THE CITY OF PROVIDENCE

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

# RESOLUTION OF THE CITY COUNCIL

*No.* 135

*Approved* March 14, 1974

RESOLVED, that His Honor the Mayor be and he is hereby authorized to execute and file an application on behalf of the City of Providence with the United States Environmental Protection Agency for a grant to perform an engineering study for a plan of sewerage improvements for the City of Providence, Rhode Island, and to provide additional information and to furnish such documents as may be required by said agency, to execute such contracts as are required by said agency, and to act as the authorized correspondent of the applicant.

IN CITY COUNCIL
MAR 7 1974
READ AND PASSED

_____ PRES.

Vincent Vespia
_____ CLERK

APPROVED

MAYOR

Joseph A. Doorley Jr.

MAR 14 1974

IN CITY COUNCIL

FEB 21 1974
FIRST READING
REFERRED TO FINANCE
Rosem. Mendoza Acting CLERK

THE COMMITTEE ON
Finance
Approves Passage of
The Within Resolution
Vincent Vespa
March 4 1974 Chairman Clerk

Councilman Lynch and Councilman Flaherty

# PLAN OF STUDY

# OF

# SEWERAGE IMPROVEMENTS

# FOR

# THE CITY OF PROVIDENCE, RHODE ISLAND

# TO

# THE HONORABLE JOSEPH A. DOORLEY, JR.

# MAYOR OF THE CITY OF PROVIDENCE

FEBRUARY 26, 1973
(REVISED JANUARY 15, 1974)

Submitted by:

Waterman Engineering Company
450 North Broadway
East Providence, Rhode Island 02914

AND

Anderson-Nichols & Company, Inc.
150 Causeway Street
Boston, Massachusetts 02114

**WATERMAN ENGINEERING COMPANY**

*Civil Engineers*

450 NORTH BROADWAY, EAST PROVIDENCE, RHODE ISLAND 02914

January 15, 1974

The Honorable Joseph A. Doorley, Jr.
Mayor, City of Providence
City Hall
25 Dorrance Street
Providence, Rhode Island 02900

Subject: Study on Sewerage Improvements
City of Providence, Rhode Island
Amendment No. 1 to Contract dated February 26, 1973

Dear Mayor Doorley:

Waterman Engineering Company, together with Anderson-Nichols & Company, Inc., is submitting the attached Plan of Study as Amendment No. 1 to our contract with the City of Providence, dated February 26, 1973, and executed for the City by the Mayor in May of 1973.

This amendment to our contract is necessitated by recent requirements of the Environmental Protection Agency which have been established since the execution of the original contract with the City of Providence.

The new federal requirements are included in the scope of work and must be fulfilled as part of the sewerage study in order to obtain State and EPA grant funds. These new requirements include the following items of work:

1. Expansion of the study area to include North Providence, Johnston, and, in the future, Smithfield, as well as a small portion of Cranston.

2. Performance of an Infiltration/Inflow Analysis on the existing sewer system.

3. Upgrading of the treatment facility to the level of "best practicable" treatment.

4. Preparation of an Environmental Impact Assessment.

5. Performance of a cost-effective analysis.

6. Consideration of the following:

   a. sewer system separation
   b. elimination of dry weather overflows
   c. treated wastewater reuse alternatives
   d. treatment of stormwater overflow

The work outlined in the attached Plan of Study, as modified to incorporate the latest requirements of the Environmental Protection Agency, will result in a study which will develop for the City of Providence all the tools necessary to effectively control the discharge of all wastewaters generated within the environs of the City. The work will include a survey of the collection system, methods of eliminating combined sewage/stormwater overflow, preparing a sewer ordinance, conducting a survey of industrial discharges, determining methods of improving discharge quality from the present sewage treatment plant, an assessment of environmental impacts, and related matters.

Immediately upon your acceptance of this amendment to our contract, we will proceed to assist your staff in the preparation of applications for State and Federal funds, working in close cooperation with the Rhode Island Health Department and EPA. Other than these applications, no additional work will be performed on the items proposed herein, nor will any billings be made unless and until we receive from the City of Providence a separate written authorization to proceed with the work proposed. This would presumably be issued when financial arrangements satisfactory to the City have been made.

As detailed in the Cost section of the Plan of Study, the engineering fee for the work effort associated with this amendment is $378,000, of which $22,000, $49,500 and $11,500 are to be apportioned to the towns of North Providence, Johnston and Smithfield, respectively.

The total engineering fee of $638,000 for the study, when reduced by the State and Federal grants (75% EPA, 15% State) results in a net cost of $63,800 for the project, of which $2,200, $4,950, and $1,150 are to be borne by the towns of North Providence, Johnston and Smithfield, respectively.

For your convenience, we have provided a statement below for acceptance of this amendment to our contract by the City of Providence. This format is in keeping with Manual #45, American Society of Civil Engineers. Please return one signed copy of this amendment for our records.

We look forward to serving the City of Providence on this important assignment.

Very truly yours,

WATERMAN ENGINEERING COMPANY:

Frederick V. Waterman, President

ANDERSON-NICHOLS & COMPANY, INC:

Warren F. Darnell, Jr., Senior Vice President

FVW/WFD/mwm

Charles V. Glynn, Treasurer

Amendment No. 1 to the February 26, 1973 contract with Waterman Engineering Company and Anderson-Nichols & Company, Inc., acting in joint venture, is accepted by the City of Providence.

Joseph A. Doorley Jr.
Mayor, City of Providence

Date February 13, 1974

CERTIFICATE

I, Robert S. Toporzer, Clerk of Anderson-Nichols & Company, Inc., a Corporation organized and existing under the Laws of the Commonwealth of Massachusetts, do hereby certify that by consent of the Board of Directors on February 12, 1973, the following resolution was adopted:

> RESOLVED: That the following officers be, and they hereby are, ex-officio, authorized to execute, on behalf of the Corporation, offers and contracts, including, without limitation thereto, bids, proposals and purchase orders; applications for licenses and bonds; releases; leases; patent, copyright and trademark applications, assignments, licenses and related powers of attorney; and other instruments relating to the business of the Corporation, without limitation as to amount involved or the value fairly attributable thereto:
>
> > The Executive Vice President or any Senior Vice President together with an authorized representative of the sole stockholder of the Corporation, said authorized representative being the President, Executive Vice President, Senior Vice President, Vice President-Finance, Treasurer, Secretary or Controller of the Corporation.

I hereby certify that Warren F. Daniell, Jr., is a duly elected Senior Vice President and that Charles V. Glynn is an authorized representative of the sole stockholder of the Corporation, and that

the resolution enumerated above has not been amended nor rescinded and remains in full force and effect as of this date.

IN WITNESS WHEREOF, I have hereunto signed my name and affixed the Seal of the Corporation, this first day of February in the year nineteen hundred and seventy-four.

Robert S. Popejoy
Clerk

NATIONAL

23-280—Colored Tabs
23-281—Clear Tabs

**NATIONAL INSERTABLE-TAB INDEXES ENABLE YOU TO MAKE YOUR OWN SUBJECT ARRANGEMENT, USING PLAIN INSERTS ON WHICH TO WRITE YOUR OWN CAPTIONS.**

Made in U. S. A.

Step I Application

FORM APPROVED
OMB NO. 158-R0177

U.S. ENVIRONMENTAL PROTECTION AGENCY

# APPLICATION FOR FEDERAL ASSISTANCE

| EPA USE ONLY | |
|---|---|
| EPA PROJECT CONTROL NO. | DATE RECEIVED |
| FORMER FEDERAL NO. (If any) | P.E. NUMBER |

**PART I. GENERAL INFORMATION**

1. APPLICANT

a. NAME: City of Providence, Rhode Island

b. DEPARTMENT/DIVISION: Mayor

c. CONGRESSIONAL DISTRICT: First and Second

d. ADDRESS (Street or P.O. Box Number, Town/City, State and Zip Code): City Hall, 27 Dorrance Street, Providence, Rhode Island 02900

e. COUNTY: Providence

2. PROJECT TITLE: Study of Sewerage Improvements

3. CATALOG NUMBER AND TITLE OF EPA PROGRAM(S) TO WHICH THIS APPLICATION IS DIRECTED

Cat. No. 66.400, Construction Grants for Wastewater Treatment Works

| 4. TOTAL COST OF PROJECT | 5. TOTAL BUDGET PERIOD COST OF PROJECT | 6. TOTAL EPA SHARE REQUESTED FOR BUDGET PERIOD |
|---|---|---|
| $ 638,000 | $ 638,000 | $ 478,500 |

| 7. PROJECT PERIOD | 8. BUDGET PERIOD |
|---|---|
| FROM: 1 July 1974 TO: 28 Feb 1977 | FROM: 1 July 1974 TO: 28 Feb 1977 |

9. TYPE OF APPLICANT (Check appropriate box or boxes)

| a. GOVERNMENTAL AGENCY | b. NONGOVERNMENTAL | c. OTHER |
|---|---|---|
| [ ] STATE | [ ] NONPROFIT ORGANIZATION OR INSTITUTION | [ ] INDIVIDUAL |
| [ ] INTERSTATE | | |
| [X] MUNICIPAL | [ ] PROFIT-MAKING ORGANIZATION OR INSTITUTION | [ ] COLLEGE OR UNIVERSITY |
| [ ] INTERMUNICIPAL | | |

10. TYPE OF GRANT

a. [X] NEW b. [ ] CONTINUATION (Current Grant Number N/A )

| | | |
|---|---|---|
| 11. PROJECT LOCATION | a. STATE: Rhode Island | b. COUNTY: Providence |
| | c. MUNICIPALITY: Providence | d. CONGRESSIONAL DISTRICT: First and Second |
| 12. PROJECT AREA | a. STATE: Rhode Island | b. COUNTY: Providence |
| | c. MUNICIPALITY: Providence, North Providence, Johnston | d. CONGRESSIONAL DISTRICT: First and Second |

| | YES | NO |
|---|---|---|
| 13. DOES PROJECT REQUIRE CLEARINGHOUSE NOTIFICATION IN ACCORDANCE WITH OFFICE OF MANAGEMENT AND BUDGET CIRCULAR A-95? | X | |
| 14. HAS AN ENVIRONMENTAL ASSESSMENT BEEN MADE FOR THIS PROJECT OR FOR A COMPREHENSIVE PLAN WHICH INCLUDES THIS PROJECT? | | X |
| 15. HAS AN ENVIRONMENTAL IMPACT STATEMENT BEEN MADE FOR THIS PROJECT OR FOR A CLASS OF PROJECTS INCLUDING THIS PROJECT? | | X |
| 16. IS THE PROJECT COVERED BY A CURRENT FEDERALLY APPROVED PLAN? | X | |

a. FEDERAL AGENCY:

b. DATE:

17. APPLICANT CONTACT

a. NAME: Hon. Joseph A. Doorley, Jr.

b. TITLE: Mayor, City of Providence

c. ADDRESS (Street, City, State and Zip Code): City Hall, 27 Dorrance Street, Providence, Rhode Island 02900

d. PHONE NO. (Include Area Code): (401) 421-7740

18. OFFICIAL OR AGENCY TO WHOM CHECKS ARE TO BE MAILED

a. TITLE: Hon. Joseph A. Doorley, Jr., Mayor, City of Providence

b. ADDRESS (Street, City, State and Zip Code): City Hall, 27 Dorrance Street, Providence, Rhode Island 02900

