PHILADELPHIA WATER DEPARTMENT
STATEMENT NO. 3

BEFORE THE
PHILADELPHIA WATER, SEWER AND STORM WATER RATE BOARD

In the Matter of the Philadelphia Water Department's Proposed Change in Water, Wastewater and Stormwater Rates and Related Charges	Fiscal Years 2022 - 2023

Direct Testimony

of

Stephen J. Furtek and Trisha Grace

on behalf of

The Philadelphia Water Department

Dated: January 2021

TABLE OF CONTENTS

I. INTRODUCTION AND PURPOSE OF TESTIMONY

Q1. PLEASE STATE YOUR NAMES AND POSITIONS WITH THE PHILADELPHIA WATER DEPARTMENT.

A1. My name is Stephen J. Furtek. I am the General Manager of the Engineering and Construction Division at the Philadelphia Water Department (the "Department" or "PWD"). Also testifying is Trisha Grace who is the Projects Control Manager for the Department's Capital Program.

Q2. WOULD EACH OF YOU PLEASE DESCRIBE YOUR JOB RESPONSIBILITIES, EXPERIENCE AND EDUCATIONAL BACKGROUND.

A2. Mr. Furtek

I am responsible for managing the Engineering & Construction Division which is charged with the implementation of the Water Department's Capital Improvement Program, generation and maintenance of as-built drawings, and provision of engineering support to the Department at large. Duties for the Engineering & Construction Division also include administration of One Call mark outs, private development review, maintaining the Department's Geographic Information System (GIS), and Act 537 management.

I hold a Bachelor of Science degree in Civil and Urban Engineering from the University of Pennsylvania and am a registered Professional Engineer licensed in Pennsylvania. I was appointed as General Manager of Planning and Engineering (now the Engineering and Construction Division) in March 2005. Since joining the Department in 1982, I have held several positions with increasing responsibility, including Supervisor of the Water and Sewer Design Section, Manager of the Design Branch and my current position. A

more detailed overview of my relevant work experience is set forth in my attached resume which is marked as Schedule SJF-1.

Ms. Grace

I am responsible for the implementation of the Water Department's Capital Improvement Program, supervising the public works construction contracting and payment processing systems.

I hold a Bachelor of Science degree in Civil Engineering from Drexel University. I started employment with the City of Philadelphia in September 1996 as an entry level civil engineer after working in private industry for a national environmental engineering firm. During my time with the City, I have worked in 3 different operating departments within the City as an engineer with increasing responsibility that lead to my current position as the Capital Program Manager. A more detailed overview of my relevant work experience is set forth in my attached resume which is marked as Schedule TG-1.

Q3. PLEASE IDENTIFY THE SCHEDULES ATTACHED TO YOUR TESTIMONY.

A3. The following schedules accompany this testimony.

Schedule SJF-1	Resume of Stephen J. Furtek
Schedule SJF-2	Capital Program and Budget Process
Schedule TG-1	Resume of Trisha Grace

Q4. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A4. The purpose of our testimony is to describe: (i) the City's Capital Program and Capital Budget Process; (ii) the Department's current and projected Capital Improvement

Programs; and, (iii) COVID-19 impacts on the Capital Program; and (iv) Rate relief needed to support the Capital Program.

II. THE CITY'S CAPITAL PROGRAM AND CAPITAL BUDGET PROCESS

Q5. PLEASE DESCRIBE THE HOME RULE CHARTER REQUIREMENTS RELATED TO THE CITY'S CAPITAL PROGRAM AND CAPITAL BUDGET.

A5. The Philadelphia Home Rule Charter requires that prior to the passage of the annual operating budget ordinance, Philadelphia City Council ("City Council") must adopt a capital program and capital budget. The capital program must show planned capital expenditures to be financed from funds subject to control and appropriation by City Council for each of the six ensuing fiscal years. The capital budget ordinance must show the planned capital expenditures to be financed from funds subject to control or appropriation by City Council during the ensuing fiscal year.

Q6. HOW IS THE CITY'S CAPITAL PROGRAM AND CAPITAL BUDGET DEVELOPED AND APPROVED?

A6. The process for developing and approving the Capital Program and Capital Budget is described in Appendix I of the City's FY 2021-2026 Capital Program Book, a copy of which is attached to our testimony as Schedule SJF-2.

