RECLAIMING THE CLEAN WATER ACT: A NEW APPROACH TO WASTEWATER MANAGEMENT

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I. INTRODUCTION

The solution to finite pollution might be dilution, but the solution to massive pollution is reclamation and reuse. Today, the United States produces upwards of 5.3 million metric tons dry weight of sludge per year.[1] In coastal areas alone, wastewater treatment plants discharge over 10 billion gallons of wastewater effluent per day.[2] With waste of this magnitude being produced at an ever-increasing rate, continued reliance on traditional waste management techniques poses a serious threat to human health and the environment.

The more sewage discharged into the nation's waters, the more substantially it affects the natural ecosystems.[3] In the past, commu-

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1. NAT'L RESEARCH COUNCIL, USE OF RECLAIMED WATER AND SLUDGE IN FOOD CROP PRODUCTION 2 (1996).

2. NAT'L RESEARCH COUNCIL, MANAGING WASTEWATER IN COASTAL URBAN AREAS 2, 21 (1993).

3. *See id.* at 4 ("As with any activity that affects the environment, the potential for harm depends on the magnitude of the insult, where it occurs, and the characteristics of the stress."); U.S. COMM'N ON OCEAN POLICY, AN OCEAN BLUEPRINT FOR THE 21ST CENTURY 206 box 14.1 (2004), *available at* http://oceancommission.gov/documents/full_color_rpt/000_ocean_full_report.pdf ("Although nutrients such as nitrogen and phosphorous are necessary to marine ecosystems in small quantities, human activities on the coasts and inland areas have greatly increased the flow of nutrients, in some cases to harmful levels.").

nities discharged sewage into the oceans with little regard to the effect such discharge might have.[4] When the volume of receiving waters is substantial and population is limited, discharging into these waters provides a simple solution to a messy problem. However, as the population grows and becomes concentrated in particular areas, the impact of discharging effluent into the waters increases. The results can be overwhelming. Fish and oysters become contaminated.[5] Beaches close due to sewage contamination.[6] Oxygen-consuming algal blooms devastate aquatic ecosystems.[7]

Even so, old habits die hard. The United States has been slow to adopt new methods of sewage control. Following the enactment of the Clean Water Act (CWA) in 1972,[8] the federal government placed restrictions on wastewater effluent. Communities struggled with the challenge of how to meet these costly requirements. Despite the CWA's mandate of more advanced treatment, many communities clung to primary treatment as their sole method of treatment.[9] Other communities used landfills or incineration as tried-and-true methods of dealing with waste.[10] However, this approach to wastewater management merely turns water pollution into land or air pollution. When communities face waste problems of substantial magnitude, this type of out-of-sight, out-of-mind approach is no longer a viable option.

Communities must find a way to manage their wastes in a sustainable fashion.[11] Innovative technologies can transform traditional pollutants into useful—or at least harmless—substances. Reusing waste can increase economic efficiency and prevent pollution from entering the nation's waterways.

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4. NAT'L RESEARCH COUNCIL, *supra* note 1, at 15 fig. 1.1 (graphing the change in types of POTW techniques since 1940).

5. MARK KURLANSKY, THE BIG OYSTER: HISTORY ON THE HALF SHELL 250-55 (2006).

6. U.S. COMM'N ON OCEAN POLICY, *supra* note 3, at 204.

7. *Id.* at 204, 206 box 14.1, 208.

8. Federal Water Pollution Control Act, 33 U.S.C. §§ 1251-1387 (1972) (amended 1977, 1981, 1987, 1988, 1990, 1994, 2000, 2002).

9. Primary treatment is a wastewater treatment method that skims grease from the top of the sewage and filters out many undissolved solids. Since primary treatment typically just removes larger debris and sediment from the wastewater, use of primary treatment as the sole method results in minimally treated wastewater being poured directly into natural waterways. *See* NAT'L RESEARCH COUNCIL, *supra* note 1, at 15 fig. 1.1, 47-49.

10. *See id.* at 2, 14, 152 ("Sludge disposal has always represented a substantial portion of the cost of wastewater management. . . . Currently, 36 percent of sludge is applied to the land for several beneficial purposes including agriculture, turfgrass production, and reclamation of surface mining areas; 38 percent is landfilled; 16 percent is incinerated; and the remainder is surface disposed by other means.").

11. The term "sustainability" has been given a variety of different meanings. For the purposes of this Comment, sustainability means the minimizing of waste through recycling, reclamation, and reuse.

The question becomes, how do we go about changing the way we deal with our waste? The problem is twofold. First, we must develop the technological basis to transform waste byproducts into usable resources. Second, assuming such technology exists, we must create a regulatory program that encourages implementation of these new waste management techniques.[12] To be effective, such a program needs to spark a substantial change from traditional waste disposal techniques to financially self-sustaining wastewater management facilities.

Most communities actually want more advanced wastewater infrastructure but resist because the costs are so substantial.[13] Moreover it can be risky and expensive to implement new technologies.[14] While some municipalities may consider possible increases in the stringency of wastewater regulations when making choices regarding wastewater management, most communities avoid new technologies because of regulatory restrictions, cost, and uncertainty.[15]

Moreover, in such a heavily regulated field, the costly, time-consuming challenge of navigating regulatory restrictions and requirements alone can impose a substantial burden on the implementation of nontraditional facilities.[16] A successful CWA program must increase innovation, minimize the time and costs affiliated with the regulatory process, and prevent pollution.[17] This Comment will focus on a policy proposal designed to spur the implementation of innovative, efficient wastewater facilities while minimizing transaction costs associated with regulatory compliance.

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12. *See* N.F. GRAY, BIOLOGY OF WASTEWATER TREATMENT 1180 (2d ed., Imperial Coll. Press 2004) ("Two factors currently make sustainability implementation difficult. First is the requirement to currently treat wastewaters and to continue to do so effectively in the future. The second is the problem of expecting private companies not only to deliver current service requirements but also to develop the technology and achieve the resource use changes needed to achieve a closed urban water cycle in the future.").

13. FOOD & WATER WATCH, CLEAR WATERS 4-6 (Oct. 2007), *available at* http://www.foodandwaterwatch.org/water/americaswater/clearwaters/clearwaters_SEPT07_WEB.pdf (finding that most states need millions, or even billions, more to deal with wastewater infrastructure).

14. *See* U.S. GEN. ACCOUNTING OFFICE, WATER POLLUTION: INFORMATION ON THE USE OF ALTERNATIVE WASTEWATER TREATMENT SYSTEMS 2-4 (1994); Richard B. Stewart, *Regulation, Innovation, and Administrative Law: A Conceptual Framework*, 69 CAL. L. REV. 1256, 1279 (1981).

15. *See* U.S. GEN. ACCOUNTING OFFICE, *supra* note 14, at 2-4; Howard Latin, *Ideal Versus Real Regulatory Efficiency: Implementation of Uniform Standards and "Fine-Tuning" Regulatory Reforms*, 37 STAN. L. REV. 1267, 1291 (1985).