19. SUBMISSIONS TO OTHER FEDERAL AGENCIES

None

FORM APPROVED
OMB NO. 158-R0077

PART II. SCHEDULE A - BUDGET

APPLICANT'S NAME: City of Providence, Rhode Island

EPA PROJECT CONTROL NO.:

SECTION A - BUDGET BY SOURCE

| | FUNDING SOURCE | FUNDS REQUIRED | |
|---|---|---|---|
| | | BUDGET PERIOD | PROJECT PERIOD |
| EPA SOURCES | Construction Grants for Wastewater Treatment Works - Catalog No. 66.400 | $478,500 | $478,500 |
| | | | |
| | | | |
| | TOTAL | $478,500 | $478,500 |
| OTHER FEDERAL SOURCES | | | |
| | | | |
| | | | |
| | | | |
| | TOTAL | 0 | 0 |
| NON FEDERAL SOURCES | State of Rhode Island | $ 95,700 | $ 95,700 |
| | City of Providence, Rhode Island | 63,800 | 63,800 |
| | | | |
| | | | |
| | TOTAL | $159,500 | $159,500 |
| | TOTAL BUDGET | $638,000 | $638,000 |

SECTION B - BUDGET ESTIMATES FOR BALANCE OF THE PROJECT PERIOD

| FUNDING SOURCE | ADDITIONAL SUPPORT TO COMPLETE PROJECTS - BUDGET PERIODS | | |
|---|---|---|---|
| | (1) FROM Jul 1974 TO Feb 1977 | (2) FROM ____ TO ____ | (3) FROM ____ TO ____ |
| EPA SUPPORT | $478,000 | N/A | N/A |
| OTHER FEDERAL SUPPORT | | | |
| OTHER FUNDING SOURCE | (State) 95,700 | | |
| | (City) 63,800 | | |
| TOTALS | $638,000 | | |

SECTION C - FORECASTED CASH NEEDS BY QUARTER

| FUNDS SOURCE | FIRST QUARTER | SECOND QUARTER | THIRD QUARTER | FOURTH QUARTER | TOTAL |
|---|---|---|---|---|---|
| FEDERAL | $75,000 | $75,000 | $75,000 | $75,000 | $300,000 |
| NON-FEDERAL | $25,000 | $25,000 | $25,000 | $25,000 | $100,000 |

FORM APPROVED
OMB NO. 158-R0077

| APPLICANT'S NAME | EPA PROJECT CONTROL NO. |
|---|---|
| City of Providence, Rhode Island | |

SECTION D - BUDGET BY COST CATEGORY OR PROGRAM ELEMENT

| TABLE A. COST CATEGORY | PROJECT PERIOD | | BUDGET PERIOD | | EPA USE ONLY | |
|---|---|---|---|---|---|---|
| | TOTAL | REQUESTED | TOTAL | REQUESTED | ALLOWABLE BUDGET PERIOD COSTS | APPROVED GRANT AMOUNT |
| PERSONNEL | | | | | | |
| FRINGE BENEFITS | | | | | | |
| TRAVEL | | | | | | |
| EQUIPMENT | | | | | | |
| SUPPLIES | | | | | | |
| CONTRACTUAL PERSONAL SERVICES | | | | | | |
| CONSTRUCTION | | | | | | |
| OTHER | | | | | | |
| TOTAL DIRECT COSTS | | | | | | |
| INDIRECT COSTS | | | | | | |
| **TOTALS** | N/A | N/A | N/A | N/A | | |

| TABLE B. PROGRAM ELEMENT | PROJECT PERIOD | | BUDGET PERIOD | | EPA USE ONLY | |
|---|---|---|---|---|---|---|
| | TOTAL | REQUESTED | TOTAL | REQUESTED | ALLOWABLE BUDGET PERIOD COSTS | APPROVED GRANT AMOUNT |
| Sewer Use Regulations | | | | | | |
| | 12,000 | 9,000 | 12,000 | 9,000 | | |
| System of Sewer Use Charges | 58,000 | 43,500 | 58,000 | 43,500 | | |
| Infiltration/Inflow Analysis | 300,000 | 225,000 | 300,000 | 225,000 | | |
| Report on Sewerage Improvements | 210,000 | 157,500 | 210,000 | 157,500 | | |
| Environmental Impact Assessment | 58,000 | 43,500 | 58,000 | 43,500 | | |
| (SEE ATTACHED BREAKDOWN OF ENGINEERING FEE) | | | | | | |
| | | | | | | |
| **TOTALS** | $638,000 | $478,500 | $638,000 | $478,500 | | |

SECTION E - DETAILED ITEMIZATION OF DIRECT COSTS *(See Instructions)*

SECTION F - INDIRECT COSTS

INDIRECT COSTS ARE A

☐ PREDETERMINED FIXED RATE ☐ PROVISIONAL RATE: _____ % OF N/A (BASE)

If the indirect cost rate is predetermined fixed, indicate the Federal agency that approved the cost allocation plan or if the indirect cost rate is a proposed provisional rate, indicate any Federal agency that has approved the use of such rate.

| NAME OF AGENCY | DATE OF APPROVAL |
|---|---|
| N/A | |

FORM APPROVED
OMB NO. 158-R0077

PART II — SCHEDULE B - BUDGET

*(For construction projects and other projects involving land acquisition, land development, or the relocation of individuals and businesses.)*

| APPLICANT'S NAME | EPA PROJECT CONTROL NO. |
|---|---|
| City of Providence, Rhode Island | |

## SECTION A - CALCULATION OF EPA GRANT

| COST CLASSIFICATION | PROJECT PERIOD COST | BUDGET PERIOD COST | EPA USE ONLY: AMOUNT APPROVED FOR BUDGET PERIOD |
|---|---|---|---|
| 1. ADMINISTRATIVE EXPENSES | | | |
| 2. LAND, STRUCTURES, RIGHT-OF-WAY | | | |
| 3. ARCHITECTURAL, ENGINEERING BASIC FEES | $638,000 | $638,000 | |
| 4. OTHER ARCHITECTURAL/ENGINEERING FEES | | | |
| 5. CONSTRUCTION AND PROJECT IMPROVEMENT COST | | | |
| 6. EQUIPMENT | | | |
| 7. CONTINGENCIES | | | |
| 8. RELOCATION PAYMENTS | | | |
| 9. INDIRECT COSTS | | | |
| 10. TOTALS — TOTALS | $638,000 | $638,000 | |

## SECTION B - INDIRECT COSTS

INDIRECT COSTS ARE A PREDETERMINED FIXED RATE OF _____ % OF _____ (BASE). N/A

| NAME OF AGENCY THAT APPROVED THE RATE | DATE OF APPROVAL |
|---|---|
| N/A | |

## SECTION C - BUDGET BY FUNDING SOURCE

| FUNDING SOURCE | | FUNDS REQUIRED: PROJECT PERIOD | FUNDS REQUIRED: BUDGET PERIOD | DATE BUDGET PERIOD FUNDS AVAILABLE |
|---|---|---|---|---|
| EPA SOURCES | Construction Grants for Wastewater Treatment Works, Cat. No. 66.400 | $478,500 | $478,500 | |
| | TOTAL | $478,500 | $478,500 | |
| OTHER FEDERAL SOURCES | TOTAL | 0 | 0 | |
| STATE | STATE AID — TOTAL | $ 95,700 | $ 95,700 | |
| FUNDS SUPPLIED BY APPLICANT | CASH | $ 63,800 | $ 63,800 | |
| | GENERAL OBLIGATION FUNDS | | | |
| | REVENUE BONDS/CERTIFICATES | | | |
| | OTHER: | | | |
| | TOTAL | $159,500 | $159,500 | |
| OTHER NON-FEDERAL SOURCES | TOTAL | 0 | 0 | |
| | TOTALS | $638,000 | $638,000 | |

FORM APPROVED
OMB NO. 158-R0077

| PART III | CERTIFICATION AND AGREEMENT |
|---|---|

The undersigned representative certifies that the information submitted herewith is true and correct to the best of his knowledge and belief and that he is authorized to sign and submit this application.

The applicant agrees that if a grant is awarded on the basis of this application or any revision or amendment thereof, it will comply with all applicable statutory provisions and with the applicable terms, conditions, and procedures of the Environmental Protection Agency grant regulations (40 CFR Chapter I, Subchapter B) and of the grant agreement.

| SIGNATURE OF AUTHORIZED REPRESENTATIVE | TYPED NAME AND TITLE |
|---|---|
| Joseph A Doorley Jr | Hon. Joseph A. Doorley, Jr.<br>Mayor, City of Providence |
| DATE: 12/13/74 | PHONE NUMBER (Include Area Code): (401) 421-7740 |
| | PROPOSAL VALIDITY DATE: 90 Days |

U.S. GOVERNMENT USE ONLY

| AGENCY INTERNAL REFERRAL OFFICE | DATE RECEIVED | DATE REFERRED | REFERRED TO |
|---|---|---|---|
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| AGENCY EXTERNAL REFERRAL | DATE RECEIVED | DATE REFERRED | REFERRED TO |
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CITY OF PROVIDENCE, RHODE ISLAND
STUDY OF SEWERAGE IMPROVEMENTS

BREAKDOWN OF ENGINEERING FEE

| ITEM OF WORK | February 24, 1973 Contract Fee | Providence | North Providence | Johnston | Smithfield | Total |
|---|---|---|---|---|---|---|
| Task 1 - SEWER USE REGULATIONS | | | | | | |
| Identify Compatible Pollutants | $ 1,000 | $ 1,000 | | | | |
| Establish Acceptable Limits | 500 | 500 | | | | |
| Set Up Permit System | | | | | | |
| 1. Prohibitions, Fines and Controls | 1,000 | 1,000 | | | | |
| 2. Treatability | 5,000 | 5,000 | | | | |
| 3. Pretreatment | 2,000 | 2,000 | $ 500 | $ 500 | | |
| 4. Implementation | 500 | 500 | 500 | 500 | | |
| | $ 10,000 | $ 10,000 | $ 1,000 | $ 1,000 | | $ 12,000 |
| Task 2 - COST RECOVERY & SEWER CHARGES | | | | | | |
| Develop & Distribute Questionnaire | $ 10,000 | $ 10,000 | $ 500 | $ 500 | | |
| Methodology | 2,500 | 2,500 | 500 | 500 | | |
| Operation & Maintenance Costs | 5,000 | 5,000 | | | | |
| Rate Study | 25,000 | 25,000 | 2,500 | 2,500 | | |
| Implementation & Administration | 2,500 | 2,500 | | | | |
| Provisions for Other Communities | 5,000 | 5,000 | 500 | 500 | | |
| | $ 50,000 | $ 50,000 | $ 4,000 | $ 4,000 | | $ 58,000 |
| Task 3 - INFILTRATION/INFLOW ANALYSIS | | | | | | |
| Providence 435 miles @ 12¢/linear foot | $ 50,000 (sewer map only) | $275,000 | | | | |
| Johnston 40 miles @ 12¢/linear foot | | | | $ 25,000 | | |
| North Providence | | | DONE | | | |
| | | $275,000 | | $ 25,000 | | $300,000 |
| Task 4 - PRELIMINARY REPORT | | | | | | |
| Population | $ 5,000 | $ 5,000 | $ 500 | $ 500 | $ 500 | |
| Water Consumption & Flows | 10,000 | 10,000 | 500 | 500 | 500 | |
| Existing Sewer System | 44,000 | 50,000 | 2,500 | 5,000 | -- | |
| Existing Treatment Plant | 23,000 | 25,000 | -- | -- | -- | |
| Formulation of Alternatives | 38,000 | 50,000 | 5,000 | 5,000 | 5,000 | |
| Cost Estimates | 10,000 | 15,000 | 2,000 | 2,000 | 2,000 | |
| Recommendations | 10,000 | 10,000 | 500 | 500 | 500 | |
| Financing & Cost Apportionment | 5,000 | 5,000 | 500 | 500 | -- | |
| Implementation & Administration | 5,000 | 5,000 | 500 | 500 | -- | |
| | $150,000 | $175,000 | $ 12,000 | $ 14,500 | $ 8,500 | $210,000 |
| Task 5 - ENVIRONMENTAL IMPACT ASSESSMENT | | | | | | |
| | -- | $ 45,000 | $ 5,000 | $ 5,000 | $ 3,000 | $ 58,000 |
| PROJECT TOTALS | $260,000 | $555,000 | $ 22,000 | $ 49,500 | $11,500 | $638,000 * |
| Less 90% Grant Participation | | 499,500 | 19,800 | 44,550 | 10,350 | 574,200 |
| LOCAL PROJECT COST | | $ 55,500 | $ 2,200 | $ 4,950 | $ 1,150 | $ 63,800 |

* The dollar value of Amendment No. 1 is the difference between the total project cost of $638,000 and the base contract fee of $260,000. Engineering Fee for Amendment No. 1 is $378,000.

