

11-1-1971

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Nicholas P. Moros, *Effluent Fees in Water Quality Management: The Vermont Water Pollution Control Act*, 1 B.C. Env'tl. Aff. L. Rev. 631 (1971), <http://lawdigitalcommons.bc.edu/ealr/vol1/iss3/10>

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EFFLUENT FEES IN WATER QUALITY MANAGEMENT: THE VERMONT WATER POLLUTION CONTROL ACT

*By Nicholas P. Moros**

I. INTRODUCTION

The State of Vermont recently enacted¹ a Water Pollution Control Act² which is unique in American legislation and probably one of the most effective anti-pollution measures yet introduced in the United States. The statute's uniqueness and strength derive from the fact that it combines a discharge permit system and an effluent fee system. The concept of a permit system is not new in theory or application to environmental control;³ neither is the theory of an effluent fee system new, although in actual practice the system has had little significance in the United States.⁴ Vermont, however, is the first government in this country to join the two systems in a single water quality management program.

The general purpose of the Vermont statute is to raise the quality of the state's waters.⁵ The provisions for discharge permits, temporary pollution permits, effluent fees, and penalties are all directed toward this goal. As between the discharge permit system and the effluent fee system, the effluent fee should contribute more to the improvement of water quality. It is this system which will be analyzed below.

The specific purpose of the effluent fee provision is to provide an economic incentive for polluters to reduce the volume and noxiousness of their discharges.⁶ In order to fully understand the operation of the statute, this purpose, as well as the statute's general purpose, must be borne in mind. Because of the nature of the purposes, the Water Resources Board, which administers

the Act, is limited in the approaches it may lawfully take with respect to pollution.

II. GENERAL OVERVIEW OF THE WATER POLLUTION CONTROL ACT

The Act gives the Water Resources Board the authority to set classifications A through D for the state's various watercourses.⁷ Class A waters refer to those which are of reservoir quality, and class D waters refer to those which treat industrial waste within certain restricted zones. The Board has also been given authority to set water quality standards and permissible effluent levels for each of the four main classifications. These guidelines specifically set forth maximum permissible levels regarding such matters as pH, color and turbidity, temperature increase, and chemical compounds.⁸ Under the current Water Quality Standards, the Board has decided that all wastes being discharged into the state's waters must undergo secondary treatment.⁹ It should be noted that it is highly possible that the Board will revise and upgrade the present water quality standards. At the very least, the standards will probably be expanded to cover certain wastes for which no maximum levels exist at the present time.¹⁰

Persons who expect to discharge wastes into the state's waters are required to file discharge reports with the Department of Water Resources.¹¹ These reports must set forth the location, nature, volume and frequency of the expected discharges. Presumably these data will be used by the Board in updating water quality standards. After filing a discharge report, a person applies to the Department for a discharge permit.¹² The permit must be granted by the Department if it finds that the proposed discharge will not reduce the quality of the receiving waters below the classification established for them.¹³ In other words, if the applicant has complied with the water quality standards, regarding such matters as secondary treatment and acceptable levels of various chemicals, he will be granted a permit; otherwise no permit will be accorded him.¹⁴ For the purposes of this article, those persons who are granted discharge permits will be referred to as "dischargers" and those who are denied discharge permits will be referred to as "polluters."

If denied a discharge permit, the applicant may file for a temporary pollution permit.¹⁵ A temporary pollution permit will not, however, automatically be granted. The Department must

be satisfied that the polluter is installing, or making a good faith effort to install, treatment facilities.¹⁶ The polluter who is refused a temporary pollution permit has the option to close down his operations, or to pay out penalties which can run \$10,000 per day and/or to incur the risk of being imprisoned five years for each violation.¹⁷ As a condition of retaining a temporary pollution permit, the polluter must pay periodic effluent fees in accordance with rates established by the Board.¹⁸ As mentioned above, the effluent fee provides an economic incentive for the polluter to install the required abatement facilities.¹⁹

In terms of enforcement, the law is relatively strong. It contains provisions for action by the attorney general,²⁰ for imposition of penalties,²¹ and for implementation of traditional common law remedies to compensate injured parties.²² Moreover, the effluent fee provision itself functions as an enforcement device.

III. VARIOUS OBJECTIVES OF AN EFFLUENT FEE SYSTEM

In analyzing the statute, one must recognize a fundamental distinction. The term effluent fee "system" refers to the *imposition* of an effluent fee. In contrast, effluent fee "method" refers to one of many means of *determining* the fee to be imposed. The Vermont statute itself calls for an effluent fee "system;"²³ however, since the statute also requires that the system operate as an "economic incentive," the Board is accordingly limited in its formulation of a particular fee "method."

An effluent fee system may have any of five objectives:²⁴ (1) determining whether fees do in fact lead to improvement in water quality, and if so to what extent;²⁵ (2) establishing desirable levels of water quality;²⁶ (3) achieving pre-determined levels of water quality;²⁷ (4) covering costs of improvement measures;²⁸ and (5) motivating compliance with prescribed waste disposal behavior, methods, or standards. The last mentioned objective, of course, is the one attended to in Vermont. It is to be distinguished from the second and third mentioned objectives. The Water Resources Board has already determined desirable levels of water quality through its system of classification, and these levels are achieved by means of the water quality standards and the discharge permit. They are not achieved by means of the fee system.

