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BY THE COMPTROLLER GENERAL

Report To The Congress

OF THE UNITED STATES

Environmental, Economic, And Political Issues Impede Potomac River Cleanup Efforts

Washington, D.C., metropolitan communities are experiencing almost insurmountable problems in their cooperative efforts to clean the Potomac River. Environmental, economic, and political issues have frustrated area attempts to develop and implement cost-effective regional solutions to meet Potomac River environmental mandates.

GAO believes the D.C. area's difficulties and similar problems identified in previous reviews illustrate the need for

--Congress to retain and reemphasize legislative requirements for regional planning and program implementation;

--legislative changes providing greater emphasis on cost benefit approaches to funding advanced waste water treatment; and

--EPA to assess the standards, goals, and requirements of each environmental program in a more integrated way, rather than focusing on single land, air, or water programs.

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COMPTROLLER GENERAL OF THE UNITED STATES
WASHINGTON D.C. 20548

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To the President of the Senate and the
Speaker of the House of Representatives

This report discusses the difficulties State and local governments and the Environmental Protection Agency have experienced over the past decade in implementing water quality programs in the Washington, D.C., metropolitan area.

We performed the case study to ascertain why local governments are experiencing problems implementing water quality programs. The information contained in this report should be useful to the Congress, the Environmental Protection Agency, and State and local governments in considering methods to more effectively plan and implement water quality programs.

Copies of the report will be forwarded to appropriate House and Senate committees; the Director, Office of Management and Budget; the Administrator, Environmental Protection Agency; the Governors of the States of Maryland and Virginia; the Mayor of the District of Columbia; and the County Executives of Prince George's, Montgomery, and Fairfax Counties.

Charles A. Bowsher

Comptroller General
of the United States

D I G E S T

Washington, D.C., metropolitan communities, working cooperatively for over 10 years to clean the Potomac River, have been unable to site needed regional waste water treatment facilities and to develop permanent sites for disposal of residues or sludge produced by advanced waste water treatment processes. (See pp. 1 to 22.)

GAO selected the D.C. area for a case study concerning federally mandated water quality programs for two reasons: (1) it has been considered a model for the national water pollution control program, and (2) with the help of Federal funding, it had obligated over $1 billion to water quality programs in the 1970's. GAO did not attempt to assure that the D.C. area was representative of the Nation's metropolitan areas. However, GAO believes many of the problems identified in this report are similar to those occurring in many other areas because they result from governmental structures and processes which are common throughout the Nation, to regulations that apply nationwide, and to basic environmental issues unrelated to geography. (See pp. 5 to 6.)

In spite of large expenditures and diligent efforts by State and local governments and the Environmental Protection Agency (EPA), the D.C. area has not met its Potomac River water quality standards. Furthermore, the progress which has been made has cost much more than necessary and achieved much less than desired. D.C. area governments, with partial Federal funding, spent $128.3 million to plan, design, and/or construct facilities which were either not built, not needed, or are minimally used or to prepare plans that failed to produce recommendations acceptable to the area governments and EPA. Additionally, the Blue Plains waste water treatment plant is overloaded and will have considerable difficulty achieving its pollution control requirements. Blue Plains is the area's major facility and it will cost $724 million if completed as designed. (See pp. 19 to 20; 45 to 56; 57 to 65; and p. 86.)

The experiences of the past 10 years or so have brought new concerns and problems which were not readily apparent or anticipated when area governments and the Federal Government originally established standards for cleaning the Potomac.

--The program has been much more costly than originally expected and current Federal, State, and local fiscal constraints raise significant concerns regarding the affordability of the water quality standards. (See pp. 45 to 56 and 73 to 80.)

--Meeting the standards creates a new environmental problem--sludge disposal--which has not yet been satisfactorily resolved. (See pp. 65 to 72 and 94 to 99.)

--The need for the rigorous water quality standards which form the basis for existing programs is as yet unproven and the public benefits to be derived by additional investment to meet the standards are not apparent. (See pp. 73 to 85.)

GAO's review of the D.C. area along with its prior reports argues for substantive changes in the planning and siting of waste water treatment and residues management facilities. The D.C. area is further along in its compliance with federally legislated water quality goals than many other metropolitan areas, thus its difficulties, and the problems it still must overcome, will probably be encountered by other metropolitan areas throughout the Nation.

There is no single solution to the problems local jurisdictions face in complying with environmental mandates, particularly in safely disposing of sludge and other residues. There is generally strong public opposition to the siting of disposal sites, as well as waste water treatment facilities, in any locality. Clearly, changes are needed to allow for thorough public review of the relative risks and benefits of potential and proposed waste water treatment and residues management facilities, but these changes must also recognize the national, State, and local needs for environmentally safe, cost-effective facilities and sites. (See pp. 23 to 44.)

The Federal Water Pollution Control Act provides for a regional approach to water quality planning which GAO believes is desirable, given the enormous costs of water pollution control programs and the impact that siting of waste water treatment plants and residues management facilities has on the program's economic and environmental effectiveness. Implementing a regional approach, however, is extremely difficult because it runs counter to the way local governments

traditionally operate. Local jurisdictions protect their interests by structuring the planning and program implementation mechanisms to preserve their individual prerogatives. (See pp. 23 to 34.)

If regional planning and program implementation is ever to be successful, GAO believes some local prerogatives must be sacrificed and effective organizations for planning and implementing regional solutions must be created. Such organizations, of course, must have maximum input from the local jurisdictions' elected officials and the public at large, but, just as importantly, must also have the responsibility and authority to make a decision on what needs to be done and to implement it. (See p. 104.)

Furthermore, Federal, State, and local environmental agencies must consider their decisions on a comprehensive basis, by assessing the tradeoffs among the various programs and the impacts on the air, water, and land. Strategies for meeting objectives in one program, such as cleaner water, should be developed without unacceptably diminishing the quality of the land and air.

To meet their clean water mandates, local jurisdictions must produce and dispose of large quantities of sludge which in itself poses potential public health risks. Waste water treatment levels have improved dramatically, but the options available to local governments for sludge disposal have decreased as Federal laws and regulations controlling land disposal practices and incineration have become more rigorous and ocean disposal has been prohibited by Federal regulations. This poses an obvious and very serious question: are the benefits of high levels of waste water treatment worth the public health risks created by current sludge disposal practices? The National Academy of Sciences maintains that the benefits of cleaning our Nation's rivers cannot be assessed without first answering that question. (See pp. 94 to 99.)

Presently, local governments must overcome severe public opposition in siting almost any treatment or disposal facility and must also deal with complex regulations which greatly restrict their options. These double burdens make any project highly uncertain, even if shown to be feasible, cost-effective, and environmentally acceptable.

More importantly, however, this set of circumstances often forces local governments to implement costly interim programs without the benefits of comparative cost-effectiveness or environmental analyses. (See pp. 38 to 43.)

More permanent solutions are difficult to adopt because there are still major uncertainties regarding the benefits of current rigorous effluent requirements and the risks of sludge disposal programs. Local jurisdictions, given these uncertainties, are understandably hesitant to commit large sums of money to projects that may not be worth the costs or that may result in significant adverse environmental impacts. (See p. 104.)

The current legislation gives EPA little flexibility to consider costs once States have established water quality standards and those standards have been approved. GAO believes that EPA and State and local governments must give greater consideration to economic factors, such as costs, in comparison to the benefits which might be achieved in adopting or approving water quality programs. (See pp. 101 to 105.)

RECOMMENDATIONS

GAO has identified recommendations and alternatives which, if implemented at the Federal, State, and local levels, would make for more effective and economical compliance with environmental mandates. The major recommendations are summarized below and discussed in more detail in chapter 8.

RECOMMENDATIONS TO THE CONGRESS

The Congress should:

--In considering its reauthorization, retain the Federal Water Pollution Control Act's regional planning requirements. The Congress should also reemphasize that EPA require, as necessary, the establishment of regional planning organizations with authority to implement plans for metropolitan areas with existing water quality problems as a prerequisite for them to obtain Federal water quality project grants. Because of the difficulty of establishing such regional organizations, GAO has provided two additional alternatives which could also make planning more effective:

(1) requiring EPA to become a more active participant in the planning, or (2) eliminating the act's regional planning requirements and allowing EPA to assess projects on a case-by-case basis. (See pp. 105 to 106.)

--Place more emphasis on a cost benefit approach to funding advanced waste water treatment. GAO presents several ways to amend the act to increase EPA's flexibility to consider costs more closely. (See pp. 106 to 107.)

RECOMMENDATIONS TO THE ADMINISTRATOR, EPA

In addition to other recommendations that it makes in chapter 8, GAO recommends that the Administrator, EPA:

--Ascertain how the agency can manage its programs in a more integrated manner and make recommendations to the Congress on what, if any, legislative changes may be required. (See p. 108.)

--Fund no new planning efforts in metropolitan areas where regional approaches are needed until State and local governments develop the institutional mechanisms to assure thorough assessments of alternatives and implementation of resulting recommendations. (See p. 108.)

--Approve no treatment plant upgrading or expansion without first having an approved program for disposing of the resulting increased sludge volumes. (See p. 109.)

AGENCY AND STATE AND LOCAL GOVERNMENTS COMMENTS AND GAO'S EVALUATION

GAO received comments from EPA, State, local and regional agencies. Generally, commentors agreed that the report thoroughly and factually assessed D.C. area problems. Also, commentors generally agreed that regional planning and cost benefit analyses were desirable, but had different opinions on how such planning and analyses should be implemented and on what they should be expected to achieve. Additionally, some local jurisdictions believed the report was too critical of local jurisdictions' efforts and not critical enough of EPA's. GAO has incorporated many of their suggested revisions where appropriate throughout the report. (See pp. 109 to 113 and apps. III to X.)

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ABBREVIATIONS

AWT	Advanced waste water treatment
COG	Metropolitan Washington Council of Governments
EPA	Environmental Protection Agency
GAO	General Accounting Office
mgd	Millions of gallons per day
WSSC	Washington Suburban Sanitary Commission

GLOSSARY

Advanced waste water treatment	Processes which remove additional pollutants from waste water beyond those eliminated by primary, which removes 50 percent of the pollutants, and secondary treatment, which removes 85 percent. It includes removal of nutrients, such as phosphorous and nitrogen, and a high percentage of suspended solids.
Biochemical oxygen demand (BOD5)	A measure of the oxygen consumed over a 5-day period in the biological process of waste decomposition.
Composting	The microbial conversion of sludge in the presence of suitable amounts of air and moisture into a product with the general appearance and many other characteristics of a fertile soil.
Dissolved oxygen	The oxygen freely available in water. Dissolved oxygen is necessary for the life of microorganisms, fish, and other aquatic fauna and for the prevention of offensive odors. Secondary treatment and advanced treatment are designed to protect dissolved oxygen in waste-receiving waters.
Effluent	The waste water discharged by an industry or municipality.
Effluent requirements	Restrictions established by a State or EPA on quantities, rates, and concentrations of chemical, physical, biological, and other constituents discharged from point sources.
Estuary	A body of water which does not flow freely, but rather is influenced by the area tides.
Nonpoint sources	Sources of pollution that are difficult to pinpoint and measure. Common examples include runoff from agricultural and forest lands, runoff from mining and construction, and storm runoff from urban areas.

Nutrients	Elements or compounds essential as raw materials to organisms for growth and development, such as carbon, oxygen, nitrogen, and phosphorous.
Pollution (of water)	Contamination or other alteration of the physical, chemical, or biological properties of water, including changes in temperature, taste, color, or odor; or the discharge into the water of any liquid, gaseous, radioactive, solid, or other substance that may create a nuisance or render such water detrimental or injurious to public health, safety, or welfare.
Sewage sludge	A nonhomogenous semisolid residue resulting from chemical and physical treatment of waste water, which consists of both toxic and nontoxic waste materials, with specific concentrations dependent on the various municipal and industrial sources discharging into the sewage treatment plant. Constituents of sludge include (1) nutrients, such as nitrogen, phosphorous, and potassium compounds; (2) heavy metals, such as cadmium, copper, mercury, nickel, lead, and zinc; (3) chlorinated hydrocarbons, including polychlorinated biphenyls and some pesticides; and (4) pathogenic organisms. In the metropolitan Washington, D.C., area, sludge is dewatered so that the residue is 20 percent solids and 80 percent water. Digested sludge is subjected to biological processes which reduce the sludge from its residual state. Undigested sludge does not receive this treatment and, thus, is more malodorous, has higher levels of pathogens, and must be disposed of in greater volume than digested sludge.
Water quality standard	A legal designation of the desired use for a given water body and of the water quality criteria appropriate for that use.

CHAPTER 1

INTRODUCTION

During the late 1960's, metropolitan Washington, D.C., governments undertook a major program to clean the Potomac River. The impetus for their efforts came as a result of early legislation to clean our Nation's waterways. The D.C. area, therefore, was well into its program to make the Potomac both fishable and swimmable when the Congress officially established this as a national goal by enacting the 1972 Federal Water Pollution Control Act (33 U.S.C. §§1251 et seq.). Consequently, the metropolitan Washington, D.C., area was on the vanguard of the Nation's efforts to clean its rivers.

Washington, D.C., metropolitan communities--working cooperatively for years to clean the Potomac River and meet other related federally legislated environmental goals--have made progress toward achieving those goals. According to Environmental Protection Agency (EPA) officials, the D.C. metropolitan region is one of the few large areas in the Nation with its entire sewer system connected to treatment plants having advanced waste water treatment (AWT) capabilities either on line or under construction. These efforts have been expensive, however, and the region has already committed over $1 billion, including Federal funds, in trying to achieve its goals. The following table shows the amounts of money obligated during the 1970's for planning, designing, and constructing D.C. area waste water treatment plants and related projects.

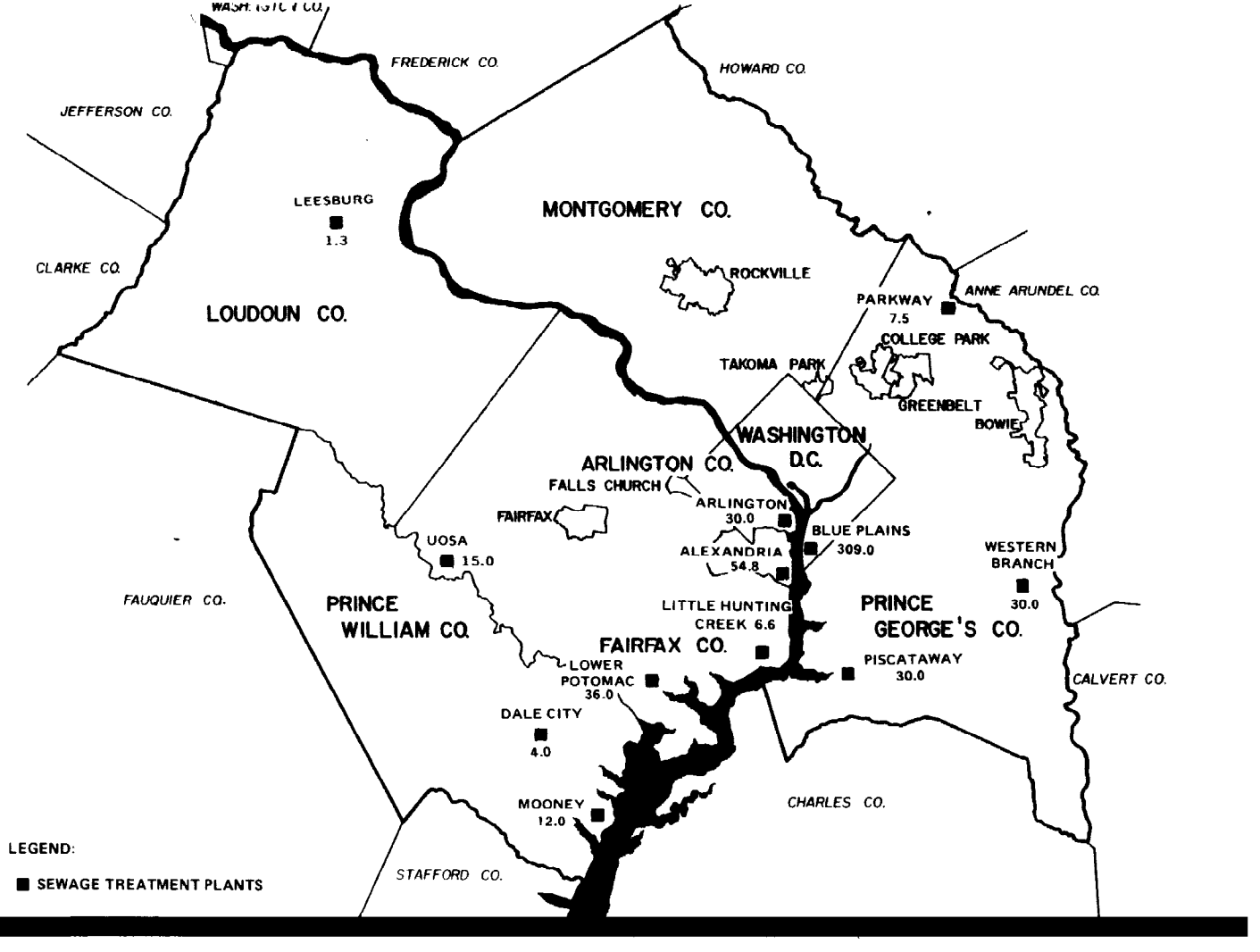
Planning and Construction Costs
for AWT Facilities Built or Being
Built During the 1970's

	----------millions of dollars----------		
Jurisdiction	Federal grant	State and local funds	Total funds obligated
District of Columbia	$198.4	$ 79.9	$ 278.3
Maryland	286.8	109.0	395.8
Virginia	284.5	95.8	380.3
Total	$769.7	$284.7	$1,054.4

The following map shows the locations and capacities of D.C. area waste water treatment plants.

D. C. AREA WASTE WATER TREATMENT PLANTS AND THEIR CAPACITIES

(In Millions of Gallons Per Day)



While much progress has been made, the D.C. area governments' ultimate goal has been elusive and much more remains to be done if current water quality standards remain in effect. Further, progress has not come without substantial difficulties. Local jurisdictions have been unable to find acceptable sites needed for regional waste water treatment plants which remain to be built, and cleaning the river has created a new environmental problem--disposing of the resulting waste water treatment plant residues, or sludge--which local governments have been unable to solve in a permanent, efficient fashion.

This report discusses the history of the D.C. area's efforts to implement a major Federal mandate, the Federal Water Pollution Control Act, and discusses some of the problems the D.C. area has encountered along the way and will probably encounter in the future. We have issued numerous reports about the problems State and local governments and EPA have had in implementing federally mandated water quality programs, and we have been very critical of the large amounts of money being spent in view of the uncertain benefits to be achieved. (See app. I for a report listing.) The interrelated and cumulative effects of these problems are illustrated in this report which focuses on a single large metropolitan area and examines in detail area governments' efforts to meet environmental goals for the Potomac River.

POTOMAC RIVER HAS HISTORY OF POLLUTION PROBLEMS

The Potomac River has had pollution problems for at least a century. Washington, D.C.'s, metropolitan population growth has consistently outstripped the region's capacity to treat its waste waters. Because of the rapid population growth which occurred after World War II, the Potomac River in the 1950's was in poor condition and recreational and commercial uses of the river were impaired.

In 1956, the Congress enacted the Federal Water Pollution Control Act. The act provided Federal grants for research into water quality problems and to aid construction of municipal waste water treatment facilities. It also provided a means for enforcing compliance with the act's requirements, including establishing of an enforcement conference that could set schedules for pollution cleanup activities.

In 1957, the Public Health Service, in the then Department of Health, Education, and Welfare, which administered the act, reported that the Potomac River could not be considered safe enough for swimming. Because there was no appropriate authoritative interstate agency in existence, the Department of Health, Education, and Welfare established a Conference on Pollution of Interstate Waters of the Potomac River (Enforcement Conference) in the D.C. metropolitan area. The Conference held sessions in

1957 and 1958 which led to the establishment of programs requiring secondary waste water treatment to achieve 80-percent removal of oxygen demanding substances (BOD5) and disinfection. The Conference also recommended control of storm water overflows from the area's combined sewer systems. The Enforcement Conference's recommendations formed the basis of sewage treatment programs in the D.C. region through the 1960's.

CLEAN POTOMAC RIVER ESTABLISHED AS NATIONAL GOAL

In his 1965 State of the Union Message, President Johnson set, as a national goal, making the Potomac River "a conservation model for our metropolitan areas." The Congress subsequently enacted the Water Quality Act in October 1965. The act established a Federal Water Pollution Control Administration within the then Department of Health, Education, and Welfare and required States to set water quality standards in interstate waters. The Potomac River water quality at this time was still considered very poor.

In the late 1960's metropolitan Washington, D.C., area governments adopted water quality standards for their interstate waters and the Federal Water Pollution Control Administration approved them, effectively making them Federal standards. Given the national goal to clean the Potomac River, it is not surprising that these standards were ambitious--making the Potomac suitable once again as a habitat for a healthy fish population and for swimming. Area governments expected to meet these standards by the mid-1970's.

The D.C. area program required local governments to undertake extensive and expensive construction programs to build, or expand and upgrade, area waste water treatment plants. More importantly, the program required local government cooperation to achieve these environmental goals. Progress seldom comes easily in metropolitan areas when programs must be implemented in a coordinated fashion by many autonomous local governments.

The D.C. region was no exception. Consequently, the Federal Government once again intervened in 1969 by convening another Enforcement Conference which recommended a new program for implementation by the local governments. Conference participants consisted of local jurisdictions in Washington, D.C., Maryland, and Virginia; State representatives from Maryland and Virginia; the Interstate Commission on the Potomac River Basin; and Federal water pollution control agencies. This report discusses the difficulties local governments have had implementing that program. The report focuses on local governments served by one major regional waste water treatment plant--Blue Plains--because it treats 70 percent of the total waste water produced in the D.C. region.

OBJECTIVE, SCOPE, AND METHODOLOGY

We performed this review to determine the types of problems the Washington, D.C., metropolitan area has had in implementing the Federal Water Pollution Control Act. We selected the Federal Water Pollution Control Act because it involves regional water quality planning and program implementation and necessitates large expenditures of Federal, State, and local funds. We selected the D.C. metropolitan area because its programs to clean the Potomac River were considered a model for national clean water programs and consequently:

--D.C. area governments began their programs in the late 1960's and, we assumed, would therefore be further along than other metropolitan areas in their water quality program implementation.

--The Federal, State, and local governments have obligated over $1 billion since the late 1960's to try to meet Potomac River clean water goals.

--The Federal Government has been extensively involved in area water quality studies and in assisting local governments in identifying area programs and implementing plant improvements.

We made no attempt, in selecting the D.C. area for a detailed case study, to assure that it is representative of other metropolitan areas in the country, and we recognize that the presence of the District of Columbia, two States, and several large local governments may make this area unique. However, the problems we identified as limiting D.C. area water quality planning and program implementation are similiar to many of the problems we have identified in many of our previous reports which had broader geographic coverage. Appendix I lists these other reports.

We used the case study approach for this review to identify and evaluate the problems D.C. area governments faced in conducting areawide planning and in implementing programs needed to accomplish regional clean water goals. Our earlier reports generally focused on single issues, including:

--difficulties encountered by State and local governments in conducting areawide planning, in disposing of waste water treatment plant residues, and in building treatment plants which meet design expectations; and

--uncertainties involved with the benefits of AWT on improving water quality.

This report examines each of these issues as they affect the D.C. metropolitan area in order to assess their cumulative impact on the efficiency and effectiveness of local governments' water quality programs.

The review concentrates on local governments in the D.C. area which use the Blue Plains waste water treatment plant located in the District of Columbia because it is the area's largest treatment plant. We conducted our audit work in the District of Columbia, Fairfax County in Virginia, and Prince George's and Montgomery Counties in Maryland because they are the principal users of the Blue Plains plant.

To obtain background information on and insight into D.C. area programs, we interviewed local government officials in each of these jurisdictions and plant operating personnel at the Blue Plains waste water treatment plant. We also conducted interviews with Maryland State officials in the Department of Health and Mental Hygiene; with Virginia officials in the State Water Control Board; and with officials of the following State, local, or regional planning and management agencies: the Interstate Commission on the Potomac River Basin, the Metropolitan Washington Council of Governments, the Washington Suburban Sanitary Commission, and the Maryland Environmental Services Agency. At the Federal level, we interviewed EPA headquarters officials in the water quality and waste management programs and EPA Region III 1/ officials responsible for D.C. area water quality programs.

We identified and reviewed reports on D.C. area water quality programs and projects by conducting a structured literature search and by reviewing the files of the Metropolitan Washington Council of Governments, the Interstate Commission on the Potomac River Basin, EPA, and the individual local governments. We developed most of the financial statistics used in this report from EPA and District of Columbia records and from material prepared for us by the Washington Suburban Sanitary Commission. We obtained statistics on sludge disposal and waste water treatment plant sewage flows primarily from reports prepared by the District of Columbia, the Washington Suburban Sanitary Commission, and the Maryland Environmental Services Agency.

1/EPA Region III consists of: Pennsylvania, Delaware, Maryland, District of Columbia, Virginia, and West Virginia.

CHAPTER 2

D.C. METROPOLITAN COMMUNITIES UNABLE TO COOPERATIVELY MEET WATER QUALITY STANDARDS

Federal legislation enacted in 1965 led to Washington, D.C., metropolitan governments agreeing to achieve advanced waste water treatment (AWT) requirements. During the past 10 years, local governments with Federal support have obligated over $1 billion to build, expand, and upgrade treatment facilities to achieve the AWT requirements; however, they still have not solved two problems which require regional solutions and which are critical if the area is to meet Potomac River water quality standards.

First, local governments and EPA have been unable to agree on the siting of a regional facility needed to treat the D.C. area's waste waters. A proposed facility was rejected by EPA for Federal funding because locations in other jurisdictions were less costly and more environmentally suited for a major waste water treatment facility while another facility was unacceptable to the jurisdiction where it was to be located.

Second, achievement of AWT solves only part of the problem because the greatly increased volumes of sludge produced by AWT must be disposed of without significantly damaging the environment. Local governments have been unable to agree on the siting of regionally acceptable permanent sludge disposal facilities. As with the facility discussed above, a proposed sludge facility was rejected by EPA because of high costs and uncertain environmental impacts and another was rejected by the jurisdiction where the facility was to be located. As a result, local governments have been relying on interim sludge disposal methods required by court orders, consent decrees, or the expiration of all other short-term alternatives.

The lack of the needed regional waste water treatment facility contributes to the Blue Plains waste water treatment plant--the area's principal plant for treating its waste water--discharging pollutants into the Potomac River which exceed allowable levels EPA established for the plant. Furthermore, it is imperative for the area to develop a long-range solution for sludge disposal because the volumes of sludge are increasing dramatically as the area progresses towards AWT.

FEDERAL LEGISLATION AND ENFORCEMENT ACTION LED TO AREA AGREEMENT ON AWT

Federal, State, and local government agencies agreed over 11 years ago on the need to expand and upgrade waste water treatment facilities to meet adopted water quality standards.

They developed rigorous limits on waste water discharges into the Potomac River which required AWT processes. Furthermore, in 1970, conferees developed a detailed agreement setting out a program which proposed building additional facilities needed to assure that Blue Plains would meet its requirements and enable the area to meet its water quality standards. The effluent requirements were set at levels which pushed existing technology to its utmost, particularly for the size plant being contemplated. The 1970 agreement remains the basis for projects built or remaining to be built today. While Federal legislation was enacted in 1972 to substantially increase the national commitment to cleaning the rivers, the metropolitan Washington, D.C., area program was already well underway and area officials anticipated that, upon implementation, their program would meet the new, more rigorous requirements.

Water quality legislation becomes basis for advanced waste water treatment

The metropolitan Washington, D.C., area's decision to implement advanced waste water treatment is an outgrowth of the 1965 Water Quality Act. Under this legislation, the area adopted water quality standards which could not be met with conventional secondary treatment and thus the region had to adopt AWT.