III. PWD'S CAPITAL IMPROVEMENT PROGRAM

Q7. PLEASE DESCRIBE THE DEPARTMENT'S CURRENT CAPITAL BUDGET FOR FISCAL YEAR 2021 AND THE PROPOSED CAPITAL BUDGET FOR

FISCAL YEAR 2022. PLEASE ALSO EXPLAIN THE KEY DIFFERENCE BETWEEN THEM.

A7. PWD's FY 2021 Capital Budget, as currently adopted by City Council, includes approximately $611 million as summarized below.

Table 1
Approved Capital Budget FY 2021

Improvements to Water and Wastewater Treatment Facilities	$ 328,000,000
Wastewater Collector System/CSO/Flood Relief	159,460,000
Water Conveyance System (new and reconstruction)	98,060,000
Engineering, Administration & Material Support	25,865,000
TOTAL	$ 611,385,000

The total amount shown is the amount appropriated by City Council during that fiscal year. The amount of the appropriation for capital projects does not always match the actual amount encumbered on capital projects in any given fiscal year. Any appropriated funds not encumbered in that year is carried-forward and may be encumbered in the next fiscal year.

PWD's Proposed FY 2022 Capital Budget includes approximately $379 million as summarized below.

Table 2
Proposed Capital Budget FY 2022

Improvements to Water and Wastewater Treatment Facilities	$ 250,550,000
Wastewater Collector System/CSO/Flood Relief	65,260,000
Water Conveyance System (new and reconstruction)	35,760,000
Engineering, Administration & Material Support	27,319,000
TOTAL	$ 378,889,000

Again, that total amount shown is the amount of the appropriation that the Department will be seeking in the upcoming process for FY 2022.

The proposed FY 2022 capital budget of $378.9 million is $232.5 million less than the FY 2021 due to the decrease in bidding projects in FY 2021 due to the pandemic. So, the difference in the total appropriations acknowledges the resulting carry-forward (from FY 2021 to FY 2022) of unused approved FY 2021 capital budget appropriation. With the carried-forward appropriations, the Department anticipates encumbered costs of approximately $611 million for capital projects in FY 2022.

Q8. PLEASE DESCRIBE THE DEPARTMENT'S PROPOSED CAPITAL BUDGET FOR FY 2023.

A8. PWD's Proposed FY 2023 Capital Budget includes approximately $603 million as summarized below.

Table 3
Proposed Capital Budget FY 2023

Improvements to Water and Wastewater Treatment Facilities	$ 309,300,000
Wastewater Collector System/CSO/Flood Relief	155,360,000
Water Conveyance System (new and reconstruction)	111,760,000
Engineering, Administration & Material Support	27,319,000
TOTAL	$ 603,739,000

That amount shown is the amount of the appropriation that the Department anticipates seeking in the upcoming process for FY 2023. It does not include any carry-forward appropriated funds. The Department anticipates encumbered costs of approximately $603 million for capital projects in FY 2023.

Q9. HAS THE DEPARTMENT PREPARED A PROPOSED CAPITAL IMPROVEMENT PROGRAM FOR FISCAL YEARS 2022 THROUGH 2027?

A9. Yes, the Department has prepared a proposed Capital Improvement Program for FY 2022 through 2027, which will be presented to City Council for approval in March of 2021. Currently projected expenditures for the Capital Improvement Program for FY 2022 through FY 2027 are summarized below.

Table 4
Proposed Capital Improvement Program (FY 2022-2027)

Improvements to Water and Wastewater Treatment Facilities	$ 1,687,350,000
Wastewater Collector System/CSO/Flood Relief	966,060,000
Water Conveyance System (new and reconstruction)	681,060,000
Engineering, Administration & Material Support	163,914,000
TOTAL	$ 3,498,384,000

The Department's Operations Division identified critical projects and maintenance activities for the Rate Period, FY 2022 and FY 2023, as explained in PWD Statement 4. The projected encumbered costs are approximately $600 million for each year in the Rate Period, as I already explained. Those amounts are included within the above-described Capital Improvement Program for FY 2022 through FY 2027.

Q10. PLEASE DESCRIBE THE LARGEST INITIATIVES INCLUDED IN THE PROPOSED CAPITAL IMPROVEMENT PROGRAM FOR FISCAL YEARS 2022 THROUGH 2027.

