THE CITY OF PROVIDENCE

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

RESOLUTION OF THE CITY COUNCIL

No. 365

Approved June 18, 1984

RESOLUTION CONFIRMING AND APPROVING SETTLEMENT OF TWO E.P.A. FEDERAL CASES ENTITLED UNITED STATES -VS- CITY OF PROVIDENCE.

WHEREAS, on or about May 4, 1978, the City entered into Consent Decrees with the United States in C.A. No. 77-0374(B) and 77-0375(P); and

WHEREAS, the said decrees provided civil penalties in the sum of $2,500.00 per day of violation by the City of certain guidelines in the operation of the City's sewage treatment plant and incinerator; and

WHEREAS, the City had previously been found in contempt of the decrees in United States v. City of Providence, 492 F. Supp. 602 (1980); and

WHEREAS, on December 30, 1983, by court judgment (J. Pettine) a fine of $622,500 was imposed in C.A. No. 77-0375(P); and

WHEREAS, a motion is pending to impose a fine of $822,500 in the companion case no. 77-0374(B) scheduled in Federal Court on June 8, 1984, and a Judgment for said amount will most probably be entered; and

WHEREAS, The total liability of the two cases against the City will total $1.44 million dollars; and

WHEREAS, the parties have entered into extended negotiations for settlement; and

WHEREAS, His Honor the Mayor in consultation with the Law Department and the Finance Director has negotiated and approved a settlement of the said cases, in the aggregate sum of $430,000, payable as follows: F.Y. 84-85: $150,000; F.Y. 85-86: $150,000; F.Y. 86-87: $130,000; and

WHEREAS, this settlement reduces the liability of the City by over 1 million dollars; and

WHEREAS, it is in the best interest of the City to conclude these cases and enter into the said settlement, in the form of the stipulation attached hereto.

NOW THEREFORE BE IT RESOLVED, His Honor the Mayor, and the City Solicitor are hereby authorized and empowered to enter into and execute such documents, as would effect the said settlement, and that such settlement is hereby ratified, confirmed and approved.

IN CITY COUNCIL
JUN 7 1984
READ AND PASSED
Louis P. Strauss
CLERK

APPROVED
JUN 18 1984
MAYOR

Councilwoman Brassil (By Request)

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF RHODE ISLAND

UNITED STATES OF AMERICA and STATE OF RHODE ISLAND Plaintiffs, v. THE CITY OF PROVIDENCE, Defendant.	)	Civil Action No. 77-0374 B

STIPULATION

The parties hereto, by their undersigned counsel, hereby stipulate and agree as follows:

1. The parties agree to compromise claims against the City of Providence for the City's violation of the Amended Consent Decree herein by payment by the City in the amount of two hundred fifty thousand dollars ($250,000).

2. The payment described in paragraph 1, supra, shall be applied to the project described in Appendix A hereto, and it shall be paid to the State of Rhode Island in increments according to the following schedule:

Date	Amount
August 1, 1984	$140,000
August 1, 1985	$110,000

3. All payments under the schedule set out in paragraph 2, supra, shall be by certified check payable to Rhode Island Department of Environmental Management, and they shall

be delivered by hand to the Chief Legal Counsel of said Department in Providence during normal business hours.

4. In the event that the City fails to make any payment within five (5) days of the respective date shown in the schedule set forth in paragraph 2, supra, the entire portion of the total amount remaining to be paid under that schedule shall become due and payable as of the sixth day after such schedule date, and the City of Providence shall be responsible for all costs (including attorneys' costs) incurred by any party in collecting any payments under this stipulation.

5. At the end of each calendar quarter, beginning with the third calendar quarter of 1984, the State of Rhode Island shall report to the Court and to the parties (1) the status of the City's payments required under paragraph 2, supra, and (2) the status of the project described in Appendix A hereto.

6. Provided that the City of Providence makes the payments required by the schedule in paragraph 2, supra, the State of Rhode Island, by August 1, 1986, will complete the project described in Appendix A hereto or as it may be modified with the agreement of the United States.

