Wet Weather Team Project Meeting Materials

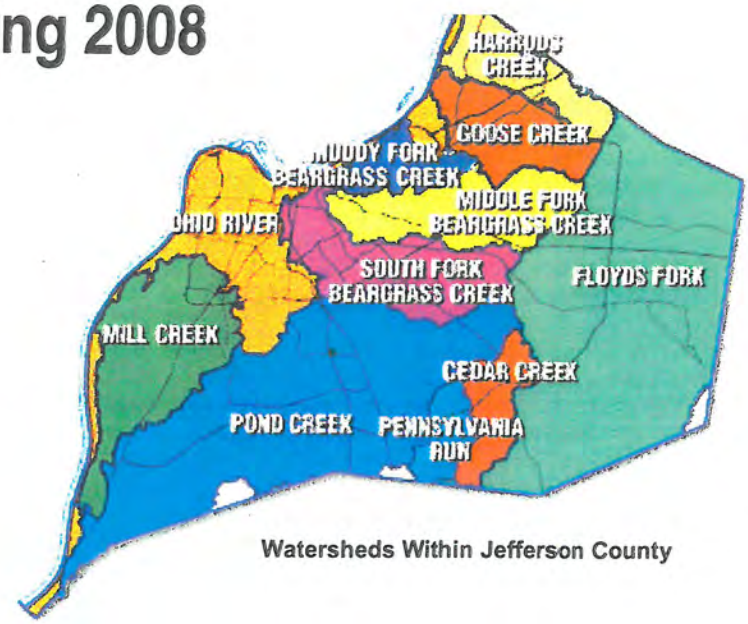
Summer 2007–Spring 2008

01.05.0220.08

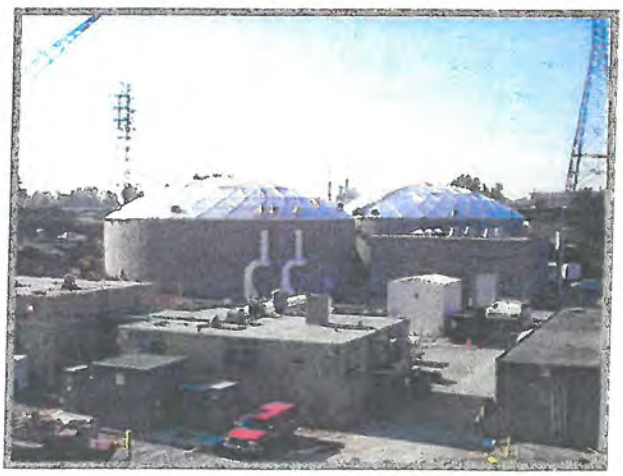
WWT Stakeholders Meeting # 20 7/15/2008

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 #20

Tuesday, July 15, 2008, 4:20-8:30 PM
MSD Main Office, Board Room
700 West Liberty St., Louisville

Meeting Objectives:

- Review changes made to the draft vision for MSD's Integrated Overflow Abatement Plan (IOAP) since the last WWT meeting.
- Review and provide feedback on MSD's draft funding plan for the IOAP.
- Discuss the preliminary ranked list of projects for the IOAP, the anticipated potential program costs, and the "knee of the curve" financial stewardship analysis of the ranked project list.
- Identify next steps and expectations for the next meeting of the Wet Weather Team.

4:20 PM **Participants Arrive and Get Settled**

4:30 PM **Introductions, Review Agenda and Ground Rules (10 minutes)**

- Review meeting objectives and ground rules.

4:40 PM **Wet Weather Project Updates and Observations (15 minutes)**

- Updates on issues related to the Wet Weather Team Project and follow-up items from the last Wet Weather Team meeting.
- WWT stakeholder updates and announcements.

4:55 PM **Update on the Integrated Overflow Abatement Plan (IOAP) Vision (15 minutes)**

- Review changes made to the draft vision for MSD's Integrated Overflow Abatement Plan based on WWT feedback since the June 19, 2008 WWT meeting.

5:10 PM **Funding Plan Discussion (50 minutes)**

- Review and provide feedback on MSD's draft funding plan for the IOAP.
- Preview the next steps in the process for finalizing the IOAP funding plan.

6:00 PM **Dinner Break (25 minutes)**

Dinner will be provided for Wet Weather Team members.

6:25 PM **Opportunity for Observer Comments (10 minutes)**

6:35 PM **Discussion of the Preliminary Ranked Project List for the IOAP and the "Knee of the Curve" Financial Stewardship Analysis (95 minutes)**

- Review the preliminary results of the prioritization of combined sewer overflows (CSOs), sanitary sewer overflows (SSOs), and green infrastructure projects for the Integrated Overflow Abatement Plan.
- Discuss the financial stewardship evaluation ("knee of the curve" analysis) of the preliminary ranked list of IOAP projects and the potential anticipated program cost.
- Preview the next steps in the programmatic analysis of IOAP projects.

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 next Wet Weather Team meeting on Tuesday, September 23, 2008.

8:30 PM **Adjourn**

Final Meeting Summary
Wet Weather Team Meeting #20
Tuesday, July 15, 2008
MSD Main Office, Louisville

The Wet Weather Team (WWT), chartered by the Louisville and Jefferson County Metropolitan Sewer District (MSD), met on July 15, 2008, at MSD's main office. The objectives of the meeting were to:

- Review changes made to the draft vision for MSD's Integrated Overflow Abatement Plan (IOAP) since the last WWT meeting.
- Review and provide feedback on MSD's draft funding plan for the IOAP.
- Discuss the methodology for estimating green infrastructure costs, the revised lists of project for addressing combined sewer overflows (CSOs) and sanitary sewer overflows (SSOs), and the preliminary "knee of the curve" financial stewardship analysis of the ranked project lists.

Wet Weather Project Updates and Announcements

The following Wet Weather Project updates and announcements were noted at the meeting.

- MSD Personnel Changes: Derek Guthrie, one of the MSD representatives on the Wet Weather Team, will be retiring on July 31, 2008. Mark Johnson will be replacing him as Chief Engineer and Director of Engineering/Operations at MSD.
- Metro Louisville Green Initiative: Brian Bingham of MSD described a meeting that Louisville Mayor Jerry Abramson convened on July 10, 2008 regarding Metro Louisville's Green Strategic Initiative (known as "Go Green Louisville," see www.louisvilleky.gov/GoGreen). MSD participated in this meeting along with representatives from various Metro Louisville government departments. The green initiative—one of the mayor's seven strategic initiatives—is wide reaching and includes city government efforts to improve water quality, air quality, land use, and energy efficiency.
- Wetlands Projects: Gary Swanson of CH2M HILL said that the technical team had been evaluating additional options to include wetlands treatment in projects, after a few WWT members had asked why there were so few preferred project alternatives that involved wetlands in the draft project lists.
  - Mr. Swanson noted that the technical team was looking at an alternative to a large storage basin that would combine constructed wetlands with a smaller storage basin to address sewer overflows near the Northern Ditch Interceptor, one of the Big Four SSO solutions. This would be MSD's first use of wetlands to help treat sewer overflows.
  - The technical team is also looking at options to add constructed wetlands outside storage basins where there is room, so that overflows would run through the wetlands before entering the basins.
  - One issue with using wetlands treatment for wastewater containing sewage is that the wetlands need to be fenced off, unlike wetlands that are used for stormwater management exclusively.
- Flows into Lower Beargrass Creek: Gary Swanson said that the University of Louisville had studied the potential to use reclaimed backwash water from the Louisville Water Company's Crescent Hill Water Treatment Plant to supplement flows in the lower section of Beargrass Creek. The study showed that the concept was feasible, but many implementation issues remain to be worked out. He also reported on a Division of Water study of the sources of natural water flows into the lower sections of Beargrass Creek. To trace the route and travel time of several natural springs, researchers put dye into the water in the springs and measured how long it took to reach the stream. In four locations the dye never made it into Beargrass Creek, but instead flowed into the sanitary sewer system. This presents a potential opportunity to restore natural flows to Beargrass Creek (an

estimated 24 percent of the base flow) by finding and addressing the infiltration and inflow (I&I) problems.

- Green Infrastructure Investments of Other Municipalities: Following up on questions from the previous WWT meeting, Gary Swanson reported on the level of investment of other communities in green solutions to address CSOs. Mr. Swanson noted that very few communities nationally have coordinated green infrastructure initiatives. As examples of those initiatives, the City of Portland, Oregon has spent $5 million annually on green infrastructure in the past (and budgeted $10 million for this fiscal year); Milwaukee has invested $10 million in sewer-related green projects; Chicago spends $900,000 annually on the Green Alleys Program; and Washington, DC is planning to invest $6 million annually in green initiatives.
- Wet Weather Team Schedule Update: Jennifer Tice of Ross & Associates asked that WWT members hold the night of Wednesday, September 24, in addition to Tuesday, September 23, for the next WWT meeting. This will be the final WWT meeting before the release of the draft IOAP for public comment, so additional time may be needed for WWT deliberations. Ms. Tice also reviewed the overall schedule of WWT-related activities through the end of the year, and noted that the facilitation and technical teams would be distributing several documents to WWT members over the summer to invite comments and feedback. (These materials are listed in the next steps section below.)

Integrated Overflow Abatement Plan Vision Update

Jennifer Tice of Ross & Associates reviewed the major changes made to the draft IOAP vision since the last WWT meeting. These changes included a new section describing MSD's plans for the Project WIN public information, education, and involvement program based on the presentation and discussion at the June 2008 WWT meeting, a new statement about the stream restoration allowance included with overflow abatement projects, and clarifications to the description of the proposed three-to-one offset of flows from new development. WWT members did not provide additional comments on the vision at this meeting, but the facilitation team encouraged participants to provide feedback following the meeting. WWT participants were also reminded that the vision will be included in MSD's consent decree response.

Project WIN Funding Plan Presentation

MSD Finance Director Marion Gee gave a presentation on the draft funding plan for MSD's consent decree response. Mr. Gee reviewed EPA's requirements for a funding plan, the funding suggestions previously provided by WWT members (e.g., ideas tracked on solution ideas list), a proposal for funding the program with annual rate increases and accessing capital markets (i.e., bond issues or other loans), and next steps in the development of a final funding plan. Principles for the funding plan include:

- Rates and fees for the IOAP must pay MSD's operating costs and debt service.
- MSD's current bond rating should be maintained. (Note: MSD's bond rating was recently upgraded to AA, which should decrease costs for future borrowings.)
- Rates and fees should allow for continued economic development in the community.

Using the assumption that the consent decree will cost $800 million, the funding presentation outlined that wastewater and drainage rates would increase 5 to 6.5 percent annually and that the consent decree surcharge would increase 2.5 to 5 percent annually through 2021. Furthermore, under this funding proposal, MSD would borrow approximately $1.15 billion by 2025 (to address both IOAP and other MSD capital needs for infrastructure renewal, replacement, and expansion), which would increase MSD's debt service payments from $94 million annually to $163 million annually by 2025. MSD also plans to pursue

grants, line-item appropriations, and public/private partnerships (e.g., recapture agreements) to help pay for capital construction costs, as appropriate.

In response to this presentation, WWT participants asked several clarifying questions and provided feedback on the draft funding proposal. WWT comments included the following.

Clarifications about the Draft Funding Plan

- In answer to a question, Mr. Gee indicated that the rate increases assume a customer growth rate of 1 percent per year. If the actual growth rate differs, the rates may need to be adjusted.
- A few WWT participants asked whether the consent decree would "go away" in 2024. MSD responded that the community would continue to be paying for the consent decree after 2024, particularly since MSD envisions issuing 30-year bonds as late as 2021.

Comments on the Draft Funding Plan

- Several WWT members commented on the fact that the consent decree surcharge does not cover all the consent decree expenditures could be confusing to the public. Furthermore, it also could be confusing that MSD's borrowings will cover more than the IOAP.
    - WWT stakeholders said that there was a potential transparency issue regarding what the consent decree surcharge is financing as compared to the wastewater and drainage rates.
    - MSD noted that many projects serve more than one purpose and that drainage, wastewater, and consent decree expenditures are interrelated. Participants noted that there are also general "costs of doing business," including MSD's debt service payments.
- WWT stakeholders suggested that MSD should find an understandable and transparent way to explain the rate increases to the public. Participants urged MSD to consider alternatives for the billing structure that would address the communication challenges with having a separate consent decree surcharge. Suggestions included:
    - Get rid of (or phase out) the separate consent decree surcharge.
    - Increase the consent decree surcharge so it covers all of the capital costs for constructed consent decree projects. (This could be helpful for describing to people how the federal government is requiring the consent decree expenditures.)
- Several WWT stakeholders indicated that it will be important for MSD to inform people what they're paying for with the rate increases. Some participants commented that it was unfortunate that the rate increases, although necessary, would affect people during hard economic times.
- One WWT participant indicated discomfort with MSD borrowing money, but nevertheless indicated general support for the draft funding plan.

Information Requests

- Some WWT members requested that MSD prepare a chart showing how a typical bill would change each year, including the wastewater and drainage fees and the consent decree surcharge. Participants also asked MSD to show how MSD's rates compare to those of other communities.
- A few WWT participants requested a breakdown of the anticipated consent decree capital expenditures and anticipated other capital expenditures each year of funding the consent decree.
- A few WWT stakeholders asked for additional explanation and examples of how the consent decree has changed (or will change) the schedule of other MSD projects.

During this session, Rob Greenwood of Ross & Associates did an explicit consensus check with each WWT participant regarding MSD's draft funding plan. All present WWT members indicated comfort with MSD's direction with the funding plan, although some participants reserved final judgment until more detailed rate information becomes available.

Discussion of CSO, SSO, and Green Infrastructure Projects in the IOAP

Green Infrastructure Cost Calculator

John Lyons of Strand Associates reviewed a spreadsheet the technical team is using to develop the cost estimates for green infrastructure efforts in the IOAP. The spreadsheet included calculations estimating the benefits in flow volume reduction per unit (e.g., flow reduction per square foot of a vegetated roof), the unit costs and program costs, and a user-defined field estimating the implementation rate for a variety of best management practices (BMPs). This tool will be used to develop a budget and "business plan" for green infrastructure in the IOAP, and will allow the technical team to compare the cost per gallon of flow removed for green solutions as compared to gray solutions.

Update on Analysis of a Potential Ordinance to Address I&I Issues

Gary Swanson of CH2M HILL added that the technical team is continuing to work on the analysis of a potential ordinance to address private sources of I&I in MSD's sewer systems. This analysis, which should be completed by the end of July, will include estimates of the volume reductions and cost savings that could be anticipated from an ordinance and an associated private-side I&I reduction effort.

Review of Revised CSO and SSO Project Lists and Initial "Knee of the Curve" Charts

Gary Swanson reviewed the revised draft project lists the technical team developed for addressing CSOs and SSOs. The two handouts showed all the CSO and SSO project alternatives the technical team has evaluated to date, along with the preferred alternatives (with the highest benefit-cost scores) highlighted in yellow. Mr. Swanson noted that the technical team is still evaluating additional alternatives, including looking for lower-cost solutions to address problems in downtown Louisville and in the South Fork of Beargrass Creek. Next steps in the technical team's analysis include developing revised versions of the gray solutions that incorporate the results of the green infrastructure analysis, conducting the analysis of the optimum level of control for individual CSOs and SSOs, evaluating the water quality benefits of the overall program, refining the cost estimates, developing final drafts of the project lists, and drafting an implementation schedule for the projects. The technical team will also be conducting the programmatic analysis of the IOAP and will share plans for this analysis with the WWT.

Mr. Swanson showed examples of "knee of the curve" plots for CSO and SSO projects in the IOAP. ("Knee of the curve" graphs plot the cumulative cost of all projects on the x-axis and the benefit-cost scores of the projects on the y-axis, with the projects ordered from the highest to lowest scores.) The technical team's initial conclusions from this analysis include the following:

- The benefit-cost evaluation provides a logical ranking of solutions.
- Projects that address clusters of CSOs or SSOs tended to score well in the benefit-cost analysis.
- The scoring system does not fully account for economies of scale for large projects or projects that provide benefits across multiple basins.
- For those and other reasons, the sequencing and scheduling of IOAP projects will consider other factors beyond the benefit-cost scores.

Project-Review Workshop with Technical Team

A sign-in sheet was circulated at the meeting inquiring about WWT members' interest in an optional project-review workshop with the technical team on August 4, 2008. There was not sufficient WWT interest in a meeting on that date; however, several WWT members expressed interest in meeting with the

technical team on another date to review the benefit-cost scoring methodology and examples of the project alternatives evaluation. The technical team plans to schedule a meeting with these individuals.

Wet Weather Team Comments

WWT members asked a number of clarifying questions in response to the presentations and also provided the following comments.

- A few WWT members asked how MSD would address the issue of maintaining pervious pavement, green roofs, and other BMPs.
  - MSD and the technical team said that MSD would be doing inspections of BMPs for property owners that get a drainage credit. The green infrastructure program budget includes inspection costs as well as other administrative costs.
- In response to the green presentation, a few WWT stakeholders asked about the issue of sump pumps.
  - MSD and the technical team indicated that this was primarily an issue within the separate sanitary sewer system; however, MSD's analysis of a private-side I&I reduction program is also considering addressing the issue of sump pump connections within the combined sewer system.
- A few WWT participants commented that more of the preferred alternatives should be green solutions, based on the estimates of cost per gallon of flow removed.
  - Gary Swanson of CH2M HILL said that the green infrastructure program budget is being developed based on a systematic, basin-by-basin analysis of flow-reduction opportunities and realistic, but conservative estimates about the anticipated market penetration (rate of adoption) of green solutions. Increasing market penetration beyond those levels would require much more financial investment, which would decrease the cost effectiveness of the green solutions.
  - Rob Greenwood of Ross & Associates added that future materials will more explicitly show how the green analysis has been incorporated into the project list (e.g., how assumptions about flow reductions from I&I efforts and green infrastructure reduce the size and costs of gray solutions).
- A few WWT stakeholders observed that the ability to quantify the benefits/effectiveness and sustainability of green infrastructure projects over time could be helpful to other communities.
- In response to a question, Gary Swanson indicated that the columns showing benefit-cost scores in the project list tables were comparable across CSO and SSO projects, although the columns had slightly different names.

During this session, the facilitation team asked WWT members about their comfort with how the technical team has applied the values-based evaluation framework in assessing the benefits and costs of project alternatives and developing the list of preferred project alternatives. About a third of WWT participants indicated that they would be interested in meeting with the technical team to look at more of the details of the technical team's analysis, while the remaining two-thirds of the group indicated comfort that the technical team had applied the methodology consistently with WWT member expectations.

Observer Comments

There were no observer comments at this meeting.

Wrap Up and Next Steps

- The facilitation team will revise the IOAP vision draft to incorporate additional information about the Project WIN funding plan.

- The technical team will host an optional meeting with several WWT members on August 7, 2008 to review and answer questions about the benefit-cost scoring methodology and the project alternatives the technical team has been evaluating. If other WWT members are interested in meeting with the technical team to review project alternatives for specific locations, please contact Gary Swanson (Gary.Swanson@CH2M.com) and Jennifer Tice (jennifer.tice@ross-assoc.com) to set up a meeting.
- The facilitation team will check in with WWT members individually to ask whether WWT members are comfortable with how the technical team has applied the values-based evaluation framework.
- The facilitation and technical teams will distribute the following series of materials to WWT members for review before the September WWT meeting:
  a. Memo describing the technical team's plans for the programmatic evaluation of the IOAP (including environmental justice, customer satisfaction, and other programmatic values);
  b. Revised vision incorporating a new funding plan description;
  c. Rate and financing impacts example;
  d. Idea list "crosswalk" document;
  e. Final draft public information, education, and involvement plan;
  f. Final draft post-construction compliance monitoring plan; and
  g. Revised project list incorporating results of the levels of control analysis.
- Potential topics for the WWT's next meeting on September 23 and 24, 2008 include:
  - Final draft IOAP vision;
  - Final draft IOAP project list;
  - Results of the programmatic analysis of IOAP projects;
  - Draft implementation schedule;
  - Program cost and rate impacts;
  - Final draft funding plan;
  - Final draft post-construction compliance monitoring plan; and
  - Final draft public information, education, and involvement plan.

Meeting Participants

Wet Weather Team Stakeholders

Steve Barger, Labor
Susan Barto, Mayor of Lyndon
Stuart Benson, Louisville Metro Council, District 20
Charles Cash, Louisville Metro Planning & Design Services Department
Allan Dittmer, University of Louisville
Laura Douglas, E.ON U.S. LLC
Faye Ellerkamp, City of Windy Hills
Mike Heitz, Louisville Metro Parks Department
Tom Herman, Zeon Chemicals
Rick Johnstone, Deputy Mayor, Louisville Metro Mayor's Office
Bob Marrett, CMB Development Company
Judy Nielsen, Louisville Metro Health Department
Lisa Santos, Irish Hill Neighborhood Association

Tina Ward-Pugh, Louisville Metro Council, District 9
David Wicks, Jefferson County Public Schools

MSD Personnel

Angela Akridge, MSD Regulatory Policy Manager
Brian Bingham, MSD Regulatory Management Services Director
Mark Johnson, MSD Director of Engineering/Operations and Chief Engineer
Bud Schardein, MSD Executive Director

Facilitation and Technical Support

Rob Greenwood, Ross & Associates Environmental Consulting
Gary Swanson, CH2M HILL
Jennifer Tice, Ross & Associates Environmental Consulting

Meeting Observers

Vicki Coombs, MSD
Kristen Crumpton, Tetra Tech
Samantha Davis, Louisville Metro Council, District 9
Marion Gee, MSD
Justin Gray, MSD
Sue Green, MSD
Clay Kelly, Strand Associates
Tim Kraus, O'Brien & Gere
John Lyons, Strand Associates
Chad McCormick, Stantec
Julia Muller, MSD
Phil Scott, O'Brien & Gere
Ram Vliddagiri, The Corradino Group

Meeting Materials

- Agenda for the 7/15/08 WWT Meeting
- Summary of the 6/19/08 WWT Meeting
- Consensus Items List (updated July 2008)
- Solution Ideas List (updated July 2008)
- Education and Outreach Ideas List (updated July 2008)
- Data Request and Monitoring Suggestions List (updated July 2008)
- Excerpt from 7/10/08 Mayor's Green Initiative Presentation
- Emergent Vision for MSD's Integrated Overflow Abatement Plan (updated July 2008)
- Project WIN Funding Plan Presentation
- CSO Project List, "Draft Summary of Ohio River CSO LTCP Solutions"
- SSO Project List, "Draft Summary of Cedar Creek and Hite Creek Modeled 2-yr, 3-hr Solutions"
- Knee of the Curve Presentation

Wet Weather Team Consensus Items
Working Draft – July 7, 2008

The following is a list of items on which the Wet Weather Team (WWT) has come to consensus, organized by the date of the WWT meeting at which consensus was reached. The facilitation team will maintain and update this list throughout the remainder of the WWT effort.

