COMMONWEALTH OF PENNSYLVANIA

DEPARTMENT OF ENVIRONMENTAL PROTECTION

IN THE MATTER OF:

City of Philadelphia Philadelphia County	Clean Streams Law Sewage

CONSENT ORDER AND AGREEMENT

This Consent Order and Agreement ("COA") is entered into this 1st day of June, 2011, by and between the Commonwealth of Pennsylvania, Department of Environmental Protection ("Department") and the City of Philadelphia Water Department ("City").

The Department has found and determined the following:

A. The Department is the agency with the duty and authority to administer and enforce the Clean Streams Law, Act of June 22, 1937, P.L. 1987, *as amended*, 35 P.S. §§ 691.1-691.1001 ("Clean Streams Law"); Section 1917-A of the Administrative Code of 1929, Act of April 9, 1929, P.L. 177, *as amended*, 71 P.S. § 510-17 ("Administrative Code"); the rules and regulations ("rules and regulations") promulgated thereunder; and with the delegated authority to administer the permit program created under the National Pollutant Discharge Elimination System ("NPDES"), under Section 402 of the Federal Clean Water Act, 33 U.S.C. § 1342.

B. The City is a municipality as defined in Section 1 of the Clean Streams Law, 35 P.S. § 691.1, with a mailing address 1101 Market Street, 5th Floor, Philadelphia, PA 19107.

C. A combined sewer system ("CSS") is a sewer system or parts thereof which was designed, permitted, built, and operated to carry sanitary sewage, storm water, and industrial waste. For purposes of the COA, the term CSS shall not include private laterals and privately-owned common sewers.

D. A combined sewer overflow ("CSO") is an intermittent overflow or other untreated discharge from a municipal CSS to the waters of the United States or Commonwealth occurring before the headworks of the Sewage Treatment Plant ("STP") and as a result of flow in excess of the CSS's dry weather carrying capacity, pursuant to 25 Pa. Code § 92a.2.

E. The City owns or operates CSOs in the City of Philadelphia, Philadelphia County. The CSOs discharge to the following outfalls: in the Delaware River Estuary Zone 3 (NPDES PA0026689 CSO Outfalls 002-008, 010-022, 058 and NPDES PA0026662 CSO Outfalls 002-017, 020-034, 036-037); in Pennypack Creek (NPDES PA0026689 CSO Outfalls 023-027); in Tacony/Frankford Creek (NPDES PA0026689 CSO Outfalls 028-052, 054-057, 059, and 060); in the Schuylkill River (NPDES PA0026671 CSO Outfalls 002-040, 075); in Eagle Creek (NPDES PA0026671 CSO Outfall 001B); and in Cobbs Creek (NPDES PA0026671 CSO Outfalls 041-047, 049-052, 054-072, 078, 082-084). The CSOs constitute sewage under Section 1 of the Clean Streams Law, 35 P.S. § 691.1.

F. The CSOs from the CSS of the City are authorized by individual NPDES Permits numbers PA0026662, PA0026671, and PA0026689 ("Permits"), issued by the Department to the City of Philadelphia on August 15, 2007, pursuant to Sections 201 and 202 of the Clean Streams Law, 35 P.S. §§ 691.201 and 691.202. True and correct copies of the presently current permits are attached hereto at Appendix A. The Permits authorize the

CSOs only when the flows in the CSS exceed conveyance or treatment capacities of the sewage treatment systems during wet weather periods.

G. The City is not upstream of and does not contribute to CSOs from sewer systems owned or operated by other municipalities or municipal authorities. The City's CSOs are not located upstream of any drinking water intakes owned or operated by the City or other municipalities or municipal authorities.

H. Under Section 402(q) of the Clean Water Act, 33 U.S.C. § 1342(q) (amended by the Wet Weather Water Quality Act of 2000," Act of December 21, 2000, P.L. 106-554, § 1(a)(4)), the City must comply with the Combined Sewer Overflow Control Policy signed by the United States Environmental Protection Agency ("USEPA") Administrator on April 11, 1994 (the "National CSO Control Policy").

I. The National CSO Control Policy (59 Fed. Reg. At 18,696) specifies that compliance schedules for permittees under a Phase II of a NPDES Permit be placed in an enforceable mechanism. A true and correct copy of the National CSO Control Policy is attached hereto at Appendix B.

J. The National CSO Control Policy represents a comprehensive national strategy to ensure that municipalities and the public engage in a comprehensive and coordinated planning effort to achieve CSO controls that ultimately meet appropriate health and environmental objectives.

K. In addition to its regulatory requirements to implement certain requirements of the National CSO Policy, set forth at 25 Pa. Code § 92a.27, the Department has its own CSO policy, called the Pennsylvania Combined Sewer Overflow Policy ("Pennsylvania CSO Policy"), DEP Doc. No. 385-2000-011 (final effective on September 6, 2008 with minor revisions effective on February 6, 2010), which replaces the Department's 2002 CSO

Policy. A true and correct copy of the Pennsylvania CSO Policy is attached hereto as Appendix C. The Pennsylvania CSO Policy strives to control and eliminate all CSO discharges to the extent practical, and require the remaining CSOs to discharge to Waters of the Commonwealth in a manner that assures compliance with state water-quality based standards.

L. The National CSO Control Policy, the Pennsylvania CSO Control Policy, and Part C of the Permits require the City to evaluate its CSSs and CSOs to meet appropriate health and environmental objectives.

M. The National CSO Control Policy requires the City to adopt either a "presumption" approach or a "demonstration" approach to meet the water-quality based standards of the Clean Water Act.

N. The City's Permits are Phase II NPDES permits that contain compliance schedules, as referenced in the National CSO Control Policy.

O. Pursuant to Part C of the City's past Permits, the City was required to complete, *inter alia*, the following reports and tasks in accordance with the following schedule:

a. A System Inventory and Characterization ("SIC") by March 27, 1995;

b. A System Hydraulic Characterization ("SHC") by June 27, 1995;

c. A Documentation of Implementation of the Nine Minimum Controls ("NMCs") by September 27, 1995; and

d. Submission to the Department of a Long Term CSO Control Plan ("LTCP") by September 27, 1996.

P. The City completed all of the reports and tasks set forth in Paragraph O in accordance with the schedule incorporated into Part C of its past Permits.

Q. To ensure that the City undertakes all measures necessary to comply with the Clean Water Act, including, but not limited to 33 U.S.C. § 1342(q), the regulations promulgated thereunder, the National CSO Control Policy, the Department's applicable Chapter 92 regulations, and the Pennsylvania CSO Control Policy, and to achieve a water-quality-based long-term control plan, and pursuant to a prior Consent Order and Agreement (dated August 4, 2008), the City was required to prepare and submit to the Department a revised and updated Long Term Control Plan by September 1, 2009.

R. The City completed the task set forth in Paragraph Q and submitted a Long Term Control Plan Update ("LTCPU") in September 2009. Between September 2009 and through the date of this COA, the Department reviewed and commented on the City's proposed 2009 LTCPU. As a result of that review and comment period, the City revised its LTCPU. Revisions to the LTCPU are documented in a letter from the City to DEP dated October 28, 2010 attached hereto as Appendix D, and in a collection of "Supplemental Documentation" dated April 2011, attached hereto as Appendix E.

S. In its LTCPU, the City has adopted a presumption approach to eliminate or control its CSOs in accordance with the National CSO Control Policy.

T. In accordance with the National CSO Control Policy and the Pennsylvania CSO Control Policy, the Department has the discretion to enter into an enforceable instrument with a permittee when the time frame for implementation of a LTCP will exceed its Phase II permit term. The main goal of such an enforceable instrument is to establish an enforceable schedule, milestones, and end date for implementation and completion of the LTCP.

U. Implementation of the City's LTCPU will go beyond the terms of its current set of NPDES permits. It is foreseeable that implementation of the City's LTCPU will also

go beyond the terms of the renewed permits that are scheduled to be issued following the expiration of the current set of permits.

V. The National CSO Policy encourages a permittee to consider its financial capability for implementing the selected CSO controls when developing its construction and financing schedules for the LTCP. These considerations include an evaluation of median household income ("MHI"), the total annual wastewater and CSO control costs per household as a percent of MHI, overall net debt as a percent of full market property value, property tax revenues as a percent of full market property value, property tax collection rate, unemployment, and the permittee's bond rating. The suggested methodology to evaluate a permittee's financial ability to implement CSO controls is set forth in the United States Environmental Protection Agency's (USEPA) Guidance for Financial Capability Assessment and Schedule Development (EPA 832-B-97-004, Feb. 1997) ("Financial Capability Guidance").

W. The City has conducted a financial capability assessment for implementing its LTCPU (*see* Section 11 of the LTCPU). It has determined that its financial burden is high, according to the methods in the Financial Capability Guidance. In arriving at this conclusion, the City has used the Financial Capability Matrix described in the Financial Capability Guidance. In part, its determination of financial capability is based on an assumption that, throughout implementation of the LTCPU, the City's projected average growth of MHI will be 2.29% and that the burden on residents from implementation of the LTCPU will be approximately 2.51% of the MHI by the end of implementation in COA Approval plus 25 years.

X. The Department issued the Permits to the City, which requires the City, inter alia, to properly operate and maintain its CSS and CSO structures.

Y. Also, pursuant to the NPDES Permits, the City is required to properly operate and maintain its CSS and CSO structures.

Z. Section 202 of the Clean Streams Law, 35 P.S. § 691.202, prohibits and makes it a nuisance for any person to discharge sewage in a manner that is contrary to the terms and conditions of a permit issued by the Department or the rules and regulations of the Department.

AA. Section 203 of the Clean Streams Law, 35 P.S. § 691.203, requires, *inter alia*, municipalities to file reports with the Department to enable the Department to determine whether existing sewer systems are adequate to meet present and future needs.

BB. In addition, Section 203 of the Clean Streams Law, 35 P.S. § 691.203, requires municipalities to construct, complete, extend and operate treatment facilities necessary to properly provide for the prevention of pollution or prevention of a public health nuisance and to negotiate with other municipalities for combined or joint sewer systems and treatment facilities.

CC. Section 210 of the Clean Streams Law, 35 P.S. § 691.210, requires a municipality to diligently comply with any Order issued pursuant to Section 203 of the Clean Streams Law.

DD. Section 402 of the Streams Law, 35 P.S. § 691.402, makes it unlawful and a nuisance for any person to conduct any activity contrary to terms of a permit issued by the Department or contrary to the rules and regulations of the Department.

EE. Title 25, Chapter 96, Section 3, 25 Pa. Code § 96.3, requires that all water quality criteria described in Chapter 93 (relating to water quality standards) shall be achieved in all surface waters, unless otherwise specified by Chapter 96.

FF. Although the City has submitted and implemented a LTCP for its CSOs, the receiving waters have not achieved water quality-based standards required under the Federal Clean Water Act and Chapter 93, and the City has not demonstrated that its discharges are complying with water quality-based standards in accordance with the National CSO Control Policy and the Pennsylvania CSO Control Policy.

GG. The City has had dry weather overflows from its CSS, but they have been unrelated to its hydraulic capacity. The City has documented these discharges to the Department in CSO Status Reports and has worked diligently to improve the operation and maintenance of its CSS to eliminate these discharges. A true and correct copy of an example of dry weather discharge documentation from a Combined Sewer Overflow (CSO) Status Report is attached hereto at Appendix F.

HH. The conditions described in Paragraph FF and GG are violations of Sections 202 and 402 of the Clean Streams Law, 35 P.S. §§ 691.202 and 691.402 and Pa. Code Title 25, Chapter 96, Section 3, 25 Pa. Code § 96.3.

II. The violation described in Paragraph FF and GG, hereof, constitutes unlawful conduct under Section 611 of the Clean Streams Law, 35 P.S. § 691.611; a statutory nuisance under Sections 402 and 601 of the Clean Streams Law, 35 P.S. §§ 691.402 and 691.601.

ORDER

After full and complete negotiation of all matters set forth in this COA and upon mutual exchange of covenants contained herein, intending to be legally bound, it is hereby ORDERED by the Department and AGREED to by the City as follows:

1) **Authority.**

This COA is an Order of the Department authorized and issued pursuant to Sections 5, 202, 203, 316, 402, and 610 of the Clean Streams Law, 35 P.S. §§ 691.5, 691.202, 691.203, 691.316, 691.402, and 691.610 and Section 1917-A of the Administrative Code, *supra.*

2) **Findings.**

a) The City agrees that the findings in Paragraphs A through II are true and correct and, in any matter or proceeding involving the City and the Department, the City shall not challenge the accuracy or validity of these findings.

b) The parties do not authorize any other persons to use the findings in this COA in any matter or proceeding.

3) **Compliance Requirements.**

Within the time frames established as part of the LTCPU process described below in the Permits, attached hereto as Appendix A, or unless otherwise specifically provided in this COA, the City shall:

a) **Deliverables:** Submit to the Department the following Deliverables[1] by the dates given:

i) Implementation and Adaptive Management Plan (6 months);

ii) Green Infrastructure Maintenance Manual development process plan (12 months);

iii) Comprehensive Monitoring Plan (18 months);

iv) Facility Concept Plans for each of the three Water Pollution Control Plants (24 months);

v) Updated Nine Minimum Controls Report (24 months);

vi) Tributary Water Quality Model - Bacteria (24 months);

vii) Tributary Water Quality Model - Dissolved Oxygen (36 months);

viii) Green Infrastructure Maintenance Manual - First Edition (36 months);

ix) Tidal Waters Water Quality Model - Bacteria (48 months); and

x) Tidal Waters Water Quality Model - Dissolved Oxygen (48 months).

Each period of time in this paragraph is the duration from the final date of execution of this COA. Upon receipt of a written approval by the Department of a deliverable, the City shall implement that Department-approved Deliverable in accordance with such document's terms and conditions. Each Department-approved Deliverable will supplement the LTCPU. Should the Department provide written comments to the City instead of an approval for any Deliverable, the City shall provide responses to the Department's comments, in accordance with the time frame specified by the Department in its comment letter. Such time frame to respond shall be at least forty-five days, unless a shorter term is agreed to by the City.

[1] Descriptions of each of these Deliverables are set forth in the attached Appendix G.

b) **Approved LTCPU:** Implement the Department-approved LTCPU (the "Approved LTCPU"), as set forth in the documents described in Paragraph R of the Findings, and including, but not limited to, any Department-approved Deliverable, and in accordance with the Department's approval letter of June 1, 2011. A true and correct copy of the Approval Letter is attached hereto as Appendix H.

c) **Water Quality Requirements:** Discharge from the CSS only to the extent that such discharges are in compliance with the City's NPDES Permits, the water quality-based requirements of the Clean Water Act, 25 PA Code Chapter 93, the Federal CSO Control Policy, and the Pennsylvania CSO Policy. The City shall accept as a condition in future NPDES Permits a section that addresses the Water Quality Requirements that apply to the CSO discharges. The Water Quality Requirements section will include a Water Quality Based Effluent Limit (WQBEL). True and correct copies of the Water Quality Requirements proposed for acceptance in the City's next NPDES Permits are attached hereto at Appendix I *(2012 NPDES Permits - Part C Addendum)*. The Water Quality Requirements shall apply to City Permits numbers PA0026662, PA0026671, and PA0026689, until the Department removes or modifies the Water Quality Requirements in a subsequent NPDES permit issuance. The City waives its rights to appeal the issuance of the next NPDES Permits on the basis of the contents of the Water Quality Requirements, provided that the terms and conditions are substantially the same as in Appendix I.

d) **Annual Reports:** Submit to the Department written progress reports providing details on the City's implementation of CSO controls. The City shall submit to the Department Annual Reports, starting September 30, 2011, and by September 30 of each subsequent year, until the Department terminates this condition. The Annual

Reports shall include information concerning the City's implementation of the Nine Minimum Controls from the National CSO Policy, the Capital Projects from the 1997 Long Term Control Plan, and the CSO program elements discussed in the Approved LTCPU. If the City fails to achieve one or more of the Performance Standards from Table 1 in the Water Quality Requirements section in its NPDES Permits, as documented in an Evaluation and Adaptation Plan (EAP)[2], the subsequent Annual Reports shall include an update reporting on the City's progress towards meeting those standards. Such updates must be provided in every subsequent Annual Report until all the applicable standards have been achieved. When the standards have been achieved, the City shall provide a declaration of the date the City achieved the standard, and documentation to support this declaration in the form of a demonstration of compliance, as set forth in Paragraph 8.f. below.

e) **Evaluation and Adaptation Plans:** Submit to the Department an EAP at least every five years, starting October 30, 2016, and by October 30 of each fifth year thereafter. Each EAP will be a comprehensive assessment of the City's progress with implementing the Approved LTCPU up until that time, and will include a description of program elements anticipated to be implemented in the next five-year period. Each EAP must also include the following components:

   i) Performance tracking of the CSO Program in the form of hydrologic/hydraulic modeling with verification using metered data, as described in Section 10 of the LTCPU;

[2] The City's requirements regarding EAPs are described in detail in Paragraph 3.e.

ii) Up-to-date values for each of the metrics that appears in Table 1 of the Water Quality Requirements section of the permits, with details to describe how the reported values were calculated;

iii) An assessment of how each reported metric value compares to the Performance Standards provided in Table 1 in the Water Quality section of the NPDES permits;

iv) If any reported metric value does not equal or exceed the corresponding Performance Standard in Table 1 in the Water Quality section of the NPDES Permits, the City shall include in that EAP an adaptive strategy for program implementation, describing the means that the City proposes to use to ensure that the metric will meet the appropriate Performance Standard by the date of the next EAP; and

v) Up-to-date values for the following additional metrics:

(1) Total number of Green Infrastructure projects used to calculate Greened Acres;

(2) Volume (in million gallons per year) managed by new infrastructure other than Green Infrastructure; and

(3) Volume Percent Capture for the CSS as a whole.

Should the Department provide comments to the City concerning the EAP, the City shall provide responses to the Department's comments, in accordance with the time frame specified by the Department in its comment letter. Such time frame to respond shall be at least forty-five days, unless a shorter term is agreed to by the City. Any adaptive strategy proposed by the City shall not be considered final until approved in writing by the Department. Beginning with Year 10 (EAP due on October 30, 2021),

the EAPs must also include an updated assessment of receiving water conditions, using the results of water quality modeling for the receiving waters. After the first 5-year cycle, the City may submit an interim EAP before the fifth year in any cycle to propose modifications to its adaptive strategy for program implementation. Notwithstanding the submission, or approval, of any interim EAPs, the City shall still submit an EAP by each fifth year.

f) **Post-Construction Monitoring Plan:** Submit to the Department, accompanying the fourth EAP (due in the twentieth year after LTCPU approval), a written Post-Construction Monitoring Plan ("PCMP"). The PCMP shall describe actions that the City proposes to take to demonstrate that CSO discharges are not causing a violation of water quality standards.

In no event shall any compliance date in this Paragraph require action and/or compliance later than June 1, 2036.

4) <u>Planning, Design, and Construction Requirements.</u>

Within the time frames established as part of the LTCPU process, or unless otherwise specifically provided in this COA, the City shall design and construct facilities sufficient to capture and treat, for at least twenty years after the completion of the construction and full implementation of all the remedial controls required under the LTCPU, flows from the CSS as detailed in the Approved LTCPU.

5) <u>Operational Requirements.</u>

Within the time frames established as part of the LTCPU process, or unless otherwise specifically provided in this COA, the City shall operate the CSS such that it captures and treats, for at least twenty years after the completion of the construction and full

implementation of all the remedial controls required under the LTCPU, flows from the CSS as detailed in the Approved LTCPU.

6) Record Keeping.

The City shall maintain copies of any records, reports, plans, data, permits and documents related to or developed pursuant to this COA, including any underlying research and data, for a period of five (5) years from the date of creation of such documents. The City shall require any independent contractor, employee, agent, or officer implementing any portion of this COA to also retain such materials for a period of five (5) years from the date of creation of such documents. The City shall submit such supporting documents to the Department upon its request.

7) Water Quality Standards.

The Approved LTCPU is based upon a "Presumption" approach, consistent with the National CSO Policy. Under the Approved LTCPU, and consistent with the National CSO Policy, the City will eliminate or remove no less than the mass of pollutants (fecal coliform bacteria, by cell count; 5-day Carbonaceous Biochemical Oxygen Demand, by mass; and Total Suspended Solids, by mass) that otherwise would be removed by the capture of 85% by volume of the combined sewage collected in the CSS during precipitation events on a system-wide annual average basis. The Post-Construction Monitoring program, herein referenced in Paragraph 3.f., is intended to verify compliance with water quality standards and the protection of designated uses, as well as to ascertain the effectiveness of the CSO controls.

8) Stipulated Civil Penalties.

a) In the event the City fails to comply in a timely manner with any of the provisions of Paragraphs 3, 4, 5, 6, or 7 the City shall be in violation of this COA. In addition to

other applicable remedies, the City shall pay civil penalties as provided in Paragraphs b., c., and d. below.

b) For violations associated with submitting plans, reports, and other documents required according to Paragraph 3.a., Paragraph 3.d., Paragraph 3.e., or Paragraph 3.f. of this Consent Order, the City shall pay civil penalties as follows:

i) Days 1 through 30 of each violation: $1,000 per day per violation;

ii) Days 31 through 60 of each violation: $1,500 per day per violation; and

iii) Days 61 and beyond of each violation: $2,000 per day per violation.

For failure to submit timely and adequate responses to the Department's comments regarding proposed deliverables, as required by Paragraph 3.a. and Paragraph 3.e., the City shall pay stipulated penalties as set forth herein.

c) Each penalty set forth in Paragraph 8.b. shall increase by $500 every five years (e.g. for days 1-30 in years 0-5 the penalty will be $1,000 per day per violation, and for days 1-30 in years 6-10 the penalty will be $1,500 per day per violation).

d) For failure to achieve any numerical Performance Standard specified in Table 1 of the Water Quality Requirements section of the NPDES permits, the City shall pay civil penalties as follows:

i) Months 1 through 6 of each violation: $25,000 per month per violation;

ii) Months 7 through 12 of each violation: $50,000 per month per violation;

iii) Months 13 and beyond of each violation: $100,000 per month per violation.

Non-compliance with any numerical Performance Standard specified in Table 1 of the Water Quality Requirements section of the NPDES permits shall constitute a separate and distinct violation. Penalties shall begin to accrue on the date that the City is required to submit an EAP, if that EAP shows a failure to achieve one or

more Performance Standard(s). The monthly penalty shall be assessed for each full month and for each part of a month that passes until the City achieves compliance with the standard(s).

e) Stipulated civil penalty payments given in Paragraphs 8.b. and 8.c. shall be assessed monthly, and be payable by the City to the Department on the twenty-eighth day of the month, beginning with the month following the date of the violation. The payment shall be made by certified check or the like, made payable to the "Commonwealth of Pennsylvania, Clean Water Fund" and shall be sent to the address in Paragraph 13.

f) Stipulated penalty payments given in Paragraph 8.d. shall be assessed monthly. Payments shall be made by no later than the twenty-eighth day of the month following the month in which the violation occurred. The payment shall be made by certified check or the like, made payable to the "Commonwealth of Pennsylvania, Clean Water Fund" and shall be sent to the address in Paragraph 13. Monthly payments may cease when the City believes it can demonstrate that compliance has been achieved. The City shall submit to DEP a demonstration of compliance with the standards. This demonstration shall be provided within 90 days of the last payment, and in no case later than the due date of the next Annual Report. The City may be liable for additional stipulated penalties if DEP should find, after reviewing the demonstration of compliance, that compliance was not actually achieved at the time originally declared by the City.

g) Any payment under this Paragraph shall neither waive the City's duty to meet its obligations under this COA nor preclude the Department from commencing an action to compel the City's compliance with terms and conditions of this COA. The

payment resolves only the City's liability for civil penalties arising from the violation of this COA for which the payment is made.

h) Stipulated civil penalties shall be due automatically and without notice.

9) Additional Remedies.

a) In the event the City fails to comply with any provision of this COA, the Department may, in addition to the remedies prescribed herein, pursue any remedy available for a violation of an order of the Department, including an action to enforce this COA.

b) The remedies provided by this Paragraph and Paragraph 8 (Stipulated Civil Penalties) are cumulative and the exercise of one does not preclude the exercise of any other. The failure of the Department to pursue any remedy shall not be deemed to be a waiver of that remedy. The payment of a stipulated civil penalty, however, shall preclude any further assessment of civil penalties for the violation for which the stipulated civil penalty is paid.

10) Reservation of Rights.

The Department reserves the right to require additional measures to achieve compliance with applicable law. The City reserves the right to challenge any action which the Department may take to require those measures.

11) Liability of the City.

The City shall be liable for any violations of the COA, including those caused by, contributed to, or allowed by its officers, agents, employees, or contractors. Except as provided in Paragraph 12.c. below, the City also shall be liable for any violation of this COA caused by, contributed to, or allowed by its successors and assigns.

12) Transfer of Site.

a) The duties and obligations under this COA shall not be modified, diminished, terminated or otherwise altered by the transfer of any legal or equitable interest in its CSS or any part thereof, unless agreed to by the Department as set forth in sub-Paragraph 12.c. below.

b) If the City intends to transfer any legal or equitable interest in its CSS which is affected by this COA, the City shall serve a copy of this COA upon the prospective transferee of the legal and equitable interest at least thirty (30) days prior to the contemplated transfer and shall simultaneously inform the Regional Office of the Department of such intent.

c) The Department in its sole discretion may agree to modify or terminate the City's duties and obligations under this COA upon transfer of the CSS. The City and transferee waive any right that they may have to challenge the Department's decision in this regard.

13) Correspondence with the Department.

All correspondence with the Department concerning this COA shall be addressed to:

Regional Water Quality Manager
Department of Environmental Protection
Southeast Regional Office
2 East Main Street
Norristown, PA 19401
Phone: 484-250-5970
Fax: 484-250-5971

14) Correspondence with the City.

All correspondence with the City concerning this COA shall be addressed to:

David A. Katz
Deputy Water Commissioner, Environmental Policy and Planning
1101 Market Street, 5th Floor
Philadelphia, PA 19107-2994
Phone: 215-685-6118
Fax: 215-685-4915

15) Force Majeure.

a) In the event that the City is prevented from complying in a timely manner with any time limit imposed in this COA solely because of a strike, fire, flood, act of God, or other circumstance beyond the City's control and which the City, by the exercise of all reasonable diligence, is unable to prevent, the City may petition the Department for an extension of time. The City may also petition the Department for an extension of time from any time limit imposed in this COA, should the City determine that the cost to implement the LTCPU has exceeded or will exceed 2.27% of the MHI for the City's residents and, as a result, that the burden on the City to implement the LTCPU has or will exceed the level established as of the date of this COA, as measured using the Financial Capability Matrix set forth in the Financial Capability Guidance. An increase in the cost of performing the obligations set forth in this COA shall not constitute circumstances beyond the City's control, with the following exception. With the exception of the circumstances of the percentage of costs to implement the LTCPU exceeding 2.27% of the MHI and a resulting increase in the financial burden

on the City, as described herein, the City's economic inability to comply with any of the obligations of this COA shall not be grounds for any extension of time.

b) The City shall only be entitled to the benefits of this paragraph if it notifies the Department within five (5) working days by telephone and within ten (10) working days in writing of the date it becomes aware or reasonably should have become aware of the event impeding performance. The written submission shall include all necessary documentation, as well as a notarized affidavit from an authorized individual specifying the reasons for the delay, the expected duration of the delay, and the efforts which have been made and are being made by the City to mitigate the effects of the event and the length of the delay. The initial written submission may be supplemented within ten working days of its submission. The City's failure to comply with the requirements of this paragraph specifically and in a timely fashion shall render this paragraph null and of no effect as to the particular incident involved.

c) The Department will decide whether to grant all or part of the extension requested on the basis of all documentation submitted by the City and other information available to the Department. In any subsequent litigation, the City shall have the burden of proving that the Department's refusal to grant the requested extension was an abuse of discretion based upon the information available to it.

16) <u>Severability.</u>

The paragraphs of this COA shall be severable and should any part hereof by declared invalid or unenforceable, the remainder shall continue in full force and effect between the parties.

17) Entire Agreement.

This COA shall constitute the entire integrated agreement of the parties. No prior or contemporaneous communications or prior drafts shall be relevant or admissible for purposes of determining the meaning or intent of any provisions herein in any litigation or any other proceeding.

18) Attorney Fees.

The parties shall bear their respective attorney fees, expenses and other costs in the prosecution or defense of this matter or any related matters, arising prior to execution of this COA.

19) Modifications.

No changes, additions, modifications, or amendments of this COA shall be effective unless they are set out in writing and signed by the parties hereto.

20) Titles.

A title used at the beginning of any paragraph of this COA may be used to aid in the construction of that paragraph, but shall not be treated as controlling.

21) Decisions under this Consent Order and Agreement.

Any decision which the Department makes under the provisions of this COA, including a notice that stipulated civil penalties are due, is intended to be neither a final action under 25 Pa. Code §1021.2, nor an Adjudication under 2 Pa. C.S. §101. Any objection which the City may have to the decision will be preserved until the Department enforces this COA.