As mentioned above, the fee system functions also as an enforcement device. In this respect, it is considerably more efficient

than litigation. The fee system permits the Water Resources Department to free itself of the enormous time and manpower commitments required by court actions. The system is a simple, self-operating process which does not require an order by the court and which when implemented, cannot be stayed by an appeal to the court.²⁸

IV. DIFFERENT EFFLUENT FEE METHODS APPLICABLE TO THE INCENTIVE OBJECTIVE

As respects the incentive objective, fees may be determined through any number of methods, each of which differs in effectiveness. Possible methods include a uniform fee, a uniform fee weighted by zones, a fee based on downstream damages, a fee based on cost of treatment, a fee based upon dilution factors, and a combination of these. This article will be limited to an examination of the two most significant approaches: the cost-of-treatment method and the downstream-damages method.

There are fundamental points which must be kept in mind while examining the two methods. First, one must recall that the purpose of the effluent fee is to motivate compliance with the prescribed water quality standards and watercourse classifications. Second, in determining a fee method, one must weigh two unsatisfactory possibilities. On the one hand, some polluters may, for reasons of economy, pay the fee rather than install treatment facilities. On the other hand, a fee may be excessively harsh for those polluters who cannot readily obtain or install treatment facilities.

This section of the article compares generally the cost-of-treatment method and the downstream-damages method and then analyzes specifically the characteristics of and precedents for the two methods. Section V will evaluate the two alternatives in terms of constitutionality, equity, incentive effects, administrative feasibility, and relation to downstream damages.²⁹

A. General Comparison

The fee method that is based on cost of treatment sets a fee which is equal to, or preferably somewhat higher than, the cost of constructing and maintaining proper treatment facilities. The fee method that is based on downstream damages reflects the impairment of interests which other users have in the watercourse. The cost-of-treatment method is more directly related to the

purpose of motivating compliance with the water quality standards. If a polluter finds it economically more advantageous to install treatment facilities than to pay an effluent fee, presumably he will choose to install the facilities. The cost-of-treatment method removes the natural tendency to delay. The downstream-damages method, on the other hand, has no direct relation to the cost of treating wastes, and consequently is not likely to be a motivating force unless the damages do, by chance, prove to be greater than the cost of treatment.³⁰

There seems to be a logical inconsistency in the statute: §912(e) (1) states that the primary purpose of the fee is to provide an economic incentive while §912(e) (2) makes it mandatory for the Board, in setting the fee rates, to approximate the downstream damages. If downstream damages are less than the cost of treatment, the effluent charges provision is emasculated as an incentive force. For the effluent fee system to operate at an optimum level, it is imperative that treatment costs be taken into account in setting the fee rates.

B. The Cost-of-Treatment Method

The characteristics of the cost-of-treatment method are quite simple: once a specific level of treatment is deemed necessary, the Department computes a fee greater than the annual cost of such treatment in order to provide an incentive to comply with the required standard. There are three ways of setting the treatment standard and corresponding fees: a uniform treatment standard for all effluents (e.g., secondary treatment),³¹ a uniform treatment standard for all effluents within certain zones of water (e.g., tertiary treatment in Class C waters, secondary treatment in Class D waters), or a specific treatment for each effluent. The last of the three would yield the best results, but it would be all but impossible to administer. While Vermont currently seems to favor the first alternative, it is conceivable that the Board might change to the second approach.³²

There are three significant precedents for a cost-of-treatment fee system. The one most similar to the Vermont system is the Czech program enacted in 1966. This system is also based on an incentive rationale, but the charges themselves are fixed after a consideration of two factors. The basic charge is derived from annual cost-of-treatment estimates; a surcharge is then imposed which reflects the degree to which a person caused degradation

of the water, i.e., downstream damage.³³ The two other cost-of-treatment precedents are the Rhur system and the several North American municipal sewage treatment programs. While neither of these precedents rests on an incentive rationale, they both compute fees which are based on cost of treatment. It would seem then that as a general proposition, the cost-of-treatment method is a fundamentally sound response to the problem of setting fees.

The fee structure must reflect the nature of the treatment process required and the degree of water quality to be achieved. The fee can be based either on actual engineering designs and estimates submitted by individual polluters or on a standardized statistical table.³⁴ The best results might emerge from setting the statistical figures relatively high and then permitting the polluter to choose either of the two methods. Such a scheme would give the polluter added incentive to produce a detailed engineering report and design, with documented costs estimates, for a conversion to the required treatment.

The central problem to the cost-of-treatment method is that, inconsistent with a statutory requirement, it does not directly reflect downstream damages. It might be argued, however, that downstream damages have already been taken into account in the setting of water quality standards³⁵ and that, therefore, a cost-of-treatment method indirectly reflects such damages. Yet even if such an argument is basically correct, the reflection could not be sufficiently accurate. In light of this fact, the provision calling for the approximation of downstream damages should be repealed or amended so as to permit the Board to reflect downstream damages to the degree that it deems appropriate. In the event that the section is not repealed or so amended, the Board might be wise to establish fee rates similar to those in the Czech structure, i.e., a basic charge based on cost of treatment with a downstream-damages surcharge. In this way, the fee would reflect downstream damages, as the statute requires, while still retaining its incentive effect—the primary purpose of the system.

