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The Struggle of Cities to Implement the Safe Drinking Water Act in the Context of Intergovernmental Relations

by

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I. INTRODUCTION

When reporting on the issue of intergovernmental relations, the media usually focuses on the power struggle between the state and federal government. Although the issue may be welfare or health care, the underlying issue is still the same: which level of government—state, federal, or both—should have the power to address a particular issue or regulate a specific area? This power struggle is not new; this country's founding fathers also labored with it. This power struggle was the tension that led to "the Great Compromise" in the drafting of the U.S. Constitution[1] and, ultimately, the Civil War.[2]

A less closely examined power struggle is the ongoing tension between local governments, and the state and federal governments. Like the federal government, local governments receive their power from the states.[3] As it has been stated, local governments are "children of the state, created usually by the action of the state legislature and even in those states dedicated to the principle of

1. *See* LEONARD W. LEVY, ORIGINAL INTENT AND THE FARMERS' CONSTITUTION 38 (1988) (citing LAWRENCE A. KAPLAN, COLONIES INTO STATES: AMERICAN DIPLOMACY, 1763-1801, at 508-09 (1972)). The large states, even after "the Great Compromise" feared that the Senate "would become a battle ground in which states' rights interests, sectional interests, and economic interests would prevail over the national interests . . . ." *Id.* at 38-39.

2. *See* PAGE SMITH, THE CONSTITUTION: A DOCUMENTARY AND NARRATIVE HISTORY 439 (1978) (noting the U.S. Supreme Court struggled with the issue of states' rights versus federal power and how the Civil War resolved the issue).

3. The Tenth Amendment to the U.S. Constitution, which notes the granting of power to the federal government by the states, reads: "[t]he powers not delegated to the United States by the Constitution, nor prohibited by it to the States, are reserved to the States respectively, or to the people." U.S. CONST. amend. X. Similarly, California's Constitution grants power to cities through a constitution provision that simply states: "[t]he Legislature shall prescribe uniform procedure for city formation and *provide for city powers*." CAL. CONST. art. XI, § 2 (emphasis added).

home rule, the *state* courts remain the final arbiter of what are local concerns."[4] Any powers that local governments possess originated from the state government.[5] However, in contrast to states, local government's autonomy is dwindling in part because courts are reaching decisions that strike down exercises of home rule power.[6]

Part of the power struggle has been over unfunded mandates the federal government has imposed on state and local governments.[7] A shift in national and state politics that occurred after the 1994 congressional elections was an effort to move away from unfunded mandates imposed by the federal government.[8] At first glance, this movement may have helped relieve some of the financial burdens placed on local governments. However, upon closer look, the financial burden actually may not have been lessened.

States, such as Iowa, are reducing state funding levels to local governments and also limiting the ability of local governments to raise taxes and borrow money.[9] As a result, local governments are forced to make difficult allocative decisions.[10] Each level of government must make allocative decisions based on politics and, often, fiscal realities. Local governments are the most susceptible to the effects of these allocative decisions because they have historically relied heavily on funding from the federal and state governments.[11] As a result of financial crises, local governments must find alternative sources of funding (e.g., private donations for specific programs), reduce the number of services provided, or lower the overall quality of services.[12] In some cases, two or more of these solutions must be pursued.

To the average person these issues may not seem important, and people may ask how this power struggle and these allocative decisions impact their life.

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4. CHARLES R. ADRIAN & CHARLES PRESS, GOVERNING URBAN AMERICA 129 (1977).

5. *See* OSBORNE M. REYNOLDS, JR., LOCAL GOVERNMENT LAW § 49, at 136 (1982).

6. *See, e.g.*, Goodell v. Humboldt County, 575 N.W.2d 486, 489 (Iowa 1998) (holding that the state legislature had preempted the regulation of concentrated animal operations by counties).

7. *See generally House Oks Curbs on Mandates: Measure Is a Key Part of GOP's "Contract"*, CHI. TRIB., Feb. 2, 1995, § 1, at 1 (outlining the issue of unfunded mandates in the political arena).

8. *See id.* One of the key issues in the 1994 congressional elections was the reduction of unfunded mandates by the federal government, a burden that local governments have often had to carry. *See id.*

9. *See* Arthur A. Neu, *Iowa's People Are Losing Power to Des Moines*, DES MOINES REG., Nov. 10, 1996, at 1A. As the author asserts, "city and county government are continually hamstrung by the state. Limitations on spending, rollbacks and forced reliance on the property tax are the major impediments." *Id.*

10. *See id.*

11. *See* Frederick M. Wirt, *The Dependent City? External Influences upon Local Control*, J. POL., Feb. 1985, at 83, 88.

12. *See* Neu, *supra* note 9.

However, one of the almost exclusive responsibilities of local governments is utilities, such as providing drinking water.[13] In addition to law enforcement, fire protection, and emergency medical care, providing drinking water is among the most important responsibilities of local governments. Municipal utilities draw water from underground wells or surface waters, treat the raw water, and pipe the treated water to their residents.[14] Usually, municipal utilities provide relatively safe drinking water to residents. Although science has progressed exponentially in this century and continues at that pace today, contaminated water from public water supplies continues to threaten the well-being of consumers throughout the country. The outbreak of cryptosporidium in Milwaukee, Wisconsin, is a recent example.[15]

Arguably, one of the biggest causes of contaminated drinking water supplies is modern agricultural practices. The application of large amounts of herbicides and insecticides results in drinking water contamination. Although farmers are more conscious of this problem than ever before, chemical application to fields continues to be a threat.[16] In addition, changing agricultural practices are threatening drinking water supplies. The number of family farms in states such as Iowa is shrinking, while the number of larger operations is increasing.[17]

Concentrated animal operations produce more manure in a smaller area than a typical family farm has in the past. Today, in the United States, animals produce 1,037,000 tons of animal waste per year.[18] However, in contrast to human waste that is treated by wastewater treatment plants, there is no equivalent practice for animal manure.[19] Animal waste is stored in manure lagoons that, in many cases,

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13. *See* REYNOLDS, *supra* note 5, § 111, at 340.

14. *See generally* IOWA DEP'T OF NAT. RESOURCES, STATE OF IOWA PUBLIC DRINKING WATER PROGRAM 1997 ANNUAL COMPLIANCE REPORT (1998) (outlining the success of drinking water monitoring efforts in Iowa in 1997).

15. *See* Don Behm, *City Continues Monitoring for Crypto*, MILWAUKEE J. SENTINEL, Dec. 12, 1995, at 2. In 1993, cryptosporidium contaminated the drinking water supply in the Milwaukee area causing illness in more than 403,000 people and killing more than 100 people. *See id.*; *Let City Launch New Crypto Study*, MILWAUKEE J. SENTINEL, Oct. 21, 1997, at 14. The *cryptosporidium* outbreak was the largest in this country in the 20th century. *See* Behm, *supra*. In response, the City of Milwaukee installed a $75 million ozone disinfection system that kills microbes. *See* Mike Nichols, *Water Works Plans to Seek Rate Increase: Homeowners Could Pay $25 More a Year if Public Service Commission Grants Request*, MILWAUKEE J. SENTINEL, July 15, 1998, at 3.

16. *See generally* Perry Beeman, *Nitrate Troubles Won't Evaporate*, DES MOINES REG., Apr. 26, 1998, at 1B (noting that one of the treats to Iowa's drinking water supplies are fertilizers).

17. *See* Jerry Perkins & Perry Beeman, *Big Pork: Trend Brings Big Money, Big Headaches into Iowa*, DES MOINES REG., June 28, 1998, at 1A.

18. *See* MINORITY STAFF OF THE U.S. SENATE COMM. ON AGRIC., NUTRITION, & FORESTRY, 105TH CONG., ANIMAL WASTE POLLUTION IN AMERICA: AN EMERGING NATIONAL PROBLEM 11 (1997) [hereinafter ANIMAL WASTE POLLUTION IN AMERICA] (citing the Center for Agricultural and Rural Development, Iowa State University).

19. *See U.S. Staggers Under Weight of Waste from Farm Animals*, GRAND RAPIDS PRESS, Apr. 26, 1998, at A6.

are potentially disasters waiting to happen.[20] When a leak occurs, the environmental effects are devastating; massive fish kills are common and drinking water supplies are threatened.[21] In addition, the high levels of nitrates, a substance that is found in human and animal waste, have been attributed to a high frequency of miscarriages in parts of the United States.[22]

Municipal water utilities monitor for the presence of contaminants, including nitrates. This testing is required by the federal government as part of the Safe Drinking Water Act (SDWA)[23] and its amendments,[24] which are comprehensive drinking water standards. Additional regulations are also promulgated at the state level.[25] In general, the SDWA sets minimum standards of drinking water quality that must be met. Compliance is achieved through systematic testing and the addition of various chemicals to the raw water prior to delivery to the consumer. In some cases, treatment techniques, such as softening water, can be very expensive. Due to the decreases in funding available, local governments are forced to make difficult decisions and find creative solutions to fund their water utilities.[26]

In some situations, local governments have challenged the rigid solutions to problems imposed by the United States Environmental Protection Agency (EPA) when a viable, less costly alternative was available.[27] Some cities have found creative solutions in response to these dilemmas. The Raccoon River Watershed Project—a cooperative effort between the Des Moines (Iowa) Water Works, agribusiness associations, and other organizations—is one of those solutions.[28] The

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20. *See, e.g.*, Lindsey Henry, *Spill's Toll Is Limited by Earlier Fish Kill*, DES MOINES REG., July 21, 1998, at 1A (noting the damage caused by a 420,000 gallon manure spill in Iowa).

21. *See id.*

22. *See* Kyle Niederpruem, *Effects of Pollution Hit Close to Home: Rash of Miscarriages Ends After Women Stop Drinking Nitrate-Contaminated Well Water*, INDIANAPOLIS STAR, Apr. 20, 1998, at A1.

23. Safe Drinking Water Act, Pub. L. No. 93-523, 88 Stat. 1660 (1974).

24. The amendments of the Safe Drinking Water Act are: the Safe Drinking Water Act Amendments of 1977, Pub. L. No. 95-190, 91 Stat. 1393; the Safe Drinking Water Act Amendments of 1980, Pub. L. No. 96-502, 94 Stat. 2737; the Safe Drinking Water Act Amendments of 1986, Pub. L. No. 99-339, 100 Stat. 642; the Lead Contamination Control Act of 1988, Pub. L. No. 100-572, 102 Stat. 2884; and the Safe Drinking Water Act Amendments of 1996, Pub. L. No. 104-182, 110 Stat. 1613.

25. *See, e.g.*, 30 TEX. ADMIN. CODE §§ 290.101-.106, .108-.121 (1997) (outlining state drinking water quality standards and public reporting requirements of public water supply systems).

26. *See, e.g.*, Jerry Perkins, *Watershed Project Is Launched*, DES MOINES REG., June 23, 1996, at 1FC (outlining a cooperative effort between farmers, environmental groups, agribusiness associations and the Des Moines Water Works to protect the City of Des Moines' water supply).

27. *See, e.g.*, Cynthia C. Kelly, *Local Governments and EPA: Increasing Costs and Frustrations*, PUB. MGMT., Sept. 1992, at 23, 23-24 (noting some cost ineffective directives imposed on cities by the EPA).

28. *See* Perkins, *supra* note 26, at 1FC.

Raccoon River Watershed Project works with farmers to minimize erosion, reduce pesticide and herbicide application, and to prevent animal manure from entering Iowa's waterways.[29] These efforts ultimately can help protect our drinking water.

This Note focuses on the struggle of one type of local government—cities[30]—to implement the Safe Drinking Water Act and its amendments. First, it outlines the power struggle between cities and the state and federal governments by examining the autonomy of cities, and the regulation of cities by the state and federal governments.[31] Second, this Note examines the allocative decision making made by cities in light of scarce financial resources due to decreases in funding by the state and federal governments.[32] Third, it outlines the history and evolution of drinking water regulations in the United States through the SDWA Amendments of 1996 and the roles of cities in implementing them.[33] Finally, the Note examines the quagmire of cities in providing safe drinking water to their residents due to current agricultural practices.[34]

II. THE POWER STRUGGLE OF CITIES

A. *Introduction*

Although it is relevant to the issues raised in this Note, it is assumed to be common knowledge that the federal government's power is derived from the states through the U.S. Constitution, and that each state's powers comes from that state's constitution.[35] The ongoing power struggle between the state and federal governments is important in understanding the overall political environment in this country. This section will focus on the origins of cities' powers and examine the history and evolution of state and federal regulations.

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29. *See id.*

30. *See* discussion *infra* Part IV. Often, the terms "local government" and "cities" are used interchangeably. In reality, that is not entirely correct. *See generally* Richard Briffault, *Our Localism: Part II—Localism and Legal Theory*, 90 COLUM. L. REV. 346 (1990) (outlining the various entities which are considered units of local government). Although there are more than 82,000 local governments in the United States, cities make up only a minority of all local governments, but they are the most numerous. *See id.* at 346-47. In reality, there are various types of legal entities which can be considered local governments, including cities, towns, villages, counties, and townships. *See* REYNOLDS, *supra* note 5, § 6, at 19.

31. *See* discussion *infra* Part II.

32. *See* discussion *infra* Part III.

33. *See* discussion *infra* Part IV.

34. *See* discussion *infra* Part V.

35. *See, e.g.*, JOHN E. NOWAK & RONALD D. ROTUNDA, CONSTITUTIONAL LAW § 3.1, at 118-20 (5th ed. 1995) (describing the history behind the enactment of the U.S. Constitution).

B. *Origins of Cities' Regulatory Powers*[36]

1. *Introduction*

Over time, municipalities have derived their power from various sources. These sources have included Dillon's Rule, inherent home rule, and charter home rule.[37] As a service of local governments, municipal utilities have similarly enjoyed varying amounts of autonomy granted by the state. The overall relationship between state and local governments is governed by state law, and "the [U.S.] Constitution does not specifically limit state power over local governments."[38] The Tenth Amendment to the U.S. Constitution extends the same protections against excessive federal power to local governments as it does to state governments.[39] However, the U.S. Supreme Court is not using it as a "significant restriction on federal authority over state or local governments."[40] In addition, to implement their power and in order to function, municipalities use different sources of revenues, some of which are dependent on the state or federal government.[41] This section will examine the historical and current sources of municipal power.

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36. The use of examples from various states throughout this Note is not intended to be a complete representation of the various existing state laws, but merely to serve as examples.

37. For an analysis of the structure of local government law, see Richard Briffault, *Our Localism: Part I—The Structure of Local Government Law*, 90 COLUM. L. REV. 1 (1990).

38. NOWAK & ROTUNDA, *supra* note 35, § 4.10, at 176 n.62. In *Lawrence County v. Lead-Deadwood School District No. 40-1*, the U.S. Supreme Court ruled unconstitutional a South Dakota law that limited the amount of discretion counties had in dispersing federal funding designed to compensate municipalities for the tax revenue lost from federal-owned tax-exempt lands. *See* Lawrence County v. Lead-Deadwood Sch. Dist. No. 40-1, 469 U.S. 256, 270 (1985); *cf.* Hunter v. City of Pittsburgh, 207 U.S. 161 (1907) (describing the "settled doctrines" of the Court with respect to states and municipalities). In his dissent, Justice Rehnquist stated that the decision was contrary to the Court's holding in *Hunter*. *See id.* at 270 (Rehnquist, J., dissenting). Justice Rehnquist noted in *Hunter* that the Court stated the "settled doctrines" of the Court with respect to states and municipalities were that:

> Municipal corporations are political subdivisions of the State, created as convenient agencies for exercising such of the governmental powers of the State as may be entrusted in them. For the purpose of executing these powers properly and efficiently they usually are given the power to acquire, hold, and manage personal and real property. The number, nature and duration of the powers conferred upon these corporations and the territory over which they shall be exercised rests in the absolute discretion of the State.

Id. at 270-71 (Rehnquist, J., dissenting) (quoting *Hunter*, 207 U.S. at 178).

39. *See* U.S. CONST. amend. X; NOWAK & ROTUNDA, *supra* note 35, § 4.10, at 176 n.62.

40. NOWAK & ROTUNDA, *supra* note 35, § 4.10, at 176 n.62.

41. *See* REYNOLDS, *supra* note 5, § 98, at 299 (noting that state-revenue sharing is one source of local governments' revenues); *see id.* § 106, at 327 (outlining the change in federal allocations to local governments to block grants).

2. *Dillon's Rule*

Historically, municipal power was defined by a legal doctrine called Dillon's Rule.[42] As it has been interpreted, Dillon's Rule states: "[local] governments have (1) those powers *expressly* conferred by state constitution, state statutes, and (where applicable) home-rule charter, (2) those powers necessarily or fairly *implied* in, or incident to, the powers expressly granted, and (3) those powers *essential* to the declared objects and purposes of the municipality or quasi-corporation."[43] This description of municipal powers is similar to the powers the federal government has been granted by the U.S. Constitution.[44] This rule has been applied by many courts in considering the extent of local governments' power.[45]

Today, many states define the power of municipalities through other means, including home rule.[46] However, any municipality that does not meet a state's criteria for home rule is still subject to Dillon's Rule.[47]

3. *Inherent Home Rule*

The doctrine of inherent home rule states that "a city has a natural, 'inherent' right to govern its own affairs where purely local matters are concerned."[48] This doctrine "may be based on the theory that a natural right of local self-government goes with legislative creation of a municipal corporation."[49] Similarly, home rule is a power desired by municipalities "because it strengthens

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42. *See id.*, § 49, at 137.