7. When the City of Providence has made all of the payments required under this stipulation and the project described in Appendix A (or as it may be modified with the agreement of the United States) has been completed, the plaintiffs shall move the Court to dismiss this case; however, the City of Providence

will have no further obligations under this stipulation once it has made all payments required herein.

We so stipulate and agree.

For the United States

F. HENRY HABICHT, II
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Land and Natural Resources Division

LINCOLN C. ALMOND
United States Attorney

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CHARLES A. PISATURO
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GERARD DeCELLES
Deputy City Solicitor

GERARD DeCELLES
Deputy City Solicitor

FOR THE STATE OF RHODE ISLAND

CHARLES E. DiLEVA
Special Assistant Attorney General
56 Pine Street
Providence, Rhode Island 02903

Entered on this ____ day of May, 1984.

FRANCIS J. BOYLE
Chief Judge

RHODE ISLAND TOXIC POLLUTANT TRANSFER AND RISK ASSESSMENT PROJECT

Revised May 1984

I. Introduction

Following discussions with numerous state, regional, and federal environmental officials and interested university representatives and members of the public, the Rhode Island Department of Environmental Management (DEM) proposes to conduct an in depth study of intermedia transfers of toxic pollutants in the environment and corresponding health risks of these transfers. This proposed study focuses on surface water contamination in the Upper Bay and air pollution from volatilization of toxics at sewage treatment plants. Although the scope of the proposed study is presently limited to these two media, the study will utilize a data storage and retrieval system which is capable of receiving and manipulating all types of environmental data and interfacing with a variety of models to determine exposure and risk from toxic pollutants in all media. The project will be conducted in two phases.

The following proposal outlines the need for and specific objectives of this project and presents more detailed task descriptions for Phase I of the study.

II. Problem Statement

In the past, pollution of the environment was measured by determining the presence of only a few substances such as suspended solids and bacteria in water and sulpher dioxide and particulate matter in the air. Over the last few years, however, it has become apparent that we must be concerned about many more substances contaminating our air and water. Toxic substances such as heavy metals and organic chemicals can affect both human health and the ecology of natural systems. While there are thousands of chemicals which may pose environmental hazards, the Environmental Protection Agency (EPA) has identified "priority pollutants" which are of particular concern. These pollutants are found widely in our society and wastes containing them flow from industrial plants, landfills, auto repair businesses and many other sources. Protecting ourselves from the effects of priority pollutants and other substances which may be added to the priority pollutant list is obviously far more complex than protecting water and air from the few traditional pollutants. Monitoring for and understanding the impacts of so many chemicals require new systems for analysis, and record keeping to allow government to make decisions on regulating pollutant discharges and on creating pollutant treatment systems.

At several locations in this country, "Integrated Environmental Management Projects" (IEMP) are presently underway. These projects consist of data collection, automation and compilation for toxic pollutants in all environmental media. These data are stored in the EPA computerized data management package PIPQUIC. PIPQUIC data can be interfaced with environmental dispersion models in order to determine exposure coefficients for various toxicants and to identify geographically the populations at risk. If the toxicity of the pollutant is known or suspected, risk evaluations can be conducted. In this manner, the relative risks of exposure to toxics in different media can be compared. Ultimately, environmental management decisions can be made on a risk reduction - cost-effectiveness basis.

The conceptual framework and objectives of Rhode Island's proposed project are similar to those of the EPA sponsored IEMP projects elsewhere in the country. Rhode Island fully recognizes both the need for prioritization of potential toxic pollutant problems and the utility of integrated environmental planning. Rhode Island plans to tailor the project to address several priority toxic pollutant problems which have already been identified by R.I. DEM and the public as potentially having significant health risks and to use the experiences of similar projects in other states as is appropriate.

III. Objectives

The objective of this project is to collect new data, to automate existing data, and to interface this data with environmental pollutant dispersion models in such a way as to allow the state to identify and to prioritize multimedia toxic pollutant problems on the basis of health and, to a lesser degree, ecological risks. Ultimately, technological control decisions will be made on a cost-effective basis in terms of risk reduction.

