APPENDIX A

GLOSSARY

GLOSSARY

acute toxicity — Severe (usually fatal) toxic effects that occur rapidly to affected organisms due to chemical exposure. Acute toxicity is usually measured using a short duration test (four days or less).

aesthetics — Regulatory water quality criteria relating to the absence of objectionable floatable material which may cause unpleasant visual effects, scum, and/or turbidity; produce objectional odors, color or taste; the growth of nuisance species of aquatic life; and/or the formation of objectionable deposits.

annual simulation — Simulation (using a computer model) of the wastewater collection system response to a typical year's rainfall.

aquatic life — The animals and plants that live in the water or the bottom sediment. Massachusetts state regulations require that all waterbodies maintain a native, naturally diverse aquatic life community.

assimilation — In waterbodies, the process that removes pollutants and/or their impacts.

bacteria standards — Regulatory water quality criteria based on the risk to human health from disease-causing microorganisms, assessed using easy-to-measure sewerage indicator bacteria, usually, fecal coliform. High counts of coliform indicate the likely presence of human, animal, or bird waste that could contain human pathogens. Massachusetts has bacteria standards for shellfishing, primary contact recreation and secondary contact recreation.

baffles — Vanes, guides, grids, grating or similar devices placed in a pipe or channel to deflect or regulate flow.

biochemical oxygen demand (BOD) — The amount of oxygen-consuming organic material in wastewater and an operational measure of potential for depletion of dissolved oxygen by the biological and chemical degradation of organic material by bacteria.

BMP — Best management practices.

boundary conditions — The water quality conditions at the edge of a study area, for example, upstream of a receiving water.

BPT	Best practicable control technology.
BWSC	Boston Water and Sewer Commission.
CAC	Citizens Advisory Committee.
catch basin	A chamber or well, usually at the street curbline, for the admission of surface water to a sewer or subdrain, having at its base a sediment sump to retain grit and detritus below the point of overflow; whereas, a stormwater drain inlet does not have a sump and does not trap sediment.
catchment	The area producing the runoff passing a particular channel or stream location.
chemical oxygen demand (COD)	A monitoring test that measures all the oxidizable matter found in a wastewater/stormwater sample, a portion of which could deplete dissolved oxygen in receiving waters.
chemically enhanced primary treatment (CEPT)	The addition of chemicals (e.g., ferric chloride) during the primary treatment process to alter the physical state of dissolved and suspended solids to facilitate removal.
chronic toxicity	Toxic effects that occur slowly and last for a long time and/or are due to continuous exposure.
class B	Waters designated as a habitat for fish, other aquatic life, and wildlife, and for primary and secondary contact recreation. Where designated they shall be suitable as a source of public water supply with appropriate treatment; suitable for irrigation and other agricultural uses; and for compatible industrial cooling and process uses.
class SB	These waters are designated as a habitat for fish, other aquatic life, and wildlife, and for primary and secondary contact recreation. In approved areas they shall be suitable for shellfish harvesting with depuration (Restricted Shellfish Areas). These waters shall have consistently good aesthetic value.
conduit	Any channel intended for the conveyance of water, whether open or closed.
combined sewer	A sewer intended to transport surface runoff, sanitary sewerage and industrial wastes.

CSO (combined sewer overflow)	Flow from a combined sewer, in excess of the sewer capacity, that is discharged into a receiving water.
CSO frequency	The number of rainfall events during which a CSO outfall or group of CSO outfalls activates within a typical annual period, usually determined from an annual simulation.
CSO outfall relocation	Physically relocating a CSO outfall from a water body with critical uses (such as swimming or shellfishing) to a water body without critical uses.
CSO volume	The volume discharged through a CSO outfall during a storm event or over a typical year, usually determined through hydraulic modeling.
CSO related bypass	Pre-authorized exceedance of weekly or monthly secondary treatment standards for BOD or TSS given to permittees with combined systems during certain wet weather events.
dechlorination	The addition of a chemical, such as, sulfur dioxide or sodium metabisulfate, that neutralizes the toxicity of residual chlorine in disinfected wastewater before it is discharged.
deep tunnel storage	Temporarily storing flow in tunnels that are typically 300-400 feet deep and within bedrock.
DEM	Massachusetts Department of Environmental Management.
DEP	Massachusetts Department of Environmental Protection.
design storm	A historical storm of a specific occurrence frequency, whose duration is chosen based on system size and the response time used to assess system performance.
disinfection	The killing or inactivation of human disease causing microorganisms or pathogens, most commonly through contact with chlorine.
dissolved oxygen	Oxygen dissolved in water, which is necessary for most aquatic animals. Oxygen levels are affected by photosynthesis, flushing, temperature, BOD, and other factors.
dry-weather flow	Usually refers to the flow in a combined sewer system without stormwater. In a separate stormwater system, dry weather flow generally indicates illegal sewer connections and/or infiltration.

effluent limits	Enforceable standards for wastewater discharges, set by the Massachusetts DEP and/or US EPA. Limits can be water quality based, set so that discharge would not be predicted to cause or worsen violations of water quality standards, or technology based, set on the minimum performance a treatment facility should achieve.
EIR	Environmental Impact Report - state process to review environmental impacts of proposed projects in a public forum.
ENF	Environmental Notification Form - the first step in the EIR process.
EOEA	Executive Office of Environmental Affairs - the Massachusetts Cabinet Office overseeing all state environmental agencies.
equivalent primary treatment	Treatment of CSO flow which achieves the same pollutant removal rates as primary treatment.
fecal coliform bacteria	Minute living organisms associated with human or animal feces that are used as an indirect indicator of the presence of other disease causing bacteria.
floatables	Floating material usually characteristic of sanitary wastewater and storm runoff.
future planned conditions	System conditions characterized by including: four batteries of primary treatment at Deer Island; total pumping capacity of 1,270 mgd at Deer Island; full implementation of SOPs; full implementation of currently defined I/I reduction programs; and full implementation of approved collection system facilities plans.
headworks	The first stage of treatment in a POTW process, typically providing screening and grit removal.
hydraulic grade line	The profile along a sewer or drainage system that represents the elevation free water surface (non-surcharge conditions) or the water pressure in the pipe (surcharge conditions).
hydraulic modeling	Computer simulation of the flows within and performance of a wastewater collection system, including stormwater, I/I, sanitary flow and combined sewage.

infiltration	Water that enters a sewer system and service connections underground through such means as, but not limited to, defective pipes, pipe joints, connections, or manhole walls. Infiltration, which is usually related to groundwater conditions, does not include, and is distinguished from, inflow.
inflow	Water other than sanitary flow that enters a sewer system (including sewer service connections) from sources which include but are not limited to roof leaders, cellar drains, sump pumps, yard drains, area drains, drains from springs and swampy areas, manhole covers, catch basins, cooling towers. Inflow, which is usually storm-related, does not include, and is distinguished from, infiltration.
in-line storage	Storage of flow within the existing sewer system.
interceptor	A sewer that intercepts and transports flows from tributary collection systems to treatment facilities.
interceptor relief	Enlarging an existing interceptor or providing a separate relief interceptor to carry more flow to treatment facilities.
less-than-primary-treatment	Typically involves only coarse screening to remove floatables and disinfection, and may include limited detention/settling of solids.
MDC	Metropolitan District Commission.
MEPA	Massachusetts Environmental Policy Act.
MGD	Millions of gallons per day.
mixing zone	An area of water contiguous to a point source, where exceptions to water quality objectives and conditions otherwise applicable to the receiving water, may be granted.
near surface storage	Temporarily storing flow in tanks or pipes that are typically less than 100 feet below grade.
nonpoint-source pollution	Any diffuse, unconfined, and nondiscrete conveyance which is not attributed to a particular pollutant discharge location.
NPDES	National Pollution Discharge Elimination System.

nutrients	Primarily, phosphorous and nitrogen, especially the dissolved inorganic forms, which cause excessive growth of algae or aquatic weeds if present in too high concentrations.
one-year storm	As used in this report, refers to a historical storm of 22 hour duration, peak hourly rainfall of 2.79 inches, and total rainfall depth of 2.79 inches. The storm was selected from historical storms of approximately 24 hour duration from long-term Logan Airport records as having a recurrence interval of one year. Recurrence interval is defined as the average interval between the occurrence of an event of specified characteristics and an equal or larger event.
open shellfishing	Monitoring indicates low levels of sewage indicator bacteria in the water overlying the shellfish bed; the shellfish are suitable for human consumption without depuration. For open shellfishing to be approved, both the shellfish and the overlying water must consistently have low counts of indicator bacteria.
organic contaminants	Toxic organic compounds (i.e. containing carbon) that can cause toxicity at low concentrations, including petroleum derived compounds and pesticides.
partial use designation	In accordance with the Massachusetts Water Quality Standards, the Department of Environmental Protection may designate a partial use subcategory for any water quality class where waters may be occasionally subject to short-term impairment of swimming or other recreational uses, but support these uses through most of their annual period of use; and the aquatic life community may suffer some adverse impact yet is still generally viable.
peak shaving	Controlling peak flow rates by providing temporary storage.
pollution concentrations	The amount of a pollutant in a small representative sample of flow or water body.
pollution load	The total accumulated mass of a pollutant discharged to a receiving water over a particular time period, such as, the duration of a particular storm.
POTW	Publically owned treatment works.
pretreatment	Reduction or elimination of pollutant properties in wastewater prior to discharging the wastewater into a sewer system.

primary contact recreation	Any recreation or other water use in which there is prolonged and intimate contact with the water with a significant risk of digestion. These include, but are not limited to, wading, swimming, diving, surfing and water skiing.
primary treatment	Consists of screening and sedimentation to remove floatable and settleable solids as well as disinfection.
prohibited shellfishing	Shellfish harvesting is illegal because of high bacteria counts in the overlying water or shellfish, proximity to a pollution source, such as, a sewage treatment plant or CSO outfall, or depletion due to over-harvesting.
receiving waters	Surface waterbodies into which materials (flow and pollutants) are discharged.
regulator	A structure that controls the amount of combined sewage entering an interceptor by storing flow in the upstream trunk line or by diverting some portion of the flow to an outfall.
relief sewer	A sewer built to carry the flows in excess of the capacity of an existing sewer.
restricted shellfishing	Shellfish harvested in these areas must be relayed to a clean site or a depuration plant to remove pathogens, and may be harvested only by specially licensed master diggers.
screening	Consists of vertical or inclined bars and/or mesh, generally of uniform size to retain the debris and floatables in the flow.
scum	Materials that float on the surface of wastewater or receiving waters; includes oil and floatables.
secondary contact recreation	Any recreation or other water use in which contact with the water is either incidental or accidental. These include, but are not limited to, fishing, boating and limited contact incidental to shoreline activities.
sewage	The waste matter carried by sewers.
sewerage	A system of sewers; sewer system.
sewer separation	Separating storm drainage and sanitary sewerage, usually by constructing new piping systems.

sewer surcharging	Occurs when the hydraulic grade line exceeds the crown elevation of the sewer, usually caused by flow capacity problems.
skimmer boats	Use an apparatus to remove floatable materials within a few inches of the water surface. The skimmer vessels can be equipped with moving screens on a conveyor belt system to separate floatables from water and/or a large net that is lowered into the water to collect the materials.
source control	A method of abating storm-generated or CSO pollution at the upstream, upland source where pollutants originate and/or accumulate.
stormwater controls	Controlling stormwater runoff entering a combined sewer system through either elimination, reduction or detention.
stormwater management	Techniques to decrease the volume of stormwater entering the combined system, as well as, improving the quality of stormwater discharges to receiving waters.
stormwater management model (SWMM)	Computer simulation model developed by Metcalf & Eddy for the U.S. EPA for use in hydraulic simulation of stormwater and combined sewer collection and transport systems.
SMP	System Master Plan.
swirl-vortex devices	Devices that provide flow regulation and solids separation by inducing a swirling motion (vortex) within the vessel. Solids are concentrated and removed through an underdrain, while clarified effluent passes over a weir at the top of the vessel.
TSS	Total suspended solids. High concentrations of suspended solids are of concern because; (a) toxic pollutants tend to adhere to fine particles, (b) they block light necessary for aquatic plant growth, (c) solids my affect the health or reproduction of aquatic animals, and (d) they can form unattractive plumes and slicks.
three-month storm	As used in this report, refers to a historical storm of 21 hour duration, peak hourly rainfall of 0.40 inches, and total rainfall depth of 1.84 inches. The storm was selected from historical storms of approximately 24 hour duration from long-term Logan Airport records as having a recurrence interval of three months. Recurrence interval is defined as the average interval between the occurrence of an event of specified characteristics and an equal or larger event.

total solids	The entire quantity of solids in the liquid flow or volume including the dissolved and particulate fractions.
toxicity	The degree to which a pollutant causes physiological harm to the health of an organism.
trace metals	Metals present in small concentrations. From a regulatory standpoint, this usually refers to metal concentrations that can cause toxicity at trace concentrations.
trashrack	Grill, grate or other device located at the intake of a channel, pipe, drain or spillway to prevent oversize debris from entering the structure.
trunk	A sewer, also known as a main sewer, that receives the discharge of one or more submain sewers.
typical year	Modified year 1992 rainfall to represent the average rainfall year from 40 years of historical rainfall data at Logan Airport.
WAC	Wastewater Advisory Committee of the MWRA
water quality criteria	A threshold value or concentration for a pollutant or pollutant effect as chosen by regulatory agencies to distinguish between acceptable and non-acceptable environmental conditions; usually chosen based on laboratory observations of organism response.
water quality standards	A threshold value or concentration enforced by law as a requirement to maintain acceptable environmental water-quality conditions; usually chosen based on laboratory observations of organism response.
wet-weather flow	Usually refers to the flow in a combined sewer system with stormwater, but may also constitute the flow in a separate storm drainage system or a separate sanitary drainage system with I/I.

APPENDIX B

MINUTES OF PUBLIC MEETINGS HELD ON THE DRAFT CSO CONCEPTUAL PLAN AND SYSTEM MASTER PLAN

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Master Planning and CSO Facilities Planning
CSO CONTROL PLAN PRESENTATION
Environmental Agencies and Organizations
September 19, 1994
Kendall Square, Cambridge

MINUTES

The meeting was opened by Mike Domenica, Program Manager for the MWRA's Sewerage Facilities Development Department. Mr. Domenica said the goal of the presentation was to present an overview of the MWRA's CSO program, reviewing how the program evolved and previewing some recommendations from the forthcoming report on CSO control alternatives.

Mr. Domenica used a series of overheads (in the attached handout) that illustrated his points in detail. He said that in 1988, when the Authority began its first CSO studies, 3.3 billion gallons of overflow entered the system each year. Recent CSO-related improvements have produced a significant decrease in this volume, to 1.5 billion gallons per year. Improvements in the Deer Island pumps, the completion of CSO treatment facilities and pumping station upgrades are some of the projects that helped lower the flows. Under future planned conditions - and without CSO improvements - 58 percent of the flow will be treated by 1997.

Mr. Domenica listed the elements of the CSO planning approach: to comply with state and federal CSO regulations and policies; to use a watershed approach, which included reaching back into all of the communities through a System Master Plan and looking at interceptors, infiltration and inflow, and treatment plant capacity; to focus on attaining specific water quality improvements; to tailor any improvement plans to the conditions in each basin; and to evaluate regional solutions.

Mr. Domenica turned to EPA's CSO Policy and the MWRA's planning. He noted that the new policy was developed with stakeholder input, a breakthrough in the regulatory process that resulted in a more workable set of regulations. He said the EPA's policy contains a long-term control plan approach and targets high-priority waters such as areas for swimming and shellfishing. The plan calls first for eliminating CSOs where possible and then for relocating overflows. The policy also looks at economic feasibility and affordability, calls for complying with state water quality standards and maximizing use of the treatment plant. The policy also mandates implementation of nine minimum controls to maximize system

performance by 1997.

Mr. Domenica commented that these changes bring a new era of control, focusing on wet weather controls and impacts on the whole watershed. These considerations have driven the MWRA's CSO plan.

Massachusetts' CSO policy requires elimination of CSOs by separation or relocation. If elimination is not possible or is too expensive, the owner can apply for a "partial use" permit that targets four overflows per year. State policy, like the EPA's, targets "critical use" waters that are used for swimming and shellfishing. In response to a question, Mr. Domenica noted that state policy does not differentiate between treated and untreated flow.

Lise Marx, Project Manager for CSOs, described the next phase of the work, which centered on a watershed approach to water quality. Ms. Marx reviewed the steps involved in the process. The first task was to define baseline conditions in each area. This included defining existing water quality standards for each body; defining existing water quality and uses; characterizing the watershed and hydrodynamics and trying to pinpoint CSO and non-CSO sources of pollution. The next step included setting a range of water quality goals for each segment and defining key water quality criteria. Task 3 was to define CSO and non-CSO control levels required to achieve water quality goals. Task 4 was to select a CSO control program for each waterbody. Ms. Marx said that controlling or eliminating CSOs in some waterbodies may not result in attaining water quality standards since there are other sources of pollution the MWRA does not control. The draft report will identify these sources of pollution, where possible.

Ms. Marx showed a map of the receiving water segments. She explained the 14 waterbodies used in the Baseline Water Quality Assessment distributed at the meeting. The segments were chosen by geography, uses (such as beach areas), by frequency, volume and location of CSO discharge, and natural flushing or other status.

The process produced three levels of water quality goals. Level I goals meet or exceed water quality standards at all times. Level II meets water quality standards most of the time, plus or minus 4 storm events per year, and targets key pollutants in certain waters. Level III goals will improve water quality and target aesthetics and bacteria in certain waters. Ms. Marx said that Level III goals were likely in an area where CSOs compose only a small percentage of the entire water quality problem. In this case, targeting some kind of control is a starting point until remediation of other sources is initiated.

Ms. Marx used a table on water quality measures for CSO alternatives to show what parameters are essential for different water uses, such as swimming, boating and for aquatic life. These measures allow the consultants to look at the performance of various control alternatives. The measures are based on two storms: a 3-month storm, which statistically occurs four times a year and therefore parallels the state partial use regulations, and a 1-year storm, which occurs about once a year. Greg Heath, Metcalf & Eddy, said that the design

storms reflect inches of rain, duration and intensity. He estimated the 3-month storm at 1.8 inches of rain over 24 hours, with a peak intensity of .4 inches per hour, and a 1-year storm as greater than 2 inches over 24 hours with a peak intensity of .7 inches per hour.

Ms. Marx said all available information was collected for each receiving water. Using North Dorchester Bay as an example, Ms. Marx reviewed the use criteria for the waterbodies and the causes of nonattainment of water quality. Figure 14-8 provides a visual summary of water quality for North Dorchester Bay; water quality problems occur primarily in wet weather when dissolved oxygen and fecal coliform counts violate standards. The next sample figure showed the relative contributions of other sources of pollution to North Dorchester Bay. CSO discharge is dwarfed by stormwater discharges (with high loadings of BOD, TSS, zinc and nutrients). CSO discharges bring high levels of bacteria, particularly during a 1-year storm, but the effects are of short duration. A subsequent table on CSO and stormwater bacterial impacts reveals that water quality standards in North Dorchester Bay are met in dry weather for swimming, boating and shellfishing; are met for swimming and boating after a 3-month storm; and generally are not met for a 1-year storm.

This information led to the next figure, which lists the water quality goals and control levels for each waterbody, then sets CSO control goals and strategies to meet the three levels of control. Ms. Marx reviewed the goals and potential strategies and showed how the CSO control goals became the basis for looking at a range of CSO alternatives. Ms. Marx said that relocating CSO flow from North Dorchester Bay will mean that water quality standards can be met almost all of the time. CSO flow can be discharged into Reserved Channel, which has less sensitive uses and better flushing. Bacteria will have a small, short duration impact in the Reserved channel. This alternative fits within the goals of the program, meets water quality and state and federal guidelines.

Ms. Marx turned to a discussion of similar issues for the Lower Charles River. Figure 4-7 shows that the river has continuous dry and wet weather water quality problems. The Authority assumes that dechlorination will be required for the Cottage Farm and all other facilities that chlorinate in order to reduce the potential for chlorine toxicity problems. Turning to Figures 4-2 and 4-3, Ms. Marx noted that while bacteria from CSOs causes water quality violations during a 1-year storm, much higher levels of pollutants reach the Lower Charles from stormwater and upstream pollution sources. These pollutants come from upstream of the Watertown Dam and overwhelm the CSO flow into the Lower Charles in terms of contributing to violating standards. Currently, the Lower Charles only meets bacteria standards for boating during dry weather.

Alex Strysky asked what the upstream sources of pollution are, if the bacteria from upstream decay and how the pollution was estimated. Wendy Smith Leo (from MWRA's Environmental Quality Department) said MIT had modeled the Lower Charles and the pollutants are estimated by using the river flow times average pollutant concentrations. The upstream bacteria do decay and that is taken into consideration. Illegal connections and stormwater from both direct discharges and from overland runoff have traditionally been

considered the causes of this pollution.

Ms. Marx turned to the waterbody goals table for the Lower Charles. She noted that CSO relocation is not an option for Level I control here since there is no less sensitive receiving water to handle the discharge. Sewer separation for an extended area would be difficult and expensive to accomplish. Ms. Marx reviewed potential alternatives for Level II and III control. The recommended CSO control plan will likely include a number of upgrades to the existing Cottage Farm facility, construction of a screening and disinfection facility for Stony Brook flows, construction of three small screening and disinfection facilities in the Upper Charles Basin and manual screens for other overflow locations.

Priscilla Chapman, Sierra Club, asked if the MWRA was saying in essence that there wasn't enough information to turn the Charles River around? Can the Authority be more specific about who needs to do what to improve the Charles? Lise Marx said the MWRA knows that CSOs form a very small percentage of the river's pollution load for most parameters, except for bacteria. So the plan will target bacteria removal. Over the long-term, the other possible control measures tend to involve storage, which is very expensive. The current plan is to implement controls that bring the most benefits first and to work to ensure that other parties are controlling their sources of pollution. Dan Donahue, Metcalf & Eddy, said that even after removing all CSO flow, the Lower Charles would still violate swimming standards in dry weather. The consultants could not identify any other specific sources other than stormwater and flow upstream of the Watertown Dam. Ms. Leo added that some of the monitoring data should help DEP to identify sources of pollution.

Beth Nicholson, Save the Harbor/Save the Bay, asked who was accountable for the other pollution. She urged the Authority to be specific about remediation wherever possible. Mr. Domenica said that BWSC has been seeking illegal connections aggressively, but the primary responsibility belongs to DEP, which is not committing resources to the effort. The MWRA faces the possibility of a large capital expenditure such as a tunnel or other storage to remove CSOs from the Lower Charles, and they are only about 1 percent of the problem. The MWRA plans to work with and support Charles River Watershed Association's long-range watershed research, but DEP is the entity that can require communities to look into and resolve their own contributions.

After a short break, Greg Heath of Metcalf & Eddy described the next step in the CSO plan evolution, the alternatives evaluation. Using North Dorchester Bay again as an example, Mr. Heath described the assessment process for each alternative at each level of control. He described the process in which a wide variety of options was screened down to better alternatives that could be evaluated in detail. In North Dorchester Bay, the draft recommended alternative calls for relocating the beach-side CSOs with a conduit to Reserved Channel. Mr. Heath briefly showed the pluses and minuses of the nine other possibilities and described how the chosen solution meets the critical uses for North Dorchester Bay without harming Reserved Channel. The large-flow conduit will be used to hold flow about 20 to 25 times a year but will only fill, thus overflowing, about 2 to 3 times a year. Most of the time

flow will be pumped to Deer Island. Any flow released to Reserved Channel will receive screening and disinfection. This solution can be linked to a conduit along Reserved Channel which will reduce discharges in the upstream portions.

Priscilla Chapman asked who is responsible for stormwater in Boston and how it is permitted. Mr. Heath said BWSC is applying to EPA for a discharge permit (NPDES) which, at this point in time, only requires data collection and identification of stormwater discharge locations.

Mr. Heath turned to North Dorchester Bay Chart 4 showing percentage removal of fecal coliform against cost (in present worth). The chart provides a cost-benefit analysis for five CSO control alternatives. In this area, relocation of CSO removes 70 percent of the fecal coliforms for a 1-year storm.

Mr. Heath noted that in modeling most waterbodies, alternative solutions perform fairly similarly in terms of the impact of bacteria; for example, options may have water quality impacts for 60, 65 and 70 hours, producing little long-term difference in meeting water quality standards.

Isabella Callanan, Friends of the Muddy River, asked what the life expectancy of facilities is. Mr. Heath said holding tanks made of concrete last about 50 years, and mechanical parts need to be replaced after 15 to 20 years. These life-cycle costs are included in the present worth figures.

Mr. Heath said the rankings for the alternatives gave a preference to the water quality evaluations and to costs. These and other issues were discussed in detail at the workshops held in the spring and summer. Mr. Heath said the issues were handled similarly for each of the waterbodies under discussion. Mr. Heath noted that there was not enough time to discuss siting issues, but Gretchen Roorbach of the CSO staff was available to review the ongoing work.

Mr. Domenica turned to the last page of the handout, which previews the recommended conceptual plan for CSO control. He said the plan will be available in draft form at the end of September. Mr. Domenica briefly reviewed the list, which is attached. In addition to relocating CSOs in Dorchester Bay, sewer separation is proposed for South Dorchester and in the Neponset Basin. In the Charles River, the Cottage Farm facility will be upgraded and a new screening and disinfection facility built at the MDC Fens Gatehouse to treat Stony Brook flows; screening and disinfection facilities at the Upper Charles CSOs are also planned.

At Constitution Beach, sewer separation is proposed. A variety of options is proposed for Boston Harbor CSOs, including interceptor relief projects, upgrading existing CSO facilities, building some small facilities and adding small amounts of storage. Alewife/Mystic work would include sewer separation at CAM 004.

Mr. Domenica said the report will go to court parties at the end of September. It will be made available in the library repositories and the MWRA will soon announce community briefings on the proposals. The staff would be happy to arrange additional briefings for other agencies and organizations. The final plan is due at the end of the December. The draft plan will include a proposed implemention schedule that prioritizes work in critical use areas.

Priscilla Chapman asked if the plan will include a generic bypass for wet weather flows at Deer Island. Mr. Domenica said it will not, but the full details of treatment plant capacity will be in the draft recommendations on DP-29, the Deer Island facilities reassessment study, due out in October.

Mr. Domenica thanked everyone for coming. The meeting was adjourned at 9:40PM.

Master Planning and CSO Facilities Planning
CSO CONTROL PLAN PRESENTATION

Environmental Agencies and Organizations

September 19, 1994
Kendall Square, Cambridge

ATTENDANCE

Jeffrey Kennedy	Mass Division of Marine Fisheries
Thomas Gloria	Tufts University, 119 Antrim St., Cambridge 02139
Priscilla Chapman	Sierra Club, 3 Joy St., Boston, 02108
Richard Mertens	BRA/Boston
Rick Zeroka	MCZM, 100 Cambridge St., Boston
Isabella Callanan	Friends of the Muddy River
Beth Nicholson	Save the Harbor/Save the Bay
Jodi Sugerman	"
Alex Strysky	Cambridge Conservation Commission
Mason Weinrich	Cetarean Research Unit, PO Box 159, Gloucester 01930
Roger Stern	Mass Bay Marine Studies
Jon Keledi	NWE/FC
Robert Buchsbaum	Mass Audubon Society
Lisa B (?)	Somerville Conservation Commission
Susan Redlich	Wastewater Advisory Committee
Jon Reinhardt	Somerville Conservation Commission
Mike Domenica	MWRA
Lise Marx	
Gretchen Roorbach	
Wendy Smith Leo	
Greg Heath	Metcalf & Eddy
Dan Donahue	
Nancy Farrell	Regina Villa Associates

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MWRA CSO AND MASTER PLANNING PROGRAM
DRAFT RECOMMENDED PLAN
DOWNTOWN BOSTON, THE WATERFRONT
AND FORT POINT CHANNEL
PUBLIC BRIEFING
Thursday, October 13, 1994
7:00 PM
Boston City Hall

MINUTES

Lise Marx of the MWRA convened the briefing at 7:14 PM, and introduced the MWRA and consultant personnel in attendance. Gretchen Roorbach and David Kubiak represented the MWRA and Greg Heath and Don Walker represented Metcalf and Eddy, the MWRA's consultant on the Combined Sewer Overflow (CSOs) project.

Ms. Marx reviewed the process the Authority went through in May and June to determine which CSO controls were needed for each of the fourteen receiving areas they were examining. The Authority evaluated the water quality conditions in those receiving waters and set water quality goals for each of them. Based on the water quality goals, the Authority was able to identify CSO control alternatives that would meet the goals. In June, the Authority presented a huge matrix of many different alternatives for each of the receiving waters. During the summer, a much more in-depth analysis of the alternatives was done -- not only in terms of how well they control the CSO, but in terms of siting factors, cost, and how much real water quality improvement would be obtained. Based on this work and workshops conducted through the spring and summer, the Authority has selected alternatives for each of the receiving waters. A Draft System Master Planning CSO Control Plan was developed and submitted to the Court in September that recommends specific CSO control measures for each of the areas. This plan will be finalized by December, with facilities planning in 1995.

Ms. Marx introduced Greg Heath, who presented the recommended strategies for downtown Boston, the waterfront and Fort Point Channel.

Mr. Heath used overhead slides in making his presentation, and a copy of his presentation containing significantly more detail is attached as an exhibit to these

minutes. Also included as an attachment are handouts provided by the MWRA that explain the various control technologies discussed in the report.

For each waterbody, there are three possible levels of control: Level I alternatives involve elimination of CSOs in sub-basins through sewer separation or CSO relocation and attain all of the designated uses for each basin, such as swimming, shellfishing and boating; Level II alternatives rang from one to four overflows per year and contain a variety of technologies; and Level III is a low cost option that recognizes that water quality goals will not be met in most basins until action is taken by others to control non-CSO sources of pollution. The next step was to identify specific engineering alternatives for each water body and CSO control goal. Engineers used detailed hydraulic information about the system and new system computer models to produce alternatives for two storm sizes (a three-month design storm corresponding to four overflow events per year, and one-year design storm corresponding to one overflow per year). The model allows the MWRA to assess the effectiveness of the control alternatives.

The CSO Control alternatives for the Charlestown area selected for further evaluation were:

Sewer Separation (Level I)
Near-Surface Storage (Level I, 1 Year Storm)
Equivalent Primary Treatment (Level II, 1 Year Storm)
Flow Through/Detention Treatment (Level II, 1 Year Storm)
Near-Surface Storage (Level II, 3 Month Storm)
Equivalent Primary Treatment (Level II, 3 Month Storm)
Coarse Screening (Level III)

The CSO Control alternatives for the waterfront/downtown Boston area selected for further evaluation were:

Sewer Separation (Level I)
Consolidation Conduit Storage (Level II, 1 Year)
Coarse Screening (Level III)

The CSO Control Alternatives for the Fort Point Channel area selected for further evaluation were:

Sewer Separation (Level I)
Detention Treatment at UPPS (Level II, 1 Year)
Flow-through Treatment at UPPS (Level II, 1 Year)
In System Storage in DBC (Level II, 1 Year)
Consolidation Conduit Storage, BOS 072-073 (Level II, 3 Month Storm)

Flow-through Treatment, BOS072-073 Level II, 1 Year)
Coarse Screening (Level III)

Mr. Heath pointed out the positive impact that ongoing MWRA programs (such as the Deer Island Sewage Treatment Plant) are having in reducing annual CSO volumes in the various receiving waters.

Mr. Heath said that the study had looked at the cost-effectiveness of the various alternatives, and had determined that not all of the alternatives were as cost-effective in meeting different goals. For instance, the recommended alternatives were cost-effective in reducing fecal coliform in the Fort Point Channel, but the same alternatives were not as cost-effective in removing total suspended solids (TSS) or biochemical oxygen demand (BOD) from the same waters.

Using the performance information relative to the various alternatives, the MWRA and consultants evaluated the water quality impacts, the cost and the siting issues of the CSO alternatives for each of the waterbodies and developed a ranking system for the alternatives.

The projected costs for the recommended plans are as follows:

Mystic/Chelsea Confluence (includes Chelsea area) - $32 million
Upper Inner Harbor - $22 million
Fort Point Channel - $26 million

Mr. Kubiak noted that a reasonable question to ask is why sewer separation, which would completely eliminate bacteria, was not the recommended alternatives. He said that, along with water quality, cost and siting were also used as criteria in developing the recommended alternatives. It would cost $200 million for sewer separation, versus $26 million for the recommended alternative and the added benefit from choosing the sewer separation alternative would be almost insignificant.

Ms. Marx then said that as part of the CSO System Master Plan, the MWRA is also looking at the interceptor system, infiltration and inflow and secondary treatment on Deer Island. This latter information on treatment links to the DP-29 process studying the correct size of the secondary treatment plant, whose discharge is subject to the National Pollution Discharge Elimination System (NPDES) permitting process.

Ms. Marx stated that the Draft CSO/SMP report presents a preliminary, 16-year schedule for implementation of the CSO recommendations through facilities planning, environmental review, site acquisition, permitting, design and construction. Public comments are due to Ms. Marx at the MWRA by mid-

November and will help the MWRA establish the scope of issues for the Facilities Plan/Environmental Review phase of work.

Stephen Greene asked what size tank would be installed at the Union Park pumping station. Mr. Heath said that the tank will hold 2 million gallons and should not cause a negative impact on the area.

Mr. Greene then asked if the MWRA was coordinating with the Central Artery Tunnel project on any construction areas that both projects have in common. Ms. Marx said that such coordination is ongoing.

The briefing was adjourned at 9:15 PM.

MWRA CSO AND MASTER PLANNING PROGRAM
DRAFT RECOMMENDED PLAN
DOWNTOWN BOSTON, THE WATERFRONT
AND FORT POINT CHANNEL
PUBLIC BRIEFING
Thursday, October 13, 1994
7:00 PM
Boston City Hall

ATTENDANCE

H. Joseph Powderly	Boston Water & Sewer Commission
Stephen Greene	625 Mass. Ave., Boston 02118
Jeanne Argento	Room 805, Boston City Hall
Lise Marx	MWRA
David Kubiak	MWRA
Greg Heath	Metcalf & Eddy
Frank McDonough	RVA, Inc.

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100 First Avenue
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MWRA CSO AND MASTER PLANNING PROGRAM
DRAFT RECOMMENDED PLAN
NORTH DORCHESTER BAY, RESERVED CHANNEL,
SOUTH DORCHESTER BAY AND NEPONSET RIVER
Monday, October 17, 1994
7:00 PM
Curley Recreation Center, South Boston

MINUTES

Dave Kubiak, Senior Project Manager for the MWRA, welcomed the participants to the meeting. He reviewed the process the Authority went through in May and June to determine which CSO controls were needed for each of the fourteen receiving areas they were examining. The Authority evaluated the water quality conditions in those receiving waters and set water quality goals for each of them. Based on the water quality goals, the Authority was able to identify CSO control alternatives that would meet the goals. In June, the Authority presented a huge matrix of many different alternatives for each of the receiving waters. During the summer, a much more in-depth analysis of the alternatives was done -- not only in terms of how well they control the CSO, but in terms of siting factors, cost, and how much real water quality improvement would be obtained. Based on this work and workshops conducted through the spring and summer, the Authority has selected alternatives for each of the receiving waters. Greg Heath, from Metcalf & Eddy, presented the selected alternatives for the Dorchester Bay/Neponset River areas and the water quality benefits that are achieved by these alternatives. Mr. Heath used handouts (attached) to illustrate his presentation.

Mr. Heath said for each waterbody there are three possible levels of control: Level I alternatives involve elimination of CSOs in sub-basins through sewer separation or CSO relocation and attain all of the designated uses for each basin, such as swimming, shellfishing and boating; Level II alternatives range from one to four overflows per year and contain a variety of technologies; and Level III is a low cost option that recognizes that water quality goals will not be met in most basins until action is taken by others to control non-CSO sources of pollution. The next step was to identify specific engineering alternatives for each water body and CSO control goal. Engineers used detailed hydraulic information about the system and new system computer models to produce alternatives for two storm sizes (a three-

month design storm corresponding to four overflow events per year, and one-year design storm corresponding to one overflow per year). The model allows the MWRA to assess the effectiveness of the control alternatives.

Mr. Heath explained how a broad range of alternatives was examined, from elimination to Level II and Level III controls. All of these alternatives were taken through detailed evaluation for the Reserved Channel segment.

Mr. Heath then presented the North Dorchester Bay control alternatives. This is a more focused subset of control options concentrating on higher levels of control than were seen in the Reserved Channel due to the existing uses in North Dorchester Bay (swimming, boating, shellfishing, etc.).

John Hegarty asked why Calf Pasture was dropped from consideration. Mr. Heath answered that it was dropped off due to cost and uncertainty. Other consolidation measures were also eliminated, mostly due to cost.

Mr. Heath turned to the South Dorchester Bay control alternatives. In South Dorchester Bay, the MWRA considered a broad range of alternatives, from sewer separation to flow-through treatment. After evaluation, some consolidation conduits were eliminated from consideration because it was too costly to tie the outfalls together instead of dealing with them individually.

Looking at the Neponset River CSO control alternatives, once again a broad range of alternatives was explored. Again, consolidation conduit options or options that hook the two outfalls together for storage were dropped due to cost.

Mr. Heath used a handout labeled "Impact of Ongoing MWRA Program Reductions on CSO Volume." This chart shows the receiving water segments Reserved Channel, North Dorchester Bay, South Dorchester Bay and the Neponset River. The chart shows the existing conditions (1992, five years before Deer Island is to come on line) of CSO volume; the future planned conditions, which are the starting point for developing alternatives under the recommended plan; and the conditions that will exist in 1997 when Deer Island is running at full capacity. The chart indicates that the new plant will reduce CSO flows in the area; for example, South Dorchester Bay flows are reduced by 57 million gallons per year. Therefore, the Deer Island project will significantly reduce CSO flows.

Mr. Heath then walked through aspects of the evaluation process. He used a series of three graphs to show the cost of an option vs. bacteria removed. It was found that the greatest reduction was a 70% decrease in bacteria. The reason there was only a 70% decrease is that some bacteria were also coming from non-CSO sources, specifically, stormwater. Stormwater does not have as much bacteria as CSO, but it does have enough to register 30% of bacteria going into

receiving waters. All three graphs showed a net increase in stormwater with sewer separation. Sewer separation would send more stormwater into North Dorchester Bay instead of to Deer Island.

Mr. Heath described the assessment of each alternative by ability to meet water quality standards and by cost. After a detailed evaluation in terms of water quality and costs, the alternatives were checked to determine if it was practical for them to be sites. The alternatives were ranked according to their present worth cost (which includes capital and operating costs). The least expensive alternatives received good ratings and the more expensive alternatives received less favorable ratings. The results were then integrated with cost and water quality to determine how the alternatives ranked on all of the measures.

Mr. Heath reviewed the "rating of siting issues for North Dorchester Bay." The siting parameters included site availability, constructability, short-term community impacts, long-term community impacts and environmental impacts. Each parameter had different measures. For example, for constructability, it was determined whether construction was standard, whether there were construction restraints (such as the absence of a staging area for a contractor to work), or if unique and/or special techniques were required. Siting was not used directly to influence the selection of alternatives. The selection of alternatives was based on cost and water quality.

John Hegarty asked if the Department of Fisheries allowed shellfishing on Carson Beach. Mr. Heath said he didn't think it was open.

Mr. Hegarty then asked why, when North Dorchester Bay has consistently been the cleanest water in the harbor for the last three years, digging is not allowed in the area. Meanwhile, MASSPORT allows master diggers to dig off airport flats on the Constitution Beach side which has had some of the most closings, yet isn't a restricted shellfishing bed. Mr. Heath said that question should be answered by the Department of Marine Fisheries. Mr. Kubiak added that there is a report that goes into great detail about water quality conditions in these areas and the goals that have been established. If anyone is interested in getting a lot of information on water quality, CSO staff can provide a copy of the report.

Mr. Heath next used a series of handouts to explain the recommended plan for the Reserved Channel, North Dorchester Bay, South Dorchester Bay and the Neponset River.

The plan for the Reserved Channel is to consolidate overflows with a soft-ground tunnel or some other type of pipeline. This pipe line would pick CSOs up before they are discharged into Reserved Channel and bring them to a facility near BOS080. This facility would provide screening and disinfection before discharging

back into Reserved Channel. This facility, unlike existing facilities, has a consolidation conduit upstream. For all but six rainfall events per year, the pipe is going to be able to store the flow. It will then be bled back into the interceptor system so there will be no CSO discharges into Reserved Channel. Approximately six times per year, during heavy storms, when the volume is exceeded, there would be flow/over-flow to treatment facilities.

Paul Keohan said that the overflow was eliminated along the beach by increasing the size of the conduit, but the Authority has chosen not to do this for Reserved Channel. The conduit could be increased to eliminate CSO, but because the use of Reserved Channel is not as sensitive as Dorchester Bay uses, it was decided to keep the conduit the way it is. Mr. Heath said that the level of control is very appropriate for Reserved Channel.

Mr. Heath used charts to show the predicted concentrations of bacteria in the receiving water for the Reserved Channel alternatives, and the effects of Total Suspend Solids (TSS), BOD and nutrients. CSO flow contributes more solids, BOD and nutrients than stormwater, but the in-line storage should reduce solids concentrations by 75%. The number of overflows will be reduced from 44 to 6.

Mr. Heath described the recommended plan for North Dorchester Bay that calls for eliminating CSOs to the bay and relocating them via conduit to Reserved Channel. The conduit would be sized to hold the flow of all but three or four storms per year. Any overflows would receive screening and disinfection. This solution eliminates CSO flows to a beach and shellfishing area and avoids discharging stormwater into Reserved Channel (which would happen with sewer separation). Instead of approximately 78 annual untreated flows going into North Dorchester Bay, any overflows (perhaps 3 to 4) going into Reserved Channel would be treated.

The South Dorchester recommended plan addresses three outfalls in Dorchester Bay currently served by two existing facilities. The plan recommends sewer separation in phases and upgrading the existing screening and disinfection facilities at Fox Point and Commercial Point to provide dechlorination in the short term. Adding dechlorination to the existing facilities will lower residuals from chlorine treatment and reduce impacts on aquatic life. The sewer separation, which is fairly expensive and a lengthy process, would take place over a period of years. Once it was completed, Fox Point and Commercial Point could be used to treat stormwater or be abandoned.

Mr. Heath reviewed the pollutant loadings for the area and introduced a boundary condition. These are sources of bacteria from the Neponset River that still have the potential to violate swimming standards.

John Hegarty wanted to know if the plan was able to identify the source of

pollution in the boundary condition. Mr. Kubiak said that it was beyond the Authority's scope, but it could be agricultural run-off upstream, sanitary sewer overflows upstream or a number of other possibilities.

Reviewing the "bacteria loadings immediately following a one-year storm," Mr. Heath said the information suggests that CSO is a relatively small part of the total bacteria picture. This is because the two facilities are doing a pretty good job and virtually getting CSO down to swimming level. Looking at other parameters for South Dorchester Bay, solids and BOD from CSOs are a much bigger part of the overall picture in the future planned conditions. CSO loading of solids is twice that of stormwater. This is where sewer separation will have a benefit. Stormwater will go from in excess of 250,000 mg down to 180,000 mg annually. Therefore, the stormwater component is getting larger under the recommended plan than it is in the future plan. The best way to achieve the goal of eliminating the CSO to a critical use area is by long-term separation. Moving all of this flow elsewhere is not a viable option.

Mr. Heath said the Neponset River recommended plan is sewer separation. Quite a bit of separation has already taken place in the Granite Ave. area (BOS095 & 093). Basically, this plan would eliminate CSO discharge in the long-term through sewer separation. For the Neponset River area there was no bacteria model from MIT. It is possible to look at the pollution reductions achieved by the recommended plan, however. Non-CSO bacteria is very high relative to the CSO bacteria. The boundary load is huge. Stormwater and CSO are very small in this case.

Dave Kubiak added that if the Dorchester Bay area didn't have so many critical areas for shellfishing and bathing, the Authority may not have recommended such a high level of control. Mr. Heath agreed and added that approximately one-half of the cost of this program is in the Dorchester Bay area. There is approximately $186 million in the Dorchester segments. The total cost for the plan is $374 million. Clearly the Authority is opting to spend its money in areas that are considered critical use areas. In more industrial areas, the plan is more modest.

Mr. Kubiak then had a few comments. The recommended report is available, but it is not the only report the Authority has prepared. Mr. Kubiak thought three reports in particular would be of interest:

1. Water Quality Baseline Assessment
   Details water quality conditions in the tributaries receiving water.
2. CSO Alternatives Report
   A more in-depth analysis about all the alternatives looked at tonight.
3. September Report
   Lays out draft plan/recommended plan.

In combination these three reports provide all the information the Authority has put together over the past two-and-a-half years to come up with these recommendations. If anyone would like a copy, the Authority would be happy to send them out. The Authority is looking for public comments by mid-November so the recommendation can be finalized at the end of December.

Mr. Kubiak said that the Authority does present an implementation plan in the report. This is one of several possible scenarios for implementing the projects that the Authority is now recommending. There are 22 CSO projects recommended. The Authority has broken each project up into facilities, planning, design, construction, permitting and site acquisition. Time frames are based on many different preliminary assumptions, such as whether or not a project needs facilities planning and environmental review or if it can be moved directly into design. The Authority also looked at prioritizing the projects. "A" projects have the highest priority because they are in critical use areas, or relieve some fairly serious flooding or other system problems or implement one of the EPA's nine minimum controls.

Projects were defined as priority B or C based on waterbody priority, volume of CSO controlled by the project, and the ratio of CSO versus non-CSO discharges into the receiving water. Mr. Kubiak suggested that this is just the framework that shows us the implications of making the various decisions. The Authority is now in the process of making these decisions and finalizing answers to questions. As this process continues, this will become a more formal proposal by the Authority. Then this schedule will be taken into negotiations with the EPA and other court parties to establish the next set of CSO milestones under federal court schedule. The Authority expects that the new set of CSO milestones will be accepted by the court in early 1995.

Mr. Kubiak thanked everyone for coming and adjourned the meeting.

MWRA PUBLIC MEETING
COMBINED SEWER OVERFLOWS
NORTH DORCHESTER BAY, RESERVED CHANNEL,
SOUTH DORCHESTER BAY, AND NEPONSET RIVER
Monday, October 17, 1994
7:00 PM
Curley Recreation Center, South Boston

ATTENDANCE

Jack Murray	9 Playstead Rd., Dorchester, MA 02125
Ted Park	Senator Bulger's office
Paul Keohan	Boston Water & Sewer Commission
John Hegarty	60 Mosley St., Dorchester, MA
Gretchen Roorbach	MWRA
David Kubiak	MWRA
Greg Heath	MWRA
Eric Glader	Regina Villa Associates, Inc.

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MWRA CSO AND MASTER PLANNING PROGRAM
DRAFT RECOMMENDED PLAN
THE CHARLES RIVER
PUBLIC BRIEFING
Wednesday, October 19, 1994
7:00 p.m.
Cambridge City Hall

MINUTES

David Kubiak of the MWRA convened the briefing at 7:14 PM, and introduced the MWRA and consultant personnel in attendance. Gretchen Roorbach and Vincent Ragucci represented the MWRA and Greg Heath and Don Walker represented Metcalf and Eddy, the MWRA's consultant on the Combined Sewer Overflow (CSOs) project.

Mr. Kubiak reviewed the process the Authority went through in May and June to determine which CSO controls were needed for each of the fourteen receiving areas they were examining. The Authority evaluated the water quality conditions in those receiving waters and set water quality goals for each of them. Based on the water quality goals, the Authority was able to identify CSO control alternatives that would meet the goals. In June, the Authority presented a huge matrix of many different alternatives for each of the receiving waters. During the summer, a much more in-depth analysis of the alternatives was done -- not only in terms of how well they control the CSO, but in terms of siting factors, cost, and how much real water quality improvement would be obtained. Based on this work and workshops conducted through the spring and summer, the Authority has selected alternatives for each of the receiving waters.

A Draft System Master Planning CSO Control Plan was developed and submitted to the Court in September that recommends specific CSO control measures for each of the areas. This plan will be finalized by December, with facilities planning beginning at the beginning of 1995.

Mr. Kubiak introduced Don Walker, who presented the recommended strategies for the Charles River.

Mr. Walker used overhead slides in making his presentation, and a copy of his presentation containing significantly more detail is attached as an exhibit to these minutes. Also included as an attachment are handouts provided by the MWRA that explain the various control technologies discussed in the report.

For each waterbody, there are three possible levels of control: Level I alternatives involve elimination of CSOs in sub-basins through sewer separation or CSO relocation and attain all of the designated uses for each basin, such as swimming, shellfishing and boating; Level II alternatives range from one to four overflows per year and contain a variety of technologies; and Level III is a low cost option that recognizes that water quality goals will not be met in most basins until action is taken by others to control non-CSO sources of pollution. The next step was to identify specific engineering alternatives for each water body and CSO control goal. Engineers used detailed hydraulic information about the system and new system computer models to produce alternatives for two storm sizes (a three-month design storm corresponding to four overflow events per year, and one-year design storm corresponding to one overflow per year). The model allows the MWRA to assess the effectiveness of the control alternatives.

The CSO Control alternatives for the **Lower Charles River** area selected for further evaluation were:

Sewer Separation (Level I)
Local Storage (Level II, 1 yr.)
Local Storage/Relief at WSHW (Level II, 1 yr.)
Equivalent Primary Treatment (Level II, 1 yr.)
Detention/Treatment (Level II, 1 yr.)
Local Storage (Level II, 3 mo.)
Equivalent Primary Treatment (Level II, 3 mo.)

The CSO Control alternatives for the **Lower Charles River - Stony Brook** area selected for further evaluation were:

Sewer Separation (Level I)
Consolidation Conduit Storage (Level II, 1 Year)
Consolidation/Storage/Upstream Diversion (Level II, 1 yr.)
Flow Through Treatment (Level II, 3 mo.)
Consolidation/Storage (Level II, 3 mo.)
Consolidation/Storage/Upstream Diversion (Level II, 3 mo.)

The CSO Control Alternatives for the Upper Charles area selected for further evaluation were:

Sewer Separation (Level I)
Consolidation Conduit Storage (Level II, 1 yr.)
Near Surface Storage (Level II, 1yr.)
Enlarge BOS032 Interceptor Connection (Level II, 1 yr.)
Equivalent Primary Treatment (Level II, 1 yr.)
Flow Through Treatment (Level II, 1 yr.)
In-System Storage at BOS032
Coarse Screening (Level III)

Mr. Walker said that the area from the BU Bridge to Watertown is considered the upper Charles and the area from the Charlestown Dam to the BU Bridge is considered the lower Charles.

Mr. Walker explained the three different technologies available to handle CSO flows: sewer separation involves laying another pipe to separate the stormwater and sanitary flows at the source; storage, putting in a tank to collect flows that will then be sent to Deer Island for treatment; and flow-through, discharging the flows after screening and disinfection.

Mr. Walker pointed out the positive impact that ongoing MWRA programs (such as the Deer Island Sewage Treatment Plant) are having in reducing annual CSO volumes in the various receiving waters.

Mr. Walker said that the study had looked at the cost-effectiveness of the various alternatives, and had determined that not all of the alternatives were as cost-effective in meeting different goals. For instance, the recommended alternatives were cost-effective in reducing fecal coliform in the lower Charles River, but the same alternatives were not as cost-effective in removing total suspended solids (TSS) or biochemical oxygen demand (BOD) from the same waters. Mr. Walker said the figures on reducing the fecal coliform include CSO fecal coliform, stormwater fecal coliform, and fecal coliform from upstream sources.

Using the performance information relative to the various alternatives, the MWRA and consultants evaluated the water quality impacts, the cost and the siting issues of the CSO alternatives for each of the waterbodies and developed a ranking system for the alternatives. When evaluating cost, both the capital cost of building the facility and the yearly operating cost were considered.

The projected costs for the recommended plans are: Lower Charles River - $31 million; Upper Charles River - $ 5 million.

Mr. Walker said the recommended plan for the Lower Charles River includes screen/disinfecting Stony Brook conduit and upgrading the Cottage Farm facility. The recommendation for the upper Charles River is for a flow-through treatment system.

Isabella Callanan asked if there was a value assigned to improving the Muddy River. Mr. Heath said there was no consideration of any benefit to the Muddy River. Mr. Kubiak said the improvement to the Muddy River would have been considered if it was a feasible alternative or was cost effective.

Ms. Callanan asked if the MWRA considered some diversion of flows to the Muddy River. Mr. Kubiak said it is not the MWRA's responsibility to take care of the Muddy River, except in ways that the sewer system affects water quality. No permitted CSO discharge has been identified in the Muddy River.

A resident asked if the sewer system is separated, who is responsible for the stormwater. Mr. Heath said the local municipality would be responsible for the stormwater.

An attendee asked Mr. Walker to explain how the Stony Brook system works. Mr. Walker said the Stony Brook conduit runs through parts of Roxbury and Hyde Park. In dry weather, brook flows enter the conduit and flow through the conduit. When it rains, a lot of stormwater enters the conduit. There are a number of CSO overflow points in the system.

A resident asked how much chlorine is necessary to treat overflows and if that is the best treatment process. Mr. Heath said the MWRA will use a reasonable amount of chlorine to reduce the bacteria. Disinfection treatment will be followed by de-chlorination, which de-activates the chlorine.

A resident asked what is currently the main problem in the watershed, fecal coliform or BOD. Mr. Walker said that depends upon the use of the receiving water. For swimming and boating in the lower Charles River, the problem is fecal coliform. The problem for marine life is BOD.

An attendee asked if the court has defined the standards that must be met for the receiving waters. Mr. Kubiak said the MWRA has to meet federal and state water quality standards. The CSO policy does consider the affect of non-CSO sources and will not put the total burden for the water quality on the MWRA. Mr. Heath added that the main problem with CSOs is fecal coliform. BOD and TSS come from other sources.

A participant asked if the modeling data is site specific. Mr. Walker said the MWRA and M&E have done studies, for the bacteria counts, for all of the recommended alternatives at sites along the River.

An attendee asked if the Charles gatehouse would be used. Mr. Heath said the project is still in a very early planning stage. It is not possible to say if the gate house will be used.

A resident asked what the capacity of the pipe to and from Cottage Farm is and if there is a way to increase the pipe's capacity. Mr. Kubiak said there have been improvements to the pumping capacity at Deer Island and overflows from Cottage Farm have decreased dramatically over the last 5 years.

A participant asked when the new plant at DI is on-line and all of the flow in the system cannot be treated, will the restriction be at DI or will it be upstream. Mr. Kubiak said the DI facility will be able to handle all of the flow that gets to DI. The restriction will be at the headworks and in the tunnels.

A resident asked what percentage of CSOs from Cottage Farm is untreated. Mr. Walker said all of the flow that goes to Cottage Farm is treated with disinfection and screening.

A resident asked if the intercepter pipes are clogged with sediment. Mr. Kubiak said that parts of the system have a sediment problem. There will be more on-site inspections to make sure all of the pipes are clear.

A participant asked if some of the CSOs in the Charles River are related to the Prison Point facility. Mr. Walker said the overflows along the west side of the River affect Prison Point. The plan calls for operational changes at the facility and further investigation of the downstream flows.

An attendee asked how the location was chosen for the proposed disinfection facility in the Stony Brook area. He said the facility would also be an advantage to BOS046 if it were located further upstream. Mr. Walker said the site was chosen because the gate house is at that site. This may be reconsidered during the facilities planning stage of the project.

A resident asked if the state will agree to the plan if the receiving water does not meet swimming standards. Mr. Heath said that it is not clear what DEP will approve. He noted that the MWRA's recommended plan allows for the 1-year storm event. There are only a few overflows in the Charles River that are active during a 3-month storm and even fewer during the 1-year storm.

An attendee asked why the water flowing down the Charles is brown. Mr. Heath said he believes that some of the color may be due to natural causes.

A participant asked if chemical treatment of CSOs affects TSS. Mr. Walker said the Cottage Farm facility treats only for coliform. Mr. Kubiak added that the levels of TSS are being reduced with a limited amount of storage.

An attendee said it appears that spending a lot of money to control CSO will actually have very little effect upon the Charles River. Mr. Walker said the project will have a significant impact on the aesthetics of the river and on coliform levels. Mr. Heath said improvements made by the MWRA have already made an impact in the volume of CSO flows. In 1992 there were 128 million gallons of flow released into the system a year from overflows. That should be cut in half by 1997.

A resident asked how CSOs relate to the overall pollution problem in the Charles River. Mr. Kubiak said that the MWRA has a lot of information about what the pollutants are and how they affect the Charles River. A recent report gave a summary of key pollutants for each use of a receiving water.

A resident asked if the public will see a difference in how the Charles looks. Mr. Kubiak said the MWRA is including plans for aesthetics control, but the overall plan will have a small impact on the Charles River.

A participant asked if the MWRA has any authority to enforce certain standards when local water and sewer departments make changes to their system. Mr. Kubiak said the MWRA does not have any authority over the local water and sewer departments. The MWRA will make best management practices recommendations to local communities.

A resident asked how close a screening and disinfection facility would be to the River. He noted there is not a lot of room near CAM009 for a facility. Mr. Heath said there are a number of different designs that can be used to adapt to a site. It is better to locate a facility back from the river, not right on the river. The roof of the facility could be grassed over or made into a park, depending upon the community's wishes. It would be necessary to have access to the facility for maintenance.

An attendee noted that it may not be worth doing anything at CAM009 since it is only active at the 1-year storm. Mr. Walker said there will be further discussion during the facilities planning stage, but it is possible that the recommended plan for the site will only be for screening.

A resident suggested that the MWRA should coordinate efforts with the Secretary of Environmental Affairs, Trudy Coxe, when planning facilities along the Charles

River. Mr. Kubiak said the MWRA has included the MDC in this project and will continue to meet with them.

A resident asked what the total cost for the project will be. Mr. Kubiak said the MWRA estimates that the CSO control program will cost approximately $374 million.

Mr. Kubiak said the MWRA has prioritized the 22 different CSO control projects as follows:

Priority A	involves critical use areas, areas that must comply with EPA policy and projects that resolve problems immediately
Priority B	involves projects that will make big improvements to the system for very little money
Priority C	all other projects

Mr. Kubiak said that as part of the CSO System Master Plan, the MWRA is also looking at the interceptor system, infiltration and inflow and secondary treatment on Deer Island. This information links to the DP29 process studying the correct size of the secondary treatment plant, whose discharge is subject to the National Pollutant Discharge Elimination System (NPDES) permitting process.

Mr. Kubiak stated that the Draft CSO/SMP report presents a preliminary, 16-year schedule for implementation of the CSO recommendations through facilities planning, environmental review, site acquisition, permitting, design and construction. Public comments are due to the MWRA by mid-November and will help the MWRA establish the scope of issues for the Draft Environmental Impact Report (DEIR) process.

The meeting was adjourned at 9:30 PM.

MWRA PUBLIC MEETING
COMBINED SEWER OVERFLOWS
CONCEPTUAL CONTROL PLAN & DRAFT SYSTEM MASTER PLAN
Wednesday, October 19, 1994 - 7:00 PM
Cambridge City Hall

ATTENDANCE

Brian Culver	Harvard University, 50 Church St., Camb.
Joseph Canicchi	MIT, 50 Ames St., Cambridge
John Molt	44 Coolidge Hill Rd., Cambridge
Pete Ralston	17 Rear Endicott Ave. #2, Somerville
Isabella Callanan	Friends of the Muddy River, 22 Bowker St., Brookline, MA
Alex Strysky	Cambridge Conservation Commission
Kathy Sedar	Cambridge Conservation Commission
Charles Hinds	207 1/1 Charles St., Cambridge
Nicholas Grangery	269 Hurley St., Cambridge
Aldo Griffin	Boston Parks Dept., 1010 Mass. Ave., Boston
John Elwood	305 County Rd., Bourne
Ed Burke	151 Park Drive, Boston
Jennifer Murphy	Save the Harbor/Save the Bay
Vincent Ragucci	MWRA
David Kubiak	MWRA
Gretchen Roorbach	MWRA
Greg Heath	Metcalf & Eddy
Don Walker	Metcalf & Eddy
Mary Kelly	Regina Villa Assoicates

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MWRA Public Meeting
Combined Sewer Overflow
Conceptual Control Plan & Draft System Master Plan
Tuesday, October 25, 1994
Powderhouse School, Somerville
Alewife Brook & Mystic River

Minutes

David Kubiak of the MWRA opened the meeting at 7:00 PM, and introduced Lise Marx and Gretchen Roorbach (also of the Authority), and Don Walker, from the engineering firm of Metcalf & Eddy, who would speak on (1) alternatives selected for evaluation, (2) evaluation of alternatives, and (3) the recommended plans, for each of the three waterbodies relevant to this geographic area.

Mr. Kubiak gave an overview of the process to this point, which included meetings in the summer of this year on CSO control goals and alternatives, then a paring down and evaluation of options (with particular attention paid to water quality, as well as to cost and siting issues), and a document completed in September entitled Draft CSO Conceptual Plan and System Master Plan. It is these draft recommendations which are the focus of this meeting.

Water quality improvement is the basic goal of the CSO program. To better assess water quality needs, the MWRA segmented the many watersheds within its bounds into a more manageable fourteen "waterbodies." Geography and usage determined the segments. The best level of control and the designated uses for receiving waters were determined for each waterbody, and from this treatment goals were developed at three distinct levels:

Level I	complete CSO elimination
Level II	+/- 4 CSO overflows per year
Level III	some improvement over existing conditions; mainly aesthetic

CSOs are not the only pollution source affecting these waters. They are, however, the only source under the Authority's responsibility. Level III treatment (the lowest level) was considered mainly for waterbodies in which the major pollution source is not CSOs.

Mr. Walker began his presentation by referring to a map showing the three waterbodies of interest to the geographical area of Cambridge, Somerville, and Arlington. They are the Alewife Brook, the Upper Mystic River, and the Lower Mystic River; Upper Mystic

runs from the Mystic Lakes to the Amelia Earhart Dam; the Lower Mystic runs from the dam to the mouth of the river.

Mr. Walker then reviewed each waterbody in turn. The Alewife Brook contains 11 CSOs - six in Cambridge and five in Somerville. The largest and most active outfalls are at CAM004 and SOM001A.[1] In the Upper Mystic, the CSOs are SOM007 and SOM007A; the Lower Mystic is affected by MWR205.[2] These last three originate from the Somerville Marginal CSO facility. This existing facility provides screening and disinfection. The excess flow from a storm event during low tide goes to MWR205. However, during a high tide storm event, the tide waters back up against the outfall, preventing all of the flow from escaping at MWR205; it backs up and flows out of SOM007A, on the upstream side of the dam.

Control options from complete sewer separation to coarse screening were proposed and reviewed. Some alternatives identified in the June 1994 report were eliminated because of feasibility issues or poor cost-effectiveness, in order to have a more manageable number of alternatives; those not considered include consolidated storage and primary treatment. Primary treatment options were eliminated because they were found to be less effective than the only slightly-more expensive storage alternatives, and much more expensive than slightly lesser levels of control. In comparison of a treatment facility versus consolidated storage of a three-month storm, in which a consolidation conduit would capture the flows from a storm that might happen on average four times annually, the volume of the conduit required to convey those flows would capture the entire three-month storm, so that alternative was dropped.

In the Upper Mystic, only three alternatives were identified in the June report. Of those, coarse screening at SOM007 was also eliminated, because the cost of screening would be almost the same as to completely separate it.

Janey Keough, a member of Save the Harbor/Save the Bay and a Medford resident, asked about the treatment type at the Somerville Marginal facility. Mr. Walker said that the facility performs mechanized coarse bar screening (for large solids) and bacterial treatment utilizing sodium hypochloride.

Mr. Walker said that no alternatives were eliminated for the Somerville Marginal facility, since ramp relocations off Interstate 93 (because of the Central Artery/Tunnel project) necessitate the relocation of the facility. Dechlorination would eliminate the chlorine residual from the bacterial treatment process.

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[1] CAM004 is located near the Alewife MBTA Station; SOM01A is at the downstream end of the Tannery Brook drain, and is actually in Cambridge, just up the street from the intersection of Mass. Ave.and Route 16.

[2] MWR205 is just downstream of the Earhart Dam.

Mr. Walker noted that the "future planned conditions"[3] were used in rating the performance of the identified alternatives and in determining the system needs. A number of factors will decrease the amount of future flow, including the implementation of additional system optimization plans (SOPs) and full on-line capacity at the new Deer Island treatment facility, slated for completion in 1997. Much money has been spent to date on collection and treatment systems improvements, and without implementation of any CSO control alternatives, some of the numbers will go down because of these ongoing projects. For example, the Alewife Brook will see a 33% reduction in overflows; this is due in large part to a change in operating procedures at the Alewife Brook pumping station. A smaller overflow reduction for the Upper Mystic will occur because of capacity improvements at the Alfred pumping station in Charlestown, which allows more wet-weather flow from the Somerville/Medford branch sewer into the downstream collection system and therefore fewer overflows.