43. *Id.* In *Louisville & N. R. Co. v. City of Hazard*, the Kentucky Court of Appeals applied Dillon's Rule and found that the state legislature had not granted fourth class cities the power to require railroads to have additional crew members on the trains that passed through town. *See* Louisville & N. R. Co. v. City of Hazard, 200 S.W.2d 917, 918 (Ky. 1947).

44. For example, the "Necessary and Proper" Clause of the U.S. Constitution states that Congress shall have the power "[t]o make all Laws which shall be necessary and proper for carrying into Execution, the foregoing Powers, and all other Powers vested by this Constitution in the Government of the United States . . . ." U.S. CONST. art. I, § 8, cl. 18.

45. *See generally* Gritton v. City of Des Moines, 73 N.W.2d 813 (Iowa 1955) (holding that municipal corporations' powers are granted by the state government, implied or incident to the powers granted by the state, or are "indispensably essential"); City of York v. Iowa-Nebraska Light & Power Co., 109 F.2d 683 (8th Cir. 1940) (holding that the powers of a municipal corporation are limited to the powers which are granted either expressly or implicitly by law).

46. *See* REYNOLDS, *supra* note 5, § 35, at 95.

47. *See* Elizabeth A. Fegan, *Home Rule Hits the Road in Illinois:* American Telephone and Telegraph Co. v. Village of Arlington Heights, 25 LOY. U. CHI. L.J. 577, 581 (1994) (citing CHARLES R. ADRIAN, STATE AND LOCAL GOVERNMENTS 118 (3d ed. 1972)).

48. REYNOLDS, *supra* note 5, § 25, at 66. *See, e.g.*, City of Logansport v. Public Serv. Comm'n, 177 N.E. 249, 250 (Ind. 1931) (holding that the state has the authority to regulate the operation of both private and municipal utilities, including the regulation of utility rates).

49. REYNOLDS, *supra* note 5, § 25, at 67.

the local government's autonomy and ability to respond flexibly to the concerns of its constituents."[50]

The home rule doctrine distinguishes between issues that have a local impact and issues that have a statewide impact.[51] When issues have solely a local impact, under the inherent home rule doctrine, municipalities are free to resolve those issues without state interference.[52] Local ordinances will take precedent over state laws on those issues.[53] However, when an issue is considered to be a statewide concern, the city's power is subordinate to the state, resulting in state law taking precedence over local ordinances.[54]

In determining this distinction, some courts have considered governmental matters, such as when the city is acting like an agent of the state, to be statewide concerns and have considered proprietary matters, such as when the city is acting like a private business, to be municipal concerns.[55] An example of when the city is acting as an agent of the state would be the operation of a police department for public safety.[56] Examples of the proprietary role include constructing streets, operating sewer systems and waterworks, and developing parks.[57] Thus, the operation of a municipal water utility could be considered to be a proprietary matter and fall within the dominion of the municipality.[58]

The inherent home rule doctrine has been adopted at various times in its entirety by the states of Michigan, Indiana, Iowa, and Kentucky.[59] The states of

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50. Fegan, *supra* note 47, at 585 (citations omitted).

51. *See* REYNOLDS, *supra* note 5, § 25, at 66.

52. *See id.*

53. *See id.*

54. *See id.* For a recent example, see *Goodell v. Humboldt County*, 575 N.W.2d 486 (Iowa 1998), which is discussed in Part V of this Note.

55. *See* REYNOLDS, *supra* note 5, § 25, at 67-68.

56. *See, e.g.*, City of Newport v. Horton, 47 A. 312, 316 (R.I. 1900) (finding that police officers, as a public service, are performing a function of the state, not of the municipality).

57. *See, e.g.*, City of Kansas City v. Marsh Oil Co., 41 S.W. 943, 945 (Mo. 1897) (upholding the power of municipalities to condemn land for streets, waterworks, sewers, and parks as a matter of local concern).

58. *See* REYNOLDS, *supra* note 5, § 25, at 68.

59. *See id.* at 66 (citations omitted). For examples of these decisions, see *People ex rel. Le Roy v. Hurlbut*, 24 Mich. 44 (1871) (concluding that the state legislature does not have the power to make appointments to a municipal public works board under the municipality's rights of self-government); *State ex rel. Schroeder v. Morris*, 155 N.E. 198 (Ind. 1927) (finding the doctrine of inherent home rule does not prevent state regulation of municipal fire department employees because health and safety are statewide concerns); *State ex rel. Howe v. Mayor of Des Moines*, 72 N.W. 639 (Iowa 1897) (declaring a state law that delegated the power to tax to a body of non-elected officials unconstitutional on the grounds that the legislature cannot delegate the power to tax without the consent of the people); and *City of Lexington v. Thompson*, 68 S.W. 477 (Ky. 1902) (holding a state law that fixed the minimum salary for fire department employees unconstitutional on the basis that the law interfered with the inherent right of a city to control its local affairs).

Montana, California, Nebraska, North Carolina, Oklahoma, and Texas partially have recognized this doctrine at various points throughout their histories.[60] However, almost all states today have rejected the doctrine of inherent home rule, and most courts have recognized that municipalities are subordinate to the power of state legislatures.[61]

4. *Constitutional Limitations on State Control of Municipalities*

Today, many states recognize the doctrine of municipal home rule through either state statute or constitution.[62] As opposed to inherent home rule, municipal home rule is seen as a granting of power by the state rather than a sort of "natural right" enjoyed by cities.[63]

The granting of municipal home rule can be accomplished either by enactment of a constitutional amendment to the state constitution, or by following a provision of state law grants it through the drafting and adoption of a "home rule charter."[64] Depending on the jurisdiction, most, if not all, of the following five requirements must be met for a municipality to have home rule power: (1) the municipality must be incorporated; (2) some minimum population requirement must be met; (3) the actual charter must be prepared and outline the municipality's powers and responsibilities; (4) typically the charter must be approved by a simple majority of the eligible voters voting in a special election; and (5) in some jurisdictions, additional approval must come from the state—either from the governor or the state legislature.[65]

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60. *See* REYNOLDS, *supra* note 5, § 25, at 67 (citations omitted). For relevant examples, see *State ex rel. Kern v. Arnold*, 49 P.2d 976 (Mont. 1935) (recognizing the proprietary function performed by municipal fire departments (any activity outside of their firefighting functions) and the impermissibility of state interference in that aspect of the departments' operation); *People v. Lynch*, 51 Cal. 15 (1875) (finding that the state legislature cannot exercise the power of assessment within the jurisdiction of a municipality and cannot deprive a city of its discretion in local improvements when the charter grants the city such power); *State ex rel. Smyth v. Moores*, 76 N.W. 175 (Neb. 1898) (holding that the right of municipalities to govern themselves cannot be abridged by the state); *Asbury v. Town of Albemarle*, 78 S.E. 146 (N.C. 1913) (noting that local governments serve both a public function acting on behalf of the state and private function where they act, without interference from the state, solely for the benefit of their residents); and *Thomas v. Reid*, 285 P. 92 (Okla. 1930) (recognizing the right of majority rule under the state constitution). *See also Ex parte* Lewis, 73 S.W. 811, 816 (Tex. Crim. App. 1903) (stating that the legislature does not have the power to prevent or interfere with the self-government of cities); *cf.* Brown v. City of Galveston, 75 S.W. 488, 495-96 (Tex. 1903) (holding a municipality does not have any power that has not been articulated in its charter and has its power granted only by authority of the state legislature).

61. *See* REYNOLDS, *supra* note 5, § 26, at 68.

62. *See id.* § 35, at 95.

63. *See id.*

64. *See id.* § 36, at 98.

65. *See id.* at 98-99 (footnotes omitted).

State constitutional provisions that grant powers to municipalities vary greatly but ultimately serve the same purpose. In Iowa, a constitutional provision grants municipal home rule, and the provision expressly grants a broad municipal home rule, except for the levy of taxes.[66] Iowa's constitution states:

> Municipal corporations are granted home rule power and authority, not inconsistent with the laws of the general assembly, to determine their local affairs and government, except that they shall not have power to levy any tax unless expressly authorized by the general assembly.
> The rule or proposition of law that a municipal corporation possesses and can exercise only those powers granted in express words is not a part of the law of this state.[67]

Iowa courts have interpreted this power broadly to regulate local issues that are subject to preemption by the state legislature.[68] Iowa law, in conjunction with the state constitution, also grants broad regulatory powers. The pertinent statute provides:

> A city may, except as expressly limited by the [Iowa] Constitution, and if not inconsistent with the laws of the general assembly, exercise any power and perform any function it deems appropriate to protect and preserve the rights, privileges, and property of the city or of its residents, and to preserve and improve the peace, safety, health, welfare, comfort, and convenience of its residents.[69]

Wisconsin's municipal home rule provision[70] differs from the Iowa provision. The language of the Wisconsin statute is as follows:

> Cities and villages organized pursuant to state law may determine their local affairs and government, subject only to this constitution and to such enactments of the legislature of statewide concern as with uniformity shall

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66. *See* IOWA CONST. art. III, § 38A. A similar provision also grants home rule to counties. *See id.* § 39A. For a discussion of the applicability of the provision that grants home rule to counties, see *Goodell v. Humboldt County*, 575 N.W.2d 486 (Iowa 1998).

67. IOWA CONST. art. III, § 38A.

68. *See, e.g.*, Sioux City Police Officers' Ass'n v. City of Sioux City, 495 N.W.2d 687, 693 (Iowa 1993) (noting that Iowa's home rule amendment "grants municipal corporations broad authority to regulate matters of local concern, subject to preemptions by the laws of the [legislature].") (citing City of Des Moines v. Gruen, 457 N.W.2d 340, 341 (Iowa 1990); City of Council Bluffs v. Cain, 342 N.W.2d 810, 812 (Iowa 1983)); Gravert v. Nebergall, 539 N.W.2d 184, 189 (Iowa 1995) (stating "[t]he power of home rule . . . must always yield to a state statute with which it conflicts.").

69. IOWA CODE § 364.1 (1997).

70. *See generally* WIS. CONST. art. XI, § 3 (granting home rule to cities and villages).

> affect every city or every village. The method of such determination shall be prescribed by the legislature.[71]

Wisconsin law implements this constitutional provision by requiring adoption of a charter ordinance by a city or village.[72] The municipal home rule by statute is achieved by the adoption of a home rule charter.[73] To enact, amend, or repeal a charter ordinance in whole or in part, the charter ordinance must be approved by a

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71. *Id.* § 3(1).

72. *See* WIS. STAT ANN. § 66.01 (West 1998). This section states, in part:

> (1) Under article XI, section 3, of the constitution, the method of determination of the local affairs and government of cities and villages shall be as prescribed in this section.
>
> (2)(a) A "charter ordinance" is any ordinance which enacts, amends or repeals the whole or any part of the charter of a city or village, or makes the election mentioned in sub. (4). Such charter ordinance shall be so designated, shall require a two-thirds vote of the members-elect of the legislative body of such city or village, and shall be subject to referendum as hereinafter prescribed.
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> (b) Every charter ordinance which amends or repeals the whole or any part of a city or village charter shall designate specifically the portion of the charter so amended or repealed, and every charter ordinance which makes the election mentioned in sub. (4) shall designate specifically each enactment of the legislature or portion thereof, made inapplicable to such city or village by the election mentioned in sub. (4).
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> . . . .
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> (4) Any city or village may elect in the manner prescribed in this section that the whole or any part of any laws relating to the local affairs and government of such city or village other than such enactments of the legislature of statewide concern as shall with uniformity affect every city or every village shall not apply to such city or village, and thereupon such laws or parts thereof shall cease to be in effect in such city or village.
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> (5) Any city or village by charter ordinance may make the election mentioned in sub. (4) of this section, or enact, amend, or repeal the whole or any part of its charter; but such ordinance shall not take effect until 60 days after its passage and publication. If within such 60 days a petition conforming to the requirements of s. 8.40 signed by a number of electors of the city or village equal to no less than 7% of the votes cast therein for governor at the last general election shall be filed in the office of the clerk of said city or village demanding that such ordinance be submitted to a vote of the electors it shall not take effect until submitted to referendum and approved by a majority of the electors voting thereon.

Id. § 66.01(1)-(2), (4)-(5). A similar provision grants administrative home rule to counties. *See id.* § 59.03. This statute states: "[e]very county may exercise any organizational or administrative power, subject only to the constitution and to any enactment of the legislature which is of statewide concern and which uniformly affects every county." *Id.* § 59.03(1). This section is to be interpreted broadly in favor of counties to grant them any organizational or administrative powers. *See id.* § 59.04.

73. *See* WIS. CONST. art. XI, § 3; *see also* WIS. STAT. ANN. § 66.01(2)(a).

two-thirds majority of the municipal legislative body.[74] The ordinance is then submitted to the municipality's electorate for approval by a simple majority.[75]

Like state governments, police powers that are also given by the state are powers exercised by municipalities.[76] Police powers have generally been considered actions taken to protect "public safety, health, morals, or general welfare . . . ."[77] "Because of the clear effect conditions in one city have on the rest of the state, matters affecting the public health are nearly always considered of statewide concern."[78] Although the safety of drinking water can be considered in the arena of public health, the operation of sewage systems is also a public health issue but considered more of a proprietary function, and it has been determined to be a concern for municipalities in at least two states.[79] However, most states with concentrated agricultural operations like hog lots have enacted laws regulating their operations, suggesting that many state legislatures consider these regulations to be a statewide concern.[80]

Home rule charters grant municipalities the powers necessary "for the government and administration of *local* affairs."[81] State law prevails when conflict between state and local law occurs on issues of statewide concern.[82] Recently, the power of counties to regulate concentrated agricultural operations was challenged in Iowa courts.[83] In *Goodell v. Humboldt County,* the Iowa Supreme Court decided that state law had preempted county regulation of these operations.[84] The *Goodell* court determined that the regulation of concentrated agriculture operations falls within the purview of the state because the legislature had preempted local regulation.[85] However, the *Goodell* decision has done little to resolve the issue in

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74. *See* WIS. STAT. ANN. § 66.01(2)(a), (7).

75. *See id.*

76. *See* REYNOLDS, *supra* note 5, § 39, at 107.

77. *Id.*

78. *Id.* at 108.

79. *See id.* California and Rhode Island have recognized that sewer system operations fall within the power of home rule cities. *See id.* at 108-09 n.4 (1982 & Supp. 1996). For examples of these state court's decision, see *Cramer v. City of San Diego*, 330 P.2d 235 (Cal. Dist. Ct. App. 1958) (holding that a municipal charter adopted under the state constitution prevents the state from interfering with a municipal sewer utility); and *Westerly Residents for Thoughtful Development, Inc. v. Brancato*, 565 A.2d 1262 (R.I. 1989) (finding that the town's power to run a sewer utility "is inherent in its home rule charter.").

80. *See generally* Matt M. Dummermuth, Note, *A Summary and Analysis of Laws Regulating the Production of Pork in Iowa and Other Major Pork Producing States*, 2 DRAKE J. AGRIC. L. 447 (1997) (outlining state regulatory laws of concentrated agricultural operations in major pork producing states).

81. REYNOLDS, *supra* note 5, § 37, at 102.

82. *See id.*

83. *See* Goodell v. Humboldt County, 575 N.W.2d 486 (Iowa 1998).

84. *See Goodell*, 575 N.W.2d at 494.

85. *See id.* at 507-08.

Iowa. This decision will not end the debate surrounding which level of government—state or local—should regulate concentrated agricultural operations in Iowa. Part V of this Note will further discuss this case.

5. *Conclusion*

It is important to understand the current legal state of cities' power when examining the role cities play and the difficulties they face in providing safe drinking water as cities implement the SDWA. In particular, the movement by courts away from Dillon's Rule, inherent home rule, and various constitutional limitations is resulting in diminished autonomy of cities.

C. *State and Federal Regulations of Cities*

1. *Introduction*

In order to understand the power struggle between cities and the federal and state governments, it is important to understand the history of federal and state regulations in this country. State regulation of municipal utilities also impacts the degree of autonomy that municipal utilities can exercise. This section will outline the history of federal and state regulations in this country, which mainly have been enacted in this century.

2. *History and Evolution of State and Federal Regulation in the United States*

Although today it may seem incredible, extensive regulation by the state and federal governments has not always been very prominent. It has grown immensely from the birth of this country. To understand regulatory practices today, it is helpful to understand the changes that have occurred over approximately the last hundred years.

States served as the primary source of regulations for the first hundred years of this country's history.[86] State legislatures passed laws and established various administrative agencies to serve many functions, including the incorporation of businesses, the licensing of certain types of occupations, and the regulation of banking, transportation, insurance, and utilities.[87] The federal government first assumed a regulatory role after the construction of the interstate railroad system.[88]

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86. *See* DENNIS L. DRESANG & JAMES J. GOSLING, POLITICS, POLICY, & MANAGEMENT IN THE AMERICAN STATES 290 (1989).

