KEOUGH & SWEENEY, LTD.

ATTORNEYS AND COUNSELORS AT LAW
41 MENDON AVENUE
PAWTUCKET, RHODE ISLAND 02861
TELEPHONE (401) 724-3600
FACSIMILE (401) 724-9909
www.keoughsweeney.com

JOSEPH A. KEOUGH JR.*
JEROME V. SWEENEY III*

SEAN P. KEOUGH*
STACI L. KOLB

JEROME V. SWEENEY II
OF COUNSEL

*ADMITTED TO PRACTICE IN
RHODE ISLAND & MASSACHUSETTS

RAYNHAM OFFICE:
90 NEW STATE HIGHWAY
RAYNHAM, MA 02109
TEL. (508) 822-2813
FAX (508) 822-2832

BOSTON OFFICE:
171 MILK STREET
SUITE 30
BOSTON, MA 02109
TEL. (617) 574-0054
FAX (617) 451-1914

March 24, 2014

Ms. Luly Massaro, Clerk
Rhode Island Public Utilities Commission
89 Jefferson Boulevard
Warwick, RI 02888

Re: Docket 4478 - Narragansett Bay Commission

Dear Ms. Massaro:

Enclosed please find an original and nine (9) copies of the following:

1. The Narragansett Bay Commission's Response to the Division of Public Utilities And Carriers' Second Set of Data Requests.

Please note that an electronic copy of this filing has been sent to the service list. Thank you for your attention to this matter.

Sincerely,

Joseph A. Keough Jr.

JAK/kf
Enclosures

COMM 2-1 Please provide a chart that includes each union employee, their title, and the date and amount of contracted step increases for the last 3 years.

The effective dates of the step increases were:

7/14/2013

7/1/2012

7/3/2011

The NBC's payroll system keys off of a table that includes the hourly rate that has been adjusted for the COLA and therefore NBC does not have a report that shows the step increases separately. Please see attached reports that show the step increases in July by employee by fiscal year.

By: WEE

	FY 11
IM OPERATOR III	852.80
LABORATORY CLERK	746.20
SENIOR FISCAL CLERK	1,037.40
SR. ELECTRICIAN	1,268.80
OPERATOR II	790.40
CUSTOMER SERVICE REPRESENTATIVE	764.40
CUSTOMER SERVICE REPRESENTATIVE	764.40
PROCESS MONITOR	1,164.80
PROCESS MONITOR	873.60
MECHANIC II	873.60
MECHANIC I	873.60
MECHANIC I	873.60
CUSTOMER SERVICE REPRESENTATIVE	764.40
ENVIRONMENTAL MONITOR	746.20
PROCESS MONITOR	1,164.80
OPERATOR II	873.60
IM OPERATOR IV	790.40
OPERATOR I	811.20
ENVIRONMENTAL MONITOR	1,037.40
ENVIRONMENTAL MONITOR	764.40
OPERATOR II	790.40
OPERATOR I	790.40
MECHANIC I	873.60
IM OPERATOR II	790.40
OPERATOR I	790.40
E AND I TECHNICIAN	873.60
IM MECHANIC	852.80
FIELD INVESTIGATOR	691.60
CUST. SERVICE REP.-FISCAL CLERK	837.20
BIOLOGIST	1,110.20
OPERATOR I	790.40
OPERATOR I	790.40
INVENTORY CONTROL CLERK	790.40
OPERATOR I	790.40
FIELD INVESTIGATOR	691.60
OPERATOR I	790.40
IM OPERATOR II	790.40
PROCESS MONITOR	1,185.60
MASTER ELECTRICIAN (FP)	1,414.40
CUSTOMER SERVICE REPRESENTATIVE	746.20
CUSTOMER SERVICE REPRESENTATIVE	764.40
PROCESS MONITOR	1,164.80
IM OPERATOR II	790.40
OPERATOR I	790.40
FISCAL CLERK - CUSTOMER SERVICE	746.20
MECHANIC II	873.60
SENIOR E&I TECHNICIAN	1,268.80
MECHANIC II	873.60
MAINTENANCE SCHEDULER/PLANNER (BP)	1,164.80
PROCESS MONITOR	1,809.60
UTILITY CREW FOREMAN	1,393.60
OPERATOR II	873.60
PROCESS MONITOR	1,164.80
IM OPERATOR IV	1,185.60

	FY 11
ENVIRONMENTAL MONITOR	746.20
OPERATOR II	790.40
BP CONTRACT COORDINATOR	1,393.60
ELECTRICIAN	1,185.60
IM OPERATOR II	811.20
ENVIRONMENTAL MONITOR	746.20
MECHANIC II	852.80

	FY 12
LABORATORY TECHNICIAN	1,674.40
IM OPERATOR III	1,539.20
LABORATORY CLERK	1,346.80
MECHANIC II	852.80
PROCESS MONITOR	936.00
IM OPERATOR II	1,435.20
SENIOR FISCAL CLERK	1,765.40
LABORATORY TECHNICIAN	1,674.40
SR. ELECTRICIAN	2,121.60
OPERATOR II	1,518.40
CUSTOMER SERVICE REPRESENTATIVE	673.40
PRETREATMENT CLERK	673.40
CUSTOMER SERVICE REPRESENTATIVE	1,437.80
HEAVY EQUIPMENT OPERATOR (BP)	790.40
CUSTOMER SERVICE REPRESENTATIVE	1,310.40
PROCESS MONITOR	2,100.80
FISCAL CLERK - ACCOUNTING	673.40
PROCESS MONITOR	769.60
E AND I TECHNICIAN	1,643.20
PROCESS MONITOR	936.00
OPERATOR II	811.20
PROCESS MONITOR	936.00
MECHANIC II	1,768.00
MECHANIC I	1,580.80
MECHANIC I	1,497.60
CUSTOMER SERVICE REPRESENTATIVE	673.40
ENVIRONMENTAL MONITOR	1,419.60
ELECTRICAL FOREMAN - BP	1,164.80
PROCESS MONITOR	936.00
PROCESS MONITOR	2,059.20
OPERATOR II	769.60
IM OPERATOR IV	1,435.20
INVENTORY CONTROL CLERK	748.80
OPERATOR I	1,372.80
OPERATOR I	1,414.40
OPERATOR I	561.60
ENVIRONMENTAL MONITOR	1,710.80
ELECTRICIAN	1,913.60
ENVIRONMENTAL MONITOR	1,310.40
FP CLERK	673.40
SENIOR FISCAL CLERK	691.60
MECHANIC I	790.40
OPERATOR II	1,393.60
PROCESS MONITOR	852.80
OPERATOR I	1,435.20
MECHANIC I	1,497.60
OPERATOR I	624.00
IM OPERATOR II	707.20
ENVIRONMENTAL MONITOR	1,346.80
FISCAL CLERK - PURCHASING	764.40
OPERATOR I	1,435.20
E AND I TECHNICIAN	1,643.20
IM MECHANIC	1,539.20
FIELD INVESTIGATOR	1,219.40
FIELD INVESTIGATOR	691.60
CUST. SERVICE REP.-FISCAL CLERK	1,510.60
BIOLOGIST	2,002.00

	FY 12
OPERATOR I	1,435.20
CHEMIST	1,820.00
PRETREATMENT CLERK	673.40
OPERATOR I	707.20
INVENTORY CONTROL CLERK	1,435.20
PROCESS MONITOR	936.00
OPERATOR I	1,518.40
FIELD INVESTIGATOR	1,219.40
OPERATOR I	707.20
IM OPERATOR II	1,435.20
PROCESS MONITOR	1,955.20
MASTER ELECTRICIAN (FP)	1,102.40
INVENTORY CONTROL CLERK	728.00
CUSTOMER SERVICE REPRESENTATIVE	1,419.60
CUSTOMER SERVICE REPRESENTATIVE	982.80
LABORATORY TECHNICIAN	1,674.40
MECHANIC I	1,518.40
CUSTOMER SERVICE REPRESENTATIVE	1,310.40
EMDA DATA ASSISTANT	728.00
ELECTRICIAN	1,040.00
PROCESS MONITOR	2,059.20
HUMAN RESOURCES CLERK	673.40
OPERATOR II	624.00
ASST. E&I TECHNICIAN	769.60
IM OPERATOR II	1,435.20
CUSTOMER SERVICE REPRESENTATIVE	673.40
OPERATOR I	1,518.40
FISCAL CLERK - CUSTOMER SERVICE	1,346.80
MECHANIC II	1,643.20
LABORATORY TECHNICIAN	1,838.20
SENIOR E&I TECHNICIAN	2,288.00
MECHANIC II	769.60
CUSTOMER SERVICE REPRESENTATIVE	673.40
OPERATOR II	790.40
MAINTENANCE SCHEDULER/PLANNER (BP)	2,100.80
PROCESS MONITOR	1,955.20
UTILITY CREW FOREMAN	2,475.20
OPERATOR II	1,643.20
OPERATIONS FOREMAN (BP)	936.00
OPERATOR II	1,372.80
PROCESS MONITOR	2,100.80
IM OPERATOR IV	2,017.60
ENVIRONMENTAL MONITOR	1,419.60
PROCESS MONITOR	936.00
OPERATOR II	1,393.60
FLEET MECHANIC	811.20
BP CONTRACT COORDINATOR	2,516.80
ELECTRICIAN	2,100.80
CARPENTER	936.00
IM OPERATOR II	1,497.60
ENVIRONMENTAL MONITOR	1,419.60
MECHANIC II	1,539.20

	FY 13
LABORATORY TECHNICIAN	1,838.20
IM OPERATOR III	1,664.00
LABORATORY CLERK	1,456.00
MECHANIC II	977.60
PROCESS MONITOR	1,081.60
IM OPERATOR II	1,601.60
SENIOR FISCAL CLERK	1,947.40
LABORATORY TECHNICIAN	1,838.20
SR. ELECTRICIAN	2,288.00
OPERATOR II	1,622.40
CUSTOMER SERVICE REPRESENTATIVE	782.60
MECHANIC I	728.00
PRETREATMENT CLERK	782.60
CUSTOMER SERVICE REPRESENTATIVE	1,547.00
HEAVY EQUIPMENT OPERATOR (BP)	915.20
CUSTOMER SERVICE REPRESENTATIVE	1,456.00
PROCESS MONITOR	2,267.20
FISCAL CLERK - ACCOUNTING	782.60
PROCESS MONITOR	894.40
E AND I TECHNICIAN	1,788.80
PROCESS MONITOR	1,081.60
OPERATOR II	936.00
PROCESS MONITOR	1,081.60
MECHANIC II	1,913.60
MECHANIC I	1,768.00
MECHANIC I	1,664.00
CUSTOMER SERVICE REPRESENTATIVE	782.60
ENVIRONMENTAL MONITOR	1,547.00
ELECTRICAL FOREMAN - BP	1,352.00
PROCESS MONITOR	1,081.60
PROCESS MONITOR	2,225.60
OPERATOR II	832.00
IM OPERATOR IV	1,518.40
INVENTORY CONTROL CLERK	852.80
OPERATOR I	1,518.40
OPERATOR I	1,560.00
OPERATOR I	1,497.60
ENVIRONMENTAL MONITOR	1,874.60
ELECTRICIAN	2,100.80
ENVIRONMENTAL MONITOR	1,456.00
FP CLERK	782.60
SENIOR FISCAL CLERK	800.80
MECHANIC I	915.20
OPERATOR II	728.00
PROCESS MONITOR	977.60
OPERATOR I	1,518.40
MECHANIC I	1,664.00
OPERATOR I	1,643.20
IM OPERATOR II	832.00
ENVIRONMENTAL MONITOR	1,492.40
FISCAL CLERK - PURCHASING	891.80
OPERATOR I	1,518.40
E AND I TECHNICIAN	1,913.60
IM MECHANIC	1,664.00
FIELD INVESTIGATOR	1,346.80
FIELD INVESTIGATOR	800.80
CUST. SERVICE REP.-FISCAL CLERK	1,674.40
BIOLOGIST	1,037.40
OPERATOR I	1,518.40
CHEMIST	2,002.00

	FY 13
PRETREATMENT CLERK	782.60
OPERATOR I	832.00
INVENTORY CONTROL CLERK	1,601.60
PROCESS MONITOR	1,081.60
OPERATOR I	1,622.40
FIELD INVESTIGATOR	1,346.80
OPERATOR I	832.00
IM OPERATOR II	1,518.40
PROCESS MONITOR	2,142.40
MASTER ELECTRICIAN (FP)	1,289.60
INVENTORY CONTROL CLERK	832.00
CUSTOMER SERVICE REPRESENTATIVE	1,547.00
CUSTOMER SERVICE REPRESENTATIVE	1,146.60
LABORATORY TECHNICIAN	1,838.20
MECHANIC I	1,622.40
CUSTOMER SERVICE REPRESENTATIVE	1,456.00
EMDA DATA ASSISTANT	855.40
ELECTRICIAN	1,206.40
PROCESS MONITOR	2,225.60
MECHANIC I	728.00
HUMAN RESOURCES CLERK	782.60
OPERATOR II	1,643.20
ASST. E&I TECHNICIAN	894.40
IM OPERATOR II	1,518.40
CUSTOMER SERVICE REPRESENTATIVE	782.60
OPERATOR I	1,622.40
FISCAL CLERK - CUSTOMER SERVICE	1,456.00
MECHANIC II	1,830.40
LABORATORY TECHNICIAN	946.40
SENIOR E&I TECHNICIAN	1,185.60
MECHANIC II	1,872.00
CUSTOMER SERVICE REPRESENTATIVE	782.60
OPERATOR II	915.20
MAINTENANCE SCHEDULER/PLANNER (BP)	2,267.20
PROCESS MONITOR	2,100.80
UTILITY CREW FOREMAN	2,724.80
OPERATOR II	894.40
OPERATIONS FOREMAN (BP)	1,081.60
OPERATOR II	728.00
PROCESS MONITOR	2,267.20
IM OPERATOR IV	2,225.60
ENVIRONMENTAL MONITOR	1,547.00
PROCESS MONITOR	1,081.60
OPERATOR II	1,539.20
FLEET MECHANIC	956.80
BP CONTRACT COORDINATOR	2,891.20
ELECTRICIAN	1,081.60
CARPENTER	1,081.60
IM OPERATOR II	832.00
ENVIRONMENTAL MONITOR	1,547.00
MECHANIC II	1,788.80

COMM 2-2 Please provide a list of non-union employees, their title and the amount of merit pay received for the last 3 years.

See attached.

By: WEE

Title	2011 Merit Increase
HUMAN RESOURCES MANAGER	2,904.03
SENIOR FINANCIAL ANALYST	1,585.48
PRETREATMENT TECHNICIAN	887.50
DIRECTOR OF CONSTRUCTION SERVICES	2,164.21
SAFETY COMPLIANCE COORDINATOR	1,201.46
PRINCIPAL PRETREATMENT ENGINEER	1,764.64
DIRECTOR OF CONSTRUCTION SERVICES	2,423.43
DIRECTOR OF EXECUTIVE AFFAIRS	5,867.17
PRETREATMENT MANAGER	2,283.63
SENIOR MAINTENANCE SUPERVISOR	5,514.63
ENGINEERING MANAGER	3,074.10
LABOR AND EMPLOYEE RELATIONS MANAGER	2,379.16
O AND M TECHNICIAN	1,192.55
ENVIRONMENTAL ENGINEER	1,899.69
CUSTOMER SERVICE ANALYST	956.63
CUSTOMER SERVICE MANAGER	2,702.83
PURCHASING MANAGER	2,263.48
TECHNICAL ASSISTANT	1,398.81
SENIOR CONSTRUCTION COORDINATOR	1,483.30
IM INSPECTOR	1,190.29
ENVIRONMENTAL SCIENTIST	1,731.35
SENIOR PRETREATMENT TECHNICIAN	761.35
PUBLIC AFFAIRS MULTIMEDIA COORDINATOR	1,118.67
PRETREATMENT ENGINEER	1,383.75
ASST. PRETREATMENT MANAGER	2,130.63
ASST. OPERATIONS MANAGER	1,366.85
PRETREATMENT TECHNICIAN	1,030.11
O AND M SUPERVISOR	1,603.86
PAYROLL SUPERVISOR	1,487.66
ADMINISTRATIVE ASSISTANT	7,663.00
SYSTEMS DESIGN PROGRAMMER	1,210.30
SENIOR RESIDENT REPRESENTATIVE	2,097.16
ASST. CONTROL SYSTEM ADMINISTRATOR	1,412.36
PRETREATMENT TECHNICIAN	883.43
STAFF ACCOUNTANT	1,453.37
ACCOUNTING MANAGER	2,909.13
SR. SYSTEMS PROGRAMMER/SYSTEMS ADMINISTRATOR	1,647.52
CHIEF LEGAL COUNSEL	2,695.66
CUSTOMER SERVICE ANALYST	1,207.35
PRETREATMENT TECHNICIAN	1,281.74
DIRECTOR OF ADMINISTRATION AND FINANCE	2,864.87
CONSTRUCTION OFFICE COORDINATOR	1,486.78
STAFF ACCOUNTANT	1,371.79
ASST. LABORATORY MANAGER	2,280.00
INSTRUMENTATION ENGINEER	1,430.57
APPLICATIONS SYSTEM SUPERVISOR	2,182.81
OPERATIONS MANAGER FP	2,756.38
O AND M COORDINATOR	1,142.74
IM MANAGER	2,394.72
LAB SAMPLE COMPLIANCE COORDINATOR	1,546.18
PRETREATMENT ENGINEER	1,153.13
ASST. ENVIRONMENTAL MONITORING MANAGER	2,071.94
PRINCIPAL ENVIRONMENTAL ENGINEER	2,153.41
ADMINISTRATIVE ASSISTANT	1,245.24
PERMITS COORDINATOR	1,375.26
O AND M SUPPORT SUPERVISOR	1,771.17
SENIOR ORGANIC CHEMIST	1,796.60

Title	2011 Merit Increase
CONTROL SYSTEMS ASSOCIATE	993.04
EXECUTIVE DIRECTOR	4,928.10
ASSOCIATE LEGAL COUNSEL	923.14
MECHANICAL INSPECTOR	2,118.60
RESIDENT REPRESENTATIVE	2,430.59
SENIOR DATA BASE ADMINISTRATOR	2,668.40
ENVIRONMENTAL EDUCATION COORDINATOR	1,460.21
ENVIRONMENTAL MONITORING MANAGER	2,187.10
CUSTOMER SERVICE STATISTICAL ANALYST	1,427.43
EXECUTIVE ASSISTANT	1,522.13
COLLECTIONS SUPERVISOR	1,832.32
MONITORING FIELD SUPERVISOR	1,315.49
ASST. IM MANAGER	1,171.28
DIRECTOR OF OPERATIONS AND ENGINEERING	2,769.80
ENVIRONMENTAL SCIENTIST	1,542.45
LABORATORY MANAGER	2,512.50
PURCHASING COORDINATOR	1,588.09
NETWORK AND COMMUNICATIONS ADMINISTRATOR	2,190.02
OFFICE ADMINISTRATOR	1,126.48
ENVIRONMENTAL SCIENTIST	1,810.50
BILLING SUPERVISOR	1,708.38
SOLUTIONS ARCHITECT	2,668.95
ENVIRONMENTAL ENGINEER	1,400.82
O AND M SUPERVISOR	1,640.04
PUBLIC AFFAIRS MANAGER	2,454.18
COMPUTER TRAINING APPLICATIONS SPECIALIST	968.77
ENVIRONMENTAL CHEMIST	1,454.06
CONTROL SYSTEMS ADMINISTRATOR	1,301.92
PRINCIPAL ACCOUNTANT	1,774.14
SENIOR HUMAN RESOURCES REPRESENTATIVE	1,849.66
SENIOR DATA BASE ADMINISTRATOR	2,864.23
MONITORING FIELD SUPERVISOR	1,254.62
MAINTENANCE SUPERVISOR	1,243.44
PRETREATMENT TECHNICIAN	1,113.12
ENVIRONMENTAL CHEMIST	1,490.23
O AND M SUPERVISOR	1,570.55
SENIOR ENVIRONMENTAL CHEMIST	1,688.13
EXECUTIVE PARALEGAL II	1,858.04
MONITORING FIELD SUPERVISOR	1,535.72
O AND M SUPERVISOR	1,570.39
DIRECTOR OF PLANNING, POLICY AND REGULATION	5,873.95
ENGINEERING AND OPERATIONS FISCAL ADMINISTRATOR	1,489.80
ADMINISTRATIVE ASSISTANT	1,336.73
POLLUTION PREVENTION ENGINEER	1,700.48
MAINTENANCE MANAGER	1,890.62
CUSTOMER RESEARCH SUPERVISOR	1,826.00
PERMITS AND PLANNING MANAGER	2,078.19
SENIOR SYSTEMS ADMINISTRATOR	2,202.37

Title	2012 Merit Increase
RESIDENT REPRESENTATIVE	359.00
HUMAN RESOURCES MANAGER	4,152.77
SENIOR FINANCIAL ANALYST	3,000.00
PRETREATMENT TECHNICIAN	1,091.63
DIRECTOR OF CONSTRUCTION SERVICES	12,220.79
SAFETY COMPLIANCE COORDINATOR	1,306.50
PRINCIPAL PRETREATMENT ENGINEER	1,744.14
DIRECTOR OF CONSTRUCTION SERVICES	6,377.49
DIRECTOR OF EXECUTIVE AFFAIRS	6,764.26
PRETREATMENT MANAGER	2,836.04
SENIOR MAINTENANCE SUPERVISOR	2,767.14
PAYROLL ADMINISTRATOR	1,155.00
ENGINEERING MANAGER	3,330.56
LABOR AND EMPLOYEE RELATIONS MANAGER	2,654.75
O AND M TECHNICIAN	1,411.80
ENVIRONMENTAL ENGINEER	2,025.89
CUSTOMER SERVICE ANALYST	1,521.58
CUSTOMER SERVICE MANAGER	2,576.00
PURCHASING MANAGER	558.32
TECHNICAL ASSISTANT	1,204.41
SENIOR CONSTRUCTION COORDINATOR	1,672.42
IM INSPECTOR	1,123.84
ENVIRONMENTAL SCIENTIST	2,137.54
PC SUPPORT SPECIALIST/SYSTEMS ADMINISTRATOR	2,173.61
SENIOR PRETREATMENT TECHNICIAN	793.26
PRINCIPAL ENVIRONMENTAL ENGINEER	1,120.00
PRETREATMENT ENGINEER	1,506.49
SENIOR CONSTRUCTION COORDINATOR	1,051.00
ASST. PRETREATMENT MANAGER	2,555.52
ASST. OPERATIONS MANAGER	219.00
IM SUPERVISOR	2,159.00
PRETREATMENT TECHNICIAN	1,061.01
O AND M SUPERVISOR	3,067.12
PAYROLL SUPERVISOR	2,001.04
ADMINISTRATIVE ASSISTANT	1,797.60
SYSTEMS DESIGN PROGRAMMER	1,388.82
SENIOR RESIDENT REPRESENTATIVE	1,619.48
ASST. CONTROL SYSTEM ADMINISTRATOR	1,691.61
PRETREATMENT TECHNICIAN	1,177.16
STAFF ACCOUNTANT	1,289.35
ACCOUNTING MANAGER	2,746.71
LEGAL COUNSEL	1,917.50
SR. SYSTEMS PROGRAMMER/SYSTEMS ADMINISTRATOR	1,846.72
CHIEF LEGAL COUNSEL	3,489.29
CUSTOMER SERVICE ANALYST	1,450.83
PRETREATMENT TECHNICIAN	1,559.20
RESIDENT REPRESENTATIVE	1,950.00
DIRECTOR OF ADMINISTRATION AND FINANCE	4,383.25
CONSTRUCTION OFFICE COORDINATOR	1,428.90
STAFF ACCOUNTANT	2,129.70
ASST. LABORATORY MANAGER	2,371.20
INSTRUMENTATION ENGINEER	1,469.91
APPLICATIONS SYSTEM SUPERVISOR	1,835.05
OPERATIONS MANAGER FP	3,089.66
O AND M COORDINATOR	1,617.52
IM MANAGER	2,507.15
LAB SAMPLE COMPLIANCE COORDINATOR	1,392.36
EXECUTIVE PARALEGAL	1,374.07
ENGINEERING CONSTRUCTION COORDINATOR	9,755.88
PRETREATMENT ENGINEER	1,500.16
ASST. ENVIRONMENTAL MONITORING MANAGER	2,544.29
PRINCIPAL ENVIRONMENTAL ENGINEER	2,136.56

Title	2012 Merit Increase
ADMINISTRATIVE ASSISTANT	1,325.45
PERMITS COORDINATOR	1,598.16
O AND M SUPPORT SUPERVISOR	2,950.82
SENIOR ORGANIC CHEMIST	2,124.55
CONTROL SYSTEMS ASSOCIATE	1,869.22
GOVERNMENT AFFAIRS MANAGER	219.00
HUMAN RESOURCES REP./BENEFITS COORDINATOR	1,449.27
EXECUTIVE DIRECTOR	17,816.55
ASSOCIATE LEGAL COUNSEL	353.10
ENVIRONMENTAL SAFETY & TECHNICAL ASSISTANT MANAGE	219.00
MECHANICAL INSPECTOR	2,036.13
RESIDENT REPRESENTATIVE	6,099.87
SENIOR DATA BASE ADMINISTRATOR	2,879.64
ENVIRONMENTAL EDUCATION COORDINATOR	2,239.62
ENVIRONMENTAL MONITORING MANAGER	410.77
CUSTOMER SERVICE STATISTICAL ANALYST	1,646.10
EXECUTIVE ASSISTANT	2,198.44
COLLECTIONS SUPERVISOR	2,022.56
MONITORING FIELD SUPERVISOR	1,400.01
ASST. IM MANAGER	1,642.72
DIRECTOR OF OPERATIONS AND ENGINEERING	4,237.79
ENVIRONMENTAL SCIENTIST	1,515.28
LABORATORY MANAGER	2,906.72
CAPITAL PRINCIPAL ACCOUNTANT	1,120.00
PURCHASING COORDINATOR	1,772.04
STAFF ACCOUNTANT	1,080.00
NETWORK AND COMMUNICATIONS ADMINISTRATOR	1,841.11
OFFICE ADMINISTRATOR	1,353.65
ENVIRONMENTAL SCIENTIST	1,980.39
BILLING SUPERVISOR	1,906.27
SOLUTIONS ARCHITECT	3,138.25
ENVIRONMENTAL ENGINEER	1,557.61
RESIDENT REPRESENTATIVE	1,950.00
O AND M SUPERVISOR	1,895.66
PUBLIC AFFAIRS MANAGER	2,728.86
COMPUTER TRAINING APPLICATIONS SPECIALIST	988.15
ENVIRONMENTAL CHEMIST	1,548.92
CONTROL SYSTEMS ADMINISTRATOR	219.00
PRINCIPAL ACCOUNTANT	2,240.87
SENIOR HUMAN RESOURCES REPRESENTATIVE	2,063.91
IT MANAGER	2,047.00
SENIOR DATA BASE ADMINISTRATOR	2,266.72
MONITORING FIELD SUPERVISOR	1,292.26
FACILITIES ENGINEER	1,120.00
MAINTENANCE SUPERVISOR	1,760.07
PRETREATMENT TECHNICIAN	1,275.75
ENVIRONMENTAL CHEMIST	1,586.32
O AND M SUPERVISOR	1,977.20
SENIOR ENVIRONMENTAL CHEMIST	1,798.26
CONSTRUCTION MANAGER	2,369.00
EXECUTIVE PARALEGAL II	2,070.04
MONITORING FIELD SUPERVISOR	1,776.68
O AND M SUPERVISOR	1,880.88
DIRECTOR OF PLANNING, POLICY AND REGULATION	6,624.06
ENGINEERING AND OPERATIONS FISCAL ADMINISTRATOR	1,477.28
POLLUTION PREVENTION ENGINEER	2,038.41
MAINTENANCE MANAGER	2,264.42
CUSTOMER RESEARCH SUPERVISOR	1,266.26
PERMITS AND PLANNING MANAGER	2,249.91
SENIOR SYSTEMS ADMINISTRATOR	2,973.62

Title	2013 Merit Increase
RESIDENT REPRESENTATIVE	2,628.09
HUMAN RESOURCES MANAGER	5,177.74
SENIOR FINANCIAL ANALYST	3,780.00
PRETREATMENT TECHNICIAN	2,405.47
DIRECTOR OF CONSTRUCTION SERVICES	3,044.46
SAFETY COMPLIANCE COORDINATOR	1,660.26
PRINCIPAL PRETREATMENT ENGINEER	2,216.40
DIRECTOR OF CONSTRUCTION SERVICES	7,198.89
DIRECTOR OF EXECUTIVE AFFAIRS	7,199.00
PRETREATMENT MANAGER	1,135.00
SENIOR MAINTENANCE SUPERVISOR	3,178.48
PAYROLL ADMINISTRATOR	1,510.43
ENGINEERING MANAGER	4,666.57
LABOR AND EMPLOYEE RELATIONS MANAGER	3,795.27
O AND M TECHNICIAN	1,938.87
ENVIRONMENTAL ENGINEER	2,205.20
CUSTOMER SERVICE ANALYST	2,524.79
CUSTOMER SERVICE MANAGER	3,095.49
PURCHASING MANAGER	2,341.08
TECHNICAL ASSISTANT	1,654.06
SENIOR CONSTRUCTION COORDINATOR	2,343.29
IM INSPECTOR	2,179.62
ADMINISTRATIVE ASSISTANT	1,869.50
ENVIRONMENTAL SCIENTIST	2,465.59
PC SUPPORT SPECIALIST/SYSTEMS ADMINISTRATOR	2,532.58
SENIOR PRETREATMENT TECHNICIAN	1,700.11
PRINCIPAL ENVIRONMENTAL ENGINEER	2,110.20
ENVIRONMENTAL COMPLIANCE TECHNICAL ASSISTANT	1,409.56
PRETREATMENT ENGINEER	2,760.61
SENIOR CONSTRUCTION COORDINATOR	2,171.97
ASST. PRETREATMENT MANAGER	2,823.85
ASST. OPERATIONS MANAGER	2,553.90
IM SUPERVISOR	3,022.76
PRETREATMENT TECHNICIAN	2,548.20
O AND M SUPERVISOR	2,397.35
PAYROLL SUPERVISOR	2,002.53
SYSTEMS DESIGN PROGRAMMER	2,208.99
SENIOR RESIDENT REPRESENTATIVE	2,628.09
ASST. CONTROL SYSTEM ADMINISTRATOR	2,370.17
ACCOUNTING MANAGER	2,052.54
LEGAL COUNSEL	1,675.23
SR. SYSTEMS PROGRAMMER/SYSTEMS ADMINISTRATOR	3,011.69
CHIEF LEGAL COUNSEL	3,952.18
CUSTOMER SERVICE ANALYST	2,430.65
PRETREATMENT TECHNICIAN	2,925.61
RESIDENT REPRESENTATIVE	3,044.46
DIRECTOR OF ADMINISTRATION AND FINANCE	6,019.66
CONSTRUCTION OFFICE COORDINATOR	1,929.29
PUBLIC AFFAIRS SPECIALIST	1,233.37
STAFF ACCOUNTANT	2,741.51
ASST. LABORATORY MANAGER	2,774.30
INSTRUMENTATION ENGINEER	2,059.54
APPLICATIONS SYSTEM SUPERVISOR	2,501.78
OPERATIONS MANAGER FP	4,243.13
O AND M COORDINATOR	2,183.96
IM MANAGER	3,443.15
LAB SAMPLE COMPLIANCE COORDINATOR	2,080.95
EXECUTIVE PARALEGAL	1,320.58
ENGINEERING CONSTRUCTION COORDINATOR	1,939.62
PRETREATMENT ENGINEER	2,751.14
ASST. ENVIRONMENTAL MONITORING MANAGER	2,991.67
PRINCIPAL ENVIRONMENTAL ENGINEER	2,468.57
ADMINISTRATIVE ASSISTANT	1,763.79
PERMITS COORDINATOR	2,194.80

Title	2013 Merit Increase
O AND M SUPPORT SUPERVISOR	2,719.13
SENIOR ORGANIC CHEMIST	2,041.85
CONTROL SYSTEMS ASSOCIATE	1,892.25
GOVERNMENT AFFAIRS MANAGER	2,553.90
HUMAN RESOURCES REP./BENEFITS COORDINATOR	2,385.68
EXECUTIVE DIRECTOR	7,480.58
ENVIRONMENTAL SAFETY & TECHNICAL ASSISTANT MANAG	2,553.90
ADMINISTRATIVE ASSISTANT	2,800.00
ASSOCIATE LEGAL COUNSEL	1,407.09
MECHANICAL INSPECTOR	3,160.74
RESIDENT REPRESENTATIVE	3,044.46
SENIOR DATA BASE ADMINISTRATOR	2,788.46
ENVIRONMENTAL EDUCATION COORDINATOR	2,431.47
ENVIRONMENTAL MONITORING MANAGER	2,553.90
CUSTOMER SERVICE STATISTICAL ANALYST	1,830.33
EXECUTIVE ASSISTANT	3,450.61
COLLECTIONS SUPERVISOR	3,348.41
MONITORING FIELD SUPERVISOR	2,154.00
ASST. IM MANAGER	3,512.00
DIRECTOR OF OPERATIONS AND ENGINEERING	5,819.90
ENVIRONMENTAL SCIENTIST	2,341.10
FINANCIAL ANALYST	1,660.00
LABORATORY MANAGER	3,417.82
CAPITAL ACCOUNTING ASSISTANT	1,960.00
CAPITAL PRINCIPAL ACCOUNTANT	2,110.65
PURCHASING COORDINATOR	2,251.86
STAFF ACCOUNTANT	2,641.37
NETWORK AND COMMUNICATIONS ADMINISTRATOR	2,510.05
OFFICE ADMINISTRATOR	1,300.95
ENVIRONMENTAL SCIENTIST	2,465.59
BILLING SUPERVISOR	2,119.62
SOLUTIONS ARCHITECT	3,079.17
ENVIRONMENTAL ENGINEER	2,822.73
RESIDENT REPRESENTATIVE	3,044.46
O AND M SUPERVISOR	2,656.08
PUBLIC AFFAIRS MANAGER	3,631.33
COMPUTER TRAINING APPLICATIONS SPECIALIST	1,763.84
ENVIRONMENTAL CHEMIST	2,080.88
CONTROL SYSTEMS ADMINISTRATOR	4,377.67
PRINCIPAL ACCOUNTANT	2,484.96
SENIOR HUMAN RESOURCES REPRESENTATIVE	2,786.68
IT MANAGER	3,090.21
SENIOR DATA BASE ADMINISTRATOR	2,990.98
MONITORING FIELD SUPERVISOR	1,774.71
FACILITIES ENGINEER	2,110.65
MAINTENANCE SUPERVISOR	2,376.43
PRETREATMENT TECHNICIAN	2,791.98
ENVIRONMENTAL CHEMIST	2,314.71
O AND M SUPERVISOR	2,715.35
SENIOR ENVIRONMENTAL CHEMIST	2,247.71
CONSTRUCTION MANAGER	3,498.00
EXECUTIVE PARALEGAL II	3,141.11
MONITORING FIELD SUPERVISOR	2,211.97
O AND M SUPERVISOR	2,635.37
DIRECTOR OF PLANNING, POLICY AND REGULATION	7,199.08
ENGINEERING AND OPERATIONS FISCAL ADMINISTRATOR	1,744.35
POLLUTION PREVENTION ENGINEER	2,376.78
MAINTENANCE MANAGER	3,076.95
CUSTOMER RESEARCH SUPERVISOR	1,918.77
PERMITS AND PLANNING MANAGER	2,465.75
SENIOR SYSTEMS ADMINISTRATOR	3,464.71

COMM 2-3 Please explain the basis for the 3% Cost of Living Adjustment (COLA) for both union and non-union employees for the FYE June 30, 2015 rate year.

NBC used 3% for 2015 because it is consistent with prior years. Ultimately union COLAs will be determined through the collective bargaining process. The NBC non-union employees do not receive COLA's and the 3% represents a pool of dollars available for merit raises. The COLAs for NBCs union employees as well as the amount for non-union merit increases must be approved by NBC's Board of Commissioners.

By: WEE

COMM 2-4 Since the current contracts both expire on June 30, 2014, what is the status of union contract negotiations.

NBC is in the collective bargaining process. Two sessions have been held and several more are scheduled over the next few months.

By: WEE

COMM 2-5 With regard to Commission Data Request 1-3, in addition to the statistics provided for FYE 6/30/13, provide the requested reports related to customer complaints received by NBC in the last 3 years.

There are no such reports.

By: WEE

COMM 2-6 Please indicate what measures have been taken to reduce overtime costs by Narragansett Bay Commission.

Measures to minimize overtime have been implemented over the years and include a reduced workday schedule on weekends and holidays, a staggered work week and an asset management program. However, overtime use is necessary for holiday coverage, 24/7 plant operation, plant and collection system maintenance and to ensure that RIPDES permit requirements are met. In addition, overtime use is related to weather, a factor out of NBC's control.

By: WEE

COMM 2-7 What was the total amount of sick leave bonuses paid to NBC employees, breaking down amounts into hours used and amounts paid in each category.

Sick Bonus	Total Sick Hours	Total Bonus Paid
$ 175	557.68	$ 11,463
125	1,029.07	4,119
75	1,469.19	2,413

By: WEE

COMM 2-8 Please explain the process that an employee must go through in order to obtain a waiver of health insurance. Does the employee have to produce evidence of alternative insurance? Why is the $2,500 waiver amount appropriate and how was this amount determined?

An employee must fill out a form that shows they have coverage elsewhere and on the form must indicate the carrier name and ID number. The waiver is significant enough to provide incentive for an employee to not enroll in NBC's group health plan which results in significant savings to NBC.

Health Waivers

Year Paid	Health Waiver Cost	Total # of Employees with Health Waiver	Cost of Annual Health vs. Waiver
2013	59,616	27	465,850
2012	57,212	26	442,854
2011	39,135	17	290,919
Total	**$238,272**		**$1,199,623**

By: WEE

COMM 2-9 What is the annual cost to NBC for providing professional dues and membership costs to its employees?

In FY 2013, the total cost NBC paid for employee professional dues and memberships was $13,965.

By: WEE

COMM 2-10 Please describe when a lien sale is appropriate, the process of conducting one and how balances due and costs incurred by NBC are recovered.

NBC's unpaid bill is a statutory lien against the property pursuant to Rhode Island General Law Section 46-25-22. NBC selects accounts for lien sale that have a balance over 90 days of more than $700 and also takes into consideration if the account is inactive, has had its water service terminated or whose water service cannot be terminated for nonpayment due to a variety of circumstances. Rhode Island General Law Title 44 Chapter 9 sets forth the tax lien sale process that NBC must follow. Any fees associated with the lien sale process (such as title examinations, certified notices, advertisement in the Providence Journal and auction fees) are added to the account balance when applicable. These fees are only added as the process goes forward on an unpaid account. The account balances and costs incurred by the NBC are recovered either by payment from the customer/owner, a third party or entity that has a recorded interest in the property, such as a mortgage holder, or by a lien sale purchaser if the account is purchased at the lien sale. In some instances, account balances are paid by Rhode Island Housing pursuant to R.I.G.L. 44-9-8.3.

By: LHB and CC

COMM 2-11 In addition to the $500 grant to the Providence Children's Museum awarded in 2013, please list the total amount of all grants awarded for the last 3 years, to whom the grant was awarded, the amount and from what account the monies were deducted.

RIGL 46-25-38.1 establishes the Environmental Enforcement Fund to be administered by the Executive Director and funded with sums recovered by any administrative or civil enforcement action brought under the authority of this chapter. All sums in the fund must be expended for specific purposes outlined in the legislation. (See attached)

Board Approval Date	Project Number/ Description	Recipient	Type of Project	Amount Awarded	Date Funds Paid
2011					
Apr-11	EEF# 11-001 ~ Contribution to the Blackstone Valley Tourism Council River Classroom Program to allow for underprivileged children to partake in water quality testing and their educational program.	Blackstone Valley Tourism Council	Public Information & Education	$2,400.00	Jul-11
Apr-11	EEF# 11-002 ~ Contribution to Save the Bay to support an environmental enhancement project of updatting Narragansett Bay's eelgrass bed inventory through aerial imagery.	Save the Bay	Environmental Enhancement	$2,000.00	Jun-11
Apr-11	EEF# 11-003 ~ funding to support the Woonasquatucket River Rangers Program, a part time youth environmental green job training program	Woonasquatucket River Watershed Council	Public Information & Education	$5,000.00	Jun-11
Apr-11	EEF# 11-004 ~ NBC Water Qualitiy Workshop - "A Day on Narragansett Bay: Monitoring and Research - a workshop held to gather stakeholders, researchers & regulators together to share scientific information about water quality in Narragansett Bay.	NBC PP&R Division	Environmental Education	$2,000.00	Jun-11
Jun-11	EEF# 11-005 ~ Maintenance and upgrades to the Children's Museum exhibit, WATER WAYS.	Providence Children's Museum	Public Information & Education	$7,500.00	Jun-11
Jun-11	EEF# 11-006 ~ Contribution to Leonard Walker Scholarship Fund - awarded to children in the MET School to assist children in RI to receive a better education	The MET School	Education	$2,500.00	Jul-11
Sep-11	EEF# 11-007 ~ Contribution to support the construction of the Chocolate Mill Overlook Project and educational riverfront park in Central Falls.	Blackstone Valley Tourism Council	Public Information & Education	$3,000.00	Oct-11
Oct-11	EEF# 11-008 ~ NBC World Toilet Day	NBC Public Affairs	Public Information & Education	$2,800.00	Jan-12
2012					
Mar-12	EEF# 12-001 ~ funding to support the Woonasquatucket River Watershed Council, "Clean Day on the Greenway" River Cleanup project	Woonasquatucket River Watershed Council	Environmental Enhancement	$2,000.00	May-12
May-12	EEF# 12-002 ~ Contribution to the Blackstone Valley Tourism Council River Classroom Program to allow for underprivileged children to partake in water quality testing and their educational program.	Blackstone Valley Tourism Council	Public Information & Education	$2,400.00	Jun-12
Jun-12	EEF# 12-003 ~ Contribution to Leonard Walker Scholarship Fund - awarded to children in the MET School to assist children in RI to receive a better education	The MET School	Education	$3,500.00	Jul-12

Sep-12	EEF# 12-004 ~ Johnston Historical Society to support the Belknap School History Project	Johnston Historical Society	Public Information & Education	$2,500.00	Nov-12
Jan-13	EEF# 12-005 ~ RI Governor's Bay Day/Narragansett Bay Estuary Program/ RI Natural History Survey	RI Natural History Survey	Public Information & Education	$2,000.00	Feb-13
Sep-12	EEF# 12-006 ~ Maintenance and upgrades to the Children's Museum exhibit, WATER WAYS.	Providence Children's Museum	Public Information & Education	$5,000.00	Dec-12
Sep-12	EEF# 12-007 ~ NBC World Toilet Day	NBC Public Affairs	Public Information & Education	$2,800.00	NOT COMPLETED
2013					
Mar-13	EEF# 13-001 ~ NBC Earth Day River Grant Program	NBC PP&R Division	Environmental Enhancement	$12,500.00	May-13
May-13	EEF# 13-002 ~ Contribution to the Blackstone Valley Tourism Council River Classroom Program to allow for underprivileged children to partake in water quality testing and their educational program.	Blackstone Valley Tourism Council	Public Information & Education	$2,400.00	Jun-13
Jul-13	EEF# 13-003 ~ Contribution to Leonard Walker Scholarship Fund - awarded to children in the MET School to assist children in RI to receive a better education	The MET School	Education	$2,500.00	Aug-13
Sep-13	EEF# 12-006 ~ Maintenance and upgrades to the Children's Museum exhibit, WATER WAYS.	Providence Children's Museum	Public Information & Education	$500.00	
2014					
	EEF# 14-001 ~ NBC Earth Day River Grant Program	NBC PP&R Division	Environmental Enhancement	TBD	

By: WEE

account to be known as "Narragansett Bay water quality management district commission fund", to be used as follows:

(1) For the project within the district;

(2) As prescribed in § 46-25-42, in the case of premiums or accrued interest,

(3) In the event that the amount received from the sale of the bonds exceeds the amount necessary for the planning, construction, extension, and improvement of the project, the surplus shall be used to the extent possible to retire the bonds as they may become due,

(4) Provided, however, that $6,000,000 of the proceeds of the fund may be utilized for the purposes of the Blackstone Valley sewer district and an additional $9,000,000 of the proceeds may be utilized for the purposes of the Pawtuxet River district commission.

