Wet Weather Team Project Meeting Materials

Summer 2007–Spring 2008

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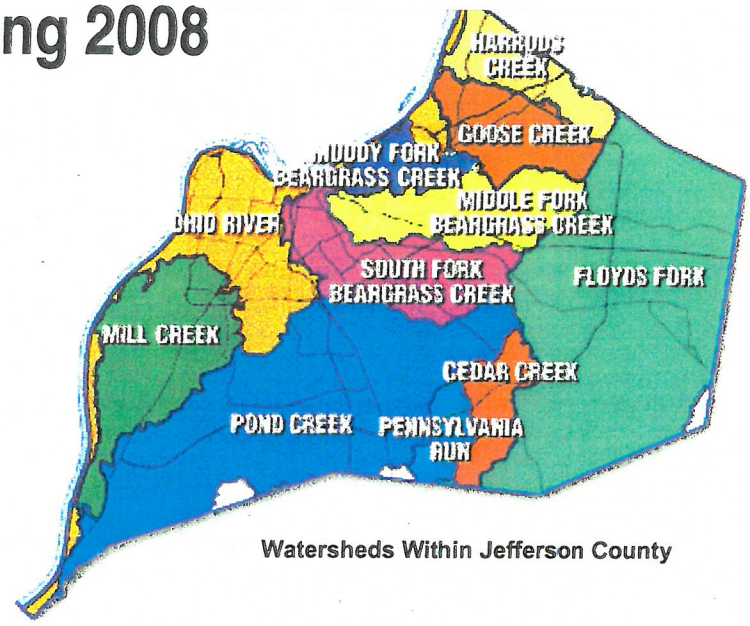
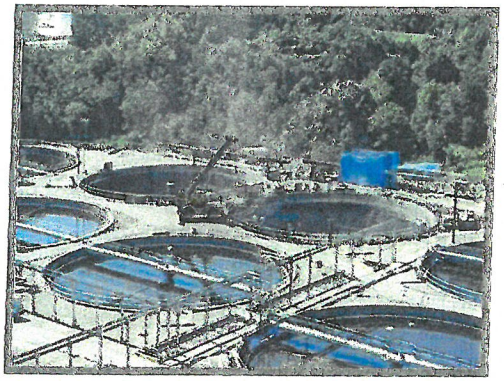
WWT Stakeholders Meeting # 9 5/22/2007

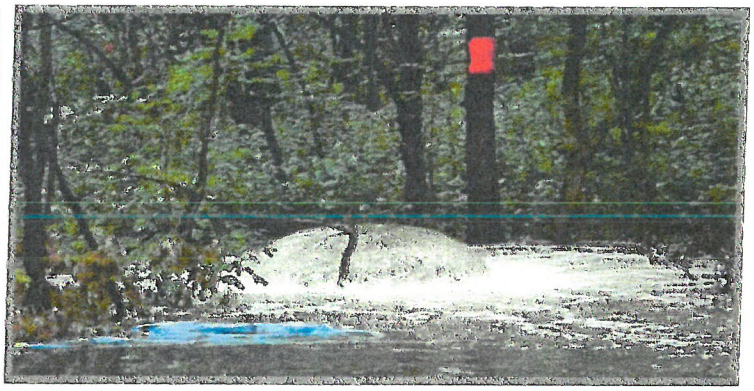
MSD

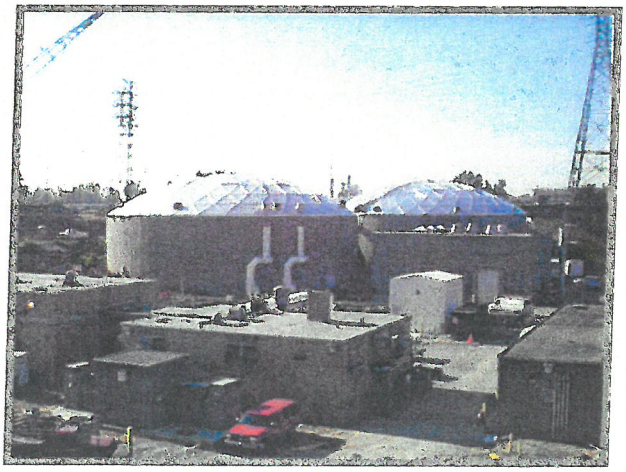
Louisville and Jefferson County
Metropolitan Sewer District



Watersheds Within Jefferson County







Agenda

Draft Agenda
Louisville and Jefferson County Metropolitan Sewer District (MSD)
Wet Weather Team Meeting #9

Tuesday, May 22, 2007, 4:00-8:30 PM (including optional tour at 4-5 PM)
Floyds Fork Wastewater Treatment Plant
1100 Blue Heron Road, Louisville

Meeting Objectives:

- Review and discuss comments provided by community members at the Project WIN public meetings in April and May 2007.
- Review and suggest refinements to the overall approach to incorporating the Wet Weather Team's community values into decision-making.
- Discuss potential relative weights for the Wet Weather Team's values.
- Identify next steps and expectations for the next meeting of the Wet Weather Team.

4:00 PM **Optional Tour of Floyds Fork Wastewater Treatment Plant (60 minutes)**

5:00 PM **Break and Additional Participants Arrive (15 minutes)**

5:15 PM **Introductions, Review Agenda and Ground Rules (10 minutes)**

- Review meeting objectives and ground rules.

5:25 PM **Wet Weather Project Updates (15 minutes)**

- Updates on MSD wet weather activities and follow-up items from the last Wet Weather Team meeting.

5:40 PM **Debrief from Project WIN Public Meetings (30 minutes)**

- Review comments provided by community members at the Project WIN public meetings in April and May 2007.
- Provide feedback on the format, structure, and content of the public meetings.

6:10 PM **Dinner Break (20 minutes)**

Dinner will be provided for Wet Weather Team members.

6:30 PM **Framework for Incorporating Values into Decision-Making (60 minutes)**

- Review feedback received (e.g., via e-mail) on performance measures and the programmatic values evaluation approach since the last Wet Weather Team meeting.
- Review and discuss the approach to evaluating the customer satisfaction value.
- Review and discuss the overall approach to incorporating the Wet Weather Team's community values into decision-making.

7:30 PM **Values Weighting Discussion (40 minutes)**

- Review the approach to using weights for the Wet Weather Team's values.
- Discuss potential relative weights for the values.

8:10 PM **Opportunity for Observer Comments (10 minutes)**

8:20 PM **Wrap Up and Next Steps (10 minutes)**

- Review plans and expectations for the June 21, 2007 Wet Weather Team meeting.

8:30 PM **Adjourn**

Final Meeting Summary
Wet Weather Team Meeting #9
Tuesday, May 22, 2007
Floyds Fork Wastewater Treatment Plant, Louisville

The Wet Weather Team (WWT), chartered by the Louisville and Jefferson County Metropolitan Sewer District (MSD), met on May 22, 2007 at Floyds Fork Wastewater Treatment Plant in Louisville. The objectives of the meeting were to:

- Review and suggest refinements to the overall approach to incorporating the Wet Weather Team's community values into decision-making;
- Discuss potential relative weights for the Wet Weather Team's values; and
- Review and discuss comments provided by community members at the Project WIN public meetings in April and May 2007.

Wet Weather Project Updates

Brian Bingham of MSD provided several updates regarding MSD's wet weather activities, as follows.

- Construction Projects: MSD is about to begin construction on two projects:
  - Constructing an inflatable dam in the sewer system near the Taylor Boulevard area; and
  - Doing sewer separation for combined sewer overflow (CSO) 206, which is the last CSO in any of the Olmsted Parks.
- Big 4 SSOs: MSD is beginning to design some of the projects related to the Big 4 sanitary sewer overflows (SSOs), including the Hikes Point interceptor.
- Rate Increase: It is anticipated that MSD's budget and audit committee will recommend the adoption of a rate increase to the full MSD Board at their next meeting on May 29, 2007. Because the proposed rate increase is greater than 7 percent, it will also require the approval of the Louisville Metro Council. The purpose of this proposed rate increase is to fund current projects, including projects related to the Big 4 SSOs. The Wet Weather Team will be responsible for addressing a long-term financing plan to fund future Wet Weather Program projects.

Rob Greenwood of Ross & Associates described the updates made to the WWT "Solution Ideas" document (included with the pre-meeting materials) since the last Wet Weather Team meeting. Ideas suggested by Wet Weather Team members during and since the April 19 meeting are now listed under a "What's New" section at the beginning of the document, as well as under the appropriate section later in the document. The "What's New" section will be updated for each Wet Weather Team meeting. The document now also includes a third section called, "Ideas Partly or Completely Outside the Scope of MSD's Wet Weather Consent Decree." This section includes municipal government actions that are only partly within MSD's control and MSD actions that are not related to sewer overflow issues.

Mr. Greenwood also noted that, at the next meeting, the facilitation team will provide two additional tracking lists: a list of Wet Weather Team data and monitoring requests; and a list of Wet Weather Team public education and outreach ideas. The lists will be updated for each Wet Weather Team meeting.

Wet Weather Team members made a number of observations and comments, including the following.

- One Wet Weather Team member asked if the 30 percent discount for people 65 years and older in the proposed rate increase would be given to whomever owns the property. Mr. Bingham responded that he believed that the discount would go to whomever pays the MSD bill, which could be the owner or the renter of the property. The details of how this discount program would be administered remain to be worked out.
- One Wet Weather Team member pointed out that there are some neighborhoods where newspaper circulation is not very thorough, so there may be many people who did not receive the newspaper insert regarding the Project WIN public meetings.

Framework for Incorporating Values into Decision-Making

Gary Swanson of CH2M HILL reviewed the changes made to the performance measure matrices for the asset protection, eco-friendly solutions, environmental enhancement, public health enhancement, and regulatory performances values since the last Wet Weather Team meeting. These changes, which resulted from comments from Wet Weather Team members, are listed below.

Asset Protection

- Added discussion in "Rationale" section addressing the option to consider purchase of impacted properties if the life-cycle cost to protect them is greater than the life-cycle cost to purchase them (including lost tax and user fee revenues).

Eco-Friendly Solutions

- Formatted to match environmental enhancement value.
- Added LEED criteria for buildings.
- Added "Rationale" and "Measurement" sections to explain reasoning behind scoring.
    - Clarified that recreation included aquatic and riparian activities.
    - Clarified that source control includes a wide range of activities including behavior change.
- Balanced both positive and negative scoring options.
- Added "fatal flaw" designation for unacceptable negative impacts.

Environmental Enhancement

- Added peak flow as an aspect.
- Clarified that habitat means both aquatic and terrestrial.
- Added "Rationale" and "Measurement" to explain scoring.
    - Differentiated predicted changes from monitored impacts.
    - Linked downstream impacts to other river uses and to pollutant loadings on the Gulf of Mexico.
- Balanced positive and negative scoring options.
- Added "fatal flaw" designation for unacceptable negative impacts.

Public Health Enhancement

- Modified performance measure for disinfection systems to recognize the value in operating well below rated capacity.

Regulatory Performance

- Changed the name from "regulatory compliance" to "regulatory performance" to recognize that compliance is required, but approaches to compliance allow for flexibility.

- Modified performance measure for treatment plants to recognize the value in operating well below rated capacity.

Wet Weather Team members expressed a high degree of comfort with the matrices in their current form. Some participants noted that, on the environmental enhancement matrix, projects (for example, taking a plant offline) that reduce flow will always receive a negative score under "stream flow impacts." Participants pointed out that in some cases it is not necessarily bad to reduce flow – for example, if the project returns flow to its pre-industrial state. One Wet Weather Team member noted that looking at base flow may be more desirable than looking at loss of flow. As a result of this discussion, the technical team will add to the rationale for the matrix the notion that under certain conditions, low or intermittent flow might not be as problematic as the scoring might imply.

Rob Greenwood of Ross & Associates asked Wet Weather Team members to send any additional comments on the matrices by May 31, 2007, after which the matrices will be considered final.

Mr. Swanson then went over the proposed approach for dealing with the customer satisfaction value. Based on input given at the April Wet Weather Team meeting, customer satisfaction will be changed to a programmatic value, which will be used to review potential impacts resulting from the entire suite of projects. All of the project-specific aspects of customer satisfaction will be distributed to other values (e.g., non-obtrusive construction techniques will be moved to eco-friendly solutions). Participants were comfortable with these changes.

Finally, Mr. Swanson walked through a flowchart showing a proposed approach for incorporating the Wet Weather Team's values into decision-making. In general, Wet Weather Team members expressed a high degree of comfort with the flow chart. Wet Weather Team members made several comments and observations, as follows.

- One Wet Weather Team member asked why the environmental justice value was singled out to inform the development of potential alternatives, while all of the other values come into play later in the flowchart. Another Wet Weather Team member noted that environmental justice is a process geared to ensure neighborhoods have an early opportunity to influence project design consistent with local needs and concerns. The technical team indicated comfort with ensuring that neighborhood meetings would include receiving input across the full range of values, and intends to alter the label in the flowchart consistent with this thinking.
- One Wet Weather Team member suggested screening for customer satisfaction, environmental and regulatory outcomes, and program costs versus affordability limits earlier in the flowchart to identify project alternatives that are "likely losers." Conversely, another member cautioned about excluding alternatives based on a predetermination of cost limitations. The example given was the new Ohio River bridge project, where one alternative (the most attractive one) was eliminated from consideration by the bridge planning team based on cost, and never shown to the public during the public outreach process. The technical team agreed that pre-screening for viability was needed, but that technically viable options would not be eliminated strictly on cost if they offered unique benefits not available from lower-cost options.

The technical team will work to address these comments and provide a revised version of the flowchart at the June 21, 2007 meeting.

Values Weighting Discussion

Rob Greenwood of Ross & Associates began the discussion by describing the values weighting

example that was sent to the Wet Weather Team after the April 19, 2007 meeting. This example demonstrates how the Wet Weather Team's decisions on how to weight the values could influence the alternatives selected for the Wet Weather Program. Mr. Greenwood emphasized that weights and preferences are going to matter in the values-based decision-making process, so it is important to see if there are certain preferences that the Wet Weather Team wants to establish.

