

# **Permitting Pollution**

**An Assessment of the Rhode Island Implementation of the  
National Pollutant Discharge Elimination System**

by

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Submitted 21 May, 1999 in partial fulfillment of the AB degree in  
Environmental Studies, Brown University Center for Environmental Studies



## **Acknowledgments**

I wish to express my sincere thanks to the following people for their help, without which this project would not have been possible: Cindy Giles and Harold Ward, for their advice and encouragement; Patti Caton, Caroline Karp, and CES students for input and help, Alicia Good, Angelo Liberti, Lola Wright, and others at the Rhode Island DEM for sharing their time and knowledge; and Kay Goodman, my family, and friends for understanding and patient support.



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## Glossary of Terms and Abbreviations

**Consent Agreement:** An enforceable agreement between a facility and the DEM providing interim effluent limits and a compliance schedule

**CWA (Clean Water Act):** 3 U. S. C. 1251 on Water Pollution Prevention and Control is commonly known as the Clean Water Act.

**DMR (Discharge Monitoring Report):** A form listing measurements for different parameters in a facility's wastewater stream, submitted by facilities to DEM on a regular basis

**Facility:** A holder of an NPDES permit and a point-source discharger of wastewater to a river or lake. Facilities fall into the following categories: publicly-owned treatment, industrial, and federally-owned(less common).

**Major industrial facility:** An NPDES facility that is ranked 80 or higher on an evaluation system which considers "flow, pollutant loadings, potential public health impacts, and water quality factors"<sup>1</sup>

**Major municipal facility:** An NPDES facility that has "a design or actual flow of one million gallons per day ... or greater, a service population of 10,000 or greater, or a significant impact on water quality (i.e., a potential for toxic discharge; close to a water intake; discharging into an endangered stream; or requiring advanced waste treatment)"<sup>2</sup>

**NPDES (National Pollutant Discharge Elimination System):** Federal Program for managing water discharges by point sources

**Numeric violation:** A permit violation consisting of an effluent measurement in excess of the permit limit

**PCS (Permit Compliance System):** EPA's computerized tracking system for NPDES data

**QNCR (Quarterly Non-Compliance Report):** A summary of non-compliant facilities and enforcement actions which is submitted by DEM to EPA

**RIPDES (Rhode Island Pollutant Discharge Elimination System):** State implementation of federal NPDES program

**TMDL (Total Maximum Daily Load):** Defined in the 303(d) List as "the amount of a pollutant that may be discharged into a water and still maintain the water quality standards"

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<sup>1</sup> USEPA Office of Water Enforcement and Permits, Guide to the Permit Compliance System Quarterly Noncompliance Report, June 1988.

<sup>2</sup> USEPA Office of Water Enforcement and Permits, June 1988.

**WWTF: (Wastewater Treatment Facility):** Classified as municipal or industrial and major or minor

**303(d) List:** A list of a state's impaired waters required by Section 303(d) of the Clean Water Act

**305(b) Report:** "The State of the State's Waters" report required by Section 305(b) of the Clean Water Act

## Abstract

This study assesses the effectiveness of the Rhode Island implementation of the National Pollutant Discharge Elimination System, or NPDES, by examining permits, numeric violations, consent agreements, parameters of the discharges of violators and by facilities under consent agreements, and the water quality of receiving waters. Data from the EPA's Permit Compliance System (PCS) from 1994-1998 were included in the analysis. The study did not include pretreatment data. While absolute numbers of numeric violations have risen moderately during the period from 1994 to 1998, the frequency of violations relative to reporting instances has risen only slightly. Between 1994 and 1997, the violations were highly concentrated (76.5%) among approximately one-quarter (30) of the facilities; in 1998 the top facilities accounted for only 54.2% of numeric violations. These violations occurred almost entirely among minor facilities and for the following parameters: pH, pH change, temperature, flow, and total suspended solids. More significant are the 15 major municipal and industrial facilities discharging under consent agreements. These facilities have had water quality-based permits since 1989 but have not yet made the changes to their plants and pretreatment programs necessary to achieve compliance with these limits. Twelve of these facilities discharge to impaired waters according to the 1998 303(d) List of Impaired Waters. Seven of the 15 facilities with interim metals limits discharge to bodies of water for which the 303(d) lists metals as a cause of impairment. These facilities have been the cause of excess loading for 9 years and should be prioritized for compliance schedule enforcement/fulfillment. Other facilities that discharge to impaired waters should receive second priority for enforcement. Limiting factors in the efficiency of compliance schedule implementation include DEM staff resources and the cost of improvements to municipal treatment facilities. These issues need to be resolved, and federal funding could reduce political obstacles to doing so. Increased enforcement of pretreatment programs and may help municipal facilities avoid violations. Additionally, an overhaul of PCS is necessary. Protocols for data entry need to be revised and standardized in order to facilitate information retrieval. The handling of facilities with compliance schedules by PCS is misleading because the facilities appear to be in compliance with water quality-based effluent limits when, in fact, they are not. Documentation of PCS is insufficient, which renders the system essentially inaccessible to most citizens seeking information about NPDES.



## **Purpose**

This purpose of this thesis project was to assess the overall effectiveness of the Rhode Island implementation of the National Pollutant Discharge Elimination System (NPDES). Since NPDES is the primary means for managing pollutant releases from point sources to the state's waters, its implementation has the capacity to impact water quality substantially. In order to evaluate the effectiveness of the program as a whole, I examined several main areas: 1) permit violations in Rhode Island; 2) enforcement actions taken by the Rhode Island Department of Environmental Management (DEM); and 3) pollutant loading to bodies of water that already have been identified as having poor or threatened water quality, particularly where the pollutants discharged under NPDES permits are directly related to the reason for impaired water quality. The product of this study is a policy recommendation based on findings, and, since chronic deficiencies in compliance and enforcement have been found, a statement to the public. This will provide the basis for a public discussion of the improvements necessary to RIPDES to ensure compliance with the Clean Water Act.

## Background

The National Pollutant Discharge Elimination System, or NPDES, is authorized by the Clean Water Act, which states that "the discharge of any pollutant by any person shall be unlawful" except under a legal permit. The implementation of NPDES has been delegated to the DEM Office of Water Resources by Region I of the United States Environmental Protection Agency (USEPA) and is generally referred to as RIPDES (Rhode Island Pollutant Discharge Elimination System).

The effectiveness of RIPDES has been questioned recently. In 1997, John DeVillars, the Regional Administrator of the USEPA Region I, brought his concerns about DEM's administration of NPDES and other programs to the attention of Governor Almond, citing budget cuts as the main cause for inadequate functioning. Specifically, between 1995 and 1997, total DEM staff was reduced by 17% as a result of budget cuts.<sup>3</sup> The water quality programs at DEM were affected more severely by these cuts than other programs: water quality permitting technical staff was reduced by 65%.<sup>4</sup> By January of 1997, less than 2 full-time technical staff positions remained in this program.<sup>5</sup> The EPA recommended the addition of staff to NPDES and other programs and threatened to revoke DEM's authorization to implement NPDES in the absence of improved staffing, enforcement, and permitting.

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<sup>3</sup> John P. DeVillars, letter to Governor Lincoln Almond, 31 Jan. 1997.

<sup>4</sup> DeVillars, 31 Jan. 1997.

<sup>5</sup> DeVillars, 31 Jan. 1997.