History of Section.
P.L. 1980, ch. 342, § 1; P.L. 1990, ch. 434, art. 2, § 2.

Reenactments. The 1996 Reenactment (P.L. 1996, ch. 404, § 1) redesignated the subdivisions.

46-25-38.1. Narragansett Bay environmental enforcement fund. — There is hereby established a separate fund within the "Narragansett Bay water quality management district commission fund" to be called the "Narragansett Bay environmental enforcement fund". This fund shall be administered by the executive director of the commission. The fund shall consist of such sums as the commission may, from time to time, deposit, or the sums recovered by any administrative or civil enforcement action brought under the authority of this chapter. All interest earned on the sums shall become part of the fund. All sums in the fund shall be expended in accordance with § 46-25-24 for the purposes set forth below:

(1) *Emergency response activities.* These activities shall include, but not be limited to, site inspections, investigatory reports, collection, monitoring, and analysis of samples of wastewater, air and/or soil waste disposal or spill response, analysis, and containment.

(2) *Enforcement activities.* These funds may also be used to support activities related to enforcement of the provisions of this chapter, and the rules and regulations adopted pursuant thereto, regarding illegal discharges and spills to the facilities, including, but not limited to, legal activities to enforce the provisions of this chapter and secure contributions from violators as well as ancillary services, personnel, or equipment to support the activities enumerated in this section.

(3) *Additional activities.* These activities shall include, but not be limited to, professional and emergency response training for employees, environmental research and development projects, public information and education, and technical assistance provided by the commission to any state, federal, or municipal agency.

(4) *Bay bond debt retirement.* Those funds which have not been committed for projects within a three (3) year period following their deposit into the fund may be used to pay the long term debt service on bonds issued pursuant to this chapter.

COMM 2-12 Please provide the actuary reports for the non-union defined benefit plan and the non-union defined contribution plan mentioned in Comm 1-22.

Attached please find the actuary reports for the non-union defined benefit plan for 2005 and 2006. The other actuary reports for the non-union defined benefit plan were attached to Commission 1.16. There are no actuary reports for defined contribution plans.

By: WEE

PLAN SPECIFICATIONS
NARRAGANSETT BAY COMMISSION
NON-UNION DEFINED BENEFIT PLAN

FOR THE PLAN YEAR 01/01/2005 THROUGH 12/31/2005

TYPE OF ENTITY Corporation.

DATES Effective-02/01/2005 Valuation-12/31/2005 Eligibility-12/31/2005 Year-end-12/31/2005

ELIGIBILITY Minimum age- 21 Months of service- 12 Maximum age- None
Age at last birthday. Other ages at nearest birthday.
Entry Age For Full Funding Limitation Calculation - as of date of hire.

HOURS REQUIRED FOR
Eligibility - 1000 Benefit accrual - 1000 Vesting - 1000

PLAN ENTRY - February 1 of the year coincident with or following satisfaction of eligibility requirements.

RETIREMENT NORMAL - First of month coincident with or following attainment of age 65, and completion of 5 years of participation.

EARLY - Upon attainment of age 62, and completion of 20 years of service. (100% Vested upon satisfaction of early retirement provisions).

AVERAGE COMPENSATION -- (retrospective salaries)

FUNDING - 3 Highest consecutive years of last 10 years.
ACCRUED BENEFIT - 3 Highest consecutive years of last 10 years.

PLAN BENEFITS

RETIREMENT-- 1.000% of average monthly compensation multiplied by total years of service limited to 30 years.

415 Limits - Percent 100.00 Dollar - $14,167

Minimum benefit - None Maximum benefit - None

Maximum 401(a)(17) compensation $210,000

PLAN SPECIFICATIONS
NARRAGANSETT BAY COMMISSION
NON-UNION DEFINED BENEFIT PLAN

FOR THE PLAN YEAR 01/01/2005 THROUGH 12/31/2005

NORMAL FORM	Life Annuity.
DEATH BENEFIT	Present value of accrued benefits.
ACCRUED BENEFIT	1.000% of average monthly compensation multiplied by total years of service limited to 30 years.
TERMINATION BENEFITS	100% vested in year 7, 0% vested in prior years. Service is calculated using all years of service.
CONTRIBUTIONS	
	EMPLOYEE REQUIRED -- None
	EMPLOYEE VOLUNTARY -- None
ASSET VALUATION METHOD	Market value.

PLAN SPECIFICATIONS
NARRAGANSETT BAY COMMISSION
NON-UNION DEFINED BENEFIT PLAN

FOR THE PLAN YEAR 01/01/2005 THROUGH 12/31/2005

PLAN ASSUMPTIONS

ACTUARIAL COST METHOD: Aggregate entry age normal with frozen initial liability.

PRE-RETIREMENT: INTEREST ASSUMED FOR DEPOSIT-- 6.000% Compounded annually

MORTALITY TABLE --	1994 GROUP ANNUITY RESERVING.
TURNOVER/DISABILITY--	T2 .
COST OF VESTING --	Yes.
SALARY SCALE --	Salaries assumed to increase at 3.500% per year.
INTEGRATION LVL INCR-	None.
BACKWARD SALARY PROJ.	Based on increases of average earnings

POST RETIREMENT: ANNUITY FACTORS BASED ON:

INTEREST --	6.000%
MORTALITY TABLE --	1994 GROUP ANNUITY RESERVING.
EXPENSE LOAD --	None
COST OF LIVING --	None
LOAD FOR ANCILLARY BENEFITS --	None

* PVB for inactives based on funding assumptions.

ASSUMPTIONS FOR PRESENT VALUE OF ACCRUED BENEFIT CALCULATIONS

PRE-RETIREMENT:	INTEREST --	6.000%
	MORTALITY TABLE --	1994 GROUP ANNUITY RESERVING.
POST-RETIREMENT:	INTEREST --	6.000%
	MORTALITY TABLE --	1994 GROUP ANNUITY RESERVING.

ASSUMPTIONS FOR "RPA '94" MINIMUM CURRENT LIABILITY CALCULATIONS

PRE-RETIREMENT:	INTEREST --	6.000%
	MORTALITY TABLE --	1983 GROUP ANNUITY.
POST-RETIREMENT:	INTEREST --	6.000%
	MORTALITY TABLE --	1983 GROUP ANNUITY.

PLAN SPECIFICATIONS
NARRAGANSETT BAY COMMISSION
NON-UNION DEFINED BENEFIT PLAN

FOR THE PLAN YEAR 01/01/2005 THROUGH 12/31/2005

ASSUMPTIONS FOR 410(b)/401(a)(4) CALCULATIONS

PRE-RETIREMENT:	INTEREST --	7.500%
POST-RETIREMENT:	INTEREST --	7.500%
	MORTALITY TABLE --	1994 GROUP ANNUITY RESERVING Unisex Proj to 2002 male rates.

PERMISSIVELY AGGREGATED PLANS: Not Tested as Single Plan.

COMPENSATION: Use Current Compensation to calculate the Benefit Accrual Rate (Annual Method).

TESTING AGE: Normal Retirement Age.

ACTUARIAL VALUATION FOR
NARRAGANSETT BAY COMMISSION
NON-UNION DEFINED BENEFIT PLAN
FOR THE PLAN YEAR 01/01/2005 THROUGH 12/31/2005

A. VALUATION AS OF 12/31/2005

1. PRESENT VALUE OF BENEFITS	$9,217,993.00
A. ACTIVE	$9,144,274.00
B. RETIRED / LATE (POSTPONED) RETIREES	$0.00
C. DEFERRED VESTED / VESTED TERMINEES	$73,719.00
2. ASSETS	$0.00
3. REMAINING UNFUNDED LIABILITY	$5,841,205.00
4. PRESENT VALUE OF FUTURE NORMAL COST.....(1 - 2 - 3)	$3,376,788.00
5. PRESENT VALUE OF FUTURE COMPENSATION	$68,157,080.00
6. CURRENT COMPENSATION	$5,673,797.00
7. WEIGHTED AVERAGE TEMPORARY ANNUITY.....(5 / 6)	12.0126
8. NORMAL COST.....(4 / 7)	$281,104.00

ACTUARIAL VALUATION FOR
NARRAGANSETT BAY COMMISSION
NON-UNION DEFINED BENEFIT PLAN
FOR THE PLAN YEAR 01/01/2005 THROUGH 12/31/2005

B. FULL FUNDING LIMITATION	---412---	---404---
1. A. ENTRY AGE ACCRUED LIABILITY	$5,841,205.00	$5,841,205.00
B. ENTRY AGE NORMAL COST	$297,679.00	$297,679.00
C. NET PREMIUMS	$0.00	$0.00
D. TOTAL	$6,138,884.00	$6,138,884.00
2. ASSETS	$0.00	$0.00
3. CREDIT BALANCE [412] / UNDEDUCTED CONTRIBUTIONS [404]	$0.00	$0.00
4. NET ASSETS....(2-3)	$0.00	$0.00
5. INTEREST ON (1D-4) TO END OF YEAR	$0.00	$0.00
6. FULL FUNDING LIMITATION 1 (NOT LESS THAN ZERO)...(1D-4+5)	$6,138,884.00	$6,138,884.00
RPA '94 MINIMUM FULL FUNDING LIMITATION		
7. A. RPA '94 CURRENT LIABILITY AS OF 01/01/2005	$2,840,216.00	$2,840,216.00
B. EXPECTED CURRENT LIABILITY INCREASE	$207,972.00	$207,972.00
C. INTEREST ON 7A AND 7B	$182,891.00	$182,891.00
D. EXPECTED BENEFIT PAYMENTS	$0.00	$0.00
E. .90 * (7A + 7B + 7C - 7D)	$2,907,971.00	$2,907,971.00
8. A. ASSETS	$0.00	$0.00
B. INTEREST TO END OF YEAR	$0.00	$0.00
C. EXPECTED BENEFIT PAYMENTS	$0.00	$0.00
9. 412(c)(7)(E) FULL FUNDING LIMIT AMOUNT ITEMS 7E-(8A+8B-8C)	$2,907,971.00	$2,907,971.00
10. FULL FUNDING LIMITATION.....(GREATER OF 6 AND 9)	$6,138,884.00	$6,138,884.00

ACTUARIAL VALUATION FOR
NARRAGANSETT BAY COMMISSION
NON-UNION DEFINED BENEFIT PLAN
FOR THE PLAN YEAR 01/01/2005 THROUGH 12/31/2005

C. ACCUMULATED FUNDING DEFICIENCY

1. PRIOR YEAR FUNDING DEFICIENCY	$0.00
2. VALUATION NORMAL COST	$281,104.00
3. AMORTIZATION CHARGES	$400,337.00
4. INTEREST	$0.00
5. ADDITIONAL FUNDING CHARGE	$0.00
6. TOTAL CHARGES.....(1 + 2 + 3 + 4 + 5)	$681,441.00
7. AMORTIZATION CREDITS	$0.00
8. INTEREST	$0.00
9. TOTAL CREDITS.....(7 + 8)	$0.00
10. DEFICIENCY.....(IGNORING CREDIT BALANCE AND CONTRIBUTION FOR LAST YEAR).....(6 - 9)	$681,441.00
11. FULL FUNDING LIMITATION CREDIT (C10 - B10) NOT < 0	$0.00

D. AMORTIZATION OF OBRA 87 FULL FUNDING LIMITATION CREDIT

NOT APPLICABLE

ACTUARIAL VALUATION FOR
NARRAGANSETT BAY COMMISSION
NON-UNION DEFINED BENEFIT PLAN
FOR THE PLAN YEAR 01/01/2005 THROUGH 12/31/2005

E. REQUIRED CONTRIBUTION	MINIMUM	MAXIMUM
1. NORMAL COST	$281,104.00	$281,104.00
2. AMORTIZATION CHARGES	$400,337.00	$748,710.00
3. PRIOR YEAR FUNDING DEFICIENCY	$0.00	N/A
4. INTEREST	$0.00	$0.00
5. ADDITIONAL FUNDING CHARGE	$0.00	N/A
6. TOTAL CHARGES.....(1 + 2 + 3 + 4 + 5)	$681,441.00	$1,029,814.00
7. PRIOR YEAR CREDIT BALANCE	$0.00	N/A
8. AMORTIZATION CREDITS	$0.00	$0.00
9. INTEREST	$0.00	$0.00
10. MISCELLANEOUS CREDITS FFL CREDIT	$0.00	$0.00
11. TOTAL CREDITS.....(7 + 8 + 9 + 10)	$0.00	$0.00
12. REQUIRED CONTRIBUTION.....(6 - 11)	$681,441.00	$1,029,814.00
13. CREDIT BALANCE ASSUMING NO CONTRIBUTION.....(11 - 6)	$0.00	$0.00

14. UNFUNDED CURRENT LIABILITY (Not Less than Zero).....$4,279,061.00
Current Liability calculated under Code Section 404(a)(1)(F) election using 4.59% interest. Assets equal (B8A + B8B - B8C).

(Excess of 100% of RPA Current Liability over Valuation Assets (unreduced by credit balance) as of Valuation date. Liability attributable to benefit increases for HCE's due to amendments made or effective within last two years are not considered. No regulation or other official guidance specifies the method for calculating the unfunded current liability under Code Section 404(a)(1)(D).)

* Minimum contribution to avoid a funding deficiency may vary with interest on late quarterly contributions, if applicable.

ACTUARIAL VALUATION FOR
NARRAGANSETT BAY COMMISSION
NON-UNION DEFINED BENEFIT PLAN
FOR THE PLAN YEAR 01/01/2005 THROUGH 12/31/2005

F. VALUES

1. BEGINNING OF PLAN YEAR	#	RPA '94
RETIRED PARTICIPANTS AND BENEFICIARIES RECEIVING PAYMENTS		
(i) VESTED		0
(ii) TOTAL	0	0
TERMINATED PARTICIPANTS		
(i) VESTED		65,992
(ii) NON-VESTED		3,658
(iii) TOTAL	5	69,650
ACTIVE PARTICIPANTS		
(i) VESTED		2,591,044
(ii) NON-VESTED		179,522
(iii) TOTAL	95	2,770,566
GRAND TOTALS		
(i) VESTED		2,657,036
(ii) NON-VESTED		183,180
(iii) TOTAL	100	2,840,216

2. EXPECTED BENEFIT PAYMENTS 0

3. EXPECTED CURRENT LIABILITY INCREASE AS OF 01/01/2005 207,972

4. PRESENT VALUE OF VESTED BENEFITS FOR PBGC.....RIR NOT IN FILE AND/OR PUBLISHED

5. ACTUARIAL EQUIVALENCE BASIS	#	VESTED	NON-VESTED	TOTAL
(i) ACTIVE	95	3,071,653	206,602	3,278,255
(ii) RETIRED	0	0	0	0
(iii) DEFERRED VESTED	0	0	0	0
(iv) POSTPONED RETIREMENT	0	0	0	0
(v) TERMINATED VESTED	3	73,718	0	73,718
(vi) TERMINATED NON-VESTED	2	0	4,369	4,369
(vii) INACTIVE	0	0	0	0
(viii) TOTAL	100	3,145,371	210,971	3,356,342

6. ENTRY AGE ACCRUED LIABILITY 5,841,205

ACTUARIAL VALUATION FOR
NARRAGANSETT BAY COMMISSION
NON-UNION DEFINED BENEFIT PLAN
FOR THE PLAN YEAR 01/01/2005 THROUGH 12/31/2005

G. AMORTIZATION BASES

412 BASES

DATE ESTABLISHED	INITIAL LIABILITY	----AMORTIZATION---- YEARS	AMOUNT	BALANCE	REASON
12/31/05	$5,841,205	30	$400,337	$5,841,205	INITIAL
TOTAL:	$5,841,205		$400,337	$5,841,205	

1. LAST YEAR'S REMAINING UNFUNDED ACCRUED LIABILITY.....$0.00
2. LAST YEAR'S NORMAL COST.....$0.00
3. FUND CONTRIBUTION FOR LAST YEAR.....$0.00
4. INTEREST ON THE FUND CONTRIBUTION.....$0.00
5. INTEREST ON ITEM (1+2-3-4).....$0.00
6. TOTAL..... (1+2-3-4+5) $0.00
7. ADJUSTMENT DUE TO ACTUARIAL ASSUMPTION OR PLAN CHANGES.....$0.00
8. REMAINING UNFUNDED LIABILITY.....$5,841,205.00

H. EQUATION OF BALANCE

1. UNAMORTIZED BASES.....$5,841,205.00
2. CREDIT BALANCE.....(FUNDING DEFICIENCY).....$0.00
3. ACCUMULATED RECONCILIATION AMOUNT.....$0.00
4. UNFUNDED LIABILITY.....(1 - 2 - 3).....$5,841,205.00

SCHEDULE B FUNDING STANDARD ACCOUNT FOR
NARRAGANSETT BAY COMMISSION
NON-UNION DEFINED BENEFIT PLAN
FOR THE PLAN YEAR 01/01/2005 THROUGH 12/31/2005

9 Funding standard account statement for this plan year

	CHARGES TO FUNDING STANDARD ACCOUNT:		
a	Prior year funding deficiency, if any		$0
b	Employer's normal cost for the plan year as of valuation date		$281,104
c	Amortization charges as of valuation date	Outstanding Balance	
	(1) All bases except funding waivers	($5,841,205)	$400,337
	(2) Funding waivers	($0)	$0
d	Interest as applicable on lines 9a, 9b, and 9c		$0
e	Additional interest charge due to late quarterly contributions, if applicable		$0
f	Additional funding charge for certain non-multiemployer plans with more than 100 participants, if applicable		$0
g	Total charges. Add lines 9a through 9f		$681,441
	CREDITS TO FUNDING STANDARD ACCOUNT:		
h	Prior year credit balance, if any		$0
i	Employer contributions. Total from column (b) of line 3a		$726,896
		Outstanding Balance	
j	Amortization credits as of valuation date	($0)	$0
k	Interest as applicable to end of plan year on lines 9h, 9i, and 9j		$20,313
l	Full funding limitation (FFL) and credits		
	(1) ERISA FFL accrued liability	$6,138,884	
	(2) "OBRA '87" FFL (170% current liability FFL)	N/A	
	(3) "RPA '94" override (90% current liability FFL)	$2,907,971	
	(4) FFL credit		$0
m	(1) Waived funding deficiency		$0
	(2) Other credits		$0
n	Total credits, Add lines 9h through 9k, 9l(4), 9l(5), 9m(1) and 9m(2)		$747,209
o	Credit balance: If line 9n is greater than line 9g, enter the difference		$65,768
p	Funding deficiency: If line 9g is greater than line 9n, enter the difference		$0

PLAN SPECIFICATIONS
NARRAGANSETT BAY COMMISSION
NON-UNION DEFINED BENEFIT PLAN

FOR THE PLAN YEAR 01/01/2006 THROUGH 12/31/2006

TYPE OF ENTITY — Corporation.

DATES — Effective-02/01/2005 Valuation-12/31/2006 Eligibility-12/31/2006 Year-end-12/31/2006

ELIGIBILITY — Minimum age- 21 Months of service- 12 Maximum age- None
Age at last birthday. Other ages at nearest birthday.
Entry Age For Full Funding Limitation Calculation - as of date of hire.

HOURS REQUIRED FOR
Eligibility - 1000 Benefit accrual - 1000 Vesting - 1000

PLAN ENTRY - January 1 of the year coincident with or following satisfaction of eligibility requirements.

RETIREMENT — NORMAL - First of month coincident with or following attainment of age 65, and completion of 5 years of participation.

EARLY - Upon attainment of age 62, and completion of 20 years of service. (100% Vested upon satisfaction of early retirement provisions).

AVERAGE COMPENSATION -- (retrospective salaries)

FUNDING - 3 Highest consecutive years of last 10 years.
ACCRUED BENEFIT - 3 Highest consecutive years of last 10 years.

PLAN BENEFITS

RETIREMENT-- 1.000% of average monthly compensation multiplied by total years of service limited to 30 years.

415 Limits - Percent 100.00 Dollar - $14,583

Minimum benefit - None Maximum benefit - None

Maximum 401(a)(17) compensation $220,000

PLAN SPECIFICATIONS
NARRAGANSETT BAY COMMISSION
NON-UNION DEFINED BENEFIT PLAN

FOR THE PLAN YEAR 01/01/2006 THROUGH 12/31/2006

NORMAL FORM	Life Annuity.
DEATH BENEFIT	Present value of accrued benefits.
ACCRUED BENEFIT	1.000% of average monthly compensation multiplied by total years of service limited to 30 years.
TERMINATION BENEFITS	100% vested in year 7, 0% vested in prior years. Service is calculated using all years of service.
CONTRIBUTIONS	
	EMPLOYEE REQUIRED -- None
	EMPLOYEE VOLUNTARY -- None
ASSET VALUATION METHOD	Market value.

PLAN SPECIFICATIONS
NARRAGANSETT BAY COMMISSION
NON-UNION DEFINED BENEFIT PLAN

FOR THE PLAN YEAR 01/01/2006 THROUGH 12/31/2006

PLAN ASSUMPTIONS

ACTUARIAL COST METHOD: Aggregate entry age normal with frozen initial liability.

PRE-RETIREMENT: INTEREST ASSUMED FOR DEPOSIT-- 6.000% Compounded annually

MORTALITY TABLE --	1994 GROUP ANNUITY RESERVING.
TURNOVER/DISABILITY--	T2 .
COST OF VESTING --	Yes.
SALARY SCALE --	Salaries assumed to increase at 3.500% per year.
INTEGRATION LVL INCR-	None.
BACKWARD SALARY PROJ.	Based on increases of average earnings

POST RETIREMENT: ANNUITY FACTORS BASED ON:

INTEREST --	6.000%
MORTALITY TABLE --	1994 GROUP ANNUITY RESERVING.
EXPENSE LOAD --	None
COST OF LIVING --	None
LOAD FOR ANCILLARY BENEFITS --	None

* PVB for inactives based on funding assumptions.

ASSUMPTIONS FOR PRESENT VALUE OF ACCRUED BENEFIT CALCULATIONS

PRE-RETIREMENT:	INTEREST --	6.000%
	MORTALITY TABLE --	1994 GROUP ANNUITY RESERVING.
POST-RETIREMENT:	INTEREST --	6.000%
	MORTALITY TABLE --	1994 GROUP ANNUITY RESERVING.

ASSUMPTIONS FOR "RPA '94" MINIMUM CURRENT LIABILITY CALCULATIONS

PRE-RETIREMENT:	INTEREST --	5.770%
	MORTALITY TABLE --	1983 GROUP ANNUITY.
POST-RETIREMENT:	INTEREST --	5.770%
	MORTALITY TABLE --	1983 GROUP ANNUITY.

PLAN SPECIFICATIONS
NARRAGANSETT BAY COMMISSION
NON-UNION DEFINED BENEFIT PLAN

FOR THE PLAN YEAR 01/01/2006 THROUGH 12/31/2006

ASSUMPTIONS FOR 410(b)/401(a)(4) CALCULATIONS

PRE-RETIREMENT:	INTEREST --	7.500%
POST-RETIREMENT:	INTEREST --	7.500%
	MORTALITY TABLE --	1994 GROUP ANNUITY RESERVING Unisex Proj to 2002 male rates.

PERMISSIVELY AGGREGATED PLANS: Not Tested as Single Plan.

COMPENSATION: Use Current Compensation to calculate the Benefit Accrual Rate (Annual Method).

TESTING AGE: Normal Retirement Age.

NARRAGANSETT BAY COMMISSION
DEFINED BENEFIT PLAN

December 31, 2006

STATEMENT OF INCOME AND EXPENSES

BEGINNING BALANCE		$ 749,690.03
INCOME:		
Total Plan Contribution	$ 691,261.10	
Total Gain/Loss	112,034.25	
TOTAL INCOME		803,295.35
EXPENSES:		
Participant Distributions		
B. Cox	$ (775.46)	
J. Flaherty	(1,315.27)	
TOTAL EXPENSES:		(2,090.73)
ENDING BALANCE		$ 1,550,894.65

SUMMARY OF CONTRIBUTIONS

SOURCE:	Deposits as of Valuation Date	Receivable due as of Valuation Date	TOTAL
Employee Contributions	$ 294,142.11	$ 0.00	$ 294,142.11
Employer Contributions	294,142.11	0.00	294,142.11
Additional Employer Contributions	102,976.88	0.00	102,976.88
TOTAL PLAN CONTRIBUTION	$ 691,261.10	$ 0.00	$ 691,261.10

STATEMENT OF ASSETS AND LIABILITIES

ASSETS	
Nationwide	$ 1,550,914.65
Receivable Contribution	0.00
TOTAL ASSETS	$ 1,550,914.65
LIABILITIES	
Participants Equity	$ 1,550,914.65
TOTAL LIABILITIES	$ 1,550,914.65

ACTUARIAL VALUATION FOR
NARRAGANSETT BAY COMMISSION
NON-UNION DEFINED BENEFIT PLAN
FOR THE PLAN YEAR 01/01/2006 THROUGH 12/31/2006

A. VALUATION AS OF 12/31/2006

1. PRESENT VALUE OF BENEFITS	$9,790,780.00
A. ACTIVE	$9,533,768.00
B. RETIRED / LATE (POSTPONED) RETIREES	$0.00
C. DEFERRED VESTED / VESTED TERMINEES	$257,012.00
2. ASSETS	$859,634.00
3. REMAINING UNFUNDED LIABILITY	$5,697,606.00
4. PRESENT VALUE OF FUTURE NORMAL COST.....(1 - 2 - 3)	$3,233,540.00
5. PRESENT VALUE OF FUTURE COMPENSATION	$67,359,995.00
6. CURRENT COMPENSATION	$5,769,487.00
7. WEIGHTED AVERAGE TEMPORARY ANNUITY.....(5 / 6)	11.6752
8. NORMAL COST.....(4 / 7)	$276,958.00

ACTUARIAL VALUATION FOR
NARRAGANSETT BAY COMMISSION
NON-UNION DEFINED BENEFIT PLAN
FOR THE PLAN YEAR 01/01/2006 THROUGH 12/31/2006

B. FULL FUNDING LIMITATION	---412---	---404---
1. A. ENTRY AGE ACCRUED LIABILITY	$6,549,837.00	$6,549,837.00
B. ENTRY AGE NORMAL COST	$297,189.00	$297,189.00
C. NET PREMIUMS	$0.00	$0.00
D. TOTAL	$6,847,026.00	$6,847,026.00
2. ASSETS	$859,634.00	$859,634.00
3. CREDIT BALANCE [412] / UNDEDUCTED CONTRIBUTIONS [404]	$69,714.00	$0.00
4. NET ASSETS....(2-3)	$789,920.00	$859,634.00
5. INTEREST ON (1D-4) TO END OF YEAR	$0.00	$0.00
6. FULL FUNDING LIMITATION 1 (NOT LESS THAN ZERO)...(1D-4+5)	$6,057,106.00	$5,987,392.00
RPA '94 MINIMUM FULL FUNDING LIMITATION		
7. A. RPA '94 CURRENT LIABILITY AS OF 01/01/2006	$3,405,963.00	$3,405,963.00
B. EXPECTED CURRENT LIABILITY INCREASE	$538,924.00	$538,924.00
C. INTEREST ON 7A AND 7B	$227,620.00	$227,620.00
D. EXPECTED BENEFIT PAYMENTS	$0.00	$0.00
E. .90 * (7A + 7B + 7C - 7D)	$3,755,256.00	$3,755,256.00
8. A. ASSETS	$859,634.00	$859,634.00
B. INTEREST TO END OF YEAR	$0.00	$0.00
C. EXPECTED BENEFIT PAYMENTS	$0.00	$0.00
9. 412(c)(7)(E) FULL FUNDING LIMIT AMOUNT ITEMS 7E-(8A+8B-8C)	$2,895,622.00	$2,895,622.00
10. FULL FUNDING LIMITATION.....(GREATER OF 6 AND 9)	$6,057,106.00	$5,987,392.00

ACTUARIAL VALUATION FOR
NARRAGANSETT BAY COMMISSION
NON-UNION DEFINED BENEFIT PLAN
FOR THE PLAN YEAR 01/01/2006 THROUGH 12/31/2006

C. ACCUMULATED FUNDING DEFICIENCY

1. PRIOR YEAR FUNDING DEFICIENCY	$0.00
2. VALUATION NORMAL COST	$276,958.00
3. AMORTIZATION CHARGES	$400,337.00
4. INTEREST	$0.00
5. ADDITIONAL FUNDING CHARGE	$0.00
6. TOTAL CHARGES.....(1 + 2 + 3 + 4 + 5)	$677,295.00
7. AMORTIZATION CREDITS	$0.00
8. INTEREST	$0.00
9. TOTAL CREDITS.....(7 + 8)	$0.00
10. DEFICIENCY.....(IGNORING CREDIT BALANCE AND CONTRIBUTION FOR LAST YEAR).....(6 - 9)	$677,295.00
11. FULL FUNDING LIMITATION CREDIT (C10 - B10) NOT < 0	$0.00

D. AMORTIZATION OF OBRA 87 FULL FUNDING LIMITATION CREDIT

NOT APPLICABLE

ACTUARIAL VALUATION FOR
NARRAGANSETT BAY COMMISSION
NON-UNION DEFINED BENEFIT PLAN
FOR THE PLAN YEAR 01/01/2006 THROUGH 12/31/2006

E. REQUIRED CONTRIBUTION	MINIMUM	MAXIMUM
1. NORMAL COST	$276,958.00	$276,958.00
2. AMORTIZATION CHARGES	$400,337.00	$748,710.00
3. PRIOR YEAR FUNDING DEFICIENCY	$0.00	N/A
4. INTEREST	$0.00	$0.00
5. ADDITIONAL FUNDING CHARGE	$0.00	N/A
6. TOTAL CHARGES.....(1 + 2 + 3 + 4 + 5)	$677,295.00	$1,025,668.00
7. PRIOR YEAR CREDIT BALANCE	$65,768.00	N/A
8. AMORTIZATION CREDITS	$0.00	$0.00
9. INTEREST	$3,946.00	$0.00
10. MISCELLANEOUS CREDITS FFL CREDIT	$0.00	$0.00
11. TOTAL CREDITS.....(7 + 8 + 9 + 10)	$69,714.00	$0.00
12. REQUIRED CONTRIBUTION.....(6 - 11)	$607,581.00	$1,025,668.00
13. CREDIT BALANCE ASSUMING NO CONTRIBUTION.....(11 - 6)	$0.00	$0.00

14. UNFUNDED CURRENT LIABILITY (Not Less than Zero)

A. 150% of Current Liability.....$5,399,127.00
B. 100% of Current Liability.....$3,312,873.00

Current Liability calculated under Code Section 404(a)(1)(D) using 5.77% interest. Current liability equal to 150% or 100% of (B7A + B7B + B7C - B7D).

Assets equal ([B8A - B3 Undeducted contributions] * (1.060 if applicable)- B8C).

(Excess of RPA Current Liability over Assets (unreduced by credit balance) as of Valuation date. Liability attributable to benefit increases for HCE's due to amendments made or effective within last two years should not be considered.)

* Minimum contribution to avoid a funding deficiency may vary with interest on late quarterly contributions, if applicable.

ACTUARIAL VALUATION FOR
NARRAGANSETT BAY COMMISSION
NON-UNION DEFINED BENEFIT PLAN
FOR THE PLAN YEAR 01/01/2006 THROUGH 12/31/2006

F. VALUES

1. BEGINNING OF PLAN YEAR	#	RPA '94
RETIRED PARTICIPANTS AND BENEFICIARIES RECEIVING PAYMENTS		
(i) VESTED		0
(ii) TOTAL	0	0
TERMINATED PARTICIPANTS		
(i) VESTED		239,363
(ii) NON-VESTED		10,241
(iii) TOTAL	8	249,604
ACTIVE PARTICIPANTS		
(i) VESTED		2,958,966
(ii) NON-VESTED		197,393
(iii) TOTAL	93	3,156,359
GRAND TOTALS		
(i) VESTED		3,198,329
(ii) NON-VESTED		207,634
(iii) TOTAL	101	3,405,963

2. EXPECTED BENEFIT PAYMENTS	0
3. EXPECTED CURRENT LIABILITY INCREASE AS OF 01/01/2006	538,924

4. PRESENT VALUE OF VESTED BENEFITS FOR PBGC.....RIR NOT IN FILE AND/OR PUBLISHED

5. ACTUARIAL EQUIVALENCE BASIS	#	VESTED	NON-VESTED	TOTAL
(i) ACTIVE	93	3,673,743	217,875	3,891,618
(ii) RETIRED	0	0	0	0
(iii) DEFERRED VESTED	4	133,572	0	133,572
(iv) POSTPONED RETIREMENT	0	0	0	0
(v) TERMINATED VESTED	3	123,440	0	123,440
(vi) TERMINATED NON-VESTED	1	0	10,290	10,290
(vii) INACTIVE	0	0	0	0
(viii) TOTAL	101	3,930,755	228,165	4,158,920

6. ENTRY AGE ACCRUED LIABILITY	6,549,837

ACTUARIAL VALUATION FOR
NARRAGANSETT BAY COMMISSION
NON-UNION DEFINED BENEFIT PLAN
FOR THE PLAN YEAR 01/01/2006 THROUGH 12/31/2006

. AMORTIZATION BASES

		4 1 2 B A S E S			
	INITIAL	----AMORTIZATION----			
DATE ESTABLISHED	LIABILITY	YEARS	AMOUNT	BALANCE	REASON
12/31/05	$5,841,205	30	$400,337	$5,767,320	INITIAL
TOTAL:	$5,841,205		$400,337	$5,767,320	

1. LAST YEAR'S REMAINING UNFUNDED ACCRUED LIABILITY.....$5,841,205.00
2. LAST YEAR'S NORMAL COST.....$281,104.00
3. FUND CONTRIBUTION FOR LAST YEAR.....$726,896.00
4. INTEREST ON THE FUND CONTRIBUTION.....$20,313.00
5. INTEREST ON ITEM (1+2-3-4).....$322,506.00
6. TOTAL..... (1+2-3-4+5) $5,697,606.00
7. ADJUSTMENT DUE TO ACTUARIAL ASSUMPTION OR PLAN CHANGES.....$0.00
8. REMAINING UNFUNDED LIABILITY.....$5,697,606.00

H. EQUATION OF BALANCE

1. UNAMORTIZED BASES.....$5,767,320.00
2. CREDIT BALANCE.....(FUNDING DEFICIENCY).....$69,714.00
3. ACCUMULATED RECONCILIATION AMOUNT.....$0.00
4. UNFUNDED LIABILITY.....(1 - 2 - 3).....$5,697,606.00

SCHEDULE B ACTUARIAL INFORMATION FOR
NARRAGANSETT BAY COMMISSION
NON-UNION DEFINED BENEFIT PLAN
FOR THE PLAN YEAR 01/01/2006 THROUGH 12/31/2006

Basic Information

1a	Actuarial valuation date:	12/31/2006
b	Assets:	
	(1) Current value of assets	$859,634
	(2) Actuarial value of assets for funding standard account	$859,634
c	(1) Accrued liability for plans using immediate gain method	N/A
	(2) Information for plans using spread gain methods	
	(a) Unfunded liability for methods with bases	$5,697,606
	(b) Accrued liability under the entry age normal method	$6,549,837
	(c) Normal cost under the entry age normal method	$297,189
d	Information on current liabilities of the plan:	
	(1) Amount excluded from current liability attributable to pre-participation service	$0
	(2) "RPA '94" information:	
	(a) Current liability	$3,602,487
	(b) Expected increase in current liability due to benefits accruing during the plan year	$570,020
	(c) Current liability computed with highest allowable interest rate	$3,602,484
	(d) Expected release from "RPA '94" current liability for the plan year	$0
	(3) "OBRA '87" information:	
	(a) Current liability	N/A
	(b) Expected increase in current liability due to benefits accruing during the plan year	N/A
	(c) Expected release from "OBRA '87" current liability for the plan year	N/A
	(4) Expected plan disbursements for the plan year	$0
2	Operational information as of the beginning of this plan year:	
a	Current value of the assets as reported on Form 5500, 5500-C/R, or 5500-EZ	$749,690

b "RPA '94" current liability:	Number	Vested	Total
(1) For retired participants and beneficiaries receiving benefits	0	0	0
(2) For terminated vested participants	7	239,363	239,363
(3) For active participants	93	2,958,966	3,156,359
(4) Total	100	3,198,329	3,395,722

c	Percentage of 2a divided by 2b(4), if less than 70% else N/A	22.08%
4	Quarterly contributions and liquidity shortfall(s):	
a	Plans other than multiemployer plans, enter funded current liability percentage for preceding year.	100.0%

7 New amortization bases established in the current plan year:

Type of base	Initial Base	Amortization amount

SCHEDULE B FUNDING STANDARD ACCOUNT FOR
NARRAGANSETT BAY COMMISSION
NON-UNION DEFINED BENEFIT PLAN
FOR THE PLAN YEAR 01/01/2006 THROUGH 12/31/2006

9 Funding standard account statement for this plan year

	CHARGES TO FUNDING STANDARD ACCOUNT:		
a	Prior year funding deficiency, if any		$0
b	Employer's normal cost for the plan year as of valuation date		$276,958
c	Amortization charges as of valuation date	Outstanding Balance	
	(1) All bases except funding waivers	($5,767,320)	$400,337
	(2) Funding waivers	($0)	$0
d	Interest as applicable on lines 9a, 9b, and 9c		$0
e	Additional interest charge due to late quarterly contributions, if applicable		$0
f	Additional funding charge for certain non-multiemployer plans with more than 100 participants, if applicable		$0
g	Total charges. Add lines 9a through 9f		$677,295
	CREDITS TO FUNDING STANDARD ACCOUNT:		
h	Prior year credit balance, if any		$69,768
i	Employer contributions. Total from column (b) of line 3a		$691,281
		Outstanding Balance	
j	Amortization credits as of valuation date	($0)	$0
k	Interest as applicable to end of plan year on lines 9h, 9i, and 9j		$24,855
l	Full funding limitation (FFL) and credits		
	(1) ERISA FFL accrued liability	$6,057,106	
	(2) "OBRA '87" FFL (170% current liability FFL)	N/A	
	(3) "RPA '94" override (90% current liability FFL)	$2,895,622	
	(4) FFL credit		$0
m	(1) Waived funding deficiency		$0
	(2) Other credits		$0
n	Total credits, Add lines 9h through 9k, 9l(4), 9l(5), 9m(1) and 9m(2)		$781,904
o	Credit balance: If line 9n is greater than line 9g, enter the difference		$104,609
p	Funding deficiency: If line 9g is greater than line 9n, enter the difference		$0

COMM 2-13 With regard to compensated absences, please provide the detail behind the $250,000 adjustment to the non-union employees' annual cost. Has an adjustment been made to compensated absences for union employees? If so, explain.

The NBC is projecting approximately 13 additional employees will become eligible for the sick compensated absences by FY 2015. The average increase to compensated absences is approximately $19,230 (13 x $19,230= 249,990). The $250,000 adjustment includes both union and non-union employees.

By: WEE

COMM 2-14 Provide any and all studies on stormwater runoff and/or the feasibility of implementing a stormwater runoff fee.

Attached please find a copy of the Parsons study. This study was previously provided to the PUC in Docket 3432.

By: WEE

NARRAGANSETT BAY COMMISSION

Final Report – Stormwater Fee Study

March 4, 2002

Prepared by: Parsons Engineering Science, Inc.

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FINAL REPORT SUMMARY OF STORMWATER FEE STUDY FINDINGS

ES F.1 EXECUTIVE SUMMARY

ES F.1.1 Introduction

This project was executed for the Narragansett Bay Commission (NBC) for the purpose of identifying a user-based revenue source to fund a portion of the Combined Sewer Overflow (CSO) Abatement Program costs. The recommendations found in this document are based on Parsons evaluation of the NBC's authority to charge a user fee, an analysis of the existing billing structure, and an inventory of data sources and assumptions made on the nature of benefits to be provided by the CSO Abatement Program. Parsons has determined that it is appropriate to integrate a new user charge component on the existing sewer utility bill that would be dedicated to the recovery of all, or any portion of the NBC's costs that are associated with the CSO Abatement Program. To facilitate the collection of this user charge, two rate models are presented for the NBC's consideration. Both models are based on a rational nexus between impervious area and the runoff that leaves a given property during a rain event.

What type of fee program might be created? Parsons recommends that a user charge be developed and implemented, based on the amount of runoff that can be expected to leave eligible properties during rain events. Structured in a similar manner to stormwater utility programs implemented across the country, this study presents two alternatives that use the amount of impervious area on a parcel as the rational nexus for stormwater runoff. Parsons recommends that the charge be identified as the CSO Abatement Program fee, an added component on the sewer utility fee structure rather than a new stormwater fee. This is consistent with the NBC's existing authority to impose sewer system utility fees and it is appropriate since substantial benefit will be provided to the NBC collection and treatment systems by the construction of the CSO Abatement Program projects.

Who will pay? The universe of properties (or accounts) that place a runoff burden on the capacity of the NBC's sewer collection and treatment systems can be defined in a number of different ways. Parsons finds that the CSO Abatement Program provides a number of benefits to the properties within the general NBC sewer service area, the most obvious being the enhanced quality of life provided by the protection of water quality throughout the ten member-community region. That enjoyment, however, is a "general" benefit and not easily related to an equitable distribution of program costs to individual parcels. The program also provides a benefit to properties in the greater sewer service area through the protection of wastewater treatment capacity that is currently diminished by the delivery of excessive flows to the NBC's treatment plants during wet weather conditions. Further, it is known that the scope of the CSO Abatement Program projects is influenced by not only the amount of runoff delivered via combined conveyance systems, but the infiltration and inflow of groundwater and stormwater runoff into all structures and pipes included in the sewer system infrastructure. It can also be argued that parcels with direct or indirect connections to combined sewer systems may place a larger and

more measurable burden on the NBC collection and treatment systems than parcels in separated sewer service areas, assuming the information is available to determine that.

Legal Sufficiency In order for any utility charge to meet the test of legal sufficiency it must be equitable, tied to a tangible service or benefit, and based on the best available information. The determination of whether all properties in the ten member-community NBC Service Area, or just those in the Combined Sewer Service (CSS) Area (generally within the cities of Providence, Pawtucket and Central Falls) are to receive a CSO Abatement Program fee is a critical decision to be made by the NBC prior to the implementation of the user fee. For that reason, Parsons has presented two alternative rate models that address each geographic approach option.

Report Contents Leading to the presentation of the Final Report, this project included the submittal of three technical memorandums documenting various stages of the study and Parsons interpretation of the unique aspects of the NBC's charter, the physical systems of the NBC and member communities, and the ongoing CSO Abatement Program. Documents attached to this final report include:

Technical Memorandum for Task A – Preparation of a Stormwater Feasibility Study

Technical Memorandum for Task B – Development/Design of Stormwater Fee Structure Alternatives

Technical Memorandum for Task C – Assessment of Administrative Considerations and Addendum to Task C, Impervious Area Model Alternative

ES F.1.2 Fee Structure Alternatives

Two alternative fee structures are recommended for consideration by the NBC. The purpose of developing two alternatives was to provide decision makers with maximum flexibility in setting a course for a CSO Abatement Program user charge; a fee that would be equitable, legally sufficient, politically acceptable and provide a dependable funding source.

The two recommended alternatives for consideration by the NBC are a Land Use Model alternative and a Modified Impervious Area alternative. Both models are based on the theory that the amount of stormwater runoff generated by a given parcel of land is tied to the amount of impervious coverage on that parcel of land. Impervious area, in this case, includes the "hard surfaces" constructed on a property, such as the building footprints and paved surfaces within the property's boundary.

