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ABSTRACT

A "combined sewer system" is a series of pipes and related equipment that gather and transport through the same pipes both stormwater and industrial/domestic wastewaters. Most combined sewer systems are old, many dating back to the nineteenth century. As the Environmental Protection Agency (EPA) increases its focus on cleaning up the environmental problems in rivers and harbors, it is necessary to address the historical contamination resulting from combined sewer discharges of industrial waste. Because many of these combined sewer systems are still discharging, the EPA must address ongoing contamination problems from these systems before implementing remedies to resolve legacy contamination issues.

This article explores the nature of combined sewer system contamination problems and the role of faulty operation and maintenance in the creation of these problems. The legal liabilities of combined sewer systems and their responsibilities in the cleanup process are studied. A case study compares how several combined sewer systems throughout the United States have responded to the issues. Finally, an assessment of the Passaic River Restoration Initiative suggests a combined government/private "potentially responsible parties" approach toward resolving these complex legal and technical issues.

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INTRODUCTION

Many older communities in the United States are served by sewer systems that carry both sewage and stormwater runoff in the same pipe. When rainstorms or malfunctions cause flow volumes to exceed pipeline capacities, untreated sewage overflows to nearby waterbodies. These combined sewer overflows (CSOs) pose a serious problem for the communities they serve. Contaminants in the mix of industrial, commercial, and domestic waste can cause toxic shock to the receiving waterways and can linger in the sediments permanently. As continuing sources of pollution, CSOs complicate and delay river and harbor cleanups by contributing unquantified and unidentified masses of pollutants to the cleanup sites.

The Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)[1] has treated municipalities handling municipal solid waste leniently, and past legislation has attempted to exempt municipalities from CERCLA liability entirely. However, nothing shields combined sewer system authorities from liability for unpermitted CSO discharges of hazardous substances. Under the Clean Water Act,[2] sewer system authorities must obtain CSO permits that impose severe restrictions on the quality and quantity of discharges from combined sewer systems. If hazardous substances were discharged without the benefit of one of these permits, *i.e.*, if they were discharged before a permit was issued, if they violated permit limits, or if they were not contemplated by the permit at all, CERCLA may well be used to impose joint and several liability on sewer system authorities for the costs of investigating, removing, and remediating the hazardous substances and restoring any natural resources that have been damaged or destroyed.

Even putting aside liability obligations, sewer system authorities also have a civic duty to lead in the remediation and restoration of the waterways that receive their CSOs. As ongoing dischargers, they must ensure that the operation of their combined sewer systems does not compromise or delay other parties' remediation and restoration efforts. Because the sewer system authorities provide service to all of a region's industry and commerce as well as transport the entire community's wastewater flow, they warehouse information that can provide insight into the pollution patterns and ecological problems of their waterways. As quasi-governmental entities, they are liaisons with the community and can lead a cleanup project by example.

1. 42 U.S.C. §§ 9601 et seq. (2000).
2. 33 U.S.C. §§ 1251 et seq. (2000).

Various river and harbor cleanup projects around the United States have demonstrated that the participation and leadership of sewer system authorities in river or harbor remediation and restoration projects are necessary for success. Examples of successful cleanups include Boston Harbor, Portland Harbor, and the Willamette River. In these waterways, sewer system authorities have either voluntarily undertaken or have been compelled to take initiatives to revive their aquatic ecosystems, while addressing the future needs of their communities. The communities along these waterways are seeing dramatic improvements in water quality, human health and safety, and natural flora and fauna because the sewer system authorities have overhauled their treatment facilities and incorporated their operation plans into comprehensive approaches to remediation and restoration.

Projects that lack such coordinated efforts are invariably disorganized and ineffectual, particularly where sewer system authorities do not effectively contribute to the restoration project. One example is the Duwamish River in Washington state, where plans to establish a community-wide initiative failed. Although the local sewer system authorities are still required to improve their sewer systems and restore portions of the river's habitats under a federal consent decree, cleanup of the Duwamish River remains a patchwork of uncoordinated projects yielding only local improvements to the condition of the river.

New initiatives can benefit from the experiences in these waterways. One such initiative is Massachusetts' Merrimack River, once dyed unnatural colors by discharge from textile mills. Another initiative that would benefit is New Jersey's Passaic River, seriously degraded from over a century's worth of industrial development and municipal growth. These rivers receive millions, if not billions of gallons of discharge from CSOs on an annual basis. Without overhauls of the combined sewer systems and participation by sewer system authorities, remediation and restoration of these rivers will be interminably delayed and ultimately infeasible.

This article will analyze the liabilities and leadership roles of sewer system authorities in urban waterway restoration projects. Section I defines and provides a brief history of the development of combined sewer systems. Section II reviews the applicable provisions of the Clean Water Act and CERCLA and discusses the extent to which combined sewer system authorities may be liable under CERCLA for pollution in rivers and harbors across the country. Section III surveys waterway restoration projects around the United States, demonstrating that sewer system authorities have unprecedented influence over the success of waterway cleanup projects. Comparison of the projects shows that, when a combined sewer system is involved, the sewer system authority's

participation and initiative is essential for the success of a river or harbor cleanup. Finally, using New Jersey's Passaic River as a case study, section IV seeks to show concretely how the foregoing principles counsel in favor of having sewer system authorities play a leading role in the effort to restore that long-neglected river.

I. COMBINED SEWER SYSTEMS

Combined sewer systems are wastewater collection and conveyance facilities that transport sewage and stormwater in a single pipe to treatment facilities.[3] During dry weather, they carry domestic, commercial, and industrial wastewater.[4] During wet weather, they also carry stormwater.[5] Because bad weather can cause the combined flow of wastewater and stormwater to exceed the sewer system's capacity, combined sewer systems are designed to overflow to the nearest body of surface water.[6] Without such a means of releasing pressure, the sewer lines would surcharge, and sewage would back up into buildings, blow out of storm drains, and flood into streets.[7]

In a typical combined sewer system, collection pipes service residences, commercial buildings and institutions, industrial facilities, and storm drains.[8] The collection pipes are connected to an interceptor that conveys the collected wastewater to a wastewater treatment facility.[9] Regulators prevent too much wastewater from entering the interceptor by diverting overcapacity flows to overflow structures.[10] CSOs are discharges of combined sewage through such overflow structures.[11]

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3. OFFICE OF WATER, U.S. ENVTL. PROT. AGENCY, COMBINED SEWER OVERFLOW (CSO) CONTROL POLICY 8 (1994) [hereinafter CSO CONTROL POLICY].

4. *See, e.g.*, N.Y./N.J. HARBOR ESTUARY PROGRAM, FACTSHEET NO. 3: COMBINED SEWER OVERFLOWS IN THE NEW YORK/NEW JERSEY HARBOR ESTUARY 1, *available at* http://www.hudsonriver.org/hep/pdf/hep_cso.pdf (last visited June 28, 2005).

5. *See id.*

6. *See, e.g.*, U.S. ENVTL. PROT. AGENCY, COMBINED SEWER OVERFLOW MANAGEMENT FACT SHEET: SEWER SEPARATION 1 (1999) [hereinafter SEWER SEPARATION FACT SHEET]; N.Y./N.J. HARBOR ESTUARY PROGRAM, *supra* note 4, at 1.

7. *See* SEWER SEPARATION FACT SHEET, *supra* note 6, at 1; N.Y./N.J. HARBOR ESTUARY PROGRAM, *supra* note 4, at 1.

8. RICHARD H. SULLIVAN ET AL., U.S. ENVTL. PROT. AGENCY, EPA-600/2-77-017d, SEWER SYSTEM EVALUATION, REHABILITATION AND NEW CONSTRUCTION: A MANUAL OF PRACTICE 34 (1977).

9. *Id.* at 35.

10. *Id.*

11. U.S. ENVTL. PROT. AGENCY, REPORT TO CONGRESS: IMPLEMENTATION AND ENFORCEMENT OF THE COMBINED SEWER OVERFLOW CONTROL POLICY 1-2 (2001) [hereinafter 2001 REPORT TO CONGRESS ON CSOs]. For diagrams of combined sewer system structures, see *id.*, fig. 1.1, and N.Y./N.J. HARBOR ESTUARY PROGRAM, *supra* note 4, at 1.

While most regulators are automatic gravity- or flow-controlled devices, some are also outfitted for manual or remote control by the combined sewer system operators.[12] These overrides allow sewer system authorities to force sewage to overflow in order to relieve pressure on the interceptor line.[13]

Combined sewer systems evolved when people began to discharge domestic sewage to storm sewers.[14] Such systems were accepted into widespread use because they took advantage of pre-existing sewer lines and their construction required a smaller investment than the construction of separate storm and sanitary sewers.[15] However, as urban centers served by combined sewer systems grew in size and number, the cumulative quantity of untreated sewage discharged into major waterways began to take its toll on the environment. Beginning in the mid-1960s, increasingly strict water quality regulations were implemented and have helped improve the condition of waterways somewhat, but disrepair and malfunctions in the nation's aging combined sewer systems ensure that CSO pollution is a continuing issue of environmental concern.[16]

Today, combined sewer systems serve around 900 communities[17] and 40 million people[18] in the United States. The Environmental

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12. FED. WATER POLLUTION CONTROL ADMIN., U.S. DEP'T OF THE INTERIOR, PROBLEMS OF COMBINED SEWER SYSTEMS 50 (1967).

13. *See, e.g.*, CLINTON BOGERT ASSOCS., CITY OF NEWARK CSO DISCHARGE CHARACTERIZATION STUDY: MONITORING PROGRAM PROPOSAL AND WORK PLAN 4 (1996).

> The City owns the regulators located in the City, but these regulators are operated and maintained by the PVSC....Knife gates are remotely operated. When the Plant flow approaches 480 mgd, the PVSC operator closes the gate at one or more of the points of interception until plant flow stabilizes at 480 mgd. The gates are reopened after the rain has ended. The sequencing is based on the operators assessment of the amount of throttling required for the specific rainfall. There are provisions for manual operation of the gates if the telemetry fails.

Id.

14. U.S. DEP'T OF HEALTH, EDUC., & WELFARE, POLLUTIONAL EFFECTS OF STORMWATER AND OVERFLOWS FROM COMBINED SEWER SYSTEMS 1 (1964).

15. *See* 2001 REPORT TO CONGRESS ON CSOs, *supra* note 11, at 2-2.

16. *See id.* at 2-2 to 2-3.

17. OFFICE OF WASTEWATER MGMT., U.S. ENVTL. PROT. AGENCY, COMBINED SEWER OVERFLOWS DEMOGRAPHICS, *available at* http://cfpub.epa.gov/npdes/cso/demo.cfm (last visited June 15, 2005) [hereinafter CSO DEMOGRAPHICS]; *cf.* 2001 REPORT TO CONGRESS ON CSOs, *supra* note 11, at 2-3 (reporting that 772 communities have NPDES permits for CSOs); John Heilprin, *EPA Says Early Sewer Systems Below Federal Standards*, NANDO TIMES, Jan. 29, 2002 (on file with author) (reporting that 772 communities rely on combined sewer systems).

18. CSO DEMOGRAPHICS, *supra* note 17; *cf.* David Whitman, *The Sickening Sewer Crisis*, U.S. NEWS & WORLD REP., June 12, 2000, *available at* http://www.usnews.com/usnews/

Protection Agency (EPA) estimates that CSOs discharge 1.2 trillion gallons of raw sewage into U.S. waterways every year,[19] in addition to the estimated 51 million pounds of toxic chemicals that municipal sewage plants release into public waters annually.[20] Renovation or replacement of the nation's combined sewer systems is an ongoing concern that will continue for a long while as untold miles of pipe are repaired, additional pipe is laid, and antiquated wastewater treatment facilities are upgraded.

II. ENVIRONMENTAL LAW GOVERNING COMBINED SEWER SYSTEM AUTHORITIES

Combined sewer system operations are most directly affected by the Clean Water Act and CERCLA. The Clean Water Act regulates CSO discharges and wastewater treatment facility effluent. The condition and the uses of the receiving water determines the restrictions on the quantity, contents, and location of such discharges. The restrictions also protect receiving waters from further deterioration. CERCLA complements the Clean Water Act by addressing the effects of any past unpermitted discharges of hazardous substances that may have harmed the environment.

A. The Clean Water Act

Enacted in 1972, the Clean Water Act's original goals were to protect fish and wildlife and to render all water quality fit for recreational purposes by 1983 and to eliminate all discharges of pollutants into navigable waters by 1985.[21] As time passed without the achievement of these goals, deadlines were adjusted or deleted to accommodate technological and economic constraints. The Clean Water Act is now a forward-looking statute with an agenda "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters."[22] On one level, the statute works to mitigate damage from the discharge of oil and hazardous substances to U.S. waters by establishing preferred response procedures and authorizing the federal government

news/articles/000612/archive_016392.htm (last visited June 28, 2005) (reporting that 42 million people depend on combined sewer systems); 2001 REPORT TO CONGRESS ON CSOs, *supra* note 11, at 2-3 (discussing EPA's 1993 estimation that 43 million people are served by combined sewer systems).

19. 2001 REPORT TO CONGRESS ON CSOs, *supra* note 11, at 2-3; Whitman, *supra* note 18.
20. Whitman, *supra* note 18.
21. 33 U.S.C. § 1251(a) (2000).
22. *Id.*

to act if a discharge poses a substantial threat to public health and welfare.[23] On another level, it seeks to prevent such materials from being discharged in the first place through the use of pollution prevention programs.[24] The National Pollutant Discharge Elimination System (NPDES) permit program and the Total Maximum Daily Load (TMDL) program are particularly important in the governance and operation of combined sewer systems.