16. *See* 33 U.S.C. § 1311(h) (2000); U.S. GEN. ACCOUNTING OFFICE, *supra* note 14, at 3; Stewart, *supra* note 14, at 1291;.

17. *See* STUART L. HART, CAPITALISM AT THE CROSSROADS: THE UNLIMITED BUSINESS OPPORTUNITIES IN SOLVING THE WORLD'S MOST DIFFICULT PROBLEMS 9-10 (Jim Boyd et al. eds., 2005).

II. PROBLEMS WITH THE CURRENT LEGAL FRAMEWORK

A. Problems with the Clean Water Act

The CWA's goals for wastewater treatment[18] are too far removed from its criteria for the proper implementation of wastewater facilities.[19] The CWA's overarching goal is "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters."[20] This is no small task. The CWA is a massive economic and scientific undertaking.[21]

> The 1972 act set the nation on a fundamentally new course for protecting its waters. It asserted federal authority over the quality of navigable waters, required the establishment of uniform minimum federal standards for municipal and industrial wastewater treatment, set strict deadlines for compliance, established a national discharge permit system, and provided substantial amounts of federal grant money to help pay for the newly required projects. The 1972 act resulted in a tremendous effort to control water pollution and produced notable water-quality improvements around the country, particularly in rivers and lakes.[22]

However, "eliminating pollution" is a complex challenge.[23] Methodologies for wastewater treatment must evolve in tandem with society's shifting trends and patterns. In the past, a major concern was typhoid outbreaks from raw sewage.[24] Today, the challenge is how to deal with pharmaceutical byproducts and hormones in the waters.[25] Tomorrow, new concerns will likely arise.[26] The CWA must create a structure that encourages adaptation. "While the approach laid out in the 1972 act produced rapid and effective improvements in many areas, it has not always allowed a process that adequately addresses regional variations in environmental systems around the country or responds well to changing needs, improved science, and more complete information."[27]

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18. 33 U.S.C. § 1251, 1281.
19. *Id.* §§ 1311-1313.
20. *Id.* § 1251(a).
21. *See* U.S. COMM'N ON OCEAN POLICY, *supra* note 3, at 208 fig.14.3 (discussing the costs associated with improving wastewater treatment).
22. NAT'L RESEARCH COUNCIL, *supra* note 2, at 2-3.
23. *See* 33 U.S.C. § 1251(a)(1) ("it is the national goal that the discharge of pollutants into the navigable waters be eliminated by 1985").
24. NAT'L RESEARCH COUNCIL, *supra* note 2, at 203.
25. U.S. COMM'N ON OCEAN POLICY, *supra* note 3, at 209.
26. *See* GRAY, *supra* note 12, at 1179 ("As our lifestyles have become more complex, so has our waste.").
27. NAT'L RESEARCH COUNCIL, *supra* note 2, at 3.

1. The Command-and-Control Approach

Currently, the CWA mandates specific pollution control technologies. "Unfortunately, pollution-control devices can never improve efficiency or produce revenue; they can only add cost."[28] Many people have decried the CWA's command-and-control technique generally.[29] In particular, wastewater treatment facilities argue that the CWA's mandate that publicly owned treatment works (POTWs) use secondary treatment is "restrictive and impracticable."[30] Over a decade after the compliance deadline, an EPA report estimated that that at least two-thirds of the nation's wastewater treatment plants still failed to meet CWA standards.[31]

Even when a community achieves secondary treatment, these facilities still produce plenty of pollution.[32] In fact, when the CWA was first proposed, the secondary treatment standard was scheduled to be replaced by the more stringent, best practicable treatment standard by 1983.[33] However, the 1981 amendments to the CWA removed the "headaches associated with setting a second level of requirements."[34] Since then, CWA standards were relaxed even more substantially for some coastal communities.[35] These communities argued that the ocean dilutes wastewater so much that secondary treatment facilities would not be worth the cost.[36] In response to these complaints, Congress added section 301(h) to the CWA, which granted waivers of the secondary treatment standard to certain coastal wastewater facilities.[37] Unfortunately, as CWA standards became more lax, the amount of wastewater generated in the United States and throughout the world increased.[38]

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28. HART, *supra* note 17, at 7.

29. *See* Latin, *supra* note 15, at 1267-70 (reviewing intellectual arguments against command-and-control technologies and concluding that a fine-tuning approach could impose crippling inefficiency on the agency).

30. Natural Res. Def. Council v. EPA, 656 F.2d 768, 771 (D.C. Cir. 1981).

31. Douglas Jehl, *Clean Water Cost Put at $ 83.5 Billion*, L.A. TIMES, Feb. 15, 1989, at A4.

32. U.S. COMM'N ON OCEAN POLICY, *supra* note 3, at 208-09.

33. 33 U.S.C. § 1311(b) (prior to 1987 amendments).

34. ANDREW STODDARD ET AL., MUNICIPAL WASTEWATER TREATMENT: EVALUATING IMPROVEMENTS IN NATIONAL WATER QUALITY 38 (2002).

35. *Id.*; *see also* BNA Daily Environment, *San Diego Mayor to Seek Waiver from Water Act's Sewage Treatment Systems* (Oct. 17, 2007).

36. *Id.*

37. 33 U.S.C. § 1311(h); *see* Clean Water Act Amendments of 1977, Pub. L. No. 95-217, 91 Stat. 1566.

38. *See* Press Release, United Nations Environment Programme, Concern Over Oceans Despite Receding Oil & Chemical Threats (Oct. 4, 2006), http://www.unep.org/Documents.Multilingual/Default.asp?DocumentID=486&ArticleID=5364&l=en.

2. Unmanaged Waste

The time has come when the oceans can no longer tolerate being used as the world's toilet. "A rising tide of sewage is threatening the health and wealth of far too many of the world's seas and oceans . . . ."[39] The volume of effluent produced by the United States is massive and it is only getting larger. In order to prevent lasting and severe damage to our nation's coastal waters, the United States' policy must shift focus from dilution as the solution toward pollution purification and reuse.

To date, sustainable wastewater management is not an idea that has been widely adopted.