Mr. Kubiak mentioned that the construction project currently underway on the Charlestown-Somerville-Everett line, across from Boston Edison by the MWRA, is for the replacement of the current Alfred pumping station. These pump replacements, capacity improvements, and implementation of 100+ recommended SOPs within all four of the CSO communities (as detailed in summer 1993 meetings) will reduce the current total CSO flow volume by 20 - 25%, thereby reducing the total capacity at the Deer Island treatment plant.

Mr. Walker then referred to Figure 3-1 from the CSO MP document (Attachment B), which charts the impact of CSO program improvements on system-wide CSOs, as measured by annual overflow volume. For example, in 1988, the annual overflow volume was over 3 billion gallons; the predicted 1997 volume is close to 1 billion gallons.

Moving along, Mr. Walker gave an overview of the evaluation process done this summer. Input was sought from all interested parties, including municipalities and the MWRA Advisory Board.

The first test was cost versus performance for a three-month storm. He referred to the pages in the handout regarding Alewife, including the Total Load Reduction for fecal coliform, total suspended solids, and BOD. For each of the three pollutants, sewer separation would actually cause a net *increase* in levels, since stormwater now piped to treatment facilities would be diverted directly into the waterbodies, and at a cost above $40 million. The best choice from this perspective for each pollutant is sewer separation upstream of CAM004. It would mean the removal of 20+% of coliform for a cost of about $3 million; this is much lower than other options which would derive very little additional benefit.

Sewer separation will not capture any suspended solids, which come mainly from

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[3] Future planned conditions, or FPC, are the anticipated future conditions of the collection and treatment system in 1997, when full treatment and pumping capacity is available on Deer Island.

stormwater. Unlike bacteria, solids do not die off over time, so they have a more noticeable, cumulative effect. The final pollutant is bio-chemical oxygen demand, which are pollutants that cause dissolved oxygen in the water to be consumed. Stormwater affects this as well, so the best CSO control would achieve a reduction of only 10%.

Mr. Walker then described the ranking system used for each alternative, and referenced the handout "Water Quality Impacts of CSO Alternatives." For each waterbody, uses were identified and data was reviewed to see if each use was being attained. "Attainment" was defined as bacteria concentrations at or below state regulations for that use (primary = swimming; secondary = boating). Each treatment alternative was then ranked high, medium, or low for (a) water quality after treatment and (b) cost. Cost was factored both for capital expenditure and annual operating cost, as well as present worth.

Then, siting issues were considered for the top-ranked alternatives. Each of the five siting parameters - site availability, constructibility, short-term community impacts, long-term community impacts, and environmental impacts - was ranked according to constraints on implementation. Mr. Walker did not review the ratings for each technology, but asked citizens to review the handout at home and to contact Mr. Kubiak with any questions.

Moving along to the recommended plans, Mr. Walker referred to the table entitled "Comparison of Recommended Plan and Other Control Alternative for Alewife Brook." He stated that the recommended plan for Alewife Brook is sewer separation upstream of the CAM004 outfall. This separation will drastically reduce the number of overflow events down to about four per year.

Two benefits of this project are that (1) no above ground site is needed for a large tank or operations building and (2) it is consistent with the separation approach used by both Cambridge and Somerville. Mr. Kubiak added that this is much different from the 1990 CSO Master Plan that recommended a $53 million pipeline to capture and hold a massive amount of flow to be pumped into the Alewife facility. By separating in one area, this approach relieves the burden at each overflow site along the Alewife Brook.

Ms. Keough asked if the amount of stormwater delivered to the Brook would change. Mr. Kubiak said that there will be a net reduction in coliform of over 20 percent, but the percentage derived from stormwater would be higher than the current level. Mr. Walker said that there is an ongoing scientific debate over the public health ramifications of sewer coliform (containing human waste) versus non-human derived stormwater coliform. This makes no difference for beach closings, but it may have an effect on overall human health risk.

Dan Greer, of Cambridge Citizens for Liveable Neighborhoods, asked for the precise location of the CAM004 outfall. Mr. Walker said that the regulator is near the Concord Avenue rotary; an outfall conduit runs behind the Alewife MBTA station, and discharges in the up-stream end of the brook, behind the parking garage spiral that is not used. Alex Strysky, of the Cambridge Conservation Commission, said, based on that information, it

is not, strictly speaking, in the New Channel (Little River), as shown on the display map.

Mr. Strysky asked if sewer separation would be carried up to the regulator. Mr. Walker answered that flow upstream of the regulator would be separated.

Mr. Greer then asked if during a heavy storm the water in Little Brook had a reverse flow. He also asked if any hydraulic study was available. Mr. Walker was not aware of any such study; he was unsure about the reverse flow question. He added that one concern raised during the spring meetings was the effect on low flows in the Alewife Brook that re-routing flow to Deer Island would have. Mr. Walker said that with the chosen treatment technology, more stormwater would be send into Alewife Brook, but as the depth in dry weather is so shallow, additional flow may actually be beneficial. He added that additional stormwater would be added only during a non-CSO storm event. For a three-month storm event, the flow will be increased by only 1 percent of current flow. The treatment makes a significant difference in the number of outfalls, but not in net stormwater content. Mr. Kubiak added that the Brook has a very heavy stormwater contribution generally.

Mr. Greer asked if the additional flow would have any effect on the Brook's salinity. Mr. Walker replied that he did not know, but would research that issue.

Mr. Greer asked about the watershed and drainage area feeding CAM004. Mr. Walker said that Fresh Pond Parkway toward Huron Avenue, Concord Avenue toward Harvard Square, and Denehy Park are all contributors. Ms. Roorbach offered to send Mr. Greer a relevant map.

Coral Damkroger, a Somerville resident, commented that in the ranking of alternatives, cost issues seem to have outweighed water quality issues.

Mr. Greer and Mr. Strysky mentioned that Denehy Park is a semi-artificial wetland, which receives stormwater runoff from Denehy and then goes into a sewer on Sherman Street. There was once a plan to connect it to the Alewife Conduit, but a railway right-of-way became an issue.

Mr. Greer said that there is a groundwater plume from the old dump toward Fresh Pond that is pumped into a sewer pipe, and somehow used to equalize Denehy Park, which is still settling at a rate of one inch per year. He added that active methane vents are present.

Mr. Greer asked about the capacity of the system during a specific frequency of storm events. Mr. Walker said that SOM002A, SOM003 and SOM004 active only in a storm event larger than a one-year storm.

Resuming his presentation, Mr. Walker referred to the graphs in the handout showing a comparison between the expected pollutant reductions achieved by the recommended plan and the total sewer separation option. The recommended plan (sewer separation at

CAM004) is termed "M2."[4] While both options would effectively eliminate CSO contributions in a three-month storm event, the pollutant load from stormwater would be increased with sewer separation, while the M2 alternative would have a negligible effect on stormwater. Mr. Walker stated that the graph title is a misnomer - it actually shows the predicted pollutant load going into the river, allowing +/- 4 overflows annually at approximately equal to a three-month storm event. Fecal coliforms are measured by "number per hundred milliliters," so the scale on the vertical axis is measuring "counts."

The next handout compares annual loadings of total suspended solids, biochemical oxygen, and total phosphorus for both FPC and the M2 treatment option. CSOs contribute such a small amount of these pollutants that expensive CSO treatments would be ineffective at removing these loads.

Mr. Kubiak said that total elimination of CSOs has a very high associated cost, as well as extensive, although short-term, neighborhood impacts. Alewife Brook is special because of the high stormwater content, and also because of system optimization work (both planned and in progress) by Cambridge and Somerville over the next decade. The MWRA's chosen control technology is not the first but actually the third or fourth step in flow/pollutant reduction; there will also be other steps taken over time. The Authority, along with DEP, promotes this type of in-system solution in place of large-scale treatment plant construction.

Mr. Walker said that the CAM004 solution will cost less than $5 million; other proposed technologies would cost close to $50 million.

Mr. Walker and Mr. Kubiak said that there was considerable debate during the summer over the appropriate weight to be given to improvement in water quality versus technology cost. These discussions occurred during meetings with about 50 people at a time, representing the engineering firm, government agencies, municipalities, environmental groups and neighborhoods.

Ms. Marx added that the Authority looked at the entire CSO system and did actively look for the areas where it could get the biggest return for its investment. Priority for a high level of control was given in areas with active shellfishing or beaches.

Mr. Strysky asked about the statistical significance of the difference in FPC. Mr. Walker answered that on an annual basis it does seem that the recommended alternative buys less treatment. These figures were calculated by an estimation of flow multiplied by the concentration to get area-wide average concentrations. There is quite a bit of storm-to-storm variation. There is a real difference in a 3-month storm, because the number of overflows will be decreased. Mr. Kubiak said that this is a limitation of this type of annual chart, because the assumption is that the system receives a bigger load on a continuous basis, when in fact bigger storms are heavier contributors.

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[4] M2 is the second "mixed" alternative presented in the spring meetings.

Mr. Walker, responding to a question from Ms. Damkroger, said that this chart shows the total load into Alewife from all sources, which includes all outfalls as well as existing stormdrains. The M2 option means that there would be zero annual overflows for three-month storms. Ms. Damkroger then asked why "4 to 7 overflows" was listed under the M2 option. Mr. Walker answered that a three-month storm event is a specific statistical number referring to a quantity of rainfall within a specific timeframe, which occurs at a frequency of four times annually. Typical years may have more than four storms greater than the three-month storm statistic. The M2 treatment technology chosen would have no overflows for a three-month storm, but would allow 4 to 7 annual overflows during heavier storms. During the modeling process, a number of alterations were made to come up with a "typical" year, which might include a storm lasting two days, one day of dry weather, and then another storm event, which would affect overflow frequency.

Mr. Greer said that the Alewife is so channelized and unnatural now, and he asked if there were any historical flow information for the waterbody. Mr. Walker replied that there was no such data to his knowledge.

Mr. Greer asked if it were correct to say that approximately 10 percent of the total system-wide CSO control monies will be spent on Alewife Brook and that large-area storage will not be used anywhere in the system. Mr. Walker said the Authority did not try to avoid using storage; it just turned out that the technology proved to be less cost effective or less feasible than other strategies, particularly separation. However, the biggest storage facility being proposed is a 4.8 million gallon tank at Somerville Marginal for three-month storage.

Mr. Walker then reviewed similar data sheets for the Upper Mystic River. The strategy here will be separation of SOM007 and continued treatment at Somerville Marginal. SOM007 is in a relatively small tributary area, and is inactive even in a one-year storm. There are a few combined manholes in this area. A stormwater drain and a sanitary pipe enter into the same manhole, but at different elevations. During big storms, the stormwater pipe floods and a mixing of stormwater and sewer flow occurs. In this case, "separation" really means erecting a barrier to prevent this mixing. The area of Shore Drive seems to be where the overflow occurs.

One option considered at SOM007A was to provide pumping, against the tide, for some storm events which occur during high tide. It was decided that this was too costly. The recommended plan will allow some flow to go through the facility upstream of the Amelia Earhart Dam at SOM007; this storage at Somerville Marginal will reduce the number of treated overflows from 11 to 3 on an annual basis. MWR205 (Somerville Marginal) is on the border between the Upper and Lower Mystic waterbodies.

The proposal calls for a storage tank that would capture the three-month overflow volume. Flow in excess of that capacity would receive some level of sedimentation, plus disinfection, screening/ floatables control and dechlorination treatment before being discharged.

Mr. Walker added that the figures given are for a worst-case scenario of a major storm

occurring at high tide, giving the maximum possible overflow at SOM007A. If a three-month storm occurred at low tide, there would be no overflow at SOM007A; SOM007 will be eliminated.

Mr. Strysky asked why no fecal coliform contributions from boundary conditions were shown on the graph. Mr. Walker replied that, while there is some boundary contribution from the Alewife Brook and the Malden River, (1) it is too small to show at this scale; and (2) by the time the coliform reach the overflow area, they have died. He said that for TSS and BOD (which are more stable pollutants), there is boundary contributions.

Mr. Kubiak asked Mr. Walker why some CSO contribution would remain with the recommended treatment (storage at Somerville Marginal). Mr. Walker said that the facility was sized for the amount of flow from MWR207. During a high tide storm some flow will go out via SOM007A, but it will have received some disinfection treatment. He said that it would go to zero if the Master Plan was changed. All other options for the Mystic/Chelsea Confluence included a flow-through screening. However, MWR205 sometimes shows a dissolved oxygen deficit. In order to control that problem, the storage option was chosen. Therefore, the conditions at MWR205 and not at SOM007 drove the alternative selection process.

In the annual load from other solids, CSOs show up only for DO, not TSS or BOD. The significant contributors are boundary flow from the Mystic and Malden Rivers, and stormwater flow.

In response to a question from Ms. Keough, Mr. Walker said that Alewife and the Malden River were included in the boundary data for the Upper Mystic River receiving water. The Alewife has no boundary measurement because the entire watershed and drainage area was included in calculations. He added that a full hydraulic study of the area has been requested.

Ms. Damkroger asked if that would give stormwater an exaggerated influence in the loadings data. Mr. Kubiak replied that the components in each are dissimilar: boundary flow is generally agriculturally-derived, while storm runoff is of urban origin. Mr. Walker added that boundary conditions were defined by average concentration and flow from the Malden River. In the Upper Mystic River data, the CSOs contribution on the chart includes only SOM007 and SOM007A, not the CSOs entering upstream in the Alewife Brook receiving water.

Mr. Walker said that FPC were used for calculations. The question is would CSO impact really change this boundary condition. For fecal coliform, there was very little impact on this scale (because of coliform die-off), nor with total suspended solids. Mr. Kubiak said that the MWRA has jurisdiction of CSO, not of all pollution sources (e.g., boundary conditions). Unfortunately, because a hydraulic study has never been done for this area, it is impossible to construct a computer model to predict upstream coliform levels.

Ms. Damkroger asked if it were correct to state that, for the stormwater component, the recommended treatment does not change the totals much from the future planned

conditions. Mr. Walker said that is correct. He added that what is proposed for Upper Mystic CSO controls will not affect the total loads coming in because the CSO component of these loads are so small that they cannot be measured. The MWRA's CSO control process addresses wastewater, not stormwater flow.

Mr. Greer asked if the MWRA was responsible for the water quality of the receiving waters or just the pollution that comes from its CSOs. Mr. Kubiak said that it is a bit more complicated. The Authority alone is accountable for CSOs and the pollution they cause, but the responsibility for water quality rests with many parties, including the MWRA, the Mass. Highway Dept., municipal DPWs, and others who own and affect property in and along the waters. Mr. Kubiak said that the MWRA is accountable for the portion of pollution that is actually the ratepayers' responsibility.

Ms. Damkroger questioned why the MWRA is not responsible for stormwater since it flows into the waters through Authority pipes. Mr. Kubiak said that he could not recommend a CSO control alternative that would have a net negative affect on water quality. Regulations for handling stormwater are constantly evolving. The standard practice today is to separate sanitary and stormwater flows. Currently, the technologies used to handle stormwater are not the same technologies used in CSO control; stormwater control focuses mainly on source reduction.

Mr. Greer asked if the boundary flow coming from outside the system could be reduced. Ms. Marx said that towns outside of the combined communities (for example, Belmont) are not allowed to send their stormwater into the Authority's pipes. The only alternative for those communities is to develop some type of local control to either reduce the quantity or improve the quality of that flow. Ms. Marx added that some of the pollutants (particularly bacteria) arrive in the system via illicit connections and those connections can be eliminated.

Mr. Kubiak said that in the urban areas, treatment methodology is more clear because the problems, the source locations, and the jurisdiction are more clear. For example, the sources of stormwater flow into South Dorchester Bay are well defined, and therefore the potential exists for its reduction. The MWRA's chosen CSO control technology there is for sewer separation. It is a costly option, but because there is such great potential for dramatic improvements in water quality in a critical-use area, the financial cost is justified.

In response to a question from Ms. Keough, Ms. Marx said that no one state agency oversees all of the pipes. There is an EPA regulation for stormwater under NPDES in effect for cities of 100,000+ residents, but its only requirement is the identification and initial sampling of the storm system. That regulation will move toward smaller communities over the next few years. It is unclear what future requirements will be.

Mr. Strysky said that the state does set water quality standards but it does not include a permitting process. These waterbodies under discussion tonight are in violation of those standards. Mr. Kubiak said that was correct, and added that those standards are enforced by DEP, but they have not directed attention toward stormwater contributions

to date.

Mr. Walker resumed his presentation with the Somerville Marginal charts. He said that the MWR205 outfall goes into the Mystic/Chelsea Confluence receiving water, essentially the Mystic River downstream of the Amelia Earhart dam, and also the Chelsea Creek. There are other pollutants entering those receiving waters, but the focus tonight is on Somerville Marginal.

The recommendation is that the existing screening be replaced with a storage facility sized to capture the volume of a three-month storm for the overflow amounts that currently flow out at MWR205. This facility would be a 4.8 billion gallon tank which could be below grade with an above-grade operations building. As flow comes in, it would get coarse screening and then enter the tank. As the tank filled, flow would continue to enter the tank, settling some solids within the tank; any flow that exited the tank would be disinfected and dechlorinated before being discharged. This flow would be discharged at MWR205, or at SOM007A if it were a high-tide storm event. Both of these outfalls would be downstream of the tank.

Mr. Walker said that since the existing facility must be moved because of an I-93 ramp relocation, the MWRA had an opportunity to change the technology used at the facility. A dissolved oxygen deficiency was identified at MWR205. The Authority wanted better contro! of the BOD-type pollutants, so the storage options was chosen.

Preliminary sites for the replacement facility are in the vicinity of the existing facility or along the pipe towards the river. Gretchen Roorbach said that a new I-93 interchange will force impacts there anyway. The MWRA is coordinating with the Massachusetts Highway Department. Ms. Marx said that an ideal location for the facility is under the highway ramp; the feasibility has not yet been ascertained.

Mr. Walker referred to a pollution reduction graph for the Mystic/Chelsea Confluence. The CSO contribution is fairly small, but the proposed option would gain a greater reduction in pollutant loads than other alternatives.

Mr. Kubiak commented that on the graph, the nutrient levels are very low. He asked if this indicated that no nutrient issues are present, or that the wrong scale was used for data presentation. Mr. Walker said that when determining attainment of uses, oxygen deficiency (which has a correlation to nutrients) was reviewed. He said that his belief is that the data indicated nutrients were not an issue, but he will recheck the scale.

Mr. Strysky asked if CSOs were a large contributor to nutrients. Mr. Walker said that the nutrient concentration in CSO would be somewhat higher than in stormwater. Mr. Kubiak said that the total flows must also be considered. Mr. Walker added that to be truly accurate, other nutrient loadings (including nitrogen) should be investigated as well, since they could be the more limiting nutrients. He stated that these graphs were included to give a general idea of the relative impacts; the actual Master Plan includes more technical data.

Mr. Walker then turned the meeting over to Mr. Kubiak to discuss implementation of these technologies.

Mr. Kubiak said that a great deal of data collection, sampling and analysis were done to arrive at the water quality information. All of this information is available in the various documents (listed below) available from the MWRA and at local repositories.

June 1994	CSO Water Quality Report [details how CSO alternatives were initially identified]
September 1994	Baseline Water Quality Assessment
September 1994	Draft CSO Conceptual Plan and System Master Plan [evaluation of recommendations]

Mr. Kubiak said that the CSO program is just one component of the assessment of the entire MWRA wastewater system (hence System Master Plan.) The following issues were also reviewed: interceptor system and its capacity for treatment; hydraulic improvements; inflow/infiltration; as well as reassessing all future needs and physical capacity. The purpose of this analysis was to come up with a overall framework for improving the wastewater system. All CSO recommendations were made with the understanding that all areas of the system would be improved.

Mr. Kubiak said that the MWRA has recommended, system-wide, approximately 22 projects. The Draft plan will be finalized in December 1994 (official comments will be accepted through November, although the Authority welcomes all comments at any time). The next phase will be Facilities Plan and Environmental Review. This process will take approximately two years. It will require much finer detail, looking at specific environmental, construction and siting impacts, and will be under the auspices of DEP and MEPA. Future steps will include design, then construction based on these recommendations. It will take about 15 - 20 years for full implementation of these recommendations.

By way of example of this on-going review process, Mr. Kubiak said that today's papers reported that only three batteries of secondary treatment capacity, instead of the originally recommended four, will be needed at the Deer Island treatment facility. He added that National Pollutant Discharge System (NPDS) Permit Renewal process is ongoing and the MWRA must demonstrate that the effluent quality permit requirements can indeed be met. Massachusetts Bay water quality will be measured for many years to determine if those standards are being met.

Mr. Strysky asked if MEPA will review all of the projects in the System Master Plan at once or look at each project separately. Mr. Kubiak said that the MWRA is still thinking about it. Some of the projects may not need MEPA review. For the projects which would require it, the MWRA may break them into groups by related issues or geographic areas.

Ms. Marx said that there are two levels of review that the Authority wants from MEPA.

The first is on water quality goals - was the right level chosen? This is an opportunity to use the ENF process. There is also a desire to have the DEP's "partial use" process run in tandem, to help speeds things up. If the processes did not run in tandem, there would be two public review processes, one following the other. With that schedule, a possible scenario is that the MWRA would go through FP with certain recommendations that end up being unusable in the ENF, forcing the Authority to begin FP anew with a different strategy. Ms. Marx added that the logistics of this tandem schedule must be worked out. Mr. Kubiak said that the partial-use standard must be obtained for each and every receiving water that will continue to receive discharges with the recommended CSO treatment plan.

Mr. Greer, speaking as a watershed activist, commented that if the MWRA could find a way to fund a hydraulic study of the Alewife/Mystic area, it would be a great contribution. The MWRA is the biggest organization involved in the watersheds, and if the MWRA does not undertake this task, no other group is waiting in the wings. It would be a definite public good. Ms. Marx questioned the status of a proposed MDC-Army Corps of Engineers study of the Alewife.

A question about the physical impacts on the Alewife reservation land was asked. Mr. Kubiak said that under this sewer separation proposal, new stormwater drains or sanitary sewers would be built in certain Cambridge neighborhoods. Ms. Marx said that the Authority will try to use the existing outfall. One-inch coarse bar screens must also be placed at all of the existing outfalls, in the existing manholes. It is possible that very localized construction would occur at each outfall location along the banks of the Alewife Brook. For the most part, the CAM004 separation will not involve construction along Alewife Brook.

In response to a question from Mr. Strysky, Mr. Walker said that the annual overflow frequency is low enough to use manually-cleaned screens. These are bars inside a manhole which catch objects, and are raked by hand after a storm event. One of the initial Level III alternatives was using coarse screens at all outfalls. These are susceptible to clogging if the CSOs activate frequently. They also require maintenance following storm events. The mechanized system is better for more frequent outfalls, like CAM002 and CAM004. The mechanical rake can be placed anywhere between the regulator and the outfall.

Mr. Greer asked if anything could be done to remove the mushroom-cap pipes in the park. Mr. Walker said that there is a regulation stating that the top of the manhole must be above the 100-year flood elevation, to prevent a discharge onto the ground in the event of such a large storm. Ms. Marx added that in this area, they may also be using that area of the manhole for excess capacity.

Mr. Kubiak, responding to a question about the timetable, said that it will proceed fairly slowly. There is no end date for the on-going programs. The slowness is a result of both the long lead times of the technical studies, and also limited funding for communities. Cambridge and Somerville have SOPs and other projects that have immediate results. Mr. Walker said that Cambridge is in Phase 6 Sewer Separation, involving pure separation

east of Harvard Square (the tributary area to CAM011). Phase Six is expected to be completed in year 2000; current plans call for Phase Seven to start in 2001, depending upon available funding. The planning for Phase Six began 10 years ago, but construction just started. He added that Cambridge does have some combined manholes. Cambridge DPW will not open a street specifically for that problem, but it will be fixed if they happen across one.

Carolyn Mieth, a Cambridge resident, asked how the determined uses were chosen. Mr. Kubiak said that both existing and desired uses were considered. Then water quality parameters related to those uses were reviewed to see how much the water had to improve in order to meet those standards. Ms. Marx said that during the May and June meetings she asked for input as to what uses the communities felt were important and also input into defining the current level of those uses.

Mr. Kubiak said that watershed planning efforts may help define goals and even CSO control goals. Watershed planning efforts could also change the CSO control goals. The MWRA is participating in EOEA watershed planning. MWRA would provide technical support in those efforts. Ms. Marx said that the goal is to transfer this knowledge around the state by taking advantage of successful approaches and encouraging the use of these approaches in other locations.

Ms. Mieth asked if the CSO program will help bring back the Alewife fishes. Ms. Marx replied that although she is not a biologist and does not know the other parameters for the fish's habitat, the pollutants from stormwater (particularly BOD) would need to be reduced before the fish population will return.

The meeting closed at 9:15 PM.

MWRA Public Meeting
Combined Sewer Overflow
Conceptual Control Plan & Draft System Master Plan
Tuesday, October 25, 1994
Powderhouse School, Somerville
Alewife Brook & Mystic River

Attendance

Janey Keough	Save the Harbor/Save the Bay	68 Charnwood Rd., Medford
Joe Favaloro	Exec. Dir., MWRA Adv. Bd.	27 Franklin St., Somerville 02145
Charles McCarthy		56 Garrison Ave. Som
Pete Ralston		17 Rear Endicott Ave #2, Som
02144		
Coral Damkroger		901 Broadway #1, Som 02144
Meredith Zona		81 Wachusett Ave., Arlington
02174		
John Reinhardt	Som. Conservation Commission	20 Appleton St., Som 02144
Lisa Brukilacchio	Som. Conserv. Comm.	16 Holyoke Rd., Som
Pam DiBona	Som. Community News	50 Walker St., Som 02144
Thom Donahue	DPW - Engineering Div.	Franey Rd., Som 02145
Rich Delaney	MAB	Boston
Margo Hrechette	Somerville 7th grade teacher	53 Lake St., Arl 02174
Joe Loyacano	Director, Arlington Public Works	
Dan Geer	Cambridge Citizens for Liveable Neighborhoods	
	PO Box 244, Cam. 02139	
Alex Strysky	Camb. Conservation Comm.	57 Inman St., Cam 02139
Walter Johnson		14 Wright St., Cam 02138-1704
Carolyn Mieth		15 Brookford St., Cam 02140
John Krajovic	MDC Planning	
Lise Marx	MWRA	
David Kubiak	MWRA	
Gretchen Roorbach	MWRA	
Elle Thomas-Smith	RVA, Inc., Boston	108 Summer St. #1, Som 02143

MINUTES OF MEETING

Meeting Date/Time:	October 13, 1994
Location:	MDC Conference Room, 8th Floor
Subject:	**Draft CSO Conceptual Plan and the MDC**
Attendees:	Lise Marx, MWRA/CSO Julia O'Brien, Director, MDC Planning David Queeley, MDC Planning Paul DiPietro, MDC Engineering Gretchen Roorbach, MWRA/CSO Daniel Driscoll, MDC Planning John Krajovic, MDC Planning

Minutes:

I. CSO Conceptual Plan Development Master Planning Process

A brief overview of the process utilized for developing the Draft CSO Conceptual Plan was presented by Lise Marx. The recommended CSO control strategy for each receiving water was discussed. This overview explained the use of cost, water quality/performance and siting issues to determine the appropriate measure of CSO control.

II. Specific CSO Siting Issues

Charles River Basin:
The MDC recommended caution with the construction of any structure in the Charles River Basin reservation. Specifically, the Charles Basin is a nationally registered Historic District and any construction would be scrutinized.

The sensitivity of the locations of facilities at CAM009 and CAM005 was discussed. The plans for a public dock by the Anderson bridge was evaluated as a potential structure near the CAM009 outfall which could potentially be designed to contain the CSO facility. However, it was pointed out that the site lines for tour boats at this location are not good and a public docking facility could provide

a hazard to boat traffic on the River, i.e. crew boats. As a result of the visibility issues, another site between Anderson Bridge and the Weeks pedestrian bridge is being evaluated. (Russell Cushman, owner of Charles River Tour Boats, is researching the possible construction of a public docking facility in this vicinity).

Alewife:
The MDC raised concerns of the proposed separation of CAM004 as the preferred plan for the Alewife system. Given the ongoing wetlands pilot program and potential Master Plan for the Alewife, John Krajovic thinks the MWRA needs to be prepared to justify a decision to not separate the area. Increased public awareness of this system and the communities interest in cleaning-up the brook may pressure the MWRA to reexamine the separation of this system. Lise Marx discussed the cost difference between the recommended plan and separation as well as the issue of stormwater quantity as two justifications for the proposed plan. In addition, the existing MWRA facilities along the Alewife Reservation was mentioned as a concern that the MDC would like to see addressed during their Master Planning for the Reservation.

South Dorchester Bay:
Paul DiPietro raised concerns of the volume of offensive solids washed onto Tenean Beach during recent events. He is particularly concerned with the operation of the Commercial Point CSO facility and hopes that the upgrade of the facility will include additional screening of flows in the area as well as finer mesh screens. Lise Marx responded that the solids on the beach may have been caused from illegal connections to stormwater pipes downstream of the facility.

North Dorchester Bay:
The location of a screening/disinfection facility in the vicinity of BOS080 was discussed. Lise Marx stated that the Authority is hoping to be able to use property within Conley Terminal or other industrial sites and not adjacent MDC park land. Julia O'Brien suggested that the pump house near Castle Island (ownership is unknown and disputed) could be a potential site for the facility. Lise said that we would investigate.

Stony Brook:
The aeration compressors in the Fens Gatehouse for the Charles River was discussed. Paul DiPietro wants the MWRA to maintain the compressors in the gatehouse if the facility is to be utilized for the screening/disinfection facility.

III. General Comments

The MDC questioned if there was an MWRA siting policy for choosing potential sites,

i.e. park land should be avoided, industrial land is first priority , etc. Gretchen Roorbach responded that the sites were chosen as a result of hydraulic considerations, existing pipe locations, and park land was only considered as a last resort.

Distribution:

Attendees
Dave Kubiak
Maggie Debbie
Mike Collins

MINUTES OF MEETING

Meeting Date/Time:	October 26, 1994
Location:	39-3B Conference Room
Subject:	Relocation of Somerville Marginal CSO Facility
Attendees:	Gretchen Roorbach, MWRA/CSO David Parker, MWRA/CSO Phil Carbone, MWRA/Collection System German Nieto, Mass. DPW/Highway (MHD) Adrienne MacNeill, Vollmer Associates

Minutes:

I. I-93/Mystic Avenue/Route 28 Interchange Preferred Plan

Vollmer Associates presented the plan for the I-93/Mystic Avenue/Route 28 Interchange plan. The proposed alignment for an access road to Assembly Square bisects the existing Somerville Marginal CSO facility. A new location for the facility has yet to be determined.

II. Relocation of Somerville Marginal Location Discussion

· Land Ownership
Phil Carbone pointed out that the land area within the facilities fence is owned by the MWRA. He suggested a land swap with the Massachusetts Highway Department (MHD) for the relocated CSO facility.

· Costs
Vollmer Associates estimated the relocation of the facility to cost between $4-6 million. This estimate was based on the costs for Commercial Point and Fox Point. Dave Parker stated that the CSO Conceptual Plan expands the facility to include 3 month storage and the estimated cost from M&E is $24 million. German Nieto, MHD, pointed out that the total estimated cost for the proposed interchange is $48 million (including $4-6 million for relocating the facility).

In addition, German Nieto wondered which agency will be responsibile for the cost of the relocated facility. No answer was suggested by either agency.

· Utilities

Phil Carbone raised the issue of relocating existing underground facilities. He was particularly concerned with plans for a Somerville brick drain pipe that is in poor condition and the MWRA interceptor. The Project Manager form Vollmer Associates admitted that she was a transportation engineer and was unfamiliar with the utilities. However, she mentioned that the brick drain will be analyzed for reconstruction as part of the project.

· Land use plans for the area

The alternate sites on Foley Street (H.K. Porter Inc. Tool Manufacturer) and Sturtevant Street were discussed. It was pointed out that the City of Somerville has hired a consultant, formerly Somerville Engineering, to develop a revitalization plan which will increase public water access in the Foley/Sturtevant Street area. It was further suggested that the proposed alternate sites may not be in accord with the City's plans for the area.

· Scope of Work for Final Design

The final design scope of work is currently being developed by the Mass. Highway for the entire interchange and CSO facility relocation project. To adequately incorporate the Authorities issues, German Nieto requested a submission of our scope of work for the relocation by the middle of next week [November 1-4].

Phil Carbone stated that the relocation of the facility will require a separate scope of work and that numerous design issues are critical, i.e. ventilation, access, lighting, etc. Phil also questioned which agency would oversee the design and implementation of the relocated facility. MHD stated that they would be responsible for the relocation but would state in the contract that the Engineer would have to work closely and in cooperation with the MWRA. Phil further questioned who would select the Engineer. German Nieto answered that the MWRA would have a person on the selection committee, but would not have veto capabilities.

The outcome of this discussion was that Gretchen Roorbach would put together a Scope of Work for either Dave Kubiak or Mike Domenica regarding the relocation of the facilities which would be added verbatim to the MHD Final Design Scope of Work.

Distribution:

Attendees
David Kubiak
Lise Marx
Maggie Debbie
Mike Hornbrook
Mike Collins

MASSACHUSETTS WATER RESOURCES AUTHORITY
Charlestown Navy Yard
100 First Avenue
Boston, Massachusetts 02129

Telephone: (617) 242-6000
Facsimile: (617) 241-6070

Briefing on
Combined Sewer Overflows and System Master Plan
for the
Union Park Neighborhood Association

November 2, 1994

MINUTES

David Kubiak, Senior Program Manager for the MWRA, opened the meeting and introduced the other presenter, Greg Heath, of the consulting engineers, Metcalf & Eddy, Inc. Mr. Kubiak said he and other team members were at the meeting to listen to and learn about the history of issues surrounding the Union Park Pump Station.

Mr. Kubiak started by describing the CSO and System Master Plan project. He listed the CSO communities - Boston , Cambridge, Somerville and Chelsea - and defined the CSO problem. He said the MWRA has to comply with applicable state and federal laws and is also operating under a federal Court Order. He noted that many solutions to the problem have been attempted over the years, the most recent of which called for 14 miles of deep rock tunnels at a cost of $1.4 billion. The MWRA has been reassessing the existing conditions and now believes that a smaller project will address the problems.

Mr. Kubiak said planning on this project has been underway for about two and a half years. Many neighborhoods - but not all of them - have been involved in elements of the planning. While he apologized for not having involved the Union Park Neighborhood Association in this process before this evening he pointed out that to date, planning had focused on water quality. The MWRA had just recently shifted its focus to site-related impacts.

Mr. Kubiak said the draft plan was released on September 30 and calls for facilities to be employed throughout the CSO communities. Near Union Park, the plan calls for a storage facility or tank that would treat combined sewage that is currently released to Fort Point Channel.

Mr. Heath used a map to show how the Union Park Pump Station (UPPS) relates to the program. CSOs compose a large potion of the flow into Fort Point Channel receiving water. The UPPS provides flood control for the entire South End, which is a low-lying part of the city. Without the pump station, many residences in the area would be flooded in wet weather. The pump station also takes some combined sewage and pumps all of the flows

into the Roxbury Canal Conduit, which flows into the Fort Point Channel through BOS 070. This is the single largest untreated CSO in the system.

The planners looked at several alternatives to a tank at Union Park. The first is sewer separation. This is the most difficult and riskiest solution to implement since it would involve reaching into homes to separate internal plumbing. Other possibilities included a detention/treatment facility at UPPS (storage similar to existing MWRA facilities at Prison Point and at the BU Bridge (Cottage Farm), and drawings and plans already exist for this effort); a flow-through and treatment facility; and in-receiving water control (booms set up in the channel to catch floatable pollutants discharged after a storm).

Mr. Heath referred to a chart depicting bacteria loadings after a 1-year storm in Fort Point Channel/Downtown Boston. The bars are correlated with boating and swimming standards in Ft. Point Channel. Sewer separation would eliminate CSO discharges but increase stormwater to the channel. The recommended alternative, detention and treatment, provides a higher level of CSO control and meets the swimming standard, although some stormwater will still be discharged.

A second chart shows the how the pollutant loadings to Fort Point Channel would be reduced by the recommended plan.

Mr. Kubiak said the plan for the neighborhood involves improving water quality in Fort Point Channel. To do so, the MWRA can build a tank underground and kill the bacteria and remove other pollutants.

Mr. Kubiak said that the proposed facility did not necessarily have to be built adjacent to the existing Union Park Pump Station and that alternative sites may exist. He was not aware of how the timing would correlate with neighborhood plans for Union Park.

A resident addressed the meeting, translating for the Greek speaking people in attendance. He said these plans factor out the people who live around the Union Park Pump Station. Many of them don't speak English and were not aware of these plans. They have noticed cases of leukemia and asthma in the neighborhood and feel that some of them are due to the pump station. They understand the need for a cleaner harbor, but don't want to pay a price for this benefit. The CSO project is a good one, but the residents want no expansion of the existing facilities.

The resident/translator said the neighbors have suffered from a litany of broken promises on the part of Boston Water and Sewer (BWSC). The noise of gravel and tractors being moved has troubled them for years. Now BWSC has agreed to remove its vehicles and dedicate some of the land to a park. Only the issue of hydrant storage remains a problem. Then the residents were told in September of the possibility of the MWRA building a tank under the property. The neighbors believe that the tank should go somewhere near the expressway since construction will take place there in any case (for the

Central Artery Project). To have a positive relationship with these people, the agencies should (1) give up the hydrant storage space and (2) build the holding tank somewhere else.

The speaker said the neighborhood is concerned about environmental problems but after two decades of suffering, little trust of public agencies exists.

Mr. Kubiak said it is possible that the tank will be built elsewhere, but the hydrant issue has to be resolved with BWSC. John Sullivan of BWSC said he had met with the group two weeks ago and he was beginning the process to deal with the hydrant removal request.

Vincent Ragucci of MWRA Public Affairs said the CSO project includes 22 projects or facilities in 4 communities. The Authority is operating under a federal court order and looking for ways to end water pollution. No plans have been finalized. Mr. Ragucci briefly explained the Facilities Planning process, which will begin next spring and involve meeting with neighborhood organizations like this one.

A resident asked about the potential for odor from the facility and if the MWRA has to conduct a health study. Mr. Kubiak said the facility would have to be very large, which is a negative for the site. Other negatives and positives have not been assessed yet, and the team will look at other locations. This phase of the study just identified water quality problems and solutions, then listed potential sites. In January, the MWRA will begin the Facilities Plan, which should take about 18 months. If this kind of facility can be located away from neighborhoods, the Authority prefers to do so.

Michael Papadopoulos, President of the Union Park Neighborhood Association, said the group was pleased to learn the details of the proposal, but unhappy that they learned of it by accident. The neighborhood wants no more projects, save the park. Expanding the UPPS could cause odor and pollution. The neighbors want to participate in the process, not fight, but they don't want any facility. Mr. Papadopoulos asked if the MWRA needs city permits to construct such a facility.

Mr. Kubiak said this is a state process. Boston's objections would have more political than legal weight in the review effort.

Mr. Papadopoulos asked for a comparison of this proposed facility with Cottage Farm. He pointed out that the need to keep the site available for some long-term plan might hold up any progress the neighbors could make toward the park. He expressed the hope that the Authority would not spend months wasting the neighbors' time.

Mr. Kubiak said if the MWRA can relocate the facility elsewhere with the same water quality benefits, he would hope to do so.

City Councillor James Kelly said the MWRA is inheriting a legacy of distrust built on

promises broken by other city agencies. Many of the neighbors bought homes expecting a park to be built there more than 20 years ago; instead, they woke one day to find construction for an expanded sewer treatment plant. He suggested that Union Park is the worst possible site for a large new facility given the proximity of the homes. New construction would have a devastating impact on the community. This neighborhood cannot afford one more additional facility, no matter how worthy.

Archie Williams, who has been working on the park effort, said that the MWRA's plans could delay implementation of the park.

Mr. Kubiak said it could take a year or more to make a decision on siting a facility at Union Park and 5 to 10 years for construction to proceed. There is no reason why the park should be held up for the MWRA's plans.

Another resident suggested that if the MWRA goes forward, it should just buy people's homes so they can move away. There are too many impacts now: a large housing development, and the expressway add to the annoyance caused by the pump station.

Mr. Williams said the residents of Union Park are constantly trying to protect the simple dignity and quiet enjoyment of their property. He asked if BWSC could hasten its decision process on moving the hydrants to get the park construction started without having to wait for another season.

Mr. Sullivan said he plans to bring the request back to the Acting Executive Director with some chance of being on the agenda for initial discussion at the November 16 BWSC Board of Directors meeting.

Mr. Kubiak reiterated his statement that a park could be enjoyed for many seasons before the MWRA could begin construction at Union Park if a facility is to be sited there. The earliest likely date for any construction could be as far as 10 years away after Facilites Planning, design and permitting.

Mr. Papadopoulos suggested that UPPS was no doubt an attractive site for the MWRA, but the BRA's original plans show a park on the site. The MWRA will not find any willingness to let it be used for another purpose; they would even like to get rid of the pumping station.

Mr. Sullivan said he understood the neighbors' feelings. BWSC is looking for other land to store the hydrants, but the problem can't be solved overnight.

Evelyn Riesenberg asked if the MWRA has conducted other meetings on the CSO plan in the South End. Mr. Kubiak said that siting has not been an issue up to this point. The plan proposes conceptual solutions and gives options in every case. Facilities planning will take up siting. Mr. Kubiak said meetings and planning will begin next spring, about

April 1 and take from 18 to 24 months. Ms. Riesenberg asked the MWRA to evaluate the proximity of residences to other wastewater facilities. Mr. Kubiak committed to doing that kind of review.

Mr. Williams said that everyone was suffering from past events, which meant there was no willingness to believe in promises. He asked Mr. Sullivan if members of the public could address the BWSC Board. Mr. Sullivan said he would have to check with the Executive Director. He was not sure if a land transfer would be handled in Executive Session.

Mr. Sullivan said he would talk to the Executive Director about approaching the board, which would probably want community input. In the meantime, BWSC has to find someplace to store its equipment. Four acres are needed for the equipment and catchbasin transfer operations. Environmental studies need to be done on prospective land and the materials cannot be located near sensitive receptors, such as schools.

Mr. Papadopoulos asked if the Union Park Neighborhood Association should send a letter to the MWRA detailing its objections. Mr. Kubiak said the minutes of the meeting would record their feelings. Michael Triantafillidis said that 60 signatures of neighbors had already been sent to BWSC.

A resident asked why treatment couldn't take place at the edge of Fort Point Channel. Mr. Kubiak said that much of the flow coming through the Roxbury Conduit is a large volume of stormwater. A facility would have to be enormous to handle all of the flow. In this case, the bacteria from CSOs is the greater problem. The facility has to move upstream with the problem.

The meeting was adjourned at 8:30.

Briefing on
Combined Sewer Overflows and System Master Plan
for the
Union Park Neighborhood Association

November 2, 1994

ATTENDANCE[1]

Tom Tinlin	Mayor Menino's office
James Kelly	City Councillor
Michael Papadopolous	Union Park Neighborhood Association
Michael Triantafillidis	120 Union Park St.
Dimitrios Sanxaridis	112 Union Park St.
Sergios Kosmidis	130 Union Park St.
Nick (?)	130 Union Park St.
John Triantafillidis	120 Union Park St.
Archie Williams	120 Union Park St.
Peter Bowne	130 Union Park St.
Evelyn Riesenberg	Boston Community Centers, 1010 Mass Ave., Boston 02118
David Kubiak	MWRA
Lise Marx	MWRA
Gretchen Roorbach	MWRA
Vinnie Ragucci	MWRA
John Sullivan	BWSC
Greg Heath	Metcalf & Eddy
Nancy Farrell	Regina Villa Associates

[1]Note: This is not a full list of attendees since everyone did not sign the attendance sheet.

APPENDIX C

LETTERS OF COMMENT ON THE DRAFT CSO CONCEPTUAL PLAN AND SYSTEM MASTER PLAN

Boston Redevelopment Authority

November 7, 1994

Lise Marx
CSO Program
Massachusetts Water
Resources Authority
Charlestown Navy Yard
100 First Avenue
Charlestown, MA 02129

Dear Lise:

Re: Draft CSO Conceptual Plan and System Master Plan

I am submitting herewith my general comments on the Draft CSO Conceptual Plan and System Master Plan document, which was sent to me a few weeks ago. (I apologize for not being able to submit these by October 28, but trust, nonetheless, that they may be helpful in preparing the final document.) On the whole, the 1994 Plan appears to be superior to the 1990 deep rock tunnel plan, particularly in its overall cost reductions as related to the benefits achieved. Except for one specific proposal, the Plan appears to propose reasonable measures to eliminate combined sewer overflows or to minimize overflows in a cost-effective manner consistent with the Harbor cleanup goals. Importantly, the data indicate that much of the pollution problem of the Harbor and its tributaries is not due to CSOs, but rather to stormwater discharge and upstream flow, thus pointing up the need to clean up these sources of pollution as well.

Our one concern involves the proposal to locate an underground storage tank (0.21 MG capacity) with an above-ground operations building potentially within the Charlestown Navy Yard (Upper Inner Harbor). Figure 4-14 (Vol. 2) seems to locate this facility within the Yard's End part of the Navy Yard. Although currently mostly vacant, the BRA does have plans for a major redevelopment of the Yard's End area, including a new biomedical research center, a hotel, and possibly a major tourist

[illegible]

attraction along the waterfront. The construction of a CSO facility here would have a significant impact on any successful redevelopment and clearly would not be acceptable. To the best of my knowledge, this proposal has not been reviewed with anyone at the BRA, especially the Navy Yard staff. Notwithstanding, we are willing to assist the Authority in finding a suitable alternate site in the area as more detailed planning proceeds, and preferably prior to publication of the final Plan.

Additional comments on the Plan documents follow:

Volume 1 - Recommended Plan

Pg. 4-19 It appears that the Plan assumes that each individual project would undergo environmental review, rather than the overall Plan as a whole. The problem of segmentation arises. It would seem more appropriate for the entire Plan to undergo one review as did the 1990 Tunnel Plan. Alternatively, a "major and complicated project" designation could be sought.

Pg. 4-20 It is indicated that design of higher priority projects would not begin until approximately nine months after completion of the EIR process, this period being taken up by procurement of design services. Why this nine month wait? Could not procurement occur during the final EIR process so that priority projects could be begun more expeditiously?

Volume 2 - CSO Strategies

Sect. 3 It would be very helpful if the text could explain the reasons the preferred alternative was selected and the other alternatives were rejected.

Table 4-1 For Southern Dorchester Bay, there appear to be errors in the CSO listings for the Recommended Plan.

Volume 3 - Infiltration/Inflow Strategies

Pg. 2-4 South System and CSO area peak infiltration rates in text do not agree with Table 2-2.

Sect. 5 The tone of the recommendations appears to be that minimal I/I controls should be considered for implementation since more aggressive controls would not have a significant cost-benefit relationship to the CSO strategy. However, independent of the CSO strategy, is it not desirable that I/I reductions be achieved, or at least pursued? Perhaps there needs to be a clearer explanation of the Plan strategies (CSO vs. overall improvement of the system).

Volume 5 - Secondary Treatment Strategies

It is assumed that the recommended strategy would allow for a future expansion should population (and hence loads) for some reason increase beyond the current revised prediction. Secondly, might there not be some cost disadvantage were additions required in the future and excess capacity not provided now?

How will the projected minor effluent violations resulting from the recommended (revised) plan comply with Federal permit requirements?

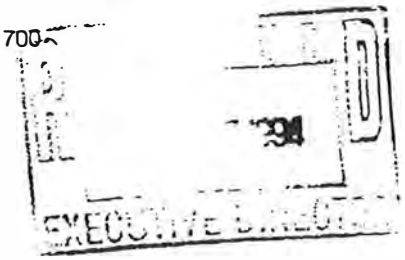
Again, I hope these somewhat brief comments will be helpful to you in preparing the final Plan.

Sincerely,

Richard B. Mertens
Environmental Review Officer

Boston Water and Sewer Commission

425 Summer Street
Boston, MA 02210-1700
617-330-9400
Fax 617-330-5167



November 16, 1994

Mr. Douglas B. MacDonald
Executive Director
Massachusetts Water Resources Authority
100 First Avenue
Boston, MA 02129

Re: Draft CSO Conceptual Plan and System Master Plan

Dear Mr. MacDonald:

The Boston Water and Sewer Commission appreciates the opportunity to comment on the Draft CSO Conceptual Plan and System Master Plan, September 1994. Our comments focus primarily on the CSO alternatives and recommendations as they effect the Commission's combined sewer system, because this is the area of our greatest knowledge. The recommended actions for interceptors and secondary treatment appear to be reasonable to us.

During the conceptual planning process the Commission staff was given the opportunity to review MWRA reports and participate fully in technical meetings. The process was particularly effective in the identification and recommendation of system optimization projects to be carried out by the Commission and funded by the Authority. The Commission had developed a list of interim, easily implementable projects during its CSO Facilities Planning Project which were compared with similar projects derived from MWRA's model. After much discussion, concurrence was reached on over ninety projects. The Commission began implementing the projects shortly thereafter, and about one-third are completed.

The Commission strongly supports the decentralized, basin-by-basin approach to controlling CSOs taken in the Conceptual Plan rather than a singular system-wide strategy. It has resulted in a cost-effective plan that will meet water quality standards. The Plan for Northern Dorchester Bay is excellent, because it will eliminate combined sewer overflows from the South Boston beaches. This will be achieved by building a conduit along the beach to collect and convey the flows to a treatment facility at the Reserved Channel. At the Dorchester Bay beaches and Constitution Beach, high levels of control are also to be achieved in these situations by separation.

The Commission supports the continuation of the planning process with facilities planning for the projects identified in the conceptual plan under the leadership of the Authority with the full participation of the CSO communities. In some cases, we believe the recommendation presented in the Conceptual Plan should be the subject of the facilities plan while in others, discussed below, we think alternatives as well as the recommendation should be considered.

Separation: In our judgement, more attention should be given to separation as a means for eliminating combined flows. The Plan evaluated the efficacy of separation within an entire basin rather than at individual overflows within a basin. The latter approach, where the combined area is small, may result in the elimination of a CSO. Selected separation in a portion of a tributary area could result in the reduction, if not the elimination, of CSOs.

Stormwater: The Plan proposes that three of MWRA's CSO treatment facilities in Boston be converted to stormwater treatment facilities. It further infers that these treatment facilities would be operated by the Commission. This implies that stormwater in these locations requires treatment. There is very limited data on stormwater quality to support this contention and no long-term studies in these areas. Until evidence of the injurious nature of stormwater is available, treatment of stormwater should not be considered.

Stony Brook: The Stony Brook System, because of its complexity, requires a separate in-depth investigation. The goals, which may take many years to effectuate, should be to carry combined flows only in the Old Stony Brook Conduit and stormwater in the Stony Brook Conduit. By judiciously removing illegal connections and discharges of combined sewage from the Stony Brook Conduit and sewer construction, the goals could be accomplished.

Siting: A deficit in the plan is a lack of serious, detailed consideration of facilities siting. It is often difficult to determine project feasibility as well as public acceptability, if potential sites are not presented.

Infiltration/Inflow: The report discounts the effectiveness of infiltration/inflow (I/I) reduction. The Commission believes that such reduction may significantly reduce peak flows at the treatment plant. First, it is necessary to distinguish between inflow and infiltration. There are numerous low-cost ways to effectively remove inflow from the sanitary sewers, such as repair of manholes and removal of catch basins. The Commission has recently launched a program to remove inflow originating in private houses through the disconnection of downspouts improperly connected to sanitary

sewers. While lasting removal of infiltration is more difficult to achieve, sewers located below the water table year-round, should be addressed. The Commission supports the continuation of the MWRA I/I Financial Assistance Program to encourage member communities to reduce the delivery of clean water to the treatment plant. Finally, the MWRA should undertake an evaluation of its interceptor system rather than assume that its I/I contribution is inconsequential.

Implementation: As stated above, the Commission looks forward to participation in the Facilities Planning and Environmental Assessment process. We believe that the Authority is best suited to assume the leadership for all Facilities Planning with the active participation of the CSO communities. The Commission asks to be assigned the responsibility for the design and construction of separation projects in Boston streets, because of our experience in neighborhood infrastructure projects. The responsibility for siting, design, construction and operation of storage and treatment facilities properly belongs with the MWRA. The Commission would like to participate in the design of end-of-pipe screening projects. We will consider accepting responsibility for the maintenance of the screens, after they are installed, since this may not be too dissimilar to our tidegate inspection program.

The schedule for the separation projects needs to be scrutinized and refined so that the work can be done as expeditiously as possible. Coordination with street reconstruction work to be done by the Boston Public Works Department as well the capacity of the Commission's Design Division should to be factored into the schedule.

Finally, an important component of implementation is financial assistance, which should be provided to CSO communities similar to that now provided for the System Optimization Plans (SOPs). In the Commission's request to carry out the separation projects in the City of Boston, reimbursement from MWRA is expected.

The Commission's detailed, basin-by-basin comments follow. In each case, we have indicated where we support the recommendations and where we believe other alternatives should be considered.

Comments by Basin

NORTHERN DORCHESTER BAY

The Commission supports both the water quality goals for this basin and the relocation of the CSOs recommended in the Plan. According to Figure 4-1, facilities planning will begin next year and design of the facilities will begin in April of 1998. Implementing controls for this basin should be given top priority and the design of the facilities should be started in 1997 with construction to begin as soon as practical.

SOUTHERN DORCHESTER BAY

The Commission agrees that sewer separation is necessary to support the water quality goals for this basin. However, the Commission does not believe that the Authority has collected enough data on the impacts of stormwater to support the assertion that it is necessary to treat stormwater at the Fox Point and the Commercial Point CSO Treatment Facilities.

Design of the separation projects is scheduled to begin in July of 1999. The Authority should consider accelerating the design of these projects and should recognize the need to coordinate these projects with other street improvements.

Tables 3-1 through 3-13 should indicate the volumes of stormwater and CSO for existing conditions, future planned conditions and the preferred alternative.

Table 3-2 should indicate the number of treated overflows per year as well as the number of untreated overflows. The annual O&M cost should be given in three significant figures.

NEPONSET RIVER

The Commission supports the recommended plan for sewer separation for the BOS 093 and BOS 095 tributary areas. Separation in the South Dorchester Bay areas may be necessary to eliminate the overflows into the Neponset River.

The estimates for overflows from BOS 095 are too high for the size of the openings at the regulator. The model should be run for the openings that currently exists at regulator 095-2.

CONSTITUTION BEACH

The Commission supports the recommended plan for separation of the BOS 002 tributary area. However, the Constitution Beach CSO Treatment Facility should not be used to treat stormwater until data is available that justifies the need for stormwater treatment.

Table 3-4 should indicate the number of overflows that are treated.

The Authority is asked to explain why the number of overflows per year at the Constitution Beach CSO Treatment Facility under future plan conditions is more than the 8-12 overflows reported at the CSO treatment facility in 1992 and 1993.

UPPER CHARLES RIVER

The Commission disagrees with the plan's recommended screening and disinfection facility at BOS 032, because a Commission planned separation project will make this facility unnecessary. As part of an I/I reduction program, separation of the BOS 032 will begin in 1995. This project along with work that has already been done in the BOS 033 tributary area should eliminate overflows from both BOS 032 and BOS 033. During Facilities Planning the effectiveness of these improvements should be reviewed.

LOWER CHARLES RIVER

The Commission believes that more alternatives exist for the overflows in this basin. It should be possible to significantly reduce or eliminate overflows from BOS 042 and BOS 049.

A small area of combined sewers currently exists at BOS 042. Separation of this area should be examined in more detail.

BOS 049 is influenced by the operation of the Charles River Estuary CSO Facility at Prison Point. The separation of the combined areas along with the recommended upgrade of the CSO Facility should be considered to effectuate the elimination of BOS 049.

It is our understanding that MWR 018, MWR 019, MWR 020, MWR 021 and MWR 022 are currently inactive. The Authority should explain why these overflows are to be reactivated in the recommended plan.

STONY BROOK SYSTEM

The Commission believes that a more detailed examination of the Stony Brook System is necessary before building a treatment facility for the Stony Brook Conduit. The Stony Brook System is a very complex system. The flows from Stony Brook Conduit (SBC) and the Old Stony Brook Conduit (OSBC) are treated differently. The SBC flows which discharge to the Charles River are predominately brook flows and stormwater. The flows in the OSBC, which are conveyed to the Authority's Prison Point CSO Treatment Facility, are combined flows. Future study of the system should include identification for separation and routes to direct CSOs from the SBC to the OSBC.

The Authority surveyed the Stony Brook System to characterize the system flows in dry and wet weather. Locations were identified in the report where illegal connections to the Stony Brook Conduit may exist. A number of these illegals will be eliminated this year. The Commission will survey the other locations more closely and test suspected illegal connections.

The complete separation of the Stony Brook System was found to be too costly. However, opportunities appear to exist for reducing the volume of CSO to the Stony Brook Conduit by separating a portion of the combined sewer areas. The Commission is currently working to identify areas where separation can be achieved without incurring high costs.

A treatment facility for the Stony Brook Conduit may be the appropriate control. However, facilities planning for the alternatives presented above should be investigated before the facility is designed.

UPPER INNER HARBOR

The Commission disagrees with the storage facility recommended for BOS 019. Storage does not appear to be necessary because the combined sewer area tributary to BOS 019 is very small. The lack of capacity in the MWRA interceptor may be contributing to the overflows at BOS 019. The Authority is requested to explain what is causing these overflows.

Figure 3-3 shows BOS 050 as active; it has been blocked since June of 1989.

The Commission's CSO Facilities Plan recommended storing overflows from BOS 057 in the overflow pipe. The Authority is asked to examine the potential for such storage at this location.

Separation of part of the BOS 060 tributary area should be investigated to determine whether CSO discharges can be eliminated.

RESERVED CHANNEL

The Commission disagrees with the storage/consolidation conduit recommended for BOS 076, BOS 078 and BOS 079. The conduit is proposed to run along East First Street in South Boston, where it is anticipated that soils contaminated with hazardous wastes will be encountered. The removal of these contaminated soils along with extensive utility relocations will make it very costly to construct this conduit.

Separation of portions of these areas should be examined. It may be possible to limit overflows from BOS 076, BOS 078 and BOS 079 by reducing the amount of wet weather flow in the interceptor.

Table 3-12 should include the number of treated overflows per year as well as the untreated overflows.

FORT POINT CHANNEL

The Commission disagrees with the consolidation/storage conduit for BOS 072 and BOS 073 and a storage facility at the Union Park pumping station as recommended in the Plan. The Commission believes that other alternatives should be considered during Facilities Planning.

Overflows at BOS 073 appear to be caused by the lack of capacity in the South Boston Interceptor rather than the flows from the tributary area. If the interceptor flow is reduced, overflows at BOS 073 may be eliminated. The effect of separating BOS 076, BOS 078 and BOS 079 areas, along the Reserved Channel, as well as areas downstream should be examined to determine whether a storage/ consolidation conduit for BOS 072 and BOS 073 is necessary.

It appears that the area available for a storage facility at the Union Park pumping station is too small and an initial discussion with the residents has shown a high level of opposition to siting a facility at the station. The Authority should pursue siting a storage facility at another location, possibly within the CA/T area.

The Commission supports the concept of in-line storage in the Dorchester Brook Conduit. Storage of overflows in the Dorchester Brook Conduit appears to be an alternative that warrants more study. Conditions within and around the Dorchester Brook Conduit need to be examined more closely during facilities planning to determine if the conduit can be used for storage and how brook flow in the conduit can be handled.

BOS 068 has a small tributary area. Separation of this area should be considered so that the overflow can be eliminated.

Thank you again for the opportunity to comment on the Draft CSO Conceptual Plan and System Master Plan. The Commission appreciates the consideration the Authority has extended to us. We look forward to continuing involvement and exchange of knowledge so that long-term solutions for controlling CSOs, improving water quality and enhancing public enjoyment of Boston Harbor and its rivers can be realized.

Yours truly,

John P. Sullivan, Jr., P.E.
Chief Engineer

JPS/LB/mo

cc: Patricia Fahy, BWSC
Commissioner Dennis DiMarzio
Commissioner Victoria Williams
Commissioner Cathleen Douglas Stone
MWRA Board/Boston Representatives:
Robert Ciolek
Lorraine Downey
Walter Ryan
Michael Domenica, MWRA
Laura Steinberg, Sullivan and Worcester

CAMBRIDGE DEPARTMENT OF PUBLIC THE WORKS

Ralph E. Dunphy
Commissioner

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December 7, 1994

Ms. Lise Marx
MWRA CSO Project
Charlestown Navy Yard
100 First Avenue
Boston MA 02129

RE: CSO CONCEPTUAL PLAN AND SYSTEM MASTER PLAN

Dear Ms. Marx:

I have recently had a chance to review the MWRA *CSO Conceptual Plan and System Master Plan* (September, 1994) with my staff and CSO Monitoring Consultant. Overall, the report appears to be a well-organized comprehensive document. The MWRA is to be commended for the system-wide approach to developing CSO abatement strategies. I have been advised, however, that there are a number of important outstanding issues for the City of Cambridge that need to be readdressed before moving forward with the recommended plan.

The major outstanding issue involves discrepancies in monitoring data obtained by the City of Cambridge and the MWRA. The City of Cambridge has, since 1989, provided the MWRA, the EPA and the DEP with the quarterly results of the Cambridge CSO metering database. It is my understanding that some of this data has been utilized by the MWRA in development of the *CSO Conceptual Plan and System Master Plan.* I have been advised that some of the recommendations in the Conceptual Plan appear to be based on MWRA data which is discrepant with the City's data.

A number of meetings have been held with the City of Cambridge, the MWRA, and your consultant, Metcalf & Eddy (M & E) to discuss these discrepancies. Unfortunately, I have been informed that they have never been finally resolved. A brief overview of the particular locations and discrepancies is as follows:

CAM 004 (Concord Avenue Rotary):
The CSO Conceptual Plan recommends upstream separation of CAM 004 based on data showing regulator activation at this location. Analysis of the City's CSO metered, time-series data for the June and August 1992 MWRA (M & E) calibrated storms correlates the regulator CSO discharges and the Alewife Brook backflow into the Cambridge System by using two meters. The data unequivocally showed that previously CSO - categorized events were actually attributable to

backflow conditions. If this data were the basis for the recommendations in the conceptual plan, separation of sewers upstream of CAM 004 would not be necessary.

Charles River Regulators (in general):
The City has reported throughout the past five years of metering that the CSO regulators along the Charles River have been mostly inactive. With the exception of CAM 017 (Binney Street at Land Boulevard regulator) and CAM 005 (Lowell Street at Mt. Auburn), our database shows no CSO discharges during the past two years.

CAM 005 (Lowell Street at Mt. Auburn):
The preferred alternative from the CSO Conceptual Plan is a screening, disinfection, and dechlorination facility at this location. City monitoring data for CSO flows at this location is limited. The City suspended CSO monitoring at this site from January 1990 to April 1993 and has had meter malfunctions since its reinstatement. Therefore, concerns regarding this recommendation cannot currently be based on known data discrepancies. As stated in the Conceptual Plan, siting a facility in this location is challenging. It is our belief that further monitoring to confirm the status of overflows at this location as capacity increases at Deer Island as well as further review of the operation of the collection system would be beneficial before getting too involved in trying to site the proposed facility in this difficult location.

CAM 009 (JFK at Memorial Drive):
The preferred alternative from the CSO Conceptual Plan is a screening, disinfection, and dechlorination facility at this location. City data and the Interim CSO Report of February 1993 indicate no activation at this regulator. It is my understanding that the MWRA may be reevaluating this location. It is our contention that a facility is not necessary here.

It is apparent that the time has come to get all the appropriate parties together to resolve these concerns. We are aware that changes in City staff and the MWRA staff through the life of this important project has made it difficult to maintain the level of review required to resolve these issues. Before it is too late, we recommend a CSO workshop / Value Engineering session with the City of Cambridge to bring together the appropriate parties from the MWRA, M & E, the City of Cambridge, and our consultants. If you prefer another method to resolve these concerns we would welcome the opportunity to consider your recommendation.

Ralph E. Dunphy
Commissioner

RED/ar

c: Robert W. Healy, Cambridge City Manager
Steve White, Deputy DPW Commissioner
Ann Daughaday, City Engineer
Elizabeth Epstein, Environmental Program Director
Alex Strysky, Conservation Commission
Robert Barrows, Maguire Group
Robert Blinco, Kaiser Engineering
John F. Fitzgerald, Director MWRA Sewerage Division
Kevin McManus, Director, MWRA Toxic Reduction and Control
David Kubiak, MWRA Program Manager, CSOs
David M. Parker, MWRA Project Engineer

CITY OF CAMBRIDGE
ENVIRONMENTAL PROGRAM
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December 6, 1994

Ms. Lisa Marx
MWRA CSO Project
Charlestown Navy Yard
100 First Avenue
Boston, MA 02129

Dear Ms. Marx,

This letter is in response to your request for comments on the draft System Master Plan, and includes the comments and concerns of the Community Development Department, the Environmental Program, the Conservation Commission, and the Department of Public Works (DPW).