87. *See id.*

88. *See id.*

Initially, states were proactive in regulating the railroad industry, but the railroad companies lobbied Congress, resulting in the passage of the Interstate Commerce Act in 1887.[89] This Act preempted many of the state regulations that included regulatory commissions which set rates and investigated the various interests involved in the railroad development.[90] However, the Interstate Commerce Act did not stop the states from adopting additional regulations, which included bank regulations, environmental regulations to protect wildlife areas, and improved antitrust regulations.[91]

State governments began regulating public utilities at the turn of the century and implemented those regulations in a manner similar to the railroad regulations.[92] In contrast to the railroads, however, the electric companies preferred to be regulated by the state governments instead of the federal government.[93] The electric companies apparently feared the public ownership of electric companies by municipalities.[94] Led by Progressive governors like Robert M. La Follette of Wisconsin and Charles Evans Hughes of New York, there was a movement for state regulation of utilities, which occurred in Wisconsin and New York in 1907.[95] Within six years of the creation of the public utility commissions in Wisconsin and New York, over two-thirds of the states created similar bodies.[96]

Until the 1960s, state and federal regulations focused on mainly economic activities.[97] Since that time, these regulations have been expanded and now include environmental regulations, like drinking water quality protections.[98] However, the state and federal governments are not the only governmental units involved in enacting environmental regulations. Cities are playing a more predominant role in protecting their citizens and drinking water supplies from environmental threats.[99] The power of cities is particularly hampered by state regulation. Considering the previous discussion regarding the decrease in cities' autonomy, it is evident that as state and federal regulation has increased, cities' autonomy has decreased.

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89. *See id.* at 290-91; *see generally* Interstate Commerce Act, ch. 104, 24 Stat. 379 (1887) (establishing the Interstate Commerce Commission).

90. *See* DRESANG & GOSLING, *supra* note 86, at 290-91.

91. *See id.* at 291.

92. *See id.*

93. *See id.*

94. *See id.*

95. *See id.*

96. *See id.* (citing Douglas D. Anderson, *State Regulation of Electric Utilities*, *in* THE POLITICS OF REGULATION 5-16 (James Q. Wilson ed., 1980)).

97. *See id.*

98. *See id.*; *see generally* Safe Drinking Water Act, Pub. L. No. 93-523, 88 Stat. 1660 (establishing the United States' first comprehensive drinking water quality standards).

99. *See* Debbie Sivas, *Groundwater Pollution from Agricultural Activities: Policies for Protection*, 7 STAN. ENVTL. L.J. 117, 157-58 (1987-88) (outlining the efforts of various communities to protect their citizens from environmental threats).

3. *Regulation of Municipal Utilities*

Many local governments own and operate public utilities providing electricity, natural gas, and water services to its residents.[100] Municipally owned and operated water utilities are subject to various forms of state regulation in addition to regulation at the federal level.[101] Therefore, in order to understand the role of municipal utilities in implementing the SDWA, it is important to understand the regulation of municipal utilities.

The regulation of municipal utilities traditionally is considered to be an issue of statewide concern.[102] Although in many ways municipally owned utilities are similar to other public utilities and may operate in an analogous manner, municipal utilities in some states may be subject to less strict regulation.[103] One major difference is that the rates of privately owned utilities must be approved by the state or federal regulatory bodies, while often municipally owned utilities are free from or subject to less stringent rate regulations within its jurisdiction.[104] For example, in Iowa, municipal water utilities are not subject to Iowa laws that regulate water utilities, and utilities enjoy broad discretion in setting rates for services.[105] However, municipal utility service rates are always subject to judicial review and may be invalidated if found to be discriminatory or unreasonable.[106]

On the contrary, Wisconsin takes a more active regulatory role in regulating utilities—public or private.[107] Wisconsin law is more restrictive of

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100. In Iowa, for example, cities are authorized to establish any public utility except a sanitary sewage or storm water drainage system. *See* IOWA CODE § 388.2 (1997). The statute states, in part:

> The proposal of a city to establish, acquire, lease, or dispose of a city utility, except a sanitary sewage or storm water drainage system, in order to undertake or to discontinue the operation of the city utility, or the proposal to establish or dissolve a combined utility system, or the proposal to establish or discontinue a utility board, is subject to the approval of the voters of the city, except that a board may be discontinued by resolution of the council when the city utility, city utilities, or combined utility system it administers is disposed of or leased for a period of over five years.

Id.

101. *See, e.g.*, IND. CODE ANN. § 8-1-2-4 (Michie 1998) (requiring municipal utilities' rates to be "reasonable and just" and to be approved by a state commission); *but cf.* Poudre Valley Rural Elec. Ass'n v. City of Loveland, 807 P.2d 547, 551-53 (Colo. 1991) (holding that the state's public utility commission has no authority to regulate a municipal utility operating within a municipality's boundaries).

102. *See* REYNOLDS, *supra* note 5, § 41, at 113. For example, see *Galbreath v. Oklahoma Natural Gas Co.*, 264 P. 878 (Okla. 1928) (holding that the state has the inherent power to regulate utility rates of public service corporations).

103. *See* REYNOLDS, *supra* note 5, § 113, at 344-45.

104. *See id.* at 345.

105. *See* IOWA CODE §§ 476.1-.91 (1997).

106. *See* REYNOLDS, *supra* note 5, § 113, at 345.

107. *See, e.g.*, WIS. STAT. ANN. § 196.03(1) (West 1998).

utilities' powers than Iowa law in that Wisconsin law does not exempt municipally owned utilities from regulation by the state's Public Service Commission.[108] Municipal utilities must provide "reasonably adequate service and facilities" and can only charge "reasonable and just" rates for services.[109] However, analogous to Iowa law, Wisconsin municipal utilities can raise rates without approval of the Public Service Commission if the rate increase meets criteria established by state law.[110]

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108. *Compare* WIS. STAT. ANN. § 196.03(1), *with* IOWA CODE §§ 476.1-.91 (1997).

109. WIS. STAT. ANN. § 196.03(1) (West 1998). In particular, the statute states:

> (1) Subject to § 196.63 [relating to telecommunications interruption by law enforcement in a crisis situation], a public utility shall furnish reasonably adequate service and facilities. The charge made by any public utility for any heat, light, water, telecommunications service or power produced, transmitted, delivered or furnished or for any service rendered or to be rendered in connection therewith shall be reasonable and just and every unjust or unreasonable charge for such service is prohibited and declared unlawful.
>
> . . . .
>
> (3)(a) In the case of a public utility furnishing water, the [public service] commission shall include, in the determination of water rates, the cost of fluoridating the water in the area served by the public utility furnishing water if the governing body of the city, village or town which owns or is served by the public utility furnishing water authorizes the fluoridation of water by the public utility furnishing water.

Id. § 196.03(1), (3)(a).

110. *See id.* § 196.193(1)-(3). The statute states:

> (1) When permitted. The commission may grant a rate increase to a municipally owned water or a municipally owned combined water and sewer public utility without a hearing if all of the following conditions are met:
>
> (a) The revenue increase is calculated by multiplying the utility's prior year's revenues from sales of utility service by the rate increase factor under sub. (2).
>
> (b) The revenue increase under par. (a), combined with the prior year's net operating income, either results in an overall rate of return that does not exceed the rate of return determined by the commission under sub. (3) or results in an amount that does not exceed 6% of the utility's prior year's total operation and maintenance expenses.
>
> (c) The utility will increase its rates for general service, wholesale service and public fire protection uniformly for all utility customers by the rate increase factor determined by the commission under sub. (2), unless the commission determines that the utility has good cause for not meeting the condition under this paragraph.
>
> (d) The effective date of the rate increase is not less than 12 months from the effective date of an increase previously filed under this section nor less than 45 days from the date on which the application was filed.
>
> (e) If the utility's rates in effect prior to the rate increase under this section were authorized pursuant to a hearing under § 196.20, the rates have been in effect for a calendar year.

4. *Conclusion*

Depending on state law, municipal utilities may enjoy large degrees of independence or varying amounts of regulations. More stringent levels of regulation make it very difficult for cities to implement the SDWA, especially when it may be necessary for utilities to raise their rates to cover the costs of implementing these regulations.

D. *Conclusion*

Although cities historically have derived their power from different sources, most cities' powers today are granted by state constitutions and state legislatures. Their power has also been tempered by federal and state regulations, and state regulation of municipal utilities. With this background in mind, it is important to examine one of the most difficult challenges cities face—allocative decision making in the distribution of financial resources in an environment where those resources are scarce.

(f) The commission has not rejected the application for good cause.

(g) If the utility has 4,000 or more customers, the effective date of the rate increase is not more than 5 years from the effective date of an increase authorized pursuant to a hearing under § 196.20.

(h) If the utility has less than 4,000 customers, the total of all prior rate increases granted since the last hearing under § 196.20 does not result in rates that are more than 40% higher than the base rates previously authorized by a hearing under § 196.20.

(2) Determination of the rate increase factor. Not later than March 1 annually, the commission shall set an increase factor to apply to rates of municipally owned water public utilities or municipally owned combined water and sewer public utilities. The factor shall be equal to the U.S. consumer price index for all urban consumers, U.S. city average, for the previous year; however, the factor may not be less than 3% nor more than 10%. The rate increase factor need not be defined by rule.

(3) Determination of an overall rate of return. Not later than March 1 annually, the commission shall set the overall rate of return to be applicable to municipally owned water public utilities or municipally owned combined water and sewer public utilities for rate increases under this section. The overall rate of return shall be equal to the simple average, rounded to the nearest tenth of 1%, of the interest rates listed for state and local bonds in the Federal Reserve Statistical Release H.15 (519) published by the federal reserve board, for the last quarter of the prior year, plus 2%. The overall rate of return need not be defined by rule.

Id. However, public notice is still required by newspaper publication or mail. *See id.* § 196.193(4).

III. ALLOCATIVE DECISION MAKING IN THE DISTRIBUTION OF FINANCIAL RESOURCES

A. *Introduction*

With the increasing amount of governmental regulation of drinking water, municipalities must continue to spend more money complying with these regulations. This burden is in addition to financial challenges that cities may already be facing. This section outlines the sources of cities' funding and examines the challenges in allocating that funding.

B. *Sources of Cities' Financial Resources*

Historically, local governments were financed primarily by their citizens through taxes, special assessments, and loans usually obtained by issuing bonds.[111] In addition, municipalities have received a large portion of their funding from the state and federal governments.[112] State funding, in varying amounts and depending on the time and jurisdiction, also has provided supplemental funding for municipalities allowing them to provide more services to their residents.[113] The current trend, however, is to decrease the state financial support of municipalities through "rollbacks," which have forced municipalities to find other sources of financial resources or to reduce the quality and quantity of services.[114] This phenomena is part of an overall trend of decentralization of power—a shift of power from the federal government to the state and local governments.[115]

The federal government's financial support of municipalities has been inconsistent, as evidenced by the use of unfunded mandates.[116] Up to the early 1970s, federal funding of municipalities came through "categorical grants" that

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111. *See* REYNOLDS, *supra* note 5, § 94, at 288-89.

112. *See* Wirt, *supra* note 11, at 88.

113. *See* REYNOLDS, *supra* note 5, § 98, at 299; *see also* Wirt, *supra* note 11, at 88.

114. *See, e.g.*, Thomas A. Fogarty, *Democratic Campaign Ads Turn Negative in Race for Nomination*, DES MOINES REG., May 28, 1998, at 4M (noting the history of rollbacks in Iowa). In Iowa, "[t]he rollback was initiated in 1978 to prevent dramatic shifts in the tax burden between farmland and residential property." *Id.* As a result of this policy, local governments can only tax at 55% of residential property's assessed value. *See id.*

115. *See* Jason S. Grumet, *Old West Justice: Federalism and Clean Air Regulation 1970-1998*, 11 TUL. ENVTL. L.J. 375, 397 (1998) (noting the devolution of power from the federal government to the states that began in the Reagan era has continued in national politics).

116. *See House Oks Curbs on Mandates: Measure Is a Key Part of GOP's "Contract"*, *supra* note 7, § 1, at 1. One of the key issues in the 1994 Congressional elections was the reduction of unfunded mandates by the federal government, a burden that local governments have often had to carry. *See id.*

were intended to fund specific categories of programs (e.g., law enforcement).[117] With the enactment of the 1972 Fiscal Assistance to State and Local Governments Act,[118] the focus of federal funding shifted to "block grants" that were given to the states based on various factors, such as population, and were in turn passed on to municipalities by the states.[119]

As cities continue to attempt to increase the quantity and quality of services to their residents, financial resources are stretched to their limits. The SDWA does little to help that situation.[120] As a result, the drinking water standards imposed by the SDWA and the EPA "distort[] local priorities, impair[] procedural flexibility, and . . . impos[e] costs on municipalities and states that need to be paid from state and local revenues."[121] "Despite the good intentions of these directives, unfunded mandates . . . crippl[e] the ability of state and local officials to confront demanding local priorities within shrinking budgets."[122] Precious financial resources that could be used for improved services instead must be used to comply with environmental regulations.

C. *Challenges and Creative Solutions for Operating with Scarce Financial Resources*

As a result of the increasing amount of governmental regulations, cities may be hit hard with huge financial burdens. For example, it was estimated that the cost of complying with drinking water quality regulations may triple between 1989 and 2010 from $3 billion to $10 billion nationally.[123] Actual costs to municipalities and users of these services could be nine to ten times higher due to a decrease in financial support from federal and state governments.[124]

The EPA has been criticized for not allowing enough flexibility in achieving compliance with the SDWA and other federal environmental legislation.[125] For example, in the early 1990s, a city in Maine was told by the EPA that it had to install a drinking water filtration system at a cost of $20 million

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117. *See* REYNOLDS, *supra* note 5, § 106, at 326.

118. Fiscal Assistance to State and Local Governments Act, Pub. L. No. 92-512, 86 Stat. 919 (1972).

119. *See* REYNOLDS, *supra* note 5, § 106, at 327.

120. For an examination of specific categories of funding authorized to be appropriated under the SDWA and its amendments, see *infra* Part IV.B.

121. Jeffrey Marks, *The Role of Federal Environmental Mandates in Intergovernmental Relations*, ENVIRONS ENVTL. L. & POL'Y J., Dec. 1996, at 17, 18.

122. *Id.* (citing U.S. GEN. ACCT. OFF., STATE AND LOCAL FINANCES: SOME JURISDICTIONS CONFRONTED BY SHORT AND LONG-TERM PROBLEMS (1993)).

123. *See* Cynthia C. Kelly, *Escalating Environmental Mandates: Can Local Governments Cope?*, PUB. MGMT., Mar. 1993, at 2, 5.

124. *See id.*

125. *See generally* Kelly, *supra* note 27, at 23-24 (citing examples of the possible effects of compliance requirements imposed by the EPA).

to comply with the SDWA.[126] However, in this case, it would have been more cost-efficient for the city to replace its one-hundred-year-old water pipes for half the cost.[127] These huge financial burdens are not only caused by federal environmental laws but by state laws as well.[128]

When examining the financial burdens municipal water utilities face, it is important to be aware of the grant programs created and authorized for appropriation under the SDWA and how the grant programs operate. Generally, the grants are awarded to states based on criteria established by the EPA; the grant monies are then made available through the state governments to the cities.[129] Inactivity by state governments in implementing the prerequisite programs can result in ineligibility for the grants and can result in the denial of funding requested by local governments. In addition, it seems obvious that the amount of these grant monies falls woefully short of satisfying potential needs, of many municipal utilities.[130]

Although some sources of federal and state funding may be available, the reality is that the major burden of the cost of compliance falls upon the customers of municipal water utilities.[131] Because municipal utilities' motivations are more to serve the public than turn a profit, the rates the customers pay have a direct

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126. *See id.* at 23.

127. *See id.*

128. *See id.* (noting the increase in environmental legislation at both the federal and state governmental levels without any funding for its implementation, the financial burden of which would be shouldered by local governments). For a look at the related issue of groundwater cleanup on local governments and its financial impact, see Mark Glaser & Chris Cherches, *Local Government's Role in Groundwater Cleanup: Preempting Superfund and Protecting the Local Economy*, PUB. MGMT., Feb. 1992, at 4, 4.

129. For example, the grants for state programs created by the SDWA in 1974 required the states to establish (immediately or within one year of application for the grant monies to the EPA) a "public water system supervision program." Safe Drinking Water Act, Pub. L. No. 93-523, § 2(a), 88 Stat. 1660, 1684 (1974). The SDWA defined a "public water system supervision program" as:

> [A] program for the adoption and enforcement of drinking water regulation (with such variances and exemptions from such regulations under conditions and in a manner which is not less stringent than the conditions under, and the manner in, which variances and exemptions may be granted under section 1415 and 1416 [of the Act]) which are no less stringent than the national primary drinking water regulations under section 1412 [of the Act], and for keeping records and making reports required by section 1413(a)(3).

Id., 88 Stat. at 1685.