The Water Quality Act established a Federal Water Pollution Control Administration (originally within the Department of Health, Education, and Welfare but transferred, in 1966, to the Department of the Interior) and required States to set water quality standards in interstate waters. The standards which Washington, D.C., adopted were intended to increase the river's use for recreational purposes--in today's parlance the river was to become both fishable and swimmable by 1975.

Once the standards were approved by the Federal Government, local governments became obliged to meet them. In 1967, Washington, D.C., adopted water quality standards for its interstate waters which the Federal Government approved in 1969. The District's standards were intended primarily to improve recreational opportunities. The standards, aimed at improving the suitability of the river as a habitat for a healthy, varied fish population, were to be realized in 1972, and the standards to allow increased water contact recreation, including swimming, were to be realized in 1975 in limited zones of the Potomac River.

In 1969, water quality conditions were poor because past programs had not accomplished their goals and Washington, D.C., clearly had not met its water quality standards. The actions recommended by the Potomac Enforcement Conferences in the 1950's had not been implemented on schedule, and the D.C. area continued to

have a serious water quality problem linked primarily to poor waste water treatment.

D.C. area waste water treatment plants were overloaded and could not adequately treat area sewage. The Blue Plains plant, which was then built to provide secondary treatment for 240 million gallons per day (mgd), was overloaded and by 1971 was receiving flows in excess of 270 mgd. Consequently, its capability to treat the waste water and remove the necessary levels of pollutants was seriously diminished. Furthermore, because of insufficient conveyance pipelines to D.C. area treatment plants, some sewage never made it to any treatment plant. Such sewage was being dumped directly into the Potomac or tributaries. Matters were made worse during storms because some communities have sewage systems which combine storm water and sanitary sewage in the same pipelines and the storm water further taxed an already overtaxed system, resulting in increased volumes of raw sewage overflowing directly into the D.C. area's waterways.

This situation contributed to a very unhealthy river. Large amounts of oxygen-demanding substances in sewage greatly reduce dissolved oxygen that a river needs to support a healthy fish population. Periodically, oxygen levels became so low in some segments of the Potomac that there were fish kills. Additionally, the high level of nutrients being deposited by waste water treatment plants resulted in the production of excessive amounts of blue-green algae which, during the summer growth season, occasionally overtook large segments of the river. As the algae died in late summer, it became foul smelling and oxygen-consuming, making the river unpleasant for recreational uses and further reducing dissolved oxygen levels necessary for acquatic life.

This situation--a highly polluted river which occurred in spite of Federal efforts to prevent it--led the Secretary of the Interior in 1969 to reconvene the third Potomac Enforcement Conference. Earlier Conference efforts had been ineffective in establishing necessary waste water treatment programs and stringent new measures were clearly called for to prevent this situation from recurring. This is what the Conference provided.

The Conference issued 15 recommendations to enhance the water quality of the Potomac estuary. 1/ The most significant recommendation called for construction of AWT facilities. The treatment level required removing 96 percent of the BOD5 (the oxygen demanding substances), and phosphorous, and 85 percent of the nitrogen. The effluent requirements for waste water treatment

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1/The Potomac River becomes an estuary at Washington, D.C. An estuary is a body of water which does not flow freely but rather is influenced by the ocean tides.

facilities were very stringent, and the expected effluent was believed to be near drinking water quality. Prior treatment levels required only 80 percent BOD5 removal and no nutrient (phosphorous and nitrogen) removal.

Treatment levels recommended by the Conference pushed existing technology to its utmost. At that time there were no AWT plants anywhere near the size of those required in the D.C. region to serve as models to gauge the achievability of the treatment levels or the costs of operating large AWT plants. The only operating AWT plant at that time was in Lake Tahoe, which was 100 times smaller than the proposed capacity of the Blue Plains plant.

Furthermore, there was considerable debate on whether both phosphorous and nitrogen controls would be necessary since the control of either would, in theory, limit algae growth. In fact, the conferees may not have intended nitrogen control at all but instead were recommending control of an ammonia nitrogen which is an oxygen-demanding substance. In an article published in February 1975, a staff environmental engineer with the Interstate Commission on the Potomac River Basin stated:

> "* * * recent investigation of the proceedings of the conference shows a surprising confusion about what, exactly, was to be recommended. Basically, the conferees seemed unaware of the differences between "ammonia removal" (which means, in essence, converting ammonia nitrogen to other things; and "total nitrogen removal"--including organic nitrogen, the stuff of plant life), ammonia, nitrates and nitrites. This confusion, deemed a "technical point," may prove to have been a very costly misunderstanding." 1/

Nevertheless, given the impetus to return the Potomac River to a high water quality river and the problems encountered in the past, the Conference adopted the rigorous treatment controls.

In 1974, before issuance of the Blue Plains operating permit required by the 1972 Federal Water Pollution Control Act, the Enforcement Conference's recommendations were reviewed and adopted by EPA--the agency that took over Interior's responsibilities for water pollution control programs in 1970. The requirements remain in effect today although EPA, since 1975, deferred its decision to require nitrogen controls and, by administrative order, phased the pollutant removal requirements in consonance with needed plant improvements.

1/Potomac Basin Reporter, Feb. 1975, "Nitrogen Removal: Misunderstood in 1969, Uncertain Now," by Richard N. Palmer.

Federal enforcement actions established areawide program to meet water quality standards

In addition to recommending requirements for waste water discharges into the Potomac River, the Conference established a regional agreement to assure that discharge requirements would be met in the Blue Plains service area. The Blue Plains service area encompasses all of the District of Columbia; portions of Montgomery and Prince George's Counties in Maryland; and portions of northern Virginia, primarily in Fairfax County. The service area treats 70 percent of the total D.C. metropolitan area's waste water, thus the success of any program to clean the Potomac River clearly hinged on the Blue Plains service area meeting program requirements. Therefore, the conferees agreed to an ambitious program of constructing, expanding, and upgrading area waste water treatment plants to assure that the Blue Plains plant would operate at levels needed to meet water quality standards by 1977.

When the Conference developed its recommendations, D.C. area governments believed that the Blue Plains plant would be expanded to meet the entire D.C. area's waste water treatment needs, but this was not to be. In 1969, the District planned to expand the Blue Plains plant to 419 mgd--the capacity local governments estimated they would require by the year 2000. The expansion required reclaiming 51 acres of Potomac River mud flats at the Blue Plains plant location. The Department of the Interior opposed filling in the mud flats, according to a newspaper account of what happened, because of its general philosophy against filling in rivers. A Department official was quoted as saying, "If we keep filling in bits and pieces of the river, pretty soon there will be nothing left." As a result, expansion of the Blue Plains plant to 419 mgd was abandoned.

Abandonment of the Blue Plains expansion created an immediate need for State, Federal, and local governments to agree on two issues: (1) how much sewage could the Blue Plains plant treat given the limited land area for constructing the upgraded plant and (2) where the alternative regional plant or plants needed for the expected excess sewage flows from Blue Plains would be built. In recognition of these issues, the Conference prepared a memorandum of understanding which Conference members signed in 1970.

The memorandum became the basis for the programs the D.C. region has undertaken since 1970 and it remains in effect today. The memorandum of understanding provided for upgrading the Blue Plains plant to an AWT plant by 1977 and limited its capacity to 309 mgd, essentially the largest plant which the existing site could accommodate. All parties recognized that the

proposed Blue Plains expansion would not adequately serve all future flows from areas serviced by the plant and that the four principal user jurisdictions 1/ had to plan immediately to provide adequate treatment for flows in excess of those that could be accepted at Blue Plains.

It was expected that by 1977 Blue Plains would reach its 309 mgd capacity and an alternative regional plant would then have to be available. Consequently, the memorandum committed the Washington Suburban Sanitary Commission (WSSC), which owns and operates Montgomery and Prince George's Counties' sewer and water systems, to build one or more new regional plants to handle the expected flows above that which the Blue Plains plant was expected to receive in 1977. The District and the Virginia communities using Blue Plains were to be permitted to purchase capacity in the new WSSC facilities to assure that sufficient sewage treatment capacity would be available to accommodate their needs after 1977. The memorandum established a detailed schedule to identify sites for the additional regional plant(s) and to complete construction by 1977.

TWO CRITICAL PROBLEMS STILL REMAIN FROM D.C. AREA'S EFFORTS TO ACHIEVE AWT AND WATER QUALITY STANDARDS

Over 10 years of effort and $1 billion dollars have been committed to solving the D.C. metropolitan area's pollution problem. Despite their efforts, D.C. area governments have been unable to find solutions to two critical problems: (1) the siting of a second regional waste water treatment plant and (2) the siting of environmentally safe permanent regional sludge disposal facilities. Proposed facilities were rejected by EPA for Federal funding because there were less costly and more environmentally suited alternatives or the proposed facilities were unacceptable to the jurisdiction in which they were to be sited.

D.C. area unable to agree on second regional plant site

Achieving the construction schedule established in the 1970 memorandum of understanding has proven much more difficult than Federal or D.C. area local officials originally expected. Although $561 million has been obligated for the Blue Plains plant, its upgrading is still far from being completed and probably will not be completed until the mid-1980's at the earliest--8 years behind schedule. While the delayed upgrading is the major contributor to the D.C. area's current Potomac River pollution problem, the local governments' failure to begin building the alternative

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1/Washington, D.C.; Montgomery and Prince George's Counties in Maryland; and Fairfax County in Virginia.

regional plant for treating sewage which exceeds the Blue Plains plant's capacity is a more significant concern. It is more significant because it will probably prevent the plant from coming into compliance with its pollution control requirements even after it is completed. As predicted, the Blue Plains plant is overloaded once again and there are no other regional plants to receive the excess sewage flows for treatment. As discussed on page 57, the overload reduces Blue Plains' operating efficiency and this, coupled with significant construction delays, results in the plant discharging more pollutants into the Potomac River than its permit intended.

EPA gave the D.C. region additional time to comply with the plant's permit requirements by issuing an administrative order in 1979 which allowed higher pollutant discharges than the permit. However, the region must eventually meet the permit requirements and the construction and upgrading of the waste water treatment facilities must be undertaken and completed to comply with the permit. The administrative order requires the D.C. area jurisdictions to complete a study to identify how this can best be done. (See p. 89.)

During the 1970's local jurisdictions had recommended several alternatives for reducing flows to the Blue Plains plant. However, they have been unable to build the plants because either

--EPA disapproved a site because of its high costs and uncertain environmental impacts in comparison to other regional alternatives, or

--a local jurisdiction rejected a proposed site because of citizen opposition.

Local governments face substantial obstacles in selecting sites for regional waste water treatment plants. There are environmental and engineering considerations, such as the location of the plant relative to area water supplies and to the population centers which will use the facility. There is also inevitable strong public opposition by citizens living near selected sites--even more so when the treatment plant will treat wastes from another political jurisdiction. These obstacles restrict plant locations. Given these difficulties, neither Montgomery nor Prince George's Counties wanted to become the recipient of a single major regional waste water treatment plant. Both Maryland jurisdictions recognized that, if the region were to continue to grow, an alternative to the Blue Plains plant had to be found. Therefore, both jurisdictions compromised and agreed in 1971 to each build a plant capable of diverting sewage from Blue Plains. Montgomery County planned to build a new plant and Prince George's County planned to expand its existing Piscataway waste water treatment plant.

Neither of these plans were implemented. Montgomery County failed twice to find a site acceptable to EPA and Prince George's refused to have the region's only alternative regional treatment plant.

Montgomery County first selected a site, on the basis of its analysis of five alternatives located within the county, in Darnestown. The Darnestown site discharge point was 2 miles upstream from WSSC's drinking water supply. The plant was planned to treat 60 mgd.

EPA disapproved the Darnestown site in 1973 when it reviewed, at the request of the State of Maryland, a regional plan which included the facility because of its proximity to the D.C. area's water supply. EPA's denial noted, however, that of the four remaining alternatives which Montgomery County considered "a point of discharge at the Dickerson site or further upstream would appear to provide an adequate margin of safety" between waste water effluent and the water supply intake.

The Montgomery County Council, after receiving notice of Darnestown's rejection, was unable to select a site and requested Maryland's Governor to make the decision. The Governor selected the Dickerson site and the Council ratified his action.

Since its efforts to find a Montgomery County plant site began, WSSC has spent approximately $12.8 million in selecting sites, designing the Dickerson plant, and preparing the required environmental assessment. However, in 1976, when WSSC submitted a grant application to EPA for funds to construct the Dickerson plant, it too was rejected.

EPA's disapproval of Dickerson surprised the county because it came at the end of its planning and design work and without prior warning. The county believed EPA approved of the project from the outset because it was aware of the project and did not object. Because EPA had objected to the Darnestown site, the county assumed EPA would have cited its objections to Dickerson as well in 1973 had there been a problem. During the course of the planning process, EPA reinforced the county's belief by approving a State plan which included Dickerson as a State-approved project. EPA also approved the State's construction grant priority list which included Dickerson. None of EPA's actions, however, committed it to construction of the project and while Montgomery County was taking steps necessary to build the plant, EPA was simultaneously assessing whether it should be built.

EPA's major objection to the Dickerson plant was its cost ($381 million). EPA analyses showed that Dickerson was up to $145 million more expensive than alternatives--the least expensive alternative being the expansion of the Piscataway plant in

Prince George's County. Other factors contributing to EPA's disapproval included:

--The plant discharged above D.C. area water intakes and represented greater environmental risks than alternatives.

--The technology proposed for Dickerson had never been tried.

--The plant seemed larger than necessary for Montgomery County and the county had allocated only a relatively small amount of its capacity for use by other jurisdictions.

The State of Maryland challenged EPA's disapproval decision in court and was joined by Montgomery County, WSSC, and the District of Columbia, but, in 1978, EPA's decision was upheld. EPA reimbursed WSSC $8.2 million of the $12.8 million spent in attempting to develop an acceptable waste water treatment plant.

Although Prince George's County had agreed to expand its Piscataway plant from its capacity of 30 mgd to at least 60 mgd to help meet some of the D.C. area's waste water treatment needs, the county would not agree to bear the full burden of treating the entire Blue Plain's excess waste water flows. The county's position was consistent with its earlier stand which had led to Montgomery and Prince George's Counties agreeing to each provide additional regional waste water treatment capacity. Therefore, after rejection of the Dickerson proposal, Prince George's County, in 1980, withdrew its plans to expand the Piscataway waste water treatment plant. The D.C. region was left with no identified alternatives for the needed regional waste water treatment facility.

As of November 1981, after 11 years of concerted effort, the D.C. region still does not have the needed regional plant or plants. Consequently, the D.C. metropolitan area does not have sufficient waste water treatment capacity to assure that its sewage will receive the treatment which EPA believes is needed to meet water quality standards established for the Potomac River. Recognizing this problem, the local jurisdictions, with partial Federal funding, have undertaken a new $1 million study to identify how they will solve the area's waste water treatment capacity problems. This study is discussed on pages 88 through 93.

AWT creates a new environmental problem--sludge

Cleaning the Potomac River of waste water pollution solves only part of the problem because the pollutants removed from the

waste water must be disposed of without significantly damaging the environment. Furthermore, AWT creates much larger volumes of such pollutants (called sludge). Finding an environmentally acceptable sludge disposal method has been a more formidable problem than expected and siting a permanent regional sludge disposal facility has proved very difficult. D.C. area governments have been unable to agree, for essentially the same reasons that they were unable to agree on the siting of a second regional waste water treatment plant, on the siting of a regionally acceptable sludge disposal facility. Because sludge must be disposed of if the D.C. area AWT plants are to continue operating, D.C. area governments, since 1974, have been repeatedly involved in litigation. This litigation has culminated in consent decrees and court orders requiring D.C. area governments to accept D.C. area sludge for disposal, while they continue to seek a long-term environmentally acceptable disposal program.

AWT creates large volumes of sludge

Sludge disposal programs are a critical component of any AWT program because, as waste water treatment levels increase, sludge volumes increase dramatically. The Blue Plains plant, for example, was producing about 300 tons of sludge per day in 1970, but by the end of 1981 it is projected to produce about 1,500 tons per day. Sludge volumes could ultimately reach 2,300 tons per day if and when Blue Plains AWT processes become fully operational including denitrification, in 1985-1986. Such large volumes of sludge are difficult to dispose of in a metropolitan area because many sludge disposal processes are land intensive. For example, a land-filling process which had been used extensively in the D.C. area since the mid-1970's would consume 1 to 1.3 acres per day at today's sludge volumes. Alternatives which are less land intensive, such as incineration, have been proposed for Blue Plains but rejected because of high energy costs and potential air pollution problems.

Communities do not easily accept sludge disposal sites. In addition to the public's negative reactions to sludge, all disposal options for sludge carry some environmental risks. Although waste water treatment sludge has varying amounts of nutrients such as nitrogen, phosphorous, and potassium which could be recycled into the environment, some sludge also contains disease-carrying organisms and toxic substances, including heavy metals such as cadmium, which are very dangerous to humans if the sludge is not properly processed and used. The environmental risks associated with sludge disposal and the public's reluctance to accept such facilities in their communities are discussed in chapters 5 and 7.

Proposed projects could not be implemented--court orders force short-term solutions

Local D.C. jurisdictions have been trying to develop a long-range sludge disposal program since 1974 but have not succeeded. Lawsuits have been initiated to continue sludge disposal programs. In response to a 1973 lawsuit initiated by the Virginia State Water Control Board, in 1974 the Blue Plains user jurisdictions and EPA agreed to a consent decree under which a long-term regional disposal plan was to be developed by 1976. This deadline, however, has been changed again and again because key projects which were components of proposed plans have not been implemented.

The Blue Plains plant was initially designed to incinerate its sludge but EPA disapproved the District's request to begin constructing its incinerators. The District designed an incineration process which included eight multiple hearth incinerators on the Blue Plains site and built the building to house the process. EPA denied, in 1975, the District's request to build the incinerators because incineration consumed large amounts of fuel oil--over 43,000 gallons per day--and posed certain air quality risks. EPA asked the District to restudy its planned sludge disposal program and develop another alternative.

The District hired a consultant who recommended a dual disposal process: (1) incineration with heat recovery to allow the generation of electricity for onsite use and (2) composting. 1/ EPA approved the composting recommendation in 1977, funded the facility's design, prepared an environmental impact statement which concluded it was environmentally acceptable, and approved a construction grant of $4.9 million. However, the District has not built the composting facility because of public opposition to it. (Discussed in more detail on page 39.) The District never requested grant assistance for the second process of the originally recommended dual process--incineration with heat recovery. No other permanent regional solutions have since been found.

The increases in waste water treatment levels since 1970, coupled with the District's inability to dispose of Blue Plains sludge, has created one crisis after another which the Federal court has had to resolve. Lacking any other alternative for most of the 1970's, local governments have disposed of sludge on the

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1/Sludge composting is the microbial conversion of sludge in the presence of suitable amounts of air and moisture into a product with the general appearance and many other characteristics of a fertile soil.

land in Montgomery and Prince George's Counties, either by land-spreading digested sludge, or landfilling undigested sludge 1/ by a trenching process--burying sludge in trenches 2-feet wide and 3-feet deep. The District does not have much suitable land for these very land intensive processes and under consent decrees and court orders, the Blue Plains users--Montgomery and Prince George's Counties in Maryland and Fairfax County in Virginia--have been required to take their own share of Blue Plains' sludge as well as a proportionate share of the District's sludge to keep the Blue Plains plant operating. This cycle has been repeated many times wherein a lawsuit is filed whenever the D.C. area's sludge management program is threatened.

The cycle begins with a community refusing to accept sludge and ends with a court order or consent decree under which area communities must accept the sludge and establish a date for development of a long-range regional sludge disposal plan. The plan is not adequately developed, another lawsuit is filed by a local jurisdiction or EPA, and the cycle begins anew. The cycle began in 1974 when Prince George's County refused to accept Blue Plains sludge; it was repeated in 1977 when local jurisdictions could not agree on a long-term sludge disposal plan; and again in 1978 when the District's composting project failed. Since 1974, the District court has entertained emergency motions, conducted numerous hearings and status calls, and entered several orders to assure that the Blue Plains plant could continue to operate despite disagreements among user jurisdictions.

As of May 1981, all four principal Blue Plains user communities were operating interim sludge disposal facilities with the ultimate long-term objective of finding a single permanent regional facility. The District was composting 200 tons per day at a court-ordered facility at the Blue Plains plant and was trying to find a way of disposing of its remaining 440 to 450 tons per day. The District's remaining share was being disposed of by the other communities along with their own share of Blue Plains sludge. According to a WSSC official, Montgomery and Prince George's Counties have almost run out of trenchable land and consequently each has built temporary composting facilities for their respective portions of Blue Plains sludge. Montgomery County was building a court-ordered permanent composting site to replace a temporary site at Dickerson, but this site was being opposed by local citizens, and, because of its proximity to the Prince George's County line, by Prince George's County. The Virginia communities were incinerating

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1/Digested sludge is subjected to biological processes which reduce the sludge from its residual state. Undigested sludge does not receive this treatment and, thus, generally is more malodorous, has higher levels of pathogens, and must be disposed of in greater volume than digested sludge.

most of their share at a Virginia plant and landfilling a small amount at a regional landfill located in Virginia.

Local jurisdictions, with EPA funding support, have undertaken a new $920,280 study to identify how they will ultimately dispose of Blue Plains sludge. This study is discussed on pages 94 through 99.

MAIN TREATMENT PLANT IS IN JEOPARDY OF NOT MEETING ESTABLISHED AWT AND WATER QUALITY REQUIREMENTS

The lack of the needed regional waste water treatment facility contributes to the Blue Plains Waste Water Treatment Plant discharging pollutants into the Potomac River which exceed the allowable levels EPA established for the plant in its operating permit. As discussed on page 63, EPA has given the plant additional time to meet the permit by issuing an administrative order which allows higher pollutant discharges than the permit. However, under current circumstances it appears that the plant will have considerable difficulty in meeting permit levels.

Furthermore, it is imperative for the D.C. metropolitan area to develop a long-range solution for sludge disposal because the volumes of sludge are increasing dramatically as the area progresses toward AWT.

Lack of a second regional facility has resulted in Blue Plains being overloaded

Because the Blue Plains plant is currently receiving more waste water flows than it was designed to treat, its capability to remove the levels of pollutants needed in order to meet its permit requirements is being reduced. Because the regional waste water treatment facilities intended to offload the Blue Plains plant were not built, and the Washington, D.C., area served by the Blue Plains plant continued to increase in population with subsequent increases in waste loads, the plant has become overloaded. As long as the area being serviced by Blue Plains continues to grow and hook up new sewage services to the plant, the situation will worsen.

Blue Plains was designed to treat an annual average flow of 309 mgd and only at that level or less will the plant probably be able to remove the amounts of pollutants needed to meet the plant's effluent requirements. The Blue Plains plant is already above the 309 mgd level and waste water flows will continue to increase. Current plant flows (May 1981) approximate an annual

average of 330 mgd 1/ and, according to the way sewage capacity is allocated among local jurisdictions, another 14 mgd 2/ can be added to the existing flows before hookups to the plant must stop. According to a plant design engineer report 3/, at 330 mgd the plant will not be able to meet its pollution control requirements all year round. At levels beyond 330 mgd, the increased flows will impose unreasonable operating and maintenance requirements on plant staff which will significantly deteriorate the reliability of the treatment plant.

Exceeding the 330 mgd level, according to the design engineering report, creates a litany of problems which translate into more pollution for the Potomac River and a severely misused plant. These problems include the following:

--The Blue Plains plant will most likely never be able to remove the amount of pollutants from the waste water that it was designed to do and which were included in the plant's operating permit.

--The frequency of partially treated and untreated sewage being discharged directly into the Potomac River will be increased because the plant's capability to treat storm-related surges in sewage flows diminishes as flows increase above 309 mgd.

--The plant will have to be operated under stressed conditions daily, leading to numerous operating and maintenance problems. Operating process equipment such as blowers, return sludge pumps, and filter washwater pumps will have to be operated on nearly a full-time basis, resulting in more frequent repairs.

--Frequent bypassing into the river of raw or partially treated waste water will be necessary during daily peak periods to perform maintenance tasks and to maintain reliability during certain periods of the year.

1/The Blue Plains plant does not have reliable flow meters. This represents the best estimate of plant operators and EPA on the flows currently going through Blue Plains. (Discussed on p. 92.)

2/A 1974 Federal court consent decree allows more sewage to be sent to the Blue Plains plant than allowed under the EPA permit. (Discussed on p. 37.)

3/"Report on Capacity Evaluation of the Wastewater Treatment Plant," Oct. 1976, Metcalf and Eddy/Engineers.

Without long-term sludge disposal facilities the area's implementation of AWT is in jeopardy

It is uncertain whether local jurisdictions will be able to find an environmentally acceptable means to adequately dispose of the total volume of sludge which the Blue Plains plant will produce when or if it becomes fully operational. Without cooperation among D.C. jurisdictions, the area does not have sufficient disposal capability to handle more sludge than will be produced by the end of 1981 and additional AWT processes will significantly increase sludge volumes. According to EPA, treatment plants cannot operate to their design requirements if they are unable to dispose of the resultant sludge because inadequate sludge disposal programs force plant operators to reduce treatment levels, thus reducing the volume of sludge created. Under these circumstances, the plant discharges greater amounts of pollutants into the river than it would discharge if operated as designed. Obviously, such a practice can negate many of the benefits of AWT.

The adequacy of sludge disposal affects the quality of waste water treatment. The Blue Plains plant's ability to remove pollutants from the water depends to a large extent on the ability of solids-processing equipment to remove sludge residues produced by treatment before discharge into the river. To properly use the solids-processing equipment, the sludge must be removed and disposed of. In 1979, EPA advised District officials that the absence of adequate disposal facilities in the past had resulted in Blue Plains operating below its most efficient levels and at times had caused excessive discharges of pollutants into the Potomac.

As discussed on page 17, D.C. area jurisdictions have had substantial difficulty finding acceptable disposal processes for Blue Plains sludge. Current processes are capable of disposing of 1,350 to 1,750 tons per day of sludge, but the expected volumes will increase as high as 2,300 tons per day if Blue Plains becomes fully operational. The D.C. area jurisdictions have not as yet identified any way to dispose of this 550 to 950 ton per day difference.

CONCLUSIONS

Despite over 10 years of effort and the commitment of over $1 billion, the D.C. metropolitan area has yet to fully implement its regional plan to achieve Potomac River water quality standards. Siting a new regional plant and developing a long-term sludge disposal plan and facility have been the major barriers. Because the necessary facilities have not been built, the D.C. region is producing more waste water than it can sufficiently treat to meet water quality standards. Furthermore, D.C. area

local jurisdictions have been unable to find a long-term solution for disposing of the enormous quantities of sludge which they now produce--and these quantitites will increase significantly in the near future. The benefits of AWT cannot be achieved if the long-term plan is not developed and implemented because plants will not operate at their designed efficiencies unless the sludge can be disposed of.

CHAPTER 3

ENVIRONMENTAL AND POLITICAL ISSUES FRUSTRATE EFFORTS TO DEVELOP COST-EFFECTIVE, REGIONAL SOLUTIONS

There are many interrelated and cumulative reasons for the D.C. area's inability to develop and implement cost-effective regional solutions to meet its waste water treatment capacity and sludge disposal problems. These include:

--Restrictions imposed by local governments precluded preparation of cost-effective regional plans.

--Mechanisms linking preparation of plans with their implementation were ineffective.

--Undesirable aspects of the facilities made it difficult for residents to accept such facilities in their neighborhoods. Also, community officials find it difficult to agree to siting of such regional facilities in their communities because of the negative perceptions and reactions associated with processing other communities' trash, garbage, and sludge. Furthermore, because many projects have some environmental risks, local officials find it extremely difficult to approve treatment processes, methods, or sites even though such risks may be minimal.

LOCAL GOVERNMENT RESTRICTIONS HANDICAPPED PREPARATION OF REGIONAL PLANS

The Federal Water Pollution Control Act required regional water quality plans as a prerequisite for Federal funding of waste water treatment facilities on the basis that such plans were necessary to achieve the act's environmental goals. Because total funds for water pollution control are limited, good planning is needed to set priorities and evaluate alternatives. Water quality plans should thoroughly analyze problems with water quality, carefully consider alternatives for cleaning the water, evaluate public acceptance of various control efforts, and establish specific timetables for regional actions. Careful planning also is needed to ensure that construction grant funds are used most effectively to improve and protect the Nation's waters.