C. The Downstream Damage Method

The rationale for the downstream-damages method is that since a polluter caused injury he should bear the cost of correction. The method presumes that impairment of water uses has a measurable economic value. This is by no means a universally accepted presumption.³⁶

In terms of precedent, there is no system in operation which is based on downstream damages. There have, however, been proposals for such effluent charge methods, the most notable proposal being that by the staff of ORSANCO (Ohio River Valley Water Sanitation Commission) in 1957. This study is somewhat limited in applicability, however, since it was of the highly industrialized Ohio River region where damages may be relatively easily measured. Damages in the Ohio River region can be accurately determined by measurement of the water's saline content; this technique is not appropriate, however, for determining damages in recreational waters, such as Vermont's.³⁷

One problem, as mentioned above, with the downstream-damages method is that it does not supply a clear economic incentive to comply with water quality standards. A second problem with this method is that it is extremely difficult to gather data on downstream damages and to make meaningful valuations thereof. Without such data and valuations, the system cannot be effectively administered. These problems are explored at length below.

V. EXAMINATION OF THE ALTERNATIVE METHODS AGAINST THE CRITERIA OF CONSTITUTIONALITY, EQUITY, AND ADMINISTRATIVE FEASIBILITY

It should be recognized that no fee system or fee method could perfectly meet each of the assessment criteria discussed in this section. The purposes of discussing these criteria is simply to reveal the major considerations which must precede a final decision on the method to be employed. In the final analysis, the Board and Department will have to consider all the criteria and, having done so, establish a set of priorities. From this process there hopefully will evolve an optimum fee structure.

A. *Constitutionality*

The first constitutional issue which must be faced is whether an effluent fee system is so extensive an interference with private property interests as to constitute a deprivation of property without just compensation. Although the disposal of wastes into the state's waters has been held to be a right, the right is not absolute. It is limited to a "reasonable use."³⁸ At present, however, it is not clear whether the courts would decide that the right to discharge wastes into the state's waters is a *private property right*. If it is not a private property right, the issue of unconstitutional "taking" is, of course, moot since no "property" would

be taken. We shall presume for purposes of this analysis that such a right is indeed a property right. If, then, a court found that a water use permitted by the Board were a "reasonable use," the effluent fee provision would arguably be constitutional, since the fees are imposed only on "unreasonable" uses. It would seem that the fee provision would be a constitutional exercise of the state's power to regulate and not an unconstitutional taking under either the United States Constitution or the Vermont Constitution.

It is extremely difficult to determine the precise point at which regulation ends and taking begins. The United States Supreme Court has recognized the difficulty of drawing a line between the two,³⁹ and there is no agreement among the various state courts. The test in New Hampshire, for example, is whether the benefit derived from the regulation outweighs the burden imposed thereby.⁴⁰ This test, if followed in Vermont, would probably cause the courts to declare unconstitutional those fees which are higher than downstream damages. Up to this time, however, Vermont has not followed the New Hampshire test. In fact, there is language in a 1960 Vermont case indicating that the court would be reluctant to apply such a test, especially as regards water pollution regulations:

When supported by strongly favored policy considerations, legislation and orders will not be struck down as unreasonable solely because a financial hardship is necessarily worked on a particular individual, even to the point of being destructive of his business.⁴¹

It should be noted that this language is dicta and not holding, but the case does, nonetheless, strongly suggest that the court would be unlikely to follow a test as stringent as that adopted by New Hampshire.

The second constitutional issue, and the more crucial one, is whether a provision imposing an effluent fee on persons not holding discharge permits is a valid exercise of the police power. For an exercise of the police power to be valid, three tests must be met: the legislative purpose must be proper, the regulations imposed must have a reasonable relation to that purpose, and the regulations must not be arbitrary or discriminatory.

The test of "proper legislative purpose" would certainly seem to be met here. The United States Supreme Court has stated that protection of the health and safety of the people is a proper

purpose,⁴² and that the determination of aesthetic values is also a proper purpose.⁴³ Water pollution control is clearly related to the people's health and safety, and to aesthetics as well. Providing an incentive to comply with water quality standards would then seem to be a logical step in achieving such proper purposes.

The administrative regulations which stem from the statute must have a reasonable and substantial relation to the purpose of the statute;⁴⁴ this is the second test for a valid exercise of the police power. It seems clear that of the various fee methods which could be utilized, the cost-of-treatment method is the least vulnerable to constitutional attack on these grounds. A fee structure which makes it economically desirable for the polluter to comply quickly with required treatment standards (thereby raising the water quality) is more likely to achieve the intended purpose than a fee structure which is computed on some other basis.

Problems may arise under this second test. If the Board decides to use the downstream-damages method, it is not altogether clear whether a reasonable and substantial relation to the purpose of the statute (raising water quality) would still exist. The Board as of this time has not adopted either method and perhaps, as suggested earlier, the Board will opt for a method similar to the Czech system whereby both cost of treatment and downstream damages are taken into account when computing the fee. It is submitted that the legislature should amend §912(e) (2) to clarify the connection between the charge and the purpose of the statute.⁴⁵ It would probably be wiser for the Board to seek legislative action rather than to simply rely on a charge structure which combined cost of treatment and downstream damages. While the court might determine that a dual fee method is constitutional, a surer course would be to avoid the question and resulting litigation.⁴⁶

Objection to the use of an effluent fee system may also be made on the ground that it is arbitrary or discriminatory. This test is crucial for Vermont, since there are a number of classifications which must be examined. For example, distinctions are drawn between persons who use the waters to dispose of wastes and persons who do not⁴⁷ and between dischargers and polluters.⁴⁸ Still other distinctions are made among polluters themselves.⁴⁹ Because the statute does assess fees on certain people but not on others, the question then arises whether the statute is arbitrary

or discriminatory. However, classification, in and of itself, does not mean that the regulation is discriminatory in the constitutional sense of the word. Classifications are proper if they are reasonable, i.e., if they serve some necessary function in light of the statute's purpose and if all persons within a given class are treated alike.