22) Jurisdiction.

The parties agree that the terms and conditions of this COA shall be enforceable and venue shall lie only in the Commonwealth Court of Pennsylvania.

23) Dispute Resolution.

a) The City may initiate dispute resolution under this paragraph, in response to any decision required of the Department under Paragraph 24.c.

b) To initiate dispute resolution, the City shall provide written notice to the Department within ten (10) days of the decision in dispute. The City shall have an additional ten (10) days to provide the Department with a written list of objections to the decision in dispute, the relevant facts, analysis and opinions and other supporting data ("Statement of Position"). The Department shall have twenty (20) days after the date it receives the City's Statement of Position to provide its Statement of Position.

c) Within the twenty (20) day period following receipt of the Department's Statement of Position, the Department's Water Quality Management Program Manager and the City's Water Commissioner, or his or her designee, shall confer in an attempt to resolve the dispute. In the event the parties are unable to resolve the dispute within this period, the Statements of Position shall be provided to the Department's Regional Director to issue a final decision resolving the dispute.

d) During the pendency of the dispute resolution procedures set forth in Subparagraphs (b) and (c), any obligation to be performed under this COA, which is the subject of such dispute and any associated activities whose performance is directly dependent upon the resolution of the dispute, shall be postponed for a period of time not to exceed the actual time taken to resolve the dispute pursuant to Subparagraphs (b) and (c) or as otherwise agreed by the parties. All other obligations and activities shall be completed in accordance with the terms of this COA.

e) Any time period for dispute resolution set forth herein may be extended by written agreement of the parties.

24) Termination.

The obligations in Paragraphs 3 through 8 of this COA shall terminate upon the first occurrence of one of these conditions:

a) On June 1, 2036,

b) When the Department determines that the City has complied with the terms and conditions of this COA, or

c) When the Department notifies the City in writing that it is terminating the COA because the City has failed to meet both of the conditions specified below:

   i) The City has failed to meet one or more of its 5, 10, 15, or 20-year Performance Standards as specified in the Water Quality Requirements section of the NPDES permits, and

   ii) Either of the following:

      (1) The Department determines that it will not approve the City's adaptive strategy for program implementation, if such is required in the City's EAP (see Paragraph 3.e. of this COA); or

      (2) The Department determines, based on any information including but not limited to any Annual Report (see Paragraph 3.d.), and notwithstanding the Department's prior approval of any adaptive strategy for program implementation, that the City is failing to maintain sufficient progress towards the Water Quality goals in the NPDES permits.

Upon termination of this COA, the Department shall incorporate the requirements set forth within Paragraph 5 (Operational Requirements) in a subsequent issuance of the City's NPDES Permits. The City waives its rights to appeal the issuance of its NPDES Permits

after termination of this COA on the basis of the inclusion of the requirements set forth within Paragraph 5, herein.

25) Revision.

In the event of the promulgation of new, or revisions to existing, Federal or state statutes or regulations, that the United States Congress, United States Environmental Protection Agency, Pennsylvania General Assembly, or the Department passes, promulgates, or issues, or any policy that revises, changes, or supersedes the National CSO Control Policy or the Pennsylvania CSO Policy, or either agency rescinds their respective policies, either party may request to the other party revisions to this COA, which may be accomplished if agreed upon in writing by both the Department and the City.

IN WITNESS WHEREOF, the parties hereto have caused this Consent Order and Agreement to be executed by their duly authorized representatives. The undersigned representatives of the City certify under penalty of law, as provided by 18 Pa. C.S. §4904, that they are authorized to execute this Consent Order and Agreement on behalf of the City, that the City consents to the entry of this Consent Order and Agreement as a final ORDER of the Department; and that the City hereby knowingly waives its rights to appeal this Consent Order and Agreement and to challenge its content or validity, which rights may be available under Section 4 of the Environmental Hearing Board Act, the Act of July 13, 1988, P.L.530, No. 1988-94, 35 P.S. §7514; the Administrative Agency Law, 2 Pa. C.S. § 103(a) and Chapters 5A and 7A; or any other provision of law. Signature by the City's attorney certifies only that the agreement has been signed after consulting with counsel.

FOR THE CITY OF PHILADELPHIA:

Howard M. Neukrug
Water Commissioner

David A. Katz
Deputy Water Commissioner

J. Barry Davis
Solicitor

FOR THE COMMONWEALTH OF PENNSYLVANIA, DEPARTMENT OF ENVIRONMENTAL PROTECTION:

Jenifer Fields
Regional Program Manager
Water Quality Protection

Adam Bram
Office of Chief Counsel
Assistant Counsel

APPENDIX A

APPENDIX B

ENVIRONMENTAL PROTECTION AGENCY

[FRL-4732-7]

Combined Sewer Overflow (CSO) Control Policy

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final policy.

SUMMARY: EPA has issued a national policy statement entitled "Combined Sewer Overflow (CSO) Control Policy." This policy establishes a consistent national approach for controlling discharges from CSOs to the Nation's waters through the National Pollutant Discharge Elimination System (NPDES) permit program.

FOR FURTHER INFORMATION CONTACT: Jeffrey Lape, Office of Wastewater Enforcement and Compliance, MC-4201, U.S. Environmental Protection Agency, 401 M Street SW., Washington, DC 20460, (202) 260-7361.

SUPPLEMENTARY INFORMATION: The main purposes of the CSO Control Policy are to elaborate on the Environmental Protection Agency's (EPA's) National CSO Control Strategy published on September 8, 1989, at 54 FR 37370, and to expedite compliance with the requirements of the Clean Water Act (CWA). While implementation of the 1989 Strategy has resulted in progress toward controlling CSOs, significant public health and water quality risks remain.

This Policy provides guidance to permittees with CSOs, NPDES authorities and State water quality standards authorities on coordinating the planning, selection, and implementation of CSO controls that meet the requirements of the CWA and allow for public involvement during the decision-making process.

Contained in the Policy are provisions for developing appropriate, site-specific NPDES permit requirements for all combined sewer systems (CSS) that overflow as a result of wet weather events. For example, the Policy lays out two alternative approaches—the "demonstration" and the "presumption" approaches—that provide communities with targets for CSO controls that achieve compliance with the Act, particularly protection of water quality and designated uses. The *Policy* also includes enforcement initiatives to require the immediate elimination of overflows that occur during dry weather and to ensure that he remaining CWA requirements are complied with as soon as practicable.

The permitting provisions of the Policy were developed as a result of extensive input received from key stakeholders during a negotiated policy dialogue. The CSO stakeholders included representatives from States, environmental groups, municipal organizations and others. The negotiated dialogue was conducted during the Summer of 1992 by the Office of Water and the Office of Water's Management Advisory Group. The enforcement initiatives, including one which is underway to address CSOs during dry weather, were developed by EPA's Office of Water and Office of Enforcement.

EPA issued a Notice of Availability on the draft CSO Control Policy on January 19, 1993, (58 FR 4994) and requested comments on the draft Policy by March 22, 1993. Approximately forty-one sets of written comments were submitted by a variety of interest groups including cities and municipal groups, environmental groups, States, professional organizations and others. All comments were considered as EPA prepared the Final Policy. The public comments were largely supportive of the draft Policy. EPA received broad endorsement of and support for the key principles and provisions from most commenters. Thus, this final Policy does not include significant changes to the major provisions of the draft Policy, but rather, it includes clarification and better explanation of the elements of the Policy to address several of the questions that were raised in the comments. Persons wishing to obtain copies of the public comments or EPA's summary analysis of the comments may write or call the EPA contact person.

The CSO Policy represents a comprehensive national strategy to ensure that municipalities, permitting authorities, water quality standards authorities and the public engage in a comprehensive and coordinated planning effort to achieve cost effective CSO controls that ultimately meet appropriate health and environmental objectives. The Policy recognizes the site-specific nature of CSOs and their impacts and provides the necessary flexibility to tailor controls to local situations. Major elements of the Policy ensure that CSO controls are cost effective and meet the objectives and requirements of the CWA.

The major provisions of the Policy are as follows.

CSO permittees should immediately undertake a process to accurately characterize their CSS and CSO discharges, demonstrate implementation of minimum technology-based controls identified in the Policy, and develop long-term CSO control plans which evaluate alternatives for attaining compliance with the CWA, including compliance with water quality standards and protection of designated uses. Once the long-term CSO control plans are completed, permittees will be responsible to implement the plans' recommendations as soon as practicable.

State water quality standards authorities will be involved in the long-term CSO control planning effort as well. The water quality standards authorities will help ensure that development of the CSO permittees' long-term CSO control plans are coordinated with the review and possible revision of water quality standards on CSO-impacted waters.

NPDES authorities will issue/reissue or modify permits, as appropriate, to require compliance with the technology-based and water quality-based requirements of the CWA. After completion of the long-term CSO control plan, NPDES permits will be reissued or modified to incorporate the additional requirements specified in the Policy, such as performance standards for the selected controls based on average design conditions, a post-construction water quality assessment program, monitoring for compliance with water quality standards, and a reopener clause authorizing the NPDES authority to reopen and modify the permit if it is determined that the CSO controls fail to meet water quality standards or protect designated uses. NPDES authorities should commence enforcement actions against permittees that have CWA violations due to CSO discharges during dry weather. In addition, NPDES authorities should ensure the implementation of the minimum technology-based controls and incorporate a schedule into an appropriate enforceable mechanism, with appropriate milestone dates, to implement the required long-term CSO control plan. Schedules for implementation of the long-term CSO control plan may be phased based on the relative importance of adverse impacts upon water quality standards and designated uses, and on a permittee's financial capability.

EPA is developing extensive guidance to support the Policy and will announce the availability of the guidances and other outreach efforts through various means, as they become available. For example, EPA is preparing guidance on the nine minimum controls, characterization and monitoring of CSOs, development of long-term CSO control plans, and financial capability.

Permittees will be expected to comply with any existing CSO-related requirements in NPDES permits,

onsent decrees or court orders unless evised to be consistent with this Policy.

The policy is organized as follows:

I. Introduction
A. Purpose and Principles
B. Application of Policy
C. Effect on Current CSO Control Efforts
D. Small System Considerations
E. Implementation Responsibilities
F. Policy Development
II. EPA Objectives for Permittees
A. Overview
B. Implementation of the Nine Minimum Controls
C. Long-Term CSO Control Plan
1. Characterization, Monitoring, and Modeling of the Combined Sewer Systems
2. Public Participation
3. Consideration of Sensitive Areas
4. Evaluation of Alternatives
5. Cost/Performance Consideration
6. Operational Plan
7. Maximizing Treatment at the Existing POTW Treatment Plant
8. Implementation Schedule
9. Post-Construction Compliance Monitoring Program
III. Coordination With State Water Quality Standards
A. Overview
B. Water Quality Standards Reviews
IV. Expectations for Permitting Authorities
A. Overview
B. NPDES Permit Requirements
1. Phase I Permits—Requirements for Demonstration of the Nine Minimum Controls and Development of the Long-Term CSO Control Plan
2. Phase II Permits—Requirements for Implementation of a Long-Term CSO Control Plan
3. Phasing Considerations
V. Enforcement and Compliance
A. Overview
B. Enforcement of CSO Dry Weather Discharge Prohibition
C. Enforcement of Wet Weather CSO Requirements
1. Enforcement for Compliance With Phase I Permits
2. Enforcement for Compliance With Phase II Permits
D. Penalties

List of Subjects in 40 CFR Part 122

Water pollution control.

Authority: Clean Water Act, 33 U.S.C. 1251 *et seq.*

Dated: April 8, 1994.

Carol M. Browner,

Administrator.

Combined Sewer Overflow (CSO) Control Policy

I. Introduction

A. Purpose and Principles

The main purposes of this Policy are to elaborate on EPA's National Combined Sewer Overflow (CSO) Control Strategy published on September 8, 1989 at 54 FR 37370 (1989 Strategy) and to expedite compliance with the requirements of the Clean Water Act (CWA). While implementation of the 1989 Strategy has resulted in progress toward controlling CSOs, significant water quality risks remain.

A combined sewer system (CSS) is a wastewater collection system owned by a State or municipality (as defined by section 502(4) of the CWA) which conveys sanitary wastewaters (domestic, commercial and industrial wastewaters) and storm water through a single-pipe system to a Publicly Owned Treatment Works (POTW) Treatment Plant (as defined in 40 CFR 403.3(p)). A CSO is the discharge from a CSS at a point prior to the POTW Treatment Plant. CSOs are point sources subject to NPDES permit requirements including both technology-based and water quality-based requirements of the CWA. CSOs are not subject to secondary treatment requirements applicable to POTWs.

CSOs consist of mixtures of domestic sewage, industrial and commercial wastewaters, and storm water runoff. CSOs often contain high levels of suspended solids, pathogenic microorganisms, toxic pollutants, floatables, nutrients, oxygen-demanding organic compounds, oil and grease, and other pollutants. CSOs can cause exceedances of water quality standards (WQS). Such exceedances may pose risks to human health, threaten aquatic life and its habitat, and impair the use and enjoyment of the Nation's waterways.

This Policy is intended to provide guidance to permittees with CSOs, National Pollutant Discharge Elimination System (NPDES) permitting authorities, State water quality standards authorities and enforcement authorities. The purpose of the Policy is to coordinate the planning, selection, design and implementation of CSO management practices and controls to meet the requirements of the CWA and to involve the public fully during the decision making process.

This Policy reiterates the objectives of the 1989 Strategy:

1. To ensure that if CSOs occur, they are only as a result of wet weather;
2. To bring all wet weather CSO discharge points into compliance with the technology-based and water quality-based requirements of the CWA; and
3. To minimize water quality, aquatic biota, and human health impacts from CSOs.

This CSO Control Policy represents a comprehensive national strategy to ensure that municipalities, permitting authorities, water quality standards authorities and the public engage in a comprehensive and coordinated planning effort to achieve cost-effective CSO controls that ultimately meet appropriate health and environmental objectives and requirements. The Policy recognizes the site-specific nature of CSOs and their impacts and provides the necessary flexibility to tailor controls to local situations. Four key principles of the Policy ensure that CSO controls are cost-effective and meet the objectives of the CWA. The key principles are:

1. Providing clear levels of control that would be presumed to meet appropriate health and environmental objectives;
2. Providing sufficient flexibility to municipalities, especially financially disadvantaged communities, to consider the site-specific nature of CSOs and to determine the most cost-effective means of reducing pollutants and meeting CWA objectives and requirements;
3. Allowing a phased approach to implementation of CSO controls considering a community's financial capability; and
4. Review and revision, as appropriate, of water quality standards and their implementation procedures when developing CSO control plans to reflect the site-specific wet weather impacts of CSOs.

This Policy is being issued in support of EPA's regulations and policy initiatives. This Policy is Agency guidance only and does not establish or affect legal rights or obligations. It does not establish a binding norm and is not finally determinative of the issues addressed. Agency decisions in any particular case will be made by applying the law and regulations on the basis of specific facts when permits are issued. The Administration has recommended that the 1994 amendments to the CWA endorse this final Policy.

B. Application of Policy

The permitting provisions of this Policy apply to all CSSs that overflow as a result of storm water flow, including snow melt runoff (40 CFR 122.26(b)(13)). Discharges from CSSs during dry weather are prohibited by the CWA. Accordingly, the permitting provisions of this Policy do not apply to CSOs during dry weather. Dry weather flow is the flow in a combined sewer that results from domestic sewage, groundwater infiltration, commercial and industrial wastewaters, and any other non-precipitation related flows (e.g., tidal infiltration). In addition to

'he permitting provisions, the nforcement and Compliance section of .nis Policy describes an enforcement initiative being developed for overflows that occur during dry weather.

Consistent with the 1989 Strategy, 30 States that submitted CSO permitting strategies have received EPA approval or, in the case of one State, conditional approval of its strategy. States and EPA Regional Offices should review these strategies and negotiate appropriate revisions to them to implement this Policy. Permitting authorities are encouraged to evaluate water pollution control needs on a watershed management basis and coordinate CSO control efforts with other point and nonpoint source control activities.

C. Effect on Current CSO Control Efforts

EPA recognizes that extensive work has been done by many Regions, States, and municipalities to abate CSOs. As such, portions of this Policy may already have been addressed by permittees' previous efforts to control CSOs. Therefore, portions of this Policy may not apply, as determined by the permitting authority on a case-by-case basis, under the following circumstances:

1. Any permittee that, on the date of ublication of this final Policy, has .ompleted or substantially completed construction of CSO control facilities that are designed to meet WQS and protect designated uses, and where it has been determined that WQS are being or will be attained, is not covered by the initial planning and construction provisions in this Policy; however, the operational plan and post-construction monitoring provisions continue to apply. If, after monitoring, it is determined that WQS are not being attained, the permittee should be required to submit a revised CSO control plan that, once implemented, will attain WQS.

2. Any permittee that, on the date of publication of this final Policy, has substantially developed or is implementing a CSO control program pursuant to an existing permit or enforcement order, and such program is considered by the NPDES permitting authority to be adequate to meet WQS and protect designated uses and is reasonably equivalent to the treatment objectives of this Policy, should complete those facilities without further planning activities otherwise expected by this Policy. Such programs, however, should be reviewed and modified to be onsistent with the sensitive area, financial capability, and post-construction monitoring provisions of this Policy.

3. Any permittee that has previously constructed CSO control facilities in an effort to comply with WQS but has failed to meet such applicable standards or to protect designated uses due to remaining CSOs may receive consideration for such efforts in future permits or enforceable orders for long-term CSO control planning, design and implementation.

In the case of any ongoing or substantially completed CSO control effort, the NPDES permit or other enforceable mechanism, as appropriate, should be revised to include all appropriate permit requirements consistent with Section IV.B. of this Policy.

D. Small System Considerations

The scope of the long-term CSO control plan, including the characterization, monitoring and modeling, and evaluation of alternatives portions of this Policy may be difficult for some small CSSs. At the discretion of the NPDES Authority, jurisdictions with populations under 75,000 may not need to complete each of the formal steps outlined in Section II.C. of this Policy, but should be required through their permits or other enforceable mechanisms to comply with the nine minimum controls (II.B), public participation (II.C.2), and sensitive areas (II.C.3) portions of this Policy. In addition, the permittee may propose to implement any of the criteria contained in this Policy for evaluation of alternatives described in II.C.4. Following approval of the proposed plan, such jurisdictions should construct the control projects and propose a monitoring program sufficient to determine whether WQS are attained and designated uses are protected.

In developing long-term CSO control plans based on the small system considerations discussed in the preceding paragraph, permittees are encouraged to discuss the scope of their long-term CSO control plan with the WQS authority and the NPDES authority. These discussions will ensure that the plan includes sufficient information to enable the permitting authority to identify the appropriate CSO controls.

E. Implementation Responsibilities

NPDES authorities (authorized States or EPA Regional Offices, as appropriate) are responsible for implementing this Policy. It is their responsibility to assure that CSO permittees develop long-term CSO control plans and that NPDES permits meet the requirements of the CWA. Further, they are responsible for coordinating the review of the long-term CSO control plan and the development of the permit with the WQS authority to determine if revisions to the WQS are appropriate. In addition, they should determine the appropriate vehicle (i.e., permit reissuance, information request under CWA section 308 or State equivalent or enforcement action) to ensure that compliance with the CWA is achieved as soon as practicable.

Permittees are responsible for documenting the implementation of the nine minimum controls and developing and implementing a long-term CSO control plan, as described in this Policy. EPA recognizes that financial considerations are a major factor affecting the implementation of CSO controls. For that reason, this Policy allows consideration of a permittee's financial capability in connection with the long-term CSO control planning effort, WQS review, and negotiation of enforceable schedules. However, each permittee is ultimately responsible for aggressively pursuing financial arrangements for the implementation of its long-term CSO control plan. As part of this effort, communities should apply to their State Revolving Fund program, or other assistance programs as appropriate, for financial assistance.

EPA and the States will undertake action to assure that all permittees with CSSs are subject to a consistent review in the permit development process, have permit requirements that achieve compliance with the CWA, and are subject to enforceable schedules that require the earliest practicable compliance date considering physical and financial feasibility.

F. Policy Development

This Policy devotes a separate section to each step involved in developing and implementing CSO controls. This is not to imply that each function occurs separately. Rather, the entire process surrounding CSO controls, community planning, WQS and permit development/revision, enforcement/compliance actions and public participation must be coordinated to control CSOs effectively. Permittees and permitting authorities are encouraged to consider innovative and alternative approaches and technologies that achieve the objectives of this Policy and the CWA.

In developing this Policy, EPA has included information on what responsible parties are expected to accomplish. Subsequent documents will provide additional guidance on how the objectives of this Policy should be met. These documents will provide further guidance on: CSO permit writing, the nine minimum controls, long-term CSO

control plans, financial capability, sewer system characterization and receiving water monitoring and modeling, and application of WQS to CSO-impacted waters. For most CSO control efforts however, sufficient detail has been included in this Policy to begin immediate implementation of its provisions.

II. EPA Objectives for Permittees

A. Overview

Permittees with CSSs that have CSOs should immediately undertake a process to accurately characterize their sewer systems, to demonstrate implementation of the nine minimum controls, and to develop a long-term CSO control plan.

B. Implementation of the Nine Minimum Controls

Permittees with CSOs should submit appropriate documentation demonstrating implementation of the nine minimum controls, including any proposed schedules for completing minor construction activities. The nine minimum controls are:

1. Proper operation and regular maintenance programs for the sewer system and the CSOs;
2. Maximum use of the collection system for storage;
3. Review and modification of pretreatment requirements to assure CSO impacts are minimized;
4. Maximization of flow to the POTW for treatment;
5. Prohibition of CSOs during dry weather;
6. Control of solid and floatable materials in CSOs;
7. Pollution prevention;
8. Public notification to ensure that the public receives adequate notification of CSO occurrences and CSO impacts; and
9. Monitoring to effectively characterize CSO impacts and the efficacy of CSO controls.

Selection and implementation of actual control measures should be based on site-specific considerations including the specific CSS's characteristics discussed under the sewer system characterization and monitoring portions of this Policy. Documentation of the nine minimum controls may include operation and maintenance plans, revised sewer use ordinances for industrial users, sewer system inspection reports, infiltration/inflow studies, pollution prevention programs, public notification plans, and facility plans for maximizing the capacities of the existing collection, storage and treatment systems, as well as contracts and schedules for minor construction programs for improving the existing system's operation. The permittee should also submit any information or data on the degree to which the nine minimum controls achieve compliance with water quality standards. These data and information should include results made available through monitoring and modeling activities done in conjunction with the development of the long-term CSO control plan described in this Policy.

This documentation should be submitted as soon as practicable, but no later than two years after the requirement to submit such documentation is included in an NPDES permit or other enforceable mechanism. Implementation of the nine minimum controls with appropriate documentation should be completed as soon as practicable but no later than January 1, 1997. These dates should be included in an appropriate enforceable mechanism.

Because the CWA requires immediate compliance with technology-based controls (section 301(b)), which on a Best Professional Judgment basis should include the nine minimum controls, a compliance schedule for implementing the nine minimum controls, if necessary, should be included in an appropriate enforceable mechanism.

C. Long-Term CSO Control Plan

Permittees with CSOs are responsible for developing and implementing long-term CSO control plans that will ultimately result in compliance with the requirements of the CWA. The long-term plans should consider the site-specific nature of CSOs and evaluate the cost effectiveness of a range of control options/strategies. The development of the long-term CSO control plan and its subsequent implementation should also be coordinated with the NPDES authority and the State authority responsible for reviewing and revising the State's WQS. The selected controls should be designed to allow cost effective expansion or cost effective retrofitting if additional controls are subsequently determined to be necessary to meet WQS, including existing and designated uses.

This policy identifies EPA's major objectives for the long-term CSO control plan. Permittees should develop and submit this long-term CSO control plan as soon as practicable, but generally within two years after the date of the NPDES permit provision, Section 308 information request, or enforcement action requiring the permittee to develop the plan. NPDES authorities may establish a longer timetable for completion of the long-term CSO control plan on a case-by-case basis to account for site-specific factors which may influence the complexity of the planning process. Once agreed upon, these dates should be included in an appropriate enforceable mechanism.

EPA expects each long-term CSO control plan to utilize appropriate information to address the following minimum elements. The Plan should also include both fixed-date project implementation schedules (which may be phased) and a financing plan to design and construct the project as soon as practicable. The minimum elements of the long-term CSO control plan are described below.

1. Characterization, Monitoring, and Modeling of the Combined Sewer System

In order to design a CSO control plan adequate to meet the requirements of the CWA, a permittee should have a thorough understanding of its sewer system, the response of the system to various precipitation events, the characteristics of the overflows, and the water quality impacts that result from CSOs. The permittee should adequately characterize through monitoring, modeling, and other means as appropriate, for a range of storm events, the response of its sewer system to wet weather events including the number, location and frequency of CSOs, volume, concentration and mass of pollutants discharged and the impacts of the CSOs on the receiving waters and their designated uses. The permittee may need to consider information on the contribution and importance of other pollution sources in order to develop a final plan designed to meet water quality standards. The purpose of the system characterization, monitoring and modeling program initially is to assist the permittee in developing appropriate measures to implement the nine minimum controls and, if necessary, to support development of the long-term CSO control plan. The monitoring and modeling data also will be used to evaluate the expected effectiveness of both the nine minimum controls and, if necessary, the long-term CSO controls, to meet WQS.

The major elements of a sewer system characterization are described below.

a. Rainfall Records—The permittee should examine the complete rainfall record for the geographic area of its existing CSS using sound statistical procedures and best available data. The permittee should evaluate flow variations in the receiving water body to correlate between CSOs and receiving water conditions.

b. Combined Sewer System Characterization—The permittee should evaluate the nature and extent of its sewer system through evaluation of available sewer system records, field inspections and other activities necessary to understand the number, location and frequency of overflows and their location relative to sensitive areas and to pollution sources in the collection system, such as indirect significant industrial users.

c. CSO Monitoring—The permittee should develop a comprehensive, representative monitoring program that measures the frequency, duration, flow rate, volume and pollutant concentration of CSO discharges and assesses the impact of the CSOs on the receiving waters. The monitoring program should include necessary CSO effluent and ambient in-stream monitoring and, where appropriate, other monitoring protocols such as biological assessment, toxicity testing and sediment sampling. Monitoring parameters should include, for example, oxygen demanding pollutants, nutrients, toxic pollutants, sediment contaminants, pathogens, bacteriological indicators (e.g., Enterococcus, E. Coli), and toxicity. A representative sample of overflow points can be selected that is sufficient to allow characterization of CSO discharges and their water quality impacts and to facilitate evaluation of control plan alternatives.

d. Modeling—Modeling of a sewer system is recognized as a valuable tool for predicting sewer system response to various wet weather events and assessing water quality impacts when evaluating different control strategies and alternatives. EPA supports the proper and effective use of models, where appropriate, in the evaluation of the nine minimum controls and the development of the long-term CSO control plan. It is also recognized that there are many models which may be used to do this. These models range from simple to complex. Having decided to use a model, the permittee should base its choice of a model on the characteristics of its sewer system, the number and location of overflow points, and the sensitivity of the receiving water body to the CSO discharges. Use of models should include appropriate calibration and verification with field measurements. The sophistication of the model should relate to the complexity of the system to be modeled and to the information needs associated with evaluation of CSO control options and water quality impacts. EPA believes that continuous simulation models, using historical rainfall data, may be the best way to model sewer systems, CSOs, and their impacts. Because of the iterative nature of modeling sewer systems, CSOs, and their impacts, monitoring and modeling efforts are complementary and should be coordinated.

2. Public Participation

In developing its long-term CSO control plan, the permittee will employ a public participation process that actively involves the affected public in the decision-making to select the long-term CSO controls. The affected public includes rate payers, industrial users of the sewer system, persons who reside downstream from the CSOs, persons who use and enjoy these downstream waters, and any other interested persons.

3. Consideration of Sensitive Areas

EPA expects a permittee's long-term CSO control plan to give the highest priority to controlling overflows to sensitive areas. Sensitive areas, as determined by the NPDES authority in coordination with State and Federal agencies, as appropriate, include designated Outstanding National Resource Waters, National Marine Sanctuaries, waters with threatened or endangered species and their habitat, waters with primary contact recreation, public drinking water intakes or their designated protection areas, and shellfish beds. For such areas, the long-term CSO control plan should:

a. Prohibit new or significantly increased overflows;

b. i. Eliminate or relocate overflows that discharge to sensitive areas wherever physically possible and economically achievable, except where elimination or relocation would provide less environmental protection than additional treatment; or

ii. Where elimination or relocation is not physically possible and economically achievable, or would provide less environmental protection than additional treatment, provide the level of treatment for remaining overflows deemed necessary to meet WQS for full protection of existing and designated uses. In any event, the level of control should not be less than those described in Evaluation of Alternatives below; and

c. Where elimination or relocation has been proven not to be physically possible and economically achievable, permitting authorities should require, for each subsequent permit term, a reassessment based on new or improved techniques to eliminate or relocate, or on changed circumstances that influence economic achievability.