Mr. Greenwood led participants in an informal, non-binding straw poll exercise based on the "homework assignment" sent to Wet Weather Team members following the April 19 meeting, in which members were asked to place all 11 values under one of the following categories:

- Important Values
- Very Important Values
- Critically Important Values

Mr. Greenwood observed that certain aspects of this straw poll are similar to the results of the initial straw poll taken during the February 13, 2007 meeting. For example, most Wet Weather Team members placed public health enhancement, environmental enhancement, and regulatory performance in the "Critically Important" category. In contrast, environmental justice was given more weight in this poll than it was in the last one. Mr. Greenwood also observed that many participants placed the financial values in the "Very Important" and "Important" categories.

Wet Weather Team members made several observations about this straw poll and about values weighting in general, including the following.

- Several participants didn't put education or environmental justice into any category because of their intrinsic nature.
- Several participants rated regulatory performance as "Important," not because they don't view it as a critical aspect of the project, but because compliance is a requirement.
- One Wet Weather Team member expressed a preference for using only two categories (e.g., "Important" and "Very Important") to weight the values.
- One Wet Weather Team member observed that it will be important to take a set of weightings, run them through the model, see what happens, and then change the weightings and see how the results differ.
- One Wet Weather Team member asked if it would be possible to factor future costs of *not* doing projects into the decision-making process. This referred specifically to the economic impacts of potential growth moratoriums, etc., if the Wet Weather Plan was found to be non-compliant with requirements. Gary Swanson of CH2M responded that this is outside the bounds of the predictive ability of the processes and tools available and would be impossible to quantify with any degree of confidence. The technical team would include this consideration in the programmatic evaluation of economic vitality as it relates to satisfying the regulatory performance issues.

Mr. Greenwood proposed that, based on the Wet Weather Team's view that all of the values are important, the difference between the relative weights for the values should be smaller rather than larger (for example, weights of 6, 8, and 10 are closer together than weights of 1, 5, and 10). Wet Weather Team members expressed a high degree of comfort with this approach.

The technical team will develop a proposed approach for weighting the values, based on the Wet Weather Team's agreement on having smaller rather than larger differences between the weights, and on the major trends from the two straw polls. The technical team will also come up with several "critical alternative" approaches to weighting the values that reflect the perspectives of participants whose votes did not

closely align with the trends. The Wet Weather Team will discuss all of the approaches at the June 21, 2007 meeting.

Update on Project WIN Public Meetings

MSD Executive Director Bud Schardein gave a brief overview of the Project WIN public meetings. Four public meetings have taken place to date, and two more are planned for late May and early June. Turn-out has been variable but most meetings have been well-attended, with about 50 people attending the most recent meeting. So far, MSD has received very few negative comments.

One Wet Weather Team member asked if MSD could put the Project WIN public meeting presentation on public television. Mr. Schardein responded that Henry Cubero of the Cubero Group is going to help MSD put the presentation on video, and that MSD will see if it can be shown on public television.

MSD will present a more detailed update on the Project WIN public meetings at the June 21, 2007 Wet Weather Team meeting. Stakeholders will be given the opportunity to provide feedback on the format, structure, and content of the meetings.

Observer Comments

There were no comments from observers at this meeting.

Wrap Up and Next Steps

- Ross & Associates will update the solution ideas list for the June 21 meeting.
- Ross & Associates will put together a list of education ideas and a list of data and monitoring requests made by Wet Weather Team members to hand out at the June 21 meeting.
- The technical team will revise the performance measurement matrices for asset protection, eco-friendly solutions, environmental enhancement, public health enhancement, and regulatory performance based on comments received from Wet Weather Team members.
- The technical team will revise the values-based decision-making process flowchart based on comments received from Wet Weather Team members.
- The technical team will put together a proposed approach for weighting the Wet Weather Team's values, along with several "critical alternative" approaches, for discussion at the June 21 meeting.
- The next WWT meeting will be on Thursday, June 21, 2007, at MSD's main office. Potential meeting topics include:
    - A more detailed overview and discussion of feedback from the Project WIN public meetings in April, May, and June;
    - Presentation and discussion of high-level control strategies for CSOs; and
    - Discussion of a proposal for weighting the Wet Weather Team's community values.

Meeting Participants

Wet Weather Team Stakeholders

Susan Barto, Mayor of Lyndon
Stuart Benson, Metro Council, District 20
Charles Cash, City of Louisville, Planning & Design Services Department

Allan Dittmer, University of Louisville
Faye Ellerkamp, City of Windy Hills
Jeff Frank, Vanguard Sales
Tom Herman, Zeon Chemicals
Rick Johnstone, Deputy Mayor, Mayor's Office
Bob Marrett, CMB Development Company
Kurt Mason, Jefferson County Soil and Water Conservation District
Judy Nielsen, Louisville Metro Health Department
Lisa Santos, Irish Hill Neighborhood Association
Bruce Scott, Kentucky Waterways Alliance
Tina Ward-Pugh, Metro Council, District 9
David Wicks, Jefferson County Public Schools

MSD Personnel

Brian Bingham, MSD Regulatory Management Services Director
Derek Guthrie, MSD Director of Engineering/Operations & Chief Engineer
Bud Schardein, MSD Executive Director

Facilitation and Technical Support

Rob Greenwood, Ross & Associates Environmental Consulting
Gary Swanson, CH2M HILL
Kate Weinberger, Ross & Associates Environmental Consulting

Meeting Observers

Henry Cubero, Cubero Group
Clay Kelly, Strand Associates
Teri Pifine, MSD
Wesley Sydnor, O'Brien & Gere

Meeting Materials

- May 22, 2007 Meeting Agenda
- Summary of the April 19, 2007 Wet Weather Team Meeting
- Updated Draft List of Wet Weather Program "Solution Ideas"
- Presentation from the Project WIN Public Meetings
- "Five Key Messages" Handout from the Project WIN Public Meetings
- Attendee Comment Sheet from the Project WIN Public Meetings
- Performance Measurement Matrices for Asset Protection, Eco-Friendly Solutions, Environmental Enhancement, Public Health Enhancement, and Regulatory Performance
- Values-Based Decision-Making Process Flowchart
- Decision Framework Incorporating Community Values Presentation

Wet Weather Team Solution Ideas
Working Draft – May 16, 2007

The following is a list of potential "solution ideas" identified by Wet Weather Team (WWT) members that will be considered in the design of the Wet Weather Program. The list will act as a "punch list" for the technical team as they consider project and program alternatives. These ideas were identified both at WWT meetings and through individual communications with WWT members (e.g., via e-mail). This list will remain "live" throughout the remainder of the WWT effort to capture ideas as they are shared. WWT members are encouraged to send additional ideas to the facilitation team for inclusion in this list.

New ideas will be listed under a "What's New" section at the beginning of the document for easy reference, as well as under the appropriate section later in the document. After the "What's New" list, this document is organized into three sections:

- Section I, "Project Alternatives," is organized into five sub-categories: Stormwater Best Management Practices (Non-Structural), Stormwater Best Management Practices (Structural), CSO and SSO Point Source Controls, General/Other Solutions, and Site-Specific Solutions.
- Section II, "Funding Ideas," is organized into three sub-categories: Cost Allocation Strategies, Financial Incentives, and Funding Sources/Options.
- Section III, "Ideas Partly or Completely Outside the Scope of MSD's Wet Weather Consent Decree," includes municipal government actions that are only partly within MSD's control and MSD actions that are not related to sewer overflow issues.

What's New (April/May 2007)

1. (I-A-3) Conduct a baseline survey and follow-up surveys of residents to determine whether education and outreach efforts are effective in changing behavior and perceptions on issues related to the Wet Weather Program.
2. (I-A-4) Hold "CSO Action Days" during or right after a hard rain to promote behavior change (e.g., don't use your dishwasher, wait to drain your bathtub, etc.).
3. (I-A-5) Develop a pledge for customers that clearly lays out behaviors that will help MSD meet Consent Decree requirements. For an example, see http://www.watershedpledge.org (see also II-B-4).
4. (I-B-5) Consider incorporating aspects of the LEED green building standards into MSD design manuals for structural BMPs.
5. (I-B-6) Ensure that urban CSO areas have at least a 30 percent tree canopy.
6. (I-C-2) Increase enforcement and inspections of downspout and sump pump connections.
7. (II-B-4) Reduce fees for families or businesses who sign a pledge that clearly lays out behaviors that will help MSD meet Consent Decree requirements (see also I-A-5).
    a. In critical CSO neighborhoods, provide free rain barrels to people who sign the pledge.
8. (III-A-1) Improve the development review process for new subdivisions. Deny permits for subdivisions or any new homes if the plant in the area is above capacity.
9. (III-A-2) Encourage local government agencies (e.g., Jefferson County Public Schools, Metro Parks) to adopt preventative practices to decrease stormwater runoff and wastewater volumes (e.g., low-flow toilets, pervious pavement, additional tree coverage, etc.).
10. (III-A-3) Develop a "comprehensive solution" for local environmental improvement and education efforts.

a. Fund and staff a collaborative planning effort to link the environmental education programs of multiple local agencies (MSD, Louisville Water Company, Metro government departments, Mayor's Office, TARC, etc.) together, develop specific goals and assessment systems, and then hold agencies accountable to those goals.

11. (III-B-1) Purchase properties within the floodplain.
    a. Buy land that is flooded on a regular basis and turn it into parks.
    b. When building a detention basin, buy properties in the floodplain that are most impacted.
12. (III-B-2) Improve implementation and enforcement of the Sediment Control Act.

I. Project Alternatives

A. Stormwater Best Management Practices (Non-Structural)

1. Influence behavior of residential and commercial landowners through education.
    a. Promote water conservation practices: rain gardens, rain barrels, and responsible alternatives for sump pumps and downspout connections.
    b. Encourage stewardship: removing invasive vegetation from riparian zones, planting wetlands, litter cleanups, etc.
2. Regularly distribute billing inserts (like LG&E's) to MSD customers with facts and tips to encourage certain behaviors (e.g., lawn chemical management, pet waste management, landscaping practices).
3. Conduct a baseline survey and follow-up surveys of residents to determine whether education and outreach efforts are effective in changing behavior and perceptions on issues related to the Wet Weather Program
4. Hold "CSO Action Days" during or right after a hard rain to promote behavior change (e.g., don't use your dishwasher, wait to drain your bathtub, etc.).
5. Develop a pledge for customers that clearly lays out behaviors that will help MSD meet Consent Decree requirements. For an example, see http://www.watershedpledge.org (see also II-B-4).

B. Stormwater Best Management Practices (Structural, including "Green" Infrastructure Solutions)

1. Use landscaped areas to control stormwater runoff.
2. Encourage homeowners to construct rain gardens and use rain barrels.
3. Install French drains along roads to accept stormwater runoff (see also detailed suggestions listed for Beechwood Village below).
4. Develop specific design parameters or standards for stormwater best management practices and low impact development techniques and include these in an MSD Design Manual. The Design Manual should provide guidance for approaches including, but not limited to, the following:
    a. Pervious pavement
    b. Level spreaders
    c. Riparian buffers
    d. Vegetated swales
    e. Wet ponds

f. Wet ponds with forebays (small basins that settle out incoming sediment before it is delivered to a stormwater BMP)[1]

g. Wetlands

5. Consider incorporating aspects of the LEED green building standards into MSD design manuals for structural BMPs.
6. Ensure that urban CSO areas have at least a 30 percent tree canopy.

C. CSO and SSO Point Source Controls

1. Disconnect downspouts and/or sump pumps (e.g., by developing educational initiatives aimed at landowners).
2. Increase enforcement and inspections of downspout and sump pump connections.

D. General/Other Solutions

1. Leverage and coordinate the Wet Weather Program efforts with MSD's MS4 stormwater management permitting responsibilities.

E. Site-Specific Solutions (Considered in Addition to the Solutions Listed Above)

Beechwood Village

1. Construct a park-like wet detention area in the wooded area of St. Matthews Park.
2. Install new sanitary lines and laterals to homes, and pumps for basement facilities when requested by the homeowner.
3. Install French drains on either side of roadways to accept stormwater runoff. The drains would be continuous trenches filled with gravel and covered by turf. The drains could also accept discharges from sump pumps and downspouts.
4. Install perforated pipe in the French drains so they can discharge more freely when they flood. The piped drain system would need to be a combination of gravity and pump depending on the topography and discharge point(s).
5. If a solid pipe system is used, the system could discharge to constructed wetlands designed to treat stormwater. Possible sites for constructed wetlands are the forest north of the Community Park and the detention pond for the bank on Shelbyville Road at the Beechwood Village entrance.
6. Restore natural stream banks for the Sinking Fork north of Shelbyville Road where the big pump now sits.

II. Funding Ideas

A. Cost Allocation Strategies

1. Equitably assign costs (focus areas for the financial equity value):
    a. Consider the burden on fixed income and low-income populations
    b. Rates and fees that are linked to the cost to serve (i.e., the level of impact)

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[1] Adapted from Pennsylvania Department of Environmental Protection, *Pennsylvania Stormwater Best Management Practices Manual*, http://www.dep.state.pa.us/dep/deputate/watermgt/wc/Subjects/StormwaterManagement/BMP%20Manual/14_Glossary_Final_Draft.pdf

2. Charge residences differently depending on the area of impervious surfaces on properties (and therefore the amount of stormwater runoff that would be generated).
3. Require lower development fees for areas that already have sewer capacity (e.g., urban areas in need of re-investment).
4. Bill based on increased water usage – the more you use, the higher the rate.

B. Financial Incentives

1. Provide incentives for "preferred" behaviors.
2. Offer incentives for developers to use cost-effective, eco-friendly solutions (e.g., low impact development techniques, stormwater best management practices).
3. Charge reduced wastewater rates to property owners that use eco-friendly techniques to reduce stormwater runoff.
4. Reduce fees for families or businesses who sign a pledge that clearly lays out behaviors that will help MSD meet Consent Decree requirements (see also I-A-5).
    a. In critical CSO neighborhoods, provide free rain barrels to people who sign the pledge.

C. Funding Sources/Options

1. Consider using volunteers to reduce costs.
2. Consider solutions that could meet the objectives of multiple agencies (e.g., water quality and flood control improvements) and therefore could potentially receive funding from multiple sources.

III. Ideas Partly or Completely Outside the Scope of MSD's Wet Weather Consent Decree

A. *Municipal Government Actions (Only Partly within MSD's Control)*

1. Improve the development review process for new subdivisions. Deny permits for subdivisions or any new homes if the plant in the area is above capacity.
2. Encourage local government agencies (e.g., Jefferson County Public Schools, Metro Parks) to adopt preventative practices to decrease stormwater runoff and wastewater volumes (e.g., low-flow toilets, pervious pavement, additional tree coverage, etc.).
3. Develop a "comprehensive solution" for local environmental improvement and education efforts.
    a. Fund and staff a collaborative planning effort to link the environmental education programs of multiple local agencies (MSD, Louisville Water Company, Metro government departments, Mayor's Office, TARC, etc.) together, develop specific goals and assessment systems, and then hold agencies accountable to those goals.

