Evaluation of Alternative Approaches (current input is from Mark Shriberg and Gary Fujita)

Alternatives for CSO Control:

ALTERNATIVE 1 – SEWER SEPARATION TO CONTROL CSOs

Description of Alternative:

Eliminate Combined Sewer Overflows by constructing separate sewers to transport sanitary sewage and stormwater runoff. This is typically done by constructing a new storm sewer and then using the old combined sewer as a "sanitary sewer" after catch basins and other storm water connections are removed and connected into the new storm sewer.

Cost/Feasibility Considerations:

- Extensive disruption to travel and access as roads are torn up for sewer construction;
- Difficult to totally eliminate wet weather inputs to the converted combined sewer (especially if household perimeter footing drains are still connected to house leads);
- Excess wet weather inputs in the converted combined sewer may lead to SSOs or other wet weather flow management facilities (storage basins);
- Cost will be excessive in large metropolitan areas;
- New storm sewers subject to EPA storm water permit requirements

Advantages/Disadvantages:

- Totally eliminates Combined Sewer Overflows;
- Storm water discharges may still adversely affect the receiving water;
- May be possible to construct the project in segments;
- Long time periods may be needed to complete the project due to the need to keep roadways open for transit and access.

ALTERNATIVE 2- "PRESUMPTIVE APPROACH" TO CSO CONTROL

Description of Alternative:

In accordance with EPA's National CSO Policy, develop and implement a program to achieve 85% reduction in the pollutant load or CSO volume, or reduce the frequency of overflows to an average of 4 events per year.

Cost/feasibility Considerations:

- Allows the permittee to configure the sewage transport and treatment system to provide the specified level of control either through maximum use of existing facilities or construction of new transport, storage or treatment facilities;
- Long Term CSO Program need not assess site specific conditions and receiving water impacts attributable to current CSO discharges;
- Sizing of proposed facilities may require extensive evaluation of current system capabilities to predict volumes, overflow frequencies and pollutant loadings.

Advantages/Disadvantages:

- Does not totally eliminate all CSOs;
- Shorter implementation schedules may be viable, especially if the Program relies on maximizing the utilization of existing facilities;
- Post-construction evaluation of in-stream water quality during and after wet weather events may be needed to determine if remaining CSOs are problematic;
- Presumptive approach may not adequately protect sensitive areas or recreational areas in the vicinity of CSOs which continue to discharge infrequently.

ALTERNATIVE 3 – "DEMONSTRATION APPROACH" TO CSO CONTROL

Description of Alternative:

In accordance with EPA's National CSO Policy, develop and implement a program to achieve an appropriate level of CSO control based on a site specific assessment of current and future conditions in order to identify facilities which will satisfy the requirements of the Clean Water Act.

Cost/Feasibility Considerations:

- Time needed to prepare the Long Term CSO Control Program may be lengthy due to need to collect in-stream and effluent data to support a site specific analysis;
- Detailed modeling of the hydraulic and hydrologic conditions likely to be needed;
- Construction costs may be reduced by tailoring proposed facilities to exactly what is needed in lieu of a "one size fits all" approach.

Advantages/Disadvantages:

- Ensures that proposed facilities are developed to meet local conditions;
- Relies on monitoring and modeling to define recommended control projects;
- Assumes that the additional time and effort to prepare a site specific analysis of CSO issues is warranted (in lieu of implementing the "Presumptive Approach").

CSO The goal for CSOs should be adopting the EPA CSO Policies by 2008 and "virtual elimination" by 2020, parallel to the toxins "virtual elimination" goal. The approach for how to do this is three-fold:

1) Increase federal and state funding: The old, crumbling infrastructure around the Great Lakes is in dire need of improvement to prevent CSOs. These improvements often involve both better maintenance and operation and also major capital investments. Federal funding for the SRF should be restored to 2002 levels and then gradually increased to meet the 2010 deadline, and state matching needs to be increased, ideally be establishing state-based trust funds.

