

Wet Weather Team Project

Meeting Materials

Summer 2007–Spring 2008

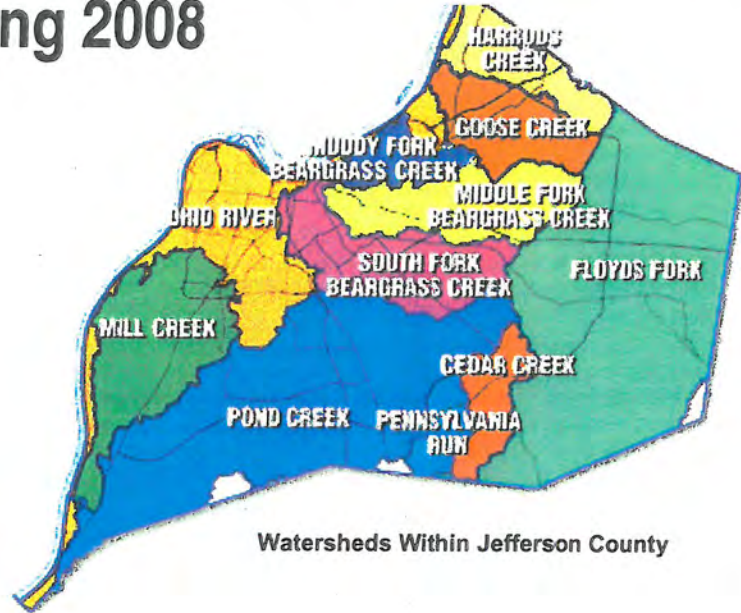
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WWT Stakeholders Meeting # 16 2/26/2008



MSD

Louisville and Jefferson County
Metropolitan Sewer District



Agenda

Draft Agenda
Louisville and Jefferson County Metropolitan Sewer District (MSD)
Wet Weather Team Meeting #16
Tuesday, February 26, 2008, 4:20-8:30 PM
MSD Main Office, Board Room
700 West Liberty St., Louisville

Meeting Objectives:

- Learn about the technical team's progress at identifying green infrastructure opportunities in Jefferson County and other related green initiatives in the community.
- Discuss high-level combined sewer overflow (CSO) control strategies for the Wet Weather Program, including the role of green infrastructure.
- As time allows, review and discuss potential changes to user fees and incentives in the funding plan for MSD's Wet Weather Program.
- 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 (20 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.

5:00 PM Green Infrastructure Opportunities (45 minutes)

- Review the overall scope of the green infrastructure initiative and how it relates to the alternatives identification and evaluation process for MSD's Wet Weather Plan.
- Review and discuss examples of the technical team's work to identify green infrastructure opportunities in Jefferson County, including watershed fact sheets, concept plans, and partnership activities.
- Updates on other related green initiatives in the community, including the Mayor's Louisville Metro Green Initiative.

5:45 PM Opportunity for Observer Comments (10 minutes)

5:55 PM Dinner Break (20 minutes)

Dinner will be provided for Wet Weather Team members.

2/26/08 Wet Weather Team Meeting Agenda, Continued

- 6:15 PM CSO Control Strategy Discussion (70 minutes)**
- Brief review of the range of high-level strategies available for control of CSOs.
 - Review and discuss examples of preliminary results of the benefit-cost analysis of project alternatives to address CSOs.
 - Discuss the emerging picture of high-level CSO control strategies for MSD's Wet Weather Program, including the roles of "green" and "grey" infrastructure solutions and non-structural solutions.
- 7:25 PM Update on Emerging Elements of MSD's Wet Weather Program (20 minutes)**
- Update on the emerging elements of MSD's Wet Weather Program, including CSO control strategy, SSO control strategy, water quality improvement vision, and regulatory compliance strategy.
- 7:45 PM Funding Plan Discussion—User Fees and Incentives (30 minutes) (*as time allows*)**
- Review the structure of MSD's user fees and the incentives that are currently built into MSD's fees and rates.
 - Review and discuss potential changes or additions to MSD's user fees and incentives.
- 8:15 PM Opportunity for Observer Comments (10 minutes)**
- 8:25 PM Wrap Up and Next Steps (5 minutes)**
- Review plans for the next Wet Weather Team meeting on Thursday, April 3, 2008.
- 8:30 PM Adjourn**

**Final Meeting Summary
Wet Weather Team Meeting #16
Tuesday, February 26, 2008
MSD Main Office, Louisville**

The Wet Weather Team (WWT), chartered by the Louisville and Jefferson County Metropolitan Sewer District (MSD), met on February 26, 2008, at MSD's main office in Louisville. The objectives of the meeting were to:

- Learn about the technical team's progress at identifying green infrastructure opportunities in Jefferson County and other related green initiatives in the community.
- Discuss high-level combined sewer overflow (CSO) control strategies for the Wet Weather Program, including the role of green infrastructure.
- Identify next steps and expectations for the next meeting of the Wet Weather Team.

Wet Weather Project Updates and Announcements

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

- Angela Akridge of MSD noted that the subgroup of WWT stakeholders working on an outreach strategy for the next set of Project WIN public meetings will meet on Thursday, February 28, 2008.
- Bud Schardein of MSD announced that MSD had a very productive meeting with EPA Region 4 on February 6, 2008. The discussion at this meeting focused on the capacity management issues related to the JTown Wastewater Treatment Plant.
- Mr. Schardein noted that a news story on the JTown plant ran on February 25, 2008.
- Mr. Schardein noted that MSD has been in discussions with a number of nearby counties for about six months about the possibility of setting up a five-county, independent sewer district. If established, the regional sewer district would be a separate utility from MSD and would have the ability to create a regional wastewater treatment plant for the Salt River watershed.

Green Infrastructure Opportunities

John Lyons of Strand Associates provided an update on the technical team's progress at identifying green infrastructure opportunities in Jefferson County and other related green initiatives in the community. Mr. Lyons began the presentation by noting that the philosophical approach behind this work is that looking for green infrastructure opportunities at multiple scales (e.g., regional scale and sewershed scale) will result in greater benefits for MSD and the community than if the work focused on site-specific opportunities alone. Within this context, there will be three types of green projects: (1) those that are owned, operated, and funded by MSD; (2) those that are the result of MSD partnering with a local agency or private entity; and (3) those that are developed by other agencies.

Out of the 49 percent of MSD's combined sewer area that is covered by impervious surfaces, the major cover types are roads, single family residences, industrial properties, and commercial properties. Therefore, the technical team is focusing on these four types of cover while identifying green opportunities. Currently, the technical team is generating maps for each sewershed in MSD's service area that identify opportunities for green infrastructure based on parameters such as land cover type. Once this is done, a subset of projects will be chosen for more detailed evaluation through a prioritization process. The outcome will be a list of green project alternatives that will be considered along with gray

alternatives during the site-specific benefit/cost analysis. The technical team will also generate a list of potential partnership opportunities for MSD.

Finally, Mr. Lyons presented several specific examples of potential green projects, including a plan for Roosevelt Perry Elementary School that would reduce total run-off by 80 percent while at the same time providing other community benefits. For example, using curb bump-outs at the school would reduce the amount of stormwater entering the combined sewer system and slow down cars driving by the school.

WWT members asked several clarifying questions in response to the presentation, and also offered a number of comments, as follows.

- A few WWT members asked why multi-family residences weren't listed as a major type of impervious cover. Mr. Lyons responded that multi-family residences only account for about 5 percent of impervious cover in MSD's combined sewer area.
- A few WWT members commented that projects such as the example at Roosevelt Perry School have educational benefits to the students who get to see how green infrastructure works first-hand.
- A few WWT members commented that it is important to incorporate green infrastructure into new development. Incentives or credits could be used to encourage developers to use green infrastructure.
- Some WWT members suggested that MSD form partnerships with people and agencies who work on climate change issues (e.g., the new committee in the Green City Partnership).
- A few WWT members commented that it would be interesting to turn the modeling process used by the green infrastructure team to identify green opportunities based on sewershed characteristics into a tool that other communities could use.
- Several WWT members suggested looking at opportunities to incorporate green infrastructure into brownfield development (e.g., in Park Hill Corridor).

CSO Control Strategy Discussion

Tim Kraus of O'Brien & Gere provided an overview of emerging high-level CSO control strategies for MSD's Wet Weather Program. Mr. Kraus began by going over some of the CSO control options that technical team will look at when developing project alternatives. "Green" control options will include techniques such as green roofs, rain gardens, rain barrels, porous pavement, and bio-retention, while "gray" control options will include sewer separation, in-line and off-line storage, and treatment. Next, Mr. Kraus explained that green solutions will be integrated into MSD's Wet Weather Program in two ways. First, MSD will be involved in a number of programmatic green projects (e.g. a rain barrel program), either alone or through partnerships with other entities. Second, the technical team will develop both green and gray project alternatives for specific CSO sites.

Mr. Kraus also described how green and gray project alternatives will be integrated. Initially, both green and gray solutions will be assessed for each project site. If a viable green solution exists for a given site, the technical team will estimate the reduction in runoff the green solution will provide, and then develop a "right-sized" gray solution that provides any remaining needed reduction. Separately, potential programmatic green projects MSD could implement or participate in will be evaluated for flow reduction potential. This estimated flow reduction of the programmatic projects MSD ultimately implements will also be factored into the design of site-specific projects.

Next, Mr. Kraus walked the group through two draft examples of how the benefit/cost analysis will work at particular CSO sites. The first example showed the results of benefit/cost analysis for two potential project alternatives (storage and storage with bio-retention) for CSO 127. The second example showed

the results of benefit/cost analysis for two potential projects alternatives (storage and sewer separation) for CSO 130. Mr. Kraus noted that the potential project alternatives shown in these examples do not represent the full range of project alternatives that will be developed for each CSO.

Last, Mr. Kraus presented a list of emerging high-level principles, strategies, and considerations the technical team is using to develop project alternatives. This list included:

- Coming into compliance with the Clean Water Act;
- Building around MSD's existing infrastructure;
- Having an initial project design target of four overflows per year (based on EPA's CSO policy);
- Evaluating additional project design targets for less than four overflows per year (since the WWT's community values could make a change to project design targets if greater levels of control achieve better benefit-cost ratios);
- Incorporating green solutions as an integral part of the program;
- Including a complementary balance of applied technologies within the project list; and
- Utilizing the benefit/cost tool for comparison and selection of projects and program elements that make up the CSO Long Term Control Plan (LTCP).

WWT members asked several clarifying questions in response to the presentation, and also offered a number of comments, as follows.

Comments on Green/Gray Evaluation Process

- A few WWT stakeholders asked if green solutions would be implemented before gray solutions. Mr. Kraus responded that this would be difficult due to the regulatory timeframe MSD is under. However, the effectiveness of the green solutions will be monitored so the reduction they offer can be more accurately estimated and adjusted for in later projects (e.g., reducing the size of gray solutions).
- A few WWT stakeholders asked if the benefits from a particular green project have to be manifested in the same sewershed as the CSO they are intended to correct for in order to offset gray infrastructure projects for that CSO. Mr. Kraus clarified that this is the case.
- Several WWT members commented that when you use old and new technologies together (i.e., gray and green solutions), there can be too much reliance on older, established technologies. It will take a while to get people to accept green solutions.
- A few WWT stakeholders commented that a challenge with relying on rain barrels as a green solution is that people may get tired of using them over time and fail to properly maintain them, and asked whether there are data on any communities that currently use a lot of rain barrels showing if use of rain barrels changes over time. The technical team responded that they will look for this information.
- Several WWT members noted that it will be important to educate people about the benefits of partnerships, and suggested that MSD might be able to find more partners by bringing up the green aspects of the Wet Weather Program at public meetings. One WWT member suggested that MSD network with partners on education activities.

Comments on Benefit/Cost Examples

- A few WWT stakeholders asked why the storage facility and bio-retention option in the CSO 127 example is so much more expensive than storage facility alone. Mr. Kraus responded that the cost is higher because cost for the bio-retention piece was added on to the cost for the storage facility, but that the cost of the storage facility itself does not change between the two options.

- Several WWT members noted that it will be important to have a good number of project alternatives to evaluate for each CSO.

Other Comments

- Several WWT members commented that it will be important to develop incentives for the greenest and simplest solutions for new development. One idea for an incentive is that developers who employ these practices could move to the front of the review line.
- Several WWT members suggested coming up with a draft best management practice (BMP) for developers that explains benefits they could receive using green infrastructure (e.g., drainage credits).
- A few WWT members commented that it is very important to use education to create a sense of personal responsibility among community members for protecting the community's water resources.
- Several WWT members commented that the values-based decision making process has worked very well so far, and that it could potentially be used in other communities and to address different kinds of environmental issues (e.g., energy use).
- A few WWT members noted that would be important to remember that there are two phases to the overall process: the benefit/cost analysis of specific project alternatives, and the evaluation of the cost of the entire suite of projects and programmatic components in MSD's Wet Weather Program.
- A few WWT members asked whether the technical team is using a quality control review system for all of the work that is being done on the identification and analysis of alternatives. Gary Swanson of CH2M Hill responded that the technical team has a quality assurance plan and that members of the technical team are reviewing each others' work.

Update on Emerging Elements of MSD's Wet Weather Program

Angela Akridge of MSD provided an update on a second meeting MSD had with EPA Region 4 and the Kentucky Division of Water since the last WWT meeting, separate from February 6, 2008 meeting regarding JTown that Bud Schardein described during the Wet Weather Project Updates. This meeting, which took place on February 20, 2008, focused on technical issues MSD has come across related to the CSO LTCP and the Sanitary Sewer Discharge Plan (SSDP). For the SSDP, the main topics of discussion included secondary treatment options for wet weather flows and schedules for design, permit approval, and outside agency review. For the LTCP, the group discussed the approach to integrating green and gray solutions that the technical team developed, which EPA staff agreed to. Finally, the group discussed approaches MSD can take to achieve and document Clean Water Act compliance. For example, for the Ohio River, EPA staff encouraged MSD to look at the impacts of overflows alone, separating out sources of pollution that the CSO LTCP will not address.

The group of technical staff from MSD, EPA Region 4, and the Kentucky Division of Water agreed to continue having face-to-face meetings to discuss technical issues through December 31, 2008, when the final LTCP and SSDP are submitted.

Observer Comments

There was one observer comment at the meeting, as follows.

- It is important to consider green infrastructure during the planning phase of development, as it is much harder to incorporate it once the building phase has already begun.

Wrap Up and Next Steps

- MSD and the technical team will put together a proposal for a high-level vision of the Wet Weather Program for the WWT to review at the next meeting on Thursday, April 3, 2008. The technical team will also work on a summary of the results of the benefit/cost analysis to present at the meeting.
 - Potential topics for the WWT's next meeting on April 3, 2008 include:
 - User fees and incentives in the funding plan for MSD's Wet Weather Program (Note: This discussion was originally planned to take place during the February 26, 2008 WWT meeting, but has been moved due to time constraints.);
 - Proposal for a high-level vision for MSD's Wet Weather Program and Consent Decree response;
 - Summary and examples of the results of the benefit/cost analysis;
 - Draft education and outreach plan; and
 - Draft monitoring and evaluation plan.
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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
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
Kurt Mason, Jefferson County Soil and Water Conservation District
Judy Nielsen, Louisville Metro Health Department
Lisa Santos, Irish Hill Neighborhood Association
Bruce Scott, Kentucky Waterways Alliance
David Tollerud, University of Louisville, School of Public Health and Information Sciences

MSD Personnel

Angela Akridge, MSD Regulatory Policy Manager
Brian Bingham, MSD Regulatory Management Services Director
Bud Schardein, MSD Executive Director

Facilitation and Technical Support

Gary Swanson, CH2M HILL
Jennifer Tice, Ross & Associates Environmental Consulting
Kate Weinberger, Ross & Associates Environmental Consulting

Meeting Observers

Jim Bruggers, Courier-Journal	Kristin Crumpton, Tetra Tech
Vicki Coombs, MSD	Marion Gee, MSD

Clay Kelly, Strand Associates
Tim Kraus, O'Brien & Gere
John Lyons, Strand Associates
Tony Marconi, URS
William Marshall, Tetra Tech

Julia Muller, MSD
Phillip Scott, O'Brien & Gere
Wes Sydnor, O'Brien & Gere
Joy Walker, MSD

Meeting Materials

- Agenda for the 2/26/08 WWT Meeting
- Summary of the 1/15/08 WWT Meeting
- Solution Ideas List (updated February 2008)
- Education and Outreach Ideas List (updated February 2008)
- Data Requests and Monitoring Suggestions List (Updated February 2008)
- Green Infrastructure Initiative Presentation
- Combined Sewer Overflow Long Term Control Plan Strategy Presentation
- Green and Gray Solutions Evaluation Process Handout
- Draft Example CSO 130 Benefit/Cost Handout
- Draft Example CSO 127 Benefit/Cost Handout
- User Fees and Incentives Presentation
- MSD Schedule of Rates, Rentals and Charges Handout

Wet Weather Team Solution Ideas Working Draft – February 12, 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 the Wet Weather Program. 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 inclusion in this list.

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

- Section I, “Project Alternatives,” is organized into five sub-categories: Stormwater Best Management Practices (Non-Structural), Stormwater Best Management Practices (Structural), CSO and SSO Point Source Controls, General/Other Solutions, and Site-Specific Solutions.
- Section II, “Funding Ideas 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 (January / February 2008)

1. (II-A-1-a-i) – Spread payments over a longer time period if this would reduce the burden on lower income residents.
2. (II-A-1-c) – Consider how the community develops to make sure that everyone pays into the solution.
3. (II-A-6-a) – Have higher rates in the near term to avoid future balloon payments.
4. (II-A-6-b) – Create balance between what the community pays now and what the community will pay later.
5. (II- A-6-c) – Do not increase rates so much that they drive companies or residents to move elsewhere.
6. (II- A-6-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.
7. (II-C-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.
8. (III-A-Other Entities-8) – Coordinate with other agencies to examine the total impacts of all utility costs (water, wastewater, energy, gas) on customers.
9. (III-A-Other Entities-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.

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 Wet Weather Program.
4. Hold "CSO Action Days" during or right after a hard rain to promote behavior change (e.g., don't use your dishwasher, wait to do your laundry, etc.).
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 Wet Weather Program. [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 Wet Weather Program 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.

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.

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.]

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. 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 involve 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.

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

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 do the inspections themselves.
 - 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.

Opportunities to Encourage/Use Green Infrastructure in Development Projects

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.

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 will be developed in the future.

Opportunities for MSD to Collaborate with Other Entities

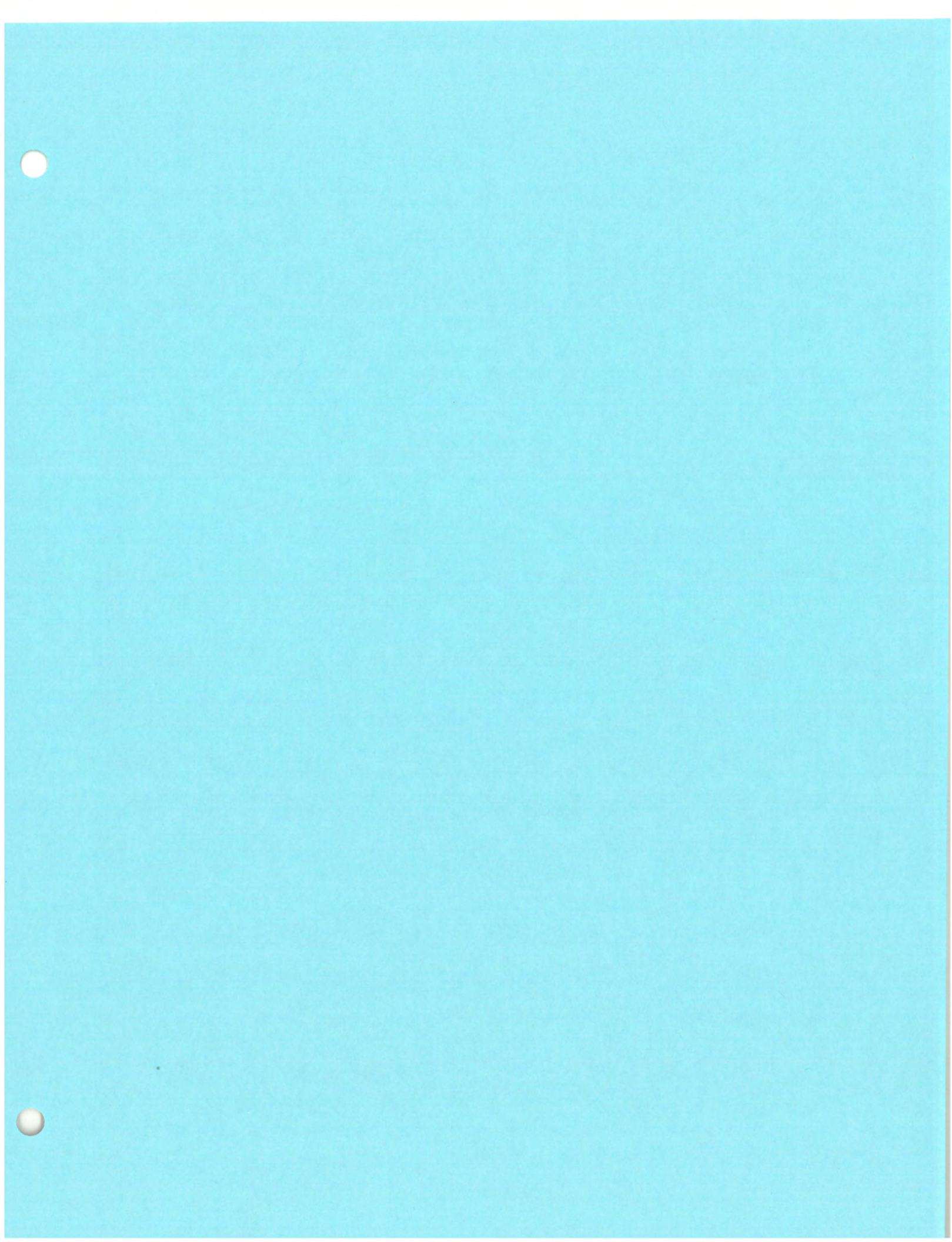
1. Coordinate with planning and zoning departments and other governmental entities around the value of green infrastructure.
2. Partner with schools to relate students' community service efforts with green projects.
3. Coordinate with other regional entities to build a major treatment plant near the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

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 – February 12, 2008

The following is a list of education and outreach ideas identified by Wet Weather Team (WWT) members for consideration for the Wet Weather Program. 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 Wet Weather Program. (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 Wet Weather Program education and outreach efforts, and Section 2, which covers efforts that are only partly within MSD's control.

What's New (January / February 2008)

1. (1-B-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 Wet Weather Program 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.
2. (1-E-5) – Support volunteer monitoring efforts, such as those practiced by the Salt River Watershed Watch program (<http://kywater.org/watch/salt/>).

I. MSD Wet Weather Program 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.
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.
 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 Wet Weather Program 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.

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 Wet Weather Program 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
2. Develop/use posters and visual displays to illustrate concepts to the public and provide context to Wet Weather Program 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.
- 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.
- 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.
- 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 Wet Weather Program. [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."

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.
- 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.).
- 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.

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 Wet Weather Program. [Note: This is also included in the Solution Ideas List.]
 - a. Develop a survey instrument (potentially with a coalition of cities) and use it every year.
2. Collect baseline data, monitor performance, and ensure “high stakes accountability” for all of the education and outreach objectives of the Wet Weather Program.
 - 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 Wet Weather Program 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 Wet Weather Program and implementation of the consent decree.
5. Support volunteer monitoring efforts, such as those practiced by the Salt River Watershed Watch program (<http://kywater.org/watch/salt/>).

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 included 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 included in the Solution Ideas List.]
3. Work with other building inspectors to raise awareness of wet weather issues during inspections.

Wet Weather Team Data Request and Monitoring Suggestions List

Working Draft – February 12, 2008

The following is a list of data requests and monitoring suggestions made by Wet Weather Team (WWT) members for consideration for the Wet Weather Program. This includes requests for information to support the WWT's deliberations and suggestions for the research, monitoring, and evaluation efforts associated with MSD's Wet Weather Program. 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 Wet Weather Program public education and outreach plan, please see the Wet Weather Team Education and Outreach Idea List.

What's New (January / February 2008)

1. (I-C-7) – Include information on the amount of debt remaining to be paid after the Consent Decree implementation period in future funding presentations.
2. (II-D-1) – Model the water quality benefits of stormwater reduction efforts and present this information to EPA along with the benefits of overflow abatement efforts.
3. (II-D-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).

I. Requests for Information to Support WWT Deliberations

A. Requests for Information on Current Conditions

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 Wet Weather Program 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).

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.

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 Wet Weather Program, 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.

II. Suggestions Related to the Wet Weather Program 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 Wet Weather Program'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. 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. 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.

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.

C. Suggestions Related to the Effectiveness of Behavior Change Efforts

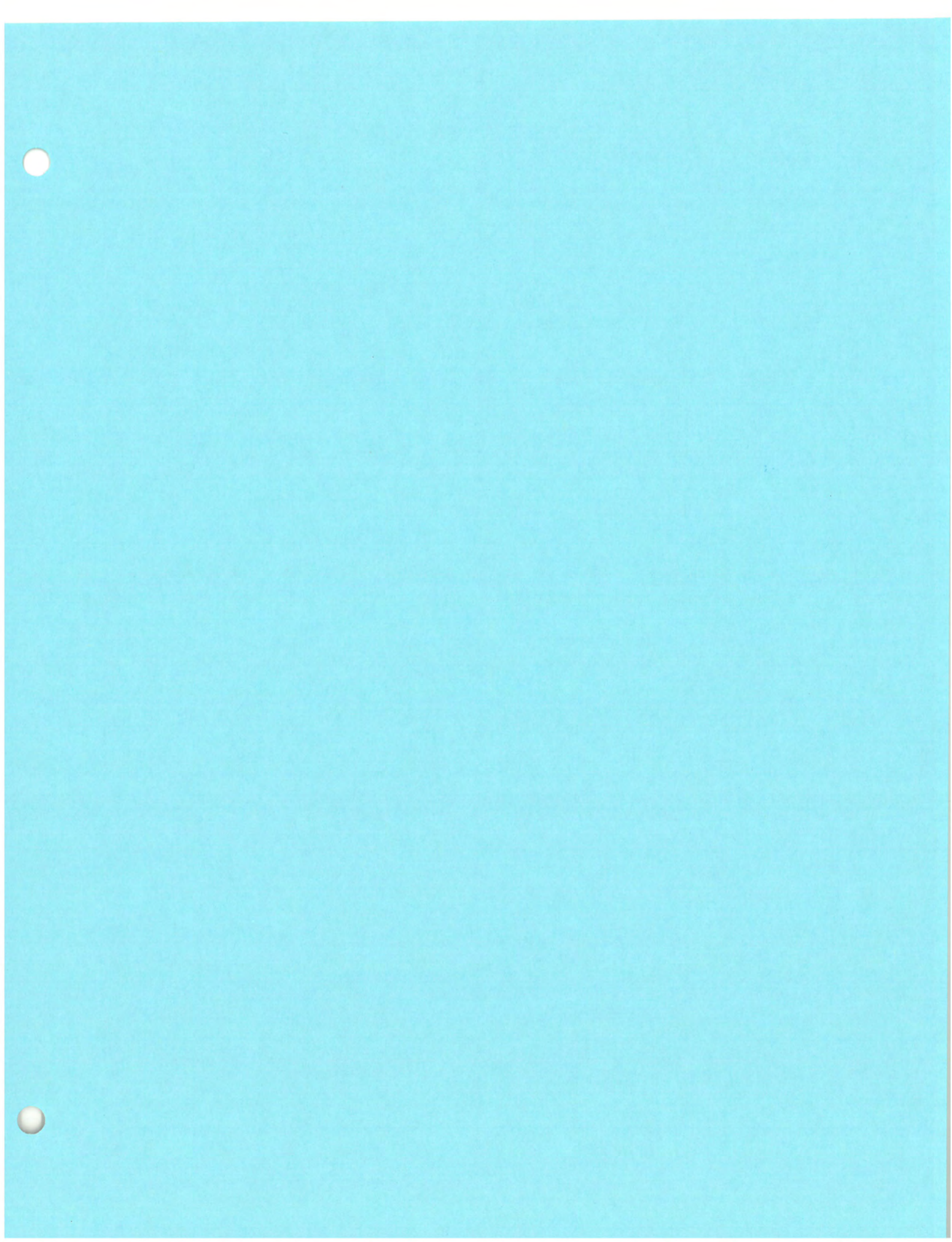
1. Conduct separate research and data analysis to supplement any data collected through surveys about people's behavior.

D. Suggestions Related to the Presentation of Information in the Wet Weather Plan

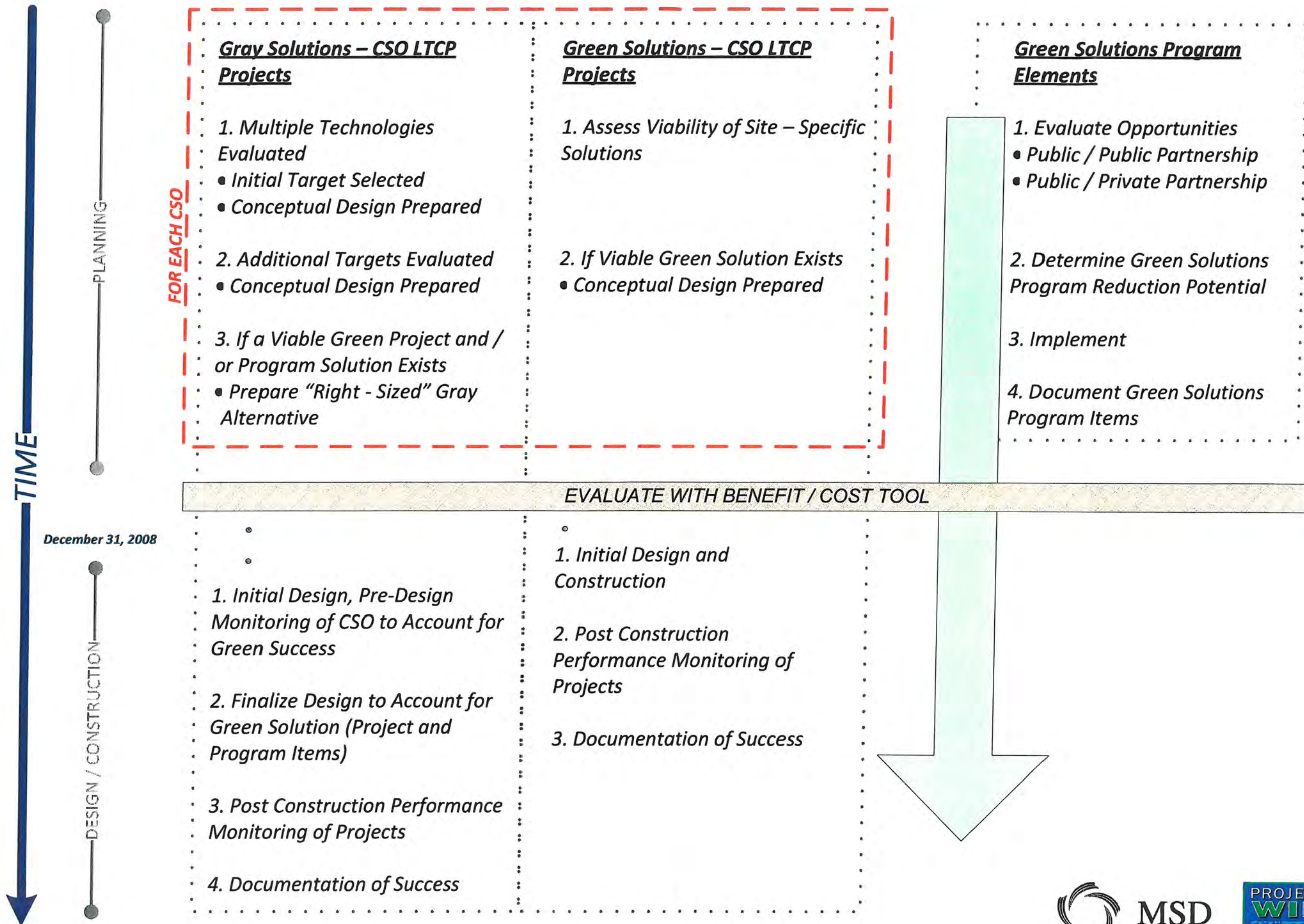
1. Model the water quality benefits of stormwater reduction efforts and present this information to EPA along with the benefits of overflow abatement efforts.
2. Present the results of water quality monitoring so they show the benefits of overflow abatement (e.g., don't focus on bacteria levels only 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).