# PART IV

## NARRATIVE STATEMENT

### SECTION A Project Justification

1. The City of Providence is served by a relatively old sewer and storm drain system, a major portion of which was constructed fifty years ago or more. The system consists of separate sewers, separate storm drains and combined sewers and storm drains with at least 100 overflow locations where during high flows, mixtures of raw sewage and storm water are overflowed into the nearest stream. During dry weather flow, there is considerable high chloride content ground water infiltration into the system through old or leaky pipes. During wet weather, the pipes in many areas are surcharged and the overflows must operate.

2. In addition to system surcharge and overflow problems, there is an uncatalogued number of industrial waste contributors to the system, some of which are apparently contributing waste in uncontrolled strength and in some cases of a toxicity not normally allowable to treatment facilities.

3. As a result of the foregoing problems, the existing sewage and waste treatment facility is frequently surcharged with all flows

over 100 mgd bypassed raw directly to Narragansett Bay and with the level of treatment lowered to an extent that in 1972, plant BOD removal efficiency averaged only 62%, far below the previously accepted Federal and State minimum of 85%.

4. As a result of plant overflows, overflows from the combined sewers and inadequate treatment, surrounding waterways are frequently polluted by mixtures of water containing raw sewage and industrial waste which create potential public health hazards. The seriousness of the pollution problem to which these problems contribute is evidenced by the closing of the approved shellfish areas in Upper Narragansett Bay for in excess of 250 days in 1972.

5. The proposed project consists of a preliminary report, as part of which studies would be made to provide the necessary planning to (a) provide a means of cataloging and regulating use of the system by all users, in particular, industrial users, (b) determine the extent of infiltration into the collection system, (c) eliminate polluted overflows from the collection system, (d) upgrade and improve the existing treatment facility to meet all applicable standards, (e) determine costs and programs of action for the recommended solution and alternative solutions to the foregoing problems, and (f) prepare an environmental impact assessment

In addition to consideration of sewage and industrial waste from the City of Providence, the report will also consider and allow for such flows as are pertinent from the City of North Providence, the Town of Johnston and the Narragansett Brewery in the City of Cranston. Provisions will also be made for acceptance of future flows from the Town of Smithfield.

6. The extent of work required for the aforementioned preliminary report is beyond the financial capability of the applicant to accomplish without grant assistance.

SECTION B Applicant Qualifications

The applicant is a legally constituted city under the laws of the State of Rhode Island and Providence Plantations with powers and responsibilities for pollution control in accordance with all applicable State and Federal laws. Financing by appropriation of the applicant's share of the project cost must be by vote of the Board of Contract and Supply of the City of Providence the same body which authorized signature by the Mayor of Providence of the attached engineering contract and amendment.

SECTION C Comprehensive Planning

Accompanying this application is a certification from the Rhode Island Statewide Planning Program relating the compatibility

of the project to the State Plan.

SECTION D Site Information

The site of the existing treatment facility is owned by the City of Providence. Additional site acquisition is not contemplated at this time.

SECTION E General Description of Work to be Included in the Project Report.

The work required to meet the objectives of the proposed preliminary report has been divided into several major tasks.

Task 1 Develop a set of sewer use regulations, including requirements for industrial pretreatment.

Task 2 Develop a system of cost recovery and sewer use charges.

Task 3 Prepare an Infiltration/Inflow Analysis.

Task 4 Prepare the preliminary engineering report on sewerage improvements.

Task 5 Prepare an Environmental Impact Assessment.

A detailed breakdown of the work plan follows:

Task 1 Sewer Use Ordinance

a. Determine critical substances affecting treatment or overflow pollution problems.

b. Establish restrictions and limits on substances entering system.

c. Set up permit system for connections to sewers or for new sewer construction.

d. Prohibit connections to storm sewers.

e. Make provisions for payments for monitoring and elimination of problems by the City.

f. Provide fines and controls.

g. Analyze "key industries" for treatability at treatment plant.

h. Establish needs for pretreatment in certain industries.

i. Provide that ordinance is mandatory for adoption by other flow contributors (Cranston brewery, North Providence, Johnston, etc.).

Task 2 Sewer Use Charges

a. Set up questionnaire to industries on:

1. Water consumption
2. Present payments to city, if any
3. Raw materials
4. Products
5. Analysis of discharges
6. Description of industry
7. Description of process
8. Volume of discharge
9. Description of discharge points (location, size, number)

b. Distribute, administer and organize data on questionnaire returns.

c. Sample, if necessary.

d. Work with EPA, State and City to devise a system of equitable sewer charges to be assessed to major sewer users and industries.

e. Ascertain proper O & M costs to be raised by sewer charges.

f. Prepare a formal sewer rate study to determine options and best alternative for equitable operating cost recovery.

g. Propose steps for implementation and administration of sewer use charges.

h. Determine charges to other flow contributors (North Providence, Johnston, Cranston).

Task 3 Infiltration/Inflow Analysis

a. Identify all existing data and information from:

1. Plans EPA, State, City -- City Plan Commission, DPW, Redev. Authority.
2. Original construction records.
3. Field inspection.
4. Records of new construction.

b. Collect or review all pertinent information.

c. Develop or locate suitable base map.

d. Transfer all existing dispersed information to base map.

e. Differentiate on the master plan:

1. Sewers, drains, combined sewers
2. Identify overflow points
3. Pipe sizes
4. Age of Pipes (year of installation)
5. Cross reference to data source (plan and prof. #)
6. Identify areas (streets) where data is lacking, contradictory, unclear or apparently in error.

f. Field check the information on the master plan.

g. Master plan will be used to determine allowable limits of infiltration, one of the prerequisites for treatment plant recommendations in Task 4.

h. Patterned interviews

i. System flow diagrams

j. Dry vs. wet weather flow determinations

k. Preliminary field survey and selective flow tests

l. Determination of excessive or non-excessive infiltration/inflow

m. Development of plan of action, budget and timetable for execution

Task 4 Preliminary Engineering Report

a. Make a population study.

b. Determine consumption and wastewater flows, present and design, including:

1. Domestic
2. Commercial and industrial
3. Infiltration determination
4. Stormwater
5. Other (North Providence, Johnston, Cranston)

c. Study existing municipal system (sewers, drains and combined

d. Study existing treatment plant, including laboratories analyses

e. Study alternatives for separation, elimination of overflows, overflow treatment, new sewers, increased treatment

efficiency (expansion of treatment facility for industrial waste treatment).

f. Determine costs.

g. Make recommendations for improvements to sewers and treatment facility, including:

1. Extent of separation of sewers and storm drains.
2. Reduction of infiltration, if found necessary.

h. Provide financing and cost apportionment plan.

i. Implementation and administering schedule including:

1. Phasing

Task 5 Environmental Impact Assessment

a. Project background

b. Summary of alternative project solutions

c. Detailed environmental evaluation of each feasible alternative

1. Probable impact on the environment
2. Adverse effects which cannot be avoided, should the proposed project be implemented
3. Relationship between short-term beneficial uses versus environmental consequences
4. Irreversible and irretrievable commitment of resources

d. Environmental comparison of alternatives and selection of proposed project

e. Agencies consulted about the project

f. Opportunity and extent of public participation

1. The results of public meetings and/or hearings pertaining to the project.

2. The source and nature of all written or other comments received by the Grantee that indicate opposition to the project.
3. The steps taken to resolve conflicts.
4. Remaining unresolved conflicts.

g. The following list of environmental evaluation issues will be addressed:

1. Water quality
2. Water supply
3. Solid waste
4. Air quality
5. Noise
6. Land use
7. Recreation, historical, cultural and aesthetic values
8. Social and economic
9. Construction

SECTION F Operation and Maintenance

Operation and maintenance costs will be estimated and considered in establishing sewer use charges and for the various alternative studies included in the report.

SECTION G Population Information

| | Total Pop. 1972 | Total Pop. 1973 | % Pop. to be Served | Design Pop. |
|---|---|---|---|---|
| Providence | 176,600 | 175,400 | 100 | * |
| North Providence | 25,140 | 25,560 | * | * |
| Johnston | 23,040 | 23,560 | * | * |
| Smithfield | 14,500+ | 15,000+ | * | * |
| Total | 239,280 | 239,520 | | * |

*To be determined as part of the report.

SECTION H Schedule

Work on the report will begin by the Engineer upon acceptance of the grant offer by the City of Providence and receipt from the City of a notice to proceed. Completion of the report will be within 30 months of the starting date.

SECTION I Civil Rights

See attached Title VI Civil Rights assurance forms.

SECTION J Consulting Engineer

Waterman Engineering Company

450 North Broadway

East Providence, Rhode Island 02914

Telephone 401/438-5775

(in joint venture with)

Anderson-Nichols & Company, Inc.

150 Causeway Street

Boston, Massachusetts 02114

Telephone 617/742-3400

# ENVIRONMENTAL PROTECTION AGENCY
## ASSURANCE OF COMPLIANCE
*(TITLE VI, CIVIL RIGHTS ACT OF 1964)*

City of Providence, Rhode Island *(hereinafter called "Assuror")*
NAME OF APPLICANT-RECIPIENT

HEREBY AGREES THAT IT will comply with Title VI of the Civil Rights Act of 1964 *(P.L. 88-352)* and all requirements of the Environmental Protection Agency (hereinafter called "EPA") issued pursuant to that title, to the end that in accordance with Title VI of that Act, no person in the United States shall, on the ground of race, color, or national origin be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity for which the Assuror receives financial assistance from EPA and hereby gives assurance that it will now and hereafter take all necessary measures to effectuate this agreement.

If any real property or structure thereon is provided or improved with the aid of financial assistance extended to the Assuror by EPA, this Assurance obligates the Assuror, or in the case of any transfer of such property, any transferee for the period during which the real property or structure is used for a purpose involving the provisions of similar services or benefits. If any personal property is so provided, this Assurance obligates the Assuror for the period during which it retains ownership or possession of the property. In all other cases, this Assurance obligates the Assuror for the period during which the financial assistance is extended to it by EPA.