2) Soft-Path Solutions: As a complementary strategy to infrastructure improvements, the most efficient way to stop sewage overflows is to stop water from flooding treatment systems when it rains. Infiltration/Inflow (I/I) is the single largest cause of overflows, yet there are cost-effective way to stop it. "Soft-path" or "Low-Impact Development" (LID) and other non-infrastructure ways to reduce CSOs/SSOs/Bypasses have received scant attention and funding, in part because of the way federal funding is structured. Soft-path approaches include onsite wastewater treatment technologies, stormwater retention and filtration (such as rain gardens, constructed wetlands and native species plantings), stream buffers, water conservation fixtures, rain barrels, reuse of "greywater", other low impact development designs. The goal is to "retain, detain, filter, treat, use, and reduce stormwater." Incentives, strategies, examples and tools for controlling CSOs without costly infrastructure improvements are needed. Efficiency in controlling overflows decreases the farther "downstream" in a wastewater system that the control occurs (i.e., controlling at the lot-level is more efficient than in the conveyance system which is more efficient than control at the plant). On-site, soft-path controls have the additional benefit of reducing stormwater runoff that often flows directly into waterways.

3) NPDES permits: EPA and state environmental agencies need to ratchet down on NPDES permits as they come up for review.

Alternatives for SSO Control:

ALTERNATIVE 1 – ELIMINATE EXCESS I/I TO STAY WITHIN SEWER CAPACITY

Description of Alternative:

Remove wet weather infiltration and inflow from sanitary sewers to ensure that peak flow rates do not exceed the transport capacity of the system.

Cost/Feasibility Considerations:

- It may be difficult to locate sources of I/I in a sewer system;
- Rehabilitation projects have typically had limited effectiveness as I/I often still finds its way into a sewer even after defective joints, manholes and pipes are repaired or replaced;
- Elimination of I/I may not be feasible without internal household plumbing alterations if homes have perimeter footing drains connected to the house lead;
- I/I may originate from the homeowner's house lead rather than in the utility's sewers;

Advantages/Disadvantages:

- I/I removal programs may reduce the threat of basement back up by eliminating wet weather flows;
- Wastewater treatment facilities are not used to process extraneous wet weather flows;
- May free up capacity for new customers to the sewer system.

ALTERNATIVE 2 – PROVIDE FACILITIES TO TRANSPORT AND TREAT ALL FLOWS

Description of Alternative:

Construct relief sewers, pump stations and treatment facilities to ensure that all wet weather flows receive full secondary treatment as set forth in the Clean Water Act.

Cost/Feasibility Considerations:

- Relief sewers may help relieve basement back up problems where such situations occur because of capacity constraints in the sewer system;
- Underground sewer lines may be simpler to install within existing rights of way and allow for shorter construction time periods;
- Existing service agreements or sewer service contracts may limit the maximum amount of flow which can be conveyed.

Advantages/Disadvantages:

- Large portions of the treatment plant capacity may be devoted to extraneous I/I in lieu of being used to treat sewage;
- It may be difficult to size the relief sewers to convey all flow (i.e. sewer may be designed for a 10 year or 25 year event);

ALTERNATIVE 3 – PROVIDE FACILITIES TO STORE EXCESS WET WEATHER FLOW

Description of Alternative:

Construct storage facilities to retain excess flows during wet weather periods and then dewater the stored flows to the wastewater plant for treatment after the end of the event.

Cost/Feasibility Considerations:

- Siting storage facilities in built up urbanized areas may be difficult and costly;
- Storage facilities will only be used on an infrequent basis, and this may make it difficult to justify a major expenditure;
- Sizing of the storage facility may be difficult especially if there is little data on wet weather peak flow rates in relation to historical rainfall events;
- The facility may not provide sufficient storage volume in the event of back to back storms
- Operation and maintenance costs may be considerable;
- Storage facilities will not necessarily relieve basement back up problems if these are attributable to inadequately sized sewer lines upstream of the storage basin.

Advantages/Disadvantages:

- Noise and odor complaints in areas adjacent to the storage facilities may be encountered;
- Excess wet weather I/I still being transported and treated;
- Treatment facilities may encounter widely variable flow rates between wet and dry days and may have difficulty sustaining their treatment effectiveness.

o. **bacterial and chemical from stormwater:** The best approach is a policy that requires 100% infiltration (or, "no net increase") of stormwater for new development to the maximum feasible