

Precipitation Harvesting for Dual Source Reuse Systems

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OVERVIEW

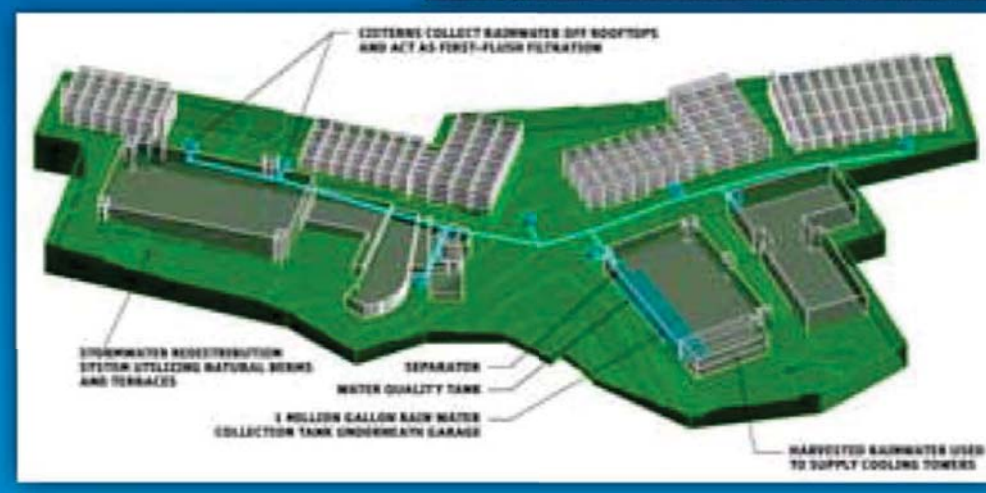
- INDUSTRIAL-INSTITUTIONAL-COMMERCIAL (ICI) FACILITIES
- DUAL STORMWATER/WATER REUSE SYSTEMS
- STORMWATER HARVESTING AND COLLECTION
- RAINWATER (ROOFTOP) HARVESTING AND COLLECTION
- SUPPLEMENTAL RECLAIMED WATER SOURCE



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ICI FACILITY EXAMPLES

- INDUSTRIES
- SCHOOLS
- GROCERY STORES
- HOTELS
- CITY FACILITIES
 - PARKS
 - CENTERS
 - CAMPUSES
- LAUNDRIES
- GOLF COURSES
- OFFICE BUILDINGS



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ALTERNATE WATER QUALITY

Dual Stormwater-Reclaimed Water System

TWO FLORIDA DUAL STORMWATER RECLAIMED WATER BASINS FOR IRRIGATION USE:

WINTER PARK CIVIC CENTER



ORLANDO TECH CENTER

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REGULATORY FRAMEWORK

- NATIONAL STORMWATER REGULATIONS
 - NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
 - CLEAN WATER ACT 40 CFR TITLE 402 (NPDES)
- STATE RECLAIMED WATER REGULATIONS
 - STATE-SPECIFIC STANDARDS AND AUTHORIZED USES
 - IN LIEU OF STATE REUSE REGULATIONS, 2004 USEPA GUIDELINES FOR WATER REUSE
- WATERS OF THE U.S. (U.S. ARMY CORPS OF ENGINEERS)
 - JURISDICTIONAL SECTION 10 & 404 WATERS (BELOW ORDINARY HIGH WATER MARK)
 - WATERS OF U.S. WETLAND AREAS NOT AVAILABLE FOR USE

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ADVANCED MICRO DEVICES (AMD)

Lantana Site, Austin Texas

- IMMENSE RAINWATER/AIR CONDITIONING CONDENSATE HARVESTING PROJECT
- USED FOR IRRIGATION AND COOLING TOWER MAKEUP
- 1.3 MILLION GALLONS/YEAR HARVESTED
 - > 3,500 GALLONS/DAY



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ALTERNATE WATER QUALITY

Stormwater Harvesting and Treatment System

SANTA MONICA URBAN RUNOFF RECYCLING FACILITY (SMURRF)