In addition, these risk evaluation methods will be used in air and water program planning processes to assure optimal use of available resources. Specifically, the project should provide valuable input into the NPDES/RIPDES Permitting Program, the Pretreatment Program, and the POTW Construction Grants Program; and will supplement several additional research projects, most notably the Upper Narragansett Bay Study which will be conducted over the next three years. The project is also expected to provide valuable input into the State Implementation Plan for attainment of ozone, and other air emissions reduction strategies.

IV. Overview

A. Phase I

The project is to be conducted in two phases. The first phase consists of two components: automation of new and existing air and water data, and laboratory analysis, model selection and use, and risk assessment of volatile organic hydrocarbon emissions from sewage treatment plants.

In Phase I, a data storage system will be selected. We hope to use one storage system which will allow us both to continue the present development of the permit enforcement tracking system, and to interface NPDES data with pollutant transport models in order to predict exposures and risks associated with surface water pollution. While the latter task would not be performed until Phase II, various data retrieval options using PIPQUIC will be explored in Phase I. Additional computer software options will be used as need arises and funding permits.

In addition, linkages between the proposed project and the Upper Narragansett Bay Study will be explored in Phase I. The Narragansett Bay Study will provide new data on toxic pollutant transport and accumulation in water, sediments, and fish tissues. Efforts will

be made to develop a sampling protocol for the Bay Study which will be of optimal use in the modelling and risk assessment excersises to be conducted during Phase II of the study. For example, bioconcentration data for pollutants with human health effects might be especially useful. Because of the timing of the Narragansett Bay Study and resource limitations, risk evaluation of toxics in surface waters will not be conducted in Phase I.

Toxic pollutant transport modelling and risk evaluation in Phase I will focus on potential health hazards created by volatilization of toxics during sewage treatment. The public frequently complains of odors from sewage treatment plants which may be associated with chemical releases. The state has identified this problem as potentially serious and in need of close scrutiny in order to better identify its severity. Selection of this problem is supported by the Philadelphia IEMP project which concluded that "sewage treatment plants are among the most important sources of air toxics in the city because volatile toxics discharged to the plants enter the air during treatment."

In addition, it is hoped that this study will better enable the state to develop a strategy for meeting the ozone standard. We believe that volatile organics from sewage treatment plants comprise a significant percentage of volatile organics in the atmosphere which react to form ozone. Quantification of this contribution would be invaluable in assessment of control options and program plans.

Furthermore, selection of this air toxics problem is compatable with continuing emphasis on quantification of risks from toxics in surface waters since POTW effluents are the primary source of toxic water pollution in Rhode Island. It is extremely important that the state understand intermedia partitioning of toxics in the sewage treatment process before management decisions are made. To this end, Phase I will contain an extensive air toxics monitoring and modelling effort and a risk assessment component. POTW sludges will also be analyzed in order to provide all data necessary for mass balancing of persistent pollutants and estimation of decay rates for non-persistent pollutants. Other sludge monitoring proposals which are presently under review may supplement this research.

B. Phase II

Phase II will focus on transport and exposure pathways for toxics in surface water. A risk evaluation for this disposal practice will be developed. At completion of the project, cross media transfers in sewage treatment between air and water could be compared in terms of human health and ecological risks.

Surface water data compiled and automated during Phase I would be combined with environmental fate models for transport of toxic

pollutants in the Upper Bay. Environmental fate models developed during the Narragansett Bay Study will be compatable with this effort.

A risk evaluation of surface water pollution will be conducted. Human exposure to pollutants through ingestion of contaminated aquatic organisms and through recreational contact will be the two primary pathways studied. An ecological risk evaluation will also be included in this section.

Funding for Phase II will be obtained through either the user fee system presently in effect for point source dischargers or from Rhode Island General Assembly appropriations.

V. Study Area Description

The study area includes the Upper Narragansett Bay and its tributaries: the Blackstone, Woonasquatucket, Ten Mile, Pawtuxet, Moshassuck and Seekonk Rivers. The combined area of these drainage basins in Rhode Island is roughly 460 square miles. The portion of the Bay which lies north of Prudence Island will be included in the study. Approximately half of this area of the Bay is conditionally approved for shellfishing while the other half is permanently closed.