The problem thus becomes how one may know whether the regulations are arbitrary or discriminatory. There are a number of judicially developed standards by which to determine these issues: the classifications must be based on substantial distinctions which suggest the propriety of substantially different legislation or regulation; the classifications must be germane to the purpose of the law; the law must apply equally to all members of a given class; and finally the classifications must not preclude the addition of other persons to already existing classes.⁵⁰

The distinction which is reflected in the statute between persons who do and who do not dispose of wastes meets the above standards. However, there are further distinctions which exist within the class "persons disposing of wastes." For example, those who use fertilizers are expressly distinguished from dischargers and polluters,⁵¹ both of whom are discussed below. The fertilizer distinction is probably valid, since the need for regulation is clearer for non-farming discharges.⁵²

In another distinction, persons disposing of wastes are divided into dischargers and polluters.⁵³ This distinction is based on two considerations: first, an examination may be made of differences in quantity and quality of wastes, and, second, an examination may be made of differences in water hydrology, presence or absence of other discharges on the same watercourses, and population density. Distinctions based on the quantity and quality of discharge are probably constitutionally valid under the standards mentioned above. The two classes are based on substantial differences. The classification is germane to the law in question since only the person who discharges unacceptable quantities of wastes and/or discharges in an unacceptable manner is subject to the fees provision. The law applies equally to dischargers, as members of one class, and polluters, as members of a different class. And finally, the structure of these two classes does not preclude addition. Therefore, it would seem that the differentiation between dischargers and polluters is neither arbitrary nor discriminatory.

A second method, which differentiates dischargers from pollu-

ters by evaluating their disposals in terms of hydrology and population density, seems similarly valid. By consideration of these and similar factors it is possible to distinguish between persons who discharge equal amounts of waste. An occasion for such a distinction would arise when persons discharge waste into different bodies of water. As discussed above, the propriety of discriminations based on such factors as hydrology and population density is to be determined by resort to judicial standards; the differences in such factors must be substantial. Since the purpose of the law is to raise water quality and since significantly different watercourses may require higher or lower standards to achieve the same level of purity, the law affects different areas differently. There is, however, equal treatment among all members of the same class.

Finally, assuming the validity of the discharger-polluter distinction, it is necessary to decide whether the alternative fee methods are either arbitrary or discriminatory. Since the fee structure applies only to polluters, and since we have already determined that creation of a separate class of polluters may be proper and valid, we need now only concern ourselves with whether the fee methods would result in discriminatory treatment within a given polluter class. In other words, it must be ascertained whether such polluters are treated alike, and whether the two methods are germane to the statute.

Application of a cost-of-treatment method would result in uniform treatment among polluters because the effluent fees would be assessed against each polluter by the same standard, i.e., cost of treatment. Different polluters might ultimately pay different rates, but that would be immaterial. The test would be whether the fees were computed in the same manner for members of the same class.

Under a downstream-damages method, however, there would most definitely be different rates for different polluters since the damage done depends in part on factors such as the number of polluters in the area, the population density, and the different downstream uses of particular watercourses. Once again, however, the fact of different rates does not *per se* indicate that members of the same class are being treated differently. As long as the same standard is used (i.e., damage done downstream) for all members of the polluter class, they are receiving equal treatment under the statute.

Assuming then that members of the same class would be treated equally under either method, we must now consider whether each of the alternative methods is germane to the purpose of the statute.

As mentioned previously, the purpose of the statute is to raise the state's water quality. In accordance with this purpose, the fee system provides an economic incentive to comply with water quality standards. It would appear that a downstream-damages method is not directly related either to the statute's purpose or to its supporting fee system. Were the purpose of the statute and the fee system to establish equity between polluters and downstream users, this method would be appropriate. This, however, is not the case. Thus, in terms of relevance to the statute's purpose, the best that can be said for the downstream-damages method is that it *might* provide an incentive to comply with water quality standards assuming that damages are greater than treatment cost, and that it *might* have a vague, indirect relation to raising water quality. It cannot, however, be said that the method is clearly suited to either purpose. Nonetheless, the statute makes mandatory an approximation of downstream damages in setting the fee schedule. As mentioned earlier, it would be advisable to seek legislative amendment of this section, but if amendment were not feasible, it would then be advisable to use the downstream damages as a basis for a surcharge (though not a basic charge). The use of a downstream-damages method to set the basic fee could result in a finding by the Vermont courts that the fee structure is arbitrary and discriminatory, not germane to the purpose of the statute, and therefore unconstitutional.