> Current biological wastewater treatment processes have changed remarkably little since their introduction in the late nineteenth century. The reliance on a few key processes, combined with the conservative nature of engineers, has meant that the wastewater industry has not been well-placed to embrace new concepts, especially that of sustainability. . . . [S]ustainability requires long-term planning and a change to the basic concept of wastewater treatment away from current end of pipe solutions towards better resource utilisation. [40]

Wastewater byproducts do not truly become pollutants until discharged into waterways, incinerated, or placed in landfills.[41] Under the CWA, "pollutant" means just about anything discharged into water.[42] Almost anything that human beings place into waterways will cause damage if placed there in sufficient quantities.[43] Moreover, it is extremely difficult to predict what effects man-made changes on the biochemical make-up of natural waterways will have on their ecosystems because ecosystems are often highly adaptive.[44] Preventing as much pollution as possible from entering natural waterways will prevent adverse environmental affects by supporting the stability of aquatic ecosystems. Moreover, pollution prevention can also help avoid costly cleanup measures, which is important from both an environmental and an economic standpoint.[45]

Recycling wastewater byproducts is a sustainable approach to pollution prevention. For the purposes of wastewater recycling, there are essentially three different types of wastewater pollutants: byproducts that are wasted resources, byproducts for which a useful

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39. *Id.*
40. GRAY, *supra* note 12, at 1179.
41. *See* NAT'L RESEARCH COUNCIL, *supra* note 1, at 2, 14, 152.
42. *See* 33 U.S.C. § 1362(6) (2000).
43. *See* NAT'L RESEARCH COUNCIL, *supra* note 2, at 4.
44. *See* PEW OCEANS COMM'N, AMERICA'S LIVING OCEANS: CHARTING A COURSE FOR SEA CHANGE 42 (2003).
45. HART, *supra* note 17, at 9; NAT'L RESEARCH COUNCIL, *supra* note 2, at 296.

purpose may someday be found, and byproducts that are simply harmful. At present, the impact that wasted nutrients, such as nitrogen and phosphorous, have on the environment is as substantial as the impact of more malignant wastewater byproducts, such as biological pathogens.[46]

"Each summer, nutrient pollution creates a dead zone the size of Massachusetts in the Gulf of Mexico."[47] Nutrient pollution is one of the most pressing problems created by wastewater treatment facilities.[48] Nutrients in proper amounts are essential for life.[49] However, when nutrients enter an aquatic ecosystem in massive quantities, they throw the ecosystem out of balance.[50] Alga thrives in these conditions, which has led to substantial increases in the amount of toxic algae reported.[51] Algal blooms, commonly referred to as red tide, can result in beach closures and serious health threats to coastal residents.[52] Disturbingly, even more toxic forms of algae have been harming marine life and human health recently.[53]

Algae consume the nutrients from the wastewater. Once the nutrients have been consumed, a process called eutrophication often occurs.[54] Eutrophication results in dead zones, areas of the ocean where there is not enough oxygen to support life.[55]

Current methods of dealing with nutrients in water usually involve using microorganisms to convert the nutrients into gases.[56] While less harmful than incineration, these processes do not cause the waste to disappear; rather, they simply transfer this matter into the air where its impacts may be less obvious. Moreover, these methods waste potentially valuable resources.

Harmful organic chemicals and toxic metals often found in wastewater present more of a challenge for wastewater recycling.[57] Many of these chemicals stay in wastewater effluent even after secondary treatment.[58] These chemicals can cause cancer and other po-

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46. NAT'L RESEARCH COUNCIL, *supra* note 2, at 4, 20.
47. PEW OCEANS COMM'N, *supra* note 44, at vi.
48. U.S. COMM'N ON OCEAN POLICY, *supra* note 3, at 206 box 14.1.
49. *Id.*
50. *See id.*
51. *See id.*
52. Kenneth R. Weiss, *Oceans in Peril: Red Tide Taints Gulf*, ORLANDO SENTINEL, Aug. 1, 2006, at A1.
53. *See* Kenneth R. Weiss, *Algae Poison Sea Life*, ORLANDO SENTINEL, July 31, 2006, at A8.
54. *See* U.S. COMM'N ON OCEAN POLICY, *supra* note 3, at 206 box 14.1; NAT'L RESEARCH COUNCIL, *supra* note 2, at 261.
55. U.S. COMM'N ON OCEAN POLICY, *supra* note 3, at 206 box 14.1; NAT'L RESEARCH COUNCIL, *supra* note 2, at 261.
56. GRAY, *supra* note 12, at 465-638.
57. *See* NAT'L RESEARCH COUNCIL, *supra* note 2, at 256-71, 374.
58. *Id.* at 99.

tentially fatal diseases.[59] Chemical companies have been moving toward reuse of waste chemicals.[60] Even the EPA has invested in research regarding groundwater purification at superfund sites.[61] However, these principles have not been incorporated into modern wastewater methodologies.

Some wastewater byproducts have little to no reuse value. "Over 100 different enteric pathogens may be found in sewage. These include . . . viruses, parasites, and bacteria, all of which may be associated with waterborne disease."[62] Wastewater treatment processes are critical to remove pathogens from wastewater effluent. Adequate disinfection techniques currently exist.[63] However, they must be applied rigorously in order to prevent the spread of the pathogens.[64] Current practices have not prevented substantial concentrations of pathogens along the coasts.[65] In order for the recycling of wastewater byproducts to be a feasible practice, the strictest disinfection techniques must be applied. Without proper treatment mechanisms, any wastewater byproduct might have the potential to spread these harmful pathogens.

3. Costs

For many municipalities, wastewater management is one of the most substantial costs the community must bear.[66] Therefore, it is important that wastewater facilities be as cost effective as possible. "Regulatory actions, even when they achieve wastewater management objectives, may often impose higher than necessary costs on government and industry. Excessive costs, in turn, slow environmental progress and divert funds from other important activities."[67]

The cost of achieving secondary treatment standards is simply more than many communities can bear.[68] In communities where wastewater treatment facilities do not have the funds to meet the secondary treatment standard, penalties can exacerbate the prob-

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59. *Id.*

60. HART, *supra* note 17, at 9, 31; NAT'L RESEARCH COUNCIL, WATER AND SUSTAINABLE DEVELOPMENT: OPPORTUNITIES FOR THE CHEMICAL SCIENCES: A WORKSHOP REPORT TO THE CHEMICAL SCIENCES ROUNDTABLE 10 (Parry Norling et al. eds., 2004).

61. *See generally* U.S. Envtl. Prot. Agency, Publications: Publications on Remediation, http://www.epa.gov/tio/pubitech.htm (last visited Nov. 10, 2006) (listing various case studies regarding remediation).

62. NAT'L RESEARCH COUNCIL, *supra* note 2, at 203.

63. *See id.* at 65-66, 345-50.

64. *See id.* at 65-66.

65. *See id.* at 4-5, 20.

66. *See* JOHN G. HEILMAN & GERALD W. JOHNSON, THE POLITICS AND ECONOMICS OF PRIVATIZATION: THE CASE OF WASTEWATER TREATMENT 116-19 (1992).

67. NAT'L RESEARCH COUNCIL, *supra* note 2, at 159.

68. *See* FOOD & WATER WATCH, *supra* note 13, at 4-6.

lem.[69] While it might be acceptable for some private polluters to shut down because they do not have the finances to adapt to CWA criteria, substandard POTWs are inevitably better than allowing raw sewage to leak into waterways.