The Land Use Model assigns impervious coverage to a parcel based on its assigned land use class and the imputed impervious coverage value for that class. The traditional Impervious Area Model assigns impervious coverage to a parcel based on the unique impervious area associated with each parcel. Parsons has modified the traditional Impervious Area Model through the assignment of billing unit values to certain

residential parcels based on sampled data and the dwelling unit information found in the existing NBC billing system. Table ES F.1 summarizes the two recommended alternatives.

Table ES F.1
Description of Recommended Alternatives

Alternative No.	Eligible Parcels*	Description
1. Land Use Model	All parcels within the ten member-community NBC service area including "free riders".	"Land Use Factors" ("imperviousness" per acre) are developed for specific Land Uses. This factor is applied to the gross lot size of all "General" parcels (residential > 6 units, commercial and industrial) to develop their imputed impervious area. All residential accounts having 1-3 units (Tier 1) or 4-6 units (Tier 2) are assigned a uniform billing unit value based on the amount of impervious found on a "typical" Tier 1 account. All other parcels are assigned an Equivalent Billing Unit (EBU) value specific to their impervious area (assigned using the "Land Use Factor".) The runoff-based user fee paid by each account is the product of the account's designated EBU's multiplied by the established flat rate per EBU.
*Eligible parcels are those that contribute either sanitary sewerage and/or stormwater to the NBC collection and treatment systems by direct or indirect sanitary sewer or stormwater connections.		
2. Modified Impervious Area Model	All parcels within the combined sewer service area (many of the parcels in Providence, Pawtucket, and Central Falls) and all "free riders" in the ten member-community service area	This model requires the assignment of the same billing categories as Alternative No. 1 and an Equivalent Billing Units (EBU) is developed in essentially the same manner for parcels in the General billing class, however, impervious area specific to each parcel is determined through measurement or other reliable means of data collection. An EBU is then assigned to each parcel based on the impervious area of each parcel and the runoff-based user fee paid by each account is the product of multiplying the parcel's billing unit (number of EBU's) times the established flat rate per EBU.
*Eligible parcels are those that contribute stormwater to the NBC collection and treatment systems by direct or indirect stormwater connections.		

ES F.1.3 Other Fee Structure Components

Table ES F.2 summarizes other components of the fee structures for the two recommended alternatives.

Table ES F.2
Summary of Fee Structure Components

Components	Alternative No. 1 – Land Use Model	Alternative No. 2 – Modified Impervious Area Model
Number of Accounts	Tier 1: 69,214 Tier 2: 2,333 General: 8,639 "Free Riders": 600 (est.) Total: 80,786	Tier 1: 43,723 Tier 2: 2,017 General: 6,451 "Free Riders": 600 (est.) Total: 52,791
Exemptions	For vacant property and rights-of-way	For vacant property and rights-of-way
Mitigation Credits	Not recommended for parcels with imputed impervious area values (all parcels)	Recommended for parcels with calculated impervious area values (primarily parcels in the General billing class)
Waivers	For parcels that demonstrate no contribution of sanitary sewerage or stormwater to the NBC system	For parcels that demonstrate no contribution of stormwater to the NBC system
Surcharges	Applied to "free riders"	Applied to "free riders"

ES F.1.4 Implementation

While other equitable fee structure alternatives could be developed for the NBC, these alternatives are recommended because they will offer an acceptable balance between equity and cost to implement. The cost of implementation is closely related to the cost of developing reliable data in the study area. Required study-wide data is available electronically from the NBC billing system and in RIGIS. This data is generally up-to-date, accurate, and easy to manipulate. Parcel level data needed from the ten member-communities is largely unavailable in an electronic format, adding substantial time and expense to the data collection effort.

Both alternatives apply a similar approach to development of the runoff-based utility fee to be collected from Tier 1 and Tier 2 residential properties. This approach takes advantage of the existing data in the NBC billing system and standard sampling methodologies, minimizing the implementation costs for approximately 85% of all eligible parcels. A hands on approach will be required for the development of fees for the parcels in the General billing class. Based on available data, a variety of sources and data collection methods will be required and will subsequently increase the level of effort required to develop a user charge for these parcels. It is important to note that regardless of the alternative selected, the revenue potential for revenue generate is significant relative to both the implementation and ongoing administrative costs. Table ES F.3 summarizes estimated costs for development, implementation, administration, and management of the fee program for each alternative. Potential revenue for each

alternative is included for comparison. Implementation costs assume work is performed over a 6-month period.

Table ES F.3
Summary of Estimated Costs and Revenue – Both Alternatives

Alternative No.	Implementation Cost (one-time)	Ongoing Administration Cost (per year)	Revenue Potential* (per year)
1. Land Use Model	$526,720	$155,000	$1.98 Million
2. Modified Impervious Area Model	$579,900	$155,000	$1.41 Million

*Note: Revenue estimates based on estimated number of EBU's calculated for each alternative and assumes a flat rate of $1.00/Month/EBU not including surcharges on potential "free riders" or waivers. Actual number of EBU's and monthly rate will be determined during implementation.

F.1 DEFINITION OF TERMS

F.1.1 Background

This section attempts to define the terms used in this report and the supporting technical memorandums for purposes of clarity and to assist the reader in understanding the findings and recommendations presented. During the course of this study some terms have evolved. Parsons initiated work on this project using terms and definitions based on our past experience with stormwater fee studies and has constantly evolved those terms to make them meaningful and specific to the unique aspects of this study. Parsons has attempted to apply those terms consistently through out the course of the project. However, differences may exist between descriptions and definitions used in previous technical memorandums and those used in the final report. Any differences are an indication of the project team's evolution in thinking about and defining aspects of this project – a natural progression for any stormwater fee study – and are not intended to be contradictory or confusing. Table F.1.1 lists key terms and definitions used in this study.

Table F.1.1
Definition of Key Terms

Term	Definition
Eligible Parcel	A parcel receiving benefit from the CSO Abatement Program and eligible to receive a runoff-based user fee. Various criteria define eligible parcels and the choice will be based on NBC policy decisions.
Utility Charge	Charge (or fee) collected from those properties receiving a specific use or benefit from a given utility system. The amount to be collected from each property based on the relative benefit received in accordance with other similar properties.
CSO Abatement Program Fee	User fee based on the amount of stormwater expected to "runoff" a property in a specific storm event, whose impact must be either collected, conveyed or treated by facilities owned and operated by the NBC.
Impervious Area	Surface features or improvements that generate stormwater runoff on a parcel.
Land Use	Designations for the types of development on a given parcel. (eg; single family residential, commercial, etc.)
Rational Nexus	The reasonable relationship between the amount of benefit received by a parcel, in terms of runoff generated, and the amount the parcel is charged.
Benefit Area	The geographic area containing all eligible parcels.
Service Area	The geographic area containing eligible parcels and used interchangeably with Benefit Area when applied to runoff.
Combined Sewer Service Area	The geographic area containing eligible parcels in the Cities of Providence, Pawtucket, and Central Falls.

Term	Definition
NBC Sewer Service Area	The geographic area containing existing NBC accounts for sanitary sewer charges.
Benefiting Parcels	Used interchangeably with Eligible Parcels.
Free Riders	Parcels that meet the criteria for eligible parcels under the various alternatives but that do not currently receive a NBC sanitary sewer bill.

F.2 SUMMARY OF ALTERNATIVE NO. 1 – LAND USE APPROACH

F.2.1 Introduction

This alternative considers the use of land use classifications and imputed impervious area as the rational nexus for determining the relative amounts of runoff that will leave an eligible parcel during a specific storm event. The model requires the assignment of a billing class code (Residential or General) to each account to facilitate the calculation of that account's billing charge. It is designed to take full advantage of coding that already exists within the NBC billing system, such as the NBC's assignment of the number of dwelling units. This approach eliminates the need to generate site-specific data for the vast majority of residential properties, approximately 85% of potential accounts.

F.2.2. Who Would Pay?

Under this alternative, parcels that are direct or indirect contributors of sanitary sewerage and/or stormwater to the NBC collection and treatment systems would be required to pay a CSO Abatement Program fee. This group includes virtually all developed properties located in the NBC's ten member-community sewer service area that have current accounts as well as those properties that are identified as "free riders".

Inclusion of all ten member-communities in this alternative is consistent with the NBC's existing authority to impose sewer system utility fees. The CSO Abatement Program provides a number of benefits to the properties within the NBC's sewer service area, the most obvious being the enhanced quality of life provided by the protection of water quality throughout the ten member-community region. The program also provides a benefit to properties in the greater sewer service area through the protection of wastewater treatment capacity that is currently diminished by the delivery of excessive flows to the NBC's treatment plants during wet weather conditions. Further, it is known that the scope of the CSO Abatement Program projects is influenced by not only the amount of runoff delivered via combined conveyance systems, but the infiltration and inflow of groundwater and stormwater runoff into all structures and pipes included in the sewer system infrastructure.

F.2.3 How Would the Rate be Applied?

The rate model used to develop this alternative is a Land Use Model. User charges for accounts in the residential billing class are calculated based on their "tier assignment" (1 to 3 dwelling units in Tier 1; and 4 to 6 dwelling units in Tier 2). All other user charges

are calculated by multiplying the rate per Equivalent Billing Unit (EBU) by the number of assigned EBU's (determined by "Land Use Factors", land use, and property size.)

F.2.4 Development of the Land Use Rate Structure

The Land Use model, using runoff as its rational nexus, features the development and application of "factors" of imperviousness for homogenous development within each billing class. The Land Use model can be modified to take full advantage of coding that already exists within the NBC billing system, namely the number of dwelling units and should be applied to all eligible parcels in the ten member-communities of the NBC service area This alternative is based on the premise that all eligible parcels within the ten member-community service area receive benefit from the capacity upgrades that the CSO Abatement Program creates.

F.2.5 Recommended Billing Classes

The manner in which CSO Abatement Program fees are calculated is based on the billing class to which each account is assigned. It is recommended that two broad categories, Residential and General by used in this alternative. This assignment is based on information found in the current NBC billing system.

TABLE F.2.1
Assignment of CSO Fee Categories to Existing NBC Customer Types
Source of Customer Type Information: February 2002 NBC Billing System Data

NBC Assigned Customer Type	NBC Assigned Dwelling Units	CSO Fee Class
Residential	1	Residential Tier 1
Residential	2	Residential Tier 1
Residential	3	Residential Tier 1
Residential	4	Residential Tier 2
Residential	5	Residential Tier 2
Residential	6	Residential Tier 2
Residential	>6	General
Commercial	>0	General
Industrial	>0	General

F.2.5.1 Residential Class: It is recommended that two residential "tiers" be established within the "Residential" billing class. The number of residential accounts located in the ten member-community service is shown in Table F.2.2. It is recommended that the Residential accounts (with less than four dwelling units) be assigned to Tier 1. Likewise, it is recommended that the Residential accounts (with between four and six dwelling units) be assigned to Tier 2.

TABLE F.2.2
Number of Accounts in the Ten Member-Community Service Area
Source of Customer Type Information: February 2002 NBC Billing System Data

Rate Model	Residential Tier 1 Accounts	Residential Tier 2 Accounts	General Accounts	Free Riders*	Total Accounts
Modified Impervious Area Model	69,214	2,333	8,639	600	80,786

*Estimated

F.2.5.2 General Class: It is recommended that residential accounts with more than six dwelling units, and all accounts coded either commercial or industrial by the existing NBC billing system be classified as "General" accounts. The number of "General" accounts located in the ten member-community service area is shown in Table F.2.2. The number of billing units assigned to each parcel in the "General" billing class is to be determined by the imputed impervious area value for each parcel's land use classification. Fees are calculated by multiplying the number of EBU's for a given land use classification by the adopted rate per EBU.

F.2.6 Determining the Billing Unit

To provide for billing equity, the assignment of relative EBU's must be achieved prior to the application of billing rates. This requires that sufficient data be acquired to develop a standard EBU by which all other accounts would be defined. It can be accomplished by evaluating a sample set of Tier 1 residential parcels from each community in the ten member-community service area to determine a median value for impervious area.

A sample set of Tier 2 residential parcels from each community must also be evaluated for the appropriate data set to develop a median value for impervious area. Once the impervious area values are known, EBU's can be developed for each rate class. For example, if the median impervious value associated with the sample set of residential properties in Tier 1 is 2,450 square feet and the respective value in Tier 2 is 4,410 square feet, then, Tier 1 accounts would default to a value of 1.0 EBUs and Tier 2 accounts would default to 1.8 EBUs.

For parcels in the "General" billing class, the imputed impervious area must be developed. That value, in square feet, is divided by the Tier 1 EBU value to determine the equivalent billing units for each "General" account. For example, if a "General" parcel is determined to have 18,620 square feet of impervious area, the assigned EBU value would be 7.6 relative to a Tier residential median impervious value of 2,450 square feet.

F.2.7 Quantifying the Number of Accounts to be Analyzed

The total number of accounts that would be generated under this alternative is estimated based on analysis of the existing NBC billing system, other available data, and field investigations performed during the course of this study. A more detailed breakdown of the types of accounts in the ten member-community service area are summarized in Table F.2.3

TABLE F.2.3
Number of Accounts Located in the Ten Member-Community Service Area by City
Source: February 2002 NBC Billing System Data

City	"Residential" Billing Category		"General" Billing Category		
	Residential 1 – 3 Dwelling Units	Residential 4 – 6 Dwelling Units	Residential Dwelling Units > 6	Commercial	Industrial
Central Falls	1,737	383	-	378	28
Cranston	60	0	-	18	
Cumberland	5,356	83	-	293	21
East Providence	3,240	15	-	322	36
Johnston	4,499	47	15	403	32
Lincoln	4,039	86	18	312	45
North Providence	8,294	85	53	584	18
Pawtucket	14,531	722	17	1,430	178
Providence	27,457	912	28	4,124	271
Smithfield	3	0	-	7	7
Total 10 M-C Service Area	**69,214**	**2,333**	**131**	**7,871**	**636**

F.2.8 Data Collection Tasks

Data collection is required to populate the Master Billing File and to validate and perform quality control measures. Data collection for this alternative during the implementation phase will require the identification of gross acreage data for all accounts in the "General" billing class within the ten member-community service area and imputation of the median impervious area value for all land use classes. Recommended data collection techniques include the use of electronic and hard copy records containing critical data, digitizing of impervious area using a combination of plat or parcel maps and aerials, and, if required, field measurement using a measuring wheel.

F.2.8.1 Sampling: The use of the "best available information" is the generally accepted criteria for legal defensibility. If acquisition and collection of reliable data is not possible, the use of sampling frames can be used, provided they employ generally accepted accounting and statistical procedures. The adequacy of the sampling set size cannot be overemphasized. The actual number of samples that will be needed, however,

cannot be determined at this time. To develop sample sizes, the interim measurement of a smaller dataset will be required for analysis. It is recommended that an initial sample size of no less than 15 properties be used for any given measurement task. Once the standard deviation and variance of the initial sample set is determined, the actual number of samples required can be more reliably determined. For populations of less than 15 total properties, it is recommended that the entire population be measured in the initial sample task. This procedure must be performed for each land use class and billing category.

F.2.9 Rate Structure Features

F.2.9.1 Exemptions: Parsons recommends the NBC adopt exemptions for vacant property and Rights-of-Way following specific definitions.

- **Vacant Property**: Vacant property defined as undeveloped land that has not been altered from its natural state and other properties containing or assigned a nominal (less than 500 sq. ft.) of impervious area should be exempted from a CSO Abatement Program fee. This will prevent undeveloped natural areas and small improvements such as dumpster pads from being charged.

- **Rights-of-Way:** Right-of-Way (R-O-W) parcels including residential streets, easements, and other public roads frequently serve as an important part of the conveyance system, carrying runoff to attenuation and other treatment facilities should be exempted from a CSO Abatement Program fee. Private roads, like driveways, are generally not designed to be a part of the conveyance system, and should be treated like other impervious areas.

F.2.9.2 Mitigation Credits: Mitigation credits are not recommended for use with this alternative. Application of the Land Use Model does not lend itself to the reduction of billing units as the factors developed are based on the sampling of parcels within a Land Use population and the removal of even a few properties would affect the Land Use "Factors". It is also not recommended that the NBC apply specific runoff values to properties whose impervious area value was "imputed" rather than measured through a mitigation credit policy.

While mitigation credits are not recommended at this time based on the implementation approach envisioned for this alternative, they may be viable in the future. In the event that reliable, site-specific impervious area information is made available or is collected, all, or portions of the Land Use Model structure could be converted to an Impervious Area Model. In that case, after conversion, the application of a mitigation credit would be strongly recommended.

F.2.9.3 Waivers: The use of waivers is recommended for this alternative. This provision is important from a legal standpoint to provide owners a way to opt out of services if they choose not to use them (removal or reduction of impervious surfaces) and a way to make adjustments for incorrectly charged parcels.

F.2.9.4 Surcharges: The application of a surcharge on all "free riders" is recommended for this alternative. This would include all accounts within the ten member-community NBC service area. The amount of the surcharge should be assigned based on the recent sewer charge adjustment that was approved to provide funding for the CSO Abatement Program. The amount of the surcharge should be proportional to the portion of the sewer rate increase that is being used to pay for the CSO Abatement Program.

F.3 SUMMARY OF ALTERNATIVE NO. 2 – MODIFIED IMPERVIOUS AREA APPROACH

F.3.1 Introduction

This alternative considers the use of impervious area, both measured and imputed, as the rational nexus for determining the relative amounts of runoff that will leave an eligible parcel during a specific storm event. The model requires the assignment of a billing class code (Residential or General) to each account to facilitate the calculation of that account's billing charge. It is designed to take full advantage of coding that already exists within the NBC billing system, such as the NBC's assignment of the number of dwelling units. This approach eliminates the need to generate site-specific data for the vast majority of residential properties, approximately 85% of potential accounts.

F.3.2 Who Would Pay?

Under this alternative, only those parcels that are direct or indirect contributors of stormwater to the NBC collection and treatment systems would be required to pay a CSO Abatement Program fee. This group includes many developed properties located in the Cities of Providence, Pawtucket and Central Falls including current NBC accounts and "free riders". This alternative assumes that parcels with direct or indirect stormwater connections to combined sewer systems, or storm sewers that discharge to the NBC collection system, place a larger burden on the collection and treatment system.

F.3.3 How Would the Rate be Applied?

This alternative uses a Modified Impervious Area Model. CSO Abatement Program fees for eligible parcels in the residential billing class are calculated based on their "tier assignment", in exactly the same manner as in the Land Use Model in Alternative No. 1. All other CSO Abatement Program fees are calculated by multiplying the rate per Equivalent Billing Unit (EBU) by the number of assigned EBU's determined by the impervious area assigned to each account through field measurement, digitizing from aerial photographs, or acquisition of impervious area information from other reliable sources.

F.3.4 Development of the Modified Impervious Area Rate Structure

The development and implementation of this alternative is based on the premise that the many properties within Providence, Pawtucket and Central Falls have a direct or indirect connection contributing stormwater to a "combined" stormwater/sewer system and subsequently to the NBC collection and treatment systems. For purposes of reference in this document, the geographic area that includes eligible properties within Providence,

Pawtucket and Central Falls will be called the "Combined Sewer Service (CSS) Area." In addition, it is assumed that each of the "developed" properties in the CSS Area will receive higher levels of benefit than other properties that are within the NBC's ten member-community sewer service area but that are not located within the CSS Area based on the direct or indirect stormwater connection premise.

F.3.5 Recommended Billing Classes

It is recommended that the same broad categories discussed for Alternative No. 1 are used for this alternative. The numbers of accounts in Tier 1, Tier 2, and General categories located in the three-city CSS Area are shown in Table F.3.2. The number of billing units assigned to each parcel in the "General" billing class is to be determined by the actual impervious area measured (or collected using a reliable method). Fees are calculated by multiplying the number of EBU's by the adopted rate per EBU.

TABLE F.3.2
Number of Accounts in Three-City CSS Area*
(Generally within Central Falls, Pawtucket and Providence)
Source of Customer Type Information: February 2002 NBC Billing System Data

Rate Model	Residential Tier 1 Accounts	Residential Tier 2 Accounts	General Accounts	Free Riders**	Total Accounts
Modified Impervious Area Model	43,723	2,017	6,451	600	52,791

*The figures presented for number of accounts in the three-city CSS Area above represent the total number of current NBC accounts in the cities of Providence, Pawtucket and Central Falls. The actual number of accounts in the CSS Area will be slightly less than the totals above because some parcels in the three cities discharge to separated sewer areas.
**Estimated

F.3.6 Determining the Billing Unit

To provide for billing equity, the assignment of relative EBU's must be achieved prior to the application of billing rates. This requires that sufficient data be acquired to develop a standard EBU by which all other accounts would be defined. It can be accomplished by evaluating a sample set of Tier 1 residential parcels from the CSS Area to determine a median value for impervious area.

A sample set of Tier 2 residential parcels must also be evaluated for the appropriate data set to develop a median value for impervious area. Once the impervious area values are known, EBU's can be developed for each rate class. For example, if the median impervious value associated with the sample set of residential properties in Tier 1 is 2,450 square feet and the respective value in Tier 2 is 4,410 square feet, then, Tier 1 accounts would default to a value of 1.0 EBUs and Tier 2 accounts would default to 1.8 EBUs.

For parcels in the "General" billing class, the measured impervious area must be developed. That value, in square feet, is divided by the Tier 1 EBU value to determine the equivalent billing units for each "General" account. For example, if a "General" parcel is determined to have 18,620 square feet of impervious area, the assigned EBU value would be 7.6 relative to a Tier residential median impervious value of 2,450 square feet.

F.3.7 Quantifying the Number of Accounts to be Analyzed

The total number of accounts that would be generated under this alternative is estimated based on analysis of the existing NBC billing system, other available data, and field investigations performed during the course of this study. A more detailed breakdown of the types of accounts in the CSS Area are summarized in Table F.3.3

TABLE F.3.3
Number of Accounts Located in the CSS Area by City
Source: February 2002 NBC Billing System Data

City*	"Residential" Billing Category		"General" Billing Category		
	Residential 1 – 3 Dwelling Units	Residential 4 – 6 Dwelling Units	Residential Dwelling Units > 6**	Commercial	Industrial
Central Falls	1,737	383	-	378	28
Pawtucket	14,529	722	17	1,427	178
Providence	27,457	912	28	4,124	271
Total CSS Area	**43,723**	**2,017**	**45**	**5,929**	**477**

*The figures presented for number of accounts in the three cities above represent the total number of current NBC accounts in those cities. The actual number of accounts in the CSS Area will be slightly less than the totals above because some parcels in the three cities discharge to separated sewer areas.
**State law requires condominiums be billed as residential units. A determination will have to be made during implementation on how to categorize condominiums.

F.3.8 Data Collection Tasks

Data collection is required to populate the Master Billing File and to validate and perform quality control measures. Data collection for this alternative during the implementation phase will require the identification of impervious area data for all accounts in the "General" billing class within the three-city CSS Area of Providence, Pawtucket and Central Falls. Recommended data collection techniques include the use of electronic and hard copy records containing critical data, digitizing of impervious area using a combination of plat or parcel maps and aerials, and, if required, field measurement using a measuring wheel. Similar sampling techniques and protocols will be required for the alternative as those described for Alternative No. 1. The procedure must be performed for each billing category.

F.3.9 Rate Structure Features

F.3.9.1 Exemptions: Parsons recommends the NBC adopt the same exemptions for vacant property and Rights-of-Way for this alternative as for Alternative No. 1.

F.3.9.2 Mitigation Credits: Mitigation credits are recommended for use with this alternative. The provision of mitigation credits can be an effective incentive to the placement and maintenance of privately maintained mitigation facilities that, ultimately, could ease the burden on the NBC's collection and treatment systems. Generally speaking, mitigation credit policies award mitigation credits based on a number of runoff factors, such as, the reduction of the quantity and reduction in the rate at which runoff leaves a property during a specified storm event. Based on scientifically developed criteria, properties are assigned a credit, as applicable. The credit is granted as a percentage, which, when subtracted from 1.0 is multiplied by the number of billing units to achieve a reduced billing unit amount. In addition to the adoption of a mitigation credit criteria, the Mitigation Credit Policy must establish the procedure by which initial credits are given and the procedure for appeal. In general, properties classified as "General" parcels and some residential properties that share in the maintenance of a mitigation credit facility are eligible to apply for mitigation credits under this alternative.

F.3.9.3 Waivers: The use of waivers is recommended for this alternative.

F.3.9.4 Surcharges: The application of a surcharge on all "free riders" is recommended for this alternative similar to that outlined for Alternative No. 1.

F.4 MASTER ACCOUNT FILE AND BILLING SYSTEM – BOTH ALTERNATIVES

F.4.1 Master Account File

The Master Account File will be required to develop the initial billing information and will be the source of specific information that is required for the accurate calculation of account-specific CSO Abatement Program fees within the NBC billing system. A test file, and later, a final billing file including the following information (in fields) must be downloaded into the existing NBC billing system to facilitate delivery of the CSO Abatement Program fee as a component of the existing wastewater utility bill:

1)	Key Field	NBC Customer Account Number
2)	Billing Code	(designating the type of billing; CSO, sewer, etc.)
3)	CSO Billing Class	(Residential, General or Exempt)
4)	CSO Fee Component Name	(CSO Abatement Program Fee)
5)	Impervious Area	(Alternative 2 only)
6)	Gross Equivalent Billing Units	(number of EBUs assigned)
7)	Adjustment Factor	(Default = 1.0)
8)	Mitigation Credit	(Default = 0.0)
9)	Net EBU's	(Alternative 2 only)
10)	Billing Rate	(optional: Reside in the NBC billing system)

F.4.2 Sufficiency of Existing NBC Billing System

The existing NBC billing system has the capacity to perform all required bill calculations for the CSO Abatement Program fee component for either alternative, removing the requirement for the development of a bill calculation system. Parsons recommends use of this existing system since it will meet the needs of the NBC for the CSO Abatement Program fee.

F.5 RECOMMENDED IMPLEMENTATION TASKS – BOTH ALTERNATIVES

The recommended implementation tasks that would be required for parcels to be included in the Land Use Model alternative and the Modified Impervious Area Model alternative are presented in Appendix F-1 and F-2 of this report.

F.6 IMPLEMENTATION AND ADMINISTRATIVE COSTS – BOTH ALTERNATIVES

F.6.1 Implementation Costs

A comparison of estimated implementation costs are provided in Table F.6.1. Total costs for the two alternatives are similar. In general, for a similar number of records to be processed, the data collection required for Alternative No. 1 is less expensive than for Alternative No. 2. For this project, however, the number of records to be processed is greater for Alternative No. 1, off-setting the savings that normally could be expected.

Table F.6.1
Comparison of Estimated Implementation Costs

Task No.	Description	Alt. No. 1 Records to be Processed	Alt. No. 1 Cost	Alt. No. 2 Records to be Processed	Alt. No. 2 Cost
1.	Data Collection – General Parcels	8,558	**$101,890**	6,451	**$167,000**
2.	Delineate the Service Area	-	**$76,755**	-	**$103,530**
2.	Data Collection – Development of Billing Unit Basis	71,101	**$66,045**	45,740	**$42,487**
3.	Data Collection – Land Use Factor	-	**$67,830**	N.A.	-
4.	Identification and Processing of "Free Riders"	600 to 1,000	**$74,970**	600 to 1,000	**$74,970**
5.	Delivery of Data to NBC Billing System/Project Start-Up	80,786	**$41,412**	52,791	**$27,200**

Task No.	Description	Alt. No. 1 Records to be Processed	Alt. No. 1 Cost	Alt. No. 2 Records to be Processed	Alt. No. 2 Cost
6.	Public Information Program	-	**$38,913**	-	**$38,913**
7.	Meetings and Project Coordination	-	**$58,905**	-	**$85,000**
8.	Mitigation Credit Policy Development and Initial Credit Assignment	N.A.	-	-	**$40,800**
Total		-	**$526,720**	-	**$579,900**

F.6.2 Administrative Costs

Estimates for additional administrative costs that will be incurred for the CSO Abatement Program fee system are the same for both alternatives. There is a greater burden placed on NBC staff to set up new accounts and maintain existing accounts based on the increased data requirements of the Modified Impervious Area Model in Alternative No. 2. However, this expense would be offset by the fact that there are fewer accounts to maintain under Alternative No. 2. Therefore, the ongoing administrative costs for either alternative would not vary significantly.

Table F.6.2
Estimated Ongoing Administrative Costs – Both Alternatives

Cost Item	Description	Cost/Yr
1.	3 Full-Time Equivalent New Hires – Principally for the Customer Service Group	$150,000
2.	Public Information Brochures/Videos/Announcements	$5,000
Total Annual Administrative Costs		**$155,000**

F.7 REVENUE ESTIMATES – BOTH ALTERNATIVES

F.7.1 Revenue Potential of "Free Riders"

Both alternatives include identification of 'free riders" in the ten member-community service area, therefore, estimated revenues gained from those parcels are the same for each. Table F.7.1 presents theoretical revenue estimates from the "free rider" parcels.

Table F.7.1
Theoretical Revenue Estimates from "Free Riders" – Both Alternatives

Assumptions		Annual Revenue
• There are 600 "free rider" parcels and each is equivalent to 10 EBU's • The stormwater charge is set at $1.00 per month for a total of $12.00 per year	6,000 EBU's x $12.00/yr	$72,000
• Each parcel receives a surcharge equal to 60% of the typical sewer use fee of $164.00 • Approx. 600 "free rider" parcels	$98.40 x 600 parcels	$59,040
Total		**$131,040**

F.7.2 Total Revenue Potential for Both Alternatives

The estimated number of EBU's and total potential revenue for Alternative No. 1 and Alternative No. 2 are shown in Table F.7.2 below.

Table F.7.2
Estimated EBU Count and Total Revenue Potential – Both Alternatives

Category	Alternative No. 1		Alternative No. 2	
Residential – Tier 1	69,214 @ 1 unit each	69,214	43,723 @ 1 unit each	43,723
Residential – Tier 2	2,333 @ 1.5 units each	3,500	2,017 @ 1.5 units each	3,025
General Accts	8,639 @ 10 units each	86,390	6,451 @ 10 units each	64,510
"Free Riders"	600 @ 10 units each	6,000	600 @ 10 units each	6,000
Total Estimated EBU's		**165,104**		**117,258**
Total Annual Revenue Potential: (#EBU's x Monthly Charge x 12)				
$1.00/Month/EBU		**$1,980,000**		**$1,410,000**
$1.50/Month/EBU		**$2,970,000**		**$2,120,000**
$2.00/Month/EBU		**$3,960,000**		**$2,820,000**
$3.00/Month/EBU		**$5,940,000**		**$4,230,000**

Appendix F-1
Implementation Tasks for Alternative No. 1
Land Use Approach

Initial Data Collection

Activity No.	Activity
1.	Acquire, catalog, and rate the usefulness of maps from communities. Identify scale of each set. Maps that are not used for data collection will be used for data validation and quality control efforts.
2.	Download or acquire an electronic version of the most recent rectified (and scalable) aerials available from RIGIS.
3.	Produce aerials in scale that matches available parcel-level maps. Visual interpretation will be used to measure lot size (in acreage) for all General accounts whose acreage value is not available in Tax Assessor's records. Additional use of aerials will be in the visual recognition of parcels that are vacant (no buildings) but have impervious area (parking). Aerials will also be used acquire impervious area measurement on selected "General" parcels.
4.	Where Step 3 cannot be used to determine either impervious area or lot size, acquire Field "cards" through respective Tax Assessor offices, using the number found on the Tax Assessor's maps acquired in Step 1.
5.	Delineate the service area for the ten member-communities based on evaluation of the sewer service maps, information gathered during field investigations and analysis of other data sources.

Development of the EBU

Activity No.	Activity
6.	Determine total impervious area for a sample set of "Residential" properties that have been designated as having from one to three dwelling units. Use either Step 3 or Step 4 to identify impervious area data. If neither method appears to be cost efficient means of acquiring the data, schedule a site visit for the purpose of measuring the property. Note: For data collection of impervious area, the impervious area related to driveways is generally not recorded on field "cards" and will have to be derived from another source for each parcel in the sample set.
7.	Determine total impervious area for a sample set of "Residential" properties that have more than three, and less than seven dwelling units. Use either Step 3 or Step 4, and data collection discussed in Step 5.
8.	Determine total impervious area for a sample set of "General" properties, including properties from each discrete group within that class (Residential with more than six dwelling units, Commercial and

Activity No.	Activity
	Industrial accounts). It is recommended that the most discrete land use descriptions be used that are available.
9.	Determine the total acreage (lot size) for all "General" properties measured in Step 6 using Tax Assessor records or aerial photographs and parcel maps (Step 4) or from Field Cards (Step 4).
10.	Sort impervious area values determined in Step 5 in ascending order. Determine the "median" record. The impervious area for the "median" record equals the "Equivalent Tier 1" impervious value for 1 billing unit.
11.	Sort impervious area values determined in Step 6 in ascending order. Determine the "median" record. The impervious are for the "median" record equals the "Equivalent Tier 2" impervious value. This value is set in terms of the value established for "Equivalent Tier 1" (Step 8).
12.	Determine the Land Use Factor – the "imperviousness per acreage for "General" class accounts, i.e., Residential accounts with more than six dwelling units, Commercially, and Industrially-coded accounts.
13.	Apply the Land Use Factors to all "General" accounts in the billing system, based on the acreage values determined (Step 7).
14.	Enter all account data in the Master Billing File.
15.	Verify a statistically valid number of accounts as a quality control check.

Identification of "Free Riders"

Activity No.	Activity
16.	Survey police departments, fire departments and Commercial Real Estate specialist for identification of vacant or abandoned buildings.
17.	Compare current NBC billing file with earlier NBC records to identify accounts that are inactive or vacated.
18.	Execute "windshield" survey of properties that are classified as "Barren, Transitional Areas" on RIGIS Land Use maps.
19.	Identify actual impervious area for each of the "Free Riders" identified in Steps 14-16. Contact Customer Service Department for acquisition of a "new" account number to be assigned to the Free Riders.
20.	Enter all account data for "Free Riders" in the Master Billing File.
21.	At data entry of all account information, the total number of billing units in the system can be determined. This value is divided into the amount of recoverable costs to identify rate needed to meet budget requirements.
22.	Assist NBC staff by preparing reports and other data to determine if adjustments to budget are required to develop a Pro Forma rate that meets the NBC's policy objectives.

Data Download to the NBC Billing System

Activity No.	Activity
23.	Request billing file layout for download in the NBC's billing system.
24.	Submit test file from Master Account File for integration in the NBC's Oracle Billing System and provide assistance in Testing of data and billing amounts.
25.	Furnish final download of Master Account File

Billing Start-Up

Activity No.	Activity
26.	Provide list of most frequently asked questions to customer service representatives. Provide educational seminar to service representatives to facilitate understanding on CSO Abatement Fee premise and to present documentation of recommended operating procedures for recurring data maintenance tasks.
27.	Provide customer inquiry forms to be used at start-up and provide consulting support in answering initial customer inquiries.
28.	Provide on-site support for 3 days following receipt of first billing statement including the CSO Abatement Fee.

Other Implementation Tasks The following tasks are related to implementation and should be scheduled at the request of the NBC:

Activity No.	Activity
29.	Assist in development of Standard Operating Procedures for Data Maintenance and Appeals Process.
30.	Modify existing forms for data collection and entry.
31.	Provide on-site training to staff on basic CSO Fee Program concepts.
32.	Provide matrix with criteria to be used for assignment of billing class codes.
33.	Provide on-site "Start-Up Support" when first cycle of bills with CSO component are delivered.
34.	Provide public information materials.
35.	Provide on-site support at the request of the NBC as staff gains familiarity with data maintenance procedures.

Appendix F-2
Implementation Tasks for Alternative No. 2
Modified Impervious Area Approach

All tasks related to the identification of "Free Riders", the Data Download to the NBC Billing System, Billing Start-Up, and other implementation tasks are similar in nature to those required for Alternative 1 and are not repeated in this appendix

Initial Data Collection

Activity No.	Activity
1.	Acquire, catalog, and rate the usefulness of the plat maps from Providence, Pawtucket and Central Falls (total of 277 maps). Identify scale of each set. Maps that are not used for data collection may be used for data validation and quality control efforts. Acquire "Field Cards" from Tax Assessors located in Providence, Pawtucket and Central Falls.
2.	Download or acquire an electronic version of the most recent rectified (and scalable) aerials available from RIGIS for a similar area.
3.	Produce aerials in scale that matches available parcel-level maps. Visual interpretation will be used to identify the impervious area to be associated with specific parcels when impervious area is not available from other sources. Additional use of aerials will be used in the visual recognition of "Free Rider" parcels that are vacant (no buildings) but have impervious area (parking). Aerials will also be used to acquire impervious area measurement on selected "General" parcels as a quality control of data collected from other sources, such as the Tax Assessor's "Field Cards".
4.	Where Step 3 cannot be used to determine impervious area, use "Field Cards" received from respective Tax Assessor offices, using the number found on the Tax Assessor's maps acquired in Step 1. Note type of impervious area that is missing on each card, i.e. pavement, driveways, outbuildings for acquisition through other means (measurement or sampling).
5.	Delineate the service area for the CSS Area based on evaluation of the sewer service maps, information gathered during field investigations and analysis of other data sources.

Development of the EBU

Activity No.	Activity
6.	Determine total impervious area for a sample set of "Residential" properties in Providence, Pawtucket and Central Falls that have been designated as having from one to three dwelling units. Use either Step 3

Activity No.	Activity
	or Step 4 to identify impervious area data. If neither method appears to be cost efficient means of acquiring the data, schedule a site visit for the purpose of measuring the property. Note: For data collection of impervious area, the impervious area related to driveways is generally not recorded on field "cards" and will have to be derived from another source for each parcel in the sample set.
7.	Determine total impervious area for a sample set of "Residential" properties in the area described in Task 5 that have more than three, and less than seven dwelling units. Use either Step 3 or Step 4, and data collection discussed in Step 5.
8.	Sort impervious area values determined in Step 5 in ascending order. Determine the "median" record. The impervious area for the "median" record equals the "Equivalent Tier 1" impervious value for 1 EBU.
9.	Sort impervious area values determined in Step 6 in ascending order. Determine the "median" record. The impervious are for the "median" record equals the "Equivalent Tier 2" impervious value. This value is set in terms of the value established for "Equivalent Tier 1" (Step 8).
10.	Define all "General" account billing units in terms of the EBU value by dividing the impervious area associated with each by the EBU value determined in Task 7.
11.	Enter all account data developed in Steps 1-9 in the Master Billing File.
12.	Verify a statistically valid number of accounts as a quality control check.

NARRAGANSETT BAY COMMISSION

Task A – Preparation of a Stormwater Feasibility Study

Technical Memorandum

November 19, 2001

(Resubmitted December 14, 2001/January 22, 2002/March 4, 2002)

Prepared by: Parsons Engineering Science, Inc.

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SUBTASK A.1 REVIEW OF LEGAL CONSTRAINTS AND OTHER CONSIDERATIONS

A.1.1 BACKGROUND

The Federal Clean Water Act required the NBC to develop a plan for the abatement of combined sewer overflows within its jurisdiction. In order to fund this capital improvement project, the Rhode Island Public Utilities Commission (RIPUC) has asked the NBC to prepare a study to evaluate the feasibility of recovering, some or all, of these costs through a CSO Abatement Program fee as part of its rate structure.

A substantial number of local jurisdictions throughout the United States have adopted or are considering the adoption of a user-charge to fund similar abatement programs. This section describes the legal context of funding options available to the NBC, in particular the use of user-charges to fund the proposed abatement program.

A.1.2 LEGAL CONTEXT FOR USER-CHARGE BASED RATE METHODOLOGIES

A.1.2.1 Basic Themes

Sound user-charges are built around a carefully crafted rate structure. A solid stormwater rate structure is developed around two major themes. The first is the "user pay" concept. This concept moves the burden of paying for stormwater and floodway management services away from a taxation basis to a user-charge, where the amount paid by any given ratepayer varies with the benefit received.

The second theme involves the balance between simplicity and equity. The fairest rate structure would be one that addressed every conceivable factor which might be found on a parcel and which influenced the rate, quality or quantity of runoff generated by that parcel. However, such a design would be expensive to administer due to the data management requirements. The key is to balance the number of factors that influence the rate structure. Ideally, that balance will include enough factors to be considered "fair", yet result in a structure that is simple enough to be easily explained and cost effectively administered.

Developing a rate structure is a two-step process. Step one poses the question, "Which group of properties should pay for what services?" This step, called the "cost apportionment" step, identifies exactly what program costs are to be imposed. The second step is called the "parcel apportionment" step. Here the rate structure is concerned with defining on what basis the costs identified in step one are to be allocated to each parcel of property.

Rate models form the heart of a rate structure. Rate models fall into one of two basic categories: 1) runoff contribution models and 2) "value of loss" based models. In practice, local governments have chosen runoff contribution models almost exclusively. There are four basic runoff contribution models: 1) impervious area models, 2) impervious plus weighted pervious area models, 3) land use models, and 4) pollutant loading models.

Whatever the model, the mechanical design of a rate structure has to resolve two fundamental questions:

- Who pays for what services - cost apportionment.
- On what basis - parcel apportionment.

A.1.2.2 Legal Considerations

All rate structures are ultimately constrained by the legal context within which they must operate. Several of the most fundamental legal points that directly impact the design of a user-charge based methodology include:

Public purpose: All stormwater management programs, operations as well as capital, funded through the charge must serve a clear public purpose. All components of the rate structure must work together to achieve a clear public purpose.

Rational nexus/special benefit: Ideally, as a user-based charge, the charge should show a reasonable relationship between the amount of service rendered and the amount of charge levied.

Reasonable/Not arbitrary: Most courts test the adequacy of any component of a rate structure that is under challenge against a "not arbitrary" or "not unreasonable" measuring stick; that is, each component of the structure must have a purpose and should be the result of logically based consideration of fact on the part of the legislative body enacting the charge. Specifically, the structure should not be inconsistent with basic tenants of stormwater engineering science. Normal procedural and statistical rigor should be documented in the construction of the fundamental structure, in the determination of all categories, classes and groups, and in the calibration of numerical parameters.

Uniform/equal application of the law: All parcels or customers equally situated must be equally treated in apportioning costs to customers; exemptions, where used, must be awarded to all similarly situated customers.

Due Process: All requirements for public notice and hearings must be followed in a timely manner. Customers should be provided reasonable access to billing data and allowed to correct billing data errors in a reasonable and timely manner.

A.1.2.3 Concept of Cost Apportionment

Cost apportionment addresses two fundamental issues of who pays and for what services they pay. All agencies or utilities provide services within a defined area. It is very important that the area benefited by the service or services rendered by the utility be carefully enumerated geographically. The NBC benefit area should include all parcels and portions of parcels within the jurisdiction that receive a benefit from the existing stormwater management system (or any facility under construction or soon to be under construction).

The most effective stormwater agencies or utilities are those that use their rate structures to achieve a carefully defined programmatic strategy. The NBC's systematic approach to executing a comprehensive abatement program for the benefit area forms the basis for

identifying and prioritizing project needs. In this case the NBC should consider a rate structure that addresses both service costs as well as capital costs. The NBC could also revisit that issue at any time with the associated rate structure impact.

A.1.2.4 Benefit and Defining the Service Area

Traditional analysis of rates and charges is predicated on a dual-rational-nexus basis, in which there is a causal relationship between property use and stormwater runoff, and a proportionality between the charge imposed and the benefit received. In Rhode Island case law suggests a third consideration, emanating from the basin-wide benefits to be achieved from the cleanup and continuing protection of Narragansett Bay. Under that consideration, and the specific authority of the NBC to impose charges for "indirect" connections to its facilities, it is possible to take a somewhat more expansive view of the potential base of ratepayers.