The cost-of-treatment method, by contrast, would seem to be particularly well suited to the general purpose of the statute and to the purpose (economic incentive) of implementing a fee system. As such, it might reasonably be considered germane to the statute. Silus Robert Lyman, however, takes a contrary position in a detailed study for the University of Wisconsin Water Resources Center.⁵⁴ Mr. Lyman argues that a fee system based on an annualized cost of treatment will reflect such variables as the financial status of the polluter, the nature of his business, and the age and condition of his plant, rather than the damage due to the watercourse. Therefore he maintains that the system would depend on arbitrary considerations and would not be germane to the purpose improvement of water quality. Conse-

quently, the system would be discriminatory and unconstitutional.⁵⁵

Mr. Peter Davis, however, General Attorney for the United States Department of Agriculture at the Wisconsin Water Resources Center, strongly disagrees with Mr. Lyman. He states that Lyman's position rests on the assumption that the fees will be levied per unit of waste *produced* while in fact such fees are generally based on units of waste *discharged*.⁵⁶

The Arthur D. Little Company (ADL) also takes a position contrary to Mr. Lyman's, but on grounds which differ from Mr. Davis'.⁵⁷ Lyman argues that an annualized cost-of-treatment method is not relevant to the purpose of the statute and is, therefore, arbitrary, discriminatory, and unconstitutional. ADL argues, on the other hand, that an annualized cost-of-treatment method is relevant to the purpose of the fee system (economic incentive) and that the fee system, in turn, is relevant to the purpose of the statute as a whole. In other words, the cost-of-treatment method motivates persons to comply with treatment standards; and then compliance or noncompliance directly affects the state's water quality, whose improvement is intended by the statute. This two-step analysis by ADL seems more satisfactory than an examination which proceeds from the particular fee method directly to the general statutory purpose. There appears then to be no logical flaw in arguing that the cost-of-treatment method is pertinent to the statute.

B. *Equity*

Under the cost-of-treatment method, an individualized charge is more equitable than a uniform charge which is based on a group average. The individualized charge recognizes differences between treaters, who already have incurred construction and operation costs, and non-treaters, who have not incurred any such costs. The non-treaters, of course, would pay the higher fees; their fees would approximate the costs of constructing and operating a treatment plant. There would also be greater equity among non-treaters (polluters) themselves, since an individualized cost-of-treatment method would eliminate the possibility of a polluter's paying something other than his actual cost.⁵⁸ It must be remembered, however, that while full equity is desirable, the more individualized programs may create great administrative burdens.

While a cost-of-treatment method permits individualized, and thereby equitable, handling of treaters and non-treaters, it does not create equity as between non-treaters and downstream users of the watercourses. This shortcoming follows from the fact that the collected fees would not be used to compensate downstream users. Such compensation, were it the statutory goal, could be accomplished through a downstream-damages method. However, if such equity were the aim of a statute, there would then be no equity between treater and non-treater. In such a case, the administrative burden of evaluating damages and setting fees would be nearly impossible; moreover, the incentive purpose of the fee system would not be met.

C. Administrative Feasibility

The more general or standardized the charge structure, the easier the system will be to administer. But while administrative considerations are best served by a generalized fee, equity demands a fee which is highly individualized. Thus, administrative feasibility must be weighed against equity.

Of the two methods which have been considered, the cost-of-treatment method, whether individualized or generalized, would be easier to administer. This conclusion follows from an examination of the immense difficulties that arise in establishing a rate schedule based on downstream damages. To base a rate structure on downstream damages, the Board must first determine the monetary damages. There are two ways to determine such damages: to ascertain the costs incurred by downstream users to purify the polluted water, or to place values on the various downstream uses. Neither alternative, as we shall see below, is satisfactory.

There are two important objections to basing damages on downstream treatment costs. First, the method is based on unrealistic assumptions. It assumes that all downstream users will treat the polluted water themselves and then continue to use it. It does not account for the possibility that some downstream individuals will simply forgo the use of such water altogether. It cannot seriously be argued, for example, that all families who have used a particular watercourse for boating and swimming are going to construct treatment facilities so that they may continue to enjoy the water. Many, if not most, simply will go elsewhere. Yet under this method of assessing damages, their in-

juries, (i.e. their being unable to use the water as before and, possibly, their incurring costs to go elsewhere) will not be reflected in the damage figures. The rate structure would reflect only damages to those persons who continue to use the water after first treating it themselves. A second objection to the downstream damages method is that the method may undermine the incentive goal of the entire fee system. It has been found, for example, that the cost of purifying water on intake for drinking purposes is substantially lower than the cost of purifying water on output at its source of pollution.⁵⁹ This finding demonstrates a danger that fees based on downstream damages may be less than treatment costs, and thereby be useless as an incentive device.

The second method of determining downstream damages is to place monetary values on actual and potential downstream uses. A value is placed, for example, on a day of boating by a given number of persons and a day of swimming by a given number of persons; then estimations are made of how many more people would use the watercourse were it cleaner. The difficulties in assigning values to such activities are enormous. Sheer arbitrariness would seem inevitable in setting the number of persons who are affected and the amount of their damages. There simply seems to be no way to accurately assess damages to actual and potential downstream uses.