Yet the EPA is obligated to take a hard line with these communities.[70] The secondary treatment standard is prescribed by law, not by regulation.[71] Moreover, "[c]ourts throughout the country have held that [CWA permit] compliance is a matter of strict liability, and a defendant's intent and good faith are irrelevant to the liability issue."[72] Without proper funding, the primary relief for these communities lies with lenient agency enforcement or equitable determination of fines by the courts.[73]

Perhaps recognizing that the burden on many communities would be significant, section 201 of the CWA introduced federal grants for the construction of treatment works.[74] This section of the CWA did not entirely ignore the economic and environmental value of reusing waste. Sections 201(d) and -(e) state the following:

> (d) Waste treatment management construction of revenue producing facilities.
>
> The Administrator shall encourage waste treatment management which results in the construction of revenue producing facilities providing for—
>
> (1) the recycling of potential sewage pollutants through the production of agriculture, silviculture, or aquaculture products, or any combination thereof;
>
> (2) the confined and contained disposal of pollutants not recycled;
>
> (3) the reclamation of wastewater; and
>
> (4) the ultimate disposal of sludge in a manner that will not result in environmental hazards.
>
> (e) Waste treatment management integration of facilities
>
> The Administrator shall encourage waste treatment management which results in integrating facilities for sewage treatment

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69. *Sewage Treatment: Rockefeller to Propose Deadline Extension for Municipal Sewage Treatment Requirements*, 19 ENV'T REP. 177, 177 (1988) (claiming that compliance with the CWA would drive many municipalities into bankruptcy); *see also, e.g.,* Haw.'s Thousand Friends v. City and County of Honolulu, 821 F. Supp. 1368 (D. Haw. 1993); Glenn E. Deegan, *Judicial Enforcement of State and Municipal Compliance with the Clean Water Act: Can the Courts Succeed?*, 19 B.C. ENVT'L. AFF. L. REV. 765, 767 (1992).

70. *See* Deegan, *supra* note 69, at 767.

71. *See* 33 U.S.C. § 1311(b) (2000).

72. *Haw.'s Thousand Friends*, 821 F. Supp. at 1392 (citing Stoddard v. W. Carolina Reg'l Sewer Auth., 784 F.2d 1200, 1208 (4th Cir. 1986); Atlantic States Legal Found. v. Tyson Foods, 897 F.2d 1128, 1142 (11th Cir. 1990)).

73. *See* 33 U.S.C. § 1319(d) (allowing courts to consider the circumstances of the violation in assessing fines).

74. *Id.* § 1281.

> and recycling with facilities to treat, dispose of, or utilize other industrial and municipal wastes, including but not limited to solid waste and waste heat and thermal discharges. Such integrated facilities shall be designed and operated to produce revenues in excess of capital and operation and maintenance costs and such revenues shall be used by the designated regional management agency to aid in financing other environmental improvement programs. [75]

These laudable goals, while economically and environmentally sound, are not self-implementing. In fact, Congress included so many different goals in the CWA that it is unclear when any one of the goals should gain priority.[76] Moreover, Congress phased out the grant program in 1990, and the Clean Water State Revolving Fund (CWSRF) took its place.[77] Phasing out the grant program and implementing the CWSRF substantially decreased federal funding of wastewater facilities.[78] Unfortunately, wastewater infrastructure was underfunded even before this shift in funding responsibility.[79]

Once the grant program was phased out, section 201's sustainability goals essentially became defunct.[80] While the CWSRF provides some money for the basics,[81] CWSRF funding is insufficient, and its funding programs are focused on amelioration much more than sustainability or reuse.[82]

In fact, the cost of simply maintaining the nation's aging wastewater system is staggering.[83] According to a study by the U.S. Commission on Ocean Policy,

> The gap between existing and needed funding for wastewater and drinking water improvements is large, and serious adverse human health and environmental effects are likely if the challenges presented by an aging public infrastructure are not addressed. Capi-

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75. *Id.*

76. *See* STEPHEN BREYER, BREAKING THE VICIOUS CIRCLE: TOWARD EFFECTIVE RISK REGULATION 19 (1993) (criticizing agency priorities as random and illogical).

77. *See* Water Quality Act of 1987 § 314, Pub. L. 100-4, 101 Stat. 46; 33 U.S.C. §§ 1381-87.

78. U.S. GEN. ACCOUNTING OFFICE, ALTERNATIVE STRATEGIES NEEDED TO REDUCE WASTEWATER TREATMENT COSTS 1-3 (1992).

79. *Id.*

80. *See* 33 U.S.C. § 1296 ("[T]he determination of the priority to be given each category of projects for construction of publicly owned treatment works within each State shall be made solely by that State . . . .").

81. *See generally* FOOD & WATER WATCH, *supra* note 13.

82. *See* U.S. GOV'T. ACCOUNTABILITY OFFICE, CLEAN WATER: HOW STATES ALLOCATE REVOLVING LOAN FUNDS AND MEASURE THEIR BENEFITS 10-11 (2006); U.S. ENVTL. PROT. AGENCY, CLEAN WATER STATE REVOLVING FUND PROGRAMS: 2005 ANNUAL REPORT 15 (2005) (finding that less than one percent of CWSRF funds go toward wastewater recycling).

83. U.S. GOV'T ACCOUNTABILITY OFFICE, *supra* note 82, at 1 ("[C]ommunities will need hundreds of billions of dollars [in coming years] to construct and upgrade aging wastewater treatment facilities, sewer systems, and other [water infrastructure] . . . .").

> tal spending for public wastewater treatment infrastructure is currently about $13 billion per year, and annual operations and maintenance costs are around $17 billion. EPA estimates that, over the next twenty years, the total additional investment needed for wastewater treatment infrastructure could exceed $270 billion . . . .[84]

Much of the nation's wastewater infrastructure needs to be repaired or replaced within the next few decades.[85] Rather than continuing to rely on outdated facilities, a push needs to be made to promote the creation of new types of wastewater facilities that produce revenue through reuse, reclamation, and recycling. Ultimately, such a strategy could relieve the public of an onerous economic and environmental burden.[86]

Ironically, promoting innovation seemed to be the EPA's plan when it decided to *decrease* funding for wastewater facilities. At that time, the EPA claimed to be "taking steps to (1) promote innovation in technology, (2) strategically invest in promising technologies, and (3) accelerate the use of these technologies."[87] However, this plan did not materialize in a meaningful way, and substantial innovations in the field of wastewater management have not emerged.[88]

The CWA has reduced the direct discharge of pollutants into the waters of the United States,[89] but progress has been increasingly undermined by underfunding and overregulating CWA wastewater programs. In order to implement the goals of the CWA, the law must change, but the regulatory approach toward wastewater facilities needs to change as well.