4. Evaluation of Alternatives

EPA expects the long-term CSO control plan to consider a reasonable range of alternatives. The plan should, for example, evaluate controls that would be necessary to achieve zero overflow events per year, an average of one to three, four to seven, and eight to twelve overflow events per year. Alternatively, the long-term plan could evaluate controls that achieve 100% capture, 90% capture, 85% capture, 80% capture, and 75% capture for treatment. The long-term control plan should also consider expansion of POTW secondary and primary capacity in the CSO abatement alternative analysis. The analysis of alternatives should be sufficient to make a reasonable assessment of cost and performance as described in Section II.C.5. Because the final long-term CSO control plan will become the basis for NPDES permit limits and requirements, the selected controls should be sufficient to meet CWA requirements.

In addition to considering sensitive areas, the long-term CSO control plan should adopt one of the following approaches:

a. "Presumption" Approach

A program that meets any of the criteria listed below would be presumed to provide an adequate level of control to meet the water quality-based requirements of the CWA, provided the permitting authority determines that such presumption is reasonable in light of the data and analysis conducted in the characterization, monitoring, and modeling of the system and the consideration of sensitive areas described above. These criteria are provided because data and modeling of wet weather events often do not give a clear picture of the level of CSO controls necessary to protect WQS.

i. No more than an average of four overflow events per year, provided that the permitting authority may allow up to two additional overflow events per year. For the purpose of this criterion, an overflow event is one or more overflows from a CSS as the result of a precipitation event that does not receive the minimum treatment specified below; or

ii. The elimination or the capture for treatment of no less than 85% by volume of the combined sewage collected in the CSS during precipitation events on a system-wide annual average basis; or

iii. The elimination or removal of no less than the mass of the pollutants, identified as causing water quality impairment through the sewer system

haracterization, monitoring, and odeling effort, for the volumes that would be eliminated or captured for treatment under paragraph ii. above. Combined sewer flows remaining after implementation of the nine minimum controls and within the criteria specified at II.C.4.a.i or ii, should receive a minimum of:

- Primary clarification (Removal of floatables and settleable solids may be achieved by any combination of treatment technologies or methods that are shown to be equivalent to primary clarification.);
- Solids and floatables disposal; and
- Disinfection of effluent, if necessary, to meet WQS, protect designated uses and protect human health, including removal of harmful disinfection chemical residuals, where necessary.

b. "Demonstration" Approach

A permittee may demonstrate that a selected control program, though not meeting the criteria specified in II.C.4.a. above is adequate to meet the water quality-based requirements of the CWA. To be a successful demonstration, the permittee should demonstrate each of the following:

i. The planned control program is adequate to meet WQS and protect designated uses, unless WQS or uses cannot be met as a result of natural background conditions or pollution sources other than CSOs;

ii. The CSO discharges remaining after implementation of the planned control program will not preclude the attainment of WQS or the receiving waters' designated uses or contribute to their impairment. Where WQS and designated uses are not met in part because of natural background conditions or pollution sources other than CSOs, a total maximum daily load, including a wasteload allocation and a load allocation, or other means should be used to apportion pollutant loads;

iii. The planned control program will provide the maximum pollution reduction benefits reasonably attainable; and

iv. The planned control program is designed to allow cost effective expansion or cost effective retrofitting if additional controls are subsequently determined to be necessary to meet WQS or designated uses.

5. Cost/Performance Considerations

The permittee should develop appropriate cost/performance curves to demonstrate the relationships among a comprehensive set of reasonable control alternatives that correspond to the different ranges specified in Section II.C.4. This should include an analysis to determine where the increment of pollution reduction achieved in the receiving water diminishes compared to the increased costs. This analysis, often known as knee of the curve, should be among the considerations used to help guide selection of controls.

6. Operational Plan

After agreement between the permittee and NPDES authority on the necessary CSO controls to be implemented under the long-term CSO control plan, the permittee should revise the operation and maintenance program developed as part of the nine minimum controls to include the agreed-upon long-term CSO controls. The revised operation and maintenance program should maximize the removal of pollutants during and after each precipitation event using all available facilities within the collection and treatment system. For any flows in excess of the criteria specified at II.C.4.a.i., ii. or iii and not receiving the treatment specified in II.C.4.a, the operational plan should ensure that such flows receive treatment to the greatest extent practicable.

7. Maximizing Treatment at the Existing POTW Treatment Plant

In some communities, POTW treatment plants may have primary treatment capacity in excess of their secondary treatment capacity. One effective strategy to abate pollution resulting from CSOs is to maximize the delivery of flows during wet weather to the POTW treatment plant for treatment. Delivering these flows can have two significant water quality benefits: First, increased flows during wet weather to the POTW treatment plant may enable the permittee to eliminate or minimize overflows to sensitive areas; second, this would maximize the use of available POTW facilities for wet weather flows and would ensure that combined sewer flows receive at least primary treatment prior to discharge.

Under EPA regulations, the intentional diversion of waste streams from any portion of a treatment facility, including secondary treatment, is a bypass. EPA bypass regulations at 40 CFR 122.41(m) allow for a facility to bypass some or all the flow from its treatment process under specified limited circumstances. Under the regulation, the permittee must show that the bypass was unavoidable to prevent loss of life, personal injury or severe property damage, that there was no feasible alternative to the bypass and that the permittee submitted the required notices. In addition, the regulation provides that a bypass may be approved only after consideration of adverse effects.

Normally, it is the responsibility of the permittee to document, on a case-by-base basis, compliance with 40 CFR 122.41(m) in order to bypass flows legally. For some CSO-related permits, the study of feasible alternatives in the control plan may provide sufficient support for the permit record and for approval of a CSO-related bypass in the permit itself, and to define the specific parameters under which a bypass can legally occur. For approval of a CSO-related bypass, the long-term CSO control plan, at a minimum, should provide justification for the cut-off point at which the flow will be diverted from the secondary treatment portion of the treatment plant, and provide a benefit-cost analysis demonstrating that conveyance of wet weather flow to the POTW for primary treatment is more beneficial than other CSO abatement alternatives such as storage and pump back for secondary treatment, sewer separation, or satellite treatment. Such a permit must define under what specific wet weather conditions a CSO-related bypass is allowed and also specify what treatment or what monitoring, and effluent limitations and requirements apply to the bypass flow. The permit should also provide that approval for the CSO-related bypass will be reviewed and may be modified or terminated if there is a substantial increase in the volume or character of pollutants being introduced to the POTW. The CSO-related bypass provision in the permit should also make it clear that all wet weather flows passing the headworks of the POTW treatment plant will receive at least primary clarification and solids and floatables removal and disposal, and disinfection, where necessary, and any other treatment that can reasonably be provided.

Under this approach, EPA would allow a permit to authorize a CSO-related bypass of the secondary treatment portion of the POTW treatment plant for combined sewer flows in certain identified circumstances. This provision would apply only to those situations where the POTW would ordinarily meet the requirements of 40 CFR 122.41(m) as evaluated on a case-by-case basis. Therefore, there must be sufficient data in the administrative record (reflected in the permit fact sheet or statement of basis) supporting all the requirements in 40 CFR 122.41(m)(4) for approval of an anticipated bypass.

For the purposes of applying this regulation to CSO permittees, "severe property damage" could include

situations where flows above a certain level wash out the POTW's secondary treatment system. EPA further believes that the feasible alternatives requirement of the regulation can be met if the record shows that the secondary treatment system is properly operated and maintained, that the system has been designed to meet secondary limits for flows greater than the peak dry weather flow, plus an appropriate quantity of wet weather flow, and that it is either technically or financially infeasible to provide secondary treatment at the existing facilities for greater amounts of wet weather flow. The feasible alternative analysis should include, for example, consideration of enhanced primary treatment (e.g., chemical addition) and non-biological secondary treatment. Other bases supporting a finding of no feasible alternative may also be available on a case-by-case basis. As part of its consideration of possible adverse effects resulting from the bypass, the permitting authority should also ensure that the bypass will not cause exceedances of WQS.

This Policy does not address the appropriateness of approving anticipated bypasses through NPDES permits in advance outside the CSO context.

8. Implementation Schedule

The permittee should include all pertinent information in the long term control plan necessary to develop the construction and financing schedule for implementation of CSO controls. Schedules for implementation of the CSO controls may be phased based on the relative importance of adverse impacts upon WQS and designated uses, priority projects identified in the long-term plan, and on a permittee's financial capability.

Construction phasing should consider:

a. Eliminating overflows that discharge to sensitive areas as the highest priority;

b. Use impairment;

c. The permittee's financial capability including consideration of such factors as:

i. Median household income;

ii. Total annual wastewater and CSO control costs per household as a percent of median household income;

iii. Overall net debt as a percent of full market property value;

iv. Property tax revenues as a percent of full market property value;

v. Property tax collection rate;

vi. Unemployment; and

vii. Bond rating;

d. Grant and loan availability;

e. Previous and current residential, commercial and industrial sewer user fees and rate structures; and

f. Other viable funding mechanisms and sources of financing.

9. Post-Construction Compliance Monitoring Program

The selected CSO controls should include a post-construction water quality monitoring program adequate to verify compliance with water quality standards and protection of designated uses as well as to ascertain the effectiveness of CSO controls. This water quality compliance monitoring program should include a plan to be approved by the NPDES authority that details the monitoring protocols to be followed, including the necessary effluent and ambient monitoring and, where appropriate, other monitoring protocols such as biological assessments, whole effluent toxicity testing, and sediment sampling.

III. Coordination With State Water Quality Standards

A. Overview

WQS are State adopted, or Federally promulgated rules which serve as the goals for the water body and the legal basis for the water quality-based NPDES permit requirements under the CWA. WQS consist of uses which States designate for their water bodies, criteria to protect the uses, an anti-degradation policy to protect the water quality improvements gained and other policies affecting the implementation of the standards. A primary objective of the long-term CSO control plan is to meet WQS, including the designated uses through reducing risks to human health and the environment by eliminating, relocating or controlling CSOs to the affected waters.

State WQS authorities, NPDES authorities, EPA regional offices, permittees, and the public should meet early and frequently throughout the long-term CSO control planning process. Development of the long-term plan should be coordinated with the review and appropriate revision of WQS and implementation procedures on CSO-impacted waters to ensure that the long-term controls will be sufficient to meet water quality standards. As part of these meetings, participants should agree on the data, information and analyses needed to support the development of the long-term CSO control plan and the review of applicable WQS, and implementation procedures, if appropriate. Agreements should be reached on the monitoring protocols and models that will be used to evaluate the water quality impacts of the overflows, to analyze the attainability of the WQS and to determine the water quality-based requirements for the permit. Many opportunities exist for permittees and States to share information as control programs are developed and as WQS are reviewed. Such information should assist States in determining the need for revisions to WQS and implementation procedures to better reflect the site-specific wet weather impacts of CSOs. Coordinating the development of the long-term CSO control plan and the review of the WQS and implementation procedures provides greater assurance that the long-term control plan selected and the limits and requirements included in the NPDES permit will be sufficient to meet WQS and to comply with sections 301(b)(1)(C) and 402(a)(2) of the CWA.

EPA encourages States and permittees jointly to sponsor workshops for the affected public in the development of the long-term CSO control plan and during the development of appropriate revisions to WQS for CSO-impacted waters. Workshops provide a forum for including the public in discussions of the implications of the proposed long-term CSO control plan on the water quality and uses for the receiving water.

B. Water Quality Standards Reviews

The CWA requires States to periodically, but at least once every three years, hold public hearings for the purpose of reviewing applicable water quality standards and, as appropriate, modifying and adopting standards. States must provide the public an opportunity to comment on any proposed revision to water quality standards and all revisions must be submitted to EPA for review and approval.

EPA regulations and guidance provide States with the flexibility to adapt their WQS, and implementation procedures to reflect site-specific conditions including those related to CSOs. For example, a State may adopt site-specific criteria for a particular pollutant if the State determines that the site-specific criteria fully protects the designated use (40 CFR 131.11). In addition, the regulations at 40 CFR 131.10(g), (h), and (j) specify when and how a designated use may be modified. A State may remove a designated use from its water quality standards only if the designated use is not an existing use. An existing use is a use actually attained in the water body on or after November 28, 1975. Furthermore, a State may not remove a designated use that will be attained by implementing the

technology-based effluent limits required under sections 301(b) and 306 of the CWA and by implementing cost-effective and reasonable best management practices for nonpoint source controls. Thus, if a State has a reasonable basis to determine that the current designated use could be attained after implementation of the technology-based controls of the CWA, then the use could not be removed.

In determining whether a use is attainable and prior to removing a designated use, States must conduct and submit to EPA a use attainability analysis. A use attainability analysis is a structured scientific assessment of the factors affecting the use, including the physical, chemical, biological, and economic factors described in 40 CFR 131.10(g). As part of the analysis, States should evaluate whether the designated use could be attained if CSO controls were implemented. For example, States should examine if sediment loadings from CSOs could be reduced so as not to bury spawning beds, or if biochemical oxygen demanding material in the effluent or the toxicity of the effluent could be corrected so as to reduce the acute or chronic physiological stress on or bioaccumulation potential of aquatic organisms.

In reviewing the attainability of their WQS and the applicability of their implementation procedures to CSO-impacted waters, States are encouraged to define more explicitly their recreational and aquatic life uses and then, if appropriate, modify the criteria accordingly to protect the designated uses.

Another option is for States to adopt partial uses by defining when primary contact recreation such as swimming does not exist, such as during certain seasons of the year in northern climates or during a particular type of storm event. In making such adjustments to their uses, States must ensure that downstream uses are protected, and that during other seasons or after the storm event has passed, the use is fully protected.

In addition to defining recreational uses with greater specificity, States are also encouraged to define the aquatic uses more precisely. Rather than "aquatic life use protection," States should consider defining the type of fishery to be protected such as a cold water fishery (e.g., trout or salmon) or a warm weather fishery (e.g., bluegill or large mouth bass). Explicitly defining the type of fishery to be protected may assist the permittee in enlisting the support of citizens for a CSO control plan.

A water quality standard variance may be appropriate, in limited circumstances on CSO-impacted waters, where the State is uncertain as to whether a standard can be attained and time is needed for the State to conduct additional analyses on the attainability of the standard. Variances are short-term modifications in water quality standards. Subject to EPA approval, States, with their own statutory authority, may grant a variance to a specific discharger for a specific pollutant. The justification for a variance is similar to that required for a permanent change in the standard, although the showings needed are less rigorous. Variances are also subject to public participation requirements of the water quality standards and permits programs and are reviewable generally every three years. A variance allows the CSO permit to be written to meet the "modified" water quality standard as analyses are conducted and as progress is made to improve water quality.

Justifications for variances are the same as those identified in 40 CFR 131.10(g) for modifications in uses. States must provide an opportunity for public review and comment on all variances. If States use the permit as the vehicle to grant the variance, notice of the permit must clearly state that the variance modifies the State's water quality standards. If the variance is approved, the State appends the variance to the State's standards and reviews the variance every three years.

IV. Expectations for Permitting Authorities

A. Overview

CSOs are point sources subject to NPDES permit requirements including both technology-based and water quality-based requirements of the CWA. CSOs are not subject to secondary treatment regulations applicable to publicly owned treatment works (*Montgomery Environmental Coalition vs. Costle*, 646 F.2d 568 (D.C. Cir. 1980)).

All permits for CSOs should require the nine minimum controls as a minimum best available technology economically achievable and best conventional technology (BAT/BCT) established on a best professional judgment (BPJ) basis by the permitting authority (40 CFR 125.3). Water quality-based requirements are to be established based on applicable water quality standards.

This policy establishes a uniform, nationally consistent approach to developing and issuing NPDES permits to permittees with CSOs. Permits for CSOs should be developed and issued expeditiously. A single, system-wide permit generally should be issued for all discharges, including CSOs, from a CSS operated by a single authority. When different parts of a single CSS are operated by more than one authority, permits issued to each authority should generally require joint preparation and implementation of the elements of this Policy and should specifically define the responsibilities and duties of each authority. Permittees should be required to coordinate system-wide implementation of the nine minimum controls and the development and implementation of the long-term CSO control plan.

The individual authorities are responsible for their own discharges and should cooperate with the permittee for the POTW receiving the flows from the CSS. When a CSO is permitted separately from the POTW, both permits should be cross-referenced for informational purposes.

EPA Regions and States should review the CSO permitting priorities established in the State CSO Permitting Strategies developed in response to the 1989 Strategy. Regions and States may elect to revise these previous priorities. In setting permitting priorities, Regions and States should not just focus on those permittees that have initiated monitoring programs. When setting priorities, Regions and States should consider, for example, the known or potential impact of CSOs on sensitive areas, and the extent of upstream industrial user discharges to the CSS.

During the permittee's development of the long-term CSO control plan, the permit writer should promote coordination between the permittee and State WQS authority in connection with possible WQS revisions. Once the permittee has completed development of the long-term CSO control plan and has coordinated with the permitting authority the selection of the controls necessary to meet the requirements of the CWA, the permitting authority should include in an appropriate enforceable mechanism, requirements for implementation of the long-term CSO control plan, including conditions for water quality monitoring and operation and maintenance.

B. NPDES Permit Requirements

Following are the major elements of NPDES permits to implement this Policy and ensure protection of water quality.

1. Phase I Permits—Requirements for Demonstration of Implementation of the Nine Minimum Controls and Development of the Long-Term CSO Control Plan

In the Phase I permit issued/modified to reflect this Policy, the NPDES authority should at least require permittees to:

a. Immediately implement BAT/BCT, which at a minimum includes the nine minimum controls, as determined on a BPJ basis by the permitting authority;

b. Develop and submit a report documenting the implementation of the nine minimum controls within two years of permit issuance/modification;

c. Comply with applicable WQS, no later than the date allowed under the State's WQS, expressed in the form of a narrative limitation; and

d. develop and submit, consistent with this Policy and based on a schedule in an appropriate enforceable mechanism, a long-term CSO control plan as soon as practicable, but generally within two years after the effective date of the permit issuance/modification. However, permitting authorities may establish a longer timetable for completion of the long-term CSO control plan on a case-by-case basis to account for site-specific factors that may influence the complexity of the planning process.

The NPDES authority should include compliance dates on the fastest practicable schedule for each of the nine minimum controls in an appropriate enforceable mechanism issued in conjunction with the Phase I permit. The use of enforceable orders is necessary unless Congress amends the CWA. All orders should require compliance with the nine minimum controls no later than January 1, 1997.

2. Phase II Permits—Requirements for Implementation of a Long-Term CSO Control Plan

Once the permittee has completed development of the long-term CSO control plan and the selection of the controls necessary to meet CWA requirements has been coordinated with the permitting and WQS authorities, the permitting authority should include, in an appropriate enforceable mechanism, requirements for implementation of the long-term CSO control plan as soon as practicable. Where the permittee has selected controls based on the "presumption" approach described in Section II.C.4, the permitting authority must have determined that the presumption that such level of treatment will achieve water quality standards is reasonable in light of the data and analysis conducted under this Policy. The Phase II permit should contain:

a. Requirements to implement the technology-based controls including the nine minimum controls determined on a BPJ basis;

b. Narrative requirements which insure that the selected CSO controls are implemented, operated and maintained as described in the long-term CSO control plan;

c. Water quality-based effluent limits under 40 CFR 122.44(d)(1) and 122.44(k), requiring, at a minimum, compliance with, no later than the date allowed under the State's WQS, the numeric performance standards for the selected CSO controls, based on average design conditions specifying at least one of the following:

i. A maximum number of overflow events per year for specified design conditions consistent with II.C.4.a.i; or

ii. A minimum percentage capture of combined sewage by volume for treatment under specified design conditions consistent with II.C.4.a.ii; or

iii. A minimum removal of the mass of pollutants discharged for specified design conditions consistent with II.C.4.a.iii; or

iv. performance standards and requirements that are consistent with II.C.4.b. of the Policy.

d. A requirement to implement, with an established schedule, the approved post-construction water quality assessment program including requirements to monitor and collect sufficient information to demonstrate compliance with WQS and protection of designated uses as well as to determine the effectiveness of CSO controls.

e. A requirement to reassess overflows to sensitive areas in those cases where elimination or relocation of the overflows is not physically possible and economically achievable. The reassessment should be based on consideration of new or improved techniques to eliminate or relocate overflows or changed circumstances that influence economic achievability;

f. Conditions establishing requirements for maximizing the treatment of wet weather flows at the POTW treatment plant, as appropriate, consistent with Section II.C.7. of this Policy;

g. A reopener clause authorizing the NPDES authority to reopen and modify the permit upon determination that the CSO controls fail to meet WQS or protect designated uses. Upon such determination, the NPDES authority should promptly notify the permittee and proceed to modify or reissue the permit. The permittee should be required to develop, submit and implement, as soon as practicable, a revised CSO control plan which contains additional controls to meet WQS and designated uses. If the initial CSO control plan was approved under the demonstration provision of Section II.C.4.b., the revised plan, at a minimum, should provide for controls that satisfy one of the criteria in Section II.C.4.a. unless the permittee demonstrates that the revised plan is clearly adequate to meet WQS at a lower cost and it is shown that the additional controls resulting from the criteria in Section II.C.4.a. will not result in a greater overall improvement in water quality.

Unless the permittee can comply with all of the requirements of the Phase II permit, the NPDES authority should include, in an enforceable mechanism, compliance dates on the fastest practicable schedule for those activities directly related to meeting the requirements of the CWA. For major permittees, the compliance schedule should be placed in a judicial order. Proper compliance with the schedule for implementing the controls recommended in the long-term CSO control plan constitutes compliance with the elements of this Policy concerning planning and implementation of a long term CSO remedy.

3. Phasing Considerations

Implementation of CSO controls may be phased based on the relative importance of and adverse impacts upon WQS and designated uses, as well as the permittee's financial capability and its previous *efforts to control* CSOs. The NPDES authority should evaluate the proposed implementation schedule and construction phasing discussed in Section II.C.8. of this Policy. The permit should require compliance with the controls proposed in the long-term CSO control plan no later than the applicable deadline(s) under the CWA or State law. If compliance with the Phase II permit is not possible, an enforceable schedule, consistent with the Enforcement and Compliance Section of this Policy, should be issued in conjunction with the Phase II permit which specifies the schedule and milestones for implementation of the long-term CSO control plan.

V. Enforcement and Compliance

A. Overview

It is important that permittees act immediately to take the necessary steps to comply with the CWA. The CSO enforcement effort will commence with

an initiative to address CSOs that discharge during dry weather, followed by an enforcement effort in conjunction with permitting CSOs discussed earlier in this Policy. Success of the enforcement effort will depend in large part upon expeditious action by NPDES authorities in issuing enforceable permits that include requirements both for the nine minimum controls and for compliance with all other requirements of the CWA. Priority for enforcement actions should be set based on environmental impacts or sensitive areas affected by CSOs.

As a further inducement for permittees to cooperate with this process, EPA is prepared to exercise its enforcement discretion in determining whether or not to seek civil penalties for past CSO violations if permittees meet the objectives and schedules of this Policy and do not have CSOs during dry weather.

B. Enforcement of CSO Dry Weather Discharge Prohibition

EPA intends to commence immediately an enforcement initiative against CSO permittees which have CWA violations due to CSOs during dry weather. Discharges during dry weather have always been prohibited by the NPDES program. Such discharges can create serious public health and water quality problems. EPA will use its CWA Section 308 monitoring, reporting, and inspection authorities, together with NPDES State authorities, to locate these violations, and to determine their causes. Appropriate remedies and penalties will be sought for CSOs during dry weather. EPA will provide NPDES authorities more specific guidance on this enforcement initiative separately.

C. Enforcement of Wet Weather CSO Requirements

Under the CWA, EPA can use several enforcement options to address permittees with CSOs. Those options directly applicable to this Policy are section 308 Information Requests, section 309(a) Administrative Orders, section 309(g) Administrative Penalty Orders, section 309 (b) and (d) Civil Judicial Actions, and section 504 Emergency Powers. NPDES States should use comparable means.

NPDES authorities should set priorities for enforcement based on environmental impacts or sensitive areas affected by CSOs. Permittees that have voluntarily initiated monitoring and are progressing expeditiously toward appropriate CSO controls should be given due consideration for their efforts.

1. Enforcement for Compliance With Phase I Permits

Enforcement for compliance with Phase I permits will focus on requirements to implement at least the nine minimum controls, and develop the long-term CSO control plan leading to compliance with the requirements of the CWA. Where immediate compliance with the Phase I permit is infeasible, the NPDES authority should issue an enforceable schedule, in concert with the Phase I permit, requiring compliance with the CWA and imposing compliance schedules with dates for each of the nine minimum controls as soon as practicable. All enforcement authorities should require compliance with the nine minimum controls no later than January 1, 1997. Where the NPDES authority is issuing an order with a compliance schedule for the nine minimum controls, this order should also include a schedule for development of the long-term CSO control plan.

If a CSO permittee fails to meet the final compliance date of the schedule, the NPDES authority should initiate appropriate judicial action.

2. Enforcement for Compliance With Phase II Permits

The main focus for enforcing compliance with Phase II permits will be to incorporate the long-term CSO control plan through a civil judicial action, an administrative order, or other enforceable mechanism requiring compliance with the CWA and imposing a compliance schedule with appropriate milestone dates necessary to implement the plan.

In general, a judicial order is the appropriate mechanism for incorporating the above provisions for Phase II. Administrative orders, however, may be appropriate for permittees whose long-term control plans will take less than five years to complete, and for minors that have complied with the final date of the enforceable order for compliance with their Phase I permit. If necessary, any of the nine minimum controls that have not been implemented by this time should be included in the terms of the judicial order.

D. Penalties

EPA is prepared not to seek civil penalties for past CSO violations, if permittees have no discharges during dry weather and meet the objectives and schedules of this Policy. Notwithstanding this, where a permittee has other significant CWA violations for which EPA or the State is taking judicial action, penalties may be considered as part of that action for the following:

1. CSOs during dry weather;
2. Violations of CSO-related requirements in NPDES permits; consent decrees or court orders which predate this policy; or
3. Other CWA violations.

EPA will not seek penalties for past CSO violations from permittees that fully comply with the Phase I permit or enforceable order requiring compliance with the Phase I permit. For permittees that fail to comply, EPA will exercise its enforcement discretion in determining whether to seek penalties for the time period for which the compliance schedule was violated. If the milestone dates of the enforceable schedule are not achieved and penalties are sought, penalties should be calculated from the last milestone date that was met.

At the time of the judicial settlement imposing a compliance schedule implementing the Phase II permit requirements, EPA will not seek penalties for past CSO violations from permittees that fully comply with the enforceable order requiring compliance with the Phase I permit and if the terms of the judicial order are expeditiously agreed to on consent. However, stipulated penalties for violation of the judicial order generally should be included in the order, consistent with existing Agency policies. Additional guidance on stipulated penalties concerning long-term CSO controls and attainment of WQS will be issued.

Paperwork Reduction Act

The information collection requirements in this policy have been approved by the Office of Management and Budget (OMB) under the Paperwork Reduction Act, 44 U.S.C. 3501 *et seq* and have been assigned OMB control number 2040–0170.

This collection of information has an estimated reporting burden averaging 578 hours per response and an estimated annual recordkeeping burden averaging 25 hours per recordkeeper. These estimates include time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to Chief, Information Policy Branch; EPA; 401 M Street SW. (Mail Code 2136); Washington, DC 20460; and to the Office of Information and Regulatory Affairs, Office of Management and

Budget, Washington, DC 20503, marked "Attention: Desk Officer for EPA."

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APPENDIX C

DEPARTMENT OF ENVIRONMENTAL PROTECTION
Bureau of Water Standards and Facility Regulation

DOCUMENT NUMBER:	385-2000-011
TITLE:	Pennsylvania Combined Sewer Overflow (CSO) Policy
EFFECTIVE DATE:	September 6, 2008 (Minor Revisions effective February 6, 2010)
AUTHORITY:	The Federal Clean Water Act and the Pennsylvania Clean Streams Law (P.S. §§ 691.1-691.1001) and the regulations promulgated thereunder.
POLICY:	To plan and provide an effective and efficient program for NPDES permitting of Combined Sewer Overflows (CSOs) in the Commonwealth.
PURPOSE:	To improve and preserve the purity of the waters of the Commonwealth through the adequate permitting and control of CSOs. To protect public health, animal and aquatic life, and to comply with the Wet Weather Water Quality Act of 2000.
APPLICABILITY:	This document provides the Department of Environmental Protection's (DEP) overall permitting and compliance monitoring policy for large, small and satellite municipal combined sewer systems.
DISCLAIMER:	The policies and procedures outlined in this guidance are intended to supplement existing requirements. Nothing in the policies or procedures shall affect regulatory requirements. The policies and procedures herein are not an adjudication or a regulation. There is no intent on the part of DEP to give the rules in these policies that weight or deference. This document establishes the framework within which DEP will exercise its administrative discretion in the future. DEP reserves the discretion to deviate from this policy statement if circumstances warrant.
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I. GENERAL

Controlling and eliminating Combined Sewer Overflows (CSOs) and the associated water quality impacts is one of the goals of the state and federal water pollution control programs. DEP's goal is to control and eliminate CSO discharges as practicable, and ultimately bring all remaining CSO discharges into compliance with state water quality standards through the National Pollutant Discharge Elimination System (NPDES) permitting program. DEP published a Combined Sewer Overflow (CSO) Policy dated March 1, 2002 to achieve this goal over several NPDES permitting cycles.

