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In this study, ELPC looked at the standards on a few key pollutant parameters. Illinois standards, or lack of standards, were then analyzed to determine whether they are protective of

We believe that the conclusions drawn in this report are valid, but a number of caveats are necessary. The resources available for this study were limited. Further, there is simply no good way to reach confident conclusions on a number of matters considered by this study. Standards, data collection and the ways of looking at the data have changed over time. Data and standards of different states are almost never directly comparable. Further, it plainly would be unwise to assume that data from other states is sound and unbiased in seeking to gauge the value or bias of Illinois data. In almost every case in which a comparison is made across time or between states, the "apples and oranges" objection could be made with considerable validity.

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II. OVERVIEW OF THE CLEAN WATER ACT AND THE ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

To understand this report, it is necessary to have some knowledge of the Clean Water Act and IEPA. The Clean Water Act is the basic law controlling water pollution in the United States and almost all of the data, programs and issues that will be treated here were directly or indirectly generated as a result of requirements of the Clean Water Act.

Generally, administration of the Clean Water Act is done in each state by an agency that has delegated authority from the U.S. EPA. In Illinois, with only a few small exceptions, IEPA has the responsibility for implementing the Act. Further, IEPA is largely responsible, when not exclusively responsible, for the creation of almost all of the reports, standards, permits and programs that are the subject of this study.

The Clean Water Act[1] was passed in 1972—over President Nixon's veto based upon his concerns about cost.[2] The Congressionally stated objective of the Act is "to restore and maintain the chemical, physical and biological integrity of the Nation's waters."[3] With the "interim goal" of making all waters of the United States "fishable and swimable" by July 1, 1983,[4] the Act required that a number of studies be performed, authorized the spending of billions of federal dollars for water treatment,[5] and set regulations on various sources of water pollution.

The Act divides pollution into three types for purposes of regulation: point source pollution, non-point source pollution, and fill material. Point source pollution is pollution from "any discernible, confined and discreet conveyance" (e.g. a pipe coming from a factory or sewerage treatment plant).[6] Such "point source" pollution is said under the Act to come from a "discharge."[7] Non-point source pollution comes from a diffuse source, such as run-off from agriculture, construction sites, parking lots, and other areas.

The distinction between point source and non-point source pollution has major legal and regulatory implications. Point sources are controlled under the National Pollution Discharge Elimination System ("NPDES").[8] Generally, one must have a NPDES permit to discharge from a point source, and it is a federal crime knowingly to discharge from a "point source" without a NPDES permit.[9] Non-point sources, however, are basically unregulated by the Clean Water

[1] 33 U.S.C. § 1251 *et seq.*
[2] Adler, R.W., Landman, J.C. and Cameron, D.M., The Clean Water Act 20 Years Later, Island Press (1993) p. 1.
[3] 33 U.S.C. § 1251(a).
[4] 33 U.S.C. § 1251(a)(3).
[5] From 1972 to 1987, through Title II of the CWA, Congress provided an average of $5 billion a year in construction grants to municipalities to build U.S. wastewater treatment infrastructure. Adler, *supra* note 2, at 112.
[6] 33 U.S.C. § 1362(14).
[7] 33 U.S.C. § 1362(12).
[8] 33 U.S.C. § 1342.
[9] 33 U.S.C. § 1319(c).

Act. Instead, Section 319 of the Act[10] provides for states to develop plans for controlling non-point source pollution and authorizes federal expenditures for this purpose, but does not establish mandatory controls.

Unfortunately, the line between "point source" and “non-point source” pollution is quite vague. Each molecule of pollution reaches water from some discrete source if one is willing to consider small enough "points.” Therefore, substantial litigation and debate has occurred regarding whether particular pollution is point or non-point source pollution.

The CWA sets elimination of discharges by 1985 as a "national goal."[11] A lot of progress has been made cleaning up point sources since 1972, but plainly the "elimination" system has not worked so far. There are currently thousands of permitted point sources in Illinois and undoubtedly there are also many illegal discharges. In addition, non-point source pollution, particularly as to nutrients (from fertilizer, manure, and soil run-off) and pesticides, remains a substantial problem.

Finally, because Section 404 covers only “fills,” draining and excavation activities that destroy wetlands now often avoid regulation. In sum, while Section 404 certainly has done much good, the protective net Section 404 offers for wetlands is full of holes.[15]

As noted, when the Clean Water Act was enacted in 1972, it was hoped that discharges would be eliminated by the mid-1980s. It was thought that, while the technology was developed and

However, the water quality standard for iron is 1 mg/L.[19] If there is less than fifteen cubic feet per second of (iron-free) flow in the stream upstream of the discharge, the technology-based standard of five cubic feet per second at 4 mg/L would lead to a violation of the water quality standard below the discharge point. Therefore, a WQBEL would be needed. For example, if the upstream stream flow were only 5 cubic feet per second, a WQBEL of 2 mg/L would be needed to prevent a violation of the 1mg/L water quality standard for iron. Therefore, the iron limit in the NPDES permit should be 2 mg/L. The hypothetical business would have to get its concentration of iron down to half of what is generally required of the industry because of the particular situation of the water into which it is discharging.[20]

Permit limits are generally enforced through self-monitoring. The permits are supposed to spell out the monitoring required.[21] The permit holders are to collect samples and file monthly discharge monitoring reports on the levels of pollution in their discharge. Obviously, this system provides incentives for permit holders to monitor inaccurately or at least to monitor at times in which it is less likely that a permit violation will be found. There are, however, some checks on self-reporting, including facility inspections and ambient water quality monitoring.[22] U.S. EPA, states and, after giving 60 days notice, citizens may bring suit to enforce permit limits.[23]

Water quality standards are composed of designated uses, criteria, implementation rules and antidegradation rules. "Use" designations are, as the name implies, a designation by the state as to the use or uses to be made of the water. For example, a water body might be designated for use as a drinking water source, for aquatic life and/or for swimming. In Illinois, there are only three use categories: general use, public and food processing water supply, and secondary contact.[24]

States have some latitude as to how they classify uses and the types of classification made, except that states may not designate a water body for the use of waste transport and assimilation.[25] In general, the use designation will dictate the criteria that will be applied. So, for example, in Illinois if a water is designated for general use, which includes swimming use, there will be criteria for pathogens that will be applicable that would not be applicable if the water was designated only for secondary contact, i.e., no swimming.

Criteria can be narrative or numeric. Narrative standards contain a narration, e.g., water must not be “offensive,”[26] and are generally somewhat subjective and hard to enforce.

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[19] 35 Ill. Admin. Code 302.208(f).

[20] Of course, nothing is ever as easy as our example. There is generally some background level of the pollutant in the water and the stream flows, effluent flows and concentration level are never constant over time. There may also be mixing problems and the standards for many pollutants vary based on the hardness or pH of the water because the pollutants involved are more or less toxic depending on hardness or pH.

[21] 40 C.F.R. § 122.48.

[22] Unfortunately, unreported violations are also discovered through fish kills and other obvious environmental damage.

[23] 33 U.S.C. §§ 1319, 1365.

[24] 35 Ill. Admin. Code Pt. 302. There are also special rules for Lake Michigan that in effect treat the Lake as an additional use category.

[25] 40 C.F.R. § 131.10(a); *see also* U.S. Environmental Protection Agency, Water Quality Standards Handbook (Second Edition, 1994) p. 2-1

[26] 35 Ill. Admin. Code 302.203.

Numeric standards are generally based on toxicity testing with the general presumption that it is the concentration that makes the poison.[27] A substance is acutely toxic at a given concentration if it kills quickly at that concentration. A substance at a particular level may also be chronically toxic; that is, it harms humans or wildlife if they are subjected to it over time. To develop water quality standards for aquatic life, organisms are subjected to various concentrations of pollutants and deaths or other effects are observed.

Normally the process for developing numeric standards is that U.S. EPA develops criteria, which are used by states to set standards. States do not have to adopt U.S. EPA criteria as standards, but must have some scientific basis for setting their own standards.[28] In many cases, states have failed to adopt any standard at all despite the fact that U.S. EPA has developed criteria.

Implementation rules tell how to set NPDES permit limits based on water quality standards. The amount of discharge, background conditions and a number of other factors must be taken into account in setting limits. The implementation rules can be as important as the numeric standards because the manner in which factors such as flow, background concentrations, measurement and monitoring are specified may be as important as the numeric standards in deciding on the effluent limits.

Antidegradation rules say when it is permissible to allow new or increased loadings of pollutants into rivers, lakes and streams.[29] Under the Clean Water Act, it is basically never permissible to issue permits to pollute in an amount that will harm existing uses of the water body. It may be permissible to allow more pollution into a water body if it is necessary to do so to allow important social or economic development and existing uses will not be harmed. Further, states are required to establish rules for designating "Outstanding National Resource Waters." If a water body is designated as an Outstanding National Resource Water, new loadings of pollutants to it are almost never allowed. Because antidegradation deals mainly with new and increased pollution, it often raises major sprawl and "smart growth" issues.

Under Section 303(d) of the Clean Water Act, states are to list water bodies not meeting water quality standards.[30] For each listed water body for each pollutant present at levels in excess of the water quality standard, states are to calculate the "total maximum daily load" ("TMDL") of the pollutant that the water body can accept without violating the WQS. TMDL calculations must be approved by U.S. EPA.

Once a TMDL is completed, the issue becomes how to implement it. If the water body is impaired by point sources, NPDES permit limits must be lowered so as to get the total loading within the TMDL.

[27] The most frequent exception here relates to chemicals that bioaccumulate up the food chain, for instance, mercury. The object with regard to such chemicals is to limit concentrations in the water body to a level low enough to ensure that valued species at the top of the food chain, such as eagles, are protected and predator species of fish will be safe to eat.
[28] 40 CFR § 131.11.
[29] 40 C.F.R. §131.12.
[30]

If the water body does not meet WQS because of non-point sources, it is unclear how the TMDL is to be implemented. Should states extend regulatory controls to non-point sources to bring waters into compliance with standards?[31] Another special problem is air deposition. Should a state limit coal combustion to prevent mercury from coal-fired power plants from reaching state waters? Clean water advocates hoped to use Section 303(d) to leverage regulatory controls or effective voluntary controls of non-point pollution, but that has happened in only a few cases.