DISSOLVED AIR FLOTATION TREATMENT

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POTENTIAL PERMITTING ISSUES

- WATER RIGHTS PERMITS
 - NOT NEEDED FOR DIFFUSED STORMWATER
 - IF HARVESTING FROM WATERS OF U.S. (STATE), THEN A WATER RIGHT PERMIT FOR STORMWATER HARVESTING IS NEEDED
- SECTION 402, CLEAN WATER ACT
 - NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
 - SECTION 402 NPDES PERMIT THROUGH USEPA FOR CONSTRUCTION
- SECTION 404, CLEAN WATER ACT
 - WATERS OF THE U.S./JURISDICTIONAL WETLANDS
 - SECTION 404 WATER QUALITY PERMIT FROM USACE FOR MAINTENANCE DREDGING AND FILLING

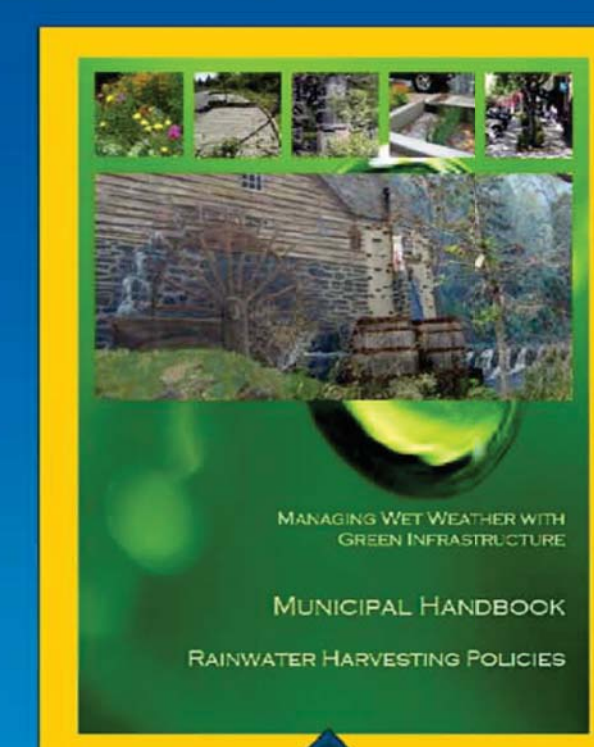
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ALTERNATE WATER IRRIGATION SOURCES

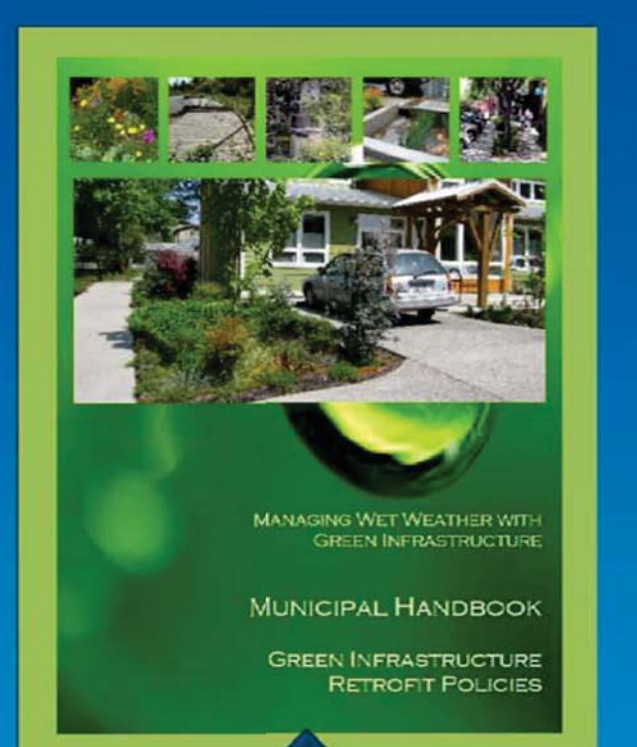
- RECLAIMED WATER (UNRESTRICTED USE WATER QUALITY)
 - 5 MG/L BOD, 3 NTU TURBIDITY, 20 CFU/100ML E.COLI
 - HIGHLY-TREATED, FILTERED WASTEWATER EFFLUENT
- EXCEPTIONAL QUALITY RECLAIMED WATER
 - MEMBRANE-FILTERED ULTRAPURE REUSE WATER
- HARVESTED RAINWATER
 - PRECIPITATION COLLECTED FROM ROOFTOP-GENERATED RUNOFF
- STORMWATER RUNOFF
 - STORMWATER COLLECTED FROM OVERLAND FLOW THAT HAS NOT ENTERED A NATURAL STREAM