B. *MSD Actions Not Related to Sewer Overflow Issues*

1. Purchase properties within the floodplain.
    a. Buy land that is flooded on a regular basis and turn it into parks.
    b. When building a detention basin, buy properties in the floodplain that are most impacted.
2. Improve implementation and enforcement of the Sediment Control Act.

Public Information Meetings
Spring 2007

Jefferson County is fortunate to have an abundance of water. In addition to 40 miles of the Ohio River, we have over 790 miles of tributary streams that enrich our lives in many ways. These waters and the surrounding areas provide habitat for a highly diverse population of fish and other aquatic creatures. These areas also provide us with recreational opportunities like wading, swimming, boating, fishing, and enjoying nature at its best. Unfortunately, our water ways are threatened by pollution from many sources. Most of the surface water in Jefferson County is judged to be "impaired", thereby limiting our recreational opportunities and aquatic habitat.

In August 2005, MSD, on behalf of our community, entered into a Consent Decree with the United States Environmental Protection Agency (EPA) and the Kentucky Environmental and Public Protection Cabinet (EPPC). This Consent Decree resolved allegations by these entities that our community had violated the Federal Clean Water Act. The alleged violations were specifically for stream water quality impairments caused by combined and separate sanitary sewer overflows (CSOs and SSOs), most of which have existed in our community for decades.

The Consent Decree has specific actions that must be taken by specific dates. One of those actions is the development of a Wet Weather Plan to abate the negative public health and stream impacts of CSOs and to eliminate SSOs from our sewer systems. Currently we are in the early stages in the development of this plan. It's the right thing to do for our community as it will improve the quality of life for those that live and recreate in this community for years to come.

The points outlined below are the major elements of the Consent Decree and the process being undertaken to develop the Wet Weather Plan. Feedback from the community on its values and highest priorities in relation to these sewer overflow and stream water quality issues is essential!

1. Addressing CSOs and SSOs is a Community-Owned Challenge
   - Compliance with the Consent Decree is not optional
   - Specific requirements are tied to stream water quality and combined/sanitary sewer overflows (CSOs and SSOs)
   - Protection of public health relative to coming in contact with untreated sewage is critical
   - Clean water in our streams and the Ohio River water is essential to recreation and aquatic health enhancements

2. Project WIN will be the Largest Single Locally-Funded Public Works Effort in this Community
   - Preliminary projected spending level is approximately $800 Million over 19 years
   - Capital projects designed and completed to enhance the underground infrastructure will influence the look of our community for generations to come
   - Opportunity to positively and simultaneously improve both stream water quality and sewer service throughout Jefferson County
   - Rate increases will be required to fund this plan

3. Our Community is under Specific Requirements with Specific Timeframes for Completion
   - Wet Weather Plan development to be submitted to EPA and EPPC by December 31, 2008
   - Beechwood Village and Southeastern Diversion Structure SSO eliminations to be completed by December 31, 2011
   - Hikes Point and Highgate Springs SSO eliminations to be completed by December 31, 2013
   - CSO abatement to be completed by 2020
   - SSO elimination to be completed by 2024
   - Enhancement of sewer system operation and maintenance programs
   - Enhancement of public education, outreach and notification programs

4. The Wet Weather Plan will Engage and be Reflective of the Community's Values and Priorities
   - A Stakeholder Group comprised of representatives from the community has been engaged since late summer 2006. The members of this group have provided input on the community's values and priorities as they pertain to the development and implementation of the Wet Weather Plan and ultimate compliance with the Clean Water Act.
   - Public Participation Process will include public information meetings and public comment meetings/forums as the Wet Weather Plan is developed and finalized

5. Overcoming this Challenge Requires Participation by Everyone
   - Community priorities may need to shift to provide higher investments for clean water
   - Behavioral changes such as the disconnection of illegal sump pumps and downspouts from the sewer system must occur
   - Water conservation during and after rain storms such as temporary suspension of dishwasher and washing machine use
   - Proper disposal of grease by putting it in the trash, not down the drain
   - Installation of rain barrels and rain gardens to reduce stormwater runoff
   - Participation in stream clean sweeps and litter control programs to keep our land and streams clean

Want to Stay Informed Between Meetings?

- Visit the Project WIN website for details about the Consent Decree, approved submittals to EPA/EPPC, minutes from the Stakeholders meetings and a list of items of how you can help with our community challenge. You can also sign up to receive emails from the overflow advisory system to warn of coming into contact with water that may be contaminated with sewage and other pollutants. The web address is: http://www.msdlouky.org/projectwin/
- Submit comments and concerns via our online customer service system. The web address is: http://www.msdlouky.org/
- Call our 24-hour customer service line at 587-0603.

PUBLIC MEETING ATTENDEE COMMENTS
Spring 2007

Zip Code

Name: _____

Address (Optional): _____

_____

Daytime Phone (Optional): _____

E-mail (Optional): _____

Comments/Questions

How do you and your family currently use the Ohio River and local area streams? How often?

_____

_____

_____

What concerns do you have about the state of our streams and river?

_____

_____

_____

How important to you is clean streams and river water, compared to other priorities in life?

_____

_____

_____

Other comments, concerns, or questions:

_____

_____

_____

_____

_____

Value:	Asset Protection		Impact						Rationale	Measurement Method
Performance Measures		Flood Damage	Homes or businesses are subject to severe structural damage	Homes or businesses are subject to minor to moderate structural damage	Flooding limits access to homes or businesses	Flooding limits access to recreational areas	Standing water on property, but access not affected and no damage expected	No standing water	Storm water BMPs can reduce stormwater peaks and reduce extent of flooded areas, while sewer separation may increase localized stormwater peak flows and increase the flooding impacts of storms. Alternatively, purchase of highly impacted properties may be a cheaper way to reduce flood damage and create green space and buffer zones.	Drainage models where available, or historic observations of flood-prone areas combined with the expected relative impacts of sewer system modifications on storm water flows
		Basement Back-ups	Sewer surcharging within 6 feet of ground surface for more than 20% of manholes	Sewer surcharging within 6 feet of ground surface for 10 - 20% of manholes	Sewer surcharging within 6 feet of ground surface for 5 - 10% of manholes	Sewer surcharging within 6 feet of ground surface for 1 - 5% of manholes	Sewer surcharging within 6 feet of ground surface for 0 - 1% of manholes	No surcharging within 6 feet of ground surface	First floor levels are typically 1 - 2 feet above ground surface, and basement floors are typically 8 - 10 feet below the first floor. A sewer surcharge of 6 feet below ground surface is highly likely to cause back-ups in homes with basement service.	Measurement methods will be via hydraulic models to quantify the hydraulic grade lines compared to ground surface elevations at manholes.
	Event Recurrence Interval	→	Most Severe Impact				Least Impact	No Impact		
		↓	5	4	3	2	1	0		
Frequency	6-10 per year	Most Likely 5	25	20	15	10	5	0		
	1-6 per year	4	20	16	12	8	4	0		
	1-2 year recurrence interval	3	15	12	9	6	3	0		
	2-5 year recurrence interval	2	10	8	6	4	2	0		
	>5 year recurrence interval	Least Likely 1	5	4	3	2	1	0		
	Not Possible	Not Possible 0	0	0	0	0	0	0		

Acronyms
BMP = Best management practice

Value: Eco-Friendly Solutions

	Scoring											
Aspect	-5	-4	-3	-2	-1	0	1	2	3	4	5	Score Per Aspect
Non-Renewable Energy Consumption	Primary energy consumption is greater than secondary treatment	Primary energy consumption equal to 75 - 100% of secondary treatment	Primary energy consumption equal to 30 - 75% of secondary treatment	Primary energy consumption equal to 15 - 30% of secondary treatment	Primary energy consumption equal to 0 - 15% of secondary treatment	No energy consumption except for cleaning and maintenance	Cleaning and maintenance not needed, no primary consumption	N/A	N/A	N/A	N/A	
Use of Natural Systems	Constructed facilities permanently displace 5+ acres wetlands or 50% locally available green space	Constructed facilities permanently displace 3 - 5 acres wetlands or 25 - 50% locally available green space	Constructed facilities permanently displace 1 - 3 acres wetlands or 10 - 15% locally available green space	Constructed facilities permanently displace 0 - 1 acre wetlands or up to 10% locally available green space	Constructed facilities temporarily disrupt wetlands or green space	Alternative does not use or affect natural systems	Alternative does not use natural systems, but enhances green space or wetland	Natural systems play a minor role in alternative function, up to 1 acre wetland or 10% additional green space created	Natural systems are significant part of alternative function, 1 - 3 acres of wetland created or 10 - 25% additional green space	Alternative fully uses natural systems, 3 - 5 acres of wetland created or 25-50% additional green space	Alternative results in multi-use natural system development. 5+ acres of wetland or 50% additional green space	
Recreation and Multiple-Use Facilities	Constructed facilities permanently eliminate recreational opportunity	Constructed facilities significantly impair recreational opportunity	Constructed facilities moderately impair recreational opportunity	Constructed facilities have minor impacts on recreational opportunity	Construction temporarily impacts recreational opportunity	No impacts on recreational opportunities	Alternative improves access to existing recreational areas	Alternative has limited positive impact on recreation	Alternative significantly enhances recreational opportunities	Alternative increases recreational opportunities in area	Alternative results in multi-use facility	
Source Control of Subwatershed Pollutant Loads	Pollutant loadings are increased by 50%	Pollutant loadings are increased by 30 - 50%	Pollutant loadings are increased by 10 - 30%	Pollutant loadings are increased by 0 - 10%	Pollutant loadings impacts are inconsistent, but likely higher	Pollutant loadings are unchanged	Pollutant loadings impacts are inconsistent, but likely lower	Source control reduces pollutant loadings by 0 - 10%	Source control reduces pollutant loadings by 10 - 30%	Source control reduces pollutant loadings by 30 - 50%	Source control reduces pollutant loadings by more than 50%	
Non-Obtrusive Construction Techniques	Permanent loss of green space or sensitive area disruption	Main thoroughfare closures, sensitive area temporary disruptions	Widespread dust and noise, blasting, secondary street closures	Localized dust, noise and local street closures	Minor dust and noise, traffic lane closures	No construction impacts	N/A	N/A	N/A	N/A	N/A	
Consistent Land Use	Intrusive or nuisance facilities inconsistent with neighborhood or land use.	Facilities inconsistent with neighborhood or land use.	Facility appearance mitigated to reduce impact on neighborhood	Facilities have significant impact on development density	Facility has minor impact on development density	No above ground facilities	Alternative mitigates existing compatibility problem	Alternative removes facility inconsistent with neighborhood	Alternative removes nuisance facility from neighborhood	Alternative enhances property values in neighborhood	Alternative provides enhancements that significantly improve neighborhood	
Impermeable Surfaces	5 acres+ of impermeable surfaces are added.	3 - 5 acres of impermeable surfaces are added.	1 - 3 acres of impermeable surfaces are added.	up to 1 acre of impermeable surfaces are added.	Minor increase in impermeable surfaces added.	No change in impermeable surface	Minor reduction in impermeable surfaces	Up to 1 acre of impermeable surfaces removed	1 - 3 acres of impermeable surfaces removed	3 - 5 acres of impermeable surfaces removed	More than 5 acres of impermeable surfaces removed	
LEED Performance	N/A	N/A	N/A	N/A	N/A	LEED not applicable or LEED score <10.	LEED Score 10 - 25	LEED Certified	LEED Silver	LEED Gold	LEED Platinum	

Instructions:
1. Score each alternative for each of the eight aspects of the value. Scores can be positive or negative, depending on the impact of the alternative on the value.
2. Total the scores for each aspect to get the total score for this alternative in this value.
3. Maximum score is 25. Shaded area represents "fatal flaw." Alternatives that score in this area should not be proposed.

Total Score Eco-Friendly Solutions (25 points maximum)	**0**

Aspect	Rationale	Measurement Method
Non-Renewable Energy Consumption	Eco-friendly solutions would be expected be low consumers of non-renewable energy. Benchmarking energy consumption against conventional secondary treatment provides penalty points for high energy consuming alternatives.	Evaluation of primary energy consumed per MG of flow treated, compared to the energy consumed at the WCWTP per MG treated
Use of Natural Systems	Natural systems replace concrete and steel construction with wet bottom storage lagoons, constructed bioswales, rain gardens etc. that increase green space of various kinds. Options that reduce wetlands and green space get penalty points.	Acres of wetlands and other types of green space created or eliminated. Also includes subjective evaluation of the "basis" of the alternative - "green" or "grey"
Recreation and Multiple-Use Facilities	Eco-friendly solutions create recreational opportunities for both water-based and riparian recreation. Boating, canoeing, kayaking, fishing, wading, swimming etc. would be direct water-based recreation. Bird watching, hiking, biking, picnicking, camping etc. would be considered related riparian recreation	Subjective evaluation of changes predicted in the aquatic or riparian environment as a result of better water quality, increased base flow or decreased flow peaks, increased tree cover or vegetated riparian areas etc.
Source Control of Subwatershed Pollutant Loads	Controlling pollutant loads at the source through behavior modification, product replacements or stormwater management BMPs that capture pollutants thereby avoiding end of pipe treatment requirements	Modeled land-side pollutant loading reductions as calculated by the BGC Water Quality Tool or by comparison to literature values or pilot program measurements
Non-Obtrusive Construction Techniques	Probable construction impacts on traffic, noise and dust are all measures of the friendliness of an alternative. Construction impacts get penalty points for creating nuisance conditions.	Subjective evaluation of probable construction impacts based on the type of construction envisioned for the alternative.
Consistent Land Use	Alternative configuration can either enhance or detract from the surrounding property. For example, an extremely unfriendly pump station can be noisy, smelly, and ugly. The same pump station can be "disguised" as a residence that fits right in with the neighborhood. If a larger parcel of land is available, a pump station can be hidden from view by landscaping, and a community garden or other green space added to enhance the neighborhood.	At the planning level, projects can be defined to avoid negative impacts on the surrounding properties. Depending on the availability of land, enhancements are possible. This aspect encourages project definition and budgets to enhance, not detract.
Impermeable Surfaces	Adding impermeable surfaces increases total runoff volume, peak runoff flow rates, and the total transport of any pollutant deposited on the surface from any source. Conversely, permeable surfaces can reduce flow volume and peaks, and provide filtering mechanisms for pollutants.	Acres of permeable surfaces created or eliminated.
LEED Performance	LEED standards are applicable to alternatives that include above-ground building structures.	Application of LEED evaluation points.

