

# Water, Wastewater & Stormwater Systems



CAROLINA NORTH

*The* UNIVERSITY of NORTH CAROLINA *at* CHAPEL HILL

# Water, Wastewater, Stormwater Draft Goals and Metrics

- Implement potable water conservation strategies
  - Possible metrics
    - Use potable water only when intended for direct human contact
    - Utilize water conserving building plumbing fixtures in all buildings



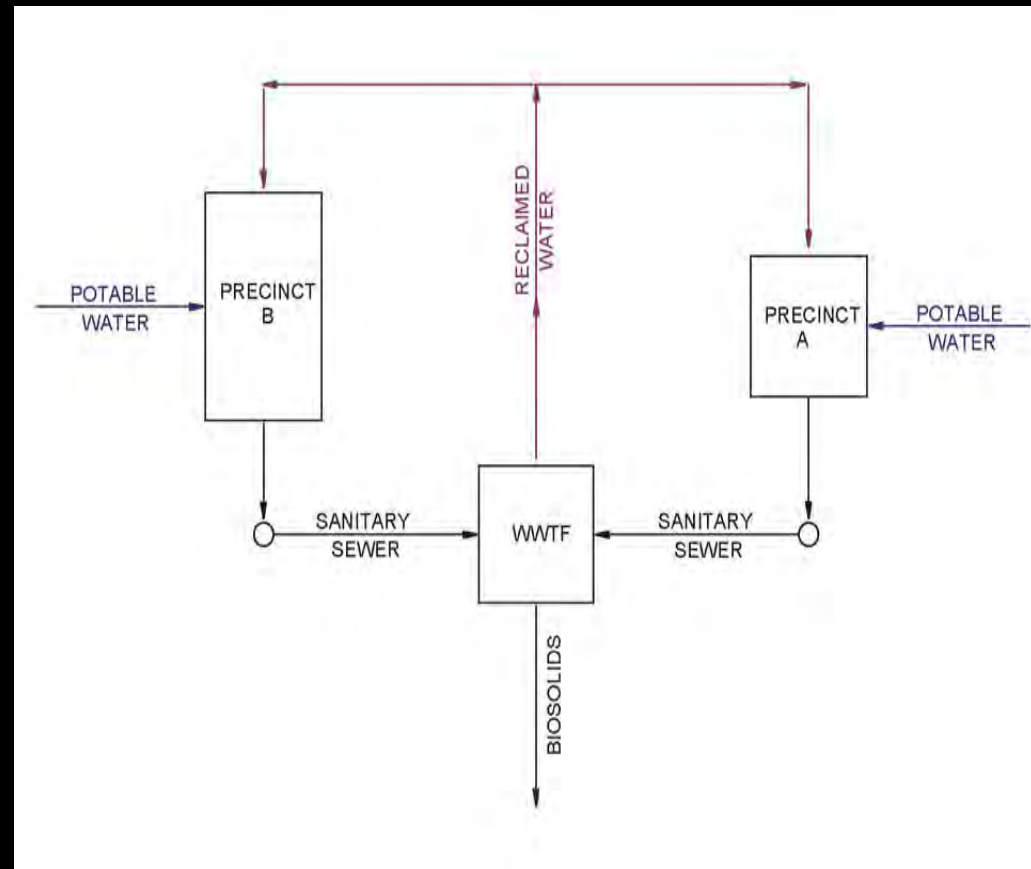
# Water, Wastewater, Stormwater Draft Goals and Metrics

- Consider alternate and/or supplemental sources for potable water
  - Possible metrics
    - 100% of roof runoff shall be collected and treated to drinking water standards to supplement the potable water supply
    - Evaluate the groundwater conditions in each phase of development and use groundwater as a supplemental source of potable water when practical and safe



# Water, Wastewater, Stormwater Draft Goals and Metrics

- Separate potable water and reclaimed water infrastructure
  - Possible metrics
    - Building and site piping networks shall be separated into potable water and reclaimed water piping systems