Ten POTWs are situated within the study area. Smithfield POTW discharges to the Woonasquatucket; Woonsocket and Burrillville POTWs discharge to the Blackstone; Warwick, West Warwick and Cranston POTWs discharge to the Pawtuxet; and Blackstone Valley District Commission, Narragansett Bay Water Quality Management District Commission's Field Point plant, East Providence, and Warren discharge to the Seekonk and Upper Bay.

Two major and approximately 30 minor industrial discharges are included in the study area.

IV. Existing Data Base

A. Ambient Data

Ambient data is available from DEM "Intensive River Surveys" performed on one river annually. Before 1982, 24-hour composite samples were analyzed for Cd, Cr, Cu, Ni and Zn. Since 1982, five more priority metals have been added to the list and one grab sample from each station is analyzed for volatile organics. The number of stations ranges from 9 on the Moshassuck to 17 on the Pawtuxet. The most recent survey dates for the tributaries of the Upper Bay are: Blackstone 1983, Moshassuck 1982, Ten Mile 1982, Pawtuxet 1981, and Woonasquatucket 1979.

United States Geological Survey periodically monitors two stations on the Pawtuxet (Cranston and Pawtuxet) and two stations on the

Blackstone (Forestdale and Manville). Samples from these stations are analyzed twice yearly for priority metals and once yearly for pesticides and PCBs.

In addition to these regular data sources, DEM is conducting an intensive study of the Pawtuxet River with the aid of the University of Rhode Island. When this study is completed, samples from 12 stations along the river will have been monitored for most of the priority pollutants. These stations will be sampled four times under fair weather conditions and twice under wet weather conditions. This type of intensive study will be expanded to other river basins in coming years.

B. Effluent Data

POTW effluent data for toxics is fairly limited. POTWs with several industrial users monitor either semi-annually or quarterly for metals. Priority pollutant scans performed in fall 1982 and spring 1983 are available for each of the nine POTWs in the Upper Bay area. These scans will be continued on an annual or biannual basis (depending on the volume of the waste discharged). Additional effluent data for Warwick, West Warwick and Cranston POTWs are available from the Pawtuxet River Study.

Effluent data for industrial direct discharges is submitted periodically in accordance with their permit. The extent of priority pollutant monitoring varies with each industry. In addition, 1982 and 1983 priority pollutant scans are available for all major industries. These full scans will be continued on an annual or biannual basis. Additional effluent monitoring on American Hoechst and Bradford Soap is being conducted in conjunction with Pawtuxet River Study.

C. Sediment Data

Sediment core samples from two stations on the lower Pawtuxet will be analyzed for seven priority metals, phthalates, polycyclic aromatic hydrocarbons, PCBs, and additional select priority pollutants. This sampling will be conducted twice. Some surface sediment data will also be available from this study.

D. POTW Sludge Data

EP toxicity tests are performed annually on sludge samples from all POTWs. The sludge extract is analyzed for 8 metals and 5 pesticides. This annual sampling was started in 1982; therefore, only two data sets are available. POTWs are also required to submit a one time sludge test for cadmium (dry weight) and PCBs in order to be granted an Order of Approval for sludge disposal. In addition, a priority pollutant scan is now being performed on sludge from the Warwick POTW.

E. Influent Data

POTW influent data for priority pollutants is available in accordance with pretreatment regulations.

VII. Phase I Task Descriptions

A. Data Compilation and Automation

Data on the release of toxic substances to surface waters of Rhode Island is in the process of being computerized for the Rhode Island Pollutant Discharge Elimination System. Computerized files have been created for information from the URI/DEM Pawtuxet River Study, RIPDES, and the priority pollutant scans. New computer files will be created for the other existing data. All new and existing computer files will be linked by key identifiers.

The data base will also include information on the sources of the data, and supportive reference files on monitoring and analysis methods, emissions factors, and detection limits.

The data base will be automated on a single system currently existing in DEM Division of Water Resources. This system will be accessible to the participants in the project.