1. NPDES Permit Program

The NPDES permit program controls water pollution by regulating point sources from which pollutants are discharged to surface waterbodies.[25] The permits list the acceptable concentrations of pollutants that may be discharged to navigable waters, provide mandatory monitoring schedules, and identify required pollution prevention actions.[26] In most states, the state environmental agencies administer the program under the auspices of the EPA.[27] Permits issued under the NPDES program are based on federal minimum and state mandatory water quality standards. Specific to combined sewer systems, NPDES permits prohibit overflows in times of dry weather, require monitoring of overflow quantity and quality, and apply the requirements of the National Pretreatment Program and the Combined Sewer Overflow Control Policy.[28]

The National Pretreatment Program seeks to limit CSO pollution by precluding industrial and commercial hazardous wastes from sewage flows in combined sewer systems.[29] The program requires all nondomestic users of municipal sewer systems to control the quantity of pollutants they discharge into the sewer system either by implementing pollution prevention techniques or by treating their wastewater prior to discharging it into the sewer system.[30]

The CSO Control Policy was promulgated in 1994 to provide guidance to sewer system authorities seeking cost-effective methods of satisfying Clean Water Act goals.[31] The policy's four fundamental principles are (1) to provide clear levels of control to meet health and

23. *Id.* § 1321.
24. *See generally id.* §§ 1311-1387.
25. *Id.* § 1342(a).
26. *Id.*
27. U.S. ENVTL. PROT. AGENCY, NPDES PERMIT PROGRAM BASICS FREQUENTLY ASKED QUESTIONS, *at* http://cfpub1.epa.gov/npdes/faqs.cfm (last visited June 15, 2005).
28. *Id.*
29. 33 U.S.C. § 1317 (2000).
30. *Id.*
31. CSO CONTROL POLICY, *supra* note 3, at 1.

environmental objectives, (2) to be flexible in light of the site-specific nature of CSOs and the costs associated with controlling them, (3) to phase the implementation of CSO controls according to the sewer system operator's financial capability, and (4) to develop CSO control plans according to the site-specific impacts of the CSOs.[32] The CSO Control Policy Implementation is implemented in a two-step process, with the minimum technology-based controls (the nine minimum controls) to have been implemented by January 1, 1997, and long-term CSO control plans currently being developed and implemented.[33]

2. TMDL Program

The TMDL program is a tool for states to use in meeting water quality standards. It was established under section 303(d) of the Clean Water Act[34] and EPA's Water Quality Planning and Management Regulations.[35] Under the TMDL program, each state must determine which of its waterbodies are suffering from limited water quality and rank them according to degree of water quality limitation. "Quality-limited waterways" violate applicable water quality standards even though federal technology-based effluent controls and more stringent state and local pollution controls have been implemented. Once a state has identified and ranked its quality-limited waterways, it must develop TMDLs for them and implement pollution control actions in accordance with those TMDLs.[36]

A TMDL defines the maximum loading of a pollutant or non-chemical parameter that can be discharged to a waterbody without compromising water quality.[37] It is the sum of three factors: waste load allocations (WLAs), load allocations (LAs), and margins of safety (MOSs).[38] Each WLA represents the maximum quantity of a pollutant that a point source can discharge to a waterbody.[39] Since WLAs are assigned for each pollutant and are incorporated into each discharger's NPDES permit, states can use WLAs to track the relative contributions of pollutants from individual dischargers to a waterway.

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32. *Id.* at 9.
33. *Id.* at 13–14.
34. *See* Federal Water Pollution Control Act § 303(d), 33 U.S.C. § 1313 (2000).
35. 40 C.F.R. § 130.7 (2004).
36. U.S. ENVTL. PROT. AGENCY, GUIDANCE FOR WATER QUALITY-BASED DECISIONS: THE TMDL PROCESS (1991), *at* http://www.epa.gov/OWOW/tmdl/decisions (last visited June 29, 2005) [hereinafter TMDL GUIDANCE].
37. *Id.*
38. 40 C.F.R. § 130.2(i) (2004).
39. *Id.* § 130.2(h).

An LA is a percentage of a TMDL ascribable to non-point sources.[40] LAs represent the state's best estimate of the pollutant loading coming from indistinct or natural background sources. MOSs are, in essence, reserves; built on conservative assumptions, they are added to the TMDL equation to compensate for uncertainties.[41]

Since aquatic ecosystems are dynamic and pollutant loads can fluctuate, the water quality in a particular waterbody can shift over time. Biennial reviews and revisions of water quality assessments give states the opportunity to catch changes in water quality and to address them by adjusting NPDES permits and TMDL allocations.[42] If application of a TMDL is successful and a waterway meets water quality standards, the waterway may be removed from the state's Section 303(d) list of quality-limited waterways and from the TMDL program.[43]

The relationship between TMDLs and CSOs is particularly complex because CSOs discharge a mixture of materials collected from a range of users. Control over the contents of an overflow is imprecise and may be impossible, meaning that WLAs assigned to CSOs have a major component of uncertainty. The mere existence of a TMDL can complicate a river or harbor cleanup because the ongoing releases of pollutants can disrupt and delay remedial and restoration activities.

B. CERCLA

CERCLA complements the Clean Water Act's twin goals of responding to existing pollution and preventing future releases by addressing historic pollution and unpermitted releases. It was enacted in 1980 to remedy the dangers posed to the environment and to public health by hazardous waste sites that had proliferated around the country.[44] Heavily litigated and often criticized as unfair or ineffectual, CERCLA uses broadly defined terms to identify the maximum number of potentially responsible parties (PRPs).

PRPs are parties that Congress presumes are responsible for the presence of hazardous substances in the environment. Generally, parties must fall within one or more of four categories of PRPs identified in CERCLA's section 107(a)(1)-(4). PRPs may be held jointly, severally, and strictly liable under section 107 for all costs incurred by the government

40. *Id.* § 130.2(g).
41. TMDL GUIDANCE, *supra* note 36.
42. *See id.*
43. *See id.*
44. *See* James M. Sweeney, Comment, *Opening the Front Door: The Argument for a Causal Requirement in Multisite CERCLA Litigation*, 46 UCLA L. REV. 1989, 1990 (1999).

or by any "innocent" private party in implementing any investigative, removal, or remedial actions consistent with the National Contingency Plan (NCP). The PRPs may also be responsible for natural resource damages (NRD), and the costs of health assessments and health effects studies.[45] Furthermore, under section 113(f) of CERCLA, parties that qualify as PRPs under section 107(a) may be liable to each other in contribution.

1. Recovery of "Response Costs" under CERCLA

Broadly speaking, a CERCLA plaintiff—whether suing to impose joint and several liability for all response costs under section 107, or for contribution under section 113—must prove (1) that there has been a "release" or "threatened release" of "hazardous substances" from a "facility,"[46] (2) that the plaintiff has incurred "response costs," (3) that the response costs were necessary and consistent with the NCP, and (4) that the defendant falls within one or more of the four categories of PRPs listed in section 107(a)(1)-(4).[47]

The four categories of PRPs are as follows: (1) parties who currently "own" or "operate" a "facility" where hazardous substances have been released, even if such parties did not themselves dispose of any hazardous substances at the facility;[48] (2) parties who owned or operated the facility at the time hazardous substances were disposed there;[49] (3) parties who "arranged" for the disposal or treatment of hazardous substances at the facility;[50] and (4) parties who transported hazardous substances to the facility for treatment or disposal.[51]

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45. 42 U.S.C. § 9607(a) (2000).

46. *Id.* § 9601(9). CERCLA defines a "facility" as

> any building, structure, installation, equipment, pipe or pipeline (including any pipe into a sewer or publicly owned treatment works), well, pit, pond, lagoon, impoundment, ditch, landfill, storage container, motor vehicle, rolling stock, or aircraft, or (B) any site or area where a hazardous substance has been deposited, stored, disposed of, or placed, or otherwise come to be located.

Id.

47. *Id.* § 9607(a); *see, e.g.*, United States v. Alcan Aluminum Corp., 990 F.2d 711, 721 (2d Cir. 1993); Amoco Oil Co. v. Borden, Inc., 889 F.2d 664, 668 (5th Cir. 1989) (citing *Ascon Properties, Inc. v. Mobil Oil Co.*, 866 F.2d 1149, 1152-53 (9th Cir. 1989) among others); Dedham Water Co. v. Cumberland Farms Dairy, Inc., 889 F.2d 1146, 1150 (1st Cir. 1989); *see also* John Copeland Nagle, *CERCLA, Causation and Responsibility*, 78 MINN. L. REV. 1493, 1504-05 (1994); Sweeney, *supra* note 44, at 1994.

48. 42 U.S.C. § 9607(a)(1) (2000).

49. *Id.* § 9607(a)(2).

50. *Id.* § 9607(a)(3).

51. *Id.* § 9607(a)(4).

The structure of CERCLA indicates that, unlike the elements of a traditional tort, CERCLA liability does not depend on proof that the defendant proximately caused the plaintiff's damages. To prove such a relationship under traditional tort law, a plaintiff might have to ascribe its response costs to particular molecules of contamination, and then trace those molecules back to a particular defendant, who may have deposited the materials at the facility decades ago. Since "fingerprinting" chemical compounds with this level of specificity is difficult and can be prohibitively time-consuming or expensive, proving proximate cause would often be an insurmountable hardship, especially with respect to sites involving multiple disposals by multiple parties or sites where various compounds have weathered or mixed or reacted with other substances.[52] CERCLA effectively circumvents this hardship with a statutory presumption that a defendant will be held responsible if there is simply a "causal nexus"[53] between the defendant and the plaintiff's response costs, even if particular costs cannot be precisely ascribed to a particular defendant.

The "causal nexus" required by CERCLA and the relevant case law consists of two elements—a "site nexus" and a "cost nexus."[54] The site nexus addresses the relationship between the defendant and the *facility* in question, and it is established merely by showing that the defendant falls within one of the four categories of PRPs outlined in section 107(a)(1)-(4).[55] Thus, parties who currently "own" or "operate" facilities where hazardous substances have been released, for that reason alone, have a statutorily sufficient nexus with the site under section 107(a)(1), and they are liable for response costs even if all disposals of hazardous substances occurred before they arrived on the property.[56] The site nexus required for a *past* owner/operator under section 107(a)(2) is that hazardous substances must have been disposed of at the facility during the defendant's tenure.[57] The site nexus required under section 107(a)(3) and (4) are equally straightforward—the former covering any parties, sometimes called "off-site generators," who "arranged" for the

52. *See* United States v. Wade, 577 F. Supp. 1326, 1332 (E.D. Pa. 1983) (stating that "to require a plaintiff under CERCLA to 'fingerprint' wastes is to eviscerate the statute").

53. *See* Amoco Oil Co. v. Borden, Inc., 889 F.2d 664, 670 (5th Cir. 1989) (likening the interpretation of "the causal nexus between releases and response costs" to "entering unexplored territory").

54. Sweeney, *supra* note 44, at 2004–05; Nagle, *supra* note 47, at 1511.

55. N.J. Tpk. Auth. v. PPG Indus., Inc., 197 F.3d 96, 105 (3d Cir. 1999) (citing Gen. Elec. Co. v. AAMCO Transmissions, Inc., 962 F.2d 281, 286 (2d Cir. 1992)).

56. 42 U.S.C. § 9607(a)(1) (2000).

57. *Id.* § 9607(a)(2).

disposal or treatment of hazardous substances at a facility,[58] and the latter covering any parties who "transported" hazardous substances to the facility for treatment or disposal.[59]

Whereas the focus of the "site nexus" is the relationship between the defendant and the facility, the focus of the "cost nexus" is the relationship between the plaintiff's response costs and the "release" or "threatened release." As section 107(a) of CERCLA indicates, any PRP that has the requisite connection with the site (*i.e.*, "facility" in question—whether as a current or past owner/operator, or as an off-site generator or transporter who sent hazardous substances to the facility for disposal) will be liable if there is a release or threatened release of a hazardous substance "that causes the incurrence of response costs...."[60] Importantly, the statute does not require proof that the conduct that connects the defendant to the site also caused the response costs to be incurred, or even the release that resulted in the response costs. For PRPs facing "arranger" or "transporter" liability under section 107(a)(3) or (4), for example, a CERCLA plaintiff need only show, first, that "the defendant's hazardous substances were deposited at the site from which there was a release,"[61] and, second (but separately), "that the release caused the incurrence of response costs.[62] In short, the historical *disposal* that supplies the nexus between the defendant and the site need *not* be connected to the *release* that causes the response costs.[63]

2. Natural Resource Damages

In addition to imposing liability for response costs incurred to remediate contamination caused by releases of hazardous substances, CERCLA also considers the damage, destruction, or loss of use of biomass and bio-support systems. These assets are a site's "natural resources," defined by CERCLA to include land, fish, wildlife, biota, air,

58. *Id.* § 9607(a)(3).
59. *Id.* § 9607(a)(4).
60. *Id.*
61. United States v. Alcan Aluminum Corp., 964 F.2d 252, 266 (3d Cir. 1992).
62. *Id.*
63. This is not to deny that a defendant, under section 107(b), may seek to escape liability by demonstrating that release and the resulting damages or costs were caused solely by an act of God, an act of war, or a third party who is unreleased to the defendant. Thus, a defendant might escape liability if there is truly no nexus between the defendant's conduct and the release that causes response costs, but as an affirmative defense, it is the defendant who bears the burden of proof on that defense, not the plaintiff, and it will only succeed if the defendant can show, among other things, that the release and the resulting damages are *entirely* attributable to God, war, or third parties. As indicated *infra*, sewer system operators have used this defense with mixed results.

water, ground water, and drinking water supplies.[64] The liability imposed on PRPs by CERCLA's section 107(a) extends to include natural resource damages (NRD), which are defined as "damages for injury to, destruction of, or loss of natural resources, including the reasonable costs of assessing such injury, destruction, or loss resulting from such a release...."[65]

Natural resources are not the property of any person. They are held in trust on behalf of the public by federal, state, and tribal governments.[66] At each CERCLA site, the applicable governmental entities designate natural resources trustees to protect and restore natural resources and pursue enforcement against polluters.[67] Trustees work together to perform a Natural Resources Damage Assessment (NRDA), to prepare and implement a restoration plan, to negotiate with or sue PRPs for the costs of restoring the natural resources, and to participate in any PRP activities with respect to the natural resources.[68]

Although early NRD settlements tended to make up only a small percentage of total damages, NRD damages have begun to overshadow remedial costs as attention has turned to larger, more complex Superfund sites.[69] The sum cost of lost resources, recovery time, past and interim lost use of renewable resources, investigation, and implementation of recovery plans can total into the high millions, if not billions, of dollars. Many high-dollar NRD sites are river basins that are closely identified with mining, industry, or other intense development. Among the sites listed by the EPA as examples of particularly large NRD cases are the Coeur d'Alene River Basin in Idaho, Commencement Bay in Washington, the Los Angeles waterfront in Southern California, the

64. 42 U.S.C. § 9601(16) (2000).