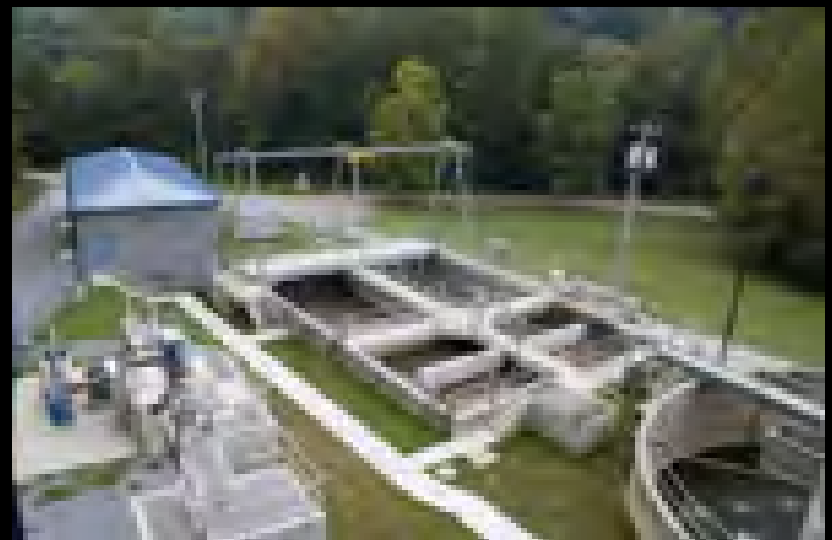
# Water, Wastewater, Stormwater Draft Goals and Metrics

- Reclaim and re-use stormwater and wastewater
  - Possible metrics
    - 100% of stormwater shall be collected for re-use
    - 100% of wastewater shall be collected for re-use
    - 100% of biosolids from wastewater shall be collected for re-use on or off site
    - 100% of gray water shall be separated from waste water for re-use



# Water, Wastewater, Stormwater Draft Goals and Metrics

- Maintain flexibility to treat wastewater on site
  - Possible metrics
    - 100% of wastewater shall be treated on site



# Water, Wastewater, Stormwater Draft Goals and Metrics

- Integrate research opportunities with innovative technologies while addressing regulatory requirements
  - Possible metrics
    - Prepare a code analysis prior to implementation of innovative technologies and provide accepted research documenting viability of innovative technologies



# Water, Wastewater, Stormwater Draft Goals and Metrics

- Stormwater systems shall replicate natural hydrology within disturbed and undisturbed areas

- Possible metrics

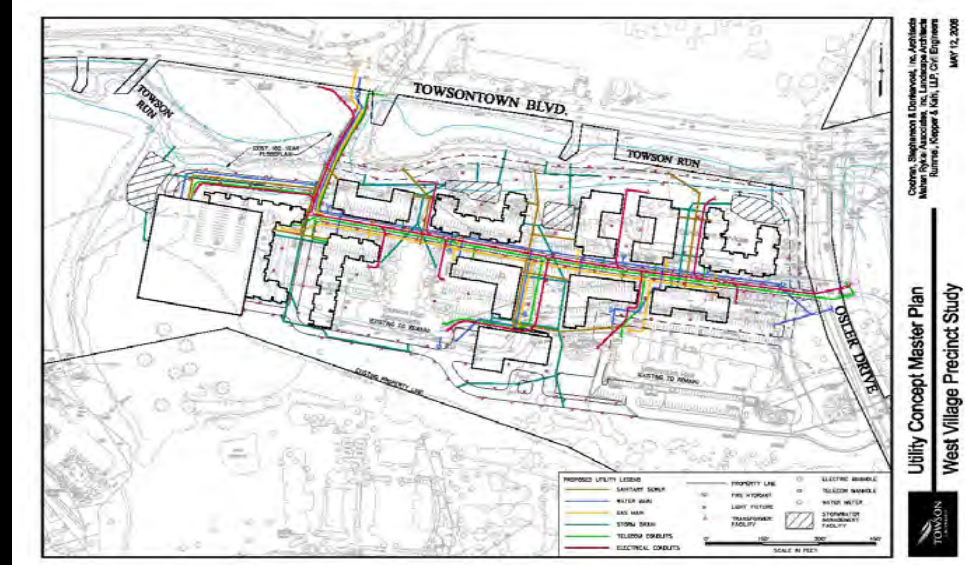
- Manage runoff from the built environment close to its source
- Provide water quality treatment for all impervious areas
- Collect and re-use the runoff from impervious areas
- Reduce impervious surfaces by X% compared to existing conditions within each phase of development
- Reduce rate and volume of stormwater from proposed development to X% of pre-development levels in 2 and 10 year storm events
- At a minimum, meet the stormwater management criteria of the Town of Chapel Hill for new development. In addition, treatment strategies shall be capable of limiting nitrogen export to 4.8 lb/acre/yr and phosphorus export to 0.8 lb/acre/year in accordance with the Jordan Lake Watershed Draft Criteria established by the North Carolina State Environmental Management Commission