Confining the stormwater charges to the cost of direct outflows from property, and providing a total exemption for onsite retention, may overlook other costs to NBC in developing and operating their system. Even a property which retains all its flows onsite is connected at least "indirectly" to public facilities such as streets and roads upon which rain will fall, and sanitary sewers which experience inflow and infiltration. Therefore, it is possible from a legal perspective to allocate some portion of the system costs to those NBC facilities that either remediate existing CSO problems, or provide a base level of "common" facilities that serve the greater community but cannot be allocated to particular properties.

A.1.2.5 Unit of Service Concept

A fundamental concept of any agency or utility is the capacity of the service delivered to be bought in measurable, discrete units of service. Hence, electricity is purchased in kilowatt-hours, phone service in minutes of service connect time, water in thousands of gallons, and so forth. In each case, buyers pay only for what they consume. This concept is founded on the intuitively appealing notion that one pays proportionate to the cost or burden one puts on the system. For stormwater a unit of service typically takes the form of an Equivalent Stormwater Unit (ESU) or some multiple of an ESU depending on the level of benefit received.

A.1.2.6 Parcel Apportionment

Parcel apportionment focuses on the question of how is each parcel's share of recoverable costs to be determined. As described earlier, a parcel's share of costs is related to the benefit derived from the services or the facilities provided by the utility in the conveyance, abatement and treatment of stormwater.

A.1.2.7 Theory of "Readiness to Serve" and "Runoff Burden"

The theory of "readiness to serve" or a standby charge, in which the mere existence of core government facilities and services is sufficient to allocate the fixed costs to a base rate which all citizens pay, may be applicable in this study. Enhancements to the NBC collection system, through increases in wet weather capacity, benefit all users in the service area. The CSO Abatement Program will help improve water quality in Narragansett Bay and provide a benefit to the community as a whole. Additional capacity provides immediate benefit to ratepayers in the combined sewer service areas

and allows for potential development in combined and separated areas where higher, future sanitary sewer flows would be expected. Additionally, even the separated sewer service areas benefit immediately from the improvements since they contribute increased flow to the NBC collection system during wet weather events.

Layers of charges can always be added to the base charge, if needed, for the variable costs of actual use of the NBC facilities and services. The theory of "runoff burden" could be used to determine additional charges.

Under this theory, the amount of runoff generated by a parcel and sent to a collection system represents that parcel's additional, proportionate share of the burden of creating and maintaining the collection system. The cost to manage, operate, and maintain the collection and treatment system then, is a tangible, aggregate measure of the management by the NBC of the burden of runoff generated by each parcel.

Note that a distinction is made between "general" benefit to the property and "special" benefit to the property. General benefit might accrue to all members of the community simply because each member can be assured of access along key transportation routes during substantial storm events. Likewise, control of flooding can lead to a reduction in water borne diseases and an improvement in the appearance of the community in general. This type of benefit is at a substantially "higher" level than special benefits.

A.1.2.8 Exemptions

The granting of exemptions to certain classes of "users" may be provided as long as the remaining users are not asked to pay more than their fair share as a result of the exemption policy and so long as the exemptions are extended to all entities exhibiting similar characteristics.

A.1.2.9 Credit and Adjustment Policies

A good rate structure provides for credits to be awarded to parcels with privately maintained stormwater facilities that perform as designed and adjustments to be assigned where site specific attributes require modification to the standard billing algorithm to assure engineering equity.

A.1.2.9.1 Credit Policies: Credits are reductions in the bill that are granted to parcels that provide on-site, man-made stormwater management facilities. Such credits should be given only to such facilities that are privately maintained and which perform at the original design level.

A.1.2.9.2 The Adjustment Factor: The adjustment factor is a simple multiplicative factor that allows a jurisdiction to deal directly with those parcels that have a unique stormwater site attribute or set of attributes that cause land use or impervious area to not fairly measure the relative runoff generated by that parcel. It is intended as an "escape valve" so that adjustments can be made on a case by case basis as necessitated by facts of the situation, rather than forcing the parcel into an estimated load which is simply inaccurate and, consequently, inequitable. The intent is to pre-empt both legal and political challenges to the rate structure.

This factor should be applied on an exception basis only; it is intended for use where failure to apply the adjustment leads to obvious, material inequity in the determination of a bill for a given parcel. It might be applied by staff in setting up the billing data base to small sets of parcels with certain common characteristics, or used to address legitimate concerns in case by case reviews initiated by the property owner.

A.1.2.10 Services Versus Infrastructure Cost Recovery

Each of the models reviewed may be used, without modification, for the funding of either infrastructure or operations and maintenance services or for both. However, service area issues do arise that are dependent upon whether the costs being recovered are service or infrastructure based.

A.1.2.11 Concept of Benefit Areas

Applying a conservative hydrologic connection test to capital projects can result in a small benefit area containing few billing units. This can pose difficult political problems where only a few parcels are faced with paying for large capital projects. An alternative approach, based on a level-of-service or readiness-to-serve concept, may provide a way to expand the boundaries of the benefit area in a legally defensible manner.

In this approach, the benefit area includes those parcels within a hydrologically defined area such as a basin where the jurisdiction implements a comprehensive capital projects program to correct existing deficiencies with respect to a common, defined level of service. Since NBC's CSO Abatement Program provides for a common level of service framework for the watershed, we feel the NBC is reasonable in charging one rate throughout either the combined sewer communities or all communities for capital projects targeted for the service area.

A.1.2.12 Setting the Rate

Rates are typically set in one of two ways: 1) by dividing the amount of revenue that is to be recovered from the user-charge by the total number of estimated billing units for any given year, or 2) by setting the rate at a "politically acceptable level" and "backing" into a budget built around those estimated proceeds. In reality, the process is more typically an iterative combination of the two approaches, where an agency starts with needs (approach one), then tempers it with the political reality of the community involved (approach two).

A.1.2.13 Review of NBC Enabling Legislation

Review of the NBC's enabling legislation identified several key issues related to this study.

Section 46-25-3 (13) of the statutes defines "sewage treatment facilities" to include combined sewer overflows, and subsection (10) defines the "project" as the entire Narragansett Bay water quality management district project, and includes the repair, rehabilitation or improvement of any sewage treatment facility. "Pollutant" is defined in Section 46-12-1, and means any material or effluent which may alter the chemical, physical, biological, or radiological characteristics and/or integrity of water, including but not limited to, dredged spoil, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat,

wrecked or discarded equipment, cellar dirt or industrial, municipal, agricultural, or other waste petroleum or petroleum products, including but not limited to oil.

That authority would be sufficient for any purpose, were it not for Section 46-25-25.3. That section appears to forbid any person to discharge "unpolluted waters such as stormwater" to any facilities of the project, other than those connected to an existing combined sewer in those areas in which a combined sewer is the only available means for disposal of unpolluted waters. This seems to be current law through the 2000 session, and there are no indications of any changes in 2001 which are not yet codified.

Assuming that there is no real obstacle presented by that section, the NBC is authorized by Section 46-25-5 (9) to make assessments and impose reasonable and just user charges. Section 46-25-21 specifically authorizes the Commission to "assess any person having a direct or an indirect connection to the project the reasonable charges for the use, operation, maintenance and improvements of the project."

A.1.2.14 Review of Rhode Island Case Law - Town of Lincoln v. City of Pawtucket, 745 A.2d 139 (R.I.2000).

In Town of Lincoln v. City of Pawtucket, the Supreme Court of Rhode Island took up a challenge from municipalities and landowners who claimed they were being unfairly charged with the cost of remediating combined system overflows into a river, because the overflows would not exist but for a combined system downstream of the challengers. They pointed out that the sanitary flow from their local systems was within the capacity of the Commission's interceptors. Their challenge was grounded primarily upon a denial of equal protection.

The executive director of the NBC was the only witness. He testified that combined sewer overflow problems emanate from excessive rainwater in all communities that comprise the NBC district. The Court found that the Rhode Island Legislature had created the NBC to implement an overall plan for dealing with pollution discharges in the Narragansett Bay and the Providence metropolitan area. The court thus found that financing the remediation of the CSO's with charges against ratepayers in all ten cities did not violate the constitutional principle of equal protection, even though the actual impact of each city's individual ratepayers on the CSO problem might vary considerably.

This is a fairly broad view of the benefits to be received from stormwater system construction and improvements. The Court noted that even in those cities which had already installed two-pipe collection systems and claimed immunity from the CSO expenses, there was a spike in the sanitary flows during rainfall events, presumably from inflow and infiltration.

A.1.2.15 Legal Context Summary

In summary, stormwater user-charge based rate structures are the product of a careful design process. This process:

- must be built around the fundamental nature of utilities with its inherent user cost concept,

- must carefully determine who exactly is the client of the service or facility and where they are located,
- must include a clear determination of services and/or facilities to be delivered and what the unit of service is,
- must incorporate a carefully defined methodology for assigning "shares" of the cost being recovered through the fee to the user (the "rate model"); and
- must be designed within a carefully constrained legal context.

SUBTASK A.2 IDENTIFICATION OF SUCCESSFUL STORMWATER RATE IMPLEMENTATIONS FOR CSO ABATEMENT PROGRAMS

A.2.1 BACKGROUND

A substantial number of local jurisdictions throughout the United States have adopted or are considering the adoption of a user-charge to fund stormwater and floodway management programs. It is estimated that some 350 to 450 user-charge based stormwater utilities have been adopted across the country. In New England many communities are interested in establishing a stormwater user based charge to help cover the cost of the numerous CSO abatement programs currently underway but few have ventured down the path.

We are not aware of any communities or agencies in the state of Rhode Island that have implemented stormwater user charges. Our investigation identified two New England communities that have implemented a charge structure, Chicopee, Massachusetts and Augusta, Maine. Other communities such as Bangor, Maine and Manchester, New Hampshire evaluated the option but eventually found other sources of funding. Our search was not limited to the northeast, and while not exhaustive, we have identified and described several community's approaches to a stormwater based user-charge.

NBC's situation is somewhat unique, not because of the combined sewers, but because of the regional nature of the utility and the fact that the member communities own, operate and maintain the local collection systems.

A.2.2 EXAMPLES OF COMBINED SEWER OVERFLOW ABATEMENT PROGRAM FUNDING

A.2.2.1 Chicopee, Massachusetts

Chicopee, Massachusetts was the first stormwater utility in Massachusetts. The goals of the Chicopee stormwater utility program were to provide capital for projects that would correct Combined Sewer Overflows, revenue for the maintenance of the stormwater system and incentives for individual property owners to reduce stormwater runoff. Prior to selecting a rate model, four models were studied. Each was considered for the respective costs to administer, for the equity they provide, for the likelihood that the fee will be sustained over time, and for political expediency. The rate structures that were considered include:

Flat Fee: A flat fee provides that a like amount is charged to all property within a discrete property use, regardless of size or any other factor.

Equivalent Residential Unit: The equivalent residential unit (ERU) billing is based on the development of the "average" billing unit (the calculated average impervious surface for a residential parcel). The ERU is then estimated by taking a random sampling of properties and finding the average impervious surface area for each property

classification. For the sample tested in Chicopee, the properties were divided into four types, including:

- Small Residential – (1,2,3 family houses and mobile homes)
- Large Residential – (condominiums, apartments and multiple housing on a single parcel, group homes, multi-use properties and child care facilities)
- Industrial, Commercial and Public Service
- Vacant and Limited Development (agricultural, forestry, recreational, vacant, open space).

Impervious Surface based on Assessor's Records: This method uses assessor's records to estimate the impervious surface area on parcels based on building size and pavement areas. Chicopee's Assessor's records contain the square footage of all buildings but do not contain the square footage of all paved areas, as pavement is not taxed on residential properties. The impervious surface area for each parcel is multiplied directly by a given rate to calculate the fee.

Impervious Surface based on Aerial Photos and GIS: This method uses GIS (Geographic Information System) to combine parcel information from the assessor's records with actual measurements of impervious surface areas as identified through the use of aerial photography. The impervious surface for each parcel is then multiplied by the rate to calculate the fee.

Using the four methods outlined above, a group of 197 randomly selected parcels were chosen for comparison of parcel information and the rates that would result from each of the four methods. Based on the resulting data, Chicopee adopted a "modified" flat fee method for billing stormwater utilities in August of 1998. The modification allowed a combination of factors to be used to calculate the stormwater rate. Single family residential rates were adopted at $40 per year and all other property rates were adopted at a fee no less than $40 and no greater than $400, based on the overall size of the property.

Equity Issues: Having considered four rate structures, the fee was established based on political expedience and was not the most accurate representation of the property's actual impervious surface or likely impact of runoff in a storm event. While, the modified flat fee is relatively equitable with regard to smaller residential properties because the variation of the impervious surface area is small within this group, a flat fee is not equitable for all other types of parcels. By modifying the flat fee, an attempt was made to consider the runoff from the standpoint of total site acreage. As ground cover and "imperviousness" and "permeability" have considerable influence on the runoff leaving a site, the use of acreage provides only limited equity. By adopting a ceiling on the maximum charge per parcel, the burden of paying shifts dramatically from the large parcels to smaller ones. The flat fee creates the least incentive for property owners to provide for mitigation of runoff or to reduce the amount of impervious surface, as individual property owners will not be aware of any relationship between the size of their bills and the amount of impervious surface on their property.

Many utility programs have taken the Chicopee approach with the understanding that over time they would need to make sweeping changes in the structure and fee calculation to improve both equity and the ability to generate sufficient funds for stormwater

management programs. With the popularity of stormwater utility programs, the public is better educated about the need to correlate rates with actual runoff contribution and future citizen groups are apt to demand a more equitable fee system from the inception.

A.2.2.2 Portland, Oregon

A similarity between the Portland, Oregon utility and the NBC is that multiple jurisdictions manage portions of the stormwater infrastructure system. Constituents work together to set broad policy on planning stormwater controls, especially to those relating to the region's natural resources. The City of Portland implemented a stormwater utility in 1977, making it one of the first communities in the nation to use a utility structure to finance stormwater management programs. All developed property is subject to a user fee of about $0.02 per square foot of impervious surface. The rate structure offers fee reductions for the use of best management practices and the degree to which runoff is handled on-site through infiltration or re-use. The City has focused on achieving the separation of sewer and stormwater through a program to separate CSOs. Utility funding supports all CSO abatement projects.

A.2.2.3 Indianapolis, Indiana

The City of Indianapolis has added a stormwater component to their existing sewer service fee to fund the repair and upgrade of its aging combined system. The infrastructure improvements are being made to reduce CSOs in an effort to prevent the Environmental Protection Agency from levying severe penalties against the City. A monthly service fee of $1.94 was added to the existing charges for sanitary sewer service. The increase is expected to raise $184 million dollars in the first five years since its adoption. The money will go towards capital projects that will capture stormwater before it enters sewers. Additional stormwater fees of $1.25 per month were adopted in June of 2001 to fund projects that will reduce property flooding during certain rain events. Credit procedures to reduce fees charged to businesses and other properties that mitigate the amount of runoff leaving their properties are provided.

A.2.2.4 Bremerton, Washington

The City of Bremerton recently adopted a stormwater fee surcharge to be applied to properties that discharge their stormwater runoff to the sanitary sewer system. The City currently charges a flat fee of $4.00 per month for residential properties and is based on the total impervious area or number of impervious surface units (ISUs) for commercial properties. The new surcharge will become effective in January of 2002. It is designed to collect an additional utility fee from properties with stormwater connections to the sanitary sewer system that often contribute to combined sewer overflows.

Authorized by ordinance, the utility funds will be used to provide programs to reduce or eliminate the conveyance of stormwater to the sanitary sewer system. If a property's stormwater system is connected to the sanitary sewer in January of 2002, the new fee will be assessed, based on the existing stormwater fee. In January of 2002, the new surcharge will be 25% of the existing stormwater fee and will continue to increase 25% per year to 100% of the current fee in 2005.

The City's goal is to remove stormwater from the sanitary sewer system and eliminate the need to build more sanitary sewer capacity to control CSOs. This is seen as an effort to directly affect the rates that all wastewater users pay for sewer service.

A.2.2.5 Fort Wayne, Indiana

Since 1991, the City of Fort Wayne, Indiana has funded stormwater management programs through the establishment of a stormwater utility. Fort Wayne's Stormwater Utility is city operated and regulated, similar to their water and wastewater utilities and is financed by dedicated user fees rather than tax revenues.

Stormwater management goals in Fort Wayne include:

- Meeting NPDES permit requirements
- Fund CSO program goals
- Repairing the sewer system
- Initiate pollution reduction programs

A budget of $35 million per year was identified to fund programs needed to satisfy the National Pollutant Discharge Elimination System (NPDES) permit requirements. The City's combined sewer system serves more than 60,000 residential and commercial customers with more than 600 miles of sewer lines, ditches and open channels draining more than 68 square miles. According to Federal mandates, Fort Wayne was required to control pollutant discharge to public waters and prohibit non-stormwater from leaving the storm drainage system. To meet the funding need, the City established its stormwater utility by ordinance in 1991 following a cost-of-service analysis and rate study that allowed the development of a rate structure that was fair, equitable, legally defensible and publicly acceptable. A temporary rate schedule for water and sanitation customers charged flat rates from $1.94 per month for residential customers to $52.47 per month for industrial customers. Prior to adopting a more permanent rate structure, data needs were to be determined for a variety of rate structures.

In 1992, stormwater charges were included on a consolidated utility bill with solid waste having first priority; stormwater being second in order of payment followed by water and sewer charges. Consolidation of charges proved cost-effective by eliminating the need to establish a separate stormwater billing system. Bills were "piggy-backed" on the existing utility bill to reduce postage and other associated charges. Simultaneously, information needed to determine the impervious area on each non-residential parcel was identified. Land-use maps, parcel ownership, GIS maps, aerial photography and service billing information were integrated to create an impervious record for each parcel.

Shopping malls, strip center, office parks, apartment and condominiums receive a consolidated bill issued to a single entity, either the landlord/manager or management association. The city agreed to allow credits for stormwater control facilities, such as pollution-preventing controls and detention basins. Credits, in the form of bill reductions, were not available to single-family residential properties.

Analysis of water quality effects on the NPDES and CSO programs were factored in a optional costs in the cost-of-service study and the cost of service analysis was adopted as the base cost of the stormwater management program.

The billing system required the merge of stormwater utility billing information with most impervious information measured directly from maps or aerials. A line item on the existing bill was added for the stormwater charge.

A.2.2.6 Edmonton, Alberta, Canada

In March 2000, the City of Edmonton City Council's Transportation and Public Works Committee approved the Combined Sewer Overflow Control Strategy and Implementation Plan. Planned over a 16-year period, the $150 million plan will receive partial funding from federal sources. The City of Edmonton intends to develop a stormwater utility program to establish a stable source of financing for future periods.

A.2.2.7 Augusta, Maine

The City of Augusta, Maine recently implemented a stormwater user charge making it the first community in the state to implement such a program. The motivation for establishing the program was to find funding for the City's CSO abatement program mandated by the state and EPA. The program is managed by the City's sanitary district. Augusta owns, operates and maintains the entire piping system to the private property line and has approximately 4,600 accounts.

Initially, all residential accounts were assigned 1 EIU that was equivalent to 2,700 square feet of impervious surface per lot. They are currently revising the value for multi-unit residential properties. EIU's for commercial, industrial, state and federal properties are determined by dividing the actual square feet of impervious surface by 2,700 square feet, the average value for residential lots.

Credits are available only for the construction of detention ponds. They have recently expanded their billing perimeter to include customers outside the sanitary district but within the hydrologic bounds of their collection system. They still maintain a public information campaign.

The City has included a new four line billing structure for stormwater services to their existing utility service bills as follows:

- $3.00 per 100 cubic feet of water used.
- $17.14 per quarter service charge.
- $10.32 per quarter times the number EIU's.
- and a flat rate catch basin cleaning charge.

SUBTASK A.3 ANALYSIS OF THE RELATIONSHIP OF STORMWATER FEES TO THE CSO ABATEMENT PROGRAM

A.3.1 INTRODUCTION

This Technical Memorandum contains information related to the stormwater component of a rate structure designed to recover CSO Abatement Program project costs from the universe of eligible parcels. These types of rate structures would be based on the billing of separate fee components for the specific program costs to be recovered for the CSO Abatement Program. Recommended CSO Abatement Program fee components in this category are likely to be:

Component #1	Existing utility charge based on water consumption
Component #2	CSO Capital Improvement Charge
Component #3	CSO Service Charge

For the purpose of this discussion, a "benefited parcel" is the term used to identify a member of the universe of parcels that can expect to receive a benefit from the CSO Abatement Program.

A.3.2 GAUGING THE CSO ABATEMENT PROGRAM'S RELATIVE BENEFIT

A.3.2.1 What is the CSO Abatement Program Fee Factor?

The CSO Abatement Program fee factor is a value, that, when multiplied by the billing unit assigned to each parcel in the NBC's benefit area, will produce the "relative" benefit received by that parcel from the CSO Abatement Program. From a politically-acceptable standpoint, it is advantageous to adopt a standard rate that can be applied to all properties within a rate class, and if possible, to all rate classes.

A.3.2.2 What is the purpose of the CSO Abatement Program Fee Factor?

The association of a fee factor to parcels within the NBC benefit area provides the normalization of billing values while charging a common rate. A fee factor can be useful in simplifying the administrative aspects of a stormwater charge while helping to maintain an equitable distribution of charges.

A.3.2.3 CSO Abatement Program Cost Impact

The costs associated with the CSO Abatement Program place a substantial financial burden on the NBC and will require changes to the existing rates and/or rate structure. Sewer service rates were recently increased 24%, the first adjustment since 1995, to help cover the costs of NBC's programs. However, even with the recent rate adjustment, additional monies are required to help cover the costs of the CSO Abatement Program improvements.

Based on the NBC Capital Improvement Program for Fiscal Years 2003 – 2007, total CSO Abatement Program costs for the period are $263,482,000 with total capital

improvements of $364,592,000. The CSO Abatement Program costs represent approximately 72% of the capital budget over the next five years.

A fee factor can help distribute the costs of the CSO improvements in an equitable manner. Since the NBC already collects user fees to help pay for the costs of the CSO Abatement Program one alternative is to increase rates and apply stormwater charges universally across all parcels with either a direct or indirect connection to the NBC collection and treatment system. Another alternative could look at applying layered or separate stormwater charges to a subset of those parcels based on the level of benefit received from CSO program improvements.

A.3.2.4 Benefit Area and Fee Factor Alternatives

The real question is how to cover the funding gap created by the CSO Abatement Program improvements in an equitable manner with the least adverse impact to ratepayers. Potential benefit area alternatives for developing fee factors for the NBC ratepayers are described below.

Benefit Area Alternative No. 1: This alternative assumes all parcels with a direct or indirect connection to the NBC collection system, from the ten member communities, will contribute to the cost of the CSO Abatement Program. Using this alternative the fee factor would be 1.00 for all parcels and all parcels would universally contribute to paying for CSO improvements. This alternative assumes all parcels in the NBC service area with a direct or indirect connection to the NBC collection system receive some general benefit or level of service from the CSO Abatement Program.

Benefit Area Alternative No. 2: This alternative assumes only the parcels with direct or indirect connections to the NBC collection system in the combined sewer service areas and parcels with stormwater connections to the collection system in the separated areas will contribute to the costs of the CSO Abatement Program. This alternative includes a more restrictive group of parcels.

From the Technical Memorandum "Stormwater Rate Impact Analysis", July 21, 1998 (Louis Berger & Assoc.) the breakdown for parcels in combined and separated sewer service areas for the NBC is shown in **Table A.3.2.**

Table A.3.2
Depicts the Percent Combined and Separated Areas of NBC District

Jurisdiction	Combined Area	Separated Area
Providence	68.3%	31.17%
Pawtucket	83.2%	16.8%
Central Falls	97.2%	2.8%
All Other Cities	0%	100%

Source: Louis Berger & Associates, Inc., 1998

By ruling out parcels in separated sewer areas, the burden for paying for the CSO improvements shifts to a smaller subset of potential NBC customers. From the table above, a weighted average of combined sewer service area of approximately 75% of parcels can be assumed for the three cities (estimated by multiplying the percentage of

combined area by population for the three cities and then taking the average for the three cities). Projected revenue for the NBC over the next five years is approximately $194,300,000 and projected revenue requirements are $308,900,000. This leaves a funding gap of approximately $114,600,000 (37% of revenue required). Assuming the customers in the combined sewer service areas are responsible for making up the difference between projected revenue and required revenue, a fee factor of 1.83 would be applied to those accounts (1.37/0.75). All other accounts in the NBC service area would receive a factor of 0.00. It should be noted that these factors would be applied to the portion of charges identified as separate stormwater charges. **Table A.3.3** summarizes the CSO Abatement Program fee factors for each benefit area alternative.

Table A.3.3
Summary of CSO Abatement Program Fee Factors for Each Benefit Area Alternative

Community	Alternative No. 1	Alternative No. 2
Providence	1.00	1.83
Pawtucket	1.00	1.83
Central Falls	1.00	1.83
Other	1.00	0.00

A.3.2.5 Summary of Fee Factor Analysis

These factors would apply to both the capital project costs of the CSO Abatement Program as well as the long-term management, operations, and maintenance costs of the NBC collection and treatment system. Once the debt is paid off for the capital projects those charges to ratepayers would go away. Charges for management, operations, and maintenance would remain along with the applicable fee factor.

As a part of subsequent rate option analysis which will be presented in Task B of this project, methods of apportioning the stormwater "benefit" will be discussed in detail. A principal focus will be the normalization of bill amounts within each billing rate category across the benefit area.

SUBTASK A.4 ESTIMATION OF THE UNIVERSE OF "FREE RIDERS" AND DISPROPORTIONATE BENEFICIARIES

A.4.1 DEFINITIONS

A.4.1.1 Master Billing File

The implementation of any rate structure should include the use of the best available information so that revenue collection will be maximized while being collected in a fair and consistent manner. All eligible parcels should be charged their fair share of total costs to be recovered. Maximum billing, and revenue collection must be based on a carefully constructed and maintained "master" billing file. The master billing file is the file used by the NBC to create periodic utility bills to be delivered to property owners.

During the subsequent CSO Abatement Program fee implementation phase, the "Universe of Benefited Properties" must be merged with the existing master billing file to add new parcels and to add CSO Abatement Program fee information, where appropriate. The master billing file must ultimately include the following stormwater information in addition to information required for billing other services:

PID (parcel identification)
Utility Code (sewer, stormwater, etc.)
Rate Class (residential, condo, institutional, general)
Fee Component (administration, capital, O&M)
Mitigation credit (defaults to 0, values from 0-1)
Mitigation adjustment (defaults to 1, values from 0-1)
Status (active, inactive)
Exempt (yes, no)
Total CSO Abatement Program fee

A.4.1.2 Benefit Area

The first step in developing the universe of benefited properties is the delineation of the NBC benefit area. Using parcel-level maps, the outline of the geographic area that includes all parcels that can expect to receive a benefit from the NBC system is drawn. The benefit area delineation is used to group properties that can expect to receive a common level of service from the proposed CSO Abatement Program.

A.4.1.3 Universe of Benefited Properties

The list comprising all parcels within the delineated benefit area is the universe of benefited properties. Whether they are vacant or developed, all properties within this area are included. Properties that are within the benefit area but that are found to not be eligible for a CSO Abatement Program fee will be tagged "inactive" or will be assigned an adjustment factor of zero.

A 4.1.4 Universe of Free Riders

The list created through the delineation of a benefit area is comprised of all properties that can expect to receive a benefit. This list includes those parcels known as "free riders", that are benefited, but are not NBC customers.

A.4.2 DATA REQUIREMENTS

A.4.2.1 Required Data Fields

In this memorandum, data requirements are common to the Cities of Central Falls, Pawtucket and Providence, Rhode Island. The following data requirements are common to both the Impervious Area and Land Use Rate Models:

Parcel Identification Number: The Parcel Identification Number (PID) is unique to each parcel of land within the service area. The Parcel Identification Number will be derived from Tax Assessors' Office from each jurisdiction. The use of the PID will allow for the future interface of stormwater data with other databases that commonly include the PID as a key field. Typically, this might include GIS, building permit and inspection tracking databases. The stormwater database should include search capabilities using both the PID and the account number. The PID is to be included in the NBC's master billing file.

Owner Billing Name and Address: The name, billing address and sites (location) address of each customer will be derived from the Tax Assessors' files and must be matched to the respective information on the NBC's utility bill. The Tax Assessors' maintains this information on an on-going basis. A monthly download would be required for piggybacking on a monthly utility bill.

Specific Land Use Code for Each Parcel: This information is available from Tax Assessor's files listed as Land Use classification. This classification is sufficient to classify parcels into the appropriate rate class. Each community uses a different land use code. A detailed investigation of how land use classes are assigned is recommended.

Taxing District Information: Within the service area, this information will determine the jurisdiction of all parcels.

Year Built Information: This information pertains to all improvements on the property including stormwater control structures. It is useful for the application of mitigation credits to parcels that have on-site, man-made facilities that are privately maintained and meet design standards in terms of performance.

Private Mitigation Facilities: The ability to provide a site-specific fee reduction based on the existence of privately maintained mitigation facilities is important from both a legal perspective and a public acceptance standpoint. Two distinct processes are used to develop the list of mitigation facilities.

By Application: This method places the burden on the property owner's application for review. The success and acceptance of this process depends on delivery of public information that will lead the owners of eligible properties to make application for this fee adjustment.

By Default: This method relies on the availability of data, including the "year built" field in the Tax Assessors files. This date can be used to eliminate all parcels built before the

adoption of the land development codes that may have required the construction of mitigation facilities. The list of remaining parcels will have to be checked by knowledgeable individuals who could determine which parcels, if any, have eligible, privately maintained facilities, and which do not. The amount of the credit is determined by application of the credit policy and procedures.

Data Requirements Specific to the Land Use Model:

- Impervious coverage by land use. These values would be determined by engineers based upon the existing land use classifications within the county;
- Lot size. Generally, this information is available through the Tax Assessors office. Reliability and accuracy must be field-tested. This information can be obtained through digitizing information on parcel maps.
- Coverage factors. Coverage factors would be determined by measuring impervious area on a statistically valid number of parcels in each rate class and calculating the percentage of impervious area related to the total property area for those parcels. The coverage factors would then be applied to all parcels in the rate class.

Data Requirements Specific to the Impervious Area Model:

- Impervious area of building area footprint;
- Impervious area of paved vehicular area;
- Impervious area related to extra features.

or

- Gross building area square footage;
- Number of stories;
- Impervious area of paved vehicular area;
- Impervious area related to extra features.

A.4.2.2 Availability of Parcel Level Data

The availability of data has been determined for the cities of Providence and Pawtucket.

City of Providence: Parsons staff has met with Gary DiSarro of the Tax Assessor's staff in Providence. The Tax Assessor's office is in City Hall, 25 Dorrance St., Providence, R.I. 02903 (401) 421-2489 (Ext. 229). The Tax Assessors office maintains the square footage of all buildings on a parcel; however, this information is also found in a proprietary program supported by CLT Consultants. The 2001 Tax Roll is being acquired by Parsons and will be used to determine data for the stormwater fee project. The Tax Roll includes property owners name, mailing address, location address, parcel number, property use code, exemption codes, valuation and assessments. A computer station is available for public use and a sample of a parcel-level data card printed from that application is included as an attachment to this document. The charge for individual data cards is $1.00 each.

City of Pawtucket: Parsons staff has met with David L. Quinn, Tax Assessor of Pawtucket. Mr. Quinn's office is located at City Hall, 137 Roosevelt Ave., Pawtucket, R.I., 02860 (401) 728-0500 (Ext. 218). The City of Pawtucket's Assessor's Office maintains parcel and building data in a proprietary system that renders the information difficult to obtain. A 2001 Tax Roll is considered public record and contains

information, such as, Parcel ID, Owner Name, Billing Address, State Land Code (land use), Assessments, and Exemptions. The Tax Roll data would be required for use in either an impervious or land use methodological approach and is being acquired by Parsons. The software application provided by "CLT", a consultant to the City, does not allow for ad hoc report writing and prevents the office from filling the data request. Parsons will request an electronic file of the data from Eugenia Flynn, CLT's Project Manager for the City. A computer station is available for public use and a sample of a parcel-level data card printed from that application is included as an attachment to this document. The charge for individual data cards is $1.00 each.

City of Central Falls: The Parsons staff also contacted the City of Central Falls' Tax Assessors office located at 580 Broad St, Central Falls, R.I. 02863 (401) 727-7430. The City's Tax Assessor is Mr. John Giancarski. The Tax Assessor's office maintains paper copies of Parcel maps. The maps are not maintained electronically. The parcels are mapped on a series of ten (ten)-plat maps. Mapped information includes the lot and block, parcel lines, contiguous street and street names and some easement information.

Parcel Data Summary: The square footage of parking areas and other horizontal improvements are stored on hard copies in the Pawtucket, Central Falls and Providence Tax Assessor's offices and in proprietary software applications in Providence and Pawtucket where the extra features portion of the data record can be viewed on a computer terminal. In all cities, the driveway data, however, is not maintained for low-density residential parcels (single family, duplex and small apartments). A random sample of driveways would be measured and the median value of the driveways added to each low-density residential record to assure a reasonable estimate of impervious area. A more sophisticated approach would be to derive a regression equation based on the sample to establish a relationship between driveway size and house size. This equation could be used to estimate driveway size for each affected record.

A.4.2.3 Availability of GIS Data Files

RIGIS: A wide variety of GIS maps are available from Rhode Island Geographic Information System (RIGIS) through the State of the Rhode Island Department of Administration's Statewide Planning Program. Data is distributed under licensing policies of the Rhode Island Geographic Information System (RIGIS). Digital data on magnetic or optical media are available from the RIGIS Coordinator at the Statewide Planning Program in Providence with payment of cost recovery license fee charges. Internet access is cost free. RIGIS vector data sets are protected under U.S. copyright law and redistribution of digital data for resale is prohibited. All hard copy products produced using RIGIS maps must credit RIGIS as a data source. Available RIGIS data layers fall into several general categories. Categories include, but are not limited to:

- Land use
- Political boundaries
- Hydrography/Hydrology (rivers)
- Raster graphic images (digital orthophotography)
- Transportation infrastructure (roads)
- Annotation labeling (road names)
- Utilities (sewer lines)

City of Providence: A series of 129 Plat maps are used in the City of Providence. A set of hard copy maps is available for $200.00. Maps are not available in an electronic format. Plat maps use the same Parcel Identification Number as the Tax Roll. Certain Citywide coverages are available form the City's Planning Department.

City of Central Falls: The City of Central Falls covers approximately a one square mile area. The parcels are mapped on a series of 10 (ten) plat maps. Mapped information includes the lot and block, parcel lines, contiguous street and street names and some easement information. The maps are not available in an electronic version; however, the hard copy set of maps is available for $10.00. At this time, Parsons is acquiring the plat maps. The City's Tax Assessor is Mr. John Giancarski. The Tax Assessor's office is located at 580 Broad St, Central Falls, R.I. 02863 (401) 727-7430.

City of Pawtucket: Maps are not available electronically. Plat maps are available in hard copies. City coverage includes 138 maps (Plats 1-69) and a key map. Parcels are designated with the six digit Parcel Identification Number that is used in the Tax Roll. Information shown on maps includes the property lines, the Parcel ID, streets and street names and lot and block information. Some utility and other easements are also depicted. Aerial photography for some areas of the City was flown in 1995. Digitized aerials are available in an AutoCAD format. A 2001 City map with street names is available digitally and in hard copy.

A.4.2.4 Data Deficiencies

The initial research finds that data deficiencies are common to all three communities studied in this memorandum; Providence, Central Falls and Pawtucket. The implementation of the CSO Abatement Program fee component by the NBC is some months away and will offer time for acquisition of the best available data and maps. Alternative means of acquiring necessary data will be evaluated for specific costs and will be presented in Task B, Subtask B.1 following the execution of data collection from a sample area.

A.4.2.5 Alternative Means of Data Acquisition

The primary data missing is that related to impervious area. The impervious area for each parcel could be derived through several techniques, including:

Site Plan Drawings: With this approach, technicians collect relevant site plans from the City's permit records and digitize impervious area from the drawings. This approach is only as accurate as the plans (relative to "as built" field conditions) and is only relevant when plans are readily retrievable from the City archives.

Field survey of a sample set of parcels: In this approach, trained crews obtain measurements from randomly chosen sample parcels. The sampling frame must be based on a statistically acceptable sample size. From the sample set, averages of impervious area and total parcel size can be determined for parcels in each rate class. This approach is clearly not as accurate as the measurement of the universe of parcels, but is an inexpensive, yet generally acceptable approach. The survey can range in rigor from an "as built" survey sealed by a registered surveyor on one hand, to a "walk around" with a

measuring wheel and field notes as long as the method is consistently applied to all parcels. Quality control must be strictly measured to insure the consistency of measurement techniques.

GIS Polygon Overlay with Tax Parcels and Aerial Photography: Aerial photography offers an alternative at an accuracy level slightly less than either the site plan approach or the field survey approach. Unlike site plans, however, the data would be available and consistent across all parcels. Recent aerials for the entire area are not available at this time, however, due to the age of the communities, it is likely that few changes have occurred since the aerials were flown. In this approach, aerial photo coverage would be superimposed on a corresponding hard copy parcel boundary map. Selected parcels are then digitized based on development seen in the aerial photo.

A.4.2.6 Data Conclusions

Data required for the land use approach is readily available and may be validated in a cost-effective manner. Sampling, for the purpose of setting service area specific impervious area coverage values, is highly recommended. This sampling is limited and could be executed through field measurement, or with the use of aerial photography or drawings. ***The land use approach, is feasible and is the basis for the first methodological approach and will be detailed in Task B, Subtask B.1 Development of a Recommended Rate Structure.***

The impervious area model (found within the "runoff contribution" or benefit family of models) is by far the most common rate methodology applied throughout the United States. Since this is the most common general model, it would be ideal for purposes of this analysis to apply such an approach. Unfortunately, the data demands of such a model are very specific: the amount of impervious area for each parcel must be known and available in timely, cost effective manner. Such is not the case at this time. In future years, as impervious area becomes available through planimetric measurement, the move to a methodology based on measured or otherwise more accurate impervious area should be considered. ***The impervious area approach is the basis for the second methodological approach and will also be detailed in Task B, Subtask B.1 Development of a Recommended Rate Structure.***

A.4.3 IDENTIFICATION OF FREE RIDERS AND DISPROPORTIONATE BENEFICIARIES

A.4.3.1 Free Riders

In other communities, the frequency of parcels that have impervious surfaces that are not associated with other utility services ranges from four to seven percent of the impervious area in the aggregate. Assuming the NBC is "typical" in this respect, the amount of potential lost revenue from these properties is likely not as significant as disparate charges associated with two parcels with similar impervious area but with less demand on other utility services. Regardless, these parcels should be identified to ensure an equitable distribution of stormwater charges. Free riders can be determined by the following methods:

1. A data file of all parcels within the NBC service area is matched with a data file of the NBC sewer billing system and the resulting list would identify possible "free riders". By using the parcel identification code, the list is checked for impervious area values found in the latest tax roll.

2. Depicting the NBC stormwater service area on a recent aerial photograph and overlaying with a coverage of the NBC sewer service area. Those parcels that are within the stormwater service area that are not in the sewer service area must be visually checked for the appearance of impervious area, such as a parking lot or storage building.

A.4.3.2 Disproportionate Beneficiaries

The volume of stormwater runoff or sewer flow from a specific site has no meaningful relationship. Unlike metered or measured services, stormwater utility charges should be based on the amount of runoff that can be expected to leave a site during a specific rain event. Only coincidentally would this runoff value be equal to the amount of sewerage discharging from a particular site, therefore all properties can be said to have a stormwater benefit disproportionate to the bill they now receive for other utility services. Obvious examples include storage or warehouse properties requiring minimal water and sewer services in proportion to the size of their facilities. On the other extreme are multiple-story hotels with parking garages that require more water and sewer services relative to the volume of runoff they generate. An equitable user charge based on runoff contribution, looking at either impervious surface calculations or land use, will address the proportionality issue for all properties.

All data manipulation is dependent on the acquisition of recent, accurate data from a variety of data sources. The full significance of potential revenue will be projected through the application of a sample service area during ***Task B, Subtask B.2 Presentation of Different Cost Apportionment Alternatives and Related Ratepayer Impacts.***

NARRAGANSETT BAY COMMISSION

Task B – Development/Design of Stormwater Fee Structure Alternatives

Technical Memorandum

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Prepared by: Parsons Engineering Science, Inc.

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SUBTASK B.1 DEVELOPMENT OF A RECOMMENDED RATE STRUCTURE

B.1.1 BACKGROUND

Fundamental concepts for the establishment of a user charge fee in any community must be considered when evaluating the feasibility of implementing a new Narragansett Bay Commission (NBC) Combined Sewer Overflow (CSO) Abatement Program fee. The NBC has unique circumstances that must be considered when trying to apply these concepts to their system.

B.1.1.1 The Utility Concept

User fee concepts are based on the theory that users pay according to the amount of benefit received (or burden placed) on the utility system and that charges are levied relative to other users in similar "use" categories. This concept is to be applied to the CSO Abatement Program fee system. Therefore, within the area served by the NBC, residential parcels of a similar size would pay a similar charge. A commercial parcel in the City of Providence might receive a different charge from a similar parcel in the Town of Smithfield since the rate of imperviousness per acre may vary greatly between those two communities.

B.1.1.2 The Benefit Concept

User fees are traditionally collected to recover the cost of providing services or capital programs to properties. For this project, those costs will be associated exclusively with components of the NBC's CSO Abatement Program. The CSO Abatement Program has been found to provide a benefit to wastewater utility customers through the protection of treatment facility capacity and through the reduction of harmful discharges to certain Federally protected receiving waters. The charges will be applied to those parcels (accounts) that have either a *direct or indirect connection* to the NBC's infrastructure system. Properties that are not connected, either directly or indirectly, should not receive a user charge.

B.1.1.3 The Benefit Area Concept

The benefit area is traditionally the geographic area in which benefited parcels are found. The universe of parcels benefiting from the NBC's infrastructure system includes accounts receiving the improvements provided by the CSO Abatement Program project. The base benefit area includes the ten member-communities currently principally served by the NBC. In addition, other accounts exist, to a lesser degree, in several adjacent communities. All of the properties have a direct or indirect connection to a combined conveyance system, or a direct or indirect connection (such as infiltration) to another NBC conveyance system.

B.1.1.4 Legislative Authority

The delineation of the benefit area defines the universe of properties that are eligible to receive a user charge. This is underscored by Section 46-25-21 of the NBC's enabling

legislation. The legislation specifically authorizing the Commission to "assess any person having a *direct or an indirect connection* to the project the reasonable charges for the use, operation, maintenance and improvements of the project." Section 46-25-5(9) authorizes the NBC to make assessments and impose reasonable and just user charges for the project.

B.1.2 RATE STRUCTURE MODEL ALTERNATIVES

An assessment of options available to the NBC includes the identification and evaluation of potential rate structure models.

B.1.2.1 Description of Rate Model Alternatives

The protection of treatment facility capacity is tied to the amount of runoff that eventually impacts the wastewater treatment facilities or overflow structures through a variety of means. Transport to the facilities that are to be affected by the CSO Abatement Program projects includes conveyance through pipes, surface flows or infiltration into the wastewater treatment conveyance system. Because almost all property generates stormwater runoff, the accumulated or aggregate runoff from all parcels must be managed in an organized and systematic manner if owners are to enjoy the use of their property with some degree of reliability. The burden of the management of this cumulating stormwater runoff falls to the community in which they reside and, if different, the downstream facility that receives the accumulated runoff. In severe wet weather conditions, this accumulated runoff has been blamed for the overflow of the combined systems and the discharge of both storm and sewer flows into protected water bodies. The CSO Abatement Program is one of the investments in facilities designed to reduce the undesired impacts of accumulated runoff.

B.1.2.1.1 Impervious Area Model: By far the most common rate models developed within the last decade are impervious area models. These are based on the observation that runoff is largely related to the amount of impervious surfaces on a parcel. Any given parcel's share of costs is, then, proportionate to the impervious surface of the parcel relative to that generated by a typical "base" property.