States have dragged their feet for 25 years on creating the TMDL water body restoration plans required by the Act. Section 303(d) provides that the U.S. EPA must carry out TMDL studies if the states refuse to do so. A series of lawsuits convinced U.S. EPA to force states to create Section 303(d) lists and do TMDL calculations. However, there was a political backlash against forcing states to move forward with TMDLs, leading the U.S. EPA to revoke the revisions to the TMDL regulations that it issued in 2000.[32] EPA is currently considering whether to make new revisions to the TMDL regulations.

Each state, including Illinois, recently issued draft lists of waters needing TMDLs during 2003-04. Illinois' list contains 411 watersheds and sets forth a schedule for TMDL production that stretches through the year 2017.[33] IEPA has completed only a few TMDLs.[34] Some other states have done hundreds.

As explained by the IEPA Website:[35]

> The Illinois General Assembly was the first state legislature in the nation to adopt a comprehensive Environmental Protection Act. It was signed into law by Governor Richard Ogilvie and became effective on July 1, 1970. As a part of that act, the Illinois Environmental Protection Agency was created.
> The mission of the Illinois EPA is to safeguard environmental quality, consistent with the social and economic needs of the State, so as to protect health, welfare, property and the quality of life.
> Today, the Illinois EPA is composed of roughly 1,200 employees, working in the headquarters in Springfield and in nine field offices and three laboratories throughout the state.
> * * *
> The IEPA was delegated authority on October 23, 1977, to issue NPDES permits to Illinois communities and industries. Transfer of this authority to the State gave Illinois industries and municipalities the opportunity to work directly with the IEPA regarding their

[31] California has done this. *See* Pronsolino v. Marcus, 91 F.Supp. 2d 1337 (N.D. Cal. 2000).
[32] 67 Fed. Reg. 70920 (Dec. 27, 2002).
[33] Illinois Environmental Protection Agency, Illinois 2002 Draft Section 303(d) list, IEPA/BOW/02-009 (June 2002), p.13.
[34] Two TMDLs for Illinois water bodies (Cedar Creek in Galesburg and Governor Bond Lake) were prepared by consultants to U.S. EPA and. As of August 2002, IEPA was developing 17 TMDLs using outside consultants. Illinois Environmental Protection Agency, Performance Self Assessment, IEPA/ENV/02-013 (August 2002) p.31.
[35] <www.epa.state.il.us/about>.

NPDES Permitting

The data below indicates the number of staff working on NPDES permitting and compliance[42] at IEPA, the Ohio EPA (OEPA), and the Minnesota Pollution Control Agency (MPCA) compared to the number of permitted sources in each state. Compared to Ohio and Minnesota, Illinois appears to devote fewer resources for each regulated source.

	FTEs[43]	NPDES Individual Permits	NPDES General Permits	Total
IEPA (2003)[44]	130	2,050	"Thousands" ~4,000	>6,000
OEPA (2003)[45]	103	---	---	>4,000
MPCA (2001)[46]	78	873	551	1,429

Operating Budgets

FY 2000	Operating Expenditures: Water Programs	Clean Water Act Implementation
IEPA[47]	$33,000,000	$24,800,000
Ohio EPA[48]	$46,349,000	$30,265,000
MPCA[49]	----	$20,183,000

Distribution of Expenditures for Water Quality Programs

Listed below is the approximate distribution of IEPA resources for Clean Water Act implementation versus national averages in the year 2000. The national average is based on data from 38 states.

	IEPA	National Average
Permitting, Compliance and Enforcement	38%	37%
Septage	0%	1%
TMDLs	7%	8%
Reporting and planning	3%	7%
WQ Standards	2%	3%
Monitoring	25%	10%
Non-point sources	7%	13%
Clean Lakes	3%	N/A
Wetlands	1%	6%
Coastal and Marine	1%	1%
Clean Water SRF, grants mgmt.	7%	9%
Data Management	5%	3%
Regional Initiatives	1%	2%

Significant differences are found with monitoring, reporting and planning, and non-point sources. However, more recent financial data indicates that IEPA is spending less on monitoring, as a percentage of total spending on CWA implementation, and more in other areas. Funding for non-point source programs has increased since 2000, although it appears that the state still spends comparatively less than other states.

As described throughout this report, IEPA can and should implement a number of operational and policy changes to more effectively utilize available resources to protect Illinois' waters. However, it is also clear that IEPA lacks sufficient resources to do the job right. A back-log of permit applications and infrequent inspections and enforcement are in large part attributable to insufficient staffing.

In 2000, IEPA conducted a "Gap Analysis" in concert with the State Water Quality Management Resource Analysis Task Force, and the agency concluded that it needed more than twice as much funding for Clean Water Act implementation than was available at that time. In March of 2003, IEPA identified $27.356 million in funding needed to administer the NPDES program alone, compared to $13.491 million in current resources.[50] IEPA reports that 26 percent of individual permittees are operating on expired permits, and there is a back-log of 1000 permit renewal and modification applications. Moreover, new stormwater and CAFO requirements will result in the need for more permits and inspections.

Historically, one of the main reasons that the Bureau of Water was under funded and heavily dependent on federal funds was that until legislation was passed in Spring 2003 providing for NPDES fees, Illinois was one of only 11 states (and the only Midwest state) that failed to charge fees for reviewing and issuing water permits and monitoring permitted sources.[51]

Industrial and municipal wastewater dischargers have long been required to pay for the costs related to the issuance of NPDES permits in most states. In some cases, the revenue collected more than pays for the cost of administering and enforcing the state's water programs. Fees are an equitable source of revenue for permitting, monitoring and enforcement activities because they are paid by the entities that generate the pollution.

Fees in other states are typically collected for the following water pollution sources: (a) Industrial wastewater; (b) Industrial stormwater; (c) Coal mine and quarry runoff; (d) Concentrated animal feedlot operations; (e) Municipal wastewater treatment facilities; and (f) Municipal stormwater discharges. For example:

> Indiana's Department of Environmental Management charges industrial and municipal dischargers an annual permit fee of $400 - $1,000, plus an amount ranging from $240 (<50,000 GPD) - $34,000 (>100 MGD) per year based on daily discharge volume. The state collects $4.1 million annually from these permit fees.
>
> Minnesota charges major municipal dischargers from $5,900 (<5 MGD) - $175,000 (>50 MGD) annually based on pollution discharge volume. Major industrial dischargers pay from

[50] Illinois Environms Enii.001e

$8,500 (<5 MGD) - $44,000 (>20 MGD) annually. Fees for non-major dischargers range from $500 - $1,000 annually. Minnesota collects $2.8 million each year, and the fees were recently increased by 25% to reflect declining support for the program out of general revenue funds.

Wisconsin's fee structure reflects both the volume discharged and concentrations of various pollutants in the wastewater flow. Wisconsin's stormwater fees alone generated $8.2 million in 2000

Under the legislation passed in spring 2003, fees for NPDES permits were established that would be sufficient to pay for many of the programs that IEPA has failed to implement properly in the past for lack of funds. [52] These fees on NPDES permits and certain other IEPA permits relating to water pollution control programs are designed to raise over $20 million.

Unfortunately, under the budget approved by the legislature in May, most of the funds that will be raised by the fee may be taken by the Director of the Bureau of the Budget for the purpose of balancing the general revenue fund. There will probably be no new money for IEPA programs this year although, as will be discussed further below, IEPA is not now adequately performing many tasks it must do under the Clean Water Act. In addition, IEPA, without new money, must implement substantial new federally-mandated programs to control pollution from urban stormwater and large animal feeding operations.

Finally, it should be noted that some states have passed large bond issues to improve water quality. In 1998, Michigan voters passed a $675 million Clean Michigan Initiative, much of which is focused on water quality programs.[53]

[52] SB 1903, the state budget.
[53] Michigan, 2002 Section 305(b) Report (April 2002) p.5.

miles of the rivers and streams (42%) it is not healthy to eat the fish because of mercury or PCB levels in the fish tissue.[59]

3,283 miles of Illinois rivers and stream were studied for swimming.[60] It was found that in 2,272 miles (69%) it is frequently not healthy to swim, generally because of pathogen levels.[61]

The Illinois Section 305(b) Report also contains data for lake acreage as follows:[62]

	Acres Studied	Acres Impaired	% Impaired
Aquatic Life	146,534	61,374	42
Fish Consumption	114,380	30,062	26
Swimming	146,534	127,680	87

The Illinois data on rivers, lakes and streams is of great interest, but the data is incomplete and inconclusive in a number of ways. First, less than 19% of the river and stream miles and only a bit over 60% of the lake acres were assessed.[63] Further, how the waters were graded naturally involves a number of judgements, the wisdom of some of which could be debated.

For most streams, whether a river or stream meets the "aquatic life" use basically involves collecting fish and/or macro invertebrates (e.g. water bugs) from the water and then determining the quality of the water by comparing the number and range of species present with what would be expected in a similar stream that was not affected by pollution. If virtually everything in the water is capable of living in low quality water, for instance carp or bloodworms, and many species that biologists would expect in a reference condition stream in that area are not present, the water body receives poor grades. If there are a number of pollution intolerant organisms in the water, such as stone fly larva, the water will be found to be “fully supporting” for aquatic life use.