# Water, Wastewater, Stormwater Draft Goals and Metrics

- Implement utility corridors and trenchless technologies to limit land disturbance
  - Possible metrics
    - Utility mains, distribution lines and services shall be within centralized utility corridors and/or shall utilize trenchless technology systems for installation and repair



# Water, Wastewater, Stormwater Draft Goals and Metrics

- Maintain Flexibility and Adaptability while Utilizing Proven Innovative Systems
  - Possible metrics
    - Innovative systems shall have a proven track record of success in at least X similar applications
    - All systems shall be designed for expansion and/or adaptability for future phases of development



# Water, Wastewater, Stormwater Draft Goals and Metrics

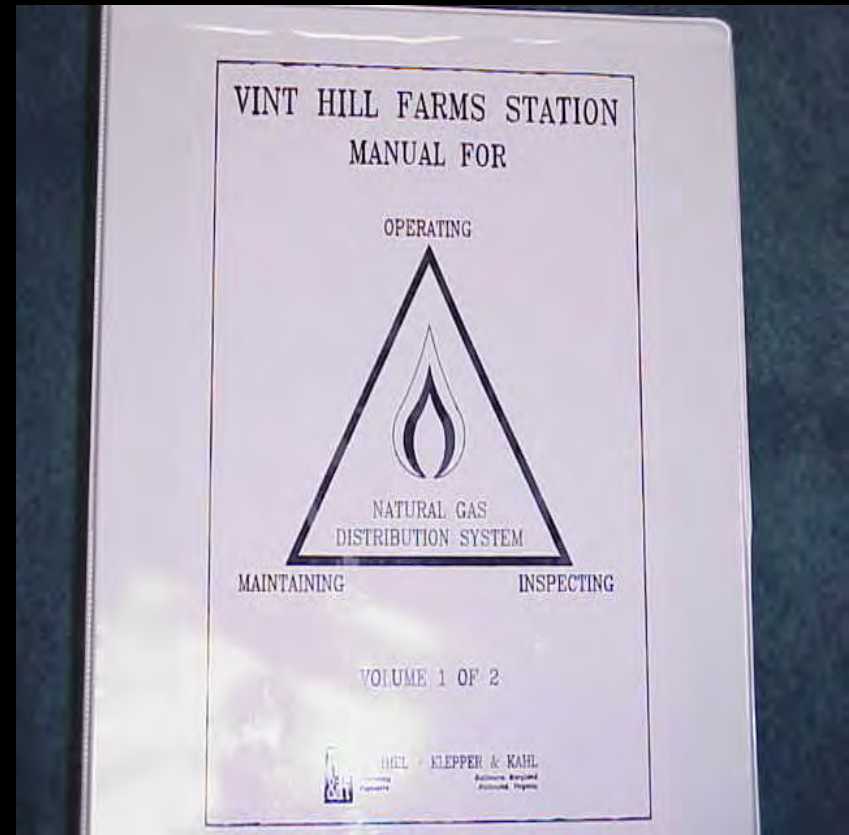
- Develop standardization of innovative systems for each phase of development
  - Possible metrics
    - After evaluation of the innovative systems that may be applicable to each phase of development, select no more than X innovative technologies for each system