Despite over 6 years of effort and $5.3 million spent in water quality planning, D.C. metropolitan efforts to prepare a

regional Potomac River water quality plan which designates sites for waste water treatment plants and sludge disposal projects have been unsuccessful. While the planning process produced substantial information on D.C. area water quality problems, the aspects of area plans dealing with waste water treatment facilities and residues management (processing and disposing of residues created by the waste water treatment process) did not recommend specific projects. The local governments imposed restrictions on planning options which could be recommended for implementation, thus effectively precluding the preparation of a cost-effective and optimal regional plan.

Regional plans necessary for cost-effective achievement of water quality environmental goals

The location of waste water treatment plants and the necessary residue disposal facilities for a metropolitan area such as Washington, D.C., depends on many factors which do not respect political boundaries. Good planning on a regionwide basis is necessary because these factors greatly affect the cost of facilities, costs which are enormous under any circumstances. They also affect the projects' environmental impacts.

The Congress recognized the importance of good planning when it enacted the Federal Water Pollution Control Act by including explicit requirements for regional planning. Section 208 of the act established the planning requirements. It envisioned rigorous areawide analyses of alternative ways to accomplish water quality objectives in a sensible and economic way.

The law was enacted with an overall objective to restore and maintain the chemical, physical, and biological integrity of the Nation's waters; the objectives and deadlines for achieving them were ambitious. One of the law's goals called for eliminating discharges of all pollutants into the Nation's navigable waters by 1985. The law established an interim goal to attain, wherever possible, water quality suitable for the protection and propagation of fish, shellfish, and wildlife and for recreation in and on the Nation's waters by 1983.

Section 208 attempted to establish the planning and management framework needed to accomplish these goals within States and also in interstate metropolitan areas. States or the local governments were to carry out a two step process, which required that they (1) establish regional planning agencies to identify major pollution problems and the programs necessary to meet designated water quality standards and (2) establish management agencies to implement the recommended programs.

EPA intended that section 208 plans contain the full range of reasonable alternatives for waste water treatment plants and

sludge disposal projects along with their comparative costs and environmental impacts. Armed with this information, it was anticipated that the decisionmaking authority would select from and would implement those alternatives which represented the best balances between costs, environmental impacts, and political acceptability.

The regional approach makes sense because there are many factors which planners must consider in selecting appropriate sites. While political boundaries of the participating jurisdictions are an important factor, it is clearly not the main factor. Costs and environmental impacts must weigh heavily in the decision. Our review of D.C. area efforts leads us to conclude that other factors which must be considered in the Washington, D.C., area include:

(1) Water supply: D.C. metropolitan area communities rely on the free-flowing portion of the Potomac River for their drinking water supply and it is more desirable from a general public health standpoint to site treatment plants so they can discharge below, rather than above drinking water intakes.

(2) Assimilative capacity of the receiving waters: Different segments of the river have different capacities to assimilate wastes without risking harm to the river's acquatic life or reducing recreational opportunities. At Washington, D.C., the Potomac River becomes an estuary, and its ability to assimilate wastes is lowest near this point but increases downstream as it becomes larger and approaches the Chesapeake Bay.

(3) Sewage system conveyance systems: Treatment plants should be located where conveyance pipelines can easily deliver the waste water. Most desirably they should be located downhill from the population centers being served to minimize pumping costs incurred delivering sewage to the plants.

(4) Availability of land to dispose of waste water residues: Many sludge disposal methods are land intensive because of the large volumes of sludge generated by AWT.

D.C. area governments' attempts to expand their waste water treatment capacity demonstrate the importance of these elements in the decisionmaking process. One alternative for increasing the region's waste water treatment capacity would be to expand Blue Plains. The plant, however, does not have sufficient space for the District to expand existing facilities to treat all the

waste water from tributary areas. Other facilities outside the D.C. city limits most likely will have to be built if the area is to continue developing and if existing pollution control requirements are retained. Furthermore, even if the Blue Plains plant could be expanded, it discharges into the upper portion of the estuary, the point which EPA believes is already accepting all the pollutants it can assimilate and still meet water quality standards. If Blue Plains were expanded, for example, other treatment plants operating in Virginia (which discharge into the same area as Blue Plains) would have to agree to reduce their discharges either by reducing flows or increasing treatment levels before EPA could approve such expansions. Consequently, it is unlikely that the District can solve the problem itself; it has to look to another local jurisdiction for assistance.

A similar situation exists with the sludge. The Blue Plains plant will produce as much as 2,300 tons of sludge per day if the plant becomes fully operational (i.e., with denitrification) in 1985 or 1986. The District cannot dispose of this volume of sludge within city limits. All sludge disposal processes except incineration require substantial areas of land which the District does not have. Even with incineration, another location would have to accept the ash for disposal, because the District does not have a landfill within the city. 1/

The proper location of alternative plants or sludge disposal sites outside of the District is critical because of their enormous costs and their potential effects on the D.C. metropolitan area's environment. For example, according to an EPA analysis, there was an estimated $145 million difference in cost between one waste water treatment plant which had been proposed as a second regional plant and its lowest cost alternative. In addition, this plant was believed to have greater environmental risk compared to the proposed alternative since it would have discharged its effluent into a portion of the river above the Washington, D.C., area's water supply intakes.

D.C. metropolitan community 208 plan did not recommend solutions to major problems

Section 208 regionwide planning efforts have not succeeded in recommending acceptable waste water treatment or sludge disposal facilities in the metropolitan Washington, D.C., area. Regional planning was conducted under the premise that each of the major Maryland jurisdictions using the Blue Plains plant should share the burdens of waste water management, and have its own sewage

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1/The District owns a landfill in Lorton, Virginia; the landfill's permit is issued by Virginia, and the District must comply with Virginia State and county regulations to operate it.

treatment plant, and that all jurisdictions should dispose of their own sludge. As a practical matter, this limited, at the outset, the recommendations which the Metropolitan Washington Council of Governments (COG) could make, but it was apparently the only way the local governments would cooperate in the planning. Although the regional planning effort involved all local governments and looked at many different planning options, the final plan was essentially a compilation of individual local plans, most of which existed before the regional planning effort had begun.

The local plans were not implemented primarily because they did not, in EPA's judgment, represent the best environmental or most cost-effective solution for the D.C. region or because one of the local governments objected to the recommended alternative. The regional planning effort then fell apart and could not develop alternative recommendations on how the D.C. region could obtain its sewage capacity or dispose of its large volumes of sewage sludge.

By 1975 when the D.C. metropolitan area governments began section 208 planning, local jurisdictions were well into their individual planning processes for area waste water treatment and sludge disposal programs. In 1971, Montgomery County and Prince George's County each agreed to build a regional plant to reduce flows to the Blue Plains plant because neither government, in our opinion, wanted to bear the full burden of a larger single regional facility needed in the D.C. area. By 1975 both counties were well along in developing the plans they intended to use for diverting excess sewage from the Blue Plains plant. WSSC was designing its proposed Dickerson plant and began building the necessary conveyance facilities to divert excessive sewage from Blue Plains to Prince George's County's plant in Piscataway.

Although the local plans represented political compromises between the two political jurisdictions, they did not represent the best areawide engineering solution to waste water treatment. The engineering studies conducted at the time did not identify the Dickerson-Piscataway solution as the best engineering alternative. A major study completed in 1971 for the counties considered 21 alternative plant sites in the two counties and concluded that excess Blue Plains sewage should be treated at a second regional plant in the vicinity of Prince George's Piscataway sewage treatment plant. Because this solution was not politically acceptable to Prince George's County, the two counties reached a compromise whereby each would build its own treatment plants. Prince George's County agreed to expand Piscataway to accept sewage from a drainage area known as the Anacostia and Oxon Run Basin, and Montgomery County agreed to build a plant at Dickerson, both of which would allow the counties to reduce the sewage treated at the Blue Plains plant. This would in turn release capacity for increased Washington, D.C., and Virginia waste water treatment at Blue Plains.

Furthermore, as a result of a 1974 U.S. District Court consent decree, the local jurisdictions were required to develop a regional sludge disposal plan by 1976. As late as 1975, the year in which the 208 planning process began, the District intended to incinerate Blue Plains plant sludge in accordance with the original plant design and had already designed an incinerator and constructed the building to house it.

Both Montgomery and Prince George's Counties had undergone considerable political difficulty in getting their respective waste water treatment projects approved, and the entire region assumed that sludge would be disposed of at Blue Plains. Consequently, by the time the 208 planning process came into being, local jurisdictions already had their individual plans for meeting the needs of the D.C. area's major sewage district and they were not inclined to begin a new planning process which would reevaluate existing plans.

To preserve these planning efforts, local jurisdictions restricted the COG planning organization by requiring it to accept ongoing plans for waste water treatment as givens, making it difficult for it to recommend alternatives. Furthermore, sludge disposal for the Blue Plains plant was being conducted outside the 208 planning process by the individual local jurisdictions under the 1974 consent decree. From the outset, these factors predisposed the planning process toward already selected projects, making it extremely difficult for COG to conduct the type of regional analysis which EPA envisioned. This ultimately led to the failure of the 208 planning process to develop specific recommendations for acceptable areawide waste water treatment and sludge disposal projects.

Plan did not recommend sites for AWT plant which were acceptable to both EPA and local governments

EPA intended that the 208 planning process would provide specific recommendations for projects necessary to meet area waste water treatment and residues disposal needs through the year 2000. It was to be specific, indicating plant sizes, costs, locations; capacity sharing arrangements among jurisdictions; and an implementation plan with timetables for all necessary treatment facilities. More importantly, it was to reach such results after reviewing all technically feasible alternatives in the planning area and demonstrating their desirability through comparative cost-effectiveness analyses, environmental assessments, and extensive public participation.

EPA evaluates projects on a regional basis to assure that they make economic and environmental sense. In EPA's judgment, the Dickerson plant, the major waste water treatment project recommended by the Washington, D.C., area's 208 planning process, did not meet this criterion. Because of the constraints placed on the

planning process by the local governments, the initial draft plan submitted in 1978 had recommended that Montgomery County build Dickerson and that Prince George's County expand Piscataway.

When Montgomery County applied for a construction grant to build Dickerson in 1976, EPA denied the application. (See p. 47.) The main reasons given were that the plant, which cost $381 million to build and operate, was $145 million more expensive than another alternative. Furthermore, because it was located upstream from Washington, D.C., area's water supply intakes, it was more environmentally risky than alternatives. Local jurisdictions and the State of Maryland challenged EPA's findings in court and refused to allow the COG planning board to remove the Dickerson proposal from the plan. The court upheld EPA's decision in 1978. Because Dickerson was a key element in the plan and Prince George's County refused to consider options which made Piscataway the area's sole solution to the Blue Plains capacity problems, the planning effort failed to produce a single implementable program for long-term waste water management.

Plan did not identify any sites for sludge disposal

The 208 plan for sludge management did not produce any new recommendations for specific projects. Instead, as with the work dealing with waste water treatment plants, the 208 plan recommended what was already in process before it had gotten underway. The plan's sludge disposal section recommended

--continuing with existing cooperative efforts and

--maintaining the basic premise that future arrangements for sludge disposal be based on the generating jurisdiction being responsible for managing its own residues.

The plan also recommended that future studies be conducted to designate sludge disposal sites.

MECHANISMS LINKING PLANS WITH IMPLEMENTATION WERE INEFFECTIVE

Even if the D.C. area communities had prepared a regional plan, there is no certainty that it would have been implemented because mechanisms linking the preparation of plans with their implementation were ineffective or nonexistent. Mechanisms to encourage intergovernmental cooperation, such as the COG, brought the local governments together in their planning efforts but provided no assurances that plans would be regional in scope--e.g., include the full range of reasonable engineering alternatives--or that they would be implemented.

Although EPA has a number of enforcement mechanisms that it can use to encourage local governments to implement necessary projects and adopt an acceptable plan (.e.g, fines, withholding of grant funds, moratoria, and certain other forms of injunctive relief), EPA was reluctant to use them. We believe EPA was reluctant because of the criticism and controversy such actions would generate and because the communities were apparently working cooperatively to resolve the D.C. area's sewage and sludge disposal problem. In fact, at one time local jurisdictions had a plan, but EPA disapproved essential components of it. (See p. 14.)

At this late date, an action against the District may have little practical value because it is unlikely the District can site the additional facilities needed to reduce flows to the Blue Plains plant. As for other Blue Plains users, EPA or the local governments have already funded sewage projects in those communities where, according to past studies, a regional plant could be located. Therefore, because those communities have their own plants and are capable of meeting their pollution control requirements, they are now largely insulated from the effects of moratoria and grant restrictions, and have little incentive to site remaining regional waste water treatment or sludge disposal facilities which may be necessary to meet the needs of the other jurisdictions.

As a result, the D.C. region is still without an acceptable regional plan and thus a solution to its waste water treatment and residues management facilities problems. EPA's current approach to the problem is to fund additional studies and hope they produce an implementable plan.

Existing mechanisms encourage intergovernmental cooperation but can do little to resolve disputes

Mechanisms, such as the COG and State and local planning agencies, were instrumental in encouraging the local governments to get together to discuss their planning efforts or to broaden the scope of their planning to include regional issues. Such mechanisms, however, must look to their member jurisdictions to implement any plans that are developed.

Areawide planning agency lacked authority to implement regional recommendations

While the COG had been designated as the D.C. area's water quality planning organization, the local jurisdictions retained their traditional prerogatives for managing their waste water treatment programs. The COG was given no program authority and

could not unilaterally implement any recommendations it developed. Instead, the COG functioned as a support organization which provided technical assistance to local jurisdictions, undertook individual studies when authorized by local jurisdictions, and provided the forum for local jurisdictions to meet and discuss water quality problems. The COG could only do what was acceptable to the individual political jurisdictions which comprised its decisionmaking bodies.

The COG established a Water Resources Planning Board to oversee the planning efforts. The board consists of representatives of each of the independent local jurisdictions in the designated planning area as well as representatives from the public, States, and various regional agencies. 1/ Each of the local jurisdictions has authority to implement waste water treatment projects which were developed by the planning organizations, but none are required to implement them. In any event, the planning organization did not recommend specific projects.

Our assessment leads us to believe that regional projects for treatment of waste water or sludge generally are not welcome in local areas chosen to become recipients of new or expanded projects. If it is not clearly in the jurisdiction's interests to accept such a burden, then the jurisdiction will not accept, unless it is required to do so.

Having sufficient sewage capacity allows a local jurisdiction to plan its development consistent with its social and economic objectives and confers it with an advantage over surrounding jurisdictions which do not have sufficient capacity and therefore cannot continue to grow. Local jurisdictions with such advantages do not want to give them up, nor do they want to give other jurisdictions control over programs which affect their social and economic objectives.

Any local jurisdiction, if its interests were not being served, had the option of withdrawing from the board or rejecting its recommendations. Each major jurisdiction using the Blue Plains plant at one time or another threatened to pull out of the process, or to disapprove the resulting plan if its particular demands were not met. Consequently, given the structure of the board and the nature of its recommendations, it may have been extremely optimistic to

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1/The planning area consists of Montgomery and Prince George's Counties in Maryland; the District of Columbia; the four Virginia counties of Loudoun, Prince William, Fairfax, and Arlington; the three independent cities in Virginia of Alexandria, Fairfax, and Falls Church; and the six municipalities in Maryland of Rockville, Bowie, College Park, Gaithersburg, Greenbelt, and Takoma Park.

expect regional agreement on the essential questions of sewage treatment and sludge disposal when the answers to such questions were not consistent with the individual wishes of each jurisdiction.

Expansion of the Piscataway sewage treatment plant is a key example of a local jurisdiction failing to implement a recommended project because it was not in its interests to do so. The existing Piscataway plant, built during the 1970's with EPA grants, was intended to serve the Piscataway drainage basin in Prince George's County through the year 2000 with the expectation that it would someday be further expanded to accommodate at least part of the sewage which exceeded Blue Plains' capacity. The further expansion of Piscataway would greatly help the D.C. region as a whole in meeting its capacity needs but would not do much for Prince George's County. In fact, because the county has sufficient capacity for its own growth and other jurisdictions do not, Prince George's has a considerable regional advantage over the other constrained jurisdictions in that regard.

Since at least 1971 when D.C. area governments conducted regional studies for an alternative regional plant, the Piscataway sewage treatment plant, or alternative sites near it, was selected as a cost-effective, environmentally acceptable alternative. The Piscataway expansion was also recommended as a component in each of the four alternatives recommended in the initial draft 208 plan. The plant was to be expanded from 30 mgd to 60 mgd and interconnected with the Blue Plains plant to allow flows which exceeded the Blue Plains capacity to be diverted to Piscataway. Piscataway would then become a second regional plant, treating some of Montgomery County's sewage as well as its own. However, in 1980, Prince George's County withdrew its long-held plans to expand the Piscataway plant because it did not itself need the additional capacity in the near term and it did not want to risk becoming responsible for treating the Blue Plains plant's entire excess flows. Furthermore, because Prince George's County believed the need to expand Piscataway had not been adequately documented in the past, it felt that the costs from an environmental and financial standpoint were prohibitive.

State planning requirements have been ineffective

The State of Maryland has its own planning process which included Piscataway as an eventual regional plant for the D.C. metropolitan area. Each local jurisdiction in Maryland must submit a 10 year water and sewer plan which it updates annually. This plan allows the State to coordinate and prioritize projects statewide. As with other planning processes, the mechanisms to enforce this plan were weak.

Until it was deleted in 1980, the Piscataway expansion had been included in Prince George's County's 10 year water and sewer

plan since 1971. Because of its presence in this local plan and the consistency of the local plan with State planning documents, EPA has funded a number of construction projects in the area on the assumption that Piscataway would eventually be expanded. Nevertheless, the State approved Prince George's County's decision to retract its plans because areawide population growth forecasts had declined, indicating that the expansion of the Piscataway plant may not be required in the 1980-1989 planning period. The State had misgivings about its actions, however, stating:

> "While we recognize the County's right to make its own planning decisions, the deletion of these projects [to expand Piscataway and interconnect it with Blue Plains] may prevent the implementation of cost-effective regional solutions to metropolitan area waste water treatment problems. Furthermore, the decision to delete these projects, at this time, after construction of the Anacostia pumping station and force main are well underway cannot be considered good facilities planning, and may well result in a waste of public funds. Unless other solutions are found, the Blue Plains Sewage Treatment Plant will soon become overloaded without the capability to transmit flow to the Piscataway Plant. Costs to all of the Washington Suburban Sanitary Commission system users will be higher if alternatives to the Piscataway Plant expansion are not economical."

It appears that the State can do little without the county's voluntary cooperation to reinstate the project and initiate action to expand the plant--an unlikely event. In negotiating the scope of current studies to find an alternative treatment plant for the D.C. metropolitan area, Prince George's County has strongly objected to any reanalysis of the Piscataway area for a possible future treatment plant site.

Local planning agency unable to resolve jurisdictional disputes

The Washington Suburban Sanitary Commission (WSSC) is another regional planning mechanism which Prince George's and Montgomery County use to jointly plan and implement programs for waste water treatment. As with the COG, however, WSSC is structured to retain the local governments' individual prerogatives, and the jurisdictions have adopted no arbitration mechanisms to assure that programs are implemented when the two jurisdictions have differences of opinion. While WSSC owns and operates the sewage and water systems used by both counties, its decisionmaking body consists of six commissioners--three from each county--who have no means of

breaking deadlocks. As a result, should one county disagree with the other on a project, the project cannot be implemented.

WSSC's difficulty in resolving disputes between counties and implementing necessary programs is demonstrated by the efforts of Montgomery County to build a compost site in Calverton, Maryland (locally called site 2). In 1977, Montgomery County authorized WSSC to budget funds to acquire the necessary land and construct the facility. Prince George's County objected to the selected site because of its proximity--within one-half mile--to the Prince George's County border and rejected WSSC funding for the project.

The differences between counties could not be resolved and the Federal District Court, being confronted with another D.C. area failure to implement needed sludge disposal projects, ordered WSSC to construct site 2 in a 1978 court order. Because of delays by Prince George's County and private citizen groups in the site area, the project was not built by the court-established deadline of August 1979. Continued problems in funding the site led Montgomery County to build an alternative short-term composting facility at another location to serve the county until it can complete site 2. The short-term site cost WSSC $4.37 million and will have to be abandoned and dismantled, according to its permit, when site 2 becomes available.

In April 1980, in view of the failure of WSSC commissioners from Prince George's County to approve site 2 in the WSSC budget, the Federal District Court once again ordered WSSC to reinclude the project in the budget and take all actions necessary to put the site into operation at the earliest practical time. As of October 1981, the $21 million site was being built, but the continued opposition of Prince George's County and local citizen groups make its ultimate use uncertain.

EPA's enforcement mechanisms have had little effect

The enforcement mechanisms which EPA has considered for the D.C. area are the imposition of sewer moratoria, which would halt area development and penalize local governments until they found the necessary sewage capacity, or the withholding of project funds until an accepted regional plan was developed. Although at one time these enforcement mechanisms might have been successful, it is doubtful that these approaches could now produce the results EPA desires--a reasonable regional waste water treatment program.

EPA has initiated or been a party to civil actions requesting other forms of injunctive relief that seek the development and ultimate implementation of regional plans. To date these efforts usually have culminated in a consent decree but have not resulted in a plan satisfying both the local jurisdictions and EPA. None

of the consent decrees spelled out the consequences of a failure to develop a satisfactory plan, nor did they explicitly require local jurisdictions to develop and implement plans in such a manner that flows to Blue Plains would be restricted to its design capacity. Of course, we have no way of forecasting whether a court would grant EPA further relief because of continuing permit violations or because of existing consent decrees. Similarly, we do not know whether the affected jurisdictions would agree to actual implementation of satisfactory regional plans in the context of a consent decree or otherwise.

Moratoriums and fines would penalize communities unable to devise regional solutions

The Blue Plains plant has not met its permit requirements or its administrative order. Even though the local jurisdictions have had nearly 11 years to develop a way to reduce waste water flows to the Blue Plains plant and 7 years to develop a plan to permanently dispose of Blue Plains' sludge, they are not much closer, if any closer, to achieving these objectives than they were when they began their efforts.

A sewer moratorium in the early to mid-1970's conceivably could have created a climate that would have prompted the local jurisdictions to cooperate in finding necessary solutions. At this time, however, it is unlikely that such an action would produce greater cooperation and, in fact, may have the opposite effect. The District of Columbia, which operates the Blue Plains plant and relies on it entirely to treat its sewage, would be severely affected by a sewer moratorium, but the city is limited in what it can do to correct the problem within its borders. Because of the limited space available at the Blue Plains site, it is unlikely that the District could increase the plant's size to accommodate the existing flows and also allow some reserve capacity for future city growth unless a major technological advancement occurs. Furthermore, past analyses of plant capabilities showed that the plant probably cannot be rerated to accommodate higher-than-design flows and still meet permit requirements. Consequently, the District will most likely have to look elsewhere for help if it is to ever operate the plant in compliance with its permit and have the sewage capacity it needs to grow.

Prince George's and Fairfax Counties, however, have adequate sewage capacity to meet current needs within their boundaries, so enforcement actions against the District of Columbia would not significantly affect them. Montgomery County likewise has alternatives, including using some of the unused capacity available in

interim treatment plants 1/ and building the locally funded plant within its borders, which it is currently planning. Consequently, the local jurisdictions are less dependent on the District to solve their individual problems than the District is on them.

Restricting grant funding would be ineffective

Withholding EPA funding would be similarly ineffective because EPA has already funded most of the D.C. metropolitan area's plants. All communities using Blue Plains, except Washington, D.C., and Montgomery County have the treatment plants they need for their current populations funded. The District has no way of expanding plant capacity within its jurisdiction, given existing standards and technologies, and Montgomery County is planning to fund its own plant. The only major projects yet to be funded in the Blue Plains service area, other than a facility to offload Blue Plain's excess flows, are those relating to sludge disposal, but to date no community has been anxious to become the recipient of a grant for a single regional sludge disposal facility.

EPA was reluctant to take enforcement action because communities were working to resolve problems

EPA considered both a sewer moratorium and grant funding restrictions in the early to mid-1970's but was reluctant to take such actions because local governments reaffirmed their intentions to work together and to solve the problem. During that time it must have seemed to all concerned that progress was imminent. Also, imposing sewer moratoria and withholding project funding are drastic steps which EPA generally takes only as a last resort. The extensive planning and massive construction programs undertaken by the D.C. area since 1970 would have made such actions appear extreme or unnecessary.

EPA considered imposing a moratorium in 1973 against WSSC hookups at the Blue Plains plant when it became dissatisfied with WSSC's progress in building the needed second regional waste water treatment plant. In 1972, EPA issued a 180-day notice to WSSC advising it that EPA would seek an "abatement action" if progress were not made in identifying ways to reduce Blue Plains pollution by the end of the 180-day period. Prince George's and Montgomery Counties had already been under State-ordered sewer moratoria in certain areas since 1970, but, according to a study conducted at the time by the Interstate Commission on the Potomac River Basin, they had not been effective in reducing sewage flows

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1/Montgomery County officials told us these interim treatment plants are privately owned or controlled so they would have to first obtain approval to put them into service.

and, in fact, may have accelerated the rate of sewage hookups to Blue Plains. The State-ordered moratoria allowed many exceptions which the counties were free to make, and builders rushed to build projects before the moratoria became really restrictive.

The situation was becoming critical in that the Blue Plains plant was becoming more and more overloaded and was unable to meet its schedules to reduce total pollutants discharged into the Potomac River. Because of this, the Virginia State Water Control Board sued WSSC in 1973 to halt its continued increases in sewage being sent to Blue Plains. The suit was settled in 1974 with a consent decree signed by EPA and the local jurisdictions reaffirming their intentions to take necessary measures to relieve the Blue Plains plant's overload as initially expressed in earlier agreements. EPA then dropped its plans to impose the moratorium and never acted on the expiration of its 180-day notice.

The consent decree did not prevent the Blue Plains plant from becoming overloaded but, instead, had the opposite effect. The manner in which the consent decree has been implemented resulted in local jurisdictions sending more sewage to Blue Plains than it was designed to treat, a situation which has contributed to the plant being overloaded today. The Blue Plains permit, which EPA issued just 1 month before the consent decree, limited sewage being sent to Blue Plains to an annual average total flow of 309 mgd. This total flow was to include both sanitary sewage as well as storm-related portions of the District's combined sewage. The consent decree, however, specifically provided that the District could exclude the storm-related portion of its combined sewage in computing its flow to the plant but went on to provide that the consent decree would not effect or alter the terms of the plant's permit. When storm-related sewage is excluded from the computations, the waste water actually treated at Blue Plains is underestimated.

The difference between the consent decree and the permit on this point has caused much confusion over what the actual requirements are. Local jurisdictions maintain that the consent decree allows them to disregard storm-related combined sewage flows in computing flows to Blue Plains. On the other hand, EPA maintains that its permit requires the addition of storm flows in computing the plant's 309 mgd capacity and that this is the overriding document. Why the consent decree contains provisions at variance with the permit regarding storm flows is not clear. Some EPA officials believe it could have been a technical error because the people who developed the permit were not involved in developing the consent decree or it could have been a compromise to allow local jurisdictions to continue increasing sewage hookups to the plant without risking a moratorium while the second regional facility was built.

At any rate, jurisdictions continue to allocate waste water flows to Blue Plains without including storm-related combined sewer flows, and this has resulted in the plant receiving more waste water flows than it can treat and still meet permit requirements. There are no pending enforcement actions designed to settle this issue.

EPA also placed partial restrictions on grants to D.C. area governments but removed them shortly after they were imposed. In 1977, EPA became concerned that Prince George's County was not taking any action to expand the Piscataway treatment plant and several EPA-funded projects were underway in Prince George's County which would not be needed if the Piscataway expansion and interconnection with Blue Plains were not completed. EPA imposed a grant restriction on these projects that predicated their continued funding on Prince George's County's actions to begin expanding its treatment plant. WSSC objected strongly, pointing to the extensive regional planning efforts underway and the spirit of cooperation indicated by these efforts. As a result, in 1978 EPA removed the grant restriction and allowed the projects to be built. These projects currently do not make much sense unless Piscataway is ultimately expanded. (See p. 49.)