65. *Id.* § 9607(a)(4)(C).

66. U.S. ENVTL. PROT. AGENCY, NATURAL RESOURCE DAMAGES: A PRIMER, *at* http://www.epa.gov/superfund/programs/nrd/primer.htm (last visited July 10, 2005).

67. *Id.*

68. *Id.*

69. *Superfund: Number and Value of Natural Resource Damage Claims, Hearing Before the House Subcomm. on Water Res. & Env't, Comm. on Transp. & Infrastructure*, 104th Cong. 7 (1995) (statement of Peter F. Guerrero, Director, Environmental Protection Issues, Resources, Community, and Economic Development Division) ("To date, natural resource damage settlements have been relatively low—accounting for a small percentage of what responsible parties have agreed to pay for Superfund cleanups. However, federal and state officials told us of three future settlements that could involve hundreds of millions of dollars."), *available at* http://archive.gao.gov/t2pbat1/154662.pdf (last visited Aug. 25, 2005).

Lower Fox River in Wisconsin, the Upper Clark Fork River Basin in Montana, and the Upper Hudson River in New York.[70]

3. Liability of Sewer System Authorities under CERCLA

Under statutory structure outlined above, a sewer system authority's exposure to CERCLA liability is well-supported when CSOs have contributed releases of hazardous substances to contaminated water bodies that the government or private parties are incurring response costs to investigate or remediate. In such cases, the sewer system authority may well be regarded as a PRP for one or more of the following reasons:

- The sewer system authority may qualify as a PRP under CERCLA section 107(a)(1) as the owner or operator of a "facility" from which hazardous substances have been released. CERCLA's definition of "facility" expressly includes "any pipe into a sewer or public publicly owned treatment works [POTWs],"[71] and has been interpreted by courts to cover not just the pipes, but the sewers and POTWs themselves.[72] Moreover, although CERCLA literally speaks of "the owner *and* operator" of a facility, the statute is interpreted to impose PRP status on both the owner and the operator of the facility, even if the owner and operator are different entities, to the extent each may exercise control over the use of the facility.[73] Further, although the "facility" in Superfund cases is usually the site at which response costs are incurred—which in our

70. *See* RESOURCE, CMTY., & ECON. DEV. DIV., GEN. ACCOUNTING OFF., SUPERFUND: OUTLOOK FOR AND EXPERIENCE WITH NATURAL RESOURCE DAMAGE SETTLEMENTS 2 (1996) *available at* http://www.gao.gov/archive/1996/rc96071.pdf (last visited Aug. 25, 2005); U.S. ENVTL. PROT. AGENCY, NATURAL RESOURCE DAMAGE ASSESSMENT SITES, *at* http://www.epa.gov/superfund/programs/nrd/nrdsites.htm (last visited Aug. 25, 2005).

71. 42 U.S.C. § 9601(9)(A) (2000).

72. Westfarm Assocs. Ltd. P'ship v. Wash. Suburban Sanitary Comm'n, 66 F.3d 669, 679–80 (4th Cir. 1995) (rejecting sewer authority's argument that Congress's inclusion of "any pipe into a sewer or publicly owned treatment works" in the definition of "facility" means that Congress intended to exclude sewers and POTWs from the definition).

73. Artesian Water Co. v. New Castle County, 659 F. Supp. 1269, 1280 (D. Del. 1987) ("Proper usage dictates that the phrase 'the owner and operator' include only those persons who are both owners and operators. But by no means does Congress always follow the rules of grammar when enacting the laws of this nation.") (citing *United States v. Md. Bank & Trust Co.*, 632 F. Supp. 573, 578 (D. Md. 1986)); *see also* New York v. Shore Realty Corp., 759 F.2d 1032, 1044 (2d Cir. 1985); United States v. Conservation Chem. Co., 619 F. Supp. 162, 186–87 (W.D. Mo. 1985); United States v. Northeastern Pharm. & Chem. Co., 579 F. Supp. 823, 848–49 (W.D. Mo. 1984).

scenario would be the water body that receives the sewage, not the sewer line itself—CERCLA's terms do not require that the response costs be incurred *at* the facility. On the contrary, the response costs need only have been caused by a release or threatened release of hazardous substances "from" a facility.[74]

- Secondly, to the extent the receiving water body is regarded as the "facility," the sewer system authority could nevertheless qualify as a PRP under CERCLA section 107(a)(3) and (a)(4) as a party who arranged for the transport of hazardous substances, and/or actually transported hazardous substances for disposal at the facility. The sewer system authority arranges for the disposal or treatment of any hazardous substances by operating pumping stations, transfer stations, and other equipment that direct flow, as well as entering into contractual agreements with upstream and downstream operators and users. Further, users of a combined sewer system do not flush their wastes into the sewer system with the intention of discharging the raw sewage or other contaminants to the nearest river or harbor through a CSO, nor can they control the fate of the wastewater they discharge. Instead, the probability and location of overflows are determined by weather patterns, the condition and capacity of the combined sewer system, and, ultimately, the sewer system authority's discretionary use of any manual overrides. Given these facts, the sewer system authority would be hard-pressed to deny that it both arranges for the transport, and actually transports, any hazardous substances that may be present in the combined sewage flow.

The next section anticipates that sewer system authorities might seek to fall under one or more specific "exceptions" to CERCLA liability and explains why those exceptions would likely be unavailing in most cases. At this juncture, however, it is worth noting that liability cannot be avoided by more generalized arguments that imposing CERCLA liability on sewer system authorities is inconsistent with their status as governmental entities funded by taxpayer dollars. As explained by the U.S. Court of Appeals for the Fourth Circuit, Congress specifically excluded state and local governments from CERCLA liability only in

74. 42 U.S.C. § 9607(a)(4) (2000).

certain limited contexts, and "if Congress had intended to exclude state and local governments from liability in other situations—such as when they, through their POTWs, are otherwise liable under CERCLA—Congress would have either: (a) excluded state and local governments from the definition of 'owner or operator' [altogether,]" rather than limiting the exclusion to the involuntary acquisition situation; or (b) included POTWs in the list of entities excluded from the definition of "owner or operator."[75]

Moreover, imposing cleanup costs on sewer authorities—which may pass the cost broadly to all taxpayers, rather than strictly on those who introduced hazardous substances into the sewer in the first instance—is not necessarily incompatible with achieving Congress's policy objectives. As the court explained:

> First, in light of the fact that many small business polluters are no longer in business or have pockets too shallow to pay for costs of environmental cleanup, all taxpayers, who are all hurt by pollution, benefit from paying for the cleanup rather than facing no cleanup at all. Second, all taxpayers benefited from lower tax rates during the period when [the sewage authority] failed to spend funds needed to mend leaks in the sewer pipes. Finally, although Congress can regulate pollution so as to internalize environmental costs in the future, Congress cannot turn back the clock and truly internalize the costs of past pollution [by imposing all liability on the industries or commercial entities that discharged hazardous substances to the combined sewer system] because the people who bought [services from such industrial or commercial entities] at the former, artificially low prices are not necessarily the same people who would buy [services from them] at the artificially high prices which would occur if [they] were now forced to pay all the costs of past pollution.[76]

C. No Exemptions from CERCLA Liability for Combined Sewer System Authorities

CERCLA's breadth is not unlimited. Various exceptions and affirmative defenses modify the statute's reach, and municipalities and

75. *Westfarm*, 66 F.3d at 678.
76. *Id.* at 679-80.

other governmental entities are further protected by the EPA's Interim Policy on CERCLA Settlements Involving Municipalities or Municipal Wastes (the Municipal Settlement Policy). As explained below, however, sewer system authorities cannot expect to exploit these exemptions and policies and avoid liability when the evidence confirms that sewer system authorities have discharged hazardous substances in their CSOs.

1. The Exemption for "Federally Permitted Releases"

In the first instance, sewer systems may argue that they are exempt from CERCLA because their discharges generally qualify as "federally permitted releases"[77] and the statute expressly precludes any person from using CERCLA to recover "response costs or damages resulting from a federally permitted release...."[78] The federally permitted release exception, however, hardly insulates sewer system authorities from all CERCLA liability. It would not, for example, protect the authority from liability for discharges to a water body that occurred before any permits were issued. Because CERCLA's retroactivity allows it to be applied both to current releases and to historical releases dating from before its own enactment, even PRPs who are now in full compliance with environmental law may still be jointly and severally liable for discharges that occurred long ago. Section 107 of CERCLA imposes liability on polluters for the costs of investigating, removing, and remediating hazardous substances that have been released into the environment. Nor does the exception cover any releases that were not contemplated during the permitting process or that exceed the limits of a permit.

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77. 42 U.S.C. § 9601(10) (2000).

> The term "federally permitted release" means (A) discharges in compliance with a permit under section 1342 of Title 33, (B) discharges resulting from circumstances identified and reviewed and made part of the public record with respect to a permit issued or modified under section 1342 of Title 33 and subject to a condition of such permit, (C) continuous or anticipated intermittent discharges from a point source, identified in a permit or permit application under section 1342 of Title 33, which are caused by events occurring within the scope of relevant operating or treatment systems...(J) the introduction of any pollutant into a publicly owned treatment works when such pollutant is specified in and in compliance with applicable pretreatment standards of section 1317(b) or (c) of Title 33 and enforceable requirements in a pretreatment program submitted by a State or municipality for Federal approval under section 1342 of Title 33....

Id.

78. *Id.* § 9607(j).

2. The Third-Party Defense

Under section 107(b)(3) of CERCLA, a PRP can assert the "third-party" or "innocent landowner" defense by demonstrating that

> [t]he release or threat of release of a hazardous substance and the damages resulting therefrom were caused solely by...an act or omission of a third party other than an employee or agent of the defendant, or than one whose act or omission occurs in connection with a contractual relationship, existing directly or indirectly, with the defendant...if the defendant establishes by a preponderance of the evidence that (a) he exercised due care with respect to the hazardous substance concerned, taking into consideration the characteristics of such hazardous substance, in light of all relevant facts and circumstances, and (b) he took precautions against foreseeable acts or omissions of any such third party and the consequences that could foreseeably result from such acts or omissions....[79]

Sewer system operators have used this defense with mixed results. For example, in *Lincoln Properties, Ltd. v. Higgins*, a county maintenance district successfully asserted the third-party defense after the dry cleaning solvent perchloroethylene (PCE) leaked from its sanitary sewer lines and contaminated the surrounding soil and ground water.[80] It turned out that several dry cleaning businesses serviced by the sewer system had been pouring their spent dry cleaning solvents down the drain in violation of the maintenance district's total ban on the discharge of such substances. At summary judgment, the maintenance district was able to demonstrate that (a) its provision of sewer services to the dry cleaners was not the kind of contractual relationship contemplated by CERCLA because the arrangement was not concerned with the handling of hazardous substances,[81] (b) it had exercised due care with respect to the hazardous substance by testing for PCE as required by state law and by responding to the release as soon as it was

79. *Id.* § 9607(b)(3).

80. Lincoln Props., Ltd. v. Higgins, 823 F. Supp. 1528, 1539–44 (E.D. Cal. 1992).

81. *Id.* at 1543 ("One who opposes assertion of the third party defense must show 'something more than a mere contractual relationship.' Thus, a landowner is precluded from raising the third-party defense only if the contract between the landowner and the third party somehow is connected with the handling of hazardous substances.") (quoting *Westwood Pharm. v. Nat'l Fuel Gas Distribution Corp.*, 964 F.2d 85, 89 (2d Cir. 1992); *see also* Shapiro v. Alexanderson, 743 F. Supp. 268, 271 (S.D.N.Y. 1990).

discovered,[82] and (c) it had taken precautions against foreseeable third party acts by maintaining its sewer lines to industry standard and prohibiting the discharge of cleaning solvents to the sewer.[83]

In contrast, in *Westfarm Associates Ltd. Partnership*, a state sanitary commission's reliance on CERCLA's third-party defense was rejected—indeed, the commission was held liable as a matter of summary judgment—because there was no proof that the sewer authority had taken any precautions against the foreseeable acts of third parties. Not only was the sanitary commission aware that a dry cleaning facility was pouring spent solvents into its sewer system, but its own regulations permitted certain quantities of those solvents to be discharged into the system.[84] The sanitary commission had also allowed its sewer lines to fall into disrepair. Video inspection of the sewer lines revealed open joints, improper alignment of pipe segments, sags in the lines, offset joints, cracks, breaks in the pipe, improperly installed gaskets, and improper manhole construction.[85] Based on this evidence, the Fourth Circuit concluded that the sanitary commission "had the power to abate the foreseeable release of PCE, yet failed to exercise that power," and that there was no evidence that the sanitary commission "exercised due care or took precautions against the foreseeable acts of third parties such as would have entitled it to the 'innocent landowner' defense."[86]

Both cases demonstrate that assertion of the third-party defense carries a heavy burden of proof, which combined sewer system authorities may not be able to satisfy. Mere compliance with Clean Water Act regulations and permits does not rise to the level of due care and precaution necessary to shift CERCLA responsibility to third parties.[87] In order to prove that pollution is "solely" the fault of a third party, combined sewer system authorities may be required to demonstrate that

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82. *Lincoln Props.*, 823 F. Supp. at 1543–44.