The Draft System Master Plan (SMP) presents an excellent starting point for ultimately meeting the "fishable and swimmable" goals of the area's water bodies. Cambridge commends the MWRA for the thorough and comprehensive approach it has taken, and for its efforts to increase public involvement in this effort. As the SMP makes clear, however, further progress in meeting water quality goals will require coordinated efforts at the federal, state, and local levels, in addition to the MWRA.

While the MWRA has adopted a sound approach in devising this SMP, Cambridge would like to urge the MWRA to reevaluate some of its data and assumptions before final CSO controls are selected during the development of the Final System Master Plan and prior to the facilities planning and environmental permitting processes.

Water Quality Goals for the Charles River and Alewife Brook

The maintenance of high water quality goals for receiving waters in Cambridge is important. It is unfortunate that the Charles River is not given the same level of CSO control in this SMP that it received in the 1990 Facilities Plan. The Charles River is a regional resource that is currently heavily-used by boaters, rowers, sailboarders, and enjoyed as a visual amenity by users of the parkland abutting the river. The use of the Charles River for sport fishing (not to mention the commercial eel harvest already permitted by the MDC) is a realistically achievable short-term goal considering the resident fish species (like bass

and pike), and other species that could be attracted to lower reaches of the Charles with additional water quality and aquatic habitat improvements (Brown trout, pickerel). The long-term goal of reopening the swimming area at Magazine Beach should also be considered when water quality goals for the Charles are discussed.

Better water quality in Alewife Brook is also desirable. While its physical characteristics may preclude swimming (although this is a worthwhile goal for the Mystic River, to which Alewife is a tributary), there is nonetheless a great deal of interest in improving the aquatic habitat and aesthetics of Alewife Brook. Restoring the Alewife Brook system (including the Little River) has increasingly been the focus of attention of residents of Cambridge, Arlington, Belmont, and Somerville. Citizen efforts to monitor water quality, census the anadromous fish run, restore the MDC's Alewife Reservation and Blair Pond site, and to seek funding for an Army Corps of Engineers Floodplain Management Study, are either now underway, or in the planning stages.

Water Quality Data, Analysis, and Modelling

The distinguishing feature of the SMP is its watershed approach to CSO control. Central to this approach are the Baseline Water Quality Assessment and the MWRA's receiving waters models which attempt to determine the extent to which CSOs contribute to the poor water quality of most of the surface waters in the metropolitan Boston area. The general conclusion in the SMP is that CSOs are for the most part relatively minor contributors of pollution compared to upstream and/or stormwater sources. Because of this, the SMP varies the level of CSO control in part due to the overall water quality benefit derived from CSO control. While the analysis and modelling approach used in the SMP is generally good, there are some remaining questions that should be answered before final CSO facilities plans are developed for the Charles River and Alewife Brook. Cambridge believes that the additional data collection, analysis, and modelling can be done within the Implementation Schedule presented in the SMP, and would be worthwhile to ensure that long-term CSO control planning is based on the most accurate data available.

Specifically, Cambridge recommends that:

1) The MWRA should verify the SMP's conclusions regarding the relative contribution of pollutants from upstream, stormwater, and CSO sources, since proposed levels of CSO control for each water body rely so heavily on this analysis. While it is not surprising to find that stormwater is a significant source of pollutants, the extent of this problem as presented in the SMP

should be reexamined due to the MWRA's relatively limited water sampling program and heavy reliance on modelling. The MWRA should confirm that its sampling program was adequate, reevaluate receiving waterbody models in light of additional sampling data, and should quantify the extent to which illegal sanitary connections to stormwater systems contribute to the pollutant loadings attributed to stormwater or upstream sources.

The MWRA should also further investigate to what degree CSOs impact sediments in the short- and long-term. Organic sewage sediment, for example, can be a continuing cause of oxygen depletion in the water column long after a CSO event.

2). The SMP should include the appropriate statistical analyses of water quality and flow data. Pollutant loadings data in the SMP were generated as a result of a sampling program, and therefore cannot be considered to be without some degree of variance due to sampling error, sample size, and other sources of error. The SMP should indicate whether differences in pollutant loadings are statistically significant. The SMP also should consider any error generated by water quality or flow models, and indicate statistical significance of data generated through these models. The MWRA should also determine how sampling variance is affected by the models, particularly whether variance is magnified in any way.

Also, cost vs. water quality benefits graphs should reflect statistical variance due to the water quality sampling program and modelling, and the variability in removal efficiency of CSO control technologies presented. This analysis would determine whether the water quality benefits of CSO control options of different costs are statistically distinguishable.

3). The SMP should present pollutant loadings in a manner which is more consistent with the Surface Water Quality Standards. The SMP displays bar graphs showing pollutant contributions from various sources for 3-month and 1-year storms and also for annual loadings from these sources. Most of these graphs indicate that CSOs contribute relatively small amounts of pollutants compared to other sources; this is most graphically portrayed in the annual loading data.

However, it is not clear at all how the extensive water quality data compiled in the SMP relates to the maximum pollutant levels allowable under the Water Quality Standards, which are measured on a per volume basis. Since the annual volume of stormwater and upstream flows are so much greater than annual CSO flows, it is to be expected that those sources will contribute higher pollutant loadings on an annual basis. The data in the SMP does not demonstrate whether pollutants in upstream and stormwater flows are concentrated enough to cause violations of water

quality standards. The MWRA should conduct an intensive water quality monitoring program that can attribute specific violations of water quality standards to upstream, stormwater, or CSO sources.

4). The MWRA should continually revise and update its models as new data becomes available. The SMP states that additional CSO controls in the Charles River and in Alewife Brook would be considered at a future date, should progress be made by others in reducing pollutant loadings from other sources. While Cambridge believes that some degree of reanalysis is appropriate now, prior to the implementation of proposed CSO controls, the SMP should clarify the criteria under which the MWRA would consider increasing the level of CSO control in the future.

Sewer System Modelling

Discrepancies remain between the flows predicted by the MWRA's system model and several years' worth of metering data collected by the Cambridge DPW. More detailed comments on these discrepancies are being forwarded to you from the DPW. The MWRA should also reexamine its model in light of continuing surcharging problems in Cambridge, and refine and update the model as current sewer system improvements (sewer separation, SOPs) are completed. Finally, operational procedures, and their impacts should be more explicitly characterized in the SMP; of special interest would be whether the operation of the MDC dams is coordinated with MWRA system operation, and how pump operations at MWRA pumping stations can maximize in-system capacity.

Future Efforts to Improve Water Quality

The SMP emphasizes that non-CSO sources of pollutants play a significant role in degrading water quality in the Charles River and Alewife Brook. The MWRA can play an important role in assisting federal, state, and local agencies, and other interested groups to address these issues and work toward the common goal of "fishable and swimmable" waters. The MWRA must work closely with these agencies to expand on the work presented in the SMP and put in place a comprehensive pollution control program that will achieve this goal. The MWRA should also consider the extent to which it can provide communities and interested groups technical assistance for water and sediment quality monitoring efforts, for identifying illegal sanitary connections to storm systems and other sources of pollution, and in recommending stormwater Best Management Practices.

Conclusion

The MWRA's draft System Master Plan has taken a thoughtful and comprehensive approach representing an important first step for improving water quality in surface waters in the metropolitan area. Cambridge looks forward to working with the MWRA to resolve the issues raised in this letter so that the long-awaited control of CSOs can begin.

Sincerely,

Elizabeth Epstein
Director

CAPE COD COMMISSION

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November 21, 1994

Lisa Marx
CSO Program, Sewerage Division
Massachusetts Water Resources Authority
Charlestown Navy Yard
100 First Avenue
Boston, Massachusetts 02129

Dear Ms. Marx:

On behalf of the staff of the Cape Cod Commission, I appreciate this opportunity to comment on the Authority's Draft CSO Conceptual Plan and System Master Plan. Our focus has been on the predictions of effluent quality from the Deer Island facility under the preferred alternatives for CSO controls and secondary treatment.

In our review of Volume 5: Secondary Treatment Standards, we noted that the summary charts, Tables 3-15 and Tables 3-17, indicate violations of some of the effluent standards for all treatment alternatives other than four batteries of secondary. In looking at the preferred alternative of three batteries of secondary (as reported to the WAC at their November 4, 1994 meeting), it's predicted that there will be a violation of the 30-Day Maximum standard for TSS.

In reviewing the effluent quality under the preferred CSO alternative and the preferred alternative of three batteries of secondary, considering a 10% growth in population within the service area (Table 3-17, Volume 5), a violation of the TSS standard for 30-Day Maximum is again predicted. In addition, while not showing violations, the effluent quality begins to reach the anticipated permit limits on the effluent for BOD, CBOD, and TSS under the 30-Day Maximum and the Maximum Day measurements.

This information raises the question of whether the effluent entering the Deer Island facility will need to be subjected to very aggressive treatment in order to consistently operate within the expected parameters of its discharge permit. Although the Commission staff has not reviewed the document, it is staff's understanding that the DP-29 report predicts no permit violations for the preferred CSO and secondary treatment alternatives, based on the same flows and loads

information used in the CSO Conceptual Plan analysis. Again, this raises the question of what level of efficiency the facility will need to be operated at in order to avoid consistent violations.

We recommend that the Final Plan and the final report of the DP-29 Study include a discussion of the assumptions that were used to predict performance of the Deer Island facility under the various treatment alternatives. This information would be extremely helpful to understanding what factors were considered in developing the recommended CSO treatment alternatives as well as the recommended sizing of secondary treatment.

We further recommend that an engineering firm who has been independent of these studies, and who has not worked under any other Authority contracts, be asked to evaluate the two sets of assumptions and provide the Authority with its predictions on operational efficiencies of the proposed facility under different alternatives. We believe this information is essential to determining whether the alternatives being considered can be implemented in a way that will result in consistent performance from the facility within the effluent standards set in the discharge permit.

Should the Authority choose not to conduct an independent review, we strongly recommend that the assumptions used in both studies to predict performance of the facility under the various alternatives be included in the final plans. With regard to the facility's performance, the predictions are presented assuming that the standard effluent limitations for secondary treatment will be required. We would like to know why the Authority presumes that more stringent limitations will not be required, and if they were, what the predicted performance of the facility would be under more stringent limitations.

We are concerned that if more stringent effluent standards were required or additional treatment is necessary in the future, for example nutrient removal, the facility could not operate more efficiently than what is currently predicted. We recommend that the Authority more seriously evaluate the effectiveness of the facility's operation with four batteries of secondary treatment. We are concerned that the implementation of the preferred alternative may result in treated effluent that only marginally meets water quality standards.

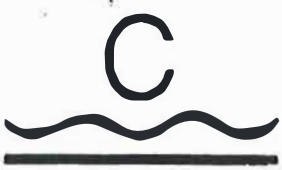
The Authority is proposing to phase implementation of its CSO Program over a multi-year period. We recommend that the Final Plan include an explanation of the effluent quality from the Deer Island facility during this period. Specifically, might there be consistent violations of any of the assumed effluent standards, and how long might these conditions persist?

Thank you for this opportunity to comment on the Draft CSO Conceptual Plan and System Master Plan. I would also like to request a copy of the DP-29 study, and am now formally requesting the opportunity to comment on the study. If you have any questions on these comments, please do not hesitate to contact me.

Sincerely,

Armando J. Carbonell
Executive Director

cc. Douglas MacDonald, Executive Director, MWRA
Trudy Coxe, Chair, MWRA Board
Susan Redlich, WAC
Ken Moraff, Staff Counsel, EPA Region I
Cape Cod Commission
Barnstable County Commissioners
Assembly of Delegates
Coastal Resources Committee
Regional Planning Agencies
Bays Legal Fund
Conservation Law Foundation
STOP
APCC



Charles River Watershed Association

December 14, 1994

Mr. Douglas B. MacDonald
Executive Director
Massachusetts Water Resources Authority
100 First Avenue
Boston, MA 02129

Dear Mr. MacDonald:

Thank you for the opportunity to comment on the MWRA's Draft *Combined Sewer Overflow Conceptual Plan and System Master Plan*. We recognize it represents the culmination of four years of intensive effort by the Authority, and is a benchmark in the enhanced understanding of the system the Authority operates.

We are pleased to see that the Authority will eliminate CSOs in both the Neponset River and Dorchester Bay. These actions are indicative of the kind of progress the Authority has made over the past decade, and of the progress we believe the Authority can make over the coming decade.

CSO Conceptual Plan

The Plan in general is a good attempt at balancing the Authority's responsibilities under the Clean Water Act to eliminate CSOs and meet rate payer demands to keep the expense of remediation reasonable. The tension between these two objectives, however, will remain a constant in all Authority planning.

The Authority makes some fundamental assumptions in the CSO Conceptual Plan that are worth considering. For example, future planned conditions assume sewer optimization and enhanced system storage capacity. Although the Authority has made significant progress in system optimization over the past four years, there is no guarantee that these future levels of optimization will be achieved or maintained. Should the levels of optimization described not be achieved, what sorts of impacts can we expect?

Assumptions are also made concerning "out of boundary" pollution and storm water impacts. While assuming sewer optimization, the Authority bases its future conditions on current out of boundary conditions for fecal coliform bacteria and other pollutants. Should those issues be

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addressed, we wonder about the relative impact on planned future conditions. If the assumptions were reversed, for example, and sewer optimization discounted while out of boundary pollution --and especially illegal storm sewer connections -- remediated, we wonder what your assessments might show.

We are particularly struck by the lack of understanding of major components of "out of boundary" pollution, and the effects of flow in the Authority's modeling. Better information about contributions to nutrient loading and metals contamination by CSOs versus all other sources needs to be developed, as does the relationship between a polluted Charles Lower Basin with contaminants entering the River from watershed sources upstream of Watertown Dam. For these reasons, we welcome the opportunity to work with the Authority during the coming five years on our Charles River Watershed Integrated Monitoring, Modeling and Management (IM3) Project. It is our strong belief that through this effort we will be able to develop a better, more comprehensive understanding of the processes driving pollution in the Charles and how they might be better managed, while developing tools and methodologies applicable to other tributaries to Boston Harbor.

We are also convinced that among the most effective methods for controlling CSOs is to deal with as much stormwater as possible on site, before it enters the sewer system. Best Management Practices (BMPs) for storm water including catch basins with separators, settling ponds and wetlands vegetation accomplish two important objectives: they keep water within a watershed and reduce flow in combined sewers. We encourage the Authority to continue to expand its aggressive sewer metering program so that we may understand the dynamics of storm water better, and treat more storm water where it falls rather than in the sewer system and at Deer and Nut Islands.

CSO Conceptual Plan, "Upper" and "Lower" Charles River Basin

We appreciate the recognition the Authority gives to the importance of the Charles River Lower Basin as a fresh water recreational venue. It is perhaps the busiest fresh water body in the Commonwealth, and was recognized as such when we, together with the US Environmental Protection Agency, lobbied to have it upgraded to Class B. Because of its recreational and aesthetic value, it is of paramount importance to achieve its Class B, fishable swimmable standard.

We are concerned that the Authority's preferred alternative for the introduction of chlorination/dechlorination facilities in the Lower Basin as its only remedial action will relegate the Lower Basin to a *de facto* Class C status. Though the Charles Lower Basin, under current circumstances, would continue to fail Class B standards whether or not CSOs are eliminated does not excuse CSOs as a significant source of pollution. Their elimination would improve water quality, and send a signal about our resolve to address and remediate other pollution sources.

The current technical solution to CSOs in the Charles River Lower Basin is therefore clearly inadequate. Further intensive investigation of technical solutions which would eliminate CSOs is essential, and we look forward to working with the Authority in that investigation. We believe strongly that over the next four years the Authority will be able to identify a technical solution to CSOs in the Charles Lower Basin that is better than either the current proposal for chlorination/dechlorination facilities or the storage tunnel advanced in the 1990 CSO facilities plan.

If over the next four years the Authority is unable to identify better technical solutions than those currently considered, however, we would continue to support the storage alternative as the preferred alternative, and the Authority should move to construct it to provide the Charles Lower Basin the greatest protection from CSO pollution.

Sincerely yours,

Robert L. Zimmerman, Jr.
Executive Director

cc: Trudy Coxe, Secretary, EOEA
Sharon McGregor, EOEA
Ken Moraff, Esq., US EPA
Roger Jansen, US EPA
Brian Pitt, US EPA
David Pinkham, US EPA
Andrew Gottlied, MDEP
Steve Lipman, MDEP
Joe Favaloro, MWRA Advisory Committee
Susan Redlich, Wastewater Advisory Committee
Elizabeth Epstein, Cambridge
Peter Shelley, Esq., CLF
Jodi Sugarman, Save the Harbor/Save the Bay

COASTAL ADVOCACY NETWORK

c/o Massachusetts Bays Program, 100 Cambridge Street, Room 2006,
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December 9, 1994

Board of Directors
Massachusetts Water Resources Authority
100 First Avenue
Boston, MA 02129

Dear Board Members,

The Coastal Advocacy Network (Network) would like to submit its comments on the Draft CSO Conceptual Plan and System Master Plan for consideration by the Massachusetts Water Resources Authority. The Network is a collaborative effort of citizen organizations dedicated to the protection and enhancement of the coastal and marine environments of Massachusetts.

First, we thank the Authority for the opportunity to comment on this plan, and for the outreach to the public throughout this process. The many presentations made to the communities is laudable, and we especially appreciate your attendance at the December 5th Network meeting to answer our questions about the CSO Plan and DP-29. We hope your efforts result in constructive comments and a strong final version of the plan.

There are several areas of concern we would like to address regarding the Draft Plan. These comments fall into two basic categories: comments on the plan itself, and conceptual comments regarding the role of the CSO Plan in relation to water quality throughout the metropolitan region.

CSO Plan Comments

Overall, we believe that many parts of the Draft Plan represent positive steps toward addressing CSO problems. The elimination of CSO discharges in Dorchester Bay and the Neponset River, for example, are actions which we fully endorse. We encourage the expedient implementation of those actions.

Alternatives to Chlorination

We have a few problems with some of the Level II Control locations, such as the Charles River and the Reserve Channel, where some discharges will remain if this Plan is implemented. In many of these areas, proposed actions will involve chlorination followed by dechlorination of the effluent before discharge. We strongly encourage the MWRA to explore alternate technologies to chlorination because of its potential environmental effects. Such alternate technologies should include UV radiation, among others. At this point, we have not seen or heard any discussion of the use of these potentially more environmentally sensitive options.

Maintenance Costs

We are also concerned with the lack of attention in the plan to the maintenance costs which will be required to ensure that the CSO infrastructure is maintained. While we are aware that this is not part of the cost of construction, such long-term maintenance is likely to involve a substantial part of the MWRA budget. Estimated maintenance costs must become part of the plan to ensure that maintenance is fully funded as part

of the MWRA budget. We are especially concerned that as these facilities age and wear, maintainance costs will rise, while legislative enthusiasm for increasing budget allocations may wane. The result will be a deficit in the maintenance budget. A discussion of maintenance costs in the plan should obligate the MWRA to not only implement but also to maintain the infrastructure proposed in the plan.

Actions along the Charles River

In addition, we are concerned with the limited number of actions proposed along the Charles River. The MWRA data show that, even with the total elimination of CSOs, background levels of fecal coliform bacteria will still leave the Charles River unswimmable. While the Network accepts that rationale for the postponement of full CSO controls, the persistence of unacceptable water quality in the Charles River, regardless of CSO controls, highlights the inseparable nature of CSO remediation and upstream stormwater management. We view the actions proposed along the Charles River as **temporary** improvements in anticipation of the implementation of upstream stormwater management controls.

We, therefore, recommend that the plan for the Charles River section involve two phases: **Phase I** should include the screening, upgrading of pumping and transport capacity, and decontamination, as currently proposed, plus an annual review of the progress in stormwater management upstream (e.g. stormwater inflow and background conditions). **Phase II** should involve the elimination of the CSOs in the Charles River once marked improvement has been shown in background water quality conditions.

The MWRA's obligation under the Clean Water Act for CSO remediation must still be met, but may be postponed until such time as further CSO infrastructure investments would have a significant effect upon water quality. This plan should be viewed as a temporary holding pattern until such time as the current standard can be met. The goal should be the elimination of the partial use standard and restoration of swimmable water throughout the entire length of the river.

Water Quality Data

Finally, we question the strength of the data on which the current conclusions regarding background conditions and stormwater inflow are based. We are aware of only one study which dealt with this, and suggest further inquiry to verify present conditions. The MWRA has an obligation to work on improving the modelling necessary for both background and stormwater pollutant flow and load calculations as a result of its use of these sources to justify limited controls on CSOs at this time.

The CSO Plan and Stormwater Management

The purpose of the CSO plan is to substantially improve the water quality within the MWRA jurisdiction. However, this goal of water quality improvement will not be achieved without greatly improved stormwater management, and without the direct involvement of the municipalities and the Commonwealth's Watershed Initiative which are charged with this responsibility.

The MWRA is in a unique position to see that both are accomplished. We believe that the MWRA should be the leader in the effort to clean up the rivers entering Boston Harbor, and the Charles River in particular. Given that CSO elimination downstream will be futile in the Charles River and elsewhere without upstream remediation, and that the costs associated with further CSO controls will not be incurred until there is upstream remediation, the MWRA should begin to explore the costs associated with an effective stormwater management strategy, or fund that exploration by other entities. The MWRA should also fund demonstration projects in rural, suburban and urban settings throughout the service area to help initiate this process. For example, some of the objectives of the proposed CSO Plan could be enhanced with source reduction strategies, on-site treatment of wastewater for both CSOs and stormwater, and community education.

These demonstration projects might include implementation of best management practices, such as installing porous pavements or developing facilities plans for alternative stormwater treatment methodologies, and should be coupled with technical assistance to the communities to help them initiate these practices on their own. This process would provide communities in the entire service area with realistic cost estimates and experience with implementation of stormwater controls. It would bring state and federal agencies, non-governmental organizations and citizen groups together in a coordinated effort to make the Charles and other rivers in the service area swimmable. The Massachusetts Department of Environmental Protection's Office of Watershed Management and the Massachusetts Office of Coastal Zone Management should be involved in this effort, as should the Massachusetts Bays Program which has experience linking best management practices to stormwater management at the local level through demonstration projects and community involvement. If stormwater management is not initiated along the Charles River, the river will fail to meet the standards under the Clean Water Act and the MWRA will have failed to optimize its CSO investments and to meet its responsiblity of CSO remediation.

To that end, as a condition of downgrading the Charles River to a partial use waterbody, the MWRA's legal obligations should include: 1) an active role in the planning actions underway in the upper and lower Charles segments, 2) specific deadlines to convene the interested parties and revisit appropriate CSO and stormwater control responsibilities in light of new information, technologies or analytical approaches, and 3) a financial committment to ensure successful achievement of water quality standards through demonstration projects and planning activities.

Thank you for your time and consideration of our comments. If you have any questions, please feel free to contact myself at (508) 281-6351, or Betsy McEvoy at (617) 727-9530 x424. We look forward to working with you on this and other issues in the future.

Sincerely,

Mason Weinrich

Mason Weinrich, Chair

Coastal Advocacy Network:
Susan Nickerson, Association for the Preservation of Cape Cod
Stephan Nofield, Bays Legal Fund
Mason Weinrich, Cetacean Research Unit
Bob Loring, Clean Water Action
Jonathon Kaledin, Clean Water Education & Funding Council
Mark Rasmussen, Coalition for Buzzards Bay
Peter Shelley, Conservation Law Foundation
Robert Buchsbaum, Massachusetts Audubon Society
Roger Stern, Massachusetts Bay Marine Studies Consortium
Paul Burns, MassPIRG
Bob Murray, Massachusetts Toxics Campaign
Polly Bradley, Safer Waters in Massachusetts
Jodi Sugerman, Save the Harbor/Save the Bay
Mary Loebig, Stop the Outfall Pipe

cc: EOEA Secretary Trudy Coxe
Diane Gould, Executive Director, Mass. Bays Program
Thomas Powers, Acting Commissioner, DEP
Peg Brady, Director, Coastal Zone Management
Lisa Marx, MWRA CSO Program

Commonwealth of Massachusetts
Executive Office of Environmental Affairs
Department of Environmental Protection

William F. Weld
Governor
Trudy Coxe
Secretary, EOEA
Thomas B. Powers
Acting Commissioner

November 23, 1994

Douglas MacDonald, Executive Director
Massachusetts Water Resources Authority
Charlestown Navy Yard
100 First Avenue
Boston, Massachusetts 02129

Re: MWRA, Combined Sewer Overflow Draft Conceptual Plan

Dear Mr. MacDonald:

This correspondence includes consolidated DEP comments regarding MWRA's Draft Combined Sewer Overflow and System Master Plan report issued by MWRA in late September 1994. Please be aware that the comments included in this correspondence relate solely to the CSO elements of the above referenced report, specifically Volumes one and two. Comments on the other elements of this report (System Master Plan) will be provided to MWRA during DEP's review and comment on the recently released DP-29 Secondary Treatment Facilities, Recommended Plan for Completion of the Deer Island Facilities, Final Draft.

DEP would like to initially compliment MWRA and its consultant, Metcalf and Eddy (M&E), for preparing the CSO Conceptual Plan. The document had to address the extremely complex issues associated with the assessment of combined sewer overflows and CSO control alternatives. This situation is particularly difficult for the MWRA planning area due to the number of overflow points, complex wastewater and stormwater collection and transmission facilities and differing receiving waters. DEP believes that MWRA and M&E did a very credible job in the time allotted to it by the Federal Court Schedule, under which this work is being regulated. This does not mean that DEP fully concurs with all of the conclusions and recommendations of the report, but DEP believes that the procedures utilized in preparation of the report were well thought-out and in general are technically sound. DEP staff has already met on a number of occasions with representatives from MWRA and M&E to review the report and DEP's concerns and questions, and we fully anticipate that the Final Conceptual Plan will address the overwhelming majority of DEP's concerns and that the subsequent FP/EIR will provide all of the information required for DEP to approve a consolidated CSO Program for the MWRA planning area and perform its requisite regulatory revisions to the

Commonwealth's Water Quality Standards by issuance of Partial Use Designations for CSO-impacted waterbodies.

On November 1st our respective staffs met to review initial DEP comments on the CSO report. Michael Collins of your staff subsequently prepared and distributed a November 15th summary of the major issues discussed at that meeting (attachment No. 1). The comments and questions included in this comment letter supplement the comments delineated in Michael Collins' November 15th memorandum, which is attached to this correspondence and should be considered by MWRA as part of DEP's formal comments.

DEP does not expect that MWRA will resolve all issues related to the CSO Program in its Final CSO Conceptual Plan, and that much of the detailed work will be performed during the FP/EIR process.

GENERAL COMMENTS

1. Based upon DEP's review of the report it is our opinion that the CSO Program described in the Conceptual Plan can and should be divided into the following three elements:

   (a) Project elements which are mainly System Optimization Program (SOP) type actions, which may be able to proceed forward without any additional MEPA review;

   (b) Early Action elements which will require further MEPA review but which DEP believes may be able to receive early MEPA review and proceed forward prior to completion and issuance of the Final EIR for the entire CSO Program, and that MEPA's "Major and Complicated" procedures should be utilized to allow for such a process; and

   (c) Those project elements which will require issuance of the Final FP/EIR for the entire CSO Program.

DEP believes that such a process is reasonable and implementable and would like to discuss the details of such a procedure with MWRA and MEPA.

2. DEP has raised the issue of whether or not EPA will be required to prepare and issue an Environmental Impact Statement (EIS) for the MWRA CSO Plan. DEP believes that this is one of the critical elements of the project's Implementation Plan and therefore needs to be expeditiously assessed by EPA and guidance provided by EPA to MWRA and the other Parties to the Federal Court Case.

3. It will be important for MWRA and the combined sewer communities (Boston, Cambridge, Somerville and Chelsea) to agree upon a plan for implementing the CSO Program. In the Draft CSO Conceptual Plan, MWRA is apparently assuming that the individual CSO communities will implement certain CSO projects, and has indicated in its Implementation Plan an

assumption that the FP/EIR process for these projects will not begin until June 1, 1996 (14 months after MWRA initiates its own FP/EIR). DEP is very concerned about such a dual FP/EIR process and the issue requires further review and discussion among relevant parties.

4. DEP is concerned with the nature of the "interconnections" and coordination of the CSO FP/EIR with the Boston Beaches Project, currently undergoing MEPA review, apparently mentioned by MEPA staff at an October 13, 1994 coordination meeting between MWRA and MEPA. DEP agrees that there are certain areas of overlap between the two projects which will require coordination of the two activities, but DEP does not believe that any type of formal interconnection of the two projects is appropriate. The Boston Beaches program includes a number of difficult jurisdiction, regulatory and technical issues (i.e. destruction of saltmarsh to upgrade bathing areas, dredging of sediments as an element of beach upgrading, etc.) which may require extensive and time-consuming interactions among a wide range of local, state and federal entities. DEP does not want to tie implementation of the CSO Plan to actions to be implemented as part of the Boston Beaches Project.

Implementation Plan

1. DEP has a number of concerns regarding the Implementation Plan included in the report much of which were addressed in the General Comment Section of this correspondence; see General Comments No. 1, 2, and 3.

2. Even though DEP agrees that this project is complex and technically challenging, DEP is of the opinion that a 27 month FP/EIR duration is ultra-conservative, and can be reduced. The nature and extent of that reduction should be fleshed-out during detailed discussions among MEPA, MWRA, EPA and DEP relative to implementation of the overall project plan.

3. MWRA should be able to initiate design for project elements which are determined not to require further MEPA review, earlier than January 1, 1996.

4. DEP is of the opinion that the 18 and 9 months included in MWRA's Implementation Plan for permitting of "large" and "small" projects respectively is ultra-conservative. For its part, DEP will expedite permitting for these projects.

5. On November 22nd staff from MWRA and DEP met to discuss issues related to Project Implementation and how to incorporate DEP's Partial Use Determination/Regulation Revision Process (PUD/RRP), and permit reviews into the timeline. Over the next month DEP will provide additional guidance on this issue to MWRA. It is DEP's understanding that MWRA will be reassessing its overall Implementation Plan based upon the

discussions it has had with MEPA, EPA, DEP, and other relevant parties.

Partial Use Determinations

An integral element of implementing MWRA's CSO Program will be DEP's preparation and promulgation of revisions to its Water Quality Standards (WQS) for delineating Partial Use-CSO Impacted segments of waterbodies which will continue to receive CSO discharges. This procedure will include DEP's filing with the Massachusetts Environmental Policy Act (MEPA) Unit of EOEA an Environmental Notification Form (ENF) for the revisions to WQS. This action will be a DEP activity but will need to be carefully coordinated with MWRA's CSO FP/EIR process in that the activities directly "feed off" each other. Much of the detailed documentation needed by DEP to perform the Partial Use Determination/Regulatory Review Process (PUD)/(RRP) will be developed by MWRA as the applicant for the CSO Plan and associated PUD request.

Discussions have already been held between our staffs regarding how this coordination will occur and further discussions will need to be held to flesh-out the details.

Water Quality Analysis of Alternatives

While MWRA has compiled a broad range of CSO alternatives in each subarea (which were developed from the workshops), the analysis of these alternatives was not completely carried out for all subareas. In many instances, information in the tables and charts was missing or listed as "NA." Also, it was difficult for some subareas to correlate alternatives from the tables with the graphs and charts contained in the appendix (some cost benefit graphs did not even include the recommended alternative). The water quality benefit information for each subarea should be completely presented so that the recommended alternatives are fully supported. This should include to the greatest extent possible the so-called fecal coliform "isogerms" which indicate the areal extent of fecal coliform violations (based on specific design storms). This information should be presented for the recommended plan and for the different alternatives in the South Dorchester Bay, Alewife Brook, Upper and Lower Inner Harbor, and the Mystic/Chelsea confluence where the choice of CSO control alternative is not readily apparent.

Compliance with DEP CSO Policy

In some subareas, the recommended plan includes alternatives which provide for less CSO control than that specified as the CSO control target (4 or less overflows per year) in the DEP CSO Policy. The cost and water quality benefit information included in the report indicate that providing CSO controls which meet the CSO control target would prove to offer little cost benefit or water quality improvement given the significance of the CSO loadings to

the receiving water in relation to other sources (stormwater and upstream sources). While it may be appropriate to proceed with the recommended alternative in these subareas, additional CSO controls may be required in the future if there is shown to be significant cost benefit or potential for improved water quality following the efforts to attempt to control stormwater pollution. In this regard, DEP considers the MWRA proposed plan to be a first phase in achieving compliance with the policy and water quality standards. The subsequent Facilities Plan/EIR phase must evaluate a plan that would fully comply with the DEP CSO Policy goal for each subarea. To the extent feasible, the Final Conceptual Plan should address this issue on a preliminary basis.

Remaining Overflows and Minimum Controls

Table 4-1 of Volume 2 lists the CSO activations and volumes for the "typical year" for future planned conditions and for the recommended plan. The activations listed for some of the subareas do not appear consistent with the levels of protection identified in the body of the report (e.g. in Alewife, Mystic/Chelsea Confluence). Subsequent discussions with the MWRA staff indicated that the inconsistency relates to the differences in running the design storm versus the typical year. This should be explained and expanded upon in the text of the report. Also, the plan should indicate which outfalls will be eliminated (bulkheaded) in implementing the recommended plan. It is the understanding of DEP that all outfalls that are to remain active will receive at a minimum, the CSO control specified in EPA's nine minimum controls.

Northern Dorchester Bay

DEP supports the recommended plan in Northern Dorchester Bay. Since all outfalls will be eliminated (i.e. bulkheaded) and all CSO flows diverted to the Reserved Channel, CSO (and some stormwater) discharges will be eliminated from this critical use area.

Southern Dorchester Bay

Figure 3-2 shows that CSO's in this area are not a major source of fecal coliform (FC) pollution, due primarily to the two existing MWRA CSO treatment facilities. However, CSO's remain a significant source of total suspended solids (TSS), biochemical oxygen demand (BOD), nutrients, and toxics to southern Dorchester Bay. Construction of dechlorination facilities at the existing CSO treatment facilities at Fox Point and Commercial Point and separation of the tributary combined sewer system over the next 20 years is the recommended plan for this subarea. However, information provided at the workshops indicated that separation will actually increase coliform loadings to the Bay. Therefore, a concurrent Illegal Connection Correction Program and additional stormwater management will be critical in achieving water quality

standards in the receiving water. In addition, Table 4-1 indicates that even after sewer separation, as many as six overflow events per year may continue to occur. MWRA has stated that these overflows may remain due to surcharging and/or hydraulic restrictions in the Dorchester Interceptor. DEP is concerned that these overflows may diminish some of the benefit of separation. The FP/EIR must fully assess this issue and, if deemed necessary, restrictions in the Dorchester Interceptor should be corrected. The recommended plan for Southern Dorchester Bay should be further developed to determine if CSO discharges can be completely eliminated. The water quality assessment should also be further developed to include an analysis of the impacts of the Neponset River on this segment, as it appears to have major impacts on Tenean Beach and other critical use areas.

Neponset River

If separation remains the recommended alternative in Southern Dorchester Bay, then separation of the two outfalls in the Neponset basin becomes the most cost effective alternative for removals of FC, TSS, and BOD. However, if implementation of the separation program is reconsidered or delayed, other CSO control alternatives (such as the recommendation from the workshops - Equivalent of Primary Treatment at Outfalls BOS095 and BOS093) may be appropriate.

Constitution Beach

DEP supports the recommended alternative to separate the one CSO outfall in this subarea as a long term CSO control strategy since this will eliminate all CSO discharges to this critical use area. However, MWRA should consider including the construction of dechlorination facilities at the Constitution Beach CSO treatment facility as an interim measure until the separation of the combined sewers is complete unless MWRA intends to expedite the sewer separation project.

Charles River Basin

The Charles River is a large and complex waterway which receives drainage from portions of over thirty municipalities and includes a number of dams which significantly complicates assessment of water quality. There are also a significant number of direct or indirect water withdrawals within the basin which affect to some extent the river's ability to assimilate the point and non-point discharges. There are two other activities which will be occurring in the basin during MWRA's FP/EIR, design and initial construction phases of its CSO Program, those activities being; (1) the Charles River Watershed Association's (CRWA) IM3 Project (Integrated Monitoring, Modeling and Management Study), and

(2) DEP's Charles River Watershed Basin Permitting Plan. MWRA has recently allocated substantial financial support to the CRWA's effort and it is DEP's hope and expectation that the CRWA project will develop substantial technical and scientific information regarding the basin, which will provide information to MWRA and the Federal and State regulatory agencies relative to development of an overall analysis of contaminant discharges in the basin and whether, and to what extent, CSO controls beyond those proposed by MWRA in its CSO Conceptual Plan will be needed to meet Water Quality Standards.

If one assumes that MWRA's project schedule, and that of the Charles River Watershed Association (for its IM3 Proposal) are followed, overall project timing and coordination of decision-making fit quite well. The MWRA Proposal calls for completion of FP/EIR process in June 1997 with initiation and completion of the design phases in mid-1998 and late 1999/early 2000 respectively. The CRWA schedule indicates that by mid 1997 the Water Quality Modeling Simulation will be completed/validated and stormwater analysis completed, with overall project completed in the Spring of 1999. DEP for its part expects to initiate its field program in 1997.

Therefore, by mid 1997, DEP will have initiated its field sampling, MWRA will have completed its FP/EIR phase, and CRWA will have analyzed stormwater and validated its water quality model. Since MWRA is not planning to initiate detailed design until mid-1998, there will be an opportunity to consider, and incorporate into program reassessment and project design, the results of the initial 3 1/2 to 4 years of CRWA's 5-year program and the results of DEP's field studies.

Upper Charles

The water quality analysis shows that the Upper Charles is dominated by stormwater and upstream impacts. The recommended plan is to screen and disinfect three of the six CSO outfalls in the area (this will address over 95% of the area CSO flows). The report should indicate why no additional controls have been identified for outfalls BOS033, CAM007, and CAM011 beyond the nine minimum controls.

Lower Charles

CSO's do not represent a major pollutant load on an annual basis for any pollutants: However, they are a considerable contributor to FC and nutrient loadings to the river for the one year storm. The recommended plan is by far the least expensive alternative yet results in the most water quality benefit from a bacteria standpoint since it also treats stormwater in the Stony Brook Conduit. DEP supports the recommended plan for construction of a screening and disinfection facility at Stony Brook as an initial phase of CSO control. However, depending on the results of the field studies noted above for other pollutant sources

(stormwater, upstream loads), CSO controls for this subarea may need to be reassessed, and additional controls (e.g. storage or separation) may be required. As indicated earlier, the Facilities Plan/EIR must evaluate a plan that would fully comply with the DEP CSO Policy goal for the Lower Charles subarea.

Back Bay/Fens

The Muddy river is heavily impacted by stormwater but CSO's are a significant source of FC and nutrients for the one year storm. The report proposes to install bar screens at the one CSO Outfall (BOS046) but does not include any discussion or evaluation of alternatives. The recommended plan may be approvable but the facilities plan must, at a minimum, identify and present the benefits and costs of other higher CSO control alternatives.

Alewife Brook

The report states that CSO's are a predominant source of FC for the one year storm but that Alewife Brook is heavily impacted by stormwater impacts relative to annual loadings. The plan does not present a detailed comparison of the alternatives with regard to water quality impacts since no detailed receiving water quality modeling was performed in this subarea. The recommended alternative is to separate sewers so that protection of the three month storm will be achieved. The plan appears to be consistent with DEP policy but further water quality analysis is necessary to present cost benefit information more clearly and to define the area for which a partial use designation is appropriate.

Upper Mystic

DEP supports the recommended plan for this subarea which is to separate the combined sewers tributary to SOM007 at a cost of $0.1 Million and to continue treatment of the discharges at SOM007A. There appears to be no water quality benefit to relocation of the Somerville Marginal relief outfall, and the recommended plan will result in untreated overflows only twice per year with minimal discharges.

Upper Inner Harbor

CSO's are a significant source of pollutants for the one year storm but are less significant than stormwater impacts on an annual basis. However, the August 94 SMP Baseline Report indicated that future non-CSO sources by themselves would not cause violations of the swimming standard for the three month storm (and only 4 hours of violation for the one year storm). The water quality modeling information presented in the conceptual plan is not clear and it is difficult to determine which alternative has the most cost benefit,

and the information in Table 3-9 does not correlate well with the information in Appendix A. DEP cannot support the recommended alternative until MWRA can detail additional water quality impacts of CSO alternatives and non-CSO sources and present a clear cost-benefit analysis of all the CSO control alternatives. As indicated earlier, the Facilities Plan/EIR must evaluate a plan that would fully comply with the DEP CSO Policy goal for the Upper Inner Harbor subarea.

Lower Inner Harbor

As with the Upper Inner Harbor, the Baseline Report indicates that there will be no violations of the swimming standard from non-CSO sources alone for the three month or one year storm for this subarea. It is important to note that the use of the segment is primarily as a shipping channel. The recommended plan is for construction of interceptor relief which will increase the capacity of the East Boston Branch Sewer which will in turn eliminate overflows from the three month storm. While the plan achieves the target level of control in the CSO Policy, the resultant water quality information in the report appears to be inaccurate and is not consistent with the information presented for other subareas in the report. Therefore, DEP cannot support the plan for this subarea until the water quality and cost benefit information is revised and is shown to support the recommended alternative.

Mystic/Chelsea Confluence

The SMP Baseline Report indicates that future non-CSO sources will cause violations of the swimming standard for the three month storm but that CSO sources alone will not cause violations for this storm. On an annual basis, this segment is dominated by non-CSO sources, however, CSO's are a significant contributor of FC and nutrients for the one year storm. The presentation on the cost-benefit of the different CSO control options is not clear for this segment. The Table 3-11 is not completely filled out and it is difficult to correlate the alternatives in the table with the water quality and cost benefit information contained in the Appendix. As such, the recommended alternative does not appear to be supported by the water quality benefit information presented in the report. From the information presented, the alternative of choice would appear to be that indicated as MCC4 in the Appendix. However, this alternative is not described in the text of the report. The plan for this subarea should be revised so that the water quality assessment of the alternatives is complete and a CSO control alternative is recommended which complies with the DEP CSO policy and is supported by the water quality analysis.

Reserved Channel

The recommended plan is for construction of a consolidation conduit from BOS076 to BOS080 where the CSO discharges will be treated at a screening and chlorination facility. While the plan will eliminate water quality standard violations from the one year storm, it is unclear from the information presented how the consolidation conduit will be sized (to convey flows up to for the one year storm?). The concept of consolidating CSO flows from the Reserved Channel to a treatment facility at BOS080 will maximize the benefit of the screening and disinfection facility, which is to be constructed to treat flows from both the Reserved Channel and North Dorchester Bay.

Fort Point Channel

The analysis of alternatives for the Fort Point Channel did not include any alternative which would provide for storage of the three month storm. While the recommended alternative may be the appropriate level of CSO control, a three month CSO control alternative, which meets the target CSO control, should be included in the cost benefit analysis.

Specific Comments

Volume One - Recommended Plan

1) Table ES-1 — The table is not consistent with the information provided at the November 4 Court Parties briefing. How does MWRA justify the contention that the average annual CSO overflow events for the entire area is 0-4, since Alewife and Boston Harbor will now be subject to as many as 9 untreated CSO events per year.

2) pg 2-3 — The technical memorandum on the Stony Brook system was never submitted for review.

3) pg 3-19 — The text indicates that the level of CSO control in Alewife Brook will be the three month storm, but this is not consistent with table 3-6.

4) Section 4 — It seems ultra-conservative to assume that the design phase for Neponset River, Constitution Beach and Alewife sewer separation projects will take 30 months, and permitting 18 months.

5) Section 4 — It seems that the 18 month design and 9 month permitting phases for manually cleaned screens at Fort Point Channel and Upper Inner Harbor is overly conservative.

6) Section 4 — The schedule calls for "delaying" the Reserve Channel Consolidation Conduit for 7 years after FP/EIR phase (complete construction in February 2008), while the North Dorchester Bay element of Reserve Channel Project would have construction completed in December 31, 2003. Even though the Reserve Channel Conduit element is a lower priority, this delay seems excessive.

7) Section 4 — The MWRA should include in the final report a schedule of financial expenditures for the overall CSO Plan.

8) Section 4 — Some of the recommended projects include one or two major construction activities but also a number of what appear to be minor independent elements. It is unclear from the text and Implementation Schedule whether MWRA is proposing to expedite implementation of these smaller independent elements or whether they will (or need to) await the larger project.

9) pg 4-19 — How will MWRA will ensure satisfactory progress in implementing the CSO plan if communities are to carry the ball on separation projects?

10) pg 4-21 — Eighteen months and thirty months seem long for design. Small projects should be no longer than one year and only the most complicated projects should be allotted 30 months.

11) pg 4-23 — Can the Dorchester Brook Conduit in-system storage project be expedited without going through the planning/EIR loop - this seems almost like an "intermediate" project.

<u>Volume Two - CSO Strategies</u>

12) pg 2-15 — EPA has indicated in guidance that equivalent primary treatment is at least 35% TSS removal and 15% BOD removal, not a standard overflow rate.

13) pg 2-29 — Graphic depictions of WQS violations (as done in past FP) would be helpful in water quality analysis.

14) pg 2-31 — Why is plan M and not the recommended plan evaluated in the water quality analysis?

15) Table 3-3 — Why isn't info included in Table 3-3 for all alternatives? Why is there untreated volumes listed of 1.88 and 1.05 MG for aesthetics (for the one year storm) when these alternatives control the one year storm?

The corresponding water quality impact chart in appendix A does not list the hours of violation for all the alternatives nor does it indicate the remaining CSO and stormwater TSS and BOD loads.

16) Table 3-5 The table indicates that there are no critical siting concerns for these facilities - is this accurate?

Does the proposal also include the installation of bar racks at outfalls BOS033, CAM007, and CAM011? Is there a specific design storm related to this option or will the treatment facilities handle all flows hydraulically delivered?

Implementation timeline for this project is such that facilities will not be operational until 2003. Will the bar rack facilities be fast-tracked?

17) Table 3-6 The missing information in the table should be filled in. Why is untreated for aesthetics listed as 46.06 MG when future planned volume is only 13.33 MG?

Are these facilities based on a design storm or will they treat all flows to the facilities?

Again, the corresponding water quality impact chart in appendix A is not completely filled out.

18) Table 3-7 There is no information on hours of WQS violations for any of the Alewife CSO control alternatives and also no information in the associated water quality impact chart. Some kind of water quality assessment needs to be performed, especially since the MWRA intends to recommend a lower level CSO control alternative.

19) Table 3-8 What is the significance of "NA" listed in this table?

20) Table 3-9 Again, the listing of "NA" should be explained. Does this mean that only separation will meet the swimming standard?

It is difficult to correlate the alternatives in table 3-9 to the water quality impact chart and the cost benefit graph located in appendix A.

The Upper Inner Harbor cost benefit graph does not include the recommended alternative among the alternatives on the graph. Also, based on the graph, UIH-4 appears to have the most cost benefit even though it costs an additional $65 million.

The recommended alternative should have an associated O & M cost.

21) Table 3-10 Again, the listing of "NA" in the table should be explained.

How can the one year storage alternative result in longer FC violation duration than the three month storm interceptor alternative?

Cost benefit graphs indicate performance vs baseline CSO loads when all other graphs in the appendix compare to total loads (including all sources). Why the inconsistency?

22) Table 3-11 The table again lists "NA" in the hours of violation analysis and it is difficult to correlate alternatives in the body of the report with those in the appendix.

The choice of the recommended alternative is not supported well by the information in the table and in appendix A. It would appear that MCC-4 should be the recommended alternative. This alternative is not included in the descriptions in the text.

23) Table 3-12 There is no option on the cost benefit graph in appendix A which corresponds to the alternative recommended in the table. Is table entry of 9.36 for solids load accurate? This is many orders of magnitude less than the other alternatives.

What design storm is the basis of the recommended alternative?

It is not clear if the cost of the screening and chlorination facility at BOS080 is included in the costs for the Reserved Channel or North Dorchester Bay facilities.

24) Table 3-13 MWRA has not selected the most cost effective CSO control with regard to fecal coliform. That would appear to be the $12.7 million alternative identified for treatment of CSO's (not storage).

25) Table 4-1 Will CSO's indicated to be plugged be permanently bulkheaded as part of the CSO plan?

CSO volumes in South Dorchester are confusing. If separation is the recommended plan, won't all CSO discharges be eliminated?

Since all Upper Charles recommended facilities are flow through treatment (screening and

disinfection), why is there such a dramatic difference in the CSO flows between future planned conditions and the recommended plan?

Also, for the Lower Inner Harbor the flows are substantially less for the recommended plan than for future planned conditions even though all treatment is flow through and many outfalls will not be modified at all. This should be explained.

Flows remaining at BOS019 are indicated to be treated CSO flows where the recommended plan at this location recommends a storage, not treatment alternative.

Fort Point Channel overflow BOS068 shows an increase in overflows from 0 under future planned conditions to 7 under the recommended plan. Is this correct?

26) Figure 4-1 Strategy M is significantly different from the Recommended plan in the Upper Mystic, Reserved Channel, Fort Point Channel, Inner Harbor, and Charles River as far as recommended facilities. Is MWRA intending to compare strategy M as a surrogate for the recommended plan in the comparisons represented in figures 4-1 through 4-4?

27) Figure 4-4 There are considerable differences in the water quality analysis presented in the conceptual plan (figures 4-1 to 4-4) and the analysis presented in the August 94 SMP Baseline Report. These inconsistencies must be clarified since actual causes of nonattainment are critical in determining appropriate CSO controls.

28) Pg 4-12 Page 4-12 indicates that there appears to be adequate space for the screening/disinfection facility at or near Conley Marine Terminal. It is DEP's understanding that Massport intends to expand its marine-related activities at Conley. Has MWRA received any guidance from Massport?

29) pg 4-27 The conceptual plan should indicate which streets are involved in the separation of CAM004 outfall and if they are impacted in any way by the ongoing Phase VI separation work by the city of Cambridge.

Some form of receiving water quality modeling should be performed for Alewife Brook to determine

if Alewife will meet class B standards in the absence of any CSO discharges. This may be necessary for the partial use designation as well. (The same applies for the Upper Mystic).

30) Pg 4-33 Who will determine whether in fact there are restrictions in upstream interceptors to the Prison Point Facility? If restrictions do exist, how might relief of the restrictions affect options assessment?

31) Pg 4-35 Will MWRA consider including the revisions to the gate on the westside wetwell into the SOP program to obtain immediate relief?

If you have any questions regarding these comments, feel free to contact me at (617) 292-5698.

Very Truly Yours,

Steven G. Lipman, P.E.
Boston Harbor Coordinator

CC: Richard Kotelly, EPA
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Lise Marx, MWRA
Jan Reitsma, MEPA
David Standley, City of Quincy consultant
David Graber, Town of Winthrop consultant

ATTACHMENT No. 1

MASSACHUSETTS WATER RESOURCES AUTHORITY

MEMORANDUM

To: Distribution

From: Michael Collins, Project Manager, SFD-CSO MPC

Subject: MWRA SMP/CSO Facilities Planning, Contract - 5716 Task 2.11.2 Minutes of Mtng. w/ DEP regarding their review comments for the Draft CCP/SMP Report

Date: November 15, 1994

A meeting was held with the DEP, M&E and members of the MWRA on Tuesday, November 1, 1994 to discuss in detail the initial DEP review comments, dated October 19, 1994, attached. In attendance were the following:

MWRA - Michael Domenica, Michael Collins, Lisa Marx and Antoinette Powell

DEP - Steven Lipman, Kevin Brander, Ron Lyberger and Alan Slater

M&E - Daniel Donahue and Greg Heath

General Discussion

Lisa Marx identified in her early discussions with MEPA that they believe initiating a new MEPA process as opposed to a filing of project change from the 1990 CSO Facilities Plan is the best course of action.

DEP stated that they will be submitting formal comments on the Draft CCP/SMP Report later (11/23/94) to the MWRA.

DEP expressed the concern that the presentation of water quality impact changes as a result of the Future Planned Conditions and CSO Control Alternatives in the Draft CCP/SMP Report were difficult to understand. The Final CCP/SMP report should include addition of the fecal coliform contour plots showing concentrations in Boston Harbor and the Charles River for several days after the design

storm occurrences for the Future Planned Conditions and several CSO Alternative Control Plans per Receiving Water Segment.

The modeling of receiving water impacts thus far is limited to models of fecal coliforms in Boston Harbor and the Charles River Basin. There may be a need during the Facilities Planning / EIR process to model more water bodies such as the Alewife Brook and Mystic River above the Amelia Earhart Dam. There may also be modeling performed for other receiving water impacts such nutrients and DO sags, in certain or all water bodies. This would be in support of the demonstration approach chosen by the MWRA.

M&E provided a copy of the colored stacked bar handouts that the MWRA is using for the neighborhood meetings, to the DEP.

The discussion then moved to a basin by basin discussion as follows.

Northern Dorchester Bay

1. The DEP finds that the water quality benefits of the alternatives are hard to understand. The exceedance times presented in Table 3-1 (Volume 2) are based on one-year storm modeling. There is no presentation of a three-month design storm condition. Fecal coliform plots for several days after the design storm will be added. The presentation of the three-month and one-year design storms is helpful in deciding the level of appropriate control.

Southern Dorchester Bay

1. The pie charts identifying the contributions by the various sources will be modified to include the Neponset River loads.
2. Where there are areas where sewer separation is to be conducted there should also be a program to locate and remove illicit sanitary discharges to separate storm drain systems.
3. More feedback is required from the DMF on the Recommended Plan, particularly in regards to the closure zones where CSO outfalls will remain in the vicinity of shellfish beds. It is believed that there will always be restricted shellfishing, where shellfish are required to go through the depuration process, but that there will be more flexibility with shellfish bed closure if the CSOs are removed from the immediate water body.

4. The upgrading of the Fox and Commercial Point screening/disinfection facilities to provide dechlorination during the interim period until the sewer separation is completed was discussed. It was asked if there was the possibility that once the sewers are separated could more separated stormwater flow be directed to the facilities for screening and disinfection of stormwater flows, under operation by the BWSC. The MWRA will discuss with BWSC the potential continued use of these facilities once sewer separation is completed.
5. As shown on Table 4-1 (Volume 2) after the recommended sewer separation is constructed there still are CSOs expected occur at these facilities Fox Point (6 per year) and Commercial Point (1 per year). It was questioned how these facilities would still experience overflows over the regulators with sewer separation. M&E believes this may be flows backing up the Dorchester Interceptor and impacting these systems or these may be sanitary sewer overflows where the sanitary sewer system may need a capacity increase. This will be further investigated by M&E, prior to issuance of the December 1994 Final CCP/SMP Report, to find what is needed to eliminate CSOs from the Southern Dorchester Bay segment.

Neponset River

1. The sewer separation that is recommended for this segment is dependent on performing the recommended alternatives in the Dorchester Bay area to lower the hydraulic grade lines in the Dorchester Interceptor which were causing a backwater to the BOS095 overflow. DEP requested any available information on the extent of South Dorchester separation necessary to allow closure of the Neponset River CSOs.

Constitution Beach

1. The sewer separation recommended for this area is quite small and the DEP would like to see this project constructed early. The early timeframe of this project enable the MWRA to abandon use of the Constitution Beach screening/disinfection facility without upgrading the facility to provide dechlorination. The MWRA will discuss the potential future use of this facility for disinfection of separate stormwater once abandoned by the MWRA. It was identified that the separate stormwater to the receiving waters is spread out with very little going through the Constitution Beach facility, making use of the facility

for screening and disinfection of separate stormwater flows unlikely.

Upper Charles River Basin

1. M&E identified that during further analysis since the preparation of the Draft CCP/SMP Report there is the strong possibility that by enlarging the BOS032 dry weather connection to the interceptor system that the overflows at this CSO drop to one-to-three expected during a typical year. This may potentially allow modification of the recommendation at this CSO in the Final CCP/SMP Report to drop the recommendation for constructing a screening / disinfection facility to installing the floatables control that would be recommended under the nine minimum CSO controls implementation.
2. M&E will check the CAM005 OFs per year where the future planned condition call for 4 OFs/year and the recommended plan calls for 11 OFs/year. They will also check because the three month design storm predicts no overflows. M&E will review the annual activation prediction at this OF and if the number of OFs/year at CAM005 is less than 4 to 7 per year the recommendation for CAM005 may be modified to installing the floatables control that would be recommended under the nine minimum CSO controls implementation. The site for the facility near the Mount Auburn Hospital was identified as not a potential problem.
3. The CAM009 recommendation for a screening / disinfection facility with the prediction of 1 OF/year under the recommended plan was questioned. M&E will review the annual activation prediction at this OF and if the number of OFs/year at CAM009 is less than 4 to 7 per year the recommendation for CAM009 may be modified to installing the floatables control that would be recommended under the nine minimum controls implementation. In addition, it was identified that there would be much local opposition to locating a CSO treatment facility in the vicinity of JFK Park.

Alewife Brook

1. The recommended sewer separation above CAM004 will eliminate all OFs in the system upstream of the Alewife Brook PS during the three month design storm.
2. At present there is no receiving water modeling being performed for the Alewife Brook. During Facilities Planning

an assessment will be performed to determine the appropriate method for identifying receiving water exceedance of standards, which may or may not include modeling of the receiving waters.

3. It is hoped that during the Facilities Planning process that CAM002 system can be optimized to further reduce the 9 OF per year to 3 to 6 OFs per year.

Upper Mystic River (above Amelia Earhart Dam)

1. The NA in the chapter 3 (Volume 2) tables indicates not available because there are no receiving water models of this area. A footnote or different symbol will be standardized and used.
2. The recommended plan for the Somerville Marginal Facility calls for a three-month storage system with screening and disinfection of exceedance flows which would then bypass the storage facility. Table 4-1 (Volume 2) identifies 31 OFs per year under the recommended plan. M&E will check the overflow frequency.

Mystic Chelsea Confluence

1. The DEP questioned why the Somerville Marginal Facility will have a storage facility. The MWRA replied that there is a DO problem in the receiving waters and the facility would aid in the removal of BOD discharged to the receiving waters. The DEP identified that the CSOs discharge only a small percentage of the BOD to the receiving waters. There may be a reconsideration to changing the recommended plan at the MWR205 and SOM007A to a Somerville Marginal screening / disinfection facility with dechlorination.
2. With the implementation of the recommended MWRA interceptor projects under the SMP the number of OFs/year at BOS014 and CHE008 drop to 1 or 2 per year. M&E will further validate this information. If the activation prediction at these OFs is less than 4 to 7 per year the recommendation for BOS014 and CHE008 may be modified to installing the floatables control screening that would be recommended under the nine minimum controls implementation before 1/1/97.
3. DEP questioned whether the screening / disinfection facility proposed for BOS017 should be modified to include 3-month storage. The recommended plan has 14 treated OFs per year.

Minutes of Meeting w/ DEP
Re: DEP Review of Draft CCP/SMP Report
November 15, 1994

Upper Inner Harbor

1. The DEP asked the MWRA to look at the potential for providing storage (3-month storm) in the future at the Prison Point Facility to lower the number of overflows per year to the 4 to 7 range. Under the recommended plan the number of OFs predicted per year are 21 activations.
2. Table 9-3 of the Baseline Water Quality Assessment report was questioned where for the three-month storm future (future planned conditions) the hours of violation of the swimming standard are shown as 21 for all sources, 3 for CSO sources and 0 for Non-CSO sources.

Lower Inner Harbor

1. Under the Volume 2, Appendix B, Cost Performance Curves for the Lower Inner Harbor, the CSO Load Reductions should be presented as a percent of the Baseline Total Load, not as a percent of the Baseline CSO Load.
2. Under Table 3-10 the exceedance of the swimming standard at 23.8 hours will be checked by M&E.

Reserved Channel

1. M&E will review the number of overflows for the storage options as shown in Table 3-12.

Fort Point Channel

1. There was no option for storage at the Union Park PS reviewed for the Draft CCP/SMP Report. The DEP asked the MWRA to look at the potential for providing storage (3-month storm) in the future at the UPPS to lower the number of overflows per year to the 4 to 7 range. Under the recommended plan the number of OFs predicted per year are 12 activations.

Lower Charles River Basin

1. The DEP identified that the screening and disinfection of the Stony Brook Conduit and upgrading of the Cottage Farm Facility may be an interim measure. The DEP asked the MWRA if the potential for providing storage (3-month storm) in the future at the Stony Brook Conduit and Cottage Farm Facilities had been investigated, in case in the future there is a

requirement to lower the number of overflows per year to approximately 4 per year.

M&E replied that the Table 3-6 alternatives for Stony Brook and Cottage Farm included storage options which were evaluated. The evaluation of providing storage for the three-month storm at Cottage Farm identified that the storage

facility could be provided without the need to infringe on the ball fields.

The benefit of providing a storage facility for the 3-month storm at Cottage Farm would have a insignificant benefit in reduction of BOD and TSS loadings to the Lower Charles basin. The CSO portion of the total BOD and TSS loads to the Lower Charles Basin for the 3-month design storm are approximately 8.5 percent each, and for the 1-year design storm are 21.5 percent each. Under the Recommended Plan for the Lower Charles River Basin there are no storage, relocation or separation projects proposed, so there are no changes predicted for BOD and TSS loadings. If a 3-month storage facility were provided at Cottage Farm the BOD and TSS load reductions to the Lower Charles River Basin would be approximately 6 percent each. For the 3-month storm the total BOD loading to the Lower Charles would be reduced from 45,000 kg to 42,000 kg, and total TSS loads would be reduced from 81,000 kg to 76,000 kg.

2. DEP asked if other alternatives were evaluated for the Back Bay Fens.

File: 5716.2.11.2
Distribution:
Meeting Attendees
David Kubiak, MWRA
Gretchen Roorbach, MWRA

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION I
J.F. KENNEDY FEDERAL BUILDING, BOSTON, MASSACHUSETTS 02203-2211

December 1, 1994

Douglas MacDonald
Massachusetts Water Resources Authority
Charlestown Navy Yard
Boston, Massachusetts 02129

Dear Mr. MacDonald:

EPA has not completed its review of the MWRA's September 1994 "Draft CSO Conceptual Plan and System Master Plan" (Draft Plan). However, some comments are in order.

First, as stated in a recent court filing (Response of the United States to the MWRA's October 17, 1994 Compliance and Progress Report, filed October 20, 1994), EPA supports the Draft Plan's recommendation that CSO discharges into Dorchester Bay be eliminated.

The schedule for this work seems quite lengthy, however, and we look forward to exploring the feasibility of a shorter time frame for this high-priority work (as you know, we have already begun meeting with your staff on this issue).

Similarly, EPA intends to pursue discussions with the MWRA about other proposed schedules in the Draft Plan. In general, the proposed schedules seem quite lengthy.

The October 20 court filing noted EPA's lack of comfort with the recommendations concerning the Charles River. While other pollution sources may contribute to the violations of water quality standards, it is clear that CSOs are a major source of pollution to this widely-used river. We have been discussing this issue with you and your staff for some time now, and we hope that we can reach a sensible compromise.

We do wish to note for the record two important concerns with the Draft Plan's analysis of the Charles River problem. First, we do not believe that a comparison of annual loadings from various pollution sources for most pollutants provides meaningful information, especially in a river environment. Since a river flows continually, "upstream" sources may well outweigh pollutants contained in intermittent discharges from CSOs on an annual basis. However, the real concern with CSOs in the Charles is their effect on the river during intermittent discharges--in that context, CSOs are a major (sometimes dominant) pollution source.

Second, we are concerned about the use of "averaga" values for

stormwater quality. The Draft Report relies heavily on its assessment of stormwater impacts to support its recommendations concerning CSO control, we would like to see a more intensive study of actual stormwater quality to support that assessment.

We look forward to continuing discussions of these and other issues.

Sincerely,

Richard P. Kotelly, Deputy Director
Water Management Division.

cc: Michael Domenica, MWRA
Steven Lipman, MADEP
John Sullivan, BWSC
David Standley, City of Quincy consultant
David Graber, Town of Winthrop consultant

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Environmental/Hydraulic/Mechanical Engineering
Water Quality Management Planning
Environmental Analysis/Modeling/Research

October 27, 1994

Mr. Douglas B. MacDonald, Executive Director
Massachusetts Water Resources Authority
Charlestown Navy Yard
100 First Avenue
Boston, MA 02129

SUBJECT: Draft CSO Conceptual Plan & System Master Plan

Dear Mr. MacDonald:

On behalf of the Selectmen of the Town of Winthrop, this letter provides comments on the subject report of September 30, 1994. As a general comment, the report is readable and well-organized, and reflects a solid, well-coordinated, long-term effort on the part of MWRA and its consultants.