130. *See infra* Part IV.B (outlining the types and amounts of grant monies authorized to be appropriated under the SDWA and its amendments).

131. *See* David L. Markell, *The Role of Local Governments in Environmental Regulation: Shoring Up Our Federal System*, 44 SYRACUSE L. REV. 885, 886 (1993) (noting the increasing financial burden facing the City of Columbus, Ohio, due to environmental mandates from the federal and state governments).

correlation to these costs.[132] If the municipal utilities' rates are regulated by a state agency, it may slow down compliance with the SDWA by increasing the time period necessary for acquiring the funds to achieve compliance.[133] In addition, if the state's regulatory body of municipal utilities directs a municipal utility to drill a new well for drinking water due to the condition of the city's other wells, the municipality may bear the entire burden of drilling the new well, unless state or federal grant money is available.[134]

Because of the strained financial situations, cities must take proactive approaches to combat agricultural threats to drinking water supplies. In Iowa, a partnership called the Raccoon River Watershed Project was formed by a group of farm, environmental, and agribusiness associations and the Des Moines Water Works to protect the Raccoon River, which is the source of drinking water for over 250,000 people.[135] As part of this program, the Des Moines Water Works built a $6 million exchange system to remove nitrates[136] from drinking water in 1990.[137] The Raccoon River Watershed Project was also planning to construct a new wetland as part of the project in an effort to recreate the natural environment that can naturally remove many of the nitrates.[138] Other erosion and educational projects are also in place to fight erosion.[139]

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132. *See* REYNOLDS, *supra* note 5, § 113, at 344.

133. *See, e.g.*, WIS. ADMIN. CODE §§ PSC 185.15, .21 (1997).

134. This hypothetical is actually based on my personal experience when I served as the secretary of a municipal water and sewer commission in a city (population 10,000) in Wisconsin from 1994-1996. The state regulatory body indicated that the city might need to drill a new well in the future, potentially costing in excess of $1 million.

135. *See* Perkins, *supra* note 26, at 1FC.

136. For a discussion on nitrate contamination in drinking water sources and the health effects of nitrates, see *infra* Part V.

137. *See* Perkins, *supra* note 26 at 1FC. The Raccoon River Watershed Project is not the only cooperative effort undertaken in Iowa. *See Protecting Waterways Unites City Dwellers, Farmers, Government*, DES MOINES REG., Aug. 19, 1997, at A4. As part of the Big Spring project in northeast Iowa, state and federal aid is being used to assist farmers in decreasing fertilizer applications by 34%, in an effort to decrease the levels of nitrates and pesticides in groundwater. *See id.* Anti-erosion programs like the Coon Creek, Beeds Lake, and Pine Lakes projects encourage conservation practices like no-till fields and the use of buffer strips. *See id.* For an analysis of drinking water treatment techniques employed by Iowa municipal utilities, including reducing nitrates, see CENTER FOR HEALTH EFFECTS OF ENVTL. CONTAMINATION, HISTORICAL COMMUNITY WATER SUPPLY AND TREATMENT DATA FOR THE STATE OF IOWA (3d ed. 1998). For more information on the report, contact the Center for Health Effects of Environmental Contamination (CHEEC), University of Iowa, 100 Oakdale Campus #N202 OH, Iowa City, IA 52242-5000 or (319) 335-4550.

138. *See* Perkins, *supra* note 26, at 1FC.

139. *See id.* Other erosion projects include: planting of willow trees to stem erosion; rotational grazing, which involves dividing pastures into smaller areas for grazing; special hybrids of corn that are planted in a higher density; demonstration sites, including the "N-check" test that allows farmers to gauge their application of nitrogen fertilizers; and by selling services which help the environment. *See id.* These efforts have been successful. *See Protecting Waterways Unites City Dwellers, Farmers, Government*, *supra* note 137, at A4. For example, by planting corn in rows closer

Another issue that has a direct correlation to available funding is the training of waterworks employees. Municipal utilities struggle to keep their workers adequately trained to comply with new environmental regulations.[140] Although many facilities are becoming more computerized, humans still play an important role in drinking water treatment. Current training methods fall short of keeping those workers abreast with the complexities of water treatment.[141] In fact, according to the EPA, a significant threat to surface water that may be treated and distributed for human consumption is contamination due to "improperly operated wastewater treatment plants, especially smaller ones."[142] The cryptosporidium and giardia outbreaks in recent years mainly can be attributed to improperly operated drinking water treatment facilities.[143]

D. *Conclusion*

Compliance with environmental laws like the SDWA may be difficult, if not impossible, unless there is a decline in unfunded mandates, and an increase in awareness by the state and federal governments of the financial crunch some cities are facing. Cities may be forced to decrease or eliminate services. If this trend continues, it will become even more important for cities to pursue alternative solutions to this problem and consider forming unique alliances like the Raccoon River Watershed Project[144] to address drinking water quality problems.

IV. THE IMPLEMENTATION OF THE SAFE DRINKING WATER ACT AND ITS AMENDMENTS BY CITIES

A. *Introduction*

One of the responsibilities of cities is to provide safe drinking water to its residents. This service is regulated at the federal level by the SDWA and its amendments.[145] This section will analyze the evolution of the SDWA and describe the various grants authorized to be appropriated to assist the cities in implementing the Act. This section also will examine the implementation of the SDWA by cities.

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together, farmers have been able to decrease weed growth and herbicide use, and have seen yields increase by, in some cases, 30%. *See id.*

140. *See FYI: Training Needed for Water Treatment*, PUB. MGMT., June 1997, at 24, 24.

141. *See id.*

142. *Id.* at 25 (noting that a source of drinking water contamination is the inadequate operation of water treatment plants).

143. *See id.*

144. *See, e.g.*, Perkins, *supra* note 26, at 1FC (outlining the Raccoon River Watershed Project).

145. *See* 42 U.S.C.A. § 300g (West 1998).

B. *The History of the Safe Drinking Water Act*

1. *Introduction*

Although it is collectively known as the SDWA, the Safe Drinking Water Act actually consists of the original bill passed in 1974,[146] and its amendments which were enacted subsequently in 1977,[147] 1980,[148] 1986,[149] 1988,[150] and 1996.[151] In terms of applicability, the SDWA generally defines a public water system as a system that provides water to the public for human consumption if the system "has at least fifteen service connections or regularly serves at least twenty-five individuals."[152] However, water systems consisting of only storage and distribution facilities, or that did not sell water to any persons, are eligible for exemption under the SDWA.[153] This section will briefly outline the history and evolution of the

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146. *See* Safe Drinking Water Act, Pub. L. No. 93-523, 88 Stat. 1660 (1974).

147. *See* Safe Drinking Water Act Amendments of 1977, Pub. L. No. 95-190, 91 Stat. 1393.

148. *See* Safe Drinking Water Act Amendments of 1980, Pub. L. No. 96-502, 94 Stat. 2737.

149. *See* Safe Drinking Water Act Amendments of 1986, Pub. L. No. 99-339, 100 Stat. 642.

150. *See* Lead Contamination Control Act of 1988, Pub. L. No. 100-572, 102 Stat. 2884.

151. *See* Safe Drinking Water Act Amendments of 1996, Pub. L. No. 104-182, 110 Stat. 1613.

152. 42 U.S.C.A. § 300f(4)(A) (West Supp. 1998). This section states:

> The term 'public water system' means a system for the provision to the public of water for human consumption through pipes or other constructed conveyances, if such system has at least fifteen service connections or regularly serves at least twenty-five individuals. Such term includes (i) any collection, treatment, storage, and distribution facilities under control of the operator of such system and used primarily in connection with such system, and (ii) any collection or pretreatment storage facilities not under such control which are used primarily in connection with such system.

Id. For a case examining the applicability of the SDWA to a particular water system, see *United States v. Midway Heights Water District*, 695 F. Supp. 1072 (E.D. Cal. 1988). In *Midway Heights Water District*, the rural water district challenged an injunction that forced it to comply with the provisions of the SDWA. *See id.* at 1073. The rural water district stipulated that the level of contaminants found in the system's drinking water exceeded MCLs but argued the provisions were inapplicable due to the small size of the system. *See id.* at 1076. Forty households representing 113 users utilized the system for drinking, cooking, bathing, and oral hygiene. *See id.* The court ruled that there was "imminent and substantial endangerment to the health of persons" and the SDWA authorized preventative action when such conditions exist. *Id.* (citing 42 U.S.C. § 300(i)(a) (1988)). Additionally, in rejecting a challenge by the rural water district, the court upheld the requirement imposed by the EPA that the water district install a chlorination/coagulation system. *See id.* at 1076-77. The court also rejected the rural water district's claim of potential economic hardship if the injunction were not lifted. *See id.*

153. *See* 42 U.S.C. § 300g (1994) (exempting certain public water systems from applicability of the National Primary Drinking Water Regulations). Section 300g states:

> Subject to sections 300g-4 and 300g-5 of this title, national primary drinking water regulations under this part shall apply to each public water system in each State; except that such regulations shall not apply to a public water system—

SDWA and describe the types of grant programs and monies available under the Act.

2. *Safe Drinking Water Act*

In 1974, Congress enacted this country's most comprehensive drinking water quality standards, the SDWA,[154] and directed the EPA, created four years earlier under President Nixon,[155] to implement the SDWA.[156] The SDWA actually

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(1) which consists only of distribution and storage facilities (and does not have any collection and treatment facilities);
(2) which obtains all of its water from, but is not owned or operated by, a public water system to which such regulations apply;
(3) which does not sell water to any person; and
(4) which is not a carrier which conveys passengers in interstate commerce.

Id.

154. *See* Safe Drinking Water Act, Pub. L. No. 93-523, 88 Stat. 1660 (1974).

155. *See id.* § 1412(a)(1), 88 Stat. at 1662; *see generally* Reorg. Plan No. 3 of 1970, 25 Fed. Reg. 15,623 (1970), *reprinted in* 5 U.S.C. app. at 1551 (1994), *and in* 84 Stat. 2086 (1970) (establishing the Environmental Protection Agency).

156. The regulation of drinking water quality in the United States did not begin with the passage of the SDWA in 1972. In fact, scientists knew about drinking water dangers even in the 19th century. In Germany in 1853, F. Cohm used a microscope and found a relationship between water quality and algae and other microorganisms. *See* Charles D. Larson, *Historical Development of the National Primary Drinking Water Regulations*, *in* SAFE DRINKING WATER ACT: AMENDMENTS, REGULATIONS AND STANDARDS 3, 6 (Edward J. Calabrese et al. eds., 1989). A year later in London, Dr. John Snow investigated the cholera outbreak and attributed it to contaminated drinking water. *See id.* In addition, Escherich discovered *Bacterium coli* in 1885. *See id.* Congress passed the Interstate Quarantine Act of 1893, ch. 114, 27 Stat. 449, that in part authorized the Surgeon General of the U.S. Public Health Service to promulgate regulations to prevent the introduction of contagious or infectious diseases from other countries and interstate. *See* Interstate Quarantine Act of 1893, ch. 114, § 3, 27 Stat. 449, 450. The first standard methods were published in 1905, and in 1912, the common cup was banned on interstate carriers. *See* Larson, *supra.* The first U.S. Public Health Service (PHS) drinking water standards, that were only bacteriological, were initially established in 1914. *See id.* The first revision of these standards occurred 11 years later, and these revisions included source protection, the addition of chemicals, and the discontinuance of the use of the plate count. *See id.* In 1942, the second revision of the PHS standards resulted in the standards being divided into two parts—standards with additional chemicals added and a waterworks practice manual. *See id.* The third revision in 1946 resulted in the practice manual being published separately, and the use of a membrane filter was allowed in 1957. *See id.* The last PHS revision prior to the adoption of the SDWA also involved many significant changes. *See id.* These revisions included: the elimination of the waterworks practice manual; the addition of carbon chloroform extract, alkyl benzene sulfonate-detergents, barium, cadmium, cyanide, nitrate, and silver to the list's contaminants to be tested for; the addition of fluorides with climate considerations; testing for radioactivity for the first time; and providing information regarding the rationale for the chemical standards. *See id.* The fourth revision of the PHS remained in effect until the passage of the SDWA. *See id.* For an evaluation of public drinking water supplies prior to the SDWA, see WATER QUALITY OFF., U.S. EPA, COMMUNITY WATER SUPPLY STUDY: SIGNIFICANCE OF NATIONAL FINDINGS (1971), *reprinted in* SENATE COMM. ON

consisted of two components—the regulation of drinking water contamination and the control of certain types of groundwater[157]—that were achieved through the SDWA's four major programs: the establishment of national drinking water standards; the regulation of underground injection wells; the protection of aquifers that serve as the sole source of drinking water for municipalities; and the protection of the areas surrounding wellheads that provide water to municipal water systems.[158]

The SDWA actually has two tiers of enforcement that occur at the federal and state levels. The EPA promulgates rules and regulations to actually implement the SDWA.[159] States then have to comply with the federal regulations and also impose their own regulations upon municipalities.[160]

In order to implement the SDWA in 1974, the EPA had the responsibility for promulgating National Interim Primary Drinking Water Regulations (NIPDWRs)[161] intended to "protect health to the extent feasible, using technology, treatment techniques, and other means, which the [EPA] Administrator determine[d] [were] generally available (considering costs) on the date of enactment of this title."[162] The NIPDWRs regulated specific contaminants that the EPA Administrator believed to have an adverse impact on the health of the consumers.[163] The NIPDWRs were to be published within 90 days of the SDWA's passage, and the EPA Administrator was to revise the NIPDWRs, as necessary, within 180 days of the SDWA's passage.[164] The NIPDWRs then became effective eighteen months after they were promulgated.[165]

As part of establishing the NIPDWRs, the EPA Administrator specified maximum contaminant levels (MCLs) for each contaminant that served as the maximum level permitted in the drinking water.[166] The water utilities were given discretion in choosing which method they used to meet the MCLs.[167]

Besides the establishment of the NPDWRs, the SDWA also required the creation of National Secondary Drinking Water Regulations (NSDWRs). In

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ENV'T & PUB. WORKS, NO. 97-9, A LEGISLATIVE HISTORY OF THE SAFE DRINKING WATER ACT (1982).

157. *See* Edward J. Messina, *Filtration Avoidance Under the Safe Drinking Water Act*, 19 VT. L. REV. 557, 560 (1995) (footnotes omitted).

158. *See id.* at 560-61 (citing 42 U.S.C. §§ 300g to 300g-6, 300h-3, 300h-6, 300h-7 (1994)).

159. *See* 42 U.S.C.A. § 300g-1 (West Supp. 1998).

160. *See id.* § 300g-2.

161. After the establishment of the initial regulations, NIPDWRs became known as the National Primary Drinking Water Regulations (NPDWRs) and have been regularly updated by the EPA. *See* Safe Drinking Water Act, Pub. L. No. 93-523, § 2(a), 88 Stat. 1660, 1662-63 (1974).

162. *Id.* § 2(a), 88 Stat. at 1662.

163. *See id.*, 88 Stat. at 1663.

164. *See id.*, 88 Stat. at 1663.

165. *See id.*, 88 Stat. at 1664.

166. *See id.*, 88 Stat. at 1663; Messina, *supra* note 157, at 565.

167. *See id.*, 88 Stat. at 1663.

contrast to the NPDWRs, the NSDWRs were designed to regulate contaminants in the water "which may adversely affect the odor or appearance of such water and consequently may cause a substantial number of persons . . . to discontinue its use, or . . . which may otherwise adversely affect the public welfare."[168] The NSDWRs generally address aesthetic concerns (e.g., water taste, color, odor) to protect the public welfare.[169] However, unlike the NPDWRs, the NSDWRs are not enforceable under the SDWA, serving instead as state guidelines.[170]

As part of the second component, the SDWA directed the EPA Administrator to promulgate regulations to protect underground sources of drinking water by regulating state underground injections that threaten drinking water supplies.[171] This component was to be implemented by the proposal of regulations for state underground injection control programs within 180 days of the passage of the SDWA.[172] Any further underground injections were to be prohibited three years after passage of the SDWA unless a permit had been previously granted.[173] However, the granting of a permit did not allow injections that would contaminate drinking water even after three years.[174]

The SDWA provided grants to states to assist them in carrying out provisions of the Act.[175] The SDWA provided grants for public water system supervision programs as follows: $15 million for the fiscal year ending June 30, 1976, and $25 million for the subsequent fiscal year;[176] grants for special study and demonstration projects totaling $7.5 million for the fiscal year ending June 30, 1975, $7.5 million for the fiscal year ending June 30, 1976, $10 million for the subsequent fiscal year;[177] and grants for projects or activities including "develop[ing] and expand[ing] the capability of programs of States and municipalities to carry out . . . purposes" including research, technical assistance,

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168. *Id.*, 88 Stat. at 1661.

169. Messina, *supra* note 157, at 566 (citing 42 U.S.C. § 300f(2) (1994)).

170. *See id.* (citing 42 U.S.C. § 300f(2) (1994), 40 C.F.R. § 143.1 (1997)).