Consensus Item	Wet Weather Team Meeting	Reference Document
1. Wet Weather Team Charter	Wet Weather Team Meeting #2 (August 15, 2006)	Wet Weather Team Charter (August 15, 2006)
2. Wet Weather Team Ground Rules	Wet Weather Team Meeting #2 (August 15, 2006)	Wet Weather Team Ground Rules (August 15, 2006)
3. Wet Weather Team Community Values	Wet Weather Team Meeting #6 (February 13, 2007)	Wet Weather Team Community Values
4. Performance Evaluation Framework for Project-Specific Values	Wet Weather Team Meeting #9 (May 22, 2007)	Final Draft Performance Measurement Matrices
5. Approach for Incorporating Programmatic and Project-Specific Values into Decision Making	Wet Weather Team Meeting #9 (May 22, 2007)	Values-Based Decision-Making Flowchart
6. Weights for Project-Specific Values	Wet Weather Team Meeting #10 (June 21, 2007)	See: Summary of the June 21, 2007 WWT Meeting (WWT Meeting #10)
7. Understanding of Sanitary Sewer Overflow Strategies and the Role of Source Control	Wet Weather Team Meeting #14 (December 6, 2007)	Wet Weather Team Stakeholder Group Understanding of Sanitary Sewer Overflow Strategies and the Role of Source Control (December 2007)
8. Understanding of Community's Anticipated Tolerance for Annual Rate Increases	Wet Weather Team Meeting #15 (January 15, 2008)	See: Summary of the January 15, 2008 WWT Meeting (WWT Meeting #15)
9. Understanding of Combined Sewer Overflow Control Strategies in MSD's Integrated Overflow Abatement Plan	Wet Weather Team Meeting #17 (April 3, 2008)	Wet Weather Team Stakeholder Group Understanding of Combined Sewer Overflow Control Strategies (April 2008)

10. Direction of Plans for the Project WIN Public Information and Outreach Program	Wet Weather Team Meeting #19 (June 19, 2008)	6/19/08 Presentation, "Project WIN Public Information and Outreach (PIO) Program"

Wet Weather Team Solution Ideas
Working Draft – July 7, 2008

The following is a list of potential "solution ideas" identified by Wet Weather Team (WWT) members that will be considered in the design of MSD's Integrated Overflow Abatement Plan (IOAP). The list will act as a resource 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 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 and Incentives," 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, MSD actions that are not related to sewer overflow issues, and green infrastructure ideas that are not directly related to sewer overflow issues.

What's New (July 2008)

1. (I-E-1 Downtown Louisville) - Consider taking advantage of planned construction on Main Street in downtown Louisville to construct the CSO solutions at a lower cost.
2. (II-C-11) – Consider revising the potential financial incentive for vegetated roofs; $4 per square foot might not be sufficient.

I. Project Alternatives

A. Stormwater Best Management Practices (Non-Structural)

1. Influence behavior of residential and commercial landowners through education. [Note: See the Education and Outreach Idea List for more ideas about educational efforts to influence behaviors.]
    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.
    c. Conduct education on environmentally sustainable ways of using fertilizer and weed killer, and other stormwater best management practices to neighborhood groups.
    d. Discourage chemical treatment of and mowing near waterways to help keep debris from waterways.
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 IOAP.
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 do your laundry, etc.). [Note: More details on this idea are in the Education and Outreach Ideas List.]
5. Encourage the use of best management practices for chemical use in lawn management practices.
    a. Inform greens keepers about best management practices (BMPs), since non-point source runoff is made worse by golf course chemicals.
6. 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).
7. Invite people to "join" Project WIN by installing rain gardens, rain barrels, reducing their use of lawn chemicals, etc.
    a. Add a page to MSD's website where people can submit notes or pictures of their efforts.
    b. Give out plaques or other awards to those who "join."

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)
    g. Wetlands
5. Consider incorporating aspects of the LEED green building standards into MSD design manuals for structural BMPs.
6. Increase tree canopy.
    a. Ensure that urban CSO areas have at least a 30 percent tree canopy.
    b. Initiate a tree-planting program with a goal to increase tree canopy in neighborhoods.
7. Work with the community group "Women of Vision" to create a meditation garden in the West End that could also act as a rain garden or roof runoff demonstration.
8. Conduct demonstration projects. [Note: Overlaps with demonstration projects in Education and Outreach Ideas List.] Specific ideas for projects include:
    a. Create a demonstration area in each Jefferson County watershed to demonstrate and interpret healthy stream habitats and what MSD is doing to study and protect them.
    b. Create some sustainable lawns as pilot projects
    c. Develop a green infrastructure best management practice site similar to SD1 (Sanitation District Number 1 of Northern Kentucky).

d. Add green demonstration/education facilities to old urban schools.
e. Use the Butchertown Greenway Pump Station that is offline for an education and demonstration facility.

9. Plant native plants with deep root systems.
10. Maintain existing detention/retention basins – many may not function properly due to lack of maintenance.
11. Design structural stormwater best management practices to be multiple use and eco-friendly.
    a. Design detention ponds and stream buffers for recreational use.
    b. Make use of detention facilities as sports fields
    c. Incorporate trails along streams to provide recreational opportunities.
12. Convert alley stormwater systems into infiltration systems using pervious pavement.
    a. Potential areas could include the central business district and the west end.

C. CSO and SSO Point Source Controls

1. Disconnect downspouts and/or sump pumps (e.g., by developing educational initiatives aimed at landowners).
    a. One potential target for a downspout disconnection program could be school buildings.
    b. Yard signs similar to those used in Portland's residential Downspout Disconnection Program could be useful for education and outreach about MSD's IOAP. [Note: This idea overlaps with the Education Ideas List.] Specific ideas for signs include:
        i. Messages such as "I disconnected my downspout" and/or "I have a rain barrel."
        ii. The bottom of the sign could invite readers to "ask me" for more information.
2. Increase enforcement and inspections of downspout and sump pump connections.
    a. Incorporate inspections into the property-transfer process (e.g., as another inspection with the sale of existing homes). For example, MSD could deputize the state plumbing inspector, which has the authority to go into private property, to conduct inspections of downspouts. MSD could pay on a per building basis for those inspections.
3. Look at large parking lots as potential sites for wastewater storage facilities. Organizations might be willing to have a covered storage facility built below a ground-level parking lot. In addition, there could be opportunities to add value for the property owner, by building a parking garage as a replacement and/or by providing credit for any non-point source pollution reduction associated with the project.
4. Repair and seal all building laterals.
5. Act on any sump pump or other illegal connection issues uncovered during the course of MSD's regular operations and maintenance work on the sanitary and combined sewer systems.

D. General/Other Solutions

1. Leverage and coordinate the IOAP efforts with MSD's MS4 stormwater management permitting responsibilities.
2. Conduct green infrastructure demonstration projects with monitoring components built in, to help demonstrate the overall effectiveness of green infrastructure solutions.
    a. Start with small, visible projects ("quick wins" – e.g., in a particular neighborhood, near a Rubbertown plant).
3. Preserve rural character where possible.

4. Create a localized resource database to support green infrastructure development efforts (e.g., provide information on contractors that install pervious pavements). Specific ideas include:
    a. Develop a list of environmentally approved chemicals for use in lawn/landscape management.
    b. Landscape architects could provide green options for projects and developments.
5. Do not rule out flow-reduction techniques to address SSOs for any watershed.
6. Look at combining different types of control options, including opportunities to reduce flows of water into the sewer system (e.g., from housing units) in tandem with other types of solutions. For example, combining storage and flow-reduction approaches could make it possible to use a smaller-sized storage facility.
7. Involve community members in addressing the root causes of SSOs (e.g., by working with the Metro Council, community organizers, and neighborhood groups).
8. Challenge preconceived notions of what U.S. EPA will accept in terms of the role of source control in an SSO elimination plan.
    a. Use technical feasibility and cost effectiveness as the primary basis for deciding the level of source control to meet regulatory compliance obligations, and work with relevant regulatory bodies to justify the basis for this approach.
9. Consider wet weather sewer overflow control strategies that reduce future maintenance issues.
10. When choosing initial green infrastructure projects, consider avoiding areas where there were problems with seepage and backups during the 1997 storm, as it may be useful to avoid known problem areas.

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.

Beargrass Creek – Middle Fork

1. Restore the Middle Fork between Grinstead crossing and confluence.
    a. Restore wetlands and improve aquatic health in the following areas:
        i. The isolated quarry areas to the north of the interstate between Grinstead and Payne (which receives a small CSO discharge). One specific idea is to remove sediments from these areas.

ii. The old meander into which CSO 127 discharges and the wet meadow in its bend.

b. Work with the City of Louisville, the Parks, and the private sector to turn this area into a greenway that connects the waterfront with Cherokee and Seneca Parks, and eventually with parks in Saint Matthews, with a bikeway from Saint Matthews to downtown.

c. Close CSOs in this area using projects that reduce flooding and improve water quality.

2. CSOs 125, 126, 127, 144, and 166; and CSOs 86 and 140 could potentially be treated at one facility (some pumping would be required). This could be a visible project that could help link areas in the community.
3. Potentially develop the River Metals property (a brownfield near the Girl Scouts Building) as a storage or wetlands treatment area.
4. Establish wetlands at Seneca Park and Old Cannons Lane.
5. Consider locations/sites for storage solutions that are closer to the SSOs in the Anchor Estates Pump Station watershed than the potential location presented at the 9/20/07 WWT meeting.
6. Utilize parks property orphaned by I-64 as a detention basin for the Beals Branch sewershed CSO. Restore the sediment-filled wetland at the confluence of Beals Branch and the Middle Fork as a treatment wetland for the basin's discharge.

Beargrass Creek – South Fork

1. Restore the South Fork between I-264 and Eastern Parkway.
   a. Restore the stream channel, along with the wet meadows and woods in the floodplain.
   b. Coordinate with landowners (e.g., the City of Louisville and Bellarmine College) on the restoration of the stream segment, which is part of a "nature education" corridor and is subject to MSD conservation easements.
   c. Potentially make this area into a bikeway as part of the solution.
2. Create a rain garden in the Germantown area to intercept stormwater flowing to a variety of minor CSOs at the old trolley turnaround.

Beargrass Creek – Muddy Fork

1. Restore Eva Bandman Park.
   a. Convert the park into restored wetlands with a boardwalk for visitors.
   b. Include the park as part of the solution for the CSOs that discharge at the confluence by having it receive their stormwater.
2. Tie the impaired section of Beargrass Creek to newly created wetlands, near Eva Bandman Park.
3. Incorporate green infrastructure into the Arts Center.
4. Turn the MSD pump station into an interpretive center.
5. For CSOs 132, 154, and 167:
   a. Conduct a concentrated effort to disconnect downspouts in this area.
   b. Use incentives to get people to help solve the problem in this area. In particular, educate people about ways to reduce non-point source pollution.
   c. Acquire properties in flood-prone areas by paying more than fair market value for the homes (as compensation to homeowners for having to move). These areas could then be used to create detention or retention basins, or other facilities/structures to reduce wet-weather sewer overflows. [Note: Purchasing properties in flood-prone areas is also listed in Section III.]

Downtown Louisville/Central Business District

1. Consider taking advantage of planned construction on Main Street in downtown Louisville to construct the CSO solutions at a lower cost.

Floyds Fork Watershed

1. Look for opportunities for green infrastructure in the Floyds Fork watershed, as it is the last undeveloped area in Jefferson County.
2. Protect Floyds Fork with riparian buffers and other preservation efforts.

Other Watershed and Site-Specific Solutions

1. Create an 800-acre lake in the southwest portion of Jefferson County. Use a dam/flood wall to build it and include marshes around it.
2. Examine other sites for green infrastructure opportunities, such as:
    a. Pond Creek Lake and the southwest pump stations (this area has been studied already by the Corp of Engineers)
    b. The Bradley Property

II. Funding Ideas and Incentives

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.
        i. Spread payments over a longer time period if this would reduce the burden on lower income residents.
    b. Rates and fees that are linked to the cost to serve (i.e., the level of impact).
    c. Consider how the community develops to make sure that everyone pays into the solution.
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.
5. Develop an equitable plan for joint funding for permeable pavement efforts.
6. Extend MSD's senior citizen's discount program to ensure that it helps people who face financial hardship. Ideas include:
    a. Consider people's ability to pay, not simply their age, and provide assistance and/or discounts to low-income populations.
    b. Evaluate whether the square footage of people's homes could be used as an indicator of the need for financial assistance.
    c. Examine the verification and process and criteria that LG&E uses for its Winterhelp program.
7. General principles for funding and cost allocation:
    a. Have higher rates in the near term to avoid future balloon payments.
    b. Create balance between what the community pays now and what the community will pay later.

c. Do not increase rates so much that they drive companies or residents to move elsewhere.
d. Use the community's resources wisely. This will involved dealing with issues such as the Big 4 SSOs, but also working on long-term strategies to improve water quality such as promoting behavior change through education.

8. Charge higher rates for people with the ability to pay in order to provide resources to offer incentives to people who "do the right thing" and discounts to people who need financial assistance.
9. Consider charging residences that have septic tanks more on their drainage bills than other residences.

B. 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.
3. Consider additional user charges that could be used as a result of adopting a different rate schedule.
4. Maintaining a certain level of bond rating could be a way of setting limits on how much money MSD borrows versus how much it generates in internal revenues.
5. Consider not borrowing any money.
6. Balance the impact of potential financial packages on MSD's bond rating, rates, and cash flow/liquidity.

C. Incentives *[Note: Incentives related to a potential ordinance to address private sources of infiltration and inflow are located in Section III-A-Regulatory Requirements/Policies]*

1. Provide incentives for "preferred" behaviors, such as:
    a. Installing/using green roofs and permeable pavement.
    b. Increasing tree canopy, changing plantings, and other activities to reduce runoff from people's yards.
    c. Reducing use of lawn chemicals.
    d. Controlling the spread of invasive species.
2. Offer incentives for developers to use cost-effective, eco-friendly solutions (e.g., low impact development techniques, stormwater best management practices).
    a. One idea for an incentive is to offer drainage credits.
        i. Offer drainage credits to companies that put money into water education for the community. For example, give companies a one dollar discount for every five dollars spent on community education.
    b. Develop incentives for developers to use the greenest and simplest solutions for new development (e.g., moving permit applications to the front of the review line).
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.
5. Develop compensation credits to help alleviate financial burden to developers and property owners.
6. Reduce rates for houses that are certified (i.e., through inspections) as eliminating inflow from their properties into the sewer systems.

7. Develop and administer a "forgivable loan" program that would cover the replacement of a private lateral line when an inspection reveals that it contributes to an SSO.
    a. The loan would be up to a maximum amount set by MSD for the private contracting work and would be forgiven at the end of, for example, 20 years, if the homeowner made no illicit connections. If illicit connections were made, the loan would be due in its full amount, civil penalties would apply, and water would be disconnected after a grace period if the illicit connections weren't removed.
    b. The loan program would require regular inspections.
    c. The loan would come due via lien if the homeowner sold the property, but the new homeowner could negotiate with MSD for a new loan but with a new twenty year term.
8. Consider not charging based on winter water usage, as this could potentially remove an incentive to conserve water, since water usage varies more in the summer.
9. Consider incentives for development in areas where there is less impact on the sewer system (i.e., encouraging lower impact development).
    a. There could be a role for impact fees in encouraging development in areas where there is less impact on the sewer system.
10. Consider using requirements when needed in addition to incentives to ensure that solutions are maintained.
11. Consider revising the potential financial incentive for vegetated roofs; $4 per square foot might not be sufficient.

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)

Regulatory Requirements/Policies

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. Require that regional detention ponds in post-developed areas provide filtration for storms that occur every two years or less.
3. Require post-development runoff to be equal to pre-development runoff.
4. Develop mandatory or alternative green solutions for development projects (e.g., by changing development codes).
5. Determine impervious surface limits for individual watersheds.
6. Deny permits for sites within CSO or SSO sewersheds that have any incidents of illegal connections to the sewer system to limit impacts on already overloaded systems.
7. Use wet weather capacity (instead of dry weather capacity) of the sewer system as the baseline for approving new development.
8. Develop an ordinance to address private sources of infiltration and inflow. Ideas related to a potential ordinance include:

    Authority and Responsibility for Inspections and Enforcement

    a. Develop an ordinance that would allow MSD or a plumbing inspector to enter homes to identify sources of infiltration and inflow (e.g., broken foundation drains). MSD could subsidize or help pay for the costs of the inspections.
    b. Require contractors and plumbers working on private property to check for sources infiltration and inflow.

c. Adopt a requirement for inspections of private properties for sources of infiltration and inflow any time a building permit is issued (e.g., for an addition to an existing home).

d. The ordinance should have the flexibility to allow people other than plumbing inspectors to conduct inspections of private properties.
    i. Allow other types of inspectors to do the inspections.
    ii. Allow property owners to make repairs themselves and then have certified inspectors inspect the repairs.
    iii. It may be better from an accountability perspective to not have MSD do the inspections, repair work, and enforcement.

Trigger for Inspections

e. Use a proactive approach to inspecting properties (such as the approach used in Johnson County, KS) that would allow MSD to target high-priority areas.

f. Use two approaches for triggering property inspections: require inspections during the property transfer process, and also proactively target certain neighborhoods/areas for inspections.

Scope

g. Have the ordinance address issues with the combined sewer system as well as the sanitary sewer system (e.g., look at ways to reduce runoff and limit impervious cover in the CSO area).

h. Expand the scope of the ordinance to include:
    i. An outright ban on downspouts, sump pumps, and basement drains.
    ii. A requirement that new parking lots and parking lots that are going to be repaved have more stormwater controls.

Financial Assistance

i. MSD should provide financial assistance to the community related to the ordinance.

j. The ordinance should include a cost-sharing component.

Other

k. Develop legislation related to private sources of infiltration and inflow that would:
    i. Prohibit clear water connections to the sanitary system.
    ii. Require homeowners to maintain the lateral line.
    iii. Provide for civil penalties for homeowners and plumbers for illicit connections or failure to repair the lateral line.
    iv. Disconnect water supply after a brief grace period if the problems aren't corrected.
    v. Give MSD the authority to inspect when an SSO occurs downstream of any sanitary connection.
    vi. Describe a process MSD would use when it must inspect sanitary connections upstream from an SSO, including notice and information about the program.
    vii. This new inspection process should begin immediately with the "Big 4" SSOs, but could be implemented when MSD detects others.

l. A draft ordinance should be reviewed by a county/city attorney.

<u>Opportunities to Encourage/Use Green Infrastructure in Development Projects</u>

1. Utilize very large basins or lakes in new development areas and in rural areas. For new developments, create larger detention/retention basins.

2. Preserve existing natural systems, vegetation, and trees during development, rather than removing and rebuilding them. Take advantage of existing assets in development opportunities.
3. Look at green parking opportunities along business corridors.
4. Look at opportunities to develop more upward and infill already developed areas (i.e., increase density).
5. Develop a "complete streets" program policy to encourage "parkway-like" streets and reduce stormwater run-off.
6. Form partnerships with housing developers to minimize impervious surfaces.
7. The parking lot on Frankfort Avenue could utilize porous pavement for public parking.
8. Develop a recognition program for those who use green infrastructure.
9. Opportunities in schools:
    a. Incorporate green elements into the three new research facilities being planned at the University of Louisville.
    b. Turn school grounds into "ecological playgrounds" for neighborhoods.
10. Look at opportunities to incorporate green infrastructure into brownfield development (e.g., in Park Hill Corridor).
11. Prepare a draft best management practice for developers on using green infrastructure.

Opportunities to Link MSD Efforts to Existing Partnerships and Programs

1. 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.
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. Integrate green projects into planning efforts underway.
4. Work with the Green City Partnership (an initiative involving the Louisville Metro Government, Jefferson County Public Schools, and the University of Louisville) on green infrastructure efforts. The Metro Green Initiative should be a leader for the community's Green City Partnership.
5. Consider green infrastructure in the context of healthy activity improvement projects and projects that promote greater walk-ability in neighborhoods.
6. Make use of neighborhood plans. There could be opportunities to incorporate green infrastructure into the 14 neighborhood plans and 6 neighborhood assessments that are being developed, as well as in neighborhood plans that well be developed in the future.
7. Convene a group of local authority figures (e.g., the mayor, the president of the University of Louisville, and others) to coordinate and work collaboratively on community environmental improvement initiatives. (WWT members suggested that an appropriate time for a meeting like this might be summer 2008, when more of the details of MSD's draft IOAP are known.)

Opportunities for MSD to Collaborate with Other Entities

1. Coordinate with planning and zoning departments and other governmental entities around the value of green infrastructure.
2. Partner with schools to relate students' community service efforts with green projects.
3. Coordinate with other regional entities to build a major treatment plant near the Salt River.

4. Consider linking IOAP construction projects to road construction efforts.
    a. One potential place for such a linkage is the road construction occurring in the Goose Creek Pump Station area.
5. Work with governmental entities to "lead by example" by eliminating infiltration and inflow entering the sewer systems from government-owned properties.
6. Consider where development will occur in the future, in order to avoid having similar wet weather problems related to private sources of infiltration and inflow in the future.
7. Partner with other cities and states that have wet weather consent decrees to collectively ask federal representatives to seek additional government funds for wastewater and stormwater management improvement efforts.
8. Coordinate with other agencies to examine the total impacts of all utility costs (water, wastewater, energy, gas) on customers.
9. Help the community implement a watershed approach to improving water quality that includes addressing stormwater and non-point source pollution in addition to CSOs and SSOs.
10. Form partnerships with people and agencies who work on climate change issues (e.g., the new committee in the Green City Partnership).
11. Network with partners on education activities.
12. Work with the Green City Partnership to develop potential incentives.
13. Develop a collaborative agreement on green infrastructure with other entities (e.g., schools, city and county government) such as the Memorandum of Understanding between Cincinnati Public Schools, the City of Cincinnati, and the County of Hamilton, Ohio regarding sustainable design "green" guidelines.
14. At the intersection of Grinstead and Lexington Road, work with the Kentucky Department of Transportation to redirect stormwater flows from the interchange into a wetland.
15. Work with Metro Parks to collect stormwater into a cistern at Beringer Spring.

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.
3. Partner with local lawn care companies to promote Louisville Green (MSD's organic fertilizer).
4. Do not give rebates during droughts and do not give special rates for irrigation meters for residential or commercial entities for lawn care, as this could be seen as encouraging lawns, which can contribute to water quality problems (e.g., runoff containing fertilizers and pesticides).

C. Green Infrastructure Ideas Not Related to Wet Weather Issues

1. Heine Brothers Coffee is looking for five acres for an urban farm to grow produce and sell to local restaurants.
2. The "86-64" community effort to remove portions of I-64 could be an opportunity to reclaim the waterfront and promote public transportation such as light rail.
3. Utilitize the open space in parks for green infrastructure.
4. Develop and educate residents about urban farming opportunities.
5. Teach and promote sensible/responsible development.
6. Require parking lots to provide shaded areas.

7. Establish a tree ordinance to protect specific trees (identified based on species, age, etc.) and require mitigation if the protect trees are damaged or removed.
8. Protect or improve water quality and flood control for developments.