Obviously, biologists can and do disagree about the relevant indices and grading systems and the systems used among states vary significantly. However, the method of determining the health of a water body by taking samples of the aquatic life is well accepted. The basic systems used by IEPA, the Index of Biotic Integrity (“IBI”) and the Macroinvertebrate Biotic Index (“MBI”), are widely recognized across the country and even internationally. Clearly, the best way to look

less dangerous than was thought or they are canceling each other out.[65] On the other, hand if there is only sparse and unhealthy aquatic life in the water, water sampling that does not show dangerous pollution levels proves only that sampling did not happen at the right times, is not testing for all the right pollutants, or that the harmful effects of the pollutants are additive in their effects.[66]

In large rivers it is impossible to do biological testing because the standard collection and sampling techniques will not work and there are no large rivers unaffected by human pollution, which could serve as a reference for comparison.[67] As to these rivers, IEPA determines whether the water is impaired by comparing water chemistry data to the numeric water quality standards. If there are numerous samples showing pollutant concentrations higher than the water quality standards (e.g., more than 10% of the samples show the level of iron is greater than 1 mg/L), the water is listed as impaired. For dissolved oxygen, the standard requires that levels stay above the level that fish need to breath and a violation of numeric water quality standards and impairment is found if a number of samples are taken showing that dissolved oxygen levels are too low. The DO standard is generally 5 mg/L in Illinois. Using numeric water quality standards in determining impairment is probably less reliable than biological sampling, but is currently the best that can be done for large rivers.

Determining whether a lake meets the aquatic life use in Illinois involves use of a complex

The Illinois system for determining whether a water body is safe for swimming now mainly depends on the fecal coliform bacteria count in the water or, if there is no fecal coliform data, on the clarity of the water.[71] There is generally no pathogen data collected for Illinois lakes except in Lake and Cook Counties, where the county health departments collect such data.[72]

U.S. EPA's report summarizing all of the state Section 305(b) reports for the period 1998-2000,[73] states that 19% of the nation's river and stream miles were assessed and that approximately 40% of these miles were found to be impaired. U.S. EPA's summary states that 43% of the nation's lake acres were assessed and that 45% of the lake acreage was found to be impaired. While it is dangerous to make comparisons of data from different states because of the differences in state data collection and analysis, the extent of monitoring and impairments of Illinois waters appear to be roughly of the same magnitude as that of the national average.

U.S. EPA's Region 5 has created a report that summarizes state 305(b) reports for 1998-2000 for the states in the region (Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin).[74] Looking at aquatic life use, Region 5 finds that the states in the region have assessed 30.3% of their rivers and stream miles and found 32.7% impaired.[75] Regarding aquatic life impairments in lakes, states in Region 5 report that they have assessed 25.7% of their lake acreage and found 30.7% to be impaired.[76] Again admitting the limitations on making comparisons, it appears that Illinois rivers, lakes and streams suffer roughly the same aquatic life use impairment as the regional average. It also appears that Illinois has monitored a higher percentage of its lakes for aquatic life use than the average state, both nationally and in the region.

Finally, while again recognizing the hazards of comparing Section 305(b) reports from different states,[77] it is interesting to compare Illinois' water quality with that of Michigan, a state that touts its water recreation opportunities. In its report on water quality data taken from 1997 to 2001, the Michigan Department of Environmental Quality ("Michigan DEQ") claims to have monitored 55% of its total inland lake acres, excluding the Great Lakes, with the following results: [78]

	Acres studied	Acres impaired	% impaired
Aquatic Life	502,989	6981	1.4
Fish Consumption	502,989	326,943	65
Swimming	502,989	3,956	.8

[71] Illinois 305(b) Report, *supra* note 52, at 41, 49.
[72] *Ibid* p. 49
[73] U.S. Environmental Protection Agency, National Water Quality Inventory 2000 Report (Aug. 2002), p. ES-3.
[74] U.S. Environmental Protection Agency Region 5, State of the Waters 2002 Region 5 (Sept. 2002).
[75] *Ibid.* p. 1-5.
[76] *Ibid.*
[77] Michigan considers all lakes surveyed in the last 20 years to be monito

Michigan DEQ claims to have assessed 21,890 miles of its rivers and streams, 79% of its total perennial rivers and streams.[79] As to these rivers and streams, Michigan DEQ reports the following:[80]

	Miles studied	Miles impaired	% impaired
Aquatic life use	21,881	777	3.6
Fish Consumption	21,881	1,542	7
Swimming	21,881	588	2.7

was impaired, IEPA might hypothetically conclude that the water was potentially impaired by metals if the iron level was higher than the water quality standard for iron (1 mg/L) in the last three years, by phosphorus because the level of phosphorus was higher than the 85th percentile of all samples in at least one sample in most of the last three years, and by habitat alterations by observing that the stream was recently channelized. In this example, one impairment was potentially caused by three different causes.

The fact that impairments are sometimes identified only through violations of numeric standards (regarding large rivers, this is the only way they are identified) results in some counter-intuitive cause listings. For example, an impairment to a certain section of the Illinois River might be identified through data showing that the water has too high a level of a particular metal pollutant. If phosphorus were above the 85th percentile level in that section of the river, phosphorus would be listed as a cause of the impairment although there is little evidence of any relation between metal pollutants and phosphorus levels.

In any event, the Illinois Section 305(b) report identifies the following top ten potential causes of impairments of Illinois rivers and streams:[84]

Cause	impaired miles
Nutrients	3082
Organic enrichment/low DO	2962
Habitat Alterations (other than flow)	2732
PCBs	2435
Pathogens (fecal coliform)	2318
Metals	2228
Siltation	1978
Suspended solids	1728
Priority organics (e.g. atrazine)	743
pH	685

The top ten potential causes of impairments for lakes are:[85]

Cause	acres impaired
Nutrients	114,903
Siltation	98,523
Suspended solids	84,635
Excessive algal growth	83,873
Organic enrichment/low DO	80,135
Noxious Aquatic plants	46,580
PCBs	23,668
Priority organics	21,546
pH	18,239
metals	16,494

[84] Illinois Section 305(b) Report, *supra* note 52, at 43.
[85] *Ibid.* at 63.

IEPA's identifications of the potential sources of the pollution that reaches the water rely on a variety of data and observations collected by or available to the Agency. The top ten potential sources of pollution causing impairments to rivers and streams are:[86]

Source	miles impaired
Agriculture	4071
Hydromodification (channelization)	2013
Municipal point sources	1566
Resource Extraction (mining, oil and gas)	1079
Urban run off/storm sewers	1004
Habitat modification (other than Hydromodification)[87]	760
Combined sewer overflow	368
Industrial point sources	348
Contaminated sediments	325
Construction	238

The top ten potential sources of pollution causing impairments to lakes are:[88]

Sources	acres
Agriculture	129,204
Habitat modification	104,819
Run off from forest/grassland or parkland (e.g. golf course fertilizer)	74,919
Recreation activities	73,591
Contaminated sediments	53,835
Urban run off/storm sewers	37,159
Municipal point sources	28,825
Hydromodification	25,180
Land disposal (e.g. dumps, septics)	22,675
Marinas	18,278

IEPA is collecting much useful information and its collection and analytical methods appear to have improved considerably over time. Unfortunately, there is reason to believe that there are entire families of chemicals that may be having a significant effect on Illinois water quality but are not being monitored in any systematic matter.

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Most notably, IEPA is collecting little information regarding potential endocrine disrupting chemicals (e.g. surfactants and plasticisers), even though such chemicals may have profound effects on aquatic life and human health. As explained recently in Water Environment & Technology:[89]

> The endocrine system is a combination of glands and hormones that affect biological reproduction, growth, and development. Endocrine disruptors are compounds that can block, mimic, stimulate, or inhibit the production of natural hormones, thereby disrupting the endocrine system's ability to function properly.

In the early 1990, researchers in Britain noted that male trout downstream from sewerage treatment plants had become hermaphrodites and had chemicals in their blood that are normally found only in females. Similar effects were later found in carp that were caged in the Mississippi River and Minnesota River downstream from the Minneapolis sewerage treatment plant and heavy agricultural runoff.[90]

While fish, of course, are immersed in water and receive the maximum impact of whatever chemicals are in the water, there are researchers who believe that exposure to even very small doses of endocrine disrupting chemicals can adversely impact human health.[91] A federal advisory committee is conducting studies of potential human health effects.[92]

Known endocrine disrupting chemicals have been found in a large number of water bodies across the United States and there is no reasonable hope that they are not present in many Illinois water bodies.[93] IEPA does test for a number of pesticides known to act as endocrine disruptors and, unsurprisingly, has found some disruptors, such as atrazine and other pesticides, in many Illinois waters. Unfortunately, IEPA fails to test for other known endocrine disruptors such as aklylphenols and estrogen.

Moreover, Illinois waters undoubtedly contain a wide range of other chemicals used in industrial, agricultural and consumer products with largely unknown effects on aquatic life and other elements of the environment. A U.S. Geological Survey study of 139 streams across 30 states in 1999 and 2000 broadly found steroids, deodorants, caffeine, perfumes, fire retardants, nonprescription drugs, in.8310.98 ducen ll

properly in a stream because of the levels of surfactants in the water, the absence of expected fish species would lead the water to be listed as impaired. The surfactant responsible, however, would not be identified as a cause and the agent responsible for putting the surfactant into the water would not be listed as a source.

It is beyond question that many Illinois waters have improved substantially since 1972. As

Illinois River side channels are severely impaired from siltation and eutrophication even while IEPA's chemical data, taken in the main channel, showed that the river was healthy.[103]

In addition to the unavoidable problem of trying to extrapolate water quality along a linear body by monitoring at a limited number of points, there are serious limitations with the monitored data. As noted above, many of the modern industrial and consumer chemicals that we know are in the water are not tested for by IEPA. Moreover, the fixed sites are monitored only every six weeks. Of course, pollution parameters vary on a constant basis and huge slugs of pollution may be completely missed by monitoring that occurs every six weeks. For example, levels of dissolved oxygen in streams affected by nutrients and algae are known to fluctuate over the course of the day with the low oxygen levels, potentially lethal to aquatic life, occurring early in the morning when samples are almost never collected.[104]

Clearly, more resources are needed for more continuous monitoring in streams, to look at conditions below known pollution sources including factories, large-scale animal feeding operations and municipal discharges, and to improve the overall coverage of the monitoring system. Still, while recognizing all the limitations in Illinois water quality monitoring, IEPA's monitoring program for aquatic life is probably no worse than that of many other states and is probably much better than many.[105]

Regarding monitoring for protection of swimmers, Illinois has serious gaps. As noted, there is generally no pathogen data for counties other than Cook and Lake. Further, in the streams and the few lakes where pathogen data is collected, such collections are limited to fecal coliform data, even though it is generally accepted that different kinds of data should be taken to gauge accurately the level of dangerous pathogens in recreational waters.