A specific problem that became acute as a result of budget cuts was the overall level of enforcement actions undertaken by the DEM. The following graph is a representation of the number of appeals made to the DEM Office of Administrative Adjudication during the period 1992-1998. These data are used by the Department as an indicator of enforcement actions, since nearly all enforcement actions are appealed before they are resolved.

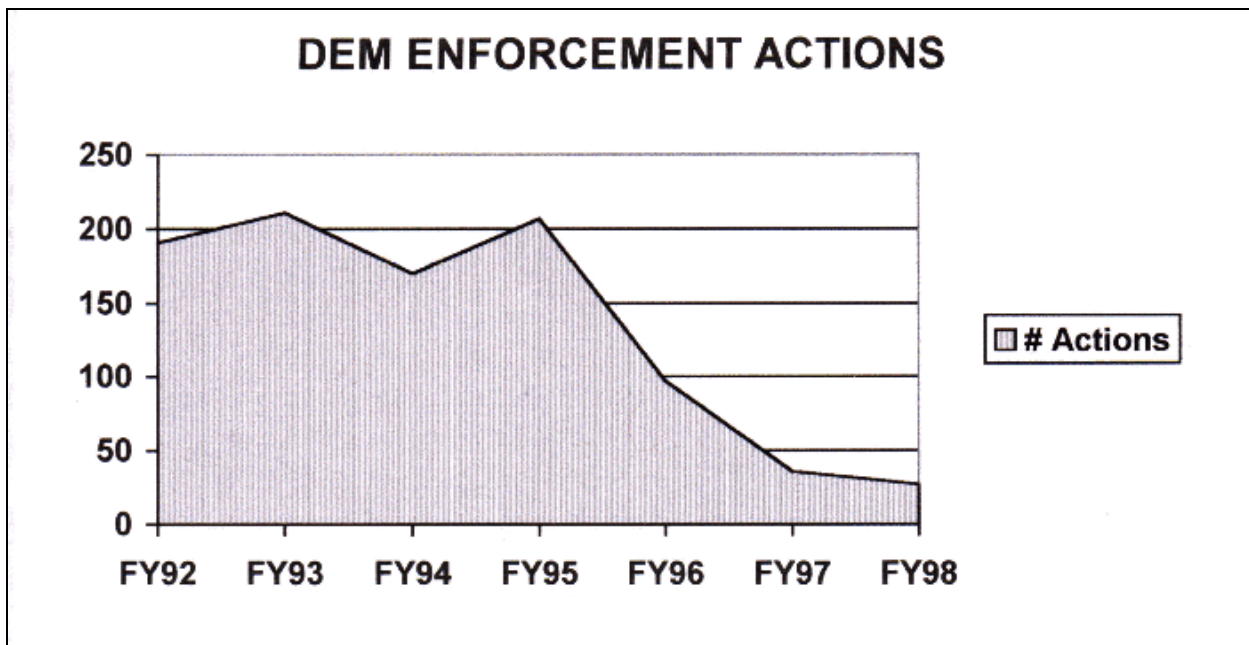


Figure 1. Trend in Enforcement. Source: C. Giles / DEM data

In the meantime, by September 1998, the program again had 11.5 staff members.<sup>6</sup> However, the EPA recommends 18.4 full-time positions for the RIPDES program.<sup>7</sup>

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<sup>6</sup> Full-time equivalents. Source: John P. DeVillars, letter to Andrew McLeod, 29 Sept. 1998.

<sup>7</sup> United States Environmental Protection Agency Region 1, "RIDEM - Budget History and Recommended Needs," 27 Feb. 1997.

Motivated by the overall drop in enforcement actions and the subsequent renewal of staffing levels in the DEM, Cynthia Giles suggested the assessment of current RIPDES enforcement patterns as an especially useful aspect of RIPDES program evaluation and requested assistance in analyzing data.

Furthermore, the extreme fluctuations in the level of staffing during a time of reorganization of the Department<sup>8</sup> suggest that the other aspects of the effectiveness of water quality programs might still be deficient. One possible indicator of an inability of DEM to fulfill its duties is the fact that nearly 70% of RIPDES facilities are currently operating with expired permits.<sup>9</sup>

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<sup>8</sup> The Department of Environmental Management underwent reorganization in 1997. A new office of Compliance and Inspection was created, meaning that the responsibility for enforcement shifted within the agency.

<sup>9</sup> According to PCS facilities data extracted 19 Feb. 1999, 101 of 147 RIPDES permits for active facilities had expired.

## Goals

This project had three main goals. The first was to assess RIPDES permit compliance and permit enforcement. The following questions represent key aspects of permit compliance.

- What are the trends in violation frequency?
- Do certain facilities violate their permits habitually?
- Has the DEM taken enforcement actions against these violators?
- Have these enforcement actions led to a change in behavior (i.e. compliance)?
- Is there a correlation between a decrease in enforcement and an increase in violations?

The purpose of the last question is to determine if a lack of enforcement provides a negative incentive for a facility to comply with its permit.

The second goal was to assess the relationship between permit violations and water quality. Any evidence that permit violations have the capacity to damage water quality provides an especially compelling reason to reduce their frequency. In order to estimate the impact that violations have on receiving waters, I developed the following questions:

- What permit parameters are often violated?
- Do these affect certain water bodies disproportionately?
- Do violations affect already impaired waters?
- Are these the parameters for which the affected body of water is already burdened?

- What is the potential effect on the receiving water?

Finally, I set out to make a policy recommendation expressing my findings, prioritizing facilities for enforcement, and suggesting mechanisms that would facilitate compliance and enforcement. The enforcement priority given to a facility should take into account issues such as budget constraints and water quality.

## Data Analysis

### Data

First, I obtained data sets from EPA in electronic form for RIPDES facilities from 1994-1998. These were extracted from the Permit Compliance System (PCS) database and fell into the following categories: facility information, the effluent limits stipulated by each facility's RIPDES permit, and the measurement data submitted on Discharge Monitoring Reports (DMRs). The DMR data are based on the facilities' self-reports, required by the RIPDES program. The frequency of reporting and the parameters measured differ by facility. Each reporting instance in the DMR data consists of a measurement of a certain permitted parameter on a particular date and carries a violation code assigned by PCS. The violation code is generated automatically by comparing the reporting data (date, measurement, etc.) to the limit and other requirements for that parameter. I did not study violation types such as missed DMR deadlines and missing measurements. These violations are also potential indicators of a facility's overall performance and are an important part of a facility profile, however they have no direct relationship to water quality. Thus, for the purposes of the study, I examined only numeric violations. This term denotes pollutant discharges in excess of permit limits.

## Permits and Violations

The number of permits (i.e. facilities) varied from year to year, and ranged from 105 in 1994 to 128 in 1997.<sup>10</sup> In 1998, the most recent year for which data were available, there were 125 facilities. A DEM list reported 23 active facilities as of December 1997 that did not appear in the PCS data provided by EPA. Likewise, there were 9 facilities in the EPA's PCS data that were not on the DEM list of active facilities.<sup>11</sup> A request for clarification and revised or additional data was submitted to the EPA in April 1998, however, as of May 1999 this discrepancy has not been resolved. Therefore, data analysis in this report reflects the facilities covered by PCS data. Twenty-seven<sup>12</sup> of Rhode Island's permitted facilities are considered major facilities. Fourteen of the 19 major municipal facilities have Industrial Pretreatment Programs. This study was not intended to include these programs.