PRESSURES PREVENTING SITING OF FACILITIES OUTWEIGH EFFORTS TO SITE FACILITIES ON A REGIONAL BASIS

The pressures exerted to prevent the siting of waste water treatment and residues management facilities far outweigh efforts to site such facilities on a regionally sensible basis. We believe the undesirable aspects of such facilities discourage their acceptance by area residents in most any locality no matter to what extent that site might be in the best interest of the metropolitan area (or the State and national interest, for that matter). Also, community officials find it difficult to agree to the siting of regional facilities in their community because of the negative perceptions and reactions associated with processing other communities' trash, garbage, and sludge. Furthermore, many projects, particularly sludge disposal projects, have some environmental risks associated with them. Local government officials find it extremely difficult to approve treatment methods, processes, or sites because of such risks, even though the risks may be minimal. In our opinion, given the fact that sludge must somehow be disposed of, selection decisions should be made to minimize the overall risks. Decisions, however, are generally made on a single project basis rather than arraying the alternatives and selecting the least risky one.

Such pressures reduce the options available to local governments to satisfactorily meet federally mandated environmental goals and make the regional siting of waste water treatment and

residue management facilities an excessively costly, difficult, and lengthy process.

Implementing composting projects--a long, hard struggle

Since 1975 composting has been proposed as an environmentally acceptable solution to area sludge disposal problems, but the region has had great difficulty finding sites for composting facilities. Many proposed facilities were found unacceptable because of potential, though minimal, risks with the process, or because of strong opposition from the communities where they were to be located. Local jurisdictions have built temporary sites because of court orders, consent decrees, or the expiration of virtually all known short-term alternatives.

The D.C. region has conducted substantial research on the development of the sludge composting process as a result of a joint EPA-Department of Agriculture funded program located at the Beltsville Agricultural Research Center in Prince George's County. The program was created to evaluate the process using Blue Plains plant sludge. Composting is the microbial conversion of sludge into a product having the general appearance and many of the other characteristics of a fertile soil.

Washington, D.C., first attempted to build a regional composting facility capable of composting 600 tons of sludge per day in 1977, but could not build the project because of strong community opposition. The District selected a site known as Oxon Cove because its proximity to Blue Plains would greatly minimize transportation costs. In the summer of 1977, EPA completed its Oxon Cove environmental assessment which concluded that the Oxon Cove site would not adversely impact surrounding communities. EPA approved Federal funding for 75 percent of the total project cost of $6.5 million.

The site, however, was located about 400 feet away from a home for the elderly and a report published at that time by the Department of Agriculture indicated a potential health hazard associated with the composting process because of an airborne fungal spore--Aspergillus fumigatus--which is emitted from compost sites and which could cause respiratory problems in susceptible people.

Because of the potential health hazard, the District totally redesigned the project to enclose much of its operations to minimize the possibility of airborne spores being released into the environment. The city also used a team of experts to evaluate whether the site could be operated safely. They concluded it could. An advisory panel composed of three prominent medical authorities from local universities and one from the U.S. Center for Disease Control concluded that, in

their opinion, "* * * the risk is so small that it is probably insignificant." Furthermore, EPA's Health Effects Research Laboratory concluded that the spores occurring naturally in residential neighborhoods would likely exceed those to be emitted from the plant. Despite these studies which showed the risks to be minimal, the District stopped further work on the compost site in 1978, after incurring costs of $656,718.

When the District terminated the project, the D.C. region faced another sludge disposal crisis because the region had no identified alternatives to Oxon Cove. The court, in 1978, once again confronted with a sludge disposal crisis, ordered the District to build a compost plant on a site identified by EPA on Blue Plains' property. The new facility, which had to be built in 6 months, was less than half the size of Oxon Cove. Ironically, although the site is still close to the residence for the elderly (it is 2,000 feet away, whereas Oxon Cove was 400 feet away), the District did not incorporate all of the environmental safeguards it designed for Oxon Cove because of the site's uncertain lifespan and the safeguard's high costs. The process is being conducted in the open air. However, District monitoring of this site has not identified any environmental problems associated with its operations.

Oxon Cove has not been the local governments' only failure in trying to implement regional programs. Local jurisdictions have spent years trying to identify suitable sites for regional or local facilities. For example:

--In 1977, local jurisdictions attempted to build a compost site at Cheltenham Boys Village, a property owned by the State of Maryland, but strong opposition by neighborhood groups and by local elected officials led to its being rejected.

--In 1977, as discussed on p. 34, WSSC attempted to build a compost plant for Montgomery County. However, WSSC was being opposed by citizen groups and, because of its proximity to Prince George's County, by Prince George's. As of October 1981, the project was under construction and Montgomery County officials believe it will be operational by fall of 1982.

--In 1977, a Maryland agency which assists counties in building needed environmental facilities attempted to build a regional sludge disposal facility in Charles County, Maryland. The sludge was to be barged to that location. The Charles County government opposed the site and the project was withdrawn from further consideration.

--In 1978, the District contracted with a private firm that employs a European mechanical composting process which composts a mixture of both sludge and municipal solid waste (garbage). The firm unsuccessfully attempted to obtain sites in two nearby rural counties but was unable to overcome public opposition and could not obtain the necessary permits.

--In 1980, the District developed another proposal to barge sludge to Haiti. The sludge would have been used in a large reforestation project, but Haiti ultimately rejected the proposal.

Given the fact that sufficient composting operations were not implemented, a significant portion of the sludge generated between 1975 and 1981 had to be trenched in Montgomery and Prince George's Counties even though State and local governments agreed that trenching is not desirable. In the summer of 1980, the existing permitted trenching sites were nearing their capacity and the counties had to find an alternative. Opposition in both counties to any new site was severe and almost all suitable land had already been used. Finding a technically acceptable site which could also overcome local opposition would be difficult, if not impossible. Both counties therefore looked for alternatives and found that composting was the only one that could be implemented quickly enough. Montgomery County quickly selected a site at Dickerson for a short-term facility, and Prince George's County selected a site near its Western Branch treatment plant.

Because trenching capacity was running out, these sites had to be designed and built in 6 months. Both projects--each costing about $4 million--met the deadline and, at the time we completed our field work in April 1981, were operating.

The Dickerson project was strongly opposed by local citizens and we were told the State had to intervene and negotiate an acceptable permit with local citizen groups. To gain public acceptance, the Dickerson facility's operations had to be restricted. The project, for example, has to be terminated and dismantled within 3 years. Furthermore, since we completed our field work, operational problems causing excessive odors have forced the temporary closure of the Western Branch site and additional construction is now underway to correct the problems.

Implementing incineration projects is difficult

Incineration is not a particularly desirable sludge disposal option to local governments because it generally uses large amounts of fuel and is therefore costly, it poses some risk to air quality, and is often opposed by citizen groups. For these reasons, siting such facilities is particularly difficult. Prince George's County

built an incinerator for its Piscataway treatment plant, but, because of strong opposition from the surrounding community, it has chosen not to use the incinerator or even test it completely to determine if it works. Furthermore, the District enacted legislation in 1975 which bans any new incineration facilities except where the Mayor finds that any other system of waste disposal would endanger the public health.

Prince George's County built an incinerator which is not used

In 1974 Prince George's County completed the construction of an incinerator for its federally funded Piscataway sewage treatment plant, but, because of severe public opposition, it has never been used. The public opposition to the incinerator was based primarily on concerns over the impact to public health because of resulting air pollution. Public opposition became more pronounced when a local resident's children were found to have higher than normal levels of lead in their blood. Because of this opposition the incinerator, which cost $2.8 million, has never been used and has not even been completely tested to determine if it works. This situation exists even though extensive review and analysis by Federal, State, and private scientists showed that the elevated levels of lead could not have been caused by the incinerator and that it was capable of being safely operated.

To allay public concerns, EPA and the State of Maryland conducted their own analyses of the health risks. Both concluded the incinerators could be operated safely. EPA funded a study conducted by Battelle Memorial Institute whereby Piscataway sludge was incinerated at a nearby plant with a similarly designed incinerator. This information was analyzed by EPA's Air and Hazardous Waste Division which concluded in 1977 that the incinerator could be operated in an environmentally safe manner. Furthermore, in a 1978 letter to the county, Maryland's Secretary of the Department of Health and Mental Hygiene certified that "* * * there will be no threat to the public health resulting from the proposed testing."

The State of Maryland is pressuring Prince George's County to at least conduct necessary tests to establish that the incinerator works to receive Federal reimbursement for the project. The incinerator still has not been tested and WSSC will forfeit the EPA grant of $1.9 million if it is not tested.

The District restricts new incineration projects

In 1975, the Washington, D.C., Council enacted legislation banning the construction of incinerators in any part of the city except where the Mayor finds that any other system of waste disposal would endanger the public health. This effectively eliminated

incineration as an option for sludge disposal as long as there are any other alternatives that would not endanger the public health.

At the time of our review, the District was studying--as it has studied several times in the past--disposal options which involve an incineration process. In mid-1980, the District's Director of Environmental Services recommended to the City Administrator a proposed bill to amend the city's Air Quality Control Regulations to allow the construction and operation of incinerators. The Director proposed legislation to lift the ban on incineration for four reasons:

--The process of reducing sludge into ashes eliminates or minimizes the unhealthy, undesirable, and unmarketable conditions associated with sludge in any other form.

--The process of reducing sludge into ashes lengthens the life of existing landfills, particularly if municipal solid waste were used as a fuel in the process.

--The process could be used to produce steam for generating electricity or heat for use at the Blue Plains plant.

--The process would provide a more permanent solution for the sludge disposal problem.

No action had yet been taken on this bill as of April 1981.

Even if legislation were enacted, implementing an incineration project would be a formidable task. The District would have to apply to EPA to amend the District's Air Quality State Implementation Plan which explicitly precludes incineration. Before EPA could approve any new incineration project, the plan would have to be amended and the project would have to undergo a permitting process to assure that there would be no significant deterioration in D.C. metropolitan area air quality. This review could take up to 1 year of air quality monitoring within the city and surrounding jurisdictions. EPA would also probably have to prepare a National Environmental Impact Statement. In preparing its 1974 Blue Plains Environmental Impact Statement, EPA received such strong opposition to incineration that it deferred a decision on whether to allow the process at Blue Plains. Within 6 months of the original 1974 statement, EPA was to prepare a supplement taking a position on incineration. As of June 1981, however, the supplement had not been prepared because the issue has been under almost continous study since 1974.

CONCLUSIONS

Regional solutions are necessary to solve waste water treatment and sludge disposal problems in the D.C. metropolitan area to achieve optimal cost and environmental benefits. These solutions, however, are very difficult to develop. Local jurisdictions have been reluctant to relinquish their individual prerogatives to a regional authority and parochialism has overridden attempts to develop and implement regionally optimal plans. Furthermore, attempts to site facilities have met with repeated failures or have only succeeded in the face of a crisis for the following reasons:

--local jurisdictions have been unable to overcome their aversion to singularly accepting wastes of other jurisdictions;

--facilities have been undesirable from the point of view of the citizens who reside in areas chosen as sites;

--facilities, particularly those required to process or dispose of waste water treatment plant sludge, have had some risks associated with them and local jurisdictions have had a difficult time dealing with risk, no matter how minimal; and

--high costs and the existence of lower cost alternatives have resulted in EPA rejections of projects acceptable to the local governments.

State and local government agencies and requirements, as well as EPA enforcement mechanisms, have been ineffective in forcing local governments to implement necessary programs. State and local mechanisms available in the D.C. region have been designed to preserve local prerogatives and, if a local jurisdiction chose not to implement a program needed to solve a regional problem, little was done to encourage anything but voluntary action.

EPA's mechanisms, which include seeking a moratorium and restricting grants, can now have little practical effect in the D.C. region. Local governments where, according to past studies, regional waste water treatment plants should or could be built, have already built or are planning to build their own treatment plants with their own funds. Consequently, these localities do not need additional Federal grants and are relatively immune from the effects of a possible moratorium. While EPA's enforcement mechanisms might have been effective if used earlier in the D.C. area, at that time local jurisdictions appeared to be on the verge of solving their problems and such extreme actions appeared unwarranted.

CHAPTER 4

INABILITY TO IMPLEMENT REGIONAL SOLUTIONS HAS BEEN COSTLY

Washington, D.C., metropolitan communities have incurred excessive costs in unsuccessfully attempting to develop and implement pollution abatement programs and facilities to meet Potomac River water quality standards. About $123 million has been or is being spent in designing and/or constructing facilities that were not constructed, are not needed, or that are minimally used. (App. II lists the facilities and their costs.) Another $5.3 million has been spent on section 208 planning which has produced no acceptable recommendations for waste water treatment or sludge disposal facilities. Also, at least $14 million has been spent by local citizens for composting projects which may have been eligible for 75 to 85 percent Federal funding. And, at least another $21 million will be spent building another composting facility which likewise might not meet EPA grant requirements.

More importantly, the inability to develop needed sewage capacity in accordance with Federal waste water treatment requirements threatens the District and perhaps Montgomery County with sewer moratoria within the next couple of years. Sewer moratoria will halt new building, thus causing severe adverse economic consequences due to the subsequent loss in tax revenues and jobs.

COSTLY PLANNING FAILS TO PRODUCE IMPLEMENTABLE PROJECTS OR PROGRAMS

The D.C. area has spent large sums of money developing plans for pollution abatement programs but has not had much success in putting these plans into action. Consequently, EPA and the local governments have had to continue initiating new planning efforts to find ways to meet area water quality goals.

This cycle of planning and replanning has cost the region and EPA $5.3 million in area planning efforts and at least another $12.8 million in local planning efforts. This cycle, however, has failed to solve D.C. area waste water treatment and sludge disposal problems. Furthermore, each new planning effort postpones the need to decide what is to be done for at least the year or two needed to complete the necessary studies. This has resulted in what one local elected official has called "paralysis by analysis"--a phrase which we believe accurately captures what has occurred in the D.C. metropolitan area since 1970.

208 planning has not resulted in implementable programs

The 208 planning process has thus far cost Federal, State, and local governments a total of $5.3 million. While the process has generated a wealth of data on pollution of the Potomac River, it has not recommended ways acceptable to both local jurisdictions and EPA to solve area waste water treatment and sludge disposal problems. These efforts, therefore, have not served the major purpose for which they were undertaken--implementing a comprehensive pollution abatement program to accomplish water quality standards.

The first 4 years of the 6 year 208 planning effort focused on developing recommendations for obtaining necessary waste water treatment facilities. These facilities were to correct existing pollution problems and allow the D.C. region to continue growing through the year 2000 without degrading water quality. The planning involved developing population projections on which to base estimated future sewage flows; a model to simulate the capability of the D.C. region to implement various treatment alternatives; improved monitoring of the Potomac and other area waterways to assess the impacts of area programs; and research on the effects of urban runoff (nonpoint pollution) on water pollution and ways to abate it. Planners also examined data from waste water treatment plant operators to estimate future volumes of sludge to assess the adequacy of regional sludge disposal plans.

Ideally, this information would have been used to develop a range of feasible projects and would have evaluated their respective costs and environmental impacts in a manner comparing alternatives. This would have provided decisionmakers a clear understanding of what options they had and which courses of action they would have to take should one or more option fail.

As discussed in chapter 3, the resulting plan submitted to EPA did not make specific recommendations for solving waste water treatment and residues management problems because local governments could not form a consensus acceptable to both EPA and themselves. Local jurisdictions wanted projects they planned to be incorporated into the regional plan without regard to comparative analyses or without including other feasible options. When the Dickerson project, which was the major waste water treatment project recommended in the original 208 plan, failed to receive EPA funding, there were no alternatives to fall back on and the plan ceased to have any utility for siting waste water treatment plants.

EPA recognized the 208 planning failure and has since funded a separate analysis using construction grant funds--not planning funds--to develop the range of alternatives, analyses, and recommendations originally expected from 208 planning. This

effort will probably cost at least $1 million and take several years to complete.

In the past 2 years, the 208 planning process has focused on completing prior work on pollution problems caused by nonpoint pollution and developing methods for abatement. Use of this knowledge to develop specific abatement programs which individual governments can implement may confront the same institutional problems which caused other 208 planning efforts to fail. While some local governments have used the information gathered to date where it served their individual needs, there is no regionwide mechanism to translate recommendations into actions throughout the region and without this, the knowledge may never be fully applied.

Nonpoint sources of water pollution present an even greater institutional problem than finding acceptable sites for waste water treatment projects. Nonpoint pollution stems from uses of the land such as mining, agriculture, and construction, or from natural forces such as the eroding action of wind and water which carry sediment into the water. The land-based nature of these problems involves virtually all the policies of the separate jurisdictions with respect to land use planning, zoning, building codes, regulation of construction, and even taxation.

Expensive local planning and design efforts fail to result in projects acceptable to EPA or local governments

At the same time that D.C. regional planning efforts were underway, local governments were conducting parallel planning efforts to solve their individual waste water treatment or sludge disposal problems, but these also failed to result in permanent abatement programs. Local efforts included the planning and design of a major waste water treatment plant and two sludge disposal projects which were never built. Additionally, the District conducted several studies to identify sludge disposal options but the city either has not or could not implement recommendations. As a consequence, planning and design efforts have not contributed to furthering pollution control goals and local jurisdictions have lost time in beginning their abatement programs. The plans have been put aside and local jurisdictions are now conducting or initiating new planning processes.

Major waste water treatment plant designed but never built

WSSC spent over $12.8 million in attempting to build a waste water treatment plant in Montgomery County, but it did not succeed. EPA denied construction grant assistance to the selected project, Dickerson, after having determined that it would cost much more than other regionally proposed alternatives and was larger than

required. Now Montgomery County is planning another facility, but, because of a change in EPA policies, the project may not be federally funded.

Although Montgomery County selected Dickerson as its waste water treatment plant in October 1973, WSSC did not apply for an EPA construction grant until March 1976. Because the plant was larger than EPA believed was necessary for the region and would cost $145 million more to build and operate than the least costly alternative, EPA denied the grant application in August 1976. (See p. 14.)

EPA reimbursed WSSC for $8.2 million of its expenditures. Under current regulations implementing the Federal Water Pollution Control Act, EPA no longer will reimburse a local government for planning or design work which does not have prior EPA approval. Because WSSC, however, initiated its planning and design work before November 1974, EPA's cutoff date before new regulations applied, EPA reimbursed WSSC for the normal Federal share of these costs.

WSSC is currently engaged in another planning and design effort to build an alternative to Dickerson but will now have difficulty qualifying for Federal funding. Because of a change in EPA funding policies since Dickerson was disapproved, it is unlikely that EPA would provide construction grant funds for the Montgomery County plant. Since 1978, the EPA Regional Office has given funding priority to projects needed to solve existing pollution problems. Montgomery County's plant will primarily accommodate future growth in the county--not correct existing problems. Because the county is running out of capacity in Blue Plains, WSSC plans to build the plant without Federal assistance.

Major sludge disposal facilities designed but never built

Washington, D.C., has conducted substantial planning and design work to develop intermediate and long-range sludge disposal facilities. It planned and designed two major projects--a sludge incinerator and a composting facility--but did not build either because of EPA and local opposition, respectively. In its continuing efforts to find a method of disposing of its sludge, the District has also conducted several major analyses to assess sludge disposal options and their relative cost-effectiveness but has not implemented any of the recommendations. It is currently undertaking another analysis using Federal funds.

The Blue Plains plant was originally designed to include eight multiple hearth incinerators to dispose of the plant's sludge volume. In 1975, EPA withheld its approval for constructing the incinerators until the local governments evaluated alternative

sludge disposal systems. When EPA postponed its incinerator decision, the District had already spent about $3.4 million on the incineration project, most of which was spent to construct the building to house it.

Since that time, the District has undertaken four studies funded partially by the Federal Government at a total cost of $392,000, and has conducted several more studies funded internally to identify alternatives. The District, however, appears to be no closer to finding a long-term solution to its sludge disposal problem now than it was in 1975 when it began its first major study in the series. The District--still lacking a long-range solution--is currently initiating a fourth major study which will cost about $920,280 and which will take 1 year to complete.

As an interim measure to dispose of its sludge while developing its long-range program, the District designed a large composting project (Oxon Cove) but this too was never built for reasons discussed in chapter 3. (See p. 39.) Before the decision was made to terminate the project, the District spent $656,718 to design the facility.

SUBSTANTIAL COSTS INCURRED FOR UNUSED OR MINIMALLY USED FACILITIES

While planning costs have been much higher than justified by resultant pollution control projects, the practice of building projects without regionally acceptable plans has been even more costly. Local governments have constructed federally funded pipeline systems with capacities much larger than needed because the plans on which they were based were never implemented. The pipelines, which will have cost over $103 million when completed, make economic sense only if the Blue Plains plant could significantly increase its capacity above current levels or if one or more regional waste water treatment plants were built downstream. Neither event has occured or is likely in the near term.

EPA justified grant assistance for two major pipeline projects, the Anacostia force main and a large discharge line from the Piscataway waste water treatment plant, anticipating that local plans to expand the Piscataway plant into a second regional facility would be implemented. Because Piscataway was not expanded and may never be, the pipeline projects no longer make economic sense. Without an expanded Piscataway plant, the Anacostia force main, which will cost $67 million if completed, is not needed; the Piscataway discharge line, costing $8.2 million, will be five times larger than needed.

Throughout most of the 1970's, D.C. area waste water treatment plans presumed Prince George's County would either expand its Piscataway waste water treatment plant to become a second regional facility or build a new regional facility nearby. The new plant

was to be operating by the early to mid-1980's when sewage flows to Blue Plains were expected to exceed its available treatment capacity. There was to have been a pipeline connecting the two plants so that excess sewage could be diverted from Blue Plains when necessary.

As part of the plan, the Anacostia force main was to be built to allow increased sewage generated in Montgomery and Prince George's Counties to be delivered to Blue Plains and Piscataway. The Anacostia area did not have sufficient pipeline capacity to transport existing sewage to Blue Plains and, during wet weather sewage flows, the hydraulic capacity of the pipes was exceeded, causing overflows of raw sewage into the Anacostia River.

The force main and the Piscataway treatment plant expansion and interconnection with Blue Plains were integral components of an overall D.C. regional waste water treatment plan. Building the force main without also completing the other components would not make sense for two reasons: (1) the Blue Plains plant did not have sufficient capacity to treat any additional sewage from the new pipeline and (2) the existing pipes were already capable of conveying the maximum sewage which Blue Plains could treat.

EPA approved the first construction grant for the Anacostia force main in 1975, but it was uncertain about the project. The preponderance of plans and studies available at the time included the project which apparently influenced EPA's decision. Furthermore, completing the Anacostia force main was a provision of a 1974 consent decree between the local jurisdictions and EPA. In 1975, however, EPA was not certain that sewage overflows were as serious as claimed and was aware that Prince George's County had not committed itself to a specific time for proceeding with the project to interconnect the plants and expand Piscataway. At the time, however, EPA was apparently willing to take the risk of funding the force main project because a second regional plant was needed to prevent Blue Plains from becoming overloaded and it was the only regional solution available. Furthermore, it looked like Prince George's County would implement the full plan. EPA had already approved the upgrading of Piscataway, including the $8.2 million discharge line that was sized large enough to accommodate the future discharges of a fully expanded plant.

By 1977, Prince George's County had not taken action on expanding its plant or interconnecting it with Blue Plains, and EPA had already authorized $38.6 million in construction grants for the force main. Consequently, EPA began conditioning D.C. area grants for the force main project on county actions to begin implementing the rest of the regional plan. However, WSSC objected strongly to the grant condition and EPA removed it.

In 1980, Prince George's County received State approval and revised its local sewer plans to exclude projects to interconnect

Piscataway and Blue Plains and any further expansion of Piscataway. This eliminated the major reason for building the Anacostia project or the large Piscataway plant discharge line.

Thus far, expenditures on the force main have totaled $51.9 million and another $15.1 million must be spent to complete the project. As of May 1981, EPA was considering whether to allow the project to continue or request that construction be halted until its ultimate use can be determined.

EPA told us that the Anacostia force main situation is unlikely to occur again. Present regulations require the grantee, by acceptance of the grant for a new pipeline project, to connect that pipeline to a waste water treatment plant. Failure to do so can result in the forefeiture of grant funds. Of course, under existing circumstances, even if the force main is ultimately connected to Blue Plains, the need for this expenditure will still remain questionable because the added pipeline capacity is not needed.

Mismatching pipeline and treatment plant capacities, as has occurred with the Anacostia force main project, has occurred before in the D.C. region. The Dulles interceptor, a large sewage conveyance pipeline built in the 1960's, is still greatly underutilized today because of insufficient treatment capacity at the Blue Plains plant.

The $27.7 million pipeline was built to transport wastes from the Dulles Airport and surrounding areas in Maryland and Virginia to the Blue Plains plant. At the time the line was built, it was expected that Blue Plains would be expanded and have sufficient capacity to treat the expected increased volume of sewage. Because the Federal Government denied the full expansion of Blue Plains and alternative plants have not been built, less than 30 percent of the pipe's capacity can be used.

LOCAL RATEPAYERS BEAR MORE OF THE COST BURDEN THAN NECESSARY

D.C. area jurisdictions have had to bear the full costs of sludge disposal programs because they have been unable to agree on sites for regionally acceptable permanent sludge disposal facilities. Composting facilities costing $35 million built or being built in the D.C. region did not meet Federal funding criteria and local jurisdictions have consequently foregone the possibility of obtaining up to 85 percent Federal funding for the facilities. Sludge programs have been managed by crisis--initiated on short notice in response to court orders or consent decrees or the expiration of other alternatives--which did not allow the time local jurisdictions would need to meet Federal grant requirements that they might otherwise have been able to meet. Furthermore, local WSSC ratepayers are most likely going to have to bear

the full cost of the unused Piscataway incinerator. The local government--responding to the concerns of its citizens--decided after the incinerator was built that it would not use the incinerator even though studies determined that it could be used safely.

Local jurisdictions have paid the full cost of their sludge disposal programs because of their inability to satisfy the facilities planning and time requirements of EPA's construction grants program. In recent years, D.C. area governments have built three composting facilities with their own money and a fourth one is under construction. The composting facilities will cost the local governments $35 million, as the table below shows.

Summary of Compost Facility Costs

	Millions of dollars
Blue Plains	$ 4.55
Dickerson	4.37
Western Branch	3.63
Equipment for Dickerson and Western Branch	1.44
Site 2	a/ 21.00
Total	$34.99

a/Montgomery County estimate of total costs for site 2 which is under construction. As of February 1981, WSSC told us $8.8 million had been spent.

To obtain Federal funding--which could have amounted to as much as 85 percent of the projects' costs--the local jurisdictions would have had to successfully

--develop a long-range comprehensive sludge management plan for the Blue Plains plant;

--complete a cost-effectiveness evaluation of all feasible alternatives; and

--complete an environmental assessment of the proposed alternatives.

None of these requirements were met. The three operating facilities were designed and built within 6 months as a result of a crisis which did not allow nearly enough time to comply with Federal grant requirements. The Blue Plains composting facility was built under a court order when an alternative composting facility was not built, and the other two facilities were built when WSSC could not find additional sites to trench the

sludge. It is also unlikely that Site 2 will be federally funded. The requisite long-range management plan still has not been prepared because of disputes among the participating jurisdictions, and WSSC has yet to provide EPA with the cost effectiveness and environmental analyses first requested in December 1978.

WSSC ratepayers in Prince George's and Montgomery Counties are also likely to bear the full costs of the Piscataway incinerator even though it is 75 percent federally fundable. As discussed on page 42, Prince George's County has not tested the incinerator and WSSC will therefore probably forfeit the Federal grant of $1.9 million.

POTENTIAL SEWER MORATORIUM THREATENS TWO COMMUNITIES WITH LOSS OF JOBS AND REVENUES

Washington, D.C., and Montgomery County are rapidly approaching the amount of sewage which the 1974 consent decree allows them to treat at the Blue Plains plant, and when they exceed their limit, they must stop hooking up new sewage connections. They will probably reach the limit by 1983 or earlier. Halting new construction in these jurisdictions would have substantial economic impact in the form of lost jobs and tax revenues.