The writer would also like to take the opportunity to compliment MWRA staff for an excellent job in preparing the July 1994 State of Boston Harbor Report. Its layout, informational content, and presentation are very well done.

The following comments are organized by program area according to the detailed plan volumes. Page, table, and figure references pertain to those respective volumes unless otherwise noted.

CSO STRATEGIES (VOL. 2)

The CSO planning process has been advanced significantly. The recommended plan represents a reasonable balance between costs and attainability. From a planning perspective, the challenge remains to further develop measures of water quality benefits and to explain those benefits to the public.

We suggest that one of the agenda items at the 11/4/94 forum be further explanation of the water quality modeling, including that

mentioned in Volume 1 at page 2-10 and on-going refinements mentioned in Volume 1 at page 1-7.

The plan properly recognizes the role that other sources of pollution (e.g., stormwater runoff) play in placing limits on attainment of water quality goals, yet reveals a practical and positive approach towards MWRA's continuing role in watershed planning.

The plan appropriately includes Combined Sewer Separation in five of the fourteen receiving water segments. That has the major benefit of reducing the human pathogens to which users of the receiving waters will be exposed.[1] In this regard, the writer reiterates the view expressed previously that fecal coliforms associated with CSO's are of much greater public health significance than are fecal coliforms associated with stormwater runoff. Separation not only has this public health benefit, but it also installs sanitary sewers which is a useful investment in infrastructure. This could be coordinated with other community infrastructure repairs. The proposed disinfection of remaining CSO's will complement the separation program in a cost-effective manner.

Removal of CSO floatables is an important aesthetic consideration. The plan is unclear as to the effectiveness of recommended technologies in this regard. Coarse screening is recommended for the Upper Inner Harbor segment (page 3-47) and Fort Point Channel (page 3-67), while devices to control floatables in Fort Point Channel (floating booms, trash nets, etc. - pages 3-69 & 70) were not recommended. For other locations, such as Reserved Channel (page 3-64) and the Lower Charles (page 3-29 & 4-23), plain "screening" is recommended, while at Back Bay Fens (page 4-26) manually-cleaned bar racks are recommended to provide "control of gross solids and floatables". Investigation of the effectiveness of different types of screens and other technologies for removal of CSO floatables should be included, and assessments of the effectiveness of the alternatives included in the discussions of "Water Quality Impacts".

Dechlorination is presumably intended wherever disinfection facilities are recommended. Volume 2's Sections 3 and 4 should be made more consistent in mentioning dechlorination. E.g., dechlorination is mentioned for the Mystic/Chelsea Confluence on page 4-36 but not on page 3-57, for North Dorchester Bay on page 3-7

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1. The report notes that elimination of CSO's "will...reduce the risk of contact with human pathogens" (page 4-12, etc.).

but not page 4-12, and for Reserved Channel in Volume I at page 3-20 but not Volume 2 (pages 3-64 & 4-38).

Referring to pages 2-21 to 2-23, it would be helpful if one simple example was given of the present worth calculations, such as for one of the alternatives in Table 2-5. Such a calculation would clarify why present worth costs are less than capital costs.

Discussion of financial arrangements and rate impacts should accompany the final report's discussion of the Implementation Schedule.

For the Upper Mystic River, on page 4-29 the wording should probably be "while lower levels of control are not substantially less expensive". Compare with wording at Volume I, page 3-19.

Volume I, Table 4-5: In the third Mystic/Chelsea project, "CHE006" should probably be "CHE008".

INFILTRATION/INFLOW STRATEGIES (VOL. 3)

The I/I plan is generally realistic and appropriately places the emphasis on community programs and incentives. The plan should remain dynamic to allow continuing evaluation of accumulated flow-meter data, results of flow-based billing, community I/I efforts, and developments in the areas of technology and measures of effectiveness. MWRA should continue to work closely with the communities, providing leadership, technical/financial assistance, and incentives.

It would be useful to augment the cost-benefit evaluations by considering cost-benefit from the standpoint of the communities, factoring in future MWRA flow-based charges (and recognizing that local pumping costs, etc. will add further incentives).

The one-year, 6-hour storm is mentioned and used for planning purposes (e.g., pages 2-1, 3-8, 4-2, 4-19, & 5-4). Please explain the logic behind the use of that storm. See related comments below under the heading of INTERCEPTOR STRATEGIES. In earlier discussions with MWRA (see below) the writer had been told that the I/I program would address concerns regarding the assumption of the one-year, 6-hour storm.

Referring to page 1-1, although MWRA-owned interceptors comprise less than 1 percent of the miles of pipe tributary to treatment facilities, they probably comprise on the order of 10 percent of the inch-miles (by virtue of their size). This, coupled with their age and materials of construction, makes them a potentially significant source of infiltration. Consider, for example, the North Metropolitan Trunk Sewer in East Boston and Winthrop.

In Table 2-1, the column headed "% of Total Inflow" should be "% of Total Infil.". The table would also be easier to understand if the word "Total" was deleted from the headings of the 2nd, 4th, 5th, and 7th columns.

Sump pumps are identified in Volume 3 (e.g., Table 3-1) as one of the sources of direct inflow. On page 3-9 there is discussion of disconnecting sump pumps and roof leaders from sanitary building services and rerouting the discharge to a storm drain or surface area. Connection of sump pumps and roof leaders (and especially the former) to storm drains is not allowed by most community ordinances. Furthermore, surface discharge from many and possibly all sump pumps is an NPDES violation (and occasionally creates a winter safety hazard due to freezing on streets). Given no alternative, discharges to sanitary sewers are even more likely to continue. This should be addressed.

Mention is made (pages 5-4 and 5-5) of reduction of I/I resulting from replacement of existing sewerage infrastructure. Unfortunately, I/I measurements a few years after new construction is completed sometimes show disappointing results, indicative of inadequate construction, inspection, testing, and enforcement of infiltration provisions of specifications. We suggest that MWRA prepare meaningful written guidance for member communities (and its own use), to help deal with this problem.

INTERCEPTOR STRATEGIES (VOL. 4)

Surcharge areas and flooding areas are identified, but it is not clear whether this includes direct overflows to drainage systems or water courses. Such direct overflows should be identified if they exist; that should not be limited to the one-year, 6-hour storm. If such overflows exist, strategies for their elimination should be considered.

The one-year, 6-hour storm is used for planning purposes (e.g., pages 1-2, 1-3, 2-7, 2-14, & 4-2). This is a matter which the

writer has previously discussed with MWRA, not only in connection with regional planning but also dating back to 1989 in connection with design of the Wellesley Extension/Relief Sewer Project and those sewers' overflows to the Charles River. The rationale for and use of that DEP design criteria should be critically evaluated. Some of the related concerns are as follows:

- Designing to, in effect, allow overflows from sanitary (as opposed to combined) sewers for storms greater than the one-year, 6-hour storm essentially institutionalizes such overflows.

- It may be totally unnecessary to plan for such overflows. Assumption of a one-year, 6-hour overflow improperly bypasses logically determining whether avoiding overflows would mean a 20% increase in sewer capacity or a much larger increase in capacity. Clearly if a 20% increase would avoid overflows, then total containment would be reasonable.

- Storm inflow rather than infiltration is generally the reason for designing for (or not designing to eliminate) overflows. There can be definite upper limits to the inflow that can enter sanitary sewers; it should not be assumed that inflow increases indefinitely as storm return period increases.

- Limiting consideration to one-year, 6-hour storms can overlook overflows that are activated during larger storms but which could probably be eliminated. We suggest that <u>all</u> overflows be shown and characterized.

- Addressing a concrete example, please let us know if any overflows remain on the Wellesley Extension/Relief Sewers, including system "vents" such as found at siphon crossings and the overflow structure located on the Charles River at the Dedham/Boston line (which was to be metered by MWRA beginning sometime after mid-1989).

Please note also that where constructed overflows exist the hydraulic grade line does not have to exceed the ground surface (page 2-6) for overflows to occur.

Referring to North Metro Sewer Section 2 - 6 in Table 2-3, why does the peak flow exceed the weighted/functional capacity while the MAX. d/D is 0.65 (less than 1). What does the asterisk mean under the EXCESS CAPACITY (MGD) column.

Surcharging to greater or less than six feet of interceptor ground surface may not by itself be an appropriate basis for recommending and prioritizing interceptor improvements (e.g., pages 2-6, 2-14, & 4-3; and SECTION FIVE). As noted on page 5-1, such surcharging "may" result in backups and overflows for "some" interceptor segments. Although the interceptors were presumably not designed for surcharge conditions, surcharging may beneficially increase sewer capacity and is not by itself a reason to provide relief. Criteria should include known problems (overflows or backups), projected flow increases, and such other local conditions as the interceptor elevation in relation to tributary community sewers, backwater effects in community sewers, locations of building connections, and actual elevations of cellars in relation to the sewers to which they connect.

SECONDARY TREATMENT STRATEGIES (VOL. 5)

The Winthrop/MWRA MOU was based on the premise that all of the construction called for in the Secondary Treatment Facilities Plan (STFP) would occur, that this construction would be completed within a certain time frame (ending in 1999), and that facilities thus constructed would provide capacity through the year 2020. MOU Paragraph I.A, among other things, stipulates that the Deer Island facility will not be expanded beyond the design flow and loading capacities found in the STFP and EIR/EID (Volumes II and III, "Facilities Planning Background and Treatment Plant") [and, by implication, that the facility would not be expanded beyond the flows and loads provided for in the initial construction], and that any additional treatment facilities (meaning advanced treatment, such as filtration) would respect the separation area described in MOU Paragraph I.E. One of the purposes was to limit the considerable impact of Deer Island construction to the ten-year period ending in 1999, with no significant further such impacts to occur for at least 20 years thereafter.

These premises were supported and amplified by the Certificate of the Secretary of Environmental Affairs on the Siting FEIR, January 31, 1986, pages 4 & 11; the G.L.C. 30 Section 61 Findings by the MWRA on the Selection of Deer Island as the Site for Wastewater Treatment Facilities, which was part of the EPA Record of Decision on the Siting FEIS, February 28, 1986, III.A (Commitments to Mitigation - Flow and Growth); and the G.L.C. 30

Section 61 Revised Final Findings by the MWRA on the STFP/EIR, October 15, 1990, III.A.

Winthrop would welcome reduction in the size of Deer Island facilities and associated reductions in cost and construction impacts, provided, however, that such reductions not be achieved by, in effect, phasing or delaying construction beyond the 1999 time frame in a way which is inimical to the Town. With this in mind, the Town requests that: (1) population[1], flow, and load projections be clearly and thoroughly supported by the planning documents (a deficiency in the STFP on which the Town commented during the STFP process); (2) the timing and nature of construction beyond year 1999 be explicitly addressed in the planning process; and (3) commitments be made within the reach of the current MOU (e.g., by amending that MOU) to assure that appropriate mitigation protections are in place relative to construction noise, traffic, etc.

The continuing DP-29 effort should address the use of space made available by the deletion of one or more secondary treatment batteries (and also reductions in numbers of Anaerobic Digesters and Waste Activated Sludge Centrifuges). Consideration should be given to moving the parking area planned for the southwestern end of the Island to the space freed up by such a deletion, thus allowing enhanced visual screening and landscaping of the southwestern end of the Island. Such screening/landscaping would include landforms and plantings, with the associated economic benefit of disposal of excess fill. We understand that related considerations include reserving an area for future plant expansion and, as noted on page 1-3, contingency plans for future nitrogen control. However, even if such relocated parking has to again be relocated in the long term, it could still be cost-effective. It might also allow completion of all construction concurrently, rather than necessitate constructing the parking area after year 1999 when the concrete batch plant can be decommissioned and removed.

Please explain more clearly what occurs during an "exceedance" of secondary hydraulic capacity (pages 3-8 to 9, etc.). Does this simply mean that all the "exceedance" flow receives primary treatment and is blended with treated secondary effluent for discharge to the ocean outfall?

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1. Comparisons with projections of State and regional planning agencies should be included. Also, please correct or clarify the population figures in the last sentence of the last full paragraph on page 2-1.

Chapter V addresses the issue of meeting EPA secondary treatment requirements, with further refinement to be provided by DP-29. Referring to pages 2-4 to 2-16, please explain why flow and load data were analyzed separately for dry-day and all-day (dry and wet) conditions. Does that have some regulatory or other significance?

We assume that DP-29 will also address, to the degree necessary, the matter of impacts of toxics, etc. on water quality in the vicinity of the outfall, updating as necessary portions of the Outfall FSEIS (Final Supplemental Environmental Impact Statement for the Boston Harbor Wastewater Conveyance System, July 31, 1988).

Thank you for this comment opportunity. In the final document due in December 1994, we ask that changes from the draft document be clearly identified to facilitate review.

Very truly yours,

S. David Graber

S. David Graber

cc: Richard N. Bangs, Chairman, Board of Selectmen
Robert E. Noonan, Selectman
Marie T. Turner, Selectman
Virginia L. Wilder, Director, Winthrop Community Development
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'94 DEC 12 P2:07

December 9, 1994

Lise Marx
CSO Program
Massachusetts Water Resources Authority
Charlestown Navy yard
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Charlestown MA 02129

Dear Ms. Marx:

I am writing on behalf of the Massachusetts Sierra Club to submit the following comments on MWRA's "CSO Conceptual Plan and System Master Plan."

1. COMPLIANCE WITH THE MASSACHUSETTS SURFACE WATER QUALITY STANDARDS.

A. Designated Uses. The Massachusetts Surface Water Quality Standards assign segments of water bodies to water quality classes . Section 4.05(1) of the Standards states, "Each class is identified by the most sensitive, and therefore governing, water uses to be achieved and protected." Most of the segments that are receiving waters for MWRA CSOs are currently classified as "B" or SB" waters. Class B waters are designated as habitat for fish, other aquatic life and wildlife and for primary and secondary contact recreation, and are supposed to have consistently good aesthetic value.

In some parts of this report, MWRA appears to be rejecting designated uses that have already been established through DEP's public review process for the water quality standards. The report in fact refers to "MWRA Water Quality Goals" -- which are in some cases different from Massachusetts DEP water quality goals. We do not see how MWRA derives authority from 314 CMR 4.00 to establish its own water quality goals.

Specific examples of omitted uses in "MWRA" water quality goals include: habitat for fish and aquatic life in Fort Point Channel and Reserved Channel, solids standard in relation to aquatic life in Mystic/Chelsea Confluence, Upper and Lower Inner Harbor, Lower Charles, and Alewife Brook, restricted shellfishing in the Upper Inner Harbor.

The report generally defends this approach by referring to non-CSO sources of pollution to these segments (stormwater or upstream sources) which contribute greater percentages of the total loading of specific pollutants. It argues in some cases that more substantial CSO remediation measures by themselves would not result in achievement of a specific pollutant standard.

The Sierra Club is not taking issue with those cases in which the CSO-

related contribution of a specific pollutant is truly insignificant. We cannot accept, however those cases in which MWRA uses finger-pointing at other sources as an excuse to avoid remedial action where there could be a meaningful reduction in pollution and measurable gain in water quality, even if compliance with a specific standard is not achieved. The purpose of this report should be to recommend CSO remediation which will achieve or help to achieve the already designated water quality levels and designated uses, not to rethink what those uses should be.

For the Alewife Brook segment, a critical concern is the annual migration of alewife to upstream spawning areas. The "Consolidation/Storage Conduit for 1-year storm control" alternative would reduce the suspended solids load to 13,000 lbs/year as compared to 25,000 lbs/yr. from the recommended alternative. The report does not quantify what specific pollutant loadings (if any) the recommended sewer separation will add to the existing loadings from stormwater in this segment. The pollutants of concern would be suspended solids and Biological Oxygen Demand.

In the Lower Charles segment, the alternative of "Stony Brook Consolidation to Storage and Cottage Farm Storage" would reduce the solids loading to the receiving waters by over 50,000 lbs. annually over the recommended alternative which is treatment for the Stony Brook conduit and improvement to the Cottage Farm CSO Facility. This reduction would appear to represent a significant water quality improvement and we urge that you reconsider the consolidation alternative for this segment.

The relocation of the CSO discharges in North Dorchester Bay to the Reserved Channel is likewise troubling in that we cannot find a quantification of the additional pollutant load to the Reserved Channel that will result from this relocation compared to what the loading would be without the relocation. The significance of this relocation to water quality in the Reserved Channel should be discussed.

In the Reserved Channel segment, the report indicates that CSOs are responsible for 41.2% of the annual flow, 73.7% of the total annual BOD loading and 72.2% of the total annual TSS loading, 47.9% of Copper and 41.1% of zinc. Control of these pollutants, however is not identified among the goals for this segment. We would like to know what effect a higher level of treatment than the level proposed in the recommended plan would have on BOD, TSS and toxics loadings in the receiving water.

In the Fort Point Channel segment, the report indicates that CSOs are responsible for 58% of the annual BOD and 56.1% of annual TSS; yet control of these pollutants is not identified among the goals for this segment. We would like to know what effect a higher level of treatment for the CSO discharges than the level proposed in the recommended plan would have on BOD and TSS loadings in the receiving water.

In the Mystic/Chelsea Creek Confluence segment, it is not clear whether storage and/or treatment of the remaining untreated CSOs would

have on levels of coliform, BOD and TSS. Is this information available?

The report did not appear to consider whether there is any remedial action that would allow opening the shellfish bed at the mouth of Chelsea Creek in the Upper Inner Harbor. Is this goal considered hopeless?

B. Partial Use Designation. It is clear that implementation of the proposed CSO plan will require a number of changes to the Massachusetts Surface Water Quality Standards. It would have been extremely helpful to have the specific changes that will be needed identified clearly in the text of the report. "Partial use designations" require a DEP review process with a public hearing. If specific "partial use designations" are not approved, the relevant parts of the CSO plan will have to be revisited.

It is troubling to see that in some cases the proposed plans do not appear to comply with the state's existing policy on Combined Sewer Overflows, in that more than four untreated discharges per year are projected. The policy allows an average of four untreated discharges in areas that are designated "partial use." In a number of cases, MWRA's recommended plan projects seven untreated discharges annually. It is not clear why "seven" equates with "an average of four."

Locations at which more than four violations are projected include: Fort Point Channel, Mystic Chelsea Confluence, Lower Inner Harbor, Alewife Brook, Upper Inner Harbor. These parts of the plan violate state policy and must be revisited.

The CSO plan proposes to provide only "coarse screens" at BOS 062 to 068 in the Fort Point Channel allegedly because these outfalls are "inactive in the three month storm." According to Table 4-1, however outfall BOS 068 is projected to have 7 activations per year. None of the final alternatives for the Fort Point Channel included providing disinfection/dechlorination for this series of outfalls -- why?

2. SEWER SEPARATION.

For areas where sewer separation is the recommended alternative (especially South Dorchester Bay, the Neponset River, and Alewife Brook), the report does not quantify the extent to which the proposed action may exacerbate the existing stormwater impact on the receiving waters or quantify this potential impact (by increasing the volume of stormwater entering the receiving waters). This impact, if there is one, should be compared with the water quality improvement that will result from separating the CSOs. This analysis is necessary since there is no guarantee at this time that a full stormwater treatment program will be implemented for these areas.

Thank you for considering these comments to the MWRA CSO Conceptual Plan. We urge the MWRA to continue to strengthen this plan so that the final recommendations will represent the maximum possible cost-effective pollution reductions in the affected receiving waters. We look forward to continued participation in this very important series

of water quality improvement projects.

Sincerely,

Priscilla A. Chapman

Priscilla A. Chapman
Associate Northeast Representative, Sierra Club

Arlington • Ashland • Bedford • Belmont • Boston • Braintree • Brookline
Dedham • Everett • Framingham • Hingham • Holbrook • Leominster
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December 6, 1994

Douglas B. MacDonald
Executive Director
Massachusetts Water Resources Authority
100 First Avenue
Boston, MA 02129

Re: Draft CSO Conceptual Plan and System Master Plan

Dear Mr. MacDonald:

The Advisory Board appreciates the opportunity to comment on the Draft CSO Conceptual Plan and System Master Plan. We expect to continue to participate in the discussion of the several components of the Plan, including ongoing review of the Authority's Capital Improvement Program and review of the DP-29 report recommending revisions in treatment facilities at Deer Island.

The Advisory Board Supports the CSO Conceptual Plan

The Advisory Board has long recommended that the Authority address and phase in CSO control basin by basin, starting with those basins where control would have the most immediate environmental benefits. In addition, the Advisory Board has recommended that the Authority revise its estimates of the additional, specific CSO control project spending that would be needed given the considerable spending commitments to improved treatment facilities, system repair and rehabilitation in both the Authority and municipal systems, and better coordination and management of system operation.

The Authority's 1994 CSO Plan and supporting levels of spending are consistent with these recommendations. Given the Authority's ongoing maintenance and capital projects, the Advisory Board has recommended that spending estimates for design and construction of new CSO control projects could be reduced to $368 million. A $1 billion reduction in planned spending (as compared to the estimated $1.38 billion of just two years ago) is an undeniably dramatic savings for ratepayers already paying some of the highest rates in the country.

The Authority's Plan has other important advantages. The proposed series of projects, instead the massive deep-tunnel system, means that progress and environmental benefits can be immediate and ongoing. Already a number of the system optimization projects have been implemented, and others are underway. Despite

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previous insistence that only a single, large-scale technology could meet water quality standards, the Authority can now show that the cumulative effect of a series of smaller projects and strategies, tailored to the specific geographic and system characteristics of each area, will also provide appropriate levels of CSO control.

Watershed Based Planning and Management Should Be Supported

Where CSO controls by themselves cannot ensure that water quality standards will be met, solutions should reflect a watershed approach. The Charles River watershed continues to be the most important case in point, where other sources far outweigh CSO-related causes of pollution.

One of the more important developments of the CSO Plan is the proposal to renew efforts to conduct watershed planning as a way of generating systemwide solutions. By focusing on the Charles, whose drainage area extends back beyond the MWRA's own service area, the Authority is pursuing just the approach that can generate solutions that can make the difference in wet weather controls.

The watershed approach also makes pollution control benefits of other Authority and community projects much more clear than the separate display of CSO control projects. For example, the Authority is planning to construct nearly two miles of new interceptor pipe along the New Neponset Valley relief sewer, thus eliminating chronic wastewater overflows to the Charles River, as well as reducing I/I by as much as 16 mgd. Through the I/I Financial Assistance Program and local maintenance programs, many communities are pursuing projects that will reduce groundwater infiltration from and pollution to the Charles River.

Key to the success of the watershed approach will be the commitment by the state and EPA to an effective planning effort. EOEA and DEP, as well as EPA, must be active participants throughout the process to ensure that the management program that emerges is both supported and implemented.

The I/I Financial Assistance Program Should Be Continued and Expanded

The I/I Financial Assistance Program goes hand in hand with the Authority's recommended CSO Control Plan. The Authority staff indicates that the upcoming proposed Capital Improvement Program for FY96-98 will include increased funding for the Financial Assistance Program.

Communities are already participating in a series of projects which are estimated to contribute to reductions of peak infiltration and inflow rates of up to 64 mgd (as of the most recent program report). While the Authority points out the

difficulties of ensuring net and sustainable reductions to such flows in an old and complex system, it does appear that I/I reductions beyond the assumed 18.66 mgd for the control plan are probable. This is particularly likely given the upcoming implementation of the new flow-based sewer rate methodology next summer.

The CSO Control Plan Should Be Reexamined and Updated Annually

The CSO Control Plan should be reexamined and updated annually, based on an assessment of both new flow data and the status of each phase of Deer Island plant start-up.

Every year, the Authority will be developing a statement of flows and loads for use in assigning sewer rates, using the new methodology. Over the next five years, the Authority expects to be bringing expanded plant treatment capacity on line in a series of phases. The MWRA should be reflecting the actual improvements to flow management and control in its plans for CSO projects -- improvements which the Advisory Board anticipates will exceed the assumptions built into the plan's "baseline conditions." The updated information can be incorporated either into the facilities planning phase, or later in the design phase for the projects as presently proposed.

Even with the huge reductions in planned spending, the $374 million in CSO control projects is still an enormous commitment to improving the infrastructure and the environment of the Boston area. We look forward to continuing to work with the Authority in refining the CSO Plan and related System Master Plan, interceptor strategies, I/I program, and the treatment plant capacity recommendations in DP-29.

Sincerely,

Andrew M. Pappastergion

Andrew M. Pappastergion
Chairman

Joseph E. Favaloro
Executive Director

CC: M. Le Domenie'a

73 Fairmont St.. Belmont MA 02178
617-489-3120 or 495-2723

Mystic River Watershed Association, Inc.

November 19. 1994

Lise Marx. Project Manager. CSO
Massachusetts Water Resources Authority
Charlestown Navy Yard
100 First Ave.
Boston. MA 02129

Re: Vol. I of the Draft CSO Conceptual
Plan and System Plan
Ref.: Comments expected at this time

Dear Ms. Marx.

To the best of my knowledge I write for the directors and members of our association. It is to the credit of our various governing bodies and agencies that the pollution in Alewife Brook and the Mystic River is being addressed and that a plan with commitment to act is now set before us to address the CSOs. It was 22 years ago, at the time of the birth of my first child. that I discovered the condition of Alewife Brook and learned about CSOs and runoff. It is truly wonderful that I am seeing the day come when public resources are applied to solving this. (Moses and other prophets usually were dead before their people arrived at goals!) We saw and smelled the flows from Tannery Brook, CAM004 near Rindge Ave.. and we knew there were major discharges from Somerville and Chelsea. MWRA describes and attends to these. During these 22 years, we saw developed plans for a detention tunnel to be built along the brook. It seemed our only hope. yet construction impacts and future loss of flow in the brook worried us. This plan is more refined and appropriate.

I. The questions the plan raises are as follows:

A. What is the effect of chlorination on alewives. adult and young?

B. Are the planners aware of an innovative treatment plan developed by a group on Cape Cod and described by students of Norton Nickerson of the Biology Dept. at Tufts?

II. Considerations for the longer perspective are these:

A. Let's lay out a second stage of work to be undertaken by the next generation after some of the bills are paid.

B. Goals:

1) With the large urban population and MDC plans to improve the parkways for cars and walking, people may come into closer contact with the brook. While the slime on the steep cement banks of Alewife Brook makes it dangerous and necessitates a fence, there may come a day when people will want something like a grassy bank and no fence.

2) For human survival, the success and improvement of the herring run is vital. Although someday it may be replaced with aquaculture, the requirements of water quality for fish for us to eat will be worth the investment of money.

3) Similarly, oysters have been found on the downstream side of the Earhart Dam, which reminds us of the past and potential.

4) People will have a better life when we can swim again in the Mystic.

C. Monitoring:

1) Coordinate with Alex Strysky's effort to take a closer look at the herring. How do their numbers respond to pollution?

2) My Alewife Ecology Guide informs people passing through Alewife Brook en route to various destinations to cancel canoeing three days following heavy rains and snow melts. I hope to refine this advice to reflect conditions as they evolve and new knowledge that comes from the monitoring responsibilities as they are undertaken in the future. Who will have that information? Will it be sufficiently complete, up-to-date and in useful form.

Regarding other sources of pollution, our association welcomes the Neponset Watershed Initiative and looks forward to modeling a similar plan after theirs. We have been involved in runoff studies and public information and see our role in helping out.

It is necessary for us to see a warning about who we are and how we think and act. When the public freely chose sewage and water quality priorities through the legislature's appropriations to the M.D.C., I pointed at the river and brook and talked with awful dismay. With the court system and water authority, we have set standards, adhere to them, and assess ourselves for the funds. We are uneasy when standards are lowered, and we are thankful for government arrangement that recognizes our weakness and is getting on with this work.

Yours sincerely,

Stewart Sanders, Vice-president

Restore Olmsted's Waterway Coalition

November 12, 1994

Lise M. Marx
Project Manager, CSO
Massachusetts Water Resources Authority
Charlestown Navy Yard
100 First Avenue
Boston, MA 02129

Dear Ms. Marx:

RE: DRAFT CSO CONCEPTUAL PLAN

I appreciate your sending me copies of the five-volume Draft CSO Conceptual Plan and System Master Plan and the Baseline Water Quality Assessment and thank you for fulfilling my request. Restore Olmsted's Waterway (ROW) Coalition commends the MWRA for commissioning such a comprehensive work and giving recommendations to make the Boston Harbor cleaner.

Although we recognize that MWRA recommendations will be beneficial for cleaning the Boston Harbor, we are concerned about at least one recommendation pertaining to the Stony Brook CSO in the Muddy River/Back Bay Fens area. Your own report corroborates our concern and states, "CSO loads of pollutants are expected to change only slightly between existing and baseline ("future planned") conditions. We expect that baseline water quality will be similar to existing water quality, and uses will continue to be impaired."(Metcalf & Eddy. 1994. Baseline Water Quality Assessment 5.7)

The Muddy River is polluted by sewer cross-connections in Brookline and Boston and also by nonpoint sources from storm drains. Fecal coliform bacteria in a recent inspection of storm drains by the EPA in dry weather, are 2,500 times the acceptable level of 200/100 ml in class B waters. As documented by Metcalf & Eddy in 1990,, Oil spills and leaking underground tanks also contribute to this pollution. MWRA recommendations do not address these sources of pollution in the Lower Charles River, primarily because this aspect was not covered under the Federal Court schedule of the Boston Harbor case. We urge you to recommend to the EPA and Commonwealth EOEA to give their immediate attention to these sources of pollution in the Muddy River. Otherwise, the Boston Harbor will continue to be polluted.

(over

163 Kent Street Brookline MA 02146 617-731-1341

The Fens is polluted by storm drain discharges and overflow from two CSOs, namely Boston Gatehouse 1 (BOS046) and Boston Gatehouse 2. In addition MWRA monitoring in 1993 of the Stony Brook drainage area indicates the possible presence of illegal connections.

The recommended alternative for the Back Bay segment involves installation of manually cleaned coarse screens at outfall BOS046 and providing disinfection and dechlorination facility on the Stony Brook Conduit. We have discussed this recommendation with our members especially those who reside in the Back Bay Fens area. They are not satisfied with the MWRA recommendations. In their view the recommended solution is not enough because they will, even after the recommendation is in place, still be subjected to foul odors and other pollution. In view of this, if it is possible to relocate the CSO treatment facility in some upper part of the Muddy River/Back Bay Fens segment until CSOs are completely eliminated, it will help the residents to enjoy a healthier neighborhood park.

This is not the first time that we are concerned about pollution in the Muddy River/Back Bay Fens. ROW has been involved with the work to clean the Muddy for the last 10 years. A copy of our "A Citizen's Guide to the Muddy River" is enclosed.

In closing, we wish to reiterate that along with MWRA's CSO control strategy, it is imperative that attention be given to illegal sewer cross connections pollution from non-point sources in the storm waters.

If there are any questions or if you need clarifications, please do not hesitate to call me at (617) 566-3613.

Sincerely,

Gulshan Saini

Gulshan Saini
Chairman, ROW Coalition

xc: John P. DeVillars, EPA
Trudy Coxe, EOEA

Save the Harbor
Save the Bay
Founded 1986

December 9, 1994

Board of Directors
Massachusetts Water Resources Authority
100 First Avenue
Charlestown, MA 02129

RE: Comments on Draft CSO Conceptual Plan

Dear Board Members:

Save the Harbor/Save the Bay is a citizen-based non-profit organization dedicated to the protection and promotion of Boston Harbor and Massachusetts Bay. We have over 1,100 members. We would like to submit our comments on the Draft CSO Conceptual Plan and Systems Master Plan.

The MWRA has taken a very comprehensive, thoughtful, and thorough approach to preparing this proposed plan which represents a positive first step in reaching our long-term goal for Boston Harbor and its tributaries of "fishable/swimmable." We commend your increased public participation process. However, the publicized public meetings were scheduled only one-week after the release of your plan. Because of the size of the report, and the detail, it was difficult to have meaningful questions so quickly after its release. Your participation in Coastal Advocacy Network meeting on December 5th, however, was extremely helpful. We suggest that in the future you hold the public meetings closer to the end of comment periods rather than the beginning.

In short, Save the Harbor/Save the Bay accepts this CSO Conceptual Plan as an interim solution to CSO pollution in Boston Harbor and its tributaries. It is obvious from this report, and your Baseline Water Quality Assessment (August 1994), that meeting water quality goals will take greater coordination in the future between the MWRA, federal, state, and local agencies, as well as citizens and advocates. We are particularly concerned about receiving water segments where you will require partial use designation from the Department of Environmental Protection (DEP) in which your proposed level of control will in the long-term, be inadequate to meet future goals of fishable/swimmable. Our comments on the plan are divided into two categories: CSO Controls and Stormwater and the MWRA.

CSO Controls

First, although your recommended CSO plan will make great strides in beginning the process of abating the wet weather pollution attributed to combined sewer overflows (84% reduction in volume, with 94% receiving at least screening and disinfection), it does not complete the job. For North Dorchester Bay, South Dorchester Bay, the Neponset River, and Constitution Beach, we are very pleased with your proposed plan to either separate sewers or relocate discharge. However, we are concerned about the level of stormwater pollution which will remain, and even increase, in South Dorchester Bay, Neponset River and Constitution Beach. We will elaborate on our stormwater concerns later in these comments. However, in regards to CSO control alone, we have several comments about the receiving water segments in which CSOs will remain.

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In these areas (Charles River, Alewife/Upper Mystic, and Boston Harbor) the proposed plan will use "Level II" controls to abate CSO pollution. Level II control is defined as "reducing untreated flows to about 4 overflows per year." Yet, according to your Figure 3-1 about 19% (close to one-fifth) of all CSO discharge locations will discharge untreated flow four or more times per year **after** the recommended plan is implemented:

Closed	Treated Flow	Untreated 0 -3 times	Untreated 4 to 7 times	Untreated 8 to10 times
21 or 26%	16 or 20%	28 or 35%	13 or 16%	2 or 3%

(Source: Figure 3-1. Overview of MWRA CSO Program)

The Massachusetts Department of Environmental Protection (DEP) *Water Quality Standards' Implementation for the Abatement of Pollution from CSOs* (May 24, 1990) state that "when it is not feasible to eliminate CSOs by separation or eliminate the impacts of CSOs by relocations," the impacted segment may be assigned a **partial use subcategory**. DEP's reasonable target in segments they grant partial use is to protect the designated use during precipitation events that occur no more often than once in three months. This translates into allowing untreated overflows on an average of four times a year. This means that close to 1/5 of current individual CSO discharges will be beyond DEPs target for partial use. In addition, it is Save the Harbor/Save the Bay's understanding, that partial use designation is granted to receiving water **segments**, not individual CSO discharge locations.

According to your Table 4-1, the **total** untreated discharges after the recommended plan, to "receiving water" segments which you have defined, is as follows:

Receiving Water Segment	Number of Untreated CSO Discharges Per Year
Alewife:	40
Upper Mystic River:	4
Mystic/Chelsea Confluence:	15
Upper Inner Harbor	21
Lower Inner Harbor	13
Fort Point Channel	13
Southern Dorchester Bay	7*
Upper Charles	5
Lower Charles	18
Back Bay Fens	2

* *This is from CSOs only (not from Fox Point or Commercial Point treatment facilities) and we assume that is during the phased sewer separation period.*

Alewife Brook, Mystic/Chelsea Confluence, Upper Inner Harbor, Lower Inner Harbor, Fort Point Channel, and the Lower Charles will, after the recommended CSO plan is implemented, be well beyond the DEP's target of no more than four untreated overflows per year in partial use segments. Will the MWRA still seek partial use designation for these areas? Will this require changing the goals of partial use? Will the DEP allow 40 untreated CSO discharges per year in Alewife Brook? 18 in the Lower Charles River?

In determining what level of control to use for CSOs in the different receiving water segments, the MWRA used a watershed-based approach. Basically, this approach utilized receiving water models to attempt to determine the extent to which CSOs contribute to poor water quality as

compared to other pollutant sources. In general, for those areas in which "Level II" controls were proposed, CSOs were found to be, for the most part, relatively minor contributors of pollution compared to stormwater and/or upstream sources. MWRA data show that levels of fecal coliform from stormwater and upstream sources would leave areas where Level II CSO control is planned unswimmable even with the total elimination of CSOs. Fort Point Channel is the exception. However, if the recommend plan is in fact implemented, levels of fecal coliform resulting from CSO discharge will leave these areas unswimmable even with the total elimination of stormwater and upstream sources. **This why we view this plan as an interim plan, as a first step toward meeting fishable/swimmable goals with regards to wet weather pollution, not a final CSO solution.**

We would like to offer just a few comments on the use of some of the areas in which Level II CSO controls are planned. Each are classified as S or SB waters - fishable/swimmable. Although they are no DEP-designated critical uses for these receiving water segments, there are several "uses" which should be considered in planning future CSO controls.

- There recently has been a great deal of interest in restoring the water quality of the Alewife Brook, which is a "critical part of the alewife migration to upstream spawning areas." Residents of surrounding communities have shown particular interest in monitoring water quality along the Brook including organizing and participating in a workshop with Karen Pelto of the Riversway Programs of the Massachusetts Department of Fisheries, Wildlife & Environmental Law Enforcement.

- The extent to which the Charles River is used for boating, and windsurfing, is evident on any clear and warm day.

- In regards to Fort Point Channel, the Children's Museum is planning an expansion which will engage young people in doing a variety of tests and explorations . using the water and ocean floor of the Channel.

- In regards to the other areas in the Inner Harbor *etc.*, the *Harbor Visions* Charrette proved that there is broad consensus about the benefits (economic and environmental) of healthy coastal waters.

Lastly, your Table 3-6, which summarizes the conceptual CSO plan is very misleading. It lists only the amount of annual CSO activations which will release untreated flow for the most active CSO, not the entire segment. Although it is noted at the bottom of the Table 3-6 that this is the case, the CSO plan, and the CSO issue complicated enough. The column "untreated" under annual CSO activation frequency - under recommended plan - should have listed the above totals per segment to be the most informative, and most accurate. Table 3-6 was used repeatedly during public meetings where it was not distributed without Table 4-1 which does list the total annual untreated discharges. In the future, we suggest that documents used for public explanation of plans should be more accurate in their representation.

The MWRA and Stormwater

It is obvious that water quality goals will not be met for Boston Harbor and its tributaries without greatly improved stormwater management and watershed planning. Although the MWRA maintains that it is not mandated to deal with stormwater pollution, we are uncertain if it was not the original intent of the Court Order that the required CSO plan would in fact provide solutions for both the stormwater and sanitary pollution associated with combined sewer overflows. Regardless of who is responsible, stormwater management will require the coordination of federal, state, and local agencies.

We feel that the MWRA is in a unique position to provide leadership in that coordination. The MWRA is clearly the most knowledgeable entity in regards to the extent and content of stormwater and upstream pollution in Boston Harbor and its tributaries. The proposed CSO plan is based on this knowledge. **We would like the MWRA to work with the federal Environmental Protection Agency (EPA) and the Massachusetts Executive Office of Environmental Affairs (EOEA) to produce a timeline and plan for when Boston Harbor and its tributaries will meet fishable/swimmable standards under the federal Clean Water Act.** This plan should include a specific deadline for when the MWRA will reconvene interested parties to revisit CSO controls in those areas in which the current CSO plan employs only Level II CSO controls. Further, the MWRA should be prepared to provide technical assistance to municipalities which will ultimately be responsible, through best management practices and controls, for source reduction of stormwater and upstream pollution.

Thank you for the opportunity to submit these comments. Please feel free to contact me should you have any questions. We look forward to working further with you on this issue until Boston Harbor is fishable and swimmable.

Sincerely,

Jodi Sugerman
Policy Director

CITY OF SOMERVILLE, MASSACHUSETTS
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION

MICHAEL E. CAPUANO
MAYOR

ROBERT J. TRAHAN
COMMISSIONER

T. THOM DONAHU
DIRECTO

November 14, 1994

Mr. David A. Kubiak
Senior Program Manager, CSO
Massachusetts Water Resources Authority
Charlestown Navy Yard
100 First Avenue
Boston, MA 02129

RE: DRAFT CSO CONCEPTUAL PLAN AND SYSTEM MASTER PLAN

Dear Mr. Kubiak:

Thank you for the chance to review and comment on the Draft CSO Conceptual Plan and System Master Plan.

Since 1988, as Somerville's Engineering Director overseeing the city's sewer operations, and as emissary to the MWRA Facilities Planning Citizens Advisory Committee and CSO subcommittee, as well as the MWRA Wastewater Advisory Committee and System Master Plan subcommittee, also as a member of the MWRA Sewer Rate Methodology Committee and the national CSO Partnership, I have been closely involved with the emerging policies, issues and strategies for developing CSO control and system master planning relating to the cleanup of Boston Harbor. In the thirteen years prior to 1988, I participated in the engineering of significant CSO projects in Swampscott, Nahant, Lynn and Lowell.

In general, I endorse the report's recommended CSO control plan, integrated as a component of an overall System Master Plan, and incorporating receiving water-specific CSO controls. I believe this approach offers the best hope for balancing realistic and achievable water quality goals with prudent and flexible cost-effective technological solutions, which can be revisited, modified and improved, as further CSO metering, sampling, systemwide inspections, enhanced flow modeling and analyses, and technological advances dictate.

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The dramatically lower overflow volumes and pollutant loadings physically measured in 1992, contrasted to computer modeling predictions of the 1990 plan, clearly substantiate the need for continued data gathering and evaluation of site-specific CSO control alternatives. At the same time, it is obvious that phased, water quality driven, low and moderate cost CSO controls can progress quickly from concept to study to design to construction, without precluding add-ons and retrofits should environmental monitoring document the need for higher levels of control.

It is my hope that as this process goes forward, CSO control will be recognized and supported as an integral component of System Master Planning, whereby each member community will benefit from partnering with MWRA watershed planning, I/I guidance and assistance, interceptor relief, local infrastructure metering and data sharing, all leading to an optimally functioning regional wastewater system.

In the specific case of CSO controls in Somerville, I encourage the MWRA to press forward as soon as possible with the recommended plans for separation of CAM-004 area at the Alewife Brook, but to also consider low cost separation of baffle manholes at SOM001, SOM003 and SOM004, as well as funding further study of the potential for full or partial separation at SOM001A - the Tannery Brook Culvert. In upper Mystic River, proposed separation of baffle manholes at SOM007 should be extended to SOM006, also a fairly low cost but effective separation project. Plans for upgrading the Somerville Marginal and Prison Point facilities appear to be prudent and beneficial, however the need for continued monitoring and evaluation along with flexible phasing is apparent.

Thank you for this opportunity to express my opinions. I look forward to a continuing partnership in progress.

Very truly yours,

F. Thom Donahue
Director of Engineering

DAVID STANDLEY, P.E.
Consultant in Environmental Management

October 24, 1994

Mr. Douglas B. MacDonald
Executive Director
Massachusetts Water Resources Authority
Charlestown Navy Yard
100 First Avenue
Boston, MA 02129

ATTN: Mr. Michael Domenica, Director, SFDD

RE: MWRA Draft CSO Conceptual Plan and System Master Plan: Comments on behalf of the City of Quincy

Dear Mr. MacDonald:

These comments on the subject document circulated to the Court Parties for review on September 30, 1994 are submitted on behalf of the City of Quincy. The MWRA and its consultant Metcalf & Eddy are to be congratulated on a number of points. The reassessment of the 1990 CSO Plan, a very important step in itself, has been undertaken in a logical manner with considerable opportunity for public information and input. The conclusions of the process and the current Plan seem logical, environmentally sound and fiscally appropriate, except as noted below. The five-volume document is well-organized, comprehensive and readable. These comments should be read in this context.

Selection of Alternatives:

Overall.

We support the selection of a mix of CSO levels of control, control options, and priorities in lieu of either the 1990 deep-rock tunnel plan or any of the tunnel options considered in this process. This support is based on the evaluation of use attainability performed to date, the cost effectiveness of the alternatives, and the environmental impacts of the alternatives. In addition, the recommended plan offers the opportunity to spread out capital investments over a decade or more without prolonging the remediation of any significant problems attributable to CSOs. It also does not foreclose, either physically or on the basis of irretrievable major investment, further remediation when and as warranted by changed

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circumstances. The Plan is a pragmatic and practical approach to environmental quality improvement and compliance with statutory mandates, and recognizes the significant economic burdens now and to be shouldered by the MWRA rate payers.

The impacts of stormwater discharges on receiving water bodies, and the implications of stormwater discharges for CSO control, are noted in the Executive Summary and are clearly delineated throughout the Plan. However, the significance of this cause of non-attainment of water quality objectives and standards is paramount in the selection of alternatives and should receive more emphasis in the general and introductory sections of the Plan, in order to ensure public understanding of the issue.

The results of the MWRA's work in evaluating the effectiveness of I/I reduction are discouraging, particularly as regards traditional cost-effectiveness comparisons. The guidance provided to public decision-makers concerning prioritization of efforts to rehabilitate existing sewers is appropriate. The conclusions reached regarding the minimal impact of I/I reduction efforts on CSO abatement needs or treatment plant capacity appear to be well-supported. However, the whole discussion is not very forward-looking. I/I is a significant component of total system flow and is even more significant with respect to peak system flow. Without constant attention to all components of the collection system it is inevitable that the significance of extraneous, clean-water flows to the treatment works will increase over time. Transfer of precipitation and groundwater to the ocean by means of pumping via a wastewater treatment plant is a very substantial waste of resources, from a number of standpoints. It therefore behooves the MWRA as well as the regulatory authorities and the municipalities to continue a progressive approach to this problem through a variety of program options, in addition to maintaining the metering program, other assessment techniques, grant support for remediation, and a full flow of information. The revision of the MWRA rate structure is a step in the right direction, of course, and its effects should be positive over the mid-term. Other suggestions are presented in the following paragraph.

Additional measures could be devised to overcome the practical and legal constraints to correcting private sources of inflow (such as the imposition of surcharges against identified sources). Stringent guidance/regulation and inspection concerning materials and means of construction of new and replacement sewers, to ensure tight, long-lasting pipes and manholes, would minimize growth in clean-water flows otherwise associated with system expansion, and would somewhat compensate for deterioration of existing facilities. Sewer separation and CSO elimination, particularly in areas adjacent to tide water, should remain a priority.

Further Procedural Steps:

Environmental Review.

The Plan appears to contemplate that environmental review will consist (a) of evaluation of "partial use" designations of specific water bodies and (b) project-specific reviews; and further that environmental review will be completed in the facility planning stage of projects. If a comprehensive EIR for the CSO Plan/SMP is contemplated (as suggested by, e.g., Mr. Kubiak (minutes of 10/7/94 WAC meeting)) it should be so stated and the schedule clarified. It would seem reasonable that the CSO Conceptual Plan and System Master Plan, when finalized, be submitted as the broad overview of the CSO program and its elements, and as the "consideration of alternatives" required by MEPA. The planning, design and implementation of the CSO Plan extends over a very long time, much longer than is normal for a project or program reviewed under MEPA. This should raise a concern about the reliability of project-specific impact assessments undertaken in the early planning stage, and suggests the possibility of a two-stage environmental review process, wherein the overall plan would be reviewed in the near future, and detailed project plans would be further reviewed as they reach the design stage. It also suggests that schedules for project implementation developed in advance of the completion of the facility planning processes should be regarded as very preliminary.

It might be efficacious to treat the process of environmental review in a phased manner, or to apply the "major and complicated" concept to this element of the overall Boston Harbor Plan.

It is presumed that the results of the DP-29 reassessment of Deer Island facilities will be integrated with these Plans in a further evaluation of water quality impacts of MWRA programs in Massachusetts Bay, particularly in the context of the Endangered Species Act.

Overall Design Issues:

Watershed/Waterbody Approach Concept.

The disaggregation of the MWRA service area, sewer system, and CSO discharge points by receiving water body has substantially enhanced the ability to develop and evaluate a range of alternatives, and to portray and evaluate the implications and costs of each, and appears to have been a major factor in reaching the current recommendations. Likewise, the very substantial increase in the amount and quality of information concerning water quality and the range and relative importance of sources of degradation, by water body, has been critical to the planning process.

Recommended Approach to the Charles River Basin.

Significant reductions in CSO flows to this basin have been achieved, and additional flow reduction and treatment are proposed in the Plan. However, it seems clear that except for reduction in floatables and other nuisance factors, little detectable or sensible improvement in the quality of the Charles River would result from implementation of further CSO removal or treatment measures at this time; because the impact of stormwater runoff and other indirect sources is so overwhelming in contrast to the impact of CSOs, in this watershed. The MWRA has documented this situation well. To argue for the commitment of additional scarce rate payer resources for further CSO control here, to achieve essentially unmeasurable and non-beneficial "progress" toward Clean Water Act goals, is unduly single-minded and non-responsive to the needs of the region; and is inconsistent with the National CSO Policy. To characterize the **comparative** reduction of costs of the CSO Plan from the 1990 tunnel version to the current plan as a "savings" a portion of which, at least, should be applied to this basin, is comparable to saying I wanted a Ferrari but couldn't afford it, bought a Ford instead which gets me there, and I'm going to spend the difference on a Bermuda vacation!

Protection of Site Availability.

The discussion in Section 4 of Volume I relegates site acquisition for some projects to around the turn of the century. The MWRA should move now to ensure that sites and routes for planned facilities (to the extent they can now be identified) will continue to be available at values which reflect the present state of development, regardless of the expected construction dates for specific projects.

Prioritization of Projects.

The proposed water body priorities (Table 4-4, Volume I) are supported. The ranking of the Charles River as second priority affords the Charles River Watershed Project the opportunity to provide the impetus for control of non-CSO sources of contamination of the River.

Potential transfer of flows to the Southern System.

This potential has been reviewed and dismissed at this time on cost-effectiveness grounds (see the discussion in Vol. IV, Sections 3 and 4). The dismissal is supported. Were it to be reconsidered, Quincy would expect that impacts on the Southern System municipal systems and on the High Level Sewer would be further assessed; with special attention to the capacity of the Nut Island Headworks and South System Pumping Station, the impact on Quincy Bay of a failure of the SSPS, impacts on the sewage flow metering system in the South System and MWRA assessments against municipalities, and any increased potential for backups and overflows from MWRA South System interceptors and municipal systems. Furthermore, the South System in-system storage projects discussed in

Vol. IV (and not recommended) should then be reassessed to determine their beneficial impacts on reduction in peak flow to the Nut Island Headworks as well as shifting the temporal relationship between North and South System peak flow deliveries to Deer Island.

Secondary Treatment Options.

Comment on this issue will generally be deferred until the availability of a report from DP 29.

Specific Design Issues:

Efficacy of Chlorination/Dechlorination of Raw Wastewater.

I am concerned that with the limited contact time available for chlorination of discharges, especially those receiving only coarse screening, followed by dechlorination, pathogen reduction may not be significant beyond mixing zones (especially those in fresh water); and would appreciate further discussion on this matter. How much will "risk of contact with human pathogens" be reduced? Will this risk reduction overshadow any risks which may be associated with the overall chlorination/dechlorination process, including transportation?

Cost and Cost-sharing Issues:

The Preliminary Implementation Schedule Assumptions presented in Table 4-5 of Volume I appear reasonable. However, the accompanying text is a matter of concern. The MWRA has already assumed a major share of the cost of CSO control planning and implementation, transferring those costs from the CSO municipalities to the rest of the member municipalities and rate payers. It is also providing significant grant assistance to those CSO municipalities for CSO control work. It is now time to clearly define, in the context of plan implementation, the division of responsibility for all remaining CSO control activities, including SMP projects. The statement on p. 4-17 of Volume I, "...it is assumed that projects involving facilities that **may be wholly owned and operated by a CSO community** would be implemented fully by the community, **financial considerations aside.** All other projects would be implemented by the MWRA." (emphasis added) represents an unacceptable degree of equivocation and potential for further unjustified shifting of the legitimate burden of CSO control to the remainder of the non-CSO rate payers. "Wholly owned and operated" would appear to imply MWRA responsibility for projects in which ownership may be shared, and excludes MWRA projects necessitated solely by the system of a CSO municipality. "Financial considerations aside" is a term without context, and can be read as committing the MWRA to implementation in the event any CSO municipality pleads poverty.

Detailed Comments:

Volume II, Table 4-1.

The figures given for Southern Dorchester Bay, Recommended Plan, are not consistent with my understanding of the Plan nor with the figures given for Future Planned Conditions. It appears that separated storm water discharges may be included (inappropriately) in the Recommended Plan values.

Vol. II, Figures 4-1 to 4-4.

The captions of these figures should be edited to indicate, as stated in the text, that they are based on the one-year storm. The impacts of the MWRA and community CSO programs would be better indicated were the figures to also present the current or historic conditions.

Vol. II, p. 4-15, Siting Issues.

Insertion of the word "adverse" is suggested in the last sentence of this paragraph, after the words "Long term".

Vol. III, p. 3-5.

It appears that the first reference to Table 3.1 in the full paragraph on this page is in error.

Vol. V, Fig. 2-1.

It appears this figure and the accompanying text are intended to represent and discuss conditions during a series of non-contiguous 4-month periods in the springs of the years 1990-1993. However, the curves appear to be continuous across the (presumed) time gaps.

No data is presented in the Plan to support the contention in this Section that "Distinct high and low groundwater periods were not discernible for the five years of data analyzed." This surprising assertion is at variance with conventional wisdom, and a number of other presentations by the Authority.

Sincerely,

David Standley, P.E.,
Consultant to the City of Quincy

cc: J. A. MacRitchie, Esq.

Commr. David A. Colton

Peter Koff, Esq.

David Kubiak, MWRA (by FAX)

WASTEWATER
ADVISORY COMMITTEE
to the Massachusetts
Water Resources Authority

December 6, 1994

Mike Domenica, Director
Systems Facilities Development Dept.
Mass. Water Resources Authority
Charlestown, MA 02129

Subject: Comments on Draft CSO Conceptual Plan

Dear Mike:

In our capacity as a citizen review committee, the Wastewater Advisory Committee has studied the prodigious Draft Conceptual Combined Sewer Overflow Control Plan released in September by the MWRA. The MWRA's recommended Plan would result in substantial CSO volume reductions, and achieve screening and treatment for 94% of the remaining CSO volume. Solutions to combined sewer overflows include complete elimination of overflows in critical use waters, separation of stormwater from the sewers, and several other technologies. The CSO Plan will mitigate the impacts of key pollutants for the remaining CSO discharges.

We have also reviewed the MWRA's comprehensive Water Quality Assessment (August, 1994) which provides justification for the chosen levels of control in the 14 receiving water segments. The Assessment makes it clear that for *most* receiving water segments in the Boston Harbor Basin, non-CSO contributions of bacteria, BOD, and TSS are generally many times greater than the CSO contributions on an annual basis.

With public attention now concentrated on reviewing the Authority's proposed **CSO Plan** and its costs to ratepayers, the EPA Region I and the Commonwealth's Executive Office of Environmental Affairs share the responsibility of providing the public with a blue-print for tackling the remaining wet weather pollution problems in the Harbor and its tributaries. The Authority has compiled an abundance of useful data and information that could be helpful to the State and local communities in pollution abatement efforts in the CSO receiving water areas.

At WAC's December monthly meeting the Committee voted to submit the attached comments to the MWRA and regulatory agencies.

(Continued)

Wastewater Advisory Committee
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Sincerely,

Robert S. Brustlin

Robert S. Brustlin, Chairman

Wastewater Advisory Committee Members

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John Fitzgerald, Director, Sewerage Division
Trudy Coxe, Secretary of Environmental Affairs
Richard Kotelly, Deputy Director, EPA Region 1
Ken Moraff, Staff Counsel, EPA Region 1
Brian Pitt, Environmental Engineer, EPA Region 1
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Patricia Fahey, Boston Water and Sewer Commission
Tom Powers, Acting Commissioner, DEP
Steve Lipman, Boston Harbor Coordinator, DEP
Thom Donohue, City of Somerville
Cambridge Environmental Program

WASTEWATER ADVISORY COMMITTEE

December 5, 1994

DRAFT CONCEPTUAL CSO PLAN

Comments and Recommendations by the Wastewater Advisory Committee

Introduction

The feature which most commends this Plan for public approval is the System Master Planning process which attempts to optimize the functioning of the entire wastewater system--from the community collection systems to the Deer Island treatment plant. The Court parties' evaluation of the Plan should be in the context of a systemwide approach to managing wastewater flows and loads.

We expect flow and load management planning will continually improve, and progress will be made in areas that are not counted in the Plan, providing a further argument against very large storage facilities such as a systemwide tunnel. Increased efficiencies in operation of facilities, additional sewer separation beyond the Plan's assumptions, cumulative reductions in inflow, and better land management practices could all contribute to future flow reductions.

The financial investment by ratepayers in CSO control ought to be tempered by the degree of complementary action by other parties responsible for pollution control, given that the greater amount of pollutant loadings in most of the CSO receiving water segments are from non-CSO contributions.

In the view of this Committee, MWRA's team of CSO staff and consultants has carried out an exemplary public participation program during the period of the Draft Conceptual Plan.

In particular, the use of workshops involving citizen groups, agency representatives, and peer review consultants went a long way to educate the public as to the assumptions behind the array of modeled alternatives. The workshop settings provided room for the discussion of CSO control priorities tailored to local situations, in keeping with EPA's CSO Policy that recognizes site-specific solutions.

Our Comments and Recommendations for the Plan follow.

Comments By Topic

A. CSO PLANNING APPROACH

We Support: The Plan's watershed-based approach to controlling pollution from combined sewer overflows, which takes into account the variety of pollution sources that affect water quality in each sub-basin of the Boston Harbor.

The Baseline Water Quality Assessment (August, 1994) sets the stage for addressing both non-CSO and CSO pollution problems, and provides the rationale for setting priorities for the level and location of CSO control efforts. The water quality assessment provides justification for prioritizing certain critical use areas where the public will be able to enjoy real benefits from the control of CSO's.

We agree with the analysis of flows and loads by sub-basin indicating that a system-wide storage system is not as practical nor effective as devising separate CSO controls for all of the sub-areas, with the exception of North Dorchester Bay and Reserved Channel.

We Support: The different levels of CSO control goals for different receiving water segments, according to the cost-effectiveness of particular controls for each sub-watershed. The CSO Plan proposes reasonable control measures considering: the already considerable investment in CSO-related improvements since 1988, the magnitude of non-CSO pollution, and the water quality benefits predicted from CSO control measures alone.

Recommendation #1: The CSO Plan should be connected to a state strategy for addressing the dominant causes of non-attainment of water quality standards in the tributary watersheds to the Harbor.

The EPA and the Commonwealth are responsible for assuring that the state's Surface Water Quality Standards are attained. Now is the time to build a process for assessing the non-CSO pollution problems that affect the waterways within the CSO Plan area, and for building a consensus for workable solutions that can parallel the CSO control measures proposed in the CSO Plan.

The CSO Plan will require partial use designations from the state, for receiving water segments that will continue to have CSO discharges. Evaluation of the environmental impacts of proposed designations is limited by the lack of a state comprehensive plan for addressing pollution abatement in the CSO receiving water segments.

B. WATER QUALITY ASSESSMENT

We Support: The active participation of the Authority in water quality assessment activities by the state and watershed organizations in order to promote an informed watershed planning process.

Recommendation #2: The Commonwealth should provide overall direction for conducting watershed monitoring and corresponding financial support for monitoring activities.

Recommendation #3: For its part, the MWRA's CSO Plan should provide greater specificity as to the role it will play in watershed planning and the kinds of resources and support it is willing to offer for specific sub-basins.

Although the Plan states that the MWRA intends to be an active participant in watershed efforts, it does not outline the level of effort and *how* the Authority intends to participate throughout the various sub-basins forming Boston Harbor.

We recommend that the Authority provide support (as is feasible within the time and budgets of staff) in the form of: 1) water quality monitoring and sampling analysis; 2) hydraulic modeling; 3) technical assistance to watershed planners in the setting of performance goals and objectives for achievement of water quality criteria in the CSO receiving water segments; and, 4) public information reports on the water quality conditions of the tributaries to Boston Harbor.

C. INTEGRATED WASTEWATER SYSTEM PLANNING: RELATIONSHIP TO THE MWRA SEWER SYSTEM

We Support: The System Master Planning process which produced recommended strategies for CSO control, interceptor relief, I/I reduction, and secondary treatment.

We Recommend #4: The CSO Plan should provide a clear description of how the planning and implementation, and any revision of proposed CSO controls during the implementation period, will relate to the Sewerage Division Comprehensive Planning.

The System Master Planning undertaken for the CSO and Deer Island facilities planning should now be folded into the Comprehensive Planning process of the Sewerage Division. The integrated approach should be continued, whereby impacts of strategies in each of the four components are measured against future conditions in the transport and treatment systems.

D. RECOMMENDED CONTROLS

Recommendation #5: Add Operational Strategies to the CSO Plan.

The steadily improving database on hydraulic conditions (due to extensive metering, field inspections, and system characterization) can be used to model operational methods to increase CSO control on a localized basis during wet weather. Flow management in the field and at CSO facilities should be investigated for potential reductions in overflows to critical use areas. Consider a pilot study for "real time" control for flow diversion and detention.

Operational Strategies should give consideration to ways to improve communication between transport and treatment facilities' managers during wet weather periods, in order to improve analysis of flow conditions and management.

Performance of CSO facilities operations should be reviewed regularly in relationship to the systemwide management of wet weather conditions.

Recommendation #6: Identification and removal of illegal connections should be emphasized and included in the facilities planning scope of work, especially where sewer separation is to occur.

Recommendation #7: The CSO Plan should outline a complete program of Best Management Practices to control the non-sanitary flow entering the collection and interceptor systems. The draft Plan lacks a thorough explanation of BMP's which should be incorporated in the sewer programs of both the Authority and the communities.

Recommendation #8: The CSO Plan should require that a community prepare a Best Management Practices Plan to accompany project implementation in a CSO community. The BMP Plans should specify the BMP's by CSO receiving water segments, and include commitments to local measures for: land management to reduce off-site impacts, source controls, and pollution prevention.

(Continued)

Recommendations for Selected Basins #9:

Charles River:

1. In the **Lower Charles** receiving water segment, the Stony Brook tributary watershed represents one-third of the entire study area. Prior to design, the area should receive further examination of hydraulic relationships in the upstream tributaries that might avoid transport and treatment of some of the Stony Brook drainage.

2. An overall pollution-control plan should be devised for the **Muddy River/Back Bay** Fens sub-watershed basin during facilities planning. Special collaboration is needed between the Corps of Engineers, the cities of Brookline and Boston, and the MWRA which all have obligations and concerns for water management (flooding, pollution of surface water and sediments in waterbodies, and combined sewer overflows). During facilities planning, the feasibility of biological treatment for stormwater should be considered.

An alternative upstream site from the MDC gatehouse for the treatment facility should be considered for benefits to the Muddy River from odor control from chlorination.

3. **Inter-agency coordination** is also called for in formulating pollution abatement plans for the **Charles River Dam.** Exploration of remedies, e.g., aeration, for the low dissolved oxygen levels should be pursued in conjunction with CSO facilities planning.

4. Because the absolute pollutant load from CSO's in the Lower Charles is of a large magnitude even in the presence of proportionately greater non-CSO pollutant loads, facilities planning should devote attention to ways of lowering pollutant loads in the combined sewers conveying flow to the CSO treatment facility.

Alewife/Mystic:

1. The Authority should commit to the identification of additional pollution control measures for the **Alewife** which could be financed by the upstream contributing communities.

Management of separated stormwater by means of wetlands enhancement or restoration should be explored.

(Continued)

E. RELATIONSHIP OF CSO PLAN TO COMMUNITY SEWER PROGRAMS

Recommendation #10: The Implementation Plan should clearly define the responsibilities of the Authority and the CSO communities regarding: a) the facilities planning; b) the design and construction of each of the planned control measures; and, c) the maintenance of the CSO control infrastructure and appurtenances.

The Authority is best suited to oversee the overall facilities planning process, but opportunities for community assumption of some of the tasks should be explored. Active participation by the communities in the design and construction of sewer separation projects should be encouraged, for their experience and knowledge of neighborhoods. Responsibilities could be developed and assigned on a component-specific basis in close consultation with the communities.

Recommendation #11: The extent of MWRA's financial responsibility vis a vis community sponsorship for implementing CSO control strategies should be defined to greater specificity.

Recommendation #12: The continuation of the MWRA's financial assistance program for I/I reduction is important to maintaining and possibly reducing the baseline flow upon which the CSO Plan is predicated.

Recommendation #13: The CSO Phase II System Optimization Program (1992-97) should report annually on its effectiveness. Consider another round of community-implemented SOP projects beyond those now planned, which might be identified during the Phase II Intermediate Projects.

Recommendation #14: The MWRA should continue to provide technical assistance to CSO communities in the analysis of hydraulic conditions during wet weather to help identify further opportunities for in-system storage or other CSO control.

Recommendation #15: Resolve differences in community metering and MWRA modeling of CSO performance. Evaluate the risks of surcharging and flooding where overflows are nominated for closure by a community.