B.1.2.1.2 Weighted Pervious Plus Impervious Area Model: This model is a variation of the impervious area model, with runoff from pervious surfaces (surfaces that *can* be penetrated by rainwater) added, on a weighted basis, to the impervious area. This model is more scientifically accurate than the impervious area model, in that it recognizes that under major storm events, pervious surfaces, once saturated, pass considerable runoff.

B.1.2.1.3 Land Use Model: The oldest of the rate models, the land use model is a variation of the impervious area model. In the application of the land use model, the use of the property is used to impute the amount of impervious area the parcel contains. This model depends on the establishment of "Coverage factors" for each class of land use, by establishing average ratios between gross area and imperviousness for each "class" of

parcels. More sophisticated versions of the model introduce a density factor to accommodate a range of coverages within a class in jurisdictions.

B.1.2.1.4 Value Rate Model: The Value of Loss Model postulates that a parcel owner's benefit is ideologically determined by the interplay of two separate factors: 1) the aggregate value of the improvements at risk should flooding occur, and 2) the risk of flooding associated with that parcel under various storm events. The value model stands in substantial contrast to the runoff contribution model. Where land surface (impervious or pervious) is the key to the runoff contribution model, the value of improvements and the risk of loss are the heart of the value model. The risk/loss model is essentially an insurance approach to valuing the benefit accorded a "customer" of the stormwater management program and utility.

Traditionally, the risk of loss is associated with flooding and the value of the property subject to loss. The nature of the NBC's CSO Abatement Program focuses on water quality issues caused by the overflow and the subsequent expense of retention and treatment of stormwater by the existing sanitary sewer system and not flooding. Therefore, the benefit being proposed by the NBC's stormwater-related projects are not primarily aimed at protection of properties during flood events and the Value Model is not viewed as an appropriate choice.

The applied technology requirements for implementation of the various rate structures are listed in Appendix B-2 for further information on the rate models.

B.1.2.2 Analysis of Rate Model Alternatives

B.1.2.2.1 Discussion of Impervious Area Model: The impervious area model has a solid theoretical base - on most parcels the amount of impervious area is clearly the predominate determinant of runoff in most situations. The model fits a broad range of stormwater management programmatic focus, including both quantity and quality oriented programs. Credit policies and adjustment policies can be readily developed and easily incorporated into the basic impervious area model. The concept is rather easily explained to the public and is generally accepted as reasonable. Data needs, however, are very specific and can be moderately expensive to acquire. The primary data need is a parcel level map and impervious area information specific to each parcel.

Investigation into the availability of data in the ten member-communities of the NBC revealed that this would be a difficult alternative to implement. Parcel level data, in terms of impervious surface area, is not available. Impervious area information is not available in an electronic format, such as GIS. The level of effort to gather the necessary data and put it into a useful and consistent medium would result in a high cost to the NBC or member communities. The City of Providence has plat maps, dating from 1997 that are available in hard copies. During a field investigation, however, it was discovered that the maps did not include some improvements that had been made prior to 1997. The failure of a community to update their plat maps was not an isolated condition.

B.1.2.2.2 Discussion of Weighted Pervious Plus Impervious Area Model: This model is most appropriately applied where substantial runoff flows into the community stormwater system from pervious lands. Incorporation of "perviousness" into the rate base provides a sound basis for charging such properties as developed but un-built lands, agricultural lands, feed lots, and landscape nurseries. Additionally, the model readily accommodates credit and adjustment mechanics.

While more scientifically valid, the model requires considerable extra investment in data collection and data maintenance and is more difficult to explain to ratepayers. Public understanding and general acceptance of this methodology is unlikely in the initial implementation period. Communities that have successfully implemented this methodology have moved to this level of complexity only after the successful establishment of a simpler initial program. Data needs are greater than those associated with the impervious area rate model, requiring parcel level maps, impervious area specific to each parcel, gross acreage information for each parcel, information related to the imperviousness of soils and ground covers, and the identification of the type and acreage of the different soil and ground covers found on each parcel. Lacking sophisticated GIS mapping, this can be quite expensive to setup and moderately expensive to maintain.

Because this model is an extension of the impervious area model with even more data needs it would also be difficult to implement in the NBC benefit area. The lack of available data at the parcel level from the ten member-communities would result in an extremely high level of effort for the NBC to implement.

B.1.2.2.3 Discussion of Land Use Model: This model is most suited for use when impervious area data does not exist, has not been consistently applied or is not readily available. Some jurisdictions that adopt the land use model eventually move to an impervious area model as site-specific data has become available. Data requirements include Land Use Maps, acreage information for all parcels, the ability to recognize which land use "zone" a non-residential property is located in for quality control purposes, most recent Tax Roll for each jurisdiction, sampling of properties within each use category to define "imperviousness" per acre of land for each category.

Gaps in available data can be overcome using statistical sampling to estimate imperviousness by land use classes. These techniques would have to be used for the ten member-communities in the NBC benefit area. The cost to perform this work would be moderate compared to the other alternatives. Appendix B-3 reveals that some data in the ten member-communities could be used as a basis for estimating imperviousness by land use class. The use of this data, in conjunction with the NBC billing files supports an approach that can be implemented.

B.1.2.2.4 Summary of Rate Structure Analysis: The table below summarizes the discussion and analysis of the three rate structure alternatives for this study.

Table B.1.1
Summary of Rate Structure Alternatives Analysis

Rate Model Alternative	Requirements for Gathering Data	Inability to Accommodate Site-Specific Conditions	Difficulty to Explain and Understand	Cost to Implement
Impervious Area	High	Low	High	High
Weighted Pervious Plus Impervious	Very High	Very Low	Very High	Very High
Land Use	Moderate	Moderate	Moderate	Moderate

B.1.2.3 Recommendation of a Rate Structure Model

After comparing the benefits and deficiencies of the rate structure alternatives, the recommended rate structure model for implementation by the NBC is the Land Use Model. Of the runoff models, the Land Use Model is more easily explained to the public, its data demands are modest and it is one of the simplest to implement of the rate models under review. It can be implemented at the most reasonable cost as it is dependent on information that is already available or can be estimated through statistical sampling.

The heart of the model is the imputing of impervious area based on class coverages rather than direct measurement. One disadvantage of this model is that it does not accommodate traditional mitigation credits and site-specific adjustments well, since each are grounded in direct measurement mechanics. This can become a problem over time in large jurisdictions with a broad range of site conditions and with parcels that contain large amounts of impervious area that may be either under or over-charged using the land use model.

B.1.2.4 Other Considerations

Based on the analysis above it is clear that the NBC should pursue implementation of a Land Use based rate model. Assuming that is the path taken for implementation, other factors should be considered in the context of a Land Use model.

B.1.2.4.1 Exemptions: Exemptions are defined as the exclusion of a potential customer due to special circumstances. Some billing authorities may wish to exempt certain properties for political reasons or to provide a high degree of equity. Exemptions from any user charge require special scrutiny to assure that applicable legal tests are met. The creation of an exemption must be founded upon a legitimate public purpose, and must not trammel State or Federal Constitutional concepts of equal protection and Constitutional prohibitions against the establishment of religion or the use of the public treasury directly or indirectly to aid religious institutions. Furthermore, to ensure public acceptance, any exemption should make common sense and be perceived as fair.

The impact of any proposed exemption should be evaluated in terms of its magnitude of fiscal consequences on remaining rate payers as the amount to be collected must now be recovered from a smaller set of parcels. Whatever exemption policy is authorized, individual customer and property data will be required and the type of exemption will define the type of data needed. Typically, exemptions fall into one of the following categories:

Vacant Property: Vacant property is defined as undeveloped land that has not been altered from its natural state and other properties containing or assigned a nominal (less than 500 sq. ft.) of impervious area.

Parsons recommends the exemption of vacant property, as defined above, from CSO Abatement Program charges. This approach will prevent small paved improvements, such as dumpster pads sitting on an otherwise undeveloped property, from being charged.

Rights-of-Way: Right-of-Way (R-O-W) parcels are typically exempted. For the purposes of this study, these include residential streets and other public roads. R-O-W's are clearly impervious and contribute stormwater to downstream facilities, however, they frequently serve as an important part of the conveyance system, carrying runoff to attenuation and other treatment facilities. Private roads, like driveways, are generally not designed to be a part of the conveyance system, and are frequently treated like other impervious areas. Most public stormwater charge structures include private roads as impervious areas in the fee calculation. In essence, the R-O-W's contribution of runoff is considered part of the stormwater conveyance system that is paid for by other funding methods, such as the existing user fees.

Parsons recommends the NBC exempt public R-O-W's such as roads and highways from the CSO Abatement Program charge.

Low-Income: Low-income exemptions are provided based on income of "hardship" qualifications. Typically, this is only employed where there is already precedence in the community for such relief.

Parsons recommends that the NBC not establish a low-income exemption from the proposed user charge, as this would represent a significant policy shift from current NBC billing practices.

B.1.2.4.2 Mitigation Credits: In traditional stormwater utility programs, mitigation credits, in the form of fee reductions are often granted to parcels that have reduced the impact of runoff from that parcel through the use of on-site man-made stormwater management facilities. In most cases, the credits are only given for facilities that are privately maintained and that meet design specific standards of performance. The granting of mitigation credits is based on the philosophy that costs to provide stormwater management is lessened in relationship to the reduction of the quantity, quality or rate of runoff leaving a property.

The mechanics of calculating a precise amount of credit due each eligible parcel lies within the expertise of professional stormwater engineering. A credit process must be based on sound engineering principles and must be codified to provide for its consistent application by individuals responsible for the program.

In the case of the CSO Abatement Program, the application of mitigation credits within the Land Use Model is not recommended. The model is not conducive to the application of mitigation credits, since site-specific, *not imputed*, impervious area information is required to implement an equitable mitigation credit policy. If impervious area for each property becomes available in the future then a mitigation credit program should be considered.

B.1.2.4.3 Other Fee Adjustments: Other fee reductions or surcharges are those adjustments that are used to accomplish a political or financial objective, other than to encourage the mitigation of runoff. Fee adjustments or surcharges should be applied under the same rules as those for the granting of exemptions.

Parsons recommends the NBC include a provision for waivers in their CSO Abatement Program fee program. In order for owners to obtain a waiver they would have to petition the NBC and demonstrate that their property places no burden or impact on the NBC collection and treatment system. This provision is important from a legal standpoint to provide owners a way to opt out of services if they choose not to use them and a way to make adjustments for incorrectly charged parcels.

Parsons also recommends that the NBC place surcharges on "free riders". By definition "free riders" are parcels that currently have a direct or indirect connection to the NBC collection or treatment system but pay no sewer user fees – most probably because they don't have any water service. In the interest of equity, these properties should be

surcharged to make up for the absence of sewer user fees and bring their fees more in-line with the burden they place on the NBC system. It is recommended that the amount of the surcharge reflect the portion of existing sewer fees that were recently added to fund certain components of the CSO Abatement Program budget, in addition to any fees approved as a result of this CSO Abatement Program fee study.

B.1.2.4.4 Designation and Assignment of Land Use Classes: The Land Use Model requires the acreage values and the determination of the appropriate zoning designation for each property. As the current NBC billing system includes the identification of the number of dwelling units associated with each property, the use of this information is recommended. Zoning information for larger, non-residential properties may be obtained through the association of the parcel address with the zones shown on the zoning maps available from RIGIS. There are a number of benefits associated with the use of NBC data wherever possible. They include the reduction in administrative costs for initial data set-up and maintenance, the ease of explaining the designation to customers and the uniform nature of the designation. For larger residential parcels (over six dwelling units) and other non-residential parcels, the use of the zoning maps is recommended to assign the imperviousness associated with each parcel using the Land Use Rate Model. A map developed from information furnished by RIGIS that depicts available Land Use Information is found in Appendix B-3.

B.1.2.4.5 Layering of CSO Abatement Program Charges: The potential for piggybacking one or more "layers" of program charges to recover specific costs exists for properties located in the CSO Abatement Program area. Separate charges may be layered to meet policy objectives, provide additional information to the users, or provide a higher degree of equity to a specific group of users.

The proposed CSO Abatement Program fee is essentially a new "layer" on the NBC's existing utility charge system. However, based on the characteristics of the NBC collection and treatment systems and the nature of the CSO Abatement Program there does not appear to be a compelling reason to layer additional CSO Abatement Program charges. The only exception would be surcharges that are recommended for application to new accounts to be created for the purpose of delivering utility charges to those properties known as "free riders".

B.1.2.4.6 Identification of "Free Riders": In the case of NBC billing, the inclusion of all developed properties that are contributing either directly or indirectly to the chosen benefit area will provide an increased level of equity among all rate payers and will maximize potential revenue to be collected.

Free riders are typically developed but unused or unoccupied parcels. Development may include buildings, parking areas and other paved surfaces that have been constructed, but are not in use and not associated with an active water or sewer billing account. Examples of properties in this category identified during field investigations in the City of Providence include:

- Parking areas that are adjacent to other developed property but not otherwise metered,
- Abandoned buildings, often with parking areas,
- Buildings that are temporarily unoccupied or that have suspended utility accounts.

Photographs of potential "free riders" that were observed in the NBC benefit area are included in Appendix B-1. The photographs, taken in January 2002, depict an abandoned school property that is owned by the City of Providence, a large commercial property and associated parking areas that were abandoned prior to their completion, a large parking area associated with a private church school, a parking lot that appears to be located on a lot that is adjacent to a high-rise retirement apartment complex, and college owned buildings and parking areas that are not found in the Tax Assessor's records.

The "free riders" represent a large amount of impervious area and substantial amounts of runoff that are not associated with the NBC billing accounts. There are a number of ways to locate these sources of potential revenue given the available information in the NBC Abatement Program area:

- Comparison of Tax Assessor files with NBC billing records using the location or premises address to identify developed parcels not currently receiving a NBC bill,
- Comparison of past NBC billing records with current billing records to identify parcels that formerly had accounts but may now be abandoned,
- Visual recognition of suspect properties using zoning map and land use designations,
- Interviews to identify properties that are traditionally in this category, including school and church properties, abandoned buildings, parking lots associated with theatres, bowling alleys, recreational facilities, parks, cemeteries,
- Site visits to potential "free rider" properties such as abandoned or temporarily vacated office buildings, strip malls, and apartments,
- Research into Tax Assessor files that have been coded "vacant" but show substantial property values or a construction date that would indicate prior development.

Parsons recommends an approach to identifying "free riders" that maximizes the use of electronic screening methods. The first step would be to compare the existing NBC billing file with city and town Tax Assessor records that are electronically available. Developed parcels that do not currently receive an NBC bill would be considered "free rider" candidates. At this time, Parsons has access to electronic tax rolls for the City of Providence, the Town of Smithfield, and the Town of Cranston.

Another screening step would be to compare past NBC billing files with the current NBC billing file to identify properties that have dropped out of the system. Comparison of files from five years ago to current files would require a relatively low level of effort and would identify some properties that have been abandoned.

Based on these results, Parsons would anticipate using specific methods from the list above to identify "free riders" in other parts of the NBC benefit area. At this time, it is not possible to estimate a reliable cost to identify all "free riders".

B.1.2.4.7 Revenue Potential of "Free Riders": Based on field investigations and experience in other communities, it is conservatively estimated that the number of "Free Riders" may be in the range of 600 to 1000 accounts. Parsons evaluated three "drainage areas", as defined by the City of Providence's Study of Sewerage Improvement maps provided by the NBC, in west Providence. The areas were chosen for study based on the variety of land uses shown on the RIGIS Land Use overlays. The field investigation identified 16 potential "free riders" in an area representing less than 5% of the total area of the city. Based on population distribution and development trends in the ten member-communities, approximately 70% of the "free riders" are expected to be found in the three combined sewer communities of Providence, Central Falls, and Pawtucket. It should be noted that these estimates are based on limited field investigation, and are not based on any other methods.

While the range of estimated "free riders" may appear to be conservative, the revenue generated from these parcels is potentially significant. A number of the example properties shown in Appendix B-1 fall into Land Use categories other than single-family residential meaning they would be assigned more than one Equivalent Billing Unit (EBU). Additionally, depending upon the level of surcharge applied to "free riders" the potential revenue from these properties would be even greater. Table B.1.2 presents theoretical revenue estimates from the "free rider" parcels.

Table B.1.2
Theoretical Revenue Estimates from "Free Riders"

Assumptions		Annual Revenue
• There are 600 "free rider" parcels and each is equivalent to 10 EBU's • The CSO Abatement Program fee is set at $1.00 per month for a total of $12.00 per year	6,000 EBU's x $12.00/yr	$72,000
• Each parcel receives a surcharge equal to 60% of the typical sewer use fee of $164.00 • Approx. 600 "free rider" parcels	$98.40 x 600 parcels	$59,040
Total		**$131,040**

B.1.2.4.8 Recoverable Costs: The amount to be recovered by the NBC through the application of user charges can be set at any politically acceptable level that does not exceed expenditures for the CSO Abatement Program. Based on input from NBC staff,

Parsons recommends cost recovery through a CSO Abatement Program fee include the following cost items:

- Consulting fees for CSO Abatement Program fee feasibility studies and implementation of the fee system set-up,
- Costs to integrate new stormwater billing components into the existing NBC billing system,
- IT costs for ongoing billing functions related to the stormwater component of the billing system,
- Costs to increase staff for customer service support,
- A portion of the debt service related to the CSO Abatement Program capital projects,
- Ongoing operations and maintenance costs of CSO Abatement Program capital projects.

B.1.3 ASSESSMENT OF DATA SOURCES FOR THE LAND USE MODEL

B.1.3.1 Cadastral (Property) Coverage

Parcel level maps are not available from any source at this time. Plat maps are available from each jurisdiction through either the Property Assessor's Office or the Recorder of Deed's Office. Parcel ownership (property) maps are not available through RIGIS.

B.1.3.2 Land Use Data provided by RIGIS

An example of a Land Use map made available by the Rhode Island Department of Administration Statewide Planning Program is included in this report. The legend shows inclusion of 23 discrete land use categories. Assuming that this information has been applied in a consistent manner, this information can be used to determine a rough estimate of total acres in each land use category by geographic area.

By first creating an overlay of the geographic areas to be studied, and then applying the factors associated with each land use category, it is possible to determine the potential gross billing units within any delineated geographical area in the NBC's existing service area. This information is available free of charge from RIGIS and can be used for any public purpose. The source of land use information found in the RIGIS file is attributed to land cover found on 1992 and 1995 aerial photography coded for Anderson modified level 3 to one half acre polygon resolution. (An example map is found in Appendix B-3).

B.1.3.3 Jurisdictional Boundaries

Each of Rhode Island's cities and towns have separate directories and associated "shape file" format data-sets available from RIGIS. These datasets are available on the Internet for cost-free download courtesy of the Environmental Data Center at the University of Rhode Island at www.edc.uri.edu. Information in each dataset includes the political boundary lines, coastline and State Line boundaries, City and town attribute codes and

name annotation. Geodetic survey horizontal and vertical monument control points are attributed to the National Geodetic Reference System and Rhode Island control bases, including elevation benchmarks and point coordinates.

B.1.3.4 Aerial Photography

No planimetric layer exists at this time, but the information found on aerial maps is sufficient for accurate sampling of impervious area measurement in all areas that predate the dates the photographs were taken. A variety of photographic products are available through RIGIS and USGS:

- Digital ortho-photography for Central Falls, Pawtucket and Providence at ½ meter pixel resolution is available in black and white. They are attributed to aerial photographs flown in 1994.
- USGS digital ortho-photography for RI from 1992/1995 is available at one-meter pixel resolution in black and white images in quarter quad tiles in a compressed image format (MrSid).
- USGS digital raster graphic images area also available from USGS.
- RIDOT ortho-photo images flown in 1997 are available in 2-foot pixel resolution.

B.1.3.5 Tax Assessors Records

The information found in the Tax Roll includes the property owner's name and address, the address of the property, the property identification number, property value information and a tax and revenue code. Other information maintained by the Tax Assessor includes acreage of the property, year built, impervious area related to the building footprint and other information that is used to determine the tax bill. Table B.1.3 shows the available tax code and use information in the Tax Assessors records.

In compliance with State Law, each tax parcel is assigned a state code that most accurately describes the use of the property. This description is recorded on the tax assessor files using one of the following two-digit State Codes

TABLE B.1.3
Rhode Island Tax and Revenue Code

STATE CODE	CODE DESCRIPTION	STATE CODE	CODE DESCRIPTION
01	Single Family	29	Land Lease Commercial Building
02	2-5 Family	70	Cemetery
03	Apartment Building	71	Charitable
04	Combination	72	Church
05	Commercial I	73	Ex-Charter
06	Commercial II	74	Federal
07	Industrial	75	Hospital
10	Utility	76	Library

STATE CODE	CODE DESCRIPTION	STATE CODE	CODE DESCRIPTION
12	Miscellaneous	78	Municipal
13	Residential Vacant Land	79	School
14	Commercial Vacant Land	80	State
15	Other Vacant Land	82	Vote of City
23	Residential Condominium	83	44-3-9 STB
24	Commercial Condominium	84	Amtrak NRR
25	Industrial Condominium	85	Act of Legislature

An example of property record cards available for each property in Providence and Pawtucket are found in the Appendix. In each instance, the zoning information, number of living units and gross acreage are all indicated. The recording of this information is a revenue requirement for each jurisdiction, and while not readily available in an electronic format, it is available on a request basis by parcel number.

No single database with information necessary to develop and implement the Land Use rate structure exists at this time for the ten member-communities. Required information will have to come from a variety of sources, including those listed above. Data will have to be collected on a case-by-case basis for each individual community. However, Parsons recommended approach will maximize the use of electronic data available such as the NBC billing files, the City of Providence Tax Rolls, and the RIGIS database to allow the implementation team to focus resources on less readily available or automated data.

B.1.4 SETTING THE RATE

Whichever theory of benefit is employed in the rate model, the strategic objective is to collect duly apportioned charges from all customers who benefit from the program in place. Rates are typically set in one of two ways:

- Budget-Driven Rate Calculation: By dividing the amount of revenue that is to be recovered from the user charge by the total number of estimated billing units for any given year.

- Politically Acceptable Rate Calculation: This calculation is setting the rate at a "politically acceptable level" and "backing" into a budget built around those estimate proceeds. In reality, the process is more typically an iterative combination of the two approaches. The agency starts with needs (approach one), and then tempers it with the political reality of the community involved (approach two).

The NBC has already begun a program of rate increases for their existing sewer service charge that will eventually recover a substantial portion of the CSO Abatement Program costs and Parsons recommends the NBC continue with this program. The CSO

Abatement Program charge, tied to the relative amount of impervious area associated with each site, will add another important component to the NBC's revenue collection system. It will equitably distribute some of the costs of the CSO Abatement Program throughout the NBC's service area, by including "free riders" in the billing system and allowing them to share in the costs of the program, and by showing the public the benefit and cost implications of the CSO Abatement Program that has been undertaken by the NBC.

Because the NBC has started to collect money for the CSO Abatement Program through their existing sewer service charge, a decision upheld in the Rhode Island courts, Parsons recommends the NBC set the new CSO Abatement Program rate at a politically acceptable level that will provide for the recovery of some of the costs associated with the program. The exact amount to be recovered by the CSO Abatement Program fee will be discussed later in the study and will require input from the NBC.

SUBTASK B.2 PRESENTATION OF DIFFERENT COST APPORTIONMENT ALTERNATIVES AND RELATED RATEPAYER IMPACTS

B.2.1 DEVELOPMENT OF THE STANDARD BILLING UNIT

The first step in developing cost apportionment is defining the value of a standard billing unit. This includes the consideration of the following cost apportionment issues:

Who are the utility customers?
What is the measure of equivalency?
Will uniform rates, residential tiers or calculated rates be used?
Shall credits be offered and will exemptions be allowed?

B.2.1.1 Who is the Rate-Payer

As stated previously, Parsons recommendation for parcels eligible to receive a CSO Abatement Program fee should be those parcels with either a direct or indirect connection to the NBC collection and treatment systems. It is further recommended that the NBC CSO Abatement Program fee be delivered to the same customer profile as already established by the NBC billing system. Data, as acquired, is to be associated with the established account numbers found in the NBC billing system. Additional customer account numbers will need to be established for "free riders". This will be the most efficient method for issuing the CSO Abatement Program fee and most customers will already be familiar with the bill – the exceptions are the estimated 600 – 1000 "free riders" that are expected to be added to the billing system.

B.2.1.2 Choosing the Standard Billing Unit

Parsons experience and previous studies of existing utility programs show that all programs use a basic billing unit. This case is no different and Parsons recommends the NBC adopt the term Equivalent Billing Unit (EBU) to describe their base billing unit.

Parsons recommends that the EBU value be developed by finding the "median" impervious area value rather than an "average" impervious area value. This avoids the skewing of the billing unit value that occurs when "outliers" are included in the development of the average value. Further, this EBU should be based on statistical sampling from all ten member-communities and should be applied across the entire benefit area. After a careful review of the nature of residential accounts found in the current NBC billing system, it is recommended that the billing account numbers be developed based on the actual impervious area found on the "median" record of a statistically acceptable sample set of residential units having from 1-3 units. The achieved value would be used to determine billing units on all other parcels.

B.2.1.3 Rate Tiers

In all rate structures, simplicity must be balanced against the need for equity. Parsons recommends establishing two tiers of residential rates for the NBC system. Tier 1 will apply to all residential parcels, with a direct or indirect connection in the ten member-communities, with from 1 to 3 dwelling units. Tier 2 will apply to all residential parcels, with a direct or indirect connection in the ten member-communities, with from 4 to 6 dwelling units. Residential parcels greater than six dwelling units, commercial, and industrial parcels will be grouped into a category classified as "general". Charges applied to parcels in the general category will be tied to the number of EBU's assigned to each property.

B.2.1.4 Calculated Rates

Fees should be calculated for each account based on the assigned impervious area that is associated with rate classes in the case of the residential tiers and each property in the case of the general rate tier.

B.2.2 RATEPAYER IMPACTS

Based on policy assumptions and billing unit account estimates, ratepayer impacts are projected below. For the purpose of this projection, the number of free riders is estimated to be 600 properties with an average billing unit assignment of 10 units each.

Table B.2.1
Estimated Billing Unit Count for CSO Abatement Program fee

Category	No. of EBU's	
Existing Residential – Tier 1	69,000 @ 1 unit each	69,000
Existing Residential – Tier 2	2,000 @ 1.5 units each	3,000
Existing Commercial Accts	7100 @ 8 units each	56,800
Existing Industrial Accts	750 @ 15 units each	11,250
Projected "Free Riders"	600 @ 10 units each	6,000
Total Estimated Billing Units		**146,050**

For every $1.00 per month charged, the NBC benefit area would generate approximately $1.8 million per year. Applying this structure would mean residential customers pay $12 per year in CSO Abatement Program fees. Assuming an average industrial account has 15 EBU's the annual contribution would be $180. Even a very large industrial account equivalent to 80 EBU's would pay less than $1,000 per year.

It is impossible at this point to quantify the exact amount of revenue to be generated through a CSO Abatement Program fee. The data needed to develop EBU's for all parcels other than residential units will have to be gathered during an implementation phase. However, the figures in Table B.2.1 give some indication of the potential revenue gains through a CSO Abatement Program fee. Additionally, the NBC will have to make a determination of what level of charges would be politically acceptable.

SUBTASK B.3 DISCUSSION OF MAJOR OBSTACLES OR CHALLENGES AND STRATEGIES TO MITIGATE THESE CHALLENGES

B.3.1 DATA DEFICIENCIES

The Land Use model recommended for implementation by the NBC will require the identification of impervious areas for all general category parcels and a sample of parcels in each residential rate class to determine the median imperviousness per residential rate class.

B.3.1.1 Impervious Data

This information resides in the Tax Assessor files of the "benefit area" communities. The cities of Pawtucket and Providence represent almost 50% of the total records needed. The use of tax assessor files is also required for the identification of total acreage attributed to each parcel. There is reluctance on the part of local jurisdictions to furnish this information, however, this information is in the public domain and with suitable pressure, it is expected that these files can be obtained. On an interim basis, specific parcel acreage information can be obtained on a site-by-site basis at the Tax Assessor's offices.

In each case, the unavailability of recent parcel maps, the age of plat maps and the difficulty of acquiring files from the Tax Assessor's offices increases the dependency on the interpretation of aerial photographs and fieldwork for validation of impervious area records. Fortunately, the mostly "built-out", highly urban nature of Providence, Pawtucket and Central Falls make the use of available rectified aerials sufficient for an estimated 95% of impervious identification where this information may not be available from other sources. Based on the assumption that residential properties will be assigned billing units on a uniform basis, the remaining 5% of commercial parcels requiring field work is estimated to be 355 parcels. This is based on a total number of 7,100 total commercial properties in the NBC Service Area.

In general, the cost of fieldwork and digitizing of data from available aerial photographs will be limited to sample sets of residential parcels and the entire group of non-residential commercial parcels.

B.3.1.2 Data Sampling

Where site-specific data is not available, statistically valid sample sets can be used to fill in missing information. A windshield survey of over 50 miles of residential neighborhoods finds that in the City of Providence, all residential properties fell into one of three basis types. The uniform nature of residential architecture within urban areas increases the dependability of sampled data.

B.3.1.3 Testing and Validation of Data

A reliable database is the result of careful data collection and testing. All sample sets should be of sufficient size to meet generally accepted statistical standards. A variety of data sources are available for the testing of data. Plat maps in most areas have not been recently updated, but have substantial value for parcel boundary recognition and quality control efforts.

B.3.1.4 Billing System Data

Following the collection and manipulation of data, the compilation of an accurate master billing file of data is necessary to support the collection of any fee. The master billing file is to be developed outside of the NBC billing system and must include the following fields:

NBC account number
User-charge description
Assigned number of billing units
Rate for benefit(s) provided
Billing cycle definition (monthly, quarterly, annually)
Calculated fee

It is recommended that rate class information be included for all parcels except those that have been determined by the NBC to be residential in nature. If a system for the granting of exemptions or fee adjustments is adopted, this information is also appropriate for inclusion. The specifications for data types and format of data will be detailed in **Subtask C – Assessment of Administrative Considerations.**

B.3.2 LEGAL CONSTRAINTS

The recommendations presented in this memorandum are consistent with our interpretation of the NBC's authorization to recover costs, through its enabling legislation, and the decisions of Rhode Island case law.

B.3.3 PUBLIC ACTIVISM AND PROGRAM ACCEPTANCE

The NBC has long recognized that community acceptance of its programs is a key to successful management and operations. Fortunately, the Narragansett Bay has helped to define the quality of life for all residents of Rhode Island and the public, in general, is receptive to its protection and clean up. The public's general perception of the NBC is that it is an advocate for environmentally sound management. While program issues are complex, the NBC is already using many public participation initiatives. These methods include public education, interaction and stakeholder participation. Political acceptance of a funding structure to help recover the cost of operations, maintenance and capital projects is sought. This section discusses the ongoing public effort made by the NBC to garner support for environmental efforts and their funding and recommendations for

using those avenues for disseminating information on an impending CSO Abatement Program fee program.

B.3.3.1 Establishment of the CSO Stakeholder Group

The NBC's comprehensive CSO Facilities Plan was completed in 1993 and approved by the Rhode Island Department of Environmental Management (RIDEM) in 1994. Realizing the high cost of the proposed plan's water quality programs, the NBC established a CSO Stakeholder Group of interested parties in an attempt to develop consensus for the CSO Program. The CSO Stakeholder Group discussed economic impacts of the proposed CSO program and other financial obligations of the NBC's operating budget and existing Non-CSO capital projects. A series of workshops provided additional public participation. Input from the stakeholders was received in June 1996, leading to a reassessment of the NBC's CSO control program. In 1997, the NBC presented 16 potential alternatives back to the stakeholders and later to the general public. The NBC has continued to be sensitive to including the suggestions and recommendations of those participating in the process. At the August 1997 stakeholder meeting, the NBC agreed to six CSO-related activities, including this funding study: an evaluation of a CSO Abatement Program fee.

Since the CSO stakeholder group has been an integral part in the CSO Abatement Program planning process and in the development of this study, Parsons recommends the project team continue to interface with the group and advise them of the status and seek input on the CSO Abatement Program fee study and implementation program. This is a good vehicle to keep interested parties in the public sector informed of the most recent proposals and involved in the decision making process.

B.3.3.2 Public Education Initiatives

The NBC has a multi-link Internet presence at its website located at http://www.narrabay.com. The site offers a variety of information to the general public and secure information to its customer base with the entry of the customer's account number and unique password. The general public can access information about the NBC, its management and facilities and over two dozen pages of information on utility-related subjects. An overview of the CSO Abatement Program is included and it is assumed that the website would be used to provide information on the stormwater rate program and rate information would be integrated into the existing body of information as it becomes appropriate.

Parsons recommends using this media platform as a means of informing the public of any impending changes to the charges on their bills. Implementation schedules, critical decision points, justifications, and PDF files of examples bills (with changes highlighted) could be displayed on the NBC's website.

B.3.3.3 Educational Materials and Publications

A variety of publications are available by hard copy or download from the website in a PDF version. Stormwater fee programs have been growing in numbers since the mid 1980s and sample materials dealing with utility topics are readily available for distribution on this topic. Parsons recommends the NBC develop specific materials for distribution to current customers notifying them of an impending change to their bills and a description of why the changes are being made. Brochures, pamphlets, billing inserts, the use of printed materials for the dissemination of educational materials will be discussed in detail in **Task C – Assessment of Administrative Considerations.**

NARRAGANSETT BAY COMMISSION

Task C – Assessment of Administrative Considerations

Technical Memorandum

February 11, 2002
(Resubmitted March 4, 2002)

Prepared by: Parsons Engineering Science, Inc.

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SUBTASK C.1 PREPARATION OF A SCHEDULE OUTLINING TASKS AND TIME FRAMES FOR IMPLEMENTATION OF THE STORMWATER RATE STRUCTURE

C.1.1 BACKGROUND

The Land Use model was introduced in Task "B" as one of several rate structure options considered for use by the Narragansett Bay Commission (NBC). Following a review of the nature of the proposed Combined Sewer Overflow (CSO) Abatement Program and data availability, the Land Use model was recommended as the most cost efficient means to develop an equitable rate structure for this project. This section further develops those recommendations through the use of actual NBC billing database files.

C.1.1.1 Review of the Recommended Rate Structure

The Land Use model, using runoff as its rational nexus, features the development and application of "factors" of imperviousness for homogenous development within each billing class. In this project, the Land Use model should be modified to take full advantage of coding that already exists within the NBC billing system, namely the number of dwelling units. This approach will alleviate the need to generate site-specific data on over 70,000 existing NBC accounts. The application of traditional Land Use model factors will only apply to properties that are in the "General" billing class, a much smaller subset of the universe of benefited properties.

C.1.1.2 Recommended Billing Classes

The manner in which utility charges are calculated is based on the billing class to which each account is assigned. It is recommended that two broad categories, Residential and General by used in this project. This assignment is to be based on information found in the current NBC billing system.

C.1.1.2.1 Residential Class: Parsons recommends that two residential "tiers" be established within the "Residential" billing class. Tier 1 should be the 69,214 Residential accounts (with less than four dwelling units). Likewise, it is recommended that the 2,333 Residential accounts (with between four and six dwelling units) be assigned to Tier 2.

C.1.1.2.2 General Class: It is recommended that residential accounts with more than six dwelling units, and all commercially and industrially coded accounts are calculated as "General" accounts. The number of billing units assigned to each parcel in the "General" billing class is to be determined by the account's total acreage, the imperviousness per acre factor and the property's use description. Fees are to be calculated by multiplying the number of billing units by the adopted rate per billing unit.

TABLE C.1.1
Assignment of CSO Fee Categories to Existing NBC Customer Types
Source of Customer Type Information: February 2002 NBC Billing System Data

NBC Assigned Customer Type	NBC Assigned Dwelling Units	CSO Fee Class
Residential	1	Residential Tier 1
Residential	2	Residential Tier 1
Residential	3	Residential Tier 1
Residential	4	Residential Tier 2
Residential	5	Residential Tier 2
Residential	6	Residential Tier 2
Residential	>6	General
Commercial	>0	General
Industrial	>0	General

C.1.1.3 Review of the Equivalent Billing Unit Value

To provide for billing equity, the assignment of relative billing units must be achieved prior to the application of billing rates. This requires that sufficient data be acquired to develop a standard Equivalent Billing Unit (EBU) by which all other accounts would be defined. The development of the EBU is included in the Schedule of Implementation Tasks. It can be accomplished by evaluating a sample set of Tier 1 residential parcels from the ten member-communities to determine a median value for impervious area.

A sample set of Tier 2 residential parcels will also be evaluated to develop a median value for impervious area. Once the impervious area values are known, EBU's can be developed for each rate class. For example, if the median impervious value associated with the sample set of residential properties in Tier 1 is 2,450 square feet and the respective value in Tier 2 is 4,410 square feet, then, Tier 1 accounts would default to a value of 1.0 EBUs and Tier 2 accounts would default to 1.8 EBUs.

Calculation: Tier 2 $\frac{\text{4,410 square feet}}{\text{2,450 sq. ft. per EBU}} = 1.8 \text{ EBUs}$

C.1.1.4 Factors of Imperviousness

Likewise, Land Use "Factors of Imperviousness" must be developed based on sampled data collected from properties in the "General" billing class. The factors will be applied to all accounts in the "General" billing class based on their lot size in acres.

For example, if the Land Use Factor for Commercial Properties within the same community is 65%, a half-acre property would be assigned an EBU value of 5.8.

Calculation: Commercial Property

$$\frac{0.5 \text{ acres} \times 43{,}560 \text{ (sq. ft/acre)} \times 0.65 \text{ (impervious coverage/acre)}}{2{,}450 \text{ sq. ft. per EBU}} = 5.8 \text{ EBUs}$$

C.1.1.5 Information Included in this Deliverable

Using the Land Use model, an equitable distribution of charges can be accomplished. This document provides an assessment of tasks and costs related to the successful implementation of the Land Use model in the NBC's benefit area. Major topics include:

- Schedule of Implementation Tasks
- Estimate of Start-Up and Administrative Costs
- Data Assembly and System Integration
- Public Information Strategy

The implementation work plan and schedule has been developed based on conditions that are specific to this project, NBC's current billing files, information available through the Rhode Island Geographic Information System (RIGIS), and an assessment of local parcel and plat maps and other data that may be acquired from local Tax Assessor's offices.

C.1.2 BILLING ACCOUNTS

A narrative description of Implementation Tasks is included, together with a series of tables that were developed for use in quantifying the number and nature of records involved in tasks to be performed during the implementation phase. An Implementation Schedule showing Tasks and Time Frames, is found in Appendix C-1.

C.1.2.1 Supporting Materials

~~The following sources were used to develop this Section:~~

1) ~~NBC billing system file (acquired February 2002)~~
2) Information gathered from interviews
3) Project status meetings
4) Land development maps (downloaded from RIGIS in 2001)
5) Site observations

C.1.2.2 Existing "Base" Billing Accounts

Although the CSO Abatement Program does not require that an account's association with either Bucklin Point or Fields Point Treatment Facilities be tracked, the relationships are shown in Table C.1.2. This information is provided to illustrate how the combination of these sets of accounts make up the "base" billing group of accounts that are eligible to receive a CSO Abatement Program Fee.

TABLE C.1.2
Billing Unit Breakdown by NBC Designated Customer Types
Source: February 2002 NBC Billing System Data

NBC Billing System Billing Area	Residential with 1-3 Dwelling Units	Residential with 4-6 Dwelling Units	Residential with > 6 Dwelling Units	Commercial	Industrial
Field's Point	40,773	1,043	96	5,142	321
Bucklin Point	28,441	1,290	35	2,729	315
CSO Abatement Program Total	69,214	2,333	131	7,871	636

C.1.2.3 "New" Billing Accounts

In addition to the accounts found in the existing (base) billing group, a number of new NBC accounts will be identified. These include eligible properties that are not currently associated with an active NBC utility account but whose stormwater runoff directly or indirectly enters the NBC collection and treatment systems and will benefit from the construction of the CSO Abatement Program. Based on experience in other communities and observations made during site visits, we expect the "free riders" to include parking lots that exist for the benefit of other developed properties, properties with recreational pavement (tennis, handball courts), properties with vacant buildings and abandoned construction sites. An outline of procedures designed to identify "free riders" and the estimated cost to accomplish this task are included in Appendix C.

C.1.2.4 Observation of Development Characteristics

The character of permitted development, impervious area coverage, data availability and data collection procedures varies significantly across the communities that are served by the NBC, leading to the recommendation that data be acquired through random sampling within each of the ten principal communities. The number of existing accounts in each component of the recommended "General" billing class is shown in Table C.1.4. The number of accounts identified in each of the ten principal communities is used for developing the sample size and is also used for estimating the resources that will be needed to collect, analyze, compile and record for each of these communities.

TABLE C.1.4
Number of Accounts Located in the "General" Billing Class
In the Ten Principal Communities
Source: February 2002 NBC Billing System Data

City	"General" Billing Category		
	Residential Dwelling Units > 6	Commercial	Industrial
Central Falls		378	28
Cranston		18	
Cumberland		293	21
East Providence		322	36
Johnston	15	403	32
Lincoln	18	312	45
North Providence	53	584	18
Pawtucket	17	1,430	178
Providence	28	4,124	271
Smithfield		7	7
Total	**131**	**7,871**	**636**

The data provided in Table C.1.5 is used in the Schedule of Implementation Tasks to estimate the resources required to provide for the assignment of relative equivalent residential values in each community and to project costs for data validation and other quality control efforts.

TABLE C.1.5
Number of Accounts Located in the Residential Tiers
In the Ten Principal Communities
Source: February 2002 NBC Billing System Data

City	"Residential" Billing Category	
	Residential 1 – 3 Dwelling Units	Residential 4 – 6 Dwelling Units
Central Falls	1,737	383
Cranston	60	0
Cumberland	5,356	83
East Providence	3,240	15
Johnston	4,499	47
Lincoln	4,039	86
North Providence	8,294	85
Pawtucket	14,531	722
Providence	27,457	912
Smithfield	3	0
Total	**69,214**	**2,333**

C.1.2.5 Data Collection Tasks

Data Collection in the implementation phase will require the collection of impervious area data on randomly chosen samples and the collection of lot size for the entire "General" billing class population. Data collection techniques will include the use of electronic and hard copy records containing lot size information, digitizing of data using maps and aerials and, possibly, field measurement using a measuring wheel.

C.1.2.5.1 Sampling: The recommendation of the Land Use model was due in part to the fact that its data requirements are less demanding than those of other "runoff" based rate models that were considered. Data collection depends, however, on the sampling of a sufficient number of properties to develop reliable information. The adequacy of the sampling set size cannot be overemphasized. The actual number of samples that will be needed, however, cannot be determined at this time. It is recommended, therefore, that an initial sample size of no less than 15 properties be used. Once the standard deviation and variance of the initial sample set is determined then the actual number of samples required can be calculated. For populations of less than 15 total properties, it is recommended that the entire population be measured in the initial sample task. This procedure must be performed for each billing category within the following account populations:

Median impervious area found on Residential Tier 1 properties: The purpose is to develop the "typical" Tier 1 impervious area amount to establish the EBU value.

Median impervious area found on Residential Tier 2 properties: The purpose is to develop the "typical" Tier 2 impervious area amount so that Tier 2 properties can be defined in terms of EBU's.

Median impervious area found on specific land uses within NBC member-communities on properties in the "General" billing class: The purpose is to develop "Land Use Factors" by identifying typical impervious coverage per acre for discrete land uses.

C.1.3 RECOMMENDED IMPLEMENTATION TASKS

C.1.3.1 Initial Data Collection

Activity No.	Activity
1.	Acquire, catalog, and rate the usefulness of maps from communities in manner described in Table C.1.6. Identify scale of each set. Maps that are not used for data collection will be used for data validation and quality control efforts.
2.	Download or acquire an electronic version of the most recent rectified (and scalable) aerials available from RIGIS.
3.	Produce aerials in scale that matches available parcel-level maps. Visual interpretation will be used to measure lot size (in acreage) for all General accounts whose acreage value is not available in Tax Assessor's records. Additional use of aerials will be in the visual recognition of parcels that are vacant (no buildings) but have impervious area (parking). Aerials will also be used acquire impervious area measurement on selected "General" parcels.
4.	Where Step 3 cannot be used to determine either impervious area or lot size, acquire Field "cards" through respective Tax Assessor offices, using the number found on the Tax Assessor's maps acquired in Step 1.
5.	Delineate the service area for the ten member-communities based on evaluation of the sewer service maps, information gathered during field investigations and analysis of other data sources.