83. *Id.* at 1544.

84. Westfarm Assocs. Ltd. P'ship v. Wash. Suburban Sanitary Comm'n, 66 F.3d 669, 682 (4th Cir. 1995).

85. *Id.* at 674.

86. *Id.* at 683.

87. *Id.* at 679 (rejecting argument that "the fact that the Clean Water Act...and the Resource Conservation and Recovery Act...permit certain levels of hazardous materials, including PCE, to be discharged into sewer systems, demonstrates that Congress could not have intended to make sewer systems operators liable for the foreseeable sewer leaking of the PCE which was permitted to be in the pipes in the first place"). *Cf.* B.F. Goodrich Co. v. Murtha, 958 F.2d 1192, 1202-03 (2d Cir. 1992) ("It does not follow that because the environmental risk posed by household waste is deemed insufficient to justify the most stringent regulations governing day-to-day handling that the environmental harm caused when that risk is realized is insufficient to require holding liable those responsible for that harm....").

they have operated under zero-discharge rules like the *Lincoln* maintenance district's; that they maintain their facilities in good condition so that overflows, spills, discharges, and leaks are not likely to occur; and that they respond immediately to any releases. It is likely that few sewer system authorities can satisfy these requirements since most combined sewer systems pre-date the Clean Water Act and have never operated under zero-discharge rules. Furthermore, age, capacity limitations, and budget constraints have caused most combined sewer systems to fall into states of disrepair similar to the *Westfarm* sewer system.

3. The Municipal Settlement Policy

The Municipal Settlement Policy is the EPA's uniform method of handling liability for municipal solid waste under CERCLA.[88] The policy was developed in 1989 in response to lobbying by various municipal groups seeking protection from potentially debilitating CERCLA liability. At the time, approximately one-fifth of the sites proposed or listed on the National Priorities List (NPL) were landfills known as co-disposal sites where everything from household trash to industrial hazardous wastes had been disposed.[89] Since there were no exemptions under CERCLA for municipal entities or municipal solid waste,[90] municipalities across the country were embroiled in CERCLA liability because the content and bulk of their solid wastes had contributed to the release and spread of toxins throughout the landfills, complicating response actions and increasing costs substantially.[91] Given the expense of participating in remediation, the possibility of being held liable for the entire cost of remediation, and the expense associated with mounting a legal defense, municipalities involved in co-disposal facilities faced fiscal crises, especially those with small tax bases or budget deficits.

The Municipal Settlement Policy provides three sets of guidelines for dealing with municipal entities under CERCLA: The first guideline instructs the EPA's regional offices to include municipalities in the information gathering process in the same manner as all other

88. Superfund Program; Interim Municipal Settlement Policy: Request for Public Comment, 54 Fed. Reg. 51,071 (Dec. 12, 1989).

89. *Id.*

90. *Id.* at 51,074.

91. *See* Rena I. Steinzor, *The Legislation of Unintended Consequences*, 9 DUKE ENVTL. L. & POL'Y F. 95, 108 (1998) (citing Rena I. Steinzor & Linda Greet, *In Defense of the Superfund Liability System*, 27 ENVTL. L. REP. 10,286 (1998)).

parties.[92] The second guideline identifies the circumstances under which municipalities and municipal waste handlers are to be exempted from CERCLA liability and not notified as PRPs: it provides, in essence, that municipalities that generated or transported municipal solid waste to a site will not be named by EPA as PRPs, but that EPA will pursue municipalities who owned or operated a site.[93] The third guideline encourages the regional offices, in cases in which municipalities are still regarded as PRPs, to accept alternative payment options for municipal CERCLA liabilities, including delayed payments, delayed payment schedules, and in-kind contributions, as a means of mitigating the financial burden on municipalities.[94]

In short, although the policy indicates that EPA will overlook generators or transporters of municipal solid waste,[95] municipal owners and operators of co-disposal sites remain exposed. Moreover, generators and transporters of municipal wastes will be considered as PRPs if there is proof that the municipal waste they handled contained hazardous substances and that those hazardous substances had commercial, institutional, or industrial origins.[96] Because the policy specifies that any such proof must be "site-specific,"[97] only sampling results or documentary evidence will overcome the policy. Moreover, because "municipal solid waste" is allowed to include household hazardous wastes, small quantity generator wastes, and some amounts of industrial, commercial, and institutional waste,[98] the policy essentially

92. Superfund Program; Interim Municipal Settlement Policy: Request for Public Comment, 54 Fed. Reg. at 51,074.

93. *Id.* at 51,074-75.

94. *Id.* at 51,075-76.

95. U.S. Envtl. Prot. Agency, Announcement and Publication of the Policy for Municipality and Municipal Solid Waste; CERCLA Settlements at NPL Co-Disposal Sites, 63 Fed. Reg. 8197, 8198 (Feb. 18, 1998) ("Consistent with the 1989 Policy, the Agency will continue its policy to not generally identify MSW generators/transporters as PRPs at NPL sites....").

96. Superfund Program; Interim Municipal Settlement Policy: Request for Public Comment, 54 Fed. Reg. at 51,074-75.

97. *Id.* at 51,075 n.8.

> The term "site-specific" information refers to information pertaining to a particular Superfund site. "Site-specific" information does not generally include, for example, "general studies" conducted by EPA or other parties which draw general conclusions about whether MSW or sewage sludge typically contain a certain percentage of hazardous substances, unless the "general study" includes "site-specific: information obtained from the PRP or superfund site in question.

Id.

98. *Id.* at 51,074.

> The term "municipal solid waste" refers to solid waste generated primarily by households, but may include some contribution of wastes

establishes a presumption against liability for generators and transporters of municipal solid waste.

Because combined sewer systems carry municipal solid waste, the Municipal Settlement Policy may be a factor in a sewer system authority's CERCLA liability for CSO pollution. That said, the policy plainly does not shield sewer system authorities from CERCLA liability when there are releases of hazardous substances from the sewer facilities that the authorities themselves own and operate. Nor does the policy preclude private parties from suing sewer system authorities under CERCLA, even if the authority's only exposure is as an "arranger/generator" or "transporter."

In addition, one may well question whether the Municipal Settlement Policy is, in fact, suited for application to combined sewer systems. It was written to address the perceived inequities associated with landfill co-disposal sites. Landfills are, for the most part, static and enclosed depositories that receive discrete quantities of waste. It might reasonably be assumed, in the usual case, that what is located in the landfill is what the generators dispatched, what the transporter delivered, and, in the final analysis, what the owner or operator accepted for disposal. By contrast, similar assumptions cannot be reliably made about CSOs. Waterways are not enclosed depositories and do not receive discrete, identifiable quantities of waste. As demonstrated by the TMDL program and other water quality programs, non-point sources and unidentified point sources are a concern in quality-limited waterways. Furthermore, the kinds of pollution in combined sewage flows vary with time, weather, and condition of the sewer system. There is no telling what chemicals a particular volume of waste will mix with, or how long it will take for the waste to move through the system. It is also difficult to tell whether the pollution will arrive at the wastewater treatment facility, or whether it will be released somewhere along the way to surface water, ground water, or surrounding soil through CSOs or leaks in the system.

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from commercial, institutional and industrial sources as well. As defined under the Resources Conservation and Recovery Act (RCRA), MSW contains only those wastes which are not required to be managed as hazardous wastes under Subtitle C of RCRA (e.g., non-hazardous substances, household hazardous wastes (HHW), or small quantity generator (SQG) wastes). Although the actual composition of such wastes varies considerably at individual sites, MSW is generally composed of large volumes of non-hazardous substances (e.g., yard waste, food waste, glass, and aluminum) and may contain small quantities of household hazardous wastes (e.g., pesticides and solvents) as well as small quantity generator wastes.

Id.

In short, the Municipal Settlement Policy's basic assumptions cannot be accommodated when it comes to random hazardous discharges from sewer systems—discharges that are not invited by the owners of the water bodies or other properties that are ultimately damaged by the CSOs.

4. Failure of the Toxic Cleanup Equity Acts

A disinclination to extend the reach of the Municipal Settlement Policy is supported by Congress's refusal to codify that policy in proposed legislation known as the Toxic Cleanup Equity Acts. The bills' sponsors designed the bills "to fine-tune the Superfund statute to block opportunistic lawsuits by large corporate polluters against cities and towns, small businesses and even such entities as the Girl Scouts of America, all of whom have been sued for their alleged contribution to a Superfund site solely because they transported or generated regular household garbage."[99]

Supported by such groups as the National League of Cities, the National Association of Counties, the U.S. Conference of Mayors, and the National Association of Towns and Townships,[100] Sen. Lautenberg and Rep. Torricelli launched an attack on CERCLA's broad application. Sen. Lautenberg decried the effects of CERCLA on municipal management: "[W]e should not bankrupt these parties or turn a blind eye to the broader public health and safety repercussions of demanding too much from them. We cannot squeeze blood from a stone—particularly when the public may end up paying in lost lives from diminished police and fire protection, or reduced disease control, or other key services that could be sacrificed."[101] Rep. Torricelli spotlighted the perceived abuses of CERCLA's strict liability scheme, accusing private industry of holding municipalities hostage by suing them as a delaying tactic, forcing municipalities with limited budgets to settle in order to avoid excessive and expensive litigation: "These lawsuits are a monumental problem....Towns with total annual budgets of $5 or $6 million are being asked to pay $2 or $3 million to share in Superfund cleanups. Even though many of these suits may be settled out of court, the cost of fighting them is staggering."[102]

99. 102 CONG. REC. E1981 (1991) (extension of remarks of Rep. Torricelli).
100. 103 CONG. REC. S5947 (1993) (statement of Sen. Lautenberg).
101. *Id.*
102. 103 CONG. REC. E277 (1993) (extension of remarks of Rep. Torricelli).

To address these issues, the proposed Toxic Cleanup Equity and Acceleration Act of 1991 prohibited third-party CERCLA claims by anyone other than the EPA for municipal solid waste issues:

> No municipality or other person shall be liable to any person other than the United States for claims of contribution under this section or for other response costs or damages under this Act for acts or omissions related to the generation, transportation, or arrangement for the transportation, treatment, or disposal of municipal solid waste or sewage sludge....[103]

The bill further sought to codify the Municipal Settlement Policy:

> In the absence of truly exceptional circumstances, the President shall not initiate or maintain any action against any municipality or other person under this Act for acts or omissions related to the generation, transportation, or arrangement for the transportation, treatment, or disposal of municipal solid waste or sewage sludge unless such acts or omissions provide a basis for liability under sections 107(a)(1) or 107(a)(2) of [CERCLA]. For the purpose of this subsection, truly exceptional circumstances shall exist only:
>
> (1) where the President obtains reliable site-specific evidence that—
>
> (A) the release or threatened release of hazardous substances on which liability is based are not those ordinarily found in municipal solid waste or sewage sludge; and
>
> (B) the hazardous substances were derived from a commercial, institutional, or industrial process or activity; or
>
> (2) (A) the total contribution to the site of commercial, institutional, and industrial hazardous substances is insignificant in terms of both volume and toxicity when compared to the volume and toxicity of the municipal solid waste and sewage sludge, or
>
> (B) absent the total contribution to the facility of commercial, institutional, and industrial hazardous substances, the contribution of hazardous substances from

103. The Toxic Cleanup Equity and Acceleration Act of 1991, S. 1557, 102d Cong. § 3(l) (1991).

> municipal solid waste and sewage sludge would be a significant cause of the release or threatened release of hazardous substances that results or will result in the response action.[104]

Finally, the bill sought to exempt municipalities from all CERCLA liability with respect to public right-of-ways:

> In no event shall a municipality incur liability under this Act for the act of owning or maintaining a public right-of-way over which hazardous substances are transported.
>
> For the purposes of the subsection, "public right-of-way" shall include roads, streets, or other public transportation routes, and pipelines used as a conduit for sewage or other liquid or semiliquid discharges.[105]

The bill proposed to give the EPA the sole power to involve municipalities and municipal solid waste handlers in CERCLA cases. Furthermore, the bill proposed to exempt municipalities from liability for transporting hazardous substances or allowing hazardous substances to be transported over the public right-of-ways they controlled. In particular, by designating sewer lines as public right-of-ways, the bill would have exonerated sewer system authorities from any responsibility for environmental harm caused by hazardous wastes contained in CSOs.

In the end, the 1991 bill passed in the Senate but failed in the House,[106] but Lautenberg and Torricelli reintroduced the bill in 1993.[107] Halfway through that term, they revised and expanded it, adding a cap on municipal liability, among other changes:

> The President shall make a good faith effort to reach final settlements as promptly as possible under this subsection, and such settlements shall—
>
> (A) allocate to all generation, transportation, or arrangement for the transportation, treatment, or disposal of municipal solid waste or sewage sludge a combined total of no more than four percent (4%) of the total response costs for the facility...;
>
> (B) require an eligible person under this subsection to pay only for his or her equitable share of the maximum four

104. *Id.* § 3(m).
105. *Id.* § 3(n).
106. 103 CONG. REC. S5947 (1993) (statement of Sen. Lautenberg).
107. S. 343, 103d Cong. (1993); H.R. 870, 103d Cong. (1993).