(CONTINUED)

F. CSO TREATMENT FACILITIES WHERE COMBINED SEWER OVERFLOWS ARE ELIMINATED

Recommendation #16: The CSO Plan should leave open the question of the future disposition, operation, and ownership of the CSO treatment facilities in these locations (Fox Pt., Commercial Pt., Constitution Beach), rather than assume that separated stormwater flows will need treatment.

Any decisions about the facilities should be based on a watershed approach to water quality improvement, and should involve the relevant city, state, and federal parties instead of the MWRA alone. Further information will be needed to make recommendations regarding stormwater management, since the CSO Plan's water quality assessment is limited to a generalized description of stormwater flows and loads, and does not characterize the quality of localized stormwater discharges by sub-basin, nor does it distinguish between non-point sources and point stormwater discharges within a sub-basin.

G. SCOPE AND TIMING OF OF FACILITIES PLANNING

Recommendation #17: During facilities planning, tributary areas should be identified where the potential exists for further sewer separation and in-line storage that could reduce downstream volumes to significantly affect the sizing of CSO storage and treatment facilities.

Engineering discussions with Cambridge and Boston should identify opportunities within the sub-systems that represent high CSO volumes and complicated hydraulic relationships (e.g., Stony Brook System, N. Charles Metropolitan, S. Charles Relief, Charles R. Valley, Ward St. Headworks, and South Boston Interceptor).

Recommendation #18: It is important to keep to the 15 year Implementation period, but time should be provided during the facilities planning stages to look at site specific enhancements before plans are finalized.

H. REASSESSMENT DURING PLAN IMPLEMENTATION

The hydraulic investigations and analyses leading up to the CSO Plan have yielded a wealth of useful information about flows and loads throughout the entire MWRA system, and provide a basis for updating the baseline conditions.

(Continued)

Recommendation #19: A Schedule for Re-Assessment of the assumptions of the 1994 CSO Plan should be included in the CSO Plan Implementation. The Authority should include the estimated cost of Re-Assessment(s), including any monitoring, modeling, and analysis, in its CSO budget projection.

Recommendation #20: The Implementation Plan should present "trigger" criteria for adjusting facilities plans in each sub-basin throughout the Implementation period. Given the 15 year period for Implementation, a method for re-evaluating the appropriateness of the level and kind of control is needed that takes into account changes in CSO flows, receiving water quality, and available technology.

Recommendation #21: The Re-Assessment should also review the technologies in the Plan for possible replacement by more effective technologies that may be identified in subsequent years. Alternatives to chlorination for disinfection should be evaluated in the future as more information is developed through research.

I. AFFORDABILITY

Recommendation #22: The Plan should describe how the capital and operating and maintenance costs of the proposed CSO program would affect the households using the sewer services in the District, in combination with the other Authority program costs going toward provision of water and sewer services.

Although "affordability" of the CSO Plan should not be used to justify more investment than is warranted by the relative gains in environmental quality, it is one of several indicators by which to judge the overall soundness of the program and the financial burden it places on the communities, depending on the proportion of low income households. This information is important to legislators and town officials who are involved in deliberations over rate relief programs.

J. PUBLIC PARTICIPATION / EDUCATION

Recommendation #23: Opportunities for public participation should continue throughout the facilities planning process. The extent of long term options is now much greater than predicted when the System Master Planning Study began. Since a large number of projects are being proposed to achieve the goals, many more decisions are involved regarding implementation timing and methods.

(Continued)

Recommendation #24: Continue with a workshop format during the facilities planning period. Because many of the alternatives are defined at a conceptual level, further input from informed and interested parties will prove useful. Public participation is important for deciding the need for further investigation and analysis on a case-by-case basis, and for helping to evaluate the siting and appropriate application of technologies.

Recommendation #25: To help the public better understand the benefits and limitations of CSO control, include in the Final CSO Plan the bar charts used during the public meeting presentations which show the contribution of CSO and stormwater in relationship to water quality standards. Add the category of "present conditions" to the categories shown. Use these charts to display information to the public when future water quality assessments are performed as part of the CSO Plan implementation and for post-construction evaluations.

Also add tables for each receiving water segment that show the state water quality standard, the CSO Plan water quality goals, the recommended controls, the water quality results, and the pollutant sources.

Recommendation #26: The historic record of CSO flows and loadings by pollutant type, disaggregated by sub-area, should be maintained and easily portrayed to help the public judge the progress over time of various improvements in the transport and treatment systems. Accompanying this information should be a description of the relative contribution of CSO pollutant loadings as compared to non-CSO sources of pollutant loadings.

WASTEWATER ADVISORY COMMITTEE

December 5, 1994

DRAFT CONCEPTUAL CSO PLAN

Comments and Recommendations by the Wastewater Advisory Committee

Introduction

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We expect flow and load management planning will continually improve, and progress will be made in areas that are not counted in the Plan, providing a further argument against very large storage facilities such as a systemwide tunnel. Increased efficiencies in operation of facilities, additional sewer separation beyond the Plan's assumptions, cumulative reductions in inflow, and better land management practices could all contribute to future flow reductions.

The financial investment by ratepayers in CSO control ought to be tempered by the degree of complementary action by other parties responsible for pollution control, given that the greater amount of pollutant loadings in most of the CSO receiving water segments are from non-CSO contributions.

In the view of this Committee, MWRA's team of CSO staff and consultants has carried out an exemplary public participation program during the period of the Draft Conceptual Plan.

In particular, the use of workshops involving citizen groups, agency representatives, and peer review consultants went a long way to educate the public as to the assumptions behind the array of modeled alternatives. The workshop settings provided room for the discussion of CSO control priorities tailored to local situations, in keeping with EPA's CSO Policy that recognizes site-specific solutions.

Our Comments and Recommendations for the Plan follow.

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December 5, 1994

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Comments and Recommendations by the Wastewater Advisory Committee

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Our Comments and Recommendations for the Plan follow.

APPENDIX D

CSO PROJECT FACT SHEETS

CSO PROJECT FACT SHEET

1. CSO Relocation to Reserved Channel to a Screening/Disinfection Facility (Project No.18)	
Capital Cost:	$ 86,100,000
O&M Cost:	$ 845,000 per year
Receiving Water:	North Dorchester Bay
Priority:	A (critical use area: shellfishing, and swimming)
Location:	Conduit route along Day Boulevard.
Project Description:	Install a consolidation conduit for outfalls BOS081 through BOS087. Surface disruptions would be minimized by soft-ground tunneling; access shafts would be required; restricted construction in the summer season in recreational areas.
Facility Layout\Size:	Consolidation conduit ranging in size from approximately 48-in. to 96-in.
Previous Planning and\or Design Efforts:	Consolidation conduit route along Day Blvd was analyzed as part of 1990 Facilities Plan and EIR.
Construction Impacts:	Construction impacts to beach use, traffic, residences, and commercial activity.
Operation and Maintenance Requirements:	• Routine conduit cleaning (every 6 months) • Operation of screening and disinfection facility

CSO PROJECT FACT SHEET

2. Upgrade Fox Point and Commercial Point Facilities to Dechlorination	
Capital Cost:	$ 2,800,000
O&M Cost:	$ 230,000 per year
Receiving Water:	South Dorchester Bay
Priority:	A (critical use areas: swimming, and shellfishing)
Location:	Within existing facilities in Dorchester.
Project Description:	Install dechlorination chemical storage and dosing system to eliminate the chlorine residual toxicity on the receiving water at the Fox Point and Commercial Point Facilities. This is a short-term improvement. Facilities will be decommissioned for CSO control when sewer separation complete (project 3).
Facility Layout\Size:	Addition of dechlorination chemical storage and dosing system, attempt to install within existing facility.
Previous Planning and\or Design Efforts:	No previous study for dechlorination at these facilities.
Construction Impacts:	
Operation and Maintenance Requirements:	• Monitoring during large storms • Equipment maintenance (weekly) • Disposal of screenings (after storm events) • Odor control, disinfection and dechlorination chemical handling (monthly)

CSO PROJECT FACT SHEET

3. Sewer Separation (South Dorchester)	
Capital Cost:	$ 92,000,000
O&M Cost:	$ 0
Receiving Water:	South Dorchester Bay
Priority:	A (critical use area: shellfishings, and swimming)
Location:	Dorchester area
Project Description:	Separate approximately 706 acres of combined system in Dorchester. Construction consists of placing a new sewer or drain pipe via open-cut excavations in streets and existing rights-of-way.
Facility Layout/Size:	Does not apply.
Previous Planning and/or Design Efforts:	Storm drain design on Ainsley Street in Dorchester.
Construction Impacts:	May have restricted access and/or local street closings during construction.
Operation and Maintenance Requirements:	• Sewer cleaning • TV inspection

CSO PROJECT FACT SHEET

4. Sewer Separation (Neponset River)	
Capital Cost:	$ 10,700,000
O&M Cost:	$ 0
Receiving Water:	Neponset River
Priority:	A (critical use area: shellfishing, and swimming)
Location:	Dorchester Neighborhood of Boston
Project Description:	Separate approximately 68 acres of the combined system in Dorchester. Construction consists placing a new sewer or drain pipe via open-cut excavations in streets and existing rights-of-way.
Facility Layout\Size:	Does not apply
Previous Planning and/or Design Efforts:	No previous study has been conducted.
Construction Impacts:	May have restricted access and/or local street closings during construction.
Operation and Maintenance Requirements:	• Sewer cleaning • TV inspection

CSO PROJECT FACT SHEET

5. Sewer Separation (Constitution Beach)	
Capital Cost:	$8,700,000
O&M Cost:	$ 0
Receiving Water:	Constitution Beach
Priority:	A (critical use area: shellfishing, and swimming)
Location:	East Boston Area (Orient Heights)
Project Description:	Separate approximately 40 acres of combined system in East Boston. Construction consists of placing a new sewer or drain pipe via open-cut excavations in streets and existing rights-of-way.
Facility Layout/Size	Does not apply.
Previous Planning and/or Design Efforts:	No previous study has been conducted.
Construction Impacts:	May have restricted access and/or local street closing during construction.
Operation and Maintenance Requirements:	• Sewer cleaning • TV inspection

CSO PROJECT FACT SHEET

6. Upgrade Cottage Farm Facility	
Capital Cost:	$ 7,000,000
O&M Cost:	$ 700,000 per year
Receiving Water:	Lower Charles River Basin
Priority:	B (Moderate waterbody priority)
Location:	Within existing facility
Project Description:	Upgrade the existing Cottage Farm CSO Facility with new effluent screens, outfall diffuser, and dechlorination equipment.
Facility Layout\Size:	Addition of dechlorination chemical storage and dosing system, attempt to install within existing facility.
Previous Planning and\or Design Efforts:	No previous study has been conducted on this facility.
Construction Impacts:	Impacts to the Charles River associated with installation of the new diffuser, and construction related truck traffic.
Operation and Maintenance Requirements:	• Facility is manned 24 hrs • Equipment maintenance (weekly) • Disposal of screenings (after storm events) • Odor control, disinfection and dechlorination chemical handling (monthly)

CSO PROJECT FACT SHEET

7. Screen and Disinfect Stony Brook Conduit Flows	
Capital Cost:	$ 24,000,000
O&M Cost:	$ 500,000 per year
Receiving Water:	Lower Charles River Basin
Priority:	B (Moderate waterbody priority)
Location:	Near Ward Street Headworks
Project Description:	Provide a screening, disinfection, and dechlorination facility on the Stony Brook Conduit for wet weather flows, bypass dry weather base flows.
Facility Layout/Size:	Screening, disinfection and dechlorination equipment
Previous planning and\or design efforts:	Fens Gatehouse site was reviewed as part of 1990 Facilities Plan and EIR.
Construction Impacts:	Parking lots near Ward Street Headworks.
Operation and Maintenance Requirements:	• Monitored during storms • Disposal of screening (after storm events) • Odor control, disinfection and dechlorination chemical handling (monthly)

CSO PROJECT FACT SHEET

8. Screen and Disinfect CAM005	
Capital Cost:	$ 4,000,000
O&M Cost:	$ 90,000 per year
Receiving Water:	Upper Charles
Priority:	B (Moderate waterbody priority)
Location:	Near CAM005 outfall (Mt. Auburn Hospital area)
Project Description:	Provide a screening, disinfection, and dechlorination facility.
Facility Layout\Size:	Screening, disinfection and dechlorination equipment in new facility at CAM005
Previous Planning and\or Design Efforts:	No previous studies have been conducted.
Construction Impacts:	CAM005 is located in highly visible community sensitive area and in designated parkland; construction-related noise, dust, and traffic impacts; and post-construction aesthetic impacts.
Operation and Maintenance Requirements:	• Monitored during storms • Disposal of screenings (after storm events) • Odor control, disinfection and dechlorination chemical handling(monthly)

CSO PROJECT FACT SHEET

9. Interceptor Connection Relief and Screen at BOS032	
Capital Cost:	$ 1,000,000
O&M Cost:	$ 0
Receiving Water:	Upper Charles River
Priority:	B
Location:	Along North Beacon Street
Project Description:	Replace existing interceptor connection between regulator RE-032-1 and the Charles River Valley Sewer. Install screen on outfall
Facility Layout\Size:	Does not apply
Previous Planning and\or Design Efforts:	None
Construction Impacts:	Traffic disruptions along North Beacon Street
Operation and Maintenance Requirements:	None

CSO PROJECT FACT SHEET

10. Sewer Separation at CAM002 and CAM004 and Screens at Remaining Outfalls	
Capital Cost:	$ 12,000,000
O&M Cost:	$ 40,000
Receiving Water:	Alewife Brook
Priority:	B (Moderate volume of CSO controlled)
Location:	West side of Cambridge near Arlington
Project Description:	Separate combined areas upstream of CAM002 and CAM004. Much of existing tributary area is currently two-pipe. Construction consists of open-cut excavations in streets and existing rights-of-way. Install screens at remaining outfalls.
Facility Layout\Size:	Does not apply.
Previous Planning and\or Design Efforts:	The City of Cambridge has completed design for separation in this area, which is a portion of Phase VII Sewer Separation Project.
Construction Impacts:	May have restricted access and/or local street closing during construction.
Operation and Maintenance Requirements:	• Sewer cleaning • TV inspection

CSO PROJECT FACT SHEET

11. Separate Baffle Manholes Upstream of SOM001	
Capital Cost:	$ 400,000
O&M Cost:	$ 0
Receiving Water:	Alewife Brook
Priority:	B
Location:	Somerville near Cambridge line
Project Description:	Separate baffle manholes. May require new manhole construction
Facility Layout\Size:	Not Applicable
Previous Planning and\or Design Efforts:	None
Construction Impacts:	Minor traffic impacts
Operation and Maintenance Requirements:	None

CSO PROJECT FACT SHEET

12. Sewer Separation at SOM006 and SOM007	
Capital Cost:	$ 200,000
O&M Cost:	$ 0
Receiving Water:	Upper Mystic River
Priority:	B (Moderate waterbody priority)
Location:	Separation baffles in combined manholes Northeast Somerville across Mystic River from Wellington Circle
Project Description:	Separate common manholes upstream of SOM007, and SOM006, if existing
Facility Layout\Size:	Does not apply - baffle separation within existing manholes.
Previous Planning and\or Design Efforts:	No previous study has been conducted.
Construction Impacts:	Minimal environmental impacts to surrounding area.
Operation and Maintenance Requirements:	• Manhole cleaning (monthly)

CSO PROJECT FACT SHEET

13. Upgrade Prison Point Facility	
Capital Cost:	$ 2,000,000
O&M Cost:	$ 600,000 per year
Receiving Water:	Upper Inner Harbor
Priority:	B (Moderate waterbody priority and moderate volume of CSO controlled)
Location:	One Monsignor O'Brien Highway
Project Description:	Upgrade the existing Prison Point CSO Facility to provide dechlorination.
Facility Layout\Size:	Addition of dechlorination chemical storage and dosing system, attempt to install within existing facility.
Previous Planning and\or Design Efforts:	No previous studies have been conducted on the upgrade of this facility.
Construction Impacts:	None
Operation and Maintenance Requirements:	• Facility is manned 24 hours • Equipment maintenance (weekly) • Disposal of screenings (after storm events) • Odor control, disinfection and dechlorination chemical handling (monthly)

CSO PROJECT FACT SHEET

14. Screening and Disinfection at BOS019	
Capital Cost:	$ 2,500,000
O&M Cost:	$ 116,000 per year
Receiving Water:	Upper Inner Harbor
Priority:	C (low waterbody priority and a low volume of CSO controlled)
Location:	Charlestown Navy Yard Area
Project Description:	Install screening and disinfection facility at outfall BOS019. Some or all equipment may be located below grade.
Facility Layout\Size:	Less than 1/2 acre
Previous Planning and\or Design Efforts:	No previous study has been conducted on installing storage at this outfall.
Construction Impacts:	The outfall location is in a sensitive community area (Boston Housing Authority Dwellings, ballfield and Charlestown Navy Yard).
Operation and Maintenance Requirements:	• Disposal of screening (after storm events) • Disinfection chemical handling (monthly)

CSO PROJECT FACT SHEET

15. Interceptor Relief and Screens at BOS003-013	
Capital Cost:	$ 37,600,000
O&M Cost:	$ 0
Receiving Water:	Upper and Lower Inner Harbor
Priority:	B (moderate waterbody priority)
Location:	East Boston: Outfall BOS003-13 Area
Project Description:	Construct relief interceptor for East Boston Branch Sewer, and install screens in existing outfalls.
Facility Layout\Size:	Proposed relief sewer route is within Marginal, Jeffries, Maverick and Cottage Streets.
Previous Planning and\or Design Efforts:	No previous study has been conducted.
Construction Impacts:	Local street impairment during construction. Area has high volume of local and commercial traffic.
Operation and Maintenance Requirements:	• Interceptor cleaning. • TV inspection.

CSO PROJECT FACT SHEET

16. Trunk Sewer Relief and Screens at CHE002 through CHE004	
Capital Cost:	$ 1,800,000
O&M Cost:	$ 0
Receiving Water:	Mystic/Chelsea Confluence
Priority:	A (Relieves local flooding conditions)
Location:	Chelsea Waterfront Area
Project Description:	Install a relief sewer to replace the existing undersized sewer, and install screens in outfalls. Construction consists open-cut excavations in streets and existing rights-of-way
Previous Planning and\or Design Efforts:	No previous study has been conducted.
Construction Impacts:	Short term noise, dust, and traffic impacts.
Operation and Maintenance Requirements:	• Sewer cleaning • TV inspection

CSO PROJECT FACT SHEET

17. Relocate and Upgrade Somerville Marginal CSO Facility	
Capital Cost:	$ 7,000,000
O&M Cost:	$ 406,000 per year
Receiving Water:	Mystic/Chelsea Confluence
Priority:	B (moderate volume of CSO controlled)
Location:	Near existing Somerville Marginal facility. Preferred site is under I-93.
Project Description:	Construct screening, disinfection and dechlorination equipment at a new facility replacing the existing Somerville Marginal CSO facility.
Facility Layout\Size:	Screening, disinfection and dechlorination equipment in new facility.
Previous Planning and\or Design Efforts:	No previous study has been conducted on this facility.
Construction Impacts:	Coordinate with Massachusetts Highway Department on relocation of the Somerville Marginal facility.
Operation and Maintenance Requirements:	• On-site monitoring during storm • Equipment maintenance (weekly) • Disposal of screening (after storm events) • Odor control, disinfection and dechlorination chemical handling (monthly)

CSO PROJECT FACT SHEET

18. Screen and Disinfect BOS017	
Capital Cost:	$ 2,000,000
O&M Cost:	$ 109,000 per year
Receiving Water:	Mystic/Chelsea Confluence
Priority:	C (low waterbody priority and a low volume of CSO controlled)
Location:	Medford Street in Charlestown
Project Description:	Install mechanical screening, disinfection, and dechlorination facility at outfall.
Facility Layout\Size:	Screening, disinfection and dechlorination equipment in new facility
Previous Planning and\or Design Efforts:	No previous study has been conducted on these locations.
Construction Impacts:	None
Operation and Maintenance Requirements:	• On-site monitoring during storms • Equipment maintenance (weekly) • Disposal of screening (after storm events) • Odor control, disinfection and dechlorination chemical handling (monthly)

CSO PROJECT FACT SHEET

19. Outfall Repairs and Manually-Cleaned Screen at CHE008	
Capital Cost:	$ 1,300,000
O&M Cost:	$ 5,000 per year
Receiving Water:	Chelsea Creek
Priority:	B
Location:	Off Eastern Avenue, Chelsea
Project Description:	Repair or replace existing outfall and install screen
Facility Layout\Size:	Not Applicable
Previous Planning and\or Design Efforts:	None
Construction Impacts:	Short-term traffic disruption on Eastern Avenue
Operation and Maintenance Requirements:	Periodic cleaning of screens

CSO PROJECT FACT SHEET

20. Consolidation to Screening/Disinfection facility at BOS080	
Capital Cost:	$ 34,500,000
O&M Cost:	$ 40,000 per year
Receiving Water:	Reserved Channel
Priority:	B (high waterbody priority and a high volume of CSO controlled)
Location:	Conley Marine Terminal on Reserve Channel, or other industrial location
Project Description:	Install consolidation conduit for outfalls BOS076 through BOS080 to a screening, disinfection, and dechlorination facility in the vicinity of BOS080; install screens on remaining outfalls
Previous Planning and\or Design Efforts:	Consolidation conduit route was analyzed as part of 1990 Facilities Plan and EIR.
Construction Impacts:	Local street impairment during construction of conduit. East First Street has high volumes of commercial traffic.
Operation and Maintenance Requirements:	• Equipment maintenance (weekly) • Disposal of screening (after storm events) • Odor control, disinfection and dechlorination chemical handling (monthly)

CSO PROJECT FACT SHEET

21. Detention/Treatment of Union Park Pumping Station Overflows	
Capital Cost:	$ 16,600,000
O&M Cost:	$ 800,000 per year
Receiving Water:	Fort Point Channel
Priority:	B (a high volume of CSO controlled)
Location:	Vicinity of Union Park Pumping Station
Project Description:	Install storage tank with disinfection and dechlorination.
Facility Layout\Size:	2.2 MG storage tank (approximately 110'x 210') constructed adjacent to or near the existing Pump Station.
Previous Planning and\or Design Efforts:	Storage tanks were previously part of original design.
Construction Impacts:	Neighborhood groups are concerned with the development of a facility on a parcel planned for a park. Residential uses immediately adjacent to site.
Operation and Maintenance Requirements:	• Equipment maintenance (weekly) • Odor control, disinfection and dechlorination chemical handling (monthly)

CSO PROJECT FACT SHEET

22. In-Line Storage Dorchester Brook Conduit	
Capital Cost:	$ 4,000,000
O&M Cost:	$ 16,000 per year
Receiving Water:	Fort Point Channel
Priority:	C (low waterbody priority and a low volume of CSO controlled)
Location:	Fort Point Channel, Dorchester Brook Conduit
Project Description:	Install a hydraulic gate, a pump-out station, and piping modifications, on the existing Dorchester Brook Conduit to be used to store overflows from up to the one-year storm.
Previous Planning and\or Design Efforts:	No previous study has been conducted on storage in this conduit.
Construction Impacts:	None
Operation and Maintenance Requirements:	• Pump equipment maintenance (weekly)

CSO PROJECT FACT SHEET

23. Storage/Consolidation Conduit and Screens at BOS072-073	
Capital Cost:	$ 5,100,000
O&M Cost:	$ 50,000 per year
Receiving Water:	Fort Point Channel
Priority:	C (low waterbody priority and a low volume of CSO controlled)
Location:	Fort Point Channel, between outfalls BOS072 and BOS073 (Gillette Parking Lot)
Project Description:	Install a consolidation/storage conduit with pump-out station running between outfalls BOS072 and BOS073 to store the overflows from the three-month storm. Install screens on remaining outfalls.
Facility Layout\Size:	Consolidation conduit providing 0.4 MG of storage, linking CSO outfalls.
Previous Planning and\or Design Efforts:	No previous study has been conducted.
Construction Impacts:	Requires significant coordination with CA/T; short-term disruption of parking.
Operation and Maintenance Requirements:	• Disposal of Screening (after storm events) • Pump equipment maintenance (monthly) • Conduit flushing (yearly)

24. Independent Manually-Cleaned Screens and Outfall Closing Projects	
Capital Cost:	$ 2,700,000
O&M Cost:	$ 180,000 per year
Receiving Water:	Multiple Receiving Waters
Priority:	A
Location:	Region Wide
Project Description:	Install manually-cleaned bar screens in remaining outfalls in various receiving water segments, and block regulators tributary to BOS042 and MWR010
Facility Layout\Size:	Not Applicable
Previous Planning and\or Design Efforts:	None
Construction Impacts:	Minor short term impacts at outfalls
Operation and Maintenance Requirements:	Periodic cleaning of screens

APPENDIX E

DESCRIPTIONS OF CSO CONTROL TECHNOLOGIES

CSO

CONTROL TECHNOLOGY

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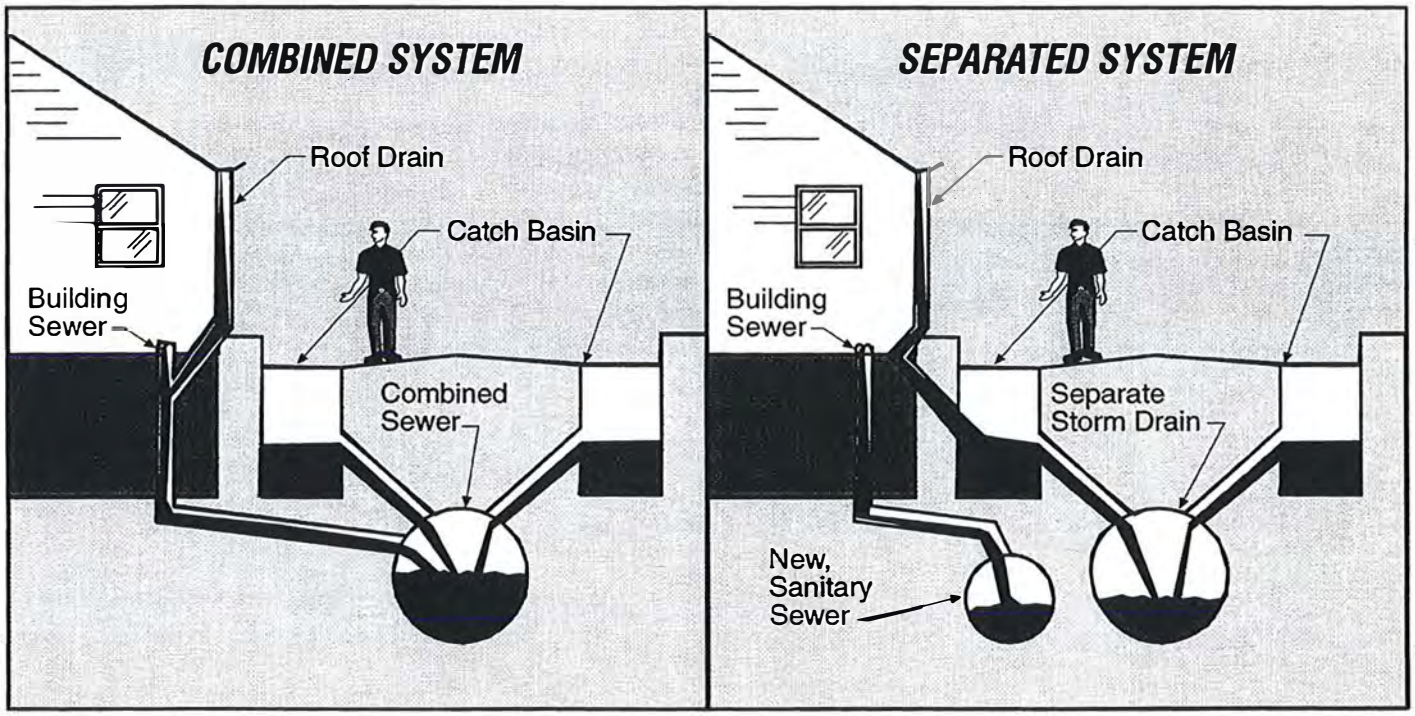
Winter 1994-95

SEWER SEPARATION



Description

In a combined sewer system, stormwater and sanitary sewage are collected in the same pipe and conveyed to the wastewater treatment plant. In wet weather, the combined sewer may not have enough capacity to convey the large quantities of stormwater runoff, causing the mixture of sanitary sewage and stormwater to overflow at certain points within the combined system, called the combined sewer overflow, or "CSO." In a separated sewer system, one pipe conveys only sanitary sewage to the wastewater treatment plant, while a separate pipe conveys stormwater to a stormwater outfall. In a separated system, sanitary sewage cannot overflow into receiving waters. The process of sewer separation is the conversion of a combined system into separate stormwater and sanitary sewer systems. This is achieved either by constructing a new sanitary sewer and modifying the existing combined sewer so that it conveys only stormwater, or by constructing a new storm drain system and modifying the existing combined sewer so that it conveys only sanitary sewage.

Site Requirements

Construction occurs throughout the tributary combined system, typically in streets, with new pipes running parallel to the existing combined sewer pipes.

Maintenance Requirements

Reduction in stormwater flows to the treatment plant and elimination of CSO regulators (overflow points) may reduce overall collection system operations and maintenance costs.

Sewer separation

Advantages

Eliminates discharge of raw sanitary sewage during wet weather.

Post-construction operation and maintenance are minimal.

Flows to wastewater treatment plants are reduced since stormwater is removed and, if the sanitary sewer lines are new, infiltration (leakage of groundwater into pipes) is also reduced.

Upstream flooding may be reduced if existing combined sewers are undersized and cannot adequately handle stormwater flows.

Disadvantages

Frequency and total volume of stormwater discharges to receiving waters are increased. In a separated system, urban stormwater discharges, which may contain sediments, organic matter, bacteria, metals, oils, and other pollutants, would potentially increase pollutant loads to the receiving waters.

Sewer separation can be disruptive in the short term to residential and commercial areas due to traffic, noise, dust, and other construction-related impacts.

In older neighborhoods, sanitary sewage and roof drainage may be combined within the internal house plumbing, making complete separation of these areas more difficult and expensive.

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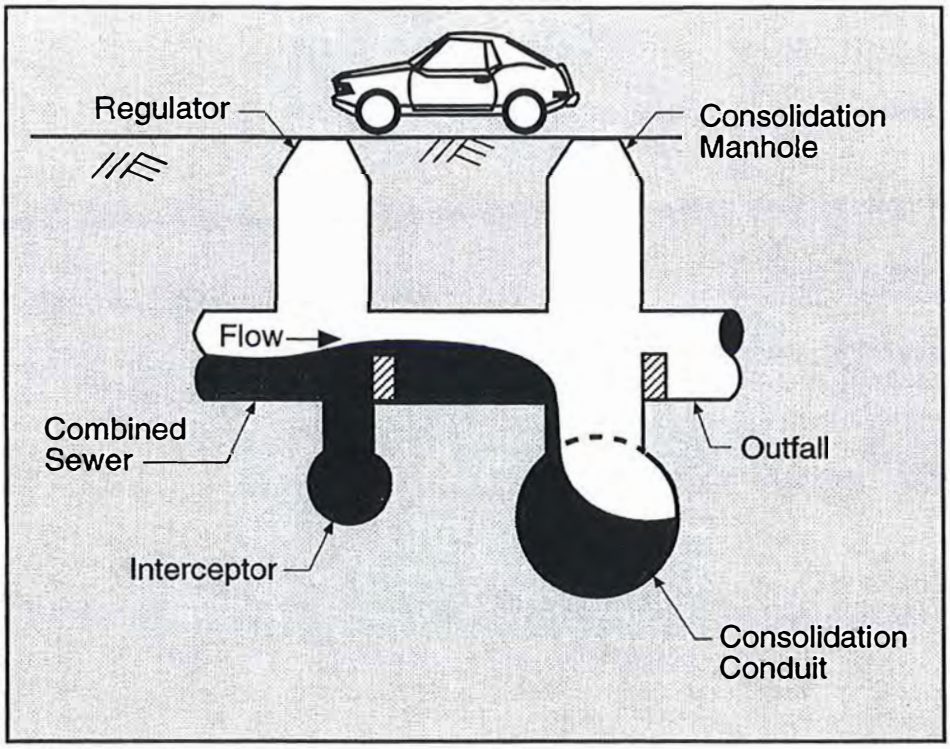
CSO CONSOLIDATION



Description

Consolidation of CSOs involves constructing a series of pipes to capture and convey combined flow from a series of two or more overflow locations. Three general applications for CSO consolidation include the following:

Consolidation of multiple overflows to a single location for storage treatment.
This approach eliminates the need to provide a CSO control facility at each overflow location and may allow the CSO to be conveyed to a location where it is easier to site a facility. Consolidation conduits for this purpose are typically sized to convey flow from a very large storm, which would occur on average once every two years. Overflows from the consolidation conduit would occur during larger storms.

CSO consolidation/relocation.
In some cases, it may be appropriate to relocate CSOs from a sensitive receiving water to a less sensitive receiving water. A consolidation conduit for this purpose would be sized to convey maximum flow that could possibly be discharged at each CSO, eliminating discharges into the more sensitive water body.

CSO consolidation/storage.
In some cases, the storage volume within a consolidation conduit may provide a sufficient level of control without the need for a downstream facility. In this case, a dewatering pump station would be provided to return the contents of the conduit to the collection system at the end of the storm.

CSO consolidation

Advantages

Reduces the number of CSO storage or treatment facilities required.

Allows greater flexibility in siting of CSO facilities.

Consolidation of multiple CSO outfalls may allow elimination of one or more outfalls.

CSO relocation can eliminate CSOs to sensitive areas.

Disadvantages

Sediment buildup may occur in consolidation/storage conduits.

Potential construction impacts of installing large diameter pipes.

Site Requirements

No above-ground structures are required for consolidation conduits. Consolidation/storage conduits require adjacent pumping stations. Construction site required depends on installation techniques (open-cut excavation v. soft-ground tunneling).

Maintenance Requirements

Conduits may require periodic flushing to control sediment deposits.

CSO CONTROL TECHNOLOGY

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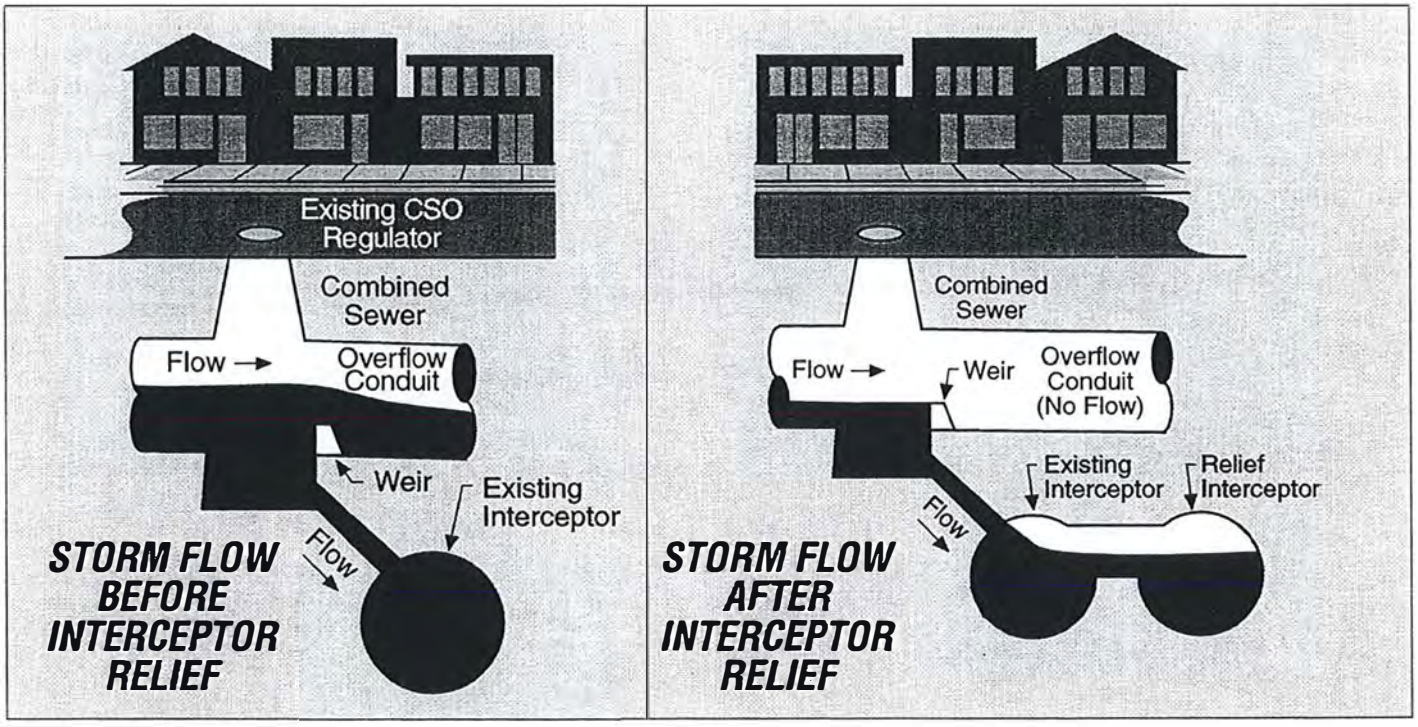
INTERCEPTOR RELIEF



Description

Interceptors are large-diameter sewers that collect flow from a number of smaller sewers and convey it to the wastewater treatment plant. If a section of an interceptor downstream of CSOs does not have sufficient capacity to carry the combined flows during wet weather, flow can back up upstream of the interceptor, contributing to the frequency and/or duration of overflows. If there is sufficient capacity further downstream of the segment of restricted flow, then relief of the segment may reduce the upstream CSOs.

Interceptor relief could be achieved by constructing a new conduit parallel to the existing interceptor to convey additional flows downstream. If the existing interceptor was old or in poor condition, the new interceptor would likely replace it. Otherwise, the existing interceptor could remain in service after the relief conduit was in operation, and the relief interceptor would not have to be as large.

Interceptor relief

Advantages

Combined sewer overflows are reduced.

Upstream flooding, if it occurs, is reduced.

Post-construction operation and maintenance are minimal.

No above-ground structures are required.

More flow would be conveyed to the wastewater treatment plant, consistent with the U.S. EPA CSO policy.

Disadvantages

Requires that downstream pipes have enough capacity to handle the additional flow conveyed by the relief interceptor. This capacity is not always available.

Disruptions to local traffic, utility service and other community activities may occur during construction.

Site Requirements

Construction occurs in the general area of the existing interceptor, usually in streets. No new above-ground structures are required.

Maintenance Requirements

No substantial change over existing collection system maintenance programs.

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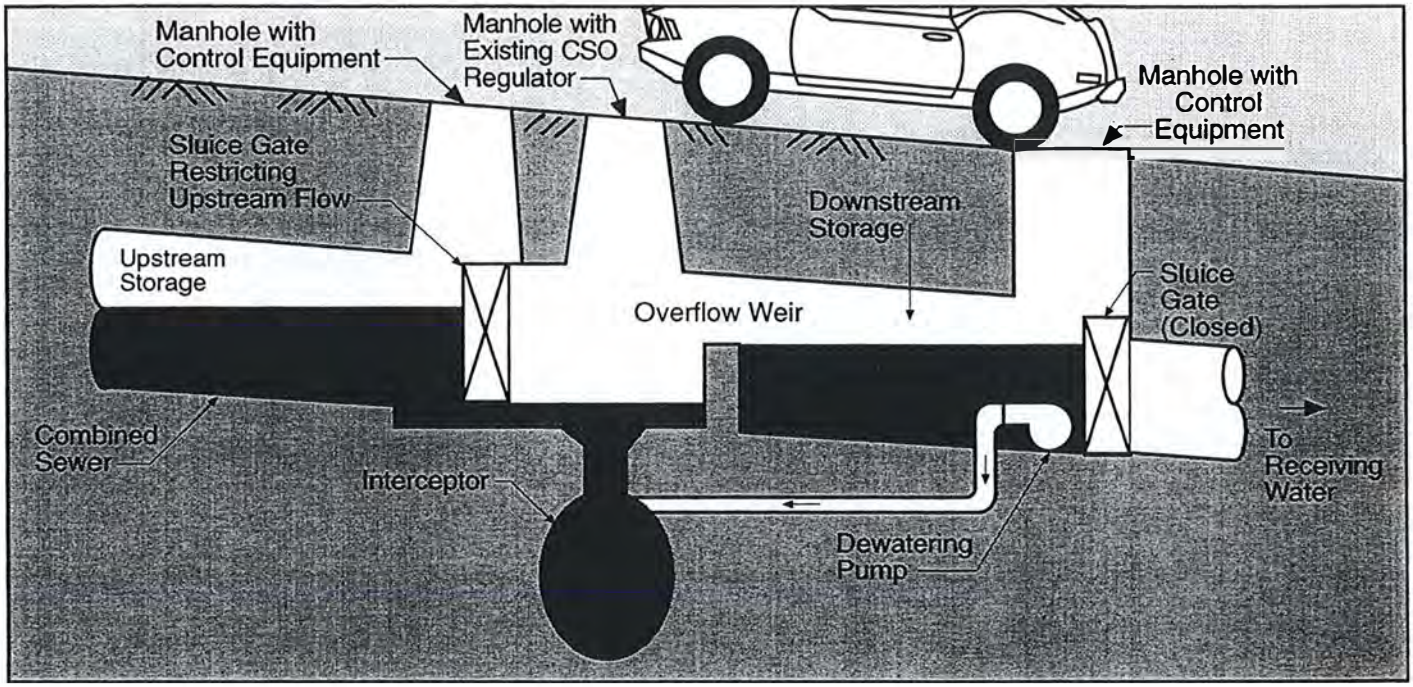
IN-SYSTEM STORAGE



Description

This technology optimizes the use of existing storage capacity within the collection and transport system. Where a large diameter pipe is known to flow less-than-full during a given storm event, the empty space between the water surface and the crown (top) of the pipe could be used for storage.

In-system storage facilities may be configured in a number of different ways, depending on the existing system layout and hydraulics. Two common locations for utilizing in-system storage are in combined sewers immediately upstream of CSO regulators* and in outfall conduits downstream of CSO regulators. Typical features may include one or more of the following: a downstream gate, to hold back flow in the conduit used for storage, opening to release flow at the end of the storm or to prevent upstream flooding; a remote control system to control the downstream gate automatically; a dewatering pump station, in locations such as an outfall pipe, where it may not be possible to drain the pipe by gravity back to the collection system at the end of a storm.

Control of in-line storage in multiple locations can be integrated into a centralized, computer operated system that optimizes the storage and routing of flows as the storm event occurs. This is known as "real-time control."

**Regulators are devices or structures that control the flow from the upstream combined sewer into the large, collecting pipes called interceptors. The regulators divert flow in excess of the interceptor capacity to the CSO outfall.*

In-system storage

Advantages

Using existing conduits for storage is usually cost-effective if sufficient storage capacity is available.

Minimal site area is required for construction and long-term operation.

In-line storage projects are usually relatively easy to implement.

May reduce the required size of more expensive off-line CSO control facilities.

Disadvantages

Available storage volume limited by existing pipe dimensions.

Potential for upstream flooding if control system fails.

Potential for sediment deposition and increased collection system maintenance requirements where flows are stored.

Site Requirements

Construction would typically involve installation of a gate structure and possibly a dewatering pump station, with minimal site requirements. Above-grade structures may not be required or may consist of small enclosures for control equipment.

Maintenance Requirements

Routine inspection/maintenance of control gates; possibly increased need for flushing of sediment deposited upstream of the control gates.

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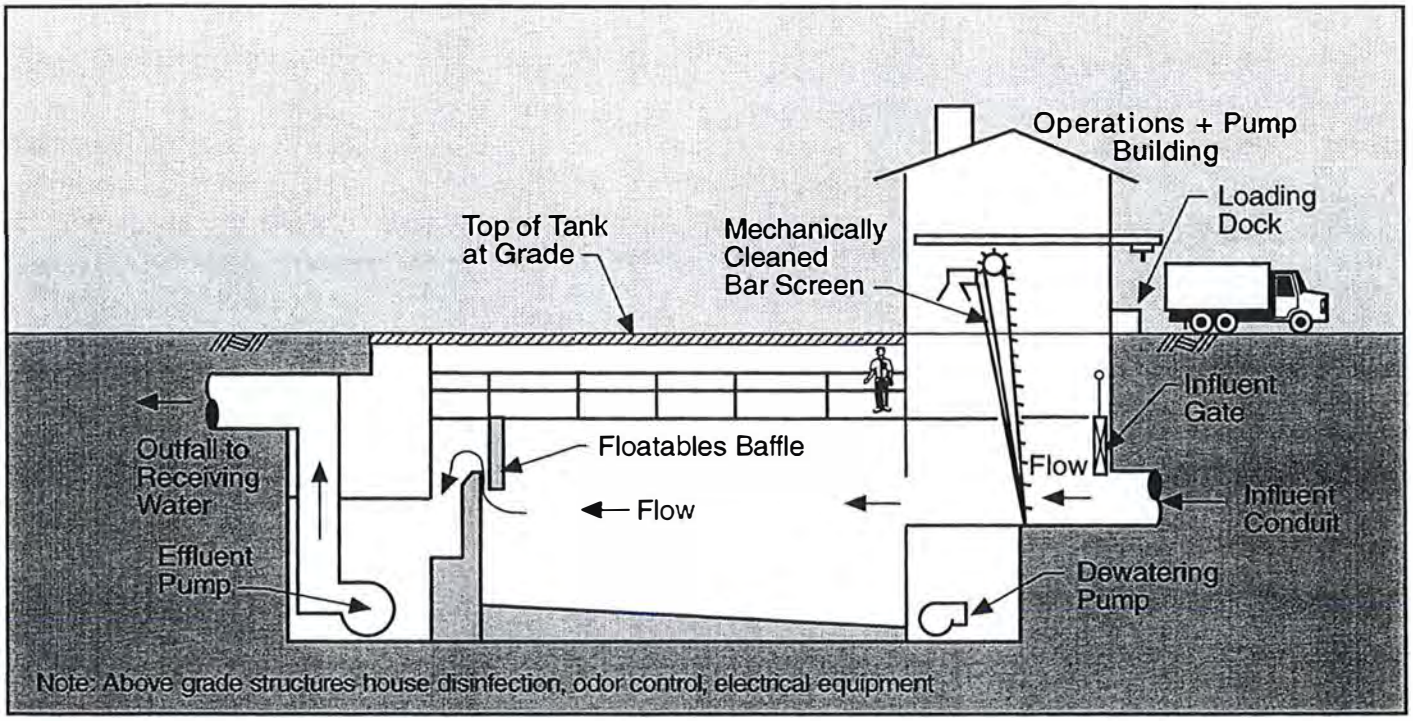
NEAR SURFACE STORAGE/TREATMENT



Description

Near-surface storage and treatment is provided by a tank that holds the CSO in wet weather and may provide flow-through treatment of CSO flows in excess of the volume of the tank. At the end of the storm, the contents of the tank can be returned to the collection system for treatment at the Deer Island wastewater treatment plant. "Near-surface" indicates that the facilities are constructed at relatively shallow depths (typically less than 30 ft.), using traditional open-cut excavation techniques. Variations of this technology include:

Storage-only: Flow greater than the tank volume is diverted to an outfall upstream of the tank.

Storage/sedimentation: Flow greater than the tank volume passes through the tank, receiving treatment (floatables control, solids removal, disinfection). The degree of treatment depends on the rate of flow through the tank.

Detention/treatment: Similar to storage/sedimentation tank, but with smaller volume and surface area, providing less storage, and a lower level of treatment.

While the size of each type of facility will vary for a given overflow volume and peak flow rate, the features of each facility will generally be similar. In addition to the tank, these facilities would include: influent bar screens, located upstream of the tank, to capture large objects (planks, bricks) and floatable material before they get into the tanks; disinfection, to reduce pathogens in the flow which passes through the facility and is discharged to receiving waters (sodium hypochlorite solution, similar to bleach, is typically used as disinfectant for CSO and dechlorination of effluent may be required); pumping systems, to bring the flow into the facility, pass flow out of the facility to the receiving water or return the contents of the tank to the collection system; and odor control, to eliminate odors in the exhaust air discharged from the facility ventilation system.

Near surface storage treatment

Advantages

Eliminates overflow for storms up to the volume of the tank.

Flow-through facilities control floatables, solids, and pathogens for larger storms.

Tanks can be below-grade, allowing beneficial use of the area above for such potential uses as a parkland or for parking.

Disadvantages

Potentially large land requirements.

Relatively high maintenance requirements.

Site Requirements

Size of the site depends on the volume of flow to be stored, depth of tank and peak flow-rate to be treated. For example, a 20 ft. deep tank sized to store 10 million gallons would have a surface area of approximately 1.5 acres. A storage/sedimentation tank sized to treat a peak flow rate of 100 MGD would have a surface area of approximately 1.0 acres and would provide approximately 3.6 million gallons of storage. In each case, additional area would be required for an above-ground operations building, pump building (if necessary), and truck access.

Maintenance Requirements

These facilities require only routine maintenance inspection between storms. Operator attention is required during storms and for post-storm cleanup.

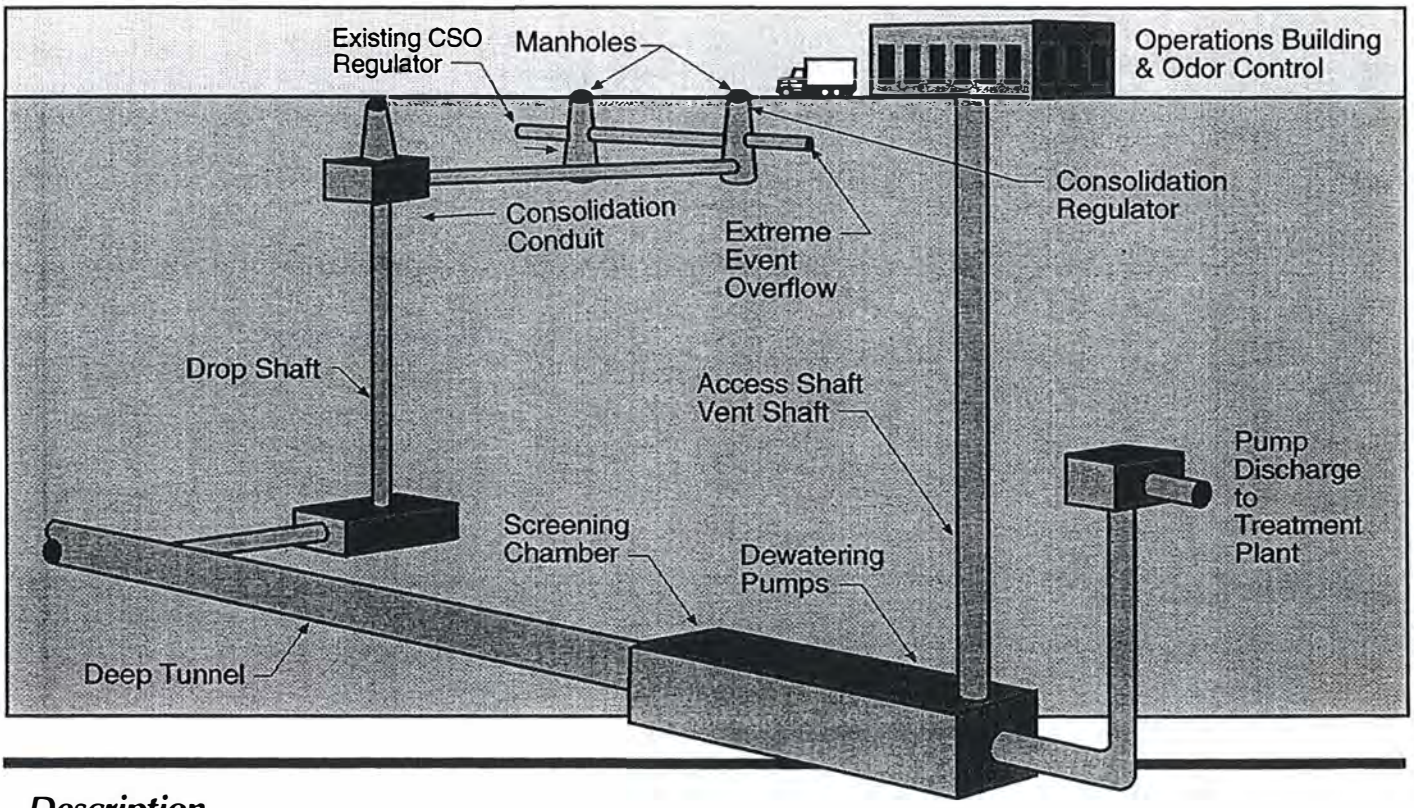
CSO

CONTROL TECHNOLOGY

A publication of the Massachusetts Water Resources Authority's Sewerage Division

Winter 1994-95

DEEP TUNNEL STORAGE



Description

Deep tunnel systems provide storage for large volumes of CSO in tunnels constructed in bedrock, hundreds of feet below grade. After a storm event, the flow stored in the tunnel is pumped back to the transport system and conveyed to the Deer Island wastewater treatment plant. If the tunnel storage capacity is exceeded, excess CSO volume may be discharged to receiving waters. While the size, depth and complexity of a tunnel system will vary depending on the overflow volume to be captured and subsurface conditions, a tunnel system will generally include the following features:

Consolidation conduits: In most cases, it is not practical to connect every CSO location directly to a deep tunnel. Pipes to collect the flow, built nearer to the surface, can convey overflows from multiple CSOs to the deep tunnel.
Vertical drop shafts: To deliver flow from CSOs or consolidation conduits near the surface to the deep tunnel.
Coarse bar screens: May be located at each drop shaft or just upstream of the pump-out system; screens protect downstream pumps by removing large objects from the combined flow.
Deep tunnel: Sized to store and convey flows for storms of a given magnitude. Usually constructed in bedrock using tunnel boring machines (TBMs).
Access shafts: To provide a means of access for personnel and equipment.
Vent shafts: To allow for the balancing of air pressure in the tunnel as the tunnel is filling or being pumped out.
Dewatering system: To pump stored combined sewage out of the tunnel after the storm event.
Odor control systems: May be required at vent shafts to eliminate odors in vented air.

Deep tunnel storage

Advantages

Relatively large volumes can be stored with limited above-ground structures, minimizing siting impacts that might otherwise be associated with near-surface facilities sized to provide a similar level of control.

For very large volumes, storage in deep tunnels is generally more cost-effective and practical than storage in near-surface facilities.

Disadvantages

Tunnel construction is difficult to complete in stages, and implementation benefits are typically not achieved until the tunnel system is completed; in addition, initial capital costs are very high.

Tunnels provide only one system-wide level of control (storage), limiting the transport system's flexibility to provide less expensive levels of control in individual locations where storage may not be required to meet water quality goals.

Unexpected changes in subsurface conditions can cause substantial increases in project cost.

Large quantities of excavated material must be disposed.

Site Requirements

Construction requires access shafts for personnel, equipment and removal of excavated material. These sites may also serve as contractor staging areas. After construction, surface structures will be required for access and vent shafts and the dewatering facility. The number and size of these structures will depend on the size and length of the deep tunnel.

Maintenance Requirements

During dry weather, routine inspection of mechanical equipment (gates, bar screens, pumps) is required. After storms, disposal of screenings is required, along with periodic inspections of the tunnel.

CSO

CONTROL TECHNOLOGY

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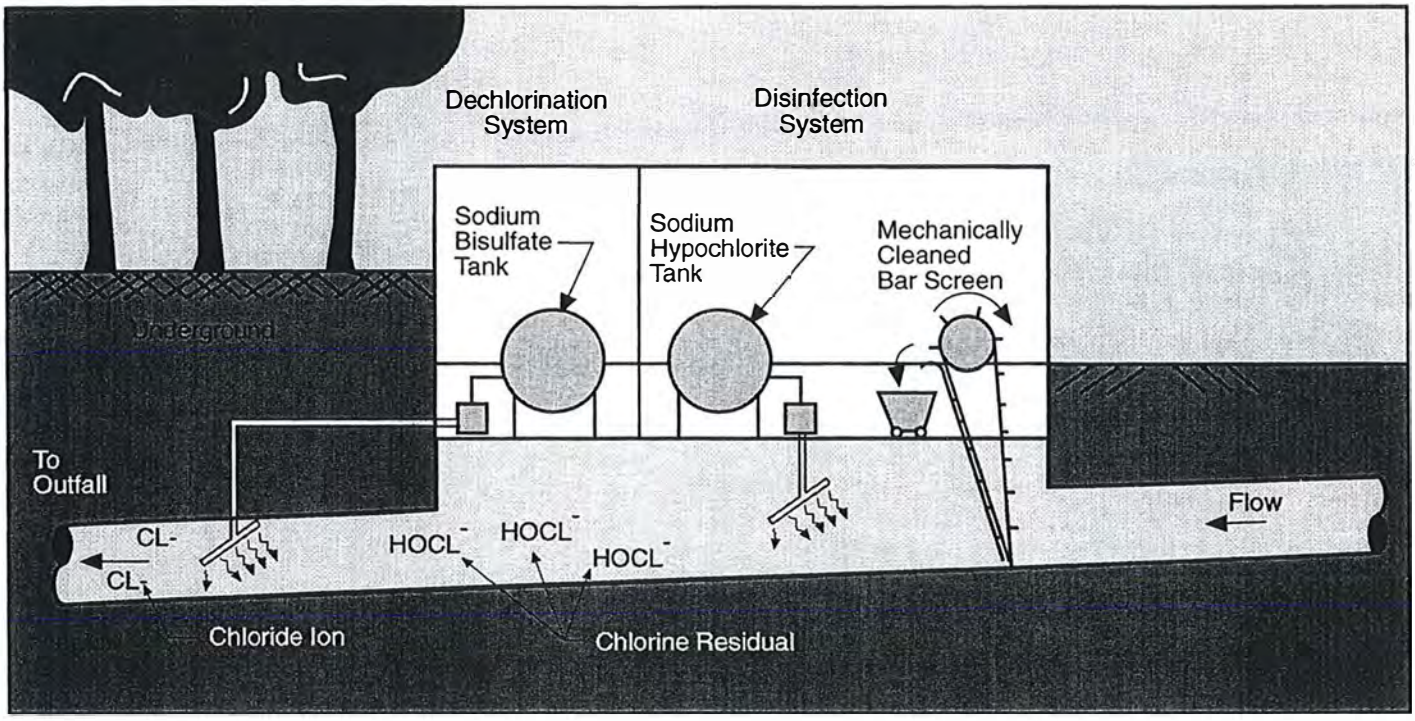
Winter 1994-95

SCREENING, DISINFECTION & DECHLORINATION



Description

These facilities provide flow-through treatment of CSOs. Mechanically cleaned bar screens remove floatable materials and large objects, such as planks and bricks, from the combined sewage. Disinfection reduces bacterial concentrations, and dechlorination, where required, eliminates the potential toxic effects of chlorine on the receiving water.

Mechanically cleaned bar screens consist of vertical or inclined steel bars spaced evenly across the flow channel, with 0.25 to 1.00-inch of clear spacing between the bars. Debris retained on the bars as flow passes through is automatically cleared by a rake mechanism. It is typically deposited into a collection bin for off-site disposal.

Disinfection is usually accomplished with sodium hypochlorite solution (similar to bleach). Disinfection equipment typically includes a chemical storage tank, metering pumps, a diffuser to disperse the hypochlorite into the combined flow, and automatic controls to regulate the dosage of the disinfectant. Having the appropriate dose rate, mixing, and contact time between the disinfectant and the microorganisms in the flow are all key to achieving sufficient disinfection. Since residual chlorine concentrations may also harm aquatic organisms in the receiving water, sodium bisulfite solution can be added to the flow to convert the potentially harmful chlorine compounds into a harmless chloride ion (like salt). This process is referred to as dechlorination.

Screening, disinfection & dechlorination

Advantages

Provides relatively low-cost control for floatables, gross solids, and pathogens.

Relatively small site requirements.

Facility can be fully automated, requiring only routine maintenance and disposal of screenings by staff.

Disadvantages

Bar screenings do not provide control of organic material, fine solids, nutrients, or metals in the combined flow.

The disinfection efficiency is lower than for storage/sedimentation facilities.

Site Requirements

Relatively small sites (0.5 - 1.0 acre) are required for these facilities. Facilities required would be limited to a building housing the screening, disinfection and dechlorination equipment. Parking and truck access would also be required. Depending upon site specific conditions, it may be possible to locate some or most of these facilities below grade.

Maintenance Requirements

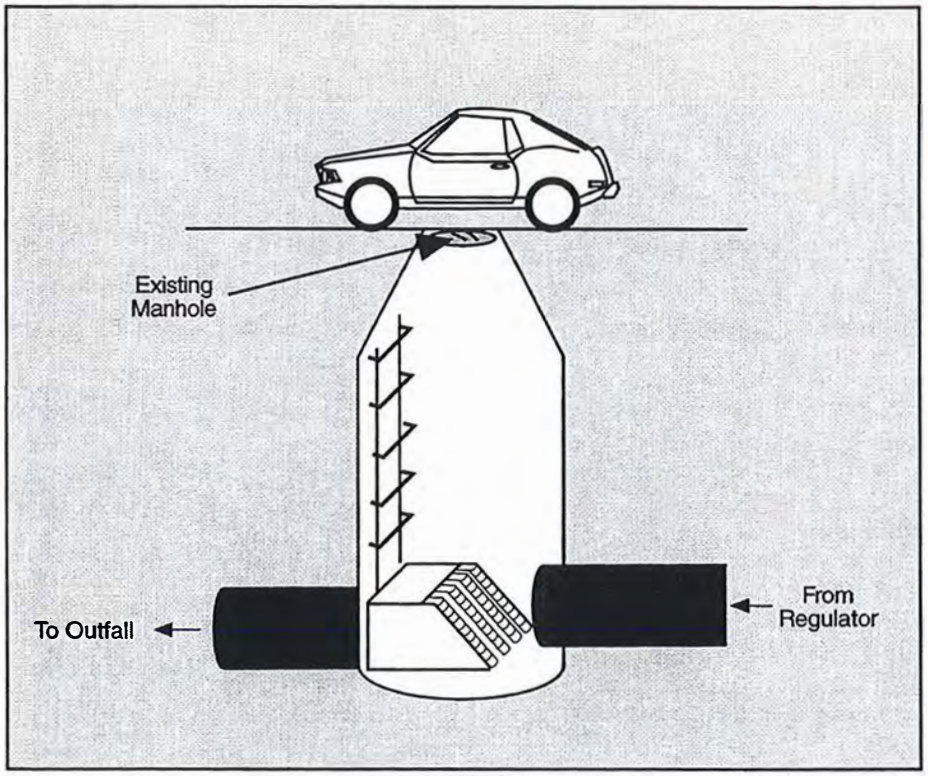
Facilities would require only routine maintenance inspection between storms. Operator attention is required during storms. Cleanup and disposal of screenings required after storms.

CSO CONTROL TECHNOLOGY

A publication of the Massachusetts Water Resources Authority's Sewerage Division

Winter 1994 - 95

MANUALLY CLEANED BAR SCREENS



Description

This technology is intended to improve aesthetics during large storm events by controlling the larger, more visible solids and floatables in the CSO discharge. Manually cleaned bar screens would be installed in a manhole or similar structure on a relatively inactive CSO outfall, providing a minimum level of treatment during the occasional activation of the overflow. The bar screens consist of inclined steel bars with one- to two-inch clear spacings. Materials that are retained on the bars, as flow passes through, must be manually raked off the bars and disposed off-site.

Advantages

Relatively low-cost and easy to site and install.

No moving parts, therefore, may be more reliable than mechanical equipment for relatively infrequent activations.

Consistent with U.S. EPA CSO Policy for Minimum Controls.

Disadvantages

Requires operator attention during activations to prevent clogging of bar screen.

Provides relatively low level of treatment for CSO discharge.

Manually cleaned bar screens

Site Requirements

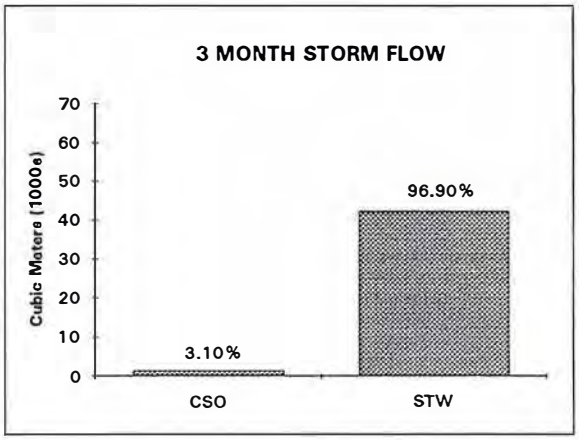
Bar screens can be located in below-grade structure. Truck access required for disposal of trapped material.