A. PERMITS ISSUED UNDER THE MARCH 1, 2002 CSO POLICY

The March 1, 2002 CSO Policy, and previous EPA strategies, focused on the need to assure that all combined sewer systems received CSO permits and that NPDES permit conditions were met. The permit conditions required that permittees document Nine Minimum Controls (NMCs) and begin implementing a Long Term Control Plan (LTCP) for all CSOs in the system within the five-year permit term. All CSO permittees should have documented implementation of NMCs to DEP for the CSOs under the existing permit and should have begun implementing a Long-Term Control Plan during that permit term. Permittees must document compliance with these permit conditions prior to the renewal of permits for another five-year term.

B. REPLACEMENT OF THE 2002 POLICY

Current information about CSO locations, number of outfalls and permit compliance dates is available electronically in a table titled "Status of Pennsylvania CSOs by region" on DEP's Web site at www.depweb.state.pa.us. Once at DEP's Web site, click these links in the following order:

1. "Tools" (left side of page)
2. "Technical Guidance" (middle of page)
3. "Water Standards Facility Regulation" folder
4. "Pennsylvania Combined Sewer Overflow (CSO) Policy (Status of PA CSOs by Region)" folder
5. "Combined Sewer Overflow Listing.xls"

To further enhance and support compliance with CSO and NPDES permit conditions among the regulated community, DEP has refined and enhanced the 2002 CSO Policy. Under the revised policy, DEP will conduct or provide for appropriate follow-up actions, including compliance monitoring, compliance actions, permit renewal, plan reviews, field inspections, water quality monitoring and enforcement as necessary to promote the development and implementation of NMCs and LTCPs at each CSO facility.

DEP will also continue to provide case-specific compliance assistance, training and guidance to CSO system owners and operators when required. Additionally, DEP will work with associations and municipal organizations to conduct outreach and training in support of this policy. These activities are intended to bring CSO facilities currently not complying with existing permit conditions into compliance, and are also intended to

assure continued compliance at those facilities currently in compliance. This new round of permitting and compliance activity is being termed DEP's Phase III CSO NPDES Permitting/Compliance Program (CSO Phase III Program).

C. SCOPE OF THE POLICY

This document replaces DEP's March 1, 2002 Combined Sewer Overflow (CSO) Policy. This document establishes DEP's policy regarding CSO Phase III permitting to implement, as appropriate, EPA's April, 1994 National Combined Sewer Overflow (CSO) Control Policy and the subsequent Wet Weather Water Quality Act of 2000 that codified that policy. This policy applies to DEP staff, and CSO system permittees, regarding permit requirements for CSOs and the actions necessary to achieve compliance with the requirements of the CSO Phase III Program.

D. RELATION TO PAG-6 NPDES GENERAL PERMIT FOR WET WEATHER OVERFLOW DISCHARGES FROM COMBINED SEWER SYSTEMS

In conjunction with this policy, DEP completed and issued a revision to its General Permit for CSOs. This General Permit is part of DEP's Phase II CSO Policy and is included herein by reference. The General Permit is on DEP's Web site at www.depweb.state.pa.us. Once at DEP's Web site, click these links in the following order:

1. "Licensing, Permits and Certification" (left side of page)
2. Go to link "Water Management General Permits" (toward bottom of page)
3. Open "NPDES (National Pollutant Discharge Elimination System)" folder
4. Open "General Permits" folder
5. Open "04 PAG-06 Wet Weather Overflow Discharge from Combined Sewer Systems" folder

DEP may initiate review and actions (individually or as a group) to amend or revoke current permit coverage and to re-issue approvals of coverage under the revised General Permit.

E. RELATION TO EPA CSO STRATEGIES AND GUIDANCE

This policy is to be used in conjunction with all current EPA guidance documents except where indicated otherwise in this policy. These EPA guidance documents serve as the basic guidance for permit writers, compliance staff and the regulated community. EPA's guidance on CSOs is found at http://cfpub.epa.gov/npdes/cso/guidedocs.cfm?program_id=5 and includes:

CSO Control Policy, April 1994 (59 Federal Register 18688)
Guidance for Nine Minimum Controls (EPA 832-B-95-003, May '95)
Guidance for Long-Term Control Plan (EPA 832-B-95-002, Sept. '95)
Guidance for Screening and Ranking (EPA 832-B-95-004, Aug. '95)
Guidance for Funding Options (EPA 832-B-95-007, Aug. '95)
Guidance for Permit Writers (EPA 832-B-95-008, Sept. '95)

Guidance on Financial Capability Assessment and Schedule Development (EPA 832-B-97-004, Mar. '97)
Guidance for Monitoring and Modeling (EPA 832-B-99-002, Jan. '99)
Guidance: Coordinating CSO Long-Term Planning with Water Quality Standards Reviews (EPA 833-R-01-002, July 2001)
Wet Weather Water Quality Act of 2000, codified in the Consolidated Appropriations Act, 2001 (P.L. 106-554)

F. FUTURE REVISIONS OF THE POLICY

This policy is in its fourth generation and builds upon DEP's prior strategies and policies, and EPA's two (1989 and 1994) previous National CSO Strategies. It recognizes efforts by EPA, DEP and the CSO system owners and operators to control CSOs and to minimize water quality impacts. This CSO policy will be reviewed and revised at least once every five years to reflect expected changes to state or federal CSO policies. Related guidance updates will be completed as needed.

G. DEFINITIONS

All standard definitions in the state and EPA regulations implementing the NPDES program apply and are incorporated in this policy by this reference.

H. AUTHORITY

This policy is established under the authority of the Federal Clean Water Act, the Pennsylvania Clean Streams Law and Pennsylvania's delegation agreement with EPA to administer the National Pollutant Discharge Elimination System (NPDES) permitting program.

II. DEPARTMENT'S OVERALL CSO POLICY

It is DEP's policy to administer an effective Phase III CSO NPDES Permitting/Compliance Program to eliminate CSO discharges and ensure, as soon as possible, the achievement of applicable water quality standards. It is further DEP's policy to take necessary permitting and compliance actions under existing and renewed NPDES permits to assure that any remaining CSO discharges are controlled through the development and implementation of NMCs and a LTCP that will ultimately result in compliance with water quality standards.

DEP will include conditions that require implementation of NMCs and LTCPs in all Phase III CSO NPDES permits. Where either NMCs or LTCPs have not been developed in accordance with the enforceable permit conditions included in the previous permit, DEP will initiate an appropriate enforcement mechanism in coordination with the permit action.

DEP may allow a focused LTCP for CSO facilities serving populations of less than 75,000 residents consistent with EPA's National CSO Control Policy.

DEP will initiate an intensified outreach initiative to assure that CSO permit conditions and related enforcement actions are met.

DEP will not authorize dry weather overflow discharges from combined systems. These discharges are a violation of both state and federal law and regulations.

DEP will encourage watershed approaches to resolve CSO impacts.

DEP will not permit or otherwise authorize any new combined sewer systems.

DEP will not approve continued use of existing CSO systems following repair or replacement, but not elimination of the CSO, without a detailed analysis by the permittee comparing such repair or replacement with separation of the storm water from sanitary sewage collection and conveyance and/or other method of elimination of the CSO. This evaluation must be included in a LTCP. Where a LTCP has not been completed, a separate evaluation must be submitted to DEP for approval prior to such actions.

This policy does not address separate sanitary sewer overflows (SSOs) and is not applicable to SSOs.

III. PERMIT RENEWAL OPTIONS FOR SMALL AND LARGE POTWs/SATELLITE SYSTEMS WITH CSOs

During the previous cycles of CSO permitting, the majority of the CSO systems in the Commonwealth were permitted in accordance with the EPA's National Combined Sewer Overflow Control Policy. The EPA policy and DEP's 2002 CSO Policy, as well as the permits issued under those documents, required all CSO permittees to document NMCs and begin implementing a LTCP. Therefore, Phase III CSO renewal permits require the continued implementation of the NMCs and LTCPs.

DEP may authorize certain LTCP requirements to be waived for CSO systems serving jurisdictional populations of less than 75,000. The focused DEP requirements for these systems include continued implementation of the NMCs, public participation, consideration of sensitive areas and post-construction compliance monitoring. Application of the reduced scope LTCP to small systems is not automatic. The regulations at 25 Pa. Code Sections 92.81-92.83 establish eligibility for General NPDES permits. DEP will review applications or Notices of Intent (NOIs) to determine the scope of a LTCP in any CSO permit. The descriptions below identify the classification of CSO systems and the applicable permit conditions that will be applied to each type of system as part of the CSO Phase III Program:

A. PUBLICLY OWNED TREATMENT WORKS (POTWs) OWNED AND/OR OPERATED COMBINED SEWER SYSTEM

1. These CSO facilities are part of a POTW with the collection, conveyance and treatment facilities, owned and operated by the municipality and/or municipal authority.

2. For permitting purposes, this category of facility is further divided as to size. The conditions imposed on these systems vary according to the population served by the system as described below. Generally, the CSOs from these facilities are

covered under the individual NPDES permit that authorizes and regulates the discharge(s) from the associated treatment facility. The requirements for these facilities are as follows:

Small POTW Operated CSO Systems - serve a jurisdictional population of less than 75,000. This category of system is normally permitted using permit conditions included in the individual NPDES permit for the POTW. At a minimum, these systems must meet the specific CSO permitting requirements in Attachment 1(B). If the system discharges to special protection waters (i.e. High Quality or Exceptional Value water), the requirements of Attachment 1(B) must be used under an individual NPDES CSO permit.

Large POTW Operated CSO Systems - serve a jurisdictional population of 75,000 or more. This category of system is normally permitted using permit conditions included in the Individual NPDES Permit for the POTW. These systems must meet the specific CSO permitting requirements in Attachment 2 that will be included in an individual permit. Attachment 2 requires a detailed LTCP (nine planning elements).

B. SATELLITE COMBINED SEWER SYSTEMS

1. These systems provide only collection and conveyance facilities for transporting combined wastewater and storm water to a POTW for treatment. These satellite combined sewer systems usually surround major metropolitan areas and consist of collection and conveyance systems designed and built as combined sewer systems. The satellite combined sewer systems, like the POTWs, are publicly owned and/or operated. However, their owners/operators are not directly responsible for the operation of the wastewater treatment facilities receiving flows from the collection and conveyance system.

2. For permitting purposes, this category of facility is further divided as to size. The conditions imposed on these systems also vary according to the population served by the system as described below:

   Small Satellite CSO System - serve a jurisdictional population less than 75,000. These systems must meet the specific CSO permitting requirements in Attachment 1(A) when coverage under the General NPDES CSO Permit is obtained. If the system does not meet the requirements for coverage under a General NPDES CSO Permit or the discharge is to special protection waters (i.e. High Quality or Exceptional Value water), the requirements of Attachment 1(B) will be included under an individual NPDES CSO permit.

   Large Satellite CSO System - serve a jurisdictional population of 75,000 or more that usually surround major metropolitan areas and consist of collection and conveyance systems designed, built and operated as combined sewer systems and are not directly responsible for the operation of the wastewater treatment plant. This policy provides that an individual permit must be issued for these facilities

and the requirements in Attachment 2 must be used. Attachment 2 requires a detailed LTCP (nine planning elements).

C. PERMIT REQUIREMENTS

All Phase III NPDES CSO Permits must include applicable permitting requirements in Attachment 1(A) - General Permit Requirements for Small Flow CSO Systems or Attachment 1(B) – Individual Permit Requirements for Small CSO Systems or Attachment 2- Individual Permit Requirements for Large CSO Systems. CSO outfalls will be listed in Part A of the permit. The permit will also include the following as a footnote "All discharges of floating materials, oil, grease, scum, sheen and substances which produce color, tastes, odors, turbidity or settle to form deposits shall be controlled to levels which will not be inimical or harmful to the water uses to be protected or to human, animal, plant or aquatic life." Attachment 3 - DMR Supplemental Reports for CSOs - must be used with attachments 1(A), 1(B) or 2 in all CSO permits. The permit language specified in the attachments will be used verbatim unless DEP determines that there is justification to deviate from the language in an individual permit for a specific situation. Any deviation from established permit language in an individual permit must be fully justified and documented in the Water Quality Protection Report for the permit. If the change involves a major change or policy issue, DEP's Regional Office must present the issue to DEP's Central Office for review and approval. These cases may require review by EPA. Referral of such issues will stop permit review time period commitments to allow for sufficient time for these issues to be resolved.

IV. SUBMITTAL AND DEP REVIEW OF PERMIT RENEWAL APPLICATIONS AND NOIs

A. DOCUMENTATION OF NMC AND LTCP IMPLEMENTATION

Phase III NPDES CSO Permits require continued implementation of NMCs and continued implementation of LTCPs. The application or Notice of Intent (NOI) for the renewal of CSO permits submitted to DEP by an applicant must, therefore, include a description of NMCs in place at the time of the application or NOI submittal and documentation of the implementation of these NMCs. The applicant for permit renewal must submit documentation identifying which of the NMCs have been implemented and that the required NMCs will continue to be implemented during the new permit term (5 years). Permit applicants must also submit a copy of the LTCP if one had not been submitted to DEP previously. Any amendments to a previously submitted LTCP or associated schedules must be submitted to and approved by DEP during the term of the applicable permit.

If the terms of the previous permit have not been met (i.e. NMCs have not been developed, NMCs have not been implemented or a LTCP has not been developed and submitted to DEP), the provisions of Section V of this policy apply. DEP's record of the compliance status of CSO permittees titled "Status of Pennsylvania CSOs by region" is available at www.depweb.state.pa.us. See page 1 of this document at I.B. for information on how to navigate to this Web page. Permittees whose status is not correctly identified should provide DEP with documentation of the correct status as soon as possible.

B. DEP REVIEW OF APPLICATION OR NOI FOR PERMIT RENEWAL

Before issuing or renewing Phase III NPDES CSO permits, the permit writers and operations staff of DEP will conduct permit status and compliance reviews of each system for full compliance with the NMC and LTCP permit requirements or requirements of any prior enforcement actions. These reviews will be conducted in consultation with DEP legal counsel and should be used as a basis for considering permit renewal requirements and whether an enforcement mechanism is necessary to resolve non-compliance. This review will also be used to refine the scope and extent of the LTCP requirements.

The permit engineers will review permit renewal applications to determine progress made in completing and implementing NMCs and implementing a LTCP in previous permit cycles. The operations staff review will focus on prior compliance histories, monitoring information, annual Chapter 94 reports and requirements of any enforcement actions.

In cases where NMCs have not been documented or a LTCP has not been developed and submitted to DEP, the procedures outlined in Section V of this policy will be initiated prior to permit application or NOI review.

Permit application reviews will include:

1. the status of NMC and LTCP development and implementation during previous permit cycles

2. post NMC/LTCP monitoring program data

3. what impacts these programs have in reducing the number, volume and frequency of overflows from the system

4. what BMPs the permittee must implement to achieve the goals of the LTCP

5. known water quality impacts from any unique or site-specific situations (high industrial waste contributions, special recreational uses etc.)

6. NMC and LTCP activities and schedules proposed for the permit term under consideration for renewal

7. applicability of a focused LTCP associated with small CSO systems discussed in Section III above

8. review of Chapter 94 annual reports for consistency with LTCPs where they address CSOs

9. an assurance that the LTCP includes clear endpoints as either numeric or narrative performance standards to meet water quality standards

C. REVIEW OF MONITORING DATA PRIOR TO PERMIT RENEWAL

CSO permit conditions require NPDES permitted municipalities to submit CSO data and related information during the NPDES permit renewal application/NOI process as follows:

1. Renewal monitoring data - The General and Individual NPDES CSO permits require permittees to identify the water body receiving flows from CSOs, location of the CSOs, number of outfalls and the watershed, and water body classification. These permits also include monitoring and reporting requirements including flow, frequency, duration and magnitude of the CSO, number of CSO events and any known downstream water quality impacts. Monitoring data must be submitted to DEP as part of the permit renewal application or NOI using a format similar to Attachment 3. DEP will review the monitoring data before the NPDES permit is renewed.

2. Ongoing Reporting - The discharge monitoring report will continue to be used for reporting all incidences of CSO discharge. Attachment 3, DMR Supplemental Reports for CSOs, must be used by permittees to record and report overflow data for each overflow point. The CSO Monthly Inspection Report form (3800-FM-WSFR0441) must be used to document inspection activities for all outfalls. If there is a discharge from a CSO during a month, an outfall-specific CSO Detailed Outfall Report form (3800-FM-WSFR0442) must be completed. Where necessary, additional narrative explanations may be added to these forms. These reports must be filed with the regular DMR for the facility or separately for satellite facilities within 28 days of the end of the month. Confirmation that these reports have been submitted should be included as part of the permit renewal application or NOI.

3. Post-Construction Compliance Monitoring – A post-construction monitoring program must be carried out to assure the effectiveness of the overall program being implemented in meeting the Clean Water Act requirements and in meeting requirements established in the LTCP. The post-construction compliance monitoring program is intended to ascertain the effectiveness of CSO controls. The permittee must conduct a monitoring program during and after LTCP implementation to help determine the effectiveness of the overall program. Monitoring during LTCP implementation must include, minimization of combined sewer overflows, data collection to measure the overall effects of the program and to determine the effectiveness of CSO controls. The monitoring plan should use existing monitoring stations (both those used in previous studies and those used for collecting data during system characterization) to collect long-term data for comparisons. Monitoring plan components must be identified in a work plan.

4. Municipal wasteload management (Title 25, Chapter 94) annual report - In addition to the special DMR supplemental report, the overflow discharge data must be summarized annually and submitted to the appropriate Regional Office of DEP with the facility's Annual Wasteload Management (Chapter 94) Report. The

minimum information required to be included is specified in the CSO permit condition and Chapter 94. As a minimum, the Wasteload Management Report must provide the current operational status of major overflow points, a summary of on-going NMC implementation efforts that demonstrate consistency and compliance with the approved NMC documentation report, a summary of inspection and maintenance, a summary of the last 12 months of CSO overflow data, average number of overflows per year, any known downstream water quality impacts, and actions taken or planned to reduce or eliminate the CSO discharges.

D. WATER QUALITY PROTECTION REPORT

The permit application analysis must be documented in a water quality protection report developed by DEP. This document establishes the basis for permit issuance or renewal.

E. COMPLIANCE HISTORY

CSO permittees are required to provide a summary of prior compliance with all DEP permits held by the permittee and actions completed or proposed to be completed to resolve any permit non-compliance. Where the compliance history documents non-compliance or where DEP determines that a permittee has not complied with permit conditions or requirements, appropriate compliance action will be initiated and an enforceable compliance schedule established prior to permit renewal.

F. DEP DETERMINED NON-COMPLIANCE

If DEP determines during its review of permit renewal information that the terms of the previous permit have not been met (i.e. NMCs have not been developed, NMCs have not been implemented or a LTCP has not been developed, etc.), the review of the application or NOI shall cease. In these cases, the provisions of Section V of this policy shall be applied.

V. COMPLIANCE POLICY FOR CSO PERMIT VIOLATIONS/DEP CSO RESPONSE PLAN

A. COMPLIANCE PRIORITIES

DEP's highest priority CSO cases are those that have been documented as a public health hazard or have water quality impacts that have resulted in documented impairment or loss of designated or existing use as confirmed by a stream assessment. Compliance priority will also be given to combined sewer systems without necessary CSO permits or any newly identified unpermitted CSOs. Compliance Schedules will be used to bring these facilities under a permit. Current CSO permittees will be evaluated for compliance with permit conditions by DEP on a continuous basis. When DEP determines that a permittee is in jeopardy of non-compliance with the CSO conditions of the permit (i.e. permit term is nearing the end and NMCs or LTCP conditions have not been met), DEP may initiate compliance assistance. When a permittee has failed to meet permit conditions (i.e. permit term has ended or an application for a permit renewal has been received and the NMCs or LTCP conditions have not been met) a compliance action may be taken.

B. COMPLIANCE ASSISTANCE

DEP's policy of compliance through outreach, technical support and pollution prevention is an important element of this policy. Where DEP determines potential non-compliance with NMC or LTCP conditions in permits, permittees will be notified of such potential non-compliance and DEP will provide information, technical assistance and outreach to the permittee. DEP will also work with municipal and authority organizations to provide educational opportunities regarding CSOs for permittees.

C. COMPLIANCE ACTIONS FOR VIOLATION OF EXISTING PERMIT CONDITIONS

The previous NPDES permits issued to wastewater facilities with CSOs included a requirement that the permittee document NMCs and implement a LTCP. Permittees have had at least one, if not two, permit cycles to complete these required activities (i.e. 5 to 10 years). It is DEP's policy to require continued implementation of NMCs and of a LTCP during the Phase III CSO permit cycle. When the permittee has not documented implementation of NMCs and/or has not implemented the LTCP in accordance with its schedule by the end of the permit term, the permittee is in non-compliance with the CSO conditions and requirements of the existing NPDES permit.

As a matter of DEP policy, the Phase III CSO permits will not contain an additional compliance schedule for implementation of either the NMCs or the LTCPs. However, if a schedule is needed to bring a facility into compliance with permit requirements, enforceable mechanisms may be used as a separate action independent of any permit action(s). When an enforceable mechanism is used to resolve permit violations, it must be included with draft permit documents sent to the EPA and provided to the discharger.

The term enforceable mechanisms may include a consent order and agreement (CO&A), a 'Department Order', a court issued order or other enforceable instrument. These enforcement mechanisms are not part of the permits and are not referenced in permits. The enforcement mechanisms will be tailored to site-specific situations and will be based on the review of NMC/LTCP before a Phase III permit is renewed. The enforcement mechanisms shall provide appropriate enforceable milestones, schedules, and, where appropriate, penalties that address all non-compliance issues.

D. COMPLIANCE SCHEDULES

When DEP determines that immediate compliance is not feasible, stipulated penalties and a schedule for implementation may be included in a 'Department Order' or CO&A. Compliance schedules for the completion and implementation of NMCs or the development of a LTCP may not extend beyond 18 months of the permit reissuance date unless the permittee submits compelling justification for an extended compliance schedule. Compliance schedules shall include all of the elements of the required permit condition and the schedule of completion of each of the required activities under that condition. In the case where the permittee has not developed and implemented NMCs, the compliance schedule shall identify each of the controls and shall assign a specific

date on which that control will be implemented. In the case where an applicant has not developed a LTCP, the compliance schedule shall identify the specific plan elements required for the facility and the specific date when that element will be completed. LTCP schedules shall also include the date for final plan submittal to DEP.

DEP's existing enforcement policy has sufficient flexibility and adaptability for DEP regional offices to tailor each compliance action to the specific circumstances (i.e., severity of problem, significance of problem, extent of actual harm or damage, and prior compliance history) of a CSO problem.

VI. LONG-TERM CONTROL PLAN AND NMCs

A. COMPLIANCE WITH EPA LTCP REQUIREMENTS

EPA's Combined Sewer Overflow (CSO) Control Policy (EPA 830-B-94-001) of April 1994 describes the minimum content of LTCPs in Section II. C. The minimum elements of a LTCP listed in that document shall be required for all LTCPs submitted to DEP except for those CSO facilities qualifying for a reduced scope LTCP as discussed in Section III of this policy. LTCP proposals that do not include these elements shall be declared incomplete and returned to the permittee for revision. In cases where a LTCP has not been previously submitted and/or approved by DEP, but is submitted with the application for permit renewal, a detailed review and DEP action shall be taken on each submittal prior to permit renewal. When documentation of implementation of NMCs has not previously been submitted, DEP will confirm the submittal of such information upon receipt, in writing to the permittee. The DEP regional office staff will update the appropriate CSO database to reflect the compliance status of the permittee.

B. LTCPS EXTENDING BEYOND THE CURRENT PERMIT TERM

The permit and/or Fact Sheet developed for the CSO facility shall incorporate the LTCP by reference. LTCP schedules shall be consistent with the 1994 EPA CSO Policy and the 1997 EPA CSO Guidance for Financial Capability Assessment and Schedule Development as well as the other guidance documents in Chapter I, Section E of this document.

If the implementation of LTCPs extends beyond the permit term of a new or renewed permit, the permit shall include a schedule for the interim steps that will be implemented during the permit term.

In addition for those permittees for whom the LTCP extends beyond the term of a new or renewed permit, DEP reserves the right to issue or enter into an additional but separate enforceable instrument. Factors that DEP may consider before taking such additional actions include the size of the facility, the size of the community or communities being served by the permittee, whether there is a potential to effect potable water supplies, whether there is a potential to effect sensitive areas, the level of cooperation exhibited by the permittee and any other relevant factor. The additional enforceable instrument shall include a compliance schedule consistent with the 1994 EPA CSO Policy and the 1997 CSO Guidance for Financial Capability Assessment and Schedule Development

and shall include specific milestones and an end date for the implementation and completion of the LTCP.

C. AREA-WIDE PLANNING COORDINATION

It is the policy of DEP to require operators of POTW's and any satellite conveyance systems contributing flow to a CSS that is connected to the POTW to cooperate with each other and coordinate their respective NMC and LTCP efforts such that implementation leads to the achievement of Water Quality Standards (WQS). This is to assure that individual system NMC and LTCP efforts are consistent with and compliment each other. To accomplish this, each CSO Phase III permit must contain one of the following two requirements:

POTW Operated CSO Systems – The permittee shall cooperate with and participate in any satellite CSO system's NMC and LTCP activities being developed and/or carried out by the operator(s) of these systems, and shall participate in implementing applicable portions of the approved NMC and LTCP for these systems.

Satellite CSO Systems – The operator of the satellite combined sewer system or a separate sanitary sewer system contributing flow to the CSS covered by the general permit shall participate in any area-wide CSO NMC and LTCP activities being developed and/or carried out by the operator of the POTW identified in the NOI that provides sewage treatment services. The operator shall also participate in implementing applicable portions of the approved NMC and LTCP for the operator of the POTW providing treatment and/or conveyance and treatment to the permittee.

LTCP submittals that do not include area-wide planning coordination, where needed, will be returned to the permittee for appropriate coordination prior to resubmittal or review.

D. MAXIMIZING TREATMENT AT THE EXISTING POTW

Federal regulations at 40 CFR 122.41(m) allow for a CSO-related bypass (i.e. a bypass of certain portions of the treatment facility at the POTW). This can be an effective management tool for CSO systems if the bypass is proposed as provided for in the EPA's CSO Guidance for Permit Writers. Its use should be limited to systems that have implemented NMCs and LTCPs, have maximized flows to the treatment plant and have justified the need to use a CSO-related bypass as part of its operational plan for the implementation of their NMCs or LTCP. The permittee has the burden of demonstrating that it meets all requirements of 40 CFR 122.41(m).

Attachment 4 provides permit language to be used in authorizing CSO-related bypasses in NPDES permits. This permit condition language is to be used as provided by the policy unless there is documented justification for some change. Additional guidance on the use and limitation of the CSO-related bypass provisions are documented in EPA's Permit Writers' Guidance. Any adjustments made to the CSO-related Bypass requirement must be documented in the permit Fact Sheet.

Attachment 1(A)

Phase III General Permit Requirements for Small CSO Systems

PART C - OTHER SPECIFIC REQUIREMENTS

I. MANAGEMENT AND CONTROL OF COMBINED SEWER OVERFLOWS

A. Combined sewer overflows (CSOs) are allowed to discharge only in compliance with this permit when flows in combined sewer systems exceed the design capacity of the conveyance or treatment facilities of the system. Overflows that occur without an accompanying precipitation event or snowmelt are termed "dry weather overflows" and are prohibited. CSOs are point source discharges that must be provided with control measures in accordance with the Federal Clean Water Act and the 1994 National CSO Policy.

B. The point source discharge locations (outfalls) identified in the NOI submitted by the permittee for coverage under this general permit serve as authorized combined sewer overflow locations on the permittee's sewer system.

II. CONTINUED IMPLEMENTATION OF TECHNOLOGY-BASED NINE MINIMUM CONTROLS

A. Upon approval of coverage under this permit, the permittee shall continue the implementation of the NMCs, demonstrate system wide compliance with the NMCs and submit discharge monitoring reports and annual reports to DEP with appropriate documentation. The permittee's NMC documentation report is incorporated in this permit and the NMCs listed in the NOI are hereby incorporated by reference as enforceable provisions of this permit.

B. DEP will use the EPA guidance document entitled "Guidance For Nine Minimum Controls" (EPA 832-B-95-003), dated May 1995, and specific comments provided during review of the NMC documentation reports to determine continued compliance with the CSO permit requirements.

III. IMPLEMENTATION OF WATER QUALITY-BASED LONG TERM CONTROL PLAN (LTCP)

A. The long term goal of the LTCP requirements in this permit is to achieve compliance with the state water quality standards upon completion of the LTCP implementation. The CSO discharge(s) shall comply with the performance standards of the selected CSO controls and shall comply with the water quality standards found in Chapter 93. When additional CSO-related information and data becomes available to revise water quality-based effluent limitations, the permit should be revised, as appropriate, to reflect the new effluent limitations.