171. *See id.* § 2(a), 88 Stat. at 1674. The Act defined "underground injection" as "the subsurface emplacement of fluids by well injection." *Id.*, 88 Stat. at 1676. The major concern of underground injections was that they threatened drinking water supplies because the injections

> [M]ay result in the presence in underground water which supplies or can reasonably be expected to supply any public water system of any contaminant, and if the presence of such contaminant may result in such system's not complying with any national primary drinking water regulation or may otherwise adversely affect the health of persons.

Id., 88 Stat. at 1676.

172. *See id.*, 88 Stat. at 1674.

173. *See id.*, 88 Stat. at 1675.

174. *See id.*, 88 Stat. at 1675.

175. *See, e.g., id.*, 88 Stat. at 1684 (establishing grants for state water supervision programs).

176. *See id.*, 88 Stat. at 1684.

177. *See id.*, 88 Stat. at 1685-86.

information, training, or personnel allocating $15 million for the fiscal year ending June 30, 1975, $25 million for the fiscal year ending June 30, 1976, and $35 million for the fiscal year ending June 30, 1977.[178] In addition, funding was appropriated for conducting surveys of the quantity, quality, and availability of rural drinking water supplies.[179] The purpose of these surveys was to focus on persons who were served by public or private drinking water sources and who may have been subjected to health risks associated with poor drinking water quality.[180] In funding these surveys, Congress provided $1 million for the fiscal year ending June 30, 1975, $2 million for the next fiscal year, and $1 million for the third fiscal year.[181]

3. *Safe Drinking Water Act Amendments of 1977*

The SDWA Amendments of 1977 made various changes to the original language of the SDWA to extend and increase authorizations provided for public water systems. As part of the amendments, Congress directed the EPA to submit a report within eighteen months after the amendments' passage that included the identification and analysis of costs associated with compliance and implementation of drinking water regulations; alternative methods of compliance that could be pursued by the state and local governments; and proposals for funding the costs of complying the SDWA's regulations.[182] Additionally, the SDWA Amendments of 1977 required a separate report to be created by the EPA identifying and analyzing the same criteria as it applied to public water utilities serving small communities.[183] The SDWA Amendments of 1977 added to the monitoring requirements of the original SDWA by calling for monitoring of unregulated contaminants that had a detrimental impact on drinking water.[184]

The SDWA Amendments of 1977 appropriated additional funding for each of the programs established under the SDWA for two additional fiscal years.[185] Funding designated for research, technical assistance, information, and training of personnel was reauthorized for appropriation in the amounts of $17 million for fiscal years 1978 and 1979.[186] Additionally, $8 million was authorized for two fiscal years to be used for "provid[ing] technical assistance to states and municipalities in the establishment and administration of public water system

178. *Id.*, 88 Stat. at 1684.
179. *See id.* § 3(a), 88 Stat. at 1693.
180. *See id.*
181. *See id.* § 3(c), 88 Stat. at 1694.
182. *See* Safe Drinking Water Act Amendments of 1977, Pub. L. No. 95-190, § 3(a), 91 Stat. 1393, 1393-94.
183. *See id.*, 91 Stat. at 1394.
184. *See id.* § 12, 91 Stat. at 1398.
185. *See id.* § 2(a)-(d), 91 Stat. at 1393.
186. *See id.* § 2(a), 91 Stat. at 1393.

supervision programs . . . ."[187] State program grants for public water system supervision programs were authorized for appropriation,[188] and funding for the purpose of underground water source protection was also authorized.[189] An amount of $1 million was authorized to be appropriated for two fiscal years to be used for surveys of rural public water systems.[190]

4. *Safe Drinking Water Act Amendments of 1980*

The SDWA Amendments of 1980 made minor changes to the exemption provisions of the SDWA by allowing noncompliance of a public water system in certain situations and amending other sections.[191] Also, a new section was added relating to what it called "optional demonstration by states relating to oil or natural gas" that related to the regulation of underground injection programs.[192] The purpose of these grants was to encourage states to develop effective programs for "prevent[ing] underground injection[s] which endanger[] drinking water sources."[193]

5. *Safe Drinking Water Act Amendments of 1986*

Congress made significant revisions to the SDWA in 1986 that may have been partially due to its dissatisfaction with the EPA's failure to establish standards for a large number of contaminants that have adverse effects on humans.[194] In response, the SDWA Amendments of 1986 increased the number of contaminants regulated and set specific deadlines for compliance.[195] The law required the EPA to regulate eighty-three specific contaminants and to prescribe a priority list of contaminants.[196] In addition to the MCLs that were required to be promulgated

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187. Safe Drinking Water Act, Pub. L. No. 93-523, § 2(a), 88 Stat. 1660, 1683 (1974); *see* Safe Drinking Water Act Amendments of 1977, Pub. L. No. 95-190, § 2(a), 91 Stat. 1393, 1393.

188. *See id.* § 2(b), 91 Stat. at 1393 (allocating $35 million and $45 million for fiscal years 1978 and 1979, respectively).

189. *See id.* § 2(c), 91 Stat. at 1393 (allocating $10 million for fiscal years 1978 and 1979).

190. *See id.* § 2(d), 91 Stat. at 1393.

191. *See* Safe Drinking Water Act Amendments of 1980, Pub. L. No. 96-502, §§ 3-5, 94 Stat. 2737, 2738-39; *see also* Safe Drinking Water Act, Pub. L. No. 93-523, § 2(a), 88 Stat. 1660, 1672 (1974).

192. *Id.* § 2(a), 94 Stat. at 2737.

193. *Id.*, 94 Stat. at 2737.

194. *See* Messina, *supra* note 157 at 562 (citing 47 Fed. Reg. 9350 (1982); 48 Fed. Reg. 45,502 (1983)); *see generally* Safe Drinking Water Act Amendments of 1986, Pub. L. No. 99-339, 100 Stat. 642 (amending the Safe Drinking Water Act).

195. *See id.* § 101(b), 100 Stat. at 643.

196. *See* H.R. CONF. REP. NO. 99-575, at 30 (1986), *reprinted in* 1986 U.S.C.C.A.N. 1566, 1593-94 (outlining the 83 contaminants for regulation by the EPA).

with the passage of the SDWA in 1974, the SDWA Amendments of 1986 also required the establishment of maximum contaminant level goals (MCLGs).[197] Unlike the MCLs, the MCLGs are unenforceable goals that water utilities should attempt to achieve.[198]

The SDWA Amendments of 1986 authorized appropriations for programs created previously under the SDWA and its first two amendments.[199] Appropriations were authorized for technical assistance and emergency grants,[200] state supervision programs,[201] underground water source protection programs,[202] and state programs designed to establish wellhead protection areas.[203] For technical assistance and emergency grants, $7.65 million was authorized to be appropriated for fiscal years 1987 and 1988, and $8.05 million was authorized for fiscal years 1989-1991.[204] Grant funding was also authorized for appropriation to assist in compliance with these regulations and the research of threats to drinking water supplies.[205] These grants were authorized in the amount of $35.6 million for fiscal years 1987 and 1988, and $38.02 million for fiscal years 1989-1991.[206] Grants for the state supervision programs were authorized to be appropriated in the amount of $37.2 million for fiscal years 1987 and 1988, and $40.15 million for fiscal years 1989-1991.[207] The underground water source protection program received $19.7 million for fiscal years 1987 and 1988, and $20.85 million for fiscal years 1989-1991.[208] Grants for the protection of wellhead areas received $20 million for fiscal years 1987 and 1988, and $35 million for fiscal years 1989-1991.[209]

6. *Lead Contamination Act of 1988*

In 1988, the SDWA was again amended by the passage of the Lead Contamination Control Act of 1988.[210] These amendments instituted a prohibition on the use of drinking water coolers containing lead components with lead levels greater than eight percent.[211] Lead is known to have unhealthy effects on the

197. *See id.* § 101(a), 100 Stat. at 643.
198. *See* Messina, *supra* note 157, at 563 (citing 42 U.S.C. § 300g-1(b)(4) (1994)).
199. *See generally* Safe Drinking Water Act Amendments of 1986, Pub. L. No. 99-339, 100 Stat. 642 (reauthorizing appropriations for various programs).
200. *See id.* § 301(a), 100 Stat. at 663-64.
201. *See id.* § 301(b), 100 Stat. at 644.
202. *See id.* § 301(c), 100 Stat. at 664.
203. *See id.* § 301(e), 100 Stat. at 664.
204. *See id.* § 301(a), 100 Stat. at 663.
205. *See id.*, 100 Stat. at 663.
206. *See id.*, 100 Stat. at 663-64.
207. *See id.* § 301(b), 100 Stat. at 664.
208. *See id.* § 301(c), 100 Stat. at 664.
209. *See id.* § 301(e), 100 Stat. at 664.
210. Lead Contamination Act of 1988, Pub. L. No. 100-572, 102 Stat. 2884.
211. *See id.* § 2(a), 102 Stat. at 2884-87.

human body.[212] The Lead Contamination Control Act of 1988 also established a state grant program designed to prevent lead poisoning, particularly in children and infants.[213] Applicants for these grants had to prove their programs "include[d] educational programs designed to communicate to parents, educators, and local health officials the significance and prevalence of lead poisoning in infants and children which the program is designed to detect and prevent."[214] Grant monies were authorized to be appropriated in the amount, as follows: $20 million for fiscal year 1989, $22 million for fiscal year 1990, and $24 million for fiscal year 1991.[215] However, the amendments were not generally applicable to municipal utilities providing drinking water to city residents.[216]

7. *Safe Drinking Water Act Amendments of 1996*

Most recently, Congress passed the Safe Drinking Water Act Amendments of 1996.[217] In general, these amendments seem to be directed more at municipalities. One new provision of the amendments is the requirement that municipal water utilities release an annual report detailing the presence of chemicals and bacteria in the water.[218] In addition, consumers must be notified

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212. *See id.*, 102 Stat. at 2884 (establishing lead standards for water distribution products like water coolers).

213. *See id.* § 3, 102 Stat. at 2887-89.

214. *Id.*, 102 Stat. at 2887.

215. *See id.*, 102 Stat. at 2889.

216. In *American Water Works Ass'n v. EPA*, the American Water Works Association and the Natural Resources Defense Council sought a judicial review of the final rule promulgated by the EPA relating to lead. *See* American Water Works Ass'n v. EPA, 40 F.3d 1266, 1268 (D.C. Cir. 1994). Instead of setting an MCL for a lead, the EPA chose, as permitted under the SDWA, to specify a treatment technique because the EPA determined that it was not "economically or technologically feasible" to deduce the level of the contaminant in public water systems. *Id.* at 1269 (citing 42 U.S.C. § 300f(1)(C)(ii) (1994)). After examining the history behind the rule, which included the determination that it is extremely difficult to ascertain the level of lead in a system, the court, in part, ruled that the EPA's actions were appropriate and the agency's interpretation of the SDWA's language was reasonable in light of the legislative history of the Act. *See id.* at 1270-72. The American Water Works Association also challenged the EPA's exclusion of transient, non-community systems from the lead rule. *See id.* at 1272-73. The court remanded that issue to the EPA for further justification of the agency's decision to exclude transient systems. *See id.* at 1273. The court also partially vacated the EPA's final rule that established "criteria for determining whether a water system service line is under the 'control' of the system operator, and thus subject to the lead service line replacement regulations." *Id.* at 1275. The court found that the EPA had failed to provide adequate notice to interested parties, in particular, the owners of private lead service lines. *See id.* at 1275.

217. Safe Drinking Water Act Amendments of 1996, Pub. L. No. 104-182, 110 Stat. 1613.

218. *See id.* § 114, 110 Stat. at 1639-40; *see also* National Primary Drinking Water Regulations: Consumer Confidence, 63 Fed. Reg. 7605, 7609 (1998) (to be codified at 40 C.F.R. pts. 141 & 142) (proposed Feb. 13, 1998).

within twenty-four hours when a contaminant poses a "significant risk" to the drinking water supply.[219] The amendments also broadened the scope of the applicability of the SDWA to include any system that pumps "water for human consumption through pipes or other constructed conveyances."[220]

The amendments also assist municipalities in complying with the SDWA and the regulations established under it.[221] For this reason, these amendments do not completely appear to be an unfunded mandate. Like many of the earlier amendments, the SDWA Amendments of 1996 reauthorized the appropriation of funding for programs that were already in existence.[222] These programs included: critical aquifer protection,[223] wellhead protection areas,[224] and underground injection control grants.[225]

The SDWA Amendments of 1996 have also created some new programs and provided for their funding. An amount of $2.5 million was authorized to be appropriated for four fiscal years beginning in 1997.[226] These funds will be used for studying the health risk associated with arsenic in drinking water.[227] Another grant program was established to provide funding to colleges and universities "to establish and operate small public water system technology assistance centers . . . ."[228] The purpose of this program is to assist small and rural communities and Native American Tribes served by small public water systems.[229] These grants are authorized to be appropriated for $2 million for fiscal years 1997 through 1999, and $5 million for fiscal years 2000 through 2003.[230]

Similarly, grants of $15 million each year for fiscal years 1997 through 2003 are authorized to be appropriated to "provide technical assistance to small public water systems to enable [them] . . . to achieve and maintain compliance with applicable [NPDWRs] . . . ."[231] Operator certification programs were created

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219. *See id.*, 110 Stat. at 1636-38 (to be codified at 42 U.S.C. § 300g-3(c)).

220. *Id.* § 101(b)(1)(A), 110 Stat. at 1616 (to be codified at 42 U.S.C. § 300f(4)). The impetus for this change was *Imperial Irrigation District v. EPA*, 4 F.3d 774 (9th Cir. 1993), in which the court determined that the public water system provisions of the SDWA were inapplicable "to an irrigation district supplying residences, schools and businesses with untreated water through open canals." 63 Fed. Reg. 41,940, 41,940 (1998).

221. *See* Bill Bell, Jr., *Drinking Water Bill Clears House, Senate*, DES MOINES REG., Aug. 3, 1996, at 3A.

222. *See, e.g., id.* § 120, 110 Stat. at 1650-51 (to be codified at 42 U.S.C. §§ 300h-6, 300h-7(k), 300j-2(b)(5)).

223. *See id.* § 120(a), 110 Stat. at 1650 (to be codified at 42 U.S.C. § 300h-6).

224. *See id.* § 120(b), 110 Stat. at 1650 (to be codified at 42 U.S.C. § 300h-7(k)).

225. *See id.* § 120(c), 110 Stat. at 1651 (to be codified at 42 U.S.C. § 300j-2(b)(5)).

226. *See id.* § 109, 110 Stat. at 1627-28 (to be codified at 42 U.S.C. § 300g-1(b)).

227. *See id.*, 110 Stat. at 1627-28.

228. *Id.* § 119, 110 Stat. at 1649 (to be codified at 42 U.S.C. § 300g-9).

229. *See id.*, 110 Stat. at 1649.

230. *See id.*, 110 Stat. at 1649-50.

231. *Id.* § 122, 110 Stat. at 1651 (to be codified at 42 U.S.C. § 300j-1(e)).

under the law which would "specify[] minimum standards for certification and (recertification) of the operators [of water treatment equipment]" employed by water utilities.[232] These grants, totaling $30 million each year for fiscal years 1997 through 2003, will be distributed through state grants.[233] One of the grant programs is designated as the "state revolving loan funds," designed to "further the health protection objectives . . . , promote the efficient use of fund resources, and for other purposes . . . ."[234]

These grants are also to be used in assisting "disadvantaged communities," which are defined as "the service area of a public water system that meets affordability criteria established after public review and comment by the State in which the public water system is located."[235] These grants seem to address the financial strain that some communities are facing. Nearly $599 million was authorized for appropriation in the fiscal year 1994, with $1 billion authorized for the subsequent fiscal years 1995 through 2003.[236]

When the amendments were enacted, Congress created a new grant program for state ground water protection grants.[237] In order for a state to be eligible for grant monies, it must submit an application for a state groundwater protection program, and grant monies will be awarded based on "an assessment of the extent of ground water resources in the State and the likelihood that awarding the grant will result in sustained and reliable protection of ground water quality."[238] Grant monies were also allocated for "innovative programs proposed by a State for the prevention of ground water contamination."[239] However, any award of funding under these grant programs cannot be used for any remedial programs to address existing groundwater contamination.[240] Congress authorized $15 million to be appropriated for the fiscal years 1997 through 2003.[241] Additionally, grants to support state drinking water quality programs were created.[242] In particular, $5 million was authorized to be appropriated for five fiscal years to assist state programs; however, the amount of the grant funding cannot exceed fifty percent of the costs associated with administering the state program.[243]

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232. *Id.* § 123, 110 Stat. at 1652 (to be codified at 42 U.S.C. § 300g-8).
233. *See id.*, 110 Stat. at 1653.
234. *Id.* § 130, 110 Stat. at 1662 (to be codified at 42 U.S.C. § 300j-12).
235. *Id.*, 110 Stat. at 1666.
236. *See id.*, 110 Stat. at 1671.
237. *See id.* § 131, 110 Stat. at 1672 (to be codified at 42 U.S.C. § 300h-8).
238. *Id.*, 110 Stat. at 1673.
239. *Id.*, 110 Stat. at 1673.
240. *See id.*, 110 Stat. at 1673.
241. *See id.*, 110 Stat. at 1673.
242. *See id.* § 133, 110 Stat. at 1678 (to be codified at 42 U.S.C. § 300j-14).
243. *See id.*, 110 Stat. at 1678-79.