THE ASSURANCE is given in consideration of and for the purpose of obtaining any and all Federal grants, loans, contracts, property discounts or other financial assistance extended after the date hereof to the Assuror by EPA including installment payments after such date on account of arrangements for Federal financial assistance which were approved before such date. The Assuror recognizes and agrees that such Federal financial assistance will be extended in reliance on the representations and agreements made in this Assurance and that the United States shall reserve the right to seek judicial enforcement of this Assurance. This Assurance is binding on the Assuror, its successors, transferees, and assignees, and the person or persons whose signature appear below are authorized to sign this Assurance on behalf of the Assuror.

The obligations assumed by the Assuror hereunder are in addition to any obligations which may be imposed on the Assuror by any applicable regulation now outstanding or which may hereafter be adopted by EPA to effectuate any provision or goal of the said Title VI, and no part of this Assurance shall be read so as to in any way detract from or modify any obligation which may be imposed on the Assuror by any such regulation standing alone.

2/13/74
DATE

City of Providence, Rhode Island
ASSUROR

By
PRESIDENT, CHAIRMAN OF BOARD OR COMPARABLE AUTHORIZED OFFICIAL
Mayor, City of Providence

City Hall, 27 Dorrance Street
Providence, Rhode Island 02900
ASSUROR'S MAILING ADDRESS

EPA Form 4700-1 (4-72)

U. S. DEPARTMENT OF THE INTERIOR
FEDERAL WATER POLLUTION CONTROL ADMINISTRATION

# COMPLIANCE REPORT

(Title VI, Civil Rights Act of 1964)

VARIATION OF DI FORM 1351
BUREAU OF THE BUDGET
NO. 42-R1480

APPLICANT (Name)
City of Providence, Rhode Island

PROJECT NO.

## GENERAL

Title VI of the Civil Rights Act of 1964 provides that no person in the United States shall, on the grounds of race, color, or national origin, be excluded from participation in, or be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance. The Act goes on to explain that the provisions of the Title shall not be construed to authorize action with respect to any employment practice of any employer, employment agency, or labor organization (except where the primary objective of the Federal financial assistance is to provide employment).

The primary purpose of the construction assistance programs under the Federal Water Pollution Control Act, as amended, is development of water pollution control facilities. Accordingly, the following information is required to enable the administering Program to determine whether prospective grantees are developing sewerage and sewage treatment works projects on a non-discriminatory basis so far as provision of sewerage and treatment service is concerned.

[X] CHECK HERE IF THE ENTIRE POPULATION OF THE MUNICIPALITY WILL BE SERVED BY THE PROJECT

THE FOLLOWING ITEMS SHOULD BE COMPLETED IF THE AREA SERVED BY THE PROJECT IS SHOWN ON THE APPLICATION TO CONTAIN LESS THAN THE TOTAL POPULATION OF THE MUNICIPALITY. N/A

1. ANSWERS TO THE FOLLOWING ITEMS PERTAIN TO: *(check one)*

[X] SECTION III, SUBSECTION D, CONSTRUCTION GRANT APPLICATION, FWPCA-7 N/a

[ ] SECTION VI, SUBSECTION B3, FACILITIES DEMONSTRATION GRANT APPLICATION, FWPCA-1

2. DOES THE POPULATION NOT SERVED BY THIS PROJECT RECEIVE SEWAGE SERVICE? [ ] YES [ ] NO N/A

3. DOES THE POPULATION NOT SERVED BY THIS PROJECT RECEIVE SEWAGE TREATMENT SERVICE? [ ] YES [ ] NO N/A

4. IF THE POPULATION NOT SERVED BY THIS PROJECT IS NOT RECEIVING SEWERAGE OR SEWAGE TREATMENT SERVICE: N/A

| A. IS A SUBSTANTIAL PORTION *(more than 10%)* OF SUCH NON-RECEIVING POPULATION ONE OR MORE OF THE FOLLOWING: | INDICATE THE PERCENTAGE ESTIMATE | | | |
|---|---|---|---|---|
| | AMER. INDIAN | NEGRO | SPANISH AMER. | ORIENTAL |
| | | | | |

B. EXPLAIN WHY SEWERAGE AND SEWAGE TREATMENT ARE NOT PROVIDED

N/A

C. GIVE PROSPECTIVE PLANS AND TIMETABLE FOR PROVIDING SUCH SERVICE.

N/A

D. IF ANOTHER FEDERAL AGENCY IS BEING ASKED TO ASSIST THE FINANCING OF ANY CONSTRUCTION ASSOCIATED WITH THIS PROJECT, PLEASE DESCRIBE THE ASSOCIATED WORK AND IDENTIFY THE OTHER FEDERAL AGENCY.

N/A

## CERTIFICATION

I certify that the information given above is true and correct to the best of my knowledge or belief
*(A willfully false statement is punishable by law -- U.S. Code, Title 18, Section 1001)*

| SIGNATURE OF AUTHORIZED OFFICIAL | TITLE OF AUTHORIZED OFFICIAL | DATE |
|---|---|---|
| Joseph A Doorley Jr. | Mayor, City of Providence | 2/13/74 |

FWPCA-T128 (8-67)

A-95 Clearing-
house

NOTICE OF INTENT TO APPLY FOR FEDERAL AID

UNDER OFFICE OF MANAGEMENT AND BUDGET CIRCULAR A-95, PART I, PROJECT NOTIFICATION AND REVIEW SYSTEM

1. State Application Identifier (leave blank)

2. Date Received at Clearinghouse (leave blank)

TO:

Rhode Island Statewide Planning Program
265 Melrose Street
Providence, Rhode Island 02907
(401) 277-2656

INSTRUCTIONS

Answer items 3-32 completely.
Type all entries.
For projects involving a specific site location, attach one 8½ x 11 reproducible map showing site location and boundaries.

| 3. Applicant Agency | 4. Address | | | |
|---|---|---|---|---|
| City of Providence | City Hall, 27 Dorrance Street | | | |
| **5. City** | **6. County** | **7. State** | **8. Zip** | **9. Federal Employer ID No.** |
| Providence | Providence | Rhode Island | 02900 | |

| 10. Name of Contact Person | 11. Address | 12. Telephone No. |
|---|---|---|
| James F. Lembo<br>Waterman Engineering Co. | 450 No. Broadway<br>East Providence, R.I. 02914 | 401/ 438-5775 |

13. Brief Title of Applicant's Project

Study of Sewerage Improvements for City, Providence, Rhode Island

14. Area of Project Impact

Providence, North Providence, Johnston and Smithfield

15. Congressional District:

of Applicant [ 01 and 02 ] Districts impacted by project [ 01 and 02 ]

16. Requirements of the procedural handbook of the Department of Administration, Procedure A9-1 (State Agency Applicants Only)

Has prior approval under procedure A9-1 been received?

Yes ☐ No ☐

If yes, attach copy of approval to this form.

RISPP-83(1-74)

**17. Funding**

| | |
|---|---|
| Federal Loan | $ |
| Federal Grant | 478,500 |
| State Loan | |
| State Grant or Appropriation | 95,700 |
| Municipal Funds | 63,800 |
| Other | |
| TOTAL | $ 638,000 |

**18. Federal Program (From catalog of Federal Domestic Assistance)**

Program Number 66 . 400
Program Name Constr. Grants for Trtmt. Wks
Federal Agency EPA-Region I
Address J.F. Kennedy Federal Bldg.
Boston, Mass. 02203
Contact Person (Federal) Guy St. André
Telephone No. 617/ 223-7213

**State Agency(s) Funding Project -** Rhode Island - Department of Health

**19. Applicant Agency (Same as item 3)**

City of Providence

**20. Address (Same as items 4 & 5)**

City Hall, 27 Dorrance Street, Providence

**21. Contact Person (Same as item 10)**

James F. Lembo
Waterman Engineering Co.

**22. Address (Same as item 11)**

450 No. Broadway
East Providence, R. I. 02914

**23. Phone (Same as Item 12)**

401/ 438-5775

**24. Environmental Impact Statement Required by State or Federal Agency?**

Yes [X] No [ ]

**25. Tentative date for submission of Application for federal assistance**

March 1, 1974

**26. Detailed Project Description (Include location of project, purpose, beneficiaries, size and general characteristics. If applicable, state whether project is in conformance with a community plan and cite the document). Use additional sheets if necessary.**

ADDITIONAL MATERIAL ATTACHED [X]

The proposed project is a preliminary engineering report entitled "Study of Sewerage Improvements". The study will define the problems of the existing Providence sewerage system, in particular the health hazards imposed by raw sewage overflows to waterways and inadequate treatment, and make recommendations for their solution in a program of improvements. The study will allow for sewage and waste from No. Providence, Johnston, the Narragansett Brewery and, in the future Smithfield, into the Providence system. A more detailed description of the problem and the scope of work by the study is included in the Narrative Statement, Part IV of the attached application for Federal Assistance (EPA Form 5700-12).

**27. Does the Applicant have a current equal employment opportunity and Affirmative Action Minority Component?**

Yes [ ] No [ ]

**28. Will your final application include such an equal employment opportunity and Affirmative Action Plan?**

Yes [X] No [ ]

| 29. Funding Start | 30. Project Start | 31. Funds Duration | 32. Project Duration |
|---|---|---|---|
| June 1974 | Sept. 1, 1974 | 32 months | 32 months |

ALL OTHER ENTRIES ON THIS FORM WILL BE MADE BY THE REVIEWING AGENCY

33. Notification of agencies concerned:

| Agency | Date Notified | Date of Reply | Substantive Comment |
|---|---|---|---|
| Policy and Program Review Office | | | |
| Budget Division | | | |
| DCA - Planning & Development | | | |
| Health | | | |
| Natural Resources | | | |
| Water Resources | | | |
| Historical Preservation Commission | | | |
| R.I. Commission for Human Rights | | | |
| R.I. League of Cities and Towns | | | |
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| | | | |

34. Summary of Comments and Recommendations

ATTACHMENTS TO THIS FORM _____

Prepared by: _____ Date: _____

NOTE: Section 42-44-6 of the General Laws of Rhode Island requires that municipalities, housing authorities, and human resource development agencies submit a copy of the final application for this project to the Director, Rhode Island Department of Community Affairs, 150 Washington Street, Providence, R.I. 02903

35. Approved by: _____

Per: _____
Rhode Island Statewide Planning Program

Date: _____

Plan of Study

# PLAN OF STUDY

# OF

# SEWERAGE IMPROVEMENTS

# FOR

# THE CITY OF PROVIDENCE, RHODE ISLAND

TO

THE HONORABLE JOSEPH A. DOORLEY, JR.

MAYOR OF THE CITY OF PROVIDENCE

FEBRUARY 26, 1973
(REVISED JANUARY 15, 1974)

Submitted by:

Waterman Engineering Company
450 North Broadway
East Providence, Rhode Island 02914

AND

Anderson-Nichols & Co., Inc.
150 Causeway Street
Boston, Massachusetts 02114

# TABLE OF CONTENTS

SECTION ONE

TECHNICAL

# I. INTRODUCTION

Some portions of the existing sewer and storm drain system serving the City of Providence date back to the Civil War, with the major portion of the construction of existing facilities being performed in the early part of this century. The age of the system alone would indicate that many sewers and storm drains are probably in need of repair or replacement. Coupled with this is the situation whereby many portions of the City are serviced by combined sewer and storm drains, or where stormwater overflows are utilized to relieve excessive flows during storms and periods of heavy rainfall. The age of the system would also imply that excessive quantities of infiltration and seawater may be entering the system. This is certainly borne out by the extremely high "dry weather" flows and chloride levels experienced at the sewage treatment plant. It has been pointed out by the State Department of Health that some of the overflows presently also discharge some dry weather flows (sewage) to waterways.