Wet Weather Team Education and Outreach Idea List
Working Draft – July 7, 2008

The following is a list of education and outreach ideas identified by Wet Weather Team (WWT) members for consideration for MSD's Integrated Overflow Abatement Plan (IOAP). The list will act as a resource for MSD and the technical team as they develop and refine the draft education and outreach plan for MSD's IOAP. (The focus of this list is on long-term education, outreach, and public engagement efforts, rather than near-term activities such as public meetings occurring during the WWT process.) 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, and WWT members are encouraged to send additional ideas for this list to the facilitation team.

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. The remainder of the document is organized into two main sections, Section I, which focuses on MSD IOAP education and outreach efforts, and Section 2, which covers efforts that are only partly within MSD's control.

What's New (July 2008)

1. (I-B-7-a) – Participate in the two existing environmental education school magnet programs. (These programs are located at Portland and Cane Run elementary schools.)
2. (I-B-14) – Develop a continuing education program for elected officials and other government bodies such as the Planning Commission and governing boards of other cities in Jefferson County.
3. (I-C-1-o) – communicate about Project WIN through small city newsletters
4. (I-C-5-h) – Cluster demonstration projects in one spot, so that people can view and compare multiple approaches to reducing flows into the sewer stream.
5. (I-C-11) – Web portal suggestions:
    a. Add a feature to the enhanced web portal that will allow homeowners to enter their addresses to see their proximity to local SSO and CSO zones and the problems associated with the zones. MSD could use its LOJIC database to design this feature.
    b. On the web portal, indicate whether projects are green or gray solutions, or whether the projects combine green and gray techniques.
6. (I-C-19) – Develop videos that MSD could show on Metro TV (Chanel 25) or distribute by other means. Examples include:
    a. Show potential disasters or other problems that could happen (e.g., water issues in Sudan) as a "hook" to get people's attention.
    b. Provide the history of MSD as an agency (e.g., the problems Louisville faced in the past, why MSD was created, etc.) as a "hook" to encourage people to learn more about what challenges MSD and the community face and what will be coming in the future.
    c. Show how MSD's infrastructure works and how common problems occur (e.g., when sump pumps are always running).
7. (I-C-20) – Provide parents with information at children's sporting events by setting up a tent or kiosk.
8. (I-C-21) – Consider "stepping up" outreach and education efforts when there is a crisis. In particular, remind people about the causes of the problem and explain how they can help reduce and prevent future problems.
9. (I-C-22) – Establish a "block watch" style targeted outreach approach for neighborhoods associated with individual CSO or SSO areas.

10. (I-D-1-g) – Provide information on where people can obtain rain barrels, plants for rain gardens, and other resources for reducing stormwater runoff and infiltration and inflow (I&I) to the sewer system, as well as information on how to find contractors to fix I&I issues and/or to construct green infrastructure solutions.
11. (I-D-3-a) – This "Action Day" strategy could leverage existing communication networks or set up an e-mail list to periodically distribute notices that describe actions people can take to reduce their impacts.
12. (I-D-7-a) – Look for opportunities (similar to the lawn sign idea) that recognize individual accomplishments and also advertise for Project WIN.
13. (I-D-8) – Encourage community opinion leaders to change their behavior by adopting green solutions and communicate these efforts through Project WIN.
14. (I-D-9) – Create a direct link between neighborhoods and the CSOs they border and make the neighborhoods responsible for the maintenance and monitoring of the area.
15. (I-D-10) – Consider involving adults (as well as school children) in activities such as monitoring, maintenance of green infrastructure projects, and stream/river cleanups.
    a. Consider using canoes in the creek cleanup events.
16. (I-E-1-b) – Include questions about who watches Metro TV and how people value the community's water resources in surveys about the effectiveness of Project WIN education and outreach efforts.
17. (II-A-5) – Develop and support an urban environmental education center. A possible location could be at Shawnee Park, which is a site for one of the big detention basins.

I. MSD Integrated Overflow Abatement Plan Education and Outreach Efforts

A. Education/Outreach Program Characteristics

1. MSD should expand upon its existing education and outreach efforts, including Project WIN and other MSD programs such as Living Lands and Waters.
2. Education efforts should be comprehensive, adequately resourced, and human scale to encourage behavior changes (e.g., stewardship practices).
3. To be successful, public involvement efforts should include:
    a. A corporate or programmatic identity: logo, leader, advisory board, budget, mission, goals, website, etc.
    b. Communications: announcements, fliers, newsletters, radio/TV appearances, etc.
    c. Stewardship: removing invasive vegetation from riparian zones, planting wetlands, [and yes] litter cleanups
    d. Education: stream science, water quality monitoring
    e. Conservation: promoting rain gardens, rain barrels, and responsible alternatives for sump pumps and downspout connections.
    f. Coordination: linking the public involvement activity with MSD and the wet weather team
    g. Celebration: festivals, canoe floats, and other events that call positive attention to the area's waterways.
4. Outreach efforts should show people that there is an open and transparent process within which MSD is making decisions on behalf of the community.

B. Audiences, Objectives, and Messages

1. Target education efforts in "critical CSO neighborhoods" and schools in those areas.

a. Use a targeted direct-mail approach to help address local, site-specific problems.

2. Involve commercial and industrial customers and solutions through PR and planning, not just residential customers.
3. Make a presentation to the full Metro Council.
4. Work with schools (in conjunction with Earth Day and river/creek cleanups) to involve both students and parents.
5. Message ideas:
    a. Develop positive educational messages about the value of clean water to supplement other education and outreach messages. (CSO warning signs, river sweeps, and other elements of MSD's outreach activities send a negative message about the community's water resources.)
    b. Can the "water is dirty, stay away from it" signs that EPA designated include a promise that the public can change the situation?
    c. Translate Consent Decree activities into dollar impacts for residents.
    d. Communicate that we have no choice but must comply with the requirements of the consent decree in a timely manner.
    e. Help people understand how they are connected to the problem.
    f. Help change the perception people have of streams to a positive one (people think that streams are "dead").
    g. Help people understand that green infrastructure can be incorporated into urban areas, since urban areas can be redeveloped.
    h. Craft messages explaining the importance of addressing private sources of infiltration and inflow, and people's personal responsibility for addressing it.
    i. Create community ownership of the solutions.
    j. Stress that there are two sides to EPA compliance, and note that programs will affect some people more directly than others because of the way the sewer system has developed over time:
        i. What MSD is going to do with its infrastructure that will affect the whole community.
        ii. What citizens and businesses will be asked to do.
    k. Inform the community that EPA is targeting three parts of the sewer system: CSO sewersheds, the "Big 4" SSO sewersheds, and the other SSO sewersheds.
    l. Help people understand that, even though MSD is paying the EPA Consent Decree rate surcharge, the community as a whole must help solve the problem.
    m. Help people understand the differences between the combined sewer system and the sanitary sewer system.
    n. Explain funding concepts and choices to the public. Showing side-by-side cost comparisons could be a particularly useful way of doing this.
    o. Thoroughly explain the financial assistance component of any private infiltration and inflow reduction program.
    p. Some information from MSD's Sewer Overflow Response Protocol training (such as how MSD prepares for wet weather events) could be useful to share with the public, potentially during weather forecasts.
    q. Educate people about the benefits of green projects that are the result of partnerships between MSD and other agencies.

6. Involve neighborhoods in identifying potential green infrastructure solutions (e.g., by having a neighborhood competition to get grassroots ideas for potential solutions).
7. Develop education programs for schools that allow children to take information home.
    a. Participate in the two existing environmental education school magnet programs. (These programs are located at Portland and Cane Run elementary schools.)
8. Educate local leaders on the need for source reduction. One way to do this would be to show them the cost of specific solutions to SSO and CSO problems.
9. Explain problems and programs related to SSOs directly to homeowners (individually if necessary), and enlist neighborhood associations and other neighborhood institutions to help when appropriate.
10. Conduct an aggressive education effort before instituting any new requirement that would address private-side infiltration and inflow sources.
11. Develop and implement a public information and involvement strategy for each of the three parts of the sewer system that EPA is targeting: the "Big 4" SSO sewersheds, the other SSO sewersheds, and the CSO sewersheds.
    a. Each area should be mapped and made publicly available on MSD's website.
    b. Public information should roll out in consecutive waves so the different programs can be explained to the larger community and the direct effects can be explained to the parts of the community that may need to do more to make them work.
    c. The first wave of public information should address the "Big 4" SSO sewersheds, followed by the other SSO sewersheds, and then the CSO sewersheds.
12. Communicate effectively with the community regarding rate increases.
    a. Keep the message positive.
    b. Include as part of the message that the alternative to the IOAP is having the federal courts impose requirements on the community.
    c. Tell residents what they are getting for their money and how these efforts are improving public health.
    d. Help people feel involved in the process and understand that they have some responsibility for helping solve the problem (e.g., through communications that ask, "can you help us?" instead of "we're going to do this").
    e. Help residents understand what they are paying for and what the community has to do to improve water quality and comply with the Consent Decree.
13. Share the messages from MSD's IOAP Vision at Project WIN public meetings and with builders and other contractors.
14. Develop a continuing education program for elected officials and other government bodies such as the Planning Commission and governing boards of other cities in Jefferson County.

C. General Outreach and Education Strategies and Techniques

1. Use a variety of communication media to inform Louisville residents about issues, opportunities, and activities related to the IOAP and the Consent Decree. Examples include:
    a. feature articles and/or advertisements in the Courier Journal
    b. direct mail
    c. public service announcements on television
    d. radio (WLOU/WLLV 1350 and 101.3 FM for the west)

e. e-mail lists ("UofL announcements" to University of Louisville employees, e-mail lists for Metro Council members)
f. website(s) (provide information, as well as solicit input and questions)
g. community meetings ("piggy back" on other events/meetings such as the Mayor's Night Out, community association meetings, Metro Council meetings, etc.)
h. media "groundbreaking" events
i. 5-minute DVD video (highlight the central issues and indicate the short and long-term consequences)
j. hold a "creek concert" to raise awareness of stream issues to young people
k. develop/use a Kentucky State Fair Exhibit (permanent or traveling)
l. hold a speaker's forum and/or have a group of people available that could speak at community meetings and events
m. work with the Mayor's press staff and the Louisville Metro Neighborhoods Department to get the word out
n. hold a press conference
o. communicate about Project WIN through small city newsletters

2. Develop/use posters and visual displays to illustrate concepts to the public and provide context to IOAP activities. Specific suggestions include:
    a. Schematic of a combined sewer overflow
    b. Schematic of sump pumps and downspouts connected to sanitary sewers
    c. Map of the combined sewer area and outfalls against blue line streams and landmarks (road system would do)
    d. Map of SSO outfalls including the sewersheds of the "big four," as above
    e. Water Quality maps from the Beargrass Creek report card, also water quality info about Ohio River related to CSO outfalls
    f. Comparison of city sewer rates indicating which cities have consent decrees
    g. Time frames for the major deliverables in the Consent Decree
    h. Create visible representations of the solution, since they can be helpful for explaining project concepts to the public. Use these visual representations when soliciting community input.
3. Initiate a dialog with neighborhoods, potentially including door-to-door outreach, to better understand local water quality problems and to solicit local input on potential solutions.
4. Develop a speakers bureau to attend chamber/business association meetings and other groups that use speakers.
5. Conduct demonstration projects (Note: Overlaps with demonstration projects in Solution Ideas List). Specific ideas include:
    a. Create a demonstration area in each Jefferson County watershed to demonstrate and interpret healthy stream habitats and what MSD is doing to study and protect them.
    b. Strategically place demonstration projects (e.g., porous pavement) near neighborhoods.
    c. Create some sustainable lawns as pilot projects
    d. Develop a green infrastructure best management practice site similar to SD1 (Sanitation District Number 1 of Northern Kentucky).
    e. Add green demonstration/education facilities to old urban schools.

f. The Clifton neighborhood is motivated, so would be a good demonstration area to show the effects of behavior change.

g. Use the Butchertown Greenway Pump Station that is offline for an education and demonstration facility.

h. Cluster demonstration projects in one spot, so that people can view and compare multiple approaches to reducing flows into the sewer stream.

6. Present "Where is your CSO or SSO?" information on-line: On the MSD or LOGIC website, have the ability to type in your address and have it call up the location of the CSO or SSO that the property owner's waste goes to. The website could describe the watershed that contributes water and runoff to that individual CSO or SSO.
7. Support the identification of public watershed advocates for each Jefferson County watershed. Each watershed needs a public advocate. It could be connected with a nature center, or be an independent citizen advocacy group.
8. Make MSD facilities visitor friendly. For example, add educational exhibits around the flood wall, the history of flooding, etc. to the Beargrass Creek Pump Station and near the flood detention basins at the Fairgrounds.
9. Have MSD employees be educational ambassadors, as a way of making Louisville environmentally literate.
10. Public meeting ideas:
    a. To increase attendance, consider latching onto other meetings.
    b. Ideas for places/ways to advertise the public meetings:
        i. Churches
        ii. PTA meetings.
        iii. Metro Council and neighborhood newsletters
        iv. Channel 25 (Metro Louisville programming)
        v. Short recorded messages on phones
        vi. Send announcements about the public meetings through the Department of Neighborhoods distribution list to get word out to neighborhood groups.
        vii. Listservs
        viii. Get the word out at local schools so kids can take information home to their parents.
        ix. Local TV or NPR piece
        x. Homeowners Association newsletters
        xi. Suburban city newsletters
    c. Start public meeting presentations with information on rates to get people's attention.
    d. At public meetings, consider the fact that people need time to digest information from presentations and written materials.
    e. Avoid using acronyms in presentations and discussions with community members.
    f. Conduct direct outreach to block watch groups, neighborhood associations, and business associations to identify neighborhood leaders.
    g. Give people at least two weeks advance notice of the public meetings.
    h. Have the Metro Council representative for the local area host the public meetings.
    i. Hold public meetings at local schools, maybe in conjunction with other meetings that are already taking place.

j. Give information that is as specific in terms of location as possible at the public meetings.

k. Advertise some of the potential solutions being considered, and hold the meetings near some of the likely places of disruption, as a way to get people to attend public meetings.

l. Bring up the green aspects of the IOAP at public meetings in order to find more partners for MSD to collaborate with on green projects.

11. Add a portal to MSD's website where people can submit comments on Project WIN; run a public service announcement to inform people about the issues and the website address for submitting comments.
    a. Add a feature to the enhanced web portal that will allow homeowners to enter their addresses to see their proximity to local SSO and CSO zones and the problems associated with the zones. MSD could use its LOJIC database to design this feature.
    b. On the web portal, indicate whether projects are green or gray solutions, or whether the projects combine green and gray techniques.
12. Develop and run an information booth at selected festivals in the community (similar to the booth used for Project XL).
13. Use the potential disruption along Hikes Lane (part of the Big Four SSO plan) as an opportunity for broader education of the public about wet weather sewer overflow issues.
14. Yard signs similar to those used in Portland's residential Downspout Disconnection Program could be useful for education and outreach about MSD's IOAP. [Note: Overlaps with CSO and SSO Point Source Controls in Solution Ideas List.] Specific ideas for signs include:
    a. Messages such as "I disconnected my downspout" and/or "I have a rain barrel."
    b. The bottom of the sign could invite readers to "ask me" for more information.
15. Invite people to "join" Project WIN by installing rain gardens, rain barrels, reducing their use of lawn chemicals, etc.
    a. Add a page to MSD's website where people can submit notes or pictures of their efforts.
    b. Give out plaques or other awards to those who "join."
16. Consider strategies for conducting targeted outreach and providing feedback about monitoring results to specific neighborhoods. Ideas include:
    a. Create displays about specific green infrastructure projects (porous pavement, a green roof, etc.) that describes the project, its expected benefits, and what the results have been.
17. Develop additional educational challenges related to Project WIN, similar to the Project WIN marketing campaign competition conducted with local high schools in spring 2008. One opportunity for such an activity is Public Health Week.
18. Develop an educational facility (potentially near MSD's office) similar to the Northern Kentucky Sanitation District No. 1 "Public Service Park" (http://www.sd1.org/psp/psp.asp), which includes examples of green infrastructure and stormwater best management practices, hands-on exhibits illustrating how pollutants enter local waterways, and other information.
19. Develop videos that MSD could show on Metro TV (Chanel 25) or distribute by other means. Ideas include:
    a. Show potential disasters or other problems that could happen (e.g., water issues in Sudan) as a "hook" to get people's attention.
    b. Provide the history of MSD as an agency (e.g., the problems Louisville faced in the past, why MSD was created, etc.) as a "hook" to encourage people to learn more about what challenges MSD and the community face and what will be coming in the future.
    c. Show how MSD's infrastructure works and how common problems occur (e.g., when sump pumps are always running).

20. Provide parents with information at children's sporting events by setting up a tent or kiosk.
21. Consider "stepping up" outreach and education efforts when there is a crisis. In particular, remind people about the causes of the problem and explain how they can help reduce and prevent future problems.
22. Establish a "block watch" style targeted outreach approach for neighborhoods associated with individual CSO or SSO areas.

D. Education to Change Behavior [Overlaps with Behavior Change Strategies in Solution Ideas List]

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.
    c. Conduct education regarding fertilizer, weed killer, and other stormwater best management practices to neighborhood groups.
    d. Develop and educate residents about urban farming opportunities
    e. Teach and promote sensible/responsible development.
    f. Discourage chemical treatment and mowing near waterways to help keep debris from waterways.
    g. Provide information on where people can obtain rain barrels, plants for rain gardens, and other resources for reducing stormwater runoff and infiltration and inflow (I&I) to the sewer system, as well as information on how to find contractors to fix I&I issues and/or to construct green infrastructure solutions.
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. Hold "CSO Action Days" (like Ozone Action Days) during or right after a hard rain to raise awareness and promote behavior change (e.g., don't use your dishwasher or clothes washer, wait to drain your bathtub, etc.).
    a. This "Action Day" strategy could leverage existing communication networks or set up an e-mail list to periodically distribute notices that describe actions people can take to reduce their impacts.
4. 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
5. Encourage the use of best management practices for chemical use in lawn management practices.
    a. Inform greens keepers about best management practices (BMPs), since non-point source runoff is made worse by golf course chemicals.
6. Provide technical assistance to support behavior-change efforts.
    a. Develop a program in which residents could pay a small fee for MSD or another agency to conduct a water/wastewater audit on a house similar to the energy audits offered by LG&E.
7. Establish a recognition program for neighborhood efforts to implement, maintain, and monitor green infrastructure projects.
    a. Look for opportunities (similar to the lawn sign idea) that recognize individual accomplishments and also advertise for Project WIN.

8. Encourage community opinion leaders to change their behavior by adopting green solutions and communicate these efforts through Project WIN.
9. Create a direct link between neighborhoods and the CSOs they border and make the neighborhoods responsible for the maintenance and monitoring of the area.
10. Consider involving adults (as well as school children) in activities such as monitoring, maintenance of green infrastructure projects, and stream/river cleanups.
    a. Consider using canoes in the creek cleanup events.

E. Monitoring, Evaluation, and Accountability

1. Conduct a baseline survey and follow-up surveys of residents to determine whether education and outreach efforts are effective in raising awareness and in changing behavior and perceptions on issues related to the IOAP. [Note: This is also in the Data Request and Monitoring Suggestions List.]
    a. Develop a survey instrument (potentially with a coalition of cities) and use it every year.
    b. Include questions about who watches Metro TV and how people value the community's water resources in surveys about the effectiveness of Project WIN education and outreach efforts.
2. Collect baseline data, monitor performance, and ensure "high stakes accountability" for all of the education and outreach objectives of the IOAP.
    a. Evaluate the extent to which citizens value clean water, support MSD, understand best management practices for homes and businesses, and have a basic understanding of ecological conditions and processes.
3. Consider creating/supporting an evaluation center to evaluate and document the effectiveness of education and outreach programs.
4. Develop a "report card" for MSD's IOAP to post on MSD's Project WIN website and publish it in print format regularly (e.g., annually). This report card would report on performance measures related to the goals of MSD's IOAP and implementation of the consent decree.
5. Support volunteer monitoring efforts.
    a. Support efforts such as those practiced by the Salt River Watershed Watch program (http://kywater.org/watch/salt/).
    b. Support a volunteer monitoring program to monitor water quality in streams across the county. [Note: this is also in the Data Request and Monitoring Suggestions List]
6. Display monitoring data as part of an interpretive center. The display could be interactive and provide real-time data on the temperature of the water, pH, and other water quality and stream flow conditions that MSD monitors. [Note: this is also in the Data Request and Monitoring Suggestions List]

II. 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. 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.

[Note: This is also in the Solution Ideas List.]

2. Transform governmental facilities to be role models and learning laboratories—demonstrate how to do the right thing.
    a. 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.).

       [Note: This is also in the Solution Ideas List.]
3. Work with other building inspectors to raise awareness of wet weather issues during inspections.
4. Create a centralized water education center, such as the Gwinnett Environmental & Heritage Center in Gwinnett County, Georgia.
5. Develop and support an urban environmental education center. A possible location could be at Shawnee Park, which is a site for one of the big detention basins.

Wet Weather Team Data Request and Monitoring Suggestions List
Working Draft – July 7, 2008

The following is a list of data requests and monitoring suggestions made by Wet Weather Team (WWT) members for consideration for MSD's Integrated Overflow Abatement Plan (IOAP). This includes requests for information to support the WWT's deliberations and suggestions for the research, monitoring, and evaluation efforts associated with MSD's IOAP. 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, and WWT members are encouraged to send additional suggestions to the facilitation team. Requests that have been responded to will be kept on this list, but marked as "Addressed." 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.

Note: For monitoring and evaluation suggestions related to the IOAP public education and outreach plan, please see the Wet Weather Team Education and Outreach Idea List.

What's New (July 2008)

1. (I-A-9) – Additional information on the proposed Project WIN Public Information and Outreach program, including plans to develop an educational book (such as the "Kid WIN" book shown in the June 19th WWT presentation) and the details of MSD's plans to expand activities with middle schools.
2. (I-B-8) – Information on the amount of runoff that a mature tree would absorb.
3. (I-C-9) – Use a consistent format to show the results of the benefit-cost analysis of CSO and SSO project alternatives. Using a standard format facilitates the WWT's understanding of the information as well as the credibility of the analysis.
4. (I-C-10) – Create a map that shows the CSO and SSO overflow locations and/or a reference guide to help readers identify the locations of projects and overflow locations.
5. (I-C-11) – Develop a map showing the locations of green infrastructure demonstration project sites.
6. (II-B-4) – Keep track of how the rain barrels distributed to property owners actually work.
7. (II-C-2-b) – Include questions about who watches Metro TV and how people value the community's water resources in surveys about the effectiveness of Project WIN education and outreach efforts.

I. Requests for Information to Support WWT Deliberations

A. Requests for Information on Current Conditions and Current Plans for the IOAP

1. Data on how fecal coliform levels change with flow volumes.
2. Data on where water quality sampling is currently done in relation to recreational areas.
3. Current data MSD has on water quality in stream reaches (as aquatic health is an issue in some, but not all, stream reaches).
4. How MSD's development fees compare to development fees in other places.
5. Specific information on the percentage of backups that are the result of MSD's activities as opposed to private property issues.
6. Cincinnati's rates before the community started to respond to its consent decree.