B. Regulatory Problems

Under the current guidelines, it can take between ten and fifteen years for a municipality to progress from proposal of a wastewater

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84. U.S. COMM'N ON OCEAN POLICY, *supra* note 3, at 211; *see also* U.S. GOV'T ACCOUNTABILITY OFFICE, *supra* note 82, at 1 (finding that CWSRFs and other sources of state funds combined fall far short of meeting the costs needed to prevent significant health and environmental impacts from occurring in many communities).

85. U.S. Envtl. Prot. Agency, Sustainable Infrastructure for Water & Wastewater, http://www.epa.gov/waterinfrastructure/ (last visited Nov. 10, 2007).

86. *See* U.S. GOV'T ACCOUNTABILITY OFFICE, *supra* note 82, at 25-26; *see also* U.S. Envtl. Prot. Agency, *supra* note 82, at 15 (finding that less than one percent of CWSRF funds go toward recycled water programs).

87. U.S. GEN. ACCOUNTING OFFICE, *supra* note 14, at 5.

88. *Compare, e.g.*, *id.* (stating that one of the most promising new innovations was the use of artificial wetlands), *with* RENEE LORION, CONSTRUCTED WETLANDS: PASSIVE SYSTEMS FOR WASTEWATER TREATMENT iii (2001) (indicating that one of the most promising new innovations is the use of constructed wetlands).

89. *See* NAT'L RESEARCH COUNCIL, *supra* note 2, at 20; Susan Bruninga, *Pretreatment Program Shows Little Progress Since 1990s, EPA Inspector General Says*, DAILY ENV'T REP., Oct. 12, 2004, at A-11 (indicating that government inaction could cause backsliding and the loss of many of the benefits made since the early 1980s).

treatment facility to the beginning of construction.[90] This time delay may exacerbate environmental harm and frustrate attempts to create state-of-the-art wastewater facilities.[91]

Supreme Court Justice Stephen Breyer has commented on regulatory shortcomings that make agencies so inefficient.[92] For example, regulators can get "tunnel vision."[93] Tunnel vision occurs when agencies focus on an outcome, such as eliminating pollution, without considering more cost-effective alternatives that might reduce most of the risk associated with the pollutant. In addition, agencies often do not develop their priorities according to consistent criteria.[94] Therefore, the agency ignores some serious problems while investing substantial resources in arguably less important programs.[95] Finally, lack of coordination among agencies and programs results in inconsistent policy choices. For example, "[p]roposed rules concerning the disposal of sewage sludge, designed to save one statistical life every five years, would encourage waste incineration likely to cause two statistical cancer deaths annually."[96]

Not only are the inner workings of agencies such as the EPA fraught with inconsistencies, there is also substantial friction between the purposes of the EPA, the needs of local governments, and the convictions held by environmental groups.[97] "Regulated industries attempt to minimize compliance costs, environmentalists may seek to protect ecological features and public health at any cost, and agency bureaucrats often try to expand discretion and budgets while defusing public criticism."[98] Conflict between regulated parties and the regulating agencies can lead to delay, litigation, and unsatisfactory compromises.[99] These conflicts ultimately result in financial loss to the public. Moreover, the failure of the local govern-

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90. 2 WILLIAM H. RODGERS, JR., ENVIRONMENTAL LAW: AIR AND WATER § 4.24 (Supp. 2006).

91. *See* Latin, *supra* note 15, at 1267, 1288 (citing Richard B. Stewart, *Regulation, Innovation, and Administrative Law: A Conceptual Framework*, 69 CAL. L. REV. 1256, 1264 (1981)).

92. BREYER, *supra* note 76, at 10-11.

93. *Id.* at 11.

94. *Id.* at 19-20.

95. *Id.* at 11.

96. *Id.* at 22.

97. *See* HEILMAN & JOHNSON, *supra* note 66, at 21; *see also* Latin, *supra* note 15, at 1270-71 ("Any system for environmental regulation must function despite the presence of pervasive uncertainty, high decisionmaking costs and manipulative strategic behavior resulting from conflicting private and public interests. . . . [T]he critical issue is not which regulatory system aspires to ideal 'efficiency' but which is most likely to prove effective.").

98. Latin, *supra* note 15, at 1293.

99. *Id.* at 1294 ("Delay, and the strain it places on agency budgets and timetables, provides industry with leverage to reduce the level of compliance that is eventually mandated.").

ment to take prompt pollution prevention measures can lead to additional environmental harm.

Hawaii's Thousand Friends v. City & County of Honolulu illustrates the perverse results of these conflicting agendas.[100] In the early 1970s, the City of Honolulu commissioned a study to determine its present and future sewage treatment needs.[101] The Commission determined that secondary treatment facilities were necessary to prevent degradation of the coastal waters.[102] However, the city abandoned plans to install a secondary treatment facility on the prospect of a possible section 301(h) waiver that had not yet been granted.[103] For its part, for years the EPA vacillated and delayed the decision whether to grant the permit.[104] Meanwhile, the city served by the wastewater facility continued to grow, producing more wastewater that was discharged into the ocean using only primary treatment.[105] Although environmental groups eventually brought this calamity to the attention of the judiciary and ultimately affected change, they pushed for a judgment that would find 11,382 violations over 1645 days.[106] Under the CWA, the penalty is up to $25,000 per day of violations.[107] The maximum fine was found to be $246,750,000. The court, recognizing the role of the regulator in the continued violation, and no doubt hesitant to put the city into bankruptcy, ultimately imposed significantly less.[108]

These conflicts impose costs on all parties involved and inhibit innovation.[109] Uncertainty regarding future regulations further discourages innovation.[110] "The [wastewater] industry is constantly looking over its shoulder, trying to conform to increasingly stringent legislation by retrofitting existing systems. . . . Solely reacting to problems as they arise has the opposite effect of stifling innovation . . . ."[111]

A flexible federal grant program is needed to assist communities in complying with the CWA.[112] This Comment recommends that a

100. Haw.'s Thousand Friends v. City & County of Honolulu, 821 F. Supp. 1368 (D. Haw. 1993).

101. *Id.* at 1374.

102. *Id.*

103. *Id.* at 1375.

104. *Id.* at 1374-78, 1380-81, 1384-89 ("The 106 million gallons of preliminarily treated sewage [within 52 days] bypassed did not receive the complete primary treatment.").

105. *Id.* at 1376.

106. *Id.* at 1393.

107. 33 U.S.C. § 1319(d) (2000).

108. *Haw.'s Thousand Friends*, 821 F. Supp. at 1395-97.

109. *See* U.S. GEN. ACCOUNTING OFFICE, *supra* note 14, at 3; Stewart, *supra* note 14, at 1263.

110. U.S. GEN. ACCOUNTING OFFICE, *supra* note 14, at 3.

111. GRAY, *supra* note 12, at 1179.

112. *See* FOOD & WATER WATCH, *supra* note 13, at 5-13 (discussing how loans are insufficient and a federal trust needs to be created to help attack the wastewater infrastructure crisis).

program be implemented by statute to promote cooperation between regulated entities and the regulators, encourage innovation and efficiency, and minimize pollution.