Local jurisdictions allocate Blue Plains capacity among themselves according to the 1974 consent decree. 1/ As a result of the consent decree and subsequent interjurisdictional agreements between Montgomery and Prince George's Counties, Blue Plains' capacity is allocated among the local jurisdictions in the following manner.

1/As discussed on page 37, one provision of the consent decree provides for the allocation of sewage flows on an annual average sanitary sewage basis but fails to include the storm-related sewage resulting from Washington, D.C.'s, combined sewer system. The Blue Plains permit specifies that these storm-related flows receive maximum treatment and that the plant still meet permit requirements on a monthly average basis.

Allocation of Blue Plains Capacity

	Allocated daily average sewage flows (millions of gallons per day)	
District of Columbia		135.0
WSSC:		
Montgomery County	77.6	
Rockville	9.3	
Prince George's County	66.4	
Total WSSC		153.3
Virginia:		
Fairfax County		16.0
Other (Maryland and Virginia)		4.7
Total allocated flows		309.0

Montgomery County and the District would have run out of capacity in 1981, but EPA agreed with a plan to avoid that and the moratorium which would have followed. The consent decree was amended so that Blue Plains users could temporarily increase their commitments to builders for flows up to 5 percent above their respective allocations while limiting their actual sanitary flows to under 309 mgd. EPA agreed to the amendment based on assurances that the local governments would either repair sewage pipelines to reduce groundwater and storm water seepage into the sewer system or build new facilities and thereby keep sewage flows within the 309 mgd sanitary sewage limit set by the consent decree.

Local jurisdictions could have agreed among themselves to temporarily reallocate capacity, because some local governments--Prince George's County and the City of Rockville, for example--have more capacity in the plant than they are currently using. They could have loaned the unused capacity to Washington, D.C., and Montgomery County but no jurisdiction would give up unused capacity because of the uncertainty of ever having it returned. The local jurisdictions, therefore, developed the alternative strategy so that flows to the plant could continue increasing without placing any jurisdiction in a moratorium. The 5 percent arrangement was successfully sold, with some difficulty, to EPA, and the consent decree was modified accordingly.

It is uncertain whether the District and Montgomery County will be able, by 1983, to make the necessary sewage line repairs to keep flows within their allocations and also allow for some continued growth. A moratorium therefore remains a possibility unless EPA makes other concessions. While we did not verify available information, the effects of a complete halt of building in the District and Montgomery County would have to be very costly. In 1979, the Metropolitan Washington Board of Trade estimated that a sewer moratorium could cost the District $75 million annually in lost tax revenues and a potential loss of at least 42,000 jobs. Montgomery County, on the other hand, could lose $1 billion of potential investment and the associated tax revenues.

As discussed on pages 35 and 64, Montgomery County may be able to postpone the full effects of a Blue Plains moratorium by using and expanding the interim treatment plants it has available but is not now using. In fact, if Montgomery County had decided and obtained the necessary approvals to use these treatment plants to begin with, reduce its flows to Blue Plains voluntarily, and loan the District some of the freed capacity, enough capacity would have been available to avert the 1981 close call with a moratorium in the first place. Once again, no jurisdiction wants to give up its capacity rights.

Furthermore, if EPA's ongoing studies conclude that the Blue Plains plant's rigorous permit requirements should be retained, EPA will have little alternative but to consider a complete moratorium on new hookups to the plant from any jurisdiction. Currently, because of the requirement to treat Washington, D.C.'s, storm-related waste water flows, it will be extremely difficult for Blue Plains to meet its permit requirements. As discussed on page 35, Washington, D.C., would probably be the most adversely affected by a moratorium since it has the fewest options to resolve the problem.

CONCLUSIONS

Local jurisdictions and EPA have spent a great deal of money on unproductive efforts to find solutions to the D.C. region's waste water treatment and sludge disposal problems and on unnecessary design and construction of projects. D.C. area governments with Federal assistance spent nearly $123 million designing and/or constructing facilities which were either not built, not needed, or are minimally used. They have spent another $5.3 million on regional planning efforts which failed to produce acceptable and implementable recommendations for waste water treatment or sludge disposal facilities.

Furthermore, the inability of local governments to agree on a long-range sludge disposal program has or will cost local residents much more money than they otherwise would have to pay. D.C. area residents have had to bear the full costs of $14 million in composting facilities currently built and might also have to bear the full costs of a $21 million facility now under construction. These facilities could have been eligible for up to 85 percent Federal funding if D.C. area local jurisdictions had cooperated and met EPA grant requirements.

More importantly, the inability to develop needed sewage capacity in accordance with Federal waste water treatment requirements threatens both the District of Columbia and perhaps Montgomery County with sewer moratoria within the next several years. Sewer moratoria halt new building, thus causing severe adverse economic consequences resulting from lost tax revenues and lost jobs.

CHAPTER 5

INABILITY TO IMPLEMENT REGIONAL SOLUTIONS HAS ADVERSE CONSEQUENCES

There are several adverse consequences of the Washington, D.C., metropolitan area's apparent inability to meet Federal water quality requirements. The foremost is the inability of the Blue Plains plant to meet its pollution control requirements. The plant, which discharges into the environmentally most sensitive portion of the estuary, is still under construction but is currently receiving more waste water than it will be capable of treating when completed. Consequently, more raw or partially treated sewage must be bypassed into the Potomac than was intended and much lower levels of pollutants are being removed from the sewage which is being fully treated. While some of these immediate problems are transitory because of the Blue Plains plant's construction delays, the high volumes of sewage going through the plant will most likely prevent it from operating as designed and the plant, therefore, will be unable to meet its permit requirements.

Additionally, the crisis-oriented management of sludge disposal programs which has characterized programs in the D.C. region over the past 7 years has resulted in reliance on land-disposal processes, the long-term environmental impacts of which are uncertain. Trenching has taken out of service or damaged large amounts of prime farm land; landfilling has contributed to leachate 1/ problems at the District's only landfill in Lorton, Virginia; and the composting process currently being used may result in the product ultimately being spread over large land areas in the region. However, Federal regulations have yet to be developed to establish how the product can be safely distributed to avoid future contamination of food crops and livestock. Ironically, while the D.C. area has adopted fairly stringent requirements on how its own sludge products can be distributed, at least one other city's sludge fertilizer product which has much higher concentrations of a substance dangerous to humans is being sold in local stores.

MUCH HIGHER LEVELS OF POLLUTANTS BEING DISCHARGED INTO THE POTOMAC THAN INTENDED

Because of the absence of an alternative treatment plant to reduce sewage flows to Blue Plains, the plant has become

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1/Leachate is a liquid that contains extracted, dissolved, or suspended materials created from water filtering through solid waste or other media.

overloaded. This overload, combined with problems caused by operating a plant still under construction, results in a greater amount of pollutants entering the Potomac than was intended. The higher level of pollutant discharges is caused by a combination of three factors.

1. The plant has been under construction now for 10 years but not all treatment processes are operating or have been built. This limits under any circumstances the plant's ability to remove the amount of pollutants to the levels cited in its permit.

2. Portions of the plant--currently the primary settling process--are being renovated, which restricts the plant's capacity to accept and treat peak sewage flows. Only 37 percent of the plant's peak sewage treatment capacity is available. Flows which occur during peak periods of the day or which are caused by storm water entering the sewers of Washington, D.C.'s, combined sewage system cannot be accepted for full treatment at the plant; therefore, they receive only primary treatment (a process which settles out the solids) and disinfection before being discharged into the Potomac. Discharges of partially treated sewage occur almost daily and during 1981 averaged 26 mgd.

3. The plant is receiving more sewage than it was designed to treat when fully operational. These high flows will, in all likelihood, prevent the plant from ever achieving the requirements cited in its permit and they add to the current transitory pollution problems being experienced from operating a plant under construction.

Blue Plains construction delays result in pollution discharges in excess of permit levels

All of the Blue Plains plant processes have not yet been completed or built and, consequently, sewage going through the plant cannot be treated to the levels cited in its permit. As a result, EPA issued an administrative order which allows higher pollutant discharges than the permit while the District identifies and undertakes the projects needed to comply with the permit. The Blue Plains plant is unable to meet the permit levels at the present time because

--the plant's nitrification facilities are built but, according to plant operators, are not fully

operational (plant operators are experiencing problems with the lime, ferric chloride, and polymer feed equipment);

--the plant's multimedia filters (a last step process to "polish" the effluent before it discharges into the Potomac) were scheduled to be operational in June 1981 but, because of a major construction problem, 1/ will be delayed at least until October 1982; and

--the plant's denitrification facility's construction, as discussed on page 74, is being delayed indefinitely while EPA conducts studies to determine if it is needed.

As a result, much more pollution is going into the Potomac than would be allowed under the plant's permit. The following table demonstrates the difference between the pollution which the permit will allow when the plant is fully operational and what was being discharged in 1980.

Blue Plains Permit Levels
Compared to Actual Performance in 1980

Pollutants to be removed	Pounds of pollutants allowed by the permit (in average pounds per day)	Pounds of pollutants actually discharged (in average pounds per day)
BOD5	12,700	29,039
Phosphorous	560	2,713
TKN (a measure of organic nitrogen)	6,130	28,450
Suspended solids	18,100	39,866

This extra pollution load on the Potomac represents only the pollution "officially" recorded as coming from Blue Plains, but it is by no means the total pollution from the plant. Some of the sewage never goes completely through the Blue Plains plant, but instead receives only primary treatment and disinfection and is bypassed through a separate line at the plant. Additionally, in the case of combined sewer flows, some sewage never reaches the

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1/In April 1981 a 304-foot section of a 900 foot concrete wall of the multimedia filter facility collapsed. Engineers believe it will take about 1-1/2 years to rebuild the wall.

plant but instead is discharged untreated through one of many overflows 1/ located through the city. The pollution loads from sewage receiving only primary treatment and disinfection does not "count" 2/ against the plant's allowable pollution load, and the pollution from combined sewer overflows is not recorded at all because it is not treated by the plant.

Most of the pollution was never intended to enter D.C. area waterways. Blue Plains is designed so that no sanitary sewage should ever receive less than complete treatment and so that most of the combined sewage should receive at least partial treatment. Untreated or partially treated sewage--even in relatively small amounts--adds to the total pollution being discharged to the river. The partially treated sewage comes from two sources, both of which periodically exceed levels the plant can treat: sanitary sewage during daily peak periods, and combined sewage (sanitary sewage and storm water which enters the District's sewers during rainy weather). Untreated sewage comes from the District's combined system. Engineers hired by the District estimate that annually 7.2 billion gallons of untreated combined sewage overflow the city's system and discharge into the area's waterways. 3/ The table on the following page compares the estimated annual pounds of pollution deposited in the Potomac in 1980 as a consequence of the Blue Plains service area's waste water.

1/Overflows are essentially escape hatches through which sewage can escape when the flows through a sewage pipeline exceed its hydraulic capacity. The District has about 58 such overflows.

2/The Blue Plains plant has two discharge lines, called 001 and 002. 002 discharges fully treated waste water. 001 is intended to discharge partially treated storm-related sewage which exceeds the plant's hydraulic capacity for full treatment. 001 was never intended to be used for discharging sanitary sewage and, therefore, EPA does not require that the pollutants coming out of 001 be counted against the total allowable pollution load from the Blue Plains plant.

3/Because storms occur intermittently, there is no way to accurately determine average daily overflows or bypasses caused by storms because the amounts fluctuate dramatically depending on the severity of the storm.

Annual Pounds of Pollutants During 1980 by Source as a Result of Blue Plains Service Area Waste Water

Pollutants	Annual pollutants from fully treated sewage	Annual pollutants from primary treated sewage	Annual pollutants from combined sewer overflows
	----------in pounds per year----------		
BOD5	10,599,162	6,797,458	a/ 4,200,000
Phosphorous	990,354	362,346	(Unknown)
TKN	10,384,302	(Unknown)	(Unknown)
Suspended solids	14,551,196	6,103,142	(Unknown)

a/This estimate was developed by the Environmental Defense Fund, Inc., in a 1980 report "Short-Term Objectives for Waste Water Treatment Plants Potomac Estuary," p. 43. The Environmental Defense Fund used 1979 data to derive this figure.

While Blue Plains was designed to treat an average daily flow of 309 mgd, plant designers, recognizing that the instantaneous flows which the plant would receive throughout the day would probably fluctuate widely, designed the plant to treat very high instantaneous flows. The plant's primary treatment facilities were designed to treat maximum flows of 939 mgd; the secondary and advanced facilities were designed to treat 650 mgd. However, because of construction now underway with the plant's primary settling tanks, the plant can only accept maximum instantaneous flows of 350 mgd, or only 37 percent of the peak flows the plant is designed to treat. When the rate of sewage flow increases above this amount, which now occurs almost daily for 2 hours, and for longer periods when it rains, flows above this amount receive only primary treatment and must be discharged into the Potomac or plant operators risk flooding the plant.

The plant has yet to have very much of its total peak capacity available for waste water treatment. While the primaries have been under renovation since March 1980 and will not be completed until January 1982, prior construction throughout the 1970's had restricted the plant's peak capacity to levels well below that of its design. In 1975, for example, the plant was capable of treating maximum flows of only 400 mgd.

The high instantaneous flow feature was designed into the plant principally because of Washington, D.C.'s, combined sewer system. The plant was designed so that, if there were rainfall, the plant would be able to provide full treatment of up to two times the normal dry weather flows from the District's combined

sewer and primary treatment of up to five times this amount to accommodate the storm water in addition to the normal sanitary sewage.

This design feature was built into Blue Plains to allow it to treat most of the combined sewer flows and the "first flush" or initial surge of sewage and storm water. The first flush of a storm in effect cleans out the combined sewer pipelines of its sanitary sewage--the major source of pollutants. The remaining sewage which receives only partial treatment or must be discharged untreated has much lower levels of pollution from sanitary sewage. It was expected that Blue Plains would have to discharge totally untreated sewage from its combined system on fewer than 45 occasions throughout a year, for a total duration of about 240 hours.

Overloading Blue Plains will probably prevent it from ever achieving current permit levels

According to the plant's design engineers, because Blue Plains is overloaded, it will most likely continue bypassing both sanitary and combined sewage. The overloading will also most likely reduce the plant's capability to remove the amount of pollutants it is supposed to remove from those waste waters receiving full treatment. Thus, the Potomac is likely to continue receiving more pollution from Blue Plains than anticipated by the plant's permit, unless sewage flows are reduced.

Blue Plains design engineers completed a reanalysis of the plant's performance in 1976 and concluded that Blue Plains "established effluent limits can only be met at the 309 mgd annual average flow condition with the denitrification in service." Blue Plains, by the time it is completed, could be receiving annual average flows approaching 350 mgd unless ways are found to reduce stormwater entering the system. The design engineers stated that flow conditions of 350 mgd are not feasible. The effect of such high flows will be twofold: (1) current permit effluent limits will not be met, and (2) more raw or partially treated sewage from the D.C. area's combined and sanitary systems will have to be occasionally bypassed into the Potomac.

The following table shows the pollution levels which design engineers believe Blue Plains will discharge if the plant's denitrification facility is not built. Denitrification, as already discussed, has been delayed since 1975, and the facility probably will not be built before 1985, if at all.

Estimated Pollutants Discharged by Blue Plains Under Different Flow Conditions

Pollutant	Permit levels	in monthly average of thousands of pounds per day At 309 mgd	At 330 mgd	At 350 mgd
BOD5	12.70	10.3 - 25.8	11.0 - 33.0	14.6 - 43.8
Phosphorous	0.56	0.5 - 1.3	0.5 - 1.4	0.6 - 1.5
TKN	6.13	3.9 - 5.2	4.1 - 8.3	4.4 - 23.4
Suspended solids	18.1	14.2 - 25.8	16.5 - 33.0	17.5 - 43.8

Design engineers concluded that, at flows above 330 mgd, the plant will have to be operated under stressed conditions daily, which will inevitably result in the plant bypassing raw or partially treated sanitary sewage. Furthermore, as plant flows increase above the 309 design limit, the plant's capacity to treat combined sewage flows decreases. Design engineers estimate that, at a 350 mgd flow, only 60 percent of the plant's originally designed capacity to treat combined sewer flows will be available. This will necessitate the continued need to bypass larger-than-intended volumes of combined sewage untreated or partially treated into the river.

EPA, recognizing that Blue Plains was not able to meet its permit requirements, in 1979 issued an administrative order of compliance, 1 month before the new Blue Plains permit. The administrative order allows higher pollutant loads from the Blue Plains plant than the subsequently issued permit and requires the District to conduct a feasibility study to identify the projects needed to bring the plant into compliance. This study is now under way and is discussed on page 89.

Blue Plains overloading can be minimized

The Blue Plains plant overload could be minimized if local jurisdictions could agree on how to share with the District some of the excess capacity they have available in other area plants. For reasons already discussed, local jurisdictions are hesitant to loan capacity which they have available to other jurisdictions because they risk losing it permanently. The difficulties local jurisdictions faced in implementing plans in the past make them understandably hesitant to loan existing capacity on the expectation that currently planned plants will ultimately be built. It would probably be to the local jurisdictions' economic advantage,

however, to loan their excess capacity because some facilities available in the region are unused and others are only partially used. For these two reasons, the major capital investments are not generating the revenues which they otherwise might. Also, less pollutants would be discharged into the Potomac.

While Blue Plains is receiving more sewage than it can effectively treat, neighboring treatment plants are sitting idle or are underused. Furthermore, some sewage is actually being pumped out of two drainage basins in Prince George's County, with excess capacity, into Blue Plains. The COG 208 Water Quality Management Plan Supplement, issued in December 1980, recommends that while the local jurisdictions are studying ways to offload Blue Plains, that the surplus capacity of neighboring treatment plants be used where feasible through existing interconnections, or through construction of new interconnections. The plan shows, for example, that the Western Branch sewage treatment plant will have significant surpluses of capacity to the year 2000.

The following table lists existing treatment plants in Montgomery and Prince George's Counties and compares their capacity with their current sewage flows and commitments.

Available Capacity in WSSC Treatment Plants

-------in millions of gallons per day------

Treatment plant	Capacity	Present and committed flows (note a)	Available capacity
Permanent plants:			
Western Branch	30	14.3	15.7
Piscataway	30	21.1	8.9
Interim plants:			
Seneca	5	4.7	0.3
Lower Anacostia	2	0	2.0
Rock Creek (note b)	3	0	3.0
Rossmore (note b)	0.3	0	0.3
Total available capacity			30.2

a/Flow data for permanent plants were obtained from WSSC data prepared in February 1979; flow data for interim treatment plants were obtained from WSSC and Montgomery County data prepared in February 1981.

b/These plants are privately owned or controlled and consequently, Montgomery County would have to obtain approval before putting them into service.

Additionally, 2.95 mgd is being pumped out of the Piscataway and Western Branch sewage areas and being sent to Blue Plains.

WSSC, if given the authority by Montgomery and Prince George's Counties, could begin operating its interim treatment plants to reduce flows to Blue Plains. The unused plants cost WSSC and private builders $18.4 million to build and are capable of being operated. Also, WSSC could stop sending sewage into Blue Plains that otherwise would go to Piscataway or Western Branch.

Furthermore, some Montgomery and Prince George's Counties' waste water flows can be diverted from Blue Plains to Western Branch and Piscataway by building connecting pipelines and pump stations. WSSC estimates such work would cost about $10 to $12 million. Use of these facilities could generate increased revenues to partially or fully offset the capital costs of the plants and the construction of the interconnection facilities, but, because this has not been a politically feasible proposal, WSSC had not developed precise estimates of the potential costs or savings.

Such actions to temporarily reduce the Blue Plains plant's overload in the short-term are made possible by the voluntary cooperation of the local jurisdictions. However, they have not effectively cooperated in the past and there are few incentives, other than a cleaner river, to encourage such cooperation in the future.

SLUDGE DISPOSAL PRACTICES RAISE ENVIRONMENTAL QUESTIONS

Since 1975, local D.C. jurisdictions have had to rely almost entirely on landfilling processes to dispose of ever-increasing volumes of raw sludge produced at Blue Plains. While precautions have been taken to minimize environmental risks inherent in these processes, the environmental impacts are still uncertain. The most extensively used process involved trenching--a modified form of landfilling which involves burying sludge in trenches 2-feet wide and 3-feet deep. Trenching was experimental at the time it was first adopted and its long-range environmental impact is still uncertain. Sludge has also been landfilled and such disposal has contributed to leachate problems at the District's Lorton landfill. These leachate problems in turn risk contaminating nearby ground and surface waters.

In January 1981 local jurisdictions began composting operations to dispose of most of the raw sludge but composting also carries some risks. The large volume of sludge composted may have to be spread over D.C. metropolitan area lands; however, there are as yet no Federal regulations on how it can be safely distributed.

Trenching--an environmentally questionable practice

Since 1975, D.C. area jurisdictions have had to rely extensively on trenching to dispose of Blue Plain's sludge. Trenching was designed as an interim measure to dispose of raw sludge until a more acceptable long-term disposal program could be found. Trenching, however, had to be used extensively until January 1981 when Montgomery and Prince George's Counties finally implemented composting programs. During the past 6 years, D.C. area jurisdictions have trenched 943,000 tons of sludge at a cost of $31 million and have had to purchase or take out of public use 2,243 acres of land, 586 of which were actually trenched. 1/ Trenching is environmentally questionable because it causes potential groundwater pollution problems; it requires large amounts of land and removes some prime farm land from production at a rate of 1 acre or more per day; and its long-range impacts on the land are uncertain.

Trenching is essentially a landfill process and creates environmental risks similar to landfilling. As with sanitary landfills, leachate can migrate from trenches and may contaminate groundwater supplies. The elements of concern in sludge leachate are pathogens, nitrates, heavy metals toxic to humans such as cadmium, and chlorinated hydrocarbons. A Department of Agriculture study of one trenched site in the D.C. region showed that some contamination of groundwater occurred within the trench site perimeters and to a lesser degree at wells immediately below the site. The contamination, however, was not serious. No serious contamination has yet been identified in D.C. area sites.

Furthermore, trenching is very land intensive. While as much as 1,000 to 1,300 wet tons of sludge per acre can be applied to the land, Blue Plains in April 1981 was producing 1,300 tons of sludge on a daily basis. 2/ That amount of sludge uses 1 acre or more per day and, according to WSSC, that large an area of geologically suited land is hard to find in the D.C. metropolitan area. While trenching can potentially improve marginal land, the process damages farm land because it requires that subsoil be brought to the surface. The scarcity of suitable land for trenching has required that some prime farm land be trenched.

1/Much more land must be purchased or set aside for trenching than is actually trenched because on a given site not all land is necessarily geologically suited for trenching and some land must be reserved for buffer zones and property access.

2/The sludge application rates for trenching were taken from U.S. Department of Agriculture reports. Application rates were as high as 2,100 tons at one trenching site, however, because it was retrenched.

Montgomery County reported it has taken out of use 1,500 acres of parkland and prime farm land within its borders alone since 1974.

The future use of trenched land is also of concern. It is believed that land can be used 5 years after being trenched but this is still not certain. The major uncertainty is the length of time it takes for the entrenched sludge to decompose. Land use after sludge decomposes is also uncertain. While it has been shown that the land can be safely used under controlled conditions to grow certain crops, there is some controversy surrounding the risks of cadmium uptake by plants grown on trenched land. Consequently, scientists cannot yet make a general statement about (1) how much cadmium or other heavy metals plants grown on trenched land will take in or about (2) how great a yield crops grown on trenched land will have.

Because of these problems and uncertainties, which have been recognized for many years, trenching has been considered the least desirable option available for sludge disposal since it was first used. Nevertheless, because of their inability to come up with a long-term regional solution, it was the only process which local jurisdictions were able to implement for most of the past 5 years. In February 1980, the Maryland State Health Department notified the counties that trenching should be stopped as the major sludge disposal practice and since January of 1981, no trenching has occurred. The Department will now consider permitting further sites only if they are to be used as an interim measure while permanent methods are being implemented, or only if they are to be used as a backup facility in case of an emergency.

Landfilling sludge causes major problems at the District's only landfill

Sludge has been a primary cause, according to a consultant for the Virginia Division of Solid and Hazardous Waste Management, for a leachate problem at the District's large regional landfill located in Lorton, Virginia. Leachate threatens to pollute groundwater sources and a stream which feeds into the Occoquan River. If the problem cannot be controlled and the landfill is found to contaminate goundwater used as a potable water supply, the landfill must be closed, according to EPA regulations.

While very little Blue Plains sludge has been disposed of at this landfill since early 1978, its sludge contributed to the problem. Fairfax County, which accepts about 138 tons of Blue Plains sludge daily for incineration at a local Virginia plant, must dispose of a portion of its own sludge at the Lorton landfill. Thus, Fairfax's need to dispose of sludge at the landfill is at least in part the result of its requirement to accept Blue Plains sludge. Furthermore, since January 1981, Fairfax County has had to dispose

of a portion of Blue Plain's digested sludge--about 50 tons per day--at the landfill. In total, Fairfax County and the city of Alexandria currently dispose of about 300 tons of sludge per day at the landfill.

Because of the leachate problems, which threaten to pollute area ground and surface waters, the Virginia Department of Health, Division of Solid and Hazardous Waste Management, placed the landfill on notice in February 1980 that no more sludge could be placed within the landfill beginning September 1, 1980. Local jurisdictions planned to build a composting facility on the landfill site and use the product for reclaiming the landfill but as of May 1981, had not completed the facility design nor received State approval for the plan. The State extended the date of its sludge ban to June 30, 1981, and the local jurisdictions have asked for a further extension to January 1, 1982, to allow time to complete the design, to build the facility, and to obtain an operating permit. There are no readily available alternatives for disposal of either solid waste or sludge. Consequently, the landfill is still receiving large volumes of sludge.

COMPOSTING IS NOW WELL ESTABLISHED BUT THERE IS STILL UNCERTAINTY ABOUT HOW THE PRODUCT CAN BE SAFELY USED

The majority of the Blue Plains plant's sludge is now being composted, and by the end of 1981 local jurisdictions plan to have facilities capable of composting the plant's entire expected 1,500 ton per day volume. It appears, however, that it may be difficult to dispose of the large volumes of compost which will be produced in the future. The composting facilities built or planned for Montgomery and Prince George's Counties, the District, and Fairfax County will, by the end of 1981, produce about 90 to 120 10-ton truckloads of compost per day, enough to cover a square mile with 7.6 inches of compost per year.

The compost will most likely have to be distributed or used within the D.C. metropolitan area because some jurisdictions outside the D.C. area have their own composting operations and, in any case, jurisdictions traditionally oppose accepting such products from wastes generated outside their own boundaries. Additionally, compost has relatively low nutrient levels and its fertilizer value is too low to make it competitive with commercial sources if it has to be transported any significant distance. Furthermore, potential health risks associated with compost make it more difficult to use for producing foodchain crops than other commercially available products.

Compost has some environmental risks limiting its uses

Compost, when used properly, has been found to be a suitable and safe product for widespread use as a soil-conditioner or low-grade fertilizer. Department of Agriculture experience, based on 6 years and $3.5 million of sewage-sludge-compost research and experimentation, is that the product has a wide range of uses with no environmental danger if properly used. Nevertheless, there are still uncertainties about how the product can be safely used and these uncertainties have kept EPA from establishing regulations governing sludge product distribution. EPA has been developing these regulations since early 1978. And, although EPA originally planned to issue them by December 1980, it is now uncertain when they will be issued.

The main element of concern in compost or other sludge-related products is the cadmium level because cadmium is particularly hazardous to humans. 1/ Cadmium is stored in the body and is known to cause many serious problems when levels become high. We were told the D.C. metropolitan area, compared to most metropolitan areas, has relatively low cadmium levels in its sludge, less than 10 parts per million. There is still substantial uncertainty, however, concerning what, if any, additional levels of cadmium can be introduced into the environment without taking a significant public health risk. The problems with cadmium in sludge products such as compost is the potential uptake of the substance by crops.