A10. The largest initiatives in the Capital Improvement Program include: (i) the Green City, Clean Waters Program; (ii) the Drinking Water Master Plan; and (iii) the Renewal and Replacement of Other Older Infrastructure, all of which are discussed below.

The Green City, Clean Waters Program

The Green City, Clean Waters Program (alternatively referred to as the Long Term Control Plan – "LTCP") is the largest initiative being undertaken by the Department in its capital program. The LTCP will require significant capital expenditures beyond the FY 2022-2027 period referenced above. Specifically, the LTCP addresses combined sewer overflows through large scale City-wide implementation of green stormwater management infrastructure along with installation of "grey" infrastructure improvements (storage and treatment plant capacity increases). This approach focuses on controlling pollution at its source and improving water quality by restoring the natural hydrologic cycle in the urban environment and is consistent with current United States Environmental Protection Agency policy for addressing wet weather impacts. LTCP expenditures in the proposed FY 2022-2027 Capital Improvement Program total $804 million, which represents 23% of the Capital Improvement Program for the period FY 2022-2027.

Drinking Water Master Plan

Another large initiative in the Capital Improvement Program involves the Drinking Water Master Plan. This 25-year plan provides a comprehensive roadmap for the Department to

upgrade critical facilities and to continue providing safe and reliable drinking water to Philadelphia residents now and in the future. In devising the plan, the Department set goals for a resilient and dependable drinking water system. After establishing these goals, the Department conducted a detailed evaluation of existing water treatment, pumping, and storage facilities to document their current condition and identify repair, replacement, or improvement needs. The Department also considered other planning drivers including water demand projections, water quality regulations, and environmental factors. PWD developed and evaluated a wide range of alternatives before identifying approximately 400 projects to be completed over the next 25 years at a cost of $2.5 billion. The projects focus on the rehabilitation of existing facilities, the complete reconstruction of several existing facilities, and the construction of several new facilities. The implementation of these projects will result in an increase in capital costs compared to historical levels. In sequencing and developing a schedule for specific projects, PWD took into consideration its other planned infrastructure improvements to avoid significant capital needs from occurring at the same time.

Water Master Plan projects that are scheduled to be constructed during FY 2022 and 2023 include: (i) the final phase of the replacement of the current clear well basin at the Baxter Water Treatment plant at an estimated cost of $110 million; (ii) the rehabilitation of the Torresdale Finished Water Pump Station to update aging critical infrastructure and enhance redundancy at an estimated cost of $80 million; and (iii) improvements in transmission piping adjacent to the Somerton water storage tank to enhance long-term regulatory compliance and water quality at an estimated cost of $4.0 million. The Water Master Plan also includes many other projects that are beyond the timeline of the Capital Improvement Program.

Replacement and Renewal of Other Aging Infrastructure

The Department also continues to invest in its water distribution and wastewater collector systems by replacing aging infrastructure to ensure reliability of service. Flood relief projects in flood prone neighborhoods also are included as part of its Capital Improvement Program for collector systems.

Water Projects

Q11. PEASE DESCRIBE THE KEY WATER TREATMENT PLANT AND WATER FACILITY UPGRADES THAT ARE INCLUDED IN THE PROPOSED CAPITAL IMPROVEMENT PROGRAM FOR FISCAL YEARS 2022 THROUGH 2027.

A11. Following are a few highlighted Water Treatment Plant and Water Facility Projects for FY 2022 through 2027:

- Construction of two 5-million gallon Clear Well Basins at the Baxter Water Treatment Plant ($110 million)
- Clear Well Roof Replacement at the Queen Lane Water Treatment Plant ($22.5 million)
- Air/Water Surface Wash System Betterment at the Baxter Water Treatment Plant ($9 million)
- Raw Water Basin Outlet Gates Addition at the Baxter Water Treatment Facility ($8 million)

Q12. WHY ARE PLANT UPGRADES IMPORTANT DURING THE RATE PERIOD, FY 2022 and FY 2023?

A12. Plant upgrades are required to keep up with plant degradation due to aging infrastructure. These upgrades are needed to meet regulatory compliance and provide reliable service to our customers, as further explained in PWD Statement 4.

Q13. PLEASE DESCRIBE THE LEVEL OF WATER MAIN REPLACEMENT THAT IS INCLUDED IN THE PROPOSED CAPITAL IMPROVEMENT PROGRAM FOR FISCAL YEARS 2022 THROUGH 2027.