Green / Gray Evaluation Process



Summary of Scores for Problem L_SO_MF_130

Values	Weights	Scores for Alternatives									
		Raw Score Alternative S_08	Weighted Score Alternative S_08	Raw Score Alternative S_09B	Weighted Score Alternative S_09B	Raw Score Alternative #3	Weighted Score Alternative #3	Raw Score Alternative #4	Weighted Score Alternative #4	Raw Score Alternative #5	Weighted Score Alternative #5
Regulatory Performance	8	20	160	8	64	0	0	0	0	0	0
Public Health Enhancement	10	25	250	10	100	0	0	0	0	0	0
Asset Protection	6	15	90	0	0	0	0	0	0	0	0
Environmental Enhancement	8	-9	-72	10	80	0	0	0	0	0	0
Eco-Friendly Solutions	6	-7	-42	-1	-6	0	0	0	0	0	0
Total Weighted Score All Values		386		238		0		0		0	
Capital Costs		\$1,964,072		\$2,062,000		\$1		\$1		\$1	
Total Present Worth Costs		\$1,688,755		\$1,969,000		\$1		\$1		\$1	
Weighted Benefit/Cost Ratio (Capital Costs)		0.1965		0.1154		0		0		0	
Weighted Benefit/Cost Ratio (Total Present Worth Costs)		0.2286		0.1209		0		0		0	

Note: Capital and Total Present Worth Costs are to be added from the Cost Model from the "Proj Summary" Page



MSD
Louisville-Jefferson County
Metropolitan Sewer District

CSO LTCP Initial Solutions Project Fact Sheet



LTCP Project Number: L_SO_MF_130_S_08_A_A

Project Type: Sewer Separation

Receiving Stream: Lower Beargrass Creek

Project Description: This project is a complete sewer separation project for the CSO 130 service area. The project will consist of the construction of a new storm sewer system and the conversion of the existing CS to a sanitary sewer with elimination of the CSO.

Design Parameters / Assumptions: There's approx. 135 properties impacted by this project. The design flow would be developed in accordance with the MSD Design Manual.

Surrounding Area Land Use: On an access road between an 'Industrial' building and a 'General Comm. And Office' building. Located off of Story Ave.

Apparent Utilities Description: No major utilities conflicts

Capital Projects: 2007~Middle Fork Rehabilitation Phase 2; 2013~USI Inspection Program

Estimated Capital Cost (2010 dollars): \$1,964,072

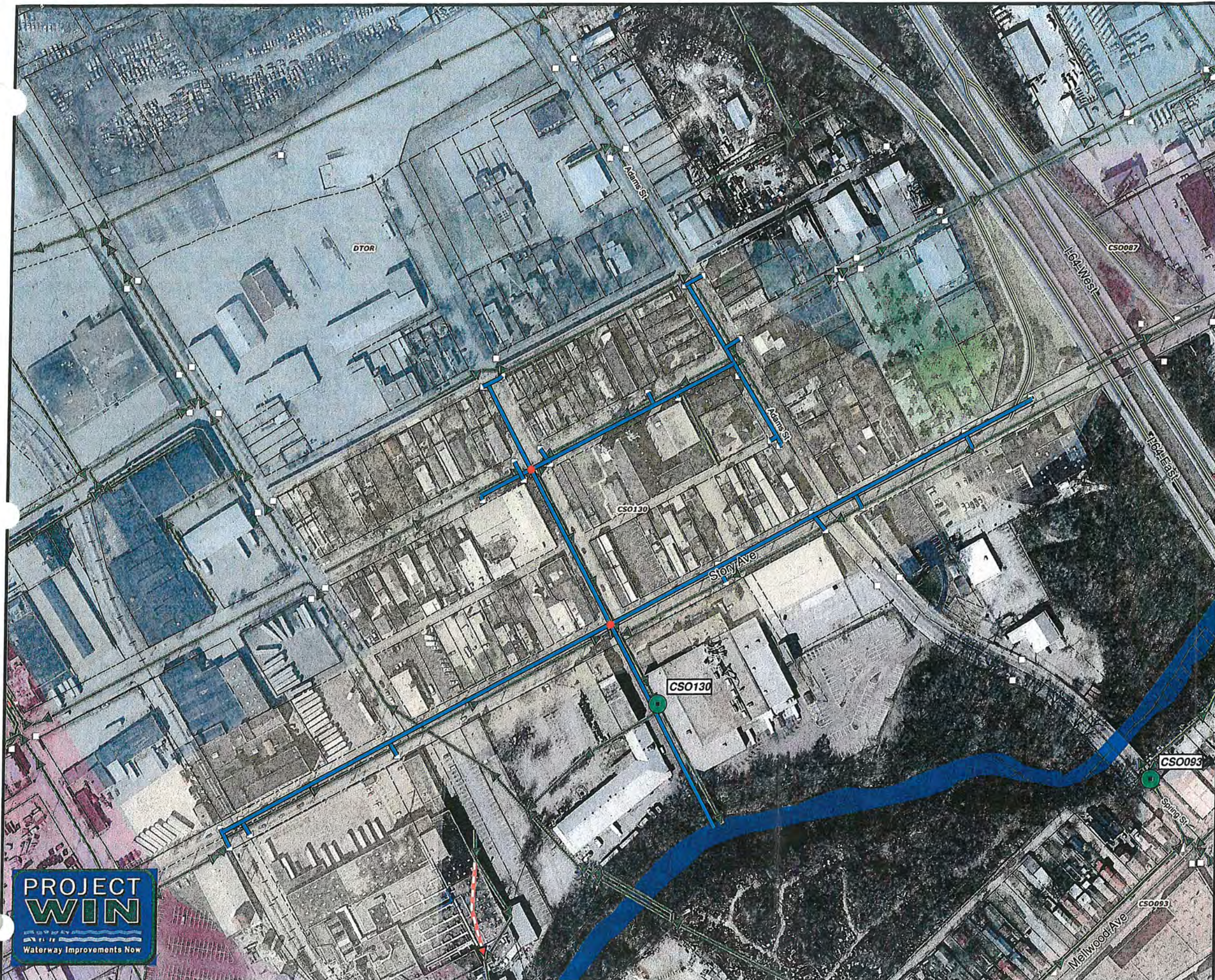
Capital Cost / Gallon Overflow Removed: \$0.57 / gallon removed

Overflow Points Addressed:

<u>CSO Number</u>	<u>CSO Name</u>	<u>2007 AAOV (MG / Yr)</u>	<u>CSO Area (Acres)</u>
CSO130	Webster Street	3.43	28.41

NOTE: Initial Solutions data is based on XP-SWMM model results.

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MSD CSO Long Term Control Plan

L_SO_MF_130_S_08_A_A



Legend

-  Active CSO Location
-  Eliminated CSO Location
-  Proposed Storm MH
-  Proposed Storm Sewer
-  Existing Sewer Line
-  Abandoned Sewer Line
-  Existing Catch Basin
-  Interstate
-  Parcel Boundary
-  Cemetery
-  Metro Park
-  Water Feature

NOTE: The CSO Boundaries are uniquely symbolized within the map.

Aerial Date: 2006

Graphic Date: Feb 13, 2008

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1 inch equals 200 feet

**PROJECT
WIN**
Waterway Improvements Now



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Louisville/Jefferson County Information Consortium (LOJIC), a Jefferson County, Kentucky, based cooperative project of:

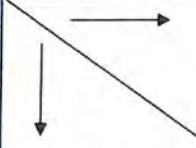
Louisville/Jefferson Metro Government
Louisville Water Company
Metropolitan Sewer District
Property Valuation Administrator

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L SO MF 130 S 08 A A Sewer Separation - Construct New Stormwater Sewer System																
Value:	Regulatory Performance		Measure		Impact							Rationale		Measurement Method		
	WWTP Peak Flows	Beargrass Creek CSOs	CSOs in Ohio River	WWTP Peak Flows	Peak flow delivered to WWTP versus rated peak hour capacity of plant	Peak flow exceeds rated capacity by more than 50%	Peak flow exceeds rated capacity by 25 - 50%	Peak flow exceeds rated capacity by 10 - 25%	Peak flow exceeds rated capacity by less than 10%	Peak flow is within rated capacity	Peak flow is less than 80% of rated capacity	WWTPs have ability to handle small short term peaks without exceeding discharge standards, but significant peaks may result in process washout and associated failure of discharge permit limits. Peak flows less than 80% of rated capacity allow plant to perform significantly better than discharge standards require.	Measurement will be from analyzing plant influent flows against pre-determined plant stress-test results and operating criteria.			
				Untreated CSO or runoff discharge flow rate % of receiving stream flow	Discharge > 5%	Discharge 1 - 5%	Discharge 1 - 0.2%	Discharge 0.1 - 0.2%	Discharge <0.1%	No discharge	CSO Event Mean Concentration for Fecal Coliform in overflows estimated at 250,000/ 100 ml. Dilution factor 0.08% required to not exceed 200 FC/100 ml Water Quality Standard. For partial treatment such as wetland treatment or bioretention, use the comparison to equivalent primary plus disinfection to proportion flow.	Measurement method will be via hydraulic model to quantify the CSO. Spreadsheet calculation to determine mix concentration.				
				Untreated CSO Average Annual Overflow Volume (AAOV)	100 MG+ AAOV	20 - 100 MG AAOV	2 - 20 MG AAOV	1 - 2 MG AAOV	<1.0 MG AAOV	No discharge	100 MG AAOV (10 events) dilution factor in average Ohio River flow is 0.04%. 1.0 MG AAOV (1 event) dilution factor is 0.06%. Cumulative impact of multiple overflow locations may become significant for WQS exceedance.	Measurement methods will be via hydraulic models to quantify the CSO discharge. Spreadsheet calculation to mix concentration.				
Performance Measure	WWTP Peak Flows	CSOs	SSOs	Release point	< 1 year recurrence interval	1-2 yr recurrence interval	2-5 yr recurrence interval	5-10 yr recurrence interval	>10 yr storm return	No discharge	Regulations do not distinguish between potential impact of SSOs, therefore frequency and impact are the same for Regulatory Performance value.	Measurement methods will be via hydraulic models to quantify the SSO discharge				
	Event Recurrence Interval	Frequency per location	Event Recurrence Interval		Most Severe Impact					Least Impact	No Impact					
					5	4	3	2	1	0	Assumptions		Base Case Score	Alternative Score	Total Score	
Frequency	6-10 per year	>10 per year	< 1 year recurrence interval	Most Likely	5	25	20	15	10	5	0	Base Case Score: average overflow volume/duration = 1.5 cfs for 29 events; LBGC average annual Q = 72.8 cfs. SD = 2.06%.	20		20	
	1-6 per year	4-10 per year	1-2 yr recurrence interval		4	20	16	12	8	4	0				0	
	1-2 year recurrence interval	1-4 per year	2-5 yr recurrence interval		3	15	12	9	6	3	0				0	
	2-5 year recurrence interval	1-2 year recurrence interval	5-10 yr recurrence interval		2	10	8	6	4	2	0			0	0	
	>5 year recurrence interval	>2 year recurrence interval	>10 yr storm return	Least Likely	1	5	4	3	2	1	0	Alternative Score: average overflow volume/duration = 0 cfs for 0 events.			0	
	Not possible	Not possible	Not Possible	Not Possible	0	0	0	0	0	0	0	Average Total Score			N/A	
Note - This value sheet calculates the average benefit over the recurrence intervals. A correction calculation is included in order to obtain a maximum score of 25. Acronyms AAOV - Average annual overflow volume CSO - Combined sewer overflow												Corrected Score			20	
				ml - Milliliters SSO - Sanitary sewer overflow		WQS - Water quality standards WWTPs - Wastewater treatment plants										

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L SO MF 130 S 08 A A Sewer Separation - Construct New Stormwater Sewer System																
Value:	Public Health		Measure			Impact						Rationale		Measurement Method		
Performance Measures	WWTP Peak Flows			Peak flow delivered to WWTP versus rated peak hour capacity of disinfection system		Peak flow exceeds rated capacity by more than 100%, wetlands treatment with < 1 day HRT	Peak flow exceeds rated capacity by 50 - 100%, wetlands treatment with < 2 days HRT	Peak flow exceeds rated capacity by 10 - 50%, wetlands treatment with < 3 days HRT	Peak flow exceeds rated capacity by less than 10%, wetlands treatment with 3 - 5 days HRT	Peak flow is within rated capacity, wetlands treatment with > 5 days HRT	Peak flow is less than 80% of rated capacity	WWTP disinfection systems have ability to adjust dose rates to handle small short term peaks without exceeding discharge standards. Significant peaks may result in inadequate disinfection that exceeds discharge permit limits. Peak flows well below system capacity allow performance significantly better than standards require.	Measurement will be from analyzing plant influent flows against pre-determined plant stress-test results and operating criteria.			
	WWTP Peak Flows	CSOs CSOs and SSOs		Release point		Untreated CSO or SSO discharge (or runoff in CSO area) where volume is > 0.04% (SSO)/0.08% (CSO) of stream's flow	Significant untreated discharge to water or ground in high public use or access area	Minor discharge to high public use area or significant discharge to water in low public use or access area, basement back-up	Minor discharge to water in low public use area, or significant minor discharge to ground in low public use or access area, discharge contained and cleaned up	Minor discharge to ground in low public use area or discharged anywhere, de minimus quantity	No discharge	Not all discharges violate the Clean Water Act. Discharges vary in the impact to public health and the environment. Therefore, EPA developed guidance on how to set priorities based on the risk to the public's health and the environment under their Enforcement Management System in Chapter X, titled "Setting Priorities for Addressing Discharges from Separate Sanitary Sewers." The assigned consequences follow the intent of the principles and priorities presented in the chapter. SSO Event Mean Concentration for Fecal Coliform estimated at 500,000/100ml. Dilution factor 0.04% required to not exceed 200 FC/100 ml Water Quality Standard.	Measurement methods will be via hydraulic models to quantify the SSO discharge and the GIS to establish relative distance from designated locations or objects.			
	Design Event Recurrence Interval	Frequency per location	Event Recurrence Interval			Most Severe Impact				Least Impact	No Impact					
						5	4	3	2	1	0	Assumptions		Base Case Score	Alternative Score	Total Score
Frequency	6-10 per year	>10 per year	< 1 year recurrence interval	Most Likely	5	25	20	15	10	5	0	Base Case Score: average overflow volume/duration = 1.5 cfs for 29 events; LBGC average annual Q = 72.8 cfs. SD = 2.06%.	25		25	
	1-6 per year	4-10 per year	1-2 yr recurrence interval		4	20	16	12	8	4	0				0	
	1-2 year recurrence interval	1-4 per year	2-5 yr recurrence interval		3	15	12	9	6	3	0				0	
	2-5 year recurrence interval	1-2 year recurrence interval	5-10 yr recurrence interval		2	10	8	6	4	2	0				0	
	>5 year recurrence interval	>2 year recurrence interval	>10 yr storm return	Least Likely	1	5	4	3	2	1	0	Alternative Score: average overflow volume/duration = 0 cfs for 0 events.		0	0	
	Not Possible	Not Possible	Not Possible	Not Possible	0	0	0	0	0	0	0	Average Total Score		NA		
Note - This value sheet calculates the average benefit over the recurrence intervals. A correction calculation is included in order to obtain a maximum score of 25.																
Acronyms CSO - Combined sewer overflow HRT - Hydraulic retention time WWTP - Wastewater treatment plant FC - Fecal coliform ml - Milliliter GIS - Geographic information system SSO - Sanitary sewer overflow												Corrected Score			25	

L SO MF 130 S 08 A A Sewer Separation - Construct New Stormwater Sewer System														
Value:	Asset Protection				Impact					Rationale		Measurement Method		
	Flood Damage			Homes or businesses are subject to severe structural damage	Homes or businesses are subject to minor to moderate structural damage	Flooding limits access to homes or businesses	Flooding limits access to recreational areas	Standing water on property, but access not affected and no damage expected	No standing water	Stormwater BMPs can reduce stormwater peaks and reduce extent of flooded areas, while sewer separation may increase localized stormwater peak flows and increase the flooding impacts of storms. Alternatively, purchase of highly impacted properties may be a cheaper way to reduce flood damage and create green space and buffer zones.	Drainage models where available, or historic observations of flood-prone areas combined with the expected relative impacts of sewer system modifications on storm water flows			
Performance Measures	Basement Back-ups			Sewer surcharging within 6 feet of ground surface for more than 20% of manholes	Sewer surcharging within 6 feet of ground surface for 10 - 20% of manholes	Sewer surcharging within 6 feet of ground surface for 5 - 10% of manholes	Sewer surcharging within 6 feet of ground surface for 1 - 5% of manholes	Sewer surcharging within 6 feet of ground surface for 0 - 1% of manholes	No surcharging within 6 feet of ground surface	First floor levels are typically 1 - 2 feet above ground surface, and basement floors are typically 8 - 10 feet below the first floor. A sewer surcharge of 6 feet below ground surface is highly likely to cause back-ups in homes with basement service.	Measurement methods will be via hydraulic models to quantify the hydraulic grade lines compared to ground surface elevations at manholes.			
	Event Recurrence Interval			Most Severe Impact				Least Impact	No Impact					
				5	4	3	2	1	0	Assumptions		Base Case Score	Alternative Score	Total Score
Frequency	6-10 per year (6-mo. Storm)	Most Likely	5	25	20	15	10	5	0	0% of manholes surcharged; sewer separation eliminates flooding	0	0	0	
	1-6 per year (1-yr. Storm)		4	20	16	12	8	4	0	50% of manholes surcharged; sewer separation eliminates flooding	20	0	20	
	1-2 year recurrence interval (5-yr. Storm)		3	15	12	9	6	3	0	50% of manholes surcharged; sewer separation eliminates flooding	15	0	15	
	2-5 year recurrence interval (10-yr. Storm)		2	10	8	6	4	2	0	50% of manholes surcharged; sewer separation eliminates flooding	10	0	10	
	>5 year recurrence interval	Least Likely	1	5	4	3	2	1	0				0	
	Not Possible	Not Possible	0	0	0	0	0	0	0	Average Total Score			9	
Note - This value sheet calculates the average benefit over the recurrence intervals. A correction calculation is included in order to obtain a maximum score of 25. Acronyms BMPs - Best management practices										Corrected Score		15		

L SO MF 130 S 08 A A Sewer Separation - Construct New Stormwater Sewer System													
Value:		Environmental Enhancement											
		Scoring											
Aspect	-5	-4	-3	-2	-1	0	1	2	3	4	5	Assumptions	Score Per Aspect
Aquatic and Terrestrial Habitat Protection	Elimination of habitat for rare or endangered species	Elimination of significant amount of common habitat	Elimination of minor amount of common habitat	Significant habitat impairment	Minor impairment to existing habitat	No impact on habitat	Minor enhancement of existing habitat	Significant enhancement of existing habitat	Creation of minor amount of common habitat	Creation of significant amount of common habitat	Creation of critical habitat for rare or endangered species	Will utilize expertise of sub-consultants Redwing Ecological Services and/or LimnoTech to score Environmental Enhancement aspects.	1
Aesthetics - Solids and Floatables	75%+ reduction in volume of flow with no S&F capture	50 - 75% of flow with no S&F removal	25 - 50% of flow with no S&F removal	10 - 25% of flow with no S&F removal	Reduces efficiency of existing S&F control device, 0 - 10% of flow with no S&F removal	No change in S&F removal	0 - 10% of discharged flow treated with positive S&F removal (screens)	10 - 25 % of discharged flow treated with positive S&F removal (screens)	25 - 50% of discharged flow treated with positive S&F removal (screens)	50 - 75% of discharged flow treated with positive S&F removal (screens)	75%+ of discharged flow treated with positive S&F removal (screens)	Storm water first-flush considered to be high in runoff pollutants	-5
Aesthetics - Odor and Air Emissions	Create annoying odor source affecting > 20 customers often	Create annoying odor source affecting <20 customers often, or >20 customers occasionally	Create annoying odor source affecting <20 customers occasionally	Create detectable odor source affecting > 50 customers often	Create detectable odor source affecting < 50 customers occasionally	No impact on odors	Eliminate detectable odor source affecting < 50 customers occasionally	Eliminate detectable odor source affecting > 50 customers often	Eliminate annoying odor source affecting <20 customers occasionally	Eliminate annoying odor source affecting <20 customers often, or >20 customers occasionally	Eliminate annoying odor source affecting >20 customers often	Will be evaluated using CH2M Hill odor model in conjunction with assessment of adjacent land use population density	0
Dissolved Oxygen Impacts	Reduction of in-stream DO by 2 mg/l + during critical flow periods	Continuous reduction of in-stream DO of 2 mg/l +	Continuous reduction of in-stream DO of 0 - 2 mg/l, possible reduction of in-stream DO 2 - 4 mg/l during critical conditions	Intermittent reduction of in-stream DO 2 mg/l + possible during non-critical conditions, reduction of DO 0 - 2 mg/l during critical conditions	Intermittent reduction of in-stream DO 0 - 2 mg/l possible during non-critical conditions	No DO impacts	Intermittent improvement of in-stream DO 0 - 2 mg/l	Intermittent improvement of in-stream DO 2 mg/l +, intermittent critical condition improvements 0 - 2 mg/l	Continuous improvement of in-stream DO 0 - 2 mg/l, intermittent critical condition improvements 2-4 mg/l	Continuous improvement of in-stream DO 2 mg/l +	Continuous improvement of critical condition in-stream DO 2 mg/l +	Will utilize expertise of sub-consultants Redwing Ecological Services and/or LimnoTech to score Environmental Enhancement aspects.	0
Downstream Impacts	75%+ increase in annual BOD or nutrient loads	50 - 75% increase in annual BOD or nutrient loads	25 - 50% increase in annual BOD or nutrient loads	10 - 25% increase in annual BOD or nutrient loads (CSO + runoff)	Potential 0 - 10 % increase in annual average BOD or nutrient loads (CSO + runoff)	No impact on BOD or nutrient loads (CSO + runoff)	0 - 10% reduction in annual BOD or nutrient loads (CSO + runoff)	10 - 25% reduction in annual BOD or nutrient loads (CSO + runoff)	25 - 50% reduction in annual BOD or nutrient loads (CSO + runoff)	50 - 75% reduction in annual BOD or nutrient loads (CSO + runoff)	75%+ reduction in annual BOD or nutrient loads (CSO + runoff)	Storm water first-flush considered to be high in runoff pollutants	-5
Stream Flow Impacts (Peak flows)	25%+ increase in peak flows	10% - 25% increase in peak flows	Up to 10% increase in peak flows	Frequent increase in flow during critical conditions	Possible increase in average flow, or minor increase in high flow peaks	No impact on peak flows	Minor reduction in flows - no significant peak reduction	Minor reduction in peak flows under some conditions	Up to 10% reduction in peak flows	10% - 25% reduction in peak flows	25%+ reduction in peak flows	AAOY reduction = 3.18 MGY (52.7%)	-1
Stream Flow Impacts (DWF only)	25%+ decrease in flow during critical conditions	10% - 25% decrease in flow during critical conditions	0-10% permanent decrease in flow during critical conditions	Frequent decrease in flow during critical conditions	Possible decrease in average flow	No impact on average or base stream flow	Intermittent increase in stream flow - not tied to critical conditions	Intermittent increase in stream flow - often improves critical conditions	0 - 10% permanent increase in stream flow during critical conditions	10 - 25 % permanent increase in stream flow during critical conditions	25%+ permanent increase in stream flow during critical conditions	AAOY reduction = 3.18 MGY (52.7%)	1
Instructions: (1.) Score each alternative for each of the seven aspects of the value. Scores can be positive or negative, depending on the impact of the alternative on the value. (2.) Total the scores for each aspect to get the total score for this alternative in this value. (3.) Shaded area represents "fatal flaw". Alternatives that score in this area should not be proposed.												Total Raw Score Calculated	-9
Aspect	Rationale						Measurement Method				Total Score (Default)		-9
Aquatic and Terrestrial Habitat Protection	Wet weather projects may affect both aquatic and terrestrial habitat through changes in base flow, peak flow, water quality, tree cover, channel shape and characteristics etc. Predictive models used to evaluate wet weather control measures have a limited ability to predict biological diversity changes, erosion impacts etc., so surrogate metrics must be used to estimate future positive and negative impacts						Project definition may specifically address changes in channel shape and configuration, tree cover etc. Predictive models will address DO and other water quality impacts. Flow models will predict base flow and peak flow rates to allow estimates of changes in erosion and water surface area.				Note: The total score calculated may be more than 25. In the instances where this might occur, a default maximum score of 25 will be calculated.		
Aesthetics - Solids and Floatables	Most CSOs have some form of solids and floatables control baffles. Improvements in capture rates can be expected with screening or other advanced treatment options. Storm water retention, constructed wetlands, and other control systems may provide solids and floatables removal as well. While reduction in solids and floatables removal efficiency is not likely, penalty points will be assessed if this is possible with any alternative.						Current solids and floatables removal efficiency has been estimated for all sites with control technology. Improvements in removal efficiencies will be estimated for all alternatives that add screening or other advanced treatment technologies. Where treatment is proposed for storm water discharges removals will be estimated based on published removal data.						
Aesthetics - Odor and Air Emissions	Odors and air emissions can be generated in storage systems, pump stations, force mains, and long flat sewers. Odors are generally characterized by both the intensity and the quality of the odor. Detectable and annoying are two common descriptors of different intensities and qualities of odors from sewage handling facilities.						Odor emissions from sewage handling facilities can be modeled for intensity, quality, and geographic spread. For planning purposes this level of evaluation is not common, and will not be done except in very rare circumstances. The potential for odor and air emissions will be estimated based on typical applications and model predictions for storage time, number of events, average flow velocities etc.						
Dissolved Oxygen Impacts	Dissolved oxygen in streams is dependent on a variety of factors including BOD load, nutrient load, stream flow velocity, water temperature, etc.						For BGC the Water Quality Tool will be used to estimate the impacts of various loading conditions, flows, temperatures, etc. Probable impacts of individual projects will be estimated based on comparisons to the various stream condition scenarios.						
Downstream Impacts	Downstream impacts refer to conditions in the Ohio River below Jefferson County. Nutrient loadings in the Ohio (not just Jefferson County) have been identified as the source of 30 - 45% of the total nutrient loads reaching the Gulf of Mexico. BOD is not likely to persist in the river long enough to get to the Gulf, but can have detrimental impacts far downstream.						Pollutant removals will be estimated based on reductions in annual average loads, since the downstream impacts are primarily long-term and cumulative.						
Stream Flow Impacts (Peak flows)	Extremely high peak flows as are often caused by urbanization of a watershed can erode the streambed, damage aquatic and terrestrial habitat, make water based recreation unsafe or impractical.						Predictive models can estimate flow peaking factors from individual sources, and the Water Quality Tool has a hydraulic component to estimate stream flows during various storm events.						
Stream Flow Impacts (DWF only)	Diversion of flows away from a stream due to abandonment of a treatment plant etc. can reduce base flows in a stream. Alternatively, other control measures such as groundwater pumping can increase base flows with beneficial results.						Predictive models can estimate flows from individual sources, and the Water Quality Tool has a hydraulic component to estimate stream flows during various dry weather events.						
Acronyms BGC - Beargrass Creek BOD - Biological oxygen demand CSO - Combined sewer overflow DO - Dissolved oxygen DWF - Dry weather flow mg/l - Milligram per liter S&F - Solids and floatables													

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L SO MF 130 S 08 A A Sewer Separation - Construct New Stormwater Sewer System														
Value:		Eco-Friendly Solutions												
Scoring														
Aspect	-5	-4	-3	-2	-1	0	1	2	3	4	5	Assumptions	Score Per Aspect	
Non-Renewable Energy Consumption	Primary energy consumption is greater than secondary treatment	Primary energy consumption equal to 75 - 100% of secondary treatment	Primary energy consumption equal to 30 - 75% of secondary treatment	Primary energy consumption equal to 15 - 30% of secondary treatment	Primary energy consumption equal to 0 - 15% of secondary treatment	No energy consumption except for cleaning and maintenance	Cleaning and maintenance not needed, no primary consumption	NA	NA	NA	NA		0	
Use of Natural Systems	Constructed facilities permanently displace 5+ acres wetlands or 50% locally available green space	Constructed facilities permanently displace 3 - 5 acres wetlands or 25 - 50% locally available green space	Constructed facilities permanently displace 1 - 3 acres wetlands or 10 - 15% locally available green space	Constructed facilities permanently displace 0 - 1 acre wetlands or up to 10% locally available green space	Constructed facilities temporarily disrupt wetlands or green space	Alternative does not use or affect natural systems, wetlands, or green space	Alternative doesn't use natural systems, but enhances green space or wetland	Natural systems play a minor role in alternative function, up to 1 acre wetland or 10% additional green space created	Natural systems are significant part of alternative function, 1 - 3 acres of wetland created or 10 - 25% additional green space	Alternative fully uses natural systems, 3 - 5 acres of wetland created or 25-50% additional green space	Alternative results in multi-use natural system development, 5+ acres of wetland or 50% additional green space		0	
Multiple-Use Facilities	Constructed facilities permanently eliminate recreational opportunity	Constructed facilities significantly impair recreational opportunity	Constructed facilities moderately impair recreational opportunity	Constructed facilities have minor impacts on recreational opportunity	Construction temporarily impacts recreational opportunity	No impacts on recreational opportunities	Alternative improves access to existing recreational areas	Alternative has limited positive impact on recreation	Alternative significantly enhances recreational opportunities	Alternative increases recreational opportunities in area	Alternative results in multi-use facility	Recreational impacts will be evaluated using either Redwing Ecological Reach Characterization Report (accessibility parameter) or CH2M Hill Recreational Use Survey.	0	
Source Control of subwatershed pollutant loads	Pollutant loadings are increased by 60%	Pollutant loadings are increased by 30 - 50%	Pollutant loadings are increased by 10 - 30%	End of pipe pollutant loadings are increased by 0 - 10%	End of pipe pollutant loadings impacts are inconsistent, but likely higher	End of pipe pollutant loadings are unchanged	Pollutant loadings impacts are inconsistent, but likely lower	Source control reduces pollutant loadings by 0 - 10%	Source control reduces pollutant loadings by 10 - 30%	Source control reduces pollutant loadings by 30 - 50%	Source control reduces pollutant loadings by more than 50%	Storm water first-flush considered to be high in runoff pollutants	-5	
Non-Obtrusive Construction Techniques	Permanent loss of green space or sensitive area disruption	Main thoroughfare closures, sensitive area temporary disruptions	Widespread dust and noise, blasting, secondary street closures	Localized dust, noise and local street closures	Minor dust and noise, traffic lane closures	No construction impacts	NA	NA	NA	NA	NA		-2	
Consistent Land Use	Intrusive or nuisance facilities inconsistent with neighborhood or land use	Facilities inconsistent with neighborhood or land use	Facility characteristics mitigated to reduce impact on neighborhood	Facilities have significant impact on development density or land use	Facility has minor impact on development density or land use	No impact on land use or no above ground facilities	Alternative mitigates existing compatibility problem	Alternative removes facility inconsistent with neighborhood	Alternative removes nuisance facility from neighborhood	Alternative enhances property values in neighborhood	Alternative provides enhancements that significantly improve neighborhood		0	
Impermeable Surfaces	5 acres+ of impermeable surfaces are added	3 - 5 acres of impermeable surfaces are added	1 - 3 acres of impermeable surfaces are added	up to 1 acre of impermeable surfaces are added	Minor increase in impermeable surfaces added	No change in impermeable surface	Minor reduction in impermeable surfaces	Up to 1 acre of impermeable surfaces removed	1 - 3 acres of impermeable surfaces removed	3 - 5 acres of impermeable surfaces removed	More than 5 acres of impermeable surfaces removed		0	
LEEDS Performance	NA	NA	NA	NA	NA	LEEDS not applicable or LEEDS score <10	LEEDS Score 10 - 25	LEEDS Certified	LEEDS Silver	LEEDS Gold	LEEDS Platinum		0	
Instructions: (1.) Score each alternative for each of the eight aspects of the value. Scores can be positive or negative, depending on the impact of the alternative on the value. (2.) Total the scores for each aspect to get the total score for this alternative in this value. (3.) Shaded area represents "fatal flaw". Alternatives that score in this area should not be proposed.											Total Raw Score Calculated		-7	
											Total Score (Default)		-7	
Aspect	Rationale						Measurement Method							
Non-Renewable Energy Consumption	Eco-friendly solutions would be expected to be low consumers of non-renewable energy. Benchmarking energy consumption against conventional secondary treatment provides penalty points for high energy consuming alternatives.						Evaluation of primary energy consumed per MG of flow treated, compared to the energy consumed at the WCWTP per MG treated.						Note: The total score calculated may be more than 25. In the instances where this might occur, a default maximum score of 25 will be calculated.	
Use of Natural Systems	Natural systems replace concrete and steel construction with wet bottom storage lagoons, constructed bioswales, rain gardens etc. that increase green space of various kinds. Options that reduce wetlands and green space get penalty points.						Acres of wetlands and other types of green space created or eliminated. Also includes subjective evaluation of the "basis" of the alternative - "green" or "grey".							
Multiple-Use Facilities	Eco-friendly solutions create recreational opportunities for both water-based and riparian recreation. Boating, canoeing, kayaking, fishing, wading, swimming etc. would be direct water-based recreation. Bird watching, hiking, biking, picnicing, camping etc. would be considered related riparian recreation.						Subjective evaluation of changes predicted in the aquatic or riparian environment as a result of better water quality, increased base flow or decreased flow peaks, increased tree cover or vegetated riparian areas etc.							
Source Control of subwatershed pollutant loads	Controlling pollutant loads at the source through behavior modification, product replacements or stormwater management BMPs that capture pollutants thereby avoiding end of pipe treatment requirements						Modeled land-side pollutant loading reductions as calculated by the BGC Water Quality Tool or by comparison to literature values or pilot program measurements.							
Non-Obtrusive Construction Techniques	Probable construction impacts on traffic, noise and dust are all measures of the friendliness of an alternative. Construction impacts get penalty points for creating nuisance conditions.						Subjective evaluation of probable construction impacts based on the type of construction envisioned for the alternative.							
Consistent Land Use	Alternative configuration can either enhance or detract from the surrounding property. For example, an extremely unfriendly pump station can be noisy, smelly, and ugly. The same pump station can be "disguised" as a residence that fits right in with the neighborhood. If a larger parcel of land is available, a pump station can be hidden from view by landscaping, and a community garden or other green space added to enhance the neighborhood.						At the planning level, projects can be defined to avoid negative impacts on the surrounding properties. Depending on the availability of land, enhancements are possible. This aspect encourages project definition and budgets to enhance, not detract.							
Impermeable Surfaces	Adding impermeable surfaces increases total runoff volume, peak runoff flowrates, and the total transport of any pollutant deposited on the surface from any source. Conversely, permeable surfaces can reduce flow volume and peaks, and provide filtering mechanisms for pollutants.						Acres of permeable surfaces created or eliminated.							
LEEDS Performance	LEED standards are applicable to alternatives that include above-ground building structures.						Application of LEED evaluation points.							
Acronyms BGC - Beargrass Creek LEEDS - Leadership in Energy and Environmental Design														
MG - million gallons WCWTP - West County Wastewater Treatment Plant														

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MSD
Louisville-Jefferson County
Metropolitan Sewer District

CSO LTCP Initial Solutions Project Fact Sheet



LTCP Project Number: L_SO_MF_130_S_09B_B_A

Project Type: Off-Line Storage

Receiving Stream: Lower Beargrass Creek

Project Description: This project is to provide a 0.20 MG underground covered off-line storage basin to reduce overflows at CSO130 to no more than 4 per year. Annual volume stored is estimated to be approx. 3.18 MG.