The discharge into the Moshassuck, Woonasquatucket, Providence and Seekonk Rivers of stormwater overflow containing large quantities of raw sewage resulted in the closing of approved shellfish growing areas in the Upper Narragansett Bay for in excess of 250 days in 1972.

In addition, all flows at the treatment plant in excess of 100 million gallons per day are bypassed from the primary stage directly to the river.

The high volumes of industrial wastes and chemicals, chloride from seawater intrusion, stormwater and infiltration have resulted in an average treatment plant efficiency in 1972 of 62%. This is far below the standards and requirements of the Environmental Protection Agency and the Rhode Island Department of Health.

The purpose of our report to you would be to make recommendations for corrective action to abate pollution of Narragansett Bay and to achieve levels of treatment acceptable to all governmental agencies.

The City of Providence presently exercises little control over the type and quantities of wastewater which are discharged to its system by industries or other communities, such as North Providence, Johnston, and the brewery in Cranston. Many constituents, such as heavy metals and chemicals are presently discharged to the municipal system which cannot be suitably handled at the treatment plant or which reach the waterways directly by means of a storm drain or combined sewer overflow. As part of our work effort, we will develop a set of rules and regulations regarding the use of sewers, which would enable the City to control such harmful and deleterious discharges.

In order for the City to distribute the capital and operation and maintenance costs associated with the sewer system and sewage treatment plant, we will perform a study to ascertain the true cost of properly maintaining or operating the facilities and to determine an equitable distribution of these charges to the sources, whether they be commercial establishments, industries, residential users or other communities. Charges to industries would normally be based on both the quantity and strength of their waste discharges. These data would be generated as part of our work effort.

At a meeting held with the Mayor of Providence, EPA, and the State Department of Health on December 14, 1973, a number of new federal requirements for a study grant (Step 1) were outlined by EPA and have been incorporated into this study:

1. Broadening of study area to include North Providence, Johnston, and possibly Smithfield.

2. Infiltration/Inflow Analysis.

3. Upgrading of treatment to Best Practicable.

4. Consideration of separation of the combined sewer system and overflow treatment.

5. Consideration of dry weather overflows.

6. Cost-effective analysis.

7. Consideration of reuse alternatives.

8. Environmental impact assessment and public hearings.

The first item above will necessitate reaching agreements with these communities to have the City of Providence act as the agent for the purposes of obtaining grant monies from the State and EPA. These agreements would also provide for reimbursement (or advance payment) to the City of Providence for any engineering work performed in those communities as part of this study. This work is outlined on the following pages and a breakdown of the estimated fees associated with the work proposed herein is presented in Section Two of this Plan of Study.

Solution of all of the above problems will enable the City to significantly abate water pollution; to control the types of wastes presently discharged indiscriminately to the municipal system; and to equitably apportion the capital and operation and maintenance costs of the collection and treatment facilities. The same data generated will also allow for equitable cost recovery for all future capital improvements, modifications and additions to the collection system and treatment plant--a mandatory requirement for federal participation in such projects.

Following is an outline of our work plan to meet these goals.

## II. WORK PLAN

Our detailed work plan, designed to meet the objectives described in the foregoing is divided into several tasks as follows:

| | |
|---|---|
| Task 1 | Develop Sewer Use Regulations. |
| Task 2 | Develop System of Cost Recovery and Sewer Use Charges. |
| Task 3 | Perform Infiltration/Inflow Analysis. |
| Task 4 | Prepare Preliminary Engineering Report on Sewerage Improvements. |
| Task 5 | Prepare Environmental Impact Assessment. |

The tasks detailed on the following pages signify the input of both Waterman Engineering and Anderson-Nichols.

### Task 1 - Develop Sewer Use Regulations

The purpose of the sewer use regulations would be to prohibit the discharge into public sewers those wastes which contain harmful or toxic substances or which would have a detrimental effect on the treatment process.

As part of the work effort to be expended on the formation of sewer use charges and the development of the treatment and treatability sections of the preliminary report under Tasks 2 and 4, respectively, data will be generated identifying those substances which cannot be discharged to the sewers or on which a limit must be placed. Once this has been accomplished, those industries which must pretreat their waste prior to discharge to a public sewer will be identified.

Development and adoption of a set of rules and regulations regarding the use of sewers will permit the City to control the type and characteristics of the wastewater reaching the sewage treatment plant and will establish a format for a permit system for connections to the public sewers and for new sewer construction. Further, the regulations will prohibit wastewater connections to storm sewers and will impose fines and controls on any violations of the regulations.

As part of the sewer use regulations, we would insert provisions for payment of expenses incurred by the City in achieving conformance with the regulations by any violator. Such expenses might include inspection and monitoring of a waste discharge of a suspected violator or the cost to the City of removing some toxic substance illegally discharged to a public sewer.

One final provision which we would propose to insert in any regulation would be the requirement that all outside contributors of flow (i. e., North Providence, Johnston, Narragansett Brewery) adopt these same regulations.

Adoption of an approved set of rules and regulations for the use of public sewers is now a requirement for the receipt of federal and state construction grant funds.

Task 2 - Develop System of Cost Recovery and Sewer Use Charges

Provisions for the recovery of the costs of operation and maintenance of treatment facilities have long been recognized under the laws of the State of Rhode Island. In recent years, the recovery of these costs have been made a prerequisite for the approval of federal grants for treatment works. This is clearly pronounced in Section 204, Paragraph (b) of the 1972 Amendments to the Federal Water Pollution Control Act, excerpts from which are presented below:

> "(b) (1) Notwithstanding any other provision of this title, the Administrator shall not approve any grant for any treatment works under Section 201 (g) (1) after March 1, 1973, unless he shall first have determined that the applicant (A) has adopted or will adopt a system of charges to assure that each recipient of waste treatment services within the applicant's jurisdiction, as determined by the Administrator, will pay its proportionate share of the costs of operation and maintenance (including replacement) of any waste treatment services provided by the applicant: (B) has made provision for the payment to such applicant by the industrial users of the treatment works, of that portion of the cost of construction of such treatment works (as determined by the Administrator) which is allocable to the treatment of such industrial wastes to the extent attributable to the Federal share of the cost of construction: and (C) has legal, institutional, managerial, and financial capability to insure adequate construction, operation, and maintenance of treatment works throughout the applicant's jurisdiction, as determined by the Administrator.
>
> "(2) The Administrator shall, within one hundred and eighty days after the date of enactment of the Federal Water Pollution Control Act Amendments of 1972, and after consultation with appropriate State, interstate, municipal, and intermunicipal agencies, issue guidelines applicable to payment of waste treatment costs by industrial and non-industrial recipients of waste treatment services which shall establish (A) classes of users of such services, including categories of industrial users; (B) criteria against which to determine the adequacy of charges imposed on classes and categories of users reflecting all factors that influence the cost of waste treatment, including strength, volume, and delivery flow rate characteristics of waste; and (C) model systems and rates of user charges typical of various treatment works serving municipal-industrial communities."

Development of such a system of cost recovery will permit a more equitable apportionment of the costs of operation and maintenance, as well as construction, to industrial and extra-municipal users.

In order to prepare such a sewer rate study to determine an equitable apportionment of costs, it will be necessary to obtain the following data from all major non-residential wastewater dischargers to the municipal system (from all of the communities within the study area):

1. Water consumption figures
2. Description of industry or discharges
3. Description of process, including raw materials used and all products and by-products
4. Description of discharge (location, receiving sewer, number of discharge points, sizes of discharge lines, etc.)
5. Analyses of typical discharges and identification of all major constituents
6. Present sewer use charges paid to the City of Providence
7. Level of wastewater pretreatment, if any

Some of these items, such as the first and last, are available from sources within the City; others are not readily available. There are several options which can be exercised to obtain these data: 1. Prepare a questionnaire for distribution to all major dischargers for voluntary submission of the requested information; 2. The City could require that all major dischargers engage an engineer to perform analyses and furnish the data (as was done by the Corps of Engineers under their 1899 Refuse Act Permit Program); and 3. Representatives of the City could perform the work necessary to generate the required data and the cost of the work could be apportioned back to the major dischargers.

In this study, we propose to utilize, with the consent of the City, a combination of the first two approaches--a questionnaire developed by us and distributed by the City, with a requirement that the data be furnished within a specified time period. Penalties for non-compliance by industries may be needed. In conjunction with this, it is anticipated that spot checks would be made at the fifty largest dischargers in order to verify the validity of data furnished.

A detailed examination of the types and number of industries located in Providence, North Providence, Johnston and Smithfield (which we understand may some day discharge its wastewater into the Providence system) has revealed that out of approximately 1,323 significant water-using establishments in these communities, as many as 1,136 may be significant process water users. Of these 1,323 establishments, over 70 % can be categorized into the jewelry and metal products industries.

A detailed breakdown is presented in Table 1 on the following pages. Questionnaires would be sent to those waste dischargers whose water consumption figures are significant.

TABLE 1

PROVIDENCE-INDUSTRIAL WASTE

| | | | |
|---|---|---|---|
| Presently connected to system | - | Johnston | - J |
| | | Providence | - P |
| | | North Providence | - NP |
| Possible future connection | - | Smithfield | - S |

* (Also Cranston - Narragansett Brewery - only present connection.)