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RAINWATER HARVESTING



MANAGING WET WEATHER

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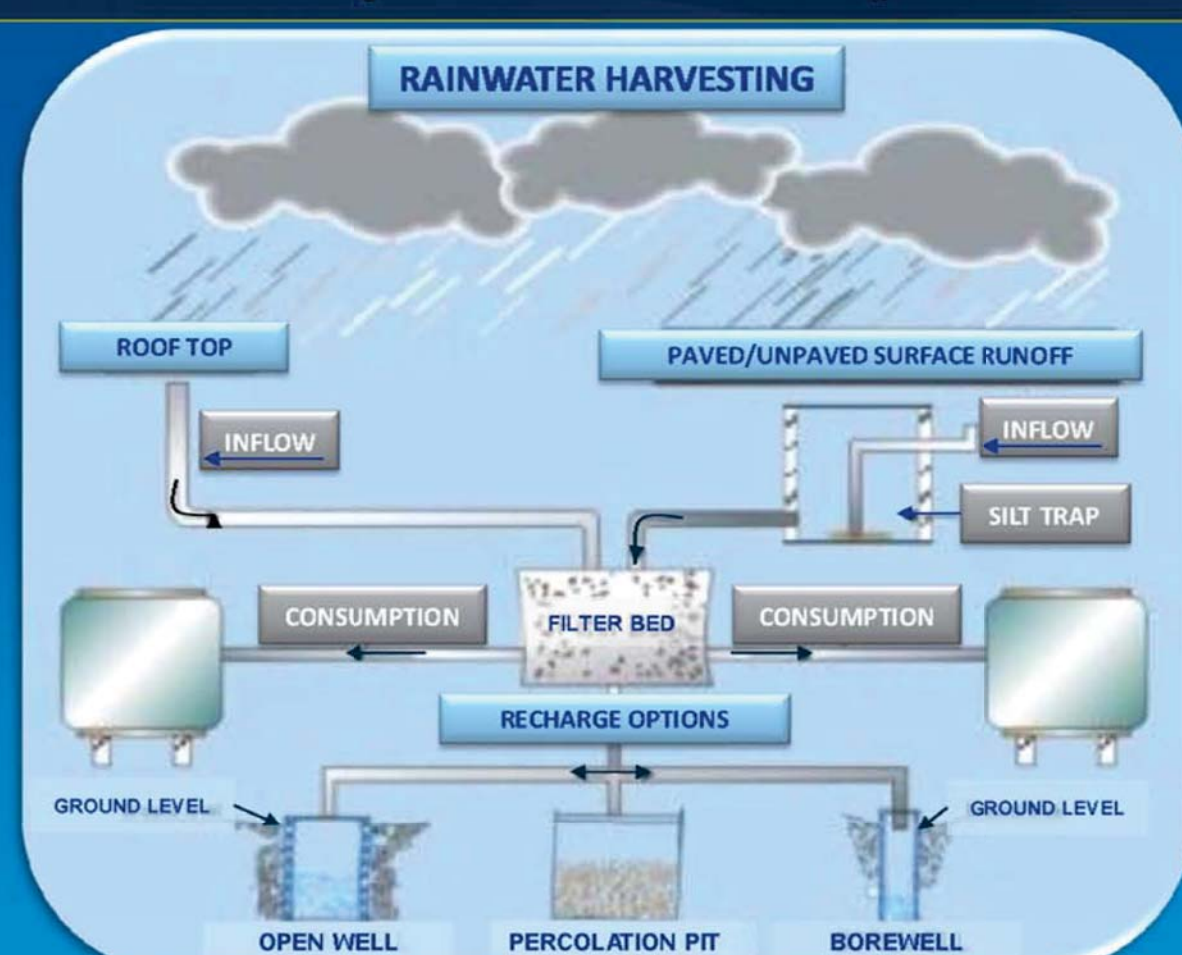
INDUSTRIAL-INSTITUTIONAL-COMMERCIAL (ICI) FACILITIES

- INDUSTRIAL CAMPUSES
- INSTITUTIONAL FACILITIES
- COMMERCIAL COMPLEXES
- OPEN SPACES
- PARKLAND AREAS
- STORMWATER MANAGEMENT FACILITIES (THOSE LOCATED OFF-CHANNEL AND OUTSIDE WATERS OF U.S.)



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RAINWATER HARVESTING (TWDB BMP 2.8)



QUESTIONS? PLEASE CONTACT:

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