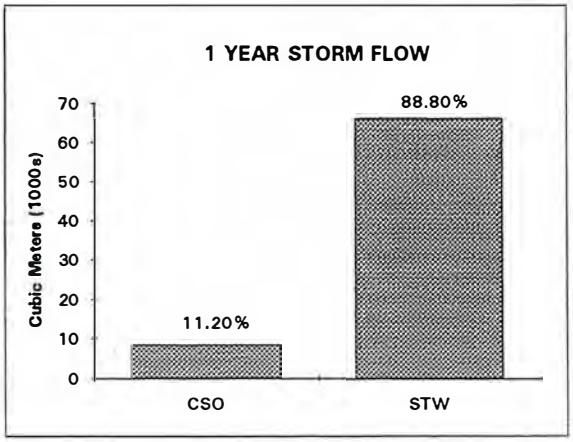
Maintenance Requirements

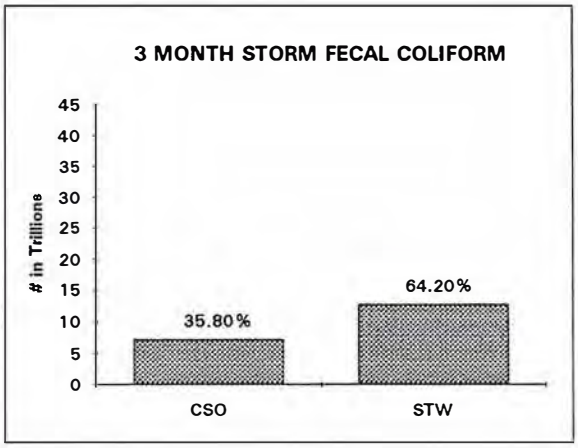
Periodic inspection between storms; manual raking required after storms causing activation of the outfall and perhaps during larger storms, depending on the buildup of solids on the bars.

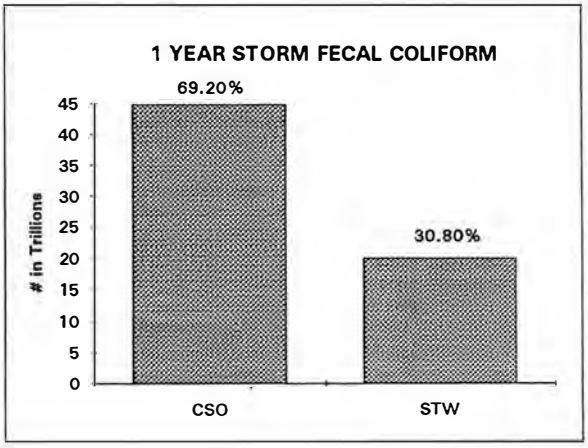
APPENDIX F

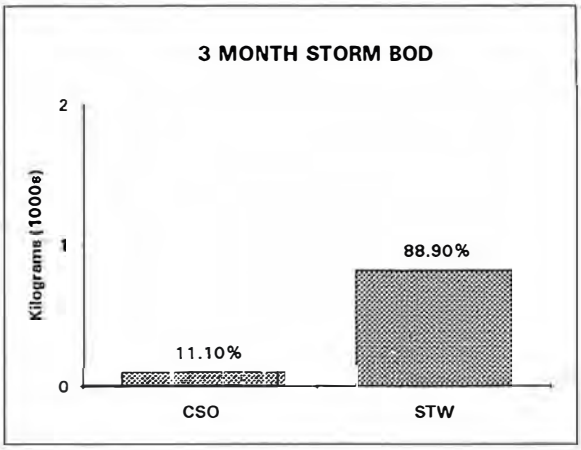
FLOWS AND LOADS TO RECEIVING WATER SEGMENTS FROM CSO, STORMWATER AND UPSTREAM SOURCES UNDER FUTURE PLANNED CONDITIONS

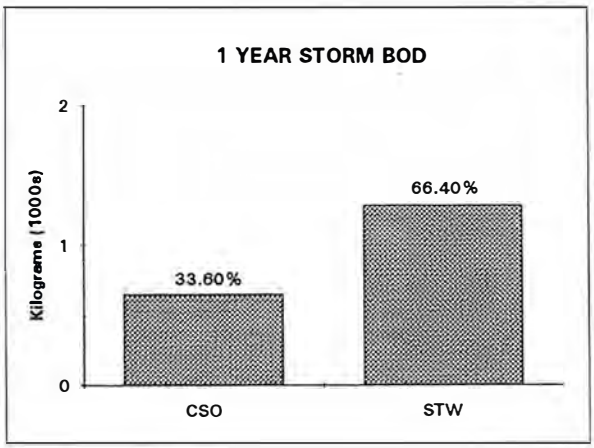




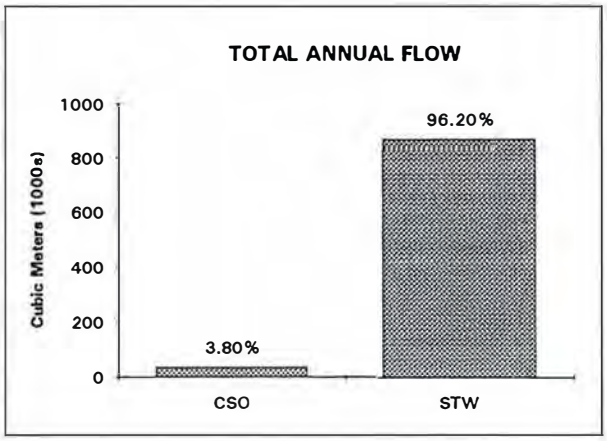


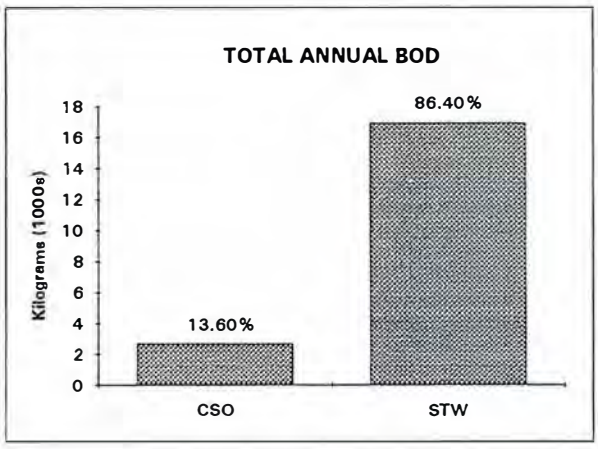


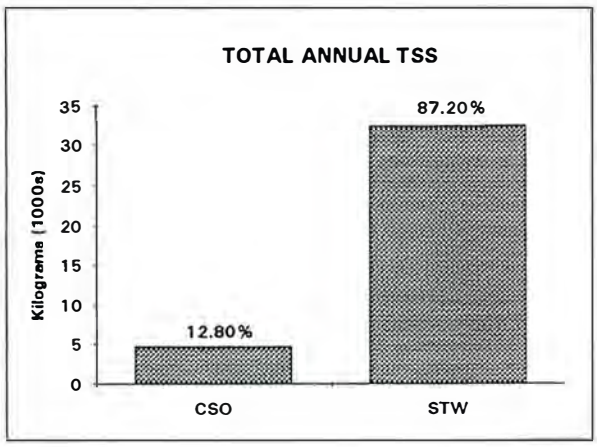


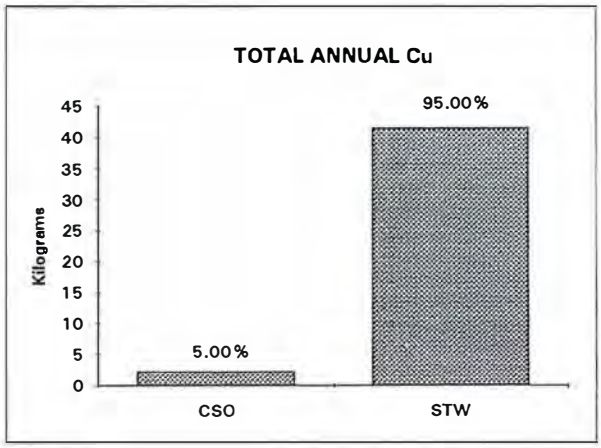


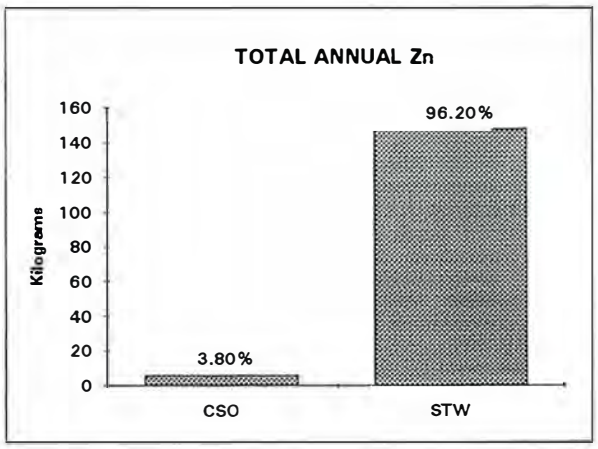
FUTURE PLANNED FLOWS AND LOADS FOR THREE MONTH AND ONE YEAR STORM EVENTS - NORTH DORCHESTER BAY



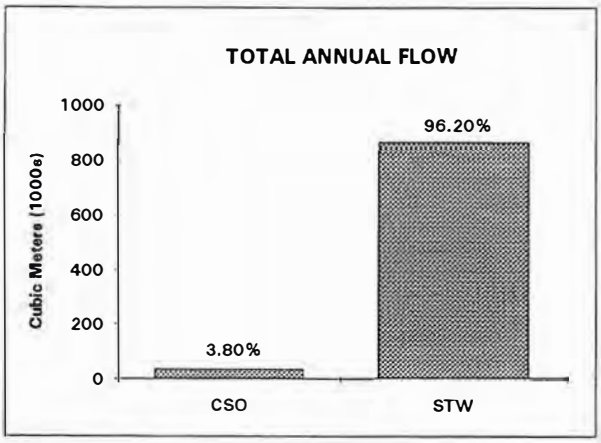


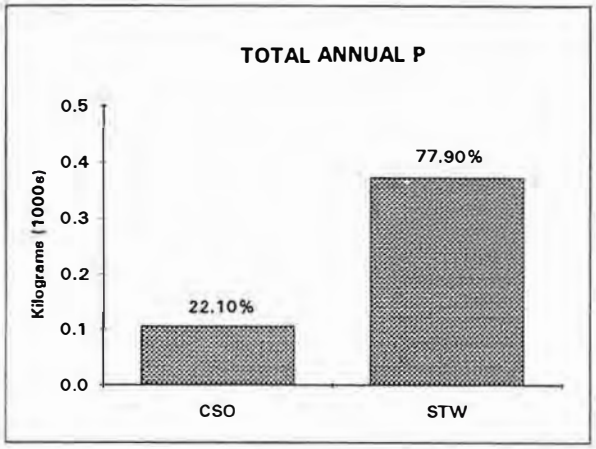


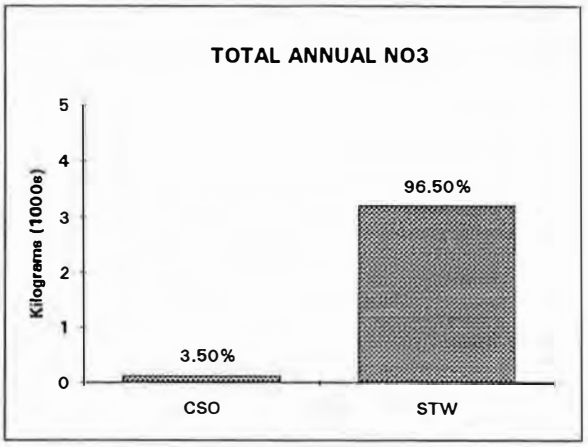


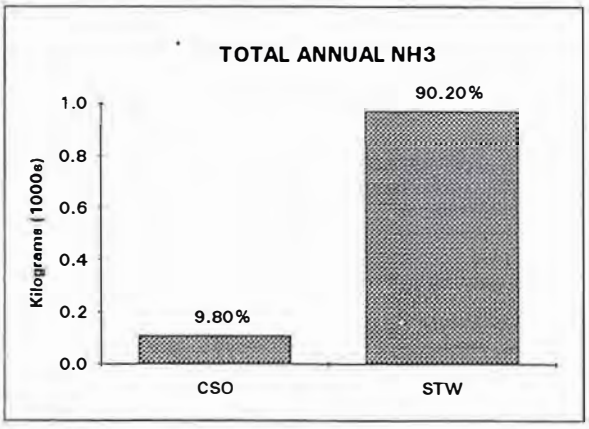


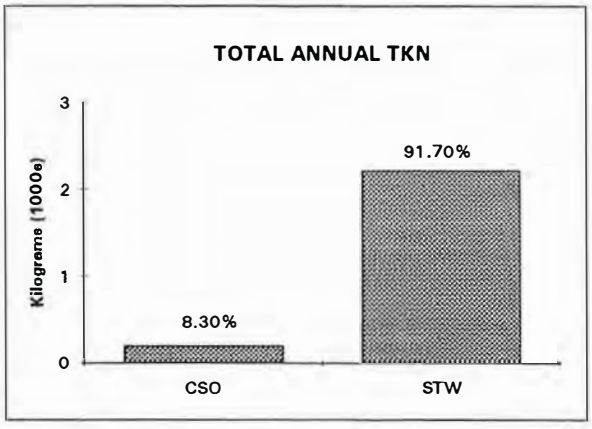
FUTURE PLANNED ANNUAL FLOWS AND LOADS - NORTH DORCHESTER BAY
FLOW, BIOCHEMICAL OXYGEN DEMAND, TOTAL SUSPENDED SOLIDS, COPPER, ZINC



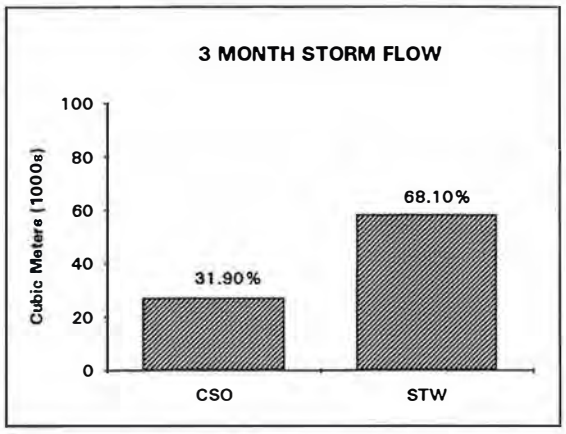


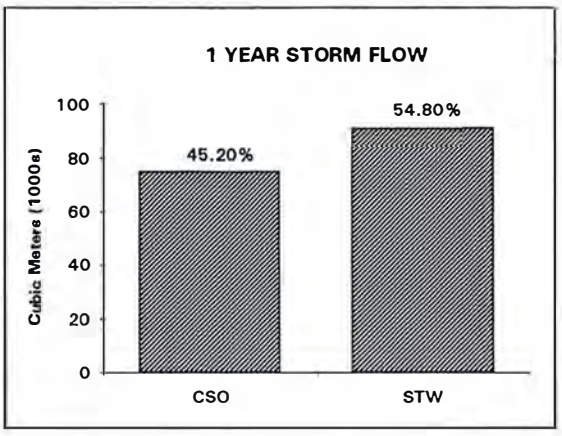


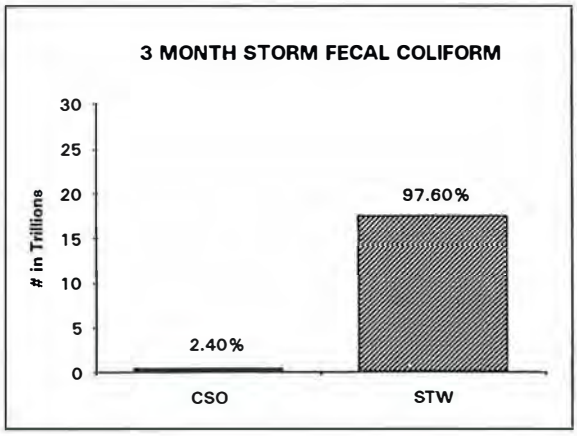


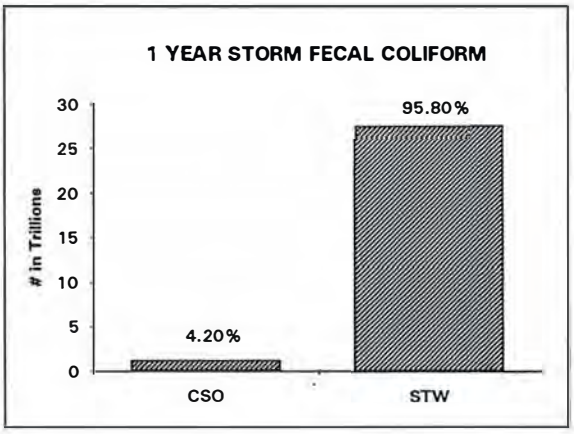


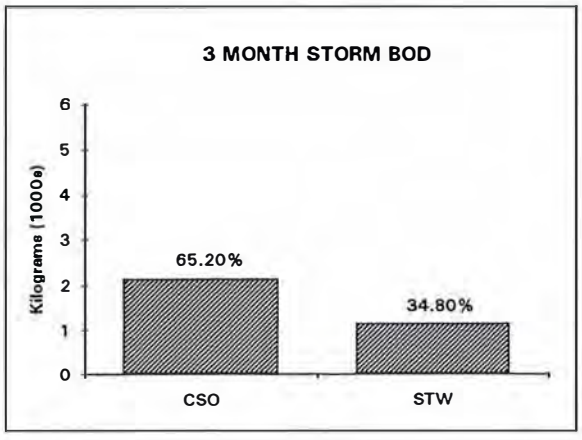
FUTURE PLANNED ANNUAL FLOWS AND LOADS - NORTH DORCHESTER BAY
FLOW, TOTAL PHOSPHORUS, NITRATE, AMMONIA, TOTAL KJELDAHL NITROGEN

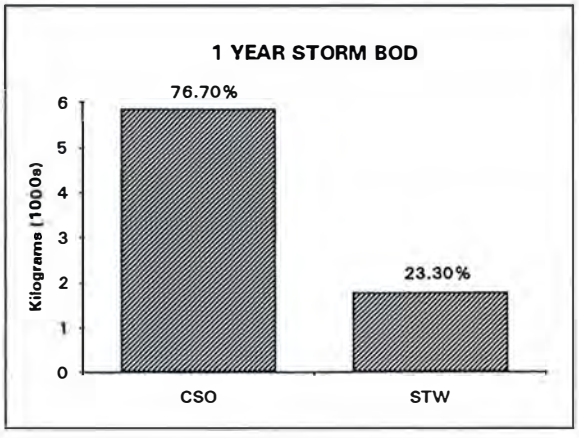




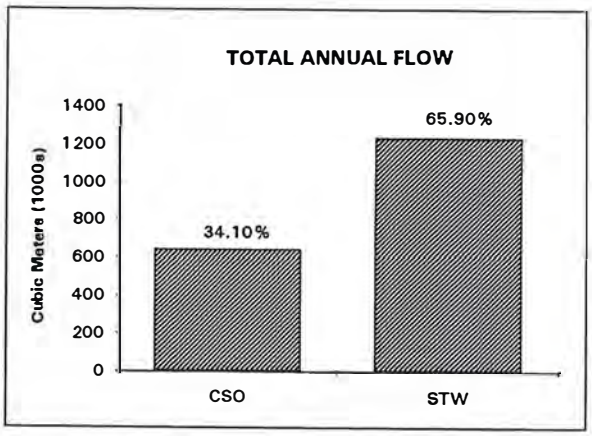


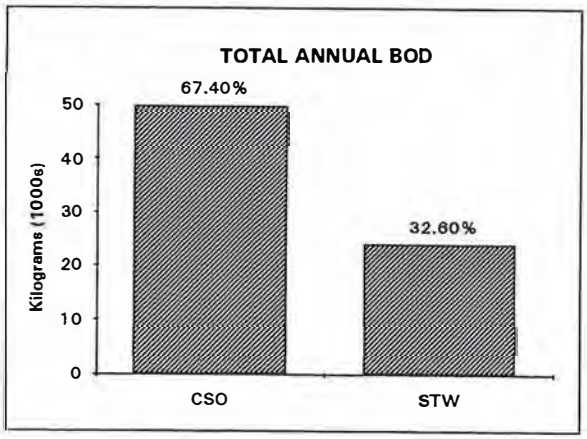


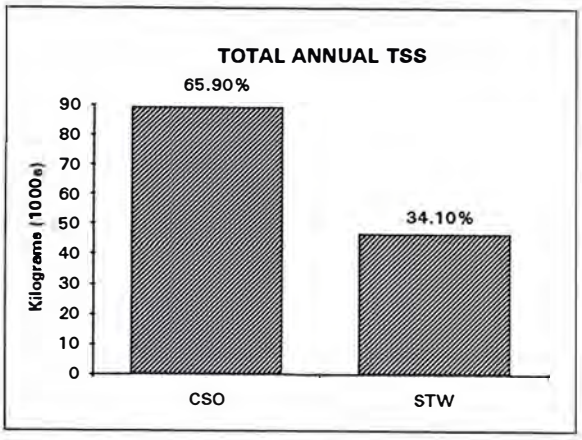


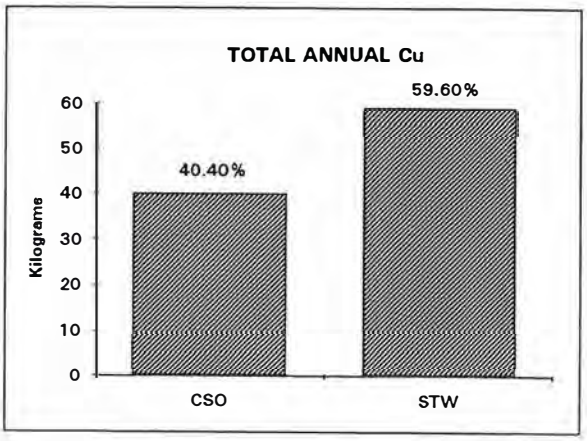


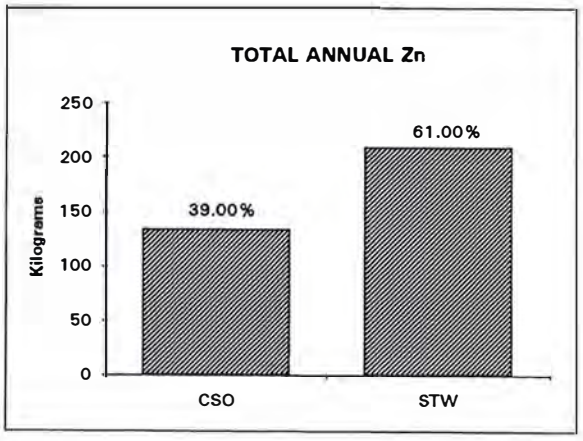
FUTURE PLANNED FLOWS AND LOADS FOR THREE MONTH AND ONE YEAR STORM EVENT - SOUTHERN DORCHESTER BAY



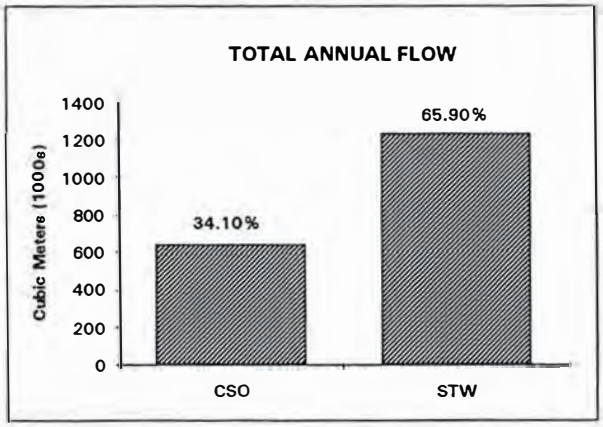


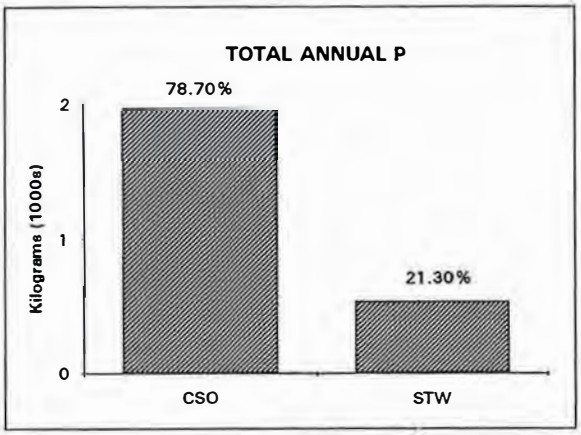


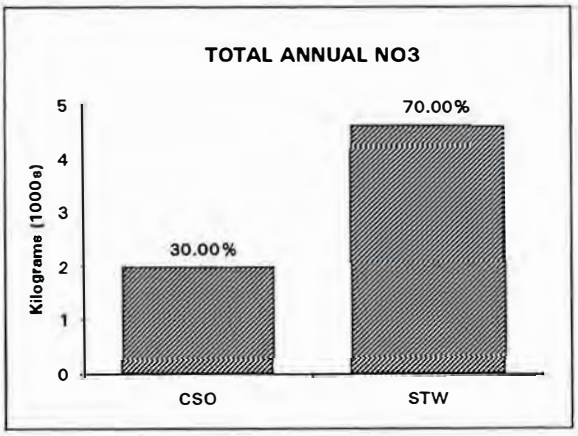


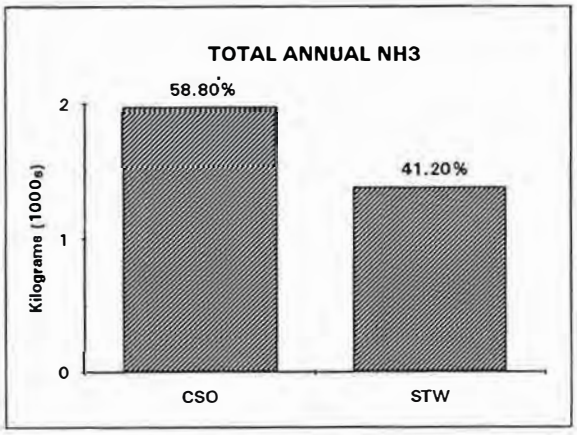


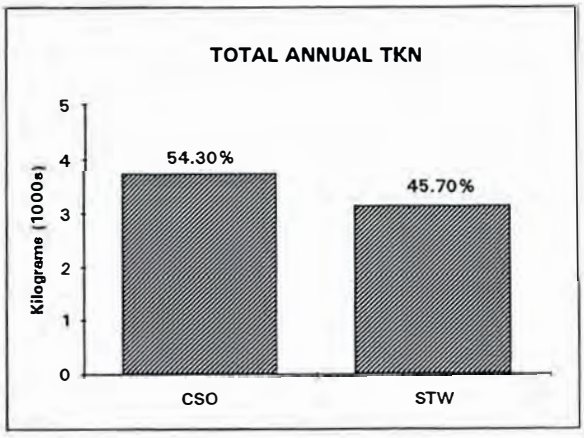
FUTURE PLANNED ANNUAL FLOWS AND LOADS FOR SOUTHERN DORCHESTER BAY
FLOWS, BIOCHEMICAL OXYGEN DEMAND, TOTAL SUSPENDED SOLIDS, COPPER, ZINC



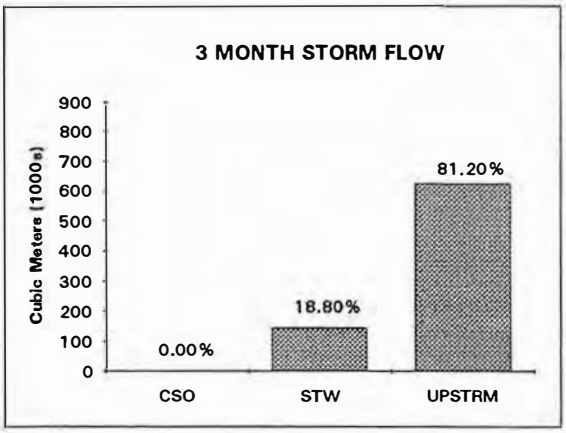


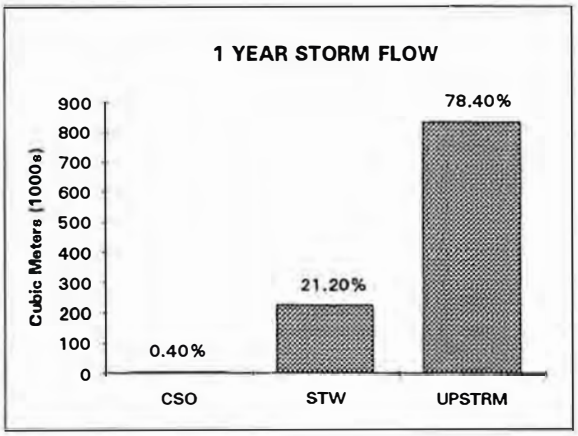


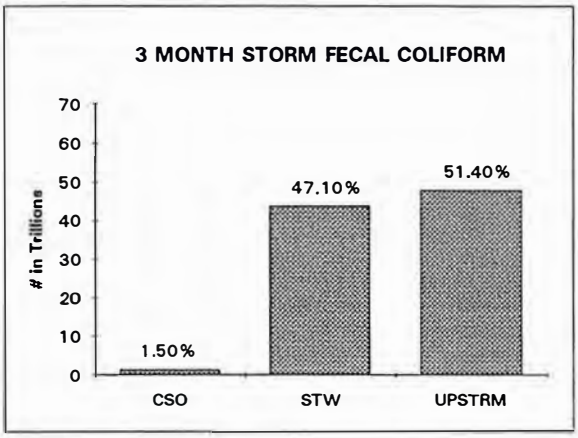


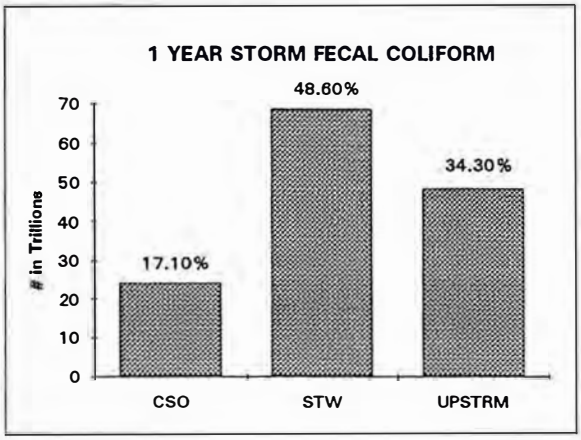


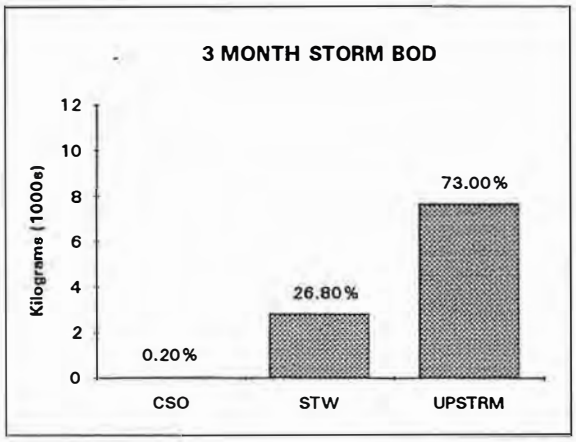
FUTURE PLANNED ANNUAL FLOWS AND LOADS FOR SOUTHERN DORCHESTER BAY FLOWS, TOTAL PHOSPHORUS, NITRATE, AMMONIA, TOTAL KJELDAHL NITROGEN

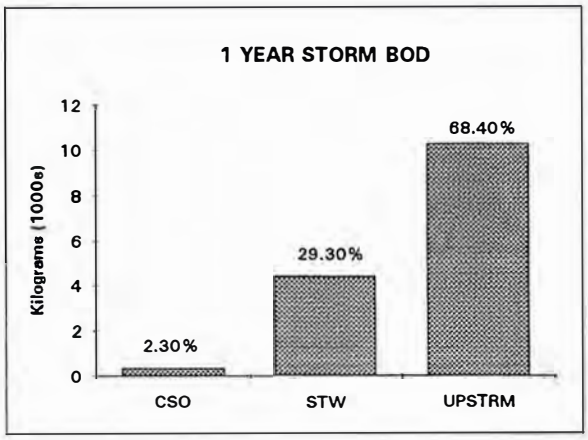




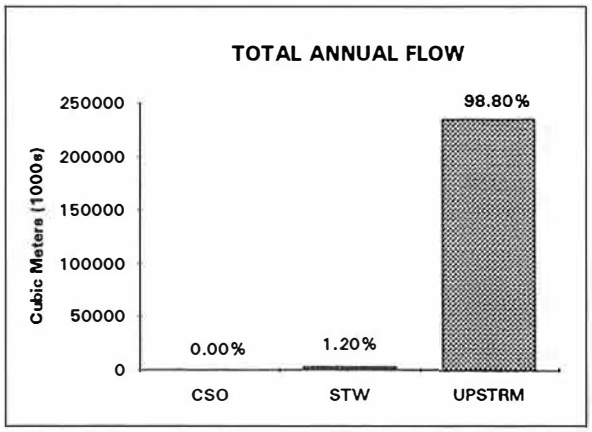


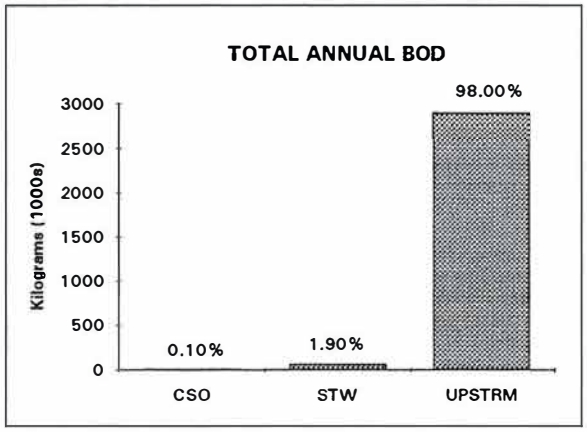


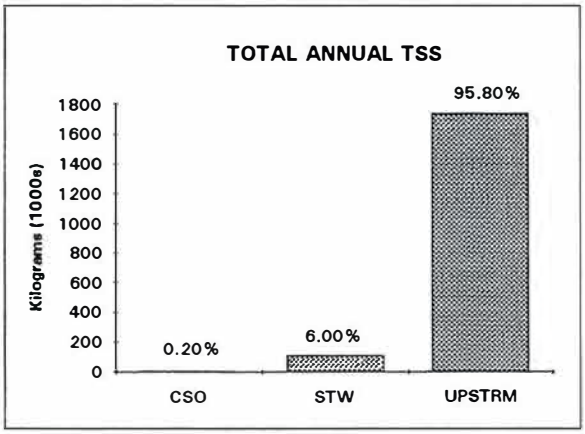


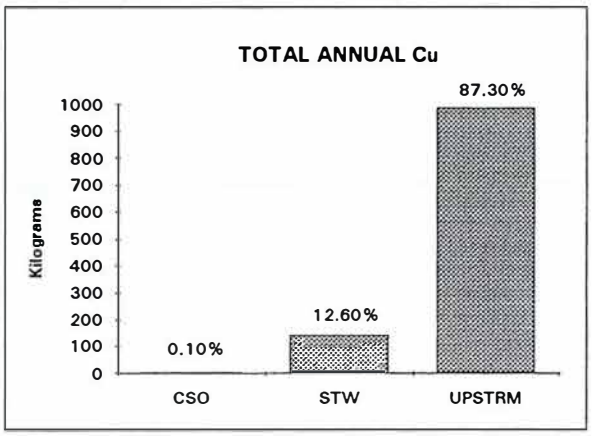


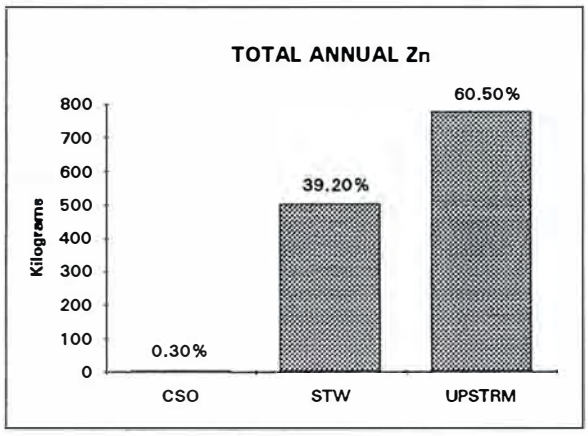
FUTURE PLANNED FLOWS AND LOADS FOR THREE MONTH AND ONE YEAR STORM EVENTS - NEPONSET RIVER



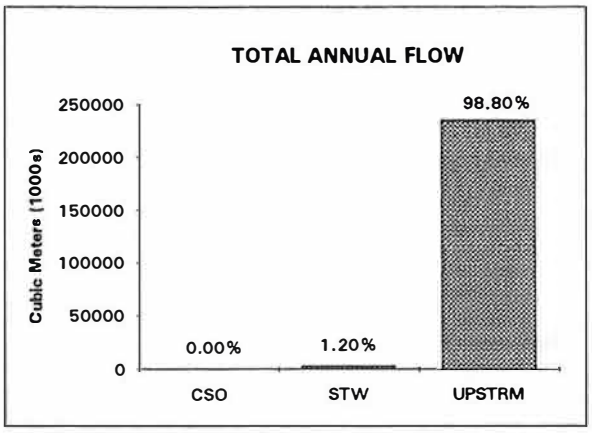


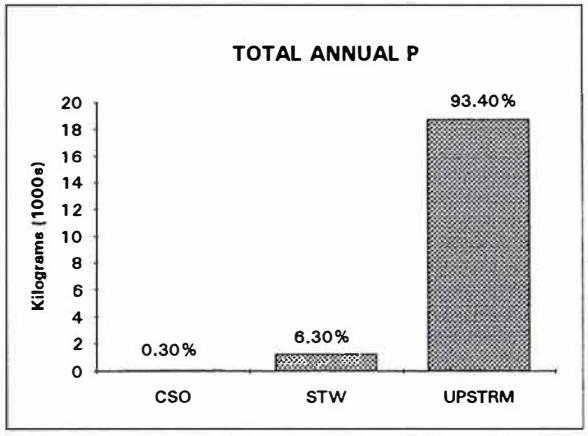


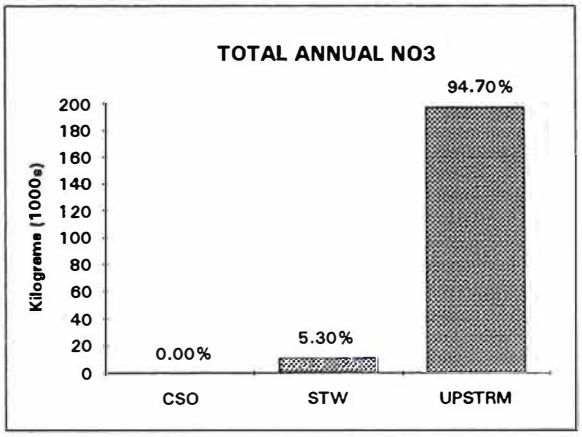


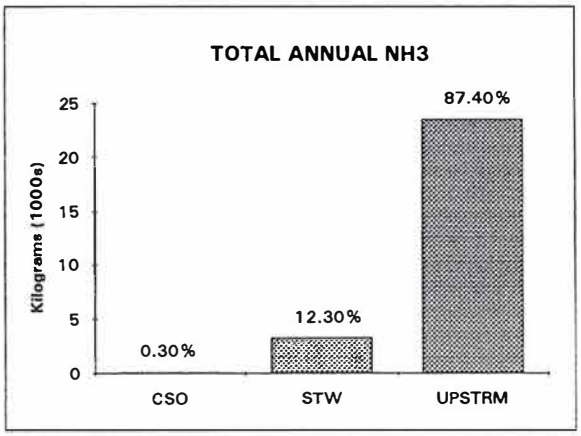


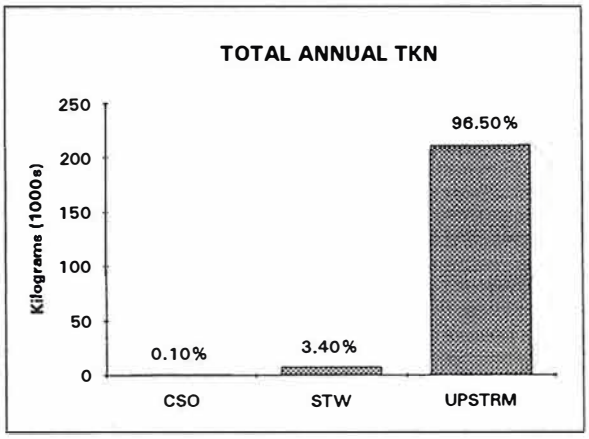
FUTURE PLANNED ANNUAL FLOWS AND LOADS - NEPONSET RIVER
FLOWS, BIOCHEMICAL OXYGEN DEMAND,TOTAL SUSPENDED SOLIDS, COPPER, ZINC



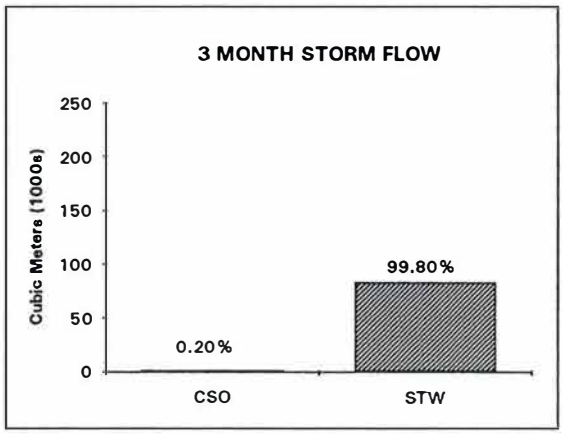


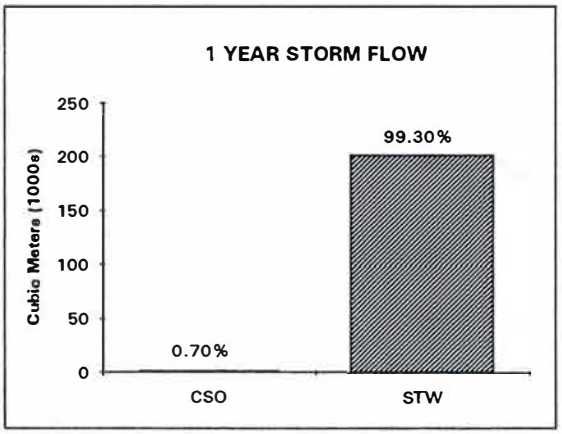


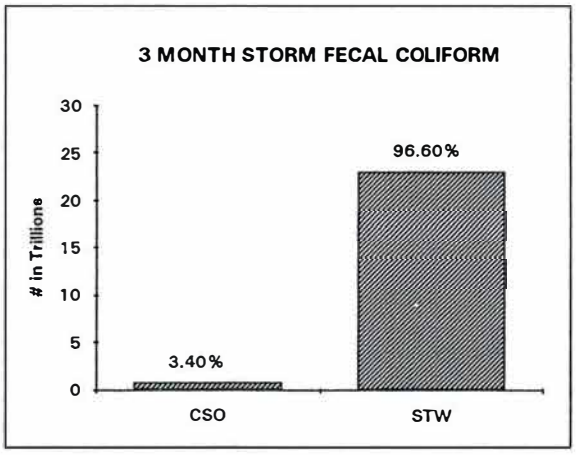


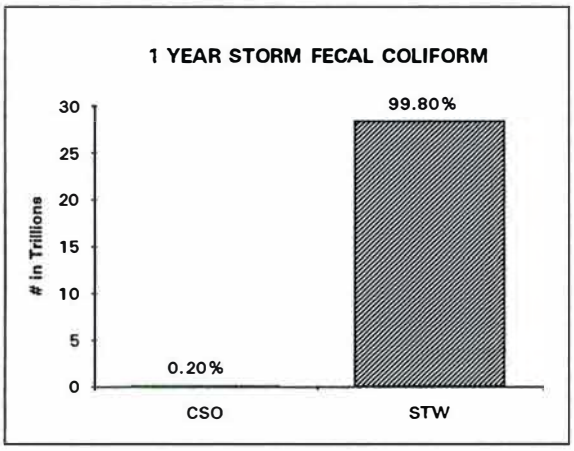


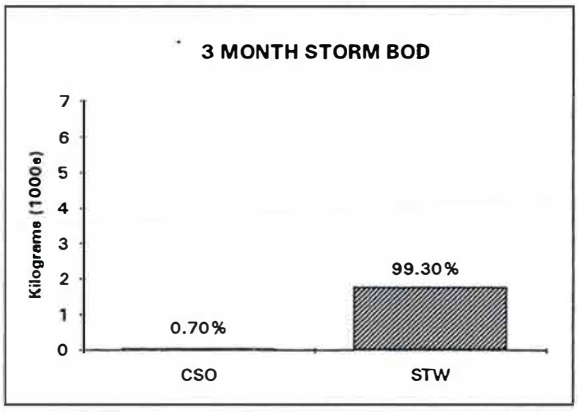
FUTURE PLANNED ANNUAL FLOWS AND LOADS - NEPONSET RIVER
FLOWS, TOTAL PHOSPHORUS, NITRATE,AMMONIA, TOTAL KJELDAHL NITROGEN

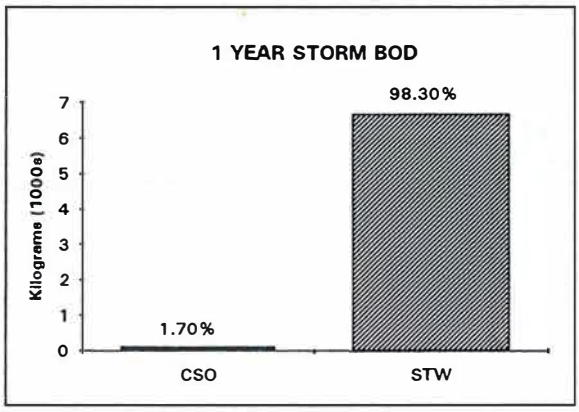




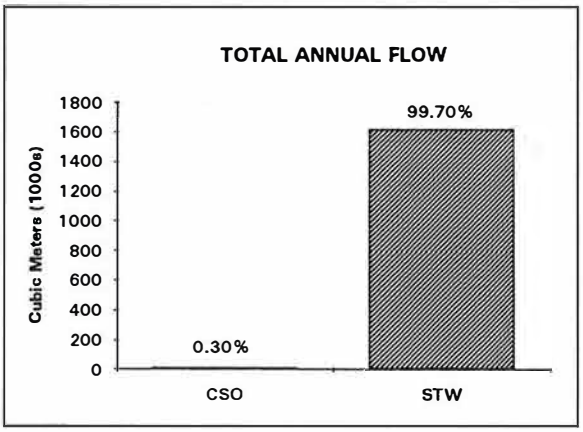


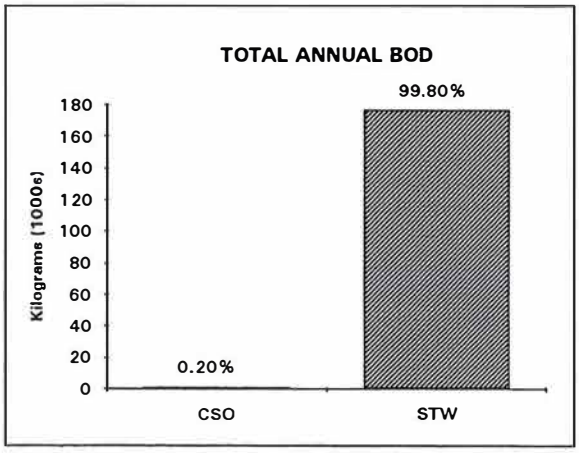


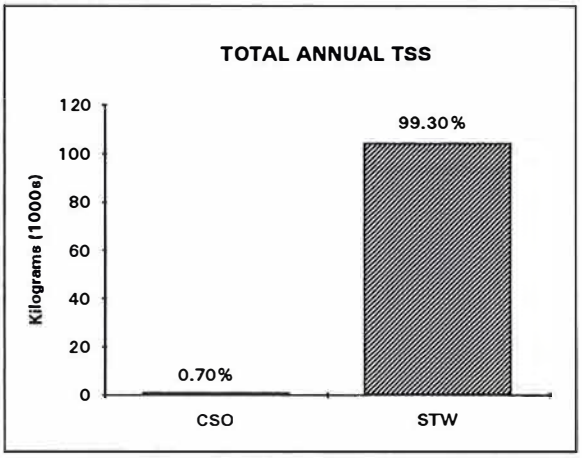


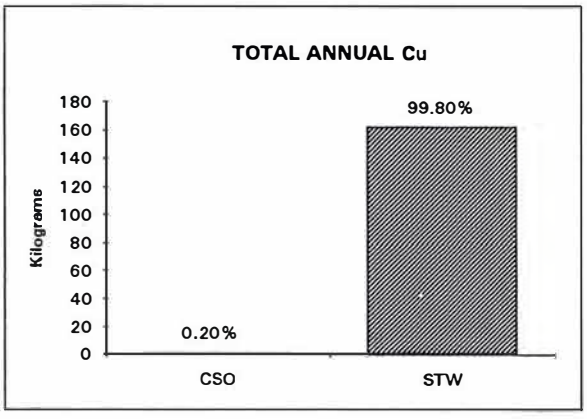


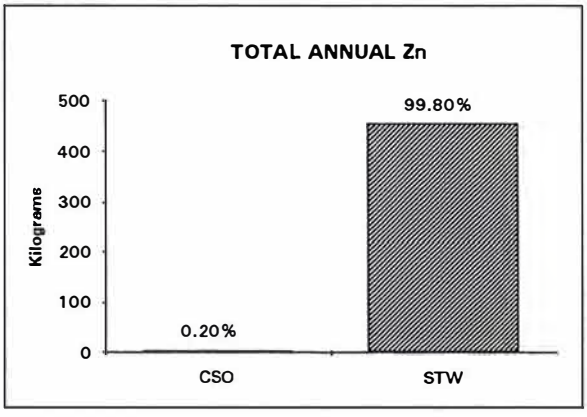
FUTURE PLANNED FLOWS AND LOADS FOR THREE MONTH AND ONE YEAR STORM EVENTS - CONSTITUTION BEACH



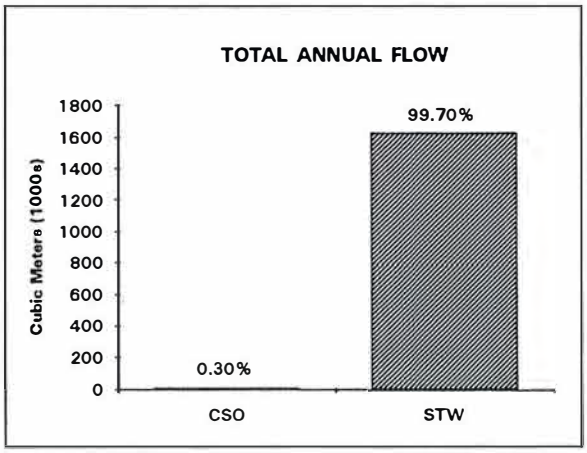


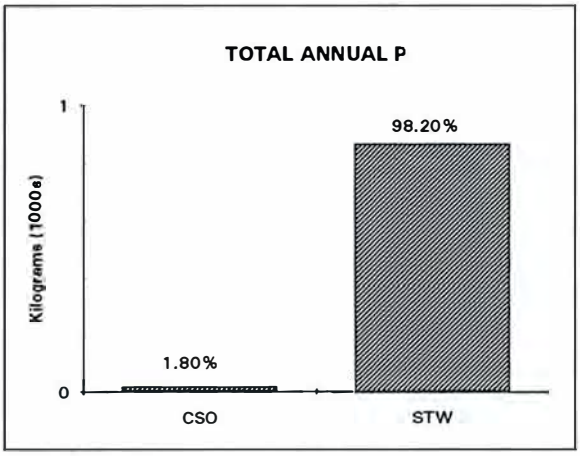


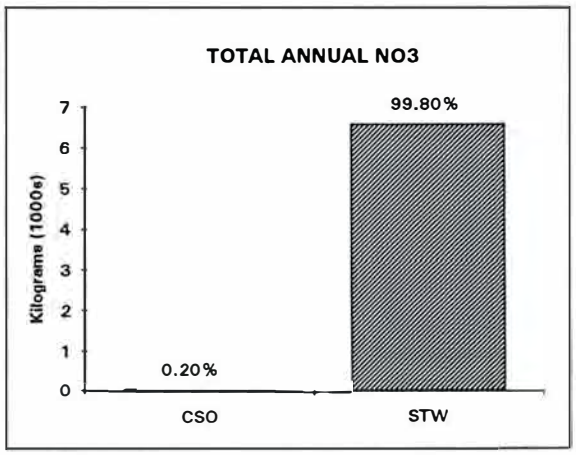


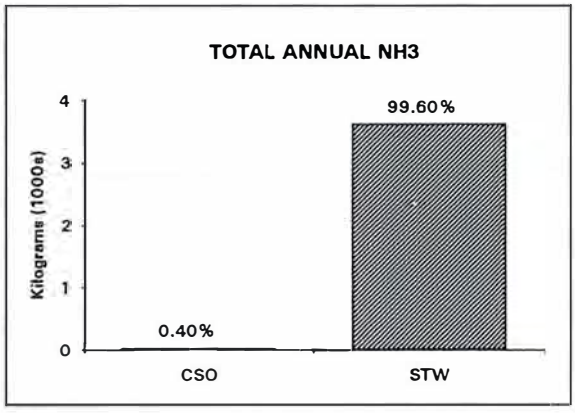


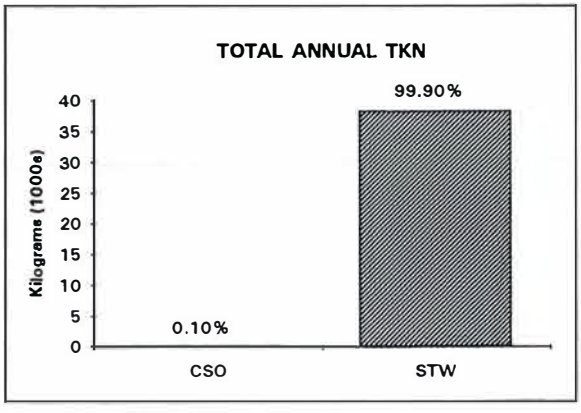
FUTURE PLANNED ANNUAL FLOWS AND LOADS -CONSTITUTION BEACH
FLOW, BIOCHEMICAL OXYGEN DEMAND, TOTAL SUSPENDED SOLIDS, COPPER, ZINC



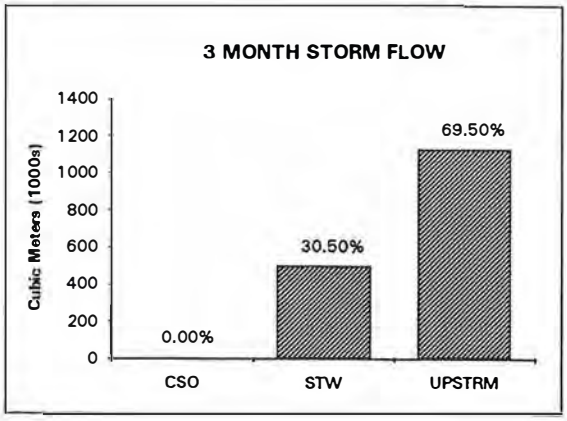


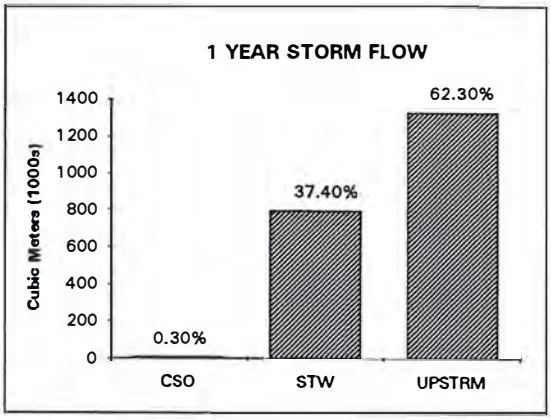


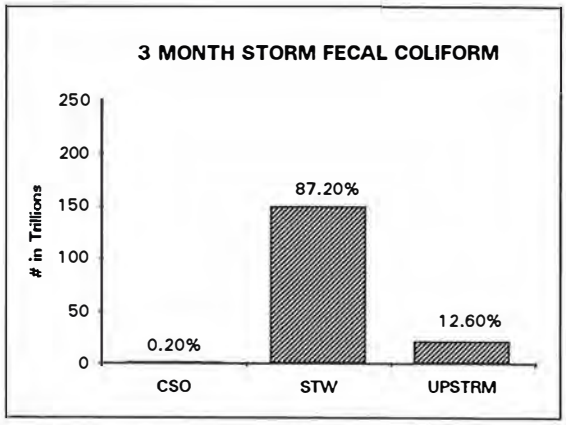


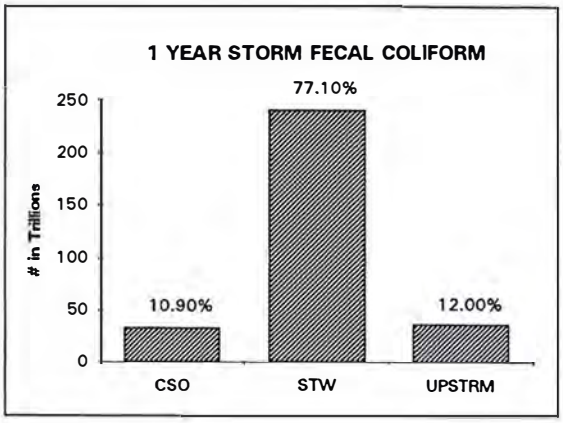


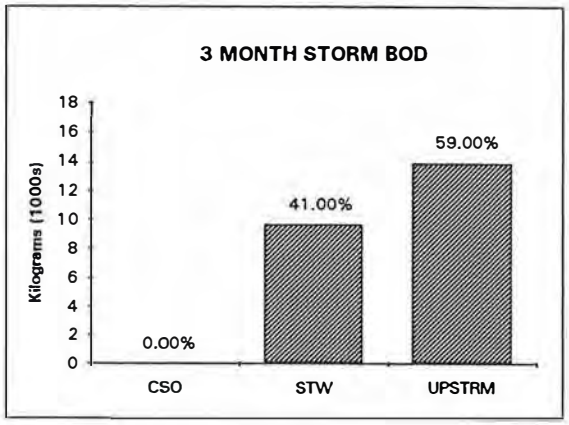
FUTURE PLANNED ANNUAL FLOWS AND LOADS -CONSTITUTION BEACH
FLOW, TOTAL PHOSPHORUS, NITRATE, AMMONIA, TOTAL KJELDAHL NITROGEN

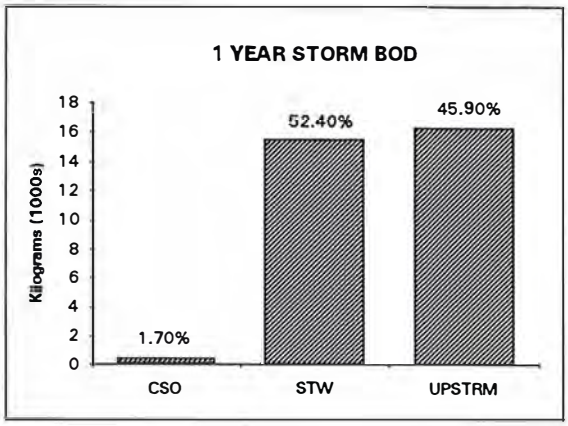




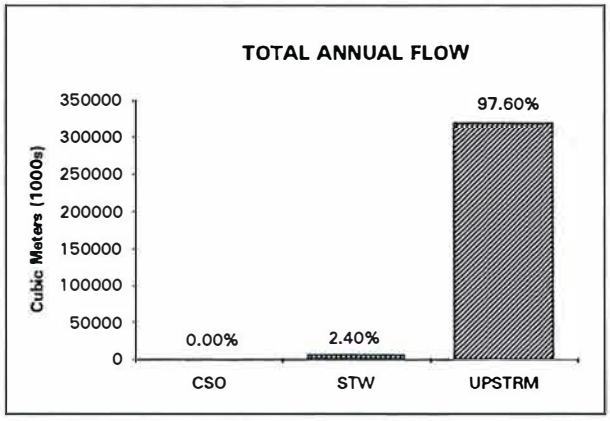


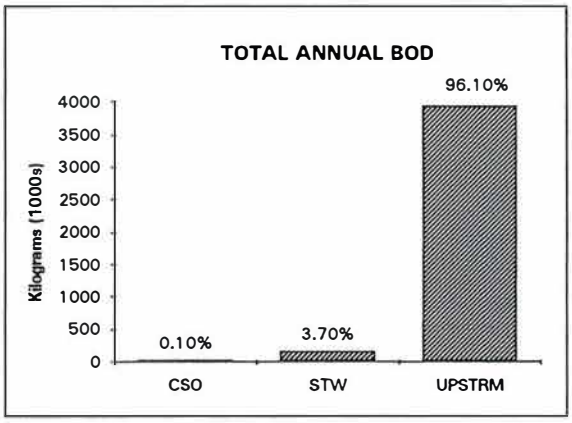


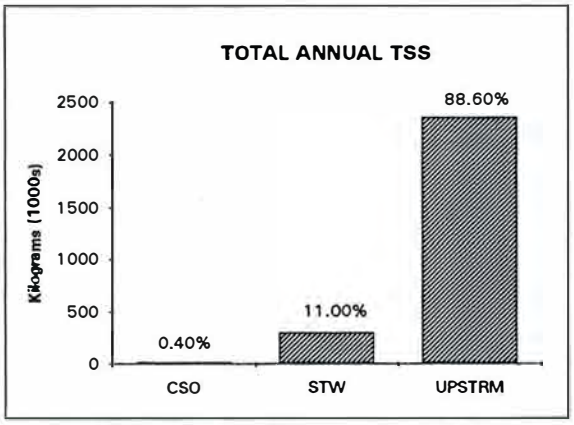


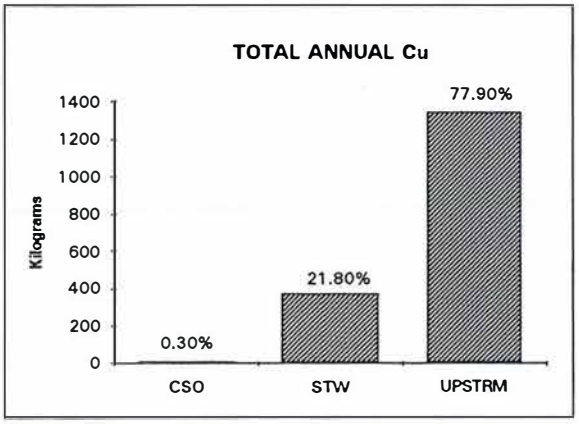


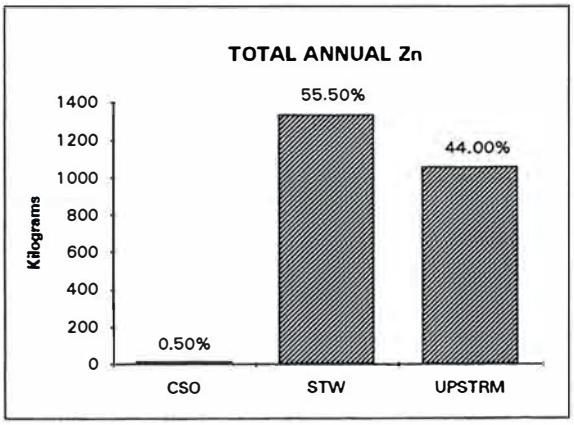
FUTURE PLANNED FLOWS AND LOADS FOR THREE MONTH AND ONE YEAR STORM EVENTS - UPPER CHARLES RIVER