Design Parameters / Assumptions: Basin is designed to 5th largest overflow event volume (0.20 MG) based on model simulation using typical year rainfall data. Effluent pump is designed based on assumption that the basin need to be empty within 24 hours.

Surrounding Area Land Use: On an access road between an 'Industrial' building and a 'General Comm. And Office' building. Located off of Story Ave.

Apparent Utilities Description: No major utilities conflicts within the area of the designed basin

Capital Projects: 2007~Middle Fork Rehabilitation Phase 2; 2013~USI Inspection Program

Estimated Capital Cost (2010 dollars): \$2,062,000

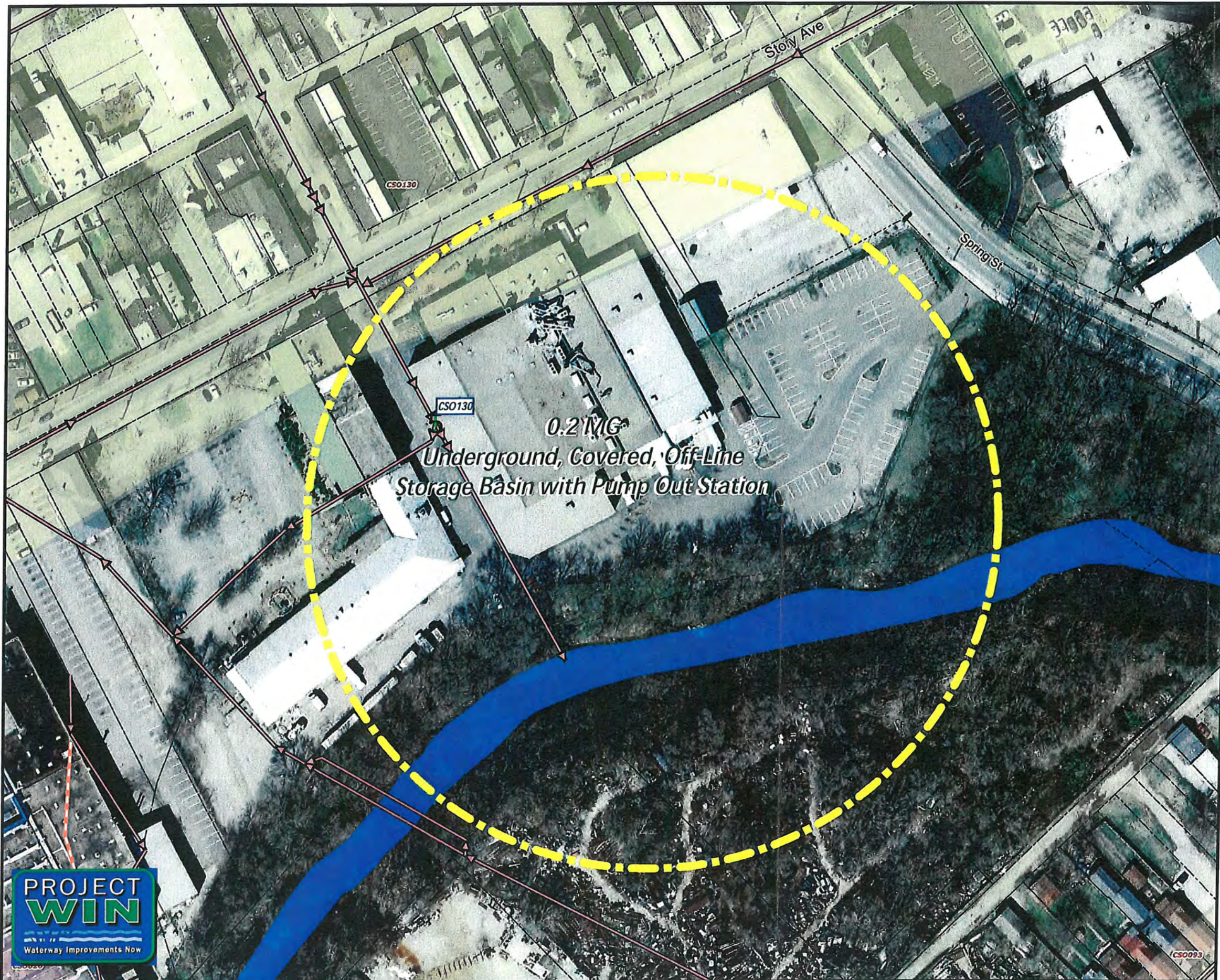
Capital Cost / Gallon Overflow Removed: \$0.65 / gallon removed

Overflow Points Addressed:

<u>CSO Number</u>	<u>CSO Name</u>	<u>2007 AAOV (MG / Yr)</u>	<u>Number of Overflow / Yr</u>	<u>CSO Area (Acres)</u>
CSO130	Webster Street	3.43	29	28.41

NOTE: Initial Solutions data is based on XP-SWMM model results.

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MSD CSO
Long Term Control Plan
L_SO_MF_130_S_09B_B_A



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Legend

- Active CSO Location
- Eliminated CSO Location
- Existing Sewer Line
- Abandoned Sewer Line
- Railroad
- Parcel Boundary
- Cemetery
- Metro Park
- Water Feature

NOTE: The CSO Boundaries are uniquely symbolized within the map.

Aerial Date: 2006

Graphic Date: Feb 26, 2008

1 inch equals 100 feet



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Louisville/Jefferson County Information Consortium (LOJIC), a Jefferson County, Kentucky, based cooperative project of

Louisville/Jefferson Metro Government, Louisville Water Company, Metropolitan Sewer District, Property Valuation Administrator

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PROJECT WIN
Waterway Improvements Now

L SO MF 130 S 09B B A Off-line Storage - Covered Underground Basin w/Pump-out Station																
Value:	Regulatory Performance			Measure		Impact						Rationale		Measurement Method		
	WWTP Peak Flows Beargrass Creek CSOs CSOs in Ohio River			Peak flow delivered to WWTP versus rated peak hour capacity of plant	Peak flow exceeds rated capacity by more than 50%	Peak flow exceeds rated capacity by 25 - 50%	Peak flow exceeds rated capacity by 10 - 25%	Peak flow exceeds rated capacity by less than 10%	Peak flow is within rated capacity	Peak flow is less than 80% of rated capacity	WWTPs have ability to handle small short term peaks without exceeding discharge standards, but significant peaks may result in process washout and associated failure of discharge permit limits. Peak flows less than 80% of rated capacity allow plant to perform significantly better than discharge standards require.	Measurement will be from analyzing plant influent flows against pre-determined plant stress-test results and operating criteria.				
				Untreated CSO or runoff discharge flow rate % of receiving stream flow	Discharge > 5%	Discharge 1 - 5%	Discharge 1 - 0.2%	Discharge 0.1 - 0.2%	Discharge <0.1%	No discharge	CSO Event Mean Concentration for Fecal Coliform in overflows estimated at 250,000/ 100 ml. Dilution factor 0.08% required to not exceed 200 FC/100 ml Water Quality Standard. For partial treatment such as wetland treatment or bioretention, use the comparison to equivalent primary plus disinfection to proportion flow.	Measurement method will be via hydraulic model to quantify the CSO. Spreadsheet calculation to determine mix concentration.				
				Untreated CSO Average Annual Overflow Volume (AAOV)	100 MG+ AAOV	20 - 100 MG AAOV	2 - 20 MG AAOV	1 - 2 MG AAOV	<1.0 MG AAOV	No discharge	100 MG AAOV (10 events) dilution factor in average Ohio River flow is 0.04%. 1.0 MG AAOV (1 event) dilution factor is 0.06%. Cumulative impact of multiple overflow locations may become significant for WQS exceedance.	Measurement methods will be via hydraulic models to quantify the CSO discharge. Spreadsheet calculation to mix concentration.				
Performance Measure	WWTP Peak Flows	CSOs	SSOs	Release point	< 1 year recurrence interval	1-2 yr recurrence interval	2-5 yr recurrence interval	5-10 yr recurrence interval	>10 yr storm return	No discharge	Regulations do not distinguish between potential impact of SSOs, therefore frequency and impact are the same for Regulatory Performance value.	Measurement methods will be via hydraulic models to quantify the SSO discharge				
	Event Recurrence Interval	Frequency per location	Event Recurrence Interval		Most Severe Impact					Least Impact	No Impact					
					5	4	3	2	1	0	Assumptions		Base Case Score	Alternative Score	Total Score	
Frequency	6-10 per year	>10 per year	< 1 year recurrence interval	Most Likely	5	25	20	15	10	5	0	Base Case Score: average overflow volume/duration = 1.5 cfs for 29 events; LBGC average annual Q = 72.8 cfs. SD = 2.06%.	20		20	
	1-6 per year	4-10 per year	1-2 yr recurrence interval		4	20	16	12	8	4	0				0	
	1-2 year recurrence interval	1-4 per year	2-5 yr recurrence interval		3	15	12	9	6	3	0	Alternative Score: average overflow volume/duration = 1.43 cfs for 4 events; LBGC average annual Q = 72.8 cfs. SD = 1.96%.		12	-12	
	2-5 year recurrence interval	1-2 year recurrence interval	5-10 yr recurrence interval		2	10	8	6	4	2	0				0	
	>5 year recurrence interval	>2 year recurrence interval	>10 yr storm return	Least Likely	1	5	4	3	2	1	0				0	
	Not possible	Not possible	Not Possible	Not Possible	0	0	0	0	0	0	0	Average Total Score			N/A	
Note - This value sheet calculates the average benefit over the recurrence intervals. A correction calculation is included in order to obtain a maximum score of 25. Acronyms AAOV - Average annual overflow volume FC - Fecal coliforms ml - Milliliters WQS - Water quality standards CSO - Combined sewer overflow MG - Million gallons SSO - Sanitary sewer overflow WWTPs - Wastewater treatment plants												Corrected Score		8		

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L SO MF 130 S 09B B A Off-line Storage - Covered Underground Basin w/Pump-out Station																
Value:	Public Health		Measure			Impact						Rationale		Measurement Method		
	WWTP Peak Flows			Peak flow delivered to WWTP versus rated peak hour capacity of disinfection system		Peak flow exceeds rated capacity by more than 100%, wetlands treatment with < 1 day HRT	Peak flow exceeds rated capacity by 50 - 100%, wetlands treatment with < 2 days HRT	Peak flow exceeds rated capacity by 10 - 50%, wetlands treatment with < 3 days HRT	Peak flow exceeds rated capacity by less than 10%, wetlands treatment with 3 - 5 days HRT	Peak flow is within rated capacity, wetlands treatment with > 5 days HRT	Peak flow is less than 80% of rated capacity	WWTP disinfection systems have ability to adjust dose rates to handle small short term peaks without exceeding discharge standards. Significant peaks may result in inadequate disinfection that exceeds discharge permit limits. Peak flows well below system capacity allow performance significantly better than standards require.	Measurement will be from analyzing plant influent flows against pre-determined plant stress-test results and operating criteria.			
Performance Measures	WWTP Peak Flows	CSOs CSOs and SSOs		Release point		Untreated CSO or SSO discharge (or runoff in CSO area) where volume is > 0.04% (SSO)/0.08% (CSO) of stream's flow	Significant untreated discharge to water or ground in high public use or access area	Minor discharge to high public use area or significant discharge to water in low public use or access area, basement back-up	Minor discharge to water in low public use area, or significant minor discharge to ground in low public use or access area, discharge contained and cleaned up	Minor discharge to ground in low public use area or discharged anywhere, de minimus quantity	No discharge	Not all discharges violate the Clean Water Act. Discharges vary in the impact to public health and the environment. Therefore, EPA developed guidance on how to set priorities based on the risk to the public's health and the environment under their Enforcement Management System in Chapter X, titled "Setting Priorities for Addressing Discharges from Separate Sanitary Sewers." The assigned consequences follow the intent of the principles and priorities presented in the chapter. SSO Event Mean Concentration for Fecal Coliform estimated at 500,000/100ml. Dilution factor 0.04% required to not exceed 200 FC/100 ml Water Quality Standard.	Measurement methods will be via hydraulic models to quantify the SSO discharge and the GIS to establish relative distance from designated locations or objects.			
		Design Event Recurrence Interval	Frequency per location	Event Recurrence Interval			Most Severe Impact				Least Impact	No Impact				
	5						4	3	2	1	0	Assumptions		Base Case Score	Alternative Score	Total Score
	Frequency	6-10 per year	>10 per year	< 1 year recurrence interval	Most Likely	5	25	20	15	10	5	0	Base Case Score: average overflow volume/duration = 1.5 cfs for 29 events; LBGC average annual Q = 72.8 cfs. SD = 2.06%.	25		25
1-6 per year		4-10 per year	1-2 yr recurrence interval		4	20	16	12	8	4	0				0	
1-2 year recurrence interval		1-4 per year	2-5 yr recurrence interval		3	15	12	9	6	3	0	Alternative Score: average overflow volume/duration = 1.43 cfs for 4 events; LBGC average annual Q = 72.8 cfs. SD = 1.96%.		15	-15	
2-5 year recurrence interval		1-2 year recurrence interval	5-10 yr recurrence interval		2	10	8	6	4	2	0				0	
>5 year recurrence interval		>2 year recurrence interval	>10 yr storm return	Least Likely	1	5	4	3	2	1	0				0	
Not Possible		Not Possible	Not Possible	Not Possible	0	0	0	0	0	0	0	Average Total Score		N/A		
Note - This value sheet calculates the average benefit over the recurrence intervals. A correction calculation is included in order to obtain a maximum score of 25.											Corrected Score				10	
Acronyms CSO - Combined sewer overflow HRT - Hydraulic retention time WWTP - Wastewater treatment plant FC - Fecal coliform ml - Milliliter GIS - Geographic information system SSO - Sanitary sewer overflow																

L SO MF 130 S 09B B A Off-line Storage - Covered Underground Basin w/Pump-out Station													
Value:	Asset Protection			Impact						Rationale	Measurement Method		
		Flood Damage		Homes or businesses are subject to severe structural damage	Homes or businesses are subject to minor to moderate structural damage	Flooding limits access to homes or businesses	Flooding limits access to recreational areas	Standing water on property, but access not affected and no damage expected	No standing water	Stormwater BMPs can reduce stormwater peaks and reduce extent of flooded areas, while sewer separation may increase localized stormwater peak flows and increase the flooding impacts of storms. Alternatively, purchase of highly impacted properties may be a cheaper way to reduce flood damage and create green space and buffer zones.	Drainage models where available, or historic observations of flood-prone areas combined with the expected relative impacts of sewer system modifications on storm water flows		
Performance Measures		Basement Back-ups		Sewer surcharging within 6 feet of ground surface for more than 20% of manholes	Sewer surcharging within 6 feet of ground surface for 10 - 20% of manholes	Sewer surcharging within 6 feet of ground surface for 5 - 10% of manholes	Sewer surcharging within 6 feet of ground surface for 1 - 5% of manholes	Sewer surcharging within 6 feet of ground surface for 0 - 1% of manholes	No surcharging within 6 feet of ground surface	First floor levels are typically 1 - 2 feet above ground surface, and basement floors are typically 8 - 10 feet below the first floor. A sewer surcharge of 6 feet below ground surface is highly likely to cause back-ups in homes with basement service.	Measurement methods will be via hydraulic models to quantify the hydraulic grade lines compared to ground surface elevations at manholes.		
	Event Recurrence Interval			Most Severe Impact					Least Impact	No Impact			
				5	4	3	2	1	0	Assumptions	Base Case Score	Alternative Score	Total Score
Frequency	6-10 per year (6-mo. Storm)	Most Likely	5	25	20	15	10	5	0	0% of manholes surcharged; off-line storage has no impact on flooding	0	0	0
	1-6 per year (1-yr. Storm)		4	20	16	12	8	4	0	50% of manholes surcharged; off-line storage has no impact on flooding	20	20	0
	1-2 year recurrence interval (5-yr. Storm)		3	15	12	9	6	3	0	50% of manholes surcharged; off-line storage has no impact on flooding	15	15	0
	2-5 year recurrence interval (10-yr. storm)		2	10	8	6	4	2	0	50% of manholes surcharged; off-line storage has no impact on flooding	10	10	0
	>5 year recurrence interval	Least Likely	1	5	4	3	2	1	0				0
	Not Possible	Not Possible	0	0	0	0	0	0	0	Average Total Score			0
Note - This value sheet calculates the average benefit over the recurrence intervals. A correction calculation is included in order to obtain a maximum score of 25. Acronyms BMPs - Best management practices										Corrected Score			0

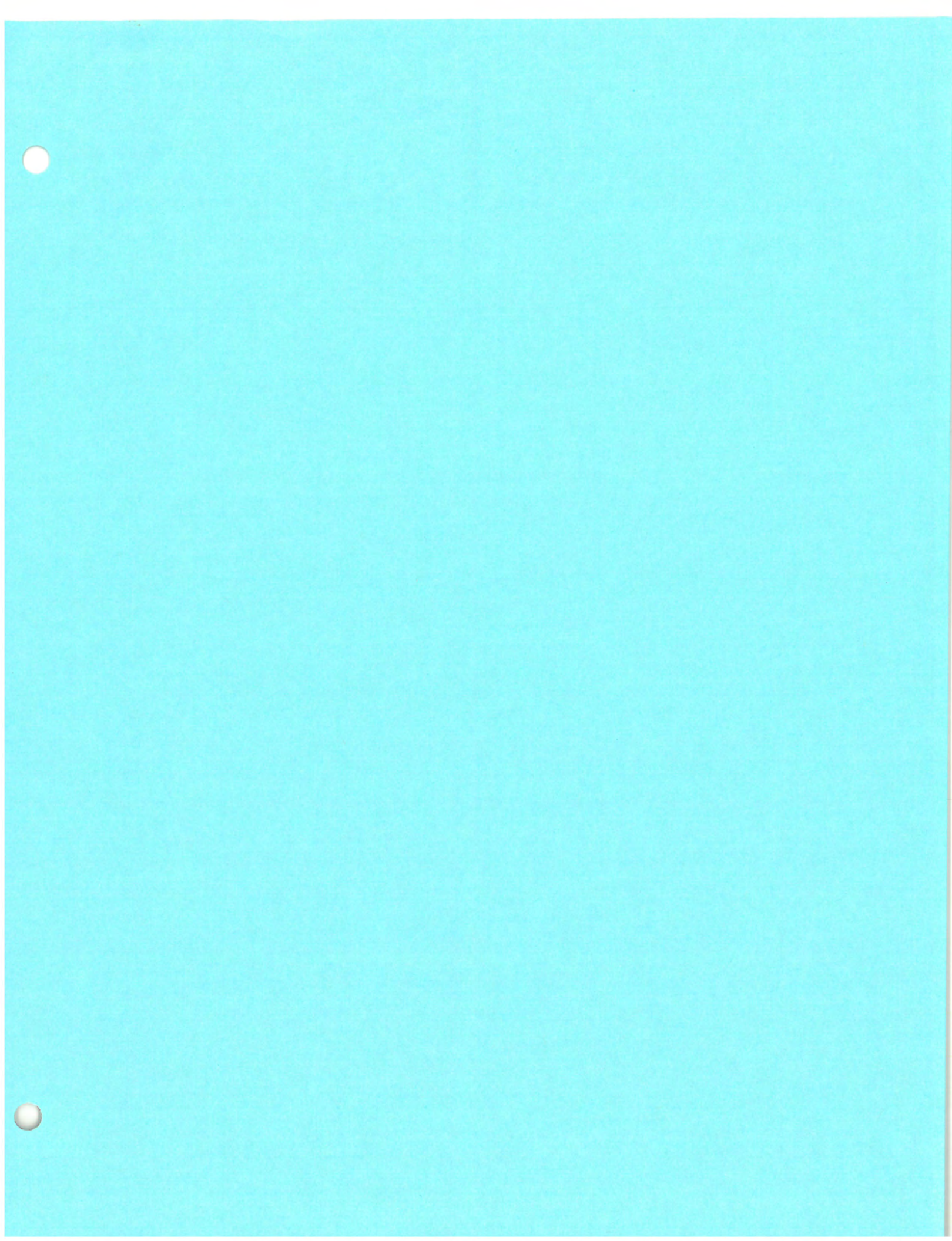
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L SO MF 130 S 09B B A Off-line Storage - Covered Underground Basin w/Pump-out Station													
Value:		Environmental Enhancement											
Scoring													
Aspect	-5	-4	-3	-2	-1	0	1	2	3	4	5	Assumptions	Score Per Aspect
Aquatic and Terrestrial Habitat Protection	Elimination of habitat for rare or endangered species	Elimination of significant amount of common habitat	Elimination of minor amount of common habitat	Significant habitat impairment	Minor impairment to existing habitat	No impact on habitat	Minor enhancement of existing habitat	Significant enhancement of existing habitat	Creation of minor amount of common habitat	Creation of significant amount of common habitat	Creation of critical habitat for rare or endangered species	We utilize expertise of sub-consultants Redwing Ecological Services and or LinnTech to score Environmental Enhancement aspects	1
Aesthetics - Solids and Floatables	75%+ reduction in volume of flow with no S&F capture	50 - 75% of flow with no S&F removal	25 - 50% of flow with no S&F removal	10 - 25% of flow with no S&F removal	Reduces efficiency of existing S&F control device, 0 - 10% of flow with no S&F removal	No change in S&F removal	0 - 10% of discharged flow treated with positive S&F removal (screens)	10 - 25 % of discharged flow treated with positive S&F removal (screens)	25 - 50% of discharged flow treated with positive S&F removal (screens)	50 - 75% of discharged flow treated with positive S&F removal screens	75%+ of discharged flow treated with positive S&F removal (screens)	S&F control integrated into basin network	5
Aesthetics - Odor and Air Emissions	Create annoying odor source affecting > 20 customers often	Create annoying odor source affecting > 20 customers often, or > 20 customers occasionally	Create annoying odor source affecting > 20 customers occasionally	Create detectable odor source affecting > 50 customers often	Create detectable odor source affecting > 50 customers occasionally	No impact on odors	Eliminate detectable odor source affecting < 50 customers occasionally	Eliminate detectable odor source affecting > 50 customers often	Eliminate annoying odor source affecting < 20 customers occasionally	Eliminate annoying odor source affecting < 20 customers often, or > 20 customers occasionally	Eliminate annoying odor source affecting > 20 customers often	Will be evaluated using CH2M Hill odor model in conjunction with assessment of adjacent land use population density	-1
Dissolved Oxygen Impacts	Reduction of in-stream DO by 8 mg/l + during critical flow periods	Continuous reduction of in-stream DO of 2 mg/l +	Continuous reduction of in-stream DO of 0 - 2 mg/l, possible reduction of in-stream DO 2 - 4 mg/l during critical conditions	Intermittent reduction of in-stream DO 2 mg/l + possible during non-critical conditions, reduction of DO 0 - 2 mg/l during critical conditions	Intermittent reduction of in-stream DO 0 - 2 mg/l possible during non-critical conditions	No DO impacts	Intermittent improvement of in-stream DO 0 - 2 mg/l	Intermittent improvement of in-stream DO 2 mg/l +, intermittent critical condition improvements 0 - 2 mg/l	Continuous improvement of in-stream DO 0 - 2 mg/l, intermittent critical condition improvements 2-4 mg/l	Continuous improvement of in-stream DO 2 mg/l +	Continuous improvement of critical condition in-stream DO 2 mg/l +	We utilize expertise of sub-consultants Redwing Ecological Services and or LinnTech to score Environmental Enhancement aspects	0
Downstream Impacts	75%+ increase in annual BOD or nutrient loads	50 - 75% increase in annual BOD or nutrient loads	25 - 50% increase in annual BOD or nutrient loads	10 - 25% increase in annual BOD or nutrient loads (CSO + runoff)	Potential 0 - 10 % increase in annual average BOD or nutrient loads (CSO + runoff)	No impact on BOD or nutrient loads (CSO + runoff)	0 - 10% reduction in annual BOD or nutrient loads (CSO + runoff)	10 - 25% reduction in annual BOD or nutrient loads (CSO + runoff)	25 - 50% reduction in annual BOD or nutrient loads (CSO + runoff)	50 - 75% reduction in annual BOD or nutrient loads (CSO + runoff)	75%+ reduction in annual BOD or nutrient loads (CSO + runoff)	AAOY reduction = 3.18 MGY (92.7%)	5
Stream Flow Impacts (Peak flows)	25%+ increase in peak flows	10% - 25% increase in peak flows	Up to 10% increase in peak flows	Frequent increase in flow during critical conditions	Possible increase in average flow, or minor increase in high flow peaks	No impact on peak flows	Minor reduction in flows - no significant peak reduction	Minor reduction in peak flows under some conditions	Up to 10% reduction in peak flows	10% - 25% reduction in peak flows	25%+ reduction in peak flows	AAOY reduction = 3.18 MGY (92.7%)	1
Stream Flow Impacts (DWF only)	25%+ decrease in flow during critical conditions	10% - 25% decrease in flow during critical conditions	0-10% permanent decrease in flow during critical conditions	Frequent decrease in flow during critical conditions	Possible decrease in average flow	No impact on average 0 - base stream flow	Intermittent increase in stream flow, not limited to critical conditions	Intermittent increase in stream flow, which improves critical conditions	0 - 10% permanent increase in stream flow during critical conditions	10 - 25 % permanent increase in stream flow during critical conditions	25%+ permanent increase in stream flow during critical conditions	AAOY reduction = 3.18 MGY (92.7%)	-1
Instructions: (1.) Score each alternative for each of the seven aspects of the value. Scores can be positive or negative, depending on the impact of the alternative on the value. (2.) Total the scores for each aspect to get the total score for this alternative in this value. (3.) Shaded area represents "fatal flaw". Alternatives that score in this area should not be proposed.												Total Raw Score Calculated	10
Aspect	Rationale						Measurement Method				Total Score (Default)		10
Aquatic and Terrestrial Habitat Protection	Wet weather projects may affect both aquatic and terrestrial habitat through changes in base flow, peak flow, water quality, tree cover, channel shape and characteristics etc. Predictive models used to evaluate wet weather control measures have a limited ability to predict biological diversity changes, erosion impacts etc., so surrogate metrics must be used to estimate future positive and negative impacts.						Project definition may specifically address changes in channel shape and configuration, tree cover etc. Predictive models will address DO and other water quality impacts. Flow models will predict base flow and peak flow rates to allow estimates of changes in erosion and water surface area.				Note: The total score calculated may be more than 25. In the instances where this might occur, a default maximum score of 25 will be calculated.		
Aesthetics - Solids and Floatables	Most CSOs have some form of solids and floatables control baffles. Improvements in capture rates can be expected with screening or other advanced treatment options. Storm water retention, constructed wetlands, and other control systems may provide solids and floatables removal as well. While reduction in solids and floatables removal efficiency is not likely, penalty points will be assessed if this is possible with any alternative.						Current solids and floatables removal efficiency has been estimated for all sites with control technology. Improvements in removal efficiencies will be estimated for all alternatives that add screening or other advanced treatment technologies. Where treatment is proposed for storm water discharges removals will be estimated based on published removal data.						
Aesthetics - Odor and Air Emissions	Odors and air emissions can be generated in storage systems, pump stations, force mains, and long flat sewers. Odors are generally characterized by both the intensity and the quality of the odor. Detectable and annoying are two common descriptors of different intensities and qualities of odors from sewage handling facilities.						Odor emissions from sewage handling facilities can be modeled for intensity, quality, and geographic spread. For planning purposes this level of evaluation is not common, and will not be done except in very rare circumstances. The potential for odor and air emissions will be estimated based on typical applications and model predictions for storage time, number of events, average flow velocities etc.						
Dissolved Oxygen Impacts	Dissolved oxygen in streams is dependent on a variety of factors including BOD load, nutrient load, stream flow velocity, water temperature, etc.						For BGC the Water Quality Tool will be used to estimate the impacts of various loading conditions, flows, temperatures, etc. Probable impacts of individual projects will be estimated based on comparisons to the various stream condition scenarios.						
Downstream Impacts	Downstream impacts refer to conditions in the Ohio River below Jefferson County. Nutrient loadings in the Ohio (not just Jefferson County) have been identified as the source of 30 - 45% of the total nutrient loads reaching the Gulf of Mexico. BOD is not likely to persist in the river long enough to get to the Gulf, but can have detrimental impacts far downriver.						Pollutant removals will be estimated based on reductions in annual average loads, since the downstream impacts are primarily long-term and cumulative.						
Stream Flow Impacts (Peak flows)	Extremely high peak flows as are often caused by urbanization of a watershed can erode the streambed, damage aquatic and terrestrial habitat, make water based recreation unsafe or impractical.						Predictive models can estimate flow peaking factors from individual sources, and the Water Quality Tool has a hydraulic component to estimate stream flows during various storm events.						
Stream Flow Impacts (DWF only)	Diversion of flows away from a stream due to abandonment of a treatment plant etc. can reduce base flows in a stream. Alternatively, other control measures such as groundwater pumping can increase base flows with beneficial results.						Predictive models can estimate flows from individual sources, and the Water Quality Tool has a hydraulic component to estimate stream flows during various dry weather events.						
Acronyms BGC - Beargrass Creek BOD - Biological oxygen demand CSO - Combined sewer overflow DO - Dissolved oxygen DWF - Dry weather flow mg/l - Milligram per liter S&F - Solids and floatables													