Virtually any attempt to compute fees on the basis of downstream damages seems ultimately to be unsatisfactory. One would always have to discount the downstream damages which are attributable to dischargers and farmers. One would always have to determine the amount of damages caused by each of the various polluters on the watercourse. It would then always be necessary to allocate damages per unit of particular waste discharged. The problem of allocating damages per unit of waste is exceedingly complex. Different wastes may have different effects on the same downstream use, and the same waste may have different effects on different downstream uses. For example, one waste may have a merely negligible effect on a downstream manufacturer's use of water, while a second waste may require him to treat his water intake extensively. A third waste may have a negligible effect on manufacturing but have a devastating effect on fishing and swimming. These conditions must be reflected in the fee. Differences in hydrology, in seasons, and in high and low

flow periods are but a few of the factors which must also be considered. Furthermore, it must be noted that much of the damage is likely to be cumulative. One unit of a waste, for example, might cause no perceptible damage at all, while a million units of the same waste might cause severe damage; thus there may be no precise relationship between unit of waste and unit of damage. Even in cases where the waste-damage relationship is well documented, there exist wide variations in tolerance.⁶⁰

In summary, then, the administrative objections to a downstream damages method are these: (1) it is extremely difficult, if not impossible, to measure damages; (2) the effects of each waste unit on each downstream use must be considered separately; (3) many of the downstream uses are social uses for which there is no market mechanism by which to determine their monetary values; and (4) the data necessary for an accurate rate structure based on downstream damages are not currently available and probably will not be available for some time.

VI. CONCLUSION

Of the two alternative fee methods considered herein, the cost-of-treatment method is the more desirable. The downstream-damages method is subject to three major criticisms which the cost-of-treatment method avoids. First, the downstream-damages method creates a heavy administrative burden; second, because it is extremely difficult to measure damages and relate them to particular polluters, such determinations will often be made arbitrarily and thereby raise questions of constitutionality; and third, a fee system based on downstream damages is not likely to provide a substantial incentive to comply with standards for the improvement of water quality.

A major problem which now faces the Board is that the statute makes divergent demands: although, the primary purpose of the fee system is to motivate polluters to clean their discharges, the statute nonetheless specifically mandates a fee system which reflects an approximation of downstream damages. A downstream-damages approach alone will not motivate polluters to treat their wastes, and it will also be constitutionally questionable. On the other hand, a cost-of-treatment approach alone will ignore the statutory requirement to approximate downstream damages.

Since the Board has not yet decided which method to use, it is impossible to evaluate the operation of an effluent fee system in

Vermont. However, in light of the two statutory objectives and the assessment criteria discussed above, the following method is suggested. The Board should first seek legislative amendment of the statute in order to reconcile the divergence between the two provisions mentioned above. As the statute now reads, no method will satisfactorily meet both statutory requirements. In order to effect such a reconciliation, the following amendment is suggested: "The Board shall establish a fee structure which operates primarily as an incentive for persons to comply with water quality standards. The Board shall furthermore have discretionary authority to compute a surcharge based on an approximation of damages to actual or potential downstream users." Such an amendment would supply sufficient flexibility for the Board to choose between two alternatives: a simple cost-of-treatment method, or a method, similar to that of the Czechs', wherein the basic charge is determined by a cost-of-treatment method and a surcharge is determined by downstream damages. Both alternatives would be safe from constitutional attack.

The optimum effluent fee method would seem to be a cost-of-treatment method which is refined by a "specific activity" approach and an option for the polluter; these refinements are discussed below. Such a method would, of course, have to be consistent with the general purpose of the statute and would also have to be constitutionally sound. Presuming that such were the case, the method would then have to be evaluated in terms of administrative feasibility and equity.

A cost-of-treatment method having a "specific activity" approach coupled with an option for the polluter would be relatively simple to administer and yet would be basically equitable. Such a method would first involve setting generalized average fees for each of the many different industrial activities; it would take into account the fact that treatment costs vary from industry to industry. Since it would not involve the details required by an individualized approach, it would have an advantage in administrative simplicity. At the same time, it would be considerably more equitable than a generalized fee structure, which would not make any distinctions among different industrial uses and which would be more likely to impose a fee that is far removed from actual treatment cost.

The option for the polluter would arise as follows. The optimum fee would be set higher than the average cost of treat-

ment within a particular industry. The polluter would, however, be permitted to submit plans for the construction of treatment facilities, together with verified engineering estimates of construction and operation costs. These being submitted, the polluter would then be given the option to pay either a semi-generalized fee or a fee based on his engineering estimates. Such an option arrangement would approach the nearly ideal equity which characterizes an individualized cost-of-treatment method, but it would avoid the administrative difficulties that arise in setting individualized fees. It would, furthermore, impose on the polluter a heavier burden to protect the quality of waters. It seems fundamentally fair that the producer of pollution should be required to finance corrective action. Moreover, placement of such an onus as the polluter would significantly reduce the amount of administrative initiatives which otherwise would have to be taken by the Board. It should be noted that if the generalized fee were substantially higher than the actual cost of treatment, the polluter would have an added incentive to begin construction quickly.

If the Board wished to establish greater equity between polluters and downstream users, it could impose on polluters a surcharge based on downstream damages. Yet were the Board to do so, it would thereby increase its administrative workload. Such a surcharge, however, would not seem to be necessary, since the method outlined above would spur vigorous efforts by polluters to clean up their wastes, and since these efforts themselves should benefit downstream users.



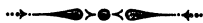
POSTSCRIPT

Since completion of this article, the Department and Board have promulgated tentative regulations and a fee structure based on annualized cost-of-treatment figures. The Board realized at the time that such a fee structure would not reflect downstream damages, but felt nevertheless that this was the only course left open to it given the incentive purpose of the fee system, and given the administrative realities—the same basic reasons for the author's favoring a fee based on cost of treatment. An opinion of the Attorney General requested by the Board stated, however, that given the wording of the statute such a fee would be uncon-

stitutional. Consequently, the legislature has postponed the effective date of the effluent fees section until July of 1972 in order that either the statutory wording may be changed to fit the proposed fee or a more acceptable fee method may be devised to satisfy the existing language of the statute. It is impossible to suggest at this early date what the eventual outcome will be.