7. Information on the "root causes" of wet weather CSO and SSO problems (e.g., the CSO volume attributable to residential downspouts) to assist with IOAP decision making. *[Note: This is an ongoing request.]*
8. Information on the differences between what is legal and required in the sanitary sewer system and the combined sewer system (e.g., whether or not it is legal to connect a sump pump to the combined sewer system).
9. Additional information on the proposed Project WIN Public Information and Outreach program, including plans to develop an educational book (such as the "Kid WIN" book shown in the June 19th WWT presentation) and the details of MSD's plans to expand activities with middle schools.

B. Requests for Information of the Effectiveness and Costs of Potential Solutions

1. Information on the long-term effectiveness of strategies that rely on source prevention (e.g., rain gardens).
2. Quantitative information on the benefits and/or effectiveness of eco-friendly solutions currently used by MSD.
3. Additional information on the benefits and challenges of different control approaches (e.g., why a storage solution might be preferable to a transport solution for a particular area). *[Note: This is an ongoing request.]*
4. Information on the costs and benefits of a regulatory approach to address private I&I as compared to other control strategies.
    a. Include information showing how the marginal costs of this approach compare to costs of other approaches and overall program costs, as there could be a lot of opposition to a new private I&I reduction program because of costs.
    b. One potential cost comparison could be comparing the costs of a private I&I reduction program using an ordinance to the costs of building a large underground storage facility to recover a similar amount of I&I.
5. Additional information on the effectiveness of green infrastructure solutions (e.g., websites or other resources).
6. Information on whether other communities have experienced any issues with their green infrastructure efforts (e.g., Chicago's Green Alley Program).
7. Data on community use of rain barrels over time in communities that have rain barrel programs.
8. Information on the amount of runoff that a mature tree would absorb.

C. Process Suggestions

1. Conduct assessments of different watersheds to find the best opportunities for green infrastructure.
2. Conduct additional analysis of the potential effects of behavior change and green infrastructure strategies at reducing flows into MSD's sewer systems.
3. Examine how choices about funding sources affect the total wastewater and stormwater rates that residents pay.
4. Provide examples illustrating the implications of different combinations of funding sources (e.g., loans, bonds, pay-as-you-go) for funding the IOAP, in order to better understand the tradeoffs. *[Addressed at the January 15, 2008 Wet Weather Team Meeting]*
5. Ask someone from the Kentucky Resources Council or one of the MSD consultants to look at the current Kentucky Plumbing Code to see if it is as strong as it needs to be as it relates to CSOs and SSOs.

6. Involve experts in making financial decisions, given the relationships among the timing of projects, cash flows, bond rating, and other factors.
7. Include information on the amount of debt remaining to be paid after the Consent Decree implementation period in future funding presentations.
8. Develop a flow diagram or decision tree showing the process for identifying and selecting projects.
9. Use a consistent format to show the results of the benefit-cost analysis of CSO and SSO project alternatives. Using a standard format facilitates the WWT's understanding of the information as well as the credibility of the analysis.
10. Create a map that shows the CSO and SSO overflow locations and/or a reference guide to help readers identify the locations of projects and overflow locations.
11. Develop a map showing the locations of green infrastructure demonstration project sites.

II. Suggestions Related to the IOAP Monitoring, Evaluation, and Research Plan

A. Suggestions Related to Water Quality and Public Health Monitoring

1. Consider monitoring water quality and flow at additional locations, based upon the IOAP's objectives and the performance measures developed for the program. Potential new monitoring locations to consider include:
    a. Intensely used public access sites within Beargrass Creek
    b. Stream segments MSD does not monitor currently, such as Buechel Branch and upper South Fork of Beargrass Creek
    c. Additional locations within the Floyds Fork watershed
2. Collect environmental performance data such as biological indexes of aquatic health (fish counts, macro-invertebrate sampling, etc.), nutrient sampling, downstream pollutant load, and tree cover or other measures of habitat restoration efforts.
3. Look for data on the public health impacts of polluted water (collected by the School of Public Health or the Health Department and included in an annual report).
4. Involve the research community (e.g., students at the University of Louisville's School of Public Health) in water quality monitoring and data analysis.
5. Consider whether to use EPA's quality control protocols for water quality monitoring efforts.
6. Support volunteer monitoring efforts.
    a. Support efforts such as those practiced by the Salt River Watershed Watch program (http://kywater.org/watch/salt/).
    b. Support a volunteer monitoring program to monitor water quality in streams across the county. [Note: this is also in the Education and Outreach Ideas List.]
7. Display stream monitoring data as part of an interpretive center. The display could be interactive and provide real-time data on the temperature of the water, pH, and other water quality and stream flow conditions that MSD monitors. [Note: this is also in the Education and Outreach Ideas List.]

B. Suggestions Related to the Effectiveness of Green Infrastructure Projects

1. Build monitoring components into green infrastructure projects to help demonstrate the overall effectiveness of green infrastructure solutions.
2. Pick a CSO catchment area and study the effects of rain barrels and rain gardens.

3. In order to gain information on the long-term effectiveness of strategies that rely on source prevention, conduct a demonstration project in a small area, and compare the changes in pollutant loading and stormwater flows to those of other areas.
4. Keep track of how the rain barrels distributed to property owners actually work.

C. Suggestions Related to the Effectiveness of Behavior Change Efforts

1. Conduct separate research and data analysis to supplement any data collected through surveys about people's behavior.
2. Conduct a baseline survey and follow-up surveys of residents to determine whether education and outreach efforts are effective in raising awareness and in changing behavior and perceptions on issues related to the IOAP. [Note: This is also in the Education and Outreach Ideas List.]
    a. Develop a survey instrument (potentially with a coalition of cities) and use it every year.
    b. Include questions about who watches Metro TV and how people value the community's water resources in surveys about the effectiveness of Project WIN education and outreach efforts.

D. Suggestions Related to the Presentation of Information in the IOAP

1. Model the water quality benefits of stormwater reduction efforts and present this information to EPA along with the benefits of overflow abatement efforts.
2. Present the results of water quality monitoring so they show the benefits of overflow abatement (e.g., don't focus on bacteria levels only during rain events, as this obscures the fact that streams usually meet the bacteria criteria at other times).

E. Other Suggestions

1. Monitor customer satisfaction data (e.g., number of hits on MSD's website, number of requests for information, customer satisfaction surveys).

Emergent Vision for MSD's Integrated Overflow Abatement Plan
Working Draft – July 9, 2008 [Changes & Additions Are Highlighted]

This document summarizes the emergent vision for MSD's Integrated Overflow Abatement Plan, as understood by the Wet Weather Team (WWT) stakeholder group. This is a working draft document that will be revised and updated during the Wet Weather Team process based on stakeholder feedback and new information about the draft Plan that becomes available.

Scope of the Integrated Overflow Abatement Plan and Expected Water Quality Benefits

The Louisville and Jefferson County Metropolitan Sewer District's Integrated Overflow Abatement Plan (IOAP) is a long-term plan to control combined sewer overflows (CSOs) and sanitary sewer overflows (SSOs) in the community. The IOAP is expected to improve water quality in both Jefferson County streams and the Ohio River. The expected water quality benefits of the IOAP include: (a) reductions in the peak levels of bacteria in Beargrass Creek and (b) a reduction in the duration of wet weather impairment of local waterways (i.e., the number of days that bacteria levels exceed water quality standards during periods of wet weather). The water quality improvements will be greater in Beargrass Creek than in the Ohio River. The IOAP—in coordination with other community water quality initiatives (further described below)—will also improve water quality under ambient conditions.

[Review Note: Revisions to the following two paragraphs of the emergent vision (regarding the relationship of the IOAP to other community initiatives) are on hold pending MSD discussions with Metro Louisville Government and other organizations.]

> Sewer overflow control is essential to meeting water quality standards, but overflow control alone is not enough to meet water quality standards. In light of this challenge, MSD plans to leverage its role in supporting broader water quality improvement efforts in the community. The IOAP will be one of the key elements of MSD's participation in those water quality improvement efforts. In particular, the IOAP will be complementary to other wet weather and water quality programs managed by MSD and/or by other community partners. These complementary efforts include, but are not limited to, the Mayor's Green City Initiative, the Partnership for a Green City, Metro Louisville's Municipal Separate Storm Sewer System (MS4) discharge permit, and initiatives of Jefferson County Public Schools, private developers, and other entities.
>
> The IOAP—as MSD's wet weather consent decree response—will be a federally enforceable action plan for sewer overflow abatement. By design, the IOAP will limit the scope of MSD's federally enforceable consent decree response to commitments that directly relate to MSD programs and activities to address combined sewer overflow (CSO) and sanitary sewer overflow (SSO) issues. Other community water quality programs, which may be partly or completely out of MSD's control, can provide synergistic benefits with the IOAP, but they do not fall under the same level of federal enforcement. These programs may, however, have different mechanisms for ensuring accountability (e.g., the State of Kentucky oversees the MS4 stormwater permit that MSD and several other agencies hold).

Values-Based Evaluation Process

MSD and the Wet Weather Team vetted and agreed upon a values-based performance evaluation framework to evaluate and select alternatives for the IOAP. The Wet Weather Team identified the following eleven community values to underpin the analysis and selection of alternatives for the IOAP.

Project-Specific Values

- Public health enhancement
- Environmental enhancement
- Regulatory performance
- Eco-friendly solutions
- Asset protection

Programmatic Values

- Customer satisfaction
- Economic vitality
- Education
- Environmental justice and equity
- Financial equity
- Financial stewardship

Using this structured decision-making process as framed by the Wet Weather Team, MSD is developing and evaluating overflow abatement control options for the IOAP based on managing risks to these community values. In particular, MSD's technical team is analyzing each project alternative considered for the IOAP in terms of potential benefits and costs, where "benefits" are quantified based on the anticipated reduction in risks to the community values and "costs" reflect the total capital and operational costs of the alternative. The benefit-cost analysis influences the selection of site-specific abatement approaches or technologies, site-specific levels of protection (within the boundary conditions for CSOs and SSOs described below), and the relative priority of projects for implementation.

Several of the Wet Weather Team's community values relate to financial considerations, including the cost-effectiveness of individual solutions and the program as a whole (financial stewardship), the affordability of the program's total costs for the community (economic vitality), and how the costs are allocated among different segments of the population (financial equity). MSD and the Wet Weather Team are using the results of the values-based benefit-cost analysis of project alternatives to provide context to discussions about the appropriate level of investment in the IOAP. Discussions about total program costs and the selection of projects for the IOAP will consider, as directed in EPA's CSO Control Policy, a "knee of the curve" analysis to determine where the increment of pollution reduction achieved in the receiving water diminishes compared to the increased costs. In addition to this analysis, the community's level of investment in the IOAP can also be considered in the context of anticipated future requirements and other needs for MSD services, including stormwater compliance needs associated with Metro Louisville's MS4 permit and requirements to meet the forthcoming total maximum daily load (TMDL) allocations for Beargrass Creek. This consideration of other water quality investment needs is important since sewer overflow control alone will not be sufficient to meet water quality standards.

Control Levels for Combined Sewer Overflows and Sanitary Sewer Overflows

Under the Clean Water Act, CSOs are permitted discharges in wet weather, as long as they are managed to avoid degradation of water quality in the receiving streams. EPA's CSO Control Policy[1] sets specific abatement targets for CSOs. To be permitted, wet-weather CSOs must be controlled so that either water quality standards are achieved or the permit-holder can show that the CSO discharges do not cause or contribute to exceedances of water quality standards. Based on EPA's CSO Control Policy, EPA may respond to MSD's proposed strategy for controlling wet weather CSO discharges indicating a need for a temporary variance or suspension of water quality standards during wet weather. Variances are temporary, not permanent, solutions to achieve compliance with the Clean Water Act. As stated in EPA's CSO Control Policy, variances are reviewable generally every three years.

MSD's strategy for SSO control reflects the fact that SSOs, unlike wet-weather CSOs, are unauthorized discharges that must be "eliminated" under the Clean Water Act. In the IOAP, the values evaluation framework will be used to determine the appropriate level of control of SSOs, although the minimum

[1] EPA's Combined Sewer Overflow Control Policy is available at http://cfpub1.epa.gov/npdes/cso/cpolicy.cfm.

level of protection is a two-year design storm. A two-year design storm is defined as a storm with a 50 percent probability of occurring in a given year. Based on an analysis of sixty years of historical weather patterns for Jefferson County, the technical team is proposing to use a three-hour "cloud burst" storm, with a statistically anticipated rainfall of 1.8 inches, as the basis for the two-year design storm. The Cities of Atlanta, Cincinnati, and Knoxville also use a two-year design storm as the minimum protection level for SSOs. The approach of using the values evaluation framework to determine the SSO control level means that solutions to address an individual SSO would be designed to protect against larger storms (e.g., a five-year storm instead of a two-year storm) if that would yield a higher benefit-cost ratio in the analysis of project alternatives.

Components of MSD's Integrated Overflow Abatement Plan

Control options in the IOAP (the IOAP "toolkit") include source control (including green infrastructure and infiltration and inflow [I&I] reduction efforts), storage, conveyance/transport, treatment, and sewer separation. The technical team is using the benefit-cost tool to compare the project alternatives and program elements considered for inclusion in the IOAP. The specific mix of control options for individual CSO or SSO locations is driven by the benefit-cost analysis of how the project alternatives affect the WWT's community values and site-specific considerations. Project alternatives are designed to be built around MSD's existing infrastructure (e.g., large diameter pipes and wastewater treatment plants) and draw on synergistic benefits from other MSD projects (e.g., the "Big Four" SSO projects). Project budgets will include a stream restoration allowance to fund localized opportunities to restore streams and other waterways near the sites of overflow abatement projects.

Driven by the values-based benefit-cost analysis, the IOAP is anticipated to reflect a balanced mix of green and gray solutions to prevent and control sewer overflows. "Green" solutions include options such as green roofs, rain gardens, rain barrels, porous pavement, and bioretention, while "gray" solutions include options such as storage, treatment, conveyance/transport, and sewer separation. In addition to site-specific green infrastructure projects, the IOAP is expected to contain programmatic green solutions that reduce flow at multiple CSO sites (e.g., a rain barrel program) and that may involve partnerships with other public and private entities.

As of June 2008, MSD's technical team is analyzing potential options to control private sources of I&I into the sanitary sewer system, including building laterals, downspouts, sump pumps, and foundation drains. Private-side I&I control is expected to be an important part of the IOAP. Options under consideration include potentially adopting a requirement for inspections of private properties (e.g., during the property transfer process, when building permits are issued, when contractors install roof and gutter systems, when plumbers connect sump pumps, and/or at other times), along with providing some form of cost share and conducting an aggressive education campaign. Although I&I reduction is particularly relevant to SSO control (since the sanitary sewer system was not designed to accept inflow), the technical team is considering whether similar requirements should also apply to the combined sewer system.

As a guiding principle, MSD's IOAP is being developed based on front-end consideration of source control and green infrastructure. This means that more traditional "gray" infrastructure in the IOAP will be sized after considering both (1) the anticipated flow-reduction benefits of programmatic and site-specific green infrastructure solutions and (2) the anticipated effectiveness of other source control approaches, including reduction of private sources of I&I. Green solutions in the IOAP will be implemented as soon as possible, to allow data to be gathered on the flow reduction benefits that occur. Prior to the final design of supporting gray solutions, the actual flow reduction performance will be documented and compared against the estimated targets. The final sizing of the gray solutions will then be based on actual documented performance of the green solutions previously implemented.

Public Information, Education, and Involvement Program ***[Review Note: This is a new section developed based on the June 19, 2008 WWT presentation and discussion.]***

Education and public involvement are critical to the long-term implementation success of the IOAP. MSD is using the term "Project WIN" (Waterway Improvements Now) to describe its consent decree response activities to the public. The ongoing public information, education, and involvement program for Project WIN will be designed to accomplish the following objectives:

1. Generate a sense of personal ownership and responsibility for clean water;
2. Promote and sustain participation in critical voluntary programs in the IOAP, including private-side I&I control and green infrastructure;
3. Promote public acceptance and support for the financial investments required to achieve consent decree and Clean Water Act compliance; and
4. Encourage support for other agency programs or legislation that supports overflow abatement efforts.

To achieve these objectives, the Project WIN education and public involvement program will use a wide range of communication media. In particular, the program includes the following elements:

- Public meetings and community events;
- Enhanced web portal for Project WIN;
- Speaker's bureau and technical support;
- Print and electronic media (e.g., print advertisements, press releases, targeted brochures and pamphlets, reports, newsletters, billing inserts, public TV video, radio announcements, etc.);
- Recognition programs;
- Demonstration projects;
- Tours, demonstrations, and workshops;
- Enhanced school partnerships; and
- Annual effectiveness monitoring through direct mail and phone surveys.

These public involvement efforts are focused on several key audiences, including the general public, schools and children, and target groups such as property owners, project neighborhoods, builders, and restaurants. Focusing education efforts on children is important to ensure the long-term sustainability of voluntary programs in the IOAP. For the general public, MSD envisions five key messages:

1. Value clean water.
2. Your investment is paying dividends, and our water is getting cleaner.
3. Protecting public health is critically important.
4. MSD and many community partners are working hard to improve water quality.
5. <u>You</u> can make a difference in improving water quality.

Monitoring, Evaluation, and Adaptive Management ***[Review Note: This section/paragraph was moved so that it follows education.]***

MSD's IOAP will use an adaptive management implementation approach based on monitoring and evaluation efforts. MSD's post-construction compliance monitoring and evaluation plan for the IOAP will include: (a) water quality monitoring, (b) sewer flow monitoring, (c) overflow events analysis, (d)

gray and green infrastructure project performance monitoring, and (e) measurement of the effectiveness of source control and behavior-change efforts. MSD will adapt its CSO management and SSO elimination approaches based on the monitoring and evaluation results; this may include recalibrating models, "right-sizing" gray solutions, reevaluating the effectiveness of green solutions, and adjusting the types and characteristics of projects planned for later phases of implementation. At this time there is recognition that historical weather trends may not be as reliable as in the past due to potential changes in the climate. The proposed adaptive management approach will allow MSD to monitor evolving weather pattern developments and adjust its plans as more data become available.

Future Development Considerations

Solutions in the IOAP will consider future development based on the community's long-term land-use plan, Cornerstone 2020.[2] IOAP solutions will be designed to accommodate the anticipated impacts of population growth and land-use development in that the solutions will consider the effects of growth on connections to existing infrastructure that is upstream from existing overflow points. The IOAP is not, however, intended to provide capacity for all future growth predicted by Cornerstone 2020. Cases where the growth outlined in Cornerstone 2020 would logically be provided by new infrastructure, and not hydraulically dependent on or connected to the IOAP solution, are not considered part of the projects in the IOAP. In summary, the solutions in the IOAP will be designed and sized to account for the impacts of anticipated growth on existing infrastructure, but the IOAP itself is not intended to build the capacity needed for growth.

MSD's Capacity, Management, Operations, and Maintenance (CMOM) Program, which is part of MSD's Consent Decree response but separate from the IOAP, includes standard operations and maintenance activities practices designed to, among other things, investigate capacity-constrained areas of the sewer system. The CMOM program also includes a System Capacity Assurance Program focused on providing capacity for current and future service needs.

Continued development in the community will require MSD to implement measures to reduce wet-weather flows. As currently conceived, MSD proposes a three-to-one offset of wet-weather flows from new development. This means that existing flows entering MSD's sanitary sewer systems will be reduced at a ratio of three gallons for every new gallon added. MSD's flow reduction efforts will be designed to correct deficiencies in the existing sewer system in the same geographic areas (sewersheds) of the system affected by the flows from new development. MSD would track flow reduction "credits" to ensure that the flow reductions occur in the appropriate geographic locations to offset the new flows. (This three-to-one offset approach is based on the City of Knoxville's Capacity Assurance Program.) As of June 2008, the MSD Board is considering the fee structure for the offset plan.

Funding Plan

[Review Note: Revisions to the text on the IOAP funding plan are on hold pending additional information and WWT discussions on IOAP program costs, rate impacts, and financing options.]

> The funding plan for the IOAP is based on the principle that rates and fees for the IOAP must pay MSD's operating costs and debt service, and must adequately maintain MSD's current bond rating. Furthermore, MSD's rates and fees must allow for continued economic development in the community. In particular, a strong local economy will be important to sustain the affordability of the IOAP. These principles for the funding plan will affect the amount of money

[2] For more information about the Cornerstone 2020 plan, see http://www.louisvilleky.gov/PlanningDesign/Cornerstone+2020.htm.

MSD may borrow at any one time and the level of increases in rates and fees needed to fund capital and operating expenses for IOAP implementation.

Preliminary estimates of IOAP costs appear to be within community tolerance for rate increases.