# Water, Wastewater, Stormwater Draft Goals and Metrics

- Develop Operations & Maintenance strategies for all innovative systems
  - Possible metrics
    - Each innovative technology selected for the utility systems shall have an operations and maintenance manual jointly prepared by the professional engineer of record and the manufacturer





# Water, Wastewater, Stormwater Draft Goals and Metrics

- Integration of design, operation, maintenance and intended use of spaces
  - Possible metrics
    - Execute a Memorandum of Agreement to be signed by the design consultant(s), owner(s) and user(s) establishing the accepted use, operation and maintenance of the facility



**Memorandum of Agreement**

I. Thou shalt...

II. Thou shalt...

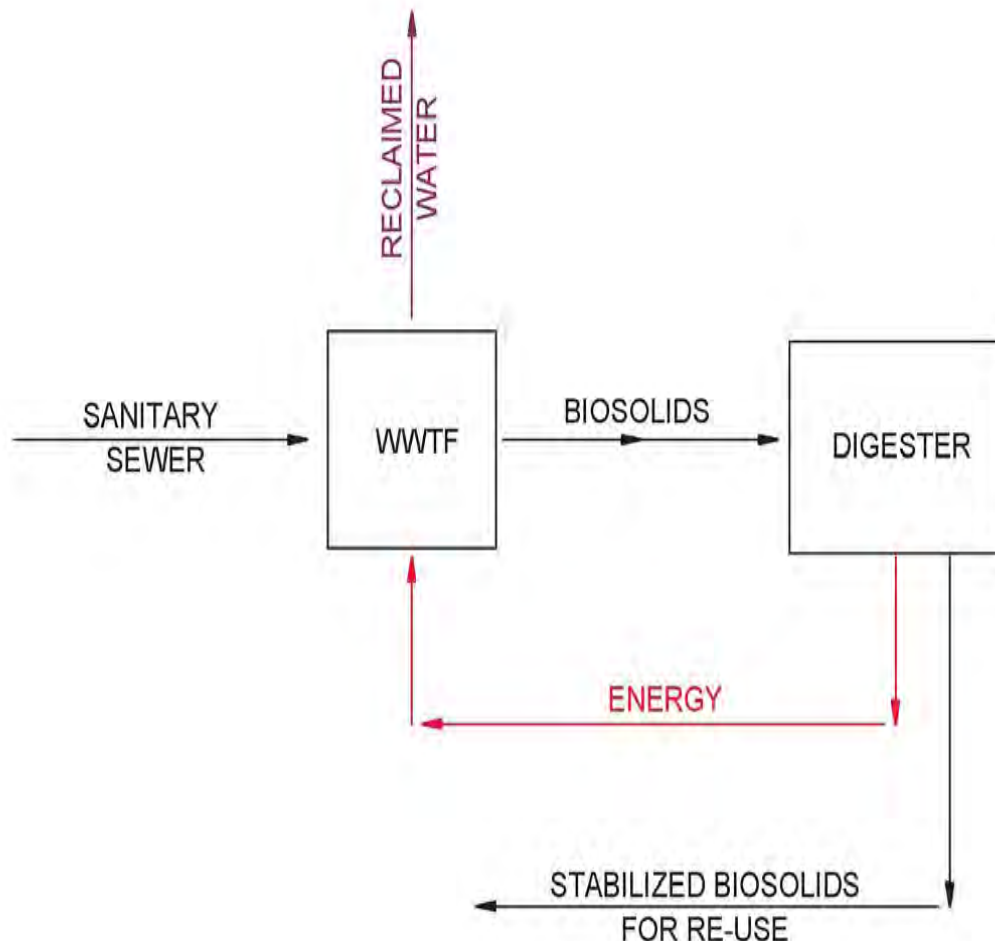
Approved \_\_\_\_\_  
John Doe

Approved \_\_\_\_\_  
Jane Doe

Approved \_\_\_\_\_  
Bill Doe

# Water, Wastewater, Stormwater Draft Goals and Metrics

- Consider energy efficiency of on-site systems
  - Possible metrics
    - Evaluate the energy efficiency of the on-site systems and provide a means to collect and re-use waste by-products from the systems