The author spoke to Mr. Willard Farnum, Permit Administrator in the Department of Water Resources. He offered his own personal opinion, which is not necessarily the view of the Department, that the legislature is likely to delete the entire effluent fees section from the statute. He bases this opinion on the political pressures being brought by the business community.

We feel that such a deletion would eviscerate the statute. With the effluent fees provision, Vermont remains in the vanguard of responsible and imaginative environmental control; without the effluent fees provisions, Vermont is merely one of many states with weak water quality control programs. To delete the effluent fees provision would bring an unfortunate end to what would have been a courageous and highly significant piece of legislation and would be a vast disservice to the citizenry of Vermont.



FOOTNOTES

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The author wishes to thank Commissioner Martin Johnson of the Vermont Board of Water Resources for permission to obtain access to an Arthur D. Little Report prepared for the Board on effluent charge methods. The author further wishes to express his deepest thanks to Mr. Robert M. Bohlig of Arthur D. Little whose time and patience were of great help in preparing this article. Conversations with Mr. Bohlig and contents of the ADL Report provide much of the structure and source materials for this article.

¹ The statute was passed in the spring of 1969 and was to have been fully operable on July 1, 1971. See Postscript however.

² Number 252 of the Acts of 1969 (Adjourned Session), 10 V.S.A. Chap. 33, §§901-920. The new law is actually an amendment to existing water pollution statutes in Vermont, the first act of which was passed in 1943. There have been a series of amendments to the original act in 1949, 1951, 1953, 1961, 1964, 1967, and 1969.

³ See New Mexico Statutes Annotated, Vol. II, 75-5-1 Utah Code Annotated, Vol. 7B, 73-3-1; Wyoming Statutes Annotated, Vol. 9, §41-201.

See also Land and Water Law Review, 1969, vol. 4, p. 487 for a similar proposal for Idaho; these statutes require permits for the appropriation of water for "any beneficial use" and are aimed at regulating the state's limited water resource rather than pollution as such.

⁴ It has been used in Winnipeg, Denver, Cincinnati, St. Louis, Houston and Dallas in setting rates for the use of sewage lines and facilities. The purpose of these particular systems is to shift the cost of sewage treatment from local government to the dischargers.

See Maystre and Geyer, *Charges for Treating Industrial Waste Water in Municipal Plants*, Journal of the Water Pollution Control Federation July 1970, and Richard Wood, *Wastewater Rates and Service Charges in Great Britain*, J.W.P.C.F., Dec. 1969, for a detailed examination of the above systems.

⁵ §§903, 909(b), and 911a(c).

⁶ §912(e)(1), 10 V.S.A. Chapt. 33.

⁷ The various sections dealing with the mechanics of classification are §§902, 903, 904, 905, 906, 907 and 908.

⁸ Water Use Classes, Standards of Quality and Technical Guidelines for Intrastate Waters (as adopted March 10, 1967) and General Policy, Water Use Classes, Standards of Quality for Interstate Waters (as adopted May 29, 1967).

⁹ *Id.*

¹⁰ The need for updating is a result of changes made in Federally acceptable standards. See Federal Register, vol. 35, #128, July 2, 1970, Title 18, Chapter V, part 601, sub-part B. It will be noted that the federal standards are stricter and cover certain wastes not referred to in the current Vermont standards. Compliance with the federal requirements will be necessary to qualify for the federal grant program in treatment facility construction. A second reason is the obvious legislative intent to raise existing water quality and the current availability of data not previously available (due to the filing of detailed discharge reports).

¹¹ §910

¹² §911

¹³ §911(c).

¹⁴ There is one minor criticism at this point. It would be easy for the Department to adopt an overly legalistic approach here which could be potentially inequitable. For example, the standards call for secondary treatment of all wastes; it may well be that a discharger is using some other method to control disposal. Should such an applicant be denied a discharge permit merely because his wastes—though disposed at an acceptable level—are not accorded secondary treatment? Hopefully not.

¹⁵ §912.

¹⁶ §912(c).

¹⁷ §909(b) permit requirements, §918-penalties of \$10,000 and/or five years for violation of any statutory provision.

¹⁸ §912(d)(5).

¹⁹ §912(e)(1).

²⁰ §917.

²¹ §918.

²² §919 provides that the statute shall not be construed "to affect, impair or abridge the right of riparian or littoral owners or others to sue for damages or injunctions or exercise any other common law or statutory remedy to abate and recover damages for water pollution." This provision provides a source of potential litigation which is not really relevant to this article, but is an interesting question nonetheless.

§919 makes it clear that a defendant cannot claim compliance with Board or Department regulations as a defense to a private common law action by downstream users; these rights of downstream users cannot be reduced by the statute. The interesting question is whether such plaintiff's rights are enhanced by the statute. That is, may a plaintiff argue that new legal remedies are available to him by virtue of the statute? The court could have three options: it could decide that the statute does indeed supplement existing rights, it could decide that it does not, or it could find that while the statute provides no new remedies, a heretofore "reasonable use" has become unreasonable in view of changed circumstances (i.e. administrative classifications, standards and orders). There is case law in Vermont which would support the third option. A discharger is entitled to a "reasonable use" of the state's waters. *Laurie v. Silsby*, 76 Vt. 240 (1903). The courts have subsequently recognized the relativity of what is a reasonable use. *State v. Morse*, 84 Vt. 387 (1911). Changed circumstances very often change what may have once been a reasonable use into an unreasonable one. Administrative standards may well be considered such changed circumstances.