B. The permittee shall continue the implementation of the approved LTCP, demonstrate system-wide compliance with the LTCP's installed alternatives and submit with the Annual Report referenced in Section IV.B, annual progress reports on implementation.

C. The permittee shall continue to implement its approved long term control plan (LTCP). The LTCP, at a minimum, shall incorporate the following requirements:

1. Continued implementation of the nine minimum controls;

2. Protection of sensitive areas (recreation areas, public water supply, unique ecological habitat, etc.);

3. Public participation in any revisions or updates to the LTCP.

4. The selected CSO controls should include a post-construction monitoring program plan adequate to verify compliance with water quality standards and protection of designated uses as well as to ascertain the effectiveness of CSO controls. This water quality compliance monitoring program should include a plan to be approved by DEP that details the monitoring protocols to be followed.

D. The LTCP is described in the EPA's guidance document entitled "Guidance For Long Term Control Plan" (EPA 832-B-95-002), dated September 1995. Using a compliance monitoring program, the permittee shall periodically review the effectiveness of the LTCP and propose any changes or revisions to the LTCP to DEP for review and approval before its implementation. This shall be done at each approval renewal and as needed during the permit or approval term.

E. The permittee shall implement, inspect, monitor and effectively operate and maintain the CSO controls identified in the LTCP pursuant to the LTCP implementation schedule. Notwithstanding any other provisions of this permit, the interim steps and/or milestones identified in the NOI and/or LTCP shall be incorporated by reference as enforceable provisions of this permit.

IV. MONITORING AND REPORTING REQUIREMENTS

A. Discharge Monitoring Report for the Combined Sewer Overflows (DMR for CSOs)

The permittee shall record data on CSO discharges in the format specified in DEP's DMR Supplemental Reports for CSOs attached to this permit. The data shall be submitted to the appropriate regional office of DEP within 28 days of the end of the month. Satellite Combined Sewer Systems with CSOs on collection systems connected to a permitted POTW will submit their DMR Supplemental Reports for CSOs to the POTW. The permitted POTW will submit the DMR Supplemental Reports for CSOs from all of their satellite communities with their regular DMR. Copies of DMR Supplemental Reports for CSOs must be retained at the Sewage Treatment Plant (STP) site for at least three (3) years.

B. Annual CSO Status Report

On March 31 of each year, an Annual CSO Status Report shall be submitted to DEP with the annual "Municipal Wasteload Management Report" required by 25 Pa. Code Chapter 94, Section 94.12. For a satellite CSO system, a copy of the annual report shall also be provided to the POTW providing treatment for its wastewater.

1. The Annual CSO Status Report shall:

   a. Provide a summary of the frequency, duration and volume of the CSO discharges for the past calendar year,

   b. Provide the operational status of overflow points,

   c. Provide an identification of known in-stream water quality impacts, their causes, and their effects on downstream water uses,

   d. Summarize all actions taken to implement the NMCs and the LTCP and their effectiveness, and

   e. Evaluate and provide a progress report on implementing and necessary revisions to the NMC and LTCP.

2. Specifically, the following CSO-related information shall be included in the report:

   a. Rain gauge data - total inches (to the nearest 0.01 inch) that caused each CSO discharge being reported in the DMR Supplemental Reports for CSOs.

   b. Inspections and maintenance

      - Total number of regulator inspections conducted during the period of the report (reported by drainage system).

      - A list of blockages (if any) corrected or other interceptor maintenance performed, including location, date and time discovered, date and time corrected and any discharges to the stream observed and/or suspected to have occurred.

   c. Dry weather overflows

      Dry weather CSO discharges are prohibited. Immediate telephone notification to DEP of such discharges is required in accordance with 25 Pa. Code, Section 91.33. Indicate location, date and time discovered, date and time corrected/ceased, and action(s) taken to prevent their reoccurrence. A plan to correct this condition and schedule to implement

the plan must be submitted with the DMR Supplemental Reports for CSOs.

d. Wet weather overflows

- For all locations that have automatic level monitoring of the regulators, report all exceedances of the overflow level during the period of the report, including location, date, time, and duration of wet weather overflows.

- For all locations at which flows in the interceptors can be controlled by throttling and/or pumping, report all instances when the overflow level was reached or the gates were lowered. For each instance, provide the location, date, time, and duration of the overflow.

V. AREA-WIDE PLANNING/PARTICIPATION REQUIREMENT FOR SATELLITE CSO SYSTEMS

The operator of the satellite municipal sewer system covered by the general permit shall participate in any area-wide CSO NMCs and LTCP activities being developed and/or carried out by the operator of the POTW identified in the NOI that provides sewage treatment services. The operator shall also participate in implementing applicable portions of the approved NMC and LTCP for the operator of the POTW providing treatment and/or conveyance and treatment to the permittee.

VI. PERMIT REOPENER CLAUSE

DEP reserves the right to modify, revoke and reissue this permit as provided pursuant to 40 CFR 122.62 and 124.5 for the reasons set forth in 25 Pa. Code Section 92.51 (2) and for the following reasons:

A. To include new or revised conditions developed to comply with any State or Federal law or regulation that addresses CSOs and that is adopted or promulgated subsequent to the effective date of this permit.

B. To include new or revised conditions if new information indicates that CSO controls imposed under the permit have failed to ensure the attainment of State Water Quality Standards.

C. To include new or revised conditions based on new information resulting from implementation of the LTCP or other plans or data.

VII. COMBINED SEWER OVERFLOW COMPLIANCE SCHEDULE

The permittee shall complete the above CSO activities in accordance with the following compliance schedule:

Schedule Activity Description	Compliance Due Date
Continue Implementation of the NMCs	Permit effective date
Continue Implementation of the LTCP	Permit effective date
Submit Annual CSO Status Report to DEP with Chapter 94 Report	March 31 of each year
Submit DMR Supplemental Reports for CSOs (Attachment 3)	Within 28 days of the end of a month

Attachment 1(B)

Phase III Individual Permit Requirements for Small CSO Systems

PART C - OTHER SPECIFIC REQUIREMENTS

I. MANAGEMENT AND CONTROL OF COMBINED SEWER OVERFLOWS

A. Combined sewer overflows (CSOs) are allowed to discharge only in compliance with this permit when flows in combined sewer systems exceed the design capacity of the conveyance or treatment facilities of the system. Overflows that occur without an accompanying precipitation event or snowmelt are termed "dry weather overflows" and are prohibited. CSOs are point source discharges that must be provided with control measures in accordance with the Federal Clean Water Act and the 1994 National CSO Policy.

B. The point source discharge locations (outfalls) identified in the application submitted by the permittee serve as known combined sewer overflow locations on the permittee's sewer system.

II. CONTINUED IMPLEMENTATION OF TECHNOLOGY-BASED NINE MINIMUM CONTROLS

A. Upon issuance of this permit, the permittee shall continue the implementation of the NMCs, demonstrate system wide compliance with the NMCs and submit discharge monitoring reports and annual reports to DEP with appropriate documentation. The permittee's NMC documentation report is incorporated in this permit and the NMCs are listed here:

B. DEP will use the EPA guidance document entitled "Guidance For Nine Minimum Controls" (EPA 832-B-95-003), dated May 1995, and specific comments provided during review of the NMC documentation reports to determine continued compliance with the CSO permit requirements.

III. IMPLEMENTATION OF WATER QUALITY-BASED LONG TERM CONTROL PLAN (LTCP)

A. The long term goal of the LTCP requirements in this permit is to achieve compliance with the state water quality standards upon completion of the LTCP implementation. The CSO discharge(s) shall comply with the performance standards of the selected CSO controls and shall comply with the water quality standards found in Chapter 93. When additional CSO-related information and data becomes available to revise water quality-based effluent limitations, the permit should be revised, as appropriate, to reflect the new effluent limitations.

B. The permittee shall continue the implementation of the approved LTCP, demonstrate system-wide compliance with the LTCP's installed alternatives and submit with the

Annual Report referenced in paragraph IV.B below, annual progress reports on implementation.

C. The permittee shall continue to implement its approved long term control plan (LTCP). The LTCP, at a minimum, shall incorporate the following requirements:

1. Continued implementation of the nine minimum controls;

2. Protection of sensitive areas (recreation areas, public water supply, unique ecological habitat, etc.);

3. Public participation in developing the LTCP;

4. The selected CSO controls should include a post-construction monitoring program plan adequate to verify compliance with water quality standards and protection of designated uses as well as to ascertain the effectiveness of CSO controls. This water quality compliance monitoring program should include a plan to be approved by DEP that details the monitoring protocols to be followed.

D. The LTCP is described in the EPA's guidance document entitled "Guidance For Long Term Control Plan" (EPA 832-B-95-002), dated September 1995. Using a compliance monitoring program, the permittee shall periodically review the effectiveness of the LTCP and propose any changes or revisions to the LTCP to DEP for review and approval before its implementation. This shall be done at each permit renewal and as needed during the permit term.

E. The permittee shall implement, inspect, monitor and effectively operate and maintain the CSO controls identified in the LTCP pursuant to the LTCP implementation schedule, which is incorporated herein by reference. Notwithstanding any other provisions of this permit, the permittee will achieve the interim steps or milestones identified in the LTCP, including but not limited to the following as listed below:

<List Interim Steps/Milestones Here>

IV. MONITORING AND REPORTING REQUIREMENTS

A. Discharge Monitoring Report (DMR) Supplemental Reports for Combined Sewer Overflows

The permittee shall record data on CSO discharges in the format specified in DEP's DMR Supplemental Reports for CSOs attached to this permit. The data shall be submitted monthly to the appropriate regional office of DEP within 28 days of the end of the reporting month. For CSOs that are part of a permitted POTW, the DMR Supplemental Reports for CSOs must be submitted with the permittee's regular DMR. Copies of DMR Supplemental Reports for CSOs must be retained at the Sewage Treatment Plant (STP) site or municipality for at least three (3) years.

B. Annual CSO Status Report

On March 31 of each year, an Annual CSO Status Report shall be submitted to DEP with the annual "Municipal Wasteload Management Report" required by 25 Pa. Code Chapter 94, Section 94.12. For a satellite CSO system, a copy of the annual report shall also be provided to the POTW providing treatment for its wastewater.

1. The Annual CSO Status Report shall:

   a. Provide a summary of the frequency, duration and volume of the CSO discharges for the past calendar year,

   b. Provide the operational status of overflow points,

   c. Provide an identification of known in-stream water quality impacts, their causes, and their effects on downstream water uses,

   d. Summarize all actions taken to implement the NMCs and the LTCP and their effectiveness, and

   e. Evaluate and provide a progress report on implementing and necessary revisions to the NMC and LTCP.

2. Specifically, the following CSO-related information shall be included in the report:

   a. Rain gauge data - total inches (to the nearest 0.01 inch) that caused each CSO discharge being reported in the DMR Supplemental Reports for CSOs.

   b. Inspections and maintenance.

      - Total number of regulator inspections conducted during the period of the report (reported by drainage system).

      - A list of blockages (if any) corrected or other interceptor maintenance performed, including location, date and time discovered, date and time corrected, and any discharges to the stream observed and/or suspected to have occurred.

   c. Dry weather overflows

      Dry weather CSO discharges are prohibited. Immediate telephone notification to DEP of such discharges is required in accordance with 25 Pa. Code, Section 91.33. Indicate location, date and time discovered, date and time corrected/ceased, and action(s) taken to prevent their reoccurrence. A plan to correct this condition and schedule to implement

the plan must be submitted with the DMR Supplemental Reports for CSOs.

d. Wet weather overflows

- For all locations that have automatic level monitoring of the regulators, report all exceedances of the overflow level during the period of the report, including location, date, time, and duration of wet weather overflows.

- For all locations at which flows in the interceptors can be controlled by throttling and/or pumping, report all instances when the overflow level was reached or the gates were lowered. For each instance, provide the location, date, time, and duration of the overflow.

V. AREA-WIDE PLANNING/PARTICIPATION REQUIREMENT

Where applicable, the permittee shall cooperate with and participate in any interconnected CSO system's NMCs and LTCP activities being developed and/or carried out by the operator(s) of these systems, and shall participate in implementing applicable portions of the approved NMC and LTCP for these systems.

VI. PERMIT REOPENER CLAUSE

DEP reserves the right to modify, revoke and reissue this permit as provided pursuant to 40 CFR 122.62 and 124.5 for the reasons set forth in 25 Pa. Code Section 92.51(2) and for the following reasons:

A. To include new or revised conditions developed to comply with any State or Federal law or regulation that addresses CSOs and that is adopted or promulgated subsequent to the effective date of this permit.

B. To include new or revised conditions if new information indicates that CSO controls imposed under the permit have failed to ensure the attainment of State Water Quality Standards.

C. To include new or revised conditions based on new information resulting from implementation of the LTCP or other plans or data.

VII. COMBINED SEWER OVERFLOW COMPLIANCE SCHEDULE

The permittee shall complete the above CSO activities in accordance with the following compliance schedule:

Schedule Activity Description	Compliance Due Date
Continue Implementation of the NMCs	Permit effective date
Continue Implementation of the LTCP	Permit effective date
Submit Annual CSO Status Report to Department with Chapter 94 Report	March 31 of each year
Submit DMR Supplemental Reports for CSOs (Attachment 3)	Within 28 days of the end of a month

Scheduled Interim Milestones	Compliance Due Date

List here all interim milestones (from approved NMC and LTCPs) for tracking through PCS or eFACTS

Attachment 2

Phase II Individual Permit Requirements for Large CSO Systems

PART C - OTHER SPECIFIC REQUIREMENTS

I. MANAGEMENT AND CONTROL OF COMBINED SEWER OVERFLOWS

Combined sewer overflows (CSOs) are allowed to discharge only in compliance with this permit when flows in combined sewer systems exceed the design capacity of the conveyance or treatment facilities of the system during or immediately after wet weather periods. Overflows that occur without an accompanying precipitation event or snow-melt are termed "dry weather overflows" and are prohibited. CSOs are point source discharges that must be provided with control measures in accordance with the Federal Clean Water Act and the 1994 National CSO Policy.

The point source discharge locations (outfalls) specifically identified in the application submitted by the permittee serve as known combined sewer overflow locations on the permittee's sewer system.

II. CONTINUED IMPLEMENTATION OF TECHNOLOGY-BASED NINE MINIMUM CONTROLS

A. Upon issuance of this permit, the permittee shall continue the implementation of the NMCs, demonstrate system wide compliance with the NMCs and submit discharge monitoring reports and annual reports to DEP with appropriate documentation. The permittee's NMC documentation report is incorporated in this permit and the NMCs are listed here:

B. DEP will use the EPA guidance document entitled "Guidance For Nine Minimum Controls" (EPA 832-B-95-003), dated May 1995, and specific comments provided during review of the NMC documentation reports to determine continued compliance with the CSO permit requirements.

III. IMPLEMENTATION OF WATER QUALITY-BASED LONG TERM CONTROL PLAN (LTCP)

A. The long term goal of the LTCP requirements in this permit is to achieve compliance with the state water quality standards upon completion of the LTCP implementation. The CSO discharge(s) shall comply with the performance standards of the selected CSO controls and shall comply with the water quality standards found in Chapter 93. When additional CSO-related information and data becomes available to revise water quality-based effluent limitations, the permit should be revised, as appropriate, to reflect the new effluent limitations.

B. The permittee shall continue the implementation of the approved LTCP, demonstrate system-wide compliance with the LTCP's installed alternatives and submit with the

Annual Report referenced in paragraph IV.B below, annual progress reports on implementation.

C. The permittee shall continue to implement its approved long term control plan (LTCP). The LTCP, at a minimum, shall incorporate the following requirements:

1. Continued implementation of the nine minimum controls.

2. Protection of sensitive areas (recreation areas, public water supply, unique ecological habitat, etc.);

3. Characterization, monitoring and modeling of overflows and assessment of water quality impacts;

4. Evaluation and selection of control alternative - presumptive or demonstrative approach;

5. Public participation in LTCP plan development and implementation;

6. Implementation schedule and financing plan for selected control options;

7. Maximizing treatment at the existing POTW treatment plant;

8. The selected CSO controls should include a post-construction monitoring program plan adequate to verify compliance with water quality standards and protection of designated uses as well as to ascertain the effectiveness of CSO controls. This water quality compliance monitoring program should include a plan to be approved by DEP that details the monitoring protocols to be followed; and,

9. CSO System Operational Plan.

D. The LTCP is described in the EPA's guidance document entitled "Guidance For Long Term Control Plan" (EPA 832-B-95-002), dated September 1995. Using a compliance monitoring program, the permittee shall periodically review the effectiveness of the LTCP and propose any changes or revisions to the LTCP to DEP for review and approval before its implementation.

E. The permittee shall implement, inspect, monitor and effectively operate and maintain the CSO controls identified in the LTCP pursuant to the LTCP implementation schedule, which is incorporated herein by reference. Notwithstanding any other provisions of this permit, the permittee will achieve the interim steps or milestones identified in the LTCP, including but not limited to the following as listed below:

<List Interim Steps/Milestones Here>

IV. MONITORING AND REPORTING REQUIREMENTS

A. Discharge Monitoring Report (DMR) Supplemental Reports for Combined Sewer Overflows:

The permittee shall record data on CSO discharges in the format specified in DEP's DMR Supplemental Reports for CSOs attached to this permit. The data shall be submitted monthly to the appropriate regional office of DEP within 28 days of the end of the reporting month. For CSOs that are part of a permitted POTW, the DMR Supplemental Reports for CSOs must be submitted with the permittee's regular DMR. Copies of the DMR Supplemental Reports for CSOs must be retained at the Sewage Treatment Plant (STP) site for at least three (3) years.

B. Annual CSO Status Report

On March 31 of each year, an Annual CSO Status Report shall be submitted to DEP with the annual "Municipal Wasteload Management Report" required by 25 Pa. Code Chapter 94, Section 94.12. For a satellite CSO system, a copy of the annual report shall also be provided to the POTW providing treatment for its wastewater.

1. The Annual CSO Status Report shall:

   a. Provide a summary of the frequency, duration and volume of the CSO discharges for the past calendar year;

   b. Provide the operational status of overflow points;

   c. Provide an identification of known in-stream water quality impacts, their causes, and their effects on downstream water uses;

   d. Summarize all actions taken to implement the NMCs and the LTCP and their effectiveness; and,

   e. Evaluate and provide a progress report on implementing and necessary revisions to the NMC and LTCP.

2. Specifically, the following CSO-related information shall be included in the report:

   a. Rain gauge data - total inches (to the nearest 0.01 inch) that caused each CSO discharge being reported in the DMR Supplemental Reports for CSOs.

   b. Inspections and maintenance.

      - Total number of permittee/owner inspections conducted during the period of the report (reported by drainage system).

- A list of blockages (if any) corrected or other interceptor maintenance performed, including location, date and time discovered, date and time corrected, and any discharges to the stream observed and/or suspected to have occurred.

c. Dry weather overflows

Dry weather CSO discharges are prohibited. Immediate telephone notification to DEP of such discharge is required in accordance with 25 Pa. Code, Section 91.33. Indicate location, date and time discovered, date and time corrected/ceased, and action(s) taken to prevent their reoccurrence. A plan to correct this condition and schedule to implement the plan must be submitted with the DMR Supplemental Reports for CSOs.

d. Wet weather overflows

- For all locations that have automatic level monitoring of the regulators, report all exceedances of the overflow level during the period of the report, including location, date, time, and duration of wet weather overflows.

- For all locations at which flows in the interceptors can be controlled by throttling and/or pumping, report all instances when the overflow level was reached or the gates were lowered. For each instance, provide the location, date, time, and duration of the overflow.

V. AREA-WIDE PLANNING/PARTICIPATION REQUIREMENT

Where applicable, the permittee shall cooperate with and participate in any interconnected CSO system's NMCs and LTCP activities being developed and/or carried out by the operator(s) of these systems, and shall participate in implementing applicable portions of the approved NMC and LTCP for these systems.

VI. PERMIT REOPENER CLAUSE

DEP reserves the right to modify, revoke and reissue this permit as provided pursuant to 40 CFR 122.62 and 124.5 for the reasons set forth in 25 Pa. Code Section 92.51(2) and for the following reasons:

A. To include new or revised conditions developed to comply with any State or Federal law or regulation that addresses CSOs and that is adopted or promulgated subsequent to the effective date of this permit.

B. To include new or revised conditions if new information indicates that CSO controls imposed under the permit have failed to ensure the attainment of State Water Quality Standards.

C. To include new or revised conditions based on new information resulting from implementation of the LTCP or other plans or data.

VII. COMBINED SEWER OVERFLOW COMPLIANCE SCHEDULE

The permittee shall complete the above CSO activities in accordance with the following compliance schedule:

Schedule Activity Description	**Compliance Due Date**
Continue Implementation of the NMCs	Permit effective date
Continue Implementation of the LTCP	Permit effective date
Submit Annual CSO Status Report to DEP with Chapter 94 Report	March 31 of each year
Submit DMR Supplemental Reports for CSOs (Attachment 3)	Within 28 days of the end of a month

Scheduled Interim Milestones	**Compliance Due Date**

List here all interim milestones (from approved NMC and LTCPs) for tracking through PCS or eFACTS

Attachment 3

3800-FM-WSFR0441 7/2009

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

CSO SUPPLEMENTAL REPORT
MONTHLY INSPECTION REPORT

Facility Name: _____
Municipality: _____ County: _____
Watershed: _____

Month: _____ Year: _____
NPDES Permit No.: _____
Renewal application due **180 days** prior to expiration
This permit will expire on _____

CSO Outfall No.	Outfall Location*	Discharge?*	Comments

See instructions for explanation.

I certify under penalty of law that this document was prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. See Pa. C.S. § 4904 (relating to unsworn falsification).

Prepared By: _____ Signature: _____
Title: _____ Date: _____

INSTRUCTIONS FOR COMPLETING CSO MONTHLY INSPECTION SUPPLEMENTAL REPORT

1. Enter Facility Name, Municipality, County, Watershed No., Month, Year, NPDES Permit No., and Permit Expiration Date.

2. List all CSO outfalls associated with the facility, as listed in the NPDES permit, in the column labeled "CSO Outfall No.," using additional sheets as needed.

3. Specify the location of the CSO (e.g., street or other identification information) in the column labeled "Outfall Location."

4. In the column labeled "Discharge?" enter "Yes" or "No" for each outfall to report whether a discharge was identified at any time during the calendar month. **If you respond Yes for any outfall, a separate "Detailed Outfall Report" must be submitted for that outfall.**

5. Add any additional outfall-specific information as needed in the "Comments" column.

Type the name of the person who prepared the form, the person's job title, and sign and date the form after reading the certification statement.

3800-FM-WSFR0442 7/2009

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

CSO SUPPLEMENTAL REPORT
DETAILED OUTFALL REPORT

Facility Name: _____
Municipality: _____ County: _____
Watershed: _____

Month: _____ Year: _____
NPDES Permit No.: _____ Outfall No. _____
Renewal application due **180 days** prior to expiration
This permit will expire on _____

Day	Identification*	Discharge Volume (MG)*	Duration (hrs)	Cause*	Precipitation (in)	Comments
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						

See instructions for explanation.

I certify under penalty of law that this document was prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for Knowing violations. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).

Prepared By: _____ Signature: _____
Title: _____ Date: _____

INSTRUCTIONS FOR COMPLETING CSO DETAILED OUTFALL SUPPLEMENTAL REPORT

1. Enter Facility Name, Municipality, County, Watershed No., Month, Year, NPDES Permit No., CSO Outfall No., and Permit Expiration Date.

2. Explain how the discharge was identified (e.g., inspection, complaint, alarm) in the column labeled "Identification."

3. In the column labeled "Discharge Volume," specify the volume of the discharge in million gallons, and (in parentheses) identify the method used to determine the volume by selecting one of the following codes:

   O = Observed duration and rate of flow to approximate overflow volume.
   C = Calculated overflow volume utilizing a model or empirical analysis.
   M = Measured overflow volume from data collected by a calibrated flow monitor.
   U = Unable to determine.

4. In the column labeled "Duration (hrs)," specify the total discharge period. If you estimate the discharge period, explain how you arrived at the estimate in the Comments column.

5. In the column labeled "Cause," identify the cause of the overflow (e.g., line or gate blockage, malfunction, hydraulic load).

6. In the column labeled "Precipitation," report the total precipitation for the day, in inches (in), as measured using an on-site rain gauge, or use local airport data.

7. Add any additional outfall-specific information as needed in the "Comments" column.

8. Type the name of the person who prepared the form, the person's job title, and sign and date the form after reading the certification statement.

Attachment 4
Maximizing Treatment at the Existing POTW

A CSO-related bypass of the secondary treatment portion of the POTW treatment plant is authorized only when (1) the permittee is implementing Nine Minimum Controls and a Long Term Control Plan and the bypass is part of the operational plan for implementing Nine Minimum Controls and the Long Term Control Plan, (2) it is in accordance with the provision of 40 CFR 122.41 (m) and (3) the flow rate to the POTW treatment plant, as a result of a precipitation or snow-melt events, exceeds _____ MGD. (Permit writer to insert the maximum flow rate that can safely be handled by the secondary units without wash-outs based on the facility's design capacity and maximization of flow through the secondary treatment units.) Bypasses that occur when the flow at the time of the bypass is less than the above specified flow rate are not authorized under this condition.

In the event of a CSO-related bypass authorized under this condition, the permittee shall minimize the discharge of pollutants to the receiving water. At a minimum, the CSO-related bypass flows must receive primary clarification, solids and floatables removal, and disinfection. The bypass may not cause the effluent from the POTW either to exceed the effluent limits contained in its permit or to cause or contribute to a violation of water quality standards. The permittee shall report any substantial changes in the volume or character of pollutants being introduced into the POTW or that may be present in the CSO-related bypass. Authorization of CSO-related bypasses under this provision may be modified or terminated when there is a substantial change in the volume or character of pollutants being introduced to the POTW or in the bypassed flow. The permittee shall provide notice to the permitting authority of bypasses authorized under this condition within 24 hours of occurrence of the bypass.

APPENDIX D

Philadelphia
Water Department

The ARAMARK Tower
1101 Market Street
Philadelphia, Pennsylvania 19107-2994

BERNARD BRUNWASSER
Commissioner

October 28, 2010

Ms. Jenifer Fields
Water Quality Program Manager
PA Dept of Environmental Protection
Southeast Regional Office
2 East Main Street
Norristown, PA 19104

Dear Ms. Fields,

Since the Philadelphia Water Department first submitted the Long Term Control Plan Update for the Combined Sewer Overflow program in September, 2009, your staff has engaged with ours in a lengthy dialogue concerning the proposed program. Staff from the US EPA have also participated in this discussion. As a result of comments and suggestions made by the agencies, PWD has provided additional information, and has also committed to providing several additional deliverables in the early years of the Program to supplement the LTCPU. We expect that these commitments will soon be formalized in a revised Consent Order and Agreement and a revised CSO condition in the NPDES permits. The details of those formal documents are being discussed by our respective organizations now.

The purpose of this letter is to address certain fundamental issues related to the LTCPU that have emerged during the last few months, and that may not be sufficiently documented elsewhere. The work elements and basic structure of the Program have not changed, but certain key features of the proposal differ from what was presented in the September 2009 LTCPU.

The proposed LTCPU is a $2.0B ($1.2B net present value) program for addressing water quality goals as set by the Pennsylvania and National CSO Control Policies, to be implemented over a 25 year period, with metrics and milestones developed to measure progress along the way. The City budget for the LTCPU is consistent with Federal CSO Guidance recommendations for Median Household Income. The City believes that we have proposed a program that addresses the state and federal water quality goals and sets a limit on the financial burden on the City's sewer customers. Additional CSO expenditures during the 25 year period could significantly exceed the limit of the City's affordability for implementing a CSO long term control plan.

The LTCPU will provide an adequate level of control to meet the water quality-based requirements of the Clean Water Act (CWA). The City's plan is based on the National CSO Policy for a Presumption Approach to meet the water quality requirements of the CWA and the Pennsylvania Clean Streams Law as follows: the City will construct and place into operation the

controls described as the selected alternative in the LTCPU, as supplemented by this letter, to achieve the elimination of the mass of the pollutants that otherwise would be removed by the capture of 85% by volume of the combined sewage collected in the Combined Sewer System (CSS) during precipitation events on a system-wide annual average basis.

Though the original LTCPU contained a detailed proposal for a stream restoration program, with a certain amount of dedicated funding, we understand that the agencies believe it is not appropriate to include this kind of work within a CSO commitment. However, the City is committed to stream restoration and wetland creation, and so the monetary commitment toward realizing these goals must be appropriated from another source as these cannot be counted toward achievement of CSO compliance goals. Therefore, the $125M originally committed to streams and wetlands in the LTCPU must be re-appropriated toward infrastructure aimed at CSO reduction.