C.1.3.2 Development of the EBU

Activity No.	Activity
6.	Determine total impervious area for a sample set of "Residential" properties that have been designated as having from one to three dwelling units. Use either Step 3 or Step 4 to identify impervious area data. If neither method appears to be cost efficient means of acquiring the data, schedule a site visit for the purpose of measuring the property. Note: For data collection of impervious area, the impervious area related to driveways is generally not recorded on field "cards" and will have to be derived from another source for each parcel in the sample set.
7.	Determine total impervious area for a sample set of "Residential" properties that have more than three, and less than seven dwelling units. Use either Step 3 or Step 4, and data collection discussed in Step 5.
8.	Determine total impervious area for a sample set of "General" properties, including properties from each discrete group within that class (Residential with more than six dwelling units, Commercial and Industrial accounts). It is recommended that the most discrete land use descriptions be used that are available.

9.	Determine the total acreage (lot size) for all "General" properties measured in Step 6 using Tax Assessor records or aerial photographs and parcel maps (Step 4) or from Field Cards (Step 4).
10.	Sort impervious area values determined in Step 5 in ascending order. Determine the "median" record. The impervious area for the "median" record equals the "Equivalent Tier 1" impervious value for 1 billing unit.
11.	Sort impervious area values determined in Step 6 in ascending order. Determine the "median" record. The impervious are for the "median" record equals the "Equivalent Tier 2" impervious value. This value is set in terms of the value established for "Equivalent Tier 1" (Step 8).
12.	Determine the Land Use Factor – the "imperviousness per acreage for "General" class accounts, i.e., Residential accounts with more than six dwelling units, Commercially, and Industrially-coded accounts.
13.	Apply the Land Use Factors to all "General" accounts in the billing system, based on the acreage values determined (Step 7).
14.	Enter all account data in the Master Billing File.
15.	Verify a statistically valid number of accounts as a quality control check.

C.1.3.3 Identification of "Free Riders"

Activity No.	Activity
16.	Survey police departments, fire departments and Commercial Real Estate specialist for identification of vacant or abandoned buildings.
17.	Compare current NBC billing file with earlier NBC records to identify accounts that are inactive or vacated.
18.	Execute "windshield" survey of properties that are classified as "Barren, Transitional Areas" on RIGIS Land Use maps.
19.	Identify actual impervious area for each of the "Free Riders" identified in Steps 14-16. Contact Customer Service Department for acquisition of a "new" account number to be assigned to the Free Riders.
20.	Enter all account data for "Free Riders" in the Master Billing File.
21.	At data entry of all account information, the total number of billing units in the system can be determined. This value is divided into the amount of recoverable costs to identify rate needed to meet budget requirements.
22.	Assist NBC staff by preparing reports and other data to determine if adjustments to budget are required to develop a Pro Forma rate that meets the NBC's policy objectives.

C.1.3.4 Data Download to the NBC Billing System

Activity No.	Activity
23.	Request billing file layout for download in the NBC's billing system.
24.	Submit test file from Master Account File for integration in the NBC's Oracle Billing System and provide assistance in Testing of data and billing amounts.
25.	Furnish final download of Master Account File

C.1.3.5 Billing Start-Up

Activity No.	Activity
26.	Provide list of most frequently asked questions to customer service representatives. Provide educational seminar to service representatives to facilitate understanding on CSO Abatement Fee premise and to present documentation of recommended operating procedures for recurring data maintenance tasks.
27.	Provide customer inquiry forms to be used at start-up and provide consulting support in answering initial customer inquiries.
28.	Provide on-site support for 3 days following receipt of first billing statement including the CSO Abatement Fee.

C.1.3.6 Other Implementation Tasks

The following tasks are related to implementation and should be considered by the NBC:

Activity No.	Activity
	Assist in development of Standard Operating Procedures for Data
29.	Maintenance and Appeals Process.
	Modify existing forms for data collection and entry.
30.	
31.	Provide on-site training to staff on basic CSO Fee Program concepts.
32.	Provide matrix with criteria to be used for assignment of billing class codes.
33.	Provide on-site "Start-Up Support" when first cycle of bills with CSO component are delivered.
34.	Provide public information materials.
35.	Provide on-site support at the request of the NBC as staff gains familiarity with data maintenance procedures.

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TABLE C.1.6
Availability of Required Data in the Ten Principal NBC Communities
Source: January/February 2002 Phone Survey Conducted by Parsons personnel

City/Town	Contact	Address	Phone	Data Availability	Map Availability
Central Falls	John Gamcarski Tax Assessor	580 Broad Street Central Falls, RI 02863	401 727-7430	Hard copy only. Fax ist of required fields and data will be generated. Cost depends on data requested.	10 maps. Hard copy only at $1.00 each.
Cranston	Sal Saccocia, TA Office and Wendy @ Jos. Merit Co.	869 Park Ave. Cranston, RI 02910	401 461-1000	Electronic copy of data available for $100 with written request for data.	120 maps. Order from Jos. Merit Co. 401 272-9606. Approx. $250.
Cumberland	Mike O'Leary, Tax Assessor Shirley, TA's office	45 Broad St. Cumberland, RI 02864	401 728-2400 Ext. 15	Converting to new system. No electronic files available. Cards have lot size and land use code.	66 maps. Cost not available, as they are reproduced by vendor.
East Providence	James McDonald, Finance Director	145 Taunton Ave. East Providence, RI 02914	401 425-7551	Electronic copy available with written request	90 maps. Public Works Dept. 401 435-7701.
Johnston	Kendra, TA's Office	1385 Hartford Ave. Johnston, RI 02919	401 553-8826	Field cards can be purchased for $.15 each or viewed at TA's office. Include lot size and land use coding.	75 maps. Set sold for $65 of $2 each with advance notice. Copies available in TA's office.
Lincoln	Emerson Johnson or Kathy in TA's office	100 Old River Road, Box 100 Lincoln, RI 02865	401 333-1100	Fields cards available for $1 each or can be viewed at TA's office. No electronic version. Include land use and lot size.	45 maps. Set sold for $50 or $2 each with advance notice.TA's office.
North Providence	Michael Mooney, Purchasing Agent Tara, TA's office	2000 Smith Street North Providence, RI 02911	401 232-0900	Converting to new system. Cards have building information. Plat maps and deeds in Town Clerk's office for acreage, land use info.	42 maps. Order set from Planning Dir, Leo Perrotta 401 232-0900. Copies of portions of maps from TA.
Pawtucket	Bob, TA's Office Jay Smith, Engr. Dept.	137 Roosevelt Ave. Pawtucket, RI 02903	401 728-0500	Field cards copied for $1 each or can be viewed in Tas office. Converting to an electronic system	138 maps. Order from Engr. Dept for $2 each. 3 weeks notice to purchase.
Providence	City Assessor's office	25 Dorrance St. Providence, RI 02903	401 421-5900	Tax roll available for $15from TA's office. Converting to new system. No electronic files available. Cards can	129 plat maps. Set, by advance notice is $100 from Assessor's office.
Smithfield	Wendell Wilkie	84 Farnum Pike Smithfield, RI 02917	401 233-1014	Data available in electronic format from Opal Data Technologies for $150. Requires letter to City forwarded before release of file.	Set of maps $75. From TA's office. Call ahead.

SUBTASK C.2 ESTIMATION OF ADMINISTRATIVE COSTS FOR START-UP AND PROGRAM COSTS

C.2.1 IMPLEMENTATION AND ADMINISTRATIVE COSTS

C.2.1.1 Data Gathering Costs

The estimated costs to acquire the data necessary to support the Land Use model are identified in the Schedule of Implementation Tasks found in Appendix C-1.

Interviews were conducted with staff of the ten principal cities and towns in the NBC Sewer Service Area to determine the availability of Tax and parcel data, parcel-level maps, and to identify the process and cost to acquire available data files, either electronically or in hard copies. The ability to view records in the Tax Assessor's office was also determined for each community. This information, together with the names and addresses of the individual with whom the contact was made, is found in Table C.1.6.

C.2.1.2 On-Going Program Management and Appeals Process Costs

C.2.1.2.1 Changes to Property (and Billing Account) Ownership: An existing procedure for updating ownership information in the NBC billing system is in place and is reported to be effective approximately 90% of the time. This standard operating procedure relies on the delivery of change in ownership information to the NBC Customer Service Department using the Narragansett Bay Commission Request for Real Estate Closing Information Form. A copy of this form is found in Appendix C-2. The balance, approximately 10% of ownership changes, is accomplished as a result of returned utility bills. The addition of the CSO Abatement Program fee is not expected to significantly impact the existing cost of updating ownership information and Parsons recommends this system continue as currently operated.

C.2.1.2.2 Set-Up of New Billing Accounts: An existing method for establishing new accounts in the NBC billing system is in place and is described by NBC Customer Service Department Administration to be a "fast and reliable procedure." A copy of the form that is used is found in Appendix C-2. It is recommended that modifications to this one-page form be made during the implementation of this project. A duplicate copy of this form might be forwarded to an individual who is qualified to determine the appropriate Billing Category Code and calculate the appropriate number of EBU's to be assigned to the account record. These values would be presented to a Customer Service Representative who would perform the data entry task. It is recommended that three additional staff positions be created to provide for the following program support:

- Liaison between account owners and NBC Engineering Department staff during the Appeal's process.
- Determine and assign property uses and billing classification for new accounts.
- Review customer complaints.
- Digitize or site measure lot sizes and/or impervious area for accounts, as necessary.
- Maintain CSO billing program information on the NBC's website.

C.2.2 MASTER ACCOUNT FILE AND BILLING SYSTEM

C.2.2.1 Master Account File

The Master Account File will be required to develop the initial billing information and will be the source of specific information that is required for the accurate calculation of account-specific utility fees within the NBC billing system. A test file, and later, a final billing file including the following information (in fields) must be downloaded into the existing NBC billing system to facilitate delivery of the CSO Abatement Program fee as a component of the wastewater utility bill:

1)	Key Field	NBC Customer Account Number
2)	Billing Code	(designating the type of billing i.e. CSO, sewer, etc.)
3)	CSO Billing Class	(Residential, General or Exempt)
4)	CSO Fee Component Name	(to be determined)
5)	Equivalent Billing Units	(number of EBUs assigned)
6)	Adjustment Factor	(Default = 1.0)
7)	Mitigation Credit	(Default = 0.0)
8)	Billing Rate	(optional: It is recommended that this value reside in the NBC billing system, where bill calculation will occur).

The implementation phase will contain many tasks that are dependent on the accurate and dependable calculation of account data. A Master Account File is generally developed independent of any other billing system and is the source of initial account information that must be transferred electronically into the existing billing system. The Master Account File must include all the information discussed in this section, in addition to other information that is used during preliminary studies, planning and later, in the implementation phase of the project when data collection, analysis and compilation tasks are critical to the project's success.

A preliminary Master Account File has been developed in MS Access for use during this study. It has been populated with information found in a flat file of the current NBC billing records and information gathered from other sources using the NBC Account Number as the "key field". The data has been imported into Access tables to allow for ease in compilation, analysis and reporting. This database, or a similar database structure, will be required to develop the Master Account File during the implementation phase of this project.

C.2.2.2 Sufficiency of Existing Billing System

The existing billing system has the capacity to perform all required bill calculations for the CSO Abatement Program fee component, removing the requirement for the development of a bill calculation system. Parsons recommends use of this existing system because it will meet the needs of the NBC for the CSO Abatement Program fee.

The existing NBC billing system is running on an Oracle platform and appears to be fully functional with regard to the requirements of CSO billings. This assumption is based on the following reasons:

- The existing NBC billing system is "owner" based, rather than "occupant" based meeting bill delivery requirements of the CSO Abatement Program.
- NBC billing system has the capacity to provide reliable storage and manipulation of data to fully support CSO Abatement Program billing mechanics.
- Premise information is maintained within the NBC billing system, removing the need for maintaining that data in another location.
- The existing system is able to fully support the calculations required for accurate fee development.

C.2.2.3 Summary of Implementation and Administrative Costs

Summary costs for implementation of the CSO Abatement Program fee and ongoing management and administration costs are presented below. A more detailed presentation of the implementation costs is included in APPENDIX C-1.

Assumption used to develop the implementation phase cost include a project duration of six months, average labor costs of $85 per hour, and other direct costs equivalent to 5 percent of the labor costs. There is substantial uncertainty built into the cost estimate based primarily on the fact that there is a wide variety of data sources that have to be used to generate the land use, impervious area, parcel location and acreage data needed to create a Land Use model for the CSO Abatement Program fee. The study portion of this project has determined where the data is available and that it will require accessing a variety of sources to cover all aspects of the implementation phase data requirements. Table C.2.1 summarizes the implementation phase cost estimate by task.

Table C.2.1
Implementation Phase Estimated Costs – Option 1 Land Use Model

Task No.	Description	Cost
1.	Data Collection – General Parcels	$101,890
2.	Delineate the Service Area	$76,755
3.	Data Collection – Development of Billing Unit Basis	$66,045
4.	Data Collection – Land Use Factor	$67,830
5.	Identification and Processing of "Free Riders"	$74,970
6.	Delivery of Data to NBC Billing System/Project Start-Up	$41,412
7.	Public Information Program	$38,913
8.	Meetings and Project Coordination	$58,905
Implementation Phase Project Total		**$526,720**

Parsons interviewed NBC staff in both the Information Technology (IT) department and the Customer Service group to ascertain impacts to the NBC in administering the CSO Abatement Program fee system. As discussed above, the NBC already has systems in

place to accommodate much of the CSO Abatement Program fee administrative needs. Findings include:

- The IT department is prepared to handle changes to the billing database once it is populated with CSO Abatement Program fee data.
- The IT department is prepared to maintain the NBC website with any CSO Abatement Program fee information.
- The software and hardware systems are in place to accommodate any changes to the fee structure.
- Systems are in place to handle account changes
- Customer Service would require additional staffing to answer questions, respond to appeals, coordinate with NBC engineering staff and assign rate classification codes to billing accounts.
- Parsons estimates three new full-time equivalent staff would be needed to handle the additional workload to manage, administer, and maintain the new system.

Table C.2.2 summarizes estimates for additional administrative costs that will be incurred to administer the CSO Abatement Program fee system.

Table C.2.2
Estimated Ongoing Administrative Costs – Alternative No. 1 Land Use Model

Cost Item	Description	Cost/Yr
1.	3 Full-Time Equivalent New Hires – Principally for the Customer Service Group	$150,000
2.	Public Information Brochures/Videos/Announcements	$5,000
Total Annual Administrative Costs		**$155,000**

C.2.3 ENHANCEMENTS

A server-based software application has been created, and is available, with modest modifications, for interface with Access databases, such as the one developed for this project to provide staff with a flexible database, audit trail, security and virtually unlimited report writing capabilities to administrative level users.

Although it is not a requirement for the implementation of this project, the ability to calculate system revenue "scenarios" and create reports on any aspect of the billing system for any account or group of accounts is often a compelling reason to maintain a utility calculation application on another platform that is exceptionally "user-friendly".

An example of such an application can be viewed at: http://ennead.com/amtech

Log-on: sumsadmin
Password: penadmin

At the opening screen, double-click on the "Parcel" tab, choose a search function and execute a search by parcel owner name (such as Smith) and execute a search to initially link to a sample set of account records. The data shown in the demo is typical of data that is used with a rate model that is tied to impervious area, such as the Land Use model. To protect the privacy of account holders, this application has not been linked to NBC billing data. With the Commission's written permission, a sample of NBC data will be made available at the demo site and a secure log on and password will be furnished to NBC administration staff for a designated period of time

.

A similar application, developed specifically for use by NBC staff and programmed with pertinent methodological specifications, user-guides, training, installation on a client-server, and system support until the application is tested and accepted by the client can be furnished for a licensing fee ranging from $5,000 to $10,000. More complicated versions, required by jurisdictions and utility authorities for use as stand alone bill production systems and programmed to calculate delinquencies are normally offered in a significantly higher price range.

SUBTASK C.3 DEVELOPMENT OF A CREDIT POLICY

C.3.1 BACKGROUND

The extension of exemptions, credits or any form of fee reductions has the effect of redistributing the burden to a smaller customer base. Fee adjustments, however, can be an important part of the fee structure, as they provide the relief for site-specific characteristics of particular parcels. For that reason, the provision of policies that affect this delicate balance should be documented or codified so that they will be applied in a consistent manner for an extended period of time.

C.3.2 EXEMPTIONS

As previously stated in the Technical Memorandum for Task B – Development/Design of Stormwater Fee Structure Alternatives, Parsons recommended the NBC adopt exemptions for vacant property and Rights-of-Way following specific definitions.

C.3.2.1 Vacant Property

Vacant property defined as undeveloped land that has not been altered from its natural state and other properties containing or assigned a nominal (less than 500 sq. ft.) of impervious area should be exempted from a CSO Abatement Program fee. This will prevent undeveloped natural areas and small improvements such as dumpster pads from being charged.

C.3.2.2 Rights-of-Way

Right-of-Way (R-O-W) parcels including residential streets, easements, and other public roads frequently serve as an important part of the conveyance system, carrying runoff to attenuation and other treatment facilities should be exempted from a CSO Abatement Program fee. Private roads, like driveways, are generally not designed to be a part of the conveyance system, and should be treated like other impervious areas.

C.3.3 MITIGATION CREDITS

C.3.3.1 Near Term Mitigation Credit Policy

As stated in the Technical Memorandum for Task B – Development/Design of Stormwater Fee Structure Alternatives, application of the Land Use model does not lend itself to the reduction of billing units as the factors developed are based on the sampling of parcels within a Land Use population and the removal of even a few properties would affect the Land Use "Factors". It is also not recommended that the NBC apply specific runoff values to properties whose impervious area value was "imputed" rather than measured through a mitigation credit policy.

C.3.3.2 Future Mitigation Credit Policy

The provision of mitigation credits can be an effective incentive to the placement and maintenance of privately maintained mitigation facilities that, ultimately, could ease the burden on the NBC's collection and treatment systems. While mitigation credits are not recommended under the Land Use Model considered in this option, they may be feasible in the future. In the event that reliable, site-specific impervious area information is made available or is collected, all, or portions of the Land Use Model structure could be converted to an Impervious Area Model. In that case, after conversion, the application of a mitigation credit would be strongly recommended.

C.3.4 ADJUSTMENT FACTORS

C.3.4.1 Waivers

Parsons recommended in the Technical Memorandum for Task B – Development/Design of Stormwater Fee Structure Alternatives that the NBC include a provision for waivers in their CSO Abatement Program fee program. In order for owners to obtain a waiver they would have to petition the NBC and demonstrate that their property places no burden or impact on the NBC collection and treatment system. Property owners who can demonstrate their parcel contributes neither surface water nor wastewater either directly or indirectly to a facility owned or maintained by the NBC would be considered for a waiver on the CSO Abatement Program fee. This provision is important from a legal standpoint to provide owners a way to opt out of services if they choose not to use them and a way to make adjustments for incorrectly charged parcels.

C.3.4.2 Surcharges

Parsons also recommended in the Technical Memorandum for Task B – Development/Design of Stormwater Fee Structure Alternatives that the NBC place surcharges on "free riders". By definition "free riders" are parcels that currently have a direct or indirect stormwater connection to the NBC collection or treatment systems but pay no sewer user fees – most probably because they don't have any water service. In the interest of equity, these properties should be charged to make up for the absence of sewer user fees and bring their fees more in-line with the burden they place on the NBC system.

Parsons recommends the surcharge amount should be assigned based on the recent sewer charge adjustment that was approved to provide funding for the CSO Abatement Program. The amount of the surcharge should be proportional to the portion of the sewer rate increase that is being used to pay for the CSO Abatement Program.

C.3.5 DEVELOPMENT OF A STANDARD OPERATING PROCEDURE FOR THE APPEALS PROCESS

C.3.5.1 Appeals Process

Parsons recommends that the appeals policy be codified to protect the process over time and changes to staff. The appeals process is an important feature of the CSO Abatement Program fee structure, providing the "rights" to the parcel owner to give evidence of site-specific information that would lead to a rate adjustment or, exemption. It is

recommended that if an appeals process exists with regard to the existing utility billing for wastewater services, the process adopted for the CSO Abatement Program fee be similarly structured. While the provision of due process is a worthy goal, it should not cause the NBC to be the recipient of frivolous complaints and requests. The appeals policy should allow a property owner (account holder) to provide evidence that would convince an impartial individual that the rate, as applied, is inequitable and demands correction. Specifically, the appeal would have to demonstrate the parcel in question meets the definitions recommended above for exemptions or adjustment factors in the form of waivers. If requested by the NBC, the appeal could be required to be submitted by a Registered Land Surveyor or Professional Engineer.

SUBTASK C.4 DEVELOPMENT OF A PUBLIC INFORMATION STRATEGY

C.4.1 BACKGROUND

Customer relations are a key component in every successful public information program - and to the long-term success of the NBC. An effective organization is structured to satisfy the service expectations of its customers. Measuring that expectation is key to delivery. A good customer relations program facilitates feedback from customers, promptly responds with appropriate action and keeps customers informed as to what service is being delivered. The use of experienced customer relation professionals in conjunction with consultant staff is recommended. The integration of a simple, but effective "ad campaign" approach is recommended to provide the most effective presentation of public information materials early in the implementation phase.

C.4.1.1 Successful Public Information Strategy Components

Parsons experience has led to the development of many successful public information programs that included several basic components:

1) A consistent, relevant message,
2) The identification of a local advocate,
3) Thoughtfully chosen audiences,
4) Presentation materials that are attractive and easy to understand

C.4.1.2 Staff Training

It is also recommended that NBC staff participate in an early training session so that they may be provided with the knowledge that will encourage standard, consistent responses to questions they will receive from customers and local government officials.

C.4.1.3 Participation of Stakeholder and User Groups

The successful implementation of any user charge is dependent on the level to which the community has bought-in to the need for the fee increase. If acceptance of the utility charge is to be enjoyed, buy-in from interest groups should be developed early in the implementation process. This might be accomplished through Consultant-facilitated focus group meetings with organizations such as the Rhode Island Saltwater Angler's Association, the Rhode Island Marine Trade Association and the Rhode Island Shell Fisherman's Association. In addition, the Chamber of Commerce, town hall meetings and local civic groups are an appropriate public forum from which public responses can be solicited and public information materials can be distributed.

C.4.1.4 Building on a Successful Coalition Strategy

It is recommended that the NBC activate the same coalition that successfully "sold" the Clean Water Bond on the 2000 ballot to the citizens of Rhode Island. That coalition, made up of the NBC, Save The Bay, the State Department of Environmental Management and the Environmental Council on Rhode Island worked to promote the ballot issue, which was the highest vote-getting bond of all issues on the ballot. Showing

overwhelming support for protecting the environment, the voters reacted favorably to the public information spots on local radio stations, the use of editorial pieces in The Providence Journal and the interaction of volunteers stationed near the polling places. Future public information programs should build on the approval of the funding of the Clean Water Finance Agency and the public's continued support for projects such as the CSO Abatement Program.

ADDENDUM TO TASK C STORMWATER RATE MODEL ALTERNATIVE NO. 2 - MODIFIED IMPERVIOUS AREA MODEL

CX.1 INTRODUCTION

The two questions facing the Narragansett Bay Commission (NBC) are common to the development of all apportionment methodologies. Who should pay and how should their fair share be determined? Task C of this study presented an alternative based on the use of a Land Use Model. The tasks and costs associated with a Modified Impervious Area Model alternative (Alternative No. 2) are discussed in this addendum.

It is important to note that both of the alternatives being considered are based on the use of impervious area, either measured or imputed, as the rational nexus for determining the relative amounts of runoff that will leave a property during a specific storm event. In addition, both models require the assignment of a billing class code (Residential or General) to each account to facilitate the calculation of that account's billing charge.

Both of the alternatives presented are designed to take full advantage of coding that already exists within the NBC billing system, such as the NBC's assignment of the number of dwelling units. This approach eliminates the need to generate site-specific data for the vast majority of residential properties regardless of the alternative that is chosen.

CX.1.1 Land Use Model – Alternative No. 1

Who would pay? The Technical Memorandum for Task C presents tasks and costs associated with the distribution of a CSO Abatement Program fee to all accounts and "free riders" currently within the NBC's ten member-community sewer service area.

Equity and Legal Rationale This alternative applies an added CSO Abatement Program fee to all parcels that have direct or indirect sewer or stormwater connections to the NBC collection and treatment systems throughout the ten member-community service area. The amount of the charge will be tied to the amount of impervious area assigned to each billing class. This alternative is consistent with previous legal decisions discussed in Technical Memorandum for Task A – Preparation of a Stormwater Feasibility Study

How would the rate be applied? The rate model used to develop this alternative is a Modified Land Use Model. User charges for accounts in the residential billing class are calculated based on their "tier assignment" (1 to 3 dwelling units in Tier 1; and 4 to 6 dwelling units in Tier 2). All other user charges are calculated by multiplying the rate per Equivalent Billing Unit (EBU) by the number of assigned EBU's (determined by "Land Use Factors", land use, and property size.)

CX.1.2 Modified Impervious Area Model – Alternative No. 2

Who would pay? This document, an Addendum to Task C, presents tasks and costs associated with the distribution of a CSO Abatement Program fee to only those accounts that are direct or indirect contributors of stormwater to the NBC collection and treatment systems. (A group that includes a majority of developed properties located in the Cities of Providence, Pawtucket and Central Falls including current accounts and "free riders" from the ten member-community service area.)

Equity and Legal Rationale This alternative applies an added CSO Abatement Program fee to parcels that have direct or indirect stormwater connections to the NBC collection and treatment systems, primarily those parcels in the Combined Sewer Service (CSS) Areas of Providence, Pawtucket and Central Falls. This approach is considered because it is reasonable to assume that each of the "developed" properties in the CSS Area will receive higher levels of benefit than other properties that are within the NBC's ten-member community sewer service area but that are not located within the CSS Area. At the same time, all accounts in the ten member-community service area will be contributing to the CSO Abatement Program costs through the existing sewer charge. This alternative remains consistent with previous legal decisions in terms of passing on NBC capital costs to the entire service area but also makes a distinction between parcels that contribute stormwater to combined sewers in the CSS Area versus parcels in separated sewer service areas.

How would the rate be applied? The rate model used to develop this alternative is a Modified Impervious Area Model. User charges for eligible accounts in the residential billing class are calculated based on their "tier assignment", in exactly the same manner as in the Land Use Model in Alternative 1. All other user charges are calculated by multiplying the rate per Equivalent Billing Unit (EBU) by the number of assigned EBU's determined by the impervious area assigned to each account through field measurement, digitizing from aerial photographs, or acquisition of impervious area information from other reliable sources.

CX.2 DEVELOPMENT OF THE MODIFIED IMPERVIOUS AREA RATE STRUCTURE

The development and implementation of Alternative No. 2 is based on the premise that the many properties within Providence, Pawtucket and Central Falls have a direct or indirect connection contributing stormwater to a "combined" stormwater/sewer system and subsequently to the NBC collection and treatment systems. For purposes of reference in this document, the geographic area that includes eligible properties within Providence, Pawtucket and Central Falls will be called the "Combined Sewer Service (CSS) Area."

CX.3 RECOMMENDED BILLING CLASSES

The manner in which CSO Abatement Program fees are calculated is based on the billing class to which each account is assigned. It is recommended that two broad categories,

Residential and General be used in this project, regardless of the rate model chosen. This assignment is based on information found in the current NBC billing system.

TABLE CX.1
Assignment of CSO Fee Categories to Existing NBC Customer Types
Source of Customer Type Information: February 2002 NBC Billing System Data

NBC Assigned Customer Type	NBC Assigned Dwelling Units	CSO Fee Class
Residential	1	Residential Tier 1
Residential	2	Residential Tier 1
Residential	3	Residential Tier 1
Residential	4	Residential Tier 2
Residential	5	Residential Tier 2
Residential	6	Residential Tier 2
Residential	>6	General
Commercial	>0	General
Industrial	>0	General

CX.3.1 Residential Class

It is recommended that two residential "tiers" be established within the "Residential" billing class. The number of residential accounts located in the three-city CSS Area is shown in Table CX.2. It is recommended that the eligible Residential accounts (with less than four dwelling units) be assigned to Tier 1. Likewise, it is recommended that the Residential accounts (with between four and six dwelling units) be assigned to Tier 2.

TABLE CX.2
Number of Accounts in Three-City CSS Area*
(Generally within Central Falls, Pawtucket and Providence)
Source of Customer Type Information: February 2002 NBC Billing System Data

Rate Model	Residential Tier 1 Accounts	Residential Tier 2 Accounts	General Accounts	Free Riders**	Total Accounts
Modified Impervious Area Model (Alternative 2)	43,723	2,017	6,451	600	52,791

*The figures presented for number of accounts in the three-city CSS Area above represent the total number of current NBC accounts in the cities of Providence, Pawtucket and Central Falls. The actual number of accounts in the CSS Area will be slightly less than the totals above because some parcels in the three cities discharge to separated sewer areas.
**Estimated

CX.3.2 General Class

It is recommended that residential accounts with more than six dwelling units, and all accounts coded either commercial or industrial by the existing NBC billing system be classified as "General" accounts. The number of "General" accounts located in the three-city CSS Area is shown in Table CX.2. The number of billing units assigned to each parcel in the "General" billing class is to be determined by the account's total acreage, the imperviousness per acre factor and the property's use description for both rate model alternatives. Alternative No. 2 requires that the actual impervious area be measured or collected. Fees are calculated by multiplying the number of EBU's by the rate per EBU.

CX.4 DETERMINING THE BILLING UNIT

CX.4.1 Setting the Equivalent Billing Unit Value

To provide for billing equity, the assignment of relative EBU's must be achieved prior to the application of billing rates. This requires that sufficient data be acquired to develop a standard EBU by which all other accounts would be defined. The development of the EBU is included in the Schedule of Implementation Tasks. It can be accomplished by evaluating a sample set of Tier 1 residential parcels from the CSS Area to determine a median value for impervious area.

A sample set of Tier 2 residential parcels must also be evaluated for the appropriate data set to develop a median value for impervious area. Once the impervious area values are known, EBU's can be developed for each rate class. For example, if the median impervious value associated with the sample set of residential properties in Tier 1 is 2,450 square feet and the respective value in Tier 2 is 4,410 square feet, then, Tier 1 accounts would default to a value of 1.0 EBUs and Tier 2 accounts would default to 1.8 EBUs.

Calculation:

$$\frac{\text{4,410 square feet}}{\text{2,450 sq. ft. per EBU}} = 1.8 \text{ EBUs}$$

CX.4.1.1 Defining General Accounts in Terms of the Equivalent Billing Unit

In this alternative, the measured impervious area must be developed based on a dependable method. That value, in square feet, is divided by the EBU value to determine the equivalent billing units for each "General" account. For example, if a General parcel is determined to have 18,620 sq. ft. of impervious area, the EBU value would be 7.6.

Calculation:

$$\frac{\text{18,620 square feet}}{\text{2,450 sq. ft. per EBU}} = 7.6 \text{ EBUs}$$

CX.5 QUANTIFYING THE ACCOUNTS TO BE ANALYZED

An equitable distribution of CSO Abatement Program fees can be accomplished using a Modified Impervious Area Model. Costs to implement this alternative would be determined by the total number of accounts that would require impervious measurement.

Similar to the information presented in Deliverable C, the costs and tasks associated with this alternative are based on an assessment of the information available through the NBC's current billing files, the Rhode Island Geographic Information System (RIGIS), and an assessment of local parcel and plat maps and other data that may be acquired from local Tax Assessor's offices.

TABLE CX.3
Detail Account Breakdown by NBC-Designated Residential Customer Types
Source: February 2002 NBC Billing System Data

	Residential with 1-3 Dwelling Units	Residential with 4-6 Dwelling Units	Residential with > 6 Dwelling Units
Inside the CSS Area*	43,723	2,017	45
Remainder of NBC Sewer Service Area	25,096	265	84

*The figures presented for number of accounts inside the CSS Area represent the total number of current NBC accounts in the cities of Providence, Pawtucket, and Central Falls. The actual number of accounts in the CSS Area will be slightly less than the totals above because some parcels in the three cities discharge to separated sewer areas.

TABLE CX.4
Number of Accounts Located in the "General" Billing Class
Source: February 2002 NBC Billing System Data

City	"General" Billing Category		
	Residential > 6	Commercial	Industrial
Central Falls		378	28
Pawtucket	17	1,427	178
Providence	28	4,124	271
Total CSS Area*	**45**	**5,929**	**477**
Cranston		18	
Cumberland		293	21
East Providence		322	36
Johnston	15	403	32
Lincoln	16	237	45
North Providence	53	584	18
Smithfield		7	7
Remainder of NBC Sewer Service Area	**84**	**1,864**	**159**

*The figures presented for number of accounts inside the CSS Area represent the total number of current NBC accounts in the cities of Providence, Pawtucket, and Central Falls. The actual number of accounts in the CSS Area will be slightly less than the totals above because some parcels in the three cities discharge to separated sewer areas.

The data provided in Table CX.5 is used in the Schedule of Implementation Tasks to estimate the resources required to provide for the assignment of relative EBU's in each community and to project costs for data validation and other quality control efforts.

TABLE CX.5
Number of Accounts Located in the Residential Tiers 1 and 2
Source: February 2002 NBC Billing System Data

City	"Residential" Billing Category	
	Residential 1 – 3 Dwelling Units	**Residential 4 – 6 Dwelling Units**
Central Falls	1,737	383
Pawtucket	14,529	722
Providence	27,457	912
Total CSS Area*	**43,723**	**2,017**
Cranston	60	0
Cumberland	5,356	83
East Providence	3,240	15
Johnston	4,499	47
Lincoln	3,645	35
North Providence	8,293	85
Smithfield	3	0
Remainder of NBC Sewer Service Area	**25,096**	**265**

*The figures presented for number of accounts inside the CSS Area represent the total number of current NBC accounts in the cities of Providence, Pawtucket, and Central Falls. The actual number of accounts in the CSS Area will be slightly less than the totals above because some parcels in the three cities discharge to separated sewer areas.

CX.5.1 Data Collection Tasks

Data collection is required to populate the Master Billing File and to validate and perform quality control measures. Data collection required for the development of the EBU is accomplished in the same manner for both alternatives, but will require the study of a different size account set.

Data collection for Alternative 2 during the implementation phase will require the identification of impervious area data for all accounts in the "General" billing class within the three-city CSS Area of Providence, Pawtucket and Central Falls. Recommended data collection techniques include the use of electronic and hard copy records containing critical data, digitizing of impervious area using a combination of plat or parcel maps and aerials, and, if required, field measurement using a measuring wheel.

CX.5.2 Sampling

The use of the "best available information" is the generally accepted criteria for legal defensibility. If acquisition and collection of reliable data is not possible, the use of sampling frames can be used provided they employ generally accepted accounting and statistical procedures. The adequacy of the sampling set size cannot be overemphasized. The actual number of samples that will be needed, however, cannot be determined at this time. To develop sample sizes, the interim measurement of a smaller dataset may be required for analysis. It is recommended, therefore, that an initial sample size of no less than 15 properties be used for any given measurement task. Once the standard deviation and variance of the initial sample set is determined, the actual number of samples required can be more reliably determined. For populations of less than 15 total properties, it is recommended that the entire population be measured in the initial sample task. This procedure must be performed for each billing category within the following account populations:

CX.5.2.1 Median impervious area found on Residential Tier 1 properties

The purpose is to develop the "typical" Tier 1 impervious area amount to establish the EBU value.

CX.5.2.2 Median impervious area found on Residential Tier 2 properties

The purpose is to develop the "typical" Tier 2 impervious area amount so that Tier 2 properties can be defined in terms of EBU's.

CX.6 RECOMMENDED IMPLEMENTATION TASKS

The recommended implementation tasks that would be required for parcels to be included in the entire NBC sewer service area were presented in the deliverable associated with Subtask C. Only those tasks and costs that are associated with the implementation of Alternative 2 (use of the Modified Impervious Area Model within Providence, Pawtucket and Central Falls) are presented in this document.

CX.6.1 Initial Data Collection

Activity No.	Activity
1.	Acquire, catalog, and rate the usefulness of the plat maps from Providence, Pawtucket and Central Falls (total of 277 maps). Identify scale of each set. Maps that are not used for data collection may be used for data validation and quality control efforts. Acquire "Field Cards" from Tax Assessors located in Providence, Pawtucket and Central Falls.
2.	Download or acquire an electronic version of the most recent rectified (and scalable) aerials available from RIGIS for a similar area.
	Produce aerials in scale that matches available parcel-level maps. Visual

3.	interpretation will be used to identify the impervious area to be associated with specific parcels when impervious area is not available from other sources. Additional use of aerials will be used in the visual recognition of "Free Rider" parcels that are vacant (no buildings) but have impervious area (parking). Aerials will also be used to acquire impervious area measurement on selected "General" parcels as a quality control of data collected from other sources, such as the Tax Assessor's "Field Cards".
4.	Where Step 3 cannot be used to determine impervious area, use "Field Cards" received from respective Tax Assessor offices, using the number found on the Tax Assessor's maps acquired in Step 1. Note type of impervious area that is missing on each card, i.e. pavement, driveways, outbuildings for acquisition through other means (measurement or sampling).
5.	Delineate the service area for the CSS Area based on evaluation of the sewer service maps, information gathered during field investigations and analysis of other data sources.

CX.6.2 Development of the EBU

Activity No.	Activity
6.	Determine total impervious area for a sample set of "Residential" properties in Providence, Pawtucket and Central Falls that have been designated as having from one to three dwelling units. Use either Step 3 or Step 4 to identify impervious area data. If neither method appears to be cost efficient means of acquiring the data, schedule a site visit for the purpose of measuring the property. Note: For data collection of impervious area, the impervious area related to driveways is generally not recorded on field "cards" and will have to be derived from another source for each parcel in the sample set.
7.	Determine total impervious area for a sample set of "Residential" properties in the area described in Task 5 that have more than three, and less than seven dwelling units. Use either Step 3 or Step 4, and data collection discussed in Step 5.
8.	Sort impervious area values determined in Step 5 in ascending order. Determine the "median" record. The impervious area for the "median" record equals the "Equivalent Tier 1" impervious value for 1 EBU.
9.	Sort impervious area values determined in Step 6 in ascending order. Determine the "median" record. The impervious are for the "median" record equals the "Equivalent Tier 2" impervious value. This value is set in terms of the value established for "Equivalent Tier 1" (Step 8).
10.	Define all "General" account billing units in terms of the EBU value by dividing the impervious area associated with each by the EBU value determined in Task 7.

11.	Enter all account data developed in Steps 1-9 in the Master Billing File.
12.	Verify a statistically valid number of accounts as a quality control check.

All tasks related to the identification of "Free Riders", the Data Download to the NBC Billing System, Billing Start-Up, and other implementation tasks discussed in detail in the deliverable related to Task C (Alternative 1) are similar in nature to those required for Alternative 2 and are not repeated in this document. Costs related to the tasks are included in this document.

CX.7 ESTIMATION OF COSTS

CX.7.1 Implementation and Administrative Costs

CX.7.1.1 Data Gathering Costs

Interviews were conducted with staff of the principal cities and towns in the NBC Sewer Service Area to determine the availability of Tax and parcel data, parcel-level maps, and to identify the process and cost to acquire available data files, either electronically or in hard copies. The ability to view records in the Tax Assessor's office was also determined for each community. This information, as it relates to the Cities of Providence, Pawtucket and Central Falls, is provided in Table CX.6.

The estimated costs to acquire the data necessary to support the Modified Impervious Area Rate Model are identified in the Comparison of Estimated Implementation Costs found in Table CX.7. In addition to labor costs, the cost for programming charged by the Tax Assessor's offices, and acquisition of maps and other files is approximately $5,500.

CX.7.1.2 On-Going Program Management and Appeals Process Costs

CX 7.1.2.1 Changes to Billing Account Information: The procedures, staffing requirements and on-going program management and appeals costs are similar for both alternatives. The effort required to change property and billing account ownership is unchanged between Alternative No. 1 and Alternative No. 2.

CX.7.1.2.2 Set-Up of New Billing Accounts: An existing method for establishing new accounts in the NBC billing system is in place and is described by NBC Customer Service Department Administration to be a "fast and reliable procedure." It can be reasonably expected that the potential number of new billing accounts to be set up annually for Alternative No. 2 is approximately 35% less than would be expected in Alternative No. 1. The reduction in the number of new billing accounts to be set-up, however, is offset by the additional staffing resources needed to identify impervious area for all new "General" accounts. Similar to recommendations made for Alternative No. 1, it is recommended that modifications to the existing New Account Form be made during the implementation of this project. A duplicate copy of this form should be forwarded to an NBC staff member who is qualified to determine the appropriate Billing Category Code and calculate the appropriate number of EBU's to be assigned to the account

record. These values would be presented to a Customer Service Representative who would perform the data entry task. It is recommended that three additional staff positions be created to provide for the following program support:

- Liaison between account owners and NBC Engineering Department staff during the Appeal's process.
- Determine and assign property uses and billing classification for new accounts.
- Review customer complaints.
- Digitize or site measure impervious area for all "General" billing accounts.
- Maintain CSO billing program information on the NBC's website.

CX.7.2 Master Account File and Billing System

CX.7.2.1 Master Account file

The Master Account File will be required to develop the initial billing information and will be the source of specific information that is required for the accurate calculation of account-specific CSO Abatement Program fees within the NBC billing system. A test file, and later, a final billing file including the following information (in fields) must be downloaded into the existing NBC billing system to facilitate delivery of the CSO Abatement Program fee as a component of the wastewater utility bill:

1) Key Field	NBC Customer Account Number
2) Billing Code	(designating the type of billing; CSO, sewer, etc.)
3) CSO Billing Class	(Residential, General or Exempt)
4) CSO Fee Component Name	(CSO Abatement Program Fee)
5) Impervious Area	
6) Gross EBU	(number of EBUs assigned)
7) Adjustment Factor	(Default = 1.0)
8) Mitigation Credit	(Default = 0.0)
9) Net EBU's	
10) Billing Rate	(optional: It is recommended that this value reside in the NBC billing system, where bill calculation will occur).

The implementation phase will contain many tasks that are dependent on the accurate and dependable calculation of account data. A Master Account File is generally developed independent of any other billing system and is the source of initial account information that must be transferred electronically into the existing billing system. The Master Account File must include all the information discussed in this section, in addition to other information that is used during preliminary studies, planning and later, in the implementation phase of the project when data collection, analysis and compilation tasks are critical to the project's success.

A preliminary Master Account File has been developed in MS Access for use during this study. It has been populated with information found in a flat file of the current NBC billing records and information gathered from other sources using the NBC Account

Number as the "key field". The data has been imported into Access tables to allow for ease in compilation, analysis and reporting. This database, or a similar database structure, will be required to develop the Master Account File during the implementation phase of this project. The cost of the initial Master Account File programming and population is included in the Data Collection Tasks.

CX.7.2.2 Sufficiency of Existing Billing System

The existing billing system has the capacity to perform all required bill calculations for the CSO Abatement Program fee component, removing the requirement for the development of a bill calculation system. Parsons recommends use of this existing system since it will meet the needs of the NBC for the CSO Abatement Program fee.

The existing NBC billing system is running on an Oracle platform and appears to be fully functional with regard to the requirements of CSO billings. This assumption is based on the following reasons:

- The existing NBC billing system is "owner" based, rather than "occupant" based meeting bill delivery requirements of the CSO Abatement Program.
- NBC billing system has the capacity to provide reliable storage and manipulation of data to fully support CSO Abatement Program fee billing mechanics.
- Premise information is maintained within the NBC billing system, removing the need for maintaining that data in another location.
- The existing system is able to fully support the calculations required for accurate fee development.