> percent (4%) portion of response costs described in subparagraph (A).[108]

The rationale for the choice of a four percent cap is unclear, particularly in light of an EPA calculation that municipalities have historically paid between 20 to 35 percent of the settlement costs at co-disposal sites.

Congress did not pass the new and improved bill either, indicating that it had no intention of exempting municipalities from CERCLA liability on such a broad basis.[109] Although the bills tried to address an unintended consequence of CERCLA's breadth, the bills themselves were too broad. They created a protected class of PRPs who could pollute the environment with impunity because of their municipal status or their primary occupation of handling municipal solid waste.[110] This would compromise CERCLA's basic policy of seeking to impose liability on all who share responsibility for creating the pollution in the first place.

III. RIVER AND HARBOR RESTORATION INITIATIVES

Ideally, CERCLA liability and Clean Water Act obligations would mesh and bring about the restoration of U.S. waterways. Unfortunately, the chemistry and history of the polluted waterways in the United States foreclose such a simple possibility. Most surface waters receive contaminated discharges from multiple sources, including private industry, navigation, and shipping. Contaminants can also migrate from other parts of the watershed. Individual cleanup and restoration efforts cannot be effective if upstream pollution, ongoing discharges, and sedimentary disturbances continue to pollute the water. Furthermore, as time passes, the number of orphan shares of CERCLA responsibility grows, shifting more and more of the burden of remediation and restoration to a shrinking number of PRPs. The complexity of most urban waterways calls for comprehensive initiatives that involve more than just individual polluters. If a whole community's waterway resource has been impacted, it takes the involvement of the

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108. The Toxic Cleanup Equity Act of 1993, S. 965, 103d Cong. § 3(c) (1993).

109. *See* Steinzor, *supra* note 91, at 103 (noting that Rep. James Florio, who sponsored CERCLA in the House of Representatives, "clearly understood that the legislation applied to state and local governments").

110. Peter R. Hinckley, *State and Municipal Sewer System Authority Liability Under CERCLA: Who Should Pay for the Cleanup of Hazardous Industrial and Commercial Sewer Discharges?*, 22 B.C. ENVTL. AFF. L. REV. 89, 126 (1994) ("By exempting a municipal sewer system authority even though it may be directly responsible for contamination, the Equity Act gives municipalities too much protection. The Equity Act's broad exemption ...would...permit a responsible party to avoid liability.").

whole community to restore and preserve that waterway's vital ecosystems.

Where CSOs are implicated, comprehensive cleanup initiatives can be successful only if sewer system authorities participate. They are in a unique position to lead and coordinate such initiatives. They own and operate key infrastructure. They are active dischargers who may have to modernize their facilities. They are PRPs who are jointly and severally liable for remediation and restoration costs. They are clearinghouses of information about the industrial and commercial facilities they service. They have studied the ecological characteristics of their receiving waterbodies. And they are governmental and civic units with direct contacts to both higher levels of government and the community at large.

In cleanup initiatives like Boston Harbor or Portland Harbor and the Willamette River—where sewer system authorities took leadership roles, made broad improvements to sewer system infrastructure, exerted influence over users to meet higher wastewater quality standards, and served as focal points for the community—severely polluted rivers and harbors have been and are being substantially restored. In contrast, in places like the Lower Duwamish Waterway in Washington state—where sewer system authorities and municipal leadership and guidance are not effective, and where coordination among PRPs is lacking, successful restoration is much less probable. New initiatives like the one in the Merrimack River would do well to follow in the footsteps of successful projects by compelling sewer system authorities to undertake major improvements to their combined sewer systems and to take leadership roles in the cleanup initiative.

A. Boston Harbor

Considered "one of America's greatest environmental success stories,"[111] Boston Harbor is the best example of a comprehensive cleanup initiative led by a sewer system authority. In 1982, Boston Harbor had so much floating grease and debris in it that residents had nicknames for the different pieces of detritus.[112] Harbor sediments contained high levels of metals and PAHs.[113] Sewage sludge was

111. Scott Allen, *Closing in on a Healthy Harbor*, B. GLOBE, Mar. 15, 2000, at A1 (quoting former EPA regional administrator John DeVillars).

112. *Id.* ("Condoms were 'Charles River whitefish,' while tampon applicators were 'beach whistles.'").

113. Judith E. McDowell, *Contaminated Sediments in the Marine Environment*, NOREASTER, 1999, *at* http://seagrant.gso.uri.edu/noreaster/noreaster99/Noreaster99.html (last visited Aug. 28, 2005).

discharged directly into the harbor,[114] creating water clarity problems. Two outdated sewage treatment facilities in the harbor flooded every time there was moderate rainfall, backing up the city's combined sewer system and pouring raw sewage into the harbor on a regular basis.[115] Although there were attempts to clean the harbor, improvements were few and temporary.[116]

Then, in 1982, a citizen filed a lawsuit under the Clean Water Act seeking to force a cleanup of the harbor.[117] By 1985, there were multiple lawsuits pending. Federal district judge David Mazzone responded to these lawsuits by issuing an initiative for the Boston Harbor cleanup project[118] and placing a moratorium on the connection of any new sources to either of the two sewage treatment plants in the harbor.

Boston's sewer system operator, the Massachusetts Water Resources Authority (MWRA), led the Boston Harbor Project, which also involved the Commonwealth of Massachusetts, the Boston Water and Sewer Commission, the City of Quincy, and the Town of Winthrop. Because federal funds were not available at the time of the initiative, the MWRA financed the bulk of the work by raising sewer and water service fees.[119]

The Boston Harbor Project consisted of three phases of work. Phase I began with the construction of a state-of-the-art sewage treatment facility in the harbor to replace the two old facilities. It also established a fertilizer production facility where sewage sludges are

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114. Allen, *supra* note 111.

115. *Id.* ("[I]ts treatment plants on Deer Island and Nut Island, which were so poorly designed they flooded during modest rainstorms, [sent] raw sewage directly into the harbor.").

116. *Id.* ("The MDC and Governor Michael Dukakis tried for years to build a less costly treatment plant.").

117. *Id.* ("[A]ttorney Bill Golden in 1982...accidentally jogged through grease and other sewage debris that had floated onto Wollaston Beach from the nearby Nut Island treatment plant. Incensed, Golden sued the Metropolitan District Commission, which ran the sewer system before the MWRA. It was the first of several suits aimed at forcing a cleanup of the harbor.").

118. Mass. Water Resources Auth., *The Boston Harbor Case*, MWRA ONLINE, June 21, 2005, *at* http://www.mwra.state.ma.us/02org/html/court.htm (last visited Aug. 28, 2005).

119. Allen, *supra* note 111.

> [T]he US government had stopped funding sewage plant construction, leaving customers of the newly formed MWRA to foot the multi-billion-dollar bill.... [T]he MWRA had the difficult task of doubling customers' rates in the agency's first four years, while trying to find a location for unwanted sewage treatment facilities....In 1992, the MWRA ended double-digit rate increases through budget cuts and federal aid secured by the state's congressional delegation.

Id.

dried and converted into a soil additive. Phase I also introduced CSO treatment facilities to reduce the volume and impact of CSOs.[120]

Phase II included the grand opening of the new sewage treatment facility and a general upgrade of all CSO treatment facilities.[121] Phase III is ongoing and includes removing thirty-six CSO outfall points from service, separating combined sewers in a number of Boston area communities, as well as constructing storage facilities and hydraulic capacity in some parts of the sewer system. Phase III will also eliminate CSO discharges to all swimming and shellfishing areas in the harbor.[122] By project's end, an estimated $3.7 billion will have been spent cleaning up the harbor.[123]

To date, the harbor has been dredged, its ports deepened, and its sediments stabilized and capped. By eliminating sewage sludge discharges and piping of treated wastewater out to sea, the harbor also has clearer water, more abundant fish and wildlife, and clean beaches open for swimming and recreation.[124] Plans are underway to improve accessibility to the harbor islands, which are gateways to the Boston Harbor Islands National Park.[125] Although Phase III is not yet complete, Boston Harbor is already a revitalized body of water, thanks largely to the MWRA's aggressive push to accomplish the cleanup goals mandated by Judge Mazzone and to the support and participation of Boston's residents and civic groups.[126]

B. Portland Harbor and the Willamette River

The Portland Harbor Superfund site encompasses the most industrialized segment of the Willamette River. This segment extends "from the southern tip of Sauvie Island to Swan Island."[127] Forty upland

120. *See* Mass. Water Resources Auth., *Combined Sewer Overflows*, MWRA ONLINE, *at* http://www.mwra.state.ma.us/03sewer/html/sewcso.htm (*3 Phase CSO Plan Overview*) (last visited Aug. 28, 2005).

121. *Id.*

122. *Id.*

123. News Release, Mass. Water Resources Auth., Boston Harbor Welcomes People "Back to the Beaches" (Aug. 21, 1998) (on file with author) [hereinafter MWRA News Release].

124. *Id.*

125. News Release, The Virtual Flyshop, Inc., Boston Harbor Clean-up Complete, Expansion Talks Begin (Aug. 31, 2000) (on file with author).

126. MWRA News Release, *supra* note 123 ("Cooperation is the key to ensuring that Boston Harbor resources remain....With environmental groups keeping a watchful eye, state agencies making large scale improvements, and individual contributions, Boston Harbor will continue to be an environmental success story....").

127. U.S. ENVTL. PROT. AGENCY & OR. DEP'T OF ENVTL. QUALITY, PORTLAND HARBOR 1 (Dec. 2000), *available at* http://yosemite.epa.gov/R10/CLEANUP.NSF/ph/fact+sheets/$

CERCLA projects line the riverbanks, and the sediments in the river and harbor contain elevated levels of heavy metals, SVOCs, PAHs, PCBs, and pesticides such as DDT and TBT.[128] The sources of these contaminants include former and current hazardous waste as well as petroleum product storage facilities, marine construction sites, fire fighting training grounds, oil gasification plants, wood treating operations, agricultural chemical production plants, battery processing plants, chlorine production plants, ship yards, and rail car manufacturing facilities.[129]

Additionally, the City of Portland owns and operates 42 CSO outfall points that discharge into the Willamette River and 12 that drain into the Columbia Slough. Together, these two sets of CSO outfalls release an estimated three billion gallons of combined sewage into the local waterways annually.[130] Contamination along the riverbanks and in the sediment threatens the continued viability of the lower reaches of the Willamette River, which provides habitat for Chinook, steelhead, and Coho salmon, Pacific lamprey, American shad, and white sturgeon,[131] among other species.

The EPA listed Portland Harbor on the NPL on December 1, 2000,[132] but prior to that cleanup activities were already underway in the river basin and in the harbor. The Oregon Department of Environmental Quality was already remediating the 40 upland sites and performing a joint study with the EPA to investigate the contamination of near-shore, in-river sediments.[133] The pre-existing infrastructure of private and public PRPs convened as a coalition to develop a management plan for the evaluation of the contaminated sediments in the harbor.[134]

FILE/1200porthar.pdf (last visited Aug. 29, 2005) [hereinafter PORTLAND HARBOR LISTING BROCHURE].

128. *Id.*; U.S. ENVTL. PROT. AGENCY, NPL SITE NARRATIVE FOR PORTLAND HARBOR, *at* http://www.epa.gov/oerrpage/superfund/sites/npl/nar1606.htm (last visited Aug. 29, 2005) [hereinafter PORTLAND HARBOR SITE LISTING]; U.S. ENVTL. PROT. AGENCY, FACT SHEET: PORTLAND HARBOR 1 (Apr. 1999), *available at* http://www.epa.gov/r10earth/offices/oec/ptlndh3.pdf (last visited Aug. 29, 2005) [hereinafter PORTLAND HARBOR FACT SHEET].

129. PORTLAND HARBOR LISTING BROCHURE, *supra* note 127, at 1; PORTLAND HARBOR FACT SHEET, *supra* note 128.

130. Kim Murphy, *Polluted Willamette River Sullies Image of a Green Oregon*, L.A. TIMES, Apr. 8, 2000, *available at* http://www.commondreams.org/headlines/040800-03.htm (last visited Aug. 28, 2005).

131. PORTLAND HARBOR SITE LISTING, *supra* note 128.

132. *Id.*

133. *Cf.* PORTLAND HARBOR LISTING BROCHURE, *supra* note 127, at 2.

134. U.S. ENVTL. PROT. AGENCY & OR. DEP'T OF ENVTL. QUALITY, PORTLAND HARBOR: SUPERFUND FACT SHEET 2 (May 2001), *available at* http://yosemite.epa.gov/R10/CLEANUP.NSF/ph/fact+sheets/$FILE/Portland%20Harbor.pdf (last visited Aug. 29, 2005).