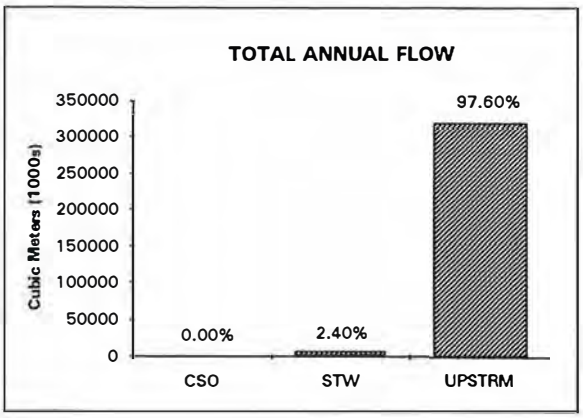


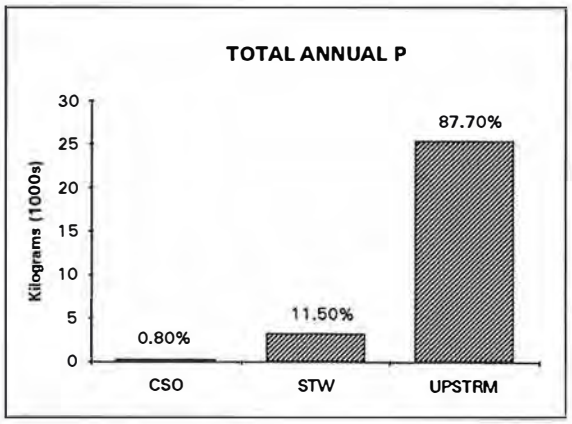


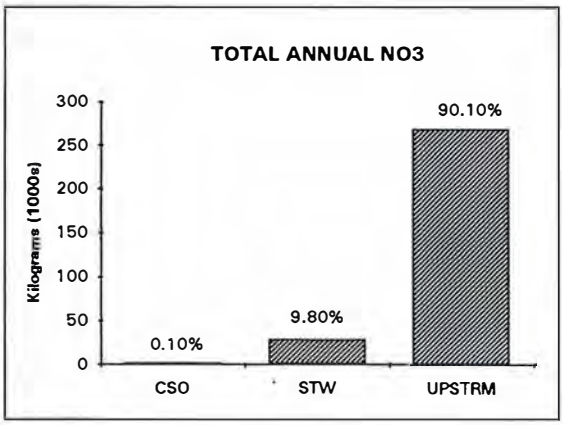


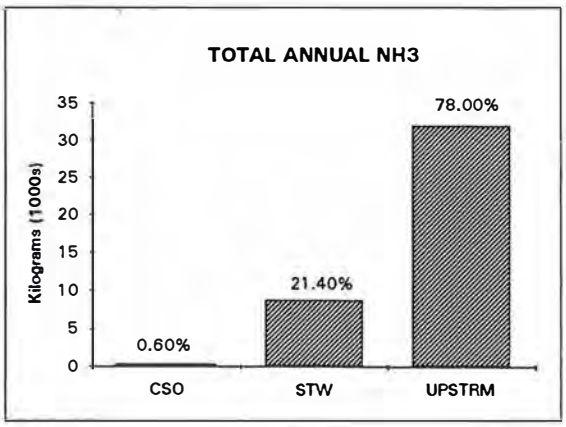


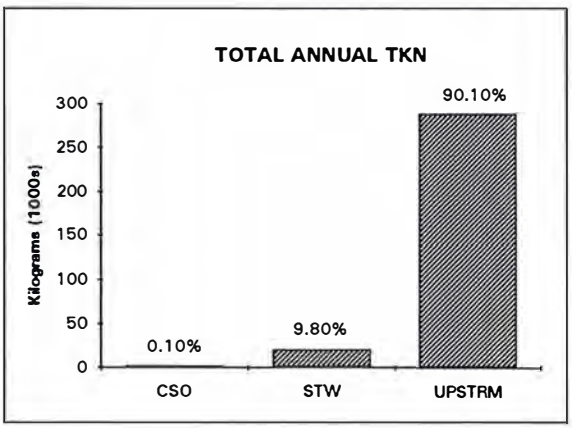
FUTURE PLANNED FLOWS AND LOADS - UPPER CHARLES RIVER
FLOWS, BIOCHEMICAL OXYGEN DEMAND, TOTAL SUSPENDED SOLIDS, COPPER, ZINC



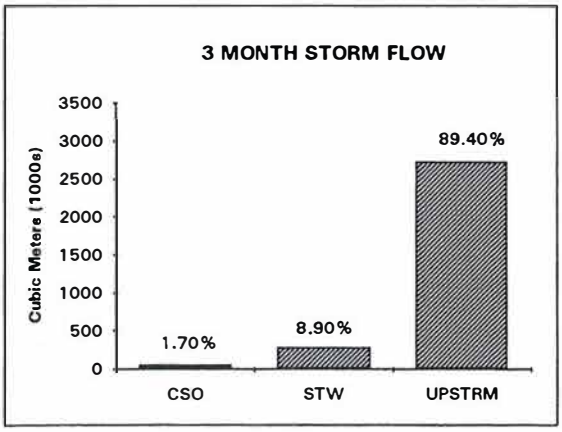


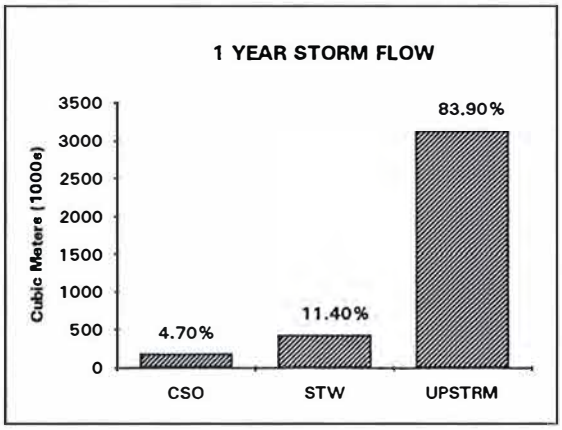


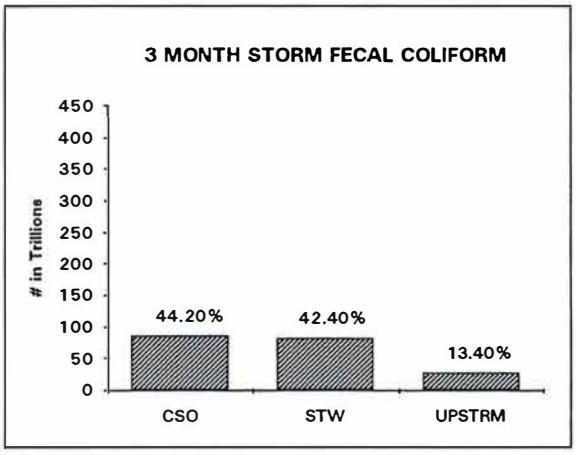


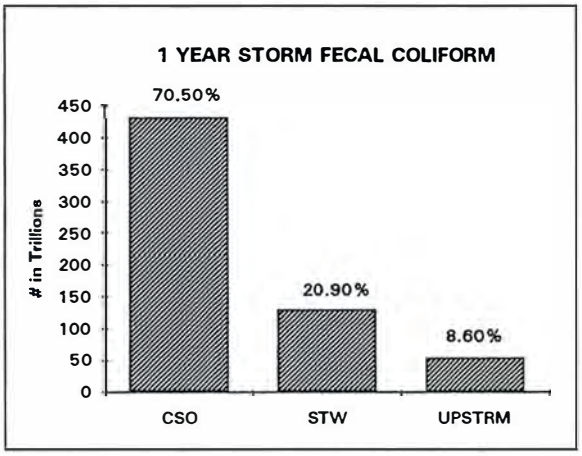


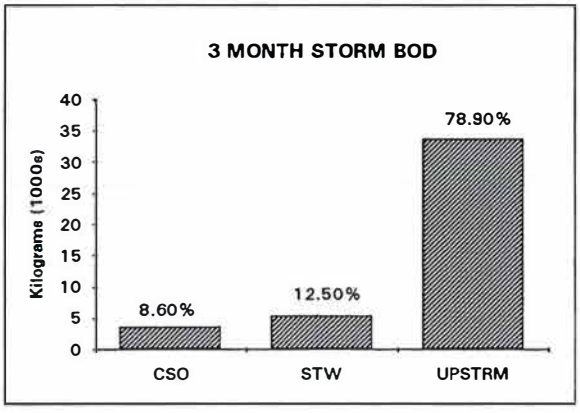
FUTURE PLANNED FLOWS AND LOADS - UPPER CHARLES RIVER
FLOWS, TOTAL PHOSPHORUS, NITRATE, AMMONIA, TOTAL KJELDAHL NITROGEN

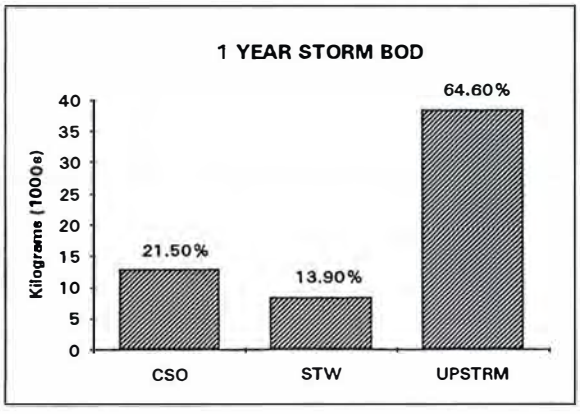




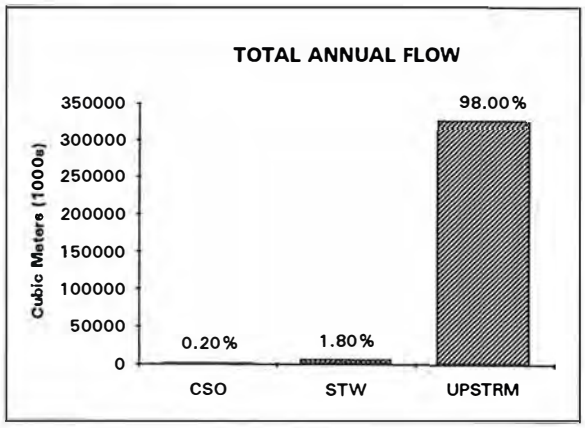


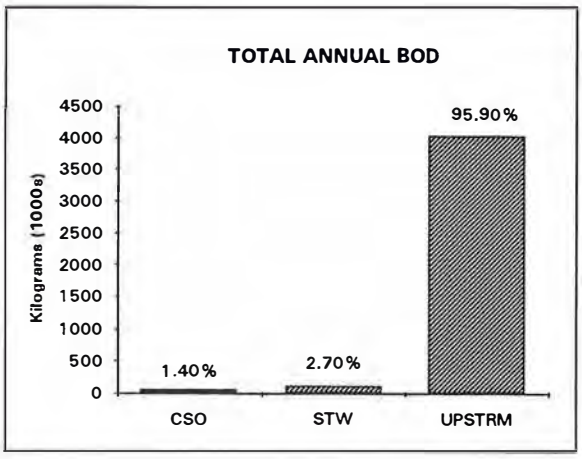


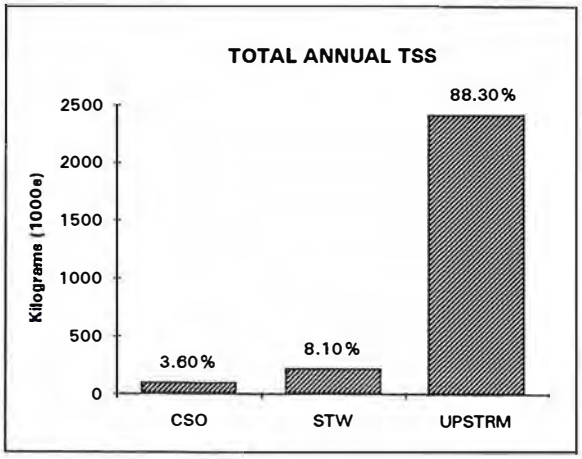


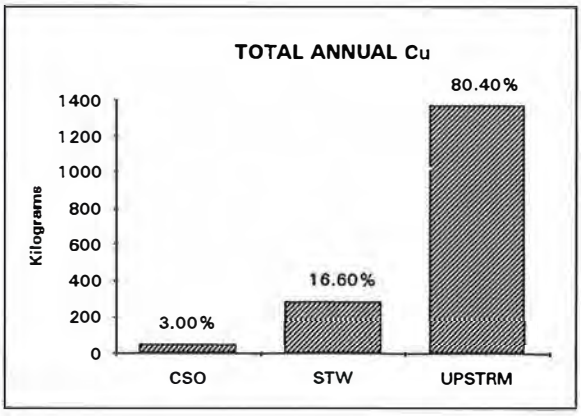


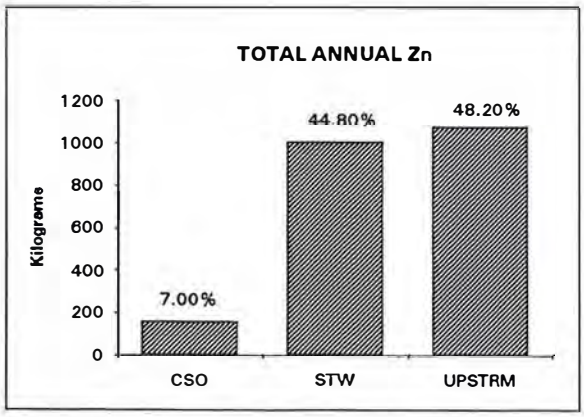
FUTURE PLANNED FLOWS AND LOADS FOR THREE MONTH AND ONE YEAR STORM EVENTS - LOWER CHARLES RIVER



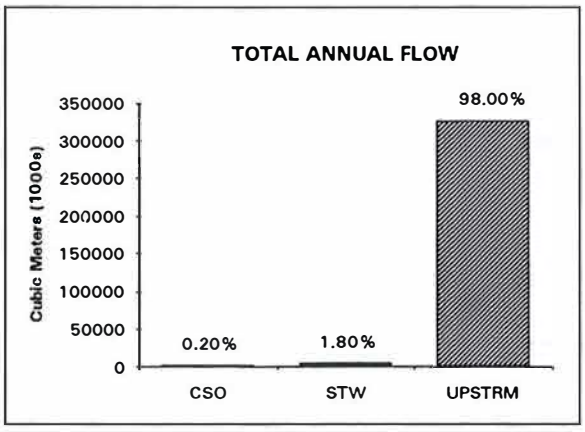


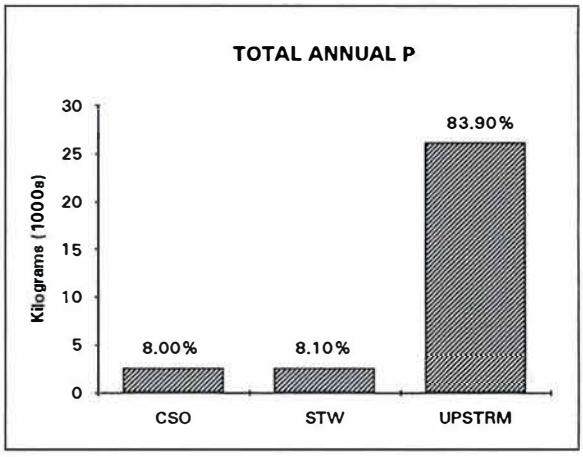


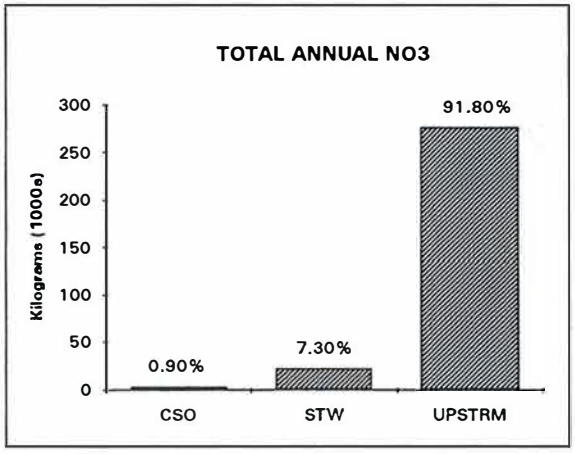


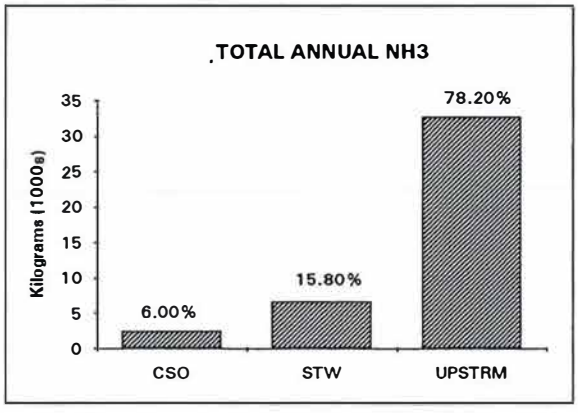


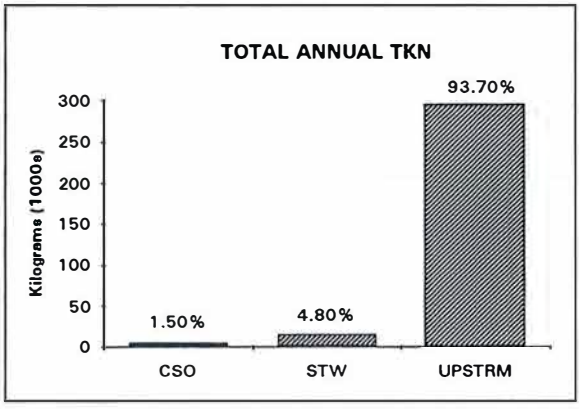
FUTURE PLANNED ANNUAL FLOWS AND LOADS -LOWER CHARLES RIVER
FLOW, BIOCHEMICAL OXYGEN DEMAND, TOTAL SUSPENDED SOLIDS, COPPER, ZINC



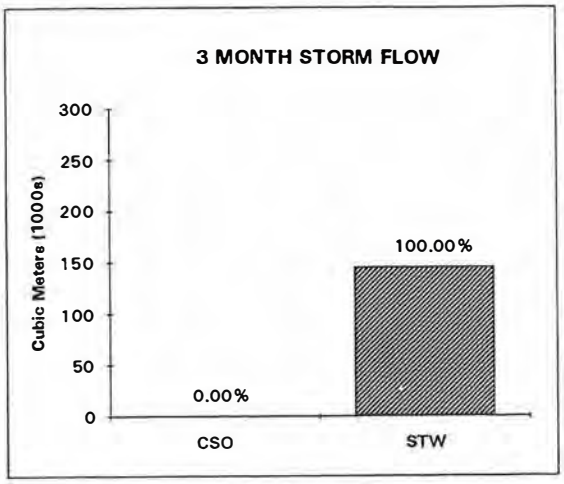


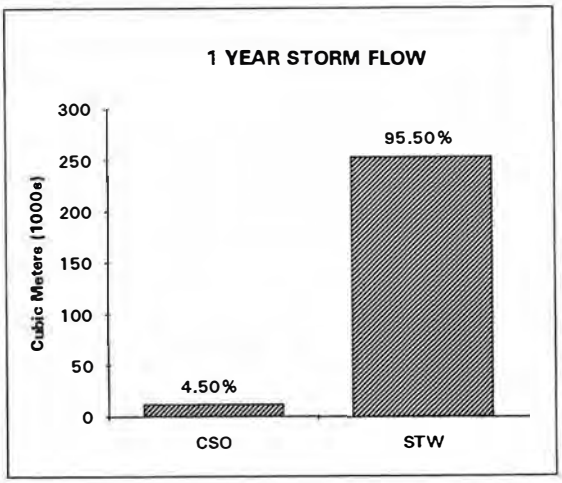


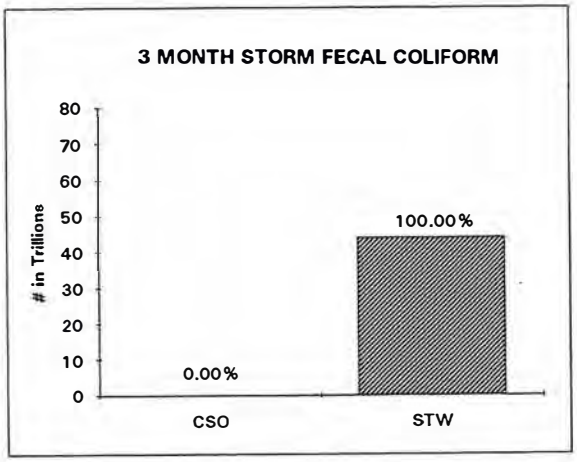


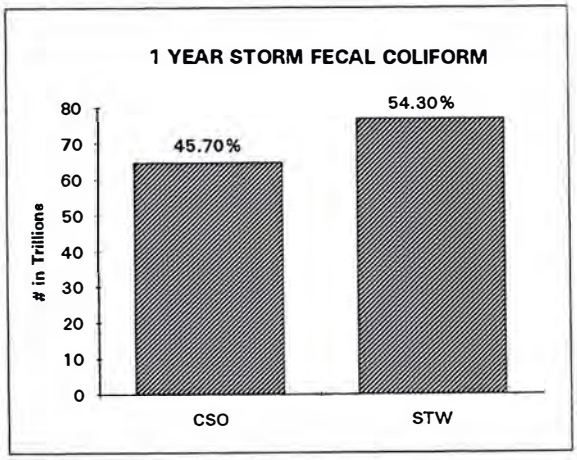


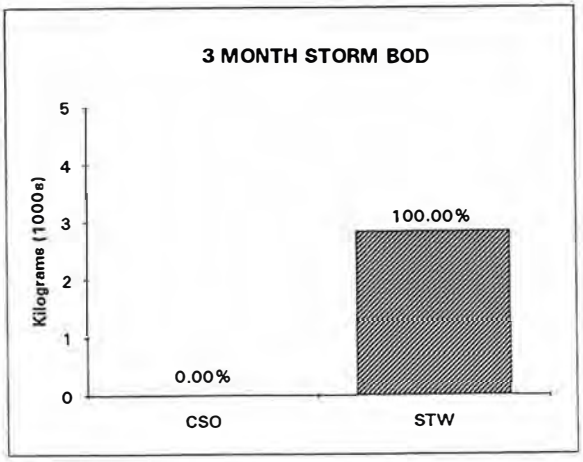
FUTURE PLANNED ANNUAL FLOWS AND LOADS -LOWER CHARLES RIVER
FLOW, TOTAL PHOSPHORUS, NITRATE, AMMONIA, TOTAL KJELDAHL NITROGEN

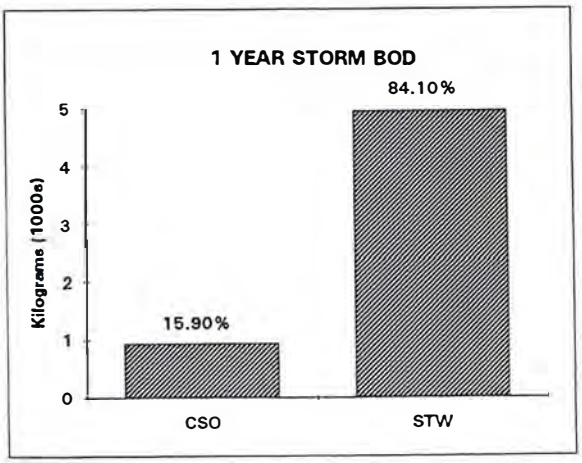




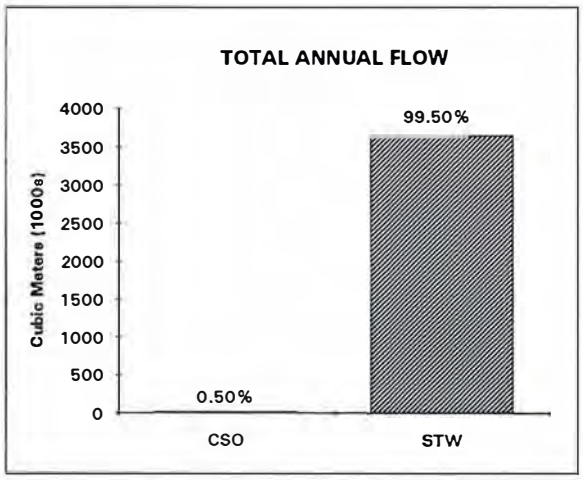


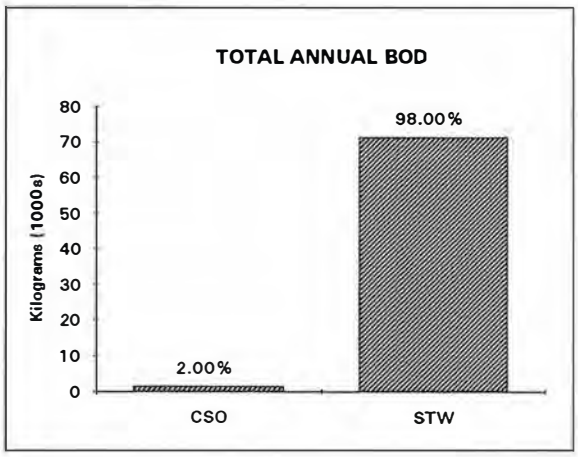


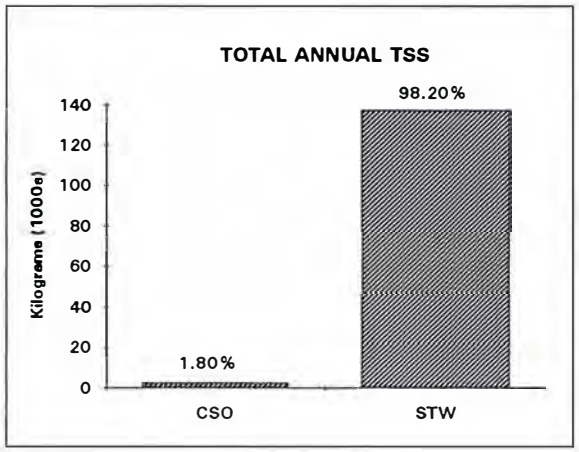


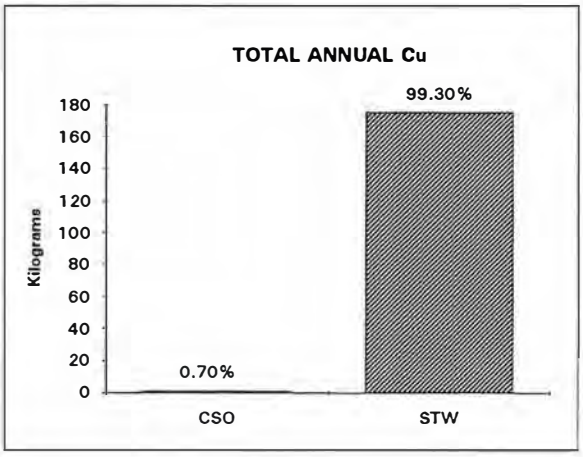


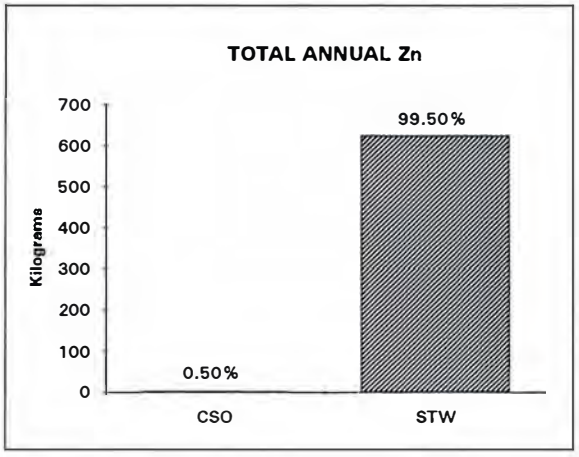
FUTURE PLANNED FLOWS AND LOADS FOR THE THREE MONTH AND ONE YEAR STORM EVENTS - BACK BAY FENS/MUDDY RIVER/STONY BROOK



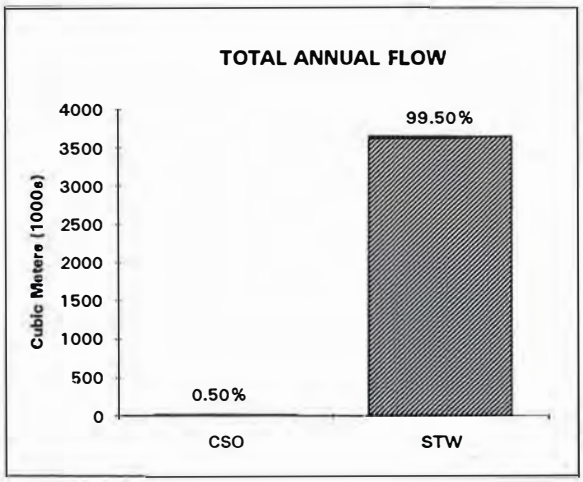


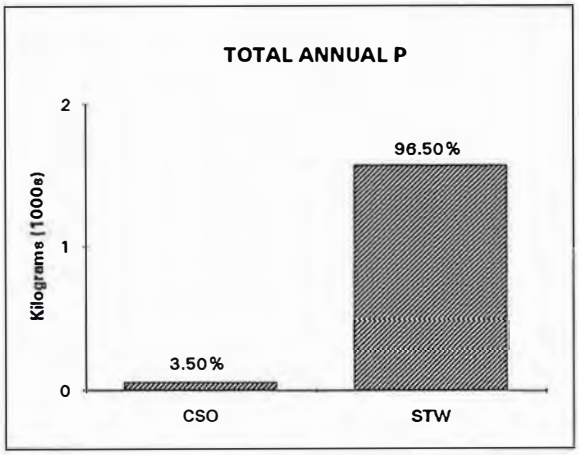


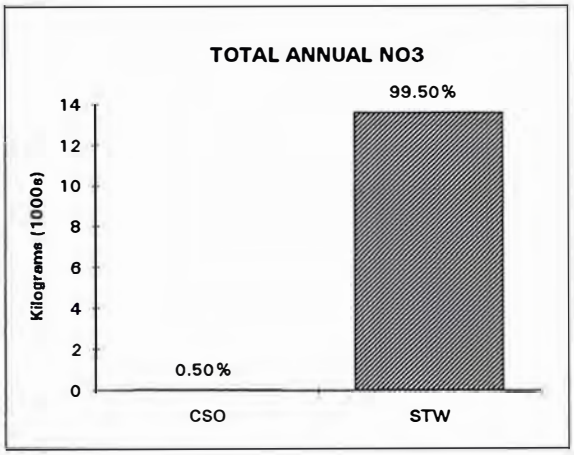


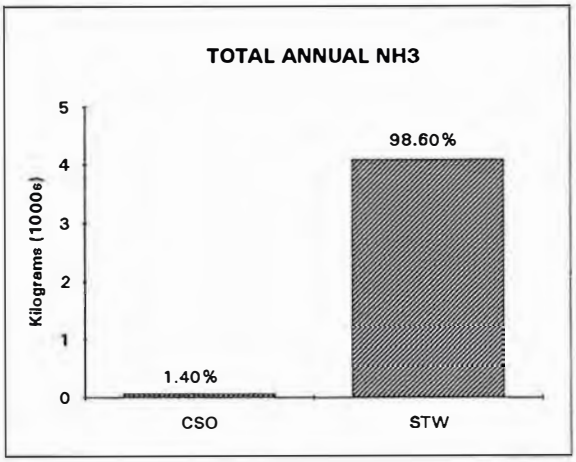


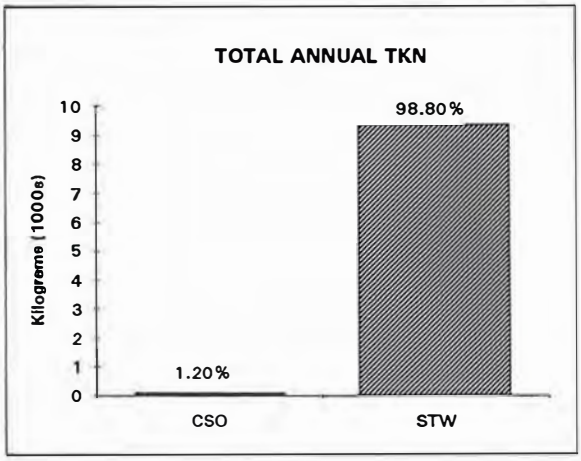
FUTURE PLANNED ANNUAL FLOWS AND LOADS - BACK BAY FENS
FLOW, BIOCHEMICAL OXYGEN DEMAND, TOTAL SUSPENDED SOLIDS, COPPER, ZINC



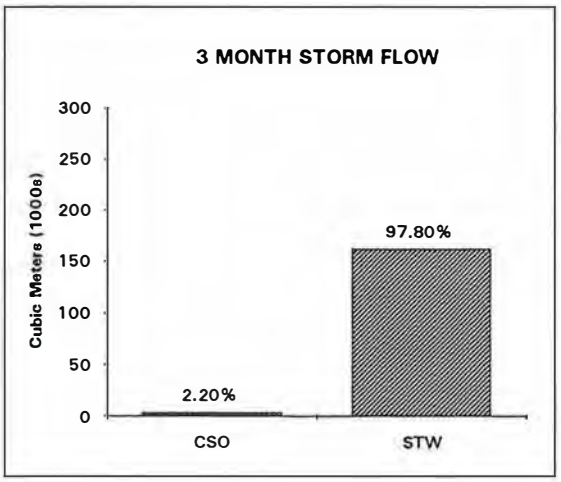


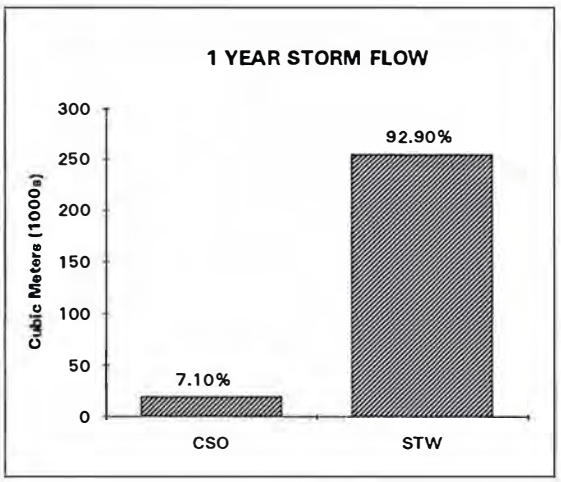


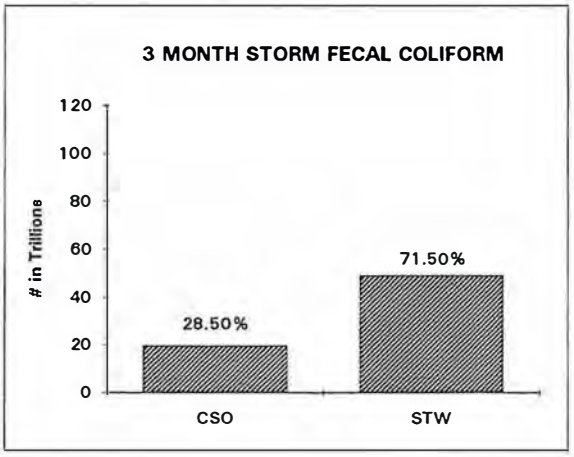


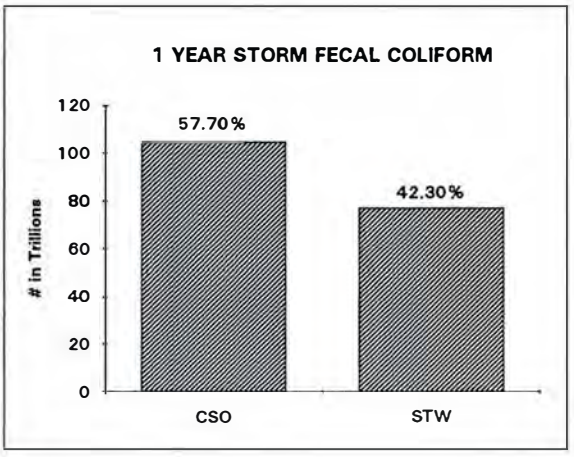


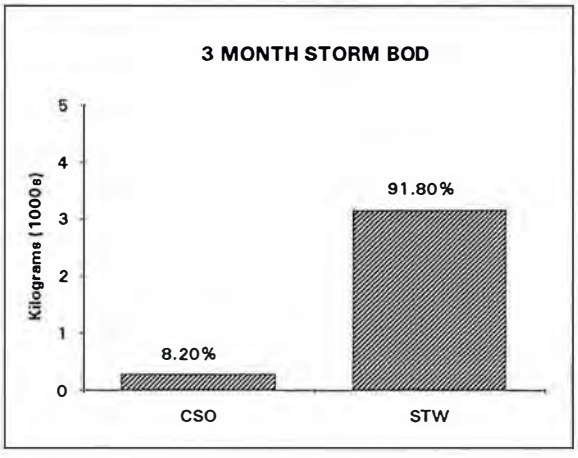
FUTURE PLANNED ANNUAL FLOWS AND LOADS - BACK BAY FENS
FLOW, TOTAL PHOSPHORUS, NITRATE, AMMONIA, TOTAL KJELDAHL NITROGEN

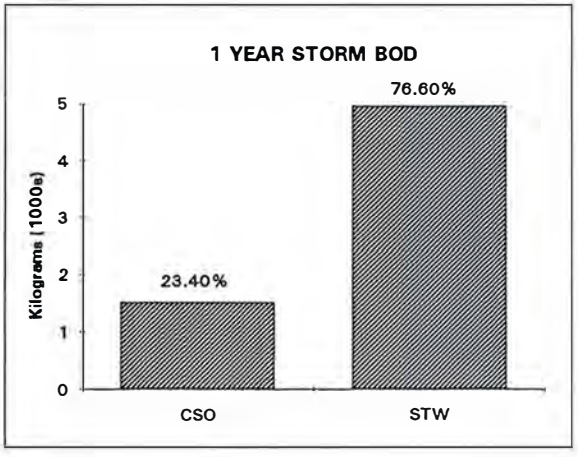




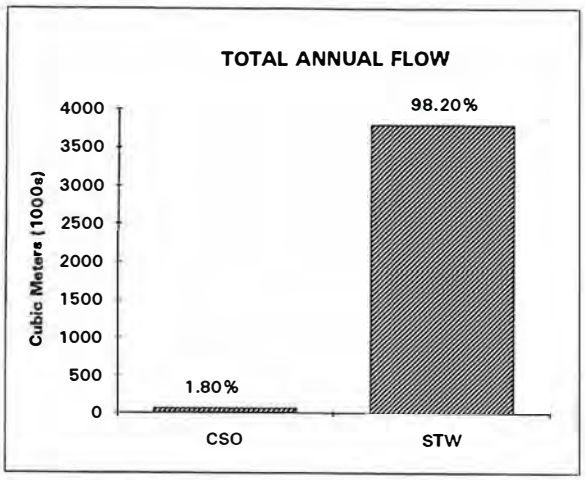


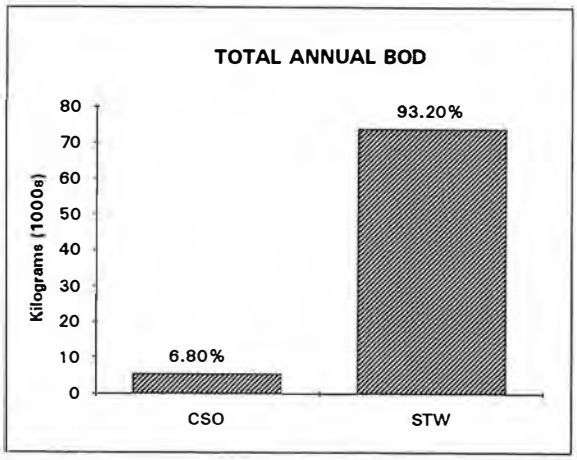


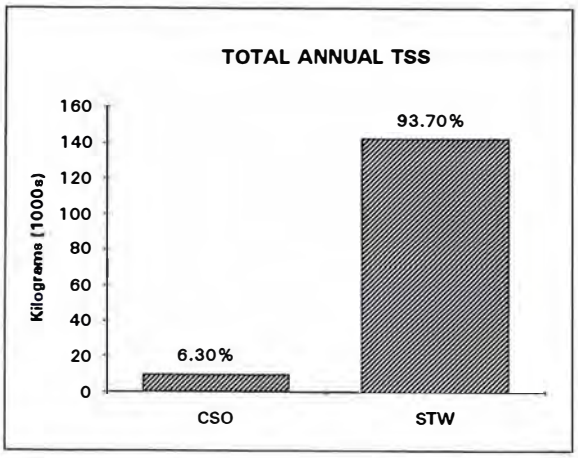


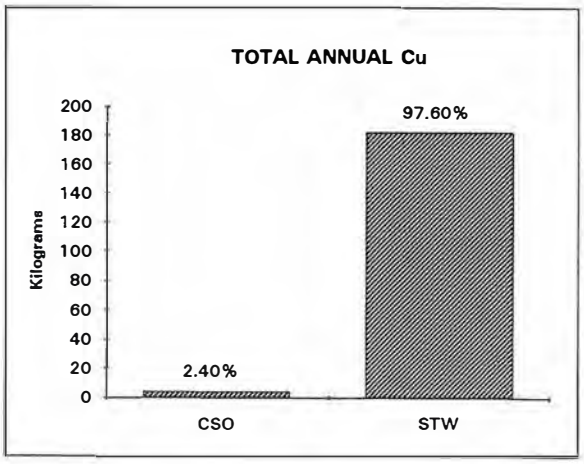


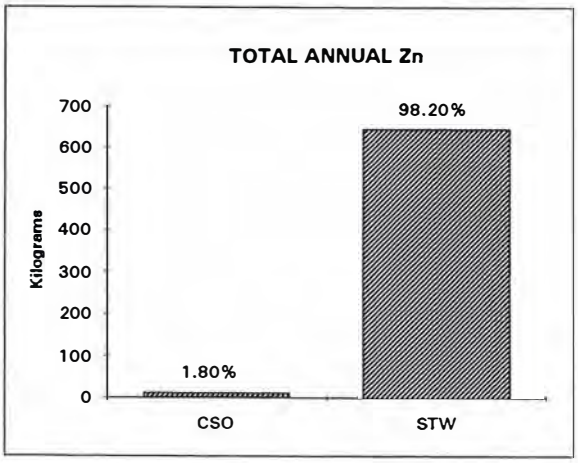
FUTURE PLANNED FLOWS AND LOADS FOR THREE MONTH AND ONE YEAR STORM EVENTS - ALEWIFE BROOK



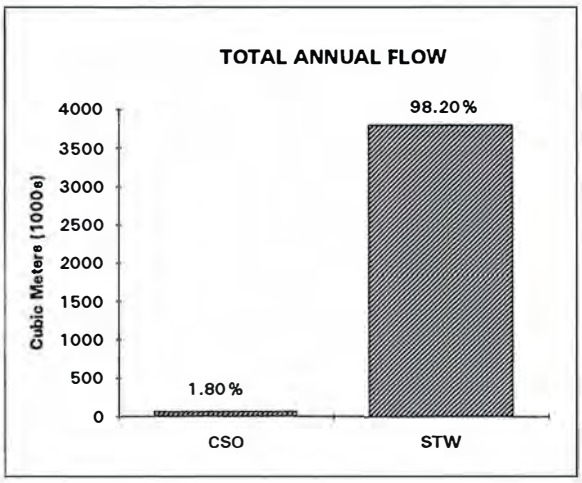


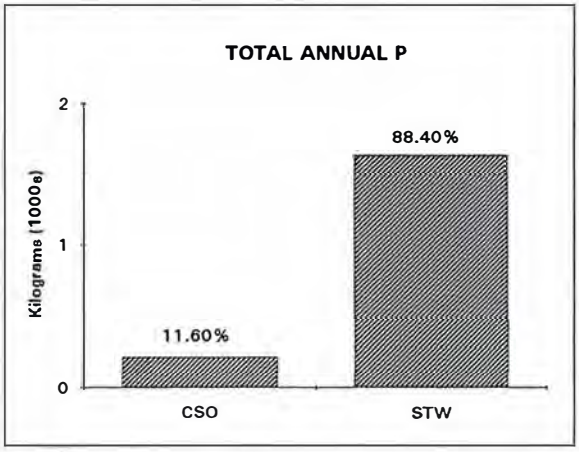


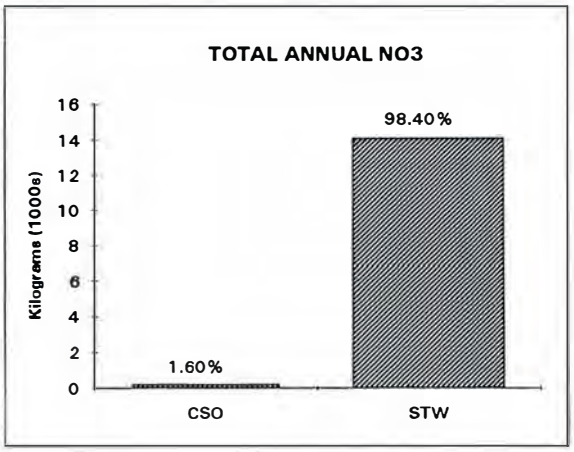


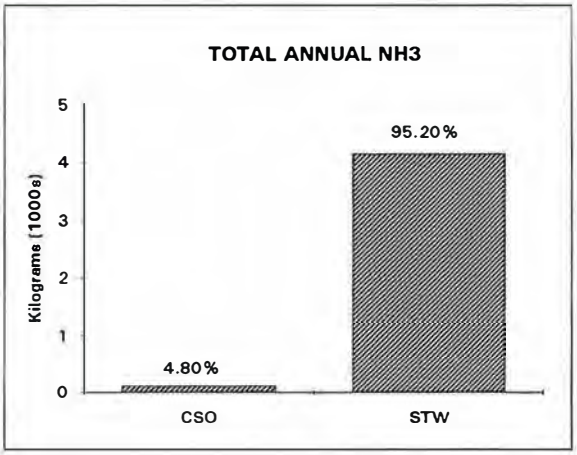


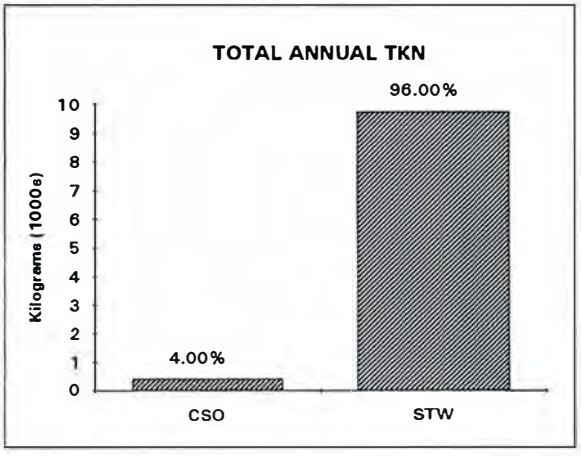
FUTURE PLANNED ANNUAL FLOWS AND LOADS - ALEWIFE BROOK
FLOW, BIOCHEMICAL OXYGEN DEMAND, TOTAL SUSPENDED SOLIDS, COPPER, ZINC



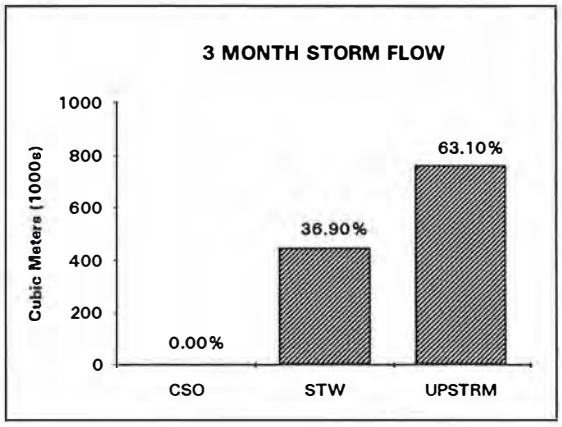


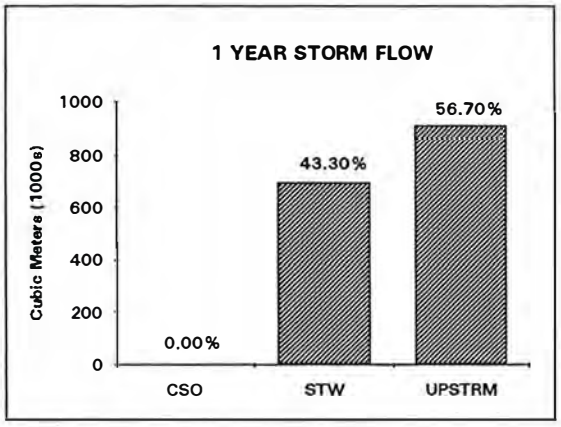


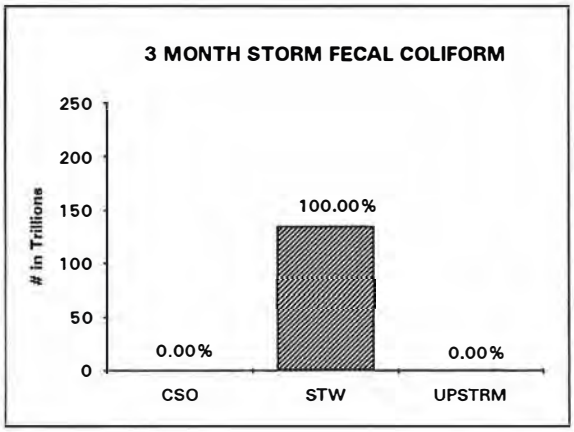


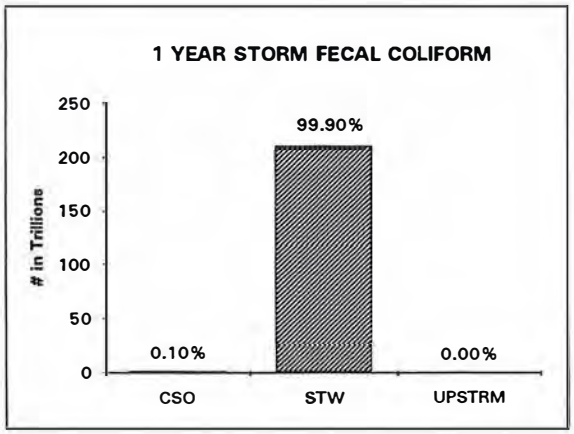


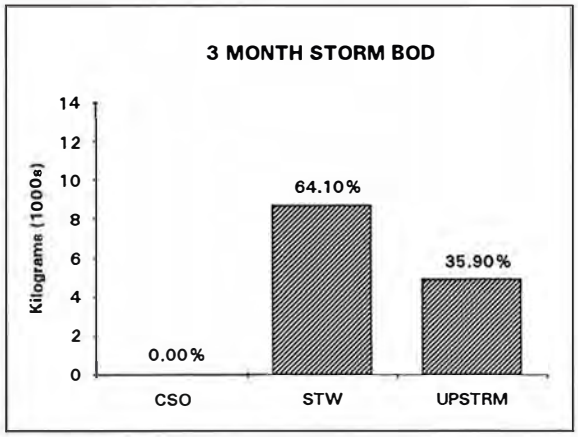
FUTURE PLANNED ANNUAL FLOWS AND LOADS - ALEWIFE BROOK
FLOW, TOTAL PHOSPHORUS, NITRATE, AMMONIA, TOTAL KJELDAHL NITROGEN

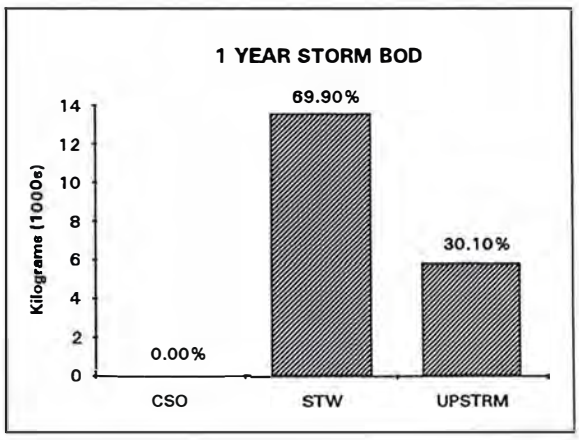




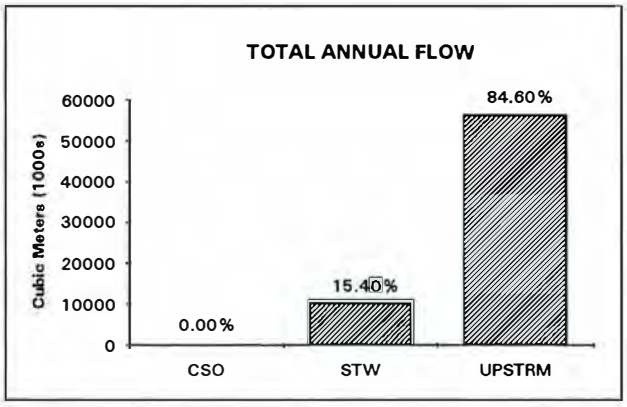


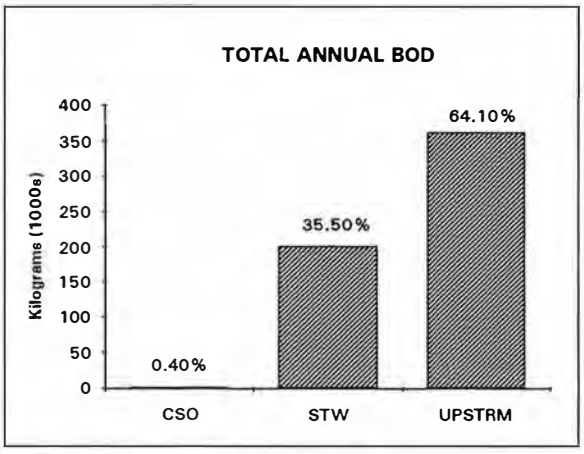


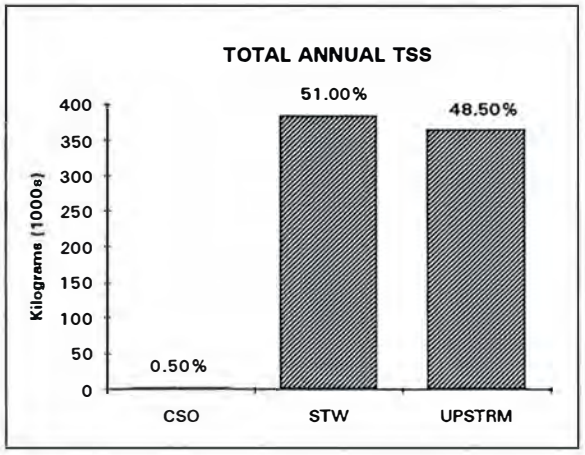


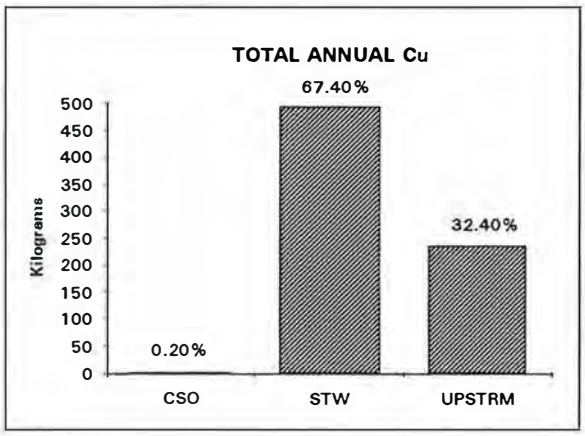


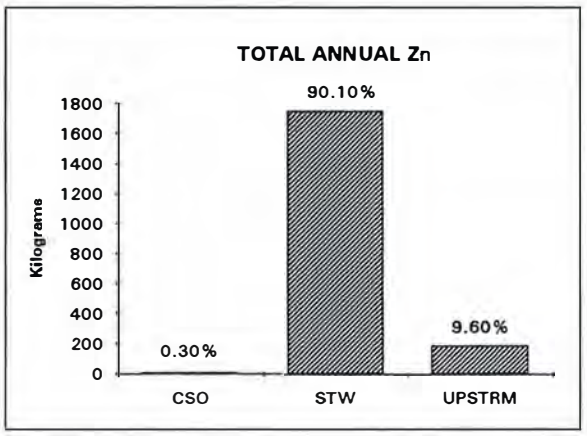
FUTURE PLANNED FLOWS AND LOADS FOR THREE MONTH AND ONE YEAR STORM EVENT - UPPER MYSTIC RIVER



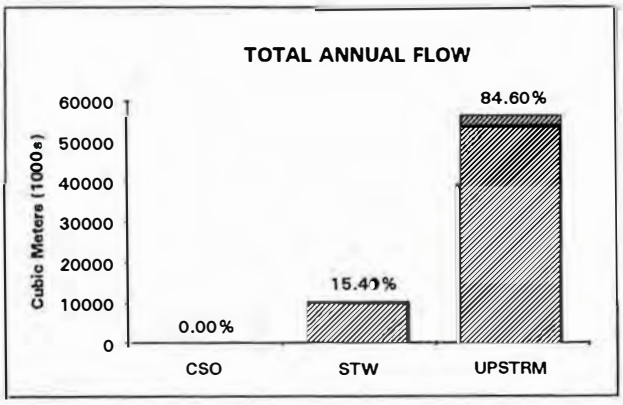


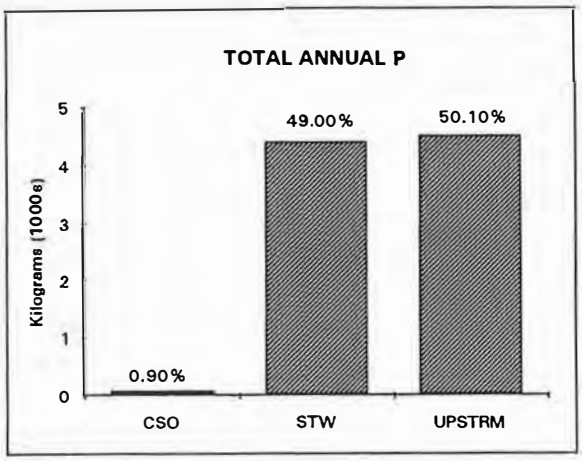


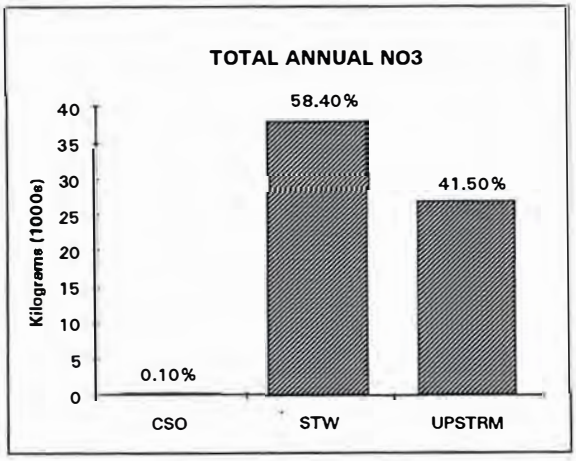


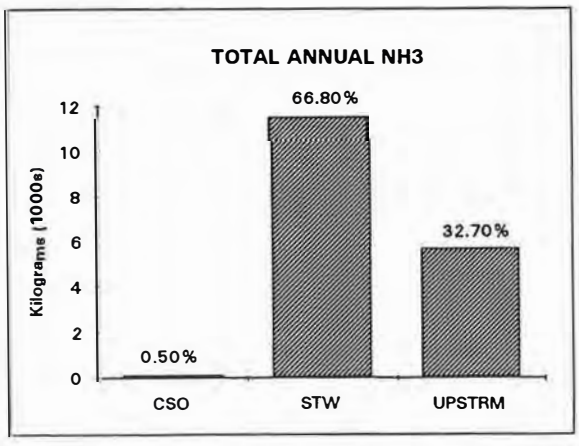


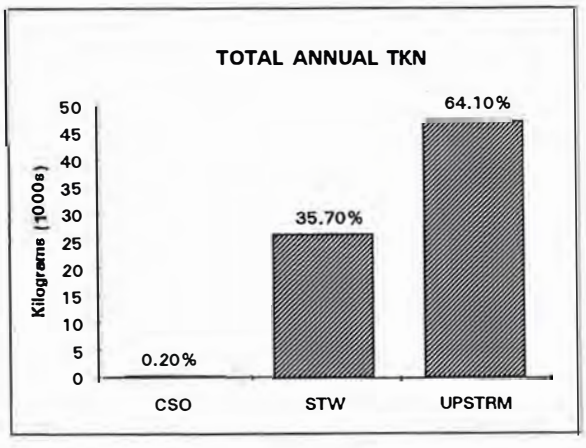
FUTURE PLANNED ANNUAL FLOWS AND LOADS - UPPER MYSTIC RIVER
FLOWS, BIOCHEMICAL OXYGEN DEMAND, TOTAL SUSPENDED SOLIDS, COPPER, ZINC



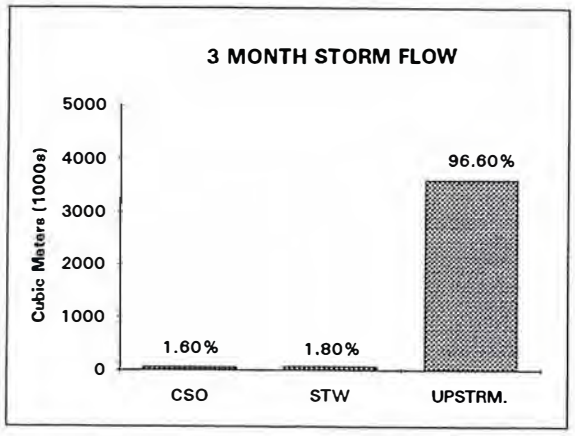


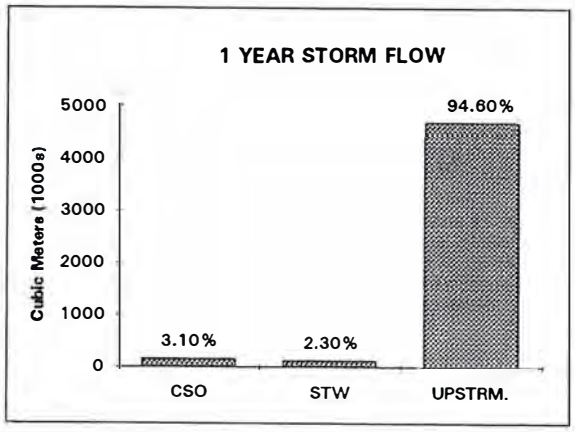


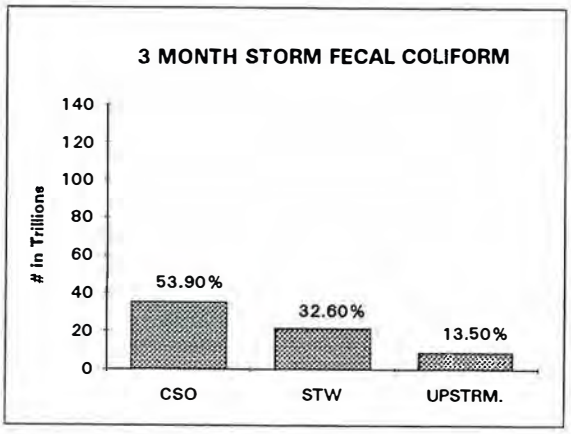


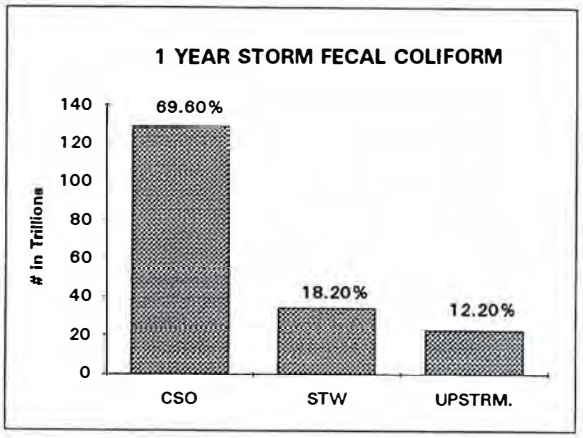


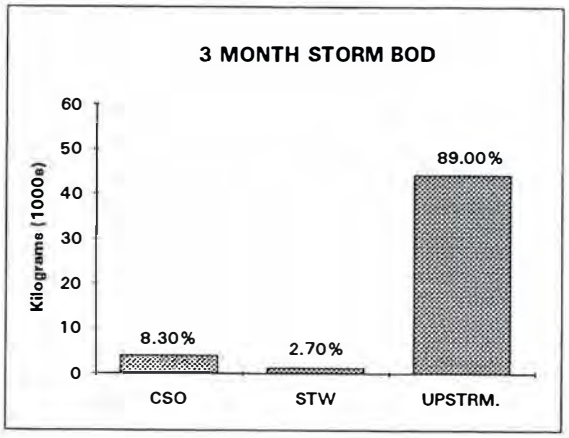
FUTURE PLANNED ANNUAL FLOWS AND LOADS - UPPER MYSTIC RIVER
FLOWS, TOTAL PHOSPHORUS, NITRATE, AMMONIA, TOTAL KJELDAHL NITROGEN