DRAFT Summary of Cedar Creek and Hite Creek Modeled 2-yr, 3-hr Solutions

*** Highlighted rows indicate the preferred alternative.

MSD Louisville / Jefferson County Metropolitan Sewer District

PROJECT WIN

Watershed/ Geographic Region	Documented and Suspected SSOs Addressed	SSO Location Description	Project or Cost Sheet Name	Solution Technology Details	Project Description	Total Benefit Score	Benefit/ Cost Ratio (Capital Costs)	Benefit/Cost Ratio (Present Worth Costs)	Justification/ Other Comments
Cedar Creek - 70158	28998, 28984, 63094, 63095, 70158	Located in Idlewood Subdivision and Rileywood Estates near Sprigwood Ln (close to Bardstown Rd), north of I-265, next to Cedar Creek and a tributary to Cedar Creek	S_CC_CC_70158_M_09A_C	In-line Storage	In-line storage with 920 LF of 96" pipe to store wet weather peak flow, total of 2,606 LF open cut sewer to increase hydraulic capacity during wet weather peak flows, 10 easements required	408	8.15	10.38	
			S_CC_CC_70158_S_01_C	Pipe Upgrades	Upsize 8,218 LF of interceptor pipes in the area, currently SSO records report 600,000 gallons of overflow at this site on average with a return period of 7 months, 26 easements required	412	5.76	7.26	
Cedar Creek - 81316	Fairmount Road PS (81316 & 97362)	On MSD owned Fairmount Rd PS (MSD1022-PS) property, north of Fairmount Rd and east of Bardstown Rd, next to Big Run Stream, in Glenmary Subdivision	S_FF_CC_81316_M_09A_C	In-line Storage	Upsize influent lines with 387 LF of 48" pipe to create upstream in-line storage, sewer in rock, 1 easement required	94	16.33	20.80	
			S_FF_CC_81316_M_03_C	Pump Station Upgrades	PS upgrades to a pumping capacity of 798 MG annually, currently SSO records report the 2 overflow approximately 27,000 gallons on average 7 times per year, 1 easement required	118	3.83	3.50	
Cedar Creek - 67997	67997, 67999, 86423, 89195, 89197	Located in Creek Hollow Subdivision off Johnson School Rd (just north of I-265), next to Little Cedar Creek	S_CC_CC_67997_M_01_C	Pipe Upgrades	Upsize 4,039 LF of open cut and 215 LF of tunneling interceptor pipe in the area, 19 easements required	144	4.84	6.06	
					Current Preferred Solution Costs for Cedar Creek:				
Hite Creek - MSD1082	Meadow Steam PS (91087 & MSD1082-PS)	Meadow Stream PS is on the west side of Crestwood near I-71	S_CC_HC_MSD1082_S_09A_C	In-line Storage	Underground in-line storage with the current influent line to the PS, consisting of 131 LF of 8" pipes, 184 LF of 30" pipes, 238 LF of 120" pipes, another underground solution with equivalent capacity, 2 easements required	242	9.43	12.06	
			S_CC_HC_MSD1082_S_09B_C	Off-line Storage	Above ground storage vault for off-line 200,000 gallon storage, and 95 LF of pipe, 2 easements required	230	8.69	8.57	
			S_HC_HC_MSD1082_S_03_C	Pump Station Upgrades	Upgrade Meadow Stream PS to handle peak flows of approximately 4.5 MGD, upgrade 15,395 LF to 18" FM in rock	264	3.19	2.81	
Hite Creek - MSD1086	Floydsburgh Road (MSD1086-PS & 90776 & 108956 & 108957)	Floydsburgh Rd PS is on the south side of Crestwood just west of Floydsburgh Rd	S_CC_HC_MSD1086_M_07_C_B	Infiltration Reduction	Inflow and Infiltration reduction by slip lining 789 LF of 8" pipe for the suspected problem area south of the PS and near the PS drainage ditch, 12 easements required	328	70.70	69.25	Cost includes I/I reduction + post construction monitoring - if project is unsuccessful the next best alternative (PS upgrades) would be implemented
			S_CC_HC_MSD1086_M_03_C	Pump Station Upgrades	Upgrade PS and 1,183 LF of FM, 110 MG annual pumping volume to handle peak flow after buildout, 1 easement required	484	37.40	37.43	
			S_CC_HC_MSD1086_M_07_C_A	Infiltration Reduction	Inflow and Infiltration reduction by slip lining the entire sewershed of 2,685 LF of 8" pipe contributing to the PS, manholes near the stream will be sealed, 12 easements required	322	28.73	27.95	
			S_CC_HC_MSD1086_M_09A_C	In-line Storage	Underground inline storage to capture wet weather peak flows and flow into wet well as storm subsides. Volume estimated at 0.03 MG (2-yr storm).	Removed project (not enough room on the site)			
			S_CC_HC_CrestwoodPS_M_13_C	New Regional Pump Station	Take Floydsburg Road PS and Kavanaugh Road PS off line, construct interceptors to run south to a new regional PS to serve the whole Crestwood area, construct 6,135 LF of FM in rock parallel to Floydsburg Road Interceptor, involves 6,914 LF of open cut sewer in rock, 35 easements required	686	8.14	9.28	
Hite Creek - MSD1085	Kavanaugh Road (MSD1085-PS)	Kavanaugh Rd PS is on the southwest side of Crestwood downstream of Cherry Lane PS & Kavanaugh Center PS	S_CC_HC_MSD1085_S_03_C	Pump Station Upgrades	Upgrade PS and 2,458 LF of FM, 246 MG annual pumping volume to handle peak flow after buildout, 1 easement required	408	14.92	15.16	
			S_CC_HC_MSD1085_S_09A_C	In-line Storage	In-line overflow storage with the two PS influent lines, involves 2,243 LF of open cut 8" - 72" sewer in rock, 3 easements required	314	5.25	6.71	
					Current Preferred Solution Costs for Hite Creek:				

*All benefit scores and Benefit/Cost ratios use a weighed benefit score.

**SSOs eliminated by projects considered part of the baseline conditions are not included.

*** Highlighted rows indicate the preferred alternative.

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DRAFT Summary of Pond Creek Modeled 2-yr, 3-hr Solutions

*** Highlighted rows indicate the preferred alternative.

MSD Louisville / Jefferson County Metropolitan Sewer District

PROJECT WIN

Watershed/ Geographic Region	Documented and Suspected SSOs Addressed	SSO Location Description	Project or Cost Sheet Name	Solution Technology Details	Project Description	Total Benefit Score	Benefit/ Cost Ratio (Capital Costs)	Benefit/Cost Ratio (Present Worth Costs)	Justification/ Other Comments
Pond Creek - PC03	25477, 25478, Cooper Chapel PS (25480 & MSD0130-PS)	South of I-265, next to Cooper Chapel and near Smyrna road, in Maple grove Subdivision, near Fishpool Creek as well as another stream, upstream of Cooper Chapel	S_PO_WC_PC03_M_01_C	Eliminate Pump Station & Pipe Upgrades	Charleswood Subdivision Interceptor will eliminate Cooper Chapel PS, upsize 1,846 LF of open cut sewer (mostly in rock) downstream, this estimate does not include Cooper Chapel PS elimination at this time	544	51.58	64.59	Charleswood Int. Project specifically eliminates Cooper Chapel PS.
Pond Creek - PC04	35308, 35309, Cinderella PS (60679 & MSD1013-PS)	35308 & 35309: North of I-265 & south of Manslick, near a stream, located near Methodist Retirement Homes. 60679 & MSD1013-PS: South and near I-265, next to Cinderella Road, located next to a stream and near 2 other streams, in Cinderella Estates Subdivision.	S_PO_WC_PC04_M_03_C	Pump Station Upgrades	Upgrade Cinderella PS to 1.3 MGD by upgrading two 0.5 MGD pumps to 0.8 MGD, reuse wet well and odor control	976	103.85	107.07	35308 and 35309 are believed to be maintenance related and added to the investigation list
			S_PO_WC_PC04_M_0309B_C	Off-line Storage	Off-line 0.23 MG pumped open storage basin at Cinderella PS to store 0.92 MG annually, 12 LF 12" FM connector	892	43.91	44.99	
			S_PO_WC_PC04_M_0109B_C	Off-line Storage	Off-line 0.46 MG gravity operated open storage basin at Cinderella PS to store 0.92 MG annually, 5 LF 12" open cut sewer connector	892	41.67	41.44	
Pond Creek - PC05	Lantana Drive #1 PS (25484 & 93719 & MSD0101-PS)	Next to Cooper Chapel Road and near Lantana Road, In Maple Grove Subdivision, Near a tree service buisness	S_PO_WC_PC05_M_09A_C	In-line Storage	In-line storage upstream of Lantana PS	currently being evaluated			
			S_PO_WC_PC05_M_0109B_C	Off-line Storage & Pipe Upgrades	Gravity operated covered 0.08 MG storage at Lantana PS to store 0.16 MG annually, additional conveyance improvements needed to carry flow to the PS, including 231 LF of open cut sewer (10"-12")	1050	220.16	225.28	
			S_PO_WC_PC05_M_010309B_C	Off-line Storage & Pipe Upgrades	Pumped open 0.08 MG off-line storage (large wet well) at Lantana PS to store 0.32 MG annually, expect to be tied into existing PS system, additional conveyance improvements needed to carry flow to the PS, including 221 LF of open cut sewer, 10 LF of 12" FM in rock	1050	76.82	79.60	
			S_PO_WC_PC05_M_0103_C	Pump Station & Pipe Upgrades	Upgrade Lantana PS to 0.9 MGD, upgrade or replace 1,345 of 8" FM in rock, additional conveyance improvements needed to carry flow to the PS and downstream of FM, including 221 LF of open cut sewer (10"-15")	972	74.10	74.79	
Pond Creek - PC06	31300, Government Center PS (MSD0180-PS)	Near Outerloop and Vaughin Mill Roads, next to Pennsylanaia Run Stream, also near many buisnesses	S_PO_WC_PC06_M_0103_C	Pump Station & Pipe Upgrades	Upgrade Government Center PS to 730 MG pumped annually by replacing existing ~1 MGD pumps with 2 MGD, can probably be tied into existing control system and building but will need upgrades, 1,589 LF of open cut and 3,507 LF of FM improvements in the area	780	27.18	29.02	
			S_PO_WC_PC06_M_010309B_C	Off-line Storage & Pipe Upgrades	Pumped covered and buried 0.41 MG off-line storage basin at the Government Center PS, 2 MG stored annually, 210 LF of open cut and 10 LF of 12" FM gravity improvements in rock	956	23.13	23.73	
			S_PO_WC_PC06_M_0109B_C	Off-line Storage & Pipe Upgrades	Gravity operated 0.82 MG off-line underground covered storage basin at the Government Center PS, 2 MG stored annually, 220 LF of open cut sewer gravity improvements	956	20.68	21.77	

DRAFT Summary of Pond Creek Modeled 2-yr, 3-hr Solutions

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MSD Louisville / Jefferson County Metropolitan Sewer District

PROJECT WIN

Watershed/ Geographic Region	Documented and Suspected SSOs Addressed	SSO Location Description	Project or Cost Sheet Name	Solution Technology Details	Project Description	Total Benefit Score	Benefit/ Cost Ratio (Capital Costs)	Benefit/Cost Ratio (Present Worth Costs)	Justification/ Other Comments
Pond Creek - PC07	Avanti PS (21229-W)	East of Fegenbush Road, close to the intersection of Fernview and Avanti, In Brynwood Subdivision, near Little Cedar Creek, upstream of Avanti (MSD0113-PS)	S_PO_WC_PC07_M_0103_C	Pump Station & Pipe Upgrades	Upgrade Avanti PS to 0.9 MGD from current pumps at 0.1 MGD each, additional gravity improvements required in area including 725 LF of 10" open cut sewer	444	31.31	34.74	Downstream improvements to accommodate increased flows.
			S_PO_WC_PC07_M_0109B_C	Off-line Storage & Pipe Upgrades	Open off-line 0.32 MG gravity storage basin (large wet well) at Avanti PS connected to wet well with a 10 LF 12" open cut sewer in rock, some downstream improvement required to eliminate surcharging including 15 LF of 10" open cut sewer	468	30.71	30.97	
			S_PO_WC_PC07_M_0309B_C	Off-line Storage	Pumped open 0.16 MG off-line storage (large wet well) at Avanti PS connected to existing wet well, assumed small structure needed for connection pumps band partial sharing of Avanti assets, 15 LF of 10" open cut sewer and 10 LF of FM	468	19.78	21.22	
Pond Creek - PC08	19369, (29933, 29948, 29943, 31083, 31084), 57874, 79076, Lea Ann Way PS (MSD1010-PS)	19369: North of Outerloop and near Layne Road, next to a stream, in Moringside Heigths & Knob View Subdivisions. (29933, 29948, 29943, 31083, 31084):North of Outerloop & South of Fern Valley Road & east of Preston Highway, All of the SSOs are along a stream, in Whispering Hills Subdivision. 57874: Near St. Antansus School, Landuse is residential however the SSO is near a commerical landuse. 79076: On Hanses Road, North of Fern Valley Road, South of Popular Level Road. Lea Ann Way PS (MSD1010-PS): MSD owned, North of Outerloop and South of Fern Valley Road, near Sungold Estates Subdivision, Near the Northern Ditch stream.	S_PO_WC_PC08_M_0103_C	Pipe Upgrades	3,255 LF of open cut sewer (12" to 18") upstream improvements for Lea Ann Way PS	422	37.95	46.79	1st pump has been replaced and developer is putting in the 4th pump. Ops is replacing the other pumps.
			S_PO_WC_PC08_M_0309B_C	Off-line Storage & Pipe Upgrades	Off-line 0.2 MG storage basin at Lea Ann Way PS operated by pumping, some clear and grubbing may be needed in sewers behind houses, 3,845 LF of open cut sewer and 31 LF of FM upstream improvements	540	23.75	26.81	
			S_PO_WC_PC08_M_0109B_C	Off-line Storage & Pipe Upgrades	Gravity operated 0.4 MG off-line storage basin at Lea Ann Way PS, 3,875 LF of open cut sewer upstream improvements, some clear and grubbing may be needed in sewers behind houses	540	16.50	17.74	
Pond Creek - PC09	27116, 70212, 17724, Caven Ave PS (MSD0133-PS)	27116 & Caven Ave PS (MSD0133-PS): West of Preston Highway, South of I-265, East of I-65, near Caven Road, next to Mud Creek Stream, and in Treasure Island Subdivision, 70212: west of Preston and near a stream.	S_PO_WC_PC09_M0109B_C	Off-line Storage & Pipe Upgrades	Off-line gravity storage (0.3 MG) at Caven Avenue PS and (1.8 MG) behind the Meijer on Preston Highway near South Park PS, 4 MG stored annually, 2 easements required, 194 LF of open cut. Basins are larger than actual required volume to allow freeboard to prevent surcharging in collection system. Basins will only be used during peak rain events and per odor guidelines should not be an irritant. ~1.5 acres needed at Meijer (see ground truth document)	570	8.04	8.53	The Meijer basin is sized to reduce surcharging in trunk sewer upstream of I-65 (7,000 LF of 32" pipe feeding 54" pipe under interstate) constriction
			S_PO_WC_PC09_M0309B_C	Off-line Storage	Off-line 0.35 MG pumped storage at Caven Avenue PS and near the Meijer on Preston Highway, 11 MG stored annually, 2 easements required, 2,500 LF of open cut, 219 LF tunneled, 194 LF of FM in rock	570	3.14	3.53	
			S_PO_WC_PC09_M_0103_C	Pump Station & Pipe Upgrades	Upsize Caven Avenue PS, additional gravity pipes in Okolona area, upsize Caven FM, 548 MG pumped annually, 17,828 LF of open cut, 397 LF tunneled	570	3.12	3.90	

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DRAFT Summary of Pond Creek Modeled 2-yr, 3-hr Solutions

*** Highlighted rows indicate the preferred alternative.

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PROJECT WIN

Watershed/ Geographic Region	Documented and Suspected SSOs Addressed	SSO Location Description	Project or Cost Sheet Name	Solution Technology Details	Project Description	Total Benefit Score	Benefit/ Cost Ratio (Capital Costs)	Benefit/Cost Ratio (Present Worth Costs)	Justification/ Other Comments
Pond Creek - PC10	Edsel PS (92098 & MSD1048-PS), Leven PS (36419 & MSD1019-PS)	Edsel PS: South of Hurtsbourne Pkwy and east of Watterson Trl on Ferndale. Leven PS: South of I-265, east of Preston Highway North of Mount Washington Road, near a stream and in Cooper Farms Subdivision.	S_PO_WC_PC10_M_0109A_C	In-line Storage	In-line storage for Leven PS, possible easements and 1,283 LF open cut sewer improvements needed	currently being evaluated			
			S_PO_WC_PC10_M_0109B_C	Off-line Storage	Add gravity operated off-line storage to Leven (0.06 MG) and Edsel (0.07 MG) PS, 4 easements required, 1 MG stored annually, 1,263 LF of open cut sewer	432	27.45	31.43	
			S_PO_WC_PC10_M_0309B_C	Off-line Storage	Add pump operated off-line storage to Leven and Edsel PS, and a gravity basin near the Jefferson Mall area, 4 easments required, 4 MG stored annually, 1,263 LF of open cut sewer	432	3.16	3.57	
			S_PO_WC_PC10_M_0103_C	Pump Station Upgrades	Upgrade Leven PS and Edsel PS, 19,718 LF of open cut, some tunneling and FM upgrades	402	2.77	3.31	
Current Preferred Solution Costs for Pond Creek:									

*All benefit scores and Benefit/Cost ratios use a weighed benefit score.
**SSOs eliminated by projects considered part of the baseline conditions are not included.
*** Highlighted rows indicate the preferred alternative.

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DRAFT Summary of Jeffersontown Modeled 2-yr, 3-hr Solutions

*** Highlighted rows indicate the preferred alternative.

MSD Louisville / Jefferson County Metropolitan Sewer District

PROJECT WIN

Watershed/ Geographic Region	Documented and Suspected SSOs Addressed	SSO Location Description	Project or Cost Sheet Name	Solution Technology Details	Project Description	Total Benefit Score	Benefit/ Cost Ratio (Capital Costs)	Benefit/Cost Ratio (Present Worth Costs)	Justification/ Other Comments
Jeffersontown - NB01	28390, 28391, 28392, 28395, 31733, Jeffersontown WWTP PS (28173 & 64505 & MSD0255A-PS & IS028 SI)	Sewer runs next to Chenoweth Run Stream tributary, through 28390 set then through Skyview Park then through the MSD0255A-PS set. The 28390 set is east of Taylorsville Rd PS, between Taylorsville Rd & Merioneth Dr, in Livingston Heights Subdivision & Bluegrass Research and Industrial Park. MSD0255A-PS in on Chenoweth Run north of Taylorsville Rd near the Academy for Individual Excellence, in Midway Farm Subdivision and Jeffersontown Business Park.	S_JT_JT_NB01_01_C	Off-line Storage & Force Main Upgrades	Relief sewer from Grassland to the WWTP, 23 MG total storage at the plant and PS, 28,950 LF FM in rock installed to the BGI, includes 6,575 LF of open cut sewer, 14 easements required	1396	3.04	3.30	
			S_JT_JT_NB01_09_C	Off-line Storage & Force Main Upgrades	26 MG annual storage at Grassland and at the plant and PS, and a 28,950 LF FM in rock installed to the BGI, includes 700 LF of open cut sewer and 1,600 LF tunneled, 14 easements required	1200	2.46	2.65	
			S_JT_JT_NB01_03_C	Pump Station Upgrades & Storage	Wet weather PS at Grassland, storage and PS at the plant, total capacity for both PS is 10 MGD, 28,950 LF of FM in rock installed from plant to the BGI, includes 700 LF of open cut sewer and 1,600 LF tunneled, 14 easements required	1158	2.39	2.61	
			S_JT_JT_NB01_13_C_A	Upgrade Treatment Plant	Full plant upgrade	Currently being evaluated			
			S_JT_JT_NB01_13_C_B	Treatment Plant Upgrades & Pipe Upgrades	Peel off portion of Jeffersontown to Cedar Creek WWTP and the rest goes to West County WWTP	Currently being evaluated			
			S_JT_JT_NB01_13_C_C	Pipe Upgrades	Send all flows to Cedar Creek WWTP	Currently being evaluated			
Jeffersontown - NB02	(28250, 28249, 28340, 28336, 104289), (28413, 28414, 28415, 28416, 28417), 98564, 99649	Next to Chenoweth Run Stream tributary, north of Watterson Trail and west of Taylorsville Rd. 28250 set is east of St Edward Elementary of Charlane Pky and St Edwards Dr, in Valley Village Subdivision. 28413 set is north of Tully Roberta Elementary on Dell Rd, in Charlane Heights Subdivision and Maple Dale Subdivision. 98564 is on Old Six Mile Lane downstream of 28413. 99649 is south of Watterson Trail upstream of 28250.	S_JT_JT_NB02_01_C	Pipe Upgrades	Upsizing pipe downstream of Charlane and Dell Road overflows with 4,045 LF of open cut sewer in rock, 100 LF of tunneling required under railroad	876	39.48	49.40	
			S_JT_JT_NB02_09_C	Off-line Storage	Underground pumped off-line storage at Jeffersontown Swimming Pool and alongside manhole 103647, annual pumping 128 MG volume, 1 property acquisition required	636	22.22	23.21	
Jeffersontown - NB03	28719, 28711, Marian Court PS (28729 & MSD0148-PS), Raintree PS (MSD0149 PS)	East of Hurtsbourne Pky and south of Taylorsville Rd. Raintree PS is east of Six Mile Ln in Highland Hills Subdivision. Marian PS is north of Gleeson Ln in Highland Hills Subdivision. 28719 is the first node downstream of Marian PS. 28711 is west of Patti Ln on Taylorsville in the Cherry Ann Village & WA Winand Subdivision.	S_JT_JT_NB03_01_C	Pipe Upgrades	Install 455 LF of 8" open cut sewer from Marion PS and 400 LF of 8" from Raintree PS to divert flows to the SED, 5 easements and 1 acquisition required	606	114.80	137.37	
			S_JT_JT_NB03_09_C	Off-line Storage & Pipe Upgrades	Underground off-line storage for Marion Ct PS, replace 928 LF of FM in rock and pumps for Raintree PS, pump 230 MG annually, upsize 1,355 LF of open cut gravity sewer downstream of FM , 1 property acquisition required	444	27.78	29.83	
			S_JT_JT_NB03_03_C	Pump Station & Pipe Upgrades	Replace 878 LF of FM in rock for Raintree, replace pumps at Marion Ct PS and Raintree PS to pump 339 MG annually, upsize 1,305 LF of open cut gravity sewer downstream of the FM	468	25.51	27.31	
Jeffersontown - NB04	Monticello Place PS (MSD0151-PS & 27969), Chenoweth Run PS (MSD0196-PS & 86052 & 64096)	Monticello PS is south of Watterson Trail on Rivana Dr, next to a tributary to Fern Creek, in Monticello Place Subdivision. Chenoweth PS is on Chenoweth Run Rd south of Taylorsville Rd, next to Chenoweth Run Stream, in Saratoga Woods Subdivision.	S_JT_JT_NB04_09_C	Off-line Storage	Off-line storage of 375,000 gallons for MSD0196 and 53,000 gallons for MSD0151, annual pumping 18 MG, 1 property acquisition required	754	22.86	22.66	
			S_JT_JT_NB04_03_C	Pump Station Upgrades	Install 8,030 LF of FM in rock for Chenoweth Run (abandon but do not remove existing FM so it could be used later), replace pumps at Chenoweth Run PS and Monticello PS, pumping 1,004 MG annually, 1 easement required	820	20.99	17.36	Looking at alternative to take off line the Chenoweth Hills WWTP using FM option, if this is feasiblie, this will become the preferred alternative
Current Preferred Solution Costs for Jeffersontown:									

All benefit scores and Benefit/Cost ratios use a weighed benefit score.