Funding was also appropriated under the SDWA Amendments of 1996 for drinking water studies.[244] These studies are designed to be used for "a continuing program of studies to identify groups within the general population that may be at greater risk than the general population of adverse health effects from exposure to contaminants in drinking water."[245] These studies are intended to focus on groups including "infants, children, pregnant women, the elderly, [and] individuals with a history of serious illness . . . ."[246] An amount of $12.5 million is authorized to be appropriated for biomedical studies of these groups for fiscal years 1997 through 2003, and $2 million is also authorized to be appropriated for fiscal years 1997 through 2001 to be used for public awareness programs regarding waterborne diseases.[247]

The last type of funding authorized for appropriation is to be used for additional drinking water research, and up to $26.593 million was authorized to be appropriated for these programs between fiscal years 1997 and 2003.[248] Due to the short time frame since the passage of the SDWA Amendments of 1996, it is uncertain exactly how the EPA will implement each of these programs.[249] However, the good news for cities is that Congress has authorized the appropriation of funds that will be made available to states, which could help offset some of the financial burdens imposed on cities.

8. *Conclusion*

The evolution of the most comprehensive drinking water standards in the United States has continued into the 1990s with Congress making further changes to the original SDWA passed in 1974. Although most of the amendments have dealt with reappropriations of program funding, additional regulations have been imposed on the state and local governments. With this information in mind, it is also important to understand the role of cities in implementing the SDWA.

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244. *See id.* § 135, 110 Stat. at 1681 (to be codified at 42 U.S.C. § 300j-18).

245. *Id.* § 137, 110 Stat. at 1680 (to be codified at 42 U.S.C. § 300j-18).

246. *Id.*, 110 Stat. at 1680.

247. *See id.*, 110 Stat. at 1681-82.

248. *See id.* § 201, 110 Stat. at 1682.

249. For an example of how the EPA is proceeding with implementing some of the grant provisions of the SDWA Amendments of 1996, see Guidance and Information for States on Implementing the Capacity Development Provisions of the Safe Drinking Water Act, 63 Fed. Reg. 6018 (1996).

C. *The Role of Cities in the Implementation of the Safe Drinking Water Act*

Cities are units of local government and have a great number of responsibilities to provide services to their residents.[250] These responsibilities include "protecting the public's health and safety, improving and sustaining a community's quality of life, maintaining a healthy economy, balancing individual interests with the interests of the larger community, and proving an equal-opportunity and open process for public involvement."[251] The service of providing safe drinking water to residents falls within many of these responsibilities.

Historically, the role of the federal government in enacting environmental regulations became more prominent starting in the 1970s.[252] In fact, between 1970 and 1980, the EPA became the largest federal regulatory agency.[253] This growth of the EPA is evidence of the shift towards the centralization of environmental regulations.[254] There are many reasons for the growth of centralized governmental environmental regulation. One of the strongest reasons is that environmental threats often fall outside of a municipality's borders.[255] However, not all environmental threats fall outside of a municipality's jurisdiction, and a solution that works in one locale may not be as effective in another.[256] Restricting the ability of municipalities to deal with environmental issues acts as a limitation on the policy options may be pursued in addressing problems.[257]

Some municipalities have challenged the "one approach fits all situations" mentality that can be found in a centralized system of environmental regulations. For example, in the related area of wastewater treatment, fourteen local governments challenged new EPA standards that dictated the removal of nitrates from wastewater treatment effluents in 1992.[258] The cost of creating the nitrate system for a thirty million-gallon-per-day treatment system would have been $100 million, and cost over $40 million to operate annually.[259] Utility costs for water and sewer have increased by thirty-three percent to comply with existing

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250. *See* Eugene Schiller & Shannon Flanagan, *Protecting Wetlands Is Good Business for Local Governments*, PUB. MGMT., Oct. 1997, at 19, 19-20.

251. *Id.* at 20.

252. *See generally* Robert W. Lake, *Central Government Limitations on Local Policy Options for Environmental Protection*, 46 PROF. GEOGRAPHER 236 (1994) (outlining the role of the federal government in establishing environmental regulations).

253. *See id.* at 236 (citation omitted).

254. *See id.* (explaining the evolution of environmental regulations).

255. *See id.* at 237.

256. *See id.*

257. *See id.* at 238.

258. *See* Kelly, *supra*, note 123, at 3 (noting various examples of the financial impact of environmental regulations).

259. *See id.* (citing comments made by the city manager of a Virginia city).

regulations.[260] A detailed discussion of the financial issues behind complying with environmental regulations is found in Part III of this Note.[261]

D. *Conclusion*

As outlined in this section, the evolution of the SDWA and its amendments has resulted in an increasing burden placed on cities. Cities faced with tight fiscal situations are forced to make difficult allocative decisions in implementing these regulations. While the SDWA does attempt to assist cities financially with its implementation, the grant amounts are probably not sufficient to make a real financial difference for cities. This problem is compounded when considered along with today's agricultural practices that threaten our cities' drinking water quality, and ultimately our health.

V. THE QUAGMIRE OF CITIES DUE TO CURRENT AGRICULTURAL PRACTICES

A. *Introduction*

Although as a society we have become more aware of the fragile nature of our world, we continue to inflict serious and long term damage on our environment.[262] Today, we have abandoned or phased out the use of many chemicals that are known to be detrimental to the environment.[263]

Agricultural practices continue to be one of the biggest threats to the environment.[264] The amount of pesticides, herbicides, and insecticides that are applied to farmers' fields continues to be high, raising the risk that the chemicals will seep into our drinking water supplies.[265] However, the greatest threat today to

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260. *See id.* (noting the financial impact on municipalities due to environmental regulations).

261. *See infra* Part III.

262. *See Agriculture Blamed for U.S. Water Pollution*, DES MOINES REG., May 14, 1998, at 6A (noting the environmental damage caused by agricultural practices to America's waterways).

263. *See* Cass R. Sunstein, *Congress, Constitutional Moments, and the Cost-Benefit State*, 48 STAN. L. REV. 247, 300-01 (1996) (noting the phaseout of chlorofluorocarbons and the government bans on DDT).

264. *See Agriculture Blamed for U.S. Water Pollution, supra* note 262, at 6A (noting that "[a]griculture is the biggest polluter of America's rivers and streams, fouling more than 173,000 miles of waterways with chemicals, erosion and animal waste runoff . . . .").

265. For examination of the percentage of types of major herbicides used and the percentage of acres to which pesticides and herbicides applied to corn and soybean acres in Iowa, see *infra* Appendices A and B, respectively. In general, the percentage of corn and soybean acres treated with herbicides continues to increase, while the percentage of corn and soybean acres treated with insecticides decreases. *See infra* Appendix B. Between 1977 and 1995, herbicide use on corn and soybeans has increased from 94% to 99% of the acres and 97% to 100%, respectively. *See infra* Appendix B. In contrast, in the same period, herbicide use on corn has decreased from 58% to 28% of the acres, while the use on soybeans has stayed below 1% of the acres. *See infra* Appendix B.

drinking water supplies may not be the pesticides, herbicides, and insecticides that are applied to our crops and food, but rather the by-products produced by humans and animals.[266] In this section, the environmental threats of concentrated animal operations and the Iowa Supreme Court case *Goodell v. Humboldt County*[267] will be examined. This section also will outline the threats to drinking water supplies by the application of chemicals as part of agricultural practices.

B. *Concentrated Agricultural Operations and* Goodell v. Humboldt County

Farming practices have evolved from the stereotypical family farm to modern commercial agricultural businesses. In Iowa, pork production contributes $8.5 billion and 89,000 jobs to the state's economy.[268] These concentrated agricultural operations produce more cattle, chicken, and swine than family farmers have historically raised on their small operations.[269] In fact, the raising of animals has become a precise assembly line from their birth to market.[270]

In urban areas, wastewater treatment plants are built to break down human waste and minimize the impact on the environment.[271] This technology has been in use for many years and continues to be improved.[272] However, an efficient and completely environmentally safe method of dealing with animal waste has not been found. A report of the U.S. Senate Committee on Agriculture, Nutrition, & Forestry[273] found that domesticated animals in the United States produce 1,370,000,000 pounds of manure per year.[274] This amount is 130 times more than

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266. For a similar discussion of the threats to agricultural practices to ground water supplies, see Sivas, *supra* note 99, at 157-58.

267. Goodell v. Humboldt County, 575 N.W.2d 486 (Iowa 1998).

268. *See* Jerry Perkins, *Livelihood's at Stake, Iowan Warns*, DES MOINES REG., June 28, 1998, at A1.

269. *See As Hog Factories Spread, So Does Manure*, GRAND RAPIDS PRESS, June 16, 1998, at A8.

270. *See, e.g.*, Eric Voogt, *Pork, Pollution, and Pig Farming: The Truth About Corporate Hog Production in Kansas*, 5 SPG KAN. J.L. & PUB. POL'Y at 219, 219 (1996) (explaining the precisely planned time line of the conception, birth, growth, and slaughter of swine in the swine production industry).

271. *See FYI: Training Needed for Water Treatment*, PUB. MGMT., June 1997, at 24, 24 (noting the crackdown by regulatory agencies on the discharges emitted from wastewater treatment facilities).

272. *See id.* (noting the use of computer controls in wastewater treatment plants).

273. ANIMAL WASTE POLLUTION IN AMERICA, *supra* note 18. This report can also be found at <http://www.senate.gov/~agriculture/animalw.htm>.

274. *See id.* at 11 (citing the Center for Agricultural and Rural Development, Iowa State University). The following is a summary of how this figure is derived:

the amount of human waste produced in the United States each year.[275] In contrast to human waste, however, animal waste is untreated prior to being placed on farmers' fields or spilling into waterways.[276] Since the practices of farming began, farmers have been putting manure on their fields as a natural fertilizer to promote the growth of their crops. However, today's concentrated animal operations produce such large amounts of waste in a small area that it cannot all be distributed on a farmer's own fields.

Often, the source of contamination or danger to public water supplies occurs outside the jurisdiction of the municipality. For example, if a hog lot is built in close proximity to a river twenty-five miles upstream from a city, the city is powerless to regulate the construction of the hog lot's manure lagoon and cannot monitor the facility. If manure from the hog lot would spill into a river that was used for the city's drinking water supply, the city could only temporarily cease drawing water from the river and rely on some other source.[277]

Recently, the EPA has announced plans to regulate large animal operations, farms with a history of pollution, and farms in "environmentally sensitive areas"[278]

Animal	Solid Manure (tons/yr.)
Cattle	1,229,190,000
Hogs	116,652,300
Chickens	14,394,000
Turkeys	5,425,000
	1,365,661,300

Id.

275. *See U.S. Staggers Under Weight of Waste from Farm Animals*, *supra* note 19, at A6.

276. *See id.*

277. The failure to be notified of hazardous situations and spills, and the inadequate training of utility employees are also problems municipalities face. Sometimes, municipalities do not receive adequate information to protect their water supplies. *See, e.g.*, Perry Beeman, *DNR: We 'Dropped the Ball' on Warning of River Sewage*, DES MOINES REG., May 13, 1997, at 1A (detailing the lack of information provided to the Des Moines Water Works when sewage was being poured into the Raccoon River, which serves as the source of drinking water for over 250,000 people). For example, in May 1997, raw sewage was spilled by Sac City, Iowa, into the Raccoon River which is the source of drinking water for 250,000 people, including residents of Des Moines, Iowa. *See id.* The Des Moines Water Works nor the public was informed for over a week that the spill had occurred, although the spill apparently did not threaten the drinking water supply. *See id.* Apparently lack of public notification is not completely uncommon, at least when the relevant state agency determines that public notification of spills is not necessary. Prior to the sewage leak into the Raccoon River, it was also not made public that over one million gallons of gasoline leaked out of a pipeline in a sparsely populated area of Pleasant Hill, Iowa. *See id.*

278. Joby Warrick & Peter S. Goodman, *EPA Plans to Regulate Livestock Waste; Clean Water Act Would be Applied*, WASH. POST, Mar. 5, 1998, at A01. These regulations are the first part of revisions to be made to the Clean Water Act by the EPA. *See Agriculture Blamed for U.S. Water Pollution*, *supra* note 262, at 6A; Federal Water Pollution Prevention and Control Act, 33 U.S.C. §§ 1251-1387 (1994).

under the Clean Water Act (CWA).[279] Only time will tell whether the provisions of the CWA and the regulations to be promulgated will sufficiently address the growing environmental problem of these operations.

States, including those that already have laws regulating hog lots, continue to debate this issue.[280] While the debate continues, manure spills and poorly constructed agricultural facilities continue to be a threat to drinking water supplies.[281] Within the last few years, millions of gallons of manure have spilled into rivers that are sources of drinking water.[282]

Even when federal environmental legislation has been enacted, the legislation has not always been fully implemented. The EPA has been criticized for failing to set standards as directed under the SDWA.[283] After an eighteen-month study in the 1980s, the National Wildlife Federation determined that 101,588 violations of the SDWA were committed by 36,763 water utilities, affecting approximately 37,000,000 Americans.[284] In response to the inactivity in promulgating standards, the National Wildlife Federation threatened to file a lawsuit against the EPA to force the agency to enforce the standards in December 1988.[285] Without the passage and implementation of adequate environmental regulations, our cities' drinking water supplies will continue to be in danger.

States have not been completely ignorant of the environmental threats of concentrated agricultural operations, and they have enacted standards, differing

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279. *See generally* Clean Water Action Plan, 63 Fed. Reg. 14,109 (1998) (noting the announcement of a new initiative to quicken the restoration of the U.S.'s waterways); Federal Water pollution Prevention and Control Act, 33 U.S.C. §§ 1251-1387 (regulating point source pollution).

280. *See, e.g.*, Jonathan Roos, *Republicans Ready to Push Hog-Lot Bill*, DES MOINES REG., Mar. 6, 1998, at 4A. For a recent summary of pork production laws in major pork producing states, see Dummermuth, *supra* note 80, at 453-68.

281. *See* ANIMAL WASTE POLLUTION IN AMERICA, *supra* note 18, at 4-5.

282. *See, e.g.*, Voogt, *supra* note 270, at 223. For a summary of some spills in 1995, see *infra* Appendix C.

283. *See* Pamela King, Note, *The Protection of Groundwater and Public Drinking Supplies: Recent Trends in Litigation and Legislation*, 42 VAND. L. REV. 1649, 1652 (1989) (citing Senator Dave Durenberger, Address at the ALI-ABA Environmental Law Conference (Feb. 19, 1986), *in* 3 J. LAND USE & ENVTL. L. 161, 167 (1987)). In *Natural Resources Defense Council, Inc. v. EPA*, four states and three environmental groups challenged the standards promulgated by the EPA for the long-term disposal of high-level nuclear waste through the method of underground injection, a method that would threaten groundwater. *See* Natural Resources Defense Council, Inc. v. EPA, 824 F.2d 1258, 1261 (1st Cir. 1987). In its ruling, the court found that the EPA's standards were arbitrary and capricious, and could result in future groundwater contamination. *See id.* at 1282.

284. *See* Pamela King, *supra*, note 283, at 1652-53 (citing NORMAN L. DEAN, DANGER ON TAP: THE GOVERNMENT'S FAILURE TO ENFORCE THE FEDERAL SAFE DRINKING WATER ACT 24 (1988)).

285. *See id.* at 1652 (citing *EPA Fails to Enforce Drinking Water Act, Group Asserts in Notice Threatening Suit*, 19 Env't Rep. (BNA), No. 33, at 1653 (Dec. 16, 1988)).

from jurisdiction to jurisdiction.[286] The regulations are not uniform, and environmental regulations may not be quickly enacted because of special interests that oppose the regulations.[287] In reality, modern concentrated agricultural operations have become a big business in states such as Iowa[288] and have strong political clout.[289] This industry continues to expand to other states that may be slow to enact environmental regulations.[290]

However, the issue of regulation can also be distracted by a power struggle over which level of government should have the power to regulate these agricultural operations. In Iowa, this issue came before the state's supreme court during its 1997-98 session in *Goodell v. Humboldt County*, and the court had to decide whether counties should have that power.[291] This case was an extremely important evaluation of whether counties could utilize their home rule power granted under the Iowa Constitution to regulate these operations.[292]

In its recent decision, the Iowa Supreme Court struck down the county's ordinances that attempted to regulate concentrated agricultural operations, and the court found that the state had preempted the right of counties to regulate these operations.[293] Among the various ordinances, one ordinance passed by the Humboldt County Board of Commissioners was designed to protect groundwater quality.[294]

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286. For a summary of water quality protections and agricultural facility regulations, see Dummermuth, *supra* note 80.

287. *See, e.g., Farmers' Ad Campaign Has Unintended Effect: Hog Farmers Seem to Be Encouraging Stricter Pollution Controls*, GREENSBORO NEWS & REC., Aug. 3, 1997, at F2 (noting the efforts of hog farmers to defeat a North Carolina bill that would have imposed greater restrictions on the hog industry).