A13. The Department has embarked on a program of accelerated main replacement which will significantly exceed historic main replacement. Over the last 25 years, PWD has replaced, on average, 19 miles of water mains annually. This level of main replacement has increased in the recent past based on a revised goal of replacing 36 miles of main in FY 2021. This is reflected in an increase in budget for water main replacements from approximately $88 million in FY 2020 to $93 million in FY 2021. The Department plans to fund an additional increase of two miles of water main replacement per year with the goal of reaching 42 miles of water main replacement annually by FY 2024. This will require an increase in the capital budget for water main replacement to approximately $98 million in FY 2022 and $103 million in FY 2023.

Q14. WHY IS THAT THE LEVEL OF WATER MAIN REPLACEMENT NECESSARY IN THE RATE PERIOD?

A14. The Water Department assesses its water main break rate against the optimal level of 15 breaks per 100 miles/year as defined by the Distribution System Optimization Program under the American Waterworks Association Partnership for Safe Water. Currently the Water Department's five-year average breaks per 100 miles is 25.7 per year. In order to decrease the water main break rate, keep up with an aging water system, and increase system reliability, the Water Department has determined that an increase in water main replacement is warranted.

Wastewater Projects

Q15. PLEASE DESCRIBE THE KEY WATER POLLUTION CONTROL PLANT AND WASTEWATER FACILITY IMPROVEMENTS THAT ARE INCLUDED IN THE PROPOSED CAPITAL IMPROVEMENT PROGRAM FOR FISCAL YEARS 2022 THROUGH 2027.

A15. Following are a few highlighted Water Pollution Control Plant and Wastewater Facility Projects for FY 2022 thorough 2027:

- New Preliminary Treatment Building at the Northeast Water Pollution Control Plant ($80 million)
- New Side Stream Treatment Process at the Southwest Pollution Control Plant ($50 million)
- Final Sedimentation Tank Betterment at the Southwest Pollution Control Plant ($35 million)
- Replacement of Aeration Tank Mixers at the Southwest Pollution Control Plant ($17 million)

Q16. PLEASE DESCRIBE THE LEVEL OF SEWER REPLACEMENT AND REHABILITATION IN THE PROPOSED CAPITAL IMPROVEMENT PROGRAM FOR FISCAL YEARS 2022 THROUGH 2027.

A16. Over the last 25 years, the Department has reconstructed and/or rehabilitated, on average, approximately 8 miles of sewer annually. The Department's Capital Renewal Program currently reconstructs or relines from six to ten miles of sewers per year based on results of its Sewer Infrastructure Assessment Program and other condition reports. Some sewers are scheduled for reconstruction as a result of programmed water main replacement and the need to update infrastructure concurrently. As infrastructure is studied further, it is likely that annual sewer renewal will increase. The capital budget for sewer replacement and/or rehabilitation was $35 million in FY 2018, $40 million in FY 2019 and $57

million in FY 2020 and 2021. Annual budget expenditures for this purpose are projected to remain constant at $57 million in FY 2022 and FY 2023.

Q17. WHY IS THAT LEVEL OF SEWER REPLACEMENT AND REHABILITATION NECESSARY IN THE RATE PERIOD, FY 2022 AND FY 2023?

A17. This level of sewer replacement is required to keep up with an aging wastewater system and system degradation in order to maintain system reliability.

IV. COVID-19 IMPACTS ON CAPITAL PROJECTS

Q18. HAS THE CAPITAL PROGRAM BEEN DELAYED BY THE PANDEMIC? PLEASE EXPLAIN HOW THE PANDEMIC HAS IMPACTED FY 2021 CAPITAL PROGRAM.

A18. Yes. The non-life sustaining business closure orders from Governor Wolf impacted the Department's ability to continue work on non-emergency field construction activities that were in progress. The Department was able to resume that work as of May 1. Beyond the projects that were already bid and underway, the pandemic forced the Department to prioritize remaining projects planned for FY 2021 and only bid those projects deemed critical in order to utilize the limited amount of capital funds in the most prudent manner. Prioritization was done by the Operations Division, as explained in PWD Statement 4. That prioritization caused less critical projects that were planned for FY 2021 to be delayed beyond FY 2021. But, those projects cannot be delayed indefinitely, since the circumstances that necessitate those capital projects in the first place have not changed.