**SSOs eliminated by projects considered part of the baseline conditions are not included.*

*** Highlighted rows indicate the preferred alternative.*

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DRAFT Summary of ORFM Modeled 2-yr, 3-hr Solutions

*** Highlighted rows indicate the preferred alternative.

MSD Louisville / Jefferson County Metropolitan Sewer District

PROJECT WIN

Watershed/ Geographic Region	Documented and Suspected SSOs Addressed	SSO Location Description	Project or Cost Sheet Name	Solution Technology Details	Project Description	Total Benefit Score	Benefit/ Cost Ratio (Capital Costs)	Benefit/Cost Ratio (Present Worth Costs)	Justification/ Other Comments
ORFM - NB01	26752, 41374, 41416, Mockingbird Valley PS (MSD0007-PS), Winton PS (MSD0010-PS), Mellwood Avenue PS (24472 & MSD0023-PS)	East of Zorn Ave and north of Brownsboro Rd (except for 41416 which is south), 3 manholes are about 10 nodes upstream of Mockingbird, Mockingbird is in Jutte Subdivision, Winton is in Winfield Subdivision, Mellwood is on Mockingbird Valley Rd just south of I-71 and just north of private natural area (Duncan CE)	S_OR_MF_NB01_01_C	Pump Station & Pipe Upgrades	Diversion Alternative for MSD0010 and MSD0007. Involves the the replacement of approximately 2,000 LF of 8" gravity sewer flowing into MSD0007, additonal upgrade of MSD0023 (total pump station upgrade) and replacement of approximately 1,240 LF of 6" FM with 12" for MSD0023. PS needs to be flood-proofed. Installation of 400 LF of 8" pipe for Winton Diversion and 2,200 LF of 15" pipe for Mockingbird Diversion. 130 LF of the sewer is tunneled, 1 MG pumped annually, 4 easements required	804	26.32	31.31	Winton PS & Mockingbird Valley PS will be eliminated.
			S_OR_MF_NB01_03_C	Pump Station & Pipe Upgrades	Replace approximately 2,000 LF of gravity sewer flowing into MSD0007, upgrade pumps at MSD0007 and MSD0010, total PS upgrade of MSD0023, upsize 2,000 LF of FM for MSD0007, and upsize 1,240 LF of FM for MSD0023, 130 LF of sewer is tunneled	744	23.89	27.89	
			S_OR_MF_NB01_09_C	Pipe Upgrades	Replace approximately 200 LF of gravity sewer flowing into the storage area for MSD0007, divert MSD0010, total open cut sewer 585 LF and 130 LF tunneled, 146 MG pumped annually	708	20.18	21.17	
			S_OR_MF_NB01_01_C_A	Pump Station & Pipe Upgrades	Replace approximately 2,000 LF of gravity sewer flowing into MSD0007, total PS upgrade of MSD0023, upsize 1,240 LF of FM for MSD0023, install 400 LF of pipe for Winton diversion and 2,200 LF of pipe for Mockingbird diversion, 130 LF of sewer is tunneled, 4 easements required	708	10.51	11.40	
ORFM - NB02	96020	On Leland Rd between Brownsboro Rd and Frankfort Ave, east of I-264, in Bellewood Subdivision	S_OR_MF_NB02_03_B	Pipe Upgrades	Relief sewer for Leland Road overflow, 325 LF of open cut sewer, 1 easement required	86	94.45	113.34	The SSO is caused by a hydraulic bottleneck of two 8" flowing into a single 8" pipe.
			S_OR_MF_NB02_09_B	Off-line Storage	Off-line pumped storage potentially along the gravity sewer in the rear of some houses along Leland, storage in the area is difficult due to lack of available land, pumping 7 MG annually, 50 LF of open cut sewer, 1 property acquisition required	78	14.20	12.76	
ORFM - NB03	Derington Court PS (MSD0095-PS)	East of Hwy 42 and north of Brownsboro Rd on Springcrest Dr, next to Goose Creek, upstream of Spring Valley STP (MSD0241), in Spring Valley Estates Subdivision	S_OR_MF_NB03_07_C	Infiltration Reduction	This location will be targeted for I/I source control (I/I rehab and private property program)	currently being evaluated			Recommend this location be targeted for aggressive source control (I/I rehab & private property program)
			S_OR_MF_NB03_09_C_B	Off-line Storage	Divert flow to an open area between the edge of pavement of Derington Court and the creek into an off-line 0.042 MG storage basin	74	24.92	24.92	
			S_OR_MF_NB03_03_C	Pump Station Upgrades	Upsize pumps in Derington Ct PS to pump 146 MG annually, upsize 460 LF of FM from 4" to 6" in rock	74	16.24	13.68	Alternatives have been arranged in order by decreasing Capital Cost ratio, not Present Worth ratio.
			S_OR_MF_NB03_09_C_A	In-line Storage	In-line storage by installing 285 LF of 60" pipe in rock parallel to the 8" gravity line running down Derington Ct to Derington Ct PS	70	14.38	18.35	If the I/I rehab is not successful, this is the next preferred alternative.
ORFM - NB04	40870, 40871, 40872, Barbour Lane PS (42680 & 65633 & 65635), West Goose Creek PS (22436 & MSD0123-PS), Pheonix Hill PS (MSD1044-PS)	3 manholes are on Indian Hills Trail just south of I-71 next to a tributary to Muddy Fork Beargrass Creek, Barbour Lane (MSD0192-PS) is east of Hwy 42 and south of I-265 on MSD owned land by Elmcroft Subdivision and Record Plant of Barbour Ln Subdivision next to Little Goose Creek, West Goose Creek is south of I-71 and just east of Hwy 42 next to a blue line stream in Seminary Dr Dedication Subdivision, Pheonix Hill is on Pheonix Hill Dr south of I-71 on MSD owned property next to Longview Creek	Solutions are being evaluated at the 5-year design level.					
Current Preferred Solution Costs for ORFM:									

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DRAFT Summary of Mill Creek, CSO, and Small WWTP

*** Highlighted rows indicate the preferred alternative.

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PROJECT WIN

Watershed/ Geographic Region	Documented and Suspected SSOs Addressed	SSO Location Description	Project or Cost Sheet Name	Solution Technology Details	Project Description	Total Benefit Score	Benefit/ Cost Ratio (Capital Costs)	Benefit/Cost Ratio (Present Worth Costs)	Justification/ Other Comments
Mill Creek - 81814-W	04498, 04542, Pioneer PS (81814-W), Fern Lea PS (MSD0047-PS), Garr's Lane PS (MSD0050-PS)	NW of intersection of I-264 & Dixie Hwy, near 4 schools including Butler Traditional High School, near Lynnview Ditch & Upper Mill Creek, in Northernburg's Subdivision & Heatherfields Subdivision & St Helens Subdivision, 04498 is between Pioneer PS and Fern Lea PS	S_MC_WC_SC	Off-line Storage & Pipe Upgrades	Construct a combination of gravity sewers (2,821 open cut), offsite 2 MG storage and 3,214 LF force mains, 25 easements required	2574	11.39	13.42	
			S_MC_WC_NB01_M_01_C	Pipe Upgrades	Construct a combination of gravity sewers (17,000 open cut), note: costs include capital project, 50 easements required	3322	10.16	12.94	This alternative was chosen based on the community values (not incorporated into the benefit tool): financial stewardship and economic vitality; this solution incorporates the already existing capital project.
					Current Mill Creek Preferred Solution Costs:				
Berrytown - NB01	Lucas Lane PS (MSD0199-LS)	in Floyds Fork, south of I-265 and west of LaGrange Rd, in Owl Cove Estates, upstream of Berrytown WWTP (MSD0209)	S_FF_BT_NB01_S_03_C_A	Pump Station Upgrades	Upgrade pumps from 48 GPM at PS to have a fixed discharge of 76 GPM	370	77.46	71.41	Would require additional storage at treatment plant.
			S_FF_BT_NB01_S_09A_C_B	Off-line Storage	Off-line 27,603 gallon underground storage basin in rock prior to Lucas Lane LS, 46 LF of open cut sewer in rock, 1 easement required	250	72.76	75.13	
Hunting Creek North - NB01	Riding Ridge PS (MSD1060-LS)	in ORFM catchment, north of I-71 and east of Hite Creek Dr, in Riding Ridge Subdivision, upstream of Hunting Creek North WWTP (MSD0291)	S_HC_HN_NB01_S_03_C_A	Pump Station Upgrades	Upgrade pumps at Riding Ridge PS from 17 GPM to 24 GPM	78	36.81	28.22	Would require additional storage at treatment plant.
			S_HC_HN_NB01_S_03_C_B	Force Main Upgrades	Increase 1,464 LF of FM (in rock) leaving Riding Ridge PS from 2" to 2.5"	126	24.95	24.12	
			S_HC_HN_NB01_S_09A_C_A	In-line Storage & Pipe Upgrades	In-line storage with 100 LF of 30" pipe off gravity main prior to the Riding Ridge LS, and increase the gravity main from 8" to 20", total open cut of 241 LF	72	21.57	27.45	
Hunting Creek North - NB02	Gunpowder PS (MSD1055-LS)	in ORFM catchment, north of I-71, on Gunpowder Lane, next to tributary of Harrods Creek, in Fox Harbor Subdivision, upstream of Hunting Creek North WWTP (MSD0291)	S_HC_HN_NB02_S_09A_C_B	In-line Storage	Replace 185 LF of 8" with 48" in-line storage pipe	162	72.20	92.26	
			S_HC_HN_NB02_S_09A_C_A	In-line Storage	Replace 120 LF of 8" with 60" in-line storage pipe	162	55.15	70.17	
			S_HC_HN_NB02_S_03_C_A	Pump Station Upgrades	Upgrade both pumps to 155 GPM each, wet well to 8 ft, and 3,485 LF of FM to 6" at the Gunpowder PS, 1 easement required	180	8.87	9.09	
Hunting Creek North - NB03	Fox Harbor #1 PS (MSD1053-LS)	in ORFM catchment, near Hwy 42 on Fox Harbor Road in Fox Harbor Estates	S_HC_HN_NB03_S_09_C_A	In-line Storage & Pipe Upgrades	Upgrade 110 LF of 12" open cut sewer upstream of Lift Station and lower upstream invert of that pipe, new drop manhole, assumed in-rock based on surrounding soil conditions	72	72.20	90.99	
			S_HC_HN_NB03_S_03_C_B	Force Main Upgrades	Upgrade 714 LF of FM from 2" to 3", assumed in-rock based on surrounding soil conditions	66	23.15	22.47	
Hunting Creek South - NB01	Fairway View PS (MSD1065-PS)	in ORFM catchment, north of I-71 and Fairway View Ct, next to tributary of Harrods Creek, in Hunting Creek Estates, upstream of Hunting Creek South WWTP (MSD0292)	S_HC_HS_NB01_S_09A_C_B	Off-line Storage	Install a 4,399 gallon off-line storage basin prior to Fairway View PS, 165 LF of 8" open cut sewer in rock, 1 easement required	56	47.40	54.96	
			S_HC_HS_NB01_S_09A_C_A	In-line Storage	Replace first two 8" segments of gravity sewer north (with 42" and 18") and east (with 42" and 30") of the Fairway View PS with in-line storage pipe, new pipe entrances at a lower elevation drilled into wet well for the larger pipe diameters, total open cut sewer rehab 470 LF in rock	66	25.58	32.05	
			S_HC_HS_NB01_S_03_C_A	Pump Station Upgrades	Upgrade pumps at PS to discharge 95 GPM (previously 88 GPM each)	96	17.31	16.28	
			S_HC_HS_NB01_S_13_C_A	Pump Station & Pipe Upgrades	Upgrade pumps to 95 GPM from 88 GPM, upsize north and east gravity sewers upstream of PS from 8" to 24", total 152 LF of open cut sewer upgrades in rock, new pipe entrances at a lower elevation drilled into wet well for the larger pipe diameters	72	10.25	10.20	
		in ORFM catchment, north of I-71 on	S_HC_HS_NB02_S_09A_C_A	In-line Storage	Replace two 8" gravity sewers immediately upstream of the Deep Creek Lift Station with a 150 LF-36" and a 170 LF-30" pipe respectively for in-line storage	180	61.96	78.33	

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DRAFT Summary of Mill Creek, CSO, and Small WWTP

*** Highlighted rows indicate the preferred alternative.

MSD Louisville / Jefferson County Metropolitan Sewer District

PROJECT WIN

Watershed/ Geographic Region	Documented and Suspected SSOs Addressed	SSO Location Description	Project or Cost Sheet Name	Solution Technology Details	Project Description	Total Benefit Score	Benefit/ Cost Ratio (Capital Costs)	Benefit/Cost Ratio (Present Worth Costs)	Justification/ Other Comments
Hunting Creek South - NB02	Deep Creek PS (MSD1063-PS)	in ORFM catchment, north of I-71 on Creekview Dr, just north of Harrods Creek, in Hunting Creek Subdivision, upstream of Hunting Creek South WWTP (MSD0292)	S_HC_HS_NB02_S_13_C_A	Pump Station & Pipe Upgrades	Install new pumps that discharge 138 GPM instead of current 122 GPM, replace 150 LF of 8" gravity sewer immediately upstream of the LS with a 36" pipe	180	22.91	23.13	
			S_HC_HS_NB02_S_03_C_A	Pump Station Upgrades	Replace lift station with a larger lift station, existing 4' diameter wet well and 122 GPM pumps, new 7' diameter wet well and 156 GPM pumps to pump 164 MG annually	186	7.89	8.79	
Lake Forest - NB01	Lake Forest PS (MSD1169-LS)	in Floyds Fork catchment, east of I-265 and north of Shelbyville Rd, in Beckley Woods Subdivision, upstream of Lake Forest WWTP (MSD0403)	S_FF_LF_NB01_S_09A_C_D	In-line Storage	Install 65 LF of 60" open cut sewer in rock for in-line storage east of the Lift Station, and replace 8" sewer south of that with a 36" open cut sewer in rock	162	59.31	75.48	
			S_FF_LF_NB01_S_09A_C_A	In-line Storage	Replace 8" gravity mains on both sides of the Lake Forest Lift Station with 130 LF of 36" pipe in rock for in-line storage, also replace 8" link with 180 LF with 42" pipe in rock	144	43.13	54.90	
			S_FF_LF_NB01_S_03_C_A	Pump Station Upgrades	Upgrade each pump at the Lake Forest LS from 83 GPM to discharge 118 GPM	192	30.46	29.04	
			S_FF_LF_NB01_S_13_C_A	In-line Storage & Pipe Upgrades	Divert flow from 88655 to 80472 with 950 LF of 8" open cut sewer in rock, and replace 8" sewer immediately upstream (and west) of Lift Station with a 85 LF of 38" open cut sewer in rock, 2 easements required	132	30.44	37.59	
Prospect - PP01			S_HC_MF_PP01_M_01_C	Diversion, New Pump Station & Off-line Storage	Construct gravity pipe to new Harrods Creek PS (Eliminates Hunting Creek North, Hunting Creek South, Timberlake, Ken Carla, and Shadow Wood WWTPs) – pump through ORFM to Morris Forman – additional storage required at CSO 058	Currently being evaluated			
			S_HC_HC_PP01_M_01_C	Diversion & Off-line Storage	Eliminate Hunting Creek North, Hunting Creek South, Timberlake, Ken Carla, and Shadow Wood WWTPs by diverting flow to Hite Creek WWTP	Currently being evaluated			
Current Preferred Solution Costs for Small WWTP:									
CSO - 42007	Sonne Avenue PS (MSD0042-PS)	east of Dixie Hwy and south of Algonquin Pkwy, north of Pinnacle Processing & Packaging, in Barringer Land Co Subdivision	S_OR_MF_42007_S_09_C	Off-line Storage	Off-line 164,000 gallon storage basin to store excess wet weather flows, store and pump 4 MG annually	342	30.37	24.14	
			S_OR_MF_42007_S_03_C	Pump Station Upgrades	Expand wet well from 6' to 12' diameter in the PS and increase pumping capacity from 150 GPM to 12,000 GPM, pump 1 MG annually	344	16.70	18.81	
CSO - 30917	08717, 13931, 139436, 44396, 44397, 66349, 104223, 104231, 99257-CO	Camp Taylor Area, near the Camp Zachary Taylor Neighborhood Association and Subdivision, east of I-65 and north of I-264, just west of Poplar Level and the Louisville Zoo, next to a tributary to South Fork Beargrass Creek	S_SF_MF_30917_M_09_C	Off-line Storage & Pipe Upgrades	A pumped storage basin at the PS to store excess wet weather flows, and to replace some target sewer after TVI inspection of the area		Currently being evaluated		Best option based on current system condition. Mainly vitrified clay pipe in the area.
			S_SF_MF_30917_01_CV_A	Pipe Upgrades	Construct approximately 47,186 LF of sanitary sewer system in street (8" and 15") to replace existing system	810	2.35	2.97	
Current Preferred Solution Costs for CSO Area:									

All benefit scores and Benefit/Cost ratios use a weighed benefit score.

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***** Highlighted rows indicate the preferred alternative.***

Current Total Capital Cost:
$178,565,567
for the developed preferred projects

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DRAFT Summary of Floyds Fork Modeled 2-yr, 3-hr Solutions

****** Highlighted rows indicate the preferred alternative.***

MSD Louisville / Jefferson County Metropolitan Sewer District

PROJECT WIN

Watershed/ Geographic Region	Documented and Suspected SSOs Addressed	SSO Location Description	Project or Cost Sheet Name	Solution Technology Details	Project Description	Total Benefit Score	Benefit/ Cost Ratio (Capital Costs)	Benefit/Cost Ratio (Present Worth Costs)	Justification/ Other Comments
Floyds Fork - NB01	33003, 65531	Located in Douglas Hills Subdivision just north of I-64 and east of I-265 on Tucker Station Rd, next to tributary to Pope Lick Stream.	S_FF_FF_NB01_S_01_C_A	Lower Overflow Pipe Inverts	Lower overflow pipe invert to divert wet weather flows to Woodland Hills PS, 15 LF of open cut sewer	84	276.77	73.81	Tucker Station Interceptor project eliminated Woodland Hills PS overflow - currently flows to FFWWTP - WW flows during large rain events are rerouted to MFWWTP (manual operation)
			S_FF_FF_NB01_S_03_C_A	Pipe Upgrades	1,650 LF of pipe upgrades from 15" to 18"	108	11.05	13.86	
			S_FF_FF_NB01_S_09A_C_A	In-line Storage	In-line storage with 400 LF and 110 LF 48" pipes, 16 LF of 15" pipes, 1 easement required	72	11.00	13.95	
Floyds Fork - NB02	Eden Care PS (MSD1105-PS)	Eden Care PS off Blankenbaker Pky and just north of I-64, near a blue line stream, in Martin C B Farm Subdivision	S_FF_FF_NB02_S_09A_C_A	In-line Storage	In-line storage with 50 LF of 48" pipe (previously 8")	162	305.02	383.22	
			S_FF_FF_NB02_S_03_C_A	Pump Station Upgrades	Upgrade both pumps in the Eden Care PS to discharge 115 GPM (previously 95 GPM) each	168	17.85	17.53	
Floyds Fork - NB03	Olde Copper Court PS (MSD0165-PS), Ashburton PS (MSD0166-PS)	Pump stations are located in Copperfield Subdivision near Beckley Station just north of I-64 and east of I-265, off Glendower Dr, south of Midland Trail Golf Club, near tributary to Floyds Fork Stream	S_FF_FF_NB03_M_01_C_A	Upgrade Force Main & Pipes	Divert flow from Ashburton PS by upgrading 370 LF of FM and adding 115 LF of 8" gravity sewer, also eliminates the overflow at Olde Copper Ct PS	356	150.66	161.00	
			S_FF_FF_NB03_M_03_C_B	Force Main Upgrades	Upgrade 620 LF of FM for Olde Copper Ct PS and 700 LF of FM for Ashburton PS, will eliminate overflow at Ashburton and passes additional flow to Olde Copper	364	111.57	106.61	
			S_FF_FF_NB03_M_HB_C_C	Upgrade Force Main & Pipes	Remove Olde Copper Ct PS, use 370 LF of 8" gravity sewer to divert flow to another part of the system, upgrade 700 LF of FM for Ashburton PS, will eliminate overflow at Ashburton and passes additional flow to Olde Copper	288	86.27	91.31	
			S_FF_FF_NB03_M_HB_C_A	In-line Storage & Upgrade Force Main	In-line storage with 320 LF of 42" pipe with 70 LF of 15" connectors and drop shafts, upgrade 700 LF of FM for Ashburton PS, will eliminate overflow at Ashburton and passes additional flow to Olde Copper, 2 easements required	288	52.51	59.44	
			S_FF_FF_NB03_M_HB_C_B	In-line Storage & Upgrade Force Main	In-line storage with 150 LF of 60" pipe with a drop shaft upstream of Olde Copper Ct PS, 62 LF of 15" connectors, upgrade 700 LF of FM for Ashburton PS, will eliminate overflow at Ashburton and passes additional flow to Olde Copper, 2 easements required	288	51.19	58.40	
			S_FF_FF_NB03_M_03_C_A	Pump Station Upgrades	Upgrade pumps in Olde Copper Ct PS for a combined 60 GPM to 100 GPM, upgrade 700 LF of FM for the Ashburton PS, will eliminate overflow at Ashburton and passes additional flow to Olde Copper	264	47.82	42.51	
			S_FF_FF_NB03_M_03_C_C	Pump Station Upgrades	Upgrade existing wet well from 4' to 8' diameter and pumps at Olde Copper Ct PS for a combined 60 GPM to 90 GPM, upgrade 700 LF of FM in rock for Ashburton PS, will eliminate overflow at Ashburton and passes additional flow to Olde Copper	312	27.03	27.73	
Current Preferred Solution Costs for Floyds Fork:									

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DRAFT Summary of Middle Fork and SED Modeled 2-yr, 3-hr Solutions