Cadmium is a non-essential metal that is absent from the body at birth, but which accumulates with age, mainly in the kidneys and liver. The major source of cadmium uptake for humans is through foods; however, air, water, and cigarettes also contribute. In 1972 the Joint Committee of the World Health Organization and the Food and Agricultural Organization of the United Nations published a report on cadmium. On the basis of the known effects of cadmium, this international group of experts concluded that, "* * * the present day levels of cadmium in the kidney should not be allowed to rise further * * *." Since that time, EPA's Carcinogen Assessment Group has reviewed laboratory studies of animals and epidemiological studies of humans and has concluded that cadmium is an oncogen (a tumor-producing substance). In addition, the Office of Special Pesticide Reviews has prepared a position document on cadmium in

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1/ In addition to cadmium, EPA has identified a number of other chemical contaminants in sewage sludge (lead, copper, nickel, zinc, boron, and PCB's) which present potential health and environmental risks. Also, pathogenic organisms which survive the composting and other treatment processes present potential risks of disease transmission to anyone who uses sludge compost. In this report we considered only the risks of cadmium because this has been the major stated concern with D.C. area sludge.

which it has concluded that cadmium is a mutagen (causes chromosomal damage) and a teratogen (causes birth defects).

Consequently, EPA is quite cautious in establishing its regulations on sludge products--some of which contain very high levels of cadmium. EPA, however, is confronted with a dilemma: To begin with, it must institute programs such as those in the D.C. metropolitan area to clean the waters, but those programs in turn produce large quantities of sludge. Furthermore, the sludge must be disposed of somewhere, but EPA must assure that it does not endanger public health.

EPA's delayed regulations make compost distribution very difficult

Absent Federal regulations on marketing and distributing compost products, local jurisdictions may have a difficult time getting rid of the product. Federal regulations could remove some of the stigma attached to sludge products which are safe for widespread use and restrict use of sludge products which have significant risks. State governments, well aware of the potential public health problems with some waste water treatment sludges, have established fairly rigorous standards for distributing locally produced sludge products. Ironically, these regulations control only products made within their boundaries, and at least one sludge product sold in local stores has much higher levels of cadmium than locally produced compost.

So what do States do when there are no Federal regulations on distributing compost and their local jurisdictions must compost large volumes of waste water treatment sludges because they lack other alternatives? The District and Maryland have established fairly rigorous guidelines or regulations limiting compost distribution.

Washington, D.C. guidelines limit compost distribution to: (1) turf farms; (2) nurseries; (3) golf courses; (4) new lawn establishment (but not by homeowners); (5) parkland (but not on playground areas); and (6) reclamation projects. The guidelines require that a program of surveillance be carried out and that proper records be maintained to insure that sewage sludge compost be used as intended.

Maryland has recently issued new regulations which require individual site permitting on a case-by-case basis when compost is to be used for (1) growth of food chain crops which are intended to be sold to the general public; and (2) the growth of grass, foliage, or food chain crops intended to be consumed by dairy cattle. Maryland's new regulations relaxed regulations which required that permits be issued for all users of the product and reissued each time the product is used at a different site.

The restrictions imposed by Washington, D.C., and Maryland in the past have greatly restricted the District's ability to market the compost produced at Blue Plains since 1979. Consequently, large volumes of this compost were being stored (as of May 1981) by a contractor who had been unable to successfully market it. It is too early to tell what effects the regulations will have on marketing sludge from the newly built Maryland composting sites. It should not be too significant a problem in the immediate future because Maryland counties have access to a substantial amount of publicly owned land. The Maryland jurisdictions are confident that they will be able to develop a market for their entire compost production.

However, EPA regulations are needed to assist States in establishing adequate controls over sludge products to prohibit significant health risks but not unduly restrict the safe use of sludge products. We had recommended in 1977 that EPA take actions to develop interim guidance on sludge that is acceptable for agricultural purposes, including use on home gardens, until such time as final regulations can be developed. The difficulties of establishing these guidelines and regulations has apparently been more formidable than EPA believed at the time.

On May 23, 1977, we sent a letter to EPA stating:

> "We have identified a potentially hazardous situation which we believe warrants your immediate attention. Sewage sludge products having high amounts of cadmium are being sold or given away to the public for uncontrolled use * * * this practice represents a potential health hazard." (Emphasis added.) 1/

The letter cited recommendations by the Food and Drug Administration that sludge containing more than 20 parts per million of cadmium not be used on agricultural land and crops in the food chain. The letter also cited recommendations by the Department of Agriculture that sludge containing more than 25 parts per million of cadmium not be applied to privately owned agricultural land (unless the cadmium to zinc ratio was less than or equal to 1.5 percent). We stated further that sewage sludge products with cadmium levels that are 3 to 7 times higher than that recommended by the Food and Drug Administration and that exceed the cadmium to zinc ratio cited by the Department of Agriculture were available nationwide for use on agricultural land, including home gardens.

EPA responded in August of 1977, stating it intended to deal with the problem cited through regulations promulgated under

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1/Letter report to the Administrator, EPA (CED-77-78, May 23, 1977).

the Resource Conservation and Recovery Act of 1976. EPA stated it intended to "assign high priority to the development and issuance of an information bulletin on home uses of sewage sludge" which will "receive wide distribution * * * and be prepared for municipalities as well as for the general public."

While guidelines were established in January 1981, no regulations for sewage sludge marketing and distribution have yet been promulgated.

In the D.C. area at least one sludge fertilizer product made from Milwaukee waste water treatment sludges is being sold in local stores. While the product prominently displays a warning that it should not be used in food chain crops, its sale and use are not controlled by local State regulations. Consequently, the D.C. area's own sludge product--which contains much lower levels of cadmium--is more closely regulated than other products which, presumably, because of the higher cadmium levels, pose greater health risks.

CONCLUSIONS

The Blue Plains sewage treatment plant is discharging much more pollutants into the Potomac estuary than its permit intended, and it will be extremely difficult for the plant to meet those permit levels. While much of the current pollution problem is transitory and is occurring because the plant is far behind its construction schedule, the Blue Plains plant is already overloaded and because of this, its ability to remove the intended levels of pollutants will continue to be impaired. There are available alternatives to offload some of the excess sewage being treated at the Blue Plains plant to treatment plants with available capacity in Montgomery and Prince George's Counties, but these governments have not approved such alternatives and we see little likelihood they will do so in the future.

Additionally, the crisis-oriented management of sludge disposal programs has caused the D.C. region to rely almost exclusively on land disposal processes, until 1981, the long-term environmental impacts of which are uncertain. Landfilling and trenching practices have damaged or taken out of service prime farm land, risked potential ground water contamination in large areas of Prince George's and Montgomery Counties, and have contributed to leachate problems at the District's only landfill in Lorton, Virginia.

Furthermore, the composting process currently being used in the D.C. area may result in the product ultimately being spread over large land areas in the region, but Federal regulations have yet to be developed to establish how the product can be safely distributed to prevent future contamination of food crops and livestock.

CHAPTER 6

EFFLUENT STANDARDS ARE BEING CHALLENGED BECAUSE OF HIGH COSTS AND UNCERTAIN EFFECTS ON WATER QUALITY

The Blue Plains effluent requirements were established to meet water quality standards for the Potomac River. Washington, D.C., metropolitan governments are presently questioning the validity of these requirements because of their high costs and their uncertain effects on Potomac water quality. When local governments undertook area programs to clean the Potomac, they had assumed that technology would soon be available at a reasonable cost to meet the established Potomac River standards and that the extremely high treatment levels were necessary. However, meeting the high treatment levels will be difficult at best, costs are much higher than had been anticipated, and there are serious doubts as to whether achievement of the required treatment levels of waste water would make an appreciable difference in the Potomac River's water quality.

LOCAL JURISDICTIONS QUESTION NEED FOR STRINGENT EFFLUENT REQUIREMENTS

For some years now, local D.C. area jurisdictions have questioned the need for the waste water treatment requirements initially recommended by the enforcement conference in 1969 and ultimately adopted by area jurisdictions and EPA. These requirements were based on early models of the Potomac estuary's ability to assimilate wastes and are believed, by the local jurisdictions, to be more stringent than necessary to meet their water quality standards. Local jurisdictions question the need for both phosphorous and nitrogen controls because, in theory, limiting either one could control algae. They also question the need to maintain high treatment levels year round when presumably they should only be required to meet such high levels during a serious summer drought when the estuary is most vulnerable to pollution. Although the original model was developed in the late 1960's and refined in the early 1970's, EPA only began updating the model in 1977 and did not undertake a full scale effort to update and verify its earlier model findings until 1979. The concerns of local jurisdictions are still an open issue because EPA's modeling work will not be completed until late 1981.

AWT is justified for the D.C. region on the basis of predictions that, without it, water quality standards will be violated, at least during summer droughts. These predictions are based on a mathematical model which measures the effect of pollutants on the estuary. The model predicts the amounts of pollutants the

estuary can accept without diminishing its water quality as measured by chemical criteria such as dissolved oxygen.

The model estimates the type and maximum pollution loads the estuary can assimilate which becomes the basis EPA uses to establish or approve permits limiting discharges from waste water treatment plants. 1/ Each waste water treatment plant is allocated a percentage of the total pollution which the model shows the waterway can assimilate, and each plant must then treat its waste waters to the levels required to keep pollutants being discharged within its allowed limits.

Local jurisdictions first questioned the discharge requirements shortly after EPA issued or approved its first discharge permits for D.C. area plants. They challenged EPA's requirement that the plants denitrify the waste water being discharged because of its high costs and the uncertain need of denitrification to meet water quality standards. EPA, therefore, reviewed its requirements and the support justifying denitrification, and, in 1975, EPA deferred construction of D.C. area denitrification facilities until it could more conclusively establish their need. In revising its permit for the Blue Plains plant in 1979, EPA did not include its earlier requirement for nitrogen removal because it was no longer certain whether it would be necessary. EPA's current modeling effort is directed at studying the need for denitrification and its decision will not be made until current modeling work is completed.

The denitrification process is expensive--it would currently cost the Blue Plains user jurisdictions about $150 million to build and about $17 million per year to operate such a facility. The operating costs are high because the process is energy intensive and uses large amounts of methanol. At the time EPA made its decision to postpone denitrification, for example, an EPA official estimated that the Blue Plains facility alone would consume about 7.13 million gallons of methanol per year--nearly the total national production capability at that time!

Since the mid-1970's, local jurisdictions have also questioned the need to meet the stringent discharge requirements year round. Local governments could save substantial amounts of money in operating and maintenance costs and also significantly reduce sludge volumes if they were allowed to reduce treatment levels during periods of the year when the river is capable of assimilating larger volumes of pollutants without violating water quality standards.

1/EPA establishes permits for the District because the city does not yet have an agency delegated to set effluent requirements. Maryland and Virginia have such agencies and establish their own requirements which are subject to EPA approval.

Essentially, the estuary can assimilate less pollution as the volume of water flowing into it decreases or as water temperatures increase. EPA established its pollution control limits at levels necessary to protect the estuary during a severe summer drought. Modelers calculated allowable pollution loads assuming a 7-day-10-year low flow in the Potomac and an 84 degree Fahrenheit water temperature. EPA further conditioned this, when it developed the Blue Plains permit, by requiring the plant's operators to maximize combined sewer flows to the plant and also maintain discharge limits on a monthly average basis.

The effect of these modeling and permit requirements is to protect the estuary continuously with extremely high waste water treatment levels which should, in theory, be required only very infrequently. Waste water treatment levels are intended to maintain water quality standards when the river flows are very low, specifically 705 cubic feet per second entering the estuary; when the water is the warmest, 84 degrees Fahrenheit; and when it is raining.

We reviewed river flow and rainfall data from 1970 through 1980 and the data show how infrequently this worst case occurred. During the period, river flows at Little Falls, the point where river water enters the estuary, never fell below 790 cubic feet per second and on only 14 occasions--0.4 percent of the time--were the flows below 1,000 cubic feet per second. Measurable rain fell in the D.C. region on only five of these occasions. This 10-year period, however, may not be representative of the river flows likely to occur in the Potomac because the 1970's was considered a decade with large amounts of rainfall.

Local jurisdictions have argued since the mid-1970's that the permits for plants discharging into the estuary should allow higher levels of pollutant discharges in the winter months. During this time, the river's assimilative capacity is greater because water temperatures are lower. The District went a step further and requested in its 1979 permit application for Blue Plains that EPA consider relaxing the phosphorous standard during periods when river flows exceed the 7-day-10-year low flow. Its justification was based on operating cost savings and reductions in sludge volumes. The table on the following page, prepared by the District of Columbia, shows operating costs for phosphorous removal, including chemical and sludge disposal costs, at various levels of phosphorous removal.

Costs and Sludge Volumes Associated With Varied Levels of Phosphorous Controls at the Blue Plains Plant

Phosphorous concentrations in Blue Plains effluent (in milligrams per liter)	Annual costs to achieve concentrations (in millions of dollars)	Sludge produced (wet tons per day)
a/ 0.22	$9.6	487
0.50	7.7	391
1.00	5.8	296
1.60	4.1	210

a/Required by permit.

Specifically, the District requested that a 1.0 milligram per liter standard be in effect at all times when river flows are above the 7-day-10-year low flow. It requested that the permit levels--0.22 milligrams per liter--be put in effect only when flows fall below this point. This would have saved $3.8 million in annual operating costs and reduced sludge volumes by 191 wet tons per day.

Because the feasibility of this strategy or any strategy which allows varying treatment levels according to the river's changing assimilative capacity could not be demonstrated, EPA did not approve the request. EPA's current modeling efforts, however, will look at this issue and it may be considered in future permits.

While the local jurisdictions have questioned the stringency of Blue Plain's effluent requirements, environmental groups have maintained the requirements are not stringent enough. Because of the questions concerning the effluent standards, the Blue Plains permit has been under administrative or judicial review almost continuously since it was first issued in 1974. Under these review proceedings, the environmental groups have maintained, among other things, that EPA should

--reinstate its denitrification requirements and

--implement measures designed to prevent the release of untreated sewage into the Potomac resulting from peak inflows beyond the plant's capacity.

Furthermore, the Virginia State Water Control Board has maintained that the Blue Plains permit does not sufficiently limit the amount of waste water flows to the plant and excess flows could reduce treatment plant effectiveness in removing pollutants and degrade downstream water quality.

COSTS INCREASE DRAMATICALLY AND LOCAL JURISDICTIONS MAY NOT BE ABLE TO AFFORD NEEDED ADDITIONAL FACILITIES

In 1969, when the program was established to improve the quality of water in the Potomac estuary, the costs of sewage treatment plants needed to meet water quality goals were not a major concern. Energy supplies were plentiful and reasonably priced. Neither construction costs nor energy costs were considered a significant program constraint. Because of these cost assumptions, AWT, which includes removing both phosphorous and nitrogen from the waste water, was expected to be worth the anticipated benefits resulting from reducing or eliminating the severe concentrations of algae in the estuary. Further, although AWT processes produce substantially more sludge than secondary treatment, it was then believed that the sludge could be disposed of by incineration at a reasonable cost at the Blue Plains plant site.

After over 10 years of trying to achieve compliance with water quality standards, it is becoming increasingly clear to the local governments that such assumptions may no longer be valid and that a reassessment of the rigorous pollution control requirements is needed, specifically in light of the following.

--Construction costs have escalated significantly and much more construction will be necessary if current treatment requirements remain in effect.

--High energy costs make traditional sludge incineration undesirable and alternatives have yet to be found.

--There are doubts as to whether achieving required advanced waste water treatment levels would make an appreciable difference in the Potomac River water quality.

Construction costs increase dramatically

Blue Plains was initially expected to cost $360 million, but as of June 1981, $561 million had been obligated for constructing the plant and as much as an additional $163 million will be needed to complete the plant as presently designed. This estimate of additional construction cost is conservative because it assumes that the District will build the sludge disposal incinerators with heat recovery recommended for the plant in a 1978 consultant's report. The District is undertaking an analysis of alternative incineration processes which use municipal solid waste as fuel. These alternatives are all extraordinarily expensive, and, should the city choose

to build one, its costs alone could range from $150 to $300 million, according to local officials.

Obtaining funds of this magnitude will not be easy. The District, like many major cities, is experiencing fiscal difficulties and about half the non-Federal share of Blue Plains capital will have to be paid for by the city. Because of these fiscal difficulties, the District, in June 1981, had to reduce by 36 percent its fiscal year 1982 planned capital expenditures for water and sewer operations. Furthermore, Federal funds are not limitless; in fact, current efforts to balance the budget may result in reduced Federal funding, and States must prioritize expenditures for their Federal waste water treatment grants. The costs of completing the Blue Plains plant may force States in the D.C. region to reallocate a substantial portion of their construction grant funds to the completion of Blue Plains. Maryland and Virginia have many plants in their States which require upgrading, and they have earmarked funds for these plants on their priority lists. However, these States have earmarked only nominal amounts for the completion of the Blue Plains plant.

The following table shows the total unobligated Federal money State governments, including the District, currently have available to manage their entire statewide waste water treatment construction grants program and the percentage of these funds which may be required to complete Blue Plains.

Total Unobligated Construction Grant Funds Available to States in the D.C. Metropolitan Area Compared to Their Share of the Costs for Completing Blue Plains

Jurisdictions	Unobligated Federal funds available for statewide programs a/	Federal funds needed to complete Blue Plains plant as designed	Percent of current available Federal funds needed to complete the Blue Plains plant
	---(millions of dollars)---		
District of Columbia	$ 38.0	$60.6	159
Maryland	134.8	58.7	44
Virginia	11.6	3.2	28

a/These figures do not include funds rescinded by Public Law 97-12 totaling $1.7 billion from EPA's waste water treatment program nationwide. EPA estimates that the rescission will reduce funds available to Maryland by $57.3 million; to the District of Columbia by $8.1 million; and to Virginia by $17.3 million.

Clearly, unless construction grants increase appreciably over the coming years, the States in the D.C. area will have to allocate a large share of their total unobligated Federal waste water treatment funds just to complete the Blue Plains plant. However, it is unlikely that construction grants will increase in the coming years. This is particularly unlikely in light of the fact that the current administration has proposed legislation to eliminate all construction grant funding in fiscal year 1982 and to reduce funding levels proposed for fiscal years 1983 through 1986.

Much more construction needed if standards remain as stringent as they currently are

As discussed on page 19, the Blue Plains plant is currently receiving more sewage than its design engineers believe it can treat and meet intended pollution control requirements. For the District to meet its intended requirements, either a second regional plant or plants must be built or the city will have to find a way to reduce its storm-related combined sewage entering the plant, the principal source of the excess waste water.

An EPA engineer estimates that by 1985 it could cost from $500 million to $1.4 billion, depending on which option is taken. Because most of the cost is caused by the District's combined sewer system, the largest portion of the non-Federal share of these costs--from $125 million to $350 million--may have to be paid for by the District. Whether it can obtain such funds given its fiscal problems is highly uncertain.

Operating and maintenance costs increase dramatically

In the last 4 years as AWT processes have come on line, operating and maintenance costs for the Blue Plains plant have doubled from $21 million annually in fiscal year 1977 to a budgeted annual cost in fiscal year 1981 of $40 to $45 million. Costs will continue to increase dramatically as the new AWT processes come on line. Such costs would be increased by an estimated $17 million annually if denitrification, which is an open issue, is implemented.

In actuality, however, the operating and maintenance costs would be higher if the District staffed the plant to the levels believed necessary for its size and complexity. According to a staffing report submitted by the District to EPA in January 1981, for example, Blue Plains had only 25 percent of the maintenance personnel which design engineers believed necessary to assure that the plant is properly staffed.

MAJOR UNANSWERED QUESTIONS TROUBLE LOCAL JURISDICTIONS: CAN TREATMENT LEVELS BE ACHIEVED AND WHAT BENEFITS WILL THEY PRODUCE?

Blue Plains is an advanced technology treatment plant and plant operators--even after 10 years' experience in building and running the facility--are uncertain if its rigorous effluent limits can ever be achieved. Existing technology may not be sufficient for removing the high levels of nutrients required by the existing permit or being considered by EPA.

What is more important, however, is that it is still unclear precisely what measurable effect further improvements in waste water treatment levels will have on the estuary. There is still substantial controversy over the need for nitrogen and phosphorous controls, and scientists who have studied the Potomac have widely differing opinions on the effect that increased waste water nutrient removal will have on the estuary. Some believe it will have no effect; some believe only phosphorous controls may be needed; and still others believe phosphorous controls will have no effect and that only nitrogen controls are needed.

Scientists are able to agree on one thing--the Potomac has improved markedly over the past decade although water quality standards are still not being achieved at all times. EPA has recently documented this in a report entitled, "Tidewater Potomac Cleanup: A Decade of Progress." The paradox, however, is that waste water treatment levels at Blue Plains are still far from those intended by EPA but the river is being used for fishing and recreation, the two goals AWT was undertaken to meet. Pollution must yet be reduced by a factor of at least 2 to nearly 5 times (depending on the specific pollutant) before Blue Plains will comply with its intended permit levels. This raises the obvious question of whether the permit levels have to be as stringent as they are to meet the D.C. area water quality goals.

Effluent requirements may not be achievable

It is uncertain whether Blue Plains, one of the largest AWT plants in the country, will ever be able to achieve its intended permit requirements. The limiting factor at the present time is its requirement for phosphorous controls.

When Blue Plains becomes fully operational it is expected to remove 97 percent of the phosphorous from the waste water before discharging the effluent into the estuary. Presently, the plant is removing only about 82.5 percent. Plant operators told us they are not certain they will ever be able to achieve the ultimate levels intended by the permit especially if the plant's denitrification facility is not built.

The denitrification facility itself is another uncertainty. Blue Plains may be required to remove 85 percent of the nitrogen from its waste water but this also pushes technology. There is no operating plant in the country which has such a facility the size of the one to be used at Blue Plains. Plant operators told us that because of this they do not know if this limit could be achieved.

Arguments still exist over the need for nutrient controls

Waste water treatment plants are required to remove nutrients from their waste water to prevent excessive algae growth in the estuary. Excessive nutrients in a body of water, such as the Potomac estuary, cause it to eutrophy; that is, it creates an imbalance in the waterway, making it more suitable as a habitat for plant, rather than animal, life.

Nutrient removal is controversial because the modeling techniques used to determine the effects of nutrients on a body of water, such as the estuary, are still relatively new and experts disagree on their reliability. The problem occurs because of the large number of variables which the model must consider and the many assumptions which modelers must make. While the science of nutrient modeling has apparently progressed significantly since EPA first modeled the effects of nutrients on the Potomac estuary in the early 1970's, it is still an uncertain proposition as is evident by the disagreement among scientists who have studied the Potomac.

Currently there is an argument supporting almost any position regarding the need for nutrient controls.

--The U.S. Geological Survey is doing an extensive analysis of the effect of bottom sediments on the Potomac estuary and its preliminary conclusion, given in a November 1980 paper 1/, is that the nutrients available from sediments deposited in the estuary from upstream areas "* * * raise serious questions concerning the effectiveness of attempting to control eutrophication * * * by further improving capabilities for removing nitrogen and phosphorous at the Washington area sewage treatment plants." Essentially, an ample supply of nutrients may be available regardless of further waste water treatment improvements.

1/"High Flow Contributions to Summer Water Quality Problems in the Tidal Potomac River," presented by James P. Bennett, Nov. 17, 1980, at the fall meeting of the Interstate Commission on the Potomac River Basin.

--The Environmental Defense Fund, which has also been monitoring data collected on the Potomac, maintains, in a report published in August 1980 1/, that the phosphorous controls used by the D.C. area since the mid-1970's have had no effect on restricting algae growth. The report maintains that sufficient phophorous is available from bottom sediments and that only by implementing nitrogen controls can eutrophication be prevented.

--EPA is currently studying the estuary also and is funding--through a grant to Washington, D.C.--the work of a nationally recognized expert on modeling who has tentatively concluded, in a September 1980 report 2/, "There is evidence to indicate improvement in the quality of the Potomac estuary as a presumed result of phosphorous removal from Blue Plains as accomplished to date. Recognizing that the full implementation of planned phosphrous reduction has not yet been reached, the present path of phosphorous removal appears reasonable and should be continued."

Recognizing the uncertain need for these stringent nutrient controls, EPA, since 1975, has deferred its requirements that treatment plants discharging into the Potomac estuary build denitrification facilities. The need for denitrification, and even phosphorous controls, has obviously not yet been settled and is the focus of EPA's reanalysis of the Potomac's assimilative capacity. EPA, however, appears to be caught in a dilemma. The stringent nutrient control requirements in the Washington, D.C., area were set at a time when there was little scientific evidence to support them; however, once established, the burden for demonstrating they are not needed rests with the plant operator, the District of Columbia. Science, however, may not have yet progressed to the point which will allow the District to show that these requirements should no longer be required.

1/"Short-term Objectives for Wastewater Treatment Plants, Potomac Estuary," a paper prepared by Thomas P. Flaherty, Process Research Institute, Aug. 1980 for the Blue Plains NPDES Adjudicatory Hearing.

2/"Rebuttal of Dr. Robert V. Thomann on Structure and Credibility of Entrophication Modeling of Potomac Estuary and Comparison of Environmental Defense Analysis to Accepted Procedures," by Dr. Robert V. Thomann, Limno-Tech, Inc., Sept. 22, 1980.

Potomac water quality improves, but why? Blue Plains is not even close to its intended permit requirements

Blue Plains, by far the largest plant discharging into the Potomac estuary, is dumping at least 2 to nearly 5 times more pollution (see p. 59), depending on the pollutant, than intended under its operating permit. In spite of this, all indications are that the Potomac water quality has improved markedly in the past decade. The estuary is used extensively for water recreation and for fishing although the standards used to measure the river's suitability for these purposes are still not being met at all times and in all places. Given the physical evidence, the obvious question is: are the water quality standards more stringent than necessary to meet the stated goals for the use of the river?

Despite the physical evidence of a cleaner river and the extraordinarily high costs of completing waste water treatment plants to meet the water quality standards, we could find no scientific study addressing the question of whether the standards are higher than necessary to accomplish the stated goals for the Potomac River. Studies underway now are directed at determining what levels of waste water treatment and/or nonpoint pollution control are needed to meet the standards--essentially chemical constituents of the water such as dissolved oxygen--without determining if the standards are higher than necessary to assure the river is suitable as a habitat for a healthy, varied fish population and for water recreation. Specific questions, such as how numerous and varied is the current fish population and what will be gained by a marginal improvement in water quality, are not being asked.

Even with much lower waste water treatment levels than included in EPA's Blue Plains permit, metropolitan area plants have accomplished a considerable cleanup effort, as indicated by chemical improvements in the Potomac estuary's water quality over the past decade. A 1981 report published for EPA entitled "Tidewater Potomac Cleanup: A Decade of Progress," cites substantial evidence that the Potomac's water quality has improved. It compared chemical constituents of the river in the 1969-1970 period with those observed in 1977-1979 and found numerous beneficial changes although waste water flows increased 24 percent during the period. Specifically,

--total phosphorous decreased about 50 percent;

--total dissolved oxygen increased 10 percent;

--oxygen-demanding substances decreased 35 percent; and

--total organic carbon and total nitrogen showed similar beneficial changes.

Furthermore, although scientific studies have not been conducted, the U.S. Geological Survey conducted a fishery survey between March and July 1980, which indicated that the variety and quantity of fish in the Potomac had increased. The survey consisted mainly of field observations, interviews with anglers, photographing of representative catches, and a limited literature search, and it identified several species of sporting and forage fish that inhabit the river. The survey indicated that anglers, as well as newspapers and sporting magazines, often point out that the return of the largemouth bass (a sporting fish) is directly related to the reduction of pollution in the river.

CONCLUSIONS

Washington, D.C., metropolitan governments are questioning the need for the Blue Plains plant's stringent effluent requirements which were established to meet Potomac River water quality standards because of the requirements' high costs and their uncertain effects on the river's water quality. The costs of achieving these requirements have skyrocketed and the Blue Plains plant--originally estimated to cost $360 million--will now in all likelihood cost $724 million if it is completed as designed. Operational costs have likewise escalated beyond expectations. In the past 2 years the Blue Plains plant's operating costs have doubled as AWT processes have come on line, even though the District has not staffed the plant at levels which design engineers believe necessary to properly operate and maintain it.

