preserve the quality of Orlando's many lakes, recognizing the importance of lake beauty, cleanliness, and recreational use as a natural asset contributing to the general appeal of Orlando as a residential and business community.

*9J-5.011(2)(a)*

<b>Objective 2.1</b>	The City shall continue to fully implement a water quality monitoring plan as a basis for determining water quality and prioritization of lake and drainwell retrofit and/or upgrading.	<i>State Plan 187.201(8)(b)1, 10 ECFRPC 37.05 9J-5.011(2)(b)1,4,5 Conservation 1.2.2 Approved February 7, 2000 Effective Date March 9, 2000 Doc. No. 32636</i>
Policy 2.1.1	Lakes shall be monitored and maintained at their determined existing average annual Trophic State Index and shall not exhibit during any 3 year period a sustained annual average increase of 5 points over the TSI trend published in the Lake Water Quality Report. Changes to the TSI trend shall consider seasonal fluctuations, analytical precision and methodology and historical water quality trends to differentiate between natural fluctuations and man made impacts.	<i>ECFRPC 37.05 Approved February 7, 2000 Effective Date March 9, 2000 Doc. No. 32636</i>
Policy 2.1.2	The City shall provide incentives to property owners to implement BMP's or retrofit individual stormwater management facilities to reduce nutrient loads which will impact water quality of receiving bodies . Stormwater utility fees should be reduced for significant reductions in runoff or improvement to water quality from the site.	<i>State Plan 187.201(8)(b)12 ECFRPC 38.03, 38.04, 39.11 9J-5.011(2)(c)5</i>
Policy 2.1.3	The City shall provide technical assistance to lakefront property owners to maintain and increase the use of natural vegetation along lakeshores.	<i>ECFRPC 39.11 9J-5.011(2)(c)5 Urban Design 8.2.1 Conservation 1.4.9</i>
Policy 2.1.4	The City shall annually publish a quantitative report on the variability of water quality including the trophic state of each City lake.	
Policy 2.1.5	The City shall encourage citizen and neighborhood involvement in addressing lake water quality concerns for those lakes wholly and/or partially within the City of Orlando.	<i>State Plan 187.201(8)(b)1 9J-5.011(2)(c)5 Approved February 7, 2000 Effective Date March 9, 2000 Doc. No. 32636</i>