CX.8 RATE STRUCTURE FEATURES

The extension of exemptions, credits or any form of fee reductions has the effect of redistributing the burden to a smaller customer base. Fee adjustments, however, can be an important part of the fee structure, as they provide the relief for site-specific characteristics of particular parcels. For that reason, the provision of policies that affect this delicate balance should be so documented, or even codified, so that they will be applied in a consistent manner for an extended period of time. The development of a credit policy lends itself particularly well to the Impervious Area Rate Model in contrast with its use in a Land Use Rate Model (Alternative No. 1) that depends entirely on the assignment of imputed or assigned impervious area values.

CX.8.1 Exemptions

As previously stated in the Technical Memorandum for Task B – Development/Design of Stormwater Fee Structure Alternatives, Parsons recommended the NBC adopt exemptions for vacant property and Rights-of-Way following specific definitions.

PARSONS

TABLE CX.6
Availability of Required Data in the Three CSS Area Cities
Source: January/February 2002 Phone Survey Conducted by Parsons personnel

City/Town	Contact	Address	Phone	Data/Field Card Availability	Plat/Parcel Map Availability
Central Falls	John Gamcarski Tax Assessor (Contact: Teresa)	580 Broad Street Central Falls, RI 02863	401 727-7430	Need a maximum of approximately 400 "Field Cards" that are available by copying the hard copy for $1 a piece. Tax roll information may be requested by faxing list of fields required and data will be generated. City will quote a charge at time of request.	Order set of 10 plat maps for $10.
Pawtucket	Contact: Bob Burns, Deputy TA and Jay Smith, Engr. Dept.	137 Roosevelt Ave. Pawtucket, RI 02903	401 728-0500 Ext. 218	Need a maximum of approximately 1,600 "Field Cards"./ Individual cards can be copied for $1 each or can be viewed in Tax Assessor's office. They will not copy 1,600 cards, and may be able to have a report written. Fee unknown, but would include cost of programming required to write the report. The Tax Assessor records are being converting to an electronic system, but no time frame is known for the availability of electronic data.	Order set of 138 plat maps from Engr. Dept. for $276. (Allow 3 weeks.)
Providence	Contact: John Gelati, Deputy TA.	25 Dorrance St. Providence, RI 02903	401 421-5900	Tax roll available for $15 from TA's office. Converting to new system. Generally, no electronic files area available. Need a maximum of approximately 4,425 "Field Cards"Cards can be viewed at TA's office, however it may be possible to receive data through request sent to Mr. Gelati.	Order set of 129 plat maps for $100.

CX.8.1.1 Vacant Property

Vacant property defined as undeveloped land that has not been altered from its natural state and other properties containing or assigned a nominal (less than 500 sq. ft.) of impervious area should be exempted from a CSO Abatement Program fee. This will prevent undeveloped natural areas and small improvements such as dumpster pads from being charged.

CX.8.1.2 Rights-of-Way

Right-of-Way (R-O-W) parcels including residential streets, easements, and other public roads frequently serve as an important part of the conveyance system, carrying runoff to attenuation and other treatment facilities should be exempted from a CSO Abatement Program fee. Private roads, like driveways, are generally not designed to be a part of the conveyance system, and should be treated like other impervious areas.

CX.8.2 Mitigation Credits

CX.8.2.1 Mitigation Credit Policy

As stated in the Technical Memorandum for Task B – Development/Design of Stormwater Fee Structure Alternatives, application of the Land Use model does not lend itself to the reduction of billing units as the factors developed are based on the sampling of all parcels within a Land Use population and the removal of even a few properties would affect the Land Use "Factors". It is recommended however, for use with the Impervious Area Rate Model. The development of a mitigation credit policy should be tied to "findings of fact" based on scientific research to define the type of mitigating facilities that may exist and the amount of mitigation that they provide.

The provision of mitigation credits can be an effective incentive to the placement and maintenance of privately maintained mitigation facilities that, ultimately, could ease the burden on the NBC's collection and treatment systems. Generally speaking, mitigation credit policies award mitigation credits based on a number of runoff factors, such as, the reduction of the quantity, improvement in quality and reduction in the rate at which runoff leaves a property during a specified storm event. Based on scientifically developed criteria, properties are assigned a credit, as applicable. The credit is granted as a percentage, which, when subtracted from 1.0 is multiplied by the number of billing units to achieve a reduced billing unit amount.

In addition to the adoption of a mitigation credit criteria, the Mitigation Credit Policy must establish the procedure by which initial credits are given and the procedure for appeal.

In generally, properties classified as "General" parcels and some residential properties that share in the maintenance of a mitigation credit facility are eligible to apply for mitigation credits under this alternative.

CX.8.3 Adjustment Factors

CX.8.3.1 Waivers

The use of waivers is recommended for all rate model alternatives. This provision is important from a legal standpoint to provide owners a way to opt out of services if they choose not to use them (removal or reduction of impervious surfaces) and a way to make adjustments for incorrectly charged parcels.

CX.8.3.2 Surcharges

The application of a surcharge on all "free riders" is recommended. This would include all accounts within the ten member-community NBC service area. The amount of the surcharge should be assigned based on the recent sewer charge adjustment that was approved to provide funding for the CSO Abatement Program. The amount of the surcharge should be proportional to the portion of the sewer rate increase that is being used to pay for the CSO Abatement Program.

CX.9 IMPLEMENTATION AND ADMINISTRATIVE COST COMPARISON

CX.9.1 Implementation Costs

A comparison of estimated implementation costs are provided in Table CX.7. Total costs for the two alternatives are similar. In general, for a similar number of records to be processed, the data collection required for Alternative No. 1 is less expensive than for Alternative No. 2. For the purpose of this project, however, the number of records to be processed is greater for Alternative No. 1, off-setting the savings that normally could be expected.

Table CX.7
Comparison of Estimated Implementation Costs

Task No.	Description	Alt. No. 1 Records to be Processed	Alt. No. 1 Cost	Alt. No. 2 Records to be Processed	Alt. No. 2 Cost
1.	Data Collection – General Parcels	8,558	**$101,890**	6,451	**$167,000**
2.	Delineate the Service Area	-	**$76,755**		**$103,530**
3.	Data Collection – Development of Billing Unit Basis	71,101	**$66,045**	45,740	**$42,487**
4.	Data Collection – Land Use Factor	-	**$67,830**	N.A.	-
5.	Identification and Processing of "Free Riders"	600 to 1,000	**$74,970**	600 to 1,000	**$74,970**
6.	Delivery of Data to NBC	80,786			

Task No.	Description	Alt. No. 1 Records to be Processed	Alt. No. 1 Cost	Alt. No. 2 Records to be Processed	Alt. No. 2 Cost
	Billing System/Project Start-Up		**$41,412**	52,791	**$27,200**
7.	Public Information Program	-	**$38,913**	-	**$38,913**
8.	Meetings and Project Coordination	-	**$58,905**	-	**$85,000**
9.	Mitigation Credit Policy Development and Initial Credit Assignment	N.A	-	-	**$40,800**
Total		-	**$526,720**	-	**$579,900**

CX.9.2 Administrative Costs

Estimates for additional administrative costs that will be incurred to administer the CSO Abatement Program fee system for this alternative do not differ from those costs for Alternative No. 1. There is a greater burden placed on NBC staff to set up new accounts and maintain existing accounts based on the increased data requirements of an Impervious Area Model. However, this expense would be offset by the fact that there are fewer accounts to maintain under Alternative No. 2. Therefore, the ongoing administrative costs for either alternative would not vary significantly.

Table CX.8
Estimated Ongoing Administrative Costs

Cost Item	Description	Cost/Yr
1.	3 Full-Time Equivalent New Hires – Principally for the Customer Service Group	$150,000
2.	Public Information Brochures/Videos/Announcements	$5,000
Total Annual Administrative Costs		**$155,000**

CX.10 REVENUE ESTIMATES

CX.10.1 Revenue Potential of "Free Riders"

This alternative includes identification of 'free riders" in the ten member-community service area, therefore, estimated revenues gained from those parcels are the same as discussed in the deliverable for Task B. Table CX.9 presents theoretical revenue estimates from the "free rider" parcels discussed in Task B.

Table CX.9
Theoretical Revenue Estimates from "Free Riders"

Assumptions		Annual Revenue
• There are 600 "free rider" parcels and each is equivalent to 10 EBU's • The stormwater charge is set at $1.00 per month for a total of $12.00 per year	6,000 EBU's x $12.00/yr	$72,000
• Each parcel receives a surcharge equal to 60% of the typical sewer use fee of $164.00 • Approx. 600 "free rider" parcels	$98.40 x 600 parcels	$59,040
Total		**$131,040**

CX.10.2 Revenue Potential for Alternative No. 2 – Impervious Area model

The estimated number of EBU's for the Impervious Area Method is shown in Table CX.10 below.

Table CX.10
Estimated Billing Unit Count for CSO Abatement Program Fee

Category	No. of EBU's	
Existing Residential – Tier 1	43,723 @ 1 unit each	43,723
Existing Residential – Tier 2	2,017 @ 1.5 units each	3,025
Existing General Accts	6,451 @ 10 units each	64,510
Projected "Free Riders"	600 @ 10 units each	6,000
Total Estimated Billing Units		**117,258**

For every $1.00 per month charged, the NBC benefit area would generate approximately $1.41 million per year. The estimated revenue potential for Alternative No. 1 assuming the same monthly charge was $1.98 million per year.

TASK A
APPENDIX

RESIDENTIAL PROPERTY
RECORD CARDS

Residential Property Rec Card - Providence, RI

Property Location: 249 Warrington **Account:** 05205300000 **Map Block No:** 18290925 **Class:** R **State Class:** 01 **Printed** Wed, Nov 14, 2001 Card 1 of 1

Current Owner:

Robert, Brian
Robert, Carmen
249 Warrington St
Providence Ri 02907

Night	Date	Plan

Deed Info: /- -
Zoning: R1
Routing No: 052314.000
Neighborhd: 1230
Living Units: 1
Census Trct:
District: 5
Estimates
MRA: 105,738
Weighted: 103,900
Market: 104,200

Appraised Value:

Land:	9,300	
Building:	95,800	Prior
Total:	105,100	79,100

Assessed Information:
Code: NTP Value: 104,200

Effective DOV: 12/31/00
Value Flag: MARKET
Manual Override Reason:
NO OVERRIDE

Notes

000000103

Entered Information

Date	Time	ID	Adv	Entrance Code	Source
01/07/1999	12:00	JC		Entry + Sign	Owner

Sales History

Book/Page	Date	Price	Type	Validity

Permit Information

Date	Permit #	Price	Purpose	% Comp.
				0
				0

Land Information

Type		Size	Grade	Influence	Factor	Value
Primary	S	4500	0		0	9,250

Total Acres for this Parcel 0.103

Other Building Information

Type	Qty	Year	Stor	Stor2	Grade	Cond	Accord	Value
Garage-Wd/Cb	1	1930	19	19	C	A	0%	3,300
	0	0	0	0			0%	0
	0	0	0	0			0%	0
	0	0	0	0			0%	0
	0	0	0	0			0%	0
	0	0	0	0			0%	0
	0	0	0	0			0%	0
						Total OBY for this card		3,300

Cole·Layer·Trumble Company

Inspection witness by: _____

Residential Property Reco Card - Providence, RI

Property Location: 249 Warrington | **Account:** 05205300000 | **Map Block No:** 18290925 | **Class:** R | **State Class:** 01 | **Printed** Wed, Nov 14, 2001 | Card 1 of 1

Dwelling Information

Style:	Old Style
Condo Style:	
Exterior Walls:	Masonry+frm
Story Height:	2.0
Attic:	Full Finish
Interior/Exterior:	Same
Basement:	Full
Bsmt Garage:	0
Rec Room size:	10 12
FBLA size:	0 0
Unfinished Area:	0
Inlaw Apts:	0
WB Fireplace:	*Stacks* 1 *Openings* 1
MTL Fireplace:	*Stacks* 0 *Openings* 0
Heating Type:	Basic
Fuel:	Oil
Heating System:	Steam
Year Built:	1930
Eff. Yr Built:	0
Ground Flr Area:	891
Tot Living Area:	2392
Grade:	C+
Condition:	Average
Cost/Design:	0
CDU:	AV

Building Notes:

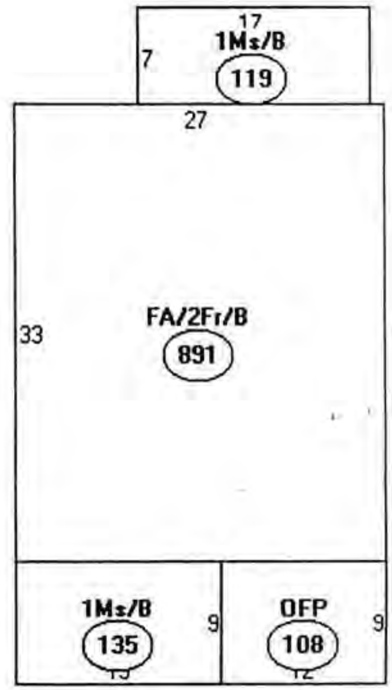
	Low	*1st*	*2nd*	*3rd*	*Tot*
Rooms:	0	0	0	0	12
Bedrooms:	0	0	0	0	6
Full Baths:	0	0	0	0	1
Half Baths:	0	0	0	0	1
Add'l Fixtures:	0	0	0	0	1

Replacement Costs

Base Price:	90,430
Additions:	15,300
Unfinished Area:	0
Basement:	0
Attic:	10,240
Plumbing:	2,220
Heating A/C Adj.:	0
FBLA:	0
Rec Room:	890
Fire Place:	3,330
Basement Garage:	0
Subtotal:	122,410
Grade Factor:	1.08
Total RCN:	132,200
Percent Good:	0.7
Market Adj.:	0
Total RCNLD:	92,540

Addition Information

Low	*1st*	*2nd*	*3rd*	*Area*	*Points*
50	20			135	68
	11			108	24
50	20			119	61



Descriptor/Area
A: FA/2Fr/B 891 sqft
B: 1Ms/B 135 sqft
C: OFP 108 sqft
D: 1Ms/B 119 sqft

[illegible]	[illegible]	[illegible]	Market	Income
Land:	9,300	9,300	9,300	0
Building:	94,900	95,800	94,900	0
Total:	104,200	105,100	104,200	0

[illegible] Sales Summary

Parcel ID	Location	[illegible]	[illegible]	[illegible]	Style	Grade	[illegible]	[illegible]	Bath Full	Bath Half	Acres
05200450000	166 Ontario	11/30/2000	120,000	2632	Old Style	C+	1901	4	2	1	0.086
04500300000	72 Comstock Ave	10/14/1999	100,000	2295	Old Style	C+	1910	6	2	0	0.104
04502060000	15 Wesleyan Ave	06/09/2000	104,000	2418	Old Style	C+	1900	6	2	1	0.092
05202220000	207 Lexington Ave	09/17/1999	124,000	2528	Gambrel	B	1904	5	1	1	0.115
05804040000	216 Baker	02/04/2000	89,000	2084	Old Style	C-	1920	4	1	1	0.072

PAWTUCKET, RHODE ISLAND REVIEW DOCUMENT

MAP/LOT: 010124
PROPERTY LOCATION: 8 DIANA DR

MAP/ROUTE: 01-122 LIVING UNITS: 1 NEIGHBORHOOD: 1.00 ZONE: RS CLASS: R - 01 CARD: 1 OF 1

CURRENT OWNER/ADDRESS

METZ ERICH R

8 DIANA DRIVE
PAWTUCKET RI 02861

PERMIT DATA:

Date	Permit #	Price	Purpose
19990331	99-0993	20,000	ADD 20X29 AND B
0		0	

NOTE:
NOTE:

SALES DATA:

Date	Type	Price
0		0
0		0
0		0

*DWELLING DATA:

Style: CAPE
St. Ht: 1.00
Attic: FULL FINISH
Total Rooms: 7
Bedrooms: 3

Basement: FULL

Full Baths: 2
Half Baths: 0
Add'l Fixtures 0 Total Fixtures: 8
Heating System: WARM AIR
Type: GAS
Fin. Bsmt. Living Area: 0
Basement Rec Room Area: 0
Total Fireplace: 1
Basement Garage (# Cars) 0

TOTAL LIVING AREA: 1539
Quality Grade: C

Year Built: 1946 CDU: GD

OUTBUILDING DATA

Type	Qty	Size1	Size2	Grd	Cond	Value
RG1	1	14	22	C	A	$3,100
	0	0	0			$0
	0	0	0			$0
	0	0	0			$0
	0	0	0			$0
	0	0	0			$0
		Outbuilding Total				$3,100

PRIOR VALUE

LAND	31,600
BLDG	82,300
TOTAL	113,900

- ASSESSMENT INFORMATION -

Effective Date of Value: 12/31/99

Cost Estimate - 113,900

LAND DATA:

TYPE	SIZE	INFLUENCE FACTORS	(%)	LAND VALUE
PRIMARY	7380		0	31,640
	0		0	0
	0		0	0

Total Value: 113,900

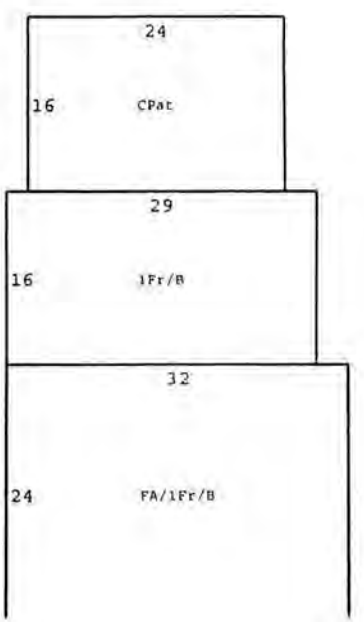
TOTAL ACREAGE: 0.169 TOTAL LAND VALUE: 31,600

*DWELLING PRICE:

Base Price	56,260
Additions	22,900
Unfin. Area	0
Basement	0
Attic	9,590
Plumbing	2,300
Heat/AC Adj.	2,130
FBLA	0
Rec Rm	0
Fireplace	3,420
Bsmt. Gar.	0
SUBTOTAL	96,580
Grade Factor	1.00
TOTAL RCN	$96,580
% Good	0.82
Market Adj.	0
TOTAL RCNLD	$79,200

ADDITION DATA:

	Lower Level	First Floor	Second Floor	Third Floor	Area	
A	Bsmnt Unfsh	1s Frame			464	21800
B		Conc Patio			384	1100
C					0	000
D					0	000
E					0	000
F					0	000
G					0	000
H					0	000

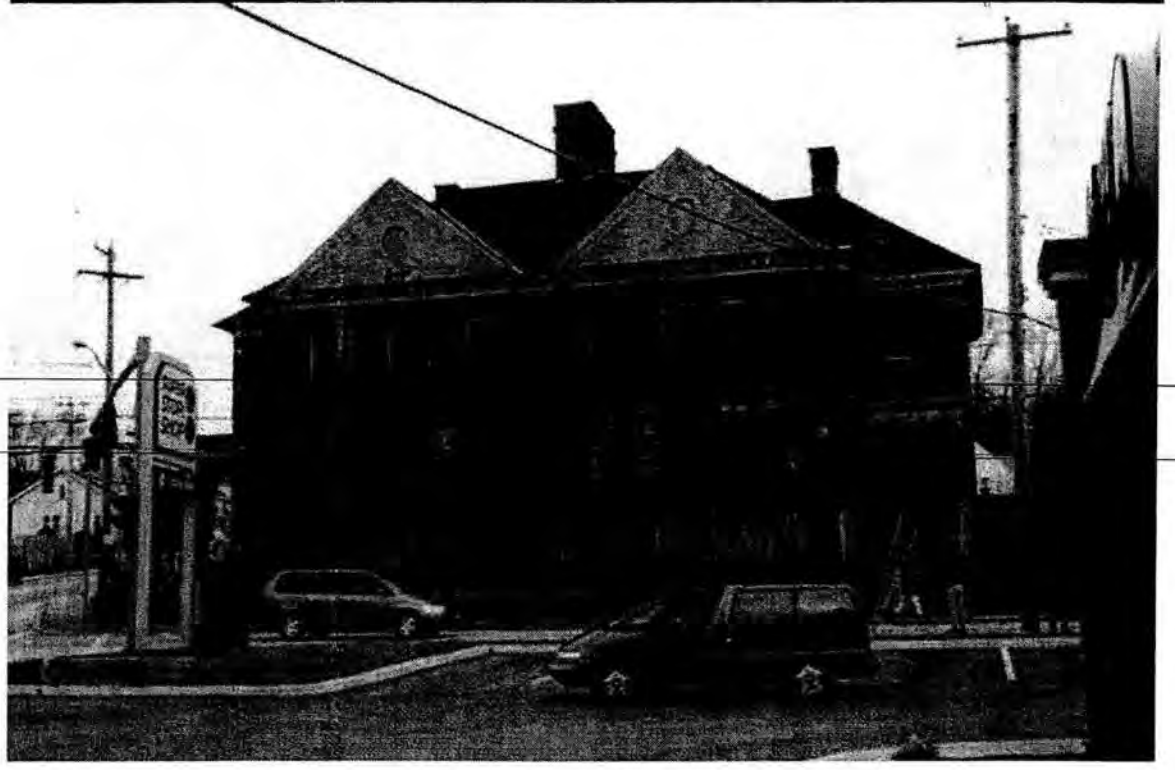


TASK B.1
APPENDIX

PHOTO'S
OF
SAMPLE PROPERTIES

APPENDIX B.1

The following pages include photographs that were taken to illustrate some of the data collection issues discussed in Subtask B. The buildings shown represent vacant and abandoned buildings that are likely to be "Free Riders". The large commercial property has an extensive parking area at the front and rear of the building. The schoolhouse property did not provide parking and is unlikely to be redeveloped without demolition or the acquisition of an additional property for parking. Both have been located on Plat Map 80 in Appendix B-3.



APPENDIX B.1

This photograph illustrates a large expanse of parking that serves both a church and a private school. Generally, the Tax Assessor's records do not contain measurements of parking areas that are associated with tax-exempt properties. The parking on this site may be a "Free Rider", as it is not on the either the school or church parcel. This property is located on Plat Map 80, found in Appendix B-3.

APPENDIX B.1

The examples shown, a residential treatment facility and a college campus both have extensive parking areas that are often located on parcels adjacent to the primary facility and not be associated with an existing utility account. The parking areas are potentially "Free Riders".

APPENDIX B.1

Over twenty buildings similar to the multi-family building below were located within a quarter-mile radius. The bottom photograph depicts a row of buildings that were typical on many urban streets. The uniform nature of residential development illustrated below was found to be typical of entire neighborhoods. Recognizing this phenomenon as a data collection "tool" would reduce the number and cost of data collection tasks in the development of the "equivalent billing unit", the assignment of impervious area and in the quality control phase of the implementation project.

APPENDIX B.1

A challenge that must be met is the identification of impervious area associated with mixed-use properties. Until further study is done, it is recommended that the property be classified according to the information in the existing billing system.

TASK B.2
APPENDIX

APPLIED TECHNOLOGIES FOR IMPLEMENTATION OF VARIOUS RATE STRUCTURES

APPENDIX B.2

APPLIED TECHNOLOGIES FOR IMPLEMENTATION OF VARIOUS RATE STRUCTURES

Impervious Area Model

Application of Impervious Area Information to Properties Located Within Benefit Areas:

Step 1 Acquire parcel level maps of the benefit area

Step 2 Develop a master list of parcels within the benefit area

Step 3 Acquire impervious area information for all non-residential parcels in the benefit area

Step 4 Determine what impervious area information is not available

Step 5 Determine the veracity of available impervious area information and identify anomalies that may exist in the way information is determined and coded into the records

Step 6 Sample a statistically-valid number of residential properties to determine the "typical" impervious area found on the median record in the sample data set

Step 7 Sample a statistically-valid number of residential properties to determine the "typical driveway" size and apply to residential impervious measurement

Step 8 Determine the impervious area, in terms of an equivalent billing unit, for all non-residential parcels

Step 9 -Option A Assign a uniform billing unit to residential parcels

- Option B Assign residential parcels to "tiers" if this is politically acceptable and the site specific information on impervious area is available for all residential parcels

Impervious, Plus Weighted Pervious Area Model

The application of this model begins with the steps outlined for the Impervious Model.

Step 10 Overlay parcel map with soils map or ground cover map to classify the "imperviousness" of pervious areas located on each parcel.

Step 11 Subtract impervious area from gross acreage associated with each parcel and assign value in master billing file

Step 12 Multiply the resulting pervious area value by the "imperviousness" factor

Step 13 Develop total bill unit amount for each parcel by adding value achieved from Steps 9 and 12.

Land Use Model

Application of Land Use Methodology to Properties Located Within Benefit Areas:

The estimated total acreage for each of a set of detailed land use classes for each property in the selected benefit area would be derived through the application of mapping techniques. Electronic land use "maps" would be obtained through RIGIS and checked against available land use maps of each jurisdiction located within the selected benefit

area. Municipal and benefit areas would be added using mapping techniques. The total acreage of each land use category would be digitized using the resulting map. If parcel level maps were available as an electronic coverage, the resulting coverage would yield a data set of land use in acres by municipality for that portion of the CSO Abatement Area within the NBC service area. The parcel level maps may not be available for use in implementation and this data deficiency would require that datasets be used through an address matching process. The gross acreage by land use would be converted to "imputed impervious area" through the application of "impervious coverage factors." An impervious coverage factor is the percentage of a given area (square foot or acre, for example) associated with a given land use class that is typically covered by hard, impervious surfaces. An impervious coverage factor of 50% for parking means that, on average, 50 percent of any land use classified as parking is covered with an impervious surface such as asphalt or concrete. Impervious coverage factors would be multiplied by the gross area associated with each of the aggregated land use codes for each municipality in the benefit area. No contribution is made from properties classified as agricultural, forest, open land, utilities and wetland.

Step 1 Build the following rectified coverages for the Narragansett Bay Service Area:

1. Land use
2. Obtain land use class definitions
3. Determine how land use classes were assigned for each jurisdiction
4. Community boundaries
5. Watershed boundary
6. NBC boundary and Service area boundary

Step 2 Clip all coverages to NBC Service Area (or CSO Abatement Area) based on policy decision of Commission.

Step 3 Join all coverages (polygon overlay each to the service area coverage).

Step 4 Query acres by land use by community within the NBC (or CSO Abatement) Service Area.

Step 5 Construct land use class "coverage factors"

1. Use impervious area rations by land use class as developed for a study area, using most disaggregated land use classifications available
    1. If not available, determine if impervious area ratios have been analyzed by local communities; obtain copies if available.
    2. If not, determine if impervious area, land use and PIN are available from any community in the NBC (or CSO) Benefit Area.
    3. If not, construct coverages from RIGIS data.
    4. Collapse detailed use codes into equivalent land use classes, to the extent possible.

5. Calculate: impervious area/gross area.
6. Calculate mean, median and standard deviation by land use class; test for normal distribution.

Step 6 Multiply coverage factors by acres by land use for each community.

Step 7 Build data table (The following example includes only those communities that are principally within the CSO Abatement Benefit Area. If the rate structure includes all properties within the greater NBC service area, all communities would be included in the table.

APPENDIX B.2

Value Model Alternative A - GIS Method

This approach is build around a full GIS based extrapolation of digital data. It is preferred approach if the necessary information is readily available.

Step 1 Create addition coverage: Equalized taxable value in either NBC or CSO Abatement Service Area *by parcel*. Develop list of all PINs in NBC or CSO Abatement Service Area by community through polygon overlay of community boundary, NBC boundary (or CSO Abatement Service Area boundary). This exercise will require working with all communities that are located within the Service Area.

Step 2 Clip value to NBC or CSO Abatement Service Area.

Step 3 Join clipped value to aggregated coverages derived above in land use approach.

Step 4 Obtain digital file of PINS, equalized taxable value and, optionally, the land use for each parcel in the appropriate Service Area.

Step 5 Link Equalized taxable value file to cadastral (parcel) coverage.

Step 6 Extract "equalized taxable value by land use by community" and export to table:

Land Use Classes	**Value in Pawtucket**	**Value in Providence**	**Value in Central Falls**	**Total Value**
Residential				
Commercial				
Governmental, Roads, Runways, other ROW, etc.				
Governmental (Not Roads, etc.)				
Other categories, as needed.				
Total				

APPENDIX B.2

Value Model Alternative B - Manual Method

If the preferred approach is not achievable, develop list of PINS in Service Area by using cadastral where available according to the steps outlined above, then supplementing the GIS approach with manual extraction for areas where this information is not available.

Step 1 List all sections by section, township and range for those sections wholly contained in the Service Area.

Step 2 List all sections by section, township and range for those sections where the Service Area transects the section.

Step 3 Obtain digital cadastral maps where available for list derived in Step 1 and hard copy tax maps for each section listed in Step 2.

Step 4 Depict Service Area boundary on maps obtained in Step 3.

Step 5 List all PINS inside the Service Area on those section maps in an Access or Excel file.

Step 6 Obtain digital files of PINS, equalized taxable value and, optionally the land use for each parcel in all communities in the Service Area.

Step 7 Create data file of all PINS in Service area by selecting all Tax Key numbers within the listed Sections and concatenating list of individual PINS derived in Step 5.

Step 8 Link PINS in Service Area to appraisal data and extract equalized taxable value for each PIN on the list.

Step 9 Generate Access or Excel table as follows:

Value in Pawtucket	Value in Providence	Value in Central Falls	Total Value

For all approached, continue as follows:

Step A 1. Calculate pro forma rate necessary to pay for portion of Service Area Program Budget to be recovered.

1. Obtain consensus on "recoverable" portion of budget for the Service Area

2. Determine gross equalized value for each community in Service Area (confirm use of "equalized" value).
3. Sum gross equalized value for all communities, divide into annual budget needs; convert to rate.

Step B Multiply aggregate equalized value for each portion of community in Service Area by the pro forma rate.

Opt. Step C Query "value by land use by community"
Opt. Step D Multiply value by rate for each community for each land use.

APPENDIX B-3

The following exhibits are included as an illustration of data resources available for the implementation of this project. Exhibits include:

1. Residential Property Record Card acquired from the Tax Assessor, Providence, R.I. (2 pages)
2. Property Information acquired from the Tax Assessor, Pawtucket, R.I.
3. Land Use Map Coverage, RIGIS
4. Plat Maps (portions of Plats 34 and 80), Deed Office, Providence R.I. (2 sheets)
5. Land Use Map, printed from RIGIS electronic data file, with overlay of geographic information
6. Rectified Area, printed from RIGIS electronic data file

Residential Property Record Card - Providence, RI

Property Location: 249 Warrington **Account:** 05205300000 **Map Block No:** 18290925 **Class:** R **State Class:** 01 **Printed** Wed, Nov 14, 2001 Card 1 of 1

Current Owner

Robert, Brian
Robert, Carmen
249 Warrington St
Providence Ri 02907

Previous Owner History

Name	Deed	Date

Miscellaneous

Deed Info:
Zoning: R1
Routing No: 052314.000
Neighborhd: 1230
Living Units: 1
Census Trct:
District: 5

Estimates
MRA: 105,738
Weighted: 103,900
Market: 104,200

Assessment Information

Appraised Value:

Land:	9,300	
Building:	95,800	Prior
Total:	105,100	79,100

Assessed Information: Code: NTP Value: 104,200

Effective DOV: 12/31/00
Value Flag: MARKET
Manual Override Reason: NO OVERRIDE

Notes

000000103

Entrance Information

Date	Time	ID	Actv	Entrance Code	Source
01/07/1999	12:00	JC		Entry + Sign	Owner

Sales History

Book/Page	Date	Price	Type	Validity

Permit Information

Date	Permit #	Price	Purpose	% Comp.
				0
				0

Land Information

Type		Size	Grade	Influence Factor and %	Value
Primary	S	4500	0	0	9,250

Total Acres for this Parcel 0.103

OB / Building Information

Type	Qty	Year	Size1	Size2	Grade	Cond	%Good	Value
Garage-Wd/Cb	1	1930	19	19	C	A	0%	3,300
	0	0	0	0			0%	0
	0	0	0	0			0%	0
	0	0	0	0			0%	0
	0	0	0	0			0%	0
	0	0	0	0			0%	0
	0	0	0	0			0%	0

Total OBY for this card 3,300

Cole·Layer·Trumble Company

Inspection witness by: _____

Residential Property Rec . Card - Providence, RI

Property Location: 249 Warrington | **Account:** 05205300000 | **Map Block No:** 18290925 | **Class:** R | **State Class:** 01 | **Printed** Wed, Nov 14, 2001 | Card 1 of 1

Dwelling Information

Style:	Old Style
Condo Style:	
Exterior Walls:	Masonry+frm
Story Height:	2.0
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Interior/Exterior:	Same
Basement:	Full
Bsmt Garage:	0
Rec Room size:	10 12
FBLA size:	0 0
Unfinished Area:	0
Inlaw Apts:	0
WB Fireplace:	Stacks 1 Openings 1
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Heating Type:	Basic
Fuel:	Oil
Heating System:	Steam
Year Built:	1930
Eff. Yr Built:	0
Ground Flr Area:	891
Tot Living Area:	2392
Grade:	C+
Condition:	Average
Cost/Design:	0
CDU:	AV

Building Notes:

	Low	1st	2nd	3rd	Tot
Rooms:	0	0	0	0	12
Bedrooms:	0	0	0	0	6
Full Baths:	0	0	0	0	1
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Add'l Fixtures:	0	0	0	0	1

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Base Price:	90,430
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Total RCNLD:	92,540

Addition Information

Low	1st	2nd	3rd	Area	Points
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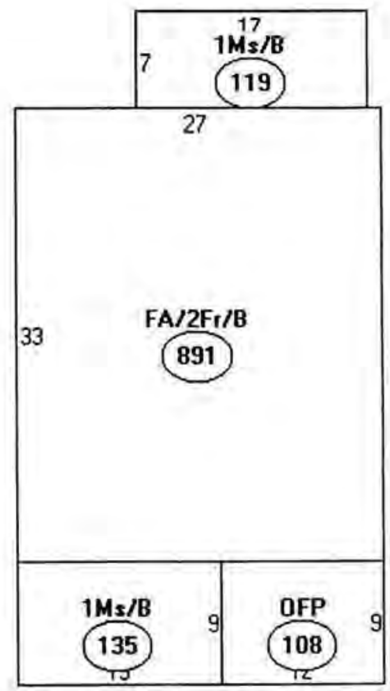


Descriptor/Area

A: FA/2Fr/B 891 sqft

B: 1Ms/B 135 sqft

C: OFP 108 sqft

D: 1Ms/B 119 sqft

Owner Values: Includes all Land/Building/OBYs for this Parcel

	Current	Cost	Market	Income
Land:	9,300	9,300	9,300	0
Building:	94,900	95,800	94,900	0
Total:	104,200	105,100	104,200	0

Comparable Sales Summary

Parcel ID	Location	DOS	Price	TLA	Style	Grade	Year built	Bdrm room	Bath Full	Bath Half	Acres
05200450000	166 Ontario	11/30/2000	120,000	2632	Old Style	C+	1901	4	2	1	0.086
04500300000	72 Comstock Ave	10/14/1999	100,000	2295	Old Style	C+	1910	6	2	0	0.104
04502060000	15 Wesleyan Ave	06/09/2000	104,000	2418	Old Style	C+	1900	6	2	1	0.092
05202220000	207 Lexington Ave	09/17/1999	124,000	2528	Gambrel	B	1904	5	1	1	0.115
05804040000	216 Baker	02/04/2000	89,000	2084	Old Style	C-	1920	4	1	1	0.072

PAWTUCKET, RHODE ISLAND REVIEW DOCUMENT

MAP/LOT: 010124
PROPERTY LOCATION: 8 DIANA DR

MAP/ROUTE: 01-122 LIVING UNITS: 1 NEIGHBORHOOD: 1.00 ZONE: RS CLASS: R - 01 CARD: 1 OF 1

CURRENT OWNER/ADDRESS

METZ ERICH R

8 DIANA DRIVE
PAWTUCKET RI 02861

PERMIT DATA:

Date	Permit #	Price	Purpose
19990331	99-0993	20,000	ADD 20X29 AND B
0		0	

NOTE:
NOTE:

SALES DATA:

Date	Type	Price
0		0
0		0
0		0

*DWELLING DATA:

Style: CAPE
St. Ht: 1.00
Attic: FULL FINISH
Total Rooms: 7
Bedrooms: 3

Basement: FULL

Full Baths: 2
Half Baths: 0
Add'l Fixtures 0 Total Fixtures: 8
Heating System: WARM AIR
Type: GAS
Fin. Bsmt. Living Area: 0
Basement Rec Room Area: 0
Total Fireplace: 1
Basement Garage (# Cars) 0

TOTAL LIVING AREA: 1539
Quality Grade: C

Year Built: 1946 CDU: GD

OUTBUILDING DATA

Type	Qty	Size1	Size2	Grd	Cond	Value
RG1	1	14	22	C	A	$3,100
	0	0	0			$0
	0	0	0			$0
	0	0	0			$0
	0	0	0			$0
	0	0	0			$0
	0	0	0			$0
		Outbuilding Total				$3,100

PRIOR VALUE

LAND	31,600
BLDG	82,300
TOTAL	113,900

LAND DATA:

TYPE	SIZE	INFLUENCE FACTORS	(%)	LAND VALUE
PRIMARY	7380		0	31,640
	0		0	0
	0		0	0

TOTAL ACREAGE: 0.169 TOTAL LAND VALUE: 31,600

*DWELLING PRICE:

Base Price	56,260
Additions	22,900
Unfin. Area	0
Basement	0
Attic	9,590
Plumbing	2,300
Heat/AC Adj.	2,130
FBLA	0
Rec Rm	0
Fireplace	3,420
Bsmt. Gar.	0
SUBTOTAL	96,580
Grade Factor	1.00
TOTAL RCN	$96,580
% Good	0.82
Market Adj.	0
TOTAL RCNLD	$79,200

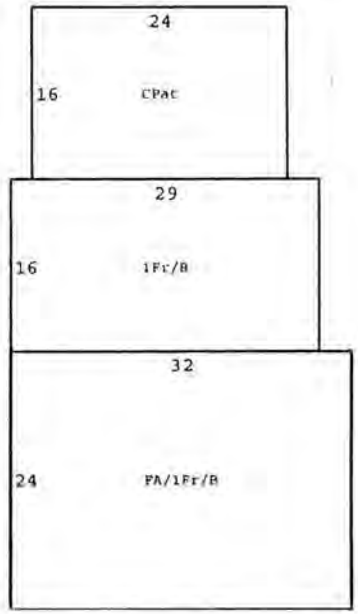
- ASSESSMENT INFORMATION -

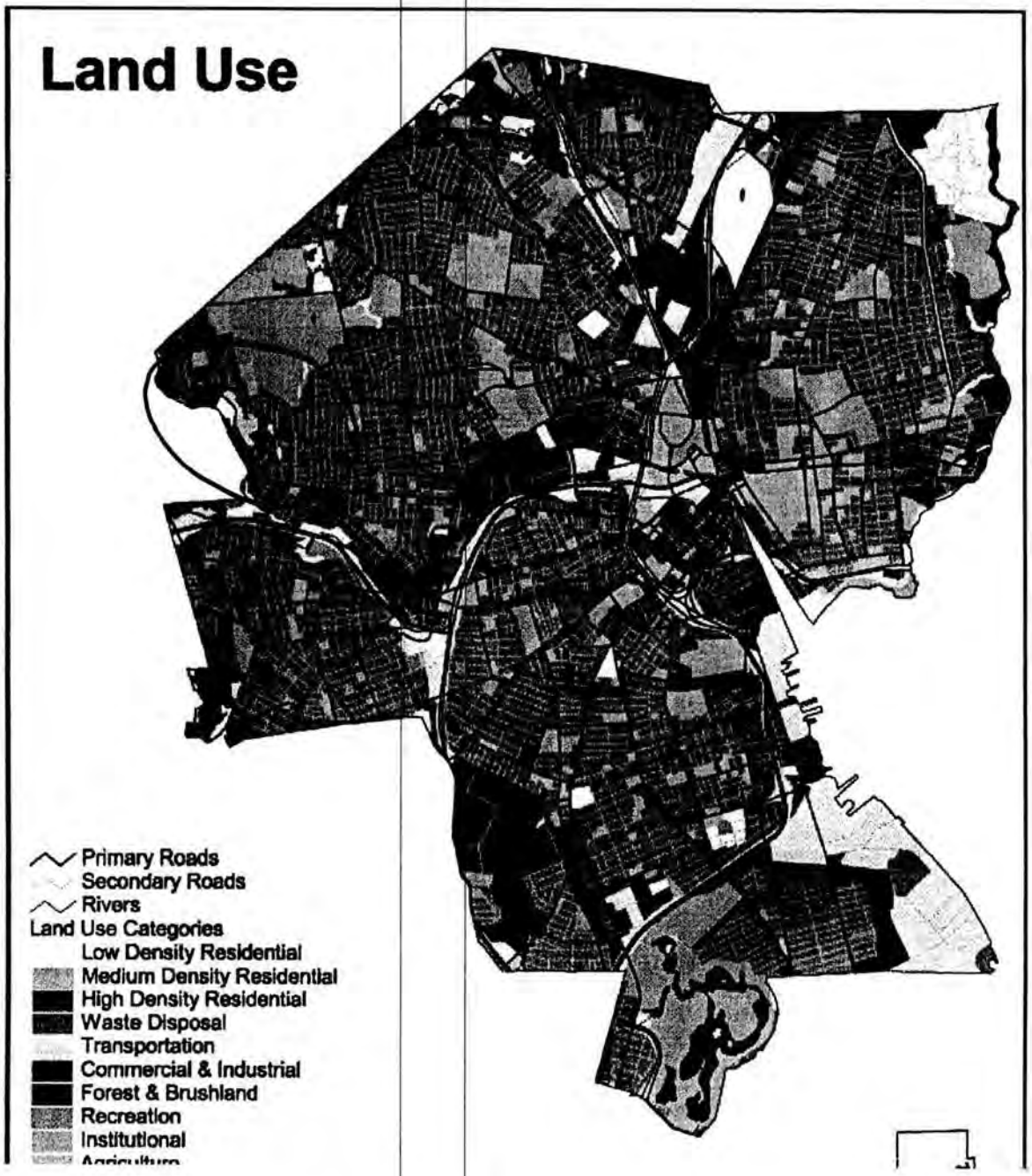
Effective Date of Value: 12/31/99
Cost Estimate - 113,900