One of the public stakeholders was the City of Portland, which became involved because of its combined sewer system. When the city sought to renew the combined sewer system's NPDES permit in 1991, the Department of Environmental Quality informed the city that it would have to guarantee that water quality standards would be met at all discharge points, including CSO points, within five years of the renewal of the permit.[135] Since the city knew it would not be able to meet this goal, it negotiated a settlement in which it would abate all CSO events and replace the combined sewer system with separated systems by 2011.[136]

On January 26, 2001, just after Portland Harbor was listed on the NPL, Mayor Vera Catz of Portland reported in her State of the City address that "99 percent of the sewer discharges into the Columbia Slough have ended" and the city had reduced CSOs by half.[137] With the estimated cost of abating the city's CSO problem ranging from $500 million to $1.2 billion, Portland's initiative and commitment to the overall cleanup process represents a milestone in the remediation of the river and harbor and is exemplary for its on-schedule implementation.[138]

C. Lower Duwamish Waterway

A counterpoint to the Boston Harbor success story and the encouraging news from Portland is the Lower Duwamish Waterway in Seattle, Washington, where four major PRPs have been unable to negotiate a cooperative remediation schedule with federal and state officials. The Lower Duwamish Waterway is a five-mile stretch of the Duwamish River that is a rich natural resource area supporting recreational, commercial, and subsistence fishing.[139] It is home to three salmon hatcheries, provides critical stage habitat for the endangered Puget Sound Chinook salmon, serves as a migratory route for several other species of Pacific and Coho salmon, and is a nesting territory for

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135. Northwest Envtl. Advocates v. City of Portland, 56 F.3d 979, 982 (9th Cir. 1995).

136. *Id.*

137. Vera Catz, State of the City Address 2001 (Jan. 26, 2001) (on file with author).

138. *See* Bureau of Envtl. Servs., City of Portland, *Willamette River Projects: Reducing Combined Sewer Overflows* (July 26, 2001) (on file with author) ("Portland's CSO program is on schedule and within budget. By the end of 2000, Portland will remove about 53% of the CSO overflow volume from the Willamette River and Columbia Slough and will have spent about $300 million dollars. Portland has already controlled or eliminated eight Willamette River CSO outfalls.").

139. U.S. ENVTL. PROT. AGENCY, NPL SITE NARRATIVE FOR LOWER DUWAMISH WATERWAY, *at* http://www.epa.gov/superfund/sites/npl/nar1622.htm (last visited Aug. 29, 2005) [hereinafter LOWER DUWAMISH WATERWAY SITE LISTING].

the bald eagle.[140] It is also the site of the Duwamish industrial corridor, the most concentrated industrial area in Washington state and home to such entities as the Boeing Company, PACCAR/Kenworth Truck, King County International Airport, and the Port of Seattle's major marine terminals.[141] The City of Seattle and King County operate a number of CSO outfalls that discharge into the waterway, including seven that account for approximately 318 million gallons of untreated sewage annually.[142]

Currently, the waterway is a patchwork of independent remediation sites variously governed by CERCLA, the Resource Conservation and Recovery Act, the state toxics control act, and regulations that govern leaking underground storage tanks.[143] The pollutants contaminating these remediation sites include PCBs, perchlorinated terphenyls, mercury, lead, SVOCs, TPHs, chlorinated hydrocarbons, and pesticide residues.[144] In an attempt to consolidate the individual efforts, the four main PRPs in the area—Boeing, the Port of Seattle, the City of Seattle, and King County—worked with the EPA and the Washington Department of Ecology to formulate a 10-year remediation schedule to clean the waterway and keep it off the NPL. These negotiations failed when Boeing and the Port balked at providing a tolling period for NRD claims.[145] As a result, the EPA added the Lower Duwamish Waterway to the NPL in December 2000.

Continuing individual remediation efforts in the waterway include Seattle's and King County's responses to the impacts of their CSOs.[146] Their activities are mandated under a 1991 consent decree with

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140. *Id.*

141. Int'l Inst. for Geo-Information Sci. & Earth Observation, *Conflict Resolution and Collaborative Spatial Decision-Making, Case Study Background: the Duwamish Waterway* (June 29, 2001) (on file with author).

142. LOWER DUWAMISH WATERWAY SITE LISTING, *supra* note 139.

143. Duwamish Coalition, Overview of the Cleanup Process, § 2.1 Regulatory Jurisdiction—Who's in Charge of Site Cleanups (June 29, 2001) (on file with author).

144. *Id.* § 2.2, tbl. 2-3; *Superfund Cleanup Proposed Along Duwamish River*, THE SUN (Bremerton, Wash.), Dec. 7, 2000, *at* http://web.kitsapsun.com/news/2000/december/120789227.html (last visited July 15, 2005)); Pam Johnson, *Lower Duwamish River Likely to Become Superfund Site*, SOUND & STRAITS (People for Puget Sound, Seattle, Wash.), Dec. 2000, at 6, *available at* http://pugetsound.org/index/cms-filesystem-action?file=newsletters/sound_straits_2000_12.pdf (last visited Aug. 29, 2005).

145. *Superfund Cleanup Proposed Along Duwamish River*, *supra* note 144 ("Boeing resisted because company executives maintained that the three-year clock had already run out, while the trustees believe the clock has not started yet ...."); *see also* Johnson, *supra* note 144 ("Negotiations failed when The Boeing Company could not agree to language protecting the rights of the Natural Resource Trustees....").

146. *See, e.g.*, WASTEWATER TREATMENT DIV., KING COUNTY DEP'T OF NATURAL RES. & PARKS, NORFOLK CSO SEDIMENT REMEDIATION PROJECT, *at* http://dnr.metrokc.gov/WTD/

the National Oceanic and Atmospheric Administration that requires them to perform $24 million worth of contaminant source control, sediment cleanup, real estate acquisition and restoration, and replacement of natural habitat resources.[147] The efficiency and effectiveness of these and other efforts will not likely be optimal, however, given the lack of coordination with other PRPs and the community.

D. Merrimack River

The Merrimack River flows from New Hampshire through Massachusetts. It is New England's fourth largest watershed[148] and second largest surface drinking water source.[149] The river was once a hatchery and nursery for Atlantic salmon, shad, alewives, herring, and eel, but development has caused fish populations to decline precipitously and, in some cases, to be eliminated altogether. Dammed and canalled since the late 1700s, the river has hosted a large textile industry since the early 1800s. Historically, trash and dyes from the textile mills were dumped into the river, destroying the potability of the river's water. Population growth and lack of sewage treatment in the late 1800s exacerbated the river's condition, with contamination spreading to nearby municipal wells.[150] Municipalities regularly discharged raw sewage directly to the river.[151] Although improvements to the river began in the 1970s with the enactment of the Clean Water Act, regular discharges of raw sewage to the river did not end until 1992,[152] and CSOs and other pollution sources continue to contribute unacceptable levels of contamination to local waterways.[153]

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duwamish/norfolk.htm (last visited Aug. 28, 2005) (discussing Norfolk CSO cleanup project).

147. *See* United States v. City of Seattle, No. C90-395 WD (W.D. Wash. 1991).

148. Executive Off. of Envtl. Aff., *Merrimack River Watershed, at* http://www.mass.gov/envir/water/merrimack/merrimack.htm (last visited Nov. 30, 2005).

149. LOWELL NAT'L HISTORICAL PARK, U.S. DEP'T OF THE INTERIOR, THE MERRIMACK RIVER 2, *available at* http://www.nps.gov/lowe/River.pdf (last visited Aug. 29, 2005).

150. *Id.*

151. *Id.* ("Sometimes diseases [would spread] downstream from one river city to another.").

152. *Id.* ("Manchester, New Hampshire, stopped regularly discharging raw sewage only in 1992.").

153. *Id.* ("Salt, grease, trash, and pesticides run off into the river from cities and suburbs alike....[P]oor monitoring allows violation of toxics regulations....Aging treatment plants need updating. Riverside vegetation buffers are often lacking. And...mercury is found in the Merrimack [River].").

An early river restoration program in the Merrimack River was created under the Anadromous Fish Conservation Act of 1965 to bring migratory fish back to the river. Fish ladders and elevators were constructed to facilitate migration, and species including salmon and shad were stocked at various life-cycle stages. These efforts continue with the goal of bringing fish populations back to one-tenth of historic highs.[154] Meanwhile, a more comprehensive river restoration project has developed in the wake of the fledgling Merrimack River Watershed Consortium's overtures at "holistic" watershed management,[155] and in response to EPA administrative orders requiring the abatement of CSOs and the separation of combined sewer systems in the Merrimack River basin.[156] In New Hampshire, orders apply to the cities of Manchester and Nashua as well as to Manchester Waste Water and the Nashua Wastewater Systems. In Massachusetts, orders apply to the cities of Lowell, Lawrence, and Haverhill and to the Lowell City Waste Water Utility, Merrimack Waste Water Treatment, Haverhill Water Treatment, and the Greater Lawrence Sanitary District, which serves the Massachusetts towns of Methuen, Andover and North Andover, as well as North Salem, New Hampshire.

The lead force in carrying out the watershed-wide improvement program is the Merrimack River Initiative (MRI), a group that was formed by agreement among the EPA, the State of New Hampshire, and the Commonwealth of Massachusetts. It was formed after a 1988 collaboration on water quality issues. The EPA's Approved Order mandated improvements will cost an estimated $500 million. Furthermore, the overall cost of improving the quality of the river could top $1 billion. In response to these estimated costs, the MRI has spearheaded a campaign to ensure that any cleanup efforts are cost-effective. To address a "dearth of information about the river,"[157] the cities of Manchester, Nashua, Lowell, Lawrence, and Haverhill have asked the Army Corps of Engineers to conduct a pollution study of the entire 5,000 square-mile river basin.[158] Members of Congress and state

154. *Id.*

155. U.S. ENVTL. PROT. AGENCY, A PHASE I INVENTORY OF CURRENT EPA EFFORTS TO PROTECT ECOSYSTEMS 157-60 (1995), *available at* http://www.epa.gov/docs/ecoplaces/ecosystems.pdf (last visited July 15, 2005).

156. Press Release, U.S. Envtl. Prot. Agency, EPA Orders Lawrence Sewer District to Control Sewage Discharged into Merrimack (June 25, 1999), *available at* http://www.epa.gov/NE/pr/1999/062599a.html (last visited July 15, 2005); Roger Talbot, *Research of River Needed, Cities Say*, UNION LEADER (Manchester, N.H.), Apr. 26, 2000, at A1, *available at* http://www.theunionleader.com/pages/water9.htm (last visited July 15, 2005).

157. Talbot, *supra* note 156.

158. *Id.*

officials supported the request as "a rare opportunity to cost-effectively address community-supported restoration of an historic and unique natural resource"[159] and successfully secured funding for it.[160] The cities of Manchester and Nashua have asked for federal assistance in the design and construction of their CSO elimination projects.[161] Manchester, Nashua, Lawrence, Lowell, and Methuen are working together to develop a comprehensive environmental restoration plan for the river basin.[162]

At the grass-roots level, the Merrimack River Watershed Council (MRWC), a non-profit organization that has worked to protect and restore the Merrimack River watershed for over 25 years,[163] has been educating citizens and organizations about the Merrimack watershed and the effect of land use decisions, recreational use, and other activities on the watershed. The MRWC performs shoreline surveys of targeted streams; leads summer canoe and kayak trips on the river; presents educational discussions; initiates community-based partnerships for the beautification of public spaces, reuse of vacant lots and brownfield sites, and protection of local waterways; finances a study of nine subwatersheds in the Merrimack River basin; and coordinates with other regional river revitalization projects such as the Spicket River Revitalization Project, the Shawsheen River Watershed Project, and the Manchester Urban Ecosystem Project.[164] The MRI's efforts at the governmental level and the MRWC's efforts at the community level provide a framework that can drive the efficient and comprehensive restoration of the Merrimack River.

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159. *Id.* (quoting Mayor James A. Rurak of Haverhill, Massachusetts).

160. *Communities Band Together to Study Pollution in Merrimack River*, FOSTER'S DAILY DEMOCRAT (Dover, N.H.), July 6, 2001, *available at* http://premium1.fosters.com/2001/news/july/06/nh0706a.htm (last visited July 15, 2005) ("Nashua and Manchester in New Hampshire and Lowell, Lawrence and Haverhill in Massachusetts will each pay $100,000 to the river study. That matches a $500,000 grant from the U.S. Army Corp of Engineers.").

161. Press Release, U.S. Senate Committee on Environment and Public Works, Smith Requests Funding for Environmental Protection Agency Water Projects in Manchester, Nashua and Jaffrey (June 1, 2001) (on file with author); *see also* N.H. DEP'T OF ENVTL. SERVS., WD-WEB-9, ENVIRONMENTAL FACT SHEET: COMBINED SEWER OVERFLOWS (CSOs) (2003), *at* http://www.des.state.nh.us/factsheets/wwt/web-9.htm (last visited July 15, 2005) ("In May of 1995, the City of Manchester completed its Long Term Control Plan (LTCP) for CSOs....In 1999, the City began implementing Phase I of its CSO Facility Plan that will take approximately 10 years to complete....In 1992, the City of Nashua completed a study of CSOs....The City has recently begun the design and construction of combined sewer separation projects to separate all sources of stormwater flow into its collection system.").

162. Press Release, *supra* note 161.

163. Talbot, *supra* note 156.

164. MERRIMACK RIVER WATERSHED COUNCIL, INC., ABOUT US (July 31, 2001) (on file with author).

IV. CASE STUDY: THE PASSAIC RIVER AND THE PASSAIC RIVER RESTORATION INITIATIVE

Considered one of America's historic rivers, the Passaic River flows 90 miles across north and north central New Jersey through seven counties and 45 municipalities to Newark Bay. At its headwaters in Mendham, New Jersey, several small streams join near a high school athletic field. From there, it flows through a national park and a national wildlife refuge, past the Watchung Mountains and rural farmlands. In these upstream areas, the river is classified as a Wild Trout Stream by the New Jersey Division of Fish, Game and Wildlife. Rainbow trout are indigenous and plentiful, and the river's banks serve as habitat for such species as mink, otter, muskrat, fox, heron, and blue spotted salamander.[165]

The Passaic River's rural character changes as the river approaches the suburban communities of Morris County. It is a habitat for freshwater bass, carp, catfish, herring, and shad, as well as a drinking water source for the neighboring communities.[166] The river also receives the effluent from their wastewater treatment facilities.[167]

The river changes dramatically in Essex County, past the Great Falls in Paterson. Here, the river enters one of the most industrialized areas in the United States.[168] For over a century, the river has served as a drainage canal for textile mills, chemical refineries, manufacturing facilities, and other heavy industry and commerce.[169] Furthermore, wastewater from some of the country's most densely populated areas discharges into the Passaic River. Artificial structures contain the river's banks and industry replaced the natural habitat of the area.[170] Although some aquatic life exists, the New Jersey Department of Environmental Protection has issued fish consumption advisories and no harvest advisories from this part of the river.[171]

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165. *About the Passaic, at* http://www.passaicriver.com/about.htm (last visited Aug. 29, 2005).