In order to determine the number and frequency of violations, I summarized the violation codes in the DMR data by facility. Then I found the ratio of numeric violations (violation code=E90) to total reporting instances by each facility. The average numeric violation frequency in 1998 was 4.76%. Thirty-six facilities reported no numeric

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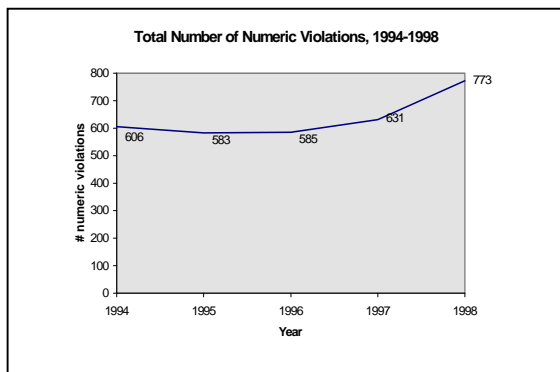
<sup>10</sup> The number of RIPDES facilities in 1995 was 116; in 1996, 130. Source: PCS facilities data.

<sup>11</sup> Source: Cynthia Giles, letter to Robert Mendoza, 27 Apr. 1998. This letter addressed the discrepancies and requested clarification and revised/additional data.

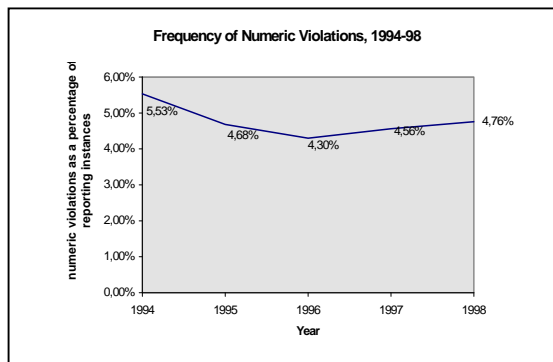
<sup>12</sup> Source: PCS facilities data. The 305(b) Report cites a figure of 29 major facilities and approximately 130 minor facilities (p. I-11) but only 27 major facilities show up in the database. According to a staff member of the Office of Water Resources, there are currently 27, and this figure will soon be updated in PCS to 25 to reflect the termination of direct discharge by two major facilities. Source: Angelo Liberti, e-mail to the author, 31 Mar. 1999.

violations during 1998, 47 facilities reported 10% or fewer numeric violations, twenty-two had between 10% and 20% numeric violations, twelve had between 20% and 30% numeric violations, and the remaining 9 facilities reported 30% or more numeric violations.

To examine the 5-year trends in violation, I summed the violation occurrences by year. There was a moderate increase in the absolute number of numeric violations (Figure 1), but when the trend was adjusted for reporting frequency this rise was insignificant (see Figure 2). To summarize with respect to my first set of starting questions, the trend in violation frequency shows a stable level of violations, thus, the data do not indicate any correlation between the decline in enforcement and increased violation.



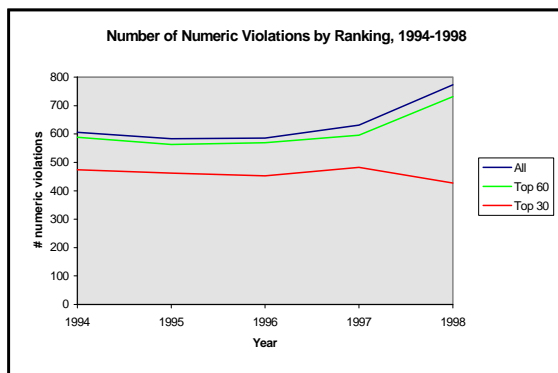
**Figure 2. Trend in quantity of numeric violations, 1994-1998. Source: PCS DMR data.**



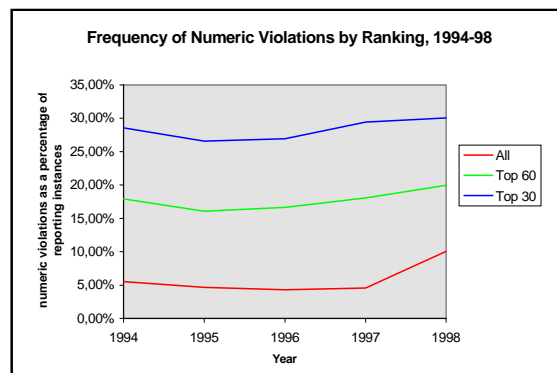
**Figure 3. Trend in frequency of numeric violations, 1994-1998. Source: PCS DMR data.**

For enforcement purposes, the concentration of violations is important because it is a factor that can aid in determining priorities and strategies for enforcement actions. When violations are concentrated among a subset of the facilities, it is possible to address a large percentage of the violations with few enforcement actions. In order to see the trends in the distribution of numeric violations, I ranked the facilities in

descending order of numeric violation occurrence and plotted the numeric violation occurrence over 5 years according to the following groups: All facilities, top 60 facilities, and top 30 facilities. The resulting graph shows a slight change in distribution. The groupings "Top 60" and "Top 30" do not necessarily include the same facilities each year, but reflect only the number of facilities responsible for a certain number of violations. A shift has occurred from violations by the top 30 facilities to violations by the facilities ranked 31-60. In 1997, for example, the top 30 facilities were responsible for 76.5% of the total number of numeric violations reported, and the "Top 60" accounted for 94.5%. In 1998, however, violations by the top 30 facilities represented only 54.2% of numeric violations, while the top 60 still contributed 94.7%. This means that targeting the top 30 facilities with enforcement actions would still address a large number of violations, but these would make up only just over half of the problem. The average numerical violation frequency for facilities in the lower groupings of violators has increased moderately.



**Figure 4. Trend in concentration of number of reported violations, 1994-1998. Source: PCS DMR data.**



**Figure 5. Trend in concentration of frequency of numeric violations, 1994-1998. Source: PCS DMR data.**

At present, there is not enough evidence to correlate this rise with a decrease in enforcement, but future study may reveal a trend in this area.

I decided to examine the "Top 30" in more detail, since the concentration of violations was highest here. In order to assess whether the same facilities appeared in the "Top 30" on a regular basis, I created a table listing the top 30 facilities for each year in descending order of numeric violation frequency. Since I wanted to see the "movement" of facilities currently within this ranking, I tracked the facilities in the "Top 30" in 1997<sup>13</sup> backwards manually, color-coding their position in the list. A majority of the facilities occur within the category in multiple years. There was very little change among the top 10 facilities on the lists. Of these, all but one facility had been in the "Top 30" at least once during the period from 1994-1997, seven had been in the "Top 30" throughout the period from 1994-1997, and four had ranked among the top 10 for four consecutive years. The top 10 facilities in 1998 also showed a similar continuity; only two of them had not been in the "Top 30" in one of the prior years examined. Just over half (11) of the facilities ranked 11-30 had been among the "Top 30" in the previous years.

To account for differences in reporting frequency, I ranked the facilities by frequency of numeric violation and again tracked them back through time beginning in 1997. Here the trends were also strong among the top 30 facilities.<sup>14</sup> All but 5 of the top 30 facilities had been among the "Top 30" during at least one of the prior years I

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<sup>13</sup> This analysis was performed before 1998 data became available. A comparison with 1998 data follows.