U.S. EPA, which in 1976 recommended testing fecal coliform levels as an indication of recreational water quality, has now concluded, based on multi-site epidemiological studies, that enterococci and E.coli levels have a much higher correlation than fecal coliform with swimming-associated gastroenteritis in fresh water.[106] Thus, Illinois authorities, to the extent they have

[103] Illinois Environmental Protection Agency, Illinois Water Quality Report 2000 Report (2000) pp. 3-4**.** Reportedly this admission occurred after IEPA circulated its first draft of its 2000 305(b) report, giving the Illinois River largely a clean bill of health, at the very time that Lt. Governor Wood was in Washington, D.C. attempting to get federal money to address the serious problems in the River and its side channels that can be seen even by casual observers.
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been measuring the healthfulness of recreational waters, have been largely measuring the wrong thing. Illinois should soon change its system for pathogen monitoring to monitor for E.coli or enterococci as a result of the October 2000 enactment of amendments to the Clean Water Act, known as the "Beach Bill".[107]

[107] 33 U.S.C. §1346. Many public beaches are already testing for E.coli rather than fecal coliform.

State water quality standards consist of use designations, criteria, which may be numeric or narrative, and antidegradation rules. It appears that Illinois has serious flaws in its use designations, indeed in its whole system for designating uses. Further, Illinois has not established use criteria for key pollutants. Illinois' antidegradation standards, however, are reasonably protective, or at least will be if they are properly implemented in permit writing. Illinois mixing zone regulations, which govern how standards are implemented where there is dilution available, have strengths but also a serious flaw.

As mentioned above, Illinois has three main use designation categories: drinking water and food processing, general use, and secondary contact. By way of contrast, Ohio has seven aquatic use classifications (warmwater, limited warmwater, exceptional warmwater, modified warmwater, seasonal salmonid, coldwater, and limited resource water), some of which have sub-classifications, and three recreational use classifications (bathing waters, primary contact and secondary contact).[108]

Illinois' unrefined classification system has led to a "dumbing down" of Illinois standards for some toxins. Water quality standards are supposed to be set at a level that will protect the "most sensitive use" of the water body to which the standard applies.[109] In a water body listed for "general use," the water quality standards should be stringent enough to protect all aquatic life in that water. Under Illinois's crude use classification system, the water bodies that fall into the general use category include drainage ditches and other water bodies that never harbored pollution sensitive species. Because of this, industry and municipalities have been able to convince the Pollution Control Board that setting a general use waters numeric criteria that would protect pollution intolerant species would require millions in wastewater treatment for waters that do not need so much protection.[110] Rather than adopt stringent standards that would make drainage ditches safe for aquatic life, the Pollution Control Board has adopted "one size fits all" standards that are not protective of highly sensitive species in the Illinois water bodies in which they could live.

Although the state budget is now very limited, it would be worth the investment to review and revise the use classification system for Illinois waters. A more refined use classification system would allow for the application of much stricter chemical criteria to protect certain exceptional warm water streams that harbor rare or endangered species, such as native mussels, and to cool water habitats that have relatively sensitive non-salmonid species, such as sculpin and darters.

108

In large part because of the unrefined use classification system discussed above, Illinois standards for particular toxins often consist of the federal criteria for that toxin loosened to allow more pollution in Illinois. This is done on the theory that the sensitive species relied on in the federal criteria setting process are not present in Illinois. [111] No effort is made to determine whether there are other species that are sensitive to the toxin under consideration that are present in Illinois but were not considered in development of the federal criteria.[112] For example,

> Effects directly related to nutrients can also result in human health problems. … The USEPA has an established maximum contaminant level of 10 mg/L because nitrates in drinking water can cause potentially fatal low oxygen levels in the blood when ingested by infants. Nitrate concentrations as low as 4 mg/L in drinking water supplies from rural areas have also been linked to an increased risk of non-Hodgkin lymphoma.
>
> * * *
>
> Nutrient impairment can cause problems other than those related to human health. One of the most expensive problems caused by nutrient enrichment is the increased treatment required for drinking water. .. . Adverse ecological effects associated with nutrient enrichment include reductions in dissolved oxygen (DO) and the occurrence of HABs (harmful algal blooms). High algal and macrophyte biomass may be associated with severe diurnal swings in DO and pH in some water bodies. Low DO can release toxic metals from sediments contaminating habitats of local aquatic organisms. In addition, low DO can cause increased availability of toxic substances like ammonia and hydrogen sulfide, reducing acceptable habitat for most aquatic organisms, including valuable game fish. Decreased water clarity (increased turbidity) can cause loss of macrophytes and creation of dense algal mats. Loss of macrophytes and enrichment may alter the native composition and species diversity of aquatic communities. [115]

Speaking specifically with regard to the Fox River, the Illinois Natural History Survey wrote of the effect of elevated phosphorus levels on the Fox.

> High nutrient inputs and still-water environments created by the numerous channel dams situated along the entire main stem of the Fox River in Illinois promote excessive algal growths. Very high phosphorus levels appear to promote and sustain massive algal blooms along the Fox River.
>
> Pronounced algal growth will continue to produce fluctuating DO levels behind the low channel dams unless significant reduction in phosphorus levels occurs.[116]

Despite the large number of Illinois waters impaired by phosphorous, IEPA has only slowly moved to develop phosphorous standards. While there is a .05 mg/L standard for phosphorus in lakes with a surface area over 20 acres,[117] there is generally no phosphorus standard for Illinois rivers, streams or small lakes. As a consequence, few Illinois NPDES permits contain any limit on phosphorus discharges.

[115] U.S. Environmental Protection Agency, Nutrient Criteria, Technical Guidance Manual, Rivers and Streams, EPA -822-B-00-002 (July 2000) (pp. 4-5, citations om

During his recent election campaign, Governor Blagojevich promised to establish phosphorus standards by 2004. However, IEPA has presented a schedule to U.S. EPA that calls for nutrient standards to be adopted by the IPCB in fall of 2008.[118]

Reduction of the levels of phosphorous discharged by Illinois wastewater treatment plants is certainly technologically feasible. Minnesota, Michigan, and Wisconsin all generally impose limits at least as strict as 1 mg/L on phosphorous,[119] and there are established wastewater treatment methods that consistently allow reduction of phosphorus pollution to well under 1 mg/L.[120]

As mentioned above, the Clean Water Act requires states to establish and implement antidegradation policies. As their name implies, antidegradation standards are designed to ensure that waters do not get dirtier than they already are. The idea of the Clean Water Act is ultimately to bring all of the nation's waters up to "A", not to allow everything to get to "D-".

An antidegradation policy must do three things:[121]

> Assure that waters are kept clean enough to protect existing uses. New loadings must not be allowed if they would harm the aquatic species now living in the water body or make it unsafe to swim in a water body in which it is now safe.
>
> Prohibit new pollution loadings to water bodies unless allowing such pollution is necessary to accommodate significant social or economic development.
>
> Provide for the designation of Outstanding National Resource Waters.

On February 21, 2002, Illinois established antidegradation standards and implementation rules that should accomplish these three purposes. This development came only after a long battle. As with the TMDL requirement, U.S. EPA and the states, including Illinois, largely ignored antidegradation for the first 25 years after passage of the Clean Water Act.

In Illinois, real progress toward establishing standards began after ELPC, McHenry County Defenders, Prairie Rivers Network, Sierra Club and other groups in October 1997 threatened to sue U.S. EPA because of the failure of IEPA to adopt proper antidegradation rules. This led to a long negotiation and regulatory process that ultimately resulted in IEPA proposing fairly sound draft rules to the IPCB for adoption. A year and a half and much debate later, the IPCB adopted rules that were slightly improved from those proposed by IEPA despite extensive efforts by industrial polluters and others to persuade the IPCB to weaken the IEPA proposal.

Illinois' new antidegradation rules give substantial protection against new pollution to every river, lake and stream in the state. The rules do not contain loopholes for small additions of new

[118] Draft Illinois Plan for Adoption of Nutrient Water Quality Standards, June 17,2003.
[119] Minnesota Pollution Control Agency, 2002 Minnesota Water Quality, (2002) pp. 35-37; Mich. Admin. Rule 323.1060; Wis. Code NR 217.04(1)(a)1.
[120] Barnard, J.L.; and Scruggs, C.E., Biological Phosphorus Removal, Water Environment and Technology, (Feb. 2003) p.27
[121] 40 C.F.R. 131.12.

pollution.[122] In addition, the rules contain procedural safeguards requiring the IEPA to make sure that new permits will not harm drinking water, swimming, or aquatic life. The rules also require applicants seeking permission for any new or expanded discharges to prove that the new pollution is really necessary after considering alternatives. Further, the Illinois rules allow a fair chance for designation of exceptionally high quality waterways as “outstanding resource

pollutant in question. Other mixing zones, known as "zones of initial dilution" (“ZIDs”) are areas that do not meet acute standards, which are standards designed to protect aquatic life from immediate fatality resulting from contact with the pollutant. ZIDs (known by some as "zones of instant death") are supposed to be limited to an area within which effluent dispersion is immediate and rapid.[125] Assuming that any ZID allowed is strictly limited in area, the only fatalities from the ZID should be aquatic life that has the bad luck to swim immediately in front of

Federal regulations prohibit states from issuing permits for discharges that may "cause or contribute" to violations of state numeric or narrative water quality standards.[129] In other words, the NPDES permits issued by IEPA should have limits and conditions in them that prevent water quality standards from being violated. The permits should also require monitoring so that they can be enforced.[130] Further, permits should be written and considered in an open atmosphere with the public able to participate fully in the process.[131]

It is, however, a notorious fact that states differ as to the extent that the NPDES permits they issue actually prevent violations of water quality standards. By varying the assumptions and procedures used in writing permit limits, different states develop different limits for situations in which all the relevant environmental factors are identical. As explained in a General Accounting Office report:

> The permitting authorities also differ considerably in the amount and type of data they require to determine whether pollutants have a reasonable potential to violate a state's water quality standards and, if so, how extensively such pollutants need to be controlled. Differences in numeric discharge limits occur because both the water quality standards and the policies for implementing these standards in the permits differ among the states. For example, the states have adopted different implementation policies concerning several technical factors that affect discharge limits, including the size and location of the "mixing zones" where the discharges and the receiving waters mix, the potential for dilution, and the background concentration of the pollutants.[132]

Illinois faces serious challenges with regard to its NPDES permit writing and the manner in which it issues permits to pollute. Many Illinois permits are not adequately protective of water quality. In large part this is due to the fact that IEPA, contrary to Illinois law,[133] generally does not require permit applicants to show that they are entitled to the requested permit, but instead places the burden on itself and any objecting third parties to prove that the permit as sought would allow violations of water quality standards. Particularly in view of the severe budget restraints on IEPA, the agency cannot continue trying to do a substantial portion of the applicants' work for them.