166. *Id.*

167. Highlands Task Force Action Plan, *A Report to Governor James E. McGreevey and the New Jersey Legislature* 26 (Mar. 2004) (on file with author).

168. *Id.*

169. TIMOTHY J. IANNUZI ET AL., A COMMON TRAGEDY: HISTORY OF AN URBAN RIVER 44–47 (2002).

170. *Id.* at 49.

171. Div. Sci., Research & Tech., *Public Meeting – Responses to Comments & Questions*, at http://www.state.nj.us/dep/dsr/response-other.htm (last updated July 2, 2004).

A. The Combined Sewer System

A combined sewer system services this portion of New Jersey, stretching from the Great Falls in Paterson to Newark Bay and encompassing 47 municipalities with a 1993 population of 1.5 million people and 380 major industrial facilities. The system contains approximately 2,000 miles of collection sewers, 12 branches of interceptors totaling 35 miles of pipe, a number of pumping stations and force mains, and 62 regulators with associated CSO outfall points. CSOs discharge into the Passaic River and its tributaries and into the Peripheral Ditch, a manmade drainage canal located near Newark International Airport. It is estimated that one quarter of New Jersey's wastewater flows through this system to the Water Pollution Control Facility in Newark Bay. This facility treats up to 330 million gallons per day (mgd), generating approximately 250 dry tons of sewage sludge daily and discharging treated effluent through a six-fingered outfall pipe terminating at Robins Reef in New York Harbor.[172]

The combined sewer system dates back to the mid-1800s when a rudimentary sewer system funneled untreated waste through wooden and stone pipes into the Passaic River. The system grew as it became standard for industry and commerce to channel their wastes to the river. By the late 1800s, the water quality had deteriorated to such a degree that an estimated one-third of the total volume of the river consisted of wastewater and sewage. As a consequence of this volume of wastewater and sewage, the fishing industry along the river disappeared, swimming became unsafe, and unbearable odors emanating from the river spurred the abandonment of riverside residential developments.[173]

In 1902, the New Jersey state legislature chartered the Passaic Valley Sewerage Commission (PVSC) to reduce the pollution in the Passaic River and its tributaries. In 1907, the legislature banned the discharge of noxious or polluting matter to the Passaic River between the Great Falls and the mouth of the river, and authorized the PVSC to negotiate contracts with municipalities to construct and operate a sewage collection and treatment system. Beginning in 1924, interceptors, pumping stations, a treatment plant, outfalls, and sedimentation basins were constructed. The system reached its current capacity in 1976 when

172. *See generally* Killam Assocs., Passaic Valley Sewerage Comm'rs, Interim Sewer System Inventory and Assessment Report for the Towns of Harrison and Kearny, the Borough of East Newark, and the Cities of Newark and Paterson 2, 4, 6, 8-9 (Feb. 1996) (unpublished report, on file with author) [hereinafter Sewer System Inventory].

173. NORMAN F. BRYDON, THE PASSAIC RIVER: PAST, PRESENT, AND FUTURE, 278-79 (1974).

the Water Pollution Control Facility was completed and put into operation.[174] The PVSC now owns and operates the Water Pollution Control Facility, the main interceptor sewer and branch interceptors, and 62 CSO outfall points. The PVSC also operates a number of CSO outfall points that are located near Newark Bay and are owned by the City of Newark. Municipalities affiliated with the combined sewer system own and operate the collection sewers, associated facilities and equipment, and the remaining CSO outfall points.[175]

B. Condition of the Combined Sewer System

The PVSC and its associated municipalities have battled malfunctions and disrepair in the combined sewer system throughout much of the system's existence. Construction of the Water Pollution Control Facility began in 1971 because "the flows and treatment required [had] completely outstripped the existing facilities" by the late 1960s.[176] At that time, the old facility had a treatment capacity of 252 mgd, but "[a]fter every rain storm there had to be massive basin repairs due to the destructive effect of grit and rags which could not be stopped during the flows of 440 [mgd] or greater."[177]

> Grit and rags that went through the inadequate screen and grit chambers overloaded the basins to the point of massive breakdowns. In particular, during [1971], two heavy rains in May and then the disastrous storms of August and September topped off by rains on October 10, 11, 24 and November 2, caused...problems."[178]

It was not unusual to find items as large as baby carriages and logs being washed into the treatment facility.

The capacity shortage at the wastewater treatment facility seriously affected the upstream. Prior to 1962, there was not adequate capacity to pump all of the flow through the treatment plant.[179] Silt and

174. PASSAIC VALLEY SEWERAGE COMM'RS, OVERVIEW TOUR OF THE PASSAIC VALLEY SEWERAGE COMMISSIONERS 330 MILLION GALLONS PER DAY SECONDARY WASTEWATER TREATMENT PLANT, *at* http://www.pvsc.com/about/about.htm (last visited Aug. 29, 2005).

175. *See id.*; CLINTON BOGERT ASSOCS., *supra* note 13, at 4.

176. S.A. Lubetkin, CHIEF ENGINEER'S ANN. REP. TO PASSAIC VALLEY SEWERAGE COMM'RS., 1971, at 1 [hereinafter 1971 ANNUAL REPORT].

177. *Id.*

178. *Id.* at 58.

179. Memorandum from George T. Cowhead, Jr., Newark office, New Jersey Dep't Envtl. Protection to Central File of New Jersey Dep't Envtl. Protection (Dec. 5, 1966) (on file with author).

sediment built up inside the pipes and took up much of the space needed for the sewage flow; as a result, the combined sewer system was frequently surcharged, with overflows occurring at the slightest increase in sewage volumes, even during dry weather.[180] According to the PVSC's Chief Engineer, there were at least "three overflow points [that] continue[d] to discharge a small but unsightly amount of sewage to the river during peak hours."[181] Additionally, blockages in the CSO outfalls sometimes caused sewage to back up into buildings and to flood into streets. Frelinghuysen Avenue in Newark was particularly stricken with frequent combined sewage flooding.[182]

Deterioration of the combined sewer system contributed to the surcharge and overflow problems. Visual inspections of the system revealed disintegrating mortar in brick sewer structures, joints that had settled out of alignment and started to leak, corroded cement pipe finishes, cracked pipes, and deterioration in manhole and regulator chambers.[183] These breaches provided pathways through which raw sewage could leak out and contaminate surrounding soils. Flowing into the sewer system through the breaches, ground water could infiltrate into the system and increase flow volumes. In 1976, inspectors noted that almost every tide gate in the system was broken or leaking, allowing water, fish, and debris from the Passaic River to backwash into regulator chambers and up the interceptor lines. Flow meters recording peak flows at high tide and fish found in the screens at the Newark Bay pumping stations confirmed that tide gates were malfunctioning. Debris blocked other gates in the system—preventing some from opening and others from closing, disrupting flow, and causing overflows and flooding.[184] A particularly bad situation was recorded in the 1970s when the branch interceptor serving the town of Clifton was so clogged that it was unable to handle even dry weather flows. Reportedly, the interceptor regularly surcharged to eight feet over the pipe crown in dry weather and overflowed daily.[185] By 1997, it was estimated that the PVSC would have to spend approximately $80 million in order to repair the combined sewer system.

180. Sewer System Inventory, *supra* note 172, at V-14.

181. *See id.*

182. Clinton Bogert Assocs., City of Newark, New Jersey Feasibility Study: Pollution Abatement Program (revised Jan. 24, 1979) (on file with author).

183. Charles A. Manganaro Consulting Eng'rs, PC, Passaic Valley Sewerage Comm'rs, Combined Sewer System Facilities Inventory and Assessment Analysis 3-2 to 3-21 (Feb. 1996).

184. Sewer System Inventory, *supra* note 172, at V-15 (citing data from 1976 inspections).

185. *Id.* at V-14.

C. Maintenance of the Combined Sewer System

Much of the combined sewer system's poor condition is attributable to the failure to maintain the system to industry standards. In 1983, the PVSC conducted a phase I investigation of the combined sewer system and produced a Combined Sewer Overflow Facility Plan. The Phase I Facility Plan identified deficiencies in the system and proposed that further analysis be performed and that a comprehensive water quality control plan for the Passaic River be formulated.[186] Apparently, no comprehensive plan was ever prepared, and there is no record of the deficiencies reported in the Facility Plan ever being corrected. In areas where the Facility Plan concluded that the combined sewer system lacked sufficient capacity for one-year or even six-month storms, the PVSC performed an additional study in 1996 to confirm the problem.[187] In Paterson, the Facility Plan estimated that 1,500 cubic yards of debris needed to be cleaned out of the system, yet no removal of the debris was undertaken, nor were modifications made to prevent the future accumulation of debris. A review of the combined sewer system's maintenance history reveals that only 19% of defective flap gates, 20% of defective tide gates, 23% of defective regulators, 31% of defective overflow structures, 4% of defective chambers, and no defective outfalls were improved between the 1970s and the 1990s.

One particularly extreme example of lag time between identifying and correcting a problem occurred at the City of Newark's Roanoke Avenue CSO regulator. Overflows of a "chemical liquid" were first documented there in 1956.[188] The PVSC spent 1968 through 1976 trying to stop the overflows, but consultants inspecting the regulator chamber in 1992 observed a "mysterious red corrosive substance" indicating that "a heavy source of industrial pollution flows into and out of this facility."[189] The problem had been allowed to continue for 36 years.

As of 1997, the PVSC had not addressed CSO control beyond an initial planning process even though New Jersey's Combined Sewer Overflow Control Strategy and CSO Long-Term Control Planning Process were approved by the EPA in 1996 and 1998, respectively. By

186. Elson T. Killam Assocs., Inc., Passaic Valley Sewerage Commissioners' Combined Sewer Overflow Facility Plan, Phase I, at 1-3, 8-5 (Dec. 1983).

187. *See* Charles A. Manganaro Consulting Engineers, PC, *supra* note 183, at 4-1.

188. Michael D. Andolino, Weekly Summary of Inspections by Inspectors, Week of February 27, to March 2, 1956, at 3 (1956) (Passaic Valley Sewerage Commissioners internal report).

189. Killam Assocs., City of Newark: Sewer System Inventory and Assessment Report, app. A, inspection rep. 022 (Feb. 1996) (unpublished report, on file with author).

comparison, nearly all the combined sewer systems that were members of the Association of Metropolitan Sewerage Agencies had completed several cycles of CSO planning by the time the EPA promulgated the CSO Control Policy in 1994, having initiated CSO planning in the 1970s.

Many of these sewerage authorities followed EPA guidance documents published through the 1980s and 1990s and either upgraded their systems or are in the process of upgrading them. Minneapolis-St. Paul will have spent approximately $320 million when it completes its sewer separation project. San Francisco has constructed wet weather treatment facilities and additional storage capacity at a cost of approximately $850 million. Phase I of Chicago's Tunnel and Reservoir Plan for the construction of extensive deep tunnel storage is expected to cost $2.5 billion. To reduce impacts from CSOs, Washington, D.C., has constructed flow-through treatment facilities consisting of three 57-foot-diameter swirl concentrators with hypochlorite disinfection and dechlorination of the discharge. Closer to the PVSC, New York City has budgeted $2.3 billion through 2005 solely for CSO control.[190]

D. Hazardous Substances in the Combined Sewer System

The poor condition of PVSC's combined sewer system is problematic because the system is known to have transported and to continue to transport hazardous substances in its combined sewage flow. Before the establishment of the National Pretreatment Program, hazardous substances were routinely discharged to the combined sewer system. Although the PVSC had its own basic pretreatment program, the PVSC Chief Engineer's annual reports from the late 1950s through the late 1970s contain copious records of industrial discharges directly to the river, to separate storm sewers, and to the combined sewer system.

One example occurred in 1971 at the Roanoke Avenue Storm Sewer when the PVSC tried to prevent industrial waste from flooding into a storm sewer that discharged directly to the river. The PVSC's workers discovered the presence of explosive wastes in the storm sewer and cited Ashland Chemical Company for discharging them. Those discharges ceased, but six months later, when a sewer cleaning crew was preparing to do a video inspection of the sewer, an explosion in a manhole located on the Pitt-Consul Chemical Company property injured three men and forced the inspection to be postponed until tests could be performed to ensure that inspectors could enter the sewer line safely.[191]

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190. ASS'N METRO. SEWERAGE AGENCIES, APPROACHES TO COMBINED SEWER OVERFLOW CONTROL: A CSO ASSESSMENT REPORT (1994).

191. *See* 1971 ANNUAL REPORT, *supra* note 176, at 130–31.

Before the establishment of the National Pretreatment Program, hazardous substances were routinely discharged to the combined sewer system. Even after the establishment of the National Pretreatment Program, the combined sewage system continued to transport hazardous substances in the sewage flow. Most likely these substances originated from noncompliant discharges, illegal connections, or infiltration of contaminated ground water, and were introduced to the river via CSOs and other leaks and discharges.