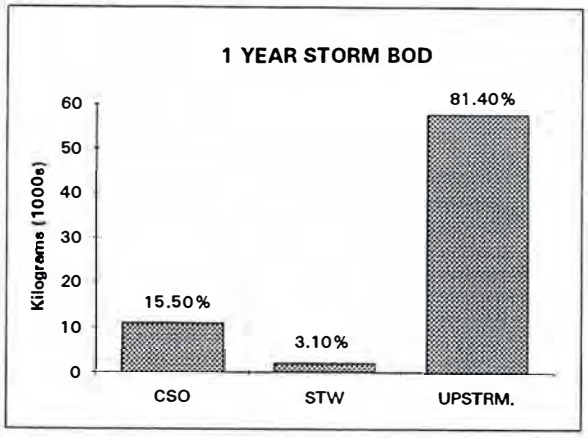




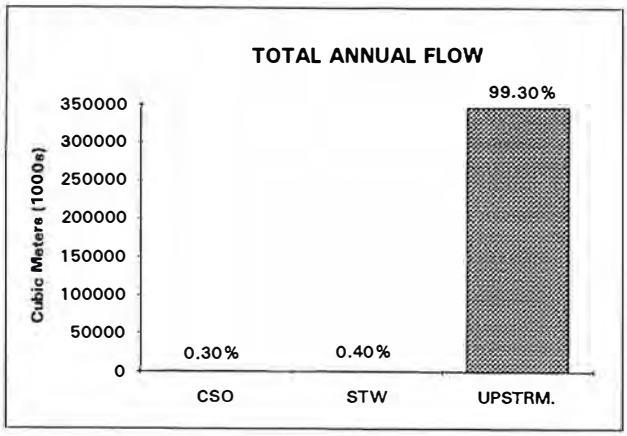


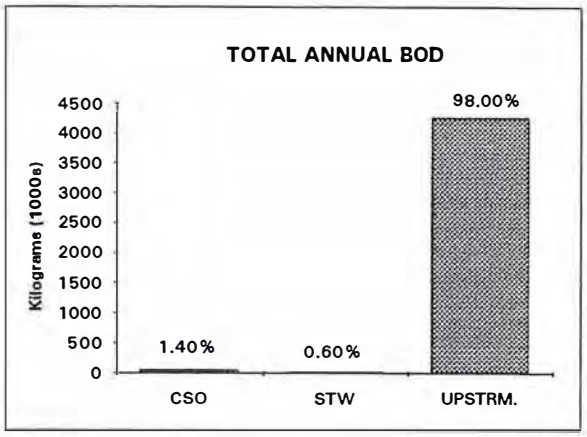


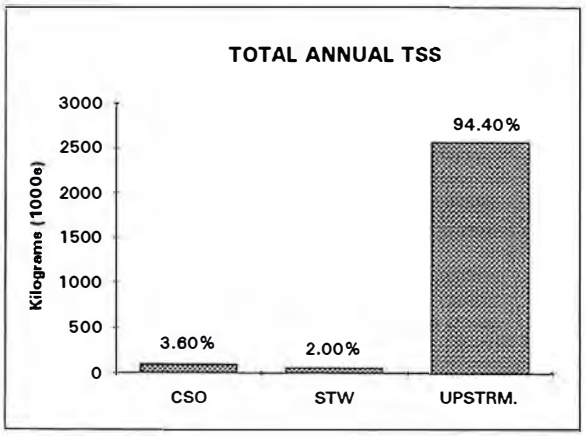


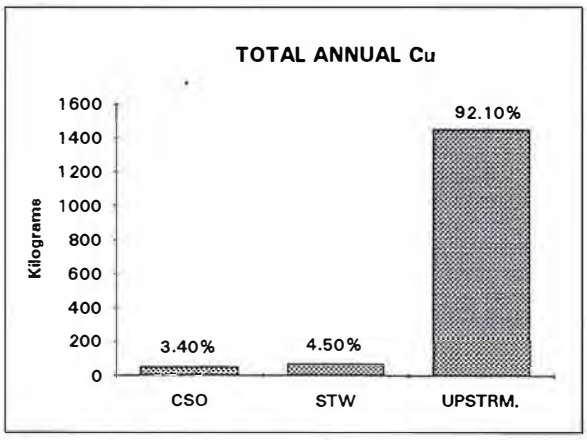


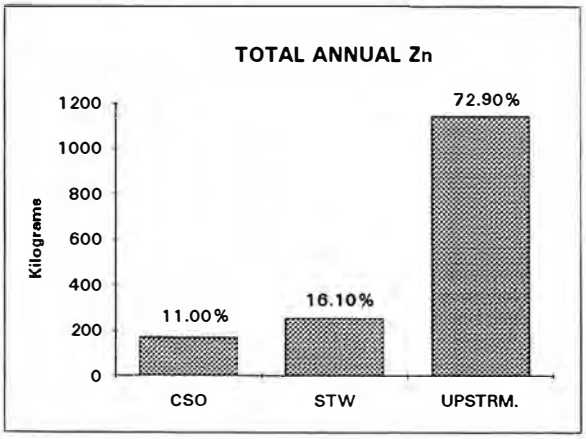
FUTURE PLANNED FLOWS AND LOADS FOR THREE MONTH AND ONE YEAR STORM EVENTS - UPPER INNER HARBOR



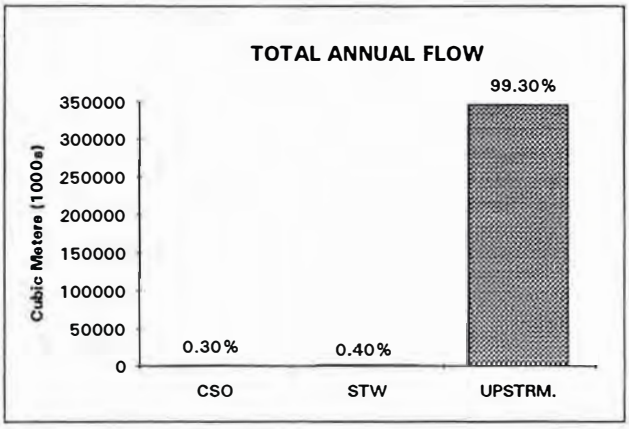


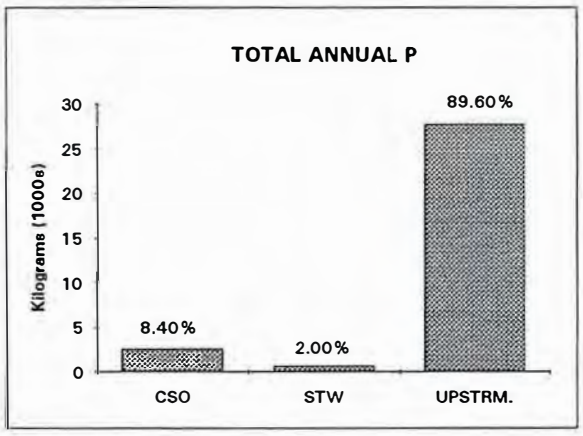


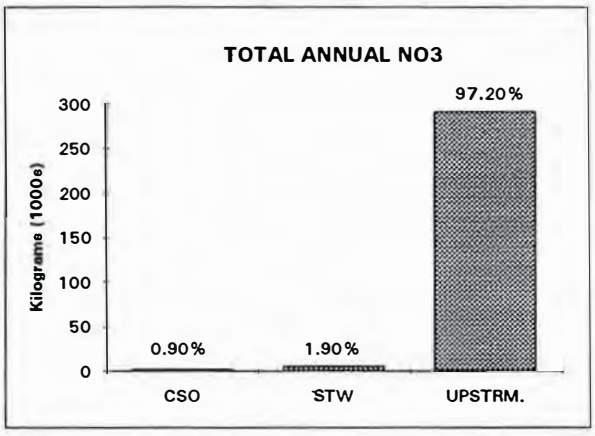


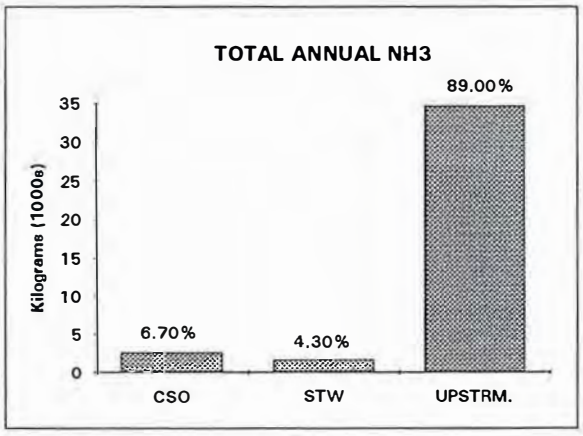


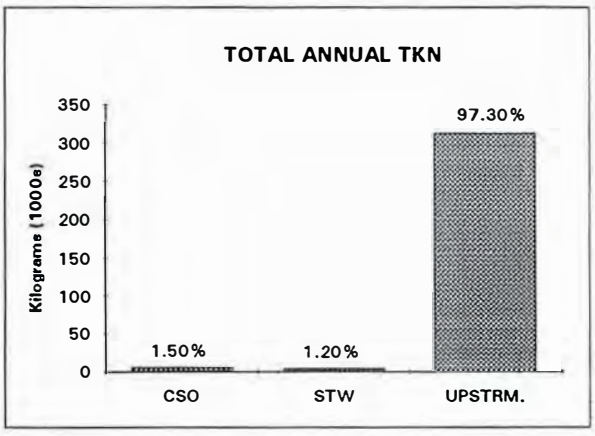
FUTURE PLANNED ANNUAL FLOWS AND LOADS UPPER INNER HARBOR FLOWS, BIOCHEMICAL OXYGEN DEMAND, TOTAL SUSPENDED SOLIDS, COPPER, ZINC



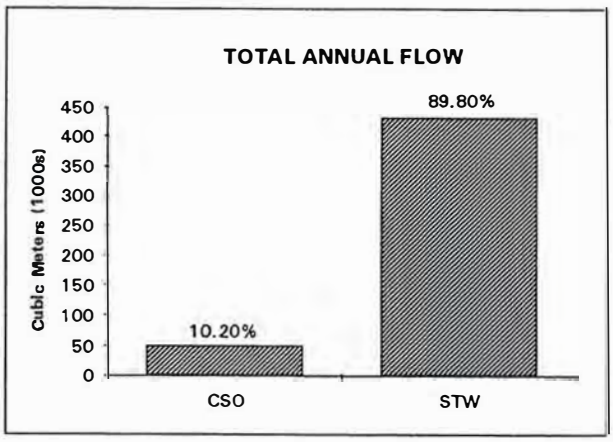


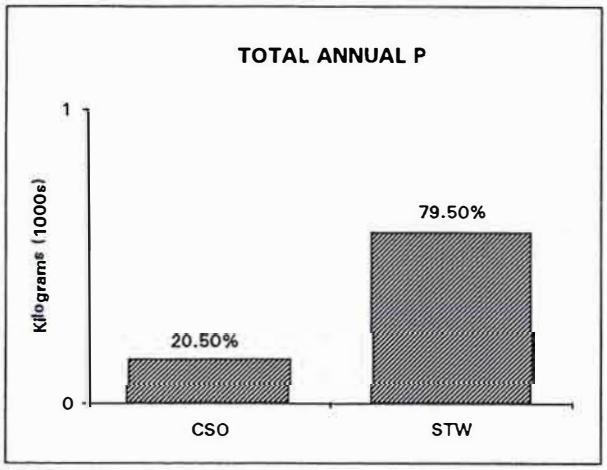


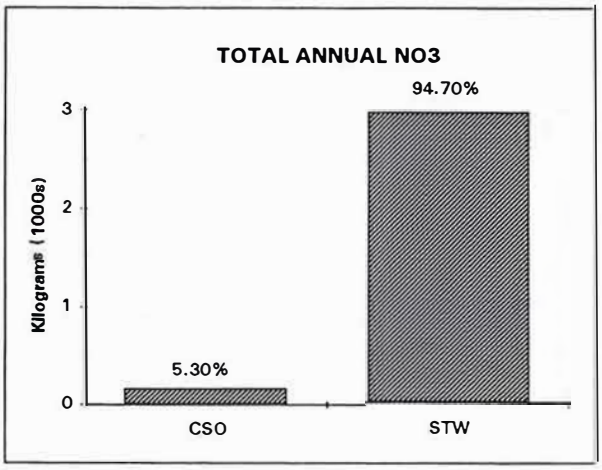


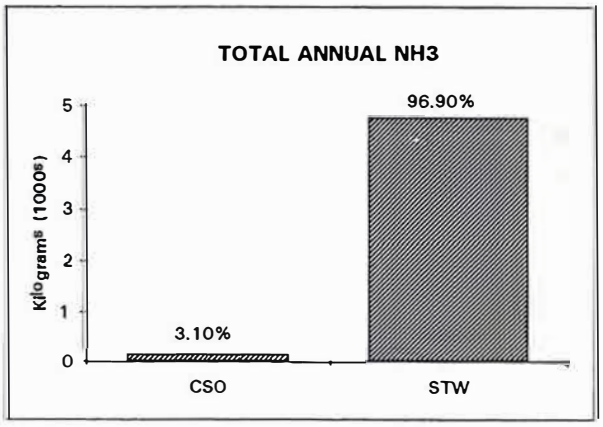


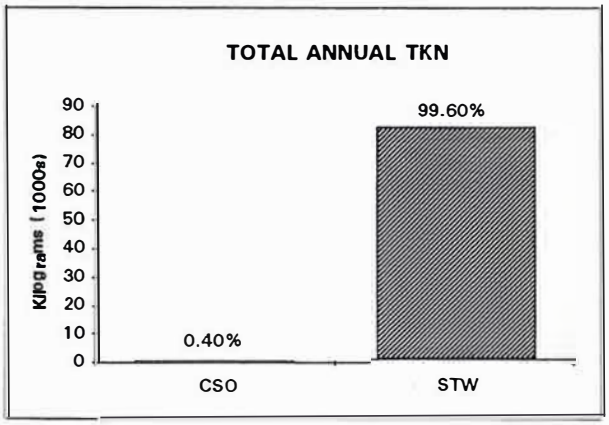
FUTURE PLANNED ANNUAL FLOWS AND LOADS - UPPER INNER HARBOR
FLOWS, TOTAL PHOSPHORUS, NITRATE, AMMONIA, TOTAL KJELDAHL NITROGEN



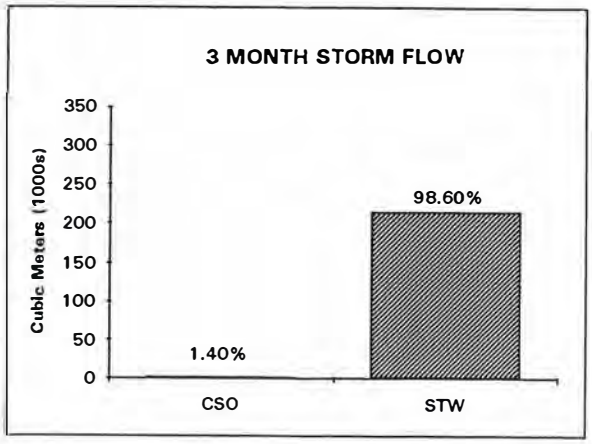


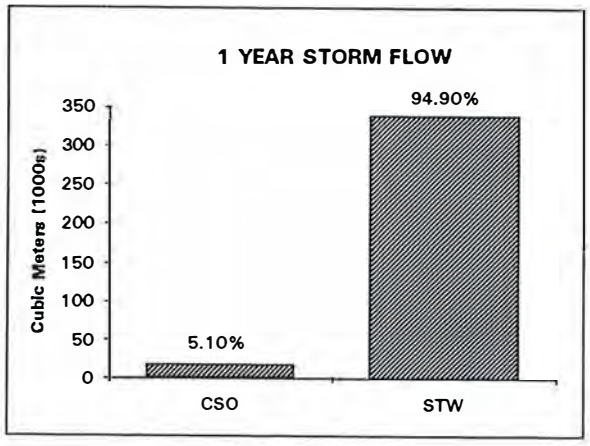


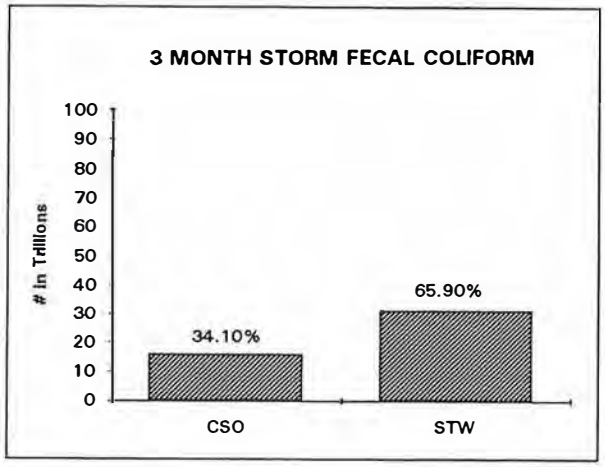


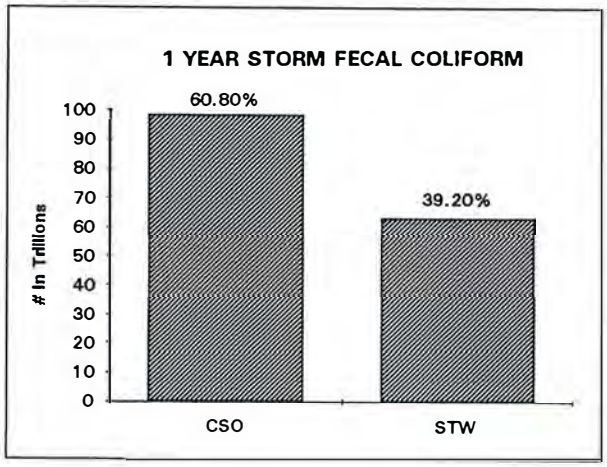


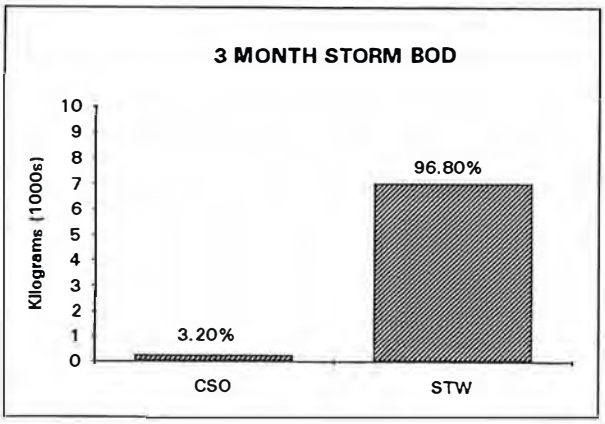
FUTURE PLANNED ANNUAL FLOWS AND LOADS-LOWER INNER HARBOR
FLOW, TOTAL PHOSPHORUS, NITRATE, AMMONIA, TOTAL KJELDAHL NITROGEN

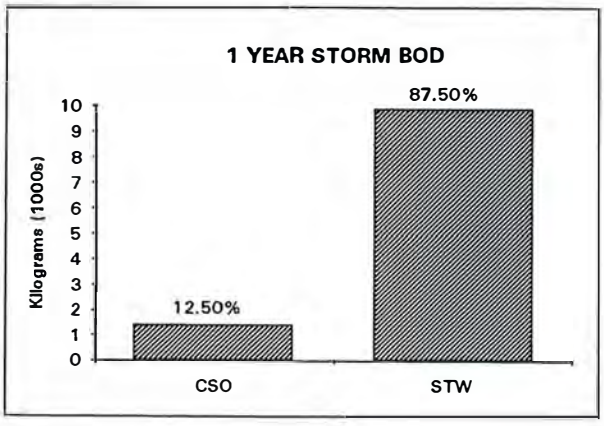




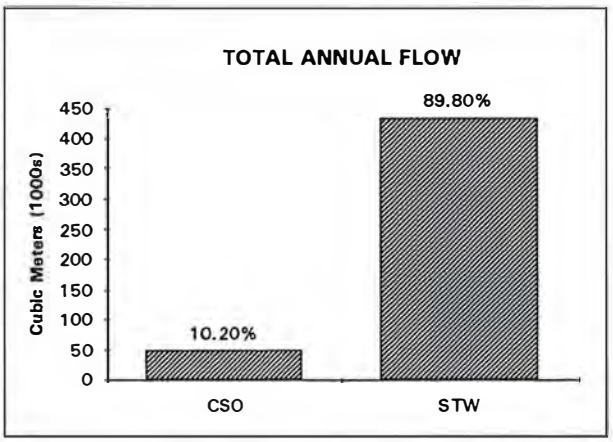


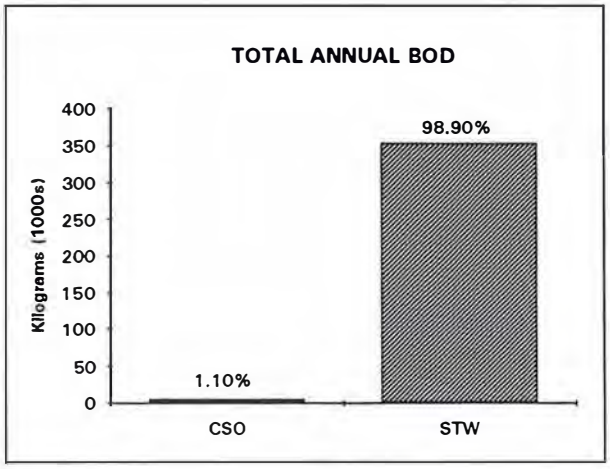


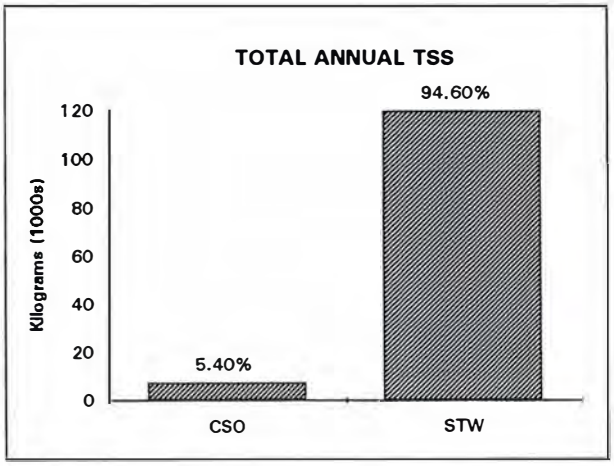


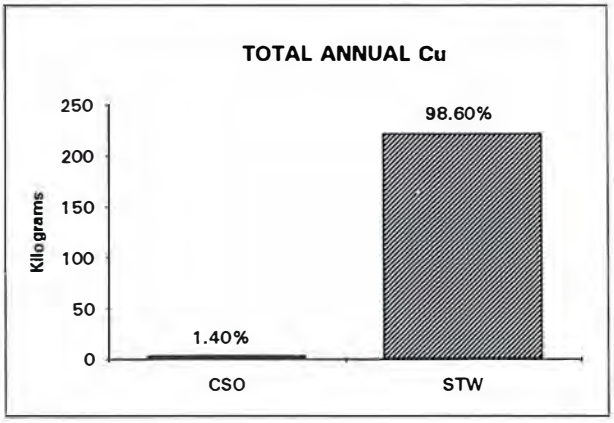


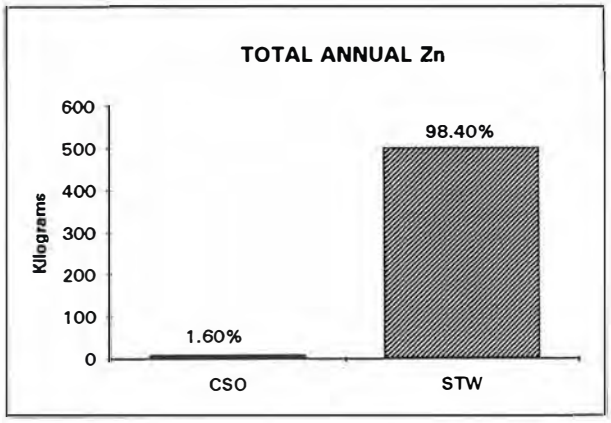
FUTURE PLANNED FLOWS AND LOADS FOR THREE MONTH AND ONE YEAR STORM EVENTS - LOWER INNER HARBOR



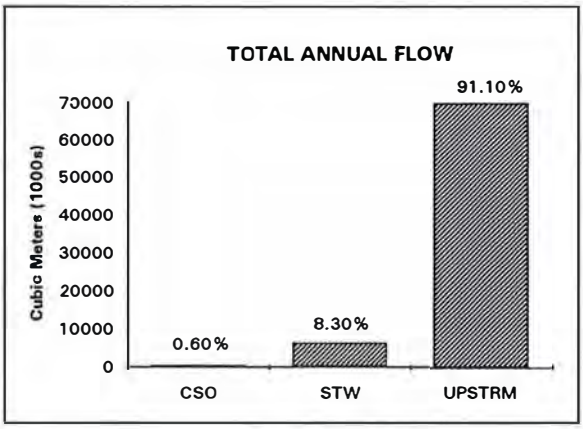


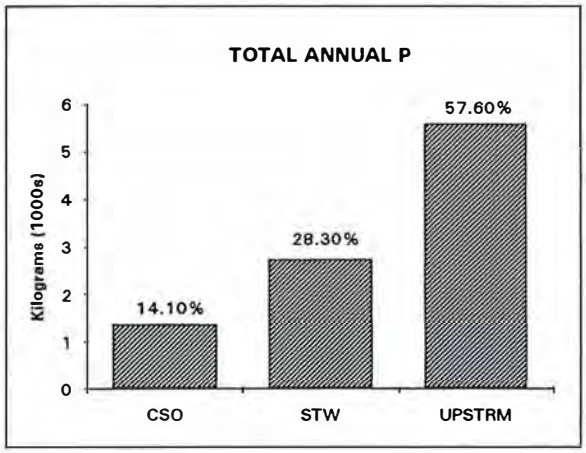


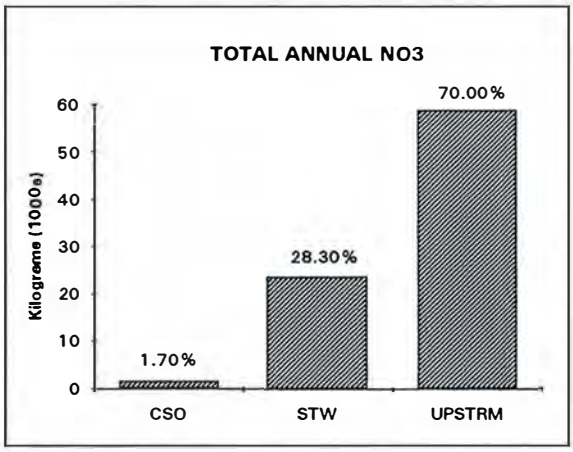


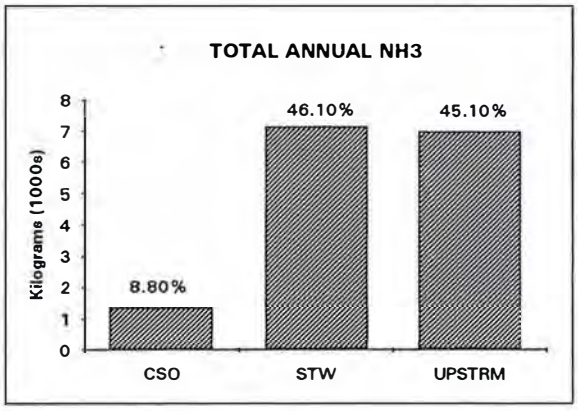


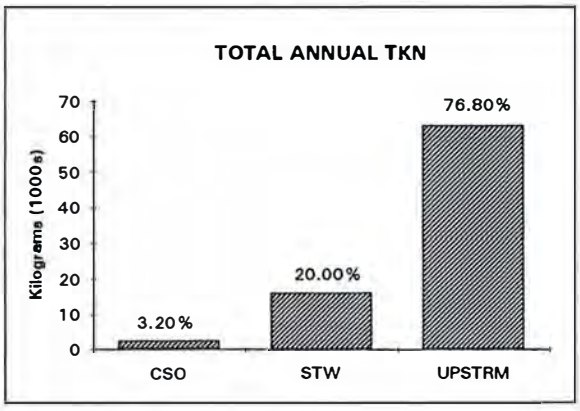
FUTURE PLANNED ANNUAL FLOWS AND LOADS - LOWER INNER HABOR
FLOW, BIOCHEMICAL OXYGEN DEMAND, TOTAL SUSPENDED SOLIDS, COPPER, ZINC



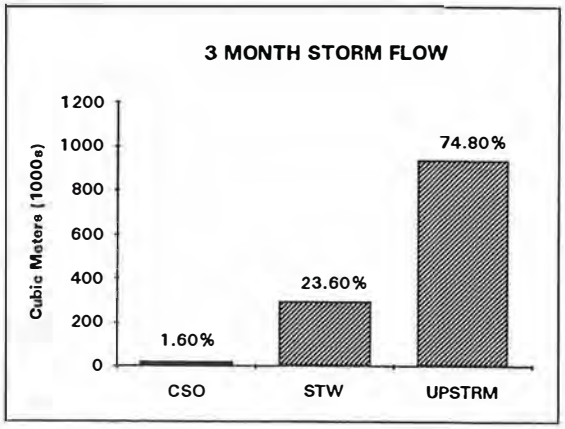


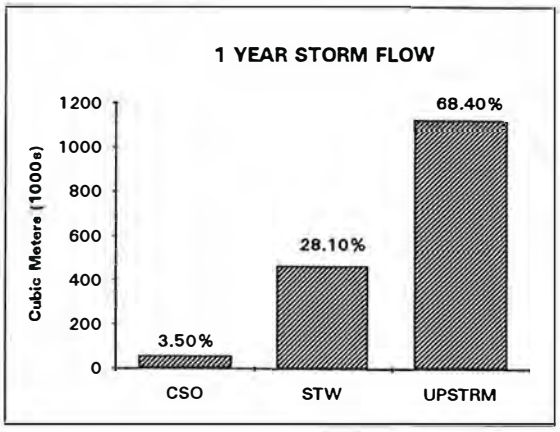


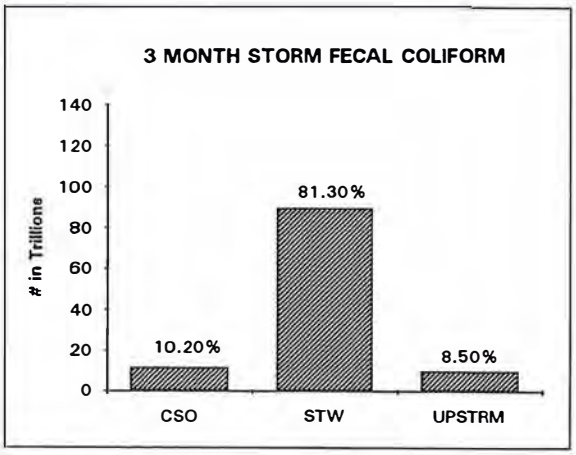


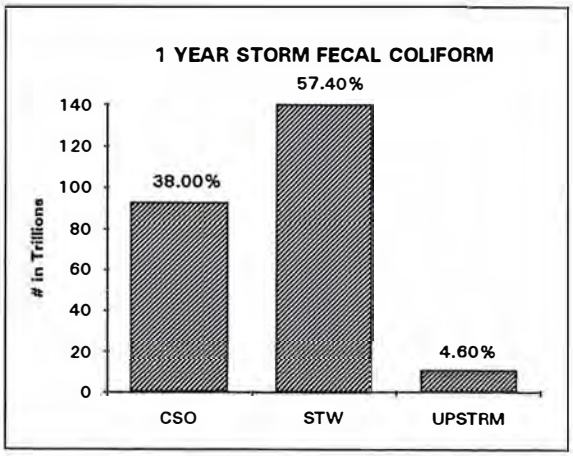


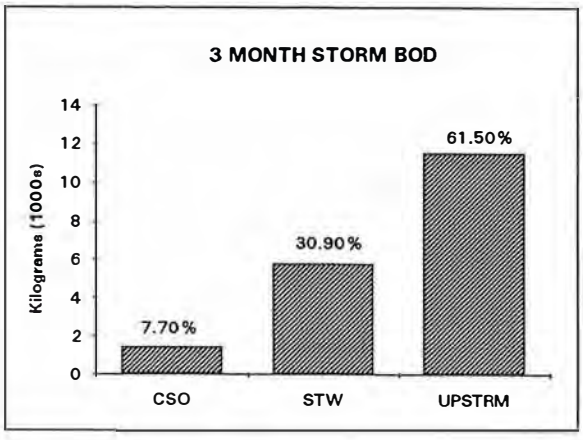
FUTURE PLANNED ANNUAL FLOWS AND LOADS - MYSTIC /CHELSEA CONFLUENCE FLOWS, TOTAL PHOSPHORUS, NITRATE, AMMONIA, TOTAL KJELDAHL NITROGEN

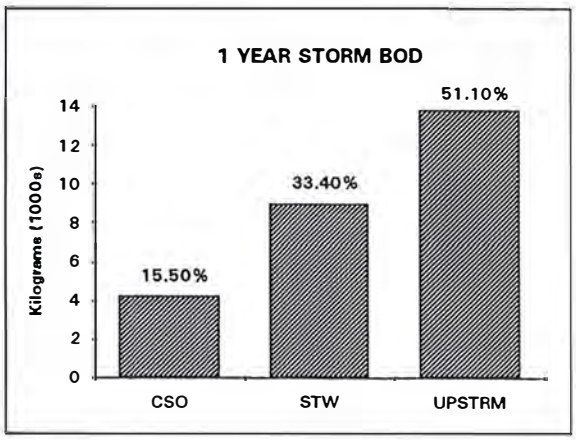




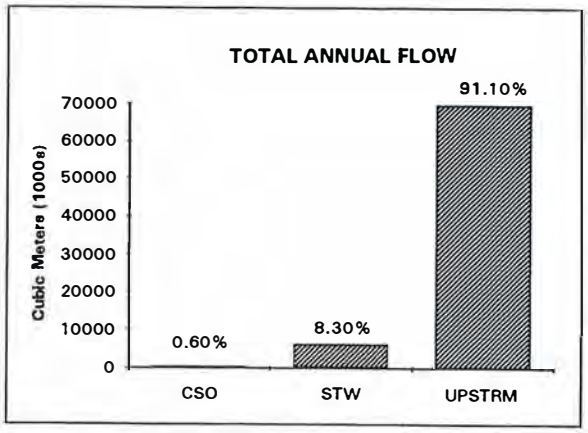


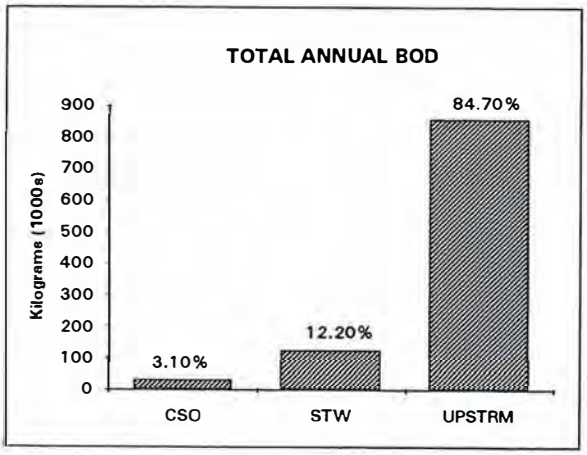


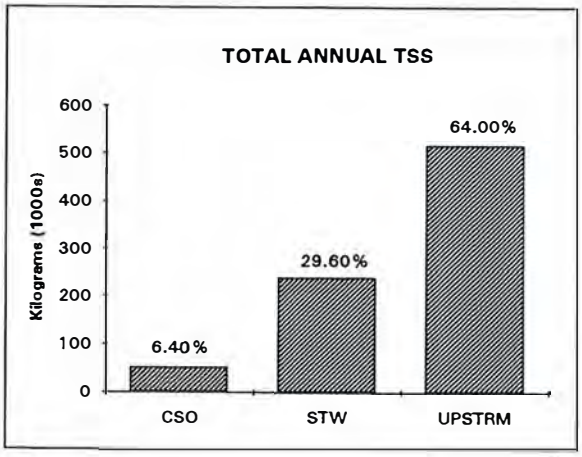


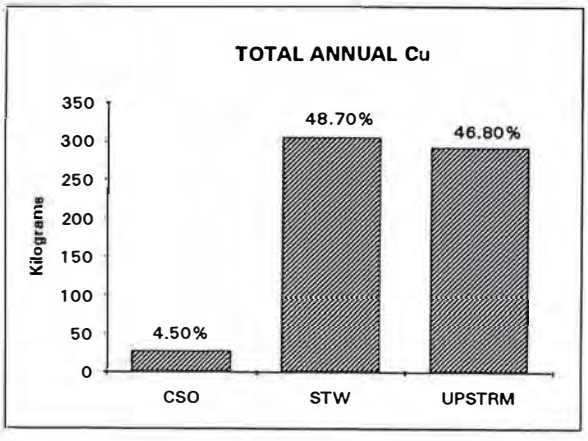


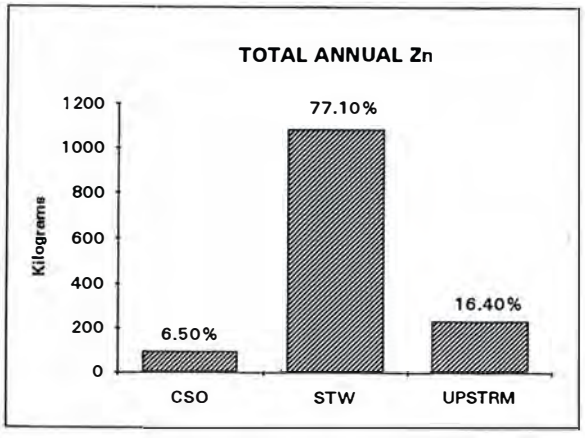
FUTURE PLANNED FLOWS AND LOADS FOR THREE MONTH AND ONE YEAR STORM EVENTS - MYSTIC RIVER/CHELSEA CREEK CONFLUENCE



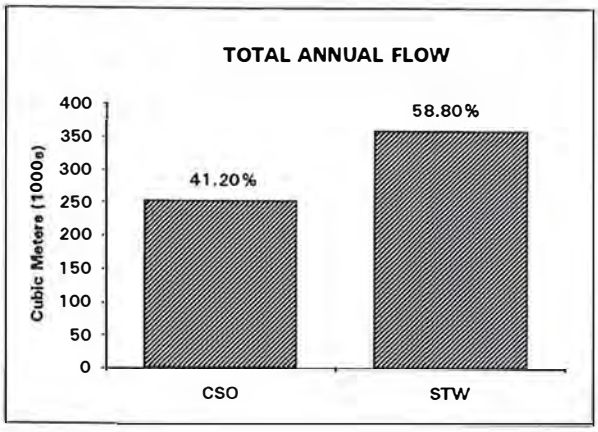


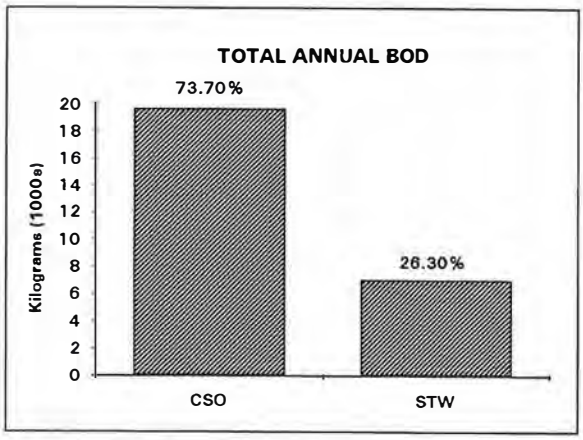


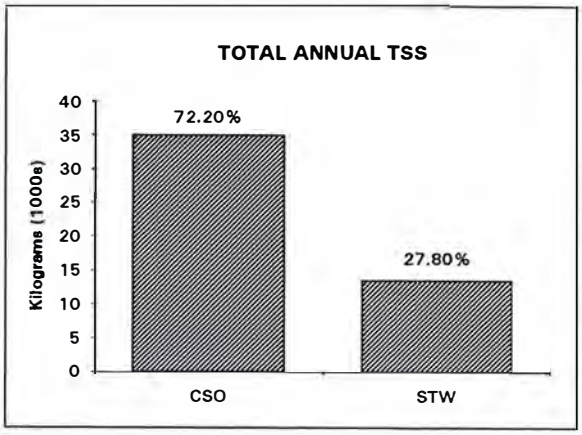


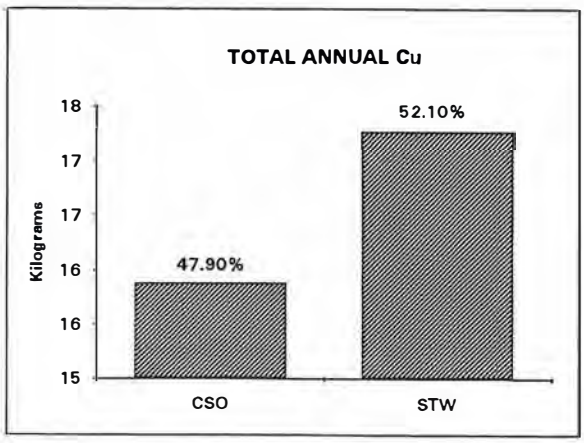


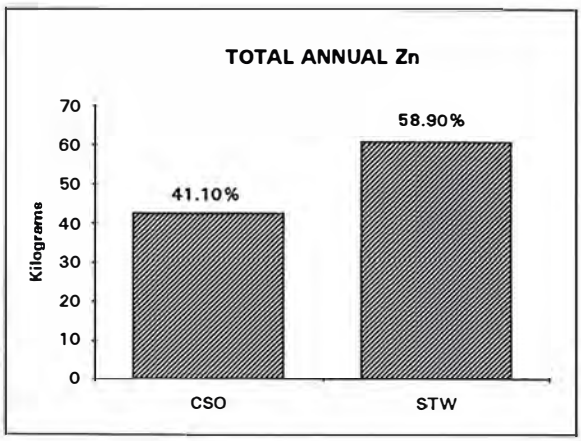
FUTURE PLANNED ANNUAL FLOWS AND LOADS - MYSTIC /CHELSEA CONFLUENCE FLOWS, BIOCHEMICAL OXYGEN DEMAND, TOTAL SUSPENDED SOLIDS, COPPER, ZINC



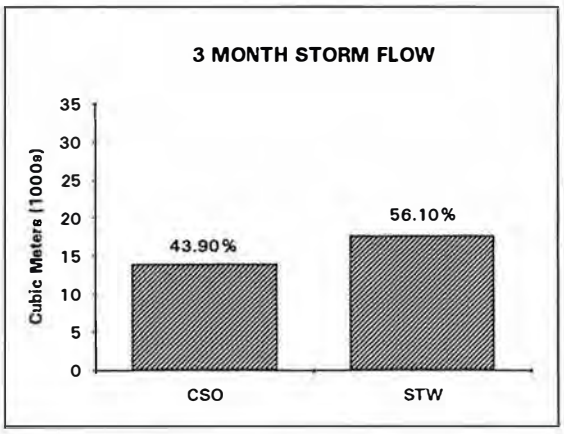


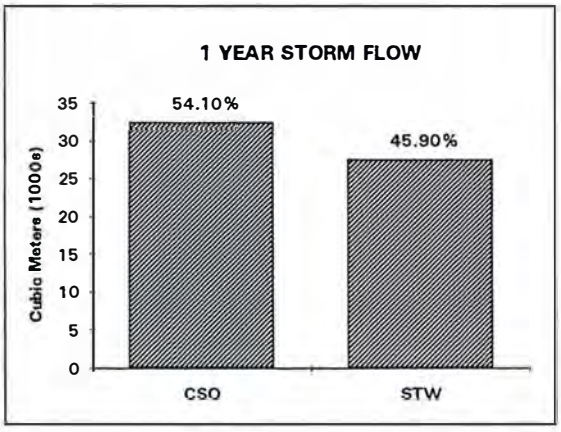


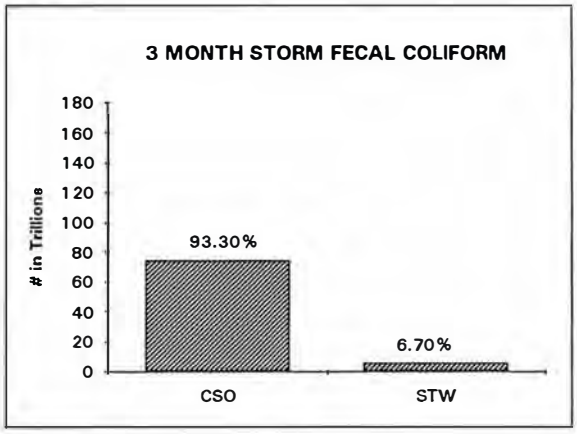


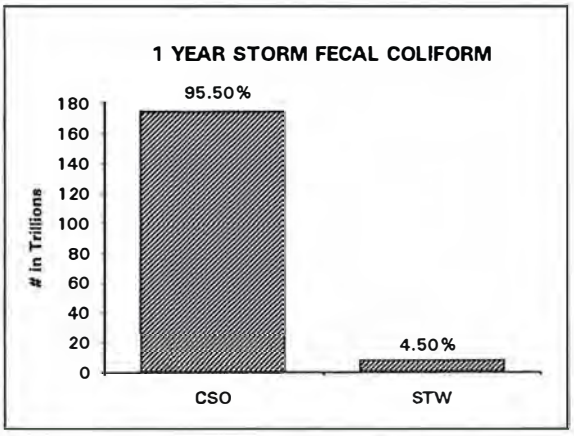


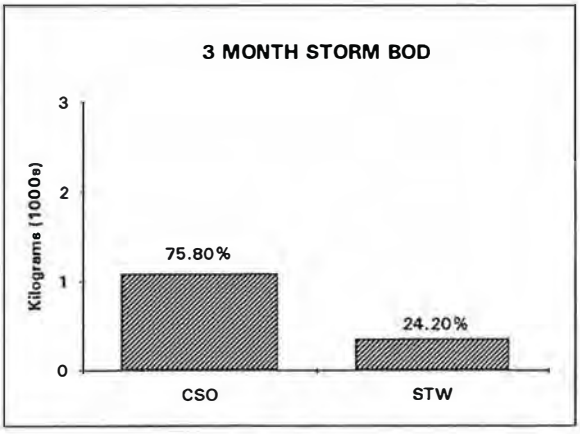
FUTURE PLANNED ANNUAL FLOWS AND LOADS - RESERVED CHANNEL FLOWS, BIOCHEMICAL OXYGEN DEMAND, TOTAL SUSPENDED SOLIDS, COPPER, ZINC

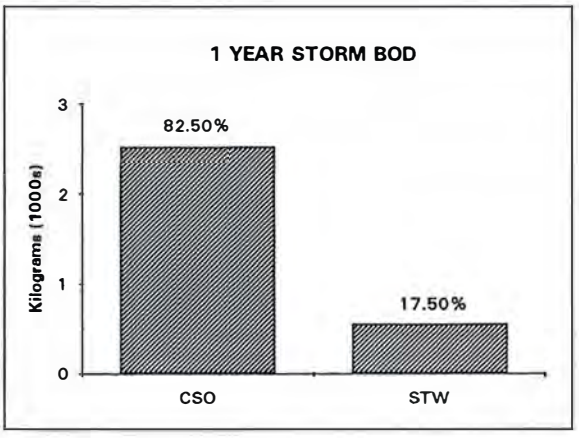




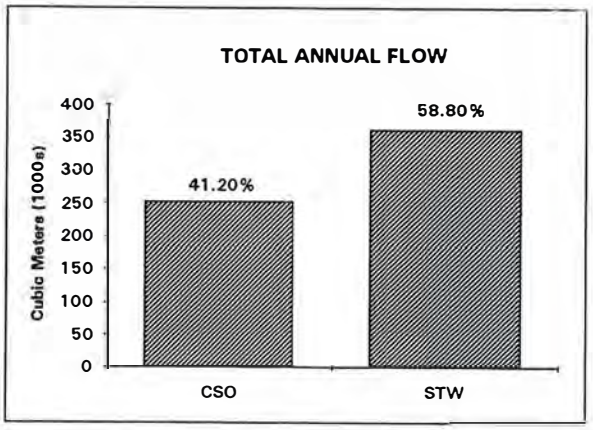


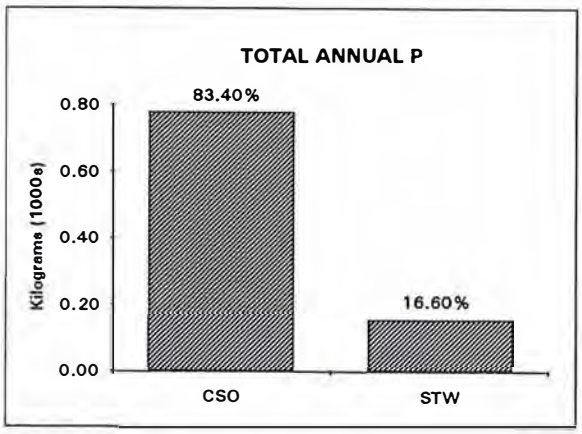


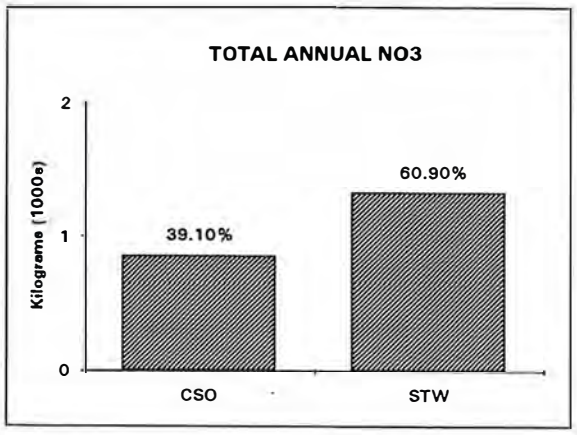


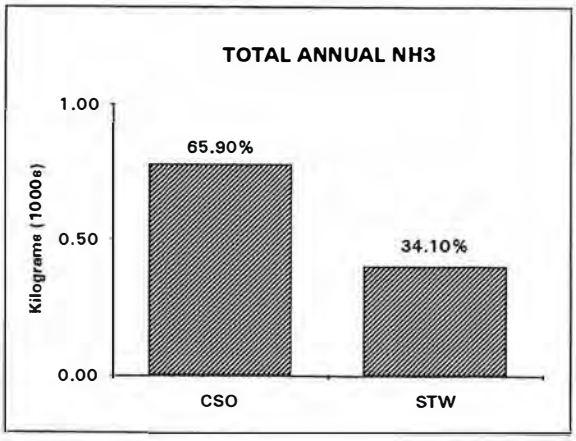


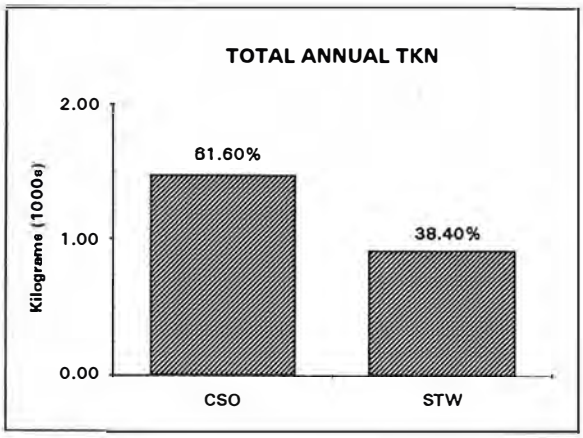
FUTURE PLANNED FLOWS AND LOADS FOR THREE MONTH AND ONE YEAR STORM EVENTS - RESERVED CHANNEL



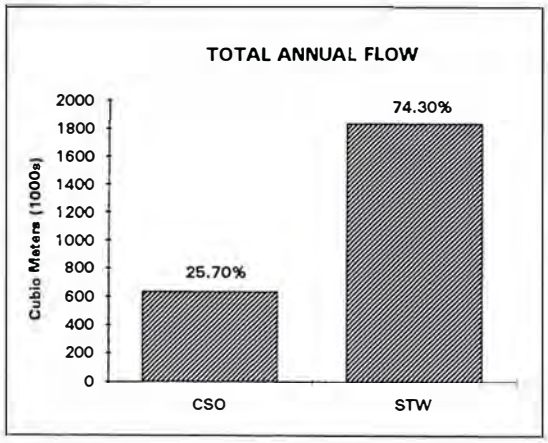


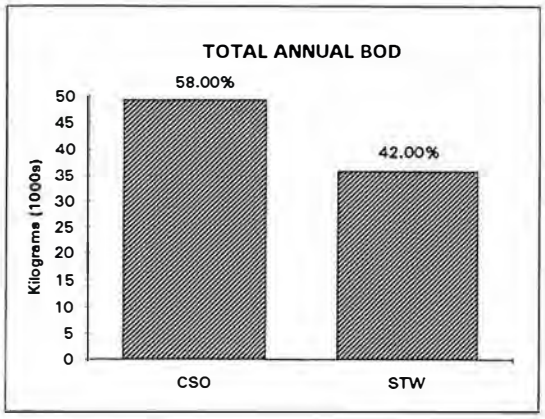


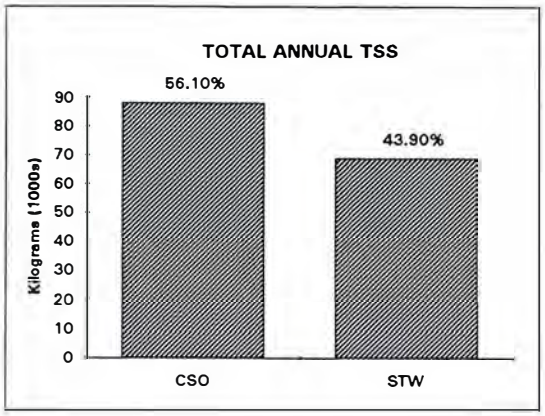


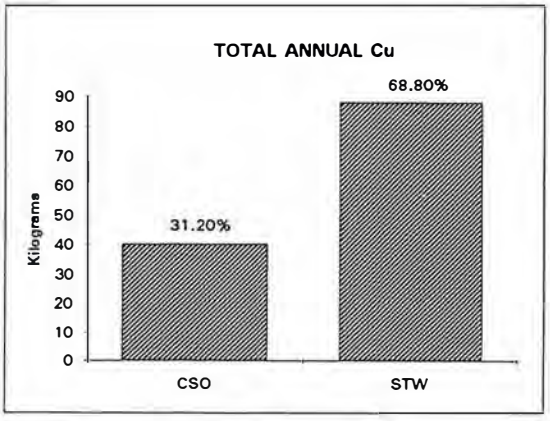


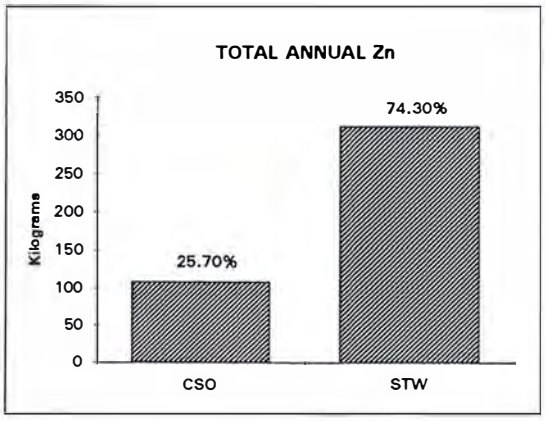
FUTURE PLANNED ANNUAL FLOWS AND LOADS - RESERVED CHANNEL FLOWS, TOTAL PHOSPHORUS, NITRATE, AMMONIA, TOTAL KJELDAHL NITROGEN



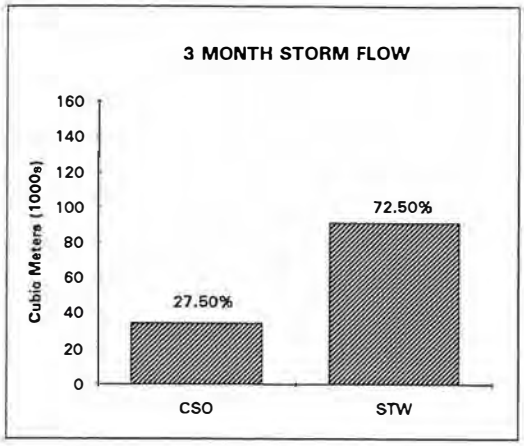


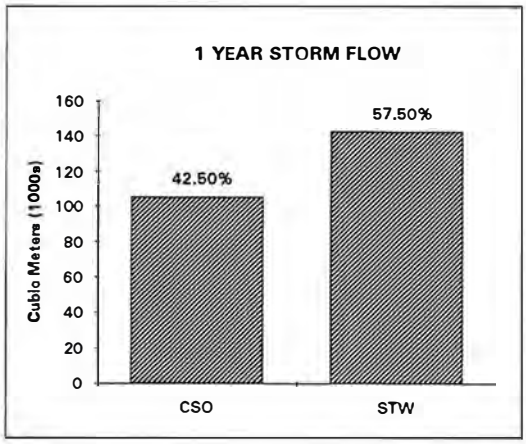


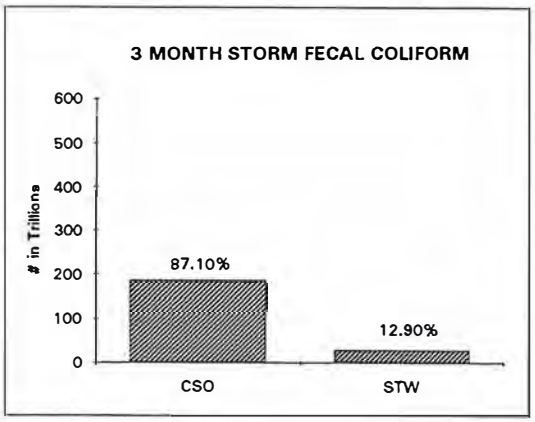


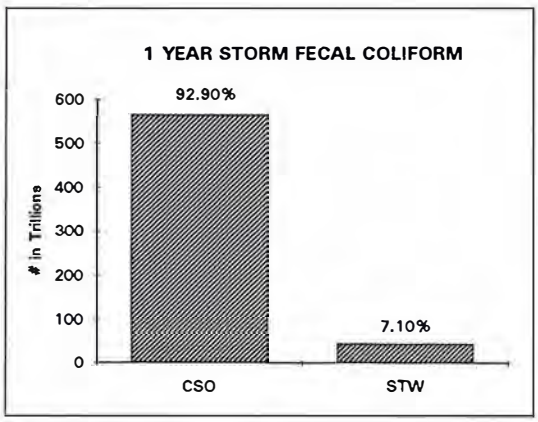


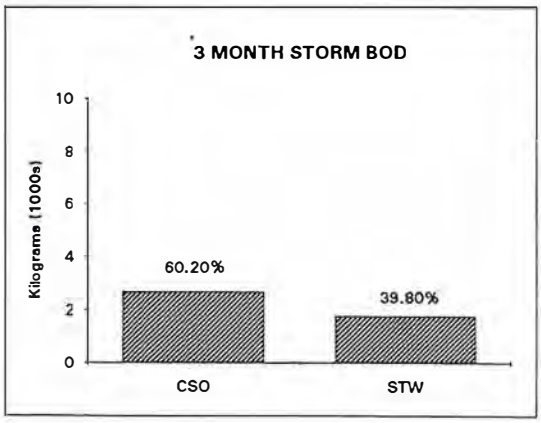
FUTURE PLANNED ANNUAL FLOWS AND LOADS - FORT POINT CHANNEL
FLOW, BIOCHEMICAL OXYGEN DEMAND, TOTAL SUSPENDED SOLIDS, COPPER, ZINC

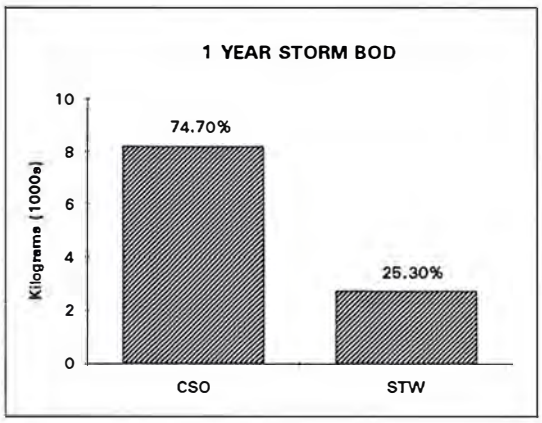




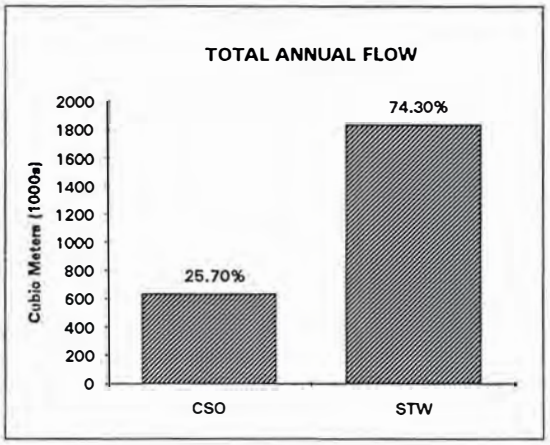


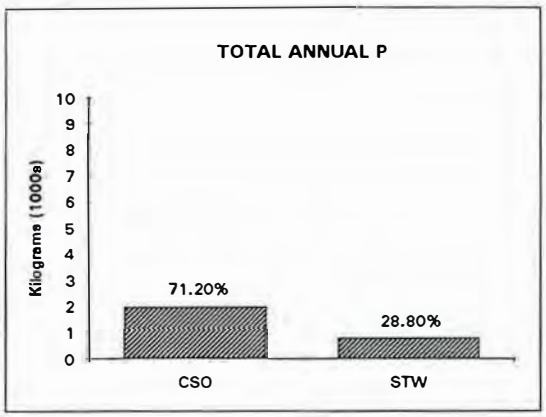


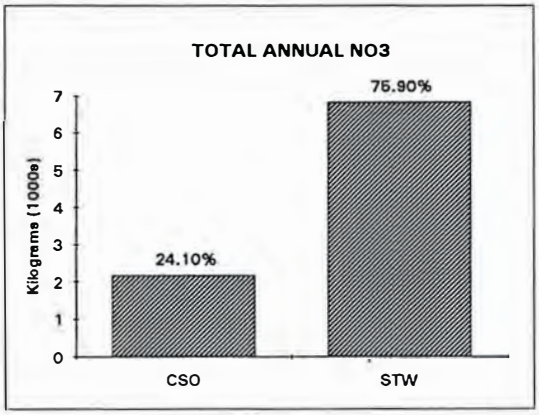


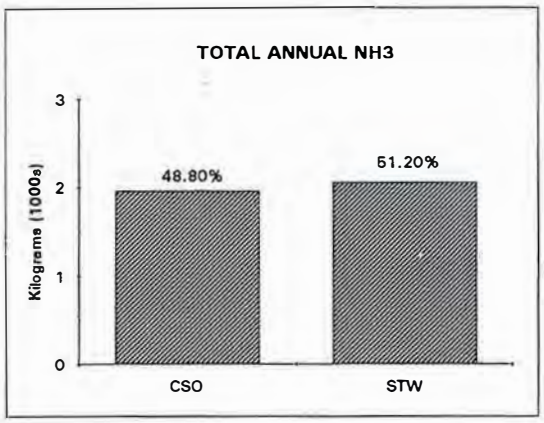


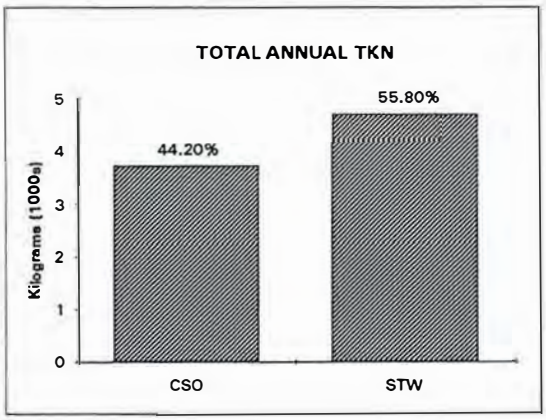
FUTURE PLANNED FLOWS AND LOADS FOR THREE MONTH AND ONE YEAR STORM EVENTS - FORT POINT CHANNEL











FUTURE PLANNED ANNUAL FLOWS AND LOADS - FORT POINT CHANNEL
FLOW, TOTAL PHOSPHORUS, NITRATE, AMMONIA, TOTAL KJELDAHL NITROGEN