Q19. ARE ANY ADJUSTMENTS IN THE CONSTRUCTION SCHEDULE NEEDED TO CATCH UP? PLEASE EXPLAIN.

A19. Yes. The Department, in essence, is sliding the program back one year for all those projects that were not bid in FY 2021.

Q20. HOW WILL THIS IMPACT BIDDING OF CAPITAL PROJECTS IN FY 2022 AND 2023?

A20. The Department believes that in FY 2022, with new rates in place to support new bond issuance to fund the capital program, the program will resume to normal levels.

V. RATE RELIEF NEEDED TO SUPPORT CAPITAL PROGRAM

Q21. WHY IS THIS LEVEL OF CAPITAL IMPROVEMENT PROGRAM NECESSARY IN THE RATE PERIOD, FY 2022 AND FY 2023?

A21. This level of capital investment throughout the projected period is required to address replacement of aging infrastructure, meeting regulatory requirements and to maintain reliable service to our customers. Absent relief, the Department's ability to fund this level of capital investment would be limited. This would jeopardize the Department's ability to appropriately invest in infrastructure improvements related to water and wastewater treatment plant upgrades, clean water storage tanks, pumping stations, and water main and sewer replacements, as necessary to maintain system reliability and customer service levels.

Q22. PLEASE EXPLAIN HOW PWD PLANS TO FUND THE PROPOSED CAPITAL IMPROVEMENT PROGRAM FOR THE RATE PERIOD.

A22. PWD expects most of such funding to be in the form of new borrowing financed through revenue bonds. PWD Statement 2 (Direct Testimony of Melissa LaBuda) addresses this issue in greater detail.

Q23. PLEASE EXPLAIN HOW THE ABOVE CAPITAL PROGRAM BUDGET RELATES TO THE PENDING RATE CASE.

A23. The proposed rates will support the Capital Improvement Program in FY 2022 and FY 2023. As mentioned above, a significant portion of the costs of the Capital Improvement Program for these years will be funded with the proceeds of debt. Debt service requirements and contributions from current revenues are integral components of the revenue requirements for the Rate Period.

VI. CONCLUSION

Q24. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A24. Yes, it does.

Schedule SJF-1

Stephen J. Furtek, P.E.

Education: **B.S. degree, Civil & Urban Engineering, University of Pennsylvania (1978-82)**

Experience: **Philadelphia Water Department (August 1982 – present)**

3/2005 to Present **General Manager of the Engineering & Construction Division**

Responsible for the administration and management of the Engineering & Construction Division of the Water Department. The Engineering & Construction Division is responsible for the implementation of the Department's capital program. The division is comprised of the following units:

- Design Branch – Responsible for providing in-house design services, as well as managing outsourced design services, for the capital program. In addition, Design provides technical support to the Department at large regarding water and wastewater issues.
- Construction Branch: - Construction Branch is responsible for administration and construction inspection of all capital program projects, including surveying and generation of as-built drawings.
- Projects Control Section – The Projects Control Section is responsible for developing, maintaining, and tracking the capital improvement program. This section is charged with maintaining the Department's as-built drawings & system maps as well as developing, implementing, and maintaining the Department's Geographic Information System (GIS). This Section is also home to the One-Call Unit, which is responsible for implementing the State's requirement that buried infrastructure, be field marked prior to excavation.

10/1996 to 2/2005 **Manager of Design Branch**

Responsible for managing a multidiscipline design-engineering unit for the Water Department consisting of architectural, civil, structural, electrical, and mechanical personnel. This unit is responsible for the design of the Water Department's capital program, including the generation of biddable plans and specifications.
In addition, this unit is responsible for managing numerous professional engineering services contracts. These firms provide engineering services to supplement the Water Department's in-house staff in designing the annual capital program.

1/1988 to 10/1996 **Engineering Supervisor, Water & Sewer Section, Design Branch**

Supervised a group of design engineers and drafting technicians. Responsible for the oversight of the preparation of contract plans and specifications for the Water Department's water main relay and sewer reconstruction capital program, using both in-house staff and engineering consulting firms.

8/1982 to 1/1988 **Civil Engineer, Structural Section, Design Branch**

Prepared contract plans and specifications and performed structural design as required to support various construction and/or rehabilitation projects of Water Department facilities.