Value: Environmental Enhancement

Aspect	-5	-4	-3	-2	-1	0	1	2	3	4	5	Score Per Aspect
Aquatic and Terrestrial Habitat Protection	Elimination of habitat for rare or endangered species	Elimination of significant amount of common habitat	Elimination of minor amount of common habitat	Significant habitat impairment	Minor impairment to existing habitat	No impact on habitat	Minor enhancement of existing habitat	Significant enhancement of existing habitat	Creation of minor amount of common habitat	Creation of significant amount of common habitat	Creation of critical habitat for rare or endangered species.	
Aesthetics - Solids and Floatables (S&F)	75%+ reduction in volume of flow with no S&F capture	50 - 75% of flow with no S&F removal	25 - 50% of flow with no S&F removal	10 - 25% of flow with no S&F removal	Reduces efficiency of existing S&F control device, 0 - 10% of flow with no S&F removal	No change in S&F removal	0 - 10% of flow treated with screens	10 - 25 % of flow treated with screens	25 - 50% of flow treated with screens	50 - 75% of flow treated with screens	75% + of flow treated with screens	
Aesthetics - Odor and Air Emissions	Create annoying odor source affecting > 20 customers often	Create annoying odor source affecting <20 customers often, or >20 customers occasionally	Create annoying odor source affecting <20 customers occasionally	Create detectable odor source affecting > 50 customers often	Create detectable odor source affecting < 50 customers occasionally	No impact on odors	Eliminate detectable odor source affecting < 50 customers occasionally	Eliminate detectable odor source affecting > 50 customers often	Eliminate annoying odor source affecting <20 customers occasionally	Eliminate annoying odor source affecting <20 customers often, or >20 customers occasionally	Eliminate annoying odor source affecting >20 customers often	
Dissolved Oxygen (DO) Impacts	Reduction of in-stream DO by 2 mg/l + during critical flow periods	Continuous reduction of in-stream DO of 2 mg/l +	Continuous reduction of in-stream DO f 0 - 2 mg/l, possible reduction of in-stream DO 2 - 4 mg/l during critical conditions	in stream DO 2+ mg/l possible during non-critical conditions, reduction of DO 0 - 2 mg/l during critical conditions	Intermittent reduction of in stream DO 0 - 2 mg/l possible during non-critical conditions	No DO impacts	Intermittent improvement of in-stream DO 0 - 2 mg/l	Intermittent improvement of in-stream DO 2+ mg/l, intermittent critical condition improvements 0 - 2 mg/l	Continuous improvement of in-stream DO 0 - 2 mg/l, intermittent critical condition improvements 2-4 mg/l	Continuous improvement of in-stream DO 2 + mg/l	Continuous improvement of critical condition in-stream DO 2 mg/l +	
Downstream Impacts (Biochemical Oxygen Demand [BOD] and Nutrient Loads)	75%+ increase in annual BOD or nutrient loads	50 - 75% increase in annual BOD or nutrient loads	25 - 50% increase in annual BOD or nutrient loads	10 - 25% increase in annual BOD or nutrient loads	Potential 0 - 10 % increase in annual average BOD or nutrient loads	No impact on BOD or nutrient loads	0 - 10% reduction in annual BOD or nutrient loads	10 - 25% reduction in annual BOD or nutrient loads	25 - 50% reduction in annual BOD or nutrient loads	50 - 75% reduction in annual BOD or nutrient loads	75%+ reduction in annual BOD or nutrient loads	
Stream Flow Impacts (Peak flows)	25% + increase in peak flows	10% - 25% increase in peak flows	Up to 10% increase in peak flows	Frequent increase in flow during critical conditions	Possible increase in average flow, or minor increase in high flow peaks	No impact on peak flows	Minor reduction in flows - no significant peak reduction	Minor reduction in peak flows under some conditions	Up to 10% reduction in peak flows	10% - 25% reduction in peak flows	25%+ reduction in peak flows	
Stream Flow Impacts (Dry Weather Flows only)	25%+ decrease in flow during critical conditions.	10% - 25% decrease in flow during critical conditions	0-10% permanent decrease in flow during critical conditions	Frequent decrease in flow during critical conditions	Possible decrease in average flow	No impact on stream flow	Intermittent increase in stream flow - not timed to critical conditions	Intermittent increase in stream flow - often improves critical conditions	0 - 10% permanent increase in stream flow during critical conditions	10 - 25 % permanent increase in stream flow during critical conditions	25%+ permanent increase in stream flow during critical conditions.	
Instructions: **1. Score each alternative for each of the seven aspects of the value. Scores can be positive or negative, depending on the impact of the alternative on the value.** **2. Total the scores for each aspect to get the total score for this alternative in this value.** **3. Maximum score is 25. Shaded area represents "fatal flaw". Alternatives that score in this area should not be proposed.**										Total Score Environmental Enhancement (Maximum Score = 25)		0

Aspect	Rationale	Measurement Method
Aquatic and Terrestrial Habitat Protection	Wet weather projects may affect both aquatic and terrestrial habitat through changes in base flow, peak flow, water quality, tree cover, channel shape and characteristics etc. Predictive models used to evaluate wet weather control measures have a limited ability to predict biological diversity changes, erosion impacts etc., so surrogate metrics must be used to estimate future positive and negative impacts.	Project definition may specifically address changes in channel shape and configuration, tree cover etc. Predictive models will address DO and other water quality impacts. Flow models will predict base flow and peak flow rates to allow estimates of changes in erosion and water surface area.
Aesthetics - Solids and Floatables (S&F)	Most CSOs have some form of solids and floatables control baffles. Improvements in capture rates can be expected with screening or other advanced treatment options. Storm water retention, constructed wetlands, and other control systems may provide solids and floatables removal as well. While reduction in solids and floatables removal efficiency is not likely, penalty points will be assessed if this is possible with any alternative.	Current solids and floatables removal efficiency has been estimated for all sites with control technology. Improvements in removal efficiencies will be estimated for all alternatives that add screening or other advanced treatment technologies. Where treatment is proposed for storm water discharges removals will be estimated based on published removal data.
Aesthetics - Odor and Air Emissions	Odors and air emissions can be generated in storage systems, pump stations, force mains, and long flat sewers. Odors are generally characterized by both the intensity and the quality of the odor. Detectable and annoying are two common descriptors of different intensities and qualities of odors from sewage handling facilities.	Odor emissions from sewage handling facilities can be modeled for intensity, quality, and geographic spread. For planning purposes this level of evaluation is not common, and will not be done except in very rare circumstances. The potential for odor and air emissions will be estimated based on typical applications and model predictions for storage time, number of events, average flow velocities etc.
Dissolved Oxygen (DO) Impacts	Dissolved oxygen in streams is dependent on a variety of factors including BOD load, nutrient load, stream flow velocity, water temp etc.	For BGC the Water Quality Tool will be used to estimate the impacts of various loading conditions, flows, temperatures, etc. Probable impacts of individual projects will be estimated based on comparisons to the various stream condition scenarios.
Downstream Impacts (Biochemical Oxygen Demand [BOD] and Nutrient Loads)	Downstream impacts refer to conditions in the Ohio River below Jefferson County. Nutrient loadings in the Ohio (not just Jefferson County) have been identified as the source of 30 - 45% of the total nutrient loads reaching the Gulf of Mexico. BOD is not likely to persist in the river long enough to get to the Gulf, but can have detrimental impacts far downriver.	Pollutant removals will be estimated based on reductions in annual average loads, since the downstream impacts are primarily long-term and cumulative.
Stream Flow Impacts (Peak flows)	Extremely high peak flows as are often caused by urbanization of a watershed can erode the streambed, damage aquatic and terrestrial habitat, make water based recreation unsafe or impractical	Predictive models can estimate flow peaking factors from individual sources, and the Water Quality Tool has a hydraulic component to estimate stream flows during various storm events.
Stream Flow Impacts (Dry Weather Flows only)	Diversion of flows away from a stream due to abandonment of a treatment plant etc. can reduce base flows in a stream. Alternatively, other control measures such as groundwater pumping can increase base flows with beneficial results.	Predictive models can estimate flows from individual sources, and the Water Quality Tool has a hydraulic component to estimate stream flows during various dry weather events.

Value:	Public Health Enhancement		Measure			Impact						Rationale	Measurement Method
Performance Measures	WWTP Peak Flows			WWTP Peak Flows	Peak flow delivered to WWTP versus rated peak hour capacity of disinfection system	Peak flow exceeds rated capacity by more than 100%	Peak flow exceeds rated capacity by 50 - 100%	Peak flow exceeds rated capacity by 10 - 50%	Peak flow exceeds rated capacity by less than 10%	Peak flow is within rated capacity	Peak flow is less than 80% of rated capacity	WWTP disinfection systems have ability to adjust dose rates to handle small short term peaks without exceeding discharge standards. Significant peaks may result in inadequate disinfection that exceeds discharge permit limits. Peak flows well below system capacity allow performance significantly better than standards require.	Measurement will be from analyzing plant influent flows against pre-determined plant stress-test results and operating criteria.
		CSOs	CSOs and SSOs	Release point		Discharge where volume is > 0.04% of stream's flow	Discharge to water or ground in high public use or access area	Discharge to water in low public use or access area. Basement back-up	Discharge to ground in low public use or access area, discharge contained and cleaned up.	De minimus quantity	No discharge	Not all discharges violate the Clean Water Act. Discharges vary in the impact to public health and the environment. Therefore, EPA developed guidance on how to set priorities based on the risk to the public's health and the environment under their Enforcement Management System in Chapter X, titled "Setting Priorities for Addressing Discharges from Separate Sanitary Sewers." The assigned consequences follow the intent of the principles and priorities presented in the chapter. SSO Event Mean Concentration for Fecal Coliform estimated at 500,000/100ml. Dilution factor 0.04% required to not exceed 200 FC/100 ml Water Quality Standard.	Measurement methods will be via hydraulic models to quantify the SSO discharge and the GIS to establish relative distance from designated locations or objects.
	Design Event Recurrence Interval	Frequency per location	Event Recurrence Interval	→		Most Severe Impact				Least Impact	No Impact		
				↓		5	4	3	2	1	0		
Frequency	6-10 per year	>10 per year	< 1 year recurrence interval	Most Likely	5	25	20	15	10	5	0		
	1-6 per year	4-10 per year	1-2 yr recurrence interval		4	20	16	12	8	4	0		
	1-2 year recurrence interval	1-4 per year	2-5 yr recurrence interval		3	15	12	9	6	3	0		
	2-5 year recurrence interval	1-2 year recurrence interval	5-10 yr recurrence interval		2	10	8	6	4	2	0		
	>5 year recurrence interval	>2 year recurrence interval	>10 yr storm return	Least Likely	1	5	4	3	2	1	0		
	Not Possible	Not Possible	Not Possible	Not Possible	0	0	0	0	0	0	0		

Acronyms

CSO = Combined sewer overflow
FC = Fecal coliform
GIS = Geographic information system
SSO = Sanitary sewer overflow
WWTP = Wastewater treatment plant