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PROJECT WIN

Watershed/ Geographic Region	Documented and Suspected SSOs Addressed	SSO Location Description	Project or Cost Sheet Name	Solution Technology Details	Project Description	Total Benefit Score	Benefit/ Cost Ratio (Capital Costs)	Benefit/Cost Ratio (Present Worth Costs)	Justification/ Other Comments
Middle Fork - MF01	02932, 02933, 02935, 23211, 27005, 45835, 47583, 47593, 47596, 47603, 47604, IS021A-SI, Upper Middle Fork PS (08935-SM)	ISO21A-SI is SE of I-64 & Old Cannons Ln intersection, next to Middle Fork Beargrass Creek. Upper Middle Fork PS (MSD0011-LS) is south of I-64 off Breckinridge Ln in the Village Subdivision, south of St Matthews Brown Park, next to Middle Fork Beargrass Creek. 23211 is south of I-264 between Newburgh and Bardstown, next to South Fork Beargrass Creek. 45835 & 27005 are in CSO catchment between I-64 and Bardstown Rd on Beargrass Rd, in Cherokee Park, near historic Gardencourt & Highlands areas, next to Middle Fork Beargrass Creek. Other 8 locations are NE of I-64 and I-264 intersection, close to Oxmoor Farm Natural Area, in Oxmoor Shoping Center & Oxmoor Ct Subdivision & The Park at Oxmoor & Hurtsbourne Subdivision, next to Middle Fork Beargrass Creek.	S_MISF_MF_NB01_M_01_C_A1	Off-line Storage & Pipe Upgrades	Construct 30" Force Main Diversion to Hikes Lane Interceptor, construct Middle Fork Relief Interceptor between Oxmoor and Middle Fork at Breckinridge, construct 1.5 MG covered basin somewhere near Car Wash Site and 24 MG open basin at Buechel Site, upsize Pipe D/S of MH 15138 to 15", 500 LF tunneling, 6,900 LF open cut sewer, 10,200 LF FM, 20 easements and 1 acquisition required	586	1.13	1.23	Advantages: Proposed storage is in an unused parking area. Storage is immediately adjacent to diversion. Disadvantages: Requires property acquisition at car wash site. Requires construction under an existing parking lot. Storage basin is in a heavily used commercial corridor. Two storage basins to maintain.
			S_MISF_MF_NB01_M_01_C_A2	Off-line Storage & Pipe Upgrades	Divert Upper Middle Fork Pump Station to Hikes Lane Interceptor Using Capacity of Existing Pumps. Open Storage at Buechel Basin and Covered Storage at Oxmoor Bullit property. Upsize Pipe D/S of 15138 to 15", 500 LF tunneling, 3,750 LF open cut sewer, 10,200 LF FM, 20 easements and 1 acquisition required	640	1.13	1.22	Advantages: Construction of proposed storage would be adjacent to interceptor and is not developed. Eliminates need for Middle Fork Relief Interceptor. No stream crossings for MFRI. Disadvantages: Requires property acquisition at Oxmoor Area. Storage basin is in a heavily used commercial corridor. Two storage basins to maintain. Storage basin is not immediately adjacent to diversion and would require additional storage or potentially complex gate system to control flow.
			S_MISF_MF_NB01_M_01_C_B1	Pump Station & Pipe Upgrades with Off-line Storage	Divert all necessary flow through Upper Middle Fork PS to Hikes Lane Interceptor by upgrading pumps to convey peak 2-yr discharge in diversion, construct 27 MG open storage at Buechel Basin, upsize pipe downstream of 15138 to 15", and construct 36" FM diversion to Hikes Lane Interceptor, 500 LF tunneling, 6,900 LF open cut sewer, 10,200 LF FM, storage 40 MG annually, 20 easements and 1 acquisition required	640	1.10	1.22	Advantages: One storage basin to maintain/operate on property MSD is already attempting to acquire. Storage is in an industrial area. Disadvantages: Upsizing of the UMPFS may require additional property/easement to be acquired.
			S_MISF_MF_NB01_M_01_C_A3	Off-line Storage & Pipe Upgrades	Construct 30" Force Main Diversion to Hikes Lane Interceptor, construct 3 MG covered basin at Cannons Lane Site and 24 MG open basin at Buechel Site, upsize Pipe D/S of MH 15138 to 15", 500 LF tunneling, 6,900 LF open cut sewer, 10,200 LF FM, storage 45 MG annually, 20 easements and 1 acquisition required	640	1.09	1.19	Advantages: Construction of proposed storage would be adjacent to interceptor and is not developed. Property is KYTC property and may be easier to acquire. Disadvantages: Two storage basins to maintain. Storage basin is not immediately adjacent to diversion and would require additional storage or potentially complex gate system to control flow. KYTC may have issues with the proposal.
			S_MISF_MF_NB01_09B_C_A2	Off-line Storage & Pipe Upgrades	No Upper Middle Fork PS diversion, small uncovered storage at Buechel Basin, significant covered storage at Oxmoor Mall Site, and upsize pipe downstream of 15138, 5,150 LF of open cut sewer, storage pumping 35 MG annually, 20 easements and a significant acquisition required	640	Project has been removed.		
			S_MISF_MF_NB01_09B_C_A1	Off-line Storage & Pipe Upgrades	No Upper Middle Fork PS diversion to Hikes Lane, small open storage at Buechel Basin, large covered storage at Breck Car Wash Lot, upsize pipe downstream of 15138, and construct relief Middle Fork Interceptor sections, 8,300 LF open cut sewer, storage 32 MG annually, 20 easements and 1 acquisition required	514	Project has been removed.		
Middle Fork - MF04	Devondale PS (21628-W), Goose Creek PS (46891 & 62418 & 91629 & 91630 & 105936)	Devondale PS (MSD0040-PS) is on Arrowwood Rd north of Westport & east of I-264, near Goose Creek, between Willowdale Subdivision & Devondale Subdivision. Goose Creek (MSD0185-PS) is on Old Westport Rd east of I-264, next to Goose Creek, and near 4 schools including JCPS.	S_MI_MF_NB04_03_C	Pump Station & Pipe Upgrades	Upgrade Devondale PS to pumping 365 MG annually, also upsize downstream 1,000 LF of FM and a 3,810 LF of downstream collectors and interceptors	258	Solution being evaluated at the 5-year design level.		
			S_MI_MF_NB04_09B_C	Off-line Storage	Off-line storage of 300,000 gallons near the Devondale PS, 100 LF of open cut sewer in rock, 1 acquisition required	346	Solution being evaluated at the 5-year design level.		
			S_MI_MF_M_NB06_01_C_C	In-line Storage & Pipe Upgrades	Two diversion gravity pipes, and 150 LF of 72-inch storage pipe at MSD0057-PS, total of 4,100 LF of open cut sewer in rock, 11 easements required	556	32.26	39.83	Anchor Estates #1 PS & Vannah PS will be eliminated.
			S_MI_MF_NB06_M_09_C	In-Line Storage & Pipe Upgrades	Diversion at 01106, storage in 150 LF (at MSD0057) and 300 LF (at 00746) 72" pipe, 100 LF of 8" open cut sewer	574	27.70	35.42	

DRAFT Summary of Middle Fork and SED Modeled 2-yr, 3-hr Solutions

****** Highlighted rows indicate the preferred alternative.***

MSD Louisville / Jefferson County Metropolitan Sewer District

PROJECT WIN

Watershed/ Geographic Region	Documented and Suspected SSOs Addressed	SSO Location Description	Project or Cost Sheet Name	Solution Technology Details	Project Description	Total Benefit Score	Benefit/ Cost Ratio (Capital Costs)	Benefit/Cost Ratio (Present Worth Costs)	Justification/ Other Comments
Middle Fork - MF06	Vannah PS (01106), Anchor Estates #1 PS (00746, 00056-W), Anchor Estates #2 PS (MSD0057-LS)	Between LaGrange Rd & Shelbyville Rd east of I-265, Vannah PS (MSD1005-PS) is in Foxboro Manor Subdivision, Anchor Estates PSs are in Anchor Estates subdivision and #2 is next to Middle Fork Beargrass Creek tributary	S_MI_MF_NB06_M_01_C_A	Pipe Upgrades	Three diversion gravity pipes (one at MSD0057), 9,790 LF of 8" - 10" open cut sewer in rock, 23 easements required	628	20.86	25.39	
			S_MI_MF_NB06_M_01_C_B	Pump Station & Pipe Upgrades	Two diversion gravity pipes, and MSD0057-PS upgrades with flow diverted to 00746 diversion, 73 MG annually pumped, 3,950 LF of open cut sewer in rock, 11 easements required	580	20.10	23.05	
			S_MI_MF_NB06_M_03_C	Pump Station & Pipe Upgrades	Upsize PS to 372 MG annually, increase size of 2,300 LF of FM, upsize 2,300 LF of open cut downstream collector in rock	484	5.34	6.11	
Current Preferred Solution Costs for Middle Fork:									
SED - NB03	47250	In NDI catchment, east of Poplar Level Rd and north of Fern Valley Rd, in Rangeland Subdivision next to Rangeland Elementary School, near tributary to Blue Spring Ditch	S_SD_MF_NB03_07_C	Infiltration Reduction	Targeted for I/I rehab and private property programs	Currently being evaluated.			This location is a validated Modeled Overflow Point. Since the contributing system is small, recommend that this location be targeted for I/I source control (I/I rehab and private property program)
			S_SD_MF_NB03_09B_C	Off-line Storage	Off-line closed 0.084 MGD storage in open field adjacent to SSO, 150 LF of open cut sewer, 1 property acquisition required	92	13.78	13.85	
			S_SD_MF_NB03_01_C	Pipe Upgrades	2,394 LF of 10" relief sewer that parallels the existing sewer along Rustic Way mainly in the R/W outside of the pavement to an existing 27" interceptor	94	9.95	12.32	
SED - NB05	16649 (Sutherland), 51594	north of I-264 near Newburgh Rd, 16649 is near Hayfield Subdivision and Dundee Estates in the Upper Highlands, 51594 is next to South Fork Beargrass Creek in Jefferson Heights Subdivision	S_SD_MF_NB05_01_C	Pipe Upgrades	Upsize 1,760 LF of gravity pipe from 10" to 15" along rear yards to eliminate Sutherland SSO possibly with pipe-bursting	156	27.41	33.71	
			S_SD_MF_NB05_09B_C	Off-line Storage	Off-line 0.068 MG storage in an open field on Atherton High School Property for Sutherland SSO, acquisition assumed to be negligible	156	32.41	32.41	
Current Preferred Solution Costs for SED:									

****All benefit scores and Benefit/Cost ratios use a weighed benefit score.***
*****SSOs eliminated by projects considered part of the baseline conditions are not included.***
****** Highlighted rows indicate the preferred alternative.***

Created 5/26/2008, Revised 7/14/2008, Printed 8/1/2008

[Presentation excerpt shared at the 7/15/08 Wet Weather Team Meeting.]

Move forward with a smart, sensible "green" agenda initiative

Review with the Mayor

July 10, 2008

Louisville METRO

Green Initiative Team Members

Ted Pullen - Owner
Christy Dooley - Project Manager
Cass Harris - Team leader

Bruce Traughber
Cecil Goins
Kim Livesay
John Hamilton
Susan Hamilton
Diane Secor(MSD)

Ben Tipton
Matt Maskey
Sheryl Powell
Cynthia Lee
Nina Walfoort(TARC)
Betty Younis

Louisville METRO

Green Strategic Initiative Vision

- *Take stock of projects underway in city government and the Partnership for a Green City - and develop environmental baseline (or carbon footprint).*
- *Analyze cost-benefit of options to reduce environmental impact and energy consumption.*
- *Focus on financially sustainable measures that improve air and water quality, land use and energy efficiency.*
- *Establish Louisville Metro as a model employer - from energy-efficient buildings to encouraging transit use - to promote "green" actions from other employers.*
- *Energize projects under way that focus on environmentally responsible land-use - including reclamation of brownfields; Community of Trees; conservation subdivisions; incentives for development near public transit.*

Initiative Owner: Ted Pullen

Louisville METRO

Green Initiative Goal Statement

Louisville Metro Government will operate in a sustainable, environmentally responsible manner, mindful of its role as steward of the natural and built resources of the community as well as its responsibility to global concerns, while also balancing fiscal realities. As it continues to improve its infrastructure and operations, Louisville Metro Government will provide a "green" model for the corporate sector, institutions, organizations and private citizens.

Louisville METRO

MSD

Project WIN Funding Plan

Wet Weather Team
Stakeholder Group Meeting
July 15, 2008

MSD

Purpose of this Presentation

- Review EPA criteria for funding plan.
- Discuss proposed consent decree funding plan.
- Review and discuss potential refinements to MSD's rate structure.

MSD

Consent Decree Requirements for the Wet Weather Team

"The team will prepare a plan for funding the program and will develop a program for public information, education, and involvement."

MSD

EPA's Long Term Control Plan (LTCP) Guidance on Funding

Indicates that the method of financing can be selected or modified based on public input.

Method of financing should be determined by:

- Availability of each option in the community
- Advantage and limitations of a specific type of financing

The LTCP should identify a specific capital and annual cost funding approach.

MSD

EPA's Long Term Control Plan Funding Guidance (cont'd)

Potential funding sources include:

- Bonds
- Loans
- Grants
- Privatization
- Other Capital Funding Sources (e.g., special reserves or "pay-as-you-go")

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Viable Funding Options

- Finance consent decree with internally generated funds (rate increases)
- Access Capital Markets (bonds issues or other loans)

Note: The numbers presented assume the consent decree will cost $800 million.

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Funding with Rate Increases

- Wastewater & Drainage rate increases would range from 5% to 6.5%.
- Consent Decree Surcharge rate increases would range from 2.5% to 5%.
- As of August 1, 2008, the average residential bill (wastewater & consent decree surcharge) will be $29.50. This amount is projected to increase to $68 by 2025.

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Funding with Rate Increases

- MSD's annual revenues are projected to increase from $170 million in FY 2008 to $333 million in FY 2021.

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Funding with Rate Increases

Rate Structure expected to remain the same except:

- ↗Residential customers will be billed based on winter consumption.
- ↗Bills will be generated on a monthly basis.
- ↗Senior citizens discount program expected to be expanded.

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Funding via Capital Markets

- ↗Approximately $1.15 billion would be borrowed by 2025.
- ↗MSD's debt service payments will increase from $94 million annually to approximately $163 million annually by 2025.
- ↗Assumes interest rates in the 5% to 6% range.
- ↗Mixture of fixed and variable rate borrowings will be utilized.

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Funding via Capital Markets

Potential borrowings:

Year	Amount
2009	$150 million
2012	$250 million
2015	$250 million
2018	$250 million
2021	$250 million

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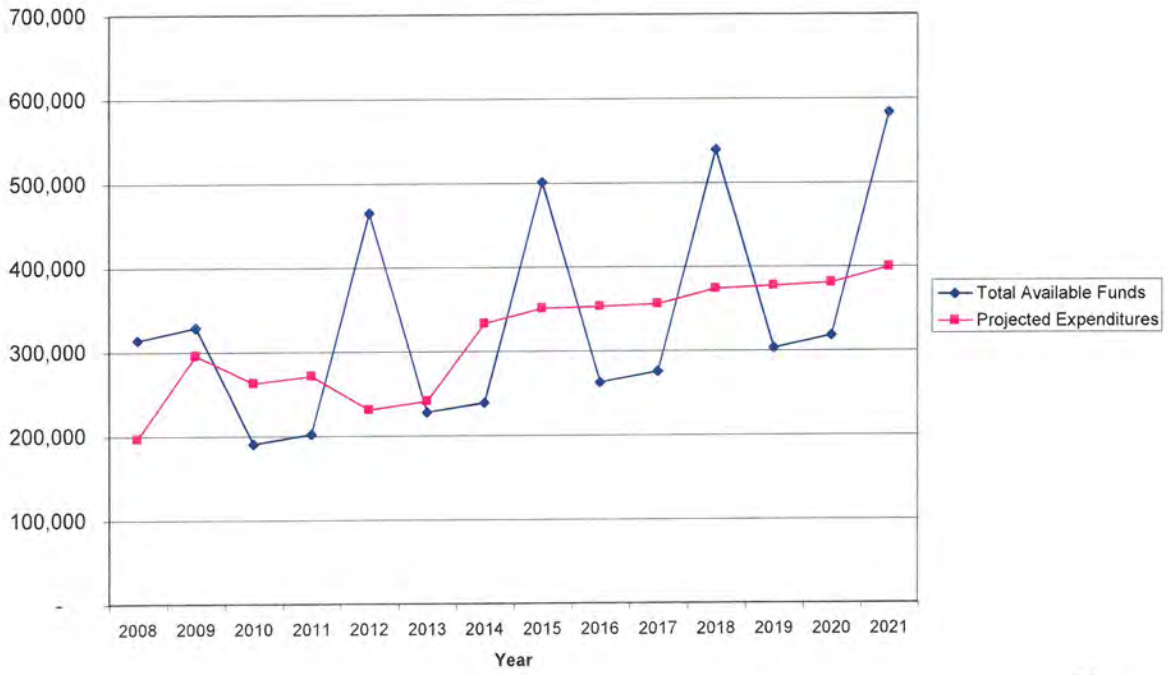
Projected Available Funds and Expenditures (000's)



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Other Funding Sources

- Grants and line item appropriations will continue to be pursued; however, they were omitted from the funding plan due to their uncertain nature.
- MSD will pursue public/private partnerships (i.e. recapture agreements) to reduce our capital construction costs as appropriate.

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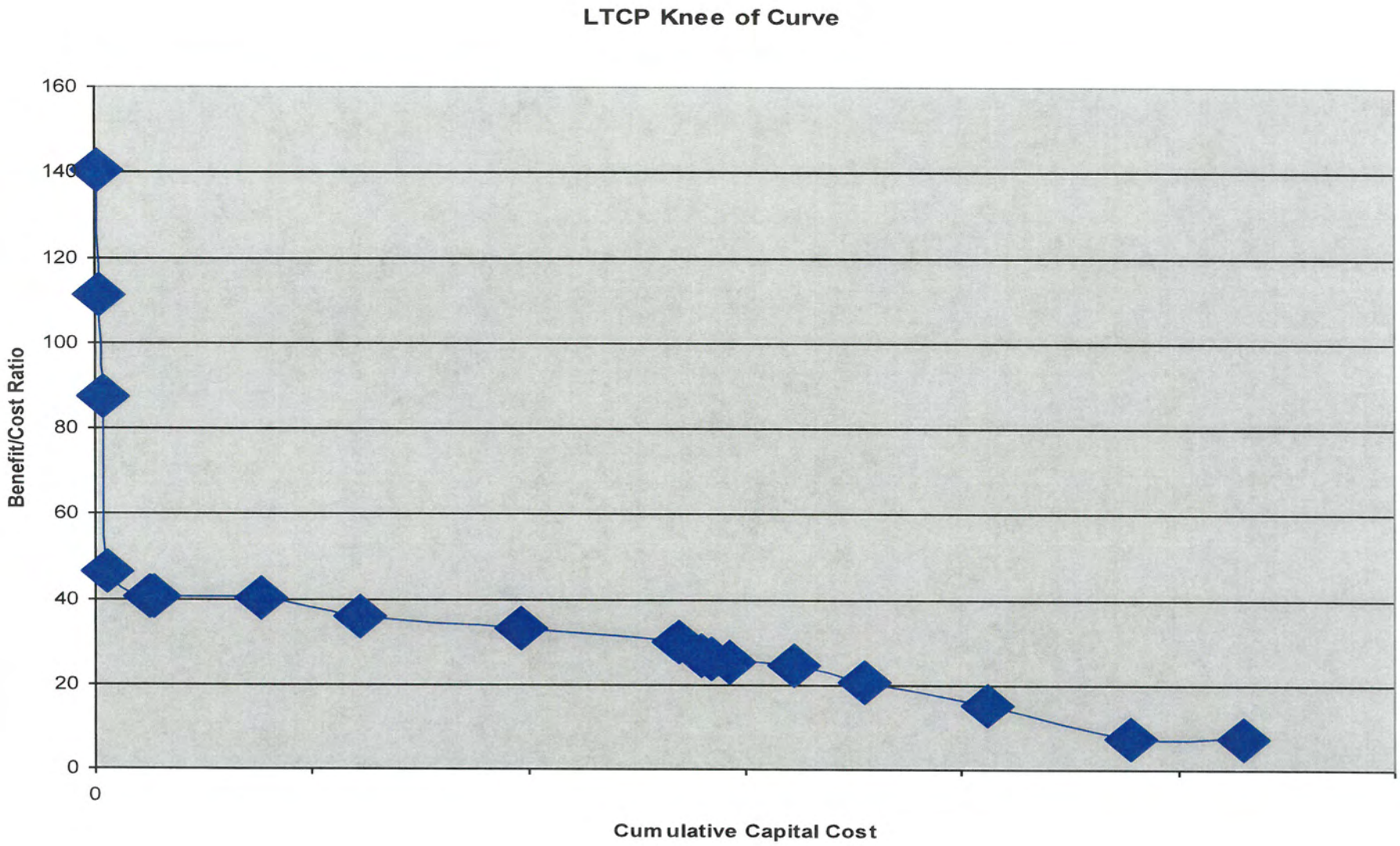
Questions

“Knee of the Curve”

First Draft July 15, 2008

LTCP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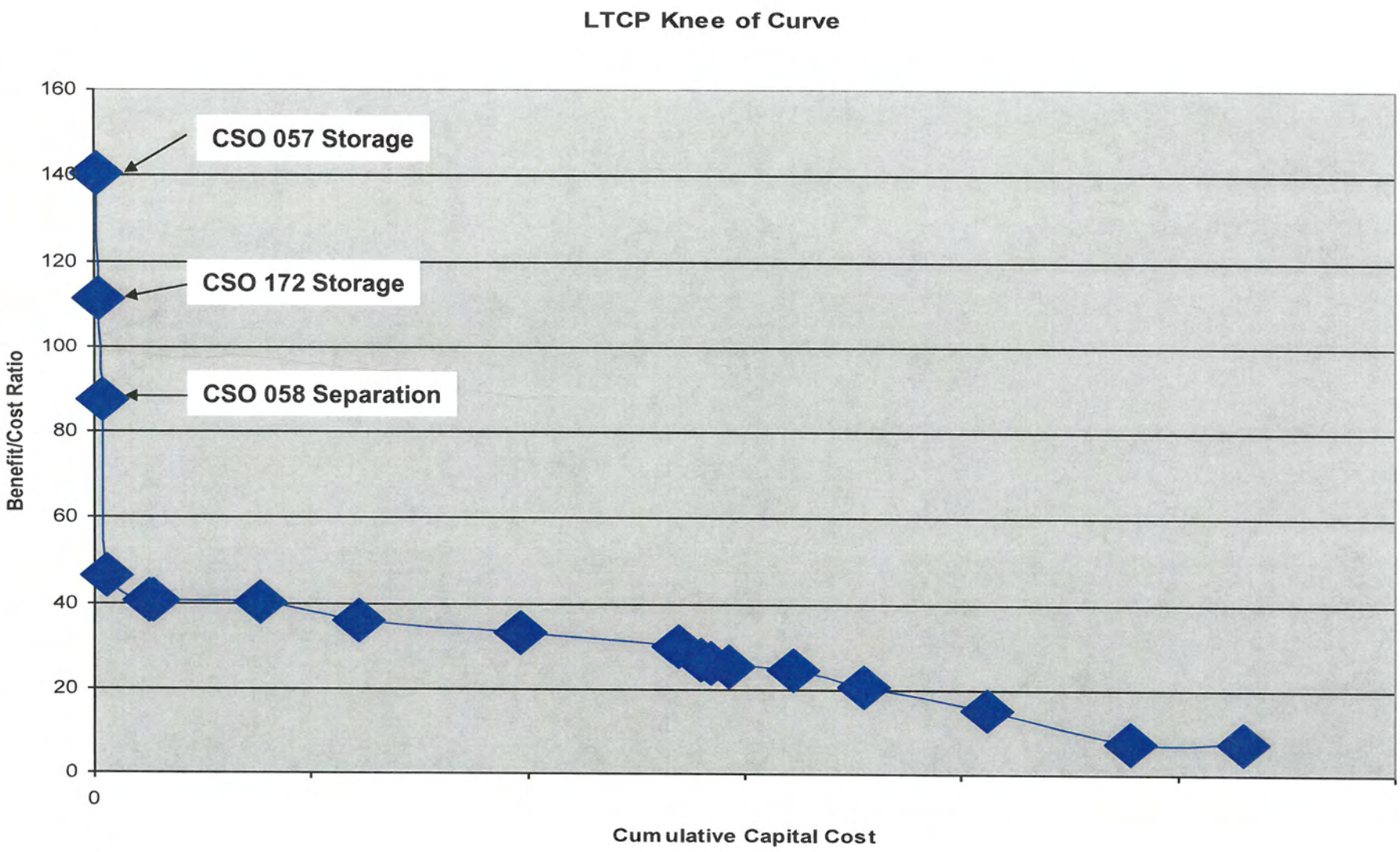
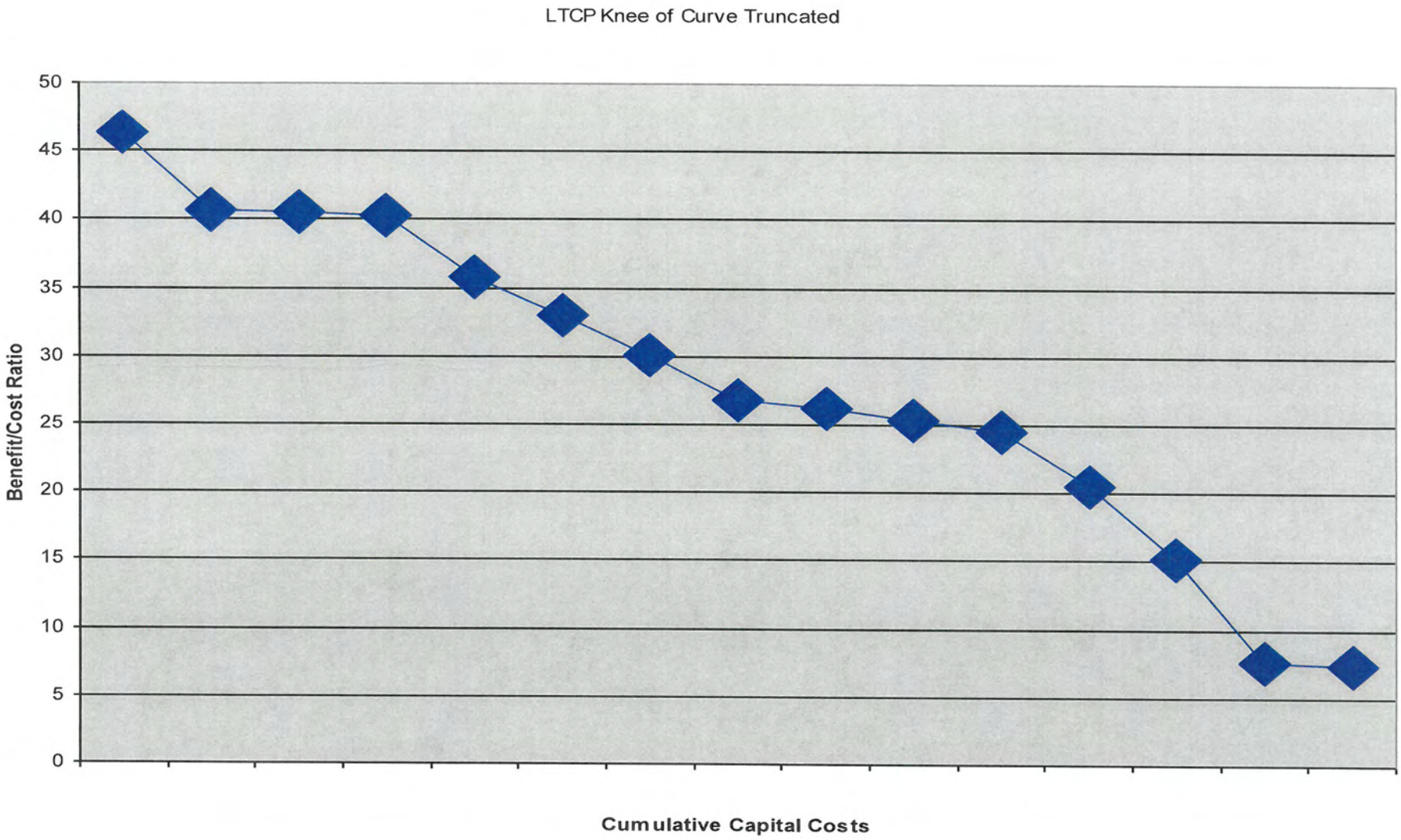
140
120
100
80
60
40
20
0
0
Benefit/Cost Ratio
Cumulative Capital Cost