Data automation will run concurrently with the sampling effort and is expected to last three to six months.

Estimated Costs of Data Automation

- Work station and hard disk storage	8,500
- Plotting and graphics hard copy device, mapping software	5,500
- Contractual consultant services	11,000
- Contractual manpower for data handling	15,000
Subtotal	40,000

B. Data Collection

1. Air Toxic Pollutant Analyses

Limited data currently exists relating to air toxics measurements from POTW releases. In Phase I, a monitoring plan will be developed to test for volatile organic pollutant emissions

from the ten POTWs in the study area. The sampling effort may focus on a few POTWs which are suspected to be the largest sources volatile organic pollutants. In addition, a few background samples from both urban and nonurban areas will be collected and analyzed for volatile organic pollutants. Priority pollutant analyses on air samples can be conducted at an estimated cost of $2,000 per sample.

Estimated Cost - 50 samples @ $2,000 each

Subtotal = $100,000

2. Sludge Analyses

Additional sludge testing will be performed to supplement the data from annual EP toxicity tests. Sludge samples from the ten POTWs in the study area will be tested for priority pollutants on three occasions.

Estimated Cost - 30 samples @ $1,300 each

Subtotal = $39,000

C. Air Dispersion Model

Following Data collection and analysis, a ground level point source model would be used to estimate off site concentrations of compounds detected from volatilization at sewage treatment plants. The predictive model would be selected utilizing assistance from EPA Region I and an outside contractor. The model would focus on dispersion of those volatile organic pollutants identified to be of most concern following an initial screening of field data.

A designated area approximately one square mile surrounding select POTWs will be correlated with surface water and sludge analyses and graphically depicted using PIPQUIC and contractually arranged graphics display equipment. The cost estimate includes costs of accessing and running the model.

Estimated cost - $30,000

D. Risk Analysis of POTW Emissions

Risk analysis of toxicants emitted to the air via volatilization during the wastewater treatment process would involve two steps: risk estimation, in which measures of risk associated with exposures from each sewage treatment plant would be determined, and risk evaluation, in which risks associated with different management alternatives involving cross media transfers would

be compared and assessed to identify the most acceptable alternatives in terms of risk burden and distribution. These steps are briefly outlined as follows:

1. Risk Estimation

   a. Exposure Determination

   - Toxicants present in sewage treatment plant wastewater that are of possible concern in terms of volatilization potential and toxicity to human health would be identified.

   - Time-averaged, ambient concentrations of each toxicant of concern would be determined as a function of spatial relationship (in terms of distance and direction) to each sewage treatment plant. This would be accomplished by calculating total toxicant volatilization from sewage treatment plant processes, monitoring sewage treatment plant emissions, and applying a calibrated air dispersive model to predict transport and fate of volatile pollutants.

   - Air exposure zones within which ambient toxicant concentrations fall within selected ranges would be spatially defined and mapped.

   - Pertinent characteristics of populations within each exposure zone (i.e., number, nature of exposure, etc.) would be determined.

   b. Toxicity and Risk Determination

   - The nature of and, where possible, the magnitude of risks associated with standard levels of exposure to each toxicant of concern would be determined. Risk estimates, expressed as probabilities of harm, are available only for a limited number of carcinogenic substances; in these cases, actual probabilities of harm (aggregate and maximum individual) associated with levels of exposure experienced in each zone would be calculated. Since interactive effects of toxic substances cannot be readily assessed, risks associated with each substance would be assumed to be additive. Total risk due to exposure to these toxicants would be determined.

     For non-carcinogenic toxicants with known threshold effects, risk would be assessed in terms of the degree to which population exposures exceed acceptable levels, as determined by model predictions. If PIPQUIC is selected as a data storage system, its available "support tools" will be used to rank risks geographically by pollutant and by emission source.

2. Risk Evaluation

   Risks from each sewage treatment plant would be evaluated in relation to risks from exposure to toxicants in other media (i.e.,

surface waters), in relation to other types of risks, and in terms of the net consequences of reducing risks associated with sewage treatment plant air emissions by transfering toxicants to other media through various management options.