<sup>14</sup> In further discussion, "Top 30" and other rankings will refer to the ranking by numeric violation frequency unless otherwise noted.

examined, and 14 of the 30 had been ranked among the "Top 30" every year from 1994-1997. Two of these 5 "newcomer" facilities also appeared in the 1998 "Top 30". Overall, however, the shift in distribution of numeric violations in 1998 was paralleled by the first-time appearance of a large proportion of facilities in the "Top 30". Nine of the Top 30 facilities in 1998 had not been in the Top 30 during any of the 4 previous years. This deserves further observation in future years. Despite a significant number of new facilities in the Top 30, it is clear that many facilities have a pattern of habitual violation.

## **Enforcement**

I obtained enforcement data from DEM and EPA in printed form. They consisted of an automatically-generated PCS summary of all enforcement actions taken by EPA and DEM from 1990 to 1998 and a manually-generated list of formal enforcement actions<sup>15</sup> issued by DEM between 1990 and 1998. According to these documents, enforcement actions had been taken against only one<sup>16</sup> of these facilities. This signaled a potential area of concern, so I examined the relationship of these violations to the water quality of the relevant receiving waters, moving on to my second set of questions (see Goals).

To assess the extent to which permit violations affect already impaired water bodies, I compared the list of the receiving waters for the violating facilities with the

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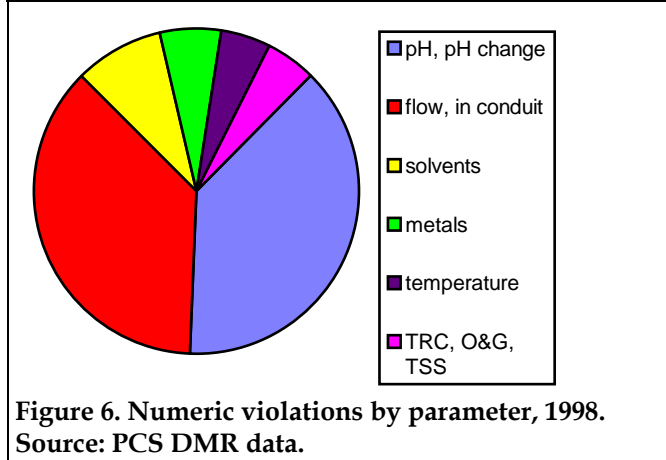
<sup>15</sup> The list defined a formal enforcement action as a Notice of Violation with penalty.

<sup>16</sup> The one facility that appeared in the enforcement data was also the only major facility among the Top 30.

State of Rhode Island 1998 303(d) List of Impaired Waters. Approximately half of the water bodies to which violators discharge appear on the 303(d) list.<sup>17</sup> One possible explanation for the lack of enforcement action against top violators was the limited list of parameters for which their numeric violations occurred. The only 5 parameters violated by the top 22 facilities in 1997 were pH, change in pH, flow, temperature, and total suspended solids (TSS). In fact, a total of only 4 of the top 30 facilities reported numeric violations for parameters other than these. These are important parameters, but do not necessarily represent the most significant problems in Rhode Island water quality. The causes of water quality impairment most frequently listed by the 303(d) list of Impaired Waters are heavy metals, nutrients, biodiversity impacts, and pathogens. TSS, however, is an indicator for all suspended material, including nutrients. The parameters for which numeric violations were reported in 1998 were more varied, but temperature, pH, change in pH, flow, and TSS still accounted for 82.2% of numeric violations reported. Other parameters for which violations were reported were: oil & grease (O&G), cadmium, copper, lead, total residual chlorine (TRC), xylene, toluene, benzene, and ethylbenzene.

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<sup>17</sup> This comparison does not take into account stream segments or discrepancies between the two water body lists.



Another possible reason for the lack of enforcement is that all of the top 30 violators except for the facility ranked 27<sup>th</sup> are minor facilities. Their small

total discharge can mean that they do not represent a significant threat to water quality. However, one should note that many minor facilities discharge to small bodies of water, where violations can have a proportionately larger impact.<sup>18</sup>

Finally, minor facilities, due to their large numbers, are not required to be listed on Quarterly Noncompliance Reports (QNCRs).<sup>19</sup> This reflects EPA's emphasis on major facilities. It is possible to generate a QNCR for minor facilities, but only the most recent 6 months can be included in the report<sup>20</sup>. Facilities will be listed on a QNCR if they have reported effluent violations 20% in excess of their permit limits for four months out of the six-month period (the quarter of the QNCR and the previous quarter).<sup>21</sup>

The enforcement actions that had been taken since 1990 focused entirely on major facilities, even though according to PCS data, the major facilities had numeric violation frequencies of less than 1%. Meanwhile, the large numbers of numeric violations that PCS had flagged were not the targets of any enforcement actions. This apparently contradictory situation resulted from the fact that the majors in question, who had been violating their permit limits, now have compliance schedules allowing them to

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<sup>18</sup> DeVillars, 31 Jan. 1997.  
<sup>19</sup> USEPA Office of Water Enforcement and Permits, June 1988.

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<sup>20</sup> Alicia Good and Angelo Liberti, personal interview, 12 May 1999.

<sup>21</sup> Good and Liberti, 12 May 1999.

discharge under higher limits. Most discharges, allowable under the interim limits but in excess of their original permit limits, are not recorded by PCS as violations, meaning that despite a violation frequency of less than 1%, many or all of their effluent levels may exceed water quality-based limits. According to EPA, PCS, due to a limited number of data fields, can only accommodate one limit value per parameter per facility, season, and monitoring location. Original permit limits are overridden with higher interim limits, which is why fewer violations show up in PCS than expected. To understand and assess these facilities, it was necessary to adapt my initial questions to their circumstances and to conduct a case-by-case inquiry into their performance with respect to NPDES.

### **Major Facilities**

Twenty-seven, or approximately one-fifth, of Rhode Island NPDES facilities are major dischargers. Eight of them are industrial facilities; the remaining 19 are publicly-owned treatment works (POTWs). Water quality-based limits were developed beginning in 1989, replacing earlier technology-based limits as part of an effort to minimize the cost-benefit ratio of NPDES' requirements of facilities. Instead of requiring facilities to use a certain technology or process, these permits set parameter-specific discharge limits based on the receiving water's characteristics. Currently, 92% of all

major facilities<sup>22</sup> have water quality-based permit limits, however, most facilities did not have the technology to comply with these limits when they were introduced and were immediately in violation of their permits. These facilities have been operating under consent agreements, consent decrees, or compliance orders, since that time.<sup>23</sup> These arrangements allow the facilities to continue to discharge at prior (non-water quality-based) permit levels until they have completed the steps necessary to reduce discharge of certain parameters. These steps and appropriate deadlines are determined in agreement with DEM and constitute a compliance schedule. Consent agreements and the other arrangements listed above offer the facility legal protection while providing the DEM with a legal tool to enforce the compliance schedule - if the facility does not fulfill their obligations, the DEM can take the matter to court and obtain a court order for the facility's compliance<sup>24</sup>. Currently, most facilities under consent agreements are in various stages of the development and approval of improvement plans.

The consent agreement provides the facility with interim effluent limits which are immediately attainable. I attempted to compare the final permit limits with the

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<sup>22</sup> State of Rhode Island and Providence Plantations, Department of Environmental Management, Office of Water Resources, The State of the State's Waters: Rhode Island Section 305(b) Report (1998) II-6.