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L SO MF 130 S 09B B A Off-line Storage - Construct Covered Underground Basin w/Pump-out Station													
Value: Eco-Friendly Solutions													
Scoring													
Aspect	-5	-4	-3	-2	-1	0	1	2	3	4	5	Assumptions	Score Per Aspect
Non-Renewable Energy Consumption	Primary energy consumption is greater than secondary treatment	Primary energy consumption equal to 75 - 100% of secondary treatment	Primary energy consumption equal to 30 - 75% of secondary treatment	Primary energy consumption equal to 15 - 30% of secondary treatment	Primary energy consumption equal to 0 - 15% of secondary treatment	No energy consumption except for cleaning and maintenance	Cleaning and maintenance not needed, no primary consumption	NA	NA	NA	NA	PS consumes X HP/MG, equivalent to Y% of secondary treatment	-1
Use of Natural Systems	Constructed facilities permanently displace 5+ acres wetlands or 50% locally available green space	Constructed facilities permanently displace 3 - 5 acres wetlands or 25 - 50% locally available green space	Constructed facilities permanently displace 1 - 3 acres wetlands or 10 - 15% locally available green space	Constructed facilities permanently displace 0 - 1 acre wetlands or up to 10% locally available green space	Constructed facilities temporarily disrupt wetlands or green space	Alternative does not use or affect natural systems, wetlands, or green space	Alternative doesn't use natural systems, but enhances green space or wetland	Natural systems play a minor role in alternative function, up to 1 acre wetland or 10% additional green space created	Natural systems are significant part of alternative function, 1 - 3 acres of wetland created or 10 - 25% additional green space	Alternative fully uses natural systems, 3 - 5 acres of wetland created or 25-50% additional green space	Alternative results in multi-use natural system development, 5+ acres of wetland or 50% additional green space	Proposed site within stream corridor	-2
Multiple-Use Facilities	Constructed facilities permanently eliminate recreational opportunity	Constructed facilities significantly impair recreational opportunity	Constructed facilities moderately impair recreational opportunity	Constructed facilities have minor impacts on recreational opportunity	Construction temporarily impacts recreational opportunity	No impacts on recreational opportunities	Alternative improves access to existing recreational areas	Alternative has limited positive impact on recreation	Alternative significantly enhances recreational opportunities	Alternative increases recreational opportunities in area	Alternative results in multi-use facility	Recreational impacts will be evaluated using either Redwing Ecological Reach Characterization Report (accessibility parameter) or CH2M Hill Recreational Use Survey.	0
Source Control of subwatershed pollutant loads	Pollutant loadings are increased by 50%	Pollutant loadings are increased by 30 - 50%	Pollutant loadings are increased by 10 - 30%	End of pipe pollutant loadings are increased by 0 - 10%	End of pipe pollutant loadings impacts are inconsistent, but likely higher	End of pipe pollutant loadings are unchanged	Pollutant loadings impacts are inconsistent, but likely lower	Source control reduces pollutant loadings by 0 - 10%	Source control reduces pollutant loadings by 10 - 30%	Source control reduces pollutant loadings by 30 - 50%	Source control reduces pollutant loadings by more than 50%	AAOV reduction = 3.18 MGy (92.7%)	5
Non-Obtrusive Construction Techniques	Permanent loss of green space or sensitive area disruption	Main thoroughfare closures, sensitive area temporary disruptions	Widespread dust and noise, blasting, secondary street closures	Localized dust, noise and local street closures	Minor dust and noise, traffic lane closures	No construction impacts	NA	NA	NA	NA	NA	remote area	-1
Consistent Land Use	Intrusive or nuisance facilities inconsistent with neighborhood or land use	Facilities inconsistent with neighborhood or land use	Facility characteristics mitigated to reduce impact on neighborhood	Facilities have significant impact on development density or land use	Facility has minor impact on development density or land use	No impact on land use or no above ground facilities	Alternative mitigates existing compatibility problem	Alternative removes facility inconsistent with neighborhood	Alternative removes nuisance facility from neighborhood	Alternative enhances property values in neighborhood	Alternative provides enhancements that significantly improve neighborhood	Proposed site within stream corridor	-1
Impermeable Surfaces	5 acres+ of impermeable surfaces are added	3 - 5 acres of impermeable surfaces are added	1 - 3 acres of impermeable surfaces are added	up to 1 acre of impermeable surfaces are added	Minor increase in impermeable surfaces added	No change in impermeable surface	Minor reduction in impermeable surfaces	Up to 1 acre of impermeable surfaces removed	1 - 3 acres of impermeable surfaces removed	3 - 5 acres of impermeable surfaces removed	More than 5 acres of impermeable surfaces removed	Covered concrete basin proposed	-1
LEEDS Performance	NA	NA	NA	NA	NA	LEEDS not applicable or LEEDS score <10	LEEDS Score 10 - 25	LEEDS Certified	LEEDS Silver	LEEDS Gold	LEEDS Platinum		0
Instructions: (1.) Score each alternative for each of the eight aspects of the value. Scores can be positive or negative, depending on the impact of the alternative on the value. (2.) Total the scores for each aspect to get the total score for this alternative in this value. (3.) Shaded area represents "fatal flaw". Alternatives that score in this area should not be proposed.										Total Raw Score Calculated		-1	
Aspect	Rationale						Measurement Method				Total Score (Default)		-1
Non-Renewable Energy Consumption	Eco-friendly solutions would be expected to be low consumers of non-renewable energy. Benchmarking energy consumption against conventional secondary treatment provides penalty points for high energy consuming alternatives.						Evaluation of primary energy consumed per MG of flow treated, compared to the energy consumed at the WCWTP per MG treated.				Note: The total score calculated may be more than 25. In the instances where this might occur, a default maximum score of 25 will be calculated.		
Use of Natural Systems	Natural systems replace concrete and steel construction with wet bottom storage lagoons, constructed bioswales, rain gardens etc. that increase green space of various kinds. Options that reduce wetlands and green space get penalty points.						Acres of wetlands and other types of green space created or eliminated. Also includes subjective evaluation of the "basis" of the alternative - "green" or "grey".						
Multiple-Use Facilities	Eco-friendly solutions create recreational opportunities for both water-based and riparian recreation. Boating, canoeing, kayaking, fishing, wading, swimming etc. would be direct water-based recreation. Bird watching, hiking, biking, picnicing, camping etc. would be considered related riparian recreation.						Subjective evaluation of changes predicted in the aquatic or riparian environment as a result of better water quality, increased base flow or decreased flow peaks, increased tree cover or vegetated riparian areas etc.						
Source Control of subwatershed pollutant loads	Controlling pollutant loads at the source through behavior modification, product replacements or stormwater management BMPs that capture pollutants thereby avoiding end of pipe treatment requirements						Modeled land-side pollutant loading reductions as calculated by the BGC Water Quality Tool or by comparison to literature values or pilot program measurements.						
Non-Obtrusive Construction Techniques	Probable construction impacts on traffic, noise and dust are all measures of the friendliness of an alternative. Construction impacts get penalty points for creating nuisance conditions.						Subjective evaluation of probable construction impacts based on the type of construction envisioned for the alternative.						
Consistent Land Use	Alternative configuration can either enhance or detract from the surrounding property. For example, an extremely unfriendly pump station can be noisy, smelly, and ugly. The same pump station can be "disguised" as a residence that fits right in with the neighborhood. If a larger parcel of land is available, a pump station can be hidden from view by landscaping, and a community garden or other green space added to enhance the neighborhood.						At the planning level, projects can be defined to avoid negative impacts on the surrounding properties. Depending on the availability of land, enhancements are possible. This aspect encourages project definition and budgets to enhance, not detract.						
Impermeable Surfaces	Adding impermeable surfaces increases total runoff volume, peak runoff flowrates, and the total transport of any pollutant deposited on the surface from any source. Conversely, permeable surfaces can reduce flow volume and peaks, and provide filtering mechanisms for pollutants.						Acres of permeable surfaces created or eliminated.						
LEEDS Performance	LEED standards are applicable to alternatives that include above-ground building structures.						Application of LEED evaluation points.						
Acronyms BGC - Beargrass Creek LEEDS - Leadership in Energy and Environmental Design MG - million gallons WCWTP - West County Wastewater Treatment Plant													

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Summary of Scores for Problem L_MI_MF_127

Values	Weights	Scores for Alternatives									
		Raw Score Alternative M_09B	Weighted Score Alternative M_09B	Raw Score Alternative M_13	Weighted Score Alternative M_13	Raw Score Alternative #3	Weighted Score Alternative #3	Raw Score Alternative #4	Weighted Score Alternative #4	Raw Score Alternative #5	Weighted Score Alternative #5
Regulatory Performance	8	10	80	10	80	0	0	0	0	0	0
Public Health Enhancement	10	10	100	10	100	0	0	0	0	0	0
Asset Protection	6	0	0	0	0	0	0	0	0	0	0
Environmental Enhancement	8	11	88	13	104	0	0	0	0	0	0
Eco-Friendly Solutions	6	-1	-6	0	0	0	0	0	0	0	0
Total Weighted Score All Values		262		284		0		0		0	
Capital Costs		\$13,362,335		\$14,731,961		\$1		\$1		\$1	
Total Present Worth Costs		\$12,002,301		\$13,603,258		\$1		\$1		\$1	
Weighted Benefit/Cost Ratio (Capital Costs)		0.0196		0.0193		0		0		0	
Weighted Benefit/Cost Ratio (Total Present Worth Costs)		0.0218		0.0209		0		0		0	

Note: Capital and Total Present Worth Costs are to be added from the Cost Model from the "Proj Summary" Page

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CSO LTCP Initial Solutions Project Fact Sheet



LTCP Project Number: L_MI_MF_127_M_09B_B_A

Project Type: Off-Line Storage

Receiving Stream: Middle Fork Beargrass Creek

Project Description: This project is to provide a 3.15 MG, uncovered, earthen off-line storage basin to reduce overflows at CSO 127 to no more than four per year. Annual volume stored is approximately 46.06 MG.

Design Parameters / Assumptions: Basin is designed to 5th largest overflow event volume (3.15 MG) based on model simulation using typical year rainfall data.

Surrounding Area Land Use: The CSO is in a small parking lot about 10' from one 'General Comm. And Office' building and about 15' from another; both of which are located directly on Lexington Rd..

Apparent Utilities Description: Prim. OH elec. ln. located < 30' from the storage basin to the SW

Capital Projects: 2007~Central Region Automation FY05-06 - In progress; 2007~Central Region PS Modification - Under Construction; 2007~Middle Fork Rehab Phase 2 & 2013~RTC @ CSOs 125, 126, 127, & 140 - Awaiting Start

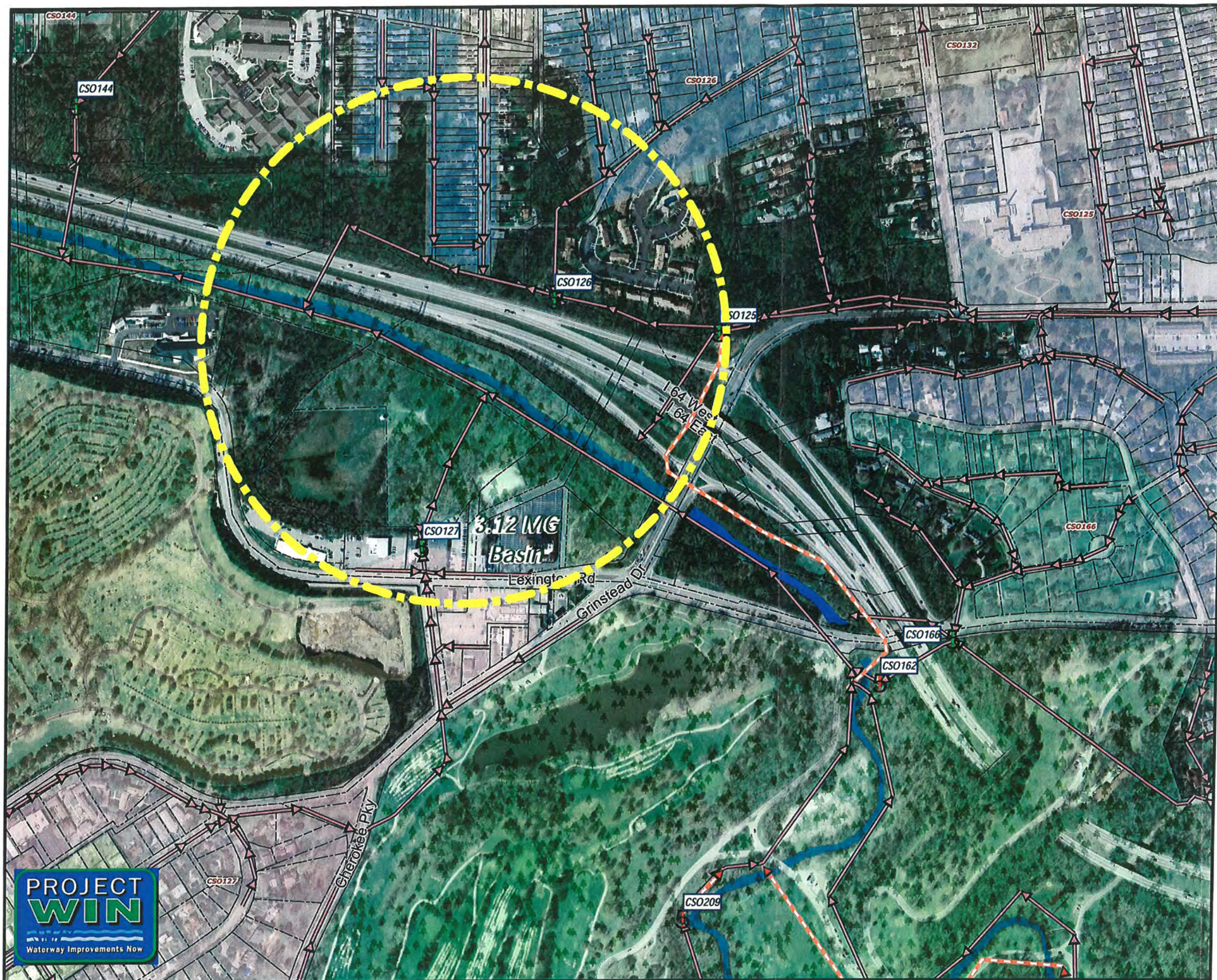
Estimated Capital Cost (2010 dollars): \$13,362,335

Capital Cost / Gallon Overflow Removed: \$0.029 / gallon removed

Overflow Points Addressed:

<u>CSO Number</u>	<u>CSO Name</u>	<u>2007 AAOV (MG / Yr)</u>	<u>Number of Overflow / Yr</u>	<u>CSO Area (Acres)</u>
CSO125	Regulator Number 24 - Grinstead Drive	18.61	29	391.03
CSO126	Regulator Number 26 - Raymod Avenue	0.34	6	35.29
CSO127	Etley Avenue	13.38	31	192.26
CSO166	Beals Branch Sanitary Diversion	16.89	32	696.65

NOTE: Initial Solutions data is based on XP-SWMM model results.



MSD CSO
Long Term Control Plan
L_MI_MF_127_M_09B_B_A



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Legend

-  Active CSO Location
-  Eliminated CSO Location
-  Existing Sewer Line
-  Abandoned Sewer Line
-  Railroad
-  Parcel Boundary
-  Cemetery
-  Metro Park
-  Water Feature

NOTE: The CSO Boundaries are uniquely symbolized within the map.

Aerial Date: 2006

Graphic Date: Feb 26, 2008

1 inch equals 400 feet

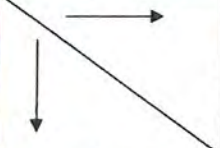


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Louisville/Jefferson County Information Consortium (LOJIC), a Jefferson County Kentucky, based cooperative project of

Louisville/Jefferson Metro Government
Louisville Water Company
Metropolitan Sewer District
Property Valuation Administrator
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L MI MF 127 M 09B B A Off-line Storage - Earthen Basin																
Value:	Regulatory Performance			Measure		Impact						Rationale		Measurement Method		
	WWTP Peak Flows Beargrass Creek CSOs CSOs in Ohio River			Peak flow delivered to WWTP versus rated peak hour capacity of plant	Peak flow exceeds rated capacity by more than 50%	Peak flow exceeds rated capacity by 25 - 50%	Peak flow exceeds rated capacity by 10 - 25%	Peak flow exceeds rated capacity by less than 10%	Peak flow is within rated capacity	Peak flow is less than 80% of rated capacity	WWTPs have ability to handle small short term peaks without exceeding discharge standards, but significant peaks may result in process washout and associated failure of discharge permit limits. Peak flows less than 80% of rated capacity allow plant to perform significantly better than discharge standards require.	Measurement will be from analyzing plant influent flows against pre-determined plant stress-test results and operating criteria.				
				Untreated CSO or runoff discharge flow rate % of receiving stream flow	Discharge > 5%	Discharge 1 - 5%	Discharge 1 - 0.2%	Discharge 0.1 - 0.2%	Discharge <0.1%	No discharge	CSO Event Mean Concentration for Fecal Coliform in overflows estimated at 250,000/ 100 ml. Dilution factor 0.08% required to not exceed 200 FC/100 ml Water Quality Standard. For partial treatment such as wetland treatment or bioretention, use the comparison to equivalent primary plus disinfection to proportion flow.	Measurement method will be via hydraulic model to quantify the CSO. Spreadsheet calculation to determine mix concentration.				
				Untreated CSO Average Annual Overflow Volume (AAOV)	100 MG+ AAOV	20 - 100 MG AAOV	2 - 20 MG AAOV	1 - 2 MG AAOV	<1.0 MG AAOV	No discharge	100 MG AAOV (10 events) dilution factor in average Ohio River flow is 0.04%. 1.0 MG AAOV (1 event) dilution factor is 0.06%. Cumulative impact of multiple overflow locations may become significant for WQS exceedance.	Measurement methods will be via hydraulic models to quantify the CSO discharge. Spreadsheet calculation to mix concentration.				
Performance Measure	WWTP Peak Flows	CSOs	SSOs	Release point	< 1 year recurrence interval	1-2 yr recurrence interval	2-5 yr recurrence interval	5-10 yr recurrence interval	>10 yr storm return	No discharge	Regulations do not distinguish between potential impact of SSOs, therefore frequency and impact are the same for Regulatory Performance value.	Measurement methods will be via hydraulic models to quantify the SSO discharge				
	Event Recurrence Interval	Frequency per location	Event Recurrence Interval		Most Severe Impact					Least Impact	No Impact					
					5	4	3	2	1	0	Assumptions		Base Case Score	Alternative Score	Total Score	
Frequency	6-10 per year	>10 per year	< 1 year recurrence interval	Most Likely	5	25	20	15	10	5	0	Base Case Score: average overflow volume/duration = 26.1 cfs for 26 events; BGCMI-LG average annual Q = 37.6 cfs. SD = 69.5%.		25		25
	1-6 per year	4-10 per year	1-2 yr recurrence interval		4	20	16	12	8	4	0					0
	1-2 year recurrence interval	1-4 per year	2-5 yr recurrence interval		3	15	12	9	6	3	0	Alternative Score: average overflow volume/duration = 8.04 cfs for 4 events; BGCMI-LG average annual Q = 37.6 cfs. SD = 21.4%.			15	-15
	2-5 year recurrence interval	1-2 year recurrence interval	5-10 yr recurrence interval		2	10	8	6	4	2	0					0
	>5 year recurrence interval	>2 year recurrence interval	>10 yr storm return	Least Likely	1	5	4	3	2	1	0					0
	Not possible	Not possible	Not Possible	Not Possible	0	0	0	0	0	0	0	Average Total Score			N/A	
Note - This value sheet calculates the average benefit over the recurrence intervals. A correction calculation is included in order to obtain a maximum score of 25.												Corrected Score			10	
Acronyms AAOV - Average annual overflow volume FC - Fecal coliforms ml - Milliliters WQS - Water quality standards CSO - Combined sewer overflow MG - Million gallons SSO - Sanitary sewer overflow WWTPs - Wastewater treatment plants																

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L MI MF 127 M 09B B A Off-line Storage - Earthen Basin													
Value:	Asset Protection			Impact						Rationale	Measurement Method		
		Flood Damage		Homes or businesses are subject to severe structural damage	Homes or businesses are subject to minor to moderate structural damage	Flooding limits access to homes or businesses	Flooding limits access to recreational areas	Standing water on property, but access not affected and no damage expected	No standing water	Stormwater BMPs can reduce stormwater peaks and reduce extent of flooded areas, while sewer separation may increase localized stormwater peak flows and increase the flooding impacts of storms. Alternatively, purchase of highly impacted properties may be a cheaper way to reduce flood damage and create green space and buffer zones.	Drainage models where available, or historic observations of flood-prone areas combined with the expected relative impacts of sewer system modifications on storm water flows		
Basement Back-ups		Sewer surcharging within 6 feet of ground surface for more than 20% of manholes	Sewer surcharging within 6 feet of ground surface for 10 - 20% of manholes	Sewer surcharging within 6 feet of ground surface for 5 - 10% of manholes	Sewer surcharging within 6 feet of ground surface for 1 - 5% of manholes	Sewer surcharging within 6 feet of ground surface for 0 - 1% of manholes	No surcharging within 6 feet of ground surface	First floor levels are typically 1 - 2 feet above ground surface, and basement floors are typically 8 - 10 feet below the first floor. A sewer surcharge of 6 feet below ground surface is highly likely to cause back-ups in homes with basement service.	Measurement methods will be via hydraulic models to quantify the hydraulic grade lines compared to ground surface elevations at manholes.				
Performance Measures		Event Recurrence Interval			Most Severe Impact					Least Impact	No Impact		
	5				4	3	2	1	0				
									Assumptions		Base Case Score	Alternative Score	Total Score
Frequency	6-10 per year (6-mo. Storm)	Most Likely	5	25	20	15	10	5	0	0% of manholes surcharged; off-line storage has no impact on flooding	0	0	0
	1-6 per year (1-yr. Storm)		4	20	16	12	8	4	0	33% of manholes surcharged; off-line storage has no impact on flooding	20	20	0
	1-2 year recurrence interval (5-yr. Storm)		3	15	12	9	6	3	0	100% of manholes surcharged; off-line storage has no impact on flooding	15	15	0
	2-5 year recurrence interval (10-yr. Storm)		2	10	8	6	4	2	0	100% of manholes surcharged; off-line storage has no impact on flooding	10	10	0
	>5 year recurrence interval	Least Likely	1	5	4	3	2	1	0				0
	Not Possible	Not Possible	0	0	0	0	0	0	0	Average Total Score		0	
Note - This value sheet calculates the average benefit over the recurrence intervals. A correction calculation is included in order to obtain a maximum score of 25.										Corrected Score		0	
Acronyms BMPs - Best management practices													

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L MI MF 127 M 09B B A Off-line Storage - Earthen Basin													
Value: Environmental Enhancement													
Scoring													
Aspect	-5	-4	-3	-2	-1	0	1	2	3	4	5	Assumptions	Score Per Aspect
Aquatic and Terrestrial Habitat Protection	Elimination of habitat for rare or endangered species	Elimination of significant amount of common habitat	Elimination of minor amount of common habitat	Significant habitat impairment	Minor impairment to existing habitat	No impact on habitat	Minor enhancement of existing habitat	Significant enhancement of existing habitat	Creation of minor amount of common habitat	Creation of significant amount of common habitat	Creation of critical habitat for rare or endangered species	We utilize expertise of sub-consultants Redwing Ecological Services and/or LimnoTech to score Environmental Enhancement aspects.	2
Aesthetics - Solids and Floatables	75%+ reduction in volume of flow with no S&F capture	50 - 75% of flow with no S&F removal	25 - 50% of flow with no S&F removal	10 - 25% of flow with no S&F removal	Reduces efficiency of existing S&F control device, 0 - 10% of flow with no S&F removal	No change in S&F removal	0 - 10% of discharged flow treated with positive S&F removal (screens)	10 - 25 % of discharged flow treated with positive S&F removal (screens)	25 - 50% of discharged flow treated with positive S&F removal (screens)	50 - 75% of discharged flow treated with positive S&F removal (screens)	75%+ of discharged flow treated with positive S&F removal (screens)	S&F control integrated into basin headworks	5
Aesthetics - Odor and Air Emissions	Create annoying odor source affecting > 20 customers often	Create annoying odor source affecting >20 customers often, or >20 customers occasionally	Create annoying odor source affecting >20 customers occasionally	Create detectable odor source affecting > 50 customers often	Create detectable odor source affecting > 50 customers occasionally	No impact on odors	Eliminate detectable odor source affecting < 50 customers occasionally	Eliminate detectable odor source affecting > 50 customers often	Eliminate annoying odor source affecting <20 customers occasionally	Eliminate annoying odor source affecting <20 customers often, or >20 customers occasionally	Eliminate annoying odor source affecting >20 customers often	Will be evaluated using CH2M Hill odor model in conjunction with assessment of adjacent land use/population density	-1
Dissolved Oxygen Impacts	Reduction of in-stream DO by 2 mg/l + during critical flow periods	Continuous reduction of in-stream DO of 2 mg/l +	Continuous reduction of in-stream DO 2 - 4 mg/l during critical conditions	Intermittent reduction of in-stream DO 2 mg/l + possible during non-critical conditions, reduction of DO 0 - 2 mg/l during critical conditions	Intermittent reduction of in-stream DO 0 - 2 mg/l possible during non-critical conditions	No DO impacts	Intermittent improvement of in-stream DO 0 - 2 mg/l	Intermittent improvement of in-stream DO 2 mg/l +, intermittent critical condition improvements 0 - 2 mg/l	Continuous improvement of in-stream DO 0 - 2 mg/l, intermittent critical condition improvements 2-4 mg/l	Continuous improvement of in-stream DO 2 mg/l +	Continuous improvement of critical condition in-stream DO 2 mg/l +	We utilize expertise of sub-consultants Redwing Ecological Services and/or LimnoTech to score Environmental Enhancement aspects.	0
Downstream Impacts	75%+ increase in annual BOD or nutrient loads	50 - 75% increase in annual BOD or nutrient loads	25 - 50% increase in annual BOD or nutrient loads	10 - 25% increase in annual BOD or nutrient loads (CSO + runoff)	Potential 0 - 10 % increase in annual average BOD or nutrient loads (CSO + runoff)	No impact on BOD or nutrient loads (CSO + runoff)	0 - 10% reduction in annual BOD or nutrient loads (CSO + runoff)	10 - 25% reduction in annual BOD or nutrient loads (CSO + runoff)	25 - 50% reduction in annual BOD or nutrient loads (CSO + runoff)	50 - 75% reduction in annual BOD or nutrient loads (CSO + runoff)	75%+ reduction in annual BOD or nutrient loads (CSO + runoff)	AAOV reduction = 45.05 MGY (93.6%)	5
Stream Flow Impacts (Peak flows)	25%+ increase in peak flows	10% - 25% increase in peak flows	Up to 10% increase in peak flows	Frequent increase in flow during critical conditions	Possible increase in average flow, or minor increase in high flow peaks	No impact on peak flows	Minor reduction in flows - no significant peak reduction	Minor reduction in peak flows under some conditions	Up to 10% reduction in peak flows	10% - 25% reduction in peak flows	25%+ reduction in peak flows	AAOV reduction = 45.05 MGY (93.6%)	-1
Stream Flow Impacts (DWF only)	25%+ decrease in flow during critical conditions	10% - 25% decrease in flow during critical conditions	0-10% permanent decrease in flow during critical conditions	Frequent decrease in flow during critical conditions	Possible decrease in average flow	No impact on average or base stream flow	Intermittent increase in stream flow - not limited to critical conditions	Intermittent increase in stream flow - often improves critical conditions	0 - 10% permanent increase in stream flow during critical conditions	10 - 25 % permanent increase in stream flow during critical conditions	25%+ permanent increase in stream flow during critical conditions	AAOV reduction = 45.05 MGY (93.6%)	1
Instructions: (1.) Score each alternative for each of the seven aspects of the value. Scores can be positive or negative, depending on the impact of the alternative on the value. (2.) Total the scores for each aspect to get the total score for this alternative in this value. (3.) Shaded area represents "fatal flaw". Alternatives that score in this area should not be proposed.											Total Raw Score Calculated		11
Aspect	Rationale						Measurement Method				Total Score (Default)		11
Aquatic and Terrestrial Habitat Protection	Wet weather projects may affect both aquatic and terrestrial habitat through changes in base flow, peak flow, water quality, tree cover, channel shape and characteristics etc. Predictive models used to evaluate wet weather control measures have a limited ability to predict biological diversity changes, erosion impacts etc., so surrogate metrics must be used to estimate future positive and negative impacts.						Project definition may specifically address changes in channel shape and configuration, tree cover etc. Predictive models will address DO and other water quality impacts. Flow models will predict base flow and peak flow rates to allow estimates of changes in erosion and water surface area.				Note: The total score calculated may be more than 25. In the instances where this might occur, a default maximum score of 25 will be calculated.		
Aesthetics - Solids and Floatables	Most CSOs have some form of solids and floatables control baffles. Improvements in capture rates can be expected with screening or other advanced treatment options. Storm water retention, constructed wetlands, and other control systems may provide solids and floatables removal as well. While reduction in solids and floatables removal efficiency is not likely, penalty points will be assessed if this is possible with any alternative.						Current solids and floatables removal efficiency has been estimated for all sites with control technology. Improvements in removal efficiencies will be estimated for all alternatives that add screening or other advanced treatment technologies. Where treatment is proposed for storm water discharges removals will be estimated based on published removal data.						
Aesthetics - Odor and Air Emissions	Odors and air emissions can be generated in storage systems, pump stations, force mains, and long flat sewers. Odors are generally characterized by both the intensity and the quality of the odor. Detectable and annoying are two common descriptors of different intensities and qualities of odors from sewage handling facilities.						Odor emissions from sewage handling facilities can be modeled for intensity, quality, and geographic spread. For planning purposes this level of evaluation is not common, and will not be done except in very rare circumstances. The potential for odor and air emissions will be estimated based on typical applications and model predictions for storage time, number of events, average flow velocities etc.						
Dissolved Oxygen Impacts	Dissolved oxygen in streams is dependent on a variety of factors including BOD load, nutrient load, stream flow velocity, water temperature, etc.						For BGC the Water Quality Tool will be used to estimate the impacts of various loading conditions, flows, temperatures, etc. Probable impacts of individual projects will be estimated based on comparisons to the various stream condition scenarios.						
Downstream Impacts	Downstream impacts refer to conditions in the Ohio River below Jefferson County. Nutrient loadings in the Ohio (not just Jefferson County) have been identified as the source of 30 - 45% of the total nutrient loads reaching the Gulf of Mexico. BOD is not likely to persist in the river long enough to get to the Gulf, but can have detrimental impacts far downriver.						Pollutant removals will be estimated based on reductions in annual average loads, since the downstream impacts are primarily long-term and cumulative.						
Stream Flow Impacts (Peak flows)	Extremely high peak flows as are often caused by urbanization of a watershed can erode the streambed, damage aquatic and terrestrial habitat, make water based recreation unsafe or impractical.						Predictive models can estimate flow peaking factors from individual sources, and the Water Quality Tool has a hydraulic component to estimate stream flows during various storm events.						
Stream Flow Impacts (DWF only)	Diversion of flows away from a stream due to abandonment of a treatment plant etc. can reduce base flows in a stream. Alternatively, other control measures such as groundwater pumping can increase base flows with beneficial results.						Predictive models can estimate flows from individual sources, and the Water Quality Tool has a hydraulic component to estimate stream flows during various dry weather events.						
Acronyms BGC - Beargrass Creek BOD - Biological oxygen demand CSO - Combined sewer overflow DO - Dissolved oxygen DWF - Dry weather flow mg/l - Milligram per liter S&F - Solids and floatables													