Sincerely,

Bernard Brunwasser
Water Commissioner

APPENDIX E

Supplemental Documentation

in support of the City of Philadelphia's Combined Sewer Overflow Long Term Control Plan Update

April 2011

The City of Philadelphia (City) submitted its Long Term Control Plan Update to the Department of Environmental Protection (DEP) on September, 1, 2009. Since that date the City and DEP have engaged in a series of discussions regarding the Update.

As a result of these discussions, the City hereby submits the attached Supplemental Documentation to the LTCP Update. This Supplemental Documentation hereby amends, and becomes fully incorporated into, the City's LTCP Update.

The Supplemental Documentation consists of six (6) separate documents as described below:

Document #1 - PWD System-wide Combined Sewer Overflow Volume Summary

Document #2 - Mass Loading Presumptive Approach

Document #3 - Background and purpose of the conversion of the combined sewer system hydrologic and hydraulic models from USEPA SWMM4 to SWMM5

Document #4 - Description of interceptor lining program (TTF and Cobbs), history and context

Document #5 - Rationale for Equal Distribution of Green Stormwater Infrastructure Implementation in all Neighborhoods

Document #6 - Application of Sensitive Area Criteria to City of Philadelphia CSO Receiving Waters

Document #1
Technical Memorandum
Office of Watersheds - PWD
March, 2011

Subject: **PWD System-wide Combined Sewer Overflow Volume Summary**

SUMMARY

This technical memorandum describes the methodology and results of the Philadelphia Water Department's estimation of the system-wide combined sewer overflow volume. At present, the system-wide overflow volume calculation is based on USEPA SWMM Version 4 modeling results from the individual sewershed regulators that then are aggregated based on interceptor and drainage district configuration and accumulated to a PWD system-wide result. The methodology and results described in this technical memorandum are those developed using the 2009 SWMM4 versions of PWD's combined sewer system hydrologic and hydraulic models.

Further detail regarding the hydrologic and hydraulic models used as basis for the combined sewer overflow and capture volume calculation can be found in *LTCPU Supplemental Document 4: Hydrologic and Hydraulic Modeling*.

PWD System-wide Overflow Volume

System-wide overflow volume is the aggregation of each interceptor and Water Pollution Control Plant (WPCP) district combined sewer overflow volume. Aggregation to the interceptor level begins with individual sewershed regulators and the respective capture and overflow volumes. WPCP district level aggregation is from the interceptors draining to that district's WPCP. The PWD system-wide aggregation calculation is from either interceptor or WPCP district level, summing each system or district's overflow volume to total system-wide overflow volume.

Capture Methodology

Capture of combined sanitary and stormwater flows requires first that wet weather events are defined. In the Long Term Control Plan Update (LTCPU), baseline wet weather is defined as when the flow in the dry weather pipe, connecting the regulator to the interceptor, increases by more than 5 percent of the dry weather baseflow. Capture calculations are performed in two steps. In the baseline condition, captured volume is the volume of combined sewer flow that is sent to the WPCPs during wet weather. In alternatives with CSO controls in place, captured volume includes volume sent to the WPCPs and the volume prevented from reaching the Combined Sewer System (CSS) by source controls (infiltrated, evaporated, and/or transpired runoff volume). Percent capture is calculated as the ratio of the captured volume to the sum of captured volume and volume overflowed to receiving waters.

The capture calculations are performed at each regulator. Each of the regulators is assigned to an interceptor system and the capture results from each regulator can be aggregated for that interceptor system. These results from the interceptors are further aggregated by WPCP drainage district and by watershed.

Baseline Capture Calculations and Overflow Estimation

Baseline capture calculations use the following approach.

1. The capture formula is "Percentage Capture at a given regulator = 100 * [Total Volume through the dry weather pipe at the regulator / (Total Volume through the dry weather pipe at the regulator + Total volume that overflows to receiving water from the regulator)]".
2. For each regulator in the CSS, the dry weather flow pipe (DWO) and wet weather overflow pipe (SWO) is identified.
3. Flow for all the pipes identified in the last step is generated from the SWMM models. Another set of flows for the same pipes as above are generated for the same period as the wet weather simulation except using 0 (zero) precipitation. The zero precipitation simulation is performed to obtain the dry weather flows for the period of interest.
4. For each of the regulators, DWO and SWO pipe flow calculations are performed as follows.
    a. A tolerance is set for the baseflow for all the regulators which when exceeded indicates the regulator is in wet weather conditions (This tolerance is set at 5% for the LTCPU, when flow in the DWO pipe is above 5% of baseflow, the regulator is assumed to be in wet weather). Based on the baseflow tolerance, the wet weather events are identified for the regulator. Capture calculations are performed for the wet weather events (using the formula in step 1).
    b. If overflows from one regulator (Regulator "A") are re-regulated at another regulator (Regulator "B"), the overflow from A will be ignored when the capture result is aggregated to interceptor system. Overflow in A is considered "negative flow" in the calculations.
    c. If a regulator (Regulator "C") re-regulates flow from upstream regulator's DWO (Regulator "D", Regulator "E"), all the DWO flows from D and E (negative flows) are ignored and only DWO flow from C is used when capture result is aggregated to the interceptor system.
    d. Negative flow through DWO (flow being relieved) pipes is subtracted when the capture calculation is performed. This accounts for regulators relieving other regulators.
    e. The result from the CAPTURE program is summarized for annual totals and aggregated by interceptor, WPCP and watershed systems.

The volume of combined sewer overflow is estimated directly as the sewage volume not captured within the combined sewer system. The current estimate of the average annual City-wide overflow volumes is between 10,307 million gallons to 15,952 million gallons, with an inferred average overflow volume of 13,100 million gallons. This estimate range was developed using the hydrologic and hydraulic model, and the uncertainty estimation methodology, as described in the *LTCPU Supplemental Document 4: Hydrologic and Hydraulic Mode*ling. These estimates will be refined, and the uncertainty reduced, as the City GIS and flow monitoring information base is refined and expanded, and as the hydrologic and hydraulic model code, structures and validations evolve in response to those improvements and technology innovations.

Green Stormwater Infrastructure, Traditional Infrastructure and Large Scale Centralized Storage Capture Calculation Methodology

Capture calculations for the alternatives that have been analyzed in the LTCPU – Green Stormwater Infrastructure, Traditional Infrastructure (Transmission to the WPCP) and Large Scale Centralized Storage (Tunnel) – are performed using the baseline model capture values as the foundation. The approach described below assumes that the overflow volume reduction, as compared to the baseline values, is due to implementation of the alternatives.

Steps included in alternative capture calculation

1. The overflow volume (SWO_0) to the receiving waters and treated volume (DWO_0) from the baseline models are obtained. This may be aggregated to the interceptor level or further aggregated to the WPCP drainage district level or the watershed level depending on the alternative for which effective capture calculations need to be performed.
2. The alternative scenario's overflow volume (SWO_1) is aggregated to the interceptor level or further aggregated to the WPCP drainage district level or the watershed level, depending on the alternative (representing Green Stormwater Infrastructure, Traditional Infrastructure or Large Scale Centralized Storage).
3. The treated flow that accounts for the reduction in volume that overflows to the receiving water due to implementation of the alternatives when compared to the baseline is inferred by the water balance: $[(SWO_0 + DWO_0) - (SWO_1)]$
4. The alternative capture formula is: $100*[(SWO_0 + DWO_0) - (SWO_1)] / (SWO_0 + DWO_0)$

Document #2
Technical Memorandum
Office of Watersheds - PWD
March, 2011

Subject: **Mass Loading Presumptive Approach**

SUMMARY

As suggested by NRDC, Clean Water Action, and Penn Future, PWD has completed a preliminary analysis of the elimination or removal of no less than the mass of the pollutants that would be eliminated or captured for treatment under an 85% capture by volume scenario, as discussed in Section II.C.4.a of the National CSO Policy. The results suggest that a presumption approach based on equivalent mass removal is viable as an alternative to the demonstration approach.

National CSO Policy Language

Section II.C.4.a of the National CSO Policy allows the presumptive approach to be met by a minimum 85% capture of pollutant loads. For reference, here is the language describing the various ways of presuming compliance with the water quality standards:

"A program that meets any of the criteria listed below would be presumed to provide an adequate level of control to meet the water quality-based requirements of the CWA provided the permitting authority determines that such presumption is reasonable in light of the data and analysis conducted in the characterization, monitoring, and modeling of the system ...

i. No more than an average of four overflow events per year, provided that the permitting authority may allow up to two additional overflow events per year. For the purpose of this criterion, an overflow event is one or more overflows from a CSS as the result of a precipitation event that does not receive the minimum treatment specified below; or

ii. The elimination or the capture for treatment of no less than 85% by volume of the combined sewage collected in the CSS during precipitation events on a system-wide annual average basis; or

iii. The elimination or removal of no less than the mass of the pollutants identified as causing water quality impairment through the sewer system characterization, monitoring, and modeling effort for the volumes that would be eliminated or captured for treatment under paragraph ii. above."

It is **paragraph iii** that is the subject of this memorandum.

To establish target pollutant load mass removal rates, 85% of combined sewage must be treated according to the requirements of the Policy, which are primary clarification, solids and floatables disposal, disinfection of effluent, as necessary, and removal of disinfection residuals, where necessary. For reference, text from *Combined Sewer Overflows: Guidance for*

Long Term Control Plan (EPA, 1995) is provided below.

"The definition of "primary clarification" is one of the key implementation issues underlying the presumption approach and has generated considerable debate among regulators, municipalities, consultants, and equipment suppliers. The intent of primary clarification is removal of settleable solids from the waste stream, which will result in the environmental benefits outlined above. The CSO Control Policy does not define specific design criteria or performance criteria for primary clarification, however. This guidance document does not provide a definition either; instead, it discusses general considerations for primary clarification under the presumption approach, recognizing the variable nature of CSOs and general lack of historical data on CSO treatment facility performance. "

The city-wide average primary clarification percent removal numbers used in the subsequent equivalent mass calculations were determined from a sample analysis conducted at each of PWD's Water Pollution Control Plants (WPCP). Samples were taken at influent and effluent points during wet weather conditions for the primary clarification portion of the treatment systems. The sampling period for each WPCP, number of sample events and sample statistics for each district and city-wide are presented in Table 1. The values used in the subsequent calculations are highlighted in blue.

Table 1. Summary of WPCP primary clarification statistics and sampling study data.

		SE	*SW*	*NE*	*City-Wide Numbers*
Sampling Period		6/2008 - 6/2009	8/2008 - 8/2009	11/2008 - 4/2009	Varies between 6/2008 - 8/2009
# of Sample Events		7	16	5	28
TSS - % Removed	*Average*	65	68	69	**67**
	Max	88	80	84	84
	Min	37	44	50	44
BOD_5 - % Removed	*Average*	42	46	29	**39**
	Max	74	57	50	60
	Min	13	40	24	26

*Highlighted Values are the Values Used in this Analysis

Mass Loading Approach

To establish pollutant mass based targets to meet option iii requires a comparison of the pollutant removal by mass of the LTCPU selected alternative with an alternative that achieves 85% capture by volume using a traditional treatment approach. In following Section II.C.4.a of the National CSO Policy, PWD defines the 85% by volume traditional alternative as satellite primary clarification and disinfection (SPC) of the CSOs prior to discharge. To decide on the appropriate pollutant removal efficiencies, the results of sampling of the primary settling tanks from the PWD wastewater treatment plants were used. These indicated that PWD achieves relatively high removal rates when compared to literature values, and thus sets the 85% mass removal target relatively high. The removal rates for the pollutants of concern are shown in Table 1, as well as the expected concentrations in the untreated stormwater and sanitary sewage, and the expected concentrations of the effluent from green stormwater infrastructure assuming it passes through soil as part of the treatment.

Table 1: Concentrations and Removal Percentages used in the Analysis.

Type	BOD_5 (mg/L)	TSS (mg/L)	Fecal Coliform (per 100 mL)
Untreated Stormwater	8.445[1]	65.679[1]	1.00E+05[2]
Green Infrastructure Treated Stormwater	4.5[3]	8.8[3]	2.00E+02[4]
Sanitary Sewage	134[5]	116[5]	1.45E+06[5]
PCD % Removal	39%[6]	67%[6]	99.99%[7]

PCD = Primary Clarification and Disinfection

[1] Analysis of pooled EMC results from the National Urban Runoff Program (NURP), United States Geological Survey, and NPDES Phase I monitoring data.

[2] Study of bacteria concentrations in a combined sewer system in western Pennsylvania. Bacteria concentrations are highly variable, and true event mean concentration (EMC) studies are rare due to sampling difficulties. For reference, fecal coliform concentrations reported in NURP are on the order of 10^4/100 mL, while median concentrations from NPDES Phase I data reported by Robert Pitt are on the order of 10^3/100 mL. However, sensitivity analysis within a range of 10^3-10^5 indicates that changing this value does not change the conclusions of the study.

[3] Event mean concentrations in effluent from green stormwater infrastructure derived from the International Stormwater BMP Database.

[4] Median of grab sample data in effluent from green stormwater infrastructure derived from the International Stormwater BMP Database.

[5] Derived from PWD dry weather CSS monitoring data

[6] Derived from PWD wet weather primary clarifier data

[7] 4-log reduction derived from study of chlorination units

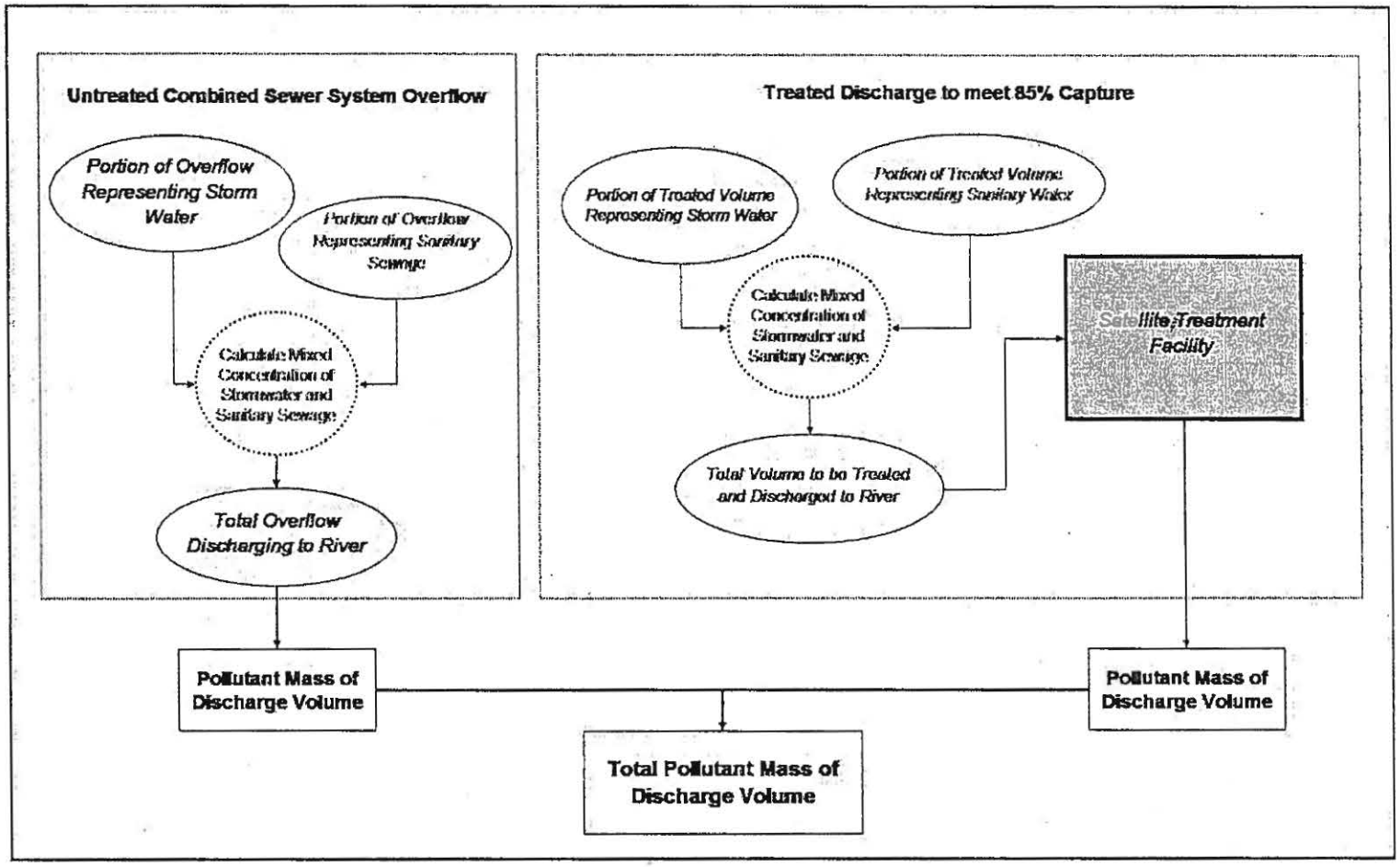


Figure 1. Traditional Alternative: Primary clarification, solids and floatables disposal, disinfection of effluent, as necessary, and removal of disinfection residuals, where necessary.

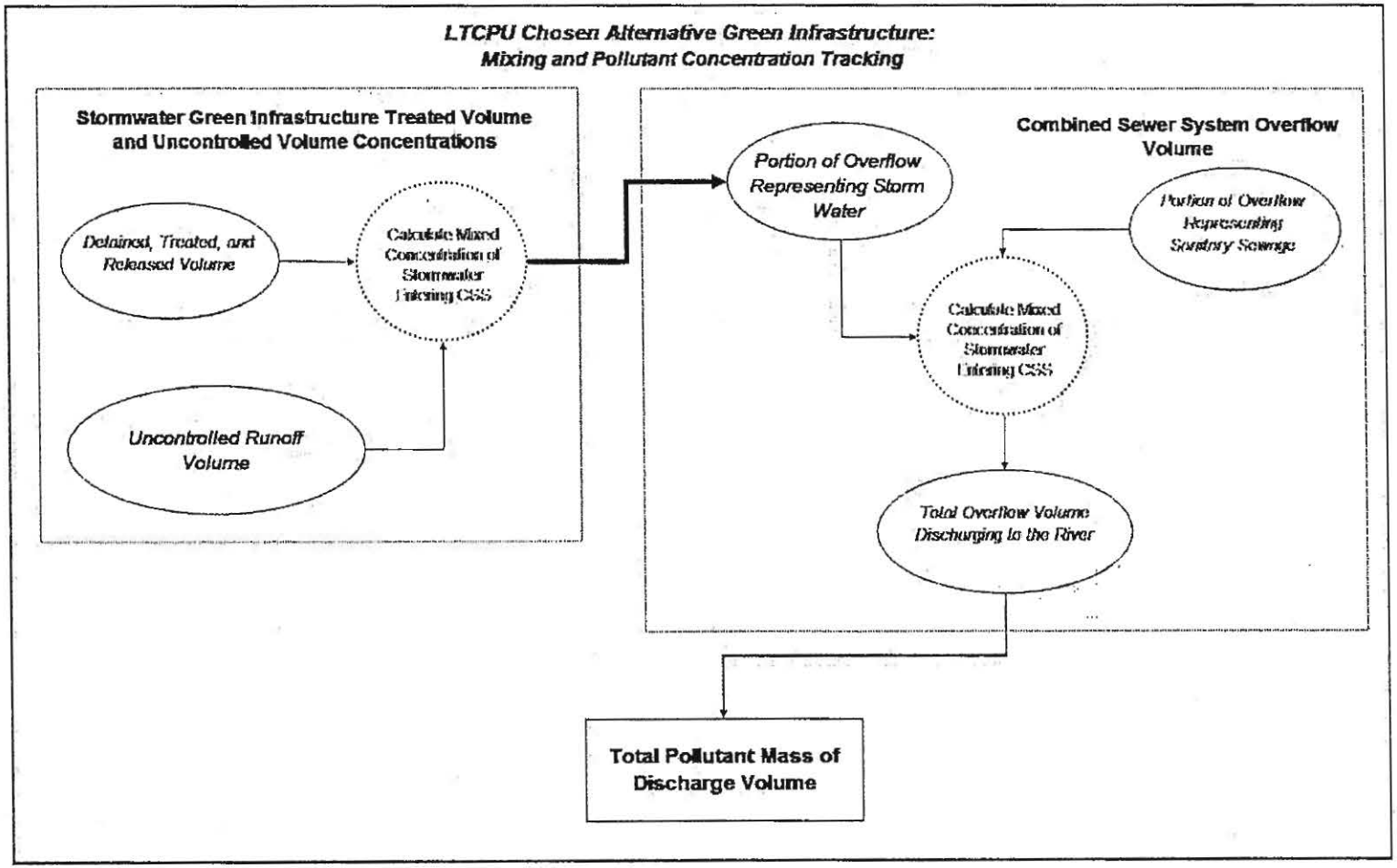


Figure 2. Green Stormwater Infrastructure Alternative

Figures 1 and 2 show a comparison of the flow paths for the traditional alternative and the LTCPU selected alternative.

For the traditional alternative, the combined sewage follows three paths to the receiving water, either as CSO, as treated effluent of the satellite primary clarifiers (SPCs), or as treated effluent from the wastewater plant (not shown). The discharge to the wastewater treatment plant is similar for both the traditional and selected options, and is not part of the comparison.

For the selected alternative, the flow path is more complex, as the green stormwater infrastructure intercepts some of the stormwater flow, eliminating some as infiltration or evapotranspiration. The remaining flow follows only two paths to the river. Part of the flow of stormwater routed to green stormwater infrastructure will bypass the structure and enter the CSS to mix with sanitary sewage, a portion of which ultimately discharges untreated to the receiving water as CSO. Some will be filtered through soil, eventually to be released slowly to flow to the treatment plants for treatment and release to the receiving water, or to remix with combined sewage and discharge to the receiving water as CSO.

An estimate of mass removal for the traditional alternative is needed to establish the equivalent mass removal target. This was done as follows.

- **85% Volume:** the volume of CSO that is represented by 85% capture was calculated. The SWMM model provides estimates of the volume of CSO plus the volume being captured at the treatment plants in wet weather under current conditions. 85% of this number represents the target volume to be captured and treated.

- **85% Pollutant Mass Removal Targets:** To establish if the selected alternative can achieve the presumptive target for mass removal at less than 85% capture by volume, the equivalent mass removal must be estimated for the 85% by volume traditional alternative. It makes sense to assume what goes to the treatment plants now would be part of the assumed treatment of the traditional alternative. This handles approximately 60% of the total volume. The remaining 25% must be treated elsewhere by satellite primary clarification and disinfection to achieve 85% capture by volume. The SPCs provide 39% removal of BOD_5, 67% removal of TSS, and 99.99% removal (4 log) of bacteria, thus establishing the target pollutant load reductions.

This establishes the pollutant mass removal targets for 85% of the volume that are equivalent to a reasonable treatment process for Philadelphia utilizing the treatment plants as they are today, and adds satellite primary clarifiers with disinfection to treat the remaining volume.

For the selected alternative, the pollutant mass removal rate must be estimated for comparison with the target mass removal established by the traditional alternative. Results of computer modeling indicate that the LTCPU selected alternative removes less than 85% of the volume of wet weather combined sewage. If the selected alternative removes at least as much pollutant mass as the traditional alternative removes, then according to Section II.C.4.a of the National CSO Policy, it meets the requirements for a presumptive approach. The pollutant mass removal by the selected alternative occurs primarily because:

- the CSO volume is reduced
- mass is removed as stormwater filters through the green stormwater infrastructure, and
- more mass is sent to treatment plants as stored volume is slowly released

Selected Alternative Compared to Target Mass Removal (Traditional or "Gray")

Table 2: Pollutant mass removal comparison of selected alternative with target mass removal of 85% by volume traditional alternative

		City-Wide		Mid-Point of Range	
Range	Constituent	Green	Gray	Green	Gray
HIGH	BOD_5 (lbs)	1,931,162	801,453	1,579,428	620,880
LOW	BOD_5 (lbs)	1,227,695	440,308		
HIGH	TSS (lbs)	5,802,360	4,056,809	4,771,307	3,194,241
LOW	TSS (lbs)	3,740,254	2,331,672		
HIGH	# of Bacteria (10^16)	9.88	10.38	8.08	8.05
LOW	# of Bacteria (10^16)	6.28	5.71		

*Highlighted values have a greater mass removed.

Table 2 provides the results of this analysis. The pollutant loads removed for the selected alternative are compared to the target pollutant removal loads represented by the traditional alternative using SPCs. The estimates are provided for a range representing flows from the SWMM models indicative of the model's accuracy. Table 2 also presents the mid-point of this range. The blue shading indicates which alternative is more successful at removing pollutants for each comparison (upper limit, lower limit, and mid-point for each pollutant).

Does the Selected Alternative Meet the Equivalent Pollutant Mass Removal Targets?

A comparison of the selected alternative with the traditional alternative can have three possible outcomes:

- the selected alternative has a higher pollutant mass removal rate than the target represented by SPCs at 85% capture by volume
- the selected alternative has the same pollutant mass removal rate than the target represented by SPCs at 85% capture by volume (the results are not significantly different)
- the selected alternative has a lower pollutant mass removal rate than the target represented by SPCs at 85% capture by volume

The results provided in Table 2 suggest that under all scenarios (upper limit, lower limit, and mid-point), the selected alternative provides at least as much mass removal as the traditional alternative at 85% capture by volume for TSS, BOD_5 and fecal coliform.

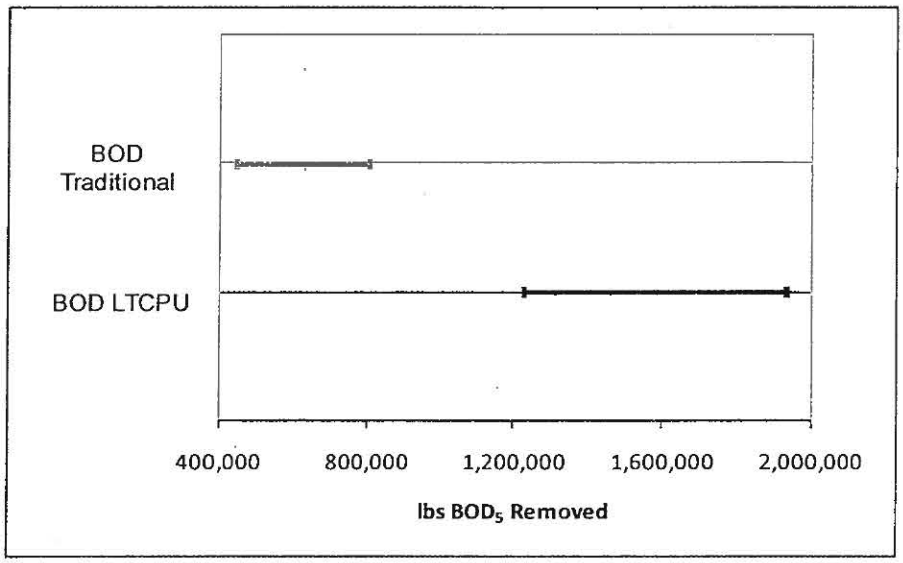


Figure 2: Annual removal of BOD5 for Selected and Traditional alternatives

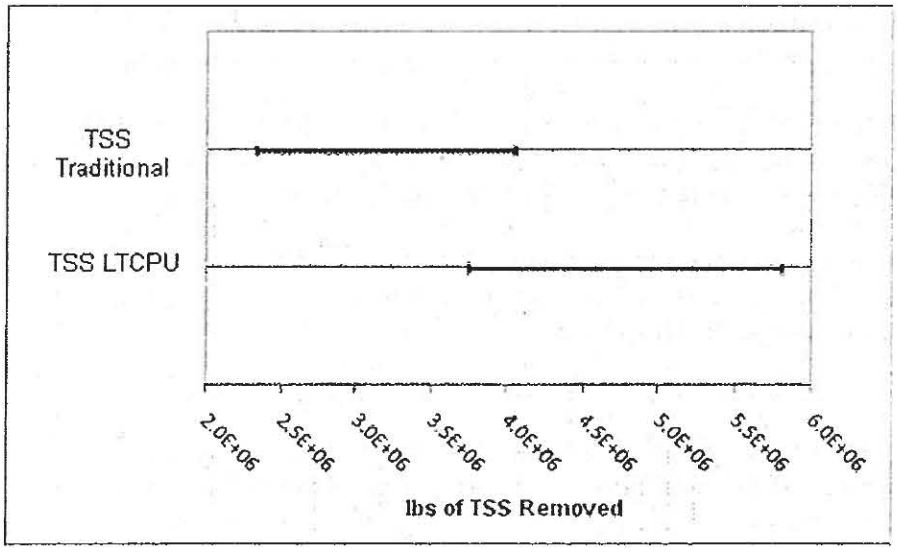


Figure 3: Annual removal of Total Suspended Solids for Selected and Traditional alternatives

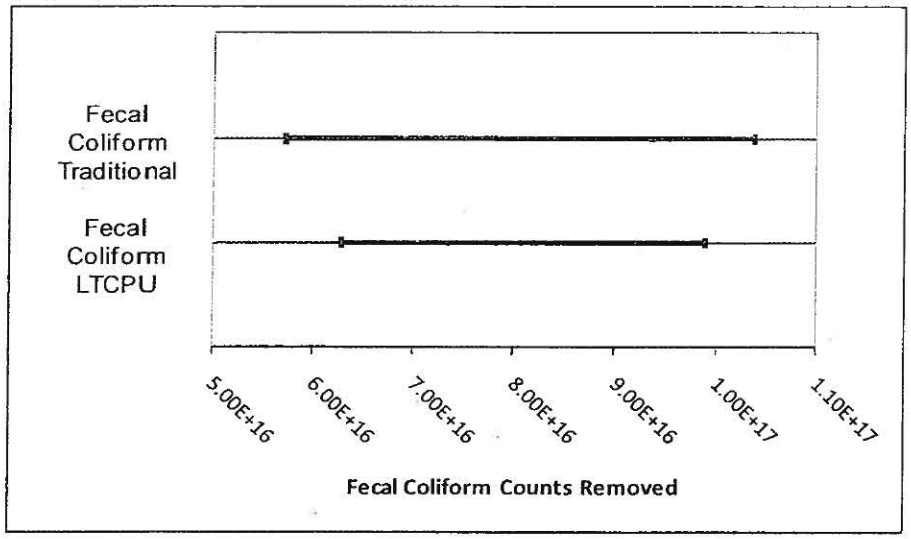


Figure 4: Annual removal of Fecal Coliform for Selected and Traditional alternatives

Figures 2 through 4 show the results for BOD_5, TSS, and fecal coliform graphically as a range of estimated mass removal of pollutant loads. The range is a result of the estimated accuracy of the SWMM model output and includes estimates for a confidence interval based on uncertainty in flow monitoring data. Based on Table 2 and Figures 2 through 4, the following conclusions are drawn.