<sup>23</sup> Consent agreements, consent decrees, and compliance orders function similarly. The DEM no longer issues compliance orders, on the recommendation of its legal advisors, and most compliance orders have been replaced by consent agreements or consent decrees. The consent agreement is the most common of these three types of documents. Some facilities request consent decrees instead, however, which have been approved by a judge at the outset of the agreement. Source: Angelo Liberti, personal interview, 29. Mar. 1999.

<sup>24</sup> Consent decrees have already been confirmed by a judge and are enforceable by contempt order. Compliance orders work much the same as consent agreements but are not issued anymore by DEM- in more recent cases, consent agreements have been used, or, upon the request of the facility, consent decrees. Source: Angelo Liberti, 29 March 1999.

interim limits. However, some interim limits for permits issued by EPA have been entered into the PCS database by EPA as interim limits (limit type=3) but for monitoring only. This means that a code such as "ADDMON", meaning "monitor only" is entered instead of a numeric limit for a given parameter in the limit field. When PCS compares a measurement for that parameter with the "limit", it cannot perform the mathematical greater-than or less-than operation necessary to determine if the measurement constitutes a violation and flag it as such. Thus, no numeric violations show up in the database, regardless of how large the measured concentration or quantity may be.<sup>25</sup>

To correct this, DEM enters interim limits into PCS as permit limit modifications with numeric limits. Theoretically, it is possible to sort the limits by the modification code to isolate all of the final limits. This was impossible, though, because instead of using the different codes available in PCS for limit type values (1=initial, 3=interim, 5=final) the DEM uses the same code for permit limit modifications and consent agreement modifications, coding them both as final limits (limit type=5). Because one code is used for two different types of data, they are indistinguishable. A search for all *so-called* final limits, i.e. those with a limit type code of "5", will yield not only actual final limits, but also interim limits. Automatic sorting by limit type code to separate

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<sup>25</sup> The effect is to hinder the automatic listing of the facility both on the Quarterly Non-Compliance Report (QNCR) and as a facility requiring an immediate enforcement action.

interim limits from final limits is rendered impossible, meaning that determining original permit levels is a task that must be performed manually.<sup>26</sup>

### Compliance Schedule Performance

Fifteen of the 27 major facilities are on compliance schedules, and one other facility is currently negotiating a consent agreement with DEM.<sup>27</sup> According to PCS, most have a compliance schedule history of over 9 years. However, their status may not have been continuous. Some facilities have only recently been issued water quality-based permits. In many cases, earlier compliance orders have been replaced by consent agreements or consent decrees, or significant modifications in the consent agreement have led to a new agreement with a new docket number. In other cases, permits re-issued by DEM have been appealed by the facility, resulting in a new consent agreement after a hiatus. Nonetheless, the entire period is marked by the inability of the facilities to meet their final, water quality-based permit limits.

There have been 15 formal RIPDES enforcement actions<sup>28</sup> by DEM from 1990-1998, most of which resulted in consent agreements. Of these, 7 were still open as of 11

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<sup>26</sup> A program could be written to find most final limits, however some cases would probably remain ambiguous.

<sup>27</sup> Angelo Liberti, e-mail to the author, 20 May 1999.

<sup>28</sup> A formal enforcement action is defined here as a Notice of Violation with penalty. Some facilities are operating under old compliance orders that were not considered formal enforcement actions (Source: Good and Liberti, 12 May 1999).

January 1999.<sup>29</sup> Twelve of the NOV's involved facilities that are still operating under consent agreements, consent decrees, or compliance orders.

Currently, there are 14 facilities with unresolved compliance schedule violations, 12 of which are still under consent agreements or similar arrangements<sup>30</sup>. These are generally violations of a procedural nature, such as missed report deadlines or failure to achieve certain compliance steps on schedule. Such violations may result in stipulated penalties of \$5000 per day<sup>31</sup>. To date, there are two stipulated penalties suits pending.<sup>32</sup>

Since coding of limits in PCS is inconsistent, numeric violations' data from PCS are unreliable as indicators of these facilities' performance. Some interim limits are entered as "monitor only" and do not provide a basis for numeric comparison of limits and discharges. Thus, PCS cannot recognize and flag numeric violations of interim limits.

### Potential for Environmental Impact

All 15 consent agreements, consent decrees, and compliance orders include interim limits for metals. Consent agreements provide interim limits only for those parameters for which the facility was in violation; they serve to amend portions of the

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<sup>29</sup> Source: DEM, Facilities under Compliance Orders, Consent Agreements or Judicial Consent Decrees as of 1/11/99, Unpublished documentation, 11 Jan. 1999.

<sup>30</sup> Source: PCS compliance schedule violations table.

<sup>31</sup> The penalty condition and amount are stipulated by law; however, in order to collect them, the DEM must file suit against the facility.

<sup>32</sup> Good and Liberti, 12 May 1999.

permit. This means that these facilities generally discharge at levels between the final and interim limits. Interim limits are set by analyzing the facility's past discharges and violations and determining a limit with which the facility could statistically (based on past discharge levels) have complied 95% of the time. Thus, one can assume that these facilities discharge significantly more of these metals than water quality-based standards would allow. According to DEM, the final metal limits will typically be approximately one-third of the interim limits for the same metals<sup>33</sup>. The potential for environmental impact is great: for at least 9 years, 15 facilities in RI have been permitted to continue to discharge metals at levels 3 to 3 ½ times higher than water quality-based standards would allow.

### Discharge to Impaired Waters

The 303(d) list prioritizes water bodies for development of Total Maximum Daily Load (TMDL) limits according to their current water quality and ranks their priority as "targeted", "high", "medium", or "low." TMDLs are assigned as the "sum of the individual wasteload allocations for point sources and load allocations for nonpoint sources and natural background taking into account a margin of safety."<sup>34</sup> Eleven of the 15 facilities on compliance schedules discharge to water bodies listed on the 1998 RI 303(d) List of Impaired Waters. Five facilities discharge to non-impaired waters, and