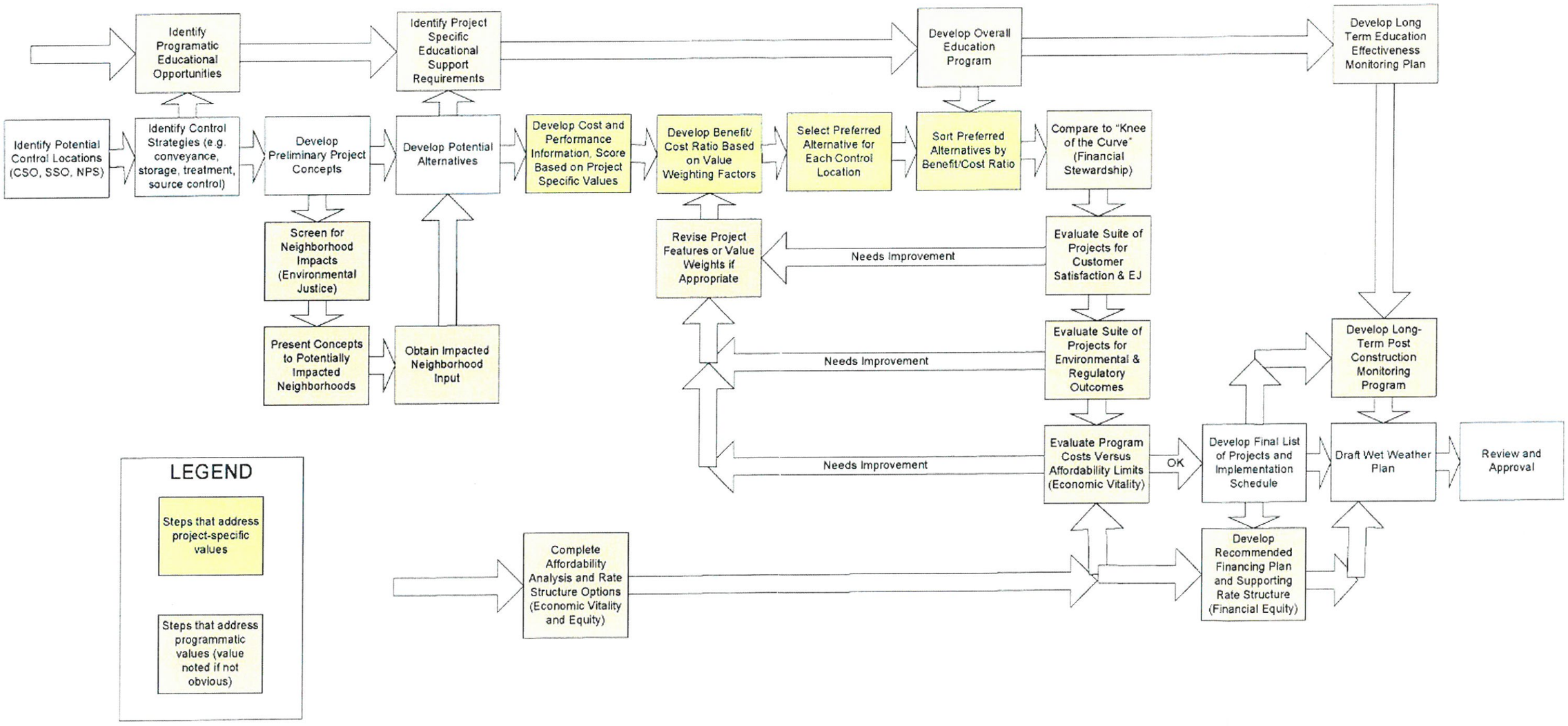
Value:	Regulatory Performance		Measure		Impact						Rationale	Measurement Method
Performance Measure	WWTP Peak Flows			Peak flow delivered to WWTP versus rated peak hour capacity of plant	Peak flow exceeds rated capacity by more than 50%	Peak flow exceeds rated capacity by 25 - 50%	Peak flow exceeds rated capacity by 10 - 25%	Peak flow exceeds rated capacity by less than 10%	Peak flow is within rated capacity	Peak flow is less than 80% of rated capacity	WWTPs have ability to handle small short term peaks without exceeding discharge standards, but significant peaks may result in process washout and associated failure of discharge permit limits. Peak flows less than 80% of rated capacity allow plant to perform significantly better than discharge standards require.	Measurement will be from analyzing plant influent flows against pre-determined plant stress-test results and operating criteria.
	CSOs	Beargrass Creek CSOs		Discharge flow rate % of receiving stream flow	Discharge > 5%	Discharge 1 - 5%	Discharge 1 - 0.2%	Discharge 0.1 - 0.2%	Discharge <0.1%	No discharge	CSO Event Mean Concentration for Fecal Coliform in overflows estimated at 250,000/ 100 ml. Dilution factor 0.08% required to not exceed 200 FC/100 ml Water Quality Standard	Measurement method will be via hydraulic model to quantify the CSO. Spreadsheet calculation to determine mix concentration.
		CSOs in Ohio River		Average Annual Overflow Volume (AAOV)	100 MG+ AAOV	20 - 100 MG AAOV	2 - 20 MG AAOV	1 - 2 MG AAOV	<1.0 MG AAOV	No discharge	100 MG AAOV (10 events) dilution factor in average Ohio River flow is 0.04%. 1.0 MG AAOV (1 event) dilution factor is 0.06%. Cumulative impact of multiple overflow locations may become significant for WQS exceedance.	Measurement methods will be via hydraulic models to quantify the CSO discharge. Spreadsheet calculation to mix concentration.
		SSOs		Release point	< 1 year recurrence interval	1-2 yr recurrence interval	2-5 yr recurrence interval	5-10 yr recurrence interval	>10 yr storm return	No discharge	Regulations do not distinguish between potential impact of SSOs, therefore frequency and impact are the same for Regulatory Performance value.	Measurement methods will be via hydraulic models to quantify the SSO discharge
	Event Recurrence Interval	Frequency per location	Event Recurrence Interval	→ / ↓	Most Severe Impact				Least Impact	No Impact		
					5	4	3	2	1	0		
Frequency	6-10 per year	>10 per year	< 1 year recurrence interval	Most Likely 5	25	20	15	10	5	0		
	1-6 per year	4-10 per year	1-2 yr recurrence interval	4	20	16	12	8	4	0		
	1-2 year recurrence interval	1-4 per year	2-5 yr recurrence interval	3	15	12	9	6	3	0		
	2-5 year recurrence interval	1-2 year recurrence interval	5-10 yr recurrence interval	2	10	8	6	4	2	0		
	>5 year recurrence interval	>2 year recurrence interval	>10 yr storm return	Least Likely 1	5	4	3	2	1	0		
	Not possible	Not possible	Not Possible	Not Possible 0	0	0	0	0	0	0		

Acronyms

AAOV = Average annual overflow volume
CSO = Combined sewer overflow
MG = Million gallons
SSO = Sanitary sewer overflow
WQS = Water quality standards
WWTP = Wastewater treatment plant

Values-Based Decision-Making Process Flowchart

Presented at the 5/22/07 Wet Weather Team Meeting



PROJECT WIN

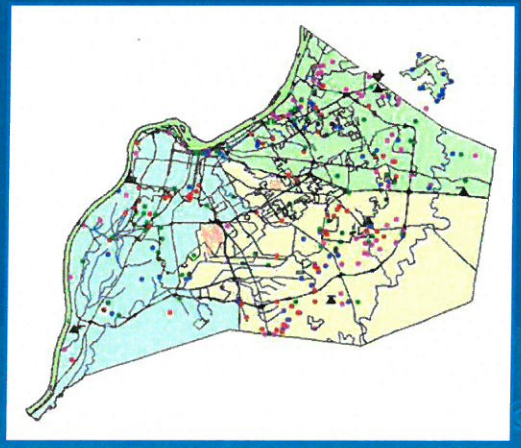
Waterway Improvements Now

Spring 2007 Public Meetings

MSD

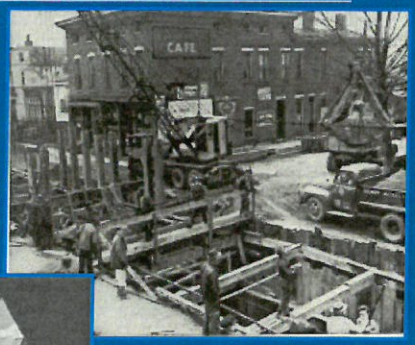
Current MSD Facilities

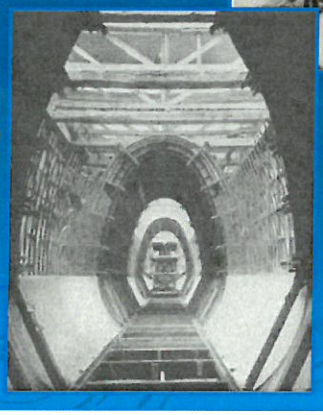
- 6 Regional Wastewater Treatment Facilities
- 17 Small Wastewater Treatment Plants
- 304 Pump Stations
- 3,200 miles of Sewers
- Louisville Green Production Facility
- Ohio River Flood Protection System
  - 16 Flood Pump Stations
  - 29 miles of Floodwall

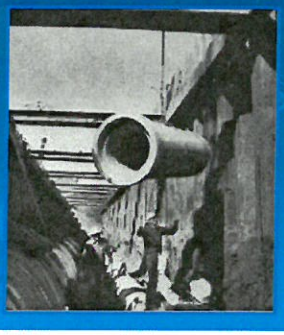


Sewer Service in Louisville
Begins Prior to the Civil War

- **1822** – Typhoid epidemic hits Louisville
- **1823** – Ditch and pond drainage begins
- **1850** – First underground sewers constructed (some still in service)
- **1906** – Commissioners of Sewerage begin constructing combined sewer system for sanitary sewage and storm drainage (most still in service)
- **1906 – 1944** Sewer service extended to Watterson
- **1944** – Commisioners of Sewerage eliminated

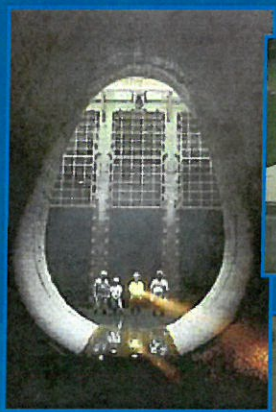






Sewer Service in Louisville
After Formation of MSD

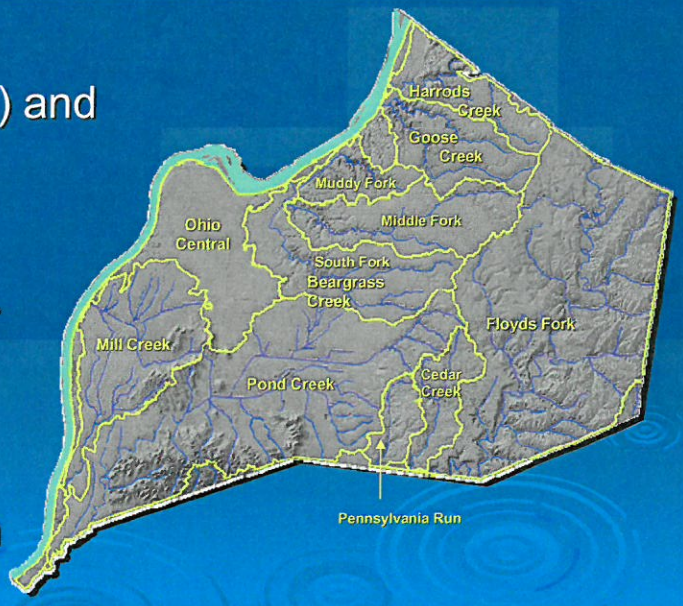
- **1946** – MSD formed by State legislature
- **1958** – Fort Southworth Wastewater Treatment plant (now Morris Forman) begins operation
- **1946 - 1980s** – Building boom outside I-264 results in sewer expansion and treatment plant construction by land development companies
- **1980 – 2000s** – MSD begins service area expansion, elimination of remote treatment plants



Sewer Service in Louisville

Statistics

- 385 square miles (Jefferson County) and parts of Oldham County
- 11 watersheds
- 220,000 customer accounts
- 693,000 people
- Annual operating budget $90 million



Jefferson County Streams

Face Typical Urban Watershed Challenges

Sewer System Improvements Targeted at Water Quality Enhancements

- 200+ neglected sewer systems acquired
- 40,000+ septic tanks eliminated
- 200+ of small treatment plants (STPs) eliminated
- 100+ small pump stations eliminated
- $150+ million CSO and SSO improvements since 1999

Approximately $1.4 billion in Total infrastructure investments

Jefferson County Streams

Face Typical Urban Watershed Challenges

The Current Situation…

- Challenges are not new or distinct to our community
- Strategies and programs have been in place to improve these conditions
- Stream water quality is improving

United States Environmental Protection Agency (EPA) mandate

- We need to do more
- We need to do it faster than originally planned

Regulatory Enforcement

Louisville's Consent Decree

- The Process
  - EPA requests information – May 2003
  - Kentucky initiates enforcement actions – February 2004
  - Consent Decree entered into Federal Court – August 2005
- The Result
  - Fair Agreement
  - Good for the community and the environment
  - Lots of work for MSD
  - Deadline and Results Oriented

Regulatory Enforcement
A Consent Decree

- Civil Penalties
  - $1,000,000 to State of Kentucky
- Supplemental Environmental Projects
  - $2,250,000 of non-sewer-related projects or activities within Jefferson County
- Estimated Cost for Compliance
  - $800,000,000 in sewer related projects and initiatives
  - Rate increases will be needed to fund this effort

Regulatory Enforcement
Louisville's Consent Decree

- Short Term Compliance Schedule
  - September 30, 2007 – Plan to eliminate 4 largest SSOs
  - December 31, 2008 – Plan to abate CSOs and eliminate SSOs
- Long Term Compliance Schedule
  - December 31, 2020 - Combined System
  - December 31, 2024 - Separate System

Regulatory Enforcement

Louisville's Consent Decree

PROJECT WIN
Waterway Improvements Now

Enhanced program building on the activities previously in place to address sewer overflow issues

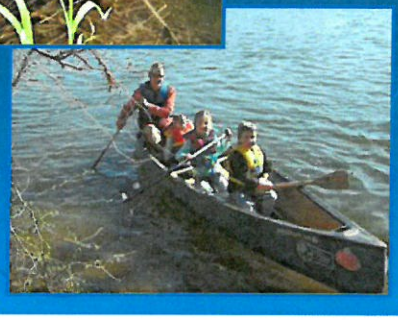
Meeting Objectives

- To inform you about significant challenges facing our community relative to clean waterways
  - why do we need it?
  - what will it involve?
  - how are we going to get it done?
- To listen to your ideas and concerns about clean waterways and how it affects <u>you</u>
  - what is important to you relative to clean waterways?
  - what concerns do you have about the condition of our streams and the Ohio River?
  - how important is clean waterways relative to your other priorities and interests?

Clean Waterways
An Essential Amenity

- Jefferson County blessed with abundance of waterways
  - 40 miles of Ohio River
  - 790 miles of tributary streams and channels
- Waterways provide many recreational amenities
  - Fishing
  - Boating
  - Swimming/wading
- Federal regulations have specific goals for these waterways
  - Fishable
  - Swimmable





Jefferson County Streams
Face Typical Urban Watershed Challenges

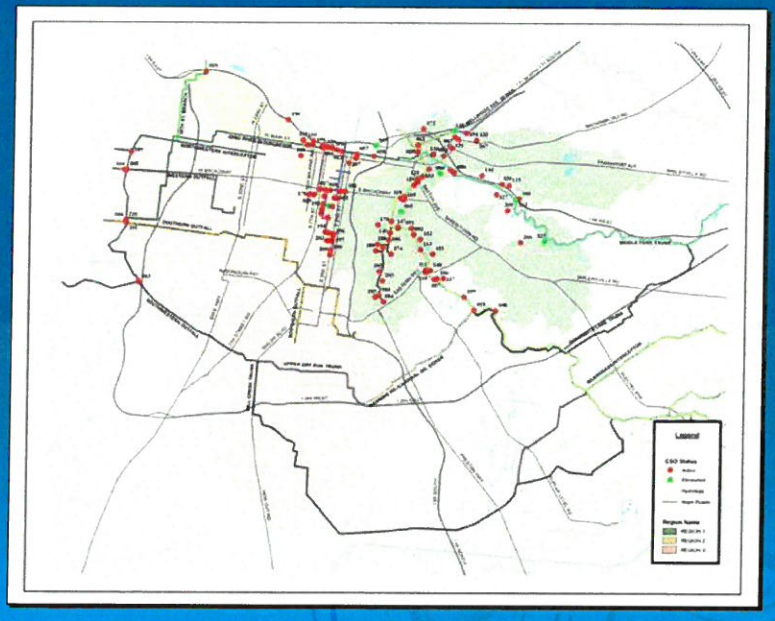
- The Challenges – Stormwater Runoff & Sewer Overflows
  - Bacterial contamination
  - Dissolved oxygen deficits
  - High temperatures
  - Toxic and non-toxic chemicals
- Stormwater Runoff
  - Lawn and garden care products
  - Grease, oil and metals from cars
  - Litter and trash
  - Sediment from construction
  - Pet and wildlife waste
  - Paved stormwater channels
  - Loss of waterway riparian vegetation