- **5-day biochemical oxygen demand (BOD_5):** The selected green alternative removes more than the traditional gray alternative (the entire range of selected alternative removal estimates is higher than the upper end of the traditional alternative range).
- **Total suspended solids (TSS):** The selected alternative removes slightly more than the equivalent traditional alternative, but the difference is not large and the range of removal rates for the selected alternative and the traditional alternative overlap.
- **Fecal coliform:** The selected alternative removes slightly more than the equivalent traditional alternative, but the difference is not large and the range of removal rates for the selected alternative and the traditional alternative overlap.

Conclusion

It appears that the selected alternative removes an equivalent mass of pollutants to an alternative consisting of satellite primary clarifiers with disinfection that controls 85% of the wet weather flow by volume. To paraphrase the language of the CSO guidance document:

Based on the analysis of pollutant loading removal for the selected LTCPU alternative, it can be considered to provide for the elimination or removal of no less than the mass of the pollutants identified as causing water quality impairment that would be eliminated or captured for treatment by an alternative treatment train that captures and treats 85% by volume of the

combined sewage collected in the CSS during precipitation events on a system-wide annual average basis.

This implies that a presumption approach would be viable for PWD's selected alternative.

It is important to note that the greatest benefit from green stormwater infrastructure stems from its ability to manage stormwater by cleaning and allowing the stormwater to infiltrate. The infiltrated volume is prevented from entering the CSS entirely and subsequently reduces the total volume discharging to the waterways. This reduction in volume discharging to the rivers and streams due to green stormwater infrastructure allows for high efficiency of pollutant mass removal. Interestingly, even though the traditional infrastructure treats a large portion of the discharge, the green stormwater infrastructure reduces pollutant loads even further by significantly reducing discharge volume through infiltration, by increasing flow delivered to WPCPs, and by reducing pollutant loads in the stormwater that does eventually discharge as a component of CSO.

Document #3
Technical Memorandum
Office of Watersheds - PWD
March, 2011

Subject: Background and purpose of the conversion of the combined sewer system hydrologic and hydraulic models from USEPA SWMM4 to SWMM5

Between 1994 and 1997, Tier I hydrologic and hydraulic (H&H) models of PWD's combined sewer system (CSS) were developed to support permit requirements for development of the System Inventory and Characterization, the System Hydraulic Characterization, the Documentation of the Implementation of the Nine Minimum Controls, and the Long Term Control Plan (LTCP). The Tier I modeling efforts included applications of a combination of the USEPA Stormwater Management Model's (SWMM 3.x) Extended Transport (EXTRAN) module for hydraulic models of the combined sewer interceptors and critical hydraulic control points, and the US Army Corps of Engineer's Storage Treatment Overflow Runoff model (STORM) for sewershed hydrology.

Between1997 and 2000, Tier II (SWMM4.x) Continuous Simulations models were developed to simulate the hydrologic and hydraulic (H&H) response of PWD's collection system to wet weather events. These models were utilized to estimate Combined Sewer Overflow (CSO) frequencies, volumes and percent capture by interceptor sub-system for an eight year period of record (1990-1997) corresponding to the period of record with the best data available for PWD rain gages. The Tier II models are based on calibrated Tier I EXTRAN models developed for the CSO compliance program, and included the development of SWMM RUNOFF module representations of sewershed hydrology, eliminating reliance on STORM and unifying the modeling system in SWMM4.

The Tier II models were modified further between 2001 and 2005 to support design-level considerations of the combined sewer system, expanding the system to about 10,000 nodes and pipes. These larger refined and complex models required longer simulation periods, as longs as 14-16 hours for each drainage district for a one-year continuous simulation.

For the development of the Long Term Control Plan Update, a planning version of the H&H models were produced to support CSO control alternatives analyses. This streamlining of the models was based on a network of about 4,000 nodes and pipes and resulted in a reduction of simulation times to a level suitable to support planning needs, allowing for the many (typical or average) year-long continuous simulations required for the evaluation of the numerous CSO control alternatives required. The streamlining process was performed with strict adherence to hydraulic principles that were designed to ensure that the hydraulic characteristics of the system were properly represented. These streamlined models were used to generate the planning level estimates for the H&H portion of PWD's Long Term Control Plan Update (LTCPU) submitted in September 2009.

The current H&H models were developed to quantify the volume and frequencies of CSOs for both existing conditions and for numerous possible CSO control alternatives. The models also currently provide an

indispensable tool for the capital projects design support, stream restoration support, flood relief project evaluations, watershed planning support, operations support, green stormwater infrastructure evaluation and support, PA Act 157 support, and outlying community contract evaluation and support.

All of the SWMM models discussed above were developed using initially 3.x and later 4.x versions of the SWMM engine code. Due to the size of the Philadelphia's H&H models and the associated requirements for specialized modeling, in the recent past, a modified version of the SWMM4.4 engine was used. This version included enhancements to the array sizes of input and output elements to accommodate more model elements than initially allowable. In addition, there were also some modifications made to the solution techniques based on recommendations from modeling groups in Philadelphia and elsewhere.

The USEPA started working on a new version of SWMM in 2002. This new version, SWMM5, is written in the *C* language, unlike earlier versions that were written in *FORTRAN*. The development and modifications for all earlier SWMM4 versions has been discontinued by EPA and the SWMM community affiliates. Support from the SWMM users community has all but ended for the versions prior to SWMM5. The official releases of SWMM by the USEPA now are limited to version 5.

SWMM5 has some advantages over its predecessors:

1. Due to dynamic memory allocation there are no limits on number of elements that can be simulated.
2. The new engine has better solution techniques like the one used to solve the dynamic wave equation for flow (Saint Venant equations are solved by a successive approximation technique that helps the solutions converge faster). There have been improvements in the way the orifices and weirs are simulated (SWMM5 now uses the classical orifice and weir equations instead of using equivalent pipe approximation).
3. The ability to use variable time steps for simulations.
4. The ability to lengthen pipes based on user inputs if shorter pipes have convergence issues.
5. Better simulation of force mains.
6. Like its predecessors, it is well supported by the online SWMM user community.

However, SWMM5 has some disadvantages:

1. The engine has bugs that are still being addressed and worked on.
2. The output format makes post-processing a little more cumbersome.
3. If users are not careful, the continuous simulation result files can be extremely large and difficult to post-process.

The PWD decided several years ago that future versions of the City's H&H models would be maintained in SWMM5. The principal reason for the decision to convert the models was because the USEPA no longer was supporting the SWMM4 versions of the models, because the new version is much more compatible with evolving changes in personal computer operating systems, and because of the improvements to the solution techniques and the hydraulics. However, the schedule for the development of the Long Term Control Plan Update required that the conversion not take place until the Update was completed.

The aim of this conversion process is to convert the existing simplified H&H models from SWMM4 to SWMM5 with minimal changes to the model structure and results. Structural changes to the model (*e.g.*, converting all the equivalent pipes to their original lengths or converting all the orifices and weirs represented by equivalent pipes back to actual orifices and weirs) will not be included in the initial stages of this conversion. Structural changes to the model will be performed gradually as the model is further expanded and refined. Initial test results indicate that the new models are fully compatible with previous

versions, and simulations produce only modest differences in CSO characteristics, due in part to how the SWMM5 engine is setup, and in part to the hydraulic enhancements over the SWMM4 engine that have been implemented.

Proposed future development activities for the models include:

- refinements of the sewershed delineations and rainfall-runoff characteristics (i.e., area, slope, impervious cover, etc.) in response to improvements in the quality of the remotely sensed data sources used in the City geographic information system
- improved model performance, through further refinements of directly connected impervious cover and rainfall-dependant infiltration and inflow model validation parameters, as the City increases the areal and temporal coverage of the sewer flow monitoring network
- model technology improvements to better-represent evapo-transpiration and application of snow melt-runoff capabilities
- changing over to the new SWMM5 hydrodynamic representations of hydraulic structures such as weirs and orifices
- employing the new low impact development features of the most recent model code releases.

As these refinements and improvements are implemented, the model-based estimates of overflow frequency, volume and duration, and the associated estimation uncertainty, will be refined and redefined.

Document #4
Technical Memorandum
Office of Watersheds - PWD
March, 2011

Subject: **Description of interceptor lining program (TTF and Cobbs), history and context**

SUMMARY

As a part of PWD's commitment to achievement of Target A (Improvement of water quality and aesthetics in dry weather) in both the Cobbs and Tacony-Frankford watersheds, the integrated watershed management plans (IWMPs) include commitments to lining the interceptors that run along the mainstems of each. This commitment has been formalized in the City's Consent Order & Agreement and will be tracked by the WQBEL.

Benefits:

- Decrease pollutant loads to surface waters by decreasing exfiltration
- Decrease amount of flow in sewer system by decreasing Inflow/Infiltration (I/I)
- Rehabilitation of sewers will increase the efficiency of the sewer system

Planning and Design is underway for the lining of the entire length of interceptor within Philadelphia in the Cobbs and Tacony-Frankford Watersheds. For planning purposes, the interceptors within both watersheds were split into sections of approximately 1.5 miles in length, with goals for lining one section per year. In the Cobbs Watershed, two of these segments have already been relined, one in 1999 and the other in 2004 at a cost of $3,500,000. The 4 remaining sections in the Cobbs Watershed will take place starting in 2011. The total estimated cost of this project is $12,500,000. The Tacony Frankford Watershed interceptor was split into 5 sections and will take place starting in 2011. The total estimated cost of this project is $20,600,000. The following tables and maps illustrate the interceptor relining projects within each watershed.

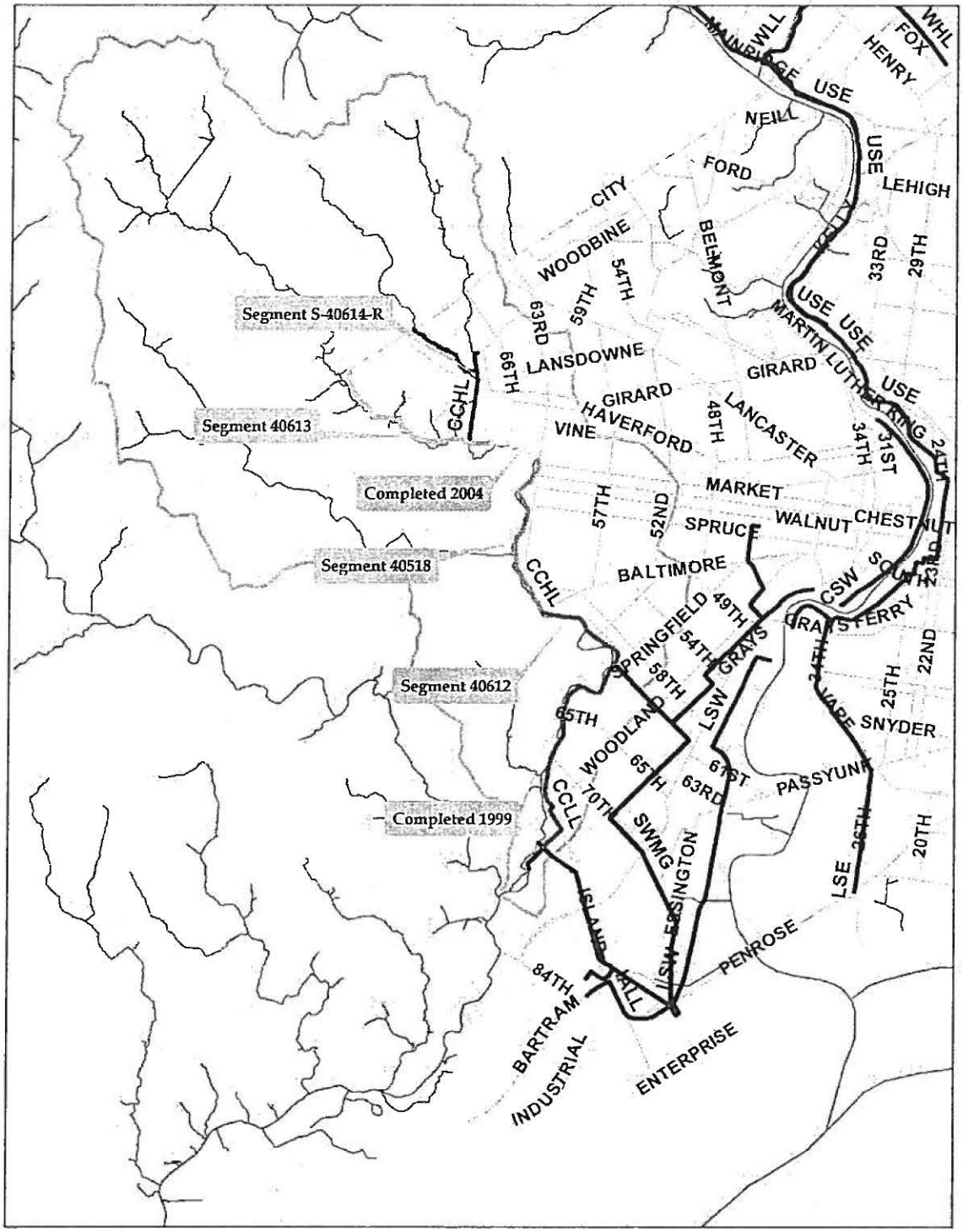
Cobbs Watershed Project Data

Project Title	Extents:
40518 - Cobbs Creek Interceptor Phase 1 CIPP Lining Contract	63rd and Market to 62nd and Baltimore
40612 - Cobbs Creek Intercepting Sewer Lining Phase 2	61st and Baltimore to 60th and Warrington
40613 - Cobbs Creek Interceptor Lining Phase 3	City Avenue to D R/W in former 67th Street
40614 - Cobbs Creek Intercepting Sewer Lining Phase 4 (Indian Creek Branch)	City Avenue to D R/W in former 67th Street

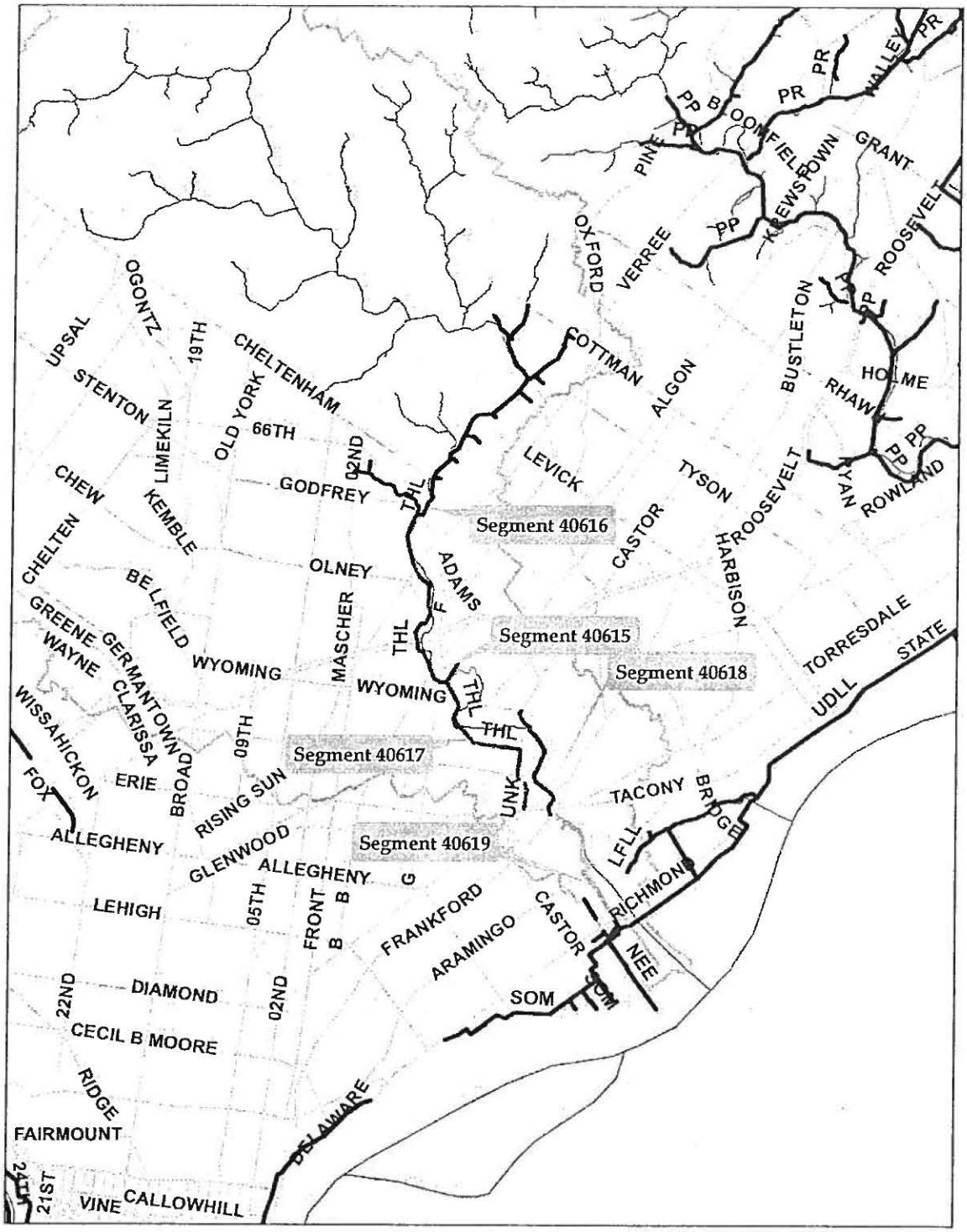
Tacony – Frankford Watershed Project Data

Project Title	Extents:
40615 - Tacony Creek intercepting Sewer Lining Phase 1	Chew & Rising Sun to I & Ramona
40616 - Tacony Creek intercepting Sewer Lining Phase 2	2nd St & 64th Ave to Chew & Rising Sun; DRW Mascher to Tacony Interceptor; Cheltenham Ave to Crescentville & Godfrey
40617 - Tacony Creek intercepting Sewer Lining Phase 3	I & Ramona to O & Erie
40618 - Upper Frankford LL Collector/Tacony Intercepting Sewer Lining Phase 4	Castor & Wyoming to Frankford/Hunting Park
46019 - Upper Frankford Creek LL Collector/Tacony Intercepting Sewer Lining Phase 5	Frankford/Hunting Park to Luzerne & Richmond

Segment Locations for Lining in the Cobbs Creek



Segment Locations for Lining in the Tacony – Frankford Creek



Document #5
Technical Memorandum
Office of Watersheds - PWD
March, 2011

Subject: Rationale for Equal Distribution of Green Stormwater Infrastructure Implementation in all Neighborhoods

SUMMARY

The public in Philadelphia will invest $2B in the *Green City, Clean Waters* program over the next 25 years. The proposed system-wide distribution of green stormwater infrastructure will yield water quality benefits and improvements uniformly to the aquatic habitat and living resources of the City's waterways, restoring resources long forsaken as assets by most residents. The uniform investment of green stormwater infrastructure will ensure equal access for all to the expected environmental, social and economic benefits derived from green infrastructure. The program is designed to maximize return on investment to benefit the residents, distributed as equally as possible across all neighborhoods to achieve a fair and equitable distribution of those benefits, and to garner maximum popular support. This keystone aspect of the *Green City, Clean Waters* plan lays the groundwork for the revitalization of our City in areas of public health, recreation, housing and neighborhood values.

Philadelphia is the first city to propose adoption of a green stormwater approach as the foundation for compliance with the national CSO Control Policy. The program will require coordinated support from the Mayor's Office and City Council as well as numerous City agencies, making an equal-distribution approach critical to widespread acceptance of the plan. It is for this reason that the *Greenworks Philadelphia* plan, the overall sustainability plan for the City that was developed independently from the CSO control plan, made *Green City, Clean Waters* the centerpiece of its "Equity Goals" strategy. *Greenworks Philadelphia's* Equity Goal is that "... Philadelphia delivers more equitable access to healthy neighborhoods through the distribution of green infrastructure."

Program Components lend themselves to system-wide application:
The 2006 revision of the City's stormwater regulations requires that development and redevelopment projects manage the first inch of runoff from the project sites. This same measure is utilized for PWD's Greened Acres concept, and is applied in both separate and combined sewered areas. Thus the application of the Greened Acres concept is intended to be equally distributed throughout the combined sewered area of the City, taking advantage of market-driven development and redevelopment. The stormwater regulations were envisioned, devised and implemented around this fundamental concept, and therefore the equal-areal application concept is a critically important success factor for the *Green City, Clean Waters* program.

Similarly, it is important for PWD's greening strategy to take advantage of opportunities that exist for implementation on publicly-owned lands, such as PWD and other City-owned properties, streets and rights-of-way, which constitute roughly 45% of the impervious land area of the City. PWD's plan for

implementation of the *Green City, Clean Waters* program is to target these publicly owned sites – which are by their nature distributed throughout the neighborhoods of the CSS.

Environmental Justice:
The USEPA defines environmental justice as

> *...the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. EPA has this goal for all communities and persons across this Nation. It will be achieved when everyone enjoys the same degree of protection from environmental and health hazards and equal access to the decision-making process to have a healthy environment in which to live, learn, and work.*

From the developmental stages of the program, the preservation of a fair and just basis for the implementation of the *Green City, Clean Waters* program was based on an equal investment of greening efforts throughout the combined sewered areas such that there is an equitable spatial distribution of burdens and benefits.

The figure included here describes the anticipated results of the equitable distribution of green stormwater infrastructure investment among economic levels, as envisioned in the *Green City, Clean Waters* program. The figure shows how investment will be equal in all combined sewer areas of the city, regardless of household income. It is clear that deviations from this distribution of investment likely would result in unfair, and environmentally and socially unjust, accumulations of investment and benefits in some areas of the City over others. Additionally, disproportionate investment of green stormwater infrastructure would reduce the expected environmental, social and economic benefits derived from the spatially equitable implementation. These so-called triple bottom line benefits are dependent upon widespread uniform applications of green infrastructure

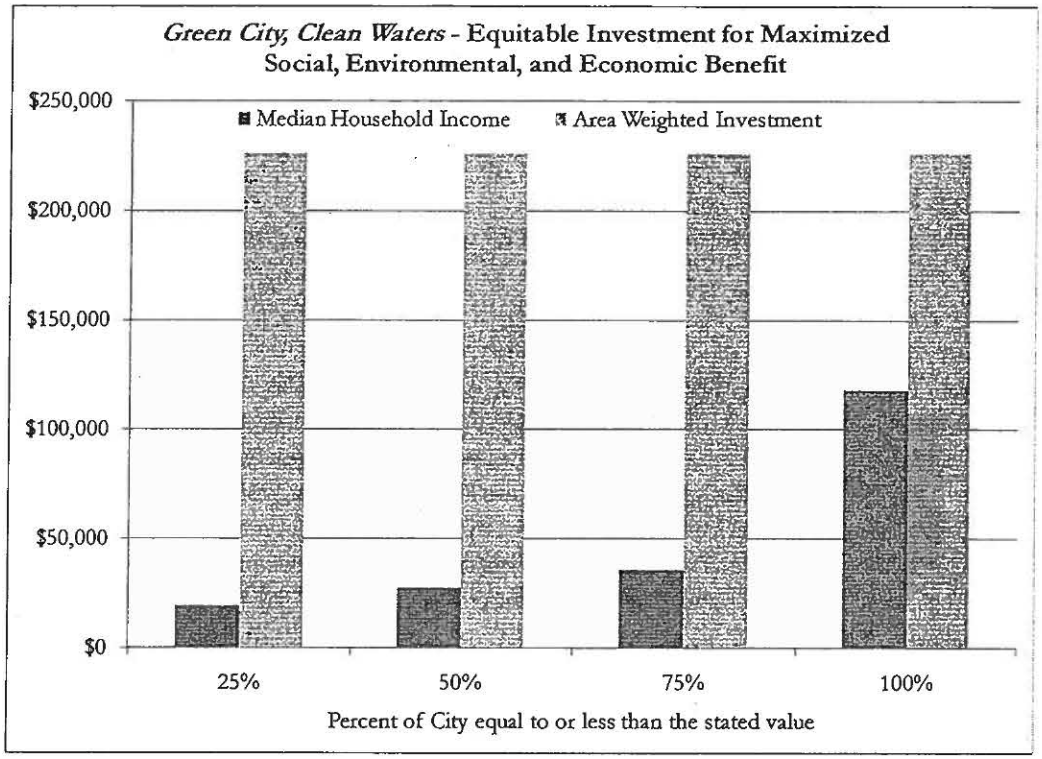


Figure 1: Distribution of Census Block Group Median Household Incomes and Green City, Clean Waters Area Weighted Investment in green stormwater infrastructure.

Document #6
Technical Memorandum
Office of Watersheds - PWD
March, 2011

Subject: **Application of Sensitive Area Criteria to City of Philadelphia CSO Receiving Waters**

SUMMARY

The LTCPU documents that no portions of the City's CSO receiving waters meet the definition of sensitive areas found in the National CSO Control Policy. It is PWD's position that the City's CSO receiving waters should be regarded as a single receiving water body with no single geographic area more sensitive than another. The concept of designating sensitive areas in the National CSO Control Policy clearly never was intended to address the entire domain of the receiving waters for a large city. It is the intent of the PWD program to treat all waterways as equally important, equally sensitive to discharges, and therefore the goal of the CSO control program is to reduce pollutant loading from CSOs to provide equal protection for all the waterways.

Table 1: Application of Sensitive Area Designation Criteria in the City of Philadelphia

Factors indicating Sensitivity	Applicability within City of Philadelphia CSO Receiving Waters
Outstanding National Water Resources	There are no Outstanding National Resource Waters within the CSO receiving waters.
National Marine Sanctuaries	There are no National Marine Sanctuaries within the CSO receiving waters.
Waters with Endangered Species or their Designated Critical Habitat	The literature reviews performed as part of this analysis have yielded no basis to infer that these species or their habitat are directly impacted or excluded by the discharge of stormwater runoff in the Philadelphia area. Absent any such direct evidence specific to Philadelphia's CSO receiving waters, it was not possible to identify any geographic subset of the receiving waters that can be specifically identified as meeting this definition of sensitive areas.
Primary Recreational Waters, such as Bathing Beaches	Though primary contact recreation activities have been observed in waterways throughout the system, these activities are prohibited in many of the CSO receiving water areas. These activities are physically unsafe in addition to exposing recreators to potentially unsafe conditions in wet weather. The City of Philadelphia is addressing these concerns through education, signage, and enforcement.
Public drinking water intakes or their designated protection areas	There are no public drinking water intakes or their designated protection areas within the CSO receiving waters.
Shellfish beds	No shellfish beds have been identified in areas impacted by Philadelphia's CSO outfalls

Waters with Endangered Species or their Designated Critical Habitat:
As described in Section 3.4.3 of the LTCPU, the literature reviews performed as part of this analysis yielded no basis to infer that threatened or endangered species or their habitat are directly impacted by the discharge of stormwater runoff in the Philadelphia area.

There are two endangered species, and two threatened species, listed under the Federal Endangered Species Act, that are known to occur in the Delaware River basin (Pennsylvania or New Jersey).