In the face of these skyrocketing costs, there is still substantial uncertainty over the need to maintain such high effluent requirements. The Potomac River models used to establish these requirements are based on a worst case river condition which is not likely to occur very frequently, but the Blue Plains plant's permit requires these treatment levels on a continuous basis. Furthermore, scientists still disagree on whether nutrient controls are necessary and there are current arguments supporting almost any position which can be taken regarding these requirements.

While uncertainties abound, the Potomac River, according to all accounts we have identified, has improved markedly over the past decade, but, because of delays in implementing water quality programs, waste water treatment levels are still far below those intended by the Blue Plains permit. This leads to two questions which are currently not being addressed: (1) Are the water quality standards higher than necessary to meet the Potomac River water quality goals? and (2) Is the additional incremental improvement in river water quality to be gained by meeting the standards worth the cost?

EPA is conducting extensive new modeling work to reevaluate the waste water treatment levels needed in the Potomac estuary to meet the criteria--such as the acceptable level of dissolved oxygen--used to measure achievement of water quality standards; however, EPA is not attempting to determine whether the criteria are themselves appropriate for the Potomac's water quality standards. EPA developed the criteria for nationwide use to gauge a river's suitability for fishing and recreational uses. Although the criteria are not presently being met in the Potomac estuary in all places and at all times, the river is used extensively for recreation and for fishing. What the D.C. area will gain in terms of greater recreational uses and improved fishing for its future investment is not a subject of any studies presently underway.

CHAPTER 7

SAME FORMIDABLE OBSTACLES ENDANGER CURRENT EFFORTS TO MEET FEDERAL REQUIREMENTS

Since 1970, Blue Plains plant users have obligated $938 million, including Federal funds, to construct the Blue Plains plant, their own treatment facilities, and related projects. Blue Plains has accounted for over $561 million of this amount and at least another $163 million will be required to complete the plant as designed. This expenditure, however, will not result in the Blue Plains service area meeting its pollution control requirements. Moreover, as much as an additional $1.4 billion in new construction may be required.

Currently, the District of Columbia, as operator of the Blue Plains plant, is undertaking two EPA-funded studies costing a total of $1.9 million. The District will make these studies to determine how to meet its intended permit requirements and how to dispose of its sludge. The studies are a prerequisite for obtaining Federal funding for the design and construction of any D.C. area waste water treatment project. In our opinion, the same obstacles which prevented the implementation of past plans will threaten the current effort with failure.

As with past plans, there are no assurances that area governments will accept the plan's recommendations. To the extent that the plan identifies alternatives outside the District of Columbia, the District is powerless to implement them on its own, and if current estimates are correct on the costs of alternatives within Washington, D.C., it is questionable if the District could afford them.

MUCH MORE REMAINS TO BE DONE TO MEET FEDERAL REQUIREMENTS

Thus far EPA and State and local governments have obligated $561 million to build Blue Plains, but much more construction remains before it is completed. Washington, D.C., government officials have estimated that if Blue Plains is completed as designed, the additional construction will cost $251 million--$163 million of which remains to be funded. Consequently, Blue Plains, if completed, may end up costing at least $724 million. Major costs yet to be incurred are for denitrification, estimated at $150 million, and sludge disposal facilities, estimated at $69 million (for incinerators and dewatering equipment to allow the sludge to burn without using much fuel). Such costs could escalate dramatically if the D.C. government chooses to build a higher technology sludge disposal facility.

If the District decides to build one of the newer high-technology sludge incinerator facilities which it is currently studying, it could cost from $150 to $300 million. The new processes generally recover heat from the incinerator (for use in producing electricity to assist in running the plant) and/or use solid waste as fuel to burn the sludge. These processes are extraordinarily expensive. The largest operating sludge and solid waste incinerator is located in Duluth, Minnesota, and cost $27 million to build; it is only one-seventh the size of the facility the Blue Plains plant would require. The largest sludge and solid waste incinerator process is being planned for Memphis, Tennessee, and it is estimated to cost $234 to $240 million when completed; it will be only one-half the size required by Blue Plains.

Furthermore, new facilities must be built to reduce flows to the Blue Plains plant. As discussed on page 19, Blue Plains is overloaded and will not be able to meet its intended permit requirements even after it is completed. To enable it to do so would require reducing waste water flows to the plant, which an EPA analysis has shown can be done in one of two ways:

(1) build the second regional waste water treatment plant, which was supposed to have been built by 1977, send Blue Plains excess sewage to it, and treat the excess combined sewage flows to such levels that the water quality standards are met; or

(2) reduce the storm water entering the plant through Washington, D.C.'s, combined sewer system either by separating the sanitary and storm sewers, greatly reducing infiltration and inflow, or by developing a means to store the combined sewage for release when the plant can completely treat it.

The District is currently conducting a major study of its combined sewer flows to understand the impact of overflows on area waterways and to explore all feasible options to reduce, as necessary, the volumes which must be discharged untreated. This study may identify less drastic options than those considered above. Furthermore, local governments are also conducting another study (see p. 89) that looks at alternative ways to expand the Blue Plains plant's capacity in a less costly and regionally acceptable manner. Local jurisdictions believe, for example, that it may be possible to move the plant's discharge line down river to a less environmentally sensitive segment and thereby allow higher pollutant discharges and perhaps eliminate the need for any new waste water treatment plants.

It is hoped that these current studies will identify lower cost but politically acceptable alternatives because previously identified alternatives are very expensive. An EPA engineer who

monitors the District programs believes costs will range from $500 million to $1.4 billion, depending on which alternative is selected. The lower cost alternative would be to build a second regional plant, interconnected with Blue Plains and located in the vicinity of the Piscataway sewage treatment plant in Prince George's County. The highest cost alternative would require the District to separate its combined system into separate sanitary and storm sewers. The second alternative is so expensive because it would require digging up large portions of the city and laying new sewer lines. A similarly expensive alternative would require massive underground storage facilities to hold the combined sewage until it could be accepted for treatment at the Blue Plains plant.

CURRENT WASTE WATER TREATMENT PLANNING FACES FAMILIAR OBSTACLES AND MAJOR UNCERTAINTIES

The District is redoing the many planning efforts that local and regional agencies have done over the past 10 years in their attempts to develop sufficient waste water treatment facilities for the D.C. area. By now, the solutions available to local governments are well known and it is likely that local governments will be confronted with the same or similiar choices that they have already rejected. As with past planning efforts, the major obstacles to overcome will be the difficulty in implementing plan recommendations.

Furthermore, many uncertainties still remain which must be clarified before local jurisdictions are likely to commit the large sums of money required for new major construction projects. Surprisingly, after so long a time and so much money has gone into D.C. area water quality planning and waste water treatment programs, there are still many fundamental questions unanswered.

--No one is certain how much sewage is going through Blue Plains.

--The plant has never come close to being fully operational and no one as yet knows for certain how it will actually perform once it is completed.

--EPA has only recently begun reexamining its permit requirements and the results will not be fully developed until late in 1981 at the earliest.

Therefore, at the present time, no one is quite sure what they are planning for in the current $1 million planning effort.

Obstacles which doomed past plans to failure still exist but are now greater

If current standards remain in effect, as much or more waste water treatment capacity must be built during the coming decade as was built in the Blue Plains service area in the past decade. How to get the cooperation of local governments to (1) undertake the comprehensive areawide analysis necessary to identify areawide solutions to their waste water treatment needs and (2) implement recommended programs will create even more formidable problems than have been created in the past decade.

Recognizing that Blue Plains will not be able to meet its permit requirements and that the 208 planning process could not identify implementable solutions to the problem, EPA authorized the Blue Plains user jurisdictions to undertake a new feasibility study, which could cost $1 milllion, to identify alternative ways in which Blue Plains can meet its permit. The feasibility study is a prerequisite first step to obtaining Federal funding for the design and construction of any proposed project. It was expected to be completed in October 1981. The projects recommended by this plan are expected to take another 3 to 5 years to design and begin building and another 3 years to build. Thus, the plant would be operational about 1987 at the earliest--10 years later than when the regional facility was first expected to be needed. We believe it is unlikely that local governments will meet this schedule.

Because the Blue Plains treatment plant is located in the District of Columbia, the District is overseeing the contractor's study work. The study is funded by Federal grants to the District, WSSC, and Fairfax County. As with past planning efforts, however, local governments have also structured the planning effort to assure they have maximum control over alternatives analyzed by the contractor.

The plan has missed its October 1981 deadline. According to District officials, July 1982 is a more realistic estimate.

Local jurisdictions delay the planning process

The current planning effort is already experiencing some of the same problems that arose in earlier efforts. The planning effort is 10 months behind schedule because local governments could not agree on defining the scope of work. Prince George's County objected to the original scope of the study which included the Piscataway area as an explicit alternative to be studied. By including Piscataway explicitly as an alternative to be considered, Prince George's County believed the study was

being predisposed toward the Piscataway expansion as the regional solution. The county maintains that it will not agree to a singular regional facility within its boundaries. Furthermore, Fairfax County objected because it did not believe the D.C. area's capacity needs have been adequately defined to conduct such a study. As a compromise, after many area meetings, it was agreed that the study would be conducted in two phases.

Phase I will define the capacity needs of the D.C. region, assuming that the existing Blue Plains permit will remain in effect, but Phase I is structured to allow local governments substantial input on alternatives to be studied. Phase I must first look at all alternatives which the District could implement within its boundaries to meet the permit and then look at other alternatives outside the District, but only after local governments complete a 6-week review of work performed. Local jurisdictions phased the study in this manner to assure that all reasonable alternatives for expanding the Blue Plains plant are adequately evaluated. Local officials told us they were concerned that past studies failed to explore these alternatives and were therefore biased toward solutions in other jurisdictions. Upon completion of Phase I, after public comments have been received, local jurisdictions will select the alternative which will allow the District to meet the Blue Plains permit requirements.

Phase II will then determine the size of the facilities needed and the system's required treatment levels on the basis of the results of EPA's current reassessment of its pollution control requirements. Phase II will also develop the interjurisdictional agreements necessary to implement the regional program.

A new regional plant may be recommended but no jurisdiction wants one and the District may not be able to afford alternatives

If current requirements remain in effect and past analyses of Blue Plains capacity are correct, the new planning effort will probably recommend substantial new construction as all other studies conducted in the past decade have recommended. If past reports of Blue Plains capacity limitations are confirmed by the current studies, a minimum of 80 mgd additional capacity will have to be built outside the District. Otherwise, the city will

have to find a way within its boundaries to divert the storm water portion of its combined sewer system from the plant. 1/

As has clearly been demonstrated in the past 10 years, no jurisdiction wants the full burden of a regional waste water treatment facility and this will continue to be a major obstacle confronting any proposal for constructing a plant outside the District of Columbia. Although the difficulties encountered in the past decade have been severe, the difficulties to be encountered in siting a new facility in the current decade are probably going to be worse. In the past 10 years, the capacity added to the region was achieved primarily by expanding existing facilities. Issues involved in siting plants, such as public opposition and environmental impacts, are not so much problems in expanding existing facilities as they are problems in constructing new facilities because existing facilities were already in use and had the necessary operating permits. Future capacity will have to come from a newly developed site or by greatly enlarging, by a factor of nearly three times or more, one of the existing plants. Obtaining necessary approvals for such a large facility will be extremely costly and uncertain under existing conditions.

Furthermore, as discussed on page 35, jurisdictions outside Washington, D.C., have little incentive to build such a plant. These jurisdictions either have all the waste water treatment capacity they will need for the next 20 years, or are now in the process of obtaining it. Neither EPA nor the States can do much to force local jurisdictions to cooperate.

If no local jurisdiction agrees to a regional facility within its boundaries, and Blue Plains cannot be expanded, then Washington, D.C., may be left with the options of separating its combined sewer system or developing a storage system to retain storm-related flows until the flows normalize and the plant can fully treat them. The only presently identified alternative is to continue dumping large volumes of combined sewage flows into the Potomac, a procedure which Blue Plains was expressly designed to prevent.

Any of these alternatives, other than allowing combined sewage to be discharged directly into the Potomac, will probably cost more than $1 billion, and the District would be hard-pressed to finance its share. Sewer separation or combined sewer storage

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1/Under the current method of allocating flows to Blue Plains, the plant will ultimately be receiving at least 350 mgd, but to meet its permit the District must reduce this to 309 mgd. This 41 mgd of additional sewage must be diverted from Blue Plains without polluting the Potomac. Additionally, EPA officials estimate that the D.C. area may require at least another 40 mgd of new capacity to accommodate growth likely to occur in the region through the year 2000.

is not a new idea to the area. Washington, D.C., undertook a separation program in the 1960's but abandoned it as prohibitively expensive. The District, like many other cites, is currently having serious fiscal problems and, even at the maximum Federal funding rate of 75 percent, would have difficulty financing such a project. Furthermore, unless other studies have been grossly in error, such a decision would not be a cost-effective solution for the D.C. regional waste water treatment problem and EPA would have difficulty, even if it had the funds, justifying a grant for the project.

The planning effort will be hampered by major uncertainties

While the current planning effort is now getting underway, there are major questions that local jurisdictions are going to want answered before agreeing to any new major construction projects. In spite of the many earlier studies, there is still uncertainty over what the region's waste water treatment capacity needs are. These major uncertainties include the following.

--The actual amount of sewage going through Blue Plains is not reliably measured.

--EPA is reassessing the assimilative capacity of the Potomac which could dramatically change, one way or the other, requirements for waste water treatment needs.

--The Blue Plains plant's ultimate performance is a matter of speculation until the plant is fully operational.

Neither plant operators nor EPA know for sure precisely how much sewage is going through Blue Plains because there is no metering system to measure effluent being discharged. The three separate requirements for accurate reliable flow measurement at Blue Plains are as follows:

(1) enabling best treatment results by balancing hydraulics through the plant;

(2) providing accurate billing to the jurisdictions using the plant; and, most importantly,

(3) determining how much pollution is actually going into the river.

We could not identify precisely why Blue Plains was not designed with a metering system to measure plant effluent. Accurately measuring flows through a plant as large and complex as this one is such a critical factor in enforcing permit requirements and

determining the plant's impact on the river that EPA's failure to require adequate meters was a major oversight.

Currently, Washington, D.C., has proposed to install a $6 million metering system but has yet to award the contract. Plant operators estimated that the metering system will not be in place until at least 1983.

Because Blue Plains was not designed with a separate metering system to measure effluent being discharged, plant operators use a series of process meters which were designed to monitor flows through various parts of the plant to properly manage the various systems. Plant operators calculated the total flow through the plant by summing flows through the 12 separate process flow meters.

While this method is sound in theory, in practice it has been defeated by the repeated failure of several of the flow meters to perform reliably. During an onsite inspection conducted in January 1981 by EPA's Engineering Technical Pilot and Field Evaluation Section, 8 of the 12 meters were inoperable. The plant has experienced major failures of its meters since May 1980 and reported flows have fluctuated widely from the 395 mgd reported in March 1980 to the 308 mgd reported in March 1981. EPA is as yet uncertain whether these flows are real or the result of an error in estimating flows. The issue will probably not be resolved with certainty until accurate meters are installed and calibrated.

Furthermore, the results of EPA's reassessment of its pollution control requirements for the Potomac have been delayed and are as yet unavailable to planners. Although the last assessment of EPA's pollution requirements was undertaken in the early 1970's, EPA did not begin this reassessment until April 1979 (though in the summer of 1977 it began collecting data and conducting tests which are being used in the reassessment). EPA did not undertake the reassessment earlier because it hoped to see the completion and operation of all Blue Plains AWT processes except denitrification. This would have enabled EPA to better evaluate the effect of Blue Plains on the estuary and more reliably determine if denitrification would be required.

Furthermore, Blue Plains will not be completed before 1982 (and, if denitrification is required, before 1985-86) and, consequently, there is still some uncertainty regarding how the plant will ultimately perform. Blue Plains plant design engineers, in a 1976 report, recommended that the plant would have to be fully operational for some time before its capabilities would be known.

Consequently, the controversies surrounding the need for the stringent discharge standards imposed on the D.C. region are not likely to be resolved by current efforts. We believe the uncertainties which remain provide one explanation of why local governments may continue their foot-dragging.

CURRENT PLANNING FOR SLUDGE DISPOSAL FACES FAMILIAR OBSTACLES

As with the waste water treatment planning effort, the District is redoing the sludge disposal studies it and other governments have done over the past 10 years. While sludge disposal technologies have developed somewhat over the years, it is unlikely that any previously unidentified option will surface to surprise local jurisdictions. Once again, they are likely to be confronted with the same options that they have considered and rejected in the past.

As with other planning efforts, there are no mechanisms to assure that any of the recommendations will be implemented. Although the study will look at options outside of Washington, D.C., as well as within the city, the same obstacles which doomed past plans to failure are still present. No local jurisdiction has been willing to accept a permanent regional sludge disposal site within its boundaries and there are no incentives for one to do so now.

Furthermore, current studies are focusing on high-technology disposal options, such as coincineration, because these provide the best prospects to dispose of large volumes of sludge on the Blue Plains plant site. While these high-technology options have been considered by the District in the past, they have not been followed up on because of their high capital costs and experimental nature. Presently there are no codisposal plants operating in the United States anywhere near the size required by Blue Plains.

Mechanisms to enforce recommendations do not exist

D.C. area governments have been trying unsuccessfully for 7 years to develop a long-range sludge disposal program, but each attempt has failed because projects on which they were based were not implemented. While the current effort, unlike past efforts, will be regional in scope, there are no mechanisms to assure that projects which are recommended will be implemented. The District of Columbia will face the same obstacles in siting facilities that it has had in the past: there is little space in Blue Plains for processes other than a form of incineration which is essentially banned by the D.C. government, and attempts to site facilities at other locations in the city have been studied before but have been unsuccessful.

As with the waste water treatment planning effort, the District is the recipient of two Federal grants totaling $920,280 to conduct the sludge disposal study for the Blue Plains waste water treatment plant sludge. The study will look at sludge disposal options in each of the Blue Plains user jurisdictions and will consider sites and processes suitable for both a single

regional facility as well as individual facilities in each jurisdiction.

The District and the local jurisdictions using the plant were under a court order to have completed a long-range sludge disposal plan by January 1, 1980, but this deadline, like the many others before it, was not met. The current sludge disposal study is another in the series of attempts to find the D.C. area's long-range solution to its sludge disposal problem. The District has tried to get this current study underway since January 1980 but, because of administrative difficulties in getting its scope approved by EPA and in selecting a contractor, the study did not begin until June 1981. Another year or more will be needed to complete the study before local jurisdictions must again face the tough decision of where to dispose of Blue Plains sludge.

Given the extensive studies conducted in the past by the District of Columbia and the individual jurisdictions which use Blue Plains, it is unlikely that the study will come up with any radical departures from the findings of past studies. It does have the advantage of bringing things together by listing the regional options available and comparing their costs and environmental impacts in a single document. The study, however, will still not obligate jurisdictions to implement any of its recommendations and implementing recommended programs, as already discussed throughout this report, has been extremely difficult in the D.C. region since 1974.

To the extent that the study identifies disposal options outside the District of Columbia, it is powerless to implement them. In the past 7 years, no local government has been able to put into operation a permanent sludge disposal project for even its own share of Blue Plains sludge, and no attempts to site a regional facility outside the District have gotten beyond the discussion phase. EPA too is powerless to force local jurisdictions to implement recommendations of another jurisdiction.

Recommendations for facilities within the District of Columbia face similarly dim prospects of being implemented anytime in the near future. The District has little available land for sludge processes off the Blue Plains site, and efforts in the past to use the land which is available have not been successful. Furthermore, the Blue Plains plant site is already crowded by waste water treatment processes and it is unlikely--particularly if EPA requires the District to build its denitrification process--that there is any room for anything other than an incineration process. Incineration processes are currently not allowed in the District of Columbia. Even if Washington, D.C., law and its air quality implementation plan are amended and EPA grants the necessary permits, traditional incineration is very energy intensive and may be prohibitively expensive for the large volumes of sludge produced at Blue Plains. Because of this, codisposal processes, which use municipal solid

waste as a fuel to burn sludge, are a focus of the options being studied for the District, but these are extraordinarily expensive to build--the consensus opinion is at least $150 to $300 million--and such a process is experimental on the scale required by Blue Plains. How the District would finance such a large expenditure and whether it and EPA would be willing to take the large risk associated with a new process is at best uncertain.

Nearly all possible options have already been considered but rejected as a long-term solution

There are not all that many options available to metropolitan areas to dispose of large volumes of waste water treatment sludge. The list of options which local governments have considered, tried, or are currently using, reads like a compendium of sludge disposal practices. Unfortunately, none as yet have been found suitable for a long-term disposal program.

Following is a list of sludge disposal practices which have at least been studied in the past for disposing of Blue Plains sludge.

1. Ocean disposal. Considered for Blue Plains in the early 1970's but rejected because of Federal opposition to the practice. Since that time, EPA regulations for administering the 1977 amendments to the Marine Protection, Research, and Sanctuaries Act prohibited ocean dumping after December 1981.

2. Thermal dehydration. A drying process which removes much of the water from the sludge and eliminates odors and pathogens, making it suitable as a fertilizer or soil conditioner. Washington, D.C., conducted a pilot project operated by a private contractor in the mid-1970's, but air pollution problems and frequent process failures caused the project to be terminated.

3. Incineration. Considered in the early to mid-1970's as the prime disposal alternative, but the tremendous fuel cost increases which have occurred since that time make it among the most expensive sludge disposal practices available and local governments have therefore not pursued it.

4. Landfilling and trenching. These processes have been used extensively in the D.C. region for sludge disposal, but suitable sites are hard to find to accommodate the large sludge volumes produced. Both land disposal practices have been opposed by D.C. area State health departments because of actual or

potential public health hazards created by sludge leachate migrating into area waterways or groundwater supplies. Neither is considered a feasible alternative for future long-term programs.

5. Composting. This process has been extensively studied in the D.C. area and is being used at the present time. Because of citizen opposition and perceived public health risks involved in the composting process, however, the region has yet to build a permanent facility. Futhermore, because of public health risks associated with the compost product, it is unclear whether local jurisdictions will be able to successfully market it. Over the long-run, extremely large volumes of the product may have to be spread over D.C. area lands if this were to become the ultimate long-range disposal option.

6. New incineration processes. The District has studied incineration with heat recovery and various forms of codisposal but has not acted on the results of any of these studies because projects would be experimental at the scale required for Blue Plains.

There are relatively few sludge disposal processes suitable for a metropolitan area with large volumes of sludge and relatively little land to dispose of it on. Many of the options available to D.C. metropolitan area governments have already been explored but found unsuitable for long-term disposal programs.

Major uncertainties still exist: all disposal options pose some environmental risk and some are technologically unproven

Even if local governments can agree on a long-range disposal practice and on sites to conduct it, they will have a hard time getting the process implemented. All sludge disposal practices carry some environmental risks which can be minimized, though never completely eliminated. State and local governments have a difficult time approving long-term practices which are environmentally risky. Furthermore, as well as the environmental risks, the newer incineration processes which are most suitable to metropolitan areas with little land are still technologically unproven at the scale needed for a large waste water treatment plant such as Blue Plains. These newer processes will face almost insurmountable problems in implementation in that they have all the risks of the more well established processes but are also both expensive and experimental.

All sludge disposal practices carry some risks which can be minimized though never fully eliminated. Regardless of the process used, for example, the cadmium in sewage sludges will pose at least some threat to public health.

All land disposal processes, including composting, risk increased levels of cadmium entering either the food chain through uptake by crops, direct ingestion by humans or livestock, or contamination of groundwater used for drinking water supplies. While landfilling and landspreading practices are regulated under the Resource Conservation and Recovery Act to minimize the risks, there are as yet no Federal regulations governing how sludge products such as compost can be distributed to private citizens for land application.

Any incineration process likewise carries risks of air pollution which is a particular problem in many metropolitan areas. Washington, D.C., for example, may not be able to burn the large volumes of sludge it now produces at Blue Plains without violating its nitrogen oxide standards. Furthermore, incineration does not solve the cadmium or other heavy metals problem. Apparently, air pollution control technology does not yet exist to capture more than 70 percent of the cadmium in waste water treatment sludges, thus 30 percent is likely to escape into the atmosphere. There are as yet no Federal emission standards on cadmium escaping from sludge incinerators and its public health implications are uncertain, but EPA is studying the matter. Furthermore, the inert components of the sludge, such as its heavy metals, become concentrated in the incinerator ash. If these trace metals are present in the sludge ash, the concentrations may become high enough to cause the residue to be classified as hazardous waste, with concommitant problems in landfilling the final residues.

The newer incineration processes being studied by Washington, D.C., have all the risks associated with traditional incineration but are also much more expensive to build and are still experimental. At the present time there are only a handfull of thermal codisposal projects being built in the United States, none of which are fully operational. In addition, the largest built is only one-seventh the size needed for disposing of the Blue Plains sludge. Because of these circumstances, codisposal options will face a difficult time being implemented in the near future.

Some new technologies which are being developed may help solve the Blue Plains sludge disposal problem in years to come. EPA's Office of Research and Development has recently completed a study which concluded that Blue Plains may be able to process its entire sludge volume at the plant site by using a modified sludge digestion process. This may provide a solution to the Blue Plains problem if the process can be successfully scaled-up from successful

demonstrations in the laboratory and at a smaller treatment plant. Since EPA's Office of Research and Development recommends this as an alternative to the Blue Plains sludge disposal problem, presumably, the District will fully evaluate the process during its current sludge disposal feasibility study.

The problems of finding and implementing acceptable sludge disposal programs in metropolitan areas are well recognized but the solutions are not. In 1978, the National Research Council of the National Academy of Sciences issued a report, "Multimedium Management of Municipal Sludge," which concluded that the Federal Water Pollution Control Act has created an urgent need for a comprehensive review of the options available for managing sludge. The report states:

> "As sludge generation increases daily, it becomes clear that postponing decisions on its disposition is in fact tantamount to deciding in favor of possible environmental damage and certain management frustration. To avoid this outcome, the timely development and implementation of a definitive, coherent federal sludge management policy should be taken * * *.
>
> "The basic message of the report is that effective sludge management demands a holistic approach [looking at the relative environmental risks associated with sludge disposal programs on the land, water and air]: today's fragmented approach is inappropriate to the nature of the material and inadequate to the size of the problem. Only when sludge is managed as an integral element of the whole environmental protection effort can economic, environmental and social costs be validly compared with benefits, or all risks be effectively assessed * * *."
>
> * * * * *
>
> "Sludge policy that mandates the production of the material but does not adequately consider its disposition in the environment is obviously incomplete."

While EPA has shown a growing interest in developing ways to better integrate its management of interrelated environmental programs, it has not adopted the more integrated approach recommended by the National Academy of Sciences. At the present time, EPA believes it should concentrate its efforts toward minimizing factors which contribute to risk while encouraging the evaluation of disposal options at the local level.

CONCLUSIONS

Because the same obstacles which have caused past planning efforts to fail are as formidable as ever, current planning efforts for D.C. area waste water treatment and sludge disposal facilities have little chance of success. Past planning efforts have been extensive, and it is likely that D.C. area local jurisdictions will be confronted with the same choices for needed projects that they have already considered but rejected.

As with past plans, there are no assurances that the plan recommendations will be accepted. To the extent that the plans identify alternatives outside the District of Columbia, the District is powerless to implement them, and if current estimates are correct on the costs of alternatives within Washington, D.C., it is questionable if the District could afford them.

CHAPTER 8

CONCLUSIONS, RECOMMENDATIONS, AGENCY AND STATE AND LOCAL GOVERNMENTS' COMMENTS, AND OUR EVALUATION

CONCLUSIONS

The metropolitan Washington, D.C., area has had a difficult time in implementing its water quality programs. In spite of large expenditures and diligent efforts by State and local governments and EPA, the D.C. area program has not met its goals and the progress which has been made has cost much more than necessary and accomplished much less than expected. The D.C. area's major waste water treatment plant, Blue Plains, could cost as much as $724 million if completed as designed, but under the present circumstances it is not likely to ever meet its intended pollution control requirements. Additionally, local governments and EPA have spent well over $125 million on planning efforts and projects that were unproductive, unnecessary, or minimally used. Local ratepayers too have had to bear much more of the cost of D.C. area programs than necessary.