[129] 40 CFR 122.44(d)(1)
[130] 40 C.F.R. 122.44(i), 122.48
[131] 33 U.S.C. §1251(e)
[132] U.S. General Accounting Office, Differences Among the States in Issuing Permits Limiting the Discharge of Pollutants, GAO/RCED-96-42 (Jan. 1996) p. 2
[133] 415 ILCS 5/39(a)

IEPA has been issuing NPDES permits to publicly operated treatment works (POTWs) and industrial dischargers since the 1970s. Nonetheless, there remain a number of substantial flaws in such permitting. In general, these flaws can be traced to the fact that IEPA does not have enough resources to do the necessary studies to develop proper permits. However, IEPA also has made the task harder for itself by failing to require permit applicants to do the work that the regulations require them to do to get permits. Discharging pollutants to water bodies should be treated as a privileged to be earned, not a right that the IEPA can restrict only if it proves that the discharge will cause a problem.[134]

While Illinois does not have a numeric standard for phosphorous or nitrogen applicable to rivers, streams, and small lakes, it does have a narrative standard that should apply to such nutrient discharges. In particular, 35 Ill. Admin. Code 302.203 provides that "the waters of the state shall be free from sludge or bottom deposits, floating debris, visible oil, odor, plant or algal growth, color or turbidity of other than natural origin." Unfortunately, IEPA ignores this standard during the permitting process as the agency does not include limits on the discharges of phosphorous or nitrogen in Illinois NPDES permits even under conditions where it is likely that discharge of nutrients will cause or contribute to algal growth, color or turbidity of other than natural origin. For example, IEPA has issued permits containing no limits on the discharge of phosphorous in cases where the receiving waters are suffering from severe algal blooms as a result of such discharges or have been identified as potentially impaired by nutrients.[135]

The lack of numeric standards for these nutrients is no excuse for IEPA's failure to limit phosphorous and nitrogen discharges. Other states in the Midwest, including Michigan, Minnesota and Wisconsin are acting now to limit phosphorus discharges even before finalizing numeric phosphorous water quality standards.[136] Illinois' failure to act must be traced to its lack of political will to impose the costs of phosphorus removal on Illinois dischargers until it is forced to do so.

In order for fish and other aquatic life to breathe, rivers, lake and streams must contain sufficient levels of dissolved oxygen. Pollutants known as biological oxygen demanding pollutants ("BOD") or deoxygenating wastes, take oxygen out of the water as they decay and therefore reduce dissolved oxygen levels. BOD comes in two main forms: nitrogenous BOD (mainly ammonia) and carbonaceous BOD ("CBOD"). Too much of these pollutants will reduce the dissolved oxygen levels in waters and thereby threaten aquatic life. In order to avoid this threat,

[134] The law is clear that there is no "right to pollute. " See 40 CFR ¶121.41(NPDES permit creates no property right);

[135] For example, Fox River Water Reclamation District West Plant, NPDES Permit No. IL0035891 (March 30, 2001); Water Reclamation District of Greater Chicago. NPDES Permit No. IL0028053 (Jan. 22, 2002)

[136] Minnesota Pollution Control Agency, 2002 Minnesota Water Quality, (2002) pp. 35-37; Mich. Admin. Rule 323.1060; Wis. Code NR 217.04(1)(a)1.

In determining CBOD5 limits, stream

winter for the species to reproduce properly.[147] Recognizing the potentially adverse effects of heat when it wrote water quality standards in the early 1970s, the IPCB established Illinois temperature standards requiring the maintenance of natural daily and seasonal temperature fluctuations and prohibiting an increase of more than five degrees Fahrenheit above natural temperatures.[148]

Unfortunately, IEPA routinely ignores these temperature standards in permit writing. Even through IEPA has acknowledged that the effluent from sewerage treatment plants will cause violations of heat standards in low-flow streams during both winter and summer, the IEPA does not consider the temperature standards in permitting such plants.[149]

In addition, IEPA fails to require proper temperature modeling of large utilities discharging heat into Illinois waters. For example, the heat discharged into the Des Plaines River system by Midwest Generation's plants appears to be causing violations of heat standards. Commonwealth Edison performed a heat demonstration for those plants in the late 1980s, but IEPA has not required Midwest Generation, which has since purchased the plants, to carry out updated heat demonstrations even though Midwest Generation is operating the plants much more than it was presumed Commonwealth Edison would in its heat demonstration.

A major technical challenge that must be faced in writing a permit for a discharge is determining what pollutants the discharge might include in quantities large enough to potentially cause a violation of a water quality standard. It is infeasible for permits to include limits on all of the thousands of possible pollutants that a discharge could hypothetically contain. Therefore, a permit writer must try to estimate what type and quantity of pollutants might be in the discharge by taking samples of the discharge and/or analogizing to other similar discharges. This approach, however, may miss metals and other toxins in the discharge because: (1) generally only a few samples of the effluent are taken, (2) concentrations of a pollutant in the discharge may vary over time, (3) the amount of dilution in the receiving water may vary over time, and (4) the toxicity of the pollutant may vary based on factors such as the hardness of the water.

The US. EPA has addressed this problem through a federal guidance document entitled the Technical Support Document for Water Quality-Based Toxics Control.[150] The Technical Support Document uses basic statistical principles to

approved U.S. EPA method until that method is commercially avqilable.[154] This approach, however, virtually assures that these methods will not become commercially available. No discharger would seek to use a more sensitive analytical method than is required by IEPA,

There are two main types of sewer systems: (1) combined systems in which rainwater combines with sanitary sewerage before both are treated at the sewerage treatment plant, and (2) separate systems in which rainwater is kept separate from the sewerage that is to be treated. Most sewerage systems in Illinois are combined systems.

Combined systems offer an advantage and a disadvantage. When they are large enough to handle the combined flow during most rain events, combined systems have the advantage that rainwater that comes into contact with city streets, yards full of fertilizer and pesticides, and other sources of pollutants receives treatment before it reaches a stream or lake. The disadvantage is that if sewerage treatment plants are not large enough to handle the combined flow, the treatment plant operator may be forced to allow a discharge of untreated or partially treated wastewater that contains both sanitary waste and rainwater runoff pollution.

It is probably not possible to require municipalities to build sewerage treatment plants capable of handling the largest imaginable combined flow. Therefore, federal regulations allow for the emergency discharge of combined untreated or partially treated sanitary wastewater and rainwater under certain circumstances usually involving very heavy rainfalls.[157] These untreated discharges are known as “bypasses.” The justification for this practice is that when discharges of only partially treated sanitary wastewater and rainwater occur, there is so much water in the stream, due to the rain, that the untreated discharge will be well diluted.

IEPA, however, appears in some cases to be allowing bypass discharges that do not comply with the federal limits on emergency discharges of untreated wastewater.[158] Further, these discharges that IEPA labels "excess flow discharges,” are not well monitored and the circumstances in which they may occur are not clearly delineated in Illinois NPDES permits. Thus, many Illinois municipalities are often allowed to discharge sanitary wastewater that has not been properly treated during light rainfall conditions that will not adequately dilute the sewerage. While this approach allows municipalities to save money by not building sufficient treatment capacity, it is not good for Illinois water bodies.

Except with regards to bio-accumulative pollutants,[160] Illinois’ mixing zone regulations on their face are fairly protective of Illinois waters, but these regulations are frequently ignored in permit writing. IEPA does not generally consider whether there are aquatic habitats that will be affected by mixing zones. As a result, there are areas, such as in the Mississippi River near 3M’s Cordova plant, where IEPA has allowed mixing zones that have killed off mussel beds or endangered species. Further, unlike other states, IEPA rarely conducts dye studies or other studies to determine the true area of a proposed mixing zone. Instead, IEPA often just assumes that the discharge instantly mixes with a fixed percentage of the low flow.

[157] 40 C.F.R. 122.41(m).
[158] *Ibid.*
[159] 35 Ill. Admin. Code 302.102(e).
[160] *See* Section V.E.

Pathogens in water bodies can pose a health risk to swimmers and others who come in contact

Similarly, with regards to Tier II protections, the permit writers at IEPA are doing little to assure that new or increased discharges are really necessary. IEPA permit writers are moving very slowly to require the broad consideration of alternatives to new discharges that the antidegradation rules require. Further, they have shown a willingness to accept frivolously superficial considerations of alternatives as satisfying the rule.[167]

A basic problem is that alternatives to new or increased discharges generally are not considered until too late in the process. A municipality bent on growth that has a developer eager to build is likely to press IEPA to approve the usual approach of building a mechanical treatment plant and dumping the wastewater, treated to the minimum extent that IEPA will accept, into the nearest stream. Under the existing Illinois Facility Planning Area rules, municipalities are required to apply to IEPA for permission to extend sewerage service into new areas. But the program has not been effectively used to force communities to consider alternatives to developments that will harm streams. The Facility Planning Area program should be improved to build antidegradation analysis into the system. Alternative means of handling wastewater resulting from growth, including land treatment and wetland polishing, should be considered early in the planning process.