- *Shortnose Sturgeon, Acipenser brevirostrum (endangered)*
- *Dwarf Wedgemussel, Alasmidonta heterodon (endangered)*
    - Note: Pennsylvania has proposed to change the status of the dwarf wedgemussel to extirpated.
- *Bog Turtle, Clemmys muhlenbergii (threatened)*
    - Note: The bog turtle is listed as extirpated in Philadelphia in the USFWS recovery plan (USFWS, 2001).
- *Bald Eagle, Haliaeetus leucocephalus (threatened)*
    - Note: It was proposed for delisting July 6, 1999 (USFWS 1999). (Source: NatureServe, 2006)
    - Note: This species has been observed in the Philadelphia Naval Yard and in the John Heinz National Wildlife Refuge at Tinicum and their nests have been observed in the Tidal Pennypack Creek, Petty Island in the Delaware River, and the John Heinz National Wildlife Refuge at Tinicum.

Since these species are known to occur within or directly downstream of the waters receiving CSO discharges under existing conditions, it is believed that PWD's proposed plan and reduction in CSO volume will continue to improve their critical habitat.

Recreational Waters
Swimming is prohibited in the City of Philadelphia creeks and streams by the Fairmount Park Commission's "Trail Rules and Regulations", which states that "no person shall bathe or swim except at authorized pools and only when a lifeguard is present". Though this is the established legal guideline for City of Philadelphia residents, PWD is aware that swimming, wading and other forms of primary contact are taking place within the City's waterways despite these legal restrictions. In order to better understand the current baseline recreational usage of the City's waterways, PWD has commissioned Drexel University to assist them with conducting an assessment of current recreational use locations and activity types taking place at each.

A preliminary survey was conducted in the summer of 2008 at six locations distributed throughout the City with locations in the Cobbs, Tacony and Schuylkill waterways. Survey sites were chosen based on discussions with individuals familiar with recreational use patterns on the study waters, results from a pilot survey of sites (conducted in the Spring of 2007) and insights drawn from windshield surveys of sites conducted during the summer and early Fall of 2007. Data including camera-observed recreational use patterns at six water locations were collected during the period of July through September 2008. The following information was collected and documented for all observations: activity location, date, day of the week, activity start time, end time and type (swimming, wading, playing, boating, onshore fishing, fishing, jet skiing, kayaking).

Location	Observed Activity
Schuylkill River	
Fairmount Dam	Boating, jet skiing, kayaking, fishing (on and off shore)
Bartram's Garden	Boating, fishing
Tacony Creek	
Adams Ave	Wading, bathing
T-14	No observed recreational activity
Bingham St	Wading, fishing
Cobbs Creek	
Cobbs Creek Environmental Education Center and Woodland Ave Dam	Wading, fishing, playing with water

PWD's initial recreation observation study did not include survey locations on the Tidal Delaware River; PWD plans to expand upon their survey in the future and will include sites on the Delaware River.

Additional information on recreational usage of the City's waterways that could indicate both primary and secondary contact within CSO receiving waters including the following Philadelphia county-wide information:

- 2009 Boat registrations: 4,531
- 2009 Fishing licenses sold to residents of Philadelphia County: 19,093
- Boating safety education certificates issued to residents of Philadelphia County between the years 2000-2009: 3,873

<u>PWD's Commitment is to Increasing Access and Aesthetics, not Swimming</u>

Assessments of recreational use within the City's waterways indicate that primary contact recreational activities occur in all of our CSO receiving waters, and it appears that the occurrence of those activities is just as probable in the highly urbanized upstream tributary areas as it is in the downstream tidal waters.

PWD has made a commitment to increasing access to currently underutilized and inaccessible waterways as a part of our integrated watershed management approach. This is a commitment to working with the City's Parks and Recreation Department to improve resources within the park system, restore stream banks to allow for passive recreation streamside, and improve the overall look and aesthetic appeal of our waterways. These improvements are not however intended to increase the primary contact usage of the waterways. Swimming is prohibited within the City's creeks and streams for a number of reasons related to safety. The City does not intend to allow or encourage swimming in creeks and streams.

Distribution of Outfalls:

Because of the dense geographic distribution of outfalls within the City's waste water system, it would not make sense to target one geographic area over another for implementation of the green stormwater infrastructure. Targeting one area over another might reduce CSO volume at a particular outfall, but that outfall would still be in close proximity to others. In this context, the City's CSO system waters should be regarded as discharging to a single receiving water body. It essentially is impossible to favor one area over another without requiring widespread reductions, and those are best addressed through the long term planning process across the entire CSS portions of the City.

Table 4: Distribution of CSO Outfalls by watershed

Watershed	# of CSO Outfalls	Avg. Distance Between (ft)
TTF:	27	965
Cobbs:	33	1678
Schuylkill:	41	918
Delaware:	63	1044

APPENDIX F

PART 1
DRY WEATHER STATUS REPORT

PRECIPITATION FOR THE PERIOD: October 2010 - December 2010

Section 2

10-01	3.06	10-08		10-15		10-22		10-29	
10-02		10-09		10-16		10-23		10-30	
10-03	0.06	10-10		10-17		10-24		10-31	
10-04	0.34	10-11		10-18	0.08	10-25			
10-05	0.21	10-12	0.24	10-19	0.43	10-26		Total Rain	
10-06	0.01	10-13		10-20		10-27	0.28	(Inches including traces)	
10-07		10-14	0.71	10-21		10-28			5.42

11-01		11-08		11-15		11-22	0.23	11-29	
11-02	0.48	11-09		11-16		11-23		11-30	
11-03		11-10		11-17		11-24			
11-04	0.11	11-11		11-18		11-25	0.27		
11-05		11-12		11-19		11-26	0.04	Total Rain	
11-06		11-13		11-20		11-27		(Inches including traces)	
11-07		11-14		11-21		11-28			1.13

12-01	1.37	12-08		12-15		12-22		12-29	
12-02		12-09		12-16		12-23		12-30	
12-03		12-10		12-17		12-24		12-31	
12-04		12-11	0.01	12-18		12-25			
12-05		12-12	1.03	12-19		12-26		Total Rain	
12-06		12-13	0.05	12-20		12-27		(Inches including traces)	
12-07		12-14		12-21		12-28			2.46

Note: Rain Gauge RG-17 & RG19 are being used for the Precipitation Report.

PART 1 DRY WEATHER STATUS REPORT				PHILADELPHIA WATER DEPARTMENT WASTE AND STORM WATER COLLECTION FLOW CONTROL UNIT									Section 1 October 2010 - December 2010
COLLECTOR	Jul-10	Aug-10	Sep-10	Oct-10	Nov-10	Dec-10	Jan-11	Feb-11	Mar-11	Apr-11	May-11	Jun-11	Totals
UPPER PENNYPACK - 5 UNITS													
INSPECTIONS	8	11	11				0	0	0	0	0	0	73
DISCHARGES	0	0	0				0	0	0	0	0	0	0
BLOCKS CLEARED	1	0	0				0	0	0	0	0	0	2
UPPER DELAWARE LOW LEVEL - 12 UNITS													
INSPECTIONS	37	40	40				0	0	0	0	0	0	239
DISCHARGES	2	0	0				0	0	0	0	0	0	2
BLOCKS CLEARED	5	5	4				0	0	0	0	0	0	26
LOWER FRANKFORD CREEK - 6 UNITS													
INSPECTIONS	6	12	12				0	0	0	0	0	0	75
DISCHARGES	0	0	0				0	0	0	0	0	0	0
BLOCKS CLEARED	0	0	0				0	0	0	0	0	0	1
LOWER FRANKFORD LOW LEVEL - 10 UNITS													
INSPECTIONS	17	13	13				0	0	0	0	0	0	113
DISCHARGES	0	0	0				0	0	0	0	0	0	0
BLOCKS CLEARED	0	0	0				0	0	0	0	0	0	1
FRANKFORD HIGH LEVEL - 14 UNITS													
INSPECTIONS	30	30	30				0	0	0	0	0	0	203
DISCHARGES	4	1	0				0	0	0	0	0	0	7
BLOCKS CLEARED	0	0	0				0	0	0	0	0	0	0
SOMERSET - 9 UNITS													
INSPECTIONS	22	27	27				0	0	0	0	0	0	145
DISCHARGES	0	0	0				0	0	0	0	0	0	0
BLOCKS CLEARED	7	2	0				0	0	0	0	0	0	11
LOWER DELAWARE LOW LEVEL - 33 UNITS													
INSPECTIONS	76	73	73				0	0	0	0	0	0	514
DISCHARGES	0	0	0				0	0	0	0	0	0	0
BLOCKS CLEARED	7	5	1				0	0	0	0	0	0	19
CENTRAL SCHUYLKILL EAST - 18 UNITS													
INSPECTIONS	58	66	66				0	0	0	0	0	0	386
DISCHARGES	0	1	0				0	0	0	0	0	0	1
BLOCKS CLEARED	6	5	4				0	0	0	0	0	0	24
LOWER SCHUYLKILL EAST - 9 UNITS													
INSPECTIONS	17	21	21				0	0	0	0	0	0	132
DISCHARGES	0	0	0				0	0	0	0	0	0	0
BLOCKS CLEARED	1	0	1				0	0	0	0	0	0	2
CENTRAL SCHUYLKILL WEST - 9 UNITS													
INSPECTIONS	13	32	32				0	0	0	0	0	0	174
DISCHARGES	0	0	0				0	0	0	0	0	0	0
BLOCKS CLEARED	0	1	2				0	0	0	0	0	0	4
SOUTHWEST MAIN GRAVITY - 10 UNITS													
INSPECTIONS	26	44	44				0	0	0	0	0	0	252
DISCHARGES	0	0	0				0	0	0	0	0	0	0
BLOCKS CLEARED	1	2	2				0	0	0	0	0	0	12
LOWER SCHUYLKILL WEST - 4 UNITS													
INSPECTIONS	18	12	12				0	0	0	0	0	0	99
DISCHARGES	0	0	0				0	0	0	0	0	0	0
BLOCKS CLEARED	3	0	0				0	0	0	0	0	0	7
COBBS CREEK HIGH LEVEL - 23 UNITS													
INSPECTIONS	50	43	43				0	0	0	0	0	0	326
DISCHARGES	1	1	0				0	0	0	0	0	0	2
BLOCKS CLEARED	4	0	6				0	0	0	0	0	0	14
COBBS CREEK LOW LEVEL - 13 UNITS													
INSPECTIONS	15	14	14				0	0	0	0	0	0	136
DISCHARGES	0	0	0				0	0	0	0	0	0	0
BLOCKS CLEARED	0	0	1				0	0	0	0	0	0	3
RELIEF SEWERS - 26 UNITS													
INSPECTIONS	28	28	28				0	0	0	0	0	0	195
DISCHARGES	0	0	0				0	0	0	0	0	0	0
BLOCKS CLEARED	0	0	0				0	0	0	0	0	0	0
TOTALS / MONTH for 201 REGULATOR UNITS													Totals
TOTAL INSPECTIONS	421	466	466				0	0	0	0	0	0	3062
TOTAL DISCHARGES	7	3	0				0	0	0	0	0	0	12
TOTAL BLOCKS CLEARED	35	20	21				0	0	0	0	0	0	126
AVER. # of INSP. / BC	12	23	22				n/a	n/a	n/a	n/a	n/a	n/a	28
DISC / 100 INSPECTIONS	1.7	0.6	0.0										0.4

PART 1
DRY WEATHER STATUS REPORT

DRY WEATHER DISCHARGES FOR THE PERIOD: Oct 2010 - Dec 2010

Section 3

Discharge Observed		Discharge Stopped		Last Inspection						
Date	Time	Date	Time	Date	Time	Site ID	Collector	Type Unit	Location	Comment
12/03/10	02:10 PM	12/03/10	03:00 PM	11/15/10	11:40 AM	T-13	FHL	SLOT	Whitaker Ave. W of Tacony Creek	DEBRIS CAUGHT ON SENSOR WIRE HANGING IN SLOT.
12/15/10	01:50 PM	12/15/10	02:50 PM	12/14/10	09:30 AM	T-13	FHL	SLOT	Whitaker Ave. W of Tacony Creek	CONTRACTOR LINING INTERCEPTOR SHUT DOWN PUMPS AT T-13 TO CHANGE PUMP OIL CAUSING OVERFLOW THROUGH SWO

APPENDIX G

Appendix G

Deliverables

Paragraph 3.a. of the Consent Order and Agreement (COA) between Pennsylvania Department of Environmental Protection (DEP) and the City of Philadelphia (City) lists ten "Deliverables" that are required to be submitted by the City within the first four years of the term of the Agreement. Descriptions of the Deliverables are presented below.

Implementation and Adaptive Management Plan:

The Implementation and Adaptive Management Plan (IAMP) will provide details on how the LTCPU CSO Program will be implemented by the City during the first five years after approval, and it will outline the City's proposal for evaluating progress and making decisions at the five-year marks throughout the term of the Consent Order and Agreement. The IAMP will describe the City's plans for tracking, reporting, and assessing progress of the CSO Program activities. It will include information about the following:

- Adaptive Implementation: The IAMP will include a description of how the City will make decisions about adapting their efforts to address future circumstances. It will outline the decision-making process that the City proposes to be used when Evaluation and Adaptation Plans (EAP) are submitted in the future at the five-year, ten-year, fifteen-year, and twenty-year milestone dates.
- Capital Projects: The IAMP will list those LTCPU capital projects that are already completed or under way, and also the projected number and types of projects proposed to be implemented in the four and a half years leading up to the delivery of the first Evaluation and Adaptation Plan (EAP). It will describe projects including (but not necessarily limited to) those associated with green stormwater infrastructure, sewer separation, and interceptor lining.
- Green Stormwater Infrastructure data system(s): The IAMP will describe the data system(s) that will be used to track Green Stormwater Infrastructure projects, from construction of the project through the lifetime of the project including periodic inspections and maintenance. The Plan should describe reporting formats proposed to be used in the Annual Reports and EAPs.
- Operation and Maintenance: The IAMP will describe the City's plans to ensure that green stormwater infrastructure projects are operating according to design. While a comprehensive Green Infrastructure Maintenance Manual is in development (see below), the IAMP should provide a statement of the status of this issue in the interim. The IAMP will address how the City will provide for compliance with maintenance obligations for those projects where maintenance is the responsibility of others, including private entities.
- Streamlining: The IAMP will contain a detailed report describing the ways in which City codes, ordinances, policies, and interagency procedures have been, or will need to be, modified to optimize the implementation of the LTCPU. It will also address coordination with non-City entities, and any conflicts between State requirements and the implementation goals of the CSO Program. It will include

recommendations for ways to overcome potential legal issues, such as those that could arise from the State Utility Law, ownership and liability concerns, and public/private boundaries issues. This section should supplement the information already provided as part of the Approved LTCPU.

- Sewer System Evaluation Survey (SSES): The IAMP will provide a plan and schedule for the implementation of a program to address wet weather inflow and infiltration (WWII) in the City's separate sewer areas. Within 3 years of the effective date of the CO&A, the City will complete a sanitary sewer evaluation survey (SSES) to better explore the potential for further remedial controls on sanitary sewer infiltration and inflow to reduce CSOs. Within two years thereafter, the City must develop and initiate implementation of a strategy to address any WWII issues identified as having a significant potential to reduce CSO discharges. In developing the scope of work for the SSES PWD will follow the American Society of Civil Engineers (ASCE) and the Water Environment Federation (WEF) Manual of Practice FD-6, "Existing Sewer Evaluation and Rehabilitation."
- Outlying Communities report: The IAMP will provide a description of the City's efforts to address wet weather peaking in the sanitary flows that are received from outlying communities under the terms of contracts (suburban wholesale wastewater customers). This section will describe actions taken to date as well as actions proposed for the future, and will address how the outlying communities themselves may be engaged in the effort to find opportunities and implement corrective action to reduce wet weather peak flows.
- Early Action Area project: The IAMP will include a proposal and schedule for the assessment of the effectiveness of green stormwater infrastructure in reducing combined sewer overflow volumes using early action areas. Early action areas are areas where green stormwater infrastructure will be implemented in a relatively concentrated area, and wet weather flows will be monitored, to demonstrate the impact of green stormwater infrastructure on the CSS flows. The proposal should address the issues of scale and timing for this effort, and should also discuss the identification of candidate areas.

Green Infrastructure Maintenance Manual development process plan:

This deliverable will describe the process and schedule for developing the Green Infrastructure Maintenance Manual.

Comprehensive Monitoring Plan:

This document will contain a description of the City's plans for performing monitoring of natural and engineered systems that are associated with the CSO Program. It will address the monitoring and assessment of surface waters, ground water, rainfall, CSO discharges, sewer flows, and green infrastructure performance.

In addition to monitoring, the Plan will also address hydrologic and hydraulic modeling. The City uses modeling to support various aspects of the CSO Program. A description will be provided of the methods to be used for performance tracking of the CSO Program in the form of hydrologic/hydraulic modeling with verification using metered data, as discussed in Section 10 of the LTCPU. There will also be a discussion

of how the City will handle future updates or changes to the model itself. If the City should make changes to the model, DEP will wish to have a way to make a meaningful comparison between future modeling results and the information already presented as part of this effort, including information in the September 2009 LTCPU.

Facility Concept Plans for each of the Water Pollution Control Plants:

There will be a separate Facility Concept Plan for each of the three Water Pollution Control Plants. Each Plan will describe specific engineering and construction proposed to increase the maximum wet weather flow rate through the facility, and thereby to increase the capture rate of combined sewage. These Plans will provide design and construction performance standards (in terms of "percent complete") for the five-year, ten-year, and fifteen-year milestone periods. These performance standards will become permit requirements by being incorporated into future versions of the NPDES permits. (Note: The Water Pollution Control Plant upgrade projects are expected to be completed at the end of the twenty-year period.)

Updated Nine Minimum Controls Report:

To support the LTCPU, the City will update the "Implementation of Nine Minimum Controls" document, which was originally submitted in September, 1995. The updated report should indicate how the City's activities are being carried out currently, and highlight how these activities may have changed as a result of new technology, new practice, or other circumstances.

Tributary Water Quality Model - Bacteria:

This report will describe the methods, and provide the results, of a project to model the receiving water quality in the Tacony/Frankford Creek and the Cobbs Creek. The work will include the collection of field data for model development and validation. The model will be used to assess the projected impact of the CSO Program in future years, and to evaluate alternative implementation options.

Tributary Water Quality Model - Dissolved oxygen:

This report will describe the methods, and provide the results, of a project to model the receiving water quality in the Tacony/Frankford Creek and the Cobbs Creek. The work will include the collection of field data for model development and validation. The model will be used to assess the projected impact of the CSO Program in future years, and to evaluate alternative implementation options.

Green Infrastructure Maintenance Manual:

The Manual will address the operation and maintenance of the full range of types of green stormwater infrastructure projects that have been, and that are proposed to be, implemented by the City as part of the CSO Program. The Manual will be designed to be used by City agencies and anyone else who has responsibility for performing maintenance of green stormwater infrastructure. The Deliverable required by the Consent Order and Agreement should be considered the "first edition" of the Manual, since it is expected that the Manual will need to be updated periodically as the technology of green stormwater infrastructure advances, and as experience is gained with specific

practices. The first edition of the Manual should propose a schedule for the planned preparation of a second edition.

Tidal waters Water Quality Model - Bacteria:

This report will describe the methods, and provide the results, of a project to model the receiving water quality in the tidal Delaware River and the tidal Schuylkill River. The work will include the collection of field data for model development and validation. The model will be used to assess the projected impact of the CSO Program in future years, and to evaluate alternative implementation options.

Tidal waters Water Quality Model - Dissolved oxygen:

This report will describe the methods, and provide the results, of a project to model the receiving water quality in the tidal Delaware River and the tidal Schuylkill River. The work will include the collection of field data for model development and validation. The model will be used to assess the projected impact of the CSO Program in future years, and to evaluate alternative implementation options.

APPENDIX H

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION
SOUTHEAST REGIONAL OFFICE

June 1, 2011

Mr. David Katz
Deputy Water Commissioner
City of Philadelphia Water Department
ARAMARK Tower
1101 Market Street, 4th Floor
Philadelphia, PA 19107-2994

Dear Mr. Katz:

The Pennsylvania Department of Environmental Protection (DEP) has completed its review of the City of Philadelphia's (City) September 2009 Long Term Control Plan Update (LTCPU), which describes the City's plan for the control of combined sewer overflows (CSOs). Since the time that the original LTCPU was submitted, DEP and the City have engaged in a dialogue that has resulted in some modifications being made to the plan. Modifications to the LTCPU are described in a revised Consent Order and Agreement (CO&A) that is being executed simultaneously with the issuance of this letter. The CO&A also lists several required deliverables which will supplement the LTCPU when they are submitted by the City and approved by DEP.

DEP hereby authorizes the City to begin implementing the LTCPU, including modifications as documented in the CO&A, as a means of addressing the requirements of the Pennsylvania Clean Streams Law, 35 P.S. Sections 691.1–691.1001, the regulations promulgated thereunder, the Pennsylvania CSO Policy, and the National CSO Control Policy. The CO&A that we are executing this date contains specific requirements and enforcement mechanisms, and is intended to be in effect for at least 25 years. The CO&A, in turn, refers to CSO requirements that will be included as special conditions in the National Pollutant Discharge Elimination System (NPDES) permits for the City's three Water Pollution Control Plants (WPCPs). NPDES permits are normally reissued by DEP every 5 years, in accordance with Federal and Pennsylvania requirements. DEP intends that each successive renewal of the Philadelphia permits during the term of the CO&A will include a condition to cover the CSO requirements.

DEP understands that the City designed its CSO program to be adaptive, such that changes in approach or emphasis can be implemented as necessary. DEP's right to review and approve major changes is provided in the CO&A. DEP also understands that the City has designed a program that addresses the state and federal water quality goals while at the same time managing the financial burden on the City's sewer customers.

DEP acknowledges that the LTCPU represents a significant undertaking for the City. We are hopeful that the effort will yield significant benefits for water quality in Philadelphia and the region.

Sincerely,

Jenifer Fields, P.E.
Regional Manager
Water Management

cc: Mr. Capacasa – USEPA, Region 3
Mr. Feola
Mr. Newbold
Adam N. Bram, Esq.
Re 30 (joh11wtsd)126

APPENDIX I

2012 NPDES Permits - Part C Addendum

[for permit No. PA *00xxxx: EXAMPLE* Water Pollution Control Plant]

Water Quality Based Combined Sewer System (CSS) Requirements

1) The Long Term Control Plan Update (LTCPU) as approved by the Department of Environmental Protection (the Approved LTCPU) for the City of Philadelphia Combined Sewer System (CSS) provides for the control of Combined Sewer Overflow (CSO) discharges to comply with the water quality standards of the Commonwealth of Pennsylvania and the water quality-based requirements of the Clean Water Act. The limitations and conditions in this section are intended to provide an adequate level of control to meet those standards and requirements.

2) The Approved LTCPU for the City of Philadelphia CSS provides for the control of CSO discharges to the following receiving waters: [*list of receiving waters forCSOs associated with this permit*].

3) The permittee shall develop and implement a system to effectively operate and maintain the facilities identified in the Approved LTCPU and any supplements thereto. The facilities for controlling discharges to the above-named receiving waters include, among other things, wet weather treatment facilities at the City's wastewater treatment plants; relined and rehabilitated intercepting sewers; diversion structures; outfall and overflow structures; and green stormwater infrastructure.

4) The green stormwater infrastructure component of the LTCPU is intended to provide for the gradual and continuing conversion of the hydrologic characteristics of the Philadelphia combined sewer service area, and consequently to reduce the frequency and volume of overflows from the combined sewer system. The City's progress in this endeavor will be tracked using a newly defined reporting standard known as "Greened Acres," as well as more traditional metrics such as overflow reduction volume.

5) Discharges from CSO outfall structures are prohibited except during wet weather when the Approved LTCPU is being implemented in accordance with the Department's approval, and when flows in combined sewer systems exceed conveyance or treatment capacities of the system during wet weather periods.

6) The permittee shall maintain the ability to track information about the ownership and maintenance responsibilities associated with all green stormwater infrastructure that is accounted for in this Program with a "Greened Acres" value.

7) The permittee shall maintain adequate legal authority to require the continued proper maintenance of all green stormwater infrastructure that is accounted for in this Program with a "Greened Acres" value, and that is not the property of the permittee.

8) All combined sewer flows conveyed to the City wastewater treatment plant shall be managed to maximize treatment, within the constraints of the hydraulic capacities and other conditions described in Part A of this Permit, and as described in the Philadelphia Combined Sewer Overflow Long Term Control Plan and its supplements.

9) A Table called "Table 1 - WQBEL Performance Standards" is included here. This table contains quantitative expressions of CSO Program implementation which are to be achieved by specific interim dates, or quantities to be achieved by the end of the Program. All of the numerical standards in this table will apply to the entire city-wide program of implementation, except for the "WPCP Upgrade" percentages.

10) The WQBEL Performance Standards used to evaluate conformance with the requirements of these Water Quality-Based Effluent Limits, for the purposes of permit compliance and assessing stipulated penalties, shall be the achievement of the following:
    - *(a) [plant name]* WPCP Upgrade: Design,
    - *(b) [plant name]* WPCP Upgrade: Construction,
    - *(c)* Miles of interceptor lined,
    - *(d)* Overflow Reduction Volume,
    - *(e)* Total Greened Acres, and
    - *(f)* Equivalent Mass Capture for TSS, BOD, and fecal coliform bacteria (25-year standard only)

Table 1 - WQBEL Performance Standards							
Metric	Units	Baseline value	Cumulative amount as of Year 5	Cumulative amount as of Year 10	Cumulative amount as of Year 15	Cumulative amount as of Year 20	Cumulative amount as of Year 25
[plant name] WPCP upgrade: Design	percent complete	0	* note (1)	* note (1)	* note (1)	100%	100%
[plant name] WPCP upgrade: Construction	percent complete	0	* note (1)	* note (1)	* note (1)	100%	100%
Miles of interceptor lined	miles	0	2	6	14.5	14.5	14.5
Overflow Reduction Volume ** (2)	million gallons per year	0	600	2,044	3,619	5,985	7,960
Total Greened Acres	Greened Acres	0	744	2,148	3,812	6,424	9,564
Equivalent Mass Capture - TSS	percent	62%	Report value	Report value	Report value	Report value	85%
Equivalent Mass Capture - BOD5	percent	62%	Report value	Report value	Report value	Report value	85%
Equivalent Mass Capture - Coliform bacteria	percent	62%	Report value	Report value	Report value	Report value	85%

*(1) Performance Standards for "percent complete" for the WPCP upgrade design and construction projects were not available at the time of the [date] Consent Order and Agreement. The City shall provide these targets to the Department along with the Facility Concept Plan for the WPCP. The Facility Concept Plan is due on a specific date given in the Consent Order and Agreement. After the Department approves the Facility Concept Plan, the targets for "percent complete" will be entered into Table 1. The formal modification of Table 1 may be accomplished by the DEP by issuing a revised NPDES permit.

**(2) Overflow Reduction Volume means the difference between the volume of overflow in million gallons per year for the condition prevailing at the time of the report and the volume of overflow in million gallons per year for the baseline year. The baseline year is represented by Philadelphia's physical systems as they were configured on January 1, 2006. Both volumes will be determined from modeling, using climatic data representing the same "typical year" for Philadelphia as determined in the LTCPU development process, and a hydrologic/hydraulic model calibrated with flow data collected for verification of actual performance.

Definition of terms used in WQBEL compliance

A key feature of the City's adaptive implementation management approach to applying greening concepts in implementing the LTCPU is the ability to apply an equivalency between achieving CSO reduction through implementing green stormwater infrastructure and achieving it through more traditional CSO controls. This equivalency allows for innovation and flexibility in meeting control requirements within the constraints of the implementation schedules.

The CSO control strategy alternatives evaluated in the Approved LTCPU include storage, transmission, treatment and source controls. The traditional CSO controls are contemplated to include storage, transmission, treatment, sewer separation, and others. The source control strategies are contemplated within the context of Greened Acres. WQBEL Performance Standards will be achieved by implementing a combination of Greened Acres and traditional CSO controls.

Greened Acres is a metric that accounts for the conversion of a highly impervious urban landscape through the implementation of projects that reduce stormwater runoff. A Greened Acre is described as an acre of impervious cover connected (tributary) to a combined sewer that subsequently is reconfigured to utilize green stormwater infrastructure to manage all or a portion of the stormwater runoff from that acre. Green stormwater infrastructure manages stormwater using one or more of the source control processes of infiltration, evaporation, transpiration, decentralized storage, alternative stormwater routing, reuse, and others.

A Greened Acre is an expression of the volume of stormwater managed by green stormwater infrastructure, based on the design for the project, and is conditional on the proper operation and maintenance of the project. One Greened Acre is equivalent to 1 inch of managed stormwater from 1 acre of drainage area, or 27,158 gallons of managed stormwater. These volumes will be tracked as Greened Acres (GA) using the following equation:

$$GA = IC * Wd$$

Where:

IC is the impervious cover utilizing green stormwater infrastructure (acres). This quantity can include the area of the stormwater management feature itself, as well as the area that drains to it.

Wd is the depth of water over the impervious surface that can be physically managed in the facility (inches). Green stormwater infrastructure designs will be aimed at controlling at least 1 inch of runoff, and up to 1.5 inches of runoff, unless otherwise deemed feasible by engineering design.