VIII. Management

R.I. DEM will take the lead role in designing and coordinating the project. R.I. DEM plans to hire a project manager in order to ensure thorough execution and timely completion of the proposed project.

Assistance would be supplied by Environmental Protection Agency Region I, Boston, Massachusetts and the Integrated Environmental Management Division of Environmental Protection Agency. A Steering Committee comprised of Environmental Protection Agency Region I, Department of Environmental Management, Department of Health, and faculty from Brown University and University of Rhode Island would develop request for proposals, select contractors, award contracts, and make project management decisions with final approval by Environmental Protection Agency Region I.

A citizens advisory committee would be established to give program direction made up of environmental organizations, medical professionals, state and local officials, and other interested groups.

IX. Project Summary

The project, as proposed, would allow DEM and the public to evaluate human and ecological risks resulting from toxics in sewage treatment plant effluents and air emissions.

In Phase I, air dispersion modelling and risk evaluation will be conducted for toxic air emissions from sewage treatment plants. We intend to use PIPQUIC as the data storage and retrieval system to the extent possible. Supplemental computer software will be used as the need arises and as finances permit.

Phase I will also include collection and automation of sludge and surface water data. Data entry will be performed in such a way as to allow interfacing of the data with a pollutant transport model which would be developed during the Narragansett Bay Study or during Phase II of the project.

Phase II will consist of evaluations of health and ecological risks associated with this partitioning between media. Risks from surface water contamination will be evaluated using transport, persistence, and bioaccumulation models. We intend to use PIPQUIC's data retrieval capabilities to depict concentrations of pollutants and resultant risks.

Upon project completion, R.I. DEM will be able to evaluate different sewage treatment and pollution control options in terms of cross media transfers

and corresponding risks. This capability will provide valuable input into both water and air programs development. The system may be expanded easily in the future to encompass toxics problems in additional media (e.g. groundwater) as resources become available and need is identified.

Rhode Island Environmental Health Study

X. Phase I Budget and Time Frame

Cost Estimate	Task	Months from Project Starting Date 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
40,000	1. Data Compilation and Automation	(1-8)
	2. Data Collection	
100,000	a. air	(1-4)
40,000	b. sludge	(1-4)
30,000	3. Air Dispersion Model Selection, Calibration and Verification	(9-11)
30,000	4. Air Toxics Risk Evaluation	(12-15)
	5. Project Report write up	(16)

10,000	contingency funds	
250,000		

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF RHODE ISLAND

UNITED STATES OF AMERICA, Plaintiff, v. THE CITY OF PROVIDENCE, Defendant.	)	Civil Action No. 77-0375 P

STIPULATION

The parties hereto, by their undersigned counsel, hereby stipulate and agree as follows:

1. The parties agree to compromise the claim of the United States against the City of Providence for the City's violation of the Amended Consent Decree herein by a payment of one hundred eighty thousand dollars ($180,000) by the City to the United States.

2. Said payment shall be made in increments according to the following schedule:

Date	Amount
August 1, 1984	$10,000
August 1, 1985	$40,000
August 1, 1986	$130,000

3. In the event that the City fails to make any payment within five (5) calendar days of the respective date

shown in the schedule set forth in paragraph 2, supra, the entire portion of the total payment remaining to be paid under that schedule shall become due and payable as of the sixth day after such schedule date, and the City of Providence shall be responsible for all costs (including attorneys' costs) incurred by the United States in collecting any payments under this stipulation.

4. All payments under the schedule set out in paragraph 2, supra, shall be by certified check payable to the Treasurer of the United States, and they shall be delivered by hand to the United States Attorney's Office in Providence during normal business hours.

5. When the City of Providence has made all of the payments required under this stipulation, the United States shall move the Court to dismiss this case.

We so stipulate and agree.

For the United States

F. HENRY HABICHT, II
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COURTNEY M. PRICE
Assistant Administrator
Enforcement and Compliance Monitoring

Entered on this ____ day of May, 1984.

RAYMOND J. PETTINE
Senior District Judge