By strongly encouraging treatment and uses of wastewater that do not result in discharges, it should be possible to make substantial progress toward protecting streams and aquatic life from nutrients, flow changes, heat pollution and exotic chemicals while saving and replenishing groundwater.[168]

As US. EPA officials explained in 1998:

> State reports of water quality conditions indicate that agriculture is the single largest source of water pollution in rivers and lakes, and these reports suggest that animal feeding operations are a significant part of this problem. As noted above, twenty-two States reported on the impacts of specific types of agriculture, and identified animal operations -- including feedlots and animal holding areas -- as the third largest type of agricultural activity affecting water quality and impacting 20% of impaired river miles, or about 35,000 river miles, in these 22 States.
>
> Animal feeding operations can impair water quality in a number of ways. If not collected and treated properly, animal manure can

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would probably have gone through without a hitch and Aux Sable Creek, now a very high quality stream with two endangered species, would be on the way to become an effluent dominated water.

[167] IEPA recently has made initial decisions to issue NPDES permits for new or increased discharges without serious consideration of alternatives in draft permits requested by Alumax Extrusion, Inc., Sherwood Lake Home Owners, and the towns of Carol Stream, New Lenox, Wauconda and Plano.

[168] Constructed wetlands and soil aquifer treatment systems should be effective in eliminating endocrine disrupting chemicals because the long residence times and high biological activity involved provide opportunities for biotransformation, which is thought by some researchers to be the most important removal mechanism. P. McGovern, *supra* note 85, at 39.

> pollute surface and/or ground water with excess nutrients, such as nitrogen and phosphorus. Animal manure is commonly spread on agricultural land for its nutrient and organic value for both crops and the soil. If the manure is not spread in accordance with a nutrient management plan (which applies nutrients at the rates which crops can use them), nitrogen and phosphorus will leave farms and enter waterbodies, causing depletion of dissolved oxygen and eutrophication. In addition, grazing animals can cause streambank erosion and erosion from fields which have been overgrazed.
>
> Studies have shown that animal feeding operations, and particularly when several of these facilities are concentrated in a single watershed, can increase nutrient pollution to a river or stream. For example, a study of Herrings Marsh Run in the coastal plain of North Carolina showed that nitrate levels in stream and ground water were highest in areas with the greatest concentration of swine and poultry production. (Hunt, P.G., et. al. 1995. Impact of animal waste on water quality in an eastern coastal plain watershed. Animal Waste and the Land-Water Interface, Kenneth Steele, Ed., Lewis Publishers, Boca Raton, FL, 589 pp.)
>
> Illinois EPA studies and field investigations have confirmed that runoff from confined animal feeding operations can adversely impact surface water resources in Illinois. Observed effects include increases in ammonia-nitrogen concentrations resulting from animal wastes and fish kills as a result of manure application on frozen ground. (Ackerman and Taylor, 1995, Stream Impacts due to Feedlot Runoff. Animal Waste and the Land-Water Interface, Kenneth Steele, Ed., Lewis Publishers, Boca Raton, FL, 589 pp.)[169]

Large animal feeding operations that fall at or above size categories set forth in federal regulations are defined to be “Concentrated Animal Feeding Operations” (“CAFOs”).[170] CAFOs are generally treated as point sources, and therefore are required under the Clean Water Act to have NPDES permits.

Earlier this year, Illinois issued a draft general permit for CAFO discharges. IEPA held hearings

provide control over offsite manure disposal, a large loophole allowing CAFO operations to simply ship their waste off to be disposed of without compliance with a nutrient management plan. Additionally, the draft permit violates a recent ruling by the 9th

400/100mL, 48% failed to meet the TSS standard of 20 mg/L, and 13% failed to meet the BOD standard of 20 mg/L.[178]

Illinois' failure to regulate surface-discharging septic systems is having a significant impact on Illinois water quality. EPA data indicates that failing septic systems can discharge fecal coliform at concentrations exceeding 100,000 times the concentration discharged from a centralized system. The nature of the contamination in impaired waterbodies in Illinois indicates that failing surface-discharging septic systems are a significant cause of such impairments. The problems created by these systems are compounded by the fact that they are most prevalent in some of the least hydrologically appropriate terrain in the state – the southwest karst region in Monroe, Randolph, and St. Clair counties. More than 70% of the new septic systems installed in 2001 in those counties were surface discharging systems.[179] A 1998 evaluation published in the Journal of Environmental Health concluded that, although the systems were mostly installed in compliance with local regulations, they were not providing adequate treatment, and that filtration of the sewage before it enters the groundwater through karst sinkholes is insufficient.[180]

Environmental organizations in Illinois (including ELPC) called these regulatory deficiencies to the attention of Region 5 last year, and early indications are promising that U.S. EPA is working together with IEPA and IDPH to develop a NPDES permitting program for surface-discharging septic systems. IEPA and IDPH collaborated to draft legislation requiring a general NPDES permit for surface-discharging septics, which was introduced in the spring. The proposed legislation would prohibit installation of these systems absent proof that there is no technically feasible alternative, and would provide effluent limits and monitoring requirements for currently existing systems. Unfortunately, heavy opposition from the septics industry and realtor lobbyists stalled the bill during the spring session. The agencies plan to work with legislators to hold public information hearings concerning the issue and the proposed legislation this fall, and have the bill re-introduced in the spring session.

Illinois law currently makes certain water quality standards inapplicable to NPDES permits for mining operations.[181] In particular, permits for mining operations may allow violations of various numeric water quality standards so long as the operation meets certain effluent limits. Although Illinois permitting on this point is now in a state of confusion, mines in the recent past have been given NPDES permits allowing them to discharge seven times the concentration of sulfate and two times the amount of chloride that would be allowed for a non-mining discharger.[182]

rules are generally sound, they can be read to exempt mining from antidegradation requirements as to total dissolved solids, chloride, iron and manganese. This is true because the antidegradation rules are located in a section of the regulations[183] that is not applicable to mining.[184] If IEPA and IPCB do not promptly correct these problems, federal promulgation of standards under Clean Water Act Section 303(c) will be necessary.

Effective public participation in the permitting process can occur only if the public is given a chance to review and comment upon all major elements of a permit. Unfortunately, Illinois' public participation procedures for NPDES permitting are seriously deficient. IEPA has interpreted those procedures,[185] to allow public review of only draft permits even when the final permit includes substantive new elements on which the public did not have a chance to comment. This problem is compounded by the fact, as mentioned earlier, that current Illinois permitting procedures allow essential permitting terms, such as monitoring, to be developed in private by IEPA and the permittee after the permit is issued and public comment is no longer practical.[186] Finally, IEPA frequently proposes permits with little investigation of their potential effect, placing the burden of proving the harmful effects of a permit on citizens and citizen groups.

In January 2003, a number of environmental groups submitted a proposal to correct flaws in permitting procedures to the IPCB. If the IPCB does not act to correct flaws in the Illinois rules relating to public participation in the permitting process, it will become necessary to petition U.S. EPA to exercise its oversight responsibilities and assure that Illinois meets the public participation goals of the Clean Water Act.

[183] 35 Ill. Admin. Code Pt. 302.
[184] 35 Ill. Admin. Code 406.202, 406.203.
[185] 35 Ill. Admin. Code Pt. 309.
[186] *See* Prairie Rivers Network v. Illinois Pollution Control Board, 335 Ill. App. 3d 391 (Ill. App. Ct. 2002).

Permit conditions mean little unless they are enforced. The principle way that NPDES permits are enforced in Illinois is by IEPA referring cases to the Illinois Attorney General, who then brings actions for penalties before the Pollu

The number of enforcement orders obtained for those years were:

2001	34	180
2000	41	297
1999	38	160
1998	37	466
1997	24	162

The significance of these figures is difficult to gauge. While it is not known how many violations each referral or order covers, it is clear that many violations do not result in any referral to the Attorney General for prosecution. IEPA's quarterly non-compliance report, a public list compiled from discharge monitoring reports filed by permittees, shows that the number of permittees reporting violations far exceeds the number of cases referred for any sort of penalty.

An obstacle here is the cumbersome procedure that IEPA must follow before referring a case to the Attorney General for prosecution. Under Section 31 of the Illinois Environmental Protection Act,[189] IEPA must generally confer at length with the permit violator before referring a case for prosecution. Generally, a violation results only in an agreement between IEPA and the violator that the violator will come into compliance in the future.

In response to the Sierra Club FOIA, IEPA also provided information on fines and payments made for environmental restoration in lieu of fines ("Supplemental Environmental Projects"). Unfortunately only total data for all prosecutions is available without any breakdown for water:

	Penalties	Supplemental Environmental Projects (SEPs)
2001	$5.5 million	$4.2 million
2000	$2.6 million	$ 759,000
1999	$2.6 million	$1.9 million
1998	$10.7 million	$656,000
1997	$4.4 million	$6.9 million

In its annual performance report, IEPA reported that in fiscal year 2001 it entered into settlement agreements in enforcement actions that included SEPs and pollution prevention measures valued at over $250,000.[190]

The efficacy of enforcement against violators in Illinois has been severely limited by the inconsequential penalties routinely assessed against them. Illinois courts have held that penalties were specifically not allowed to be "punitive."[191] Yet according to the United States Supreme Court, the very purpose of penalties under the Clean Water Act is to *be* punitive – i.e., to hit violators hard enough in the pocketbook that neither they nor similarly situated dischargers will be tempted to treat penalties as merely a cost of doing business.[192] Moreover, federal law

[189] 415 ILCS 5/31.
[190] Illinois Environmental Protection Agency, Annual Performance Report For FY01 Performance Partnership Grant, filed with U.S. EPA December 28, 2001, p. 39.
[191] City of Monmouth v. Pollution Control Board, 57 Ill.2d 482.
[192] Friends of the Earth, Inc. v. Laidlaw Environmental Services (TOC), Inc., 120 S.Ct. 693 (2000).

establishes that economic benefit is a penalty floor, and that a deterrent penalty should generally include both economic benefit *and* a gravity component above and beyond it because "unless the [defendant] is fined an amount at least as great as the economic gain in not complying with the regulations, the statute serves little deterrent value."[193] In Illinois, however, the Board has not consistently imposed economic benefit as a base penalty; and, indeed, often uses purportedly minimal economic benefit from a permit violation as a factor for mitigating the penalty. The wide gap between federal and state penalties for NPDES violations could be eliminated if the enforcement authorities pursued NPDES violators in federal court rather than the Board or state court.