III. PROPOSED SOLUTION

This Comment proposes a revitalization of 33 U.S.C. § 1281, Grants for Construction of Treatment Works, with the following amendments:

> 33 U.S.C. § 1281
> (f) Preconditions for federal grants for the creation of wastewater treatment facilities. The administrator shall allot grants in accord with the following criteria. Priority grants shall be allotted to:
> (1) facilities whose plan involves reclaiming, filtering, treating, and reselling byproducts from wastewater;
> (2) facilities that reuse wastewater;
> (3) facilities with partnership agreements with industrial or agricultural facilities to use wastewater in a safe and productive manner; and
> (4) treatment facilities substantially reducing pollutants and harmful biological elements.
> (g) Conditions for federal grants
> (1) The agency shall act as an investor and shall receive a share of the profits proportional with the percent of the start-up cost funded by the government up to fifty percent. Profit in this context means any profits received through recycling or reselling waste byproducts or any savings created by discharge of wastewater (defined in reference to the cost of bringing the wastewater under the EPA standards for clean water).
> (2) Water treated to meet certain minimum EPA guidelines will no longer be considered wastewater.
> (3) Agency use of profits received from an individual grant shall be distributed as follows:
> (A) Fifty percent of these profits go toward new grants.
> (B) Twenty-five of these profits act as bonuses for agency employees who help to choose or implement the individual project. Individual bonuses should not exceed seventy percent of an employee's salary. Any excess funds from this provision should go toward research and development of new reclamation techniques.
> (C) Twenty-five percent of these profits will be saved for monitoring and enforcement.
> (h) Operating Permits Awarded. Each grant recipient will also be awarded an operating permit pursuant to section 402 of this title. Any facility receiving grants under this program should not cause or significantly contribute to a violation of water quality standards. The length of the permit and other conditions on the permit will be determined by the Secretary. The permit will set reasonably achievable effluent limitations. This permit does not insulate

the wastewater facility from liability due to any harm caused by the facility.

A. The Grant Program

The goal of this proposed legislation is to create a movement toward profitable reuse and recycling that overcomes some of the barriers to innovation and efficiency caused by the CWA's current command-and-control approach to wastewater management. The primary barriers to innovation have traditionally been risk, sizable start-up costs, and regulatory impediments.[113] This program minimizes these barriers by providing start-up costs and an operating permit.

In order to be successful, these grants must be substantial. In 1992, the construction of a conventional wastewater treatment plant cost from one to fifteen million dollars.[114] Secondary treatment facilities are expensive, and it is likely that the cost of creating new types of facilities may be even more substantial. However, these grants are an investment in the future of clean water and cost-effective waste management. There is no assurance that these facilities will become profitable. Yet even if these plants only provide for their own maintenance fees, they would likely save the country billions of dollars.[115]

Unlike traditional technology or effluent guidelines,[116] this proposed grant program does not force the federal government to bear the brunt of the research costs. Rather than requiring the EPA to set technology standards for an entire industry, which is time-consuming and costly,[117] this proposal encourages localities to develop programs that suit their needs and promote wastewater recycling.

In addition, the fact that facilities endorsed by the grant program receive operating permits helps to create a more flexible regulatory standard. The EPA can incorporate successful technologies when it creates new standards for wastewater treatment technologies. Using successful facilities as a model, the EPA's standards can evolve to incorporate new technologies without creating substantial additional costs.

B. Regulatory Incentives

In modern society, government actions are sometimes necessary to curb free market capitalism.[118] Yet, ostensibly, the government it-

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113. U.S. GEN. ACCOUNTING OFFICE, *supra* note 14, at 3-4; Latin, *supra* note 15, at 1291.

114. *See* HEILMAN & JOHNSON, *supra* note 66, at 113-18.

115. U.S. COMM'N ON OCEAN POLICY, *supra* note 3, at 211 ("Capital spending for public wastewater treatment infrastructure is currently about $13 billion per year, and annual operations and maintenance costs are around $17 billion.").

116. U.S. GOV'T ACCOUNTING OFFICE, *supra* note 14, at 4.

117. *See* Latin, *supra* note 15, at 1294.

118. *See* MICHAEL C. MUNGER, ANALYZING POLICY: CHOICES, CONFLICTS, AND PRACTICES, 113-15 (Stephen Dunn ed., 2000).

self should be an economically viable entity.[119] It makes sense to employ the same motivational tools in government agencies as in private entities. Incentive plans for agency employees promote thorough yet efficient evaluation of proposed facilities and cement the priorities laid out in the proposed statute.

The creation of intra-agency incentive plans has several key qualities in common with privatization.[120] One is "faith in the perceived inherent efficiencies of the market economy."[121] Another is a "reduction of the bureaucratic and financial size and role of the public sector."[122]

The key problem with relying on the private sector (or even local governments) for environmental controls is that pollution is a classic externality.[123] As such, polluters often do not pay for the cost that their pollution imposes on the rest of society.[124] Without some sort of regulation, it is cheapest for polluters to dump their wastewater byproducts into the oceans and inland waters because these waters are common property resources.[125]

In addition to the counterproductive incentives inherent in privatization, privatization can carry with it "threats to political values[,] . . . loss of jobs, loss of public accountability, inefficiencies, fraud, mismanagement, and corruption in various forms."[126] On the other hand, pure governmental controls are typically time-consuming and inefficient.[127] In order to pair the efficiency of commerce with the environmentally protective policies of the EPA, this Comment proposes to utilize the motivational tools of capitalism within the agency structure.

Because selecting the projects to fund is likely to be the most difficult challenge for the regulators of the grant program, it makes sense that employees be rewarded for choosing wisely.[128] This decision-making process requires a thorough understanding of the proposed technologies in order to avoid funding expensive and unsound proposals. The technical expertise needed to make decisions regarding novel proposals places a heavy burden on agency employees and may necessitate the incorporation of industry experts into the decision-

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119. *See id.* at 238-45.

120. Privatization occurs when the private sector provides a traditionally public service. HEILMAN & JOHNSON, *supra* note 66, at 16.

121. *Id.* at 14.

122. *Id.*

123. *See* MUNGER, *supra* note 118, at 120-24.

124. *Id.*

125. *See id.*

126. HEILMAN & JOHNSON, *supra* note 66, at 16.

127. *See* MUNGER, *supra* note 118, at 238-66.

128. *See generally* James Combs et al., *How Much Do High-Performance Work Practices Matter? A Meta-Analysis of Their Effects on Organizational Performance*, 59 PERSONNEL PSYCHOL. 501 (2006) (finding that businesses that use incentive systems are more profitable).

making process. The proposed incentive program would encourage agency employees to make thoughtful, well-informed decisions and would attract the scientific expertise that the private sector often siphons off.