Although a comprehensive study of the chemical components in the combined sewage has never been performed, data sources regarding the quality of the combined sewage in the PVSC system are available. Studies dating from the late 1970s to the 1990s are a source of that data. These studies focused on the components of the influent to the Water Pollution Control Facility, the components of the sewage sludge produced at the Water Pollution Control Facility, and the components of CSOs from a few outfall points during selected wet weather events. All of these studies indicate that hazardous substances were present and continue to be present in elevated concentrations in the combined sewage flow despite the existence of pretreatment requirements:

- In 1978, the PVSC prepared a Heavy Metals Source Determination Study as part of its ocean dumping permit application. This study revealed elevated levels of cadmium, chromium, copper, lead, nickel, zinc, and mercury in the combined sewage flow.[192]
- In 1978, the PVSC participated in a comprehensive monitoring program to discover the fate of priority pollutants in publicly owned treatment works. Samples of influent taken from the grit chamber at the head of the Water Pollution Control Facility had elevated levels of benzene, tetrachloroethylene, bis(2-ethylhexyl)phthalate, aluminum, cadmium, chromium, copper, cyanide, iron, lead, manganese, nickel, silver, and zinc, among other contaminants.[193]
- Between 1984 and 1986, the PVSC performed a study of organic priority pollutants in the influent to the Water Pollution Control Facility. Samples of influent had elevated

192. Elson T. Killam Assocs., Inc., Passaic Valley Sewerage Commission, Heavy Metals Source Determination Study, in Compliance with Ocean Dumping Permit No. II NJ003 Interim Section 9(c), § VII (Aug. 15, 1978) (unpublished report, on file with author).

193. U.S. ENVTL. PROT. AGENCY, EPA-440/1-79-300, FATE OF PRIORITY POLLUTANTS IN PUBLICLY OWNED TREATMENT WORKS: PILOT STUDY (1979).

levels of such organic contaminants as benzo(a)pyrene, benzo(k)fluoranthene, hexachlorobenzene, and hexachloroethane, among others.[194]

- In 1988, the EPA sampled sludges from publicly owned treatment works around the country for a national sewage sludge survey. Sludge from the PVSC facility contained concentrations of cadmium, chromium, copper, lead, silver, zinc, tetrachlorodibenzo-p-dioxin, and bis(2-ethylhexyl)-phthalate that translate to elevated concentrations in the influent.[195]

- The PVSC published a wastewater sludge report in 1992 based on data gathered in 1991. Sludge samples contained concentrations of cadmium, chromium, copper, lead, mercury, and zinc that translate to elevated concentrations in the influent.[196]

- Samples of CSO flows taken from three outfalls in Newark in 1981 had elevated concentrations of cadmium, copper, lead, zinc, bis(2-ethylhexyl)phthalate, and pentachlorophenol.

- Samples of CSO flows taken from two outfalls in Newark in 1983 had elevated concentrations of tetrachloroethylene, chromium, copper, lead, mercury, and zinc.

- Samples of CSO flows taken from four outfalls in Newark, Harrison, and Kearny in 1997 had elevated concentrations of tetrachlorodibenzo-p-dioxin, copper, and lead.

E. Pollutant Loading to the River

The PVSC's reported overflow rate was 7.5 billion gallons per year in 1976.[197] New Jersey's TMDL program confirms the pollutant loadings to the river. The EPA's 1994 draft TMDLs in the Hackensack River, the Passaic River, and Newark Bay proposed WLAs for copper,

194. CFM, Inc., Passaic Valley Sewerage Commission, Report upon Investigation of Organic Priority Pollutants in the Influent to the Passaic Valley Sewerage Commissioners Treatment Plant 8-10 (May 1986).

195. U.S. ENVTL. PROT. AGENCY, NATIONAL SEWAGE-SLUDGE SURVEY (Oct. 1989).

196. *See* Passaic Valley Sewerage Commissioners, Domestic Wastewater Sludge Report (Dec. 1991-Jan. 1992).

197. Elson T. Killam Assocs., Pasaic Valley Sewerage Comm'rs, Report upon Overflow Analysis (1976).

nickel, lead, and mercury.[198] Although the EPA withdrew the copper TMDL in September 1997 and has recommended withdrawal of the nickel TMDL, New Jersey's 1998 section 303(d) List of Water Quality Limited Waterbodies lists the lower nontidal portion of the Passaic River and the Passaic River Estuary as being quality-limited for arsenic, chromium, copper, lead, nickel, mercury, zinc, and PCBs, and for dioxin and chlordane accumulation in fish tissue, among other contaminants.[199]

F. Remediation and Restoration of the Lower Passaic River

Lower Passaic River stakeholders began undertaking remedial and restoration measures in the river almost a decade ago. As part of the Diamond Alkali Superfund Site located in Newark, the lower six miles of the Passaic River (the Study Area) are currently the focus of a Remedial Investigation/Feasibility Study (RI/FS). This RI/FS is required under a 1994 Administrative Order on Consent between the EPA and the successors to Diamond Alkali Company and companies that are performing indemnity obligations owed to Diamond's successor. The RI/FS seeks (1) to determine the spatial distribution and concentration of dioxins, furans, PCBs, PAHs, pesticides, and metals horizontally and vertically in the Passaic River sediments; (2) to identify the primary human and ecological receptors of the contaminated sediments; and (3) to characterize the transport of contaminated sediment within the Study Area.[200] A complementary study being performed by the Army Corps of Engineers focuses on navigation and the creation and enhancement of aquatic habitats in the Lower Passaic River Basin, which consists of the lower 17 miles of the river.[201] Preliminary results from these studies and from EPA analysis of Passaic River sediment show that the river is polluted with a mix of metals, cyanide, PCBs, PAHs, semi-volatile organic compounds, dioxins, and furans.[202] As these studies progress,

198. Total Maximum Daily Loads (TMDLs) for Copper, Mercury, Nickel and Lead in New York-New Jersey Harbor, 59 Fed. Reg. 41,293 (Aug. 11, 1994).

199. U.S. ENVTL. PROT. AGENCY, TOTAL MAXIMUM DAILY LOADS: 2002 SECTION 303(d) LIST FACT SHEET FOR NEW JERSEY, *at* http://oaspub.epa.gov/waters/state_rept.control?p_state=NJ (last visited July 15, 2005).

200. U.S. ENVTL. PROT. AGENCY, REGION 2 SUPERFUND: PASSAIC RIVER STUDY AREA, *at* http://www.epa.gov/region02/superfund/pass_ou2.htm (last visited Aug. 30, 2005).

201. *See* PASSAIC RIVER RESTORATION INITIATIVE, FACT SHEET, *at* http://www.prri.org (last visited Aug. 30, 2005); U.S. Envtl. Prot. Agency, *Land Revitalization: Urban Rivers Restoration Initiative*, at http://www.epa.gov/oswer/landrevitalization/urbanrivers (last visited Nov. 1, 2005).

202. U.S. ENVTL. PROT. AGENCY, REGION 2 SUPERFUND: PASSAIC RIVER SEDIMENT DATA, *at* http://www.epa.gov/Region2/superfund/sedsamp.htm (last visited Aug. 30, 2005).

the characterization of more contaminants of concern and the identities of more PRPs may be discovered.

If the Passaic River is to be successfully and fully remediated, however, the cessation or regulated management of CSOs and other continuing contributions to the river are mandatory. Surface sediment in the Passaic River reflects only recent contaminant loading to the river. Comparing the estimated 1991 contaminant loading to the river with actual surface sediment samples taken from the Study Area indicates that CSOs could be the source of up to one third of the current heavy metal loading to the river's sediments and up to 100 percent of the current PAH and PCB loading to the river's sediments.

The combined sewer system is a thread that ties the welfare of the river to all of the industry, commerce, and pollution in the river valley. Because it was designed to overflow, hazardous substances from both riverside and landlocked facilities have the continuing potential to be discharged to the river. The PVSC Chief Engineer's annual reports relate many occasions when dyes, grease, or other contaminants in the river were traced back through the sewer system to upland facilities not located directly on the river. The combined sewer system's longtime deteriorated condition also permits ground water to infiltrate the system, transforming the combined sewer system into a conduit through which contaminated ground water from the Passaic River Valley's many hazardous waste sites can migrate to the river. Prompt correction of these problems in the combined sewer system—which can only happen with the cooperation of the PVSC and its associated municipalities—is a necessary component to remediation of the river.

Likewise, the PVSC and its associated municipalities must also participate in any Passaic River restoration effort if the restoration is to be meaningful. While compliance with pollution prevention regulations will improve future operations along the river and will help in remediating the river, compliance is already untimely and does not address the NRD issues of past flora and fauna kills and lost use of the river's resources. CSO pollution has contributed both long-term damage from releases of hazardous substances and short-term losses from discharges of biodegradable wastes. Compensating for the harm and reversing the damage will require extensive activity, including such efforts as habitat reclamation, species rehabilitation, waterfront redevelopment, and sediment recovery, particularly near CSO outfall points.

To date, the PVSC and its affiliated municipalities have not participated in any efforts to remediate or restore the river beyond a few measures that are required by federal or state environmental regulations. Comprehensive investigation of the combined sewer system's condition

and a complete upgrade of the system to eliminate CSOs are expensive undertakings that cannot be accomplished without funds similar to those spent in Boston and San Francisco and those budgeted in New York, Chicago, and Portland. Without complete knowledge of the flow patterns and chemical components being discharged into the river, the cost-efficiency of improving the combined sewer system as a method of remediating and restoring the Passaic River cannot be determined. Furthermore, the EPA has not yet formally named the PVSC and its associated municipalities as PRPs in the Passaic River; absent such a designation, sewer system authorities may understandably be reluctant to engage in such a costly project.

G. Passaic River Restoration Initiative

Congress has authorized funds for the Passaic River Restoration Initiative (PRRI), a pilot program in the Urban Rivers Restoration Initiative (URRI), to conduct a Passaic River reconnaissance study. With the continued support of the federal government, the PRRI expects to proceed under the leadership of the Army Corps of Engineers and to utilize the cooperative efforts of the Passaic River stakeholders and community to restore the environment and revitalize the economy of the Passaic River valley. With its collective voice, the PRRI and its participating entities can address the river's problems with more resources and seek funding and political support to greater effect. The PRRI will coordinate such projects as remediation of the river's sediments, restoration of wetlands and wildlife habitat, creation of recreational opportunities, and stimulation of economic development. If successful, the PRRI will serve as a model upon which Congress and the URRI will build procedures for the remediation and restoration of other polluted U.S. waterways.[203]

Because repair and upgrade of the combined sewer system will be a key factor in the successful remediation and restoration of the Passaic River, the PRRI will need the PVSC and its associated municipalities to participate in improvement projects beyond the levels required under the Clean Water Act and CERCLA. Such participation can benefit, rather than burden, the sewer system authorities. As a coalition, the PRRI has a broader audience and more opportunity for creative outreach than the PVSC and its associated municipalities do individually. By participating in the PRRI, not only will the sewer system authorities be helping the community reclaim the river efficiently; they

203. *Cf.* PASSAIC RIVER RESTORATION INITIATIVE, *supra* note 201.

will also be positioning themselves for a substantial and effective investment in compliance measures and facilities that can anticipate the growth and revitalization of north-central New Jersey for decades to come.

CONCLUSION

CERCLA can apply without any exemption to CSO discharges by sewer system authorities, even if the sewer system authorities are municipalities or other governmental entities. If a combined sewer system discharged hazardous substances into a receiving waterbody and those discharges are outside the scope of any permit, its owners and operators are liable as CERCLA PRPs for any ensuing remediation costs and restoration of the receiving waterbody.

Many waterways have hosted discharges from domestic, industrial, commercial, and municipal sources for generations. Furthermore, many pollution sources remain unidentified or misunderstood. Polluted sediments, air pollution, and navigational use further complicate the dynamics of the waterways. Therefore, groups cannot rely solely on compliance with existing environmental rules and regulations to improve a waterway's comprehensive ecological condition. Likewise, cleanup projects undertaken by a narrow class of individual PRPs who do not account for all of the pollution and who cannot eliminate continuing discharges by sources over which they have no control will also fail.

The only way such complex environments can be successfully remediated and restored is through a coalition approach that includes sewer system authorities. Federal, state, and local agencies must work with municipal entities, citizens, and private industry to change the community's patterns of using and abusing the waterway. Changes in industry standards may be necessary, broad upgrades to infrastructure and technology may be required, individual lifestyles and habits may need modification, whole populations may require education, and entire economies may need stimulation. In a few locations around the country, communities have undertaken such cooperative projects and have emerged successful. The success story at Boston Harbor demonstrates that real revitalization can emerge, but only if there is prompt, aggressive, and truly comprehensive action that takes account of impact on waterways from all sources. The continuing improvements to Portland Harbor and the Willamette River demonstrate that the changes required for such restoration and renewal are broad and long term and require a degree of initiative and volunteerism on the part of each

participant over and above run-of-the-mill compliance with the Clean Water Act and CERCLA.

As information from the lower Passaic River confirms, a lone PRP in a single cleanup project cannot achieve the restoration of a river that has suffered pollution from industry, commerce, shipping, wastewater discharge, and upstream sources. The PRRI represents the federal government's test attempt at establishing a procedural guidance to achieve such a goal. The gains in knowledge and political process that come out of the PRRI will depend on the success of the initiative. As the other restoration projects have taught, the success of the initiative depends on the participation and cooperation of local government and sewerage authorities in addition to the participation of federal agencies and private industry. The nation's rivers and harbors and, ultimately, the mental and physical health of our urban communities can only benefit.