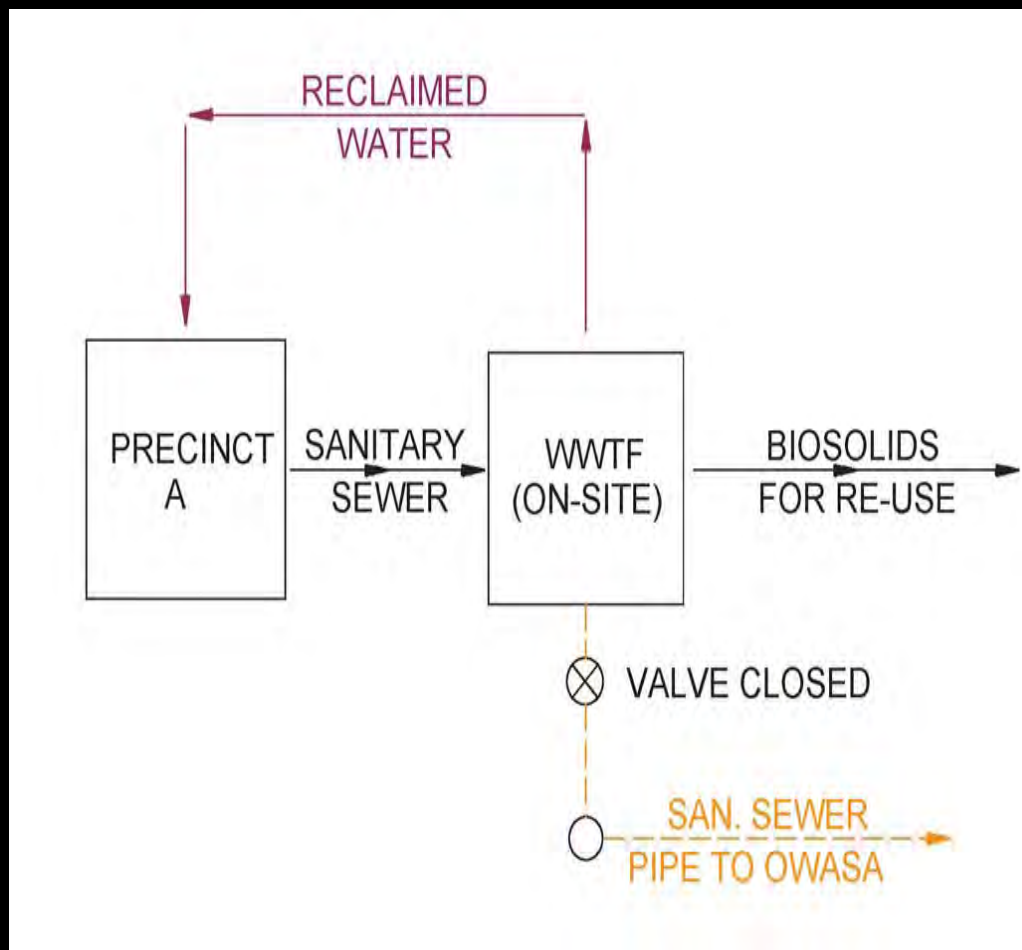
# Water, Wastewater, Stormwater Draft Goals and Metrics

- Explore means to develop innovative mechanisms to fund innovative systems
  - Possible metrics
    - Develop a funding strategy for implementation of innovative systems in each phase of development



# Water, Wastewater, Stormwater Draft Goals and Metrics

- Develop redundancy / backup for innovative systems
  - Possible metrics
    - Evaluate the need for redundancy in each of the innovative technologies and develop a strategy for implementation of back-up procedures for each system





# Water, Wastewater, Stormwater Draft Goals and Metrics

- Implement strategy for reduction and re-use of solid waste
  - Possible metrics
    - Solid waste shall be collected on-site and re-used or removed from the site in accordance with an established recycling program