If agency employees profit from successful wastewater recycling, it is likely that they would have a strong incentive to approve grant proposals that recycle wastewater byproducts efficiently and effectively. Not only would these employees have an incentive to choose the projects wisely, they would also have an interest in having the grant approval process take only as much time as necessary to make an informed decision. In this way, the goals of agency employees become more aligned with the goals of the grant-seeking organization. However, unlike the private wastewater facilities, the agency employees would see no profit from high user costs or from cost-cutting measures that might threaten the physical integrity of the wastewater facility. Therefore, facilities developed under the cooperative grant program would be less likely to undermine environmental objectives than total privatization.

Because both the agency and the wastewater facility benefit from the profits achieved through efficient reclamation of wastewater byproducts, the program helps to reduce friction. The result should be less hostility, less cost from lawsuits, and fewer transaction costs altogether.

In addition, a hierarchy of priorities focused on cost efficiency mitigates some of the prevailing problems with agency decision making. The proposed grant program focuses on profitable wastewater recycling programs that can comply with basic water quality standards. These goals are consistent with the method for implementation and the economic self-interest of the agency employees. Rather than pursuing rigid guidelines that might lead to inequitable results, agency employees are given discretion to choose among progressive waste management methods. The primary concern of giving an agency too much discretion is that its purpose will be undermined by external influences. Too much influence from either polluters or citizen groups can lead to a distortion of the agency's mission.[129] Under this proposal, economic self-interest can help the proposed statutory goals prevail over these political pressures.

However, changing agency incentives in this way raises some political concerns. "The values of efficiency are not the same as the values of democracy."[130] Many people believe that agencies should be

129. Latin, *supra* note 15, at 1293.
130. HEILMAN & JOHNSON, *supra* note 66, at 10.

more politically responsive, not less.[131] However, ideally, an increased degree of accountability of government employees will balance these concerns. Those employees responsible for evaluating and choosing among grant applicants receive the financial incentives. Because those individuals have been singled out as being responsible for the project, those employees can be more readily held accountable for any negative repercussions resulting from the approved project.

Another concern regarding the creation of an incentive program for wastewater management is that wastewater management projects take a long time to implement.[132] Even if employees assist in the creation of a profitable facility, they might not see the incentive bonuses for quite some time.

In addition, there is uncertainty regarding whether recycling of wastewater byproducts will ever be profitable.[133] However, even if recycling wastewater byproducts is not profitable at first, creating a movement toward profitable wastewater facilities should eventually promote the development of at least some profitable wastewater recycling processes. Moreover, unprofitable facilities intent on reuse are still likely to create less pollution than most current facilities.

C. Reuse

Ultimately, the proposed program will promote a movement toward a closed-loop system. A closed-loop system requires wastewater facilities to recycle the maximum possible amount of wastewater and wastewater byproducts. In addition to the value of reusing materials, such a system can prevent the type of substantial changes to natural ecosystems that disrupt their natural functions.[134] "[T]he best scenario would be to ensure that the urban water cycle becomes a closed system isolated from the natural water cycle, to protect resources and their ecology, with only treated effluents of the highest quality returned to the catchment."[135]

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131. *See* MARTIN SHAPIRO, WHO GUARDS THE GUARDIANS?: JUDICIAL CONTROL OF ADMINISTRATION 112 (1988); *but see* Mark Seidenfeld, *A Civic Republican Justification for the Bureaucratic State*, 105 HARV. L. REV. 1512, 1515 (1992) ("[G]iven the current ethic that approves of the private pursuit of self-interest as a means of making social policy, reliance on a more politically isolated administrative state may be necessary to implement something approaching the civic republican ideal."); James L. Sundquist, *Privatization: No Panacea for What Ails Government*, *in* PUBLIC-PRIVATE PARTNERSHIP: NEW OPPORTUNITIES FOR MEETING SOCIAL NEEDS 317 (Harvey Brooks et al. eds., 1984) ("By definition, government bureaucracies operate in a political environment, which means that they must satisfy political constituencies, even if that sometimes must be done at cost to efficiency.").

132. *See* RODGERS, *supra* note 90.

133. *See* GRAY, *supra* note 12, at 1059.

134. *See id.* at 1180.

135. *Id.* (citation omitted).

Wastewater recycling will prevent pollution, and pollution prevention techniques are often simpler and easier to manage than postdischarge mitigation activities.[136] Moreover, by reducing environmental impacts, a closed-loop system is likely to reduce the costs currently associated with environmental analysis of effluent discharges.[137]

Indeed, the corporate world is already coming to understand that reuse and pollution prevention are cost-effective practices. The trend is to view waste as "the enemy of good management."[138] Following pollution monitoring requirements imposed by statute, "many companies actually saved tens of millions of dollars in the process of reducing or eliminating their toxic emissions."[139]

Purification of wastewater byproducts is the most difficult part of wastewater recycling.[140] However, wastewater treatment procedures already focus on the separation of waste byproducts.[141] For example, primary treatment separates the solid waste from the nutrient-rich water.[142] Going further by separating other byproducts like ammonia or copper might allow the wastewater treatment facility to collect these byproducts and sell them on the market. Moreover, recycling these byproducts prevents them from entering natural water bodies.

The degree of success of recycling and reuse will depend substantially on the value of the purified byproducts. Solid waste recycling has had to deal with substantial fluctuations in the market prices of recycled goods.[143] With paper products, for example, supply and demand have often been out of sync.[144] Nevertheless, there have been sufficient incentives for private corporations to begin to take over the growing field of solid waste recycling.[145]

Wastewater byproducts face their own market challenges. One present-day concern is the somewhat justified stigma of using wastewater as fertilizer or for irrigation purposes.[146] At present, "land application of treated effluents and treated sludge will increase the level of toxic chemicals and pathogens in the soil. The public is concerned about pollutants and pathogens that may contaminate

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136. *See* HART, *supra* note 17, at 9; NAT'L RESEARCH COUNCIL, *supra* note 2, at 296.
137. *See* GRAY, *supra* note 12, at 1180.
138. HART, *supra* note 17, at 9.
139. *Id.* at 11.
140. *See* GRAY, *supra* note 12, at 1180; NAT'L RESEARCH COUNCIL, *supra* note 1, at 2.
141. *See* NAT'L RESEARCH COUNCIL, *supra* note 1, at 47-49 (describing primary, secondary, and tertiary treatment).
142. *See* GRAY, *supra* note 12, at 138.
143. *See* ADAM S. WEINBERG ET AL., URBAN RECYCLING AND THE SEARCH FOR SUSTAINABLE COMMUNITY DEVELOPMENT 18-25 (2000).
144. *See id.* at 25.
145. *But see id.* at 19 (describing the view that recycling was so costly that it was actually a wasteful activity).
146. NATL RESEARCH COUNCIL, *supra* note 1, at 39-40.

food crops or be transported elsewhere in the environment."[147] Even if wastewater treatment facilities can minimize toxics in fertilizers, the stigma in the mind of the public can be a powerful factor in the marketability of wastewater-generated byproducts.[148]

Another concern is the cost of reclaimed materials versus virgin materials. For example, given the current state of technology, in many areas it is cheaper to pump water from aquifers than to use reclaimed water.[149] The low cost of natural water leaves reclaimed materials susceptible to the same types of market fluctuations that have plagued solid waste recycling. Nevertheless, as clean water becomes more difficult to come by, the demand for reclaimed water is likely to increase.