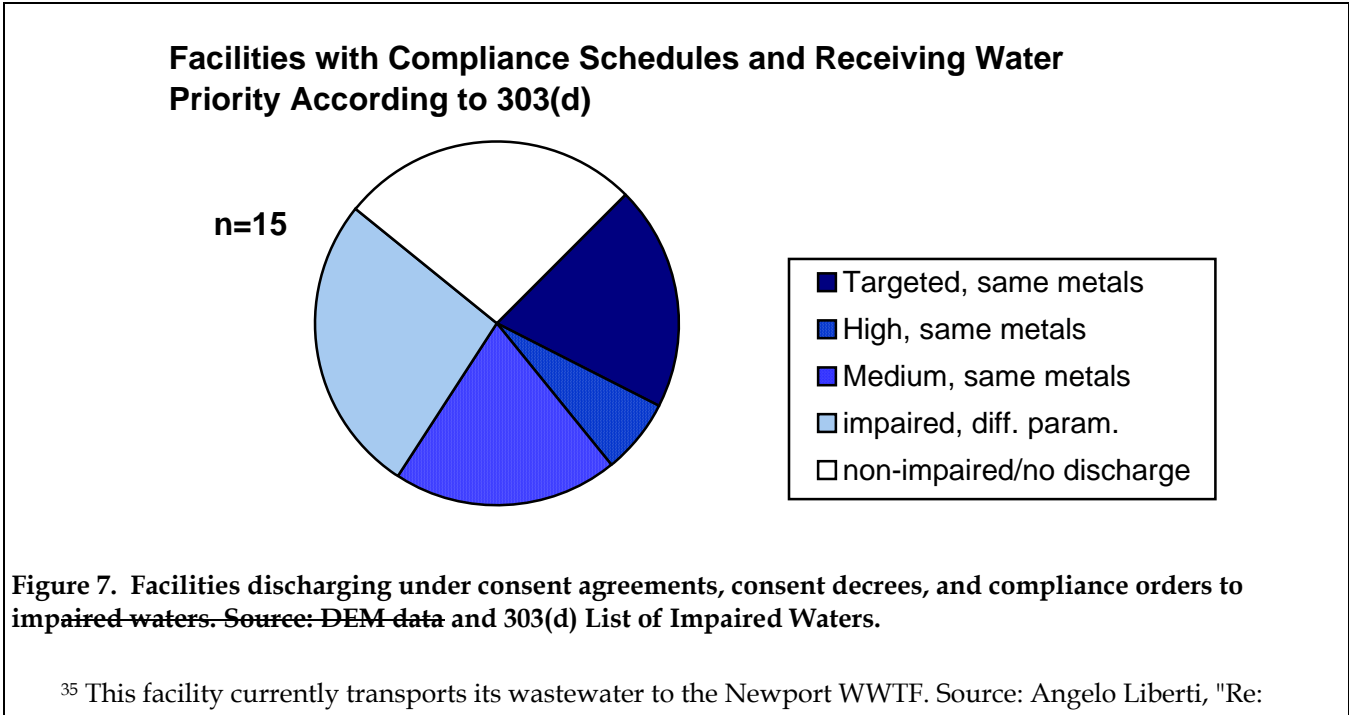
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<sup>33</sup> Source: Angelo Liberti, personal interview, 15 Mar. 1999.

<sup>34</sup> Source: 303(d) List 1.

one is currently active but has no discharge<sup>35</sup>. Four facilities discharge to waters ranked as "targeted" (highest priority) on the 303(d) List. However, only 54% of the state's rivers have been assessed.<sup>36</sup>

To determine the potential for direct contribution to existing water quality problems, I examined the parameters that occurred both in the facilities' discharge and among the reasons for impairment of the receiving water according to the 303(d) List. Seven facilities discharge metals such as cadmium, copper, lead, and mercury to waters for which these same metals are listed as a cause of impairment. The bodies of water affected by these releases are the Moshassuck, Blackstone, Pawtuxet, Woonasquatucket, and Providence Rivers. Two of these facilities discharge to the Blackstone River and three discharge to the Pawtuxet River.



<sup>35</sup> This facility currently transports its wastewater to the Newport WWTF. Source: Angelo Liberti, "Re: PCS Question," e-mail to the author, 26 Mar. 1999.

<sup>36</sup> 75% of the state's lakes have been assessed, but all of the facilities in question discharge to rivers. Source: 303(b) Report I-3 - I-4.

PCS in its current form presents obstacles to the calculation of excess loading to Rhode Island waters under consent agreements. This is due primarily to the way data are entered into PCS. For example, the coding of all limits as "final" limits (limit type=5) even though, according to PCS documentation, codes for initial (limit type=1) and interim (limit type=3) limits are available, prevents a query of final permit limits. This means that a facility will only show up on a QNCR if its effluents for a certain parameter exceed the permit limit by 20%, whereas a one-time violation of an interim limit (coded as such) would trigger a QNCR entry. Thus, a comparison of current discharges with water quality-based limits requires: 1) extensive knowledge of the system and the case histories of each facility, and 2) manual sorting and compilation of the limits provided by the consent agreements and all addenda and modifications to them.

The EPA has estimated that the Blackstone River received 360 excess pounds of cyanide, 218 excess pounds of copper, 126 excess pounds of lead, and 11 excess pounds of silver in 1996 from the Woonsocket facility alone.<sup>37</sup> In the same year, Narragansett Bay Commission's facilities (Bucklin Point and Fields Point) are estimated to have discharged approximately 4000 excess pounds of copper and 460 pounds of silver to the

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<sup>37</sup> Excess loading estimates in this paragraph are taken from: US EPA Region 1, "NPDES Program Draft Fact Sheet," 6 Feb. 1997. Using a manually compiled table of limits which, according to DEM, contained actual final limits, I was unable to reproduce the calculations EPA made of excess loading. The final limit for lead is given as 139 µg/l (max.) and 5.4 µg/l (min). There is no average limit. The facility simply never reached this high concentration.

Providence and Seekonk Rivers. All three of these rivers are ranked "targeted" (highest priority) by the 303(d) List, with metals among the causes for their impairment.

## Conclusions

Over the past five years, there have been very high levels of numeric violations among a relatively stable subset of facilities. For several years, the top 30 violators were responsible for approximately three-quarters of the numeric violations in the state. In 1998, they accounted for just over half of the numeric violations. With only one exception, these facilities are minor dischargers, and have not been the targets of enforcement actions. Although there have been violations of limits for heavy metals and solvents, the vast majority of the numeric violations are for conventional pollutants. The fact that many of these parameters play a smaller role in water quality assessments, coupled with the fact that the violators are minor dischargers, may explain the lack of enforcement action against these facilities.

Enforcement actions have been taken against many major facilities; in fact, 15 facilities are currently under consent agreements, consent decrees, or compliance orders. All have interim limits for metals. Eleven consent agreements, etc. provide interim effluent limits to facilities discharging to impaired waters. Of these, seven impact impaired waters with pre-existing high metal levels. A sixteenth facility is expected to sign a consent agreement in the near future. The allocation by DEM of its limited enforcement resources to major facilities is reasonable given financial constraints. However, compliance schedules alone don't ensure compliance; after 9 years, the interim limits are still in effect. This has resulted in prolonged excess loading of the state's waters.

Various parameters require different solutions. Reduction of discharge of so-called "conventional pollutants" such as nutrients and biochemical oxygen demand (BOD) requires significant physical improvements to facilities' treatment systems. Chlorine, on the other hand, another "conventional pollutant," can be reduced more easily; in fact, seven facilities with compliance schedules are already in compliance for total residual chlorine (TRC) and several others are in the process of designing or constructing the improvements necessary to achieve compliance for TRC. Effluent levels of pollutants such as metals may be reduced most effectively through changes to or increased enforcement of the pretreatment programs or corrosion control measures, especially in the case of lead and copper.

According to the DEM, pretreatment limits are already low, and most facilities enforce their pretreatment programs quite well. If this is the case, it means that either the POTW is not adequately treating wastewater, the pretreatment limits are not stringent enough, or the violations are from other sources (e.g. storm water flow), which seems to be an unlikely explanation for chronic violations. In either of the first two cases, improved limits and/or enforcement is necessary. For some pretreatment facilities, only pollution prevention and improved technology may be necessary to help lower the effluent quantities of metals and other parameters. Regardless, DEM must maintain the necessary staffing to enforce pretreatment where necessary, in cases where local enforcement is not satisfactory.

The DEM says, however, that there is some doubt as to whether even these steps would be effective, and lists several possible alternative problems and solutions. First, it

says, background levels of some parameters in the public water supply may exceed permit levels, and testing is planned. However, this seems to be a question that could be answered simply with one set of tests, and it is unclear why it has not yet been addressed.