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L MI MF 127 M 09B B A Off-line Storage - Earthen Basin													
Value:		Eco-Friendly Solutions											
Scoring													
Aspect	-5	-4	-3	-2	-1	0	1	2	3	4	5	Assumptions	Score Per Aspect
Non-Renewable Energy Consumption	Primary energy consumption is greater than secondary treatment	Primary energy consumption equal to 75 - 100% of secondary treatment	Primary energy consumption equal to 30 - 75% of secondary treatment	Primary energy consumption equal to 15 - 30% of secondary treatment	Primary energy consumption equal to 0 - 15% of secondary treatment	No energy consumption except for cleaning and maintenance	Cleaning and maintenance not needed, no primary consumption	NA	NA	NA	NA		0
Use of Natural Systems	Constructed facilities permanently displace 5+ acres wetlands or 50% locally available green space	Constructed facilities permanently displace 3 - 5 acres wetlands or 25 - 50% locally available green space	Constructed facilities permanently displace 1 - 3 acres wetlands or 10 - 15% locally available green space	Constructed facilities permanently displace 0 - 1 acre wetlands or up to 10% locally available green space	Constructed facilities temporarily disrupt wetlands or green space	Alternative does not use or affect natural systems, wetlands, or green space	Alternative doesn't use natural systems, but enhances green space or wetland	Natural systems play a minor role in alternative function, up to 1 acre wetland or 10% additional green space created	Natural systems are significant part of alternative function, 1 - 3 acres of wetland created or 10 - 25% additional green space	Alternative fully uses natural systems, 3 - 5 acres of wetland created or 25-50% additional green space	Alternative results in multi-use natural system development, 5+ acres of wetland or 50% additional green space	Proposed site within stream corridor	-2
Multiple-Use Facilities	Constructed facilities permanently eliminate recreational opportunity	Constructed facilities significantly impair recreational opportunity	Constructed facilities moderately impair recreational opportunity	Constructed facilities have minor impacts on recreational opportunity	Construction temporarily impacts recreational opportunity	No impacts on recreational opportunities	Alternative improves access to existing recreational areas	Alternative has limited positive impact on recreation	Alternative significantly enhances recreational opportunities	Alternative increases recreational opportunities in area	Alternative results in multi-use facility	Recreational impacts will be evaluated using either Redwing Ecological Reach Characterization Report (accessibility parameter) or CH2M Hill Recreational Use Survey.	-1
Source Control of subwatershed pollutant loads	Pollutant loadings are increased by 50%	Pollutant loadings are increased by 30 - 50%	Pollutant loadings are increased by 10 - 30%	End of pipe pollutant loadings are increased by 0 - 10%	End of pipe pollutant loadings impacts are inconsistent, but likely higher	End of pipe pollutant loadings are unchanged	Pollutant loadings impacts are inconsistent, but likely lower	Source control reduces pollutant loadings by 0 - 10%	Source control reduces pollutant loadings by 10 - 30%	Source control reduces pollutant loadings by 30 - 50%	Source control reduces pollutant loadings by more than 50%	AAOV reduction = 46.06 MGy (93.6%)	5
Non-Obtrusive Construction Techniques	Permanent loss of green space or sensitive area disruption	Main thoroughfare closures, sensitive area temporary disruptions	Widespread dust and noise, blasting, secondary street closures	Localized dust, noise and local street closures	Minor dust and noise, traffic lane closures	No construction impacts	NA	NA	NA	NA	NA	high-traffic intersection	-1
Consistent Land Use	Intrusive or nuisance facilities inconsistent with neighborhood or land use	Facilities inconsistent with neighborhood or land use	Facility characteristics mitigated to reduce impact on neighborhood	Facilities have significant impact on development density or land use	Facility has minor impact on development density or land use	No impact on land use or no above ground facilities	Alternative mitigates existing compatibility problem	Alternative removes facility inconsistent with neighborhood	Alternative removes nuisance facility from neighborhood	Alternative enhances property values in neighborhood	Alternative provides enhancements that significantly improve neighborhood	Proposed site within stream corridor	-2
Impermeable Surfaces	5 acres+ of impermeable surfaces are added	3 - 5 acres of impermeable surfaces are added	1 - 3 acres of impermeable surfaces are added	up to 1 acre of impermeable surfaces are added	Minor increase in impermeable surfaces added	No change in impermeable surfaces	Minor reduction in impermeable surfaces	Up to 1 acre of impermeable surfaces removed	1 - 3 acres of impermeable surfaces removed	3 - 5 acres of impermeable surfaces removed	More than 5 acres of impermeable surfaces removed	open basin proposed	0
LEEDS Performance	NA	NA	NA	NA	NA	LEEDS not applicable or LEEDS score <10	LEEDS Score 10 - 25	LEEDS Certified	LEEDS Silver	LEEDS Gold	LEEDS Platinum		0
Instructions: (1.) Score each alternative for each of the eight aspects of the value. Scores can be positive or negative, depending on the impact of the alternative on the value. (2.) Total the scores for each aspect to get the total score for this alternative in this value. (3.) Shaded area represents "fatal flaw". Alternatives that score in this area should not be proposed.										Total Raw Score Calculated		-1	
Aspect	Rationale						Measurement Method				Total Score (Default)		-1
Non-Renewable Energy Consumption	Eco-friendly solutions would be expected to be low consumers of non-renewable energy. Benchmarking energy consumption against conventional secondary treatment provides penalty points for high energy consuming alternatives.						Evaluation of primary energy consumed per MG of flow treated, compared to the energy consumed at the WCWTP per MG treated				Note: The total score calculated may be more than 25. In the instances where this might occur, a default maximum score of 25 will be calculated.		
Use of Natural Systems	Natural systems replace concrete and steel construction with wet bottom storage lagoons, constructed bioswales, rain gardens etc. that increase green space of various kinds. Options that reduce wetlands and green space get penalty points.						Acres of wetlands and other types of green space created or eliminated. Also includes subjective evaluation of the "basis" of the alternative - "green" or "grey".						
Multiple-Use Facilities	Eco-friendly solutions create recreational opportunities for both water-based and riparian recreation. Boating, canoeing, kayaking, fishing, wading, swimming etc. would be direct water-based recreation. Bird watching, hiking, biking, picnicing, camping etc. would be considered related riparian recreation.						Subjective evaluation of changes predicted in the aquatic or riparian environment as a result of better water quality, increased base flow or decreased flow peaks, increased tree cover or vegetated riparian areas etc.						
Source Control of subwatershed pollutant loads	Controlling pollutant loads at the source through behavior modification, product replacements or stormwater management BMPs that capture pollutants thereby avoiding end of pipe treatment requirements						Modeled land-side pollutant loading reductions as calculated by the BGC Water Quality Tool or by comparison to literature values or pilot program measurements.						
Non-Obtrusive Construction Techniques	Probable construction impacts on traffic, noise and dust are all measures of the friendliness of an alternative. Construction impacts get penalty points for creating nuisance conditions.						Subjective evaluation of probable construction impacts based on the type of construction envisioned for the alternative.						
Consistent Land Use	Alternative configuration can either enhance or detract from the surrounding property. For example, an extremely unfriendly pump station can be noisy, smelly, and ugly. The same pump station can be "disguised" as a residence that fits right in with the neighborhood. If a larger parcel of land is available, a pump station can be hidden from view by landscaping, and a community garden or other green space added to enhance the neighborhood.						At the planning level, projects can be defined to avoid negative impacts on the surrounding properties. Depending on the availability of land, enhancements are possible. This aspect encourages project definition and budgets to enhance, not detract.						
Impermeable Surfaces	Adding impermeable surfaces increases total runoff volume, peak runoff flowrates, and the total transport of any pollutant deposited on the surface from any source. Conversely, permeable surfaces can reduce flow volume and peaks, and provide filtering mechanisms for pollutants.						Acres of permeable surfaces created or eliminated.						
LEEDS Performance	LEED standards are applicable to alternatives that include above-ground building structures.						Application of LEED evaluation points.						
Acronyms BGC - Beargrass Creek LEEDS - Leadership In Energy and Environmental Design													
MG - million gallons WCWTP - West County Wastewater Treatment Plant													

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CSO LTCP Initial Solutions Project Fact Sheet



LTCP Project Number: L_MI_MF_127_M_13_A_A

Project Type: Miscellaneous

Receiving Stream: Middle Fork Beargrass Creek

Project Description: This project includes the construction of a 3.15MG offline earthen basin and a 0.016 MG bioretention basin for CSOs 125,126,127,144,166 to reduce overflow events to 2 per year, capturing 46.92 MG / year.

Design Parameters / Assumptions: Earthen basin is designed to 5th largest overflow event volume (3.15 MG) based on model simulation using typical year rainfall data. Bioretention is designed to capture excess volume between the 3rd and 5th overflow events.

Surrounding Area Land Use: The CSO is in a small parking lot about 10' from one 'General Comm. And Office' building and about 15' from another; both of which are located directly on Lexington Rd..

Apparent Utilities Description: Prim. OH elec. In. located < 30' from the storage basin to the SW

Capital Projects: 2007~Central Region Automation FY05-06 - In progress; 2007~Central Region PS Modification - Under Construction; 2007~Middle Fork Rehab Phase 2 & 2013~RTC @ CSOs 125, 126, 127, & 140 - Awaiting Start

Estimated Capital Cost (2010 dollars): \$14,731,961

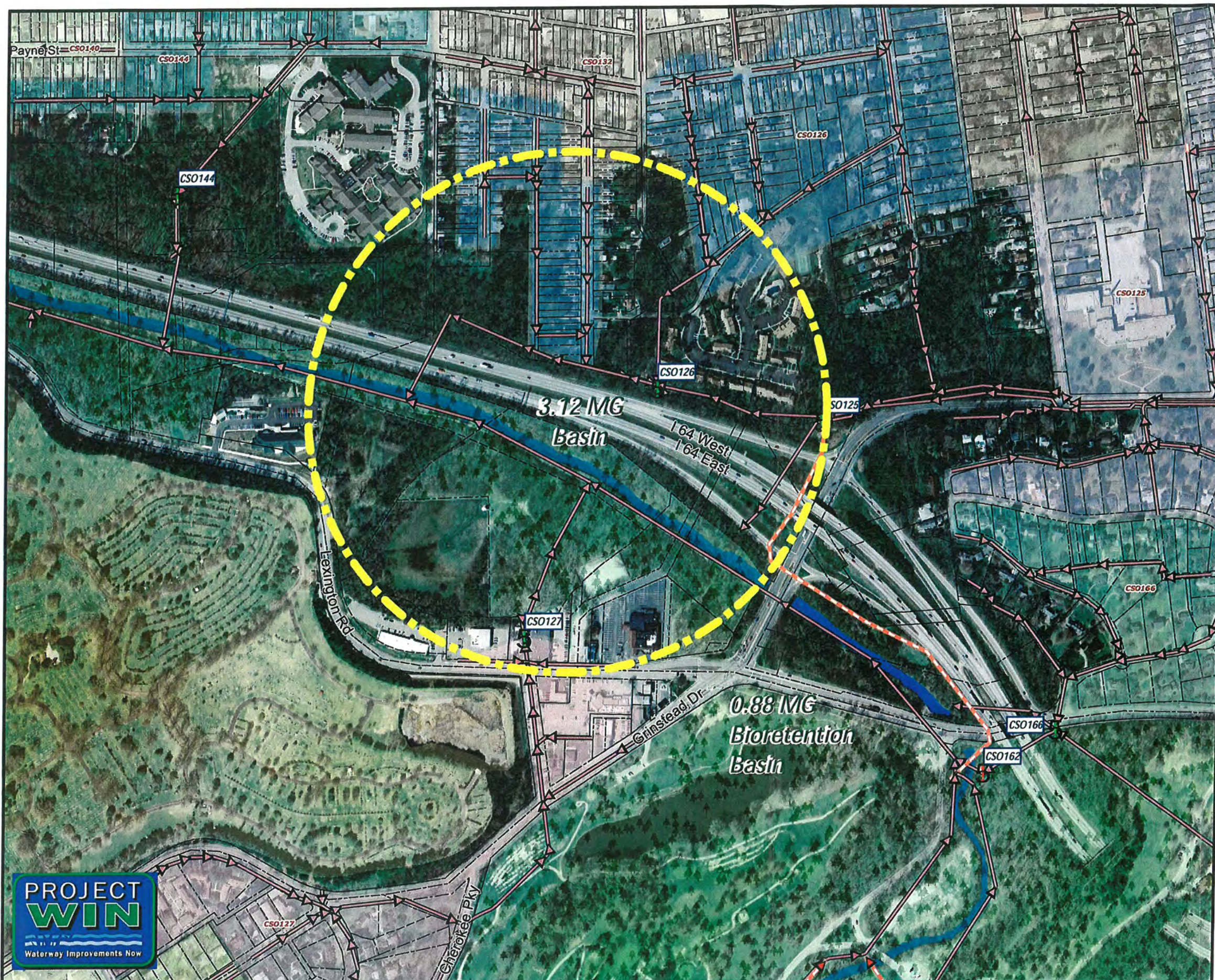
Capital Cost / Gallon Overflow Removed: \$0.31 / gallon removed

Overflow Points Addressed:

<u>CSO Number</u>	<u>CSO Name</u>	<u>2007 AAOV (MG / Yr)</u>	<u>Number of Overflow / Yr</u>	<u>CSO Area (Acres)</u>
CSO125	Regulator Number 24 - Grinstead Drive	18.61	29	391.03
CSO126	Regulator Number 26 - Raymod Avenue	0.34	6	35.29
CSO127	Etley Avenue	13.38	31	192.26
CSO144	Vance Street Regulator	0.54	30	16.40
CSO166	Beals Branch Sanitary Diversion	16.89	32	696.65

NOTE: Initial Solutions data is based on XP-SWMM model results.

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MSD CSO
Long Term Control Plan
L_MI_MF_127_M_13_A_A



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Legend

- 5 Active CSO Location
- 5 Eliminated CSO Location
- Existing Sewer Line
- Abandoned Sewer Line
- Railroad
- Parcel Boundary
- Cemetery
- Metro Park
- Water Feature

NOTE: The CSO Boundaries are uniquely symbolized within the map.

Aerial Date: 2006
Graphic Date: Feb 26, 2008

1 inch equals 400 feet



LOUISVILLE AND JEFFERSON COUNTY METROPOLITAN SEWER DISTRICT (MSD)
LOUISVILLE WATER COMPANY (LWC)
LOUISVILLE METRO GOVERNMENT, and
JEFFERSON COUNTY PROPERTY VALUATION
ADMINISTRATOR (PVA)
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Louisville/Jefferson Metro Government
Louisville Water Company
Metropolitan Sewer District
Property Valuation Administrator

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L MI MF 127 M 13 A A Off-line Storage - Earthen Basin w/Bioretenion																
Value:	Regulatory Performance			Measure		Impact						Rationale		Measurement Method		
	WWTP Peak Flows <															

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L MI MF 127 M 13 A A Off-line Storage - Earthen Basin w/Bioretenation																	
Value:		Public Health		Measure		Impact						Rationale		Measurement Method			
Performance Measures		WWTP Peak Flows		WWTP Peak Flows		Peak flow delivered to WWTP versus rated peak hour capacity of disinfection system		Peak flow exceeds rated capacity by more than 100%, wetlands treatment with < 1 day HRT	Peak flow exceeds rated capacity by 50 - 100%, wetlands treatment with < 2 days HRT	Peak flow exceeds rated capacity by 10 - 50%, wetlands treatment with < 3 days HRT	Peak flow exceeds rated capacity by less than 10%, wetlands treatment with 3 - 5 days HRT	Peak flow is within rated capacity, wetlands treatment with > 5 days HRT	Peak flow is less than 80% of rated capacity	WWTP disinfection systems have ability to adjust dose rates to handle small short term peaks without exceeding discharge standards. Significant peaks may result in inadequate disinfection that exceeds discharge permit limits. Peak flows well below system capacity allow performance significantly better than standards require.	Measurement will be from analyzing plant influent flows against pre-determined plant stress-test results and operating criteria.		
				Release point		Untreated CSO or SSO discharge (or runoff in CSO area) where volume is > 0.04% (SSO)/0.08% (CSO) of stream's flow	Significant untreated discharge to water or ground in high public use or access area	Minor discharge to high public use area or significant discharge to water in low public use or access area, basement back-up	Minor discharge to water in low public use area, or significant minor discharge to ground in low public use or access area, discharge contained and cleaned up	Minor discharge to ground in low public use area or discharged anywhere, de minimus quantity	No discharge	Not all discharges violate the Clean Water Act. Discharges vary in the impact to public health and the environment. Therefore, EPA developed guidance on how to set priorities based on the risk to the public's health and the environment under their Enforcement Management System in Chapter X, titled "Setting Priorities for Addressing Discharges from Separate Sanitary Sewers." The assigned consequences follow the intent of the principles and priorities presented in the chapter. SSO Event Mean Concentration for Fecal Coliform estimated at 500,000/100ml. Dilution factor 0.04% required to not exceed 200 FC/100 ml Water Quality Standard.	Measurement methods will be via hydraulic models to quantify the SSO discharge and the GIS to establish relative distance from designated locations or objects.				
		Design Event Recurrence Interval	Frequency per location	Event Recurrence Interval	→ ↓		Most Severe Impact					Least Impact	No Impact				
						5	4	3	2	1	0	Assumptions		Base Case Score	Alternative Score	Total Score	
Frequency		6-10 per year	>10 per year	< 1 year recurrence interval	Most Likely	5	25	20	15	10	5	0	Base Case Score: average overflow volume/duration = 26.1 cfs for 26 events; BGCMI-LG average annual Q = 37.6 cfs. SD = 69.5%.		25		25
		1-6 per year	4-10 per year	1-2 yr recurrence interval		4	20	16	12	8	4	0					0
		1-2 year recurrence interval	1-4 per year	2-5 yr recurrence interval		3	15	12	9	6	3	0	Alternative Score: average overflow volume/duration = 8.3 cfs for 2 events; BCGMI-LG average annual Q = 37.6 cfs. SD = 22.1%.			15	-15
		2-5 year recurrence interval	1-2 year recurrence interval	5-10 yr recurrence interval		2	10	8	6	4	2	0					0
		>5 year recurrence interval	>2 year recurrence interval	>10 yr storm return	Least Likely	1	5	4	3	2	1	0					0
		Not Possible	Not Possible	Not Possible	Not Possible	0	0	0	0	0	0	0	Average Total Score		N/A		
Note - This value sheet calculates the average benefit over the recurrence intervals. A correction calculation is included in order to obtain a maximum score of 25.													Corrected Score		10		
Acronyms CSO - Combined sewer overflow FC - Fecal coliform GIS - Geographic information system HRT - Hydraulic retention time ml - Milliliter SSO - Sanitary sewer overflow WWTP - Wastewater treatment plant																	

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L MI MF 127 M 13 A A Off-line Storage - Earthen Basin w/Bioretenention														
Value:		Asset Protection			Impact					Rationale		Measurement Method		
Performance Measures		Flood Damage		Homes or businesses are subject to severe structural damage	Homes or businesses are subject to minor to moderate structural damage	Flooding limits access to homes or businesses	Flooding limits access to recreational areas	Standing water on property, but access not affected and no damage expected	No standing water	Stormwater BMPs can reduce stormwater peaks and reduce extent of flooded areas, while sewer separation may increase localized stormwater peak flows and increase the flooding impacts of storms. Alternatively, purchase of highly impacted properties may be a cheaper way to reduce flood damage and create green space and buffer zones.	Drainage models where available, or historic observations of flood-prone areas combined with the expected relative impacts of sewer system modifications on storm water flows			
		Basement Back-ups		Sewer surcharging within 6 feet of ground surface for more than 20% of manholes	Sewer surcharging within 6 feet of ground surface for 10 - 20% of manholes	Sewer surcharging within 6 feet of ground surface for 5 - 10% of manholes	Sewer surcharging within 6 feet of ground surface for 1 - 5% of manholes	Sewer surcharging within 6 feet of ground surface for 0 - 1% of manholes	No surcharging within 6 feet of ground surface	First floor levels are typically 1 - 2 feet above ground surface, and basement floors are typically 8 - 10 feet below the first floor. A sewer surcharge of 6 feet below ground surface is highly likely to cause back-ups in homes with basement service.	Measurement methods will be via hydraulic models to quantify the hydraulic grade lines compared to ground surface elevations at manholes.			
	Event Recurrence Interval			Most Severe Impact				Least Impact	No Impact					
				5	4	3	2	1	0	Assumptions	Base Case Score	Alternative Score	Total Score	
Frequency	6-10 per year (6-mo. Storm)	Most Likely	5	25	20	15	10	5	0	0% of manholes surcharged; off-line storage has no impact on flooding	0	0	0	
	1-6 per year (1-yr. Storm)		4	20	16	12	8	4	0	33% of manholes surcharged; off-line storage has no impact on flooding	20	20	0	
	1-2 year recurrence interval (5-yr. Storm)		3	15	12	9	6	3	0	100% of manholes surcharged; off-line storage has no impact on flooding	15	15	0	
	2-5 year recurrence interval (10-yr. storm)		2	10	8	6	4	2	0	100% of manholes surcharged; off-line storage has no impact on flooding	10	10	0	
	>5 year recurrence interval	Least Likely	1	5	4	3	2	1	0				0	
	Not Possible	Not Possible	0	0	0	0	0	0	0	Average Total Score			0	
Note - This value sheet calculates the average benefit over the recurrence intervals. A correction calculation is included in order to obtain a maximum score of 25. Acronyms BMPs - Best management practices										Corrected Score			0	

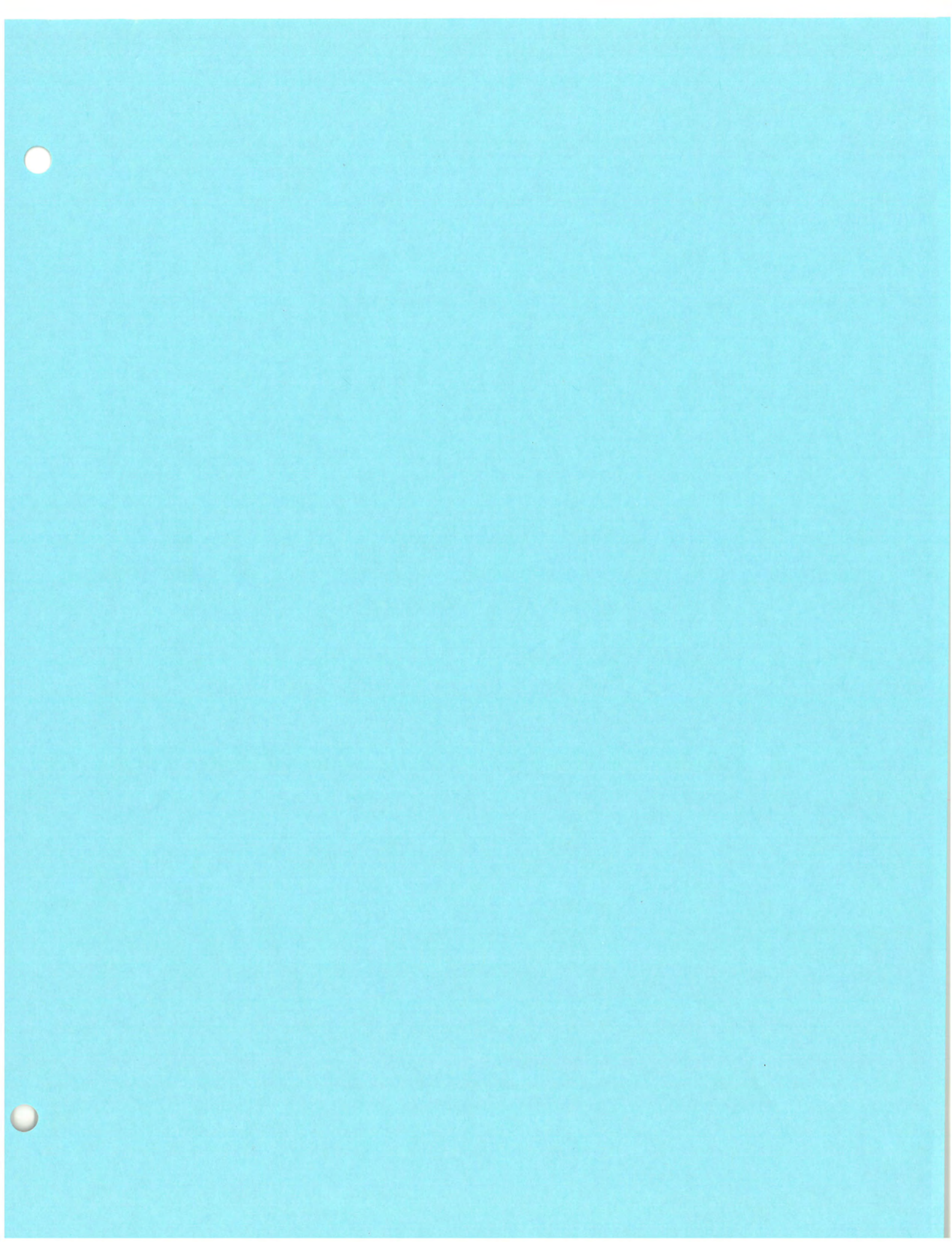
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L MI MF 127 M 13 A A Off-line Storage - Earthen Basin w/Bioretenention													
Value:		Environmental Enhancement											
Scoring													
Aspect	-5	-4	-3	-2	-1	0	1	2	3	4	5	Assumptions	Score Per Aspect
Aquatic and Terrestrial Habitat Protection	Elimination of habitat for rare or endangered species	Elimination of significant amount of common habitat	Elimination of minor amount of common habitat	Significant habitat impairment	Minor impairment to existing habitat	No impact on habitat	Minor enhancement of existing habitat	Significant enhancement of existing habitat	Creation of minor amount of common habitat	Creation of significant amount of common habitat	Creation of critical habitat for rare or endangered species	We utilize expertise of sub-consultants Redwing Ecological Services and Dr. LimnoTech to score Environmental Enhancement aspects	3
Aesthetics - Solids and Floatables	75%+ reduction in volume of flow with no S&F capture	50 - 75% of flow with no S&F removal	25 - 50% of flow with no S&F removal	10 - 25% of flow with no S&F removal	Reduces efficiency of existing S&F control device, 0 - 10% of flow with no S&F removal	No change in S&F removal	0 - 10% of discharged flow treated with positive S&F removal (screens)	10 - 25 % of discharged flow treated with positive S&F removal (screens)	25 - 50% of discharged flow treated with positive S&F removal (screens)	50 - 75% of discharged flow treated with positive S&F removal screens	75%+ of discharged flow treated with positive S&F removal (screens)	S&F control integrated into basin network	5
Aesthetics - Odor and Air Emissions	Create annoying odor source affecting > 20 customers often	Create annoying odor source affecting <20 customers often, or >20 customers occasionally	Create annoying odor source affecting <20 customers occasionally	Create detectable odor source affecting > 50 customers often	Create detectable odor source affecting < 50 customers occasionally	No impact on odors	Eliminate detectable odor source affecting < 50 customers occasionally	Eliminate detectable odor source affecting > 50 customers often	Eliminate annoying odor source affecting <20 customers occasionally	Eliminate annoying odor source affecting <20 customers often, or >20 customers occasionally	Eliminate annoying odor source affecting >20 customers often	Will be evaluated using CH2M Hill odor model in conjunction with assessment of adjacent land use population density	-1
Dissolved Oxygen Impacts	Reduction of in-stream DO by 2 mg/l + during critical flow periods	Continuous reduction of in-stream DO of 2 mg/l +	Continuous reduction of in-stream DO of 0 - 2 mg/l, possible reduction of in-stream DO 2 - 4 mg/l during critical conditions	Intermittent reduction of in-stream DO 2 mg/l + possible during non-critical conditions, reduction of DO 0 - 2 mg/l during critical conditions	Intermittent reduction of in-stream DO 0 - 2 mg/l	No DO impacts	Intermittent improvement of in-stream DO 0 - 2 mg/l	Intermittent improvement of in-stream DO 2 mg/l +, intermittent critical condition improvements 0 - 2 mg/l	Continuous improvement of in-stream DO 0 - 2 mg/l, intermittent critical condition improvements 2-4 mg/l	Continuous improvement of in-stream DO 2 mg/l +	Continuous improvement of critical condition in-stream DO 2 mg/l +	We utilize expertise of sub-consultants Redwing Ecological Services and Dr. LimnoTech to score Environmental Enhancement aspects	1
Downstream Impacts	75%+ increase in annual BOD or nutrient loads	50 - 75% increase in annual BOD or nutrient loads	25 - 50% increase in annual BOD or nutrient loads	10 - 25% increase in annual BOD or nutrient loads (CSO + runoff)	Potential 0 - 10 % increase in annual average BOD or nutrient loads (CSO + runoff)	No impact on BOD or nutrient loads (CSO + runoff)	0 - 10% reduction in annual BOD or nutrient loads (CSO + runoff)	10 - 25% reduction in annual BOD or nutrient loads (CSO + runoff)	25 - 50% reduction in annual BOD or nutrient loads (CSO + runoff)	50 - 75% reduction in annual BOD or nutrient loads (CSO + runoff)	75%+ reduction in annual BOD or nutrient loads (CSO + runoff)	AAOY reduction = 45.05 MGY (53.6%)	5
Stream Flow Impacts (Peak flows)	25%+ increase in peak flows	10% - 25% increase in peak flows	Up to 10% increase in peak flows	Frequent increase in flow during critical conditions	Possible increase in average flow, or minor increase in high flow peaks	No impact on peak flows	Minor reduction in flows - no significant peak reduction	Minor reduction in peak flows under some conditions	Up to 10% reduction in peak flows	10% - 25% reduction in peak flows	25%+ reduction in peak flows	AAOY reduction = 45.05 MGY (53.6%)	1
Stream Flow Impacts (DWF only)	25%+ decrease in flow during critical conditions	10% - 25% decrease in flow during critical conditions	0-10% permanent decrease in flow during critical conditions	Frequent decrease in flow during critical conditions	Possible decrease in average flow	No impact on average or base stream flow	Intermittent increase in stream flow - not limited to critical conditions	Intermittent increase in stream flow - often improves critical conditions	0 - 10% permanent increase in stream flow during critical conditions	10 - 25 % permanent increase in stream flow during critical conditions	25%+ permanent increase in stream flow during critical conditions	AAOY reduction = 45.05 MGY (53.6%)	-1
Instructions: (1.) Score each alternative for each of the seven aspects of the value. Scores can be positive or negative, depending on the impact of the alternative on the value. (2.) Total the scores for each aspect to get the total score for this alternative in this value. (3.) Shaded area represents "fatal flaw". Alternatives that score in this area should not be proposed.										Total Raw Score Calculated		13	
Aspect	Rationale						Measurement Method				Total Score (Default)		13
Aquatic and Terrestrial Habitat Protection	Wet weather projects may affect both aquatic and terrestrial habitat through changes in base flow, peak flow, water quality, tree cover, channel shape and characteristics etc. Predictive models used to evaluate wet weather control measures have a limited ability to predict biological diversity changes, erosion impacts etc., so surrogate metrics must be used to estimate future positive and negative impacts.						Project definition may specifically address changes in channel shape and configuration, tree cover etc. Predictive models will address DO and other water quality impacts. Flow models will predict base flow and peak flow rates to allow estimates of changes in erosion and water surface area.				Note: The total score calculated may be more than 25. In the instances where this might occur, a default maximum score of 25 will be calculated.		
Aesthetics - Solids and Floatables	Most CSOs have some form of solids and floatables control baffles. Improvements in capture rates can be expected with screening or other advanced treatment options. Storm water retention, constructed wetlands, and other control systems may provide solids and floatables removal as well. While reduction in solids and floatables removal efficiency is not likely, penalty points will be assessed if this is possible with any alternative.						Current solids and floatables removal efficiency has been estimated for all sites with control technology. Improvements in removal efficiencies will be estimated for all alternatives that add screening or other advanced treatment technologies. Where treatment is proposed for storm water discharges removals will be estimated based on published removal data.						
Aesthetics - Odor and Air Emissions	Odors and air emissions can be generated in storage systems, pump stations, force mains, and long flat sewers. Odors are generally characterized by both the intensity and the quality of the odor. Detectable and annoying are two common descriptors of different intensities and qualities of odors from sewage handling facilities.						Odor emissions from sewage handling facilities can be modeled for intensity, quality, and geographic spread. For planning purposes this level of evaluation is not common, and will not be done except in very rare circumstances. The potential for odor and air emissions will be estimated based on typical applications and model predictions for storage time, number of events, average flow velocities etc.						
Dissolved Oxygen Impacts	Dissolved oxygen in streams is dependent on a variety of factors including BOD load, nutrient load, stream flow velocity, water temperature, etc.						For BGC the Water Quality Tool will be used to estimate the impacts of various loading conditions, flows, temperatures, etc. Probable impacts of individual projects will be estimated based on comparisons to the various stream condition scenarios.						
Downstream Impacts	Downstream impacts refer to conditions in the Ohio River below Jefferson County. Nutrient loadings in the Ohio (not just Jefferson County) have been identified as the source of 30 - 45% of the total nutrient loads reaching the Gulf of Mexico. BOD is not likely to persist in the river long enough to get to the Gulf, but can have detrimental impacts far downriver.						Pollutant removals will be estimated based on reductions in annual average loads, since the downstream impacts are primarily long-term and cumulative.						
Stream Flow Impacts (Peak flows)	Extremely high peak flows as are often caused by urbanization of a watershed can erode the streambed, damage aquatic and terrestrial habitat, make water based recreation unsafe or impractical.						Predictive models can estimate flow peaking factors from individual sources, and the Water Quality Tool has a hydraulic component to estimate stream flows during various storm events.						
Stream Flow Impacts (DWF only)	Diversion of flows away from a stream due to abandonment of a treatment plant etc. can reduce base flows in a stream. Alternatively, other control measures such as groundwater pumping can increase base flows with beneficial results.						Predictive models can estimate flows from individual sources, and the Water Quality Tool has a hydraulic component to estimate stream flows during various dry weather events.						
Acronyms BGC - Beargrass Creek BOD - Biological oxygen demand CSO - Combined sewer overflow DO - Dissolved oxygen DWF - Dry weather flow mg/l - Milligram per liter S&F - Solids and floatables													