| | Total Establishments | Significant Process Water Users |
|---|---|---|
| **SIC 20 Food and Kindred Products** | | |
| J | 3 | 3 |
| NP | 5 | 4 |
| P | 32* | 24* |
| Sub Total | 40 | 31 |
| S | 1 | 1 |
| Total | 41 | 32 |
| **SIC 22 Textile Mill Products** | | |
| J | 10 | 10 |
| NP | 3 | 3 |
| P | 16 | 16 |
| Sub Total | 29 | 29 |
| S | 3 | 3 |
| Total | 42 | 32 |
| **SIC 23 Apparel and Fabric Finished Products** | | |
| J | 1 | 0 |
| P | 11 | 0 |
| Total | 12 | 0 |
| **SIC 25 Furniture & Fixtures** | | |
| P | 21 | 7 |

| | Total Establishments | Significant Process Water Users |
|---|---|---|
| **SIC 26 Paper and Allied Products** | | |
| J | 1 | 1 |
| NP | 1 | 0 |
| P | 18 | 11 |
| Total | 20 | 12 |
| **SIC 27 Printing, Publishing & Allied Industries** | | |
| J | 3 | 1 |
| NP | 2 | 0 |
| P | 63 | 27 |
| Sub Total | 68 | 28 |
| S | 1 | 0 |
| Total | 69 | 28 |
| **SIC 28 Chemicals & Allied Products** | | |
| J | 3 | 3 |
| NP | 2 | 2 |
| P | 22 | 22 |
| Sub Total | 27 | 27 |
| S | 1 | 1 |
| Total | 28 | 28 |
| **SIC 29 Petroleum & Coal** | | |
| J | 1 | 0 |
| **SIC 30 Rubber & Plastic Products** | | |
| NP | 2 | 2 |
| P | 24 | 21 |
| Sub Total | 26 | 23 |
| S | 2 | 2 |
| Total | 28 | 25 |

| | Total Establishments | Significant Process Water Users |
|---|---|---|
| **SIC 31 Leather and Leather Products** | | |
| NP | 2 | 2 |
| P | 8 | 8 |
| Total | 10 | 10 |
| **SIC 32 Stone, Clay & Glass** | | |
| J | 3 | 3 |
| NP | 2 | 2 |
| P | 9 | 3 |
| Total | 14 | 8 |
| **SIC 33 Primary Metal Industries** | | |
| J | 1 | 1 |
| NP | 3 | 3 |
| P | 37 | 37 |
| Sub Total | 41 | 41 |
| S | 2 | 2 |
| Total | 43 | 43 |
| **SIC 34 Fabricated Metal Products** | | |
| J | 14 | 14 |
| NP | 20 | 20 |
| P | 192 | 121 |
| Total | 226 | 155 |
| **SIC 35 Machinery (except electrical)** | | |
| J | 20 | 15 |
| NP | 3 | 3 |
| P | 75 | 69 |
| Sub Total | 98 | 87 |
| S | 10 | 9 |
| Total | 108 | 96 |

| | Total Establishments | Significant Process Water Users |
|---|---|---|
| SIC 36 Electrical Machinery, Electronics, Etc. | | |
| P | 25 | 25 |
| S | 2 | 2 |
| Total | 27 | 27 |
| SIC 37 Transportation Equipment | | |
| J | 1 | 1 |
| P | 2 | 2 |
| Total | 3 | 3 |
| SIC 38 Scientific Industries, Optics, Watches, Clocks | | |
| J | 1 | 1 |
| NP | 1 | 1 |
| P | 23 | 23 |
| Sub Total | 25 | 25 |
| S | 1 | 1 |
| Total | 26 | 26 |
| SIC 39 Jewelry | | |
| J | 19 | 19 |
| NP | 24 | 24 |
| P | 514 | 514 |
| Sub Total | 557 | 557 |
| S | 3 | 3 |
| Total | 560 | 560 |
| SIC 39A Other Industries | | |
| J | 2 | 2 |
| NP | 1 | 1 |
| P | 49 | 40 |
| Sub Total | 52 | 43 |

| | Total Establishments | Significant Process Water Users |
|---|---|---|
| SIC 39A Other Industries (cont.) | | |
| S | 2 | 1 |
| Total | 54 | 44 |
| TOTAL J + NP + P | 1295 | 1111 |
| ADD S | 1323 | 1136 |

In addition to the collection of data on each of these major dischargers, a great deal of work effort will be expended to determine what budget level will be necessary to maintain and operate the collection and treatment facilities. This determination will be made in conjunction with the report to be prepared under Task 4 of this Plan of Study. As part of the report, possible recommendations for modifications to the existing treatment plant may significantly alter the present-day budget costs for operating and maintaining the facility. This item will be more fully discussed under that task. It suffices here to note that an accurate budget cost for operation and maintenance will be developed as part of the work effort.

Once all major waste dischargers have been identified and accurate budget estimates for operation and maintenance costs have been developed, it will then be possible to generate options for the equitable apportionment of these costs to all major waste dischargers, including North Providence, Johnston, the Narragansett Brewery in Cranston, and possibly Smithfield. Any construction costs which may result from recommendations in the preliminary report to be rendered under Task 4 will also be apportioned as part of this proposed rate study. This work effort will also propose steps for the implementation and administration of the sewer use charges.

The cost recovery system advanced in this task will meet all of the requirements of the Environmental Protection Agency and the Rhode Island Department of Health.

Task 3 - Perform Infiltration/Inflow Analysis

On October 18, 1972 the 92nd Congress of the United States overwhelmingly passed Public Law 92-500, which is cited as the "Federal Water Pollution Control Act Amendments of 1972".

The new act recognizes that sewer problems can relate to the sewage treatment needs. Among the many new provisions is one which provides for Federal financial assistance to specifically deal with Infiltration/Inflow in existing sewer systems. It is now mandatory to identify the extraneous water problems and to determine whether the sewer system is subject to excessive infiltration/inflow. Federal grant assistance is available to study the problem and, in turn, to correct or accommodate it, provided that all such work is performed in "accordance with rules and regulations promulgated by the Administrator", (EPA).

The infiltration/inflow study is a systematic approach to evaluating a sewer system which will enable the engineer to:

1. Identify the scope and nature of the infiltration/inflow problem.

2. Establish an end objective. (The amount of infiltration/inflow that can be economically eliminated)

3. Isolate those general sections of the sewer system where infiltration/inflow is occurring.

4. Formulate a plan which can be economically justified for investigating and locating specific areas from which the major infiltration/inflow emanates.

5. Formulate a plan which will assure correction of the infiltration/inflow problem, along with alternatives for rehabilitation and a prediction of the end results that can be expected.

6. Establish hydraulic parameters for sewage treatment plant design.

Extraneous water from infiltration and inflow sources reduces the ability of sewer systems and treatment facilities to handle domestic and industrial wastewaters. Infiltration/inflow increases water pollution and causes health hazards when wastewater bypasses treatment facilities or overflows from sewer systems. In order to provide treatment for infiltration/inflow, larger treatment works are required with resultant increased costs for construction, operation, and maintenance. Elimination of infiltration/inflow by sewer system rehabilitation can often substantially reduce the cost of wastewater collection and treatment. To evaluate the benefits which can be achieved by sewer system rehabilitation, or complete separation of storm and sanitary sewers, a study must be conducted to define the infiltration/inflow conditions. A logical and systematic evaluation of the sewer system is necessary to determine the cost-effectiveness of sewer system rehabilitation to eliminate infiltration/inflow.

An infiltration/inflow study generally encompasses three phases of work. Phase I deals with the work involved under the Infiltration/Inflow Analysis (which is included as part of this Plan of Study). Phases II and III refer to the work involved under the Sewer System Evaluation and Rehabilitation work, respectively.

The infiltration/inflow analysis will demonstrate the non-existence or possible existence of excessive infiltration/inflow in each sewer system tributary to the treatment works. If the infiltration/inflow analysis reveals the non-existence of excessive infiltration/inflow, the sewer system tributary to the treatment works is not subject to excessive infiltration/inflow, and the treatment works can be designed to treat the total wastewater flow. If the infiltration/inflow analysis demonstrates the possible existence of infiltration/inflow, a sewer system evaluation survey (Phase II) would be necessary to identify the excessive infiltration/inflow conditions, develop a rehabilitation program to eliminate the excessive infiltration/inflow, and establish the design flow for the treatment works. The proposed rehabilitation program (Phase III) resulting from the

evaluation survey would normally satisfy the Regional Administrator that the sewer tributary to the treatment works will not be subject to excessive infiltration/inflow.

Phase I - Infiltration/Inflow Analysis

This first phase of the Infiltration/Inflow Study includes the following items of work:

a. Patterned Interviews
b. Sanitary and Storm Sewer Map Study
c. System Flow Diagrams
d. Dry vs. Wet Weather Flow Determinations
e. Preliminary Field Survey and Selective Flow Tests
f. Determination of Excessive or Non-Excessive I/I
g. Establish a Plan of Action, Budget and Timetable for Execution

The work under Items b and c above will involve the preparation of plans which will clearly indicate the location of all sewers and storm drains in the City of Providence and the towns of North Providence and Johnston. At present, there are no such accurate index maps, with the possible exception of North Providence.

The initial step under this task would be to identify, locate and review all existing data and information on the existing sewer and storm drainage systems. In the case of Providence, these data may be in the possession of the City (Department of Public Works, City Plan Commission, Redevelopment Authority, etc.), the Environmental Protection Agency and the State Health Department. These data will include such items as construction plan and profile drawings, original construction records and field books, and records of construction of sewers and drains in recent years. It is our understanding that a report on infiltration/inflow has already been prepared for the town of North Providence, and it is assumed that an acceptable sewer map was prepared as part of that study.

Once all of the data have been found and reviewed, it will be necessary to locate an existing base map for the master index or to develop one. Various city departments, such as the City Plan Commission and the Board of Assessors, will be contacted for assistance. As soon as a suitable base map is available, the task of transferring all data and information onto this map will be initiated.

The master plans will indicate the following relevant information on all sewers and storm drains:

1. Differentiation between sanitary sewers, storm drains and combined sewers.
2. Pipe sizes.

3. Year of installation.
4. Overflow points.
5. Cross reference to data source (plan and file number).
6. Identification of areas (streets) where data is lacking, contradictory or unclear.

An effort will be made to clarify any areas of confusion or contradiction of existing data and a field check will be made of all critical areas in the city to verify the information on the master plan to rectify any areas of confusion.

The items of work included under subsequent phases of work are presented below:

Phase II - Sewer System Evaluation

a. Physical Survey and Groundwater Analysis.
b. Rainfall Simulation.
c. Prepare Engineering Report and Analysis.
d. Preparatory Sewer Cleaning.
e. Television Inspection of Preselected Sewers.
f. Preparation of the Evaluation Survey Report and Analysis.
g. Preparation of the Proposed Rehabilitation Program.

Phase III - Rehabilitation

a. Sewer Repair.
b. Pipe Relining.
c. Sewer Replacement.
d. Finalization of Treatment Plant Design.

As part of the Plan of Study, only the work for Phase I of the I/I study is included. Until a determination of excessive infiltration/inflow is made, it it not known what work, if any, will be required in the evaluation or rehabilitation phases. Once the analyses are completed, and if subsequent phases of work are required, the work under Task 3, along with the associated engineering fee, may need to be amended.

Task 4 - Prepare Preliminary Engineering Report on Sewerage Improvements

The engineering report to be prepared under this task will have as its objective the presentation of a set of recommendations to alleviate the varied water pollution problems now facing the City. As a result of the discharge, without control, of large quantities of industrial waste; combined sewer overflows (both during wet and dry weather conditions); groundwater and seawater infiltration into sewers; and enormous quantities of stormwater "flooding" the treatment plant or being bypassed directly to the receiving river, the treatment being rendered is inadequate to meet EPA and State water quality standards. Action

on the report recommendations will rectify these violations.

The preliminary report will contain a number of sections, each of which is briefly discussed below to indicate to what problem areas the report will be addressed, and to better define the scope of work under this task.

Population - In order to establish and project domestic wastewater flows, it will be necessary to assemble population data for the entire service area of the report. This will necessarily include North Providence, Johnston and possibly Smithfield, as these areas do now, or may in the future, contribute wastewater to the Providence system. Whatever work may have previously been done on population projections, either by the City or the State, will be consulted in our work. From the figures of sewered population, we can then generate existing and projected domestic wastewater flows. As part of this population study, all industries ultimately discharging to the Providence system would be identified.

Water Consumption and Wastewater Flows - Under this section of the report, existing and anticipated theoretical wastewater flows into the treatment plant will be determined. Assuming that all major water users, not only in Providence, but also in the other contributing communities, have their water consumption metered, it then becomes a fairly straightforward task to develop wastewater flows for residences, commercial establishments and industries. Flows from this last catetory will also be reported by the industries on the questionnaire proposed under Task 2. Based on the findings of the infiltration/inflow study to be performed under Task 3, estimates for infiltration and stormwater will be added to the wastewater flows to yield final design flows for the major interceptors and treatment facility. It is anticipated that the elimination of many of the major combined sewer overflows will be one of the recommendations of the report. This additional flow, which is not now treated at the sewage treatment plant, will also have to be taken into consideration in the development of total flow in the Providence system.