In addition, the DEM reports that some facilities, including the Cranston, Warwick, Westerly, West Warwick, and Woonsocket WWTFs and Narragansett Bay Commission, and Rhode Island Economic Development Commission/Port Authority, are carrying out studies as part of their consent agreements to determine whether sampling and testing techniques routinely distort the analysis of their effluent.<sup>38</sup> If this is found to be the case, they would adopt "clean sampling techniques" to remove or adjust for this inaccuracy. The DEM expects that this will help bring some facilities into compliance for some parameters. If it does not, facilities would probably request the development of "site-specific criteria", which would involve a more detailed study of the receiving water and dilution patterns to determine whether higher limits would be appropriate for that particular facility. If all of these approaches fail, the DEM says it will seek guidance from the EPA in resolving the problem.<sup>39</sup>

So why have these facilities been allowed to remain under consent agreements for so long? It is difficult to quantify efficiency or assess why a compliance schedule deadline wasn't met. Missed deadlines can result from facility negligence or through

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<sup>38</sup> This, too, is an issue that should be resolved expediently. It also seems unlikely that this would account for levels two to three times higher than water quality-based limits would allow.

other circumstances despite due diligence. Delays in the implementation of a compliance

plan can be a failure on the part of the facility or the product of a backlog at DEM due to limited staff resources. The DEM also sees the current process as a difficult period of strategy development, since the issues involved in water quality-based permitting and compliance are far more complex than technology-based permits were.

The issue of formally extending entire compliance schedules has not yet been addressed; they have been functionally extended together with the expired permits. At a typical facility, the introduction of water quality-based limits led to an enforcement action, often followed by an appeal, which, after negotiation, resulted in a consent agreement. During the year or two of negotiation and/or appeal, the facility had interim limits. These were then formalized in a consent agreement, which typically expired approximately two years ago. However, not all consent agreements are obsolete when they expire; they are issued for the remainder of the duration of the permit (max. 5 years) but often provide compliance schedules that are longer than 5 years. The time frame for attainment differs greatly by facility. Currently there is a backlog of facilities that need to be evaluated prior to re-issuance of a permit. When the DEM issues the next permits for facilities on compliance schedules, the facilities will presumably still

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<sup>39</sup> Source for information in this paragraph: Alicia Good and Angelo Liberti, personal interview, 19. April. 1999.

not have met all of the requirements of their compliance plan, meaning that they would not be able to meet the water quality-based limits.

Thus, DEM has little incentive to reissue these permits, since the new permits would generally contain similar, if not identical water quality-based limits and because the DEM and the facility would then have to renegotiate the consent agreement.

Likewise, an enforcement action against such a facility would involve the DEM and the facility in a legal dispute, while the impediments to fulfillment of the plan would remain. For example, staffing levels would still limit DEM's permitting and enforcement efficiency. Furthermore, the facility would still need to find ways to pay for the implementation of construction plans necessary to reduce effluent levels for so-called "conventional pollutants" such as nutrients and BOD. These issues will need to be addressed in order to bring major facilities into compliance.

Most recently, however, DEM sued the City of Woonsocket for the failure of its wastewater treatment facility to meet compliance schedule requirements. Delays in meeting deadlines and completing studies were two of the main reasons cited for the suit.<sup>40</sup> The facility discharges to the Blackstone River, which is ranked by the 303(d) as Targeted and has high metals levels, especially for chromium, copper, and lead. Woonsocket's consent agreement contains interim levels for copper, lead, cadmium, zinc, silver, and other substances. According to the DEM, this suit will probably lead to

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<sup>40</sup> Source: John Hill, "DEM sues city for \$4.6 million over problems at sewage plant," Providence Journal 16. Apr. 1999: C1.

a court order to comply with the consent agreement or a re-negotiated compliance schedule.<sup>41</sup> Certainly DEM's decision to take action against Woonsocket's chronic shortcomings is well founded, however it is also overdue. Even the Woonsocket

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<sup>41</sup> Source: Good and Liberti, 19. April. 1999.

Director of Administration and Public Works, Michael Annarummo, conceded that DEM's suit should have come sooner, saying, "Two years ago that action would have made a lot of sense. But two months before we bring a solution to the table?"<sup>42</sup>

Finally, PCS does not provide sufficient information to monitor excess loading and other aspects of facilities operating under consent agreements. This is due to the data entry policy of assigning the same code to multiple limit types, which makes the data nearly useless for queries specific to final limits or to interim limits. Inconsistencies between data entry protocols at DEM and those at EPA further complicate the matter. They obscure the interim limits data and avoid the automatic detection of numeric violations that PCS is designed to provide. Overall, the system lacks adequate documentation. PCS data, though publicly available, are not accessible to a citizen who lacks extensive familiarity with the RIPDES system. Furthermore, an insider's knowledge of the intricacies of PCS is necessary to derive meaning from the data. The current deficiencies in PCS impede the tracking of violators, the effective prioritization of enforcement, and the assessment of the permitting and enforcement programs by DEM, the EPA, and the public. These problems make it difficult to hold DEM and the facilities accountable for compliance with NPDES requirements.

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<sup>42</sup> As quoted in Hill.

## Recommendations

Effective enforcement of compliance schedules requires not only that violators are penalized, but that blanket extensions to the deadlines set forth by the compliance schedule be avoided. Since consent agreements also serve to prevent EPA from taking enforcement actions and to protect the facility from citizen suits for failure to comply with NPDES, other mechanisms of ensuring the program's effectiveness and efficiency are important. For example, it is imperative that DEM have the resources necessary to implement and enforce the program fully, and it is essential that DEM be held accountable for doing so. This means that DEM must expedite the approval process for construction plans submitted by facilities and re-issue permits for facilities that do not yet have water quality-based effluent limits. This could be achieved through the addition of staff and funding and/or through a redistribution of duties. The 1997 reorganization of DEM included the creation of an Office of Compliance and Inspection, which is responsible for some aspects of enforcement. A regular assessment over the next several years of the effectiveness of these structural changes would be helpful in determining where improvements are needed.

To the extent that DEM staff resources remain the limiting factor in the compliance schedule implementation, a clear set of priorities for compliance and enforcement should be established. This should be based on water quality considerations.

First priority should be given to the enforcement and attainment of compliance plans and deadlines for the 7 major facilities that discharge metals to metal-burdened

waters under interim limits. Within this category, facilities should be prioritized in descending order of the affected receiving water's 303 (d) List priority level (see Appendix B). In their current situation, these facilities have the greatest capacity to harm their receiving waters, and where water quality is poor, there is a more urgent need to reduce pollutant loading.

Enforcement actions against these facilities would generally result in a court order to meet the demands of the compliance schedule. Some aspects of the consent agreement might, however, be renegotiated; for example, a facility might be allowed to use different means to reach compliance than originally stipulated.<sup>43</sup> Enforcement actions would also encourage facilities to enforce and/or expand their pretreatment programs.

DEM has taken a significant, albeit belated, step in enforcing these facilities' compliance schedules in its suit against Woonsocket. Ideally, this will send a signal to other facilities in this category that compliance schedules are not long-term solutions and encourage them to act expediently to attain compliance. If this does not occur, the DEM should not hesitate to take similar action against other facilities that have repeatedly failed to meet deadlines.

Other facilities, major and minor, that discharge to impaired waters should be targeted second for the conclusion of their compliance schedules. Third priority should

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<sup>43</sup> Source: Good and Liberti, 19. April. 1999.

be assigned to the remaining major facilities, which discharge to non-impaired waters. Finally, fourth priority should be given to bringing minor facilities into compliance.