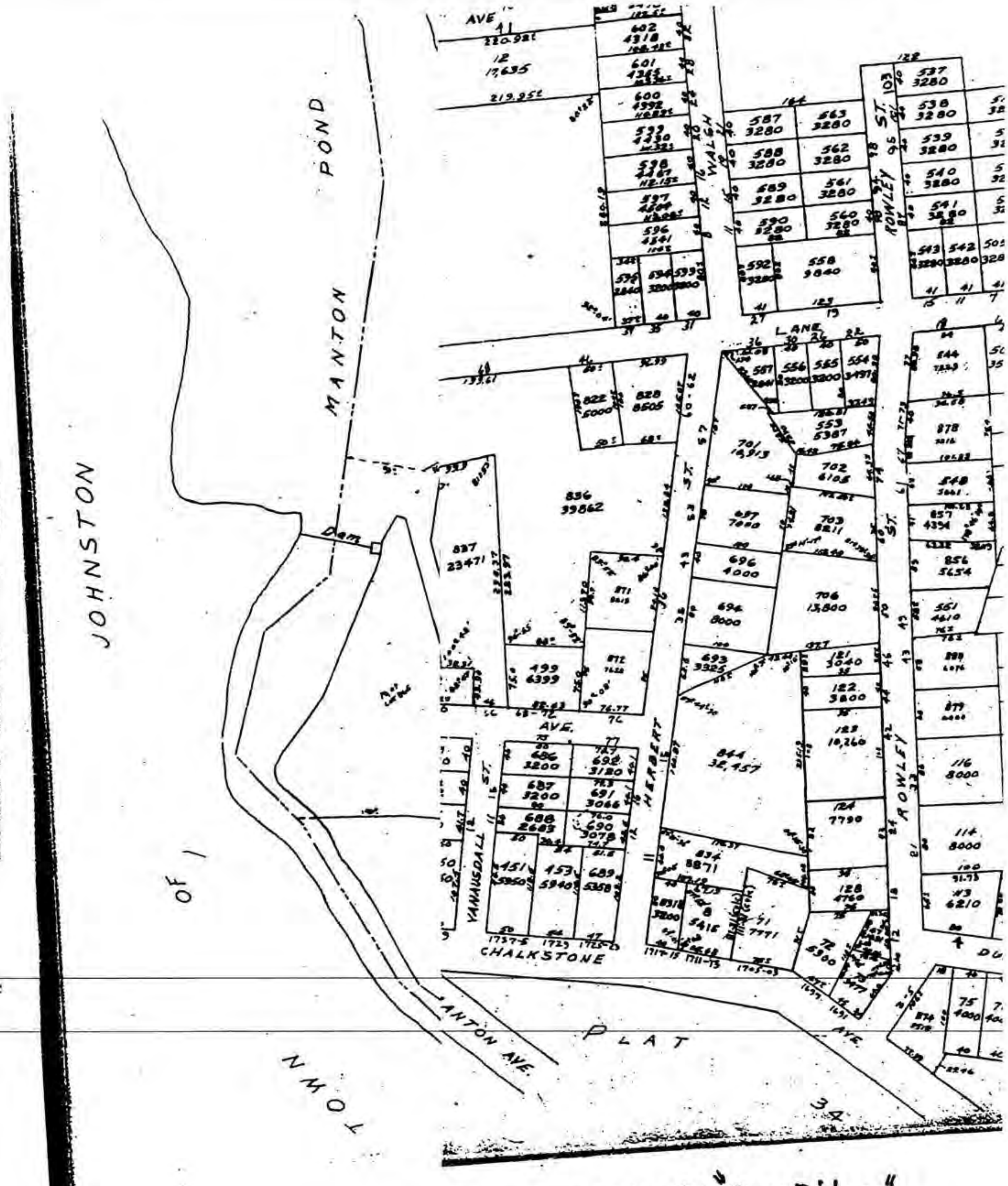
Total Value: 113,900

ADDITION DATA:

	Lower Level	First Floor	Second Floor	Third Floor	Area	
A	Bsmnt Unfsh	1s Frame			464	21800
B		Conc Patio			384	1100
C					0	000
D					0	000
E					0	000
F					0	000
G					0	000
H					0	000

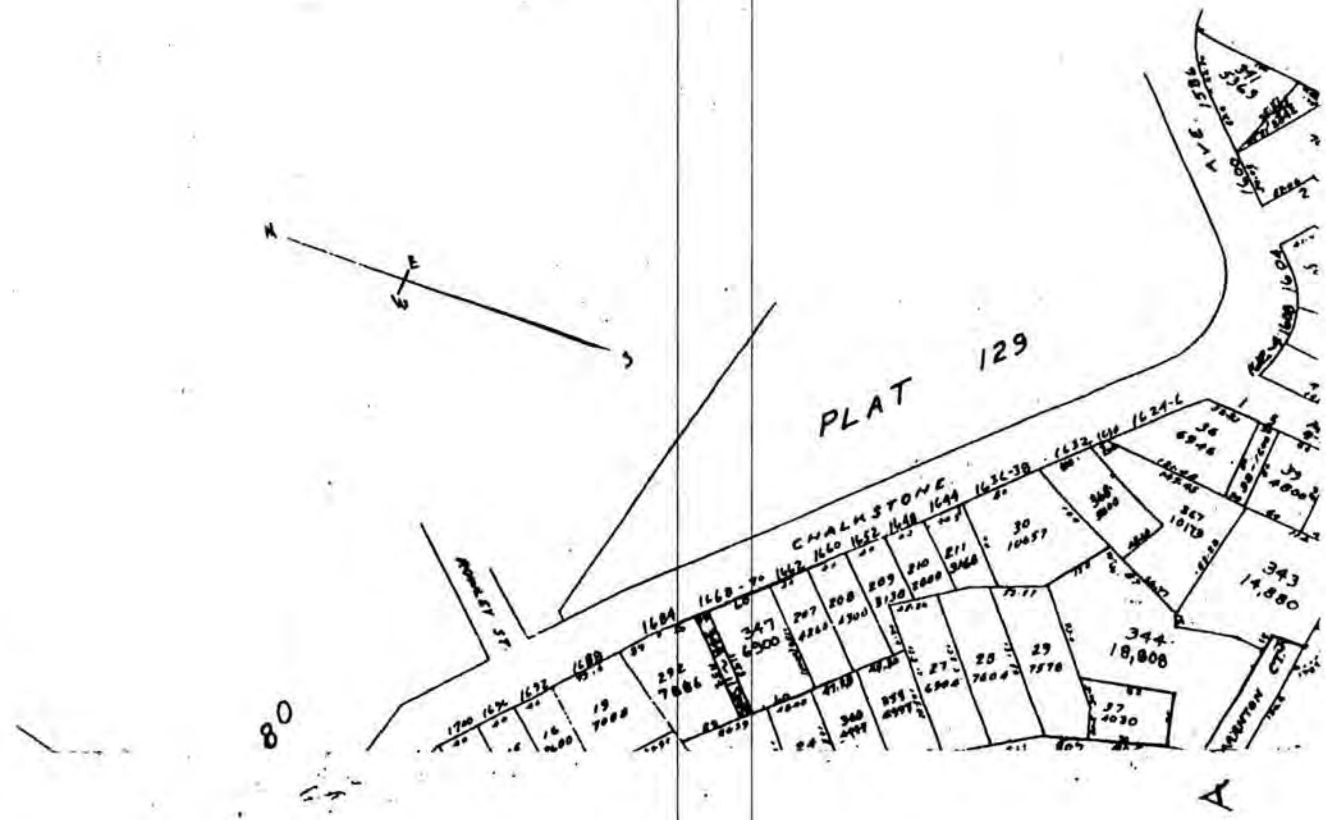


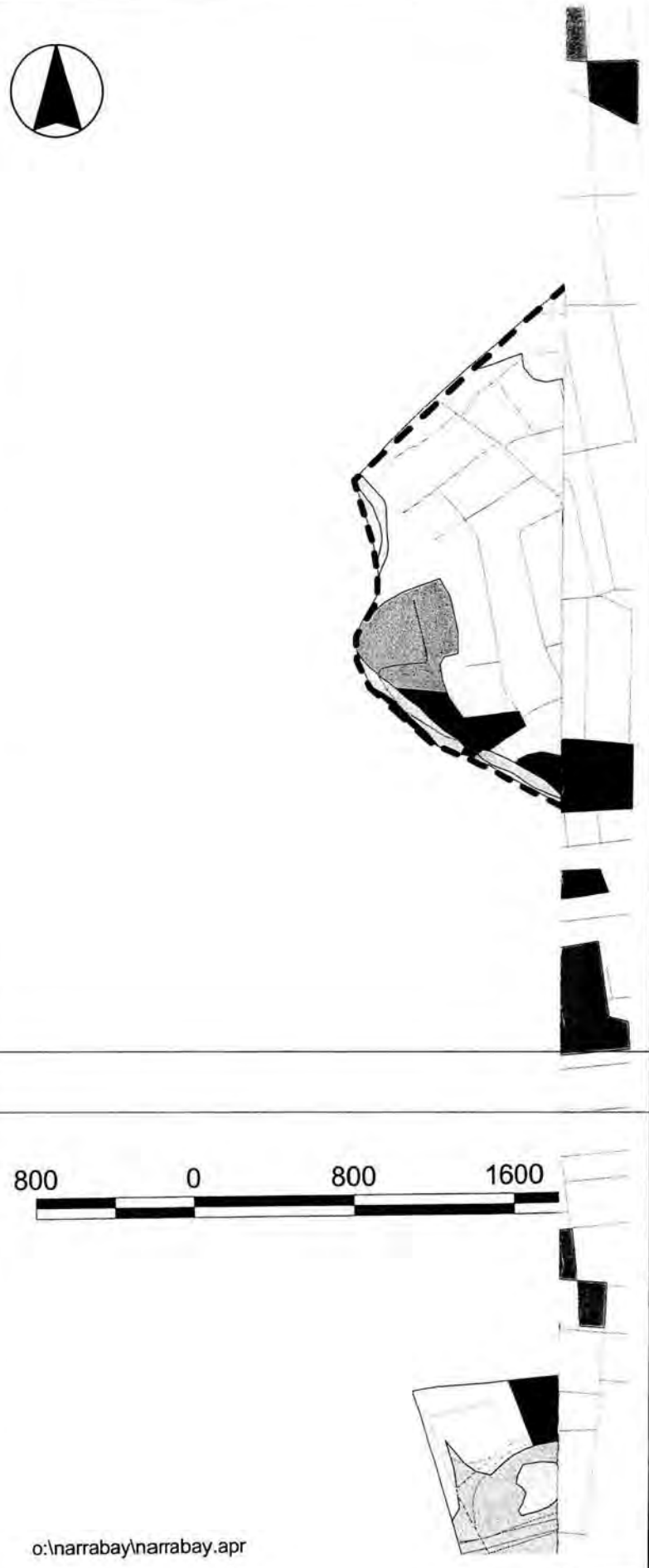

Land Use
Primary Roads
Secondary Roads
Rivers
Land Use Categories
Low Density Residential
Medium Density Residential
High Density Residential
Waste Disposal
Transportation
Commercial & Industrial
Forest & Brushland
Recreation
Institutional



Properties=Potential "Free Riders"

PLAT MAP # 80


PLAT 129
CHALKSTONE
AVE.
80
A



LEGEND

- Sewer Service Areas
- Roads
- High Density Residential
- Medium High Density Res.
- Medium Density Residential
- Commercial & Services
- Institutional
- Industrial
- Gravel Pits, Quarries
- Barren, Transitional Area
- Mixed Urban
- Developed Recreational
- Brush
- Deciduous Forest
- Mixed Evergreen
- Orchards, Groves, Nursuries
- Wetlands
- Roads
- Cemetery
- Waste Disposal Area
- Railroads
- Vacant Land
- Water & Sewage
- Water Based Commercial
- Water

800 0 800 1600

SOURCE: RIGIS

NARRAGANSETT BAY COMMISSION

STORMWATER FEE STUDY

LAND USES

NORTHEAST PROVIDENCE, RI

o:\narrabay\narrabay.apr

DECEMBER 2001

N

LEGEND

Sewer Service Area

800 0 800 Feet

SOURCE: RIGIS

NARRAGANSETT BAY COMMISSION

STORMWATER FEE STUDY

AERIAL VIEW

NORTHEAST PROVIDENCE, R

DECEMBER 2001

o:\narrabay\narrabay.apr

TASK C.1
APPENDIX

IMPLEMENTATION SCHEDULE
AND
COST ESTIMATE

APPENDIX C-1

IMPLEMENTATION TASKS
SCHEDULE AND COST ESTIMATE
ALT. NO. 1 - LAND USE MODEL

Task No.	Description	Schedule	Personnel	Est. Hours	Est. Cost
1	***Data Collection - General Parcels***				
1.01	Acquire, catalog and rate maps for use [735 maps]	Month 1 (3 weeks)	PM/Engr.	80	$6,800
1.02	Download or acquire electronic version of most recent rectified (and scalable) aerials availabe from RIGIS	Month 1 (2 weeks)	GIS Sp	40	$3,400
1.03	Scale aerials for match to parcel maps	Month 1-2 (4 weeks)	GIS Sp	120	$10,200
1.04	Visually interpretate using parcel maps and aerials to delineate lot perimeters for all General accounts whose acreage value is not available electronically, record parcel numbers where lot size cannot be determined from maps [Max. 8639 Records]	Month 2-3 (8 weeks)	GIS Tech	640	$54,400
1.05	Determine strategy for acquiring Field "cards" or procedure for recording card information on-site at Tax Assessor's offices	Month 1 (1 week)	Data Spec	40	$3,400
1.06	Assign Billing Class codes to all accounts in Master Account File [80186 records]	Month 3 (2 weeks)	Data Spec	80	$6,800
1.07	Record data for properties identified in Task 1.04	Month 3 (2 weeks)	Data Mgr	80	$6,800
Task No. 1	**Subtotal Labor** **Subtotal ODC's - Maps, Tax Rolls + 5%** **Subtotal Task No. 1**			**1080**	**$91,800** **$10,090** **$101,890**
2	***Delineate the Service Area***				
2.01	Evaluate sewer maps and other data to determine limits of sewered areas in all NBC communities	Month 1 (3 weeks)	PM/Engr.	160	$13,600
2.02	Perform field investigations of streets to confirm sewered areas from map evaluations	Month 2 (3 weeks)	PM/Engr.	360	$30,600
2.03	Perform parcel investigations for questionable properties to determine inclusion in service areas	Month 2-3 (3 weeks)	PM/Engr.	180	$15,300
2.04	Create a database and images of findings from map evaluations and field investigations	Month 2-3 (3 weeks)	GIS Sp	160	$13,600
Task No. 2	**Subtotal Labor** **Subtotal ODC's - 5%** **Subtotal Task No. 2**			**860**	**$73,100** **$3,655** **$76,755**
3	***Data Collection - Development of Billing Unit Basis***				
3.01	Create sampling frames and data collection protocol for development of Equivalent Billing Unit (EBU)	Month 1 (1 week)	PM/Engr.	40	$3,400
3.02	Determine total impervious area for sample sets identified in Task 2.01 [Range: 150 - 1430 accts]	Month 2-3 (6 weeks)	GIS Sp	560	$47,600
3.03	Determine Equivalent Billing Unit in terms of square feet of impervious on a "typical" parcel by determining the "median" record from Task 2.02	Month 3 (2 weeks)	Data Spec	60	$5,100
3.04	Assign relative EBUs to all eligible Tier 1 and Tier 2 parcels in the Master Account File based on Task 2.03 [71547 records]	Month 3 (2 weeks)	Data Mgr	80	$6,800
Task No. 3	**Subtotal Labor** **Subtotal ODC's - 5%.** **Subtotal Task No. 3**			**740**	**$62,900** **$3,145** **$66,045**

APPENDIX C-1

IMPLEMENTATION TASKS
SCHEDULE AND COST ESTIMATE
ALT. NO. 1 - LAND USE MODEL

4	***Data Collection - Land Use Factor***				
4.01	Create sampling frames and data collection protocol for development of Land Use Factors to be applied to General Parcels	Month 1(1 week)	PM/Engr.	40	$3,400
4.02	Determine total impervious area for sample sets identified in Task 3.01[150-431 accounts]	Month 2-3 (4 weeks)	GIS/Data Spec	400	$34,000
4.03	Determine Land Use Factors by Community [Min 3 to Max 30]	Month 3 (1 week)	Data Spec	40	$3,400
4.04	Apply Land Use Factors to all General accounts [8639 records]	Month 3 (2 weeks)	Data Mgr	80	$6,800
4.05	Validate a sample set of General accounts for veracity of lot size and impervious area assignments [Min 45 to Max 431]	Month 4 (2 weeks)	GIS/Data Spec	120	$10,200
4.06	Populate Master Account File with data from Task 3.04 [8639 records]	Month 4 (2 weeks)	Data Mgr	80	$6,800
Task No. 4	**Subtotal Labor** **Subtotal ODC's - 5%.** **Subtotal Task No. 4**			**760**	**$64,600** **$3,230** **$67,830**
5	***Identification and Processing of "Free Riders"***				
5.01	Prepare strategy for determining the universe of "Free Riders" and acquiring impervious area and ownership information for each property.	Month 2 (2 weeks)	PM/Engr	80	$6,800
5.02	Using visual interpretation, search for parking that appears to benefit adjacent developed properties.	Month 3-4 (6 weeks)	GIS Spec	160	$13,600
5.03	Meet with agencies to determine potential "Free Rider" sites	Month 2 (2 weeks)	PM/Engr	120	$10,200
5.04	Acquire and compare historical utility billing data with current data to identify "inactive" or "missing" accounts	Month 3 (2 weeks)	Data Spec	40	$3,400
5.05	Perform "windshield survey" to identify potential "Free Rider" sites coded "Barren, Transitional Areas" on RIGIS Land Use maps.	Month 2 (2 weeks)	GIS/Data Spec	160	$13,600
5.06	Determine impervious value, ownership, address associated with each "Free Rider"	Month 3-4 (6 weeks)	PM/Engr	160	$13,600
5.07	Assist Customer Service with assignment of NBC Account Number	Month 4 (2 weeks)	PM/Engr	40	$3,400
4.08	Enter pertinant "Free Rider" billing data in Master Account File	Month 4 (2 weeks)	Data Mgr	80	$6,800
Task No. 5	**Subtotal Labor** **Subtotal ODC's - 5%.** **Subtotal Task No. 5**			**840**	**$71,400** **$3,570** **$74,970**
6	***Delivery of Data to NBC Billing System/Project Start-Up***				
6.01	Meet with NBC staff to coordinate delivery of Master Account "Test" file in a compatible format	Month 5 (4 Mtgs)	PM/Engr	96	$8,160
6.02	Prepare Credit and Appeals Protocol	Month 4-5 (4 weeks)	PM/Engr	200	$17,000
6.03	Meet with NBC staff to coordinate training of appropriate NBC Staff on Maintenance of Records and Appeals Process	Month 5 (4 Mtgs)	PM/Engr	48	$4,080
6.04	Provide "Start-Up Assistance"	Month 6 (4 weeks)	PM/Engr	120	$10,200
Task No. 6	**Subtotal Labor** **Subtotal ODC's - 5%.** **Subtotal Task No. 6**			**464**	**$39,440** **$1,972** **$41,412**

APPENDIX C-1

IMPLEMENTATION TASKS
SCHEDULE AND COST ESTIMATE
ALT. NO. 1 - LAND USE MODEL

7	***Public Information Program***				
7.01	Meet with NBC staff to discuss Public Information Strategy	Month 3-5 (6 Mtgs)	PM/Engr	96	$8,160
7.02	Develop data and narrative documentation for use in Public Information Program	Month 3 (3 Weeks)	PM/Engr	260	$22,100
7.03	Provide Public Information Materials for Presentations to Focus Groups	Various	PM/Engr	80	$6,800
Task No. 7	**Subtotal Labor** **Subtotal ODC's - 5%.** **Subtotal Task No. 7**			**436**	**$37,060** **$1,853** **$38,913**
8	***Meetings and Project Coordination***				
8.01	Meetings with NBC Staff, Project Coordination, Documentation	Various	PM/Engr	300	$25,500
8.02	Prepare Reports and Project Archive	Various	PM/Engr	120	$10,200
8.03	Project Administration	Various	Assist.	240	$20,400
Task No. 8	**Subtotal Labor** **Subtotal ODC's - 5%.** **Subtotal Task No. 8**			**660**	**$56,100** **$2,805** **$58,905**
Total Project	**Total Labor** **Total ODC's** **Implementation Phase Total**			**5840**	**$496,400** **$30,320** **$526,720**

Assumptions:

1 $85/hour average labor rate
2 Project implementation duration a total of 6 months
3 Conservative estimate made for data collection based on wide variety of sources
4 Contingency is included in line item estimates
5 ODC's based on 5% of labor costs except where data costs are known

TASK C.2
APPENDIX

MS ACCESS DATABASE QUERIES

APPENDIX C-2

The Narragansett Bay Commission
One Service Road
Providence, Rhode Island 02905

401 • 461 • 8848
401 • 461 • 6540 FAX
401 • 461 • 6549 TDD

http://www.narrabay.com

Vincent J. Mesolella
Chairman

Paul Pinault, P.E.
Executive Director

NARRAGANSETT BAY COMMISSION NEW ACCOUNT/ NEW CONNECTIONS

NAME:	PREMISE ADDRESS:	
CONNECTION/INSTALLED DATE:	BILLING ADDRESS:	
METER SIZE & SERIAL NUMBER:	PLAT/LOT:	PHONE:
REFERENCE NUMBER:	WATER DISTRICT:	DWELLING CLASSIFICATION:
DATES AND METER READING	INVESTIGATOR/RESEARCHER	

APPENDIX C-2

NARRAGANSETT BAY COMMISSION
REQUEST FOR REAL ESTATE CLOSING INFORMATION

Date: _____ Requested by: _____

Address: _____

Tel #: _____

Fax #: _____

Property Address: _____

City: _____

Seller/Owner Name: _____

Billing Address: _____

Buyer/New Owner Name: _____

Billing Address: _____

NBC ACCOUNT #: _____

Meter Serial #: _____

CURRENT METER READING: _____ **DATE TAKEN:** _____

CLOSING DATE: _____

MAIL TO: The Narragansett Bay Commission
One Service Road
Providence, RI 02905
ATTN: JENNIE – CUSTOMER SERVICE
(401) 461-8828

OR FAX TO: (401) 461-6546

- **A separate request must be made for each account associated with a property.**

It is the responsibility of the requesting party to identify all related accounts & provide accurate & current meter readings. The property owner remains liable for all outstanding charges on all accounts associated with the particular parcel of real estate. Failure to provide NBC with all relevant accounts and/or accurate meter readings will not relieve the property owner from liability.

For Narragansett Bay Commission use only:

Previous Balance: $ _____ TOTAL DUE: $ _____

Sewer Use Fee(s): $ _____

Consumption Charges: $ _____

Post-it® Fax Note 7671	Date 2/8/02	# of pages ▶ 2
To Matt Travers	From Carol	
Co./Dept.	Co. FOR THE	
Phone #	Phone # APPENDIX	
Fax # 781 401-2043	Fax # OF TM "C"	

BP Residential 1, 2, 3 dwelling units

Query1 2/8/02

CountOfNBC Custome	Customer Type	Dwelling	City Name
437	Residential	1	Central Falls
1,737 535	Residential	2	Central Falls
765	Residential	3	Central Falls
4915	Residential	1	Cumberland
5,353 313	Residential	2	Cumberland
125	Residential	3	Cumberland
2894	Residential	1	East Providence
3,238 291	Residential	2	East Providence
53	Residential	3	East Providence
2847	Residential	1	Lincoln
3,165 252	Residential	2	Lincoln
66	Residential	3	Lincoln
9 7	Residential	1	North Providence
2	Residential	2	North Providence
9813	Residential	1	Pawtucket
14,527 2933	Residential	2	Pawtucket
1781	Residential	3	Pawtucket
11	Residential	1	Providence
16 3	Residential	2	Providence
2	Residential	3	Providence
2	Residential	1	Smithfield

Total 28,047 Accts. ✓

APPENDIX C-2

FP Residential
1, 2, 3 Dwelling Units

Query1 2/8/02

CountOfNBC Custom	Customer Type	Dwelling Units	City Name
3	3 Residential	1	Cumberland
2	2 Residential	1	East Providence
4,499	4013 Residential	1	Johnston
	435 Residential	2	Johnston
	51 Residential	3	Johnston
6	480 Residential	1	Lincoln
8,284	7500 Residential	1	North Providence
	644 Residential	2	North Providence
	140 Residential	3	North Providence
2	2 Residential	1	Pawtucket
27,441	14849 Residential	1	Providence
	7990 Residential	2	Providence
	4602 Residential	3	Providence
1	1 Residential	1	Smithfield

Total 40,712 Accts.

RP

Residential
4,5,6 dwelling units

2/8/02

CountOfNBC Customer	Customer Type	Dwelling	City Name
209	Residential	4	Central Falls
77	Residential	5	Central Falls
97	Residential	6	Central Falls
65	Residential	4	Cumberland
6	Residential	5	Cumberland
12	Residential	6	Cumberland
9	Residential	4	East Providence
4	Residential	5	East Providence
2	Residential	6	East Providence
23	Residential	4	Lincoln
5	Residential	5	Lincoln
7	Residential	6	Lincoln
1	Residential	4	North Providence
414	Residential	4	Pawtucket
128	Residential	5	Pawtucket
180	Residential	6	Pawtucket

383 | 83 | 15 | 35 | 1 | 722

Total 1,239 Accts.

FP Residential 4,5,6 Dwelling Units

Query1 2/8/02

CountOfNBC Custon	Customer Type	Dwelling Units	City Name
19	Residential	4	Johnston
47 4	Residential	5	Johnston
24	Residential	6	Johnston
44	Residential	4	North Providence
84 16	Residential	5	North Providence
24	Residential	6	North Providence
481	Residential	4	Providence
912 129	Residential	5	Providence
302	Residential	6	Providence

Total 1,043 Accts.

BP Residential > 6 Dwelling Units

qryBPRes>6 2/8/02

CountOfNBC Custon	Customer Type	City Name
16	Residential	Lincoln
17	Residential	Pawtucket

Total 33 Accts.

FP Residential >6 Dwelling Units

Query1 2/8/02

CountOfNBC Custom	Customer Type	City Name
15	Residential	Johnston
53	Residential	North Providence
28	Residential	Providence

Total 96 Accts.

BP Commercial & Industrial

2/8/02

qryBPComm&Ind

CountOfNBC Custon	Customer Type	City Name
378	Commercial	Central Falls
28	Industrial	Central Falls
293	Commercial	Cumberland
21	Industrial	Cumberland
322	Commercial	East Providence
36	Industrial	East Providence
224	Commercial	Lincoln
45	Industrial	Lincoln
1	Commercial	North Providence
1427	Commercial	Pawtucket
178	Industrial	Pawtucket
6	Commercial	Smithfield
7	Industrial	Smithfield

Total 2,966 Accts.

Commercial = 2,651
Industrial = 315

FP Commercial & Industrial

Query1 2/8/02

CountOfNBC Custon	Customer Type	City Name
403	Commercial	Johnston
32	Industrial	Johnston
13	Commercial	Lincoln
583	Commercial	North Providence
18	Industrial	North Providence
4124	Commercial	Providence
271	Industrial	Providence
1	Commercial	Smithfield

Total 5,445 Accts.

Commercial = 5,124
Industrial = 321

FP exclusively

Query1 2/9/02

Premise City	Customer Type	Dwelling Units	CountOfNBC C
CRANSTON	Commercial	1	18
CRANSTON	Residential	1	47
CRANSTON	Residential	2	12
CRANSTON	Residential	3	1

18
60
78

Total Accts

qryBPAccountsOutsideTenPrincipalCities 2/8/02

Premise City	Active	Premise State	Customer Type	CountOfNBC Custo
ALBION	☐	RI	Commercial	12
ALBION	☐	RI	Residential	66
ATTLEBORO	☐	MA	Commercial	1
ATTLEBORO	☐	MA	Residential	1
EAST GREEN	☐	RI	Residential	1
LONSDALE	☐	RI	Commercial	5
LONSDALE	☐	RI	Residential	12
MANVILLE	☐	RI	Commercial	54
MANVILLE	☐	RI	Residential	298
SAYLESVILLE	☐	RI	Commercial	4
SAYLESVILLE	☐	RI	Residential	69
SOUTH ATTLE	☐	MA	Commercial	2
SOUTH ATTLE	☐	MA	Residential	1

Total 526 Accts.

plus Centerdale RI 1 Residential Acct.

qryBPAcctsWithSeparateSewers 2/9/02

Premise City	Premise State	CountOfNBC Customer Nu	Separate Sewers
ALBION	RI	78	☐
ATTLEBORO	MA	2	☐
CENTRAL FALLS	RI	2526	☐
CUMBERLAND	RI	5750	☑
EAST GREENWICH	RI	1	☐
EAST PROVIDENCE	RI	3611	☑
LINCOLN	RI	3485	☑
LONSDALE	RI	17	☐
MANVILLE	RI	352	☐
NORTH PROVIDENCE	RI	11	☑
PAWTUCKET	RI	16871	☐
PROVIDENCE	RI	16	☐
SAYLESVILLE	RI	73	☐
SMITHFIELD	RI	15	☑
SOUTH ATTLEBORO	MA	3	☐

COMM 2-15 The PUC increased NBC's operating reserve from 1% to 1.5% in the last docket. With regard to Comm 1-41, please clarify whether NBC's operating reserve fund of 1.5% is necessary and how this increase has benefited ratepayers.

An operating reserve fund of (at least) 1.5% is necessary and ideally the operating reserve would be higher. As set forth in NBC's response to Comm. 1-41, the industry norm for wastewater utilities is in the range of 60 to 90 days of operating expenses, which, in the case of NBC, would be in the range of $6.8 to $10.2 million. NBC's existing operating reserve of $252,758 is 1.5% of O&M expense, excluding personnel and debt service expenses. NBC seeks to increase the operating reserve to $613,781, which is still far below the industry norm.

As NBC pointed out in the response to 1-41, most of NBC's costs are fixed and are required to meet permit. For example, one month of bio-solids costs alone is more than $350,000, and this year NBC has seen more than a 10% increase in dry ton production at Field's Point. Another example is electricity which costs approximately $300,000 a month and NBC's rates are net of turbine production which is dependent on wind. It is prudent and benefits ratepayers to have an operating reserve so that NBC can safely and effectively operate its facilities in order to meet the requirements of the RIPDES permit.

In addition, NBC believes that the PUC's increase of NBC's operating reserve from 1.0% to 1.5% (excluding personnel and debt service), was a positive step and beneficial to ratepayers. NBC has been able achieve an AA- credit rating from Standard and Poor's, which has ensured both access to capital markets and lower interest rates, and NBC needs to keep a strong rating. As the PUC knows, NBC is mandated to invest in large capital projects such as the CSO abatement facilities. These capital projects are financed through bonds. As of June 30, 2013, NBC's ratepayers owed more than $547 million and are obligated to bondholders to ensure that facilities are properly operated so that the revenues are generated and bonds are paid. As the PUC recognized in Docket 4364, NBC needs the security of a proper operating reserve to meet unexpected expenses and still satisfy its financial obligations to bondholders, while maintaining quality service to its ratepayers. NBC's customers benefit if NBC has a strong financial position that allows for reduced borrowing costs for projects that benefit all ratepayers.

By: WEE

COMM 2-16 With regard to both the Regulatory Compliance Building and the IM Facility, please describe why these buildings are necessary and what the benefit is to ratepayers.

See page from the CIP below. This project benefits ratepayers because it provides NBC with the facilities and clean room environment required for the proper, timely and accurate analysis of RIPDES permit required samples. Violation of the RIPDES permits can result in significant fines. The new building is also needed for the analysis of plant processes to ensure proper and optimum operation of NBC's facilities as inefficient operation can have adverse impact on treatment and costs. Additional analysis is also required to assess the impact of capital improvements on treatment and receiving waters in light of potentially more stringent discharge permit requirements. In FY 2013, the laboratory was responsible for 111,344 parameter analyses.

By: WEE

11900

NBC Regulatory Compliance Building and Related Upgrades

Photo: An Architect's rendering of the proposed Regulatory Compliance Building

This project is for the design and construction of a Regulatory Compliance Building, which will house the EMDA and Laboratory sections of the NBC. This project will unify NBC's efforts for environmental sampling and related analysis by including the necessary laboratory equipment and monitoring capability required by permit and EPA. This building is proposed to be 36,800 square feet and will be located on Service Road in Providence. This project also includes related site demolition and is currently in the design phase.

Project Overview

Location: Service Road (Providence, RI)
Contractor(s): CDM
Project Manager: Terry Cote, P.E.
Project Priority: A

Total Project Duration/Cost

Project Phase	Actual/Projected Start Date	Actual/Projected Completion Date	Project Duration	Cost (in Thousands)
Planning	September-08	June-09	9 Months	$323
Design	September-10	November-13	39 Months	2,942
Construction	June-13	November-15	29 Months	18,308
Total Project	September-08	November-15	88 Months	$21,573

Projected Expenditures - 11900P

Cost Category	Pre-FY 2014	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	Post FY-2019	Total
Administrative	$ 132	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 132
A/E Professional	191	-	-	-	-	-	-	-	191
Other	-	-	-	-	-	-	-	-	-
Total Project Costs	$ 323	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 323

Projected Expenditures - 11900D

Cost Category	Pre-FY 2014	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	Post FY-2019	Total
Administrative	$ 173	$ 15	$ -	$ -	$ -	$ -	$ -	$ -	$ 188
Land	1,247	-	-	-	-	-	-	-	1,247
A/E Professional	1,333	139	-	-	-	-	-	-	1,472
Other	28	7	-	-	-	-	-	-	35
Total Project Costs	$ 2,781	$ 161	$ -	$ -	$ -	$ -	$ -	$ -	$ 2,942

Projected Expenditures - 11900C

Cost Category	Pre-FY 2014	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	Post FY-2019	Total
Administrative	$ 2	$ 221	$ 335	$ 5	$ -	$ -	$ -	$ -	$ 563
Land	-	-	-	-	-	-	-	-	-
A/E Professional	-	155	220	-	-	-	-	-	375
Construction	-	5,510	9,215	775	-	-	-	-	15,500
Contingency	-	-	1,860	-	-	-	-	-	1,860
Other	-	5	5	-	-	-	-	-	10
Total Project Costs	$ 2	$ 5,891	$ 11,635	$ 780	$ -	$ -	$ -	$ -	$ 18,308

Note: Cash Flow Basis in Thousands

COMM 2-17 With regard to Comm 1-44, please respond to what the benefit to ratepayers is for the 97 vehicles listed in NBC's fleet.

The benefit to ratepayers is that these vehicles enable NBC to operate its facilities, maintain its collection system, manage and inspect its capital improvements, take required samples and service its customers. The list on the following pages identifies the specific vehicles and purpose. In addition, the following is offered: the Exec Van is for the public outreach program (Woon Watershed Explorers education program). The C&G (Construction and Grants) vehicles are for travel to construction sites for inspections and management. The CS (Customer Service) vehicles are for meter readings, customer site visits, water shut-off or lien sale related activities, etc. for NBC's 83,400 accounts in 8 communities. The IM (Interceptor Maintenance) vehicles are for the inspection, cleaning, maintenance and repair of the collection (the 110 miles of interceptors, 63 CSOs and 7 pump stations) system and plowing. The FP (Field's Point) vehicles are used at the Field's Point WWTF and the BP (Bucklin Point) vehicles are used at the Bucklin Point WWTF and the uses are detailed on the spreadsheet. The PT (Pretreatment) and EM (Environmental Monitoring and Data Analysis) vehicles are used to support the pretreatment program and the sampling program both of which are mandated by RIPDES Permits issued to NBC by the RIDEM. The PT vehicles are used for site visits of permitted users, emergency response and other support work as needed. The EMDA vehicles and boat are needed to support the RIPDES monitoring requirements throughout the service area (taking of samples), travel to SIUs and the septage station to satisfy the pretreatment program requirements, and river and bay sampling to support the CSO maintenance program (more than 19,000 samples were taken last year).

By: WEE

DIV	BODY	Purpose
EXEC	SPT UTILITY	Executive Director Emergency response/facility inspections
C&G	VAN	For weekly construction meetings and inspections
Exec	VAN	For Public Outreach Program
C&G	SPT UTILITY	Construction inspections
C&G	SPT UTILITY	Construction inspections
C&G	SPT UTILITY	Construction inspections
CS	SPT UTILITY	For meter readings, site visits, water shut-offs, posting of collection notices, etc.
CS	SPT UTILITY	For meter readings, site visits, water shut-offs, posting of collection notices, etc.
CS	PICKUP	For meter readings, site visits, water shut-offs, posting of collection notices, etc.
CS	SPT UTILITY	For meter readings, site visits, water shut-offs, posting of collection notices, etc.
CS	SPT UTILITY	For meter readings, site visits, water shut-offs, posting of collection notices, etc.
CS	SPT UTILITY	For meter readings, site visits, water shut-offs, posting of collection notices, etc.
IM	PICKUP	Transport staff throughout collection system, transport / trailer equipment to perform repairs
IM	SPT UTILITY	Transport NBC staff and equipment to sites throughout the collection system and attend off site meetings
IM	STETCO	Clean NBC's catch basins, sumps and other buried collections devices. Transport material to landfill
IM	PICKUP	Transport Supervisor throughout collection system to monitor staff and operations, trailer various equipment
IM	SPT UTILITY	Transport NBC staff to sites throughout the collection system and attend off site meetings
IM	16Y DUMP	Transport large material: sand / salt / ashphalt / nets / dirt / etc
IM	STETCO	Clean NBC's catch basins, sumps and other buried collections devices. Transport material to landfill
IM	FLUSHER	To perform flushing needs on NBC pipes and assets
IM	VACTOR	To perform vacuum and flushing needs on NBC pipes and assets
IM	PICKUP	Transport staff and equipment to collection system sites to perform inspections and repairs, trailer various equipment
IM	PICK-UP	Transport staff and equipment to collection system sites; plow and salt NBC property, trailer various equipment
IM	6Y DUMP	Transport materials to/from collection system facilities for inspection and repairs
IM	SKIDLOADER	To move heavy objects: dirt, snow, nets, etc
IM	BACKHOE	To perform underground utility repairs, move large objects, load materials
IM	PICK-UP	Transport staff and equipment to collection system sites; plow and salt NBC property, trailer various equipment
IM	STAKE	Transport staff / heavy equipment throughout collection system, perform plowing and salting of NBC property
IM	CREWCAB	Transport staff and equipment to collection system sites to perform inspections and repairs, trailer various equipment
IM	3YD DUMP	Transport staff and equipment to collection system sites to perform inspections and repairs
IM	VACTOR	To perform vacuum and flushing needs on NBC pipes and assets
IM	TRAILER	To move heavy equipment to sites needing attention
IM	GENERATOR	To provide back up power to various collections facilities
IM	CUES-TV	Specialty trailer that performs tv inspections of butied utilities
IM	DINGO TR.	To move heavy objects, clean CSO facilities and other various heavy materials handling
IM	FLATBED	To transport heavy equipment to collection site repairs
IM	AIR-COMP	To provide compressed air for equipment to perform sewerage repairs

IM	FLAT/BED	To transport heavy equipment/materials for sewerage repairs
ENG	SPT UTILITY	Director of Operations - Emergency response/facility inspections
ENG	PICK-UP	Vehicle used for field work - surveying/ meter maintnenace
FP	VAN	For carrying tools, parts and supplies for preventive maintenance program
FP	VAN	For carrying electrical tools, parts and supplies
FP	VAN	For carrying tools and carpentry supplies
FP	3 YD.DUMP	Used for landscaping debris, trash removal and general clean-up
FP	VAN	For carrying electrical tools, parts and supplies
FP	PICK-UP	Used by Maintenance Supervisors during work inspections
FP	PICK-UP	Used by Operations, shift-to-shift
FP	FRKLFT	Used for heavy lifting by Operations and Maintenance
FP	ROLLOFF	Used for residuals (Grit and Screeings) removals
FP	PICK-UP	Used by Maintenance Mechanics for work at remote locations
FP	PICK-UP	Used by Operations for moving heavy equipment and supplies
FP	PICK-UP	Used by O&M Support Section for personnel transport and pick-ups
FP	PICK-UP	Used by O&M Support and Maintenance for day-to day tasks
FP	STAKE	Used for heavy equipment transport off site
FP	BUCKET	Used by electricians at FP & BP for high mast lighting projects
FP	PICK-UP	Used by Operations, shift-to-shift
FP	VAC.TANK	Used by Operations to remove scum and transport for disposal
FP	VAN	For carrying electronic instruments, tools, parts and supplies
FP	VAN	For carrying electronic instruments, tools, parts and supplies
FP	PICK-UP	For carrying electronic instruments, tools, parts and supplies
FP	CARGOBOX	Houses Emergency Spill containment tools, materials and supplies
FP	PUMPSET	A portable large capacity centrifugal pump for dewatering tanks
FP	Generator	A portable emergency generator to provide power to equipment
FP	WELDER	A portable welder for outside and/or off-site welding work
BP	PICKUP	Used for plowing & heavy equipment transport off site
BP-M	TRACTOR	Used for landscaping/ heavy material+equipment transport/snow removal
BP-M	PICK-UP	Used by Operations for moving heavy equipment and supplies
C&G	SPT UTILITY	Used By BP C&G Staff - Construction Field Inspections MT
BP-T	STAKE	Used for heavy equipment transport off site
C&G	SPT UTILITY	Used By BP C&G Staff - Construction Field Inspections JM
BP-T	VAN	Used for carrying electrical tools, parts and supplies
C&G	SPT UTILITY	Used By BP C&G Staff - Construction Field Inspections
BP-T	PICKUP	Used by BP Ops Staff For On/Off Site Inspections GV
BP-T	PICK-UP	Used by Maintenance Mechanics for work at remote locations
BP-T	VAN	Used for carrying electronic instruments, tools, parts and supplies
BP-M	PICK-UP	Used by Operations, shift-to-shift

BP-M	PUMPSET	Portable large capacity centrifugal pump for dewatering tanks
BP-M	ELECTRICAL	For carrying electrical tools, parts, supplies & portable equipment
PT	SPT UTILITY	Pretreatment Vehicle for site visits benefiting ratepayers by avoiding costly fines
PT	SPT UTILITY	Pretreatment Vehicle for site visits benefiting ratepayers by avoiding costly fines
PT	SPT UTILITY	Pretreatment Vehicle for site visits benefiting ratepayers by avoiding costly fines
PT	SPT UTILITY	Pretreatment Vehicle for site visits benefiting ratepayers by avoiding costly fines
PT	SPT UTILITY	Pretreatment Vehicle for site visits benefiting ratepayers by avoiding costly fines
PT	SPT UTILITY	Pretreatment Vehicle for site visits benefiting ratepayers by avoiding costly fines
PT	UTILITY	Pretreatment Vehicle for site visits benefiting ratepayers by avoiding costly fines
EM	VAN	Sampling vehicle, benefiting ratepayers by avoiding costly fines
EM	VAN	Sampling vehicle, benefiting ratepayers by avoiding costly fines
EM	VAN	Sampling vehicle, benefiting ratepayers by avoiding costly fines
EM	VAN	Sampling vehicle, benefiting ratepayers by avoiding costly fines
EM	23' BOAT	Sampling vehicle, benefiting ratepayers by avoiding costly fines
EM	INFL.BOAT	Sampling vehicle, benefiting ratepayers by avoiding costly fines
EM	SPT UTILITY	Sampling vehicle, benefiting ratepayers by avoiding costly fines
EM	VAN	Sampling vehicle, benefiting ratepayers by avoiding costly fines
EM	VAN	Sampling vehicle, benefiting ratepayers by avoiding costly fines
EM	VAN	Sampling vehicle, benefiting ratepayers by avoiding costly fines
EM	BOAT-TRL	Sampling vehicle, benefiting ratepayers by avoiding costly fines
EM	23' BOAT-TRL	Sampling vehicle, benefiting ratepayers by avoiding costly fines

COMM 2-18 What was the total amount of Wellness credits paid to employees during the last 3 years. Since the inception of the wellness program, have employee absences reduced?

Wellness Credit Participation

Fiscal Year	Max Wellness Credit per Participant	Total Participation	Total Wellness Credits Paid
2012	$300	156	$25,500
2013	400	180	54,600
2014*	500	190	61,850

*year to date

NBC has not conducted a study to determine if employee absences reduced.

By: WEE

COMM 2-19 What were the uncollectibles for the past 3 years? Please describe NBC's collection efforts with regard to unpaid balances.

FY 2011	954.67
FY 2012	174,331.57
FY 2013	55,740.55

NBC uses phone calls, late notices, water shut-off and lien sale to collect unpaid balances. Customer Service performs monthly checks on accounts with outstanding balances. The Collections Supervisor will call all accounts with a balance of over $5,000. Accounts with a balance over $1,000 over 60 days past due are called by Customer Service Representatives. All accounts with a past due balance greater than 120 days are called. Accounts selected for water-shut off have a balance of over $500 over 90 days. These accounts will also receive a collection call prior to receiving shut-off letter. The criterion for selecting accounts for lien sale is accounts with an over 90 day balance greater than $700. These accounts may also be either inactive, already shutoff, or cannot have the water shutoff.

By: WEE

COMM 2-20 Please address NBC's efforts to reduce overtime expenses.

Please see response to COMM 2-6.

By: WEE