Unfortunately, there is no correlation between the value of a recycled byproduct and its toxicity as a discharged pollutant. Therefore, byproducts with little value are still likely to wind up discharged into waterways, placed in landfills, or burned in incinerators.[150] However, while a complete closed-loop process may not always be possible, recycling and remarketing techniques are still likely to substantially decrease the amount of waste in the nation's waters.

D. Innovations in Wastewater Management

"[T]echnology innovation is a key factor to water and profitability. . . . [T]he role of government in sustainability efforts should be facilitation rather than leadership."[151] With improved technology, the range of marketable wastewater products will increase. "The private sector has invested relatively little in developing new technologies, in part because members of the engineering, regulated, and regulatory communities have been reluctant to accept alternative systems. Investment is further limited by the private sector's uncertainty about what technologies [are] needed to meet future regulatory requirements."[152] Providing start-up costs and operating permits for new types of wastewater facilities will hopefully spur future innovation.

Although progress has been extremely limited, some innovative wastewater management techniques have emerged.[153] Solids from wastewater have been used in concrete materials, cement, and

147. *Id.*

148. *See* HART, *supra* note 17, at 17-19 (attributing the failure of genetically modified crops to public opinion).

149. NAT'L RESEARCH COUNCIL, *supra* note 1, at 153 (stating that in Florida as of 1994, "[t]otal costs of supplying reclaimed water to agriculture were estimated to range from $.70 to $.90 per 1,000 gal . . . [while] farmers typically pump water directly from the aquifer at a cost of approximately $.10 to $.15 per 1,000 gal.").

150. *See id.* at 2, 14, 152.

151. NAT'L RESEARCH COUNCIL, *supra* note 60, at 10.

152. U.S. GEN. ACCOUNTING OFFICE, *supra* note 14, at 4.

153. GRAY, *supra* note 12, at 1061.

bricks.[154] Using solids in cement is a good way of managing wastewater byproducts that can be toxic when dissolved in water or added to crops.[155]

Biological purification techniques have shown themselves to be relatively cost effective.[156] Microbiological processes can be used to precipitate metal-salts out of metal-rich waters.[157] This is a particularly promising area because the value of metals has been increasing substantially.

Using wastewater byproducts as fertilizers or fuels is becoming more mainstream.[158] In fact, even considering the costs of treating and transporting sewage sludge, it is as economical as other methods of fertilization.[159]

The use of reclaimed water is also a developing area. However, "[r]ecycling of water is only economic when the quality of the water required is unimportant, as with industries such as power generation, steel making, and coal washing."[160] Currently, "[m]ost reclaimed water goes towards various nonpotable urban uses such as irrigating public landscapes (parks, highway medians, lawns, etc.), air-conditioning and cooling, industrial processing, toilet-flushing, vehicle-washing, and construction."[161] In addition, many industries can use recycled water, which means that they can likely serve as a large consumer base for recycled water.[162]

Desalination is another possible purification method that, although expensive, is becoming an important source of water for communities that are currently feeling the impacts of what is becoming a global water crisis.[163]

> The Tampa Bay Seawater Desalination Plant is producing about 25 million gallons a day of fresh drinking water, about 10 percent of that area's demand. The $158 million facility is North America's largest plant of its kind. Miami-Dade County is working with the city of Hialeah to build a reverse osmosis plant to remove salt from water in deep brackish wells.[164]

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154. *Id.* at 826-28.
155. *Id.*
156. *Id.* at 64, 1058-68.
157. *See id.*
158. *See* NAT'L RESEARCH COUNCIL, *supra* note 2, at 317.
159. *See* GRAY, *supra* note 12, at 835.
160. *Id.* at 1061.
161. NAT'L RESEARCH COUNCIL, *supra* note 1, at 1-2.
162. *See* GRAY, *supra* note 12, at 1061.
163. Brian Skoloff, U.S. Water Managers Say Crisis of Availability Looming, Tampa Bay Online (Oct. 28, 2007), http://www2.tbo.com/content/2007/oct/28/na-us-water-managers-say-crisis-of-availability-lo/.
164. *Id.*

Unfortunately, under the current state of technology, recovered resources can offset technology costs but are not particularly profitable and are unlikely to recoup the initial costs of the technologies.[165] Nevertheless, new technologies are necessary,[166] and new technologies that promote reuse and recycling have the potential to mitigate the financial and environmental burdens associated with outdated wastewater infrastructure.

IV. ULTIMATE GOALS

The ultimate goal of the proposed amendment is to promote a movement toward reuse and away from pollution. If this program is successful, federal and state governments should no longer need to provide such substantial subsidies for wastewater facilities. Because under the proposed amendment the government receives profits in proportion to the fraction of the start-up costs that the government provided, there is still an incentive for private entities to provide start-up costs themselves. In fact, wastewater may become increasingly privatized because improved technologies could lead to the birth of a new industry. If so, the EPA's responsibilities under the CWA could shift toward monitoring environmental impacts of residual pollution and away from setting technology standards. Moreover, enforcement of water quality standards against private polluters operating for profit would be substantially more effective than enforcement against municipalities that can barely afford to treat their wastewater.[167]

In addition, profitable wastewater recycling could lead to more cooperation from regulated wastewater facilities. Ultimately, profitability of wastewater products should lead to less frequent regulatory infractions and thus cleaner natural water bodies. Furthermore, if this grant program is successful, then similar programs may be applied to other instances of pollution.

V. CONCLUSION

Proactive solutions are critical to helping our government rid itself of the substantial and ever-increasing burden that is perpetuated by our present approach to wastewater management. This proposed grant program, targeted at cost-effective reuse, recycling, and recla-

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165. GRAY, *supra* note 12, at 1059; NAT'L RESEARCH COUNCIL, *supra* note 60, at 29 (discussing costs of desalinization).

166. *Id.*

167. *See* G. Nelson Smith, III, *Lawmaker as Lawbreaker: Enforcement Actions Against Municipalities for Failing to Comply with the Clean Water Act*, 41 CLEV. ST. L. REV. 685, 712 (1993) (noting that fining municipalities is futile in part because "POTWs are not commercial or private entities operating for profit, but rather are public facilities run by public members of the community attempting to serve the community's needs.").

mation, could be an effective way of facilitating the changes necessary to protect natural aquatic ecosystems.