Project WIN
MSD's Role

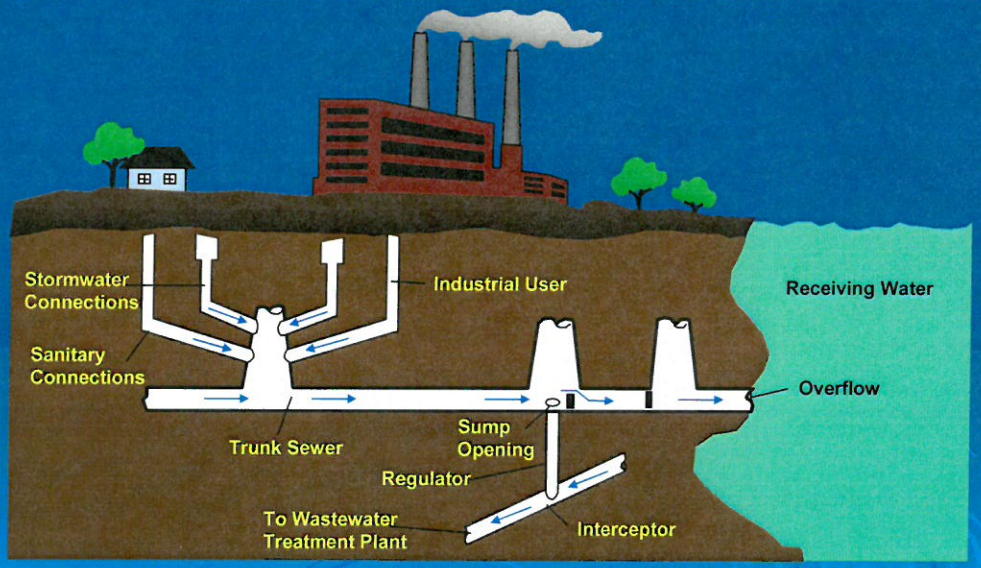
- Wastewater Collection
- Wastewater Treatment

The Combined Sewer System
CSO Locations

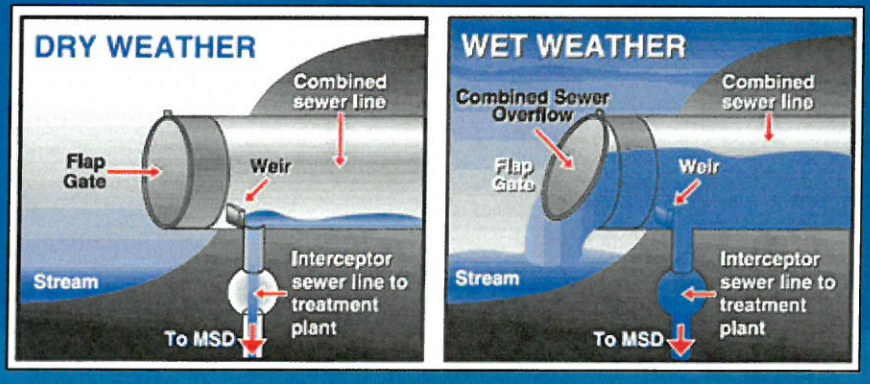


- **112 Active CSOs**
- **10 CSOs Eliminated**

Typical Combined Sewer System Configuration



Typical Combined Sewer System Configuration



What's a CSO?
A constructed release point on a pipe that carries both stormwater & wastewater

wet weather = legal, permitted
dry weather = illegal

What About SSO's?

Illegal and Un-permitted Discharges

Louisville's Consent Decree

Potential Capital Improvements

- Backup generator power
- Pump station modifications
- Treatment plant modifications
- Combined sewer separations
- Sewer overflow storage basins
- Solids and floatable control facilities
- Wet weather treatment facilities
- Real Time Control facilities

Community Involvement
Be Reflective of Values & Priorities

Wet Weather Team

- 25 people from across community
- Assist in developing plan for Public Outreach
- Assist in developing plan for Funding

Community Involvement
Be Reflective of Values & Priorities

Public Participation and Outreach

- Informational meetings throughout process
- Public comment forums
- Mailings, newspaper pieces
- Overflow advisory signs along river and streams
- Temporary overflow signs and doorcards
- Project WIN Website

Newspaper articles


SUNDAY, APRIL 29, 2007

MSD

OUR WATERWAYS
IT'S *TIME* TO IMPROVE THEM

The past year, 2006, was one of the busiest in MSD's history, and 2007 promises to be even busier. This year MSD is focusing attention on our three core businesses: wastewater collection and treatment; stormwater drainage services; and flood protection, with special emphasis on our recent signed Consent Decree to improve local water quality.


WARNING
ADVERTENCIA
DURING AND AFTER RAIN EVENTS
The surface water in this area contains runoff contaminants and is subject to sewage overflows. Avoid contact with water, due to increased health risks, during these times. For more information, visit our website or call the telephone number below.

DURANTE Y DESPUES DE LLUVIA
El agua superficial en esta área contiene contaminantes de afluencia y esta sujeta a desbordamientos de las alcantarillas. Evite todo contact con el agua bajo estas circunstancias, debido a riesgos de salud. Para mayor información, visite nuestro sitio web o llame al telefono que aparece a continuación.

MSD
www.msdlouky.org
(502) 587-0603
SIGN/SENAL MSD0025

Signs on creeks and by overflows


SEWER OVERFLOW WARNING

MSD

Door cards

Project WIN

What You Can Do To Help!!

- Learn about Project WIN
- Provide input into program development
- Support the community-wide program over the next 17 years

Find more information
on our website at

www.msdlouky.org/projectwin/

Click on
this symbol

Project WIN

What You Can Do To Help!!

Fix private sewer laterals that connect buildings to the main sewer

"leaky laterals"

Project WIN

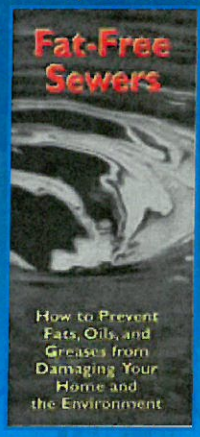
What You Can Do To Help!!

Dispose of grease properly

- Do not dump it down the drain!!!!

Put grease in metal container

Pickup brochure

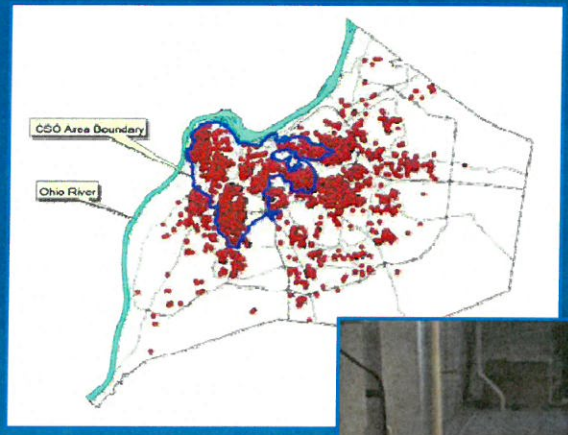


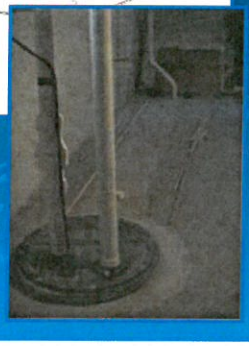
Grease accumulates in pipes

Project WIN

What You Can Do To Help!!

Disconnect sump pumps and downspouts from the sewer system





Plumbing Modification Program

587-0603

Project WIN

What You Can Do To Help!!

- Capture rain to use for watering your gardens and landscaping
  - Rain barrels
  - Rain gardens
- Plant trees and native vegetation

Project WIN

What You Can Do To Help!!

- Participate in "Clean Sweeps" and litter control programs

- Put trash in designated receptacles

- Dispose of yard wastes properly

Project WIN

What You Can Do To Help!!

Conserve water during and after rain storms

- Only use dishwashers and washing machines if absolutely necessary during these times to put less water in the sewers

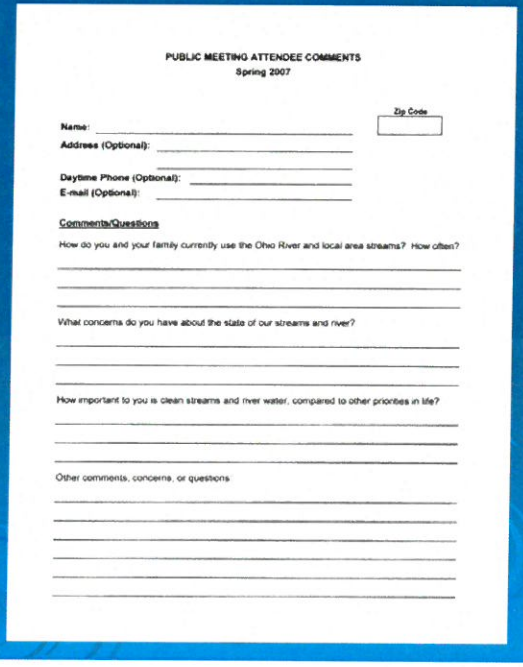
Reduce flow to drainage system

- Wash automobiles on grassy areas instead of the pavement
- Don't water the lawn or garden prior to rain events

Project WIN

What You Can Do To Help!!

Complete the Survey and leave it with us



PUBLIC MEETING ATTENDEE COMMENTS
Spring 2007

Zip Code

Name: _____

Address (Optional): _____

Daytime Phone (Optional): _____

E-mail (Optional): _____

Comments/Questions

How do you and your family currently use the Ohio River and local area streams? How often?

What concerns do you have about the state of our streams and river?

How important to you is clean streams and river water, compared to other priorities in life?

Other comments, concerns, or questions

QUESTIONS

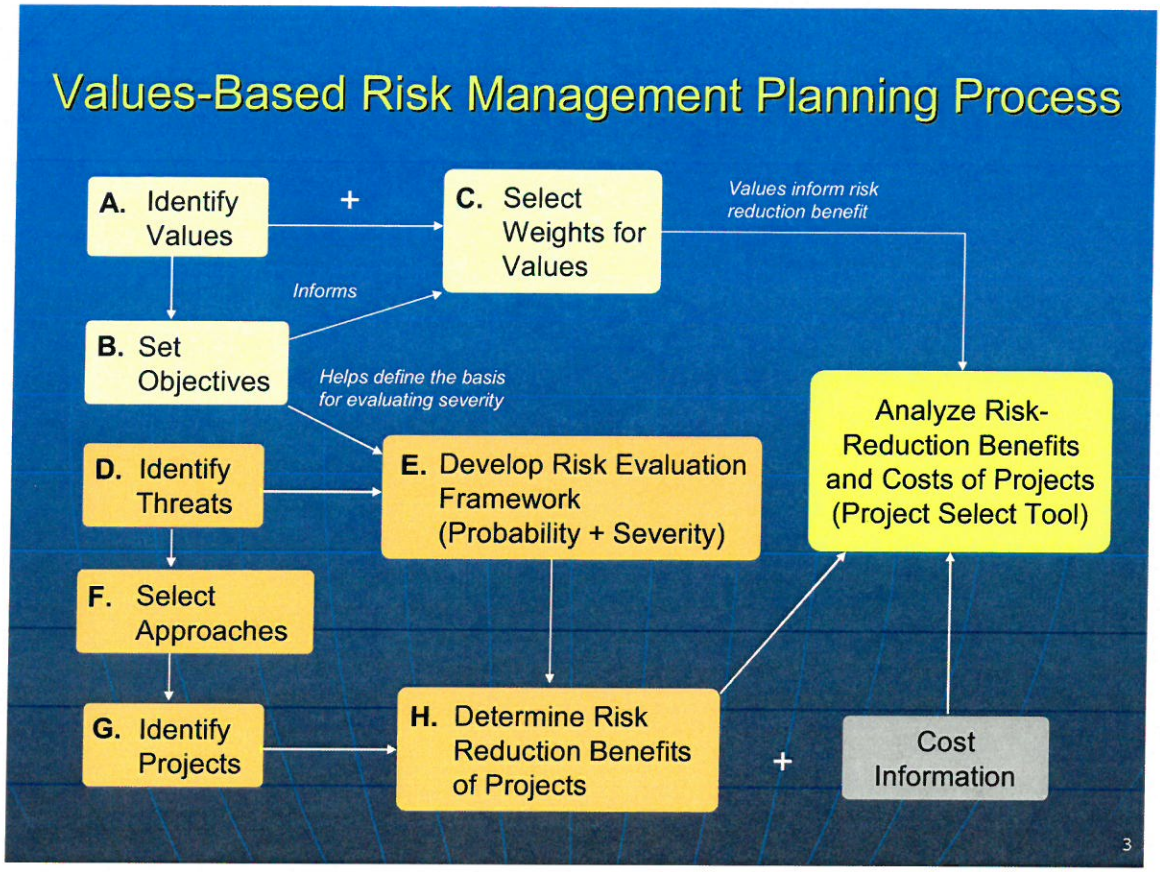
Decision Framework Incorporating Community Values

Wet Weather Team
Stakeholder Group Meeting No. 9
May 22, 2007

Louisville & Jefferson County
Metropolitan Sewer District

Presentation Outline

- Review feedback received on project-specific performance measures, and changes resulting from your comments
- Discuss the revised approach to the Customer Satisfaction value
- Review the overall approach to incorporating both project-specific and programmatic values in decision-making



Values and Performance Scales Are Used in Many Ways

- Comparing between alternatives for solving specific problems (cost-effectiveness plus some of the non-financial values)
- Prioritizing projects to identify overall program (all financial and non-financial values)
- Sequencing projects to develop schedule (financial and non-financial values, plus other implementation "readiness" factors)
- Monitoring progress through the life of the program implementation (financial and non-financial values, with different performance scales)