LTCP


LTCP Knee of Curve
160
140
120
100
80
60
40
20
0
0
Benefit/Cost Ratio
CSO 057 Storage
CSO 172 Storage
CSO 058 Separation
Cumulative Capital Cost

LTCP Truncated



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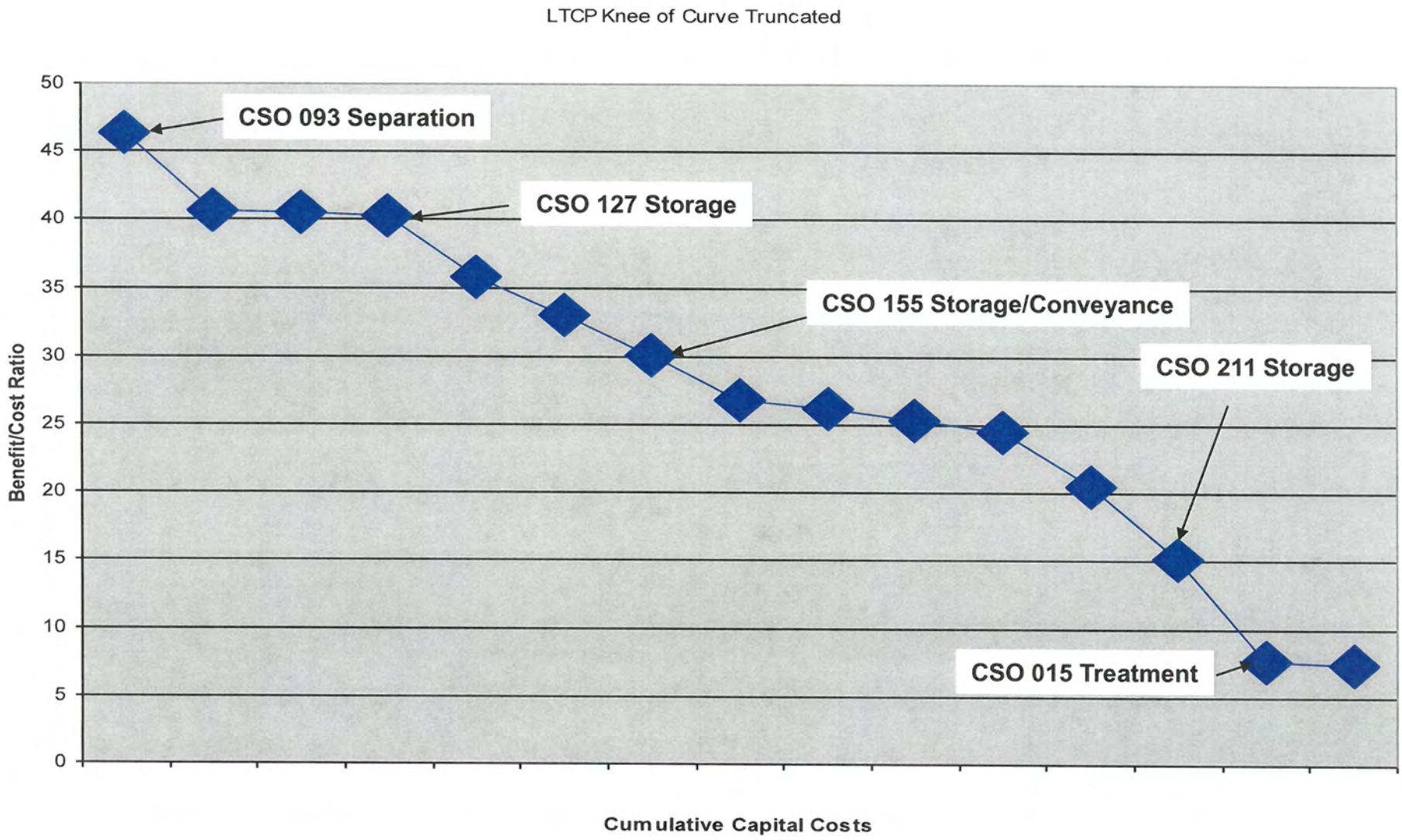
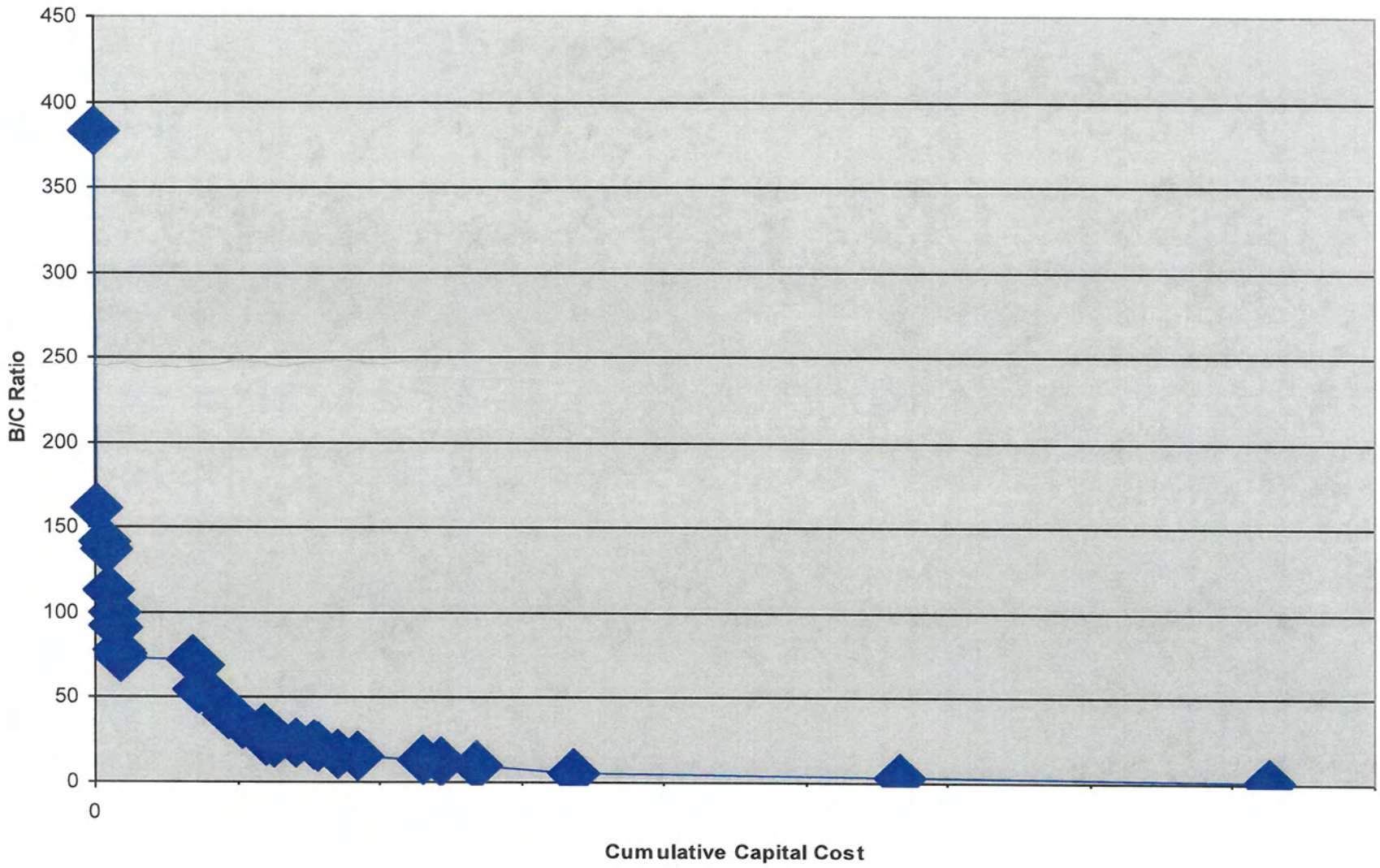


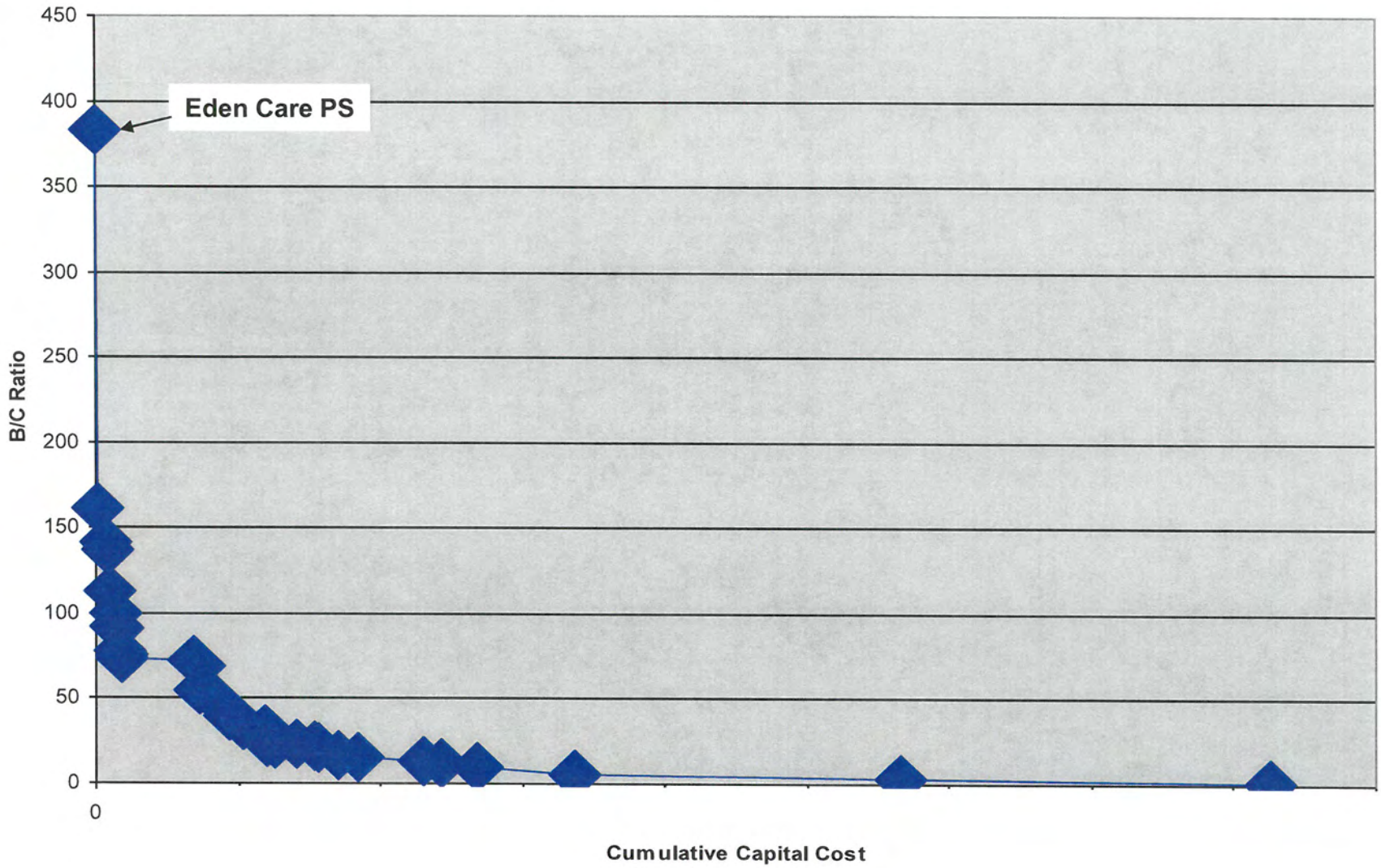
SSDP

SSDP Knee of the Curve



SSDP

SSDP Knee of the Curve



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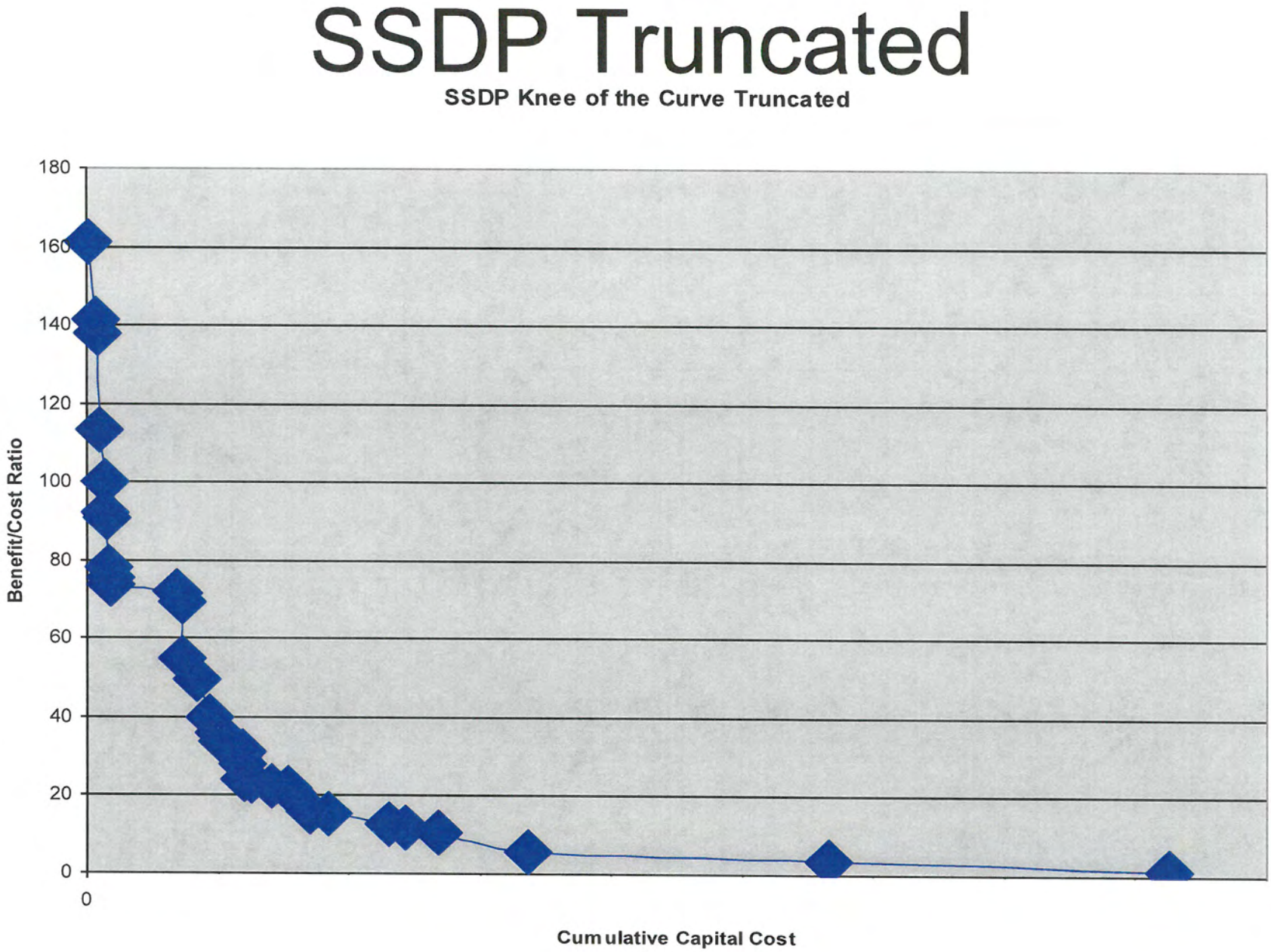

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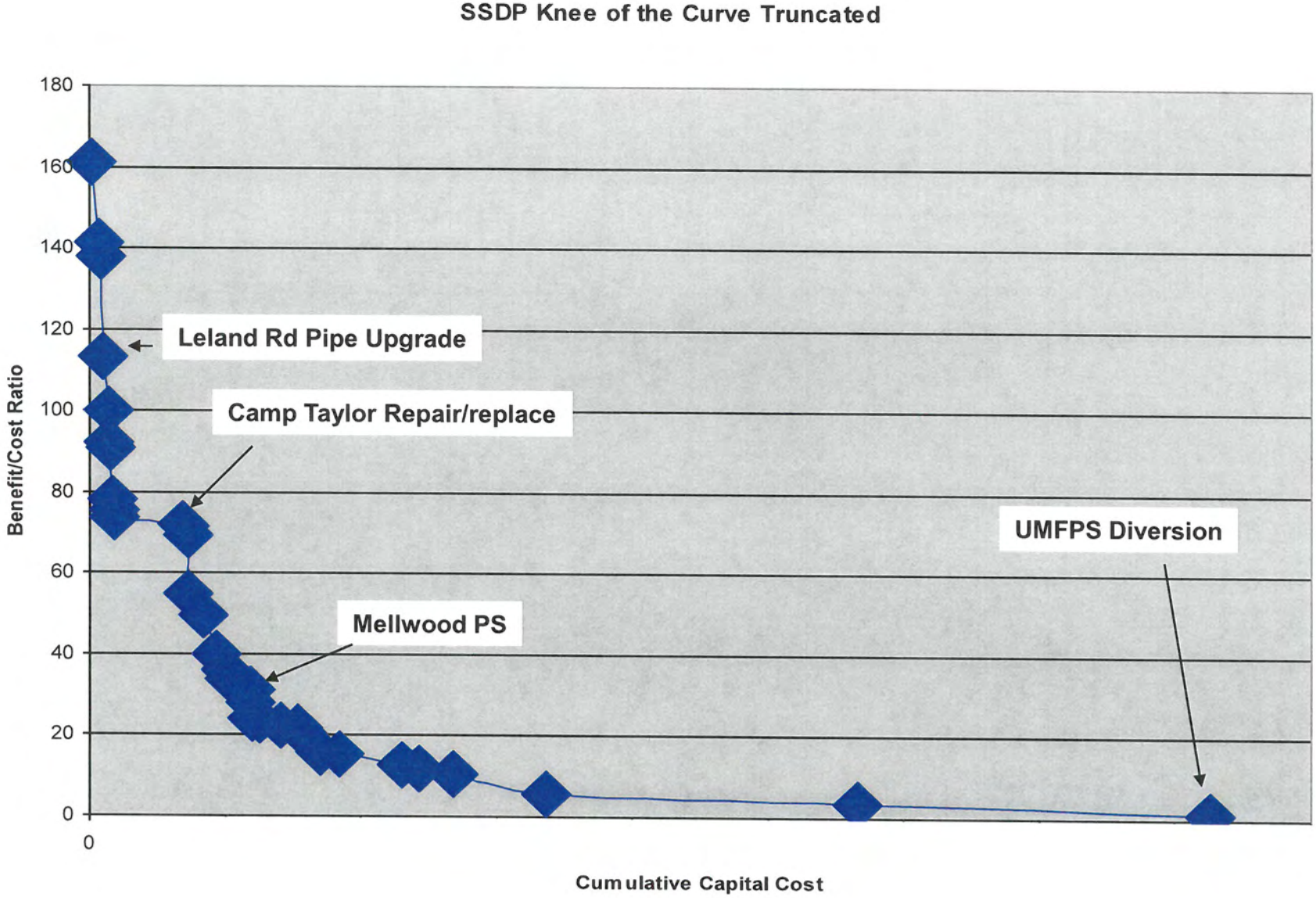

Conclusion

- B/C Evaluation has resulted in logical ranking of solutions
- Scoring system does not reflect economies of scale for very large projects
- Scoring system does not reflect "cross-basin" benefits
- Project sequencing and scheduling must consider factors other than just B/C ratio