288. *See* Perkins, *supra* note 268, at A1 (noting that pork production employs 89,000 Iowans and contributes $8.5 billion to the state's economy).

289. *See, e.g.*, Voogt, *supra* note 270, at 221 (noting the expansion of the hog industry of Kansas was restricted by the state's corporate farm law and that hog operations have instead moved to Oklahoma).

290. *See id.* (noting the expansion of the hog industry of Kansas was restricted by the state's corporate farm law and that hog operations have instead moved to Oklahoma).

291. On November 18, 1997, the Iowa Supreme Court heard arguments on whether it should uphold Humboldt County's ordinances which attempted to control all large concentrated agricultural operations. *See* Frank Santiago, *Hog-Lot Skirmish Heard by Court*, DES MOINES REG., Nov. 19, 1997, at A1.

292. *See id.*; *see also* IOWA CONST. art. III, § 39A.

293. *See* Goodell v. Humboldt County, 575 N.W.2d 486, 494 (Iowa 1998). In terms of cities, "the state may by legislation have pre-empted (or 'occupied') a particular field of activity or regulation. When the state has done this, there is no room for city law on the matter, whether law of a home-rule city or a non-home-rule city." REYNOLDS, *supra* note 5, § 43, at 120.

294. *See Goodell*, 575 N.W.2d at 489.

In reaching its decision, the court addressed arguments regarding whether the regulation of hog lots was a local or state issue.[295] In answering that question, the court noted that:

> Ensuring that livestock operations within a county are conducted in such a manner as to avoid contamination of the environment and interference with others' enjoyment and use of their property is a matter of local concern and, therefore, is a 'local affair' within the meaning of the home rule amendment [Iowa Const. art. III, § 39A].[296]

The court also noted that "[a] local matter may, however, also have statewide importance."[297] The *Goodell* court found that the Humboldt County ordinances attempted to "revise the state regulatory scheme" of hog lots and were therefore "irreconcilable with state law."[298] Even though Iowa's counties do enjoy home rule power granted by the state, the court noted "a county's exercise of home rule power cannot be 'inconsistent with the laws of the general assembly.'"[299] When it examined the ordinance intended to prevent groundwater contamination, the court found that the state legislature had specifically designated the Iowa Department of Natural Resources as the sole entity to regulate animal waste disposal from these operations.[300]

In the discussion surrounding *Goodell*, it has been suggested that the case may represent a severe blow to the home rule power of local governments in Iowa.[301] As one of the dissenting justices noted, "I have a sinking feeling that the concept of home rule for local governments, guaranteed in our constitution, will suffer under the majority holding."[302] In fact, the court never addressed the issue of whether state or local government regulation of concentrated agricultural operations was more appropriate.[303] From a legal standpoint, this question may not have been as important for the court to consider as other issues, but to the average person impacted by this decision, uncertainty remains as to who should truly regulate this area of the law and to what extent. The failure of the court to address this issue will no doubt continue this uncertainty in Iowa.

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295. *See id.* at 494.

296. *Id.*

297. *Id.* (citing 2 DENNIS JENSEN & GAIL A. O'GRADNEY, MCQUILLIN MUNICIPAL CORPORATIONS § 4.85, at 203 (3d ed. 1996 rev. vol.)).

298. *Id.* at 502.

299. *Id.* at 500 (quoting IOWA CONST. art. III, § 39A; *accord* IOWA CODE § 331.301 (1997)).

300. *See id.* at 505; *see also* IOWA CODE § 455B.172(5) (1997).

301. *See* Frank Santiago, *Local Control vs. Uniform Regulations*, DES MOINES REG., Mar. 6, 1998, at 4A.

302. *Goodell*, 575 N.W.2d at 510 (Harris, J., dissenting in part).

303. *See* Frank Santiago, *County Hog-Lot Rules Voided: State Court Ruling Sets Stage for Legislature*, DES MOINES REG., Mar. 6, 1998, at 1A.

What is disturbing about the *Goodell* decision is failure of the court to completely consider the implications of the decision. As states chip away at local governments' home rule power, the autonomy of local governments is shrinking. The court noted in addressing counties' home rule power:

> The concept of home rule envisions the possibility that state and local governments will regulate in the same area . . . . Thus, subject to this restriction [that counties cannot enact regulations less strict than state law] and principles of preemption, a county may exercise its home rule powers on matters that are also the subject of state law.[304]

This statement indicates the law has recognized local and state regulation can coexist.

Politically, the *Goodell* decision deviates from the current trend in intergovernmental relations of decentralization of power—at least in terms of the relationship between the state and federal government. The federal government is shifting responsibility for many former federal programs to the states.[305] The rationale used and statement made by the majority opinion—that some issues which are local rise to the level of becoming of statewide importance—can rationally be read as a threat to the autonomy of all local governments, not just counties.[306] The line of logic and reasoning used by the court can lead to almost any issue considered a statewide concern, and therefore out of the scope of city regulation.[307] In all fairness to the court, as the county itself conceded, these regulations were not an exercise of the county's zoning power.[308]

Assuming arguendo that the *Goodell* decision was decided correctly from a legal, political, and environmental perspective, *Goodell* does little to clarify how the negative impacts of concentrated agricultural operations will be addressed. It seems impossible for even the strongest supporter of these operations to claim that there is no significant threat to the environment by their operation. The size of the

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304. *Goodell*, 575 N.W.2d at 492 (citing Decatur County v. PERB, 564 N.W.2d 394, 398 (Iowa 1997); Sioux City Police Officers' Ass'n v. City of Sioux City, 495 N.W.2d 687, 694 (Iowa 1993)).

305. *See* Grumet, *supra* note 115, at 397 (noting the devolution of power from the federal government to the states that began in the Reagan era has continued in national politics).

306. *See Goodell*, 575 N.W.2d at 494 (noting that "[a] local matter may, however, also have statewide importance.").

307. *See also* REYNOLDS, *supra* note 5, § 38, at 104 (noting that "[i]n situations of statewide concern, state law will prevail to the extent of the conflict [between state and city].").

308. *See Goodell*, 575 N.W.2d at 495-96. In reaching the determination that the regulations were not an exercise of the county's zoning power, the court noted that "[b]ecause the ordinances adopted . . . do not regulate land by district, they are not an exercise of the county's zoning power under chapter 335 [relating to the county's zoning power]." *Id.* at 497. *See also* REYNOLDS, *supra* note 5, § 39, at 109-10 (noting that in some cases, however, city zoning can be considered a local concern).

manure spills can be enormous and can threaten the living organisms in our waterways and drinking water supplies.[309]

C. *Agricultural Use of Chemicals*

In general, the challenges municipalities face in implementing the SDWA are similar to some of the issues raised in *Wisconsin Public Intervenor v. Mortier*.[310] At issue in that case was whether a federal law regulating pesticides, the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA),[311] preempted the power of municipalities to regulate the application of pesticides at the local governmental level.[312] The Town of Casey, Wisconsin, had passed an ordinance that regulated the application of pesticides under the premise of protecting its residents' health, safety, and welfare.[313] Mortier applied for a permit to aerially apply pesticides to his land, and his permit was granted with restrictions on the method of the application of the pesticides and the fields to be sprayed.[314]

Mortier appealed all the way to the U.S. Supreme Court,[315] which held that FIFRA did not preempt local governments from enacting pesticide regulations as essentially an extension of their police power.[316] The Court reached its decision by analyzing the legislative history behind FIFRA, which was vulnerable to various interpretations.[317] Thus, the Court acknowledged the power of the Town of Casey to enact more stringent regulations regarding pesticide application.[318]

Although this case dealt with the issue of whether local governmental regulation was preempted by Congress' passage of FIFRA, *Mortier* also concerned the power of municipalities to deal with problems facing its constituents. Local governments should have the power to address problems within their jurisdiction,

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309. *See infra* Appendix D. One spill in North Carolina in 1995 involved 25 million gallons of hog waste. *See* Voogt, *supra* note 270, at 223 (citing Mike Hendricks, *Manure Spills Threaten Waterways*, KAN. CITY STAR, Sept. 24, 1995, at A1).

310. Wisconsin Pub. Intervenor v. Mortier, 501 U.S. 597 (1991). Admittedly, *Mortier* and *Goodell* are not exactly the same cases. *Mortier* involved a court review of a federal law in which the Court determined that the legislative history indicated the local governments should be able to regulate pesticide application under FIFRA. *See id.* at 605-13. Under federal law, cities do not specifically have any inherent rights, like they enjoy under state law. *See infra* Part II.A. In contrast to *Mortier*, *Goodell* involved the question of state preemption of local government regulation of concentrated agricultural operations. *See Goodell*, 575 N.W.2d at 489.

311. Federal Insecticide, Fungicide, and Rodenticide Act, 7 U.S.C. §§ 136-136y (1994).

312. *See Mortier*, 501 U.S. at 600.

313. *See id.* at 603.

314. *See id.*

315. *See id.*

316. *See id.* at 611-12.

317. *See id.* at 605-13.

318. *See id.* at 611-12.

whether it is related to pesticides or not. Thus, the issue of pesticide regulation is analogous to the current debates about concentrated agricultural operations.

One argument made by environmentalists to support the regulation of pesticides by local governments is the specific circumstances unique to local governments' locale and the differing needs to protect their drinking water.[319] Federal and state governments have not sufficiently protected municipalities from the dangers associated with pesticides.[320] The same arguments can be made about local regulation of concentrated agricultural operations. When the state completely preempts local regulation of these operations, the health and safety of people are at risk because their drinking water supplies are threatened.[321]

Two unfortunate results of the rapid increase in the growth of concentrated agricultural operations has been the slow pace in which regulatory legislation has been enacted in some jurisdictions and the insufficiency of some of the existing regulations.[322] This is apparent with the large number of spills of animal waste that poses a serious threat to drinking water.[323] Animal waste is being leaked into groundwater sources and into our streams and rivers, despite regulatory legislation.[324] These spills of animal waste pose an enormous threat to surface and underground sources of drinking water.[325] Besides killing the living organisms in surface water, animal waste in a moving body of water can travel many miles downstream, effecting all of the communities along the river who depend on it as their source for drinking water.[326]

Agricultural chemicals and animal wastes in drinking water supplies threaten everyone's health and safety. A study of cases from 1991 to 1994 in LaGrange County, Indiana, focused on the high number of miscarriages occurring

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319. *See* Elena S. Rutrick, Comment, *Local Pesticide Regulation Since* Wisconsin Public Intervenor v. Mortier, 20 B.C. ENVTL. AFF. L. REV. 65, 89 (1993).

320. *See id.* at 92 (citing Brief of Amici Curiae for Village of Milford, Michigan, Mayfield Village, Ohio, and City of Boulder, Colorado, at 6, Wisconsin Pub. Intervenor v. Mortier, 501 U.S. 597 (1991)).

321. *See* Sivas, *supra* note 99, at 157-58 (noting the efforts of local governments to protect groundwater).

322. For a recent analysis of water quality protective regulations relating to pork production, see Dummermuth, *supra* note 80, at 468-83.

323. *See, e.g.*, Jay P. Wagner, *N.C. State Officials, Producers at Odds on Hog Regulations*, DES MOINES REG., July 22, 1996, at 3A (noting a twenty-million gallon manure spill in North Carolina); *see infra* Appendix C.

324. *See infra* Appendix C (outlining a select list of animal waste spills in 1995).

325. *See Agriculture Blamed for U.S. Water Pollution, supra* note 262, at 6A (noting that farming is the cause of 70 percent of pollution in the United States' waterways).

326. *See generally* Beeman, *supra* note 16, at 1B (noting the increasing levels of nitrates, which come from sewage systems, animal waste, and fertilizers, threaten Iowa's drinking water supply). "At certain concentrations, the compounds [in nitrates] can harm infants by robbing their blood of the ability to deliver oxygen to the body. Older children and adults have an acid in their stomach that prevents that situation." *Id.* Water treatment plants lower the levels of nitrates in drinking water to safer levels. *See id.*

in the eighth week of pregnancy.[327] One of the county's residents had four consecutive miscarriages, and other women had similar traumatic experiences.[328] Three of the women lived within one mile of a hog farm.[329] Extensive testing of water in the area determined that there existed high levels of nitrates, which are found in animal and human wastes, in the residential wells.[330] After the situation was remedied, the women did not experience any further complications.[331]

Nitrates cause a variety of health problems. "Nitrate is known to cause poisoning in infants, a condition marked by bluish-gray skin that can lead to coma, and spontaneous abortions in lab animals and livestock. Boiling the water only concentrates the nitrate, making levels even higher."[332] The Centers for Disease Control and Prevention (CDC) also examined these cases of high miscarriage rates and published its results in 1996.[333] Other areas that have been considered for review for nitrate levels include: Albany, Georgia; Lancaster County, Pennsylvania; and Pojoaque, New Mexico.[334]

A study conducted by the Indiana Farm Bureau published in 1994 showed that nitrate contamination existed in 4.5% of the 9143 well water samples collected in sixty-eight counties in the state.[335] Similarly, Nebraska, a heavy agricultural state, also has reported high nitrate levels in drinking water.[336] A total of forty-six public water supplies had nitrate levels which exceeded drinking water quality standards, and nine systems were ordered to rectify the problem.[337] In 1996, the University of Iowa Hygienic Laboratory published an assessment of Iowa municipalities' efforts to implement the SDWA between 1988 and 1995.[338] During that period, nitrate (as N) was detected in drinking water sources at levels that were

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327. *See* Niederpruem, *supra* note 22, at A1. This article is one in a four-part series that appeared in the *Indianapolis Star* in April 1998 outlining the affects of the pork industry on the environment. The original newspaper series can be found online at <http://www.starnews.com/news/special/hog.html>.

328. *See* Niederpruem, *supra* note 22, at A1.

329. *See id.*

330. *See id.*

331. *See id.*

332. *Id.*

333. *See id.*

334. *See id.*

335. *See id.*

336. *See id.*

337. *See id.*

338. *See generally* GEORGE R. HALLBERG ET AL., UNIVERSITY OF IOWA HYGIENIC LAB., ASSESSMENT OF IOWA SAFE DRINKING WATER ACT MONITORING DATA: 1988-1995 (1996) (outlining and critiquing the implementation of the SDWA in Iowa between 1988 and 1995). *See infra* Appendix E (outlining a partial list of contaminants monitored, their MCLs, the percentage of samples from 1985-1995 that exceeded the MCL, and the percentage of samples from 1988-1995 that exceed one-half of the MCL).

equal to or exceeded the MCL in 22.82% of the samples.[339] Insecticides and herbicides including Alachlor (tradename Lasso) and Atrazine exceeded the MCL in 0.21% and 0.55% of the samples, respectively, taken between 1988 and 1995.[340] The data contained in Appendix E should be of concern to everyone worried about their health and the quality of their drinking water.

D. *Conclusion*

In Iowa, the regulation of hog lots has become such a contentious issue that cooperation between the state and counties will probably become strained. Instead of actually addressing the environmental concerns raised by these operations, energy will be wasted arguing over which level of government should have regulatory power. In addition, nitrates from these facilities and pesticide and herbicide application threaten the health of everyone. As a result, the environment and drinking water quality will continue to suffer.

VI. CONCLUSION

Throughout history, both the state and federal governments have served a regulatory role in an effort to protect the health, safety, and welfare of their citizens. Probably one of the most important regulatory laws ever passed was the Safe Drinking Water Act and its amendments. The SDWA represented the first comprehensive attempt to protect drinking water in the United States.

However, to implement the law and to ensure the safety of our drinking water, federal, state, and local governments all play an important role and must work together. The reality is that probably no one level of government can sufficiently protect our sources of drinking water from contamination caused by chemicals and concentrated agricultural operations.

At the federal governmental level, Congress must continue to appropriate the necessary funding for the SDWA, and the EPA must fulfill its responsibilities under the law. An example of the EPA fulfilling its obligations is the enforcement of SDWA provisions by imposing penalties on violators. In 1997, the EPA fined DeCoster Farms of Iowa $10,000 when manure entered an agricultural drainage well.[341] This fine represented the first federal case of this type, and further measures would have to be taken by DeCoster, including providing safe drinking

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339. *See* HALLBERG ET AL., *supra* note 338, at 15. However, as the report notes, there are numerous data problems with this information. *See id.* at 10-12. Regardless of these data quality issues, considering the number of instances of nitrates being found in other agricultural areas, it cannot be argued that nitrates from pesticides and herbicides do not enter our drinking water supplies. *See, e.g.*, Niederpruem, *supra* note 22, at A1 (noting the high levels of nitrates found in Nebraska wells).

340. *See infra* Appendix E.

341. *See* Perry Beeman, *DeCoster Hit with $10,000 Fine*, DES MOINES REG., Oct. 4, 1997, at 1A.

water or treating the well water, could also have been imposed if fecal coliform was found.[342] State governments must also strive to fulfill the mandates they receive from the EPA and provide financial resources to financially-challenged municipalities to assist them with achieving the standards of the SDWA. Likewise, the states must also use their enforcement power to enforce environmental legislation. For example, in addition to the action taken by the EPA in fining DeCoster Farms for the spill, the State of Iowa also considered filing a lawsuit in response to this incident.[343] States must realize that a single solution does not solve every problem, and recognize the importance of granting power and autonomy of municipalities to solve local problems.