Under the CWA, a citizens' suit generally cannot be filed if U.S. EPA or a state enforcement agency has filed suit.[194] It was the routine practice of the Attorney General's office under the last Attorney General to file an enforcement action in the IPCB on the 59th day after the filing of a citizen suit 60-day notice letter to prevent the citizen group from enforcing the law. The only apparent purpose of this practice was to protect the violator. If there is a private party ready and willing to seek enforcement through a federal action that may result in substantial penalties, it is unclear what reason there would be for the state using its limited resources through an actita bits limit Tm0.erpc

As a result of litigation and Congressional action, flows of polluted water that result from rain in urban areas coming into contact with industrial, construction and developed sites came to be treated as a point source pollution with permitting instituted in two phases.[195] However, most stormwater runoff is not regulated through individual NPDES permits but through general permits. These general permits do not contain specific pollution limits but instead require the party acting under the permit to follow certain best management practices (e.g. leaving a filter strip between a parking lot and a stream) that it is thought will reduce stormwater pollution.

Under the 1987 amendments to the CWA and U.S. EPA regulations, NPDES regulation of stormwater was developed in two phases. Phase I was promulgated by U.S. EPA in 1990 and applies to medium and large municipal separate stormwater systems generally serving populations over 100,000, construction activity disturbing 5 acres or more, and ten categories of industrial activity.[196]

Phase I only applied to one municipality in Illinois (Rockford) because other large towns in Illinois have combined sewer systems. As to industrial activities covered by Phase I, IEPA developed general permits that required persons wanting to operate under the general permit to develop a stormwater pollution prevention plan, submit notice of intent to the IEPA that the industrial facility would be operating under the plan and submit an annual facility inspection report. There is an analogous general permit for covered construction activity.[197]

Phase I is not being implemented and enforc

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The situation for implementing Phase II appears to be even more grim. Beginning March 10, 2003, construction sites that disturb one acre or more and all municipalities with separate storm systems in urban areas as defined by the Census Bureau are to develop plans for controlling storm water. We have been told that IEPA does not have the staff or other tools necessary to implement Phase II. Except in a few counties in northeast Illinois with strong stormwater programs that have undertaken to advise municipalities in their county, municipalities do not have the resources to create and implement stormwater pollution control plans.

Combined sewer overflows ("CSOs") take place when combined systems receive more rainwater than they can handle.

In 1994, USEPA issued a policy governing CSOs, intended as a guideline to ensure that state NPDES permits issued for CSOs were consistent with the requirements of the Clean Water Act.[198] The policy requires a two-phase program to control CSOs: implementation of the "nine minimum controls" ("NMC") which are preliminary measures to limit the most damaging impacts of CSOs such as discharge of solids and floatables; and a "long term control plan" ("LTCP") to permanently mitigate the impact of the CSOs. The LTCP is presumed adequate to meet water quality standards if it meets any of three criteria: (i) no more than four to six overflows per year, (ii) capture for treatment of 85% of combined sewage, or (iii) elimination of an equivalent mass of pollutants. If none of these criteria are met, the permittee must be required to demonstrate that its effluent does not violate water quality standards. Additionally, in formulating the LTCP, permittees are required under the 1994 policy to take several specific steps, including evaluation of alternative levels of pollutant capture, public participation, and extensive monitoring.

Illinois, unlike most states, had a program in place for treatment of CSO flows well before the 1994 policy came into effect. This program, while effective to some extent, does not meet the array of requirements contained in the 1994 CSO policy.

IEPA's treatment standards,[199] established in 1985, presume that CSO communities are meeting water quality standards as long as they are meeting three conditions:

(i) all dry weather flows and the first flush of storm flows, as determined by IEPA, must meet applicable effluent standards;
(ii) additional flows, up to ten times the average dry weather flow for the design year, shall receive a minimum of one hour retention for primary treatment and fifteen minutes retention for secondary disinfection; and
(iii) flows in excess of ten times dry weather flow shall be treated eragnt sT,4A,

A final source of water pollution not addressed by the above-described regulatory programs is non-point source pollution. As its name implies, non-point source pollution does not emerge from a single identifiable source, but rather is caused when rain, snowmelt or irrigation water sweeps pollution from land surfaces into waterways. In essence, non-point source pollution is runoff from farm fields, livestock facilities, paved surfaces, lawns, surface coal mines, and forestry activities, except to the extent that such runoff has been specifically defined to be a point source (for example, Congress has defined CAFOs and urban stormwater from certain activities to be point sources). The primary sources of non-point source pollution in Illinois are: (1) runoff from agriculture and urban areas, (2) modification to streams and streambanks and (3) mining activities.[201]

Non-point source pollution affects water quality in a number of ways. The nutrients from fertilizers and animal waste cause excessive algae growth. When such algae dies, the decaying process reduces oxygen levels in the water, making it harder for fish and other aquatic life to survive.[202] Sediments from soil erosion caused by agricultural and construction activity blocks sunlight necessary for plant growth, damages fish gills, and interferes with spawning habitat.[203] Finally, the pesticides, toxic chemicals and bacteria that run off of farm fields, paved surfaces and lawns are hazardous to both humans and aquatic life.[204] In Illinois, nutrients and sediments are the most common non-point source pollutants.[205]

Non-point source pollution is a major contributor to water pollution problems in Illinois. As of 2000, 33.6% of the steams and 92.7% of the inland lakes in Illinois that the IEPA assessed suffered from use impairments that were wholly or partially caused by non-point source pollution.[206] These percentages amount to a total of 5,123 miles of streams and 139,644 acres of lakes that, due at least in part to non-point source pollution, are not clean enough to support one or more designated use.[207] Given that these totals are based on an assessment of only 18.3% of the miles of streams and 60.6% of the acres of lakes in Illinois,[208] the actual amount of Illinois waters impaired by non-point source pollution is much higher. On the national level, the U.S. EPA has identified non-point source pollution as the leading cause of water impairments.[209]

[201] Illinois Environmental Protection Agency, State of Illinois Section 319 Biannual Report (Sept. 2002), p. 9.
[202] U.S. EPA, National Management Measures to Control Nonpoint Source Pollution From Agriculture (2001), p. 2-10.
[203] *Ibid.* at 2-15.
[204] U.S. General Accounting Office, Federal Role in Addressing – and Contributing to – Nonpoint Source Pollution (Feb. 1999), pp.19-20.
[205] *Ibid.*
[206] Illinois 305(b) Report, *supra* note 52, at 81.
[207] *Ibid.*
[208] *Ibid.*
[209] U.S. Environmental Protection Agency, National Water Quality Inventory – 2000 Report (Aug. 2002).

The main tool for controlling non-point source pollution is the implementation of Best Management Practices ("BMPs"). BMPs are actions that have been identified as being successful in reducing pollutant loads from various non-point sources by either reducing the amount of potential non-point source pollutants that are created or by preventing such pollutants from reaching waterways.[210] For example, in the agricultural context, BMPs include conservation tillage that limits erosion from farm fields, riparian buffers that prevent nutrients and sediment from reaching waterways, and programs to reduce the use of pesticides and fertilizers.[211]

Rather than mandating the implementation of BMPs or imposing limits on non-point source pollution that would effectively require the use of BMPs, the Clean Water Act seeks to encourage the implementation of BMPs through the non-regulatory Section 319 grant program.[212] Section 319 provides federal-matching funds to be used by the state to fund projects designed to reduce non-point source pollution. In order to obtain these funds, a state must provide 40% of the total funding for the 319 program, submit to the U.S. EPA an assessment of non-point source pollution in the state, and develop a management program for controlling pollution from non-point sources. The state's management plan must identify and provide a plan for implementing BMPs for each category of non-point source pollution identified in the state's assessment. The U.S. EPA then allocates Section 319 money to each state on the basis of a formula that considers factors such as the state's population, acres of cropland and pasture, and number of critical aquatic habitats and wellhead protection areas.[213] In fiscal year 2003, Illinois is expected to receive $9,579,800 in Section 319 funds.

Section 319 funds are then used by the state to provide financial and technical assistance to BMP projects that local governments, soil and water conservation districts, and other entities voluntarily propose to undertake.[214] In recent years, the U.S. EPA has encouraged states to better target their funding of BMPs through the use of watershed plans and TMDLs. Under the watershed approach, the state is to identify watersheds that do not meet clean water goals and develop strategies for addressing the various pollution sources in each watershed.[215] TMDLs, which are required by Section 303(d) of the Clean Water Act, require states to set maximum pollution levels for each pollutant in an impaired watershed and develop plans for reducing those levels through point source and non-point source controls.[216] The state may spend up to

[210] U.S. EPA, National Management Measures to Control Nonpoint Source Pollution From Agriculture (2001), p.2-28.
[211]

20% of its funds to develop and implement TMDLs, develop watershed plans, and conduct monitoring and program assessment activities.[217]

IEPA administers the Section 319 program as the state's primary response to non-point source pollution. IEPA has developed a list of approximately 150 BMPs, which local entities can apply for financial assistance to implement.[218] BMP project applications are evaluated on the basis of factors such as the potential for water quality improvement from the BMP, the level of detail included in the application, and the applicant's prior success in carrying out BMP projects. Projects that are submitted as part of a watershed management plan or a TMDL implementation plan are given top priority. For each BMP project, the local project applicant pays 40% of the costs, with the other 60% coming from the state's 319 funds. After the project is done, a project report is completed to assess the project and estimate the amount of pollutant load reduction the project led to.