²³ §912a(e)

²⁴ Interim Report on Economic Incentives in Water Quality Management, Alternative Effluent Charge Methods part 2, Arthur D. Little, prepared for the Vermont Department of Water Resources. There is a certain degree of overlapping in most effluent fee systems but these are the dominant characteristics of the different systems.

²⁵ That is setting a more or less arbitrary fee, and letting the operation of the fee structure find a water quality level; if the resulting quality level is still unacceptable, the fee is raised somewhat.

²⁶ This would be similar to Vermont if the discharge permit provisions were removed from the statute.

²⁷ A prime example would be the German (Ruhr) System where re-

gional treatment facilities are set up by the administrative body and users are charged a fee which will cover the costs incurred by the agency administering the program. This is also the system employed in several municipal treatment programs. Maystre and Geyer.

²⁸ §914.

²⁹ §912(e)(2) requires the fee to reflect downstream damages.

³⁰ Pragmatically, there may be little actual danger that if downstream damages are less than treatment costs, the polluter is likely to delay because of §912(c) which makes it clear that unless a polluter is making at least a good faith effort to install treatment facilities, he will be refused a temporary pollution permit and consequently the polluter must either shut down operations or reckon with the §918 penalties. Furthermore, permits may be revoked if the polluter delays unreasonably.

³¹ This is the situation in Vermont which currently calls for secondary treatment of all wastes. In all likelihood this requirement will be carried forward in any future water quality standards revisions.

³² There is a potential problem with any alternative. As circumstances change, the Board may find it necessary to require tertiary treatment to maintain a desirable quality level. This would of course result in hardship to any discharger who had recently installed costly secondary treatment.

³³ Kneese and Bower, *Managing Water Quality* (1968).

³⁴ Such a table should be relatively sophisticated so as to take into account differences among polluters such as the type of industry, size of plants, their physical characteristics and age, etc. since these and other elements have a direct bearing on the cost of treatment.

³⁵ That is, anything falling below the standards is an estimate of downstream damages.

³⁶ The incredible evaluation difficulties under this method will be explored in Section V.

³⁷ For a fully developed effluent charge system based on instream damages, see Kneese and Bower, *Managing Water Quality*, Ch. 6. Causing Offsite Costs to be Reflected in Waste Disposal Decisions.

³⁸ *State v. Morse*, 84 Vt. 387, 392; 80A 189 (1911).

³⁹ *Goldblatt v. Hempstead*, 369 U. S. 90 (1962).

⁴⁰ *Shirley v. New Hampshire Water Pollution Commission* 100 N.H. 294, 300; 124 A.2d 189, 194 (1956).

⁴¹ *Vermont Woolens Corp. v. Wackerman*, 122 Vt. 219, 228; 167 A.2d 533 (1960), citing *Anchor Hocking v. Barber*, 118 Vt. 206.

⁴² *Crowley v. Christensen*, 137 U.S. 86, 89 (1890).

⁴³ The legislature has the power "to determine that the community should be beautiful as well as healthy, spacious as well as clean, well

balanced as well as carefully patrolled." *Berman v. Parker*, 348 U.S. 26, 32, 33(1954).

⁴⁴ *Nebbia v. New York*, 291 U.S. 502, 525 (1933); *Goldblatt v. Hempstead*, 369 U.S. 590 (1962).

⁴⁵ Robert M. Bohlig of Arthur D. Little suggests the foresight of seeking legislative action clarifying the fee computation method to be used rather than risking judicial determination.

⁴⁶ Notwithstanding the fact that a presumption of reasonableness lies with the state.

⁴⁷ §909(b)

⁴⁸ §§911a(c) and 912a.

⁴⁹ §909(b) exempts persons who properly apply "fertilizer to fields and crops."

⁵⁰ ADL Report and *State v. Milwaukee*, 33 Wis. 2d 624, 633; 148 N.W. 2d 21, 25, 26 (1967); 11 Am. Jr. Const. Law §128; *Hardwick v. Woolcat*, 98 Vt. 343; and *State v. Clement Nat'l Bank*, 84 Vt. 167.

⁵¹ §909(b).

⁵² Even though no definitive studies have been made it is suspected that the contribution of fertilizers is not insignificant. Even so, the need for regulation of manufacturing discharges is probably greater.

⁵³ §912a.

⁵⁴ Silus Robert Lyman, *The Constitutionality of Effluent Charges*, University of Wisconsin Water Resources Center, Technical Report OWRR A-022-Wis (May, 1969).

⁵⁵ *Id.* at 49-52.

⁵⁶ ADL Report at 113.

⁵⁷ ADL Report p. 113.

⁵⁸ This danger is still present under a generalized average cost of treatment method.

⁵⁹ Appendix C, ADL Report.

⁶⁰ For example, chlorine content is directly related to a need of treatment in boiler feed operations, but other examples are not very commonplace. Even in the case of chlorine content there are wide ranges of tolerance. Kneese and Bower, *supra*, note 33 at 125.