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L MI MF 127 M 13 A A Off-line Storage - Earthen Basin w/Bioretenention														
Value: Eco-Friendly Solutions														
Scoring														
Aspect	-5	-4	-3	-2	-1	0	1	2	3	4	5	Assumptions	Score Per Aspect	
Non-Renewable Energy Consumption	Primary energy consumption is greater than secondary treatment	Primary energy consumption equal to 75 - 100% of secondary treatment	Primary energy consumption equal to 30 - 75% of secondary treatment	Primary energy consumption equal to 15 - 30% of secondary treatment	Primary energy consumption equal to 0 - 15% of secondary treatment	No energy consumption except for cleaning and maintenance	Cleaning and maintenance not needed, no primary consumption	NA	NA	NA	NA		0	
Use of Natural Systems	Constructed facilities permanently displace 5+ acres wetlands or 50% locally available green space	Constructed facilities permanently displace 3 - 5 acres wetlands or 25 - 50% locally available green space	Constructed facilities permanently displace 1 - 3 acres wetlands or 10 - 15% locally available green space	Constructed facilities permanently displace 0 - 1 acre wetlands or up to 10% locally available green space	Constructed facilities temporarily disrupt wetlands or green space	Alternative does not use or affect natural systems, wetlands, or green space	Alternative does not use natural systems, but enhances green space or wetland	Natural systems play a minor role in alternative function, up to 1 acre wetland or 10% additional green space created	Natural systems are significant part of alternative function, 1 - 3 acres of wetland created or 10 - 25% additional green space	Alternative fully uses natural systems, 3 - 5 acres of wetland created or 25-50% additional green space	Alternative results in multi-use natural system development, 5+ acres of wetland or 50% additional green space	Proposed site within stream corridor	-2	
Multiple-Use Facilities	Constructed facilities permanently eliminate recreational opportunity	Constructed facilities significantly impair recreational opportunity	Constructed facilities moderately impair recreational opportunity	Constructed facilities have minor impacts on recreational opportunity	Construction temporarily impacts recreational opportunity	No impacts on recreational opportunities	Alternative improves access to existing recreational areas	Alternative has limited positive impact on recreation	Alternative significantly enhances recreational opportunities	Alternative increases recreational opportunities in area	Alternative results in multi-use facility	Recreational impacts will be evaluated using either Redwing Ecological Reach Characterization Report (accessibility parameter) or CH2M Hill Recreational Use Survey.	-1	
Source Control of subwatershed pollutant loads	Pollutant loadings are increased by 50%	Pollutant loadings are increased by 30 - 50%	Pollutant loadings are increased by 10 - 30%	End of pipe pollutant loadings are increased by 0 - 10%	End of pipe pollutant loadings impacts are inconsistent, but likely higher	End of pipe pollutant loadings are unchanged	Pollutant loadings impacts are inconsistent, but likely lower	Source control reduces pollutant loadings by 0 - 10%	Source control reduces pollutant loadings by 10 - 30%	Source control reduces pollutant loadings by 30 - 50%	Source control reduces pollutant loadings by more than 50%	AAOV reduction = 46.06 MG/Y (93.6%)	5	
Non-Obtrusive Construction Techniques	Permanent loss of green space or sensitive area disruption	Main thoroughfare closures, sensitive area temporary disruptions	Widespread dust and noise, blasting, secondary street closures	Localized dust, noise and local street closures	Minor dust and noise, traffic lane closures	No construction impacts	NA	NA	NA	NA	NA	high-traffic intersection	-1	
Consistent Land Use	Intrusive or nuisance facilities inconsistent with neighborhood or land use	Facilities inconsistent with neighborhood or land use	Facility characteristics mitigated to reduce impact on neighborhood	Facilities have significant impact on development density or land use	Facility has minor impact on development density or land use	No impact on land use or no above ground facilities	Alternative mitigates existing compatibility problem	Alternative removes facility inconsistent with neighborhood	Alternative removes nuisance facility from neighborhood	Alternative enhances property values in neighborhood	Alternative provides enhancements that significantly improve neighborhood	Proposed site within stream corridor	-1	
Impermeable Surfaces	5 acres+ of impermeable surfaces are added	3 - 5 acres of impermeable surfaces are added	1 - 3 acres of impermeable surfaces are added	up to 1 acre of impermeable surfaces are added	Minor increase in impermeable surfaces added	No change in impermeable surface	Minor reduction in impermeable surfaces	Up to 1 acre of impermeable surfaces removed	1 - 3 acres of impermeable surfaces removed	3 - 5 acres of impermeable surfaces removed	More than 5 acres of impermeable surfaces removed	open basin plus wetlands proposed	0	
LEEDS Performance	NA	NA	NA	NA	NA	LEEDS not applicable or LEEDS score <10	LEEDS Score 10 - 25	LEEDS Certified	LEEDS Silver	LEEDS Gold	LEEDS Platinum		0	
Instructions: (1.) Score each alternative for each of the eight aspects of the value. Scores can be positive or negative, depending on the impact of the alternative on the value. (2.) Total the scores for each aspect to get the total score for this alternative in this value. (3.) Shaded area represents "fatal flaw". Alternatives that score in this area should not be proposed.										Total Raw Score Calculated		0		
Aspect	Rationale						Measurement Method				Total Score (Default)		0	
Non-Renewable Energy Consumption	Eco-friendly solutions would be expected to be low consumers of non-renewable energy. Benchmarking energy consumption against conventional secondary treatment provides penalty points for high energy consuming alternatives.						Evaluation of primary energy consumed per MG of flow treated, compared to the energy consumed at the WCWTP per MG treated.				Note: The total score calculated may be more than 25. In the instances where this might occur, a default maximum score of 25 will be calculated.			
Use of Natural Systems	Natural systems replace concrete and steel construction with wet bottom storage lagoons, constructed bioswales, rain gardens etc. that increase green space of various kinds. Options that reduce wetlands and green space get penalty points.						Acres of wetlands and other types of green space created or eliminated. Also includes subjective evaluation of the "basis" of the alternative - "green" or "grey".							
Multiple-Use Facilities	Eco-friendly solutions create recreational opportunities for both water-based and riparian recreation. Boating, canoeing, kayaking, fishing, wading, swimming etc. would be direct water-based recreation. Bird watching, hiking, biking, picnicing, camping etc. would be considered related riparian recreation.						Subjective evaluation of changes predicted in the aquatic or riparian environment as a result of better water quality, increased base flow or decreased flow peaks, increased tree cover or vegetated riparian areas etc.							
Source Control of subwatershed pollutant loads	Controlling pollutant loads at the source through behavior modification, product replacements or stormwater management BMPs that capture pollutants thereby avoiding end of pipe treatment requirements						Modeled land-side pollutant loading reductions as calculated by the BGC Water Quality Tool or by comparison to literature values or pilot program measurements.							
Non-Obtrusive Construction Techniques	Probable construction impacts on traffic, noise and dust are all measures of the friendliness of an alternative. Construction impacts get penalty points for creating nuisance conditions.						Subjective evaluation of probable construction impacts based on the type of construction envisioned for the alternative.							
Consistent Land Use	Alternative configuration can either enhance or detract from the surrounding property. For example, an extremely unfriendly pump station can be noisy, smelly, and ugly. The same pump station can be "disguised" as a residence that fits right in with the neighborhood. If a larger parcel of land is available, a pump station can be hidden from view by landscaping, and a community garden or other green space added to enhance the neighborhood.						At the planning level, projects can be defined to avoid negative impacts on the surrounding properties. Depending on the availability of land, enhancements are possible. This aspect encourages project definition and budgets to enhance, not detract.							
Impermeable Surfaces	Adding impermeable surfaces increases total runoff volume, peak runoff flowrates, and the total transport of any pollutant deposited on the surface from any source. Conversely, permeable surfaces can reduce flow volume and peaks, and provide filtering mechanisms for pollutants.						Acres of permeable surfaces created or eliminated.							
LEEDS Performance	LEED standards are applicable to alternatives that include above-ground building structures.						Application of LEED evaluation points.							
Acronyms BGC - Beargrass Creek LEEDS - Leadership in Energy and Environmental Design													MG - million gallons WCWTP - West County Wastewater Treatment Plant	

DRAFT





MSD

Louisville and Jefferson County
Metropolitan Sewer District

WASTEWATER SERVICE CHARGES

EFFECTIVE FOR ALL BILLS ISSUED ON AND AFTER AUGUST 15, 2007

A. WASTEWATER SERVICE CHARGES

Applicable to all bills rendered.

Fixed charges by water service meter sizes applicable to all wastewater service charge billings:

<u>Meter Size</u> Inches	<u>Monthly</u> <u>Billing</u> \$/Bill	<u>Bi-Monthly</u> <u>Billing</u> \$/Bill	<u>Meter Size</u> Inches	<u>Monthly</u> <u>Billing</u> \$/Bill	<u>Bi-Monthly</u> <u>Billing</u> \$/Bill
5/8 or 3/4	12.27	15.98	6	263.89	518.67
1	21.38	32.09	8	396.65	778.01
1-1/2	32.09	53.39	10	518.67	1,022.11
2	41.21	73.23	12	753.00	1,506.03
3	87.17	163.25	15 or 16	912.75	1,825.46
4	137.31	263.96	18 or 20	1,197.96	2,395.93

Plus \$60.51 for each reading of each meter owned by a customer for the purpose of determining billable consumption. Service Charges may be pro-rated based on the number of actual days in a billing cycle.

B. WASTEWATER VOLUME CHARGES

Regular volume rates described below are calculated by using 85% of the actual metered water used by residential customers, providing an automatic year-long 15% discount for lawn watering and other uses of water which does not enter the sanitary sewer system. Automatic volume rate discounts of 10% for commercial customers and 5% for industrial customers are also provided. The "sewer only" volume rates exclude these automatic discounts and are used for customers who are charged for only the water entering the sanitary sewer system as determined by metering systems.

*May be modified from time to time by contractual agreement with individual customers.

1. **Regular volume rate** applicable to all water used and not meeting the requirements for the optional volume rate (see below):

Residential - \$2.20 per 1,000 gallons of volume billed
Commercial - \$2.53 per 1,000 gallons of volume billed
Industrial - \$2.63 per 1,000 gallons of volume billed

2. **Optional (clean) volume rate** available to customers whose average water use during any consecutive twelve-month period exceeds 1,000,000 gallons per month. Such customers may, until such volume is less than 1,000,000 gallons per month, have the option of being charged the following optional volume rate for water used plus quality charges for total properly certified and approved BOD and SS loadings.

\$1.49 per 1,000 gallons of volume billed; or

3. **Sewer only volume rates** applicable where billable volumes are based on either the wastewater discharged to the sewer system as determined by metering, or metered water use less exemptions approved by MSD for water not ultimately discharged to the sewer system as determined by separated metering.

Residential - \$2.52 regular rate
Commercial - \$2.82 regular rate or \$1.60 optional rate/1,000 gallons
Industrial - \$2.83 regular rate or \$1.60 optional rate/1,000 gallons

4. **EPA Consent Decree Surcharge** applicable to the following billings:

Residential - \$6.95 per month or \$13.90 bi-monthly

Commercial Regular Volume Rate - greater of \$6.95 per month or \$.83 per thousand gallons of water billed

Commercial Sewer Only Volume Rate - greater of \$6.95 per month or \$.93 per thousand gallons of wastewater discharged

Industrial Regular Volume Rate - greater of \$6.95 per month or \$.87 per thousand gallons of water billed

Industrial Sewer Only Volume Rate - greater of \$6.95 per month or \$.93 per thousand gallons of wastewater discharged

Optional (clean) Volume Rate - greater of \$6.95 per month or \$.49 per thousand gallons of water billed

Optional (sewer only) Volume Rate - greater of \$6.95 per month or \$.53 per thousand gallons of wastewater discharged

C. **QUALITY CHARGES***

Applicable to contributed wastewater strengths in excess of 250 mg/liter of biochemical oxygen demand (BOD) or 270 mg/liter of suspended solids (SS):

\$0.2494 per pound of BOD loading in excess of 250 mg/liter
(or \$0.002081 per mg/liter per 1,000 gallons); and

\$0.1028 per pound of SS loading in excess of 270 mg/liter
(or \$0.00085712 per mg/liter per 1,000 gallons).

Any commercial, institutional or industrial customer who is deemed eligible to be placed on quality charges by MSD will have their wastewater tested for the purpose of accessing a quality charge billing rate in addition to the volume rate applied. MSD shall at all times have access to the premises of a customer for the purpose of determining appropriate quality charges. Quality charge billing rates will be based on sampling and analyses conducted by MSD personnel using MSD protocols and methods.

MSD will set the frequency and duration for quality charge sampling events. MSD will take business cycle fluctuations that may affect loadings into consideration when determining sampling frequency and duration.

MSD may establish standard BOD and SS loadings for a specific customer class which shall be used to assess applicable quality charge billing rates, using the quality charge rate multipliers stated above. In addition, MSD may use other methods to determine a quality charge billing rate for those customers for which standard sampling and analyzes do not represent the actual loadings being discharged.

*May be modified from time to time by contractual agreement with individual customer.

D. **FLAT RATE FOR RESIDENTIAL CUSTOMER**

Applicable to any single-family residential customer without a metered public water service:

\$25.47 monthly plus \$6.95 EPA Consent Decree Surcharge or
\$42.38 bi-monthly plus \$13.90 EPA Consent Decree Surcharge

E. **PENALTY CHARGE**

A Delinquent Bill Penalty shall be added to all wastewater service bills not paid by their due dates in accordance with the penalty policy in use by the Louisville Water Company, MSD's billing and collection agent.

F. UNUSUAL INCIDENT CHARGE

Any business, firm or individual introducing into MSD's sewer system substance detrimental to MSD's sewers, wastewater treatment facilities, pumping facilities or wastewater treatment processes, which result in abnormal costs for MSD, shall be charged and shall pay the actual total costs incurred as determined by MSD.

G. DEBT SERVICE ADJUSTMENT

Whenever MSD's net revenues are less than 1.10 times the debt service on MSD's outstanding revenue bonds for any consecutive six-month period, by order of the Board of MSD, a schedule of wastewater service charges shall be amended in order to maintain a 1.10 debt service coverage required by MSD's 1971 Bond Authorizing Resolution which was approved by the City of Louisville Ordinance Number 86, Series 1971; provided the aggregate of such adjustments for any twelve-month period shall not generate additional revenue from wastewater service charges in excess of 7%.

The term, "net revenues" is defined as gross revenue from wastewater service charges less operating expenses and debt payments other than debt service payments on MSD's outstanding revenue bonds.

H. CONNECTION FEES

1. MSD's Connection Fee is due and payable to MSD for connections to MSD's sanitary sewer system under any of the following circumstances:
 - a. whenever a physical connection from the property to be served to MSD's public sewer is required to be constructed;
 - b. a working and usable connection is present but there exists a previous commitment or obligation to pay a connection fee to MSD on the part of the current property owner or previous property owners;
2. MSD's Connection Fee is not due for connections to MSD's sanitary sewer system under any of the following circumstances:
 - a. a working and usable connection exists that serves the property that was constructed and accepted by MSD prior to August 1, 1998;
 - b. a property is being served by an MSD assessment project and the property is being assessed.
 - c. a property is being served as part of a new development being constructed under the provisions of an MSD's Lateral Extension (LE) Contract and the property owner is a third party beneficiary of the LE Contract;
 - d. connections to MSD's sewer system are exempted by a previously executed agreement with MSD;
 - e. the connection fee is exempted from payment by another provision of these Rates, Rental and Charges;
 - f. the connection fee has been specifically exempted by action of the MSD Board; or
 - g. Connection Fees are not applicable to homes:
 - i. built by, or on behalf of, an organization which is either exempt from Federal income tax under 26 U.S.C. & 501 (c)(3) of the Internal

Revenue Code, or is a government entity; and

- ii. sold to buyers who qualify according to the income guidelines established by MSD and
 - iii. a property for which a federal low income housing tax credit is not being taken by any entity or individual and
 - iv. a property which has a sales price which qualifies under price guidelines established by MSD.
3. A special MSD connection fee is due and payable for those properties to be served in the vicinity of a MSD Assessment Project (whether connecting to an interceptor or a collector line) that will be equal to the most similar Guaranteed Maximum Assessment Project (GMA). After three years from the issuance of warrants for the assessment project, the amount paid shall be the greater of the GMA or the current applicable connection fee.
4. Connection Fees may be paid by any method approved by MSD including the use of installment plans in accordance with the procedures and at interest rates approved by the MSD Board. However, if MSD's installment plan is used, the property owner shall grant MSD a mortgage on the real property to be served.

The Connection Fee shall be equal to the actual construction cost plus a \$250.00 administrative fee.

AMENDMENT NO. 1
ADDITIONS TO MSD WASTEWATER SERVICE CHARGES

I. CAPACITY CHARGE

MSD is the designated management agency for the implementation of the Master Plan for sewerage Jefferson County, and must eventually provide capacity within the comprehensive public sewerage system for all developed properties within Jefferson County. New development, even when using MSD's existing capacity, contributes to future capacity needs. Therefore, Capacity Charges shall be collected from developers of properties to help defray the future cost of providing Master Plan sewerage facilities.

When a developer of property wishes to provide sewer service by extension of or connection to MSD's sewer system, the developer, in addition to providing and paying for sewerage facilities necessary for the development, shall pay a Capacity Charge in advance of connection to MSD's wastewater treatment facilities. For developments served by MSD sewer extensions, the developer shall pay the applicable Capacity Charge irrevocable Letter of Credit from a local bank or other financial institution which guarantees MSD payment in full at MSD's request after the sewers are installed and connected to MSD's sewer system and before MSD issues its formal acceptance to the sewer extensions.

The Capacity Charge shall be calculated by multiplying the unit capacity charge times the gallons per day estimated to flow from a new development connecting to MSD's sewer system as determined by MSD. The unit capacity charge (value per gallon) shall be calculated by dividing MSD's Net Worth (system value) by MSD's total system-wide design capacity. For any calendar year, the unit capacity charge shall be based on MSD's net worth as reported in the Annual Audit Report for the fiscal year ended the June 30 prior to the calendar year.

Capacity Charges are not applicable to the following:

1. Existing developed properties connecting to MSD's system but previously served by another (non MSD) sewer system or on-lot wastewater disposal system.
2. Properties to be served by a new wastewater treatment plant to be owned by MSD and constructed and financed jointly by agreement between MSD and one or more developers; however, the prorated shares of the developers' capital costs based on their estimated use of design capacity, shall not be less than the amounts MSD would recover by using the Capacity Charge calculations. Properties in the service area not party to the agreement will pay the Capacity Charges.
3. Properties owned by the City of Louisville, Jefferson County, or joint agencies of the City of Louisville and Jefferson County.
4. Properties which connect prior to January 1, 1993 to an MSD sewer which was installed and available in an abutting right of way or easement as of January 1, 1987, provided said properties were annexed into MSD's wastewater service area at the written request of the owners dated and received by MSD prior to January 1, 1987, and provided the properties are being developed, or have recently been developed, at the time of connection.
5. Properties within the boundaries of the City of Louisville which, in 1946, transferred the then existing City sewerage system to MSD at no cost to MSD. Funds collected by the capacity charge shall be used to finance future sewerage expansion that will serve new development.
6. Property located within designated Louisville and Jefferson County Enterprise Zones is exempt from the Capacity Charge imposed by MSD on new property development pursuant to Metro Codified Ordinance Section 50.48(C).

J. DRAINAGE SERVICE CHARGES

A system and structure of drainage service charges to be applied to all developed parcels of land within the MSD drainage service area and other drainage service fees are hereby established in accordance with the following:

1. Definitions

For the purpose of this Amendment, the words or phrases below shall have the following meanings:

- a. **"MSD"** shall mean the Louisville and Jefferson County Metropolitan Sewer District
- b. **"Developed"** shall mean that condition of real property altered from its natural state by the addition to or construction on such property of impervious ground cover or other man-made physical improvements such that the hydrology of the property or a portion thereof is affected.
- c. An **"Equivalent Service Unit"** (ESU) is the measure of impervious ground cover for a typical single-family residential property and is used by MSD in assessing the drainage service charges for each parcel of property.
- d. **"Impervious Surface"** shall mean those hard surface areas either which prevent or retard the entry of water into the soil in the manner that such water entered the soil under natural conditions pre-existent to development, or which cause water to run off the surface in greater quantities or at an increase rate of flow than that present under natural conditions pre-existent to development, including, without limitations, such surfaces as roof tops, asphalt or concrete paving, driveways and parking lots, walkways, patio areas, storage areas, or other surfaces which similarly affect the natural infiltration or runoff patterns existing prior to development.
- e. **"Drainage Master Plan"** shall mean the plan for managing storm drainage and surface water runoff facilities and features within MSD's drainage service area and the drainage basins therein.
- f. **"Drainage Service Charge"** means the fee levied by MSD upon all developed real property within the boundaries of MSD's drainage service area as authorized by this amendment.
- g. The **"System"** shall mean the entire system of flood protection and stormwater drainage and surface water runoff facilities owned or leased by MSD or over which MSD has right of use for the movement and control of storm drainage and surface water runoff, including both naturally occurring and man-made facilities.
- h. **"Drainage Service Area"** shall mean the existing service area of MSD as defined by KRS 76.005(3), and any expansion thereof pursuant to KRS 76.175.
- i. **"Underdeveloped"** shall mean that condition of real property unaltered by the construction or addition to such property by man of impervious ground cover or physical man-made improvements of any kind which change the hydrology of the property from its natural state.
- j. **"Residence"** shall mean a building or structure or portion thereof, designed for and used by human beings. The term residence includes the term "residential" and "residential unit" as referring to the type of or intended use of a building or structure.
- k. **"Single -Family Residential Property or Parcel"** means any property or parcel which contains one structure with one or two residential dwelling units.
- l. **"Non-Single-Family Residential Property or Parcels"** shall mean properties or parcels which contain more than one residential structure or one residential structure with more than two residential dwelling units and institutional, commercial, or industrial properties.

2. Service Charge

A drainage service charge is imposed on every parcel of land within the drainage service area except of the following exempted properties:

- a. City-owned property where that incorporated city has entered into an interlocal drainage service agreement with MSD providing for detention basin sites, easements, drainage rights-of-way or other assets of value comparable to applicable drainage service charges;

- b. Properties owned by the City of Louisville or by Jefferson County, or their budgeted agencies, which have offset their drainage service charges by the dedication of drainage facilities and future considerations through concomitant cooperative agreements;
- c. MSD-owned property;
- d. Public roads;
- e. All undeveloped parcels of land.

The following charges are hereby established and imposed for all parcels or real property within the drainage service area, excluding exempted properties.

Class A properties or Single-Family Residential

The single-family residential charge rate shall be \$5.02 per month for each parcel having one or two residential dwelling unit(s). This flat rate fee is based on each single-family residential parcel being equal to one equivalent service unit (ESU). MSD shall determine the number of single-family residential parcels in the drainage service area and designate each as a single ESU irrespective of the size of parcel is segregated or the use of the land is modified to other than single-family. Drainage Charges may be pro-rated based on the number of actual days in a billing cycle.

Class B or other Parcels

The charge for all other parcels within the drainage service area shall be based upon the number of square feet of measured impervious surface, as determined by MSD through aerial photography and surface feature evaluation processes, expressed in whole ESUs by rounding to the next highest ESU (an ESU has been determined to be 2,500 square feet of impervious surface). The charge for Class B property may be computed by multiplying the number of ESUs for a given parcel by the unit rate established by MSD of \$5.02 per month. Drainage Charges may be pro-rated based on the number of actual days in a billing cycle. Any owner of Class B property may request a drainage charge credit adjustment for approved on-site stormwater retention or detention facilities provided:

1. The property owner remains responsible for all costs of operation and maintenance of the facility;
2. The facility has been constructed in accordance with all approved plans; "and drainage service charges" following the term "Wastewater Service Charges" whenever said term appears in said provision.
3. The owner has obtained MSD required permits for the facility; and
4. MSD has access to the facility for purposes of inspecting for compliance with design, maintenance and operating standards.

If MSD approves a drainage charge credit for on-site stormwater retention or detention facilities, the credit will be applied by reducing the number of billable ESUs by the percent of reduction in stormwater runoff due to such on-site facilities, as determined by MSD. The net billable ESUs after such credit is applied shall be expressed in whole ESUs by rounding to the next highest ESU, and the adjusted drainage service charge shall not be less than 18% of the drainage service charge before the credit adjustment.

Other Drainage Fees

The Board of MSD may establish fees for the review and approval of plans or designs of drainage facilities, and for the inspection of the construction of drainage facilities, all in accordance with KRS Section 76.085, and may establish policies for the sharing of the costs of developing regional drainage systems serving multiple developments/properties.

Billing and Collection

Drainage service charges shall be billed and made payable using the same frequencies and billing cycles used by the Louisville Water Company for its billing system. The amounts to be billed shall be included as additions to the billings of the Louisville Water Company for water and/or sewer service, or by separate billings and billing cycles for accounts not maintained by the Louisville Water Company. Drainage Charges may be pro-rated based on the number of actual days in a billing cycle.

The owner(s), tenant(s) or person(s) responsible for the payment of water service charges and/or sewer service charges shall also be responsible for the payment of drainage service charges for

the same parcel(s) except for multiple occupancy such as shopping centers, apartment, condominiums, etc., in which cases MSD may either allocate the drainage service charges among the occupants of the parcel or may deem that a single billing to the parcel's owner(s), agent or association is appropriate. In either case, the billed party shall be responsible for payment of drainage service charges. For properties not billed by the Louisville Water Company for water service charges and/or sewer service charges, the owners of such properties shall be billed drainage service charges and shall be responsible for payment of same. In all situations, the owners of properties subject to drainage service charges shall be fully responsible for payment of said charges regardless of any other parties herein above identified as also being responsible for payment of drainage service charges.

When any drainage service charges remain unpaid for a period of thirty (30) days after the amount becomes due and payable, the property, tenant and the owner thereof shall be deemed delinquent until such time as the charges are fully paid. MSD may terminate or cause to be terminated public sewer, water, and/or drainage services against the tenant or owner to obtain payment, all in accordance with KRS 76.090(4). A penalty shall be applied to delinquent drainage charges in the same manner that penalties are applied to delinquent sewer and water charges by the Louisville Water Company.

Drainage Revenues/Expenses

All monies collected through drainage service charges and drainage fees authorized herein shall be separately identified and accounted for in MSD's financial records, and all expenses related to stormwater drainage and flood control shall be separately identified and accounted for by MSD. The **DEBT SERVICE ADJUSTMENT** provision within MSD's existing schedule or rates, rentals and charges is hereby amended by adding "and drainage service charges" following the term "Wastewater Service Charges" wherever said term appears in said provisions.

Adjustment of Charge, Appeals

Any owner who considers that drainage service charges applied to the owner's parcel are inaccurate or otherwise disagrees with the determination may apply to MSD's Financial Director for a rate review, stating in writing the grounds for the adjustment. The Financial Director will review the case and report findings to the Executive Director. The Executive Director shall consider the complaint and staff recommendations and determine whether an adjustment is necessary to provide for reasonable and equitable application of the drainage service charge.

Appeal of decisions made by the Executive Director may be brought before the MSD Board in writing with notice and substance of the appeal sent to the Board's secretary within fifteen (15) days after the owner receives the Executive Director's decision. Upon reviewing the documentation, the Board shall render a final decision.

K. RECAPTURE AGREEMENTS

MSD may negotiate and execute agreements with individuals and/or entities (herein "Developers") whereby Developers may construct and pay for regional sanitary sewer facilities that serve the Developers' property and other property located within a region determined by MSD (herein "Sewershed"). The Developer must submit plans for the proposed regional sanitary sewer facilities (herein "Facilities") to MSD and MSD must approve such plans prior to construction. The Developer also must receive approval from MSD that the Facilities' construction was in accordance with its prior approved plans and specifications. Developers must transfer right, title and interest of said Facilities to MSD at no cost. When other properties within the Sewershed are developed, MSD may charge customers located within that determined Sewershed, or other customers permitted by MSD to use such Facilities, Recapture Fees on behalf of the Developers in order to recapture the cost expended by the Developers in constructing such Facilities. MSD will calculate the Recapture Fees by determining the number of developable lots within the Sewershed and dividing it into the total final cost of the Facilities. MSD will collect the Recapture Fees and, after retaining a reasonable administrative fee from the Recapture Fees, remit the balance of the Recapture Fees to the Developers in accordance with the terms of the agreements and with this section. MSD will approve future developers to use the Facilities and collect the Recapture Fees as determined in this action.