Chronic violation, whether on the part of majors or minors, should be eliminated regardless of the receiving water's status. Not only is it a violation of the law, but it is unfair to non-violating facilities which have invested capital in order to achieve compliance or remain compliant, and are thereby at a competitive disadvantage.

The DEM says that technical issues, such as the need for physical improvements, are a more significant obstacle to achieving facility compliance than are the difficulties facing the DEM in bringing about enforcement actions against non-compliant facilities.<sup>44</sup> Technology upgrade projects in municipal facilities raise questions of funding. In the next few years, funding these projects may replace the "administrative backlog" as the primary impediment to the fulfillment of consent agreements. Renewed federal grant funding to supplement the already-available revolving loans would help enable the prompt implementation of plans for facility improvement. It would also make enforcement of the compliance schedule deadlines more politically feasible. However, according to DEM, a federal decision to designate funds for the program is unlikely, and there is currently available funding in the form of low interest revolving loans. Another possible way for townships to obtain funds is to seek legislative support for

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<sup>44</sup> Source: Good and Liberti, 19. April 1999.

state bond funds in addition to the state revolving fund.<sup>45</sup> Furthermore, townships have the capacity to raise funds independently through taxes and fees. Financial issues on the facilities' side can thus be addressed in a number of ways and therefore should not deter any enforcement actions on the part of DEM.

In many cases, the amount of construction and funding necessary to bring a facility into compliance could be reduced by shifting more of the treatment burden to pretreatment programs. DEM enforcement of NPDES permits plays an important role in encouraging facilities to enforce their pretreatment programs to avoid penalties themselves. If industrial pretreatment does not have the technology to reduce pollutant loading of municipal facilities, then "pretreatment user fees" should be used to compensate by generating funds for POTW improvement.

Finally, the DEM and the EPA should collaborate to improve PCS system use and documentation for consistency and clarity. The EPA should enter interim limits as numeric limits instead of "monitor only". The different codes provided by PCS for initial, interim, and final limits should be utilized uniformly and accurately. Moreover, a staff position at DEM should be created or designated for the task of correcting old PCS permit limit entries or re-entering final numeric limits so that excess loading calculations can be performed using PCS. This would allow DEM and EPA staff to enter and access data more efficiently and would increase effectiveness of PCS as a tool for evaluating individual facilities and RIPDES as a whole.

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<sup>45</sup> Good and Liberti, 19. Apr. 1999.

## Appendix A: 1998 Top 30 Violators by Frequency of Numeric Violation

Rank	Facility ID	%E90	Facility Name
1	RI0023027	100.0%	KENNEY MANUFACTURING
2	RI0021598	66.7%	RI AIRPORT CORPORATION
3	RI0001651	54.5%	GETTY TERMINALS CORP
4	RI0021733	53.6%	ARLON FLEXIBLE TECHNOLOGIES
5	RI0021423	41.7%	TECHNICAL MATERIALS, INC.
6	RI0020401	36.1%	WORCESTER TEXTILE COMPANY
7	RI0001252	33.3%	GREENE PLASTICS CORP
8	RI0020451	33.3%	AIR PRODUCTS & CHEMICALS, INC.
9	RI0021211	33.3%	CONKLIN LIMESTONE INC
10	RI0021971	28.6%	DB MARKETING COMPANY, INC.
11	RI0001007	25.0%	CAROLINA TROUT HATCHERY
12	RI0021377	25.0%	LEVITON MANUFACTURING CO
13	RI0021636	25.0%	CHERRY SEMICONDUCTOR
14	RI0021725	25.0%	CASTEX INDUSTRIES INC
15	RI0023132	25.0%	BLACKSTONE VALLEY ELECTRIC CO
16	RI0110019	25.0%	RI DEM - DIVISION OF FISH & WILDLIFE
17	RI0110035	25.0%	RI DEM - DIVISION OF FISH & WILDLIFE
<b>18</b>	<b>RI0001627</b>	<b>22.4%</b>	<b>WOONSOCKET, CITY OF</b>
19	RI0090174	21.2%	MOBIL SERVICE STATION
20	RI0021491	20.8%	DECORATIVE SPECIALTIES INTERNATIONAL INC
21	RI0022110	20.8%	MERIT OIL OF R.I., INC.
22	RI0001473	20.0%	VICTOR ELECTRIC WIRE
23	RI0021466	20.0%	CNC INTERNATIONAL LIMITED PARTNERSHIP
24	RI0023272	19.2%	PROVIDENCE PLACE MALL
25	RI0021440	17.4%	QUEBECOR PRINTING PROVIDENCE INC
26	RI0021857	16.7%	PROVIDENCE TERMINAL ASSOCIATES II
27	RI0021865	16.7%	FLEET NATIONAL BANK
28	RI0022098	16.7%	MOBIL SERVICE STATION
29	RI0023167	16.7%	SEVEN ELEVEN CONVENIENCE STORE

Source: PCS Measurements data, 1998. Boldface indicates major facility.

## Appendix B: Major Facilities with Compliance Schedules and Receiving Water Status

<b>Facility ID</b>	<b>Facility Name</b>	<b>Receiving Water</b>	<b>Impairment parameters w/ interim limits</b>	<b>303(d) rating</b>
RI0100072	Narragansett Bay Comm. Bucklin Pt.	SEEKONK/ MOSHASSUCK/ BLACKSTONE	Cr, Cu, Pb	Targeted/ Low/ Targeted
RI0100111	Woonsocket WWTF	BLACKSTONE RIVER	Ammonia, Cl, Ceriodaphnia sp., Cd, Cu, Cyanide, Pb, Zn, Sn	Targeted
RI0100315	Narragansett Bay Commission - Fields Pt.	PROVIDENCE RIVER	metals, cyanide,	Targeted
RI0100251	Smithfield Sewer Authority	WOONASQUATUCKET RIVER	Hg, Cu, Pb, other metals, cyanide	High
RI0100013	Cranston WWTF	PAWTUXET RIVER	Cd, Cu, Pb & other metals	Medium
RI0100234	Warwick WWTF	PAWTUXET RIVER	metals incl. Cd, Cu, Pb	Medium
RI0100153	West Warwick WWTF	PAWTUXET RIVER	metals incl. Cd, Cu, Pb	Medium

<b>Facility ID</b>	<b>Facility Name</b>	<b>Receiving Water</b>	<b>Parameters w/ interim limits</b>	<b>303(d) rating</b>
RI0100030	East Greenwich WWTF	GREENWICH COVE	Cd, Cr, Cu, Pb, Hg, Ni, Sn, Zn, Cyanide, others	Targeted
RI0000191	Kenyon Industries	PAWCATUCK RIVER	Cu, Pb, Fecal coliform	Medium
RI0100064	Westerly WWTF	PAWCATUCK RIVER	Ammonia, TRC, Cu, Cyanide	Medium
RI0100005	Bristol WWTF	NARRAGANSETT BAY	Cu	Low
RI0100404	RIEDC	RHODE ISLAND SOUND	Cd, Cr, Cu, Pb, Hg, Ni, Sn, Zn, --	--
RI0000043	Bradford Dyeing Associates	PAWCATUCK WOOD	TSS, Sulfide, Surfactants, Cr, Phenol, Cu, Pb, Antimony	--
RI0100056	Warren WWTF	WARREN RIVER	Cu, Sn, TRC	--
RI0100455	Burrillville Sewer	NARRAGANSETT BAY	Cu	--

Source: PCS facilities data, DEM data, 1998 Rhode Island 303(d) List.

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