Existing Municipal System - The existing Providence system is comprised of approximately 435 miles of sanitary storm and combined sewers. In the town of Johnston, it is estimated that there are 36 miles of pipelines on the existing system. In this section of the report, the data assembled under Task 3 will be examined and discussed. The condition, age and total length of existing sanitary and combined sewers are of prime importance in determining which may readily be separated and which should remain in their present state. These data will be readily available from the work effort expended under Task 3. The elimination of some combined sewer overflows will certainly necessitate an increase in capacity of or construction of relief sewers for many of the City's major interceptors. These areas will be identified under this section.

Existing Sewage Treatment Plant - Although much work and several studies have been performed at the treatment plant over the past few years by the treatment plant operators, the engineering firm of Metcalf and Eddy and Dr. Campbell of the University of Rhode Island, the treatment efficiency for Biochemical Oxygen Demand (BOD) removal averaged 62 per cent last year. This is far below the 85-90 per cent removals presently required by the State Department of Health. The purpose of this section would be to identify and discuss the problems which are being experienced at the sewage treatment plant. In order to accomplish this, past performance records will be examined in conjunction with variations in flow, temperature and past process modifications which were attempted at the plant. We would anticipate working very closely with the plant operator to become thoroughly familiar with his operating procedures and to assist him in attaining the highest levels of treatment possible under the present flow and operating situations. We would perform a number of additional wastewater analyses to determine the influence of both industrial wastes and stormwater dilution on the treatment process. If necessary, we would perform pilot plant studies to duplicate and vary the operating procedures. The items will be more fully pursued in the next section of the report.

As part of this work, and as necessary to perform the work under Task 2, Develop System of Cost Recovery and Sewer Use Charges, complete historical data on operation and maintenance procedures and costs will be assembled and reviewed.

Development and Presentation of Alternative Solutions - The latest EPA draft guidelines for Facilities Planning (Step 1) has added a number of requirements which must now be satisfied as part of this study. These additional items of work were enumerated on Page 2 of this Plan of Study. This study must now make recommendations for upgrading the existing treatment facility to achieve the level of Best Practicable Treatment Technology. In addition, a cost-effective study must be performed on all of the alternatives studied for wastewater collection and transmission; elimination of dry and wet weather overflows; treatment, including both water and land-oriented systems; sewer separation; stormwater overflow treatment; and treated wastewater reuses, such as for industries, flow augmentation, and groundwater recharge.

In this section we will develop a number of alternative solutions to the water quality problems discussed throughout this Plan of Study. Alternatives for selective separation of combined sewers and elimination of combined sewer overflows will be presented and evaluated. Within the City of Providence, there are in excess of 100 sewer overflows. The elimination of every one of these would be an overwhelming task, involving huge expenditures of funds. Our approach would be to concentrate on the eighteen overflows identified by the State Department of Health as being most critical. These overflows are identified on Table 2 on the next page. It is felt by the State that these overflows

## TABLE 2 - MAJOR SEWER OVERFLOWS PROVIDENCE SEWER SYSTEM

| | River | Location of Drain Outlet | Location of Slot or Weir Involved |
|---|---|---|---|
| 1. | Moshassuck | W. end of Livingston St.; W. of Printery St. | Inters-Printery St. & Livingston St. |
| 2. | " | W. extension of Printery St.; W. of Randell St. | Moshassuck R & W ext. of Printery St. |
| 3. | | Beneath E. end of Stevens St. Bridge; E. of Charles St. | Moshassuck R & Stevens St. |
| 4. | Woonasquatucket | S. end of Owens St.; S. of Manton Avenue | Owens St. & Aleppo St. |
| 5. | " | S. end of Rathbone St.; S. of Promenade St. | Uncertain - Valley St. & Rathbone St. or Davis Park |
| 6. | " | S. end of Leland St.; S. of Promenade St. | Inter-Leland St. & Promenade St. |
| 7. | " | S. end of Holden St.; S. of Promenade St. | Inter-Holden St. & Promenade St. |
| 8. | " | S. end of Park St.; S. of Promenade St. | Inter-Park St. & Promenade St. |
| 9. | " | S. end of Gaspee St. bridge; N. of Kinsley Ave. | Inter-Sabin St. & Exchange St. |
| 10. | Providence | N. end of Henderson St.; N. of Allens Ave. | Inter-Allens Ave. & Henderson St. |
| 11. | " | E. end of Blackstone St.; E. of Allens Ave. | Inter-Allens Ave. & Blackstone St. |
| 12. | " | Fields Point | W. end of Earl St.; W. of Elmwood Ave. (Gorham Park) |
| 13. | " | " " | Inter-Narragansetts Ave. & Woodmont Ave. |
| 14. | " | " " | Slot @ 140 Narragansett Ave. (Mellor's Auto Parts) |
| 15. | " | " " | Weir @ 158 Narragansett Ave. (Copley Distribution Inc.) |
| 16. | " | " " | Inter-Sackett St. @ Melrose St. |
| 17. | Seekonk | E. end of India St. | 17 Gans St. |
| 18. | -- | Uncertain Frankies Live Bait | -- |

have the most detrimental effect on the shellfish areas in Upper Narragansett Bay. Because of these overflows, the shellfish areas were closed by the State for in excess of 70 per cent of the time in 1972. In addition to the combined sewage overflows which occur during storm conditions, it has been noted by the State that overflows of raw wastewater have been observed during periods of dry weather. This situation will be fully investigated and rectified. The treatment of combined sewer overflows will also receive attention.

As a result of the ultimate goal of zero discharge of pollutants established by the 1972 Amendments to the Federal Water Pollution Control Act, possible future advanced treatment, and its attendant high capital and operation and maintenance costs make sewer separation a viable alternative for consideration.

Based on the industrial flow data assembled in Task 2 and the problems associated with the existing municipal collection and treatment systems, as discussed in previous sections, alternatives will be evaluated which consider such items as industrial pretreatment at the source; a separate industrial waste treatment plant; maintain the present treatment process with modifications to properly treat the industrial wastes; construct a separate facility for the treatment of combined sewer overflows and perform only minor reparations to the existing treatment facility. These are only typical alternative considerations and the list is not comprehensive. Indeed, it has not yet been ascertained whether the industrial wastes are having a serious detrimental effect on the existing activated sludge process. Due to the high concentration of firms belonging to the jewelry and metal industry (over 70 per cent), it is likely that the collection and central treatment of these wastes will receive most favorable consideration at the existing plant site. Treatability studies will be performed to determine whether these industrial wastes can be treated efficiently by the activated sludge process when combined with large quantities of domestic sewage and storm water. In addition, limits of quantity and concentrations of certain constituents will be established and these will be included in the sewer use regulations to be developed as Task 1.

Costs - For all of the technically feasible alternatives developed and discussed in the previous section, costs will be generated and comparisons based on cost will be made. The final recommended plan will be cost-effective.

Conclusions and Recommendations - Based on the data generated, the arguments made both for and against various proposals, the costs associated with the different alternatives, and the environmental impact assessment to be performed under Task 5, final recommendations will be made to abate water pollution and to adhere to the requirements of the governmental agencies.

The recommendations of this report will deal with the following areas: construction of new sewers; combined sewer separations; elimination of certain major combined sewer and dry weather overflows; reduction of infiltration and seawater intrusion; dealings and agreements with surrounding communities contributing flow; industrial treatment and treatability studies; upgrading of the overall treatment efficiency at the existing treatment plant; modifications to the existing treatment facilities; and treated wastewater reuses.

Financing and Cost Apportionment - The contents of this section will present and discuss the various sources of planning and construction funds available to carry out the recommendations of the report. The sewer rate study prepared under Task 2 will establish a system of charges and method of cost apportionment to the users of the Providence system, such as North Providence, Johnston, Narragansett Brewery in Cranston, and possibly, at some future date, Smithfield.

Implementation and Administration - This final section of the report will deal with the presentation of our recommendations for implementing the technical recommendations of the report. These might include such items as the phasing of construction, the organization of a sewer district, or the execution of long-term financial agreements with neighboring communities.

Task 5 - Prepare Environmental Impact Assessment

In the preparation of the environmental impact assessment, we plan to adhere to the Council of Environmental Quality (CEQ) Guidelines and cover the following major items of work which will be presented in a separate report:

Project Background - We will describe the project service area, pertinent waste treatment management plans, conformity to any studies that have been done on the project area by State, Federal or private organizations, and present and future wastewater treatment needs with a discussion of development and population trends in the project area.

Summary of Alternative Project Solutions - We propose to delineate alternative solutions, the principal features of each, and discuss alternate sites and regionalization--giving, for each alternate, facility sizes and capabilities, capital and operating costs, and completion dates. We will evaluate alternate interceptor routing and ultimate sludge disposal methods. The alternative of taking no action and continuing with the existing situation will also be evaluated.

Detailed Environmental Evaluation of Each Feasible Alternative - The evaluation will consider environmental effects during operation and construction.

A. Probable impact on the environment (complete listing of beneficial and adverse effects) Both short- and long-term impacts will be described. Physical changes to the project area, alterations to ecological systems, changes in land development or zoning, and shifts in population distribution and concentration, which might be induced by the project, will also be discussed.

The time frames in which these impacts are anticipated will be included, and we will evaluate measures to prevent, eliminate, reduce or compensate for any environmentally detrimental aspect of the proposed action. Adverse impacts which cannot be substantially avoided will be considered in greater detail in the next section.

B. Adverse effects which cannot be avoided should the proposed project be implemented We will describe the kinds and magnitudes of adverse impacts which cannot be reduced in severity or which can be reduced to an acceptable level, but not eliminated. Some specific factors we shall consider are: wooded or wildlife habitat which will be lost with the project; stream or downstream impoundment siltation due to project construction; disruption of the natural setting; and the impact of the additional quantity of flows and associated residual pollutants upon the receiving bodies of water.

C. Relationship between short-term beneficial uses versus long-term environmental consequences We will describe the cumulative or long-term effects of the proposed action, which either significantly reduce or enhance the state of the environment for the future, and will consider ultimate site development.

D. Irreversible and irretrievable commitment of resources We shall describe the extent to which the proposed action curtails the diversity and range of uses of the environment. Assess irreplaceable ecosystems or natural areas and adverse land use patterns. Examples of potentially committed resources are (1) the project site and (2) the opening of areas to further development generally commit future generations to similar uses.

Environmental Comparison of Alternatives and Selection of Proposed Project - Our assessment will compare the environmental effects of alternative solutions and highlight ecological factors and include pertinent social and economic effects.

Agencies Consulted About the Project - We shall indicate Federal, State and local agencies that have been involved in the development of the project, including agencies that have jurisdiction over or expertise in planning, water quality, water supply, solid waste management, air quality, parks, recreation, fish and wildlife. Also, if necessary, we shall consult pesticide, noise and radiation control agencies and submit comments received from these agencies.

Opportunity and Extent of Public Participation - Our final assessment will be presented as a "Summary Report on Public Participation", which will discuss the following:

A. The results of public meetings and/or hearings pertaining to the project.

B. The source and nature of all written or other comments received by the grantee that indicate opposition to the project.