L. SENIOR CITIZENS DISCOUNT

Senior Citizens are eligible for a 30% discount off wastewater service charges, wastewater volume charges and the EPA Consent Decree Surcharge. This discount will be made available to customers of MSD that are 65 years or older, have a household income of \$25,000 or less, and are the primary titleholder or leaseholder on the property subject to the bill. An application will be sent to those customers that request one and the discount shall begin on the billing period

following the date that the application is approved by MSD. In order to qualify for this discount, proof of age such as a birth certificate or driver's license must be provided. In addition, proof of income such as a Federal Income Tax Form 1040 must be provided and proof of residency such as a warranty deed or lease agreement must be provided. Customers that qualify for this discount may be asked to complete a renewal application on an annual basis or as otherwise determined by MSD.

M. ADJUSTMENT OF CHARGES AND APPEALS

Any owner who considers that wastewater or drainage charges applied to the owner's parcel are inaccurate or otherwise disagrees with the determination may apply to MSD's Financial Director for a rate review, stating in writing the grounds for the adjustment. The Financial Director will review the case and report findings to the Executive Director. The Executive Director shall consider the complaint and staff recommendations and determine whether an adjustment is necessary to provide for reasonable and equitable application of the charge(s).

Appeal of decisions made by the Executive Director may be brought before the MSD Board in writing with notice and substance of the appeal sent to the Board's secretary within fifteen (15) days after the owner receives the Executive Director's decision. Upon reviewing the documentation, the Board shall render a final decision.

Severability

If any section, clause or provision of this amendment be declared by the courts to be invalid, the same shall not affect the validity of the amendment as a whole or any part thereof, other than the part so declared to be invalid.

Green Infrastructure Initiative

Wet Weather Team
Stakeholder Group Meeting No. 16
February 26, 2008

Louisville & Jefferson County
Metropolitan Sewer District

Green Infrastructure Initiative

Project Approach

- Awareness
- Exploration
- Vision

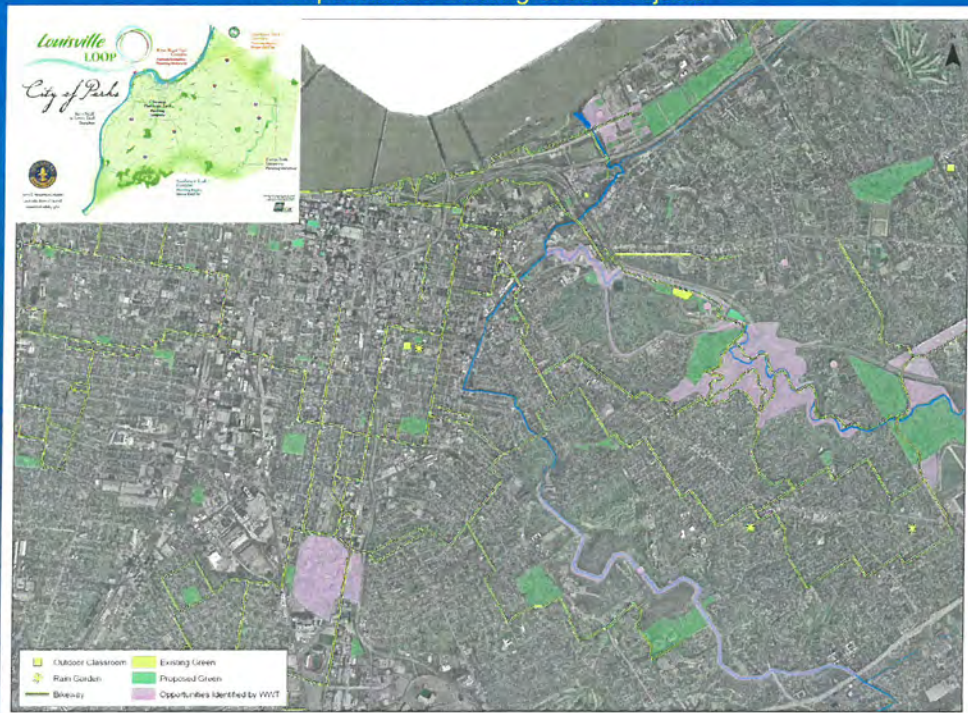
Green Opportunities Map

Projects Identified by the Wet Weather Team



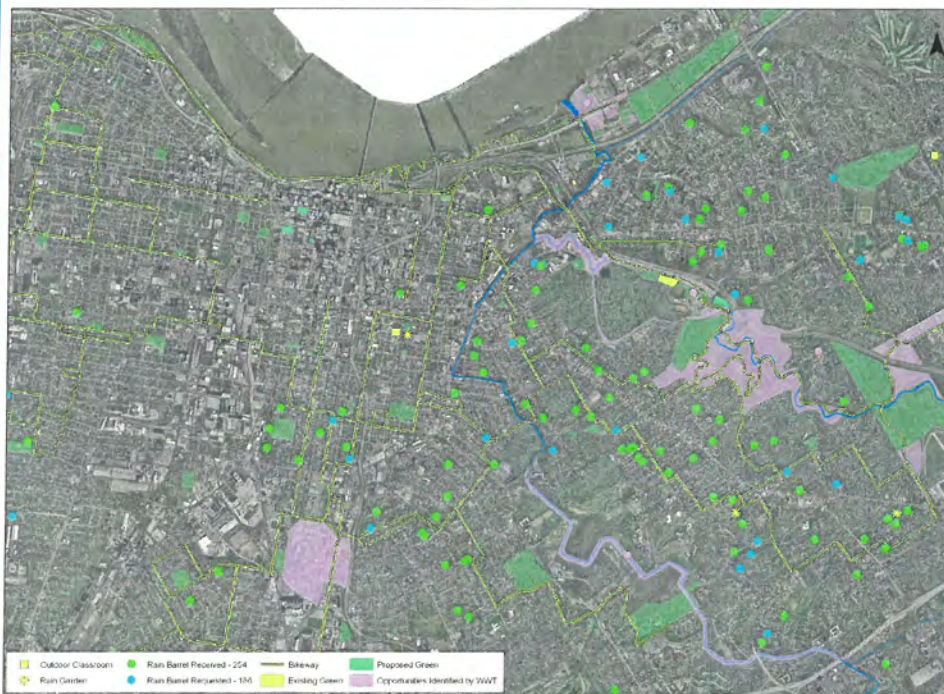
Green Opportunities Map

Proposed and Existing Green Projects



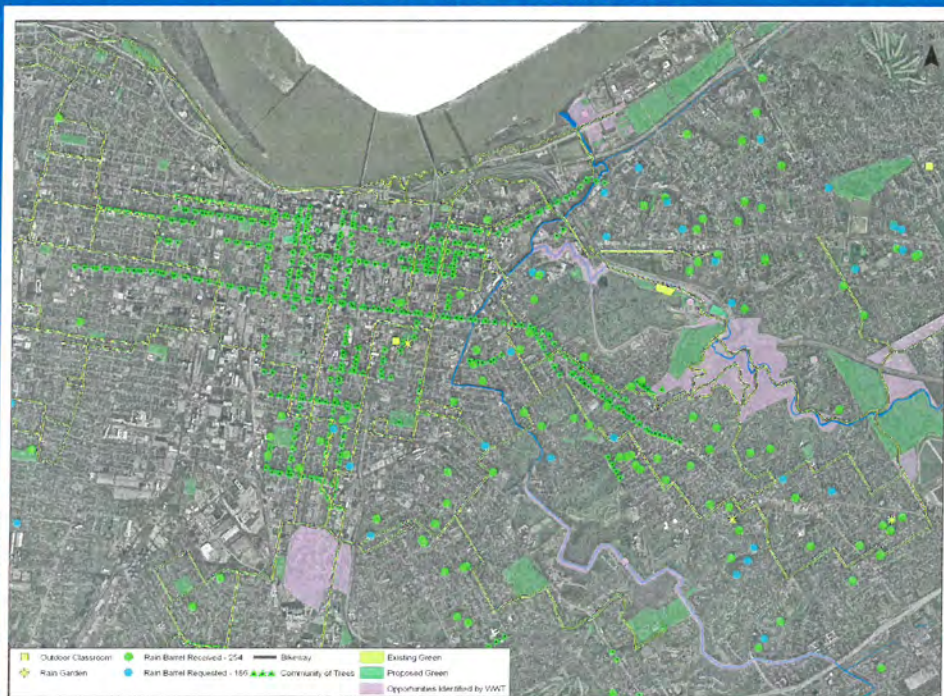
Green Opportunities Map

Rain Barrel Locations and Requests



Green Opportunities Map

Community of Trees Planting Plan



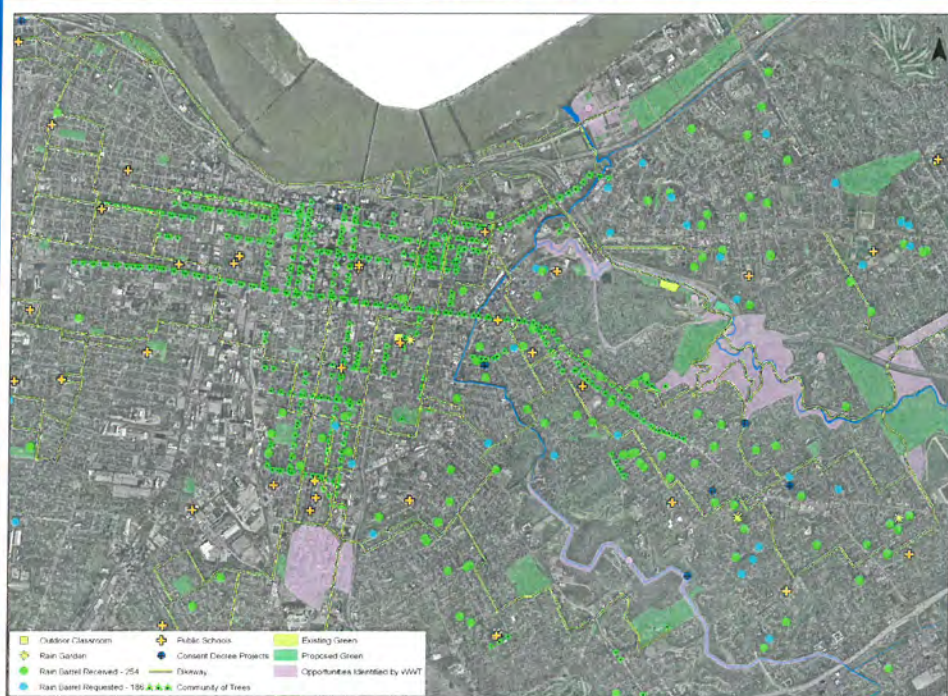
Green Opportunities Map

Public Schools with Roof and Site Work

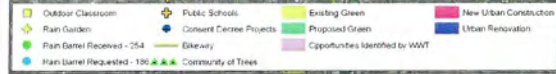


Green Opportunities Map

Consent Decree Projects



Urban Development



- CSS Area – 49% Impervious
 - Roads – 27%
 - Single Family – 27%
 - Industrial Property – 16%
 - Commercial Property – 13%

COMBINED LOWER SYSTEM MSEA					
System 1: Qualitative Source System Score	Total Score	Total Band	Aggregation	Aggregation Band	Percent of Band
0.00 to 2.00					
System 2: Qualitative Source System Score					
0.00 to 2.00					
System 3: Qualitative Source System Score					
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Evaluating CSO Characteristics to Prioritize Green Opportunities

CSO Characteristics

106 CSO Discharge Points

Characteristic	Data Range	
AAOV (MG/year)	0	845
Frequency (overflows/yr.)	0	82
Avg. Duration (hours)	0	29
Avg. Volume (MG/incident)	0	21

CSO Characteristics

106 CSO Discharge Points

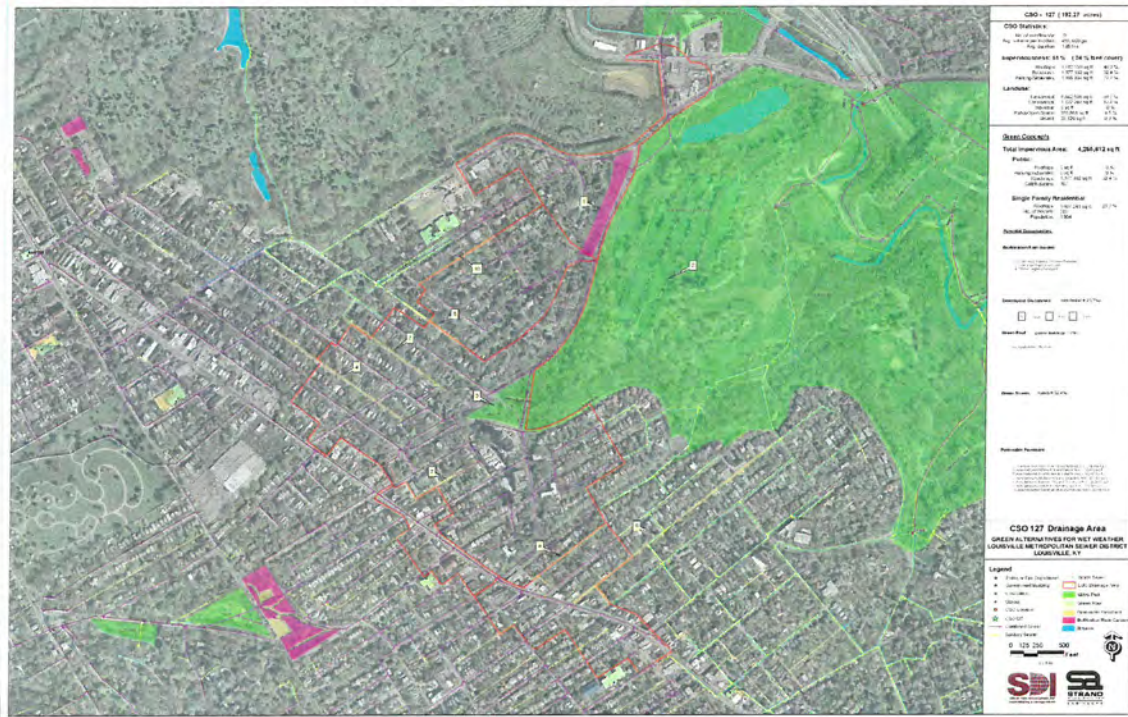
Frequency (times/year)	Number of CSOs
0	24
1-10	13
11-20	24
21-30	14
31-50	20
51-82	11

CSOs discharging <10 times/yr.

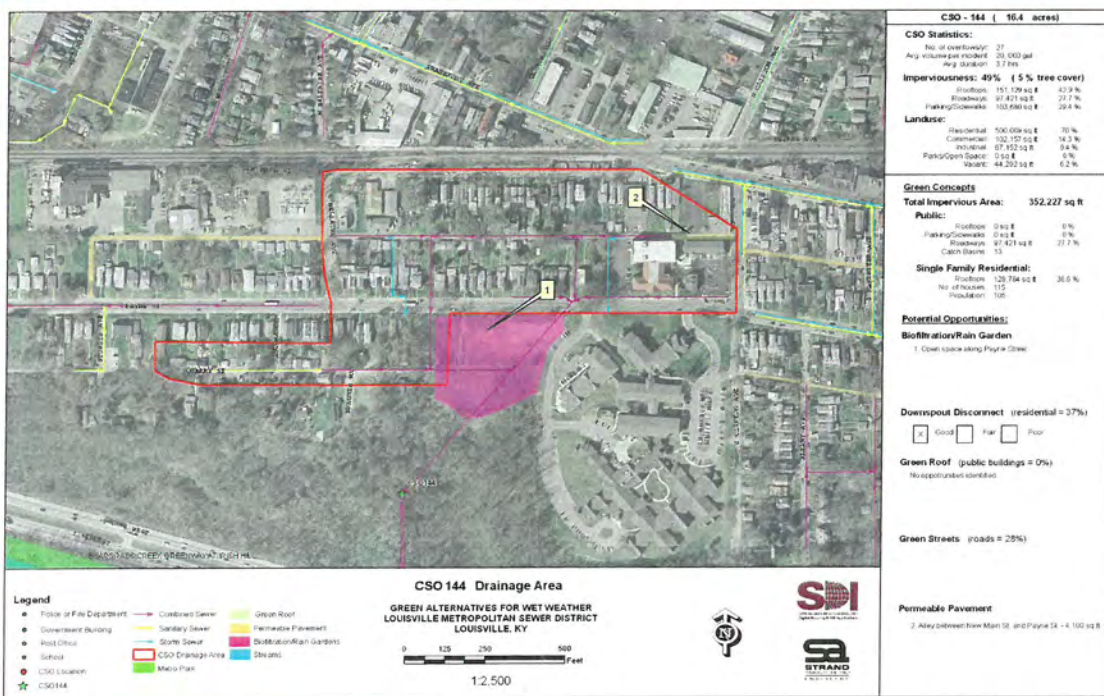
CSO#	Drainage Area	% Imp.	Land Use (% of area)				
			Res	Com	Ind	Park	Vacant
092	8	51	90	10	-	-	-
038	10	85	-	63	37	-	-
033	4	87	-	100	-	-	-
091	15	48	94	4	-	-	2
131	50	56	48	39	11	-	2
155	12	70	-	-	29	-	71
028	6	92	-	84	16	-	-
178	30	82	17	18	43	-	22
126	35	35	84	4	-	-	12
052	9	81	-	46	18	-	36
051	6	94	-	16	82	-	2

* Does not include CSOs 016 and 023 that provide interceptor relief

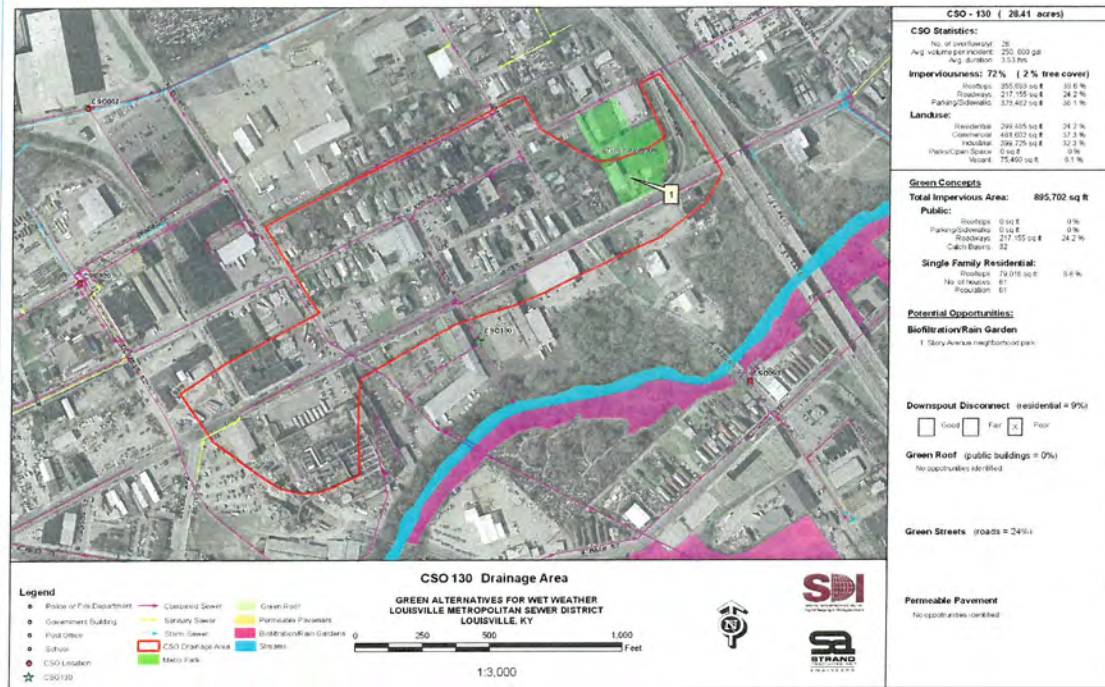
CSO 127



CSO 144



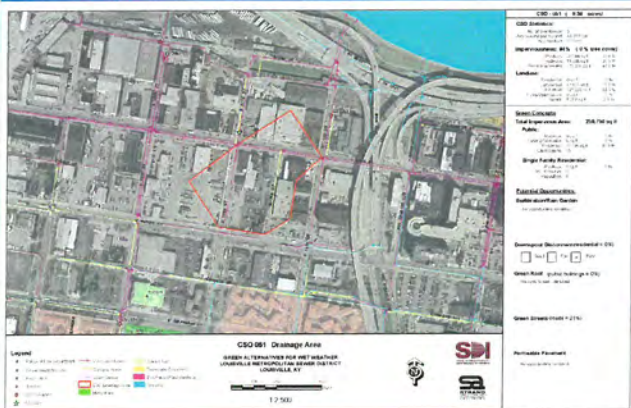
CSO 130



Small Sewersheds

CSO 051

6 Acres
 94% Impervious
 98% Commercial
 & Industrial
 Land Use

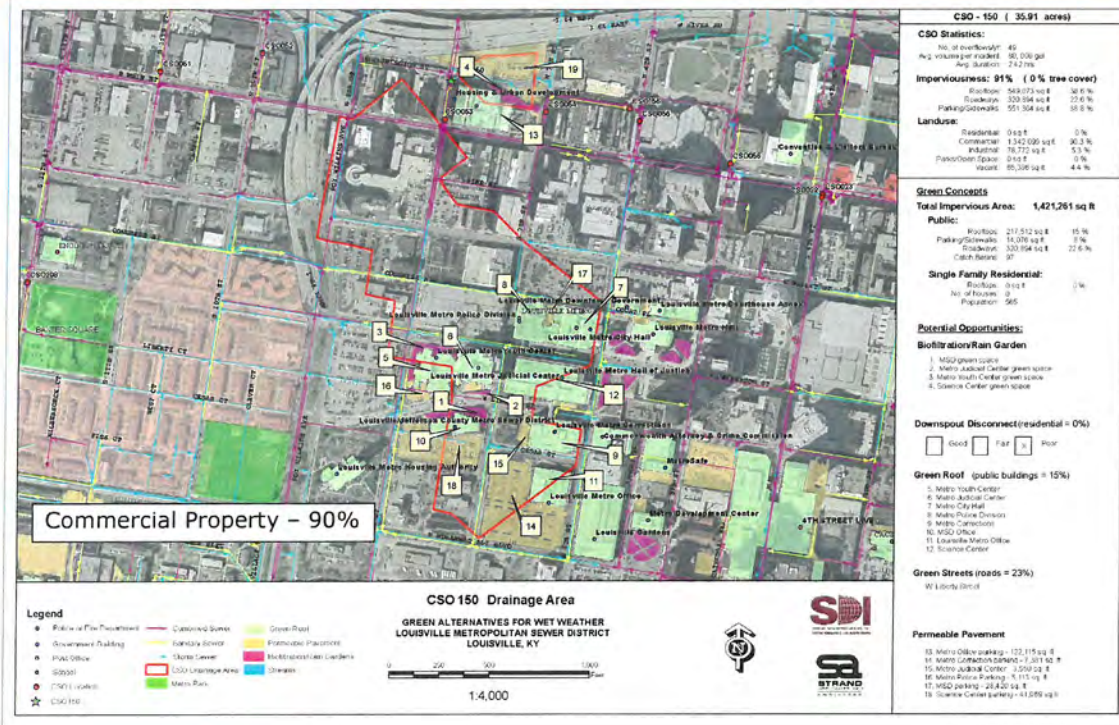


CSO 106

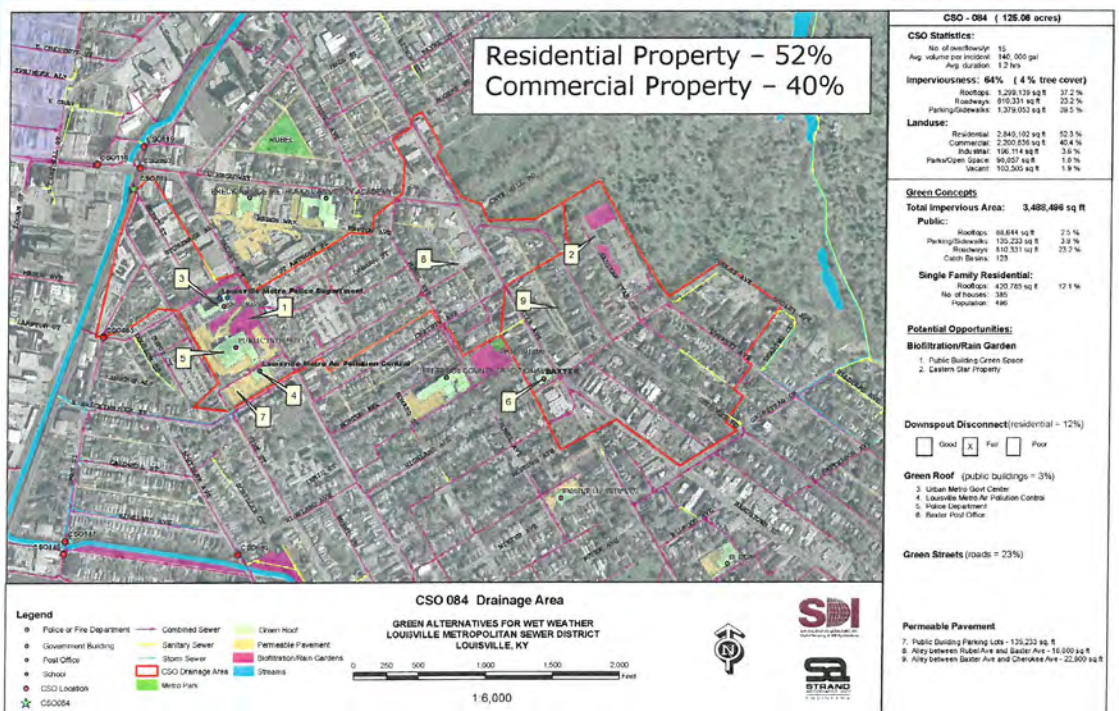
12 Acres
 31% Impervious
 96% Residential
 Land Use



Commercial Land Use



Mixed Land Use



Partnerships

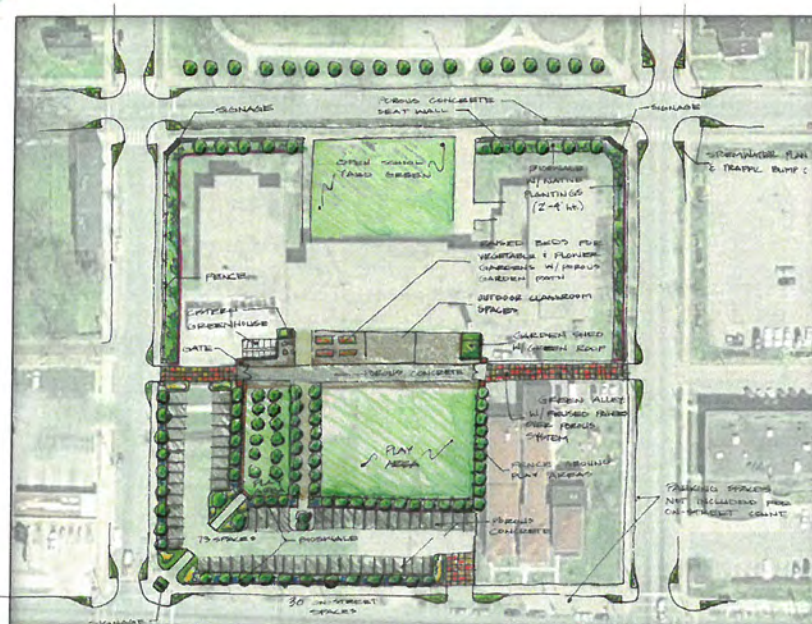
- Mayor
- JCPS (multiple meetings)
- Louisville Metro Housing Authority
- Public Works (multiple meetings)
- Economic Development
- Private Developers/Architects
- Metro Parks
- MSD Staff
- City of St. Mathews
- ACTIVE Louisville
- Partnership for a Green City
- Kentucky Association of Festivals
- Neighborhood Associations

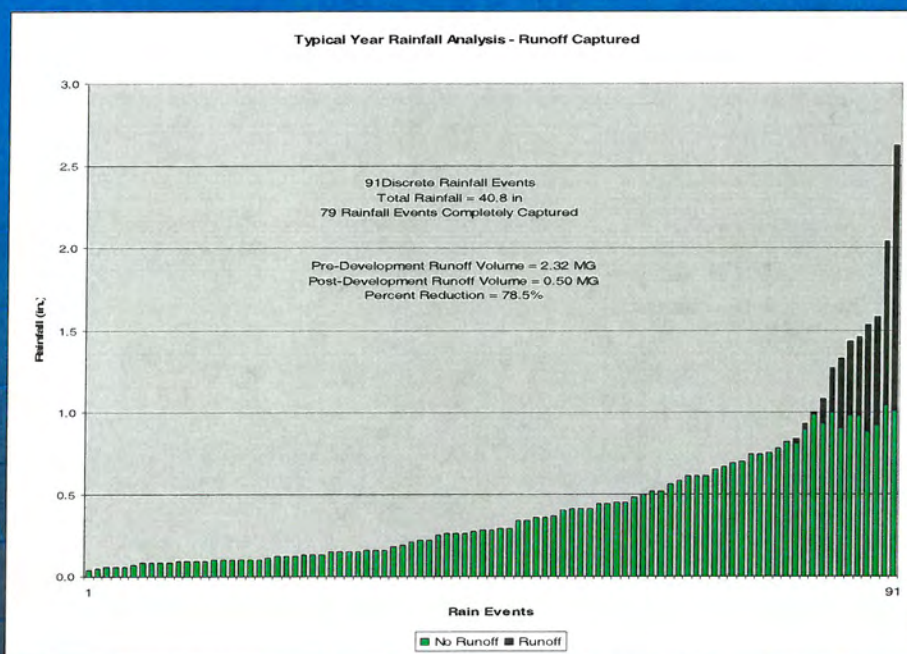
Mayor's Initiative

Activity	Participants
Rain Gardens	MSD, Youth Build, ACTIVE Louisville
Rain Barrels	MSD, Youth Build
Outdoor Classrooms	MSD, JCPS, Partnership for a Green City
Tree Planting	MSD, Parks/Olmstead, Living Lands and Waters
Riparian Buffers	Parks/Olmstead
Conservation Easements	MSD
Invasive Species Removal	MSD, Parks/Olmstead, Living Lands and Waters
Stream Clean-Up	MSD, Living Lands and Waters
Litter/ Beautification	MSD, Brightside
City Green Analysis	JCPS
Downspout Disconnect	MSD
Louisville Green	MSD
Plumbing Modification Program	MSD
Community of Trees	Louisville Metro Council, MSD, Metro Parks, Housing Authority, MDA, Brightside