Licensure: **Registered Professional Engineer in the Commonwealth of Pennsylvania.**

APPENDIX I

Capital Program and Budget Process

Spending and activity on the Capital Budget is managed throughout the fiscal year, but the annual planning and preparation for the proposed Capital Program and Budget begins in the fall.

By the beginning of October, the 'Budget Call' goes out to all departments eligible to request funds in the upcoming capital program and budget. The Budget Call provides instructions to enable departments to begin entering requests into the budget system. It also provides guidelines to ensure that requests are complete and are aligned with City policies.

Starting in November, the staffs of the City Planning Commission and the Budget Office host departmental meetings to review capital needs and new requests.

Following the departmental meetings, staff continues to work with departments to refine information about the prioritization of needs, resources, and implementation capacity.

From December through February, information is compiled to generate a working, overall list of requests and requested amounts. This list goes through several iterations, as new information is developed in discussions with departments and is aligned with Administration priorities.

In January, the Budget Office prepares 'carry forward' (CT) funding information and works with the Treasurer's Office to determine the General Obligation (CN) debt capacity for the Capital Budget.

In February, the Budget Office finalizes 'carry forward' (CT) funding amounts and works with the staff of the City Planning Commission to prepare draft recommendations for review by the Mayor.

At least one hundred and twenty days before the end of the fiscal year, the City Planning Commission submits to the Mayor a Recommended six-year Capital Program and Capital Budget. The Budget Office, working with the Law Department, prepares the required ordinances for submission.

In early March, the Mayor delivers to City Council the proposed Operating Budget, Five Year Financial Plan, and Capital Program and Budget.

As part of City Council budget hearings, a specific hearing is held on the proposed Capital Program and Budget. Capital needs and proposed spending are also addressed in City Council budget hearings with each department. After the Capital Program and Budget is introduced, a separate bond authorization ordinance is introduced a few weeks prior to passage (if authorization is needed based off the debt capacity of the City). This ordinance allows the City to place a question on the election ballot that asks the general public for permission to issue bonds for the Capital Budget. The ballot question is organized into five infrastructure categories: transit, streets and sanitation, municipal buildings, recreation, parks, museums and stadia, and economic and community development.

Through May and June, modifications are made to produce a final six-year Capital Program and Capital Budget for adoption by City Council.

Schedule TG-1

Trisha M. Grace

Education: **B.S. degree, Civil Engineering, Drexel University (1989-94)**

Experience:

06/2015 to Present **Water Engineering Projects Manager, Water Department**
Responsible for formulation and implementation of the department's capital improvement program and budget. Supervision of the public works construction contracting process and payment processing system.

06/2014 to 06/2015 **Water Engineering Projects Assistant Manager, Water Department**
Responsible for bid specification and plan review for constructability and procurement of said projects. Coordinated with other Departments regarding procurement issues, funding, right-of-way agreements. OEO participation and project work.

01/2008 to 06/2014 **Design and Construction Project Manager, Water Department**
Responsible for bid specification and plan review for constructability and procurement of said projects. Coordinated with other Departments regarding procurement issues, funding, right-of-way agreements. OEO participation and project work.

02/2006 to 01/2008 **Design and Construction Project Manager, Philadelphia International Airport**
Responsible for design, procurement and construction phase of airfield rehabilitation and building improvement projects. Supervised technical staff of engineers and inspectors. Managed contractor and consultant contracts.

06/2000 to 02/2006 **Construction Engineer 1, Water Department**
Resident construction engineer at the Southeast WPCP administering various public works construction projects. Supervised technical staff of 3. Provided computer support for office and field staff.

03/1998 to 06/2000 **Engineering Specialist, Water Department**
Managed energy efficient lighting project at various Water Dept. sites. Assisted in the design coordination and review of public works projects. Provided tech support for office and field staff. Developed and managed several Access databases for tracking of construction projects and estimates.

09/1996 to 03/1999 **Civil Engineer, Streets Department**
Responsible for design of various site improvement and maintenance projects for the Sanitation Engineering Unit, supervised vendors and contractors, coordinated hazardous waste removal contractor.

08/1994 to 09/1996 **Staff Engineer, Harding Lawson Associates**
Construction supervisor at superfund remediation site in Central NJ, assisted in producing cost estimates for successful environmental remediation projects, responsible for O&M of pump and treatment remediation systems as well as monthly sampling & reporting.