4

Performance Measures for Asset Protection

Value:	Asset Protection		Impact						Rationale	Measurement Method
Performance Measures		Flood Damage	Homes or businesses are subject to severe structural damage	Homes or businesses are subject to minor to moderate structural damage	Flooding limits access to homes or businesses	Flooding limits access to recreational areas	Standing water on property, but access not affected and no damage expected	No standing water	Storm water BMPs can reduce stormwater peaks and reduce extent of flooded areas, while sewer separation may increase localized stormwater peak flows and increase the flooding impacts of storms. Alternatively, purchase of highly impacted properties may be a cheaper way to reduce flood damage and create green space and buffer zones.	Drainage models where available, or historic observations of flood-prone areas combined with the expected relative impacts of sewer system modifications on storm water flows
		Basement Back-ups	Sewer surcharging within 6 feet of ground surface for more than 20% of manholes	Sewer surcharging within 6 feet of ground surface for 10 - 20% of manholes	Sewer surcharging within 6 feet of ground surface for 5 - 10% of manholes	Sewer surcharging within 6 feet of ground surface for 1 - 5% of manholes	Sewer surcharging within 6 feet of ground surface for 0 - 1% of manholes	No surcharging within 6 feet of ground surface	First floor levels are typically 1 - 2 feet above ground surface, and basement floors are typically 8 - 10 feet below the first floor. A sewer surcharge of 6 feet below ground surface is highly likely to cause back-ups in homes with basement service.	Measurement methods will be via hydraulic models to quantify the hydraulic grade lines compared to ground surface elevations at manholes.
	Event Recurrence Interval	→	Most Severe Impact				Least Impact	No Impact		
		↓	5	4	3	2	1	0		
Frequency	6-10 per year	Most Likely 5	25	20	15	10	5	0		
	1-6 per year	4	20	16	12	8	4	0		
	1-2 year recurrence interval	3	15	12	9	6	3	0		
	2-5 year recurrence interval	2	10	8	6	4	2	0		
	>5 year recurrence interval	Least Likely 1	5	4	3	2	1	0		
	Not Possible	Not Possible 0	0	0	0	0	0	0		

Acronyms
BMP = Best management practice

Changes Resulting From Stakeholder Input

- Added discussion in "Rationale" addressing the option to consider purchase of impacted properties if the life-cycle cost to protect them is greater than the life-cycle cost to purchase (include lost tax and user fee revenues)

Performance Measures for Eco-Friendly Solutions

Value:	Eco-Friendly Solutions											
	Scoring											
Aspect	-5	-4	-3	-2	-1	0	1	2	3	4	5	Score Per Aspect
Non-Renewable Energy Consumption	Primary energy consumption is greater than secondary treatment	Primary energy consumption equal to 75 - 100% of secondary treatment	Primary energy consumption equal to 50 - 75% of secondary treatment	Primary energy consumption equal to 25 - 50% of secondary treatment	Primary energy consumption equal to 15 - 25% of secondary treatment	No energy consumption except for cleaning and maintenance	Cleaning and maintenance not needed; no primary consumption	NA	NA	NA	NA	
Use of Natural Systems	Constructed facilities permanently displace 5+ acres wetlands or 50% locally available green space	Constructed facilities permanently displace 3 - 5 acres wetlands or 25 - 50% locally available green space	Constructed facilities permanently displace 1 - 3 acres wetlands or 15 - 15% locally available green space	Constructed facilities permanently displace 0 - 1 acre wetlands or up to 15% locally available green space	Constructed facilities temporarily disrupt wetlands or green space	Alternative does not use or affect natural systems	Alternative doesn not use natural systems, but enhances green space or wetland	Natural systems play a minor role in alternative function, up to 1 acre wetland or 10% additional green space created	Natural systems are significant part of alternative function, 1 - 3 acres of wetland created or 10 - 25% additional green space	Alternative fully uses natural systems, 3 - 5 acres of wetland created or 25-50% additional green space	Alternative results in multi-use natural system development, 5+ acres of wetland or 50% additional green space	
Multiple-Use Facilities	Constructed facilities permanently alter/hate recreational opportunity	Constructed facilities significantly impare recreational opportunity	Constructed facilities moderately impare recreational opportunity	Constructed facilities have minor impacts on recreational opportunity	Construction temporarily impacts recreational opportunity	No impacts on recreational opportunities	Alternative improves access to existing recreational areas	Alternative has limited positive impact on recreation	Alternative significantly enhances recreational opportunities	Alternative increases recreational opportunities in area	Alternative results in multi-use facility	
Source Control of subwatershed pollutant loads	Pollutant loadings are increased by 50%	Pollutant loadings are increased by 30 - 50%	Pollutant loadings are increased by 15 - 30%	Pollutant loadings are increased by 0 - 15%	Pollutant loadings impacts are inconsistent, but likely higher	Pollutant loadings are unchanged	Pollutant loadings impacts are inconsistent, but likely lower	Source control reduces pollutant loadings by 0 - 10%	Source control reduces pollutant loadings by 10 - 30%	Source control reduces pollutant loadings by 30 - 50%	Source control reduces pollutant loadings by more than 50%	
Non-Obtrusive Construction Techniques	Permanent loss of green space or sensitive area disruption	Main thoroughfare closures, sensitive area temporary disruptions	Widespread dust and noise, blasting, secondary street closures	Localized dust, noise and local street closures	Minor dust and noise, traffic lane closures	No construction impacts	NA	NA	NA	NA	NA	
Consistent Land Use	Intrusive or nuisance facilities inconsistent with neighborhood or land use	Facilities inconsistent with neighborhood or land use	Facility appearance mitigated to reduce impact on neighborhood	Facility has significant impact on development density	Facility has minor impact on development density	No above ground facilities	Alternative mitigates existing compatibility problem	Alternative removes facility inconsistent with neighborhood	Alternative removes nuisance facility from neighborhood	Alternative enhances property values in neighborhood	Alternative provides enhancements that significantly improve neighborhood	
Impermeable Surfaces	5 acres + of impermeable surfaces are added	3 - 5 acres of impermeable surfaces are added	1 - 3 acres of impermeable surfaces are added	up to 1 acre of impermeable surfaces are added	Minor increase in impermeable surfaces added	No change in impermeable surface	Minor reduction in impermeable surfaces	Up to 1 acre of impermeable surfaces removed	1 - 3 acres of impermeable surfaces removed	3 - 5 acres of impermeable surfaces removed	More than 5 acres of impermeable surfaces removed	
LEEDS Performance	NA	NA	NA	NA	NA	LEEDS not applicable or LEEDS score <10	LEEDS Score 10 - 25	LEEDS Certified	LEEDS Silver	LEEDS Gold	LEEDS Platinum	
Instructions: 1. Score each alternative for each of the eight aspects of the value. Scores can be positive or negative, depending on the impact of the alternative on the value. 2. Total the scores for each aspect to get the total score for this alternative in this value. 3. Maximum score is 25. Shaded area represents "fatal flaw". Alternatives that score in this area should not be proposed.										Total Score Eco-Friendly Solutions (25 points maximum)		0

Aspect	Rationale	Measurement Method
Energy Consumption	Eco-friendly solutions would be expected be low consumers of non-renewable energy. Benchmarking energy consumption against conventional secondary treatment provides penalty points for high energy consuming alternatives.	Evaluation of primary energy consumed per MG of flow treated compared to the energy consumed at the WCWTP per MG treated
Use of Natural Systems	Natural systems replace concrete and steel construction with wet bottom storage lagoons, constructed bioswales, rain gardens etc. that increase green space of various kinds. Options that reduce wetlands and green space get penalty points.	Acres of wetlands and other types of green space created or eliminated. Also includes subjective evaluation of the "base" of the alternative - "green" or "grey".
Multiple-Use Facilities	Eco-friendly solutions create recreational opportunities for both water-based and riparian recreation. Boating, canoing, kayeking, fishing, wading, swimming etc. would be direct water-based recreation. Bird watching, hiking, biking, picnicing, camping etc. would be considered related riparian recreation.	Subjective evaluation of changes predicted in the aquatic or riparian environment as a result of better water quality, increased base flow or decreased flow peaks, increased tree cover or vegitated riparian areas etc.
Source Control of subwatershed pollutant loads	Controlling pollutant loads at the source through behavior modification, product replacements or stormwater management BMPs that capture pollutants thereby avoiding end of pipe treatment requirements.	Modeled land-side pollutant loading reductions as calculated by the EGC Water Quality Tool or by comparison to literature values of pilot program measurements.
Non-Obtrusive Construction Techniques	Probable construction impacts on traffic, noise and dust are all measures of the friendliness of an alternative. Construction impacts get penalty points for creating nuisance conditions.	Subjective evaluation of probable construction impacts based on the type of construction envisioned for the alternative.
Consistent Land Use	Alternative configuration can either enhance or detract from the surrounding property. For example, an extremely unfriendly pump station can be noisy, smelly, and ugly. The same pump station can be "disguised" as a residence that fits right in with the neighborhood. If a larger parcel of land is available, a pump station can be hidden from view by landscaping, and a community garden or other green space added to enhance the neighborhood.	At the planning level, projects can be defined to avoid negative impacts on the surrounding properties. Depending on the availability of land enhancements are possible. This aspect encourages project definition and budgets to enhance, not detract.
Impermeable Surfaces	Adding impermeable surfaces increases total runoff volume, peak runoff flowrates, and the total transport of any pollutant deposited on the surface from any source. Conversely, permeable surfaces can reduce flow volume and peaks, and provide filtering mechanisms for pollutants.	Acres of permeable surfaces created or eliminated
LEEDS Performance	LEED standards are applicable to alternatives that include above-ground building structures.	Application of LEED evaluation points.

Changes Resulting From Stakeholder Input

- Changed format to match Environmental Enhancement
- Added LEED criteria for buildings
- Added "Rationale" and "Measurement" to explain the reasoning behind the scoring
  - clarified that recreation included aquatic and riparian activities
  - clarified that source control includes wide range of activities including behavior changes
- Balanced both positive and negative scoring options
- Added "fatal flaw" designation for unacceptable negative impacts

Performance Measures for Environmental Enhancement

Value: Environmental Enhancement

Aspect	-5	-4	-3	-2	-1	0	1	2	3	4	5	Score Per Aspect
Aquatic and Terrestrial Habitat Protection	Extinction of habitat for rare or endangered species.	Elimination of significant amount of common habitat.	Elimination of minor amount of common habitat.	Significant habitat impairment.	Minor impairment to existing habitat.	No impact on habitat.	Minor enhancement of existing habitat.	Significant enhancement of existing habitat.	Creation of minor amount of common habitat.	Creation of significant amount of common habitat.	Creation of critical habitat for rare or endangered species.	
Aesthetics - Solids and Floatables	75%+ reduction in volume of flow with no S&F controls.	50 - 75% of flow with no S&F removal.	25 - 50% of flow with no S&F removal.	10 - 25% of flow with no S&F removal.	Reduces efficiency of existing S&F control device, 0 - 50% of flow with no S&F removal.	No change in S&F removal.	0 - 10% of flow treated with screens.	10 - 25 % of flow treated with screens.	25 - 50% of flow treated with screens.	50 - 75% of flow treated with screens.	75% + of flow treated with screens.	
Aesthetics - Odor and Air Emissions	Create annoying odor source affecting > 20 customers often, or >30 customers occasionally.	Create annoying odor source affecting <20 customers often, or >30 customers occasionally.	Create annoying odor source affecting <20 customers occasionally.	Create detectable odor source affecting > 50 customers often.	Create detectable odor source affecting < 50 customers occasionally.	No impact on odors.	Eliminate detectable odor source affecting < 50 customers occasionally.	Eliminate detectable odor source affecting < 50 customers often.	Eliminate annoying odor source affecting <20 customers occasionally.	Eliminate annoying odor source affecting <20 customers occasionally.	Eliminate annoying odor source affecting >20 customers often.	
Dissolved Oxygen Impacts	Reduction of in-stream DO by 2 mg/l + during critical flow periods.	Continuous reduction of in-stream DO of 2 mg/l +.	Continuous reduction of in-stream DO of 1 - 2 mg/l, possible reduction of in-stream DO 2 - 4 mg/l during critical conditions.	Intermittent reduction of in-stream DO 2+ mg/l possible during non-critical conditions, reduction of in-stream DO 2 - 4 mg/l during critical conditions.	Intermittent reduction of in-stream DO 0 - 2 mg/l, possible during non-critical conditions.	No DO impacts.	Intermittent improvement of in-stream DO 0 - 2 mg/l.	Intermittent improvement of in-stream DO 2+ mg/l, intermittent critical condition improvements 0 - 2 mg/l.	Continuous improvement of in-stream DO 0 - 2 mg/l, intermittent critical condition improvements 1-4 mg/l.	Continuous improvement of in-stream DO 2 + mg/l.	Continuous improvement of critical condition in stream DO 2 mg/l +	
Downstream Impacts	75%+ increase in annual BOD or nutrient loads.	50 - 75% increase in annual BOD or nutrient loads.	25 - 50% increase in annual BOD or nutrient loads.	10 - 25% increase in annual BOD or nutrient loads.	Increase in annual average BOD or nutrient loads.	No impact on BOD or nutrient loads.	0 - 10% reduction in annual BOD or nutrient loads.	10 - 25% reduction in annual BOD or nutrient loads.	25 - 50% reduction in annual BOD or nutrient loads.	50 - 75% reduction in annual BOD or nutrient loads.	75% + reduction in annual BOD or nutrient loads.	
Stream Flow Impacts (Peak flows)	75% + increase in peak flows.	50% - 75% increase in peak flows.	25% - 50% increase in peak flows.	Frequent increase in flow during critical conditions.	Possible increase in average flow, or minor increase in high flow peaks.	No impact on peak flows.	Minor reduction in flows - no significant peak reduction.	Minor reduction in peak flows under some conditions.	Up to 10% reduction in peak flows.	10% - 25% reduction in peak flows.	25%+ reduction in peak flows.	
Stream Flow Impacts (DWF only)	75%+ decrease in flow during critical conditions.	50% - 75% decrease in flow during critical conditions.	25% - 50% permanent decrease in flow during critical conditions.	Frequent decrease in flow during critical conditions.	Possible decrease in average flow.	No impact on stream flow.	Intermittent increase in stream flow - not timed to critical conditions.	Intermittent increase in stream flow - often improves critical conditions.	0 - 10% permanent increase in stream flow during critical conditions.	10 - 25 % permanent increase in stream flow during critical conditions.	25%+ permanent increase in stream flow during critical conditions.	
Instructions: alternative for each of the seven aspects of the value. Scores can be positive or negative, depending on the impact of the alternative on the value. total score for this alternative in this value. Alternatives that score in this area should not be proposed.							**3. Maximum score is 25. Shaded area represents "fatal flaw".**		**2. Total the scores for each aspect to get the**	**1. Score each**	**Total Score Environmental Enhancement (Maximum Score = 25)**	0