Finally, municipalities, in the context of the financial challenges many face, must make diligent efforts to comply with the SDWA. Local governments will probably always be seen as the level of government most in touch with its residents' needs and desires—fulfilling almost a patriarchal or matriarchal role. However, the reality is that municipalities cannot completely deal with the environmental threats caused by agricultural chemicals and concentrated agricultural operations because the threat often occurs outside their jurisdiction. Thus, cooperation with other municipalities and other levels of government may be the only way the protection of drinking water supplies can be achieved. Financially-challenged municipalities must search for more unique solutions to solve their environmental problems, similar to the Raccoon River Watershed Project in Des Moines, Iowa.

In a sense, this whole issue must be considered as a balancing of power—the need and desire of municipalities to protect its citizens with the need and desire of the state to protect its citizens. Only when the importance and role of local governments is recognized can these levels of government cooperate and serve all of us as their constituents. If the issue of environmental protection of drinking water standards is approached similar to FIFRA and cities are allowed to enact environmental regulations to compliment federal and state regulations—similar to the regulations in *Mortier*, only then will the environmental protection of drinking water ever really have a chance at being successful. Enabling local governments to enact protective environmental regulations will not necessarily mean the end of agricultural practices or the family farmer, but instead will result in safer drinking water for all of us.

342. *See id.*
343. *See id.*

APPENDIX A[344]

TOTAL USE OF MAJOR HERBICIDES IN IOWA CORN AND SOYBEAN PRODUCTION; IN PERCENT OF TOTAL MASS OF A.I. APPLIED

Herbicide active ingredient common chemical name	Typical trade name	total estimated use per year ——— % of total mass applied ———							
		1979	1985	1990	1991	1992	1993	1994	1995
2,4-D	many	2.0%	1.3%	1.6%	1.6%	1.2%	2.3%	2.2%	2.9%
acetochlor	Harness	NR	NR	NR	NR	NR	ID	4.8%	15.4%
acifluorfen	Blazer	ID	0.0%	0.2%	0.1%	0.1%	0.1%	0.1%	ID
alachlor	Lasso	26.5%	19.6%	15.9%	18.1%	18.4%	14.5%	10.1%	1.9%
atrazine	atrazine	11.3%	15.8%	15.4%	15.3%	16.2%	15.5%	16.7%	16.1%
bentazon	Basagran	0.8%	1.3%	2.7%	2.1%	1.9%	1.4%	1.5%	2.7%
bromoxynil	Buctril	NR	0.4%	1.2%	1.3%	1.3%	1.1%	1.3%	1.1%
butylate	Sutan	23.2%	6.5%	0.6%	ID	ID	ID	ID	ID
chloramben	Amiben	2.7%	2.3%	0.3%	ID	ID	ID	ID	ID
chlorimuron-ethyl	Classic	NR	NR	0.0%	0.0%	0.0%	0.0%	0.02%	0.01%
clethodim	Select	NR	NR	NR	NR	ID	0.1%	0.1%	0.1%
clomazone	Command	NR	NR	1.5%	0.9%	0.5%	0.7%	0.3%	ID
cyanazine	Bladex	14.5%	16.9%	10.5%	13.7%	13.8%	18.5%	17.4%	13.2%
dicamba	Banvel	1.4%	1.3%	1.7%	1.1%	2.2%	2.3%	3.3%	3.4%
dimethenamid	Frontier	NR	NR	NR	NR	ID	ID	1.1%	1.3%
EPTC	Eradicane	0.6%	0.8%	14.9%	7.5%	8.1%	6.2%	4.0%	4.5%
ethalfluralin	Sonalan	NR	0.8%	1.2%	0.8%	0.4%	ID	ID	ID
fenoxaprop-ethyl	in Fusion	NR	NR	ID	ID	ID	0.1%	0.1%	0.3%
fluazifop-p-butyl	Fusilade	NR	0.0%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
flumetsulam	Broadstrike	NR	NR	NR	NR	NR	ID	0.1%	ID
glyphosate	Roundup	ID	0.3%	0.3%	0.8%	0.6%	2.1%	1.3%	2.6%
halosulfuron	Battalion	NR	NR	NR	NR	NR	NR	ID	0.02%
imazaquin	Scepter	NR	NR	0.0%	0.0%	ID	ID	0.04%	ID
imazethapyr	Pursuit	NR	NR	0.2%	0.4%	0.5%	0.6%	0.8%	1.0%
linuron	Lorox	0.6%	0.2%	0.0%	ID	ID	ID	ID	ID
metolachlor	Dual	2.9%	19.3%	20.4%	24.6%	24.3%	23.9%	23.9%	20.8%
metribuzin	Sencor	2.7%	2.9%	0.6%	0.5%	0.5%	0.4%	0.3%	0.1%
nicosulfuron	Accent	NR	NR	NR	0.0%	0.0%	0.1%	0.1%	0.1%
pendimethalin	Prowl	0.2%	0.8%	1.7%	2.6%	3.1%	3.7%	4.6%	5.9%
primisulfuron	Beacon	NR	NR	NR	NR	ID	ID	0.01%	0.01%
propachlor	Ramrod	2.9%	1.8%	1.1%	ID	ID	ID	ID	ID
quizalofop	Assure	NR	NR	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
sethoxydim	Poast	NR	0.0%	0.2%	0.2%	0.2%	0.2%	0.2%	0.4%
thifensulfuron	Pinnacle	NR	NR	ID	0.0%	0.0%	0.0%	0.0%	0.0%
trifluralin	Treflan	7.7%	7.6%	7.5%	8.1%	6.7%	6.0%	5.4%	6.1%
	total:	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

NR = Not Registered for Use in Iowa
ID = Insufficient Use to Estimate

****Other compounds reported but with insufficient data, too few acres to tabulate: 2,4-DB, diuron, fomesafen, lactofen, oryzalin, paraquat, simazine, and tridiphane.

344. HALLBERG ET AL., *supra* note 338, at 127.

APPENDIX B[345]

PERCENTAGE OF IOWA CROP ACRES TREATED WITH HERBICIDES AND INSECTICIDES

	1977	1979	1985	1990	1991	1992	1993	1994	1995
	Herbicides								
Corn	94%	95%	97%	95%	98%	98%	99%	99%	99%
Soybeans	97%	97%	97%	97%	99%	99%	97%	99%	100%
	Insecticides								
Corn	58%	50%	43%	35%	35%	30%	32%	27%	28%
Soybeans	ND	ND	ND	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%

NR = Not Registered for Use in Iowa

345. *Id.* at 132.

APPENDIX C[346]

SUMMARY OF SELECTED SDWA REGULATED COMPOUNDS; COMMON SOURCES OF THESE CONTAMINANTS; AND HEALTH CONCERNS

Contaminant	MCL (mg/L)	Common Sources of Contaminant in Drinking Water	Potential Health Effects
Nitrate + Nitrite (as N) & (Nitrate as N)	10.0	Animal waste, fertilizer	Methemoglobinemia
Nitrite (as N)	1.0	Animal waste, fertilizer	Methemoglobinemia
Chlordane	0.0020	Leaching from soil treatment for termites	Cancer
Heptachlor	0.00040	Leaching of insecticide for termites, very few crops	Cancer
Heptachlor Epoxide	0.00020	Biodegradation of heptachlor	Cancer
Lindane	0.00020	Insecticide on cattle; restricted 1983	Liver, kidney, nerve, immune, circulation
Methoxychlor	0.040	Insecticide for fruits, vegetables, alfalfa, livestock	Growth, liver, kidney, nerve
Toxaphene	0.0030	Insecticide on cattle, cotton, soybeans; canceled 1982	Cancer
Aldicarb	0.0030	Insecticide on cotton, potatoes, others; widely restricted	Nervous system effects
Aldicarb sulfone	0.0020	Biodegradation of aldicarb	Nervous system effects
Aldicarb sulfoxide	0.0040	Biodegradation of aldicarb	Nervous system effects
Carbofuran (Furadan)	0.040	Soil fumigant on corn and cotton; restricted in some areas	Nervous, reproductive system
Oxamyl (Vydate)	0.20	Insecticide on apples, potatoes, tomatoes	Kidney damage
2,4-D	0.070	Herbicide on wheat, corn, rangelands	Liver and kidney damage
2,4,5-TP (Silvex)	0.050	Herbicides on crops; canceled 1983	Liver and kidney damage
Dalapon	0.20	Herbicide on orchards, beans	Liver, kidney
Dinoseb	0.0070	Herbicide on crops and non-crop applications	Thyroid, reproductive organ damage
Pentachlorophenol	0.0010	Herbicide	Cancer, liver and kidney effects
Picloram (Tordon)	0.50	Herbicide on broadleaf and woody plants	Kidney, liver damage
Alachlor (Lasso)	0.0020	Herbicide on corn, soybeans, other crops	Cancer
Atrazine	0.0030	Herbicide on corn and non-cropland	Mammary gland tumors
Simazine	0.0040	Herbicide on some crops	Cancer
Ethylene dibromide (1,2-Dibromoethane or EDB)	0.00005	Leaching of soil fumigant	Cancer Cancer
Dibromochloropropane (1,2-Dibromo-3-chloropropane or DBCP)	0.0002	Soil fumigant on soybeans, cotton, pineapple, orchards	Liver, kidney damage
Glyphosate (Roundup)	0.70	Herbicide on grasses, weeds, brush	Liver, kidney, eye effects
Diquat	0.020	Herbicide on land and aquatic weeds	Liver, kidney, gastrointestinal
Endothall	0.10	Herbicide on crops, land/aquatic weeds; rapidly degraded	Cancer
Benzene	0.0050	Pesticide	Liver, kidney, nervous system
Ethyl benzene	0.70	Insecticides	Cancer
2,3,7,8-TCDD (Dioxin)	$3x10^{-8}$	Impurity in herbicides	

346. *Id.* at 3-7.

APPENDIX D[347]

SAMPLE OF MANURE SPILLS IN 1995

Date	State	Waste Type	Gallons of Waste
June 21	North Carolina	Hogs	25 million
June 21	North Carolina	Hogs	1 million
July 3	North Carolina	Chickens	8.6 million
July 6	North Carolina	Hogs	1 million
July 15	Iowa	Hogs	1.5 million
July 18	Iowa	Hogs	16,000
July 22	Iowa	Hogs	Undetermined
August 3	North Carolina	Hogs	Less than 1 million
August 3	Minnesota	Hogs	Undetermined
August 28	Missouri	Hogs	Undetermined
August 31	Missouri	Hogs	Undetermined
September 3	Missouri	Hogs	Undetermined

347. Voogt, *supra* note 270, at 223 (citing Mike Hendricks, *Manure Spills Threaten Waterways*, KAN. CITY STAR, Sept. 24, 1995, at A1).

APPENDIX E[348]

WATER QUALITY SUMMARY STATISTICS FROM THE IOWA PUBLIC WATER SUPPLY SDWA MONITORING DATA BASE; 7/1/88 THROUGH 12/31/95

Contaminant	MCL mg/L	Percentage ≥MCL	Percentage ≥ 0.5 MCL	Contaminant	MCL mg/L	Percentage ≥ MCL	Percentage ≥ 0.5 MCL
Antimony (total)	0.0060	0.08%	0.23%	Ethylene dibromide (1,2-Dibromoethane; or EDB)	0.00005	0.00%	50.00%
Arsenic	0.050	2.29%	3.56%				
Barium	2.0	0.03%	0.59%	Dibromochloropropane (1,2-Dibromo-3-chloropropane; or DBCP)	0.0002	0.00%	0.00%
Beryllium (total)	0.0040	0.00%	0.00%				
Cadmium	0.0050	0.22%	0.41%				
Chromium	0.10	0.03%	0.03%	bis(2-ethylhexyl) adipate	0.40	0.00%	0.00%
Fluoride	4.0	1.45%	4.40%	bis(2-ethylhexyl) phthalate	0.0060	0.12%	0.32%
Mercury	0.0020	0.15%	0.34%	Benzo[a]pyrene	0.0002	0.00%	0.00%
Nickel	0.10	0.00%	0.08%	Glyphosate (Roundup)	0.70	0.00%	0.00%
Selenium	0.050	0.00%	0.06%	Diquat	0.020	0.00%	0.00%
Thallium (total)	0.0020	0.08%	0.54%	Endothall	0.10		
Asbestos	7 mf/L	0.00%	0.00%	Gross Alpha	15 pCi/L	1.27%	7.67%
Cyanide	0.20	0.00%	0.00%	Adjusted Alpha (excluding Uranium)	15 pCi/L	9.66%	23.67%
Nitrate (as N)	10.0	22.82%	44.99%				
Nitrate + Nitrite (as N)	10.0	5.14%	30.04%	Uranium (AL - 30 pCi/L)	0.020	91.43%	91.43%
Nitrate + Nitrite (as N) & (Nitrate as N)	10.0	20.47%	43.01%	Combined Radium 226/228	5 pCi/L	17.87%	37.42%
				Radium 226	20 pCi/L	0.00%	1.60%
Nitrite (as N)	1.0	0.52%	1.00%	Radium 228	20 pCi/L	0.00%	0.07%
Lead	0.050	0.87%	2.27%	Radon 222 (proposed MCL)	300 pCi/L	39.74%	66.78%
Copper (action level; not MCL)	1.30	3.90%	10.11%	Gross Beta (50 pCi/L - AL)	4 mrem/yr	0.00%	0.00%
				Strontium-90 (8 pCi/L - AL)	4 mrem/yr	0.00%	0.00%
Sulfate	400/500	9.19%	17.52%	Tritium (20,000 pCi/L - AL)	4 mrem/yr	0.00%	0.00%
Chlordane	0.0020	0.00%	0.00%	Total Trihalomethanes	0.10	10.63%	38.05%
Endrin	0.0020	0.00%	0.00%	Benzene	0.0050	0.49%	00.59%
Heptachlor	0.00040	0.00%	0.00%	Carbon tetrachloride	0.0050	0.00%	0.04%
Heptachlor Epoxide	0.00020	0.00%	0.00%	Chlorobenzene	0.10	0.00%	0.00%
Hexachlorobenzene	0.0010	0.00%	0.00%	o-Dichlorobenzene	0.60	0.00%	0.00%
Hexachlorocyclopentadiene	0.050	0.00%	0.00%	p-Dichlorobenzene	0.0750	0.00%	0.00%
Lindane	0.00020	0.00%	0.00%	1,2-Dischloroethylene	0.0050	0.38%	0.44%
Methoxychlor	0.040	0.00%	0.00%	cis-1,2-Dichloroethylene	0.070	0.00%	0.02%
Toxaphene	0.0030	0.00%	0.00%	trans-1,2-Dichloroethylene	0.10	0.00%	0.00%
PCBs as Decachlorobiphenyl; PCB total as DCBP	0.00050	0.00%	0.00%	1,1-Dichloroethene (1,1-Dichloroethylene)	0.0070	0.00%	0.06%
				Methylene chloride (Dichloromethane)	0.0050	0.00%	0.02%
Aldicarb	0.0030	0.00%	0.00%				
Aldicarb sulfone	0.0020	0.00%	0.00%	1,2-Dichloropropane	0.0050	0.00%	0.00%
Aldicarb sulfoxide	0.0040	0.00%	0.00%	Ethyl Benzene	0.70	0.00%	0.00%
Carbofuran (Furadan)	0.040	0.00%	0.00%	Styrene	0.10	0.00%	0.00%
Oxamyl (Vydate)	0.20	0.00%	0.00%	Tetrachloroethylene	0.0050	0.61%	1.48%
2,4-D	0.070	0.00%	0.00%	Toluene	1.0	0.00%	0.00%
2,4,5-TP (Silvex)	0.050	0.00%	0.00%	1,2,4-Trichlorobenzene	0.070	0.00%	0.00%
Dalapon	0.20	0.00%	0.00%	1,1,1-Trichloroethane	0.2000	0.14%	0.14%
Dinoseb	0.0070	0.00%	0.00%	1,1,2-Trichloroethane	0.0050	0.00%	0.00%
Pentachlorophenol	0.0010	0.00%	0.04%	Trichloroethene (Trichloroethylene)	0.0050	0.28%	0.40%
Picloram (Tordon)	0.50	0.00%	0.00%				
Alachlor (Lasso)	0.0020	0.21%	0.70%	Vinyl chloride	0.0020	0.09%	0.12%
Atrazine	0.0030	0.55%	2.79%	Xylenes (Total)	10.0	0.00%	0.00%
Simazine	0.0040	0.00%	0.00%	2,3,7,8-TCDD (Dioxin)	$3x10^{-8}$	*	*

Not a complete list of contaminants that are monitored; only contaminants with MCLs are shown

*No analysis or not applicable

All MCLs are expressed in mg/L unless otherwise indicated

≥ MCL % = the percentage of samples that exceeded the MCL for the particular contaminant

≥ 0.5 MCL % = the percentage of samples that exceeded half of the MCL for the particular contaminant

348. HALLBERG ET AL., *supra* note 338, at 15-25.