Between fiscal years 1990 and 2002, Illinois has received a total of approximately $59.7 million in Section 319 funds from the federal government.[219] With the 40% state-funding match, this means that the state has spent a total of nearly $100 million on its Section 319 program.[220] This funding led to the completion of a total of 139 projects between 1990 and 1997. Of those, eighty-one involved the implementation of BMPs, 39 focused on providing education and technical assistance, and nineteen involved monitoring activities.[221]

Meaningful evaluation of the effectiveness of a state's non-point source pollution control efforts is hindered by a number of factors. For example, because most states (including Illinois) assess only a fraction of their waters in any given year, it is not possible to get a full picture of water quality impairments and trends.[222] In addition, while a state can generally assess how much pollutant load a particular BMP reduced, it is more difficult to make a definitive link between implementation of BMPs and improvement of water quality in a particular watershed.[223] Also, the individualized nature of each BMP project makes establishing a baseline for evaluating the effectiveness of the projects quite difficult.

The key goal for any non-point source program, of course, is a reduction in the amount of waters impaired by non-point source pollution. On this ground, Illinois's results are mixed. The percentage of Illinois streams reported to be impaired by non-point source pollution has fallen

[217] U.S. EPA, Supplemental Guidelines For the Award of Section 319 Nonpoint Source Grants to States and Territories in FY2003 (2002).
[218] Illinois Environmental Protection Agency, Illinois' Nonpoint Source Management Program (July 2001), pp. 8-9.
[219] Illinois Environmental Protection Agency, State of Illinois Section 319 Biannual Report (Sept. 2002), pp. 13-15.
[220] *Ibid.*
[221] *Ibid.* at 22.
[222] U.S. General Accounting Office, Inconsistent State Approaches Complicate Nation's Efforts to Identify Its Most Polluted Waters (Jan. 2002), p. 11.
[223] Thomas Davenport, *et al.*, National Nonpoint Source Monitoring Program: Document Water Quality Improvements From Best Management Practices Through Long-Term Monitoring Projects (2001).

from 55% in 1992 to 33.6% in 2000. On the other hand, non-point source impairment of lakes has increased from 90.8% in 1992 to 92.7% in 2000. Once again, however, it is difficult to read much into these trends given the limited amount of waters that are assessed each year.

Despite the difficulty in assessing the effectiveness of non-point source pollution control programs, we have identified a number of steps that could be taken to improve Illinois' efforts. First, the state's Section 319 program could be improved by an acceleration of TMDL development, better project selection, and increased project follow-up. Second, funding for non-point source control activities could be increased through actions by both the IEPA and the General Assembly. Finally, following the lead of other states, Illinois could enact regulatory mechanisms for controlling non-point source pollution.

The most obvious way to make Illinois' non-point source pollution control efforts more effective is to improve the Section 319 program. Such improvement could be made in three primary areas.

First, IEPA needs to increase its efforts at identifying critical non-point source pollution problems and targeting its Section 319 efforts in those areas. As noted above, such targeting would result from the development of TMDLs for watersheds throughout the state. Illinois, however, does not plan to complete the 441 TMDLs needed for the state until 2017. In addition, the Illinois EPA is off to a slow start on meeting even this deadline, as the state has initiated only twenty-one TMDLs, and completed only two TMDLs, since 1999.[224] By comparison, over same time period Ohio has completed eighty-four TMDLs, Oregon has completed 302 TMDLs, and New Mexico has completed eighty-three TMDLs.[225]

Second, IEPA could improve its project selection by considering the results of prior BMP projects in deciding on BMP applications. The identification of BMPs relies heavily on learning from past results to determine what steps will be most successful in which situations. Clearly, the results of projects that have already been carried out could provide important information on predicting the value of other BMPs. IEPA, however, has no process for formally considering those results in selecting projects.

Third, the IEPA should engage in increased follow-up to ensure that BMP projects are providing benefits after the project grant has ended. Currently, IEPA's official involvement with a BMP project ends after the project is completed and an assessment is carried out. Many of these projects, however, are ongoing and can have lasting benefit if properly maintained. To help ensure continued effectiveness, IEPA should establish a procedure for regularly monitoring BMP projects after they are completed.

The fact that many Illinois waters remain impaired due to non-point source pollution also suggests that the state should increase funding for non-point source pollution control efforts.

[224] Illinois Environmental Protection Agency, State of Illinois Section 319 Biannual Report (Sept. 2002), p. 17.
[225] U.S. Environmental Protection Agency, TMDL Reports, available at <http://www.epa.gov/owow/tmdl/> (visited March 10, 2003).

Increased funding would not only enable more BMPs to be carried out, but could also help IEPA make the improvements to the Section 319 program identified above.

One option for increasing funding would be for the General Assembly to dedicate more funds to the Section 319 program or to create new sources of funds for non-point source control programs. In the absence of increased funding, which is admittedly unlikely in today's tough budgetary times, the IEPA could also obtain more money for non-point source programs from the Clean Water State Revolving Fund ("CWSRF").[226] The CWSRF is a federal program which creates state revolving loan funds (matched by a 20% state grant) that provide low-interest loans to local governments for a variety of clean water activities. Eighteen states currently use a portion of their CWSRF funds for non-point source control programs, and both the U.S. EPA and the Northwest-Midwest Institute have encouraged the other states to do so.[227] Illinois expects to have approximately $170 million available for loans under the CWSRF program in 2003.[228] IEPA does not plan to apply any of these funds toward non-point source pollution projects, despite statutory authority to do so.[229] The CWSRF could provide a significant source of funding for non-point source pollution control projects and therefore IEPA should consider such use of those funds.

Finally, Illinois should consider the use of regulatory programs for controlling non-point source pollution. As commentators have noted, states will need to supplement the voluntary Section 319 program with some sort of regulatory controls on non-point source pollution in order to be successful in greatly reducing non-point source pollution.[230] In fact, a number of states have already enacted a variety of regulatory programs aimed at non-point source pollution.[231] Illinois should follow their lead.

As outlined by a series of thorough reports by the Environmental Law Institute,[232] the regulatory options for non-point source control are quite varied. For example, Illinois could require a permit or the implementation of BMPs for activities that are likely to lead to significant non-point source pollution such as timber harvesting or concentrated animal feeding operations that fall below the numerical thresholds for NPDES permitting. Illinois could also adopt an after-the-fact approach that enables the state to issue pollution abatement orders to major non-point source polluters. Another option would be for Illinois to require non-point source polluters to engage in watershed

[226] 33 U.S.C. § 1381.
[227] U.S. General Accounting Office, Federal Role in Addressing – and Contributing to – Nonpoint Source Pollution (Feb. 1999), p. 29; U.S. Environmental Protection Agency, The Clean Water State Revolving Fund – How to Fund Nonpoint Source and Estuary Enhancement Projects (July 1997); Northeast-Midwest Institute, The Clean Water State Revolving Fund – A Primer (March 2002), p. 26.
[228] Illinois Environmental Protection Agency, FY2003 Wastewater Loan Program Intended Use Plan.
[229] 415 ILCS 5/19.3(b)(3.5).
[230] Environmental Law Institute, Putting the Pieces Together: State Nonpoint Source Enforceable Mechanisms in Context (June 2000), p. 1; Daniel Mandelker, Controlling Nonpoint Source Water Pollution: Can It Be Done?, 65 Chi.-Kent L. Rev. 479, 480 (1989).
[231] *Ibid.*, Environmental Law Institute, Almanac of Enforceable State Laws to Control Nonpoint Source Water Pollution (1998); Pronsolino v. Marcus, 91 F.Supp. 2d 1337 (N.D.Cal. 2000).
[232] Environmental Law Institute, Putting the Pieces Together: State Nonpoint Source Enforceable Mechanisms in Context (June 2000); Environmental Law Institute, Almanac of Enforceable State Laws to Control Nonpoint Source Water Pollution (1998); Environmental Law Institute, Enforceable State Mechanisms for the Control of Nonpoint Source Water Pollution (Oct. 1997).

assessment and planning. Finally, the state could target its regulatory efforts at particular watersheds, as Maryland has done with the Chesapeake Bay. Given the persistence of non-point source pollution problems in the state, all of these options should be considered.

3. IEPA should improve the NPDES permitting process to help ensure that such permits fully protect human health and wildlife by:

   Including limits on nutrients, particularly phosphorous, which currently cause problems in vast numbers of Illinois streams and lakes
   Ensuring that permits do not allow the discharge of pollutants that: (1) harm persons that come into contact with them, (2) cause dissolved oxygen levels to fall to the point that aquatic life is harmed, (3) impact aquatic life through unnatural temperatures or temperature variations, or (4) are toxic substances in toxic amounts.
   Strengthening the permitting requirements for livestock operations, septic waste systems, and mining operations
   Allowing for full and meaningful public participation in the permitting process by subjecting all essential permit terms to public review and comment.

4. Enforcement of NDPES permits should be strengthened:

   The Illinois Attorney General should aggressively pursue enforcement actions against polluters who violate their permits
   IEPA and the Attorney General should work with citizen groups that are willing to take on a share of the burden of enforcing the Clean Water Act

5. Efforts for controlling rainfall-related pollution from stormwater run-off and combined sewer overflows must be strengthened through increased funding and more thorough implementation of legal requirements for controlling this pollution.

6. Illinois should increase its efforts to control non-point source pollution by:

   Improving the identification of non-point source pollution problems and the selection of project designed to address such problems.
   Devoting increased resources to non-point source pollution control
   Considering the implementation of various regulatory approaches for controlling non-point source pollution.