C. The steps taken to resolve conflicts.

D. Remaining unresolved conflicts.

The following list of environmental evaluation issues will be addressed:

1. Water quality
2. Water supply
3. Solid waste
4. Air quality
5. Noise
6. Land use
7. Recreation, historical, cultural and aesthetic values
8. Social and economic
9. Construction

As can be seen from this necessarily brief presentation of the scope of work envisioned in this Plan of Study, Waterman Engineering, in joint venture with Anderson-Nichols, proposes to perform a comprehensive engineering program to abate water pollution of Narragansett Bay and to control the discharges and recover the costs from its own as well as the extra-municipal participants in the Providence sewage collection and treatment facilities.

## SECTION TWO

## COST

I. SUMMARY FEES FOR ENGINEERING SERVICES (for breakdown of fee, see table on following page).

| | |
|---|---|
| **Task 1** | |
| Develop Sewer Use Regulations | $ 12,000 |
| **Task 2** | |
| Develop System of Cost Recovery and Sewer Use Charges | $ 58,000 |
| **Task 3** | |
| Perform Infiltration/Inflow Analysis | $300,000 |
| **Task 4** | |
| Prepare Preliminary Engineering Report on Sewerage Improvements | $210,000 |
| **Task 5** | |
| Prepare Environmental Impact Assessment | $ 58,000 |
| Total Engineering Fee (Total Project) | $638,000 |
| Engineering Fee (February 26, 1973 Contract) | $260,000 |
| Total Engineering Fee for Amendment No. 1 | $378,000 |

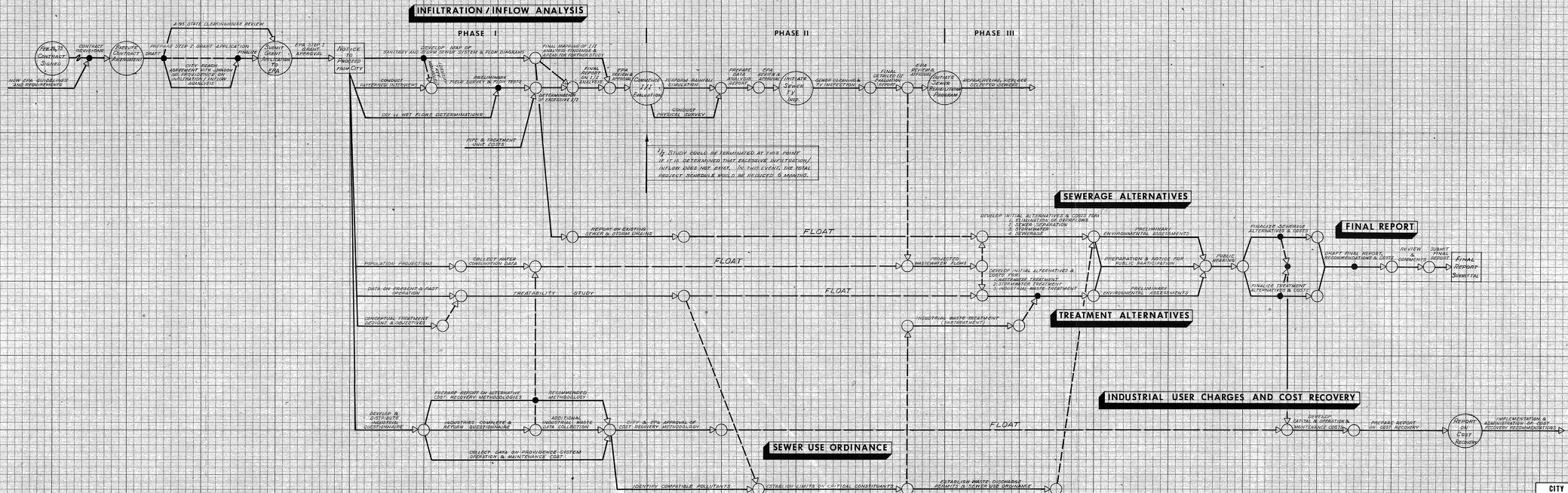
Note: Above Total Engineering Fee includes time and materials, travel and subsistence, treatability studies, field surveys, and laboratory analytical costs. Subsurface borings and transit surveys, if required, are not included.

CITY OF PROVIDENCE, RHODE ISLAND
STUDY OF SEWERAGE IMPROVEMENTS

BREAKDOWN OF ENGINEERING FEE

| ITEM OF WORK | February 26, 1973 Contract Fee | Providence | North Providence | Johnston | Smithfield | Total |
|---|---|---|---|---|---|---|
| **Task 1 - SEWER USE REGULATIONS** | | | | | | |
| Identify Compatible Pollutants | $ 1,000 | $ 1,000 | | | | |
| Establish Acceptable Limits | 500 | 500 | | | | |
| Set Up Permit System | | | | | | |
| 1. Prohibitions, Fines and Controls | 1,000 | 1,000 | | | | |
| 2. Treatability | 5,000 | 5,000 | | | | |
| 3. Pretreatment | 2,000 | 2,000 | $ 500 | $ 500 | | |
| 4. Implementation | 500 | 500 | 500 | 500 | | |
| | $ 10,000 | $ 10,000 | $ 1,000 | $ 1,000 | | $ 12,000 |
| **Task 2 - COST RECOVERY & SEWER CHARGES** | | | | | | |
| Develop & Distribute Questionnaire | $ 10,000 | $ 10,000 | $ 500 | $ 500 | | |
| Methodology | 2,500 | 2,500 | 500 | 500 | | |
| Operation & Maintenance Costs | 5,000 | 5,000 | | | | |
| Rate Study | 25,000 | 25,000 | 2,500 | 2,500 | | |
| Implementation & Administration | 2,500 | 2,500 | | | | |
| Provisions for Other Communities | 5,000 | 5,000 | 500 | 500 | | |
| | $ 50,000 | $ 50,000 | $ 4,000 | $ 4,000 | | $ 58,000 |
| **Task 3 - INFILTRATION/INFLOW ANALYSIS** | | | | | | |
| Providence 435 miles @ 12¢/linear foot | $ 50,000 (sewer map | $275,000 | | | | |
| Johnston 40 miles @ 12¢/linear foot | only) | | | $ 25,000 | | |
| North Providence | | | DONE | | | |
| | | $275,000 | | $ 25,000 | | $300,000 |
| **Task 4 - PRELIMINARY REPORT** | | | | | | |
| Population | $ 5,000 | $ 5,000 | $ 500 | $ 500 | $ 500 | |
| Water Consumption & Flows | 10,000 | 10,000 | 500 | 500 | 500 | |
| Existing Sewer System | 44,000 | 50,000 | 2,500 | 5,000 | -- | |
| Existing Treatment Plant | 23,000 | 25,000 | -- | -- | -- | |
| Formulation of Alternatives | 38,000 | 50,000 | 5,000 | 5,000 | 5,000 | |
| Cost Estimates | 10,000 | 15,000 | 2,000 | 2,000 | 2,000 | |
| Recommendations | 10,000 | 10,000 | 500 | 500 | 500 | |
| Financing & Cost Apportionment | 5,000 | 5,000 | 500 | 500 | -- | |
| Implementation & Administration | 5,000 | 5,000 | 500 | 500 | -- | |
| | $150,000 | $175,000 | $ 12,000 | $ 14,500 | $ 8,500 | $210,000 |
| **Task 5 - ENVIRONMENTAL IMPACT ASSESSMENT** | -- | $ 45,000 | $ 5,000 | $ 5,000 | $ 3,000 | $ 58,000 |
| PROJECT TOTALS | $260,000 | $555,000 | $ 22,000 | $ 49,500 | $11,500 | $638,000 * |
| Less 90% Grant Participation | | 499,500 | 19,800 | 44,550 | 10,350 | 574,200 |
| LOCAL PROJECT COST | | $ 55,500 | $ 2,200 | $ 4,950 | $ 1,150 | $ 63,800 |

* The dollar value of Amendment No. 1 is the difference between the total project cost of $638,000 and the base contract fee of $260,000. Engineering Fee for Amendment No. 1 is $378,000.




# CITY OF PROVIDENCE, RHODE ISLAND

## STUDY OF SEWERAGE IMPROVEMENTS

## WORK PLAN

CITY OF PROVIDENCE, RHODE ISLAND

STUDY OF SEWERAGE IMPROVEMENTS

JANUARY 15, 1974


WATERMAN ENGINEERING CO.
EAST PROVIDENCE RHODE ISLAND

and

ANDERSON-NICHOLS & CO., INC.
VERNON BOSTON CONCORD

**WATERMAN ENGINEERING COMPANY**
CIVIL ENGINEERS
450 NORTH BROADWAY • EAST PROVIDENCE, R. I. 02914
401-438-5775

**ANDERSON - NICHOLS & CO. INC.**
CONSULTING ENGINEERS
150 CAUSEWAY STREET • BOSTON, MASS. 02114
617-742-3400

May 23, 1975

Mr. Vincent Vespia
City Clerk
City Hall
25 Dorrance Street
Providence, Rhode Island 02901

Subject: Study of Sewerage Improvements
City of Providence
Project No. 2630

Dear Mr. Vespia:

As you know, our firms are currently performing a sewerage study for the City of Providence and it has come to our attention that the Environmental Protection Agency has continued to address correspondence to former Mayor Doorley. May we suggest that you advise them that Mayor Cianci is now acting as the City's authorized representative to that agency.

A draft letter to EPA is enclosed for your convenience should you desire to make use of it.

Please forward a copy of any correspondence with EPA to me for my files.

Thank you.

Very truly yours,

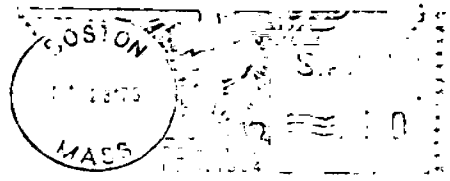
ANDERSON-NICHOLS & CO., INC.

Peter T. Silbermann

Peter T. Silbermann
Vice President

PTS/lp
Enclosure
cc/Mr. Daniel E. Healy, Acting Director, DPW
Waterman Engineering Company

**Anderson-Nichols**
150 Causeway Street
Boston, Massachusetts 02114




Mr. Vincent Vespia
City Clerk
City Hall
25 Dorrance Street
Providence, Rhode Island 02901

Engineers / Environmental Consultants / Architects

May 27, 1975

Environmental Protection Agency
Municipal Facilities Branch
John F. Kennedy Federal Building
Boston, Massachusetts 02203

Attention: Mr. Stuart C. Peterson, Chief

Subject: Notification of Authorized Representative
City of Providence, Rhode Island
C440076-01

Gentlemen:

Recent correspondence from your agency to the City of Providence has been addressed to the Honorable Joseph A. Doorley, Jr., Mayor.

Please be advised that the Mayor of the City is now the Honorable Vincent A. Cianci, Jr., who will act as the authorized representative for the City on all matters relative to the subject project.

Enclosed is a copy of "Resolution of the City Council" which on March 14, 1974, authorized the Mayor to deal with your agency.

Very truly yours,

Vincent Vespia
City Clerk

VV:hgg
Enclosure
cc: Mayor Vincent A. Cianci, Jr.
Peter T. Silbermann, Vice President
Director Healy, Public Works
Waterman Engineering Company