Aspect	Rationale	Measurement Method
Aquatic and Terrestrial Habitat Protection	Wet weather projects may affect both aquatic and terrestrial habitat through changes in base flow, peak flow, water quality, tree cover, channel shape and characteristics etc. Predictive models used to evaluate wet weather control measures have a limited ability to predict biological diversity changes, erosion impacts etc., so surrogate metrics must be used to estimate future positive and negative impacts.	Project definition may specifically address changes in channel shape and configuration, tree cover etc. Predictive models will address DO and other water quality impacts. Flow models will predict base flow and peak flow rates to allow estimates of changes in erosion and wetter surface area.
Aesthetics - Solids and Floatables	Most CSOs have some form of solids and floatables control baffles. Improvements in capture rates can be expected with screening or other advanced treatment options. Storm water retention, constructed wetlands, and other control systems may provide solids and floatables removal as well. While reduction in solids and floatables removal efficiency is not likely, penalty points will be assessed if this is possible with any alternative.	Current solids and floatables removal efficiency has been estimated for all cases with control technology. Improvements in removal efficiencies will be estimated for all alternatives that add screening or other advanced treatment technologies. Where treatment is proposed for storm water discharges, removals will be estimated based on published removal data.
Aesthetics - Odor and Air Emissions	Odors and air emissions can be generated in storage systems, pump stations, force mains, and long flat sewers. Odors are generally characterized by both the intensity and the quality of the odor. Detectable and annoying are two common descriptors of different intensities and qualities of odors from sewage handling facilities.	Odor emissions from sewage handling facilities can be modeled for intensity, quality, and geographic spread. For planning purposes this level of evaluation is not common, and will not be done except in very rare circumstances. The potential for odor and air emissions will be estimated based on typical applications and model predictions for storage time, number of events, average flow velocities etc.
Dissolved Oxygen Impacts	Dissolved oxygen in streams is dependent on a variety of factors including BOD load, nutrient load, stream flow velocity, water temp etc.	For BGC the Water Quality Tool will be used to estimate the impacts of various loading conditions, flows, temperatures, etc. Probable impacts of individual projects will be estimated based on comparisons to the various stream condition scenarios.
Downstream Impacts	Downstream impacts refer to conditions in the Ohio River below Jefferson County. Nutrient loadings in the Ohio (not just Jefferson County) have been identified as the source of 30 - 45% of the total nutrient loads reaching the Gulf of Mexico. BOD is not likely to persist in the river long enough to get to the Gulf, but can have detrimental impacts far downriver.	Pollutant removals will be estimated based on reductions in annual average loads, since the downstream impacts are primarily long-term and cumulative.
Stream Flow Impacts (Peak flows)	Extreme/y high peak flows as are often caused by urbanization of a watershed can erode the streambed, damage aquatic and terrestrial habitat, make a water based recreation unsafe or impractical.	Predictive models can estimate flow peaking factors from individual sources, and the Water Quality Tool has a hydraulic component to estimate stream flows during various storm events.
Stream Flow Impacts (DWF only)	Diversion of flows away from a stream due to abandonment of a treatment plant etc. can reduce base flows in a stream. Alternatively, other control measures such as groundwater pumping can increase base flows with beneficial results.	Predictive models can estimate flows from individual sources, and the Water Quality Tool has a hydraulic component to estimate stream flows during various dry weather events.

Changes Resulting From Stakeholder Input

- Added peak flow as an aspect
- Clarified that habitat meant both aquatic and terrestrial
- Added "Rationale" and "Measurement" to explain scoring
  - differentiated predicted changes from monitored impacts
  - linked downstream impacts to other river uses and to pollutant loadings on Gulf of Mexico
- Balanced positive and negative scores
- Added "fatal flaw" designation

Public Health Enhancement Performance Measures

Value:	Public Health Enhancement		Measure			Impact						Rationale	Measurement Method
Performance Measures	WWTP Peak Flows			Peak flow delivered to WWTP versus rated peak hour capacity of disinfection system		Peak flow exceeds rated capacity by more than 100%	Peak flow exceeds rated capacity by 50 - 100%	Peak flow exceeds rated capacity by 10 - 50%	Peak flow exceeds rated capacity by less than 10%	Peak flow is within rated capacity	Peak flow is less than 80% of rated capacity	WWTP disinfection systems have ability to adjust dose rates to handle small short term peaks without exceeding discharge standards. Significant peaks may result in inadequate disinfection that exceeds discharge permit limits. Peak flows well below system capacity allow performance significantly better than standards require.	Measurement will be from analyzing plant influent flows against pre-determined plant stress-test results and operating criteria.
	WWTP Peak Flows	CSOs	CSOs and SSOs	Release point		Discharge where volume is > 0.04% of stream's flow	Discharge to water or ground in high public use or access area	Discharge to water in low public use or access area. Basement back-up	Discharge to ground in low public use or access area, discharge contained and cleaned up.	De minimus quantity	No discharge	Not all discharges violate the Clean Water Act. Discharges vary in the impact to public health and the environment. Therefore, EPA developed guidance on how to set priorities based on the risk to the public's health and the environment under their Enforcement Management System in Chapter X, titled "Setting Priorities for Addressing Discharges from Separate Sanitary Sewers." The assigned consequences follow the intent of the principles and priorities presented in the chapter. SSO Event Mean Concentration for Fecal Coliform estimated at 500,000/100ml. Dilution factor 0.04% required to not exceed 200 FC/100 ml Water Quality Standard.	Measurement methods will be via hydraulic models to quantify the SSO discharge and the GIS to establish relative distance from designated locations or objects
	Design Event Recurrence Interval	Frequency per location	Event Recurrence Interval			Most Severe Impact				Least Impact	No Impact		
						5	4	3	2	1	0		
Frequency	6-10 per year	>10 per year	< 1 year recurrence interval	Most Likely	5	25	20	15	10	5	0		
	1-6 per year	4-10 per year	1-2 yr recurrence interval		4	20	16	12	8	4	0		
	1-2 year recurrence interval	1-4 per year	2-5 yr recurrence interval		3	15	12	9	6	3	0		
	2-5 year recurrence interval	1-2 year recurrence interval	5-10 yr recurrence interval		2	10	8	6	4	2	0		
	>5 year recurrence interval	>2 year recurrence interval	>10 yr storm return	Least Likely	1	5	4	3	2	1	0		
	Not Possible	Not Possible	Not Possible	Not Possible	0	0	0	0	0	0	0		

Acronyms
CSO = Combined sewer overflow
FC = Fecal coliform
GIS = Geographic information system
SSO = Sanitary sewer overflow
WWTP = Wastewater treatment plant

Changes Resulting From Stakeholder Input

- Modified performance measure for disinfection systems to recognize the value in operating well below rated capacity – doing better than standards is a good thing

Performance Measures for Regulatory Performance

Value:	Regulatory Performance		Measure			Impact						Rationale	Measurement Method
Performance Measure	WWTP Peak Flows			Peak flow delivered to WWTP versus rated peak hour capacity of plant		Peak flow exceeds rated capacity by more than 50%	Peak flow exceeds rated capacity by 25 - 50%	Peak flow exceeds rated capacity by 10 - 25%	Peak flow exceeds rated capacity by less than 10%	Peak flow is within rated capacity	Peak flow is less than 80% of rated capacity	WWTPs have ability to handle small short term peaks without exceeding discharge standards, but significant peaks may result in process washout and associated failure of discharge permit limits. Peak flows less than 80% of rated capacity allow plant to perform significantly better than discharge standards require	Measurement will be from analyzing plant influent flows against pre-determined plant stress-test results and operating criteria.
		Beargrass Creek CSOs		Discharge flow rate % of receiving stream flow		Discharge > 5%	Discharge 1 - 5%	Discharge 1 - 0.2%	Discharge 0.1 - 0.2%	Discharge <0.1%	No discharge	CSO Event Mean Concentration for Fecal Coliform in overflows estimated at 250,000/ 100 ml. Dilution factor 0.06% required to not exceed 200 FC/100 ml Water Quality Standard	Measurement method will be via hydraulic model to quantify the CSO. Spreadsheet calculation to determine mix concentration.
			CSOs in Ohio River	Average Annual Overflow Volume (AAOV)		100 MG+ AAOV	20 - 100 MG AAOV	2 - 20 MG AAOV	1 - 2 MG AAOV	<1.0 MG AAOV	No discharge	100 MG AAOV (10 events) dilution factor in average Ohio River flow is 0.04%. 1.0 MG AAOV (1 event) dilution factor is 0.06%. Cumulative impact of multiple overflow locations may become significant for WQS exceedance.	Measurement methods will be via hydraulic models to quantify the CSO discharge. Spreadsheet calculation to mix concentration.
	WWTP Peak Flows	CSOs	SSOs	Release point		< 1 year recurrence interval	1-2 yr recurrence interval	2-5 yr recurrence interval	5-10 yr recurrence interval	>10 yr storm return	No discharge	Regulations do not distinguish between potential impact of SSOs, therefore frequency and impact are the same for Regulatory Compliance value.	Measurement methods will be via hydraulic models to quantify the SSO discharge
	Event Recurrence Interval	Frequency per location	Event Recurrence Interval			Most Severe Impact				Least Impact	No Impact		
						5	4	3	2	1	0		
Frequency	6-10 per year	>10 per year	< 1 year recurrence interval	Most Likely	5	25	20	15	10	5	0		
	1-6 per year	4-10 per year	1-2 yr recurrence interval		4	20	16	12	8	4	0		
	1-2 year recurrence interval	1-4 per year	2-5 yr recurrence interval		3	15	12	9	6	3	0		
	2-5 year recurrence interval	1-2 year recurrence interval	5-10 yr recurrence interval		2	10	8	6	4	2	0		
	>5 year recurrence interval	>2 year recurrence interval	>10 yr storm return	Least Likely	1	5	4	3	2	1	0		
	Not possible	Not possible	Not Possible	Not Possible	0	0	0	0	0	0	0		

Acronyms:
AAOV = Average annual overflow volume MG = Million gallons WQS = Water quality standards
CSO = Combined sewer overflow SSO = Sanitary sewer overflow WWTP = Wastewater treatment plant

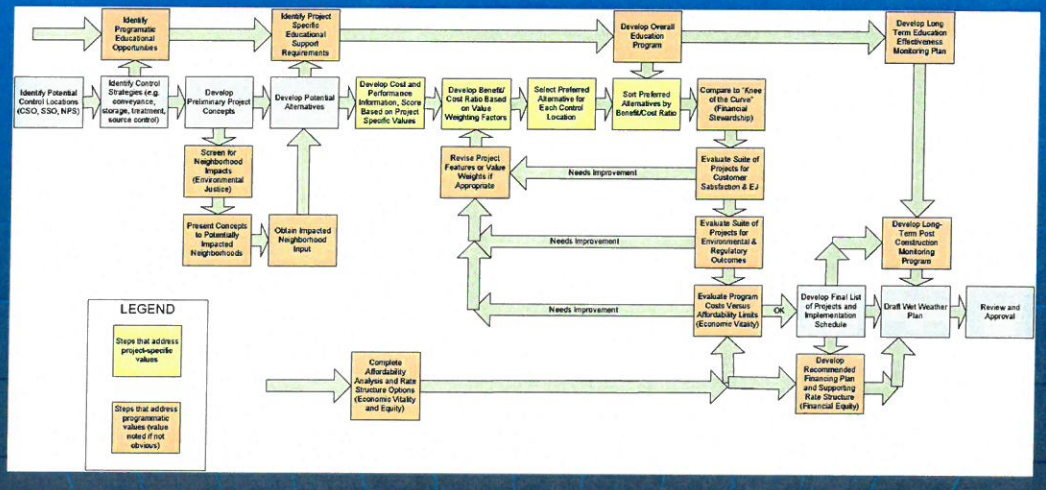
Changes Resulting From Stakeholder Input

- Changed the name from "Regulatory Compliance" to "Regulatory Performance"
  - recognized that compliance is required, but approaches to compliance allow flexibility
- Modified performance measure for treatment plants to recognize the value in operating well below rated capacity – doing better than standards is a good thing

Customer Satisfaction

- Distributed all project-specific aspects to other values (non-obtrusive construction to Eco-Friendly Solutions, etc.)
- Changed to Programmatic Value, to be used to review potential impacts resulting from the entire suite of projects

Value-Driven Decision Flowchart



Programmatic Evaluation of Environmental Justice

- Included as integral to the process
- Consult with neighborhoods early in the development of alternatives
  - obtain input on locations and impact mitigation required
  - do earlier than usual, before alternatives are fully defined
  - demonstrate consideration of neighborhood concerns and ideas in final alternative development
- After initial suite of projects has been identified, review for "unfair burden" distribution
- If the first step is done right, the second step is not expected to present issues

Programmatic Evaluation of Education Value

- Included as integral to the process
- Includes county-wide behavior change initiatives, targeted neighborhood behavior change, and project-specific education support
- Effectiveness monitored throughout the implementation
  - demonstration of program effectiveness may allow cost reductions in later stages
  - program effectiveness will result in more bang for the buck from conventional solutions
- Different than public involvement requirement of the Consent Decree

Programmatic Evaluation of Environmental Enhancement

- Model water quality improvements resulting from recommended suite of projects
  - pathogens
  - DO
  - other impairments if identified
- Develop water quality benefit/cost curves for different parameters, and different suites of projects above and below the overall benefit/cost knee of the curve
- Essential to understanding of overall water quality impacts
- Becomes benchmark expectation for long-term monitoring program

Programmatic Evaluation of Regulatory Performance

- Develop benefit/cost curves for common regulatory benchmarks
  - CSO volume captured
  - Overflows per average year
  - BOD/TSS load reduction
- Curves are developed for suite of projects above and below the overall benefit/cost knee of the curve
- Regulators expect to see this information, and will require it as part of the review and approval process

Programmatic Evaluation of Customer Satisfaction

- Evaluate suite of projects for items such as
  - neighborhood disruption (multiple times)
  - potential for service interruption
  - opportunities to mitigate construction impacts
- Coordinate with other agencies to minimize multiple disruptions

Programmatic Evaluation of Financial Stewardship, Economic Vitality, and Financial Equity

- Financial Stewardship = cost effectiveness, and knee of the curve evaluation of the point of diminishing returns
- Economic Vitality = affordability of rates, the value of clean water, impacts of moratoriums etc.
- Financial Equity = pay proportionally to your contribution, or to your ability to pay
- These values cannot be separated, e.g.
  - point of diminishing returns might not be adequate to avoid sewer moratoriums
  - Financial equity may be compromised to support economic vitality (subsidize low income and/or industrial/commercial)

Discussion
Summary
Wrap-up