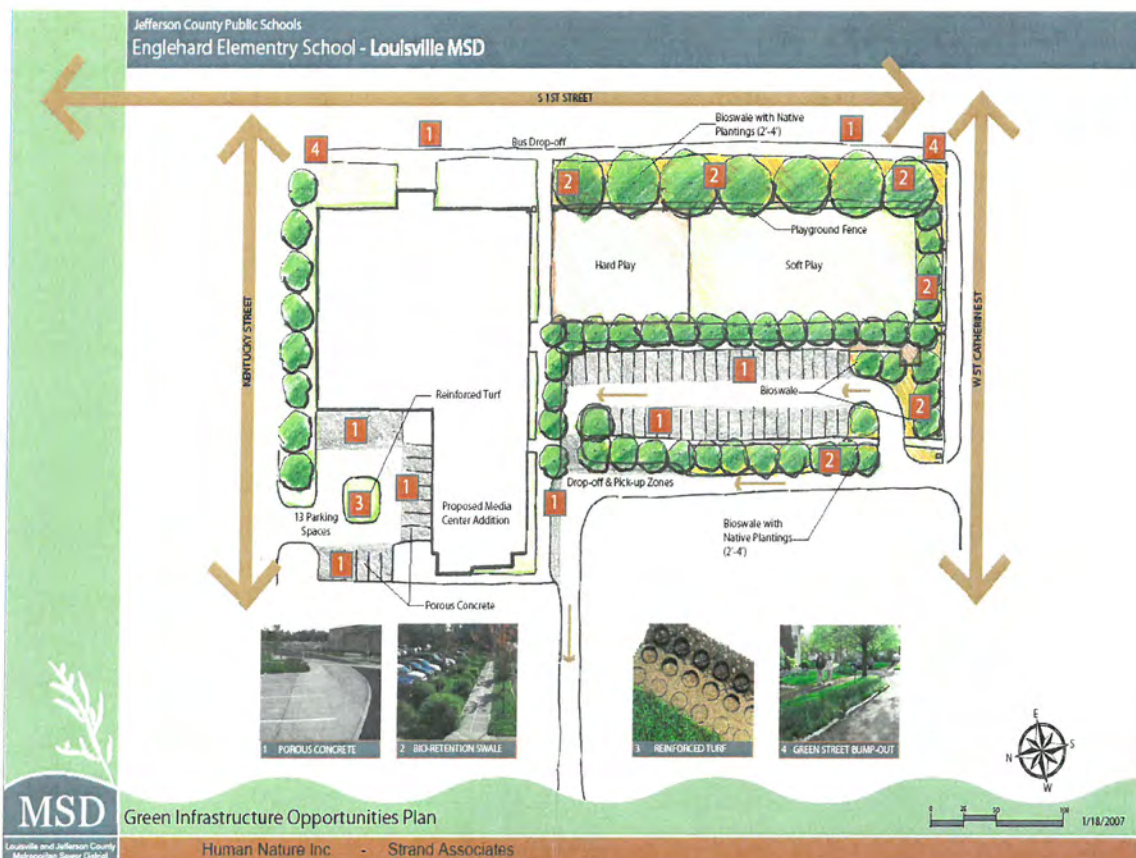
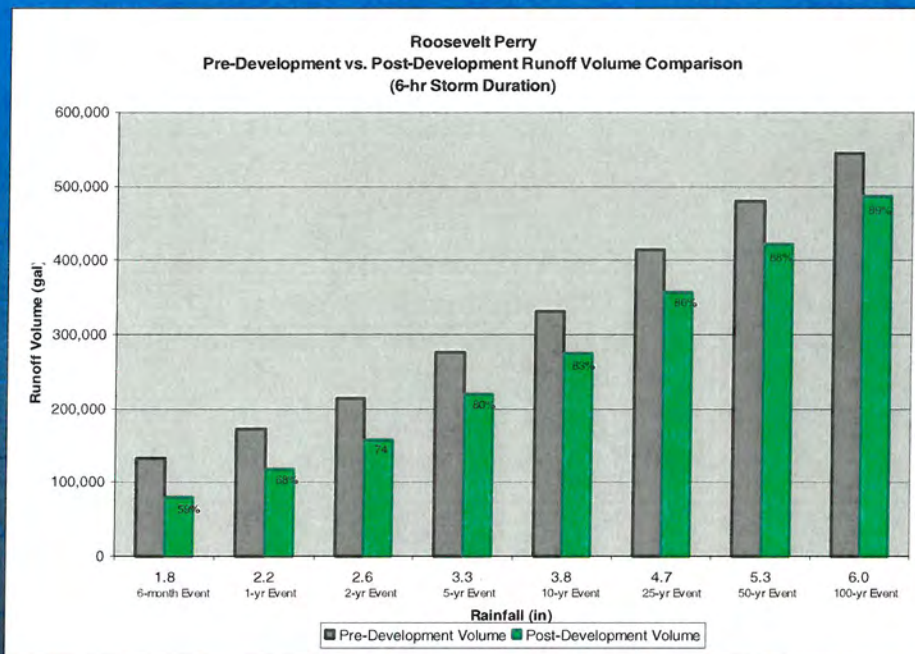
Regional Planning Initiatives
Kentucky Green and Healthy Schools
Mayor's Initiative
Partnership for a Green City
MSD Green
21st Century Parks
ACTIVE Louisville
Rubbertown Advisory Council

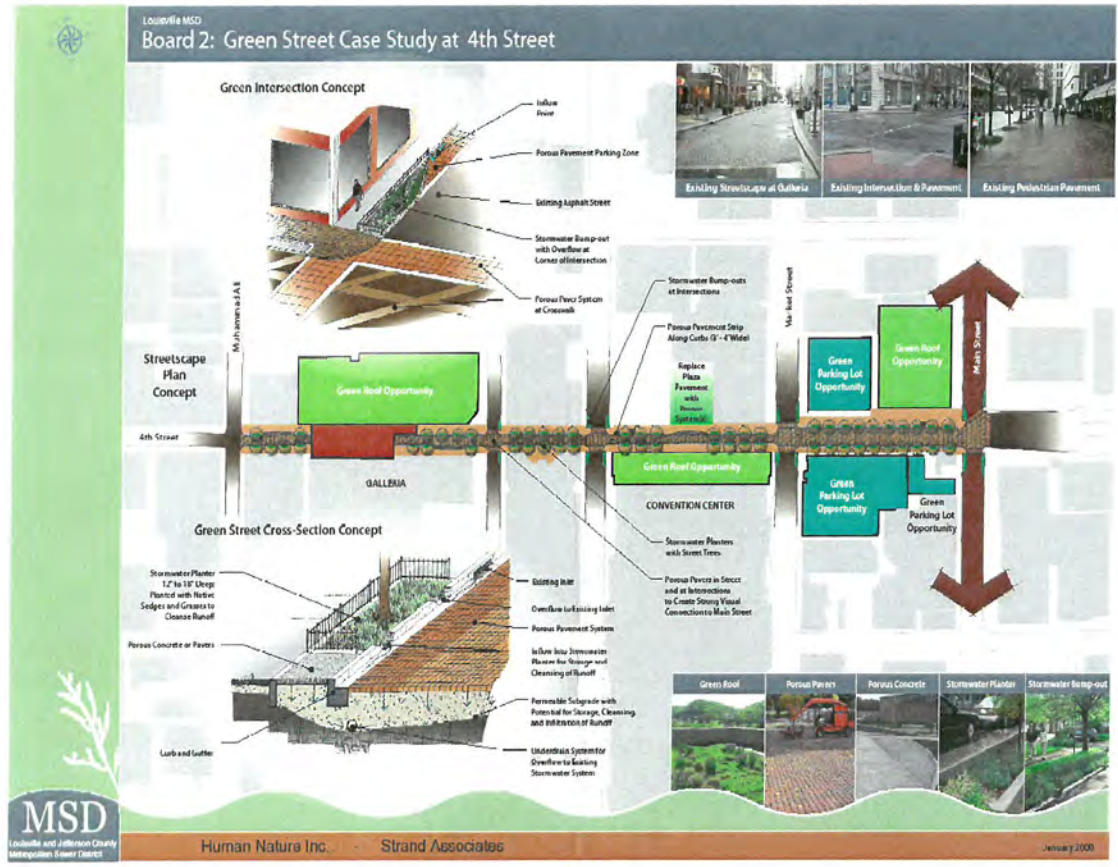
Roosevelt Perry School - Louisville MSD





Roosevelt Perry Elementary





Upcoming Tasks

- Natural Systems Mapping
- Rain Barrel Program
- Regional Green Opportunities
- Vision Stage

Combined Sewer Overflow Long Term Control Plan Control Strategy Discussion

Wet Weather Team
Stakeholder Group Meeting No. 16
February 26, 2008



Presentation Outline

- High - Level Strategies for Control of CSOs
 - Green Control Options
 - Gray Control Options
 - Green / Gray Evaluation
- Preliminary Results of Benefit - Cost Analysis
 - CSO 130 - Separation vs. Storage
 - CSO 127 - Hybrid gray - Green Solution; Storage with Bioretention
- Emerging High Level CSO Control Strategies for MSD Wet Weather Program
 - Understanding & Background



High - Level Strategies for Control of CSOs



3

High - Level Strategies for Control of CSOs Green Control Options

- Green Roofs
- Rain Gardens
- Rain Barrels
- Porous Pavement
- Bioretention



4

Green Roofs

- Green roofs are vegetated roofing systems that can be used on commercial, industrial, and residential buildings of all sizes
- The utilization of green roofs is effective in locations otherwise restricted due to the lack of available space



Visitor Center Roof - Bernheim Forest



Brown-Forman Building



5

Rain Gardens

- Rain gardens are features designed to capture and treat local stormwater runoff prior to entering a CSS
- Rain Gardens:
 - Reduces the amount of storm water runoff
 - Help keep water clean by filtering storm water runoff before it reaches local streams
 - Alleviate flooding and drainage problems



6

Rain Barrels

■ Rain Barrels:

- Reduce the amount of storm water reaching the combined sewer system
- Collect and store rain water runoff from your roof for later use
- Reduce overflow into neighboring creeks



MSD Rain Barrel Painting Party



Available from MSD



7

Porous Pavement

- Porous pavement helps reduce stormwater impacts by providing detention storage of surface runoff and allowing infiltration into underlying soil
- Porous pavement includes various types of porous surfaces, including:
 - Pervious Asphalt
 - Pervious Concrete
 - Permeable or Grass Pavers



Kentuckiana Girl Scouts, Louisville, KY



Kentuckiana Girl Scouts, Louisville, KY



8

Bioretention

- Bioretention uses the chemical, biological, and physical properties of plants, microbes and soils for removal of pollutants from storm water runoff



High - Level Strategies for Control of CSOs

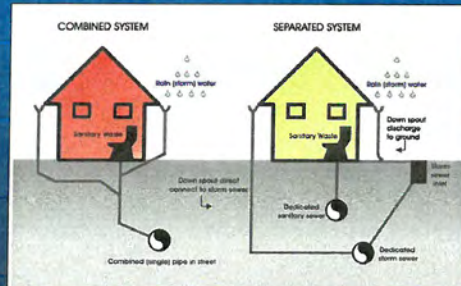
Gray Control Options

- Sewer Separation
- Offline Storage
 - Open Basins
 - Closed Basins
- Treatment
 - Physical - Chemical Treatment
- Integration of Options

Sewer Separation

- Sewer separation is the conversion of a combined sewer system (CSS) into separate sanitary and storm water systems
- Sewer system separations can consist of the following:

- Complete separation
- Partial separation
- Rain leader (Gutter and Downspouts) disconnection



Sewer Separation

- Conceptual Designs for CSO Projects:
 - CSO 086 (Middle Fork Beargrass Creek)
 - New storm water system would allow the closure of this CSO
 - CSO 091 (South Fork Beargrass Creek)
 - New storm water system removes discharge of approximately 0.07 MG combined sewage
 - CSO 202 (Ohio River - Central Relief Drain)
 - New storm water system typical of affecting 26 projects within the geographical region

Off-Line Storage

- Open basins are retention basins, constructed of earth or concrete, that are placed strategically within the combined sewer service area to retain overflow



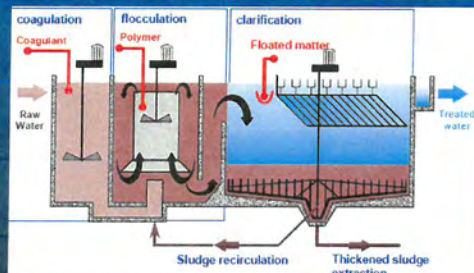
- Closed basins / tanks function as open basins, but would likely require pumping facilities for conveyance to the combined sewer service area for eventual treatment at a wastewater treatment plant



13

Physical - Chemical Treatment

- Physical - Chemical Treatment technologies are remote, independent facilities intended to reduce the pollutant load in the CSO receiving waters
- Physical - Chemical Treatment can consist of the following:
 - Primary Clarification
 - Screening
 - Vortex Separators
 - Ballasted Flocculation
 - Chemical Flocculation
 - Deep Bed Filtration
 - Disinfection



14

High - Level Strategies for Control of CSOs

Green/Gray Evaluation Process

- Green Solutions Program
 - Public/Public Partnership Element
 - Public/Private Partnerships Element
 - Goal to be determined and applied to all projects
- Integration of Green/Gray CSO LTCP Projects



15

Green/Gray Evaluation Process

- For each CSO, determine technology and prepare conceptual design(s)
 - Each CSO to have gray solution(s) sized and selected. Multiple technologies, multiple targets.
 - Each CSO to be assessed for site specific green solution(s), MSD owned and operated.
 - Each CSO to have a green solutions program target.
- For CSOs with viable green solution(s), gray alternative(s) will be "right-sized".



16

Green/Gray Evaluation Process

- Internal workshop to review projects and amend project list
- Each project and to be evaluated using benefit/cost tool

Preliminary Results of Benefit - Cost Analysis Tool

Preliminary Results of Benefit - Cost Analysis

- CSO 130
 - Storage
 - Separation
- CSO 127
 - Storage
 - Storage with Bioretention

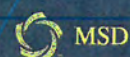
***** Refer to handouts *****

[<LINK>](#)



19

Emerging High - Level CSO Control Strategies for MSD Wet Weather Program



20

Emerging High - Level CSO Control Strategies Understanding and Background

- Compliance with Clean Water Act
- MSD to build around existing infrastructure
 - Large diameter pipes
 - Morris Forman Wastewater Treatment Plant
 - Existing projects:
 - Wheeler Basin
 - Sneads Branch Inflatable Dam
 - RTC Phases I & II
 - "Big Four" projects



Emerging High - Level CSO Control Strategies Understanding and Background

- Initial project target to be 4 overflows per year
- Additional project targets being evaluated for less than 4 overflows per year
- Green solutions to be an integral part of the program

Emerging High - Level CSO Control Strategies for MSD Wet Weather Program

Understanding and Background

- Successful integration of green infrastructure into the CSO LTCP will consist of:
 - Measurement and documentation of initial project success
 - Partnerships: Public/Public and Public/Private
 - Education
 - Community support: Own, Maintain, Operate
 - Possible incentives or cost share for new development



23

Emerging High - Level CSO Control Strategies

Understanding and Background

- Complementary balance of applied technologies within project list:
 - Green Technologies
 - Storage
 - Separation
 - Conveyance
 - Treatment
- Utilize the benefit / cost tool for comparison and selection of projects and program elements which make up the CSO LTCP

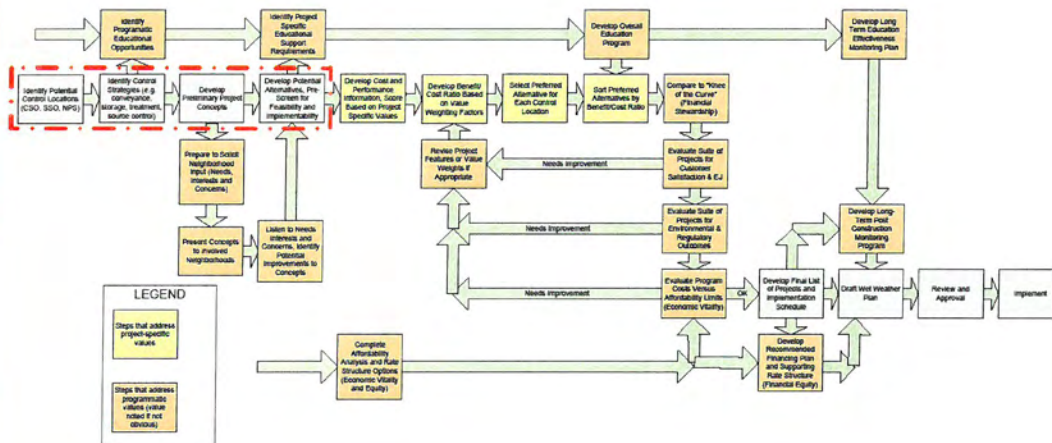


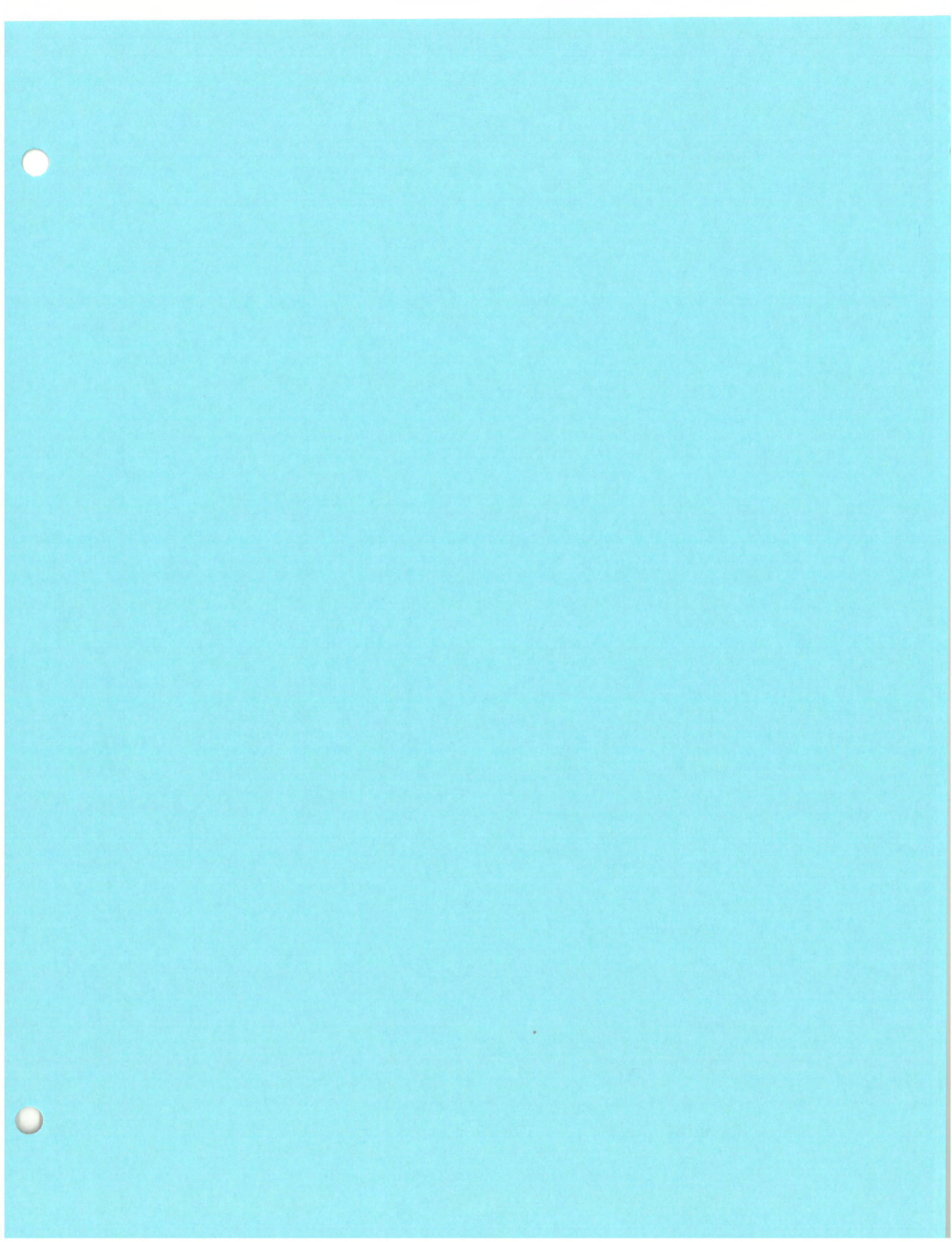
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Discussion Summary Wrap-up

Wet Weather Plan – Decision Flow Chart

Draft 6/13/2007







MSD

Project WIN Funding Plan

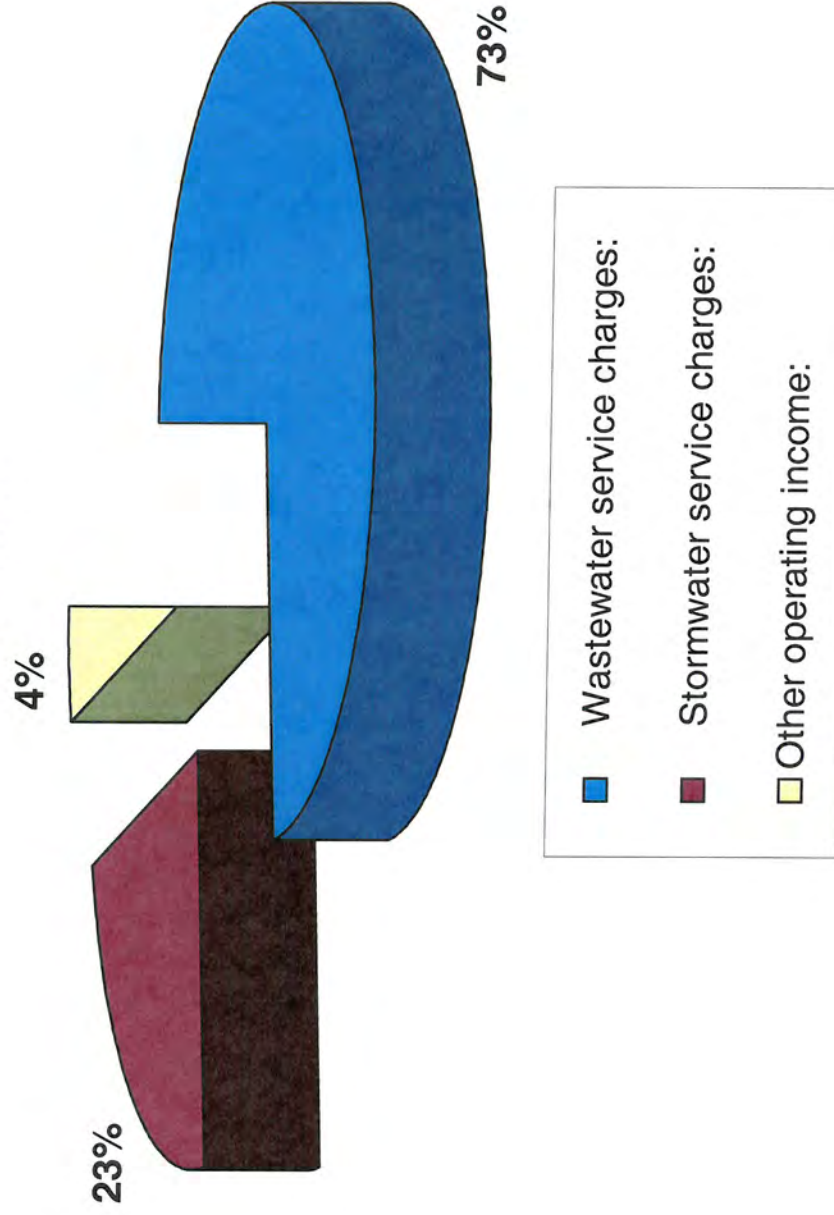
User Fees and Incentives
Wet Weather Team Meeting
February 26, 2008

Sources of FY 2007 Revenues

- Wastewater Charges - \$96.6 million
- Stormwater Charges - \$29.9 million
- Miscellaneous Income (connection fees, capacity charges, etc.) - \$6.0 million

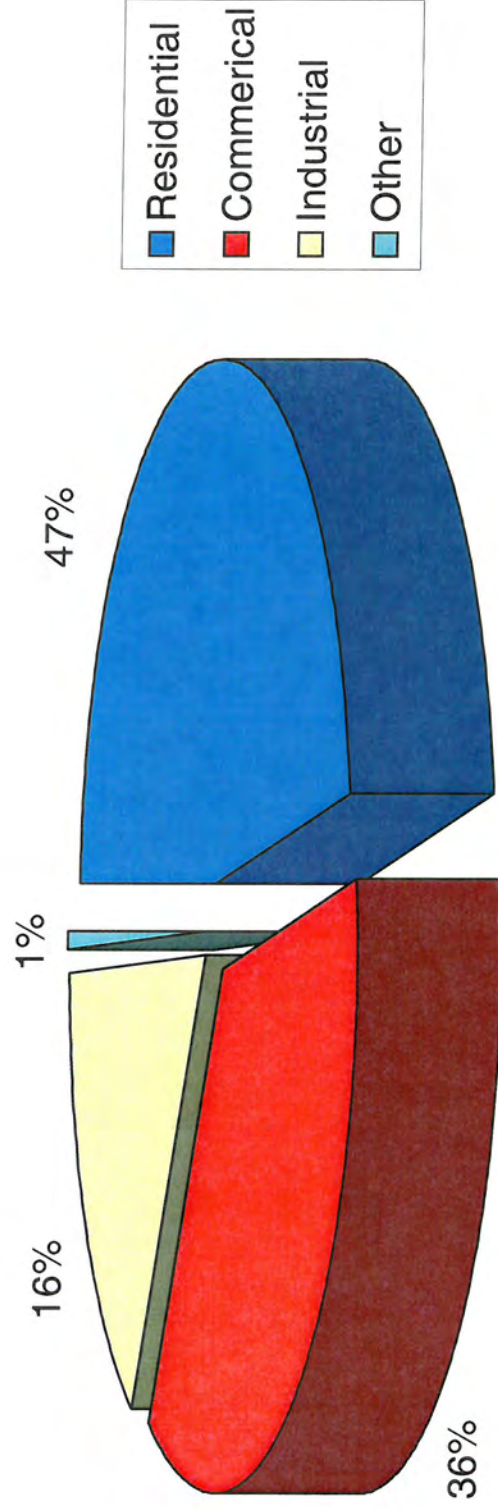
Total FY 2007 Revenues = \$132.4 million

Metropolitan Sewer District Fiscal Year 2007 Revenues



Note – MSD is self-supporting through service charges and other user fees. MSD does not receive financial support from Metro Government or the State.

Overall Service Charge Revenues FY 2007



Wastewater Revenues

Totaled \$ 96.6 million in FY 2007

Consisted of:

- WW Service Charges (\$23.9 million)
- Volume Charges (\$61.4 million)
- Quality Charges (\$11.3 million)



MSD

Wastewater Service & Volume Charges

- WW service charges are fixed charges based on water service meter sizes
- Regular volume rate – applicable to water usage.
- Optional volume rates – available to customers whose average water usage or sewer discharge exceeds 1,000,000 gallons per month
- Sewer only volume rates – applicable to metered sewer discharges.

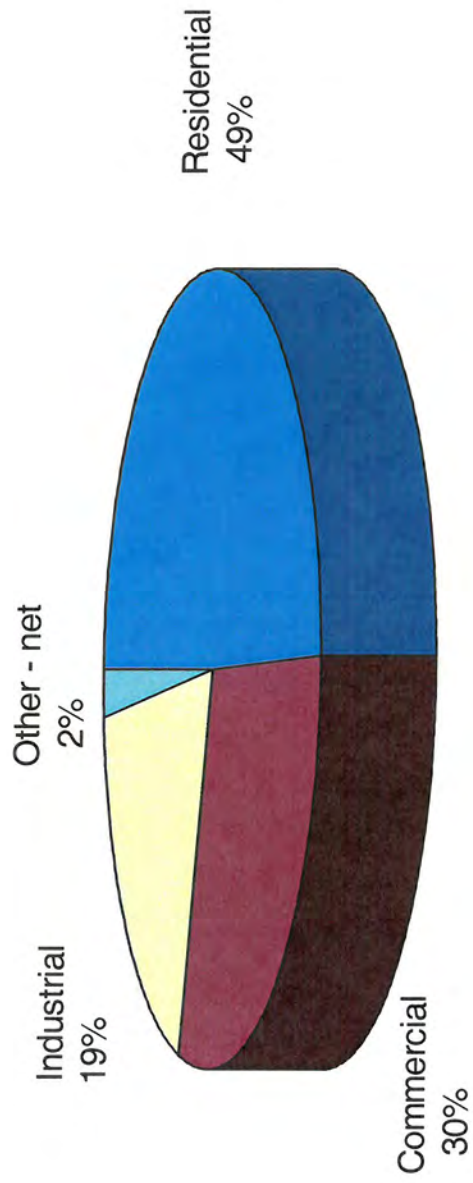
Quality Charges

Applicable to wastewater strengths in excess of 250 mg/liter of biochemical oxygen demand (BOD) or 270 mg/liter of suspended solids (SS).

Paid by commercial and industrial customers.



Wastewater Revenues FY 2007

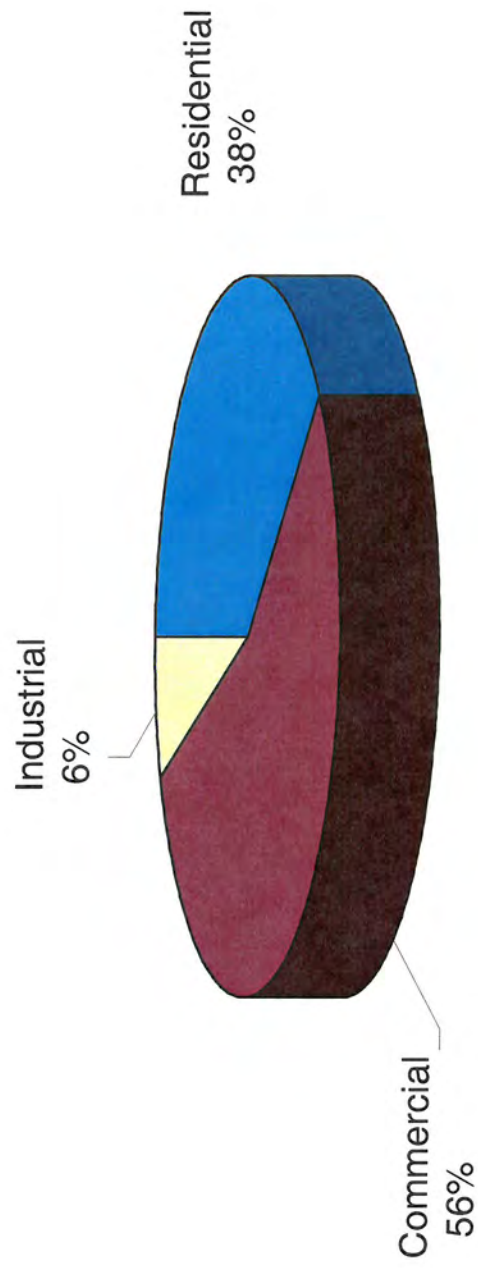




Stormwater Charges

Current rate is \$5.02 per month for residential customers and \$5.02 per 2,500 square feet of impervious surface area for commercial and industrial customers

Stormwater Service Charges FY 2007



Other Revenues

- Capacity Charges – fee paid by developers of property to help defray the future cost of providing Master Plan sewerage facilities
- Connection Fees – fee paid to connect to MSD sewers
- During the past 10 years, these fees have comprised 72% of other operating income

Implementation of New Incentives

- The use of incentives will not provide immediate reductions in expenses but should be viewed as long-term initiatives.
- Revenues lost from incentives granted to one customer class must be recovered from the remaining ones.

Current Incentives/Discounts

- Optional rate structure provides a discount for usage above 1,000,000 gallons per month
- Credit of up to 82% off stormwater billings for detention/retention basins
- Reduced quality charges for “cleaner” wastewater streams
- Senior Citizens Discount Program – 30% off consent decree and wastewater billing

Potential Incentives / Discounts

- Drainage credit for use of pervious pavement
- Drainage credit for customers that use rain barrels or rain gardens
- Splitting of drainage fee into qualitative (cleanliness) and quantitative (volume) categories could result in reduced charges for some customers



Potential Incentives / Discounts (cont'd)

- Temporary incentive for customers who disconnect downspouts from the sewer system (i.e., provide a discount off drainage or sewer bill)
- Expansion of discount program to include disabled individuals
- Create bill payment assistance program similar to L.G.&E.'s Winterhelp program.

Discussion Questions

- What incentives do you believe MSD should offer?
- Are there incentives currently offered by MSD that you feel should be modified?
- What, if any, additional information would be helpful for future discussions regarding incentives?
- What additional information would be useful regarding MSD's revenue sources?
- Do you have any other questions or comments?