There have been many reasons for the failure to implement water quality programs, but the major one, in our view, has been the seemingly irreconcilable difference between what EPA and local governments consider as reasonable solutions. Local jurisdictions in the D.C. area have proposed solutions developed through compromises among themselves which would have enabled them to achieve their water quality goals and also meet their criteria for political acceptability, but these solutions were too costly or environmentally less than optimal and were denied Federal grant assistance. This has frustrated both D.C. area local jurisdictions and EPA and has left each unhappy with the performance of the other. The inability of local governments and EPA to accommodate each other's needs exists today as it has in the past, and there is little likelihood that current efforts to find solutions to the still unresolved problems will be any more successful than past efforts.

The major reasons for this inability of the local governments and EPA to agree have been the absence of effective mechanisms in the D.C. area to conduct and implement regional plans. EPA must assure itself that proposed projects make sense on a regional basis, but regionally acceptable projects are often not in the best interests of each individual local jurisdiction. Local jurisdictions recognize this and protect their interests by structuring the planning and program implementation mechanisms to preserve their individual prerogatives. This has resulted in regional plans that have been essentially compilations of individual local jurisdictions'

plans which have been far less than optimal from a regional engineering perspective.

Local elected officials have economic and social goals to achieve for their jurisdictions as well as regional clean water goals. In our opinion, economic and social goals are clearly not viewed by D.C. area officials as subservient to regional clean water goals, nor are we saying that they should be. But, to the extent that proposed regional water quality projects are not consistent with what local jurisdictions believe to be in their best interests, the project is generally not implemented, even if clearly shown to be in the best interests of the region as a whole.

The absence of regional mechanisms was certainly not the only problem in implementing D.C. area water pollution control programs. Siting facilities under any circumstances in the D.C. region has been difficult for local jurisdictions and they have generally needed outside pressures to successfully implement programs. Most programs which D.C. area governments have implemented were done so under the pressures created by State imposed moratoria, a court order or consent decree, or the expiration of virtually all known short-term alternatives. Such a crisis-oriented form of management has been costly and environmentally risky.

In spite of these difficulties, local jurisdictions in the D.C. metropolitan area have made progress in implementing water quality programs as evidenced by the greatly expanded and improved waste water treatment facilities and the improving Potomac River water quality. This progress, though, has brought new concerns and problems which were not readily apparent or expected when area governments and the Federal Government established original goals for cleaning the Potomac River.

--The program has been much more costly to develop, operate, and maintain than originally expected and the realities of current fiscal constraints in the Federal, State, and local governments raise significant issues regarding the affordability of existing standards.

--The need for rigorous water quality standards which form the basis of existing programs is as yet unproven, and the public benefits to be derived by future investments to meet these standards are not apparent.

--The reductions in waste water pollution needed to meet existing standards created a new environmental problem--sludge disposal--which is difficult to solve in metropolitan areas with

relatively limited land and existing air pollution problems.

The underlying causes of the problems and concerns experienced by D.C. area governments in implementing their water quality programs, we believe, can be generalized. The facts that local governments generally act autonomously and in their own self-interests, that the fiscal constraints of the present time call for a reevaluation of program goals, and that the water quality programs create a dilemma whereby solving one environmental problem creates another, are not, we believe, isolated to the D.C. metropolitan area. Other reports by us (listed in app. I) have shown that on a broad geographic scale:

--regional planning has not been very successful in solving water quality problems;

--sludge disposal is a major problem as yet unresolved;

--high waste water treatment levels may not be worth the costs; and

--many costly waste water treatment projects fail to meet their intended purposes.

Consequently, we believe that there are some fundamental problems with how water quality programs have been implemented nationally over the past decade.

There is no single solution to the problems local jurisdictions face in complying with environmental mandates, particularly in safely disposing of sludge and other residues. There is generally strong public opposition to the siting of disposal facilities, as well as waste water treatment plants, in any locality. Clearly, changes are needed to allow for thorough public review of the relative risks and benefits of potential and proposed waste water treatment and residues management facilities. But these changes must also recognize the National and State needs for environmentally safe, cost-effective facilities and sites.

The Federal Water Pollution Control Act provides for a regional approach to water quality planning which we believe is desirable, given the enormous costs of water pollution control programs and the impact that siting of waste water treatment plants and residues management facilities has on the program's economic and environmental effectiveness. Implementing a regional approach, however, is difficult for metropolitan areas because it runs counter to the way local governments traditionally operate.

If regional planning and program implementation are ever to be successful, we believe some local prerogatives must be sacrificed and effective organizations for planning and implementing regional solutions must be created. Such organizations, of course, must have maximum input from the local jurisdictions' elected officials and the public at large, but, just as importantly, must also have the responsibility and authority to make a decision on what needs to be done and to implement it.

Furthermore, Federal, State, and local environmental agencies must consider their decisions on a comprehensive basis, by assessing the tradeoffs among the various programs and the impacts on the air, water, and land. Strategies for meeting objectives in one program, such as cleaner water, should be developed without unacceptably diminishing the quality of the land and air.

To meet their clean water mandates, local jurisdictions must produce and dispose of large quantities of sludge which in itself poses some risk to public health. Waste water treatment levels have improved dramatically but the options available to local governments for sludge disposal have decreased as Federal laws and regulations controlling land disposal practices and incineration have become more rigorous and ocean disposal has been prohibited. This raises an obvious and very serious question: are the benefits of high levels of waste water treatment worth the public health risks created by current sludge disposal practices? The National Academy of Sciences maintains that the benefits of cleaning our Nation's rivers cannot be assessed without first answering that question.

Presently, local governments must overcome severe public opposition in siting almost any treatment or disposal facility and must also deal with complex regulations which greatly restrict their options. These double burdens make any project highly uncertain, even if shown to be feasible, cost-effective, and environmentally acceptable. More importantly, this set of circumstances forces local governments to implement costly interim programs without the benefits of comparative cost-effectiveness or environmental analyses. Essentially, these interim programs reflect what they can and must do because they have no alternatives.

More permanent solutions are difficult to adopt because there are still major uncertainties regarding the benefits of current rigorous effluent requirements and the risks of sludge disposal programs. Local jurisdictions, given these uncertainties, are understandably hesitant to commit large sums of money on projects that may not be worth the costs or that may result in significant adverse environmental impacts. Because achieving current effluent requirements is a legal obligation, local jurisdictions must go through the motions of finding ways to meet these requirements. We believe this contributes to the recurring cycle of planning and replanning which produces the paralysis by analysis syndrome we saw in the D.C. area.

Under the present circumstances, though, little else can be done. Once States set water quality standards, the Federal Water Pollution Control Act does not allow EPA a great deal of flexibility to question the high treatment levels on the basis of the costs of achieving them in comparison to the uncertain or minimal incremental benefits to be achieved, or on the basis of the uncertain environmental impacts created by sludge disposal programs. Once water quality standards are established, however, current regulations provide that they can only be downgraded on economic grounds if achieving the existing standards would cause substantial and widespread economic impact. According to EPA, this means that the Potomac River standards could probably not be relaxed much.

We believe the legislation and regulatory approaches should be more flexible to explicitly direct EPA and State and local governments to consider the costs in comparison to the benefits which are likely to be achieved in adopting, approving, or amending water quality programs. Furthermore, we agree with the National Academy of Sciences' conclusions that water quality program administrators must consider the negative environmental effects of sludge disposal before implementing the massive water quality programs which transfer pollution problems from the water to the land or air.

We recognize that EPA cannot await scientific proof of the need for stringent clean water programs or the development of optimum disposal processes for metropolitan area waste water treatment plant sludges before it undertakes new programs, because this could seriously constrain any reasonable effort to continue improving water quality. But, we believe substantial progress could be made without the need to implement programs requiring the highest levels of waste water treatment in advance of more certain knowledge that they are in fact necessary to meet water quality goals and are worth the costs and resultant environmental risks associated with sludge disposal.

RECOMMENDATIONS TO THE CONGRESS

The Congress should, in considering reauthorization of and amendments to the Federal Water Pollution Control Act, retain the essential design of the act's regional planning provisions. The Congress should also reemphasize that EPA require, as necessary, regional planning and program implementation mechanisms for metropolitan areas as a prerequisite for them to obtain Federal water quality project grants. While such regional mechanisms can take several forms--Federal-State compacts and intergovernmental agreements, for example--we believe each should have some common elements:

1. The designated planning organization should have maximum input from local governments and citizens but should be assured the freedom to evaluate all

reasonable engineering alternatives to solve the problems at hand.

2. Participation by State and local government agencies must be mandatory from the outset and there must be an obligation by participants to begin implementing recommended and approved programs. This will require participating jurisdictions to adopt some form of dispute-resolving mechanisms to deal with inevitable disagreements between local jurisdictions and between States.

3. The participating jurisdictions should assure the regional agency is able to implement recommendations.

We recognize that establishing such regional mechanisms will not be easy because it runs counter to traditional State and local governmental roles, but this appears necessary if locally derived solutions to water quality problems are to remain a legislative objective. In the short term, we also recognize that EPA will face substantial problems because it will not be able to fund new projects in metropolitan areas until such mechanisms are operating.

Given these problems, we have also developed alternative approaches which the Congress should consider if it determines the above-recommended optimal regional approach is not acceptable. These include:

--Requiring EPA to become a more active participant. Under this strategy, EPA would continue to apply regional criteria in determining the acceptability of recommended projects for Federal funding but would assume a larger role in identifying alternatives if those developed by the local governments do not constitute a reasonable regional solution to the problems at hand.

--Eliminating regional planning as a Federal requirement, including Federal funding for such planning, and assessing projects on a case-by-case basis using as criteria available alternatives within the applicant jurisdiction's boundaries. Projects would be approved for Federal funding if they were cost and environmentally effective compared to other alternatives available to the local jurisdiction and if they are approved by the State. This would probably result in projects being implemented more quickly but at greater cost.

We also believe that the alternatives suggested to the Congress for amending the Federal Water Pollution Control Act

in our July 2, 1980, report, "Many Water Quality Standard Violations May Not Be Significant Enough to Justify Costly Preventive Actions," should be restated because the need is reaffirmed by this report. We therefore recommend that the Congress consider placing more emphasis on a cost/benefit approach in funding AWT projects. Alternative ways to amend the act to give EPA increased flexibility to consider costs more closely include the following:

1. Amend the Clean Water Act to require explicitly a cost/benefits review to show whether AWT will result in significant water quality, social, or public health benefits before such projects can be funded. The amendment should leave the water quality standards review process intact but should ensure that AWT projects are reviewed rigorously before being funded. Thus, the act would allow Federal funding of projects only where benefits exceed costs.

2. Amend the act to require the States to do a cost/benefits analysis of effluent limitations which are more stringent than those required by the act. If costs exceed benefits, the Federal Government should not fund AWT for those projects. States or EPA could still establish mandatory effluent limitations, but EPA would fund projects only where a cost/benefits analysis justified the need for such stringent limitations.

3. Amend the act to eliminate the requirement for a margin of safety which compensates for the lack of knowledge concerning the relationship between effluent limitations and water quality and include language in the act to require that all treatment beyond secondary and costing $1 million or more must produce significant ecological and social or public health improvements. This change of emphasis should promote wiser investments in AWT facilities.

4. Amend the act to declare a moratorium on AWT projects by withholding funding for waste water treatment beyond secondary until EPA can clearly show what ecological, social, and public health benefits are being realized by the various levels of treatment beyond secondary. A number of AWT plants have been built and are operating. The Congress may want to have EPA explicitly show what ecological, social, and public health benefits are being realized now that such plants are on line and operating.

RECOMMENDATIONS TO THE ADMINISTRATOR, EPA

To assist local jurisdictions in implementing necessary water quality programs while still assuring that funds are spent prudently, we recommend that the Administrator, EPA:

--Ascertain how the agency can manage its programs in a more integrated manner and make recommendations to the Congress on what, if any, legislative changes may be required. The issues raised by sludge disposal problems indicate the need to reassess the standards, goals, and requirements for each environmental program approach. The impacts that actions in one program have on other programs, and on the other environmental mediums, must be considered when making decisions. Without closely coordinated efforts, the environmental benefits gained from one regulatory program or decision can be offset by the creation of new and greater environmental problems in another program. For example, decisions made in establishing water standards should consider the effects the standards will have in creating sludge, the technology available to process and dispose of sludge, and the impacts of such processes on the air and land. Likewise, EPA's regulations precluding ocean disposal as an option presume that land or incineration disposal options pose fewer environmental risks which may or may not be the case in all situations.

--Renew earlier priority efforts to establish and issue regulations for the distribution and marketing of sewage sludge products.

--Undertake a more active role in assisting local jurisdictions in finding suitable methods for disposing of their sewage sludge and leading them through the regulatory maze to assure they can be implemented.

--Fund no new planning efforts for waste water treatment plants or related projects in metropolitan areas where regional approaches are needed until involved State and local governments have developed the institutional mechanisms needed to assure thorough regional assessments of alternatives and implementation of resulting recommendations.

--Approve no treatment plant upgrading or expansion without first having an approved program for disposing of the resulting increased sludge volumes.

AGENCY AND STATE AND LOCAL GOVERNMENTS' COMMENTS AND OUR EVALUATION

We solicited and received comments from the following eight sources: EPA; Virginia State Water Control Board; Maryland Department of Health and Mental Hygiene; Metropolitan Washington Council of Governments; District of Columbia; Fairfax County; Montgomery County; and Prince George's County. Montgomery County responded too late for us to fully incorporate its comments, but the report was revised to correct several identified technical problems. All commentors agreed that the report was a generally thorough and factual assessment of the problems the D.C. area has faced in implementing the Water Pollution Control Act. Also, they generally agreed that regional planning and cost benefit analyses were desirable, but they disagreed on how such planning and analyses should be implemented and on what they should be expected to achieve. Additionally, some local jurisdictions and the COG believed the report was too critical of local jurisdictions' efforts and not critical enough of EPA's.

Commentors agreed that regional planning is necessary for effective program implementation, but they disagreed on what constitutes an acceptable regional planning organization and what authority can realistically be given to such organizations. The Maryland Department of Health and Mental Hygiene supported our recommendations, stating that institutional planning arrangements should be formalized, creating an agency with authority to both develop and implement solutions but added that the Congress should stipulate that EPA must act as a strong mediating force. EPA likewise agreed with the thrust of our recommendations regarding the desirability of establishing planning organizations with implementing authority but stated that requiring such organizations as a prerequisite for Federal project funding is not necessary in all cases. Fairfax County also supported our recommendations, but it stated that the planning organization we recommend would be nearly impossible to establish given the expected strong objections of local governments. The COG and Prince George's County, on the other hand, stated that existing regional organizations would be adequate if given greater support by EPA. COG stated that a greater commitment by EPA to use the strong Federal policy currently contained in section 208 would provide the appropriate remedy to many of the problems identified in our report.

We agree with EPA that a strong planning organization with implementing authority may not be necessary in all cases and acknowledge the difficulty of establishing such organizations

where they are needed. However, we believe regional planning should be improved, and we have provided the Congress with a range of alternatives to consider in its deliberations on renewing the Federal Water Pollution Control Act.

EPA stated that in dealing with the regional planning issue, we failed to adequately analyze the role bargaining can play in developing a consensus among local jurisdictions on siting waste water treatment and sludge disposal facilities. EPA pointed out that the types of conflicts we described are not inevitable; essentially, EPA believes it may have been possible at one time for the District of Columbia to have agreed to treat area waste waters in exchange for other jurisdictions' acceptance of the sludge.

We agree that bargaining among local jurisdictions is a valuable tool in achieving consensus among local governments, but we did not explore bargaining options because they have not played a major role in the D.C. area. The existence of long-standing regional agreements in which the District agreed to treat other governments' waste waters makes bargaining at this time difficult. To use its bargaining leverage as the owner of property on which the Blue Plains plant is located, the District would, in our opinion, most likely have to resort to litigation. This, of course, may or may not increase its bargaining leverage.

Commentors supported the concept of cost benefit analyses in the review of water quality programs, but they were generally cautious in assessing what such analyses can actually achieve. EPA and the Maryland Department of Health and Mental Hygiene both commented on the difficulties of performing such analyses and cautioned that those involved should not expect more than can be delivered. Both, however, stated that such analyses are currently required by presently drafted revised EPA regulations to justify advanced waste water treatment processes. Furthermore, the Department appears opposed to considering costs in setting water quality standards. The State views water quality standards as the mechanism for stating its broad water quality goals and not as a means of setting economically feasible targets. EPA, on the other hand, supports the concept of cost benefit analyses in the review of water quality standards and its proposed Water Quality Regulations, as currently drafted, include provision for such analyses. The proposed regulations generally would not apply, however, to standards applicable to existing AWT projects. The Maryland Department of Health and Mental Hygiene also believes we have placed too much emphasis on cost benefit analysis and not enough emphasis on the water quality benefits achieved.

We emphasized the need to consider costs in deciding on future water quality programs because of the more than $1 billion it could cost to complete existing programs and the uncertainty over whether achievement of the required treatment levels of waste water would make an appreciable difference in

the Potomac River's water quality. Although we recognize the difficulties of performing cost benefit analyses, we believe costs need to be more explicitly considered in the decisionmaking process, particularly in the current climate of fiscal constraint which will necessitate better prioritization of expenditures. Our recommendations to the Congress for amending the Federal Water Pollution Control Act include options for accomplishing this.

Some local governments and the COG questioned the report's tone in dealing with EPA's role in area water quality management. In general, they believed EPA's actions and policies were the major factor inhibiting the area's progress in completing its water quality programs. While we agree that EPA contributed to area difficulties in implementing needed programs, we cannot attribute these difficulties primarily to EPA. Instead, they were attributable to a combination of factors which also included inadequate institutional mechanisms and inherent political, economic, and social problems that confront local jurisdictions when they attempt to site waste water treatment and disposal facilities.

EPA generally agreed with our recommendations to improve sludge management but believes it would lose too much management flexibility if it adopted the recommendation not to fund new waste water treatment projects without first having an accepted plan for sludge disposal. We believe that provisions must be made to adequately dispose of the sludge when new facilities will produce substantially larger volumes of it. The Blue Plains example developed throughout our report adequately demonstrates the need for this policy.

EPA also told us that our proposal to fund no new conveyance projects before obtaining commitments necessary to construct the receiving systems is unnecessary. EPA said it currently requires stronger commitments from local governments before funding such projects to assure situations such as the Anacostia force main will not recur. Consequently, we deleted the proposal from our final report.

There were several other general comments on the report. The Virginia State Water Control Board said that while our report accurately identified the problems involved in a regional approach to solving water quality problems, it failed to provide recommendations of much substance to correct the problems. Additionally, the Board believes we failed to address nonpoint source pollution which has contributed significantly to existing failures to meet water quality standards.

We recognize that our recommendations do not provide a quick or easy solution to the D.C. area's water quality problems. We were unable to identify any other potentially workable and politically acceptable solutions to the area's problems.

We believe, however, the combinations of recommendations to improve planning mechanisms, to assess costs and benefits, and to provide better Federal guidance on sludge disposal to local jurisdictions would alleviate some of the problems we identified from recurring in this decade. With regard to nonpoint pollution, the report discusses it briefly on page 47. We agree that nonpoint source pollution has contributed to area pollution problems. The D.C. area, however, will have the same obstacles in implementing solutions to nonpoint source pollution as it faced in siting area waste water treatment plants and sludge disposal facilities. There are no regionwide mechanisms to transform recommendations into local government action. Because of this basic problem and because nonpoint pollution studies were still underway at the time of our audit work, we did not make an in-depth analysis of this aspect of Potomac River pollution.

The Maryland Department of Health and Mental Hygiene commented that while the Washington Metropolitan area water quality problems are similar to those occuring in other parts of the Nation, it believes the atypical arrangement of government structures and processes creates many circumstances and environmental issues unique to the Washington area. We agree and recognize in our report that the presence of the District of Columbia, two States, and several large local jurisdictions, makes the D.C. area unique in terms of governmental structures. The problems we have identified in our report, however, are not unique, and for reasons discussed on pages 5 to 6 and 103, the underlying causes of these problems can be generalized to apply to other metropolitan areas.

Prince George's County commented that it believes we have advocated the construction of single large regional facilities for waste water treatment and sludge disposal without demonstrating that large facilities are in fact the best solution. Furthermore, Prince George's County stated it was disturbed by the report's statement that local jurisdictions have been unable to agree on an overall regional water quality management program.

We did not recommend a single regional facility for waste water treatment or sludge disposal. Instead, we described what local jurisdictions have adopted in their plans on the basis of their own analyses. For reasons discussed in the report, these plans were never implemented. While we recognize that local jurisdictions have made substantial progress in improving Potomac River water quality, as evidenced by the over $1 billion in new facility construction and upgrading and the apparent beneficial effect on water quality, the region has yet to solve the Blue Plains service area's overflow or sludge disposal problems. These are the problems we address in the report, and we believe that the factors which prevented their resolution over the 11-year period in which solutions were sought still exist.

COG commented that the Blue Plains permit requires higher levels of treatment than the plant was designed to achieve. They maintain the plant was designed to meet effluent limitations based on an annual average sanitary flow of 309 mgd and imply that storm flows were not supposed to be included in computing pollution loading limits. We disagree. EPA officials who developed the Blue Plains permit and who monitor plant performance told us that the plant was designed as a total flow plant and was intended to meet permit requirements, including pollution from storm related flows receiving full treatment. Our analysis of Blue Plains design engineers' reports confirms this.

The full text of the comments received on our report are included in appendices III through X. We have also dealt with numerous technical comments made by Prince George's County, COG and the Virgina State Water Control Board in the respective appendices.

LISTING OF OTHER GAO REPORTS

IDENTIFYING PROBLEMS IN PLANNING

AND IMPLEMENTING WATER QUALITY PROGRAMS

--River Basin Commissions Have Been Helpful, But Changes Are Needed, CED-81-69, May 28, 1981

--Billions Could Be Saved Through Waivers For Coastal Wastewater Treatment Plants, CED-81-68, May 22, 1981

--Millions of Dollars Could Be Saved By Implementing GAO Recommendations on Environmental Protection Agency Programs, CED-81-92, May 5, 1981

--Federal-Interstate Compact Commissions: Useful Mechanisms For Planning And Managing River Basin Operations, CED-81-34, February 20, 1981

--Costly Wastewater Treatment Plants Fail To Perform As Expected, CED-81-9, November 14, 1980

--Many Water Quality Standard Violations May Not Be Significant Enough To Justify Costly Preventive Actions, CED-80-86, July 2, 1980

--Large Construction Projects To Correct Combined Sewer Overflows Are Too Costly, CED-80-40, December 28, 1979

--Codisposal Of Garbage And Sewage Sludge--A Promising Solution To Two Problems, CED-79-59, May 16, 1979

--Water Quality Management Planning is Not Comprehensive And May Not Be Effective For Many Years, CED-78-167, December 11, 1978

--16 Air and Water Pollution Issues Facing the Nation, CED-78-148 A and B, October 11, 1978

--Sewage Sludge--How Do We Cope With It?, CED-78-152, September 25, 1978

SUMMARY OF COSTS FOR PLANNING, DESIGNING AND/OR CONSTRUCTING FACILITIES IN THE D.C. AREA WHICH WILL NOT BE BUILT, ARE NOT NEEDED, OR ARE MINIMALLY USED

Facilities designed but not constructed	Costs (millions)
Dickerson wastewater treatment plant	$ 12.8
Blue Plains incinerator	3.4
Oxon Cove composting facility	0.7
D.C. Government studies identifying sludge disposal options	0.4
Facilities built or being built that are not needed or are minimally used	
Anacostia force main	67.0
Piscataway incinerator	2.8
Piscataway discharge line	8.2
Dulles interceptor	27.7
Total costs	$ 123.0

APPENDIX III

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

SEP 30 1981

Mr. Henry Eschwege
Director
Community and Economic Development Division
U.S. General Accounting Office
Washington, D.C. 20548

Dear Mr. Eschwege:

The Environmental Protection Agency (EPA) has reviewed the General Accounting Office (GAO) draft report, "Changes Are Needed To Implement Less Costly and More Effective Regional Solutions For Potomac River Pollution."

GAO has produced a useful report summarizing the history and major continuing problems of the Washington, D.C., area wastewater treatment system. Recommendations to Congress and EPA concern how the Water Pollution Control Act can be amended or strengthened to cover regional planning, cost benefits, and sludge management problems.

Comments on the draft report which we feel should be considered are presented below. Specific technical comments from EPA Region III, which have been made available to GAO already, and comments from EPA's Inspector General and Office of Solid Waste are enclosed.

Regional Planning and Incentives

Regional planning is now required by section 208 of the Clean Water Act (CWA). We support the need for effective regional planning and program implementation, although funding will be provided locally because of a decrease in Federal grants for regional planning. As resources permit, EPA will continue to assist delegated States or local governments with the identification of reasonable regional solutions and encourage the use of dispute resolving mechanisms, such as conflict management techniques.

We do not feel, however, that prior commitments to implementation mechanisms have to be made in all cases for productive planning. Current law requires that projects be included in 208 plans as a requirement for construction grants funding and grantees must have the capability to insure implementation. Based on these requirements, we would consider restricting grant funding when a demonstration of repeated failure to implement cost-effective alternatives has occurred due to the inability of the involved parties to develop an interjurisdictional agreement.

The report does not adequately analyze the incentives various jurisdictions have in taking into account how cost effective solutions may be achieved, and ways in which other reasonable solutions could be implemented through bargaining. It is true that many communities have departed from regional coalitions when they deemed it in their best interest to do so. However, if cost-effective solutions exist, leverage can be applied through negotiation to achieve the desired result. Such negotiation process might be useful, for example, in Washington's search for a reasonable solution to its sludge disposal problem or in obtaining use of spare wastewater treatment capacity.

For example, the GAO report concludes that D.C. does not have the bargaining power to get better-situated jurisdictions to accept more of the sludge disposal burden, but it does not address the leverage that D.C. might have, or could have had at one time, because it treats wastes from other jurisdictions.

The EPA Office of Water has funded a feasibility study on methods of allocating costs to insure that jurisdictions or dischargers have incentives to implement cost-effective regional systems.* The methods being explored base cost allocation on the alternatives available to a jurisdiction or discharger outside the regional coalition system. While this research indirectly applies to the report, the general idea indicates a direction which could be applied to the Potomac River case.

The kinds of conflicts described in the GAO report are not inevitable. For example, a regional system for making efficient use of Potomac River and individual jurisdictions' reservoir water supplies has been proposed by the Interstate Commission on the Potomac River Basin and this system is being currently implemented.

*A.B. Whinston, et al., "Cost Allocation for a Regional Wastewater Treatment System," Water Resources Research, April 1979.

APPENDIX III

Cost/Benefit of Water Standards

The report points out (page 105) that once the States set water quality standards, the Act does not allow EPA a great deal of flexibility to question the costs and benefits of high treatment levels. Therefore, we agree that legislative and regulatory approaches should be more flexible in considering costs in relation to benefits.

It should be noted that while the Act is not very specific on the degree of flexibility involving costs and benefits relative to water quality standards, the present regulation (35.1550) is quite inflexible. Water quality standards can only be downgraded on economic grounds if achieving the existing standards would cause a substantial and widespread economic impact. Hence, under existing guidelines, the Potomac River water quality standards could probably not be relaxed very much.

We support the concept of cost/benefit analysis in the review of water quality standards whose designated uses are not being achieved and in the funding of advanced wastewater treatment (AT) projects. As presently drafted, revised Water Quality Standards Regulations and revised guidelines for the review of AT projects include provisions for cost/benefit analysis.

The revised Water Quality Standards Regulations will be used in the review of standards every three years. Revised standards will affect the design of future plants and can result in reduced construction and operation and maintenance (O&M) costs. The revised standards can also have a similar impact on existing plants, but obviously would be limited to O&M costs.

The revised AT Guidelines, while not applicable to facilities that have already received funding for construction, will be used to evaluate projects with substantial cost impacts. AT reviews, which have been carried out over the last three years, examine costs and environmental impacts for individual AT projects. For example, a proposal to add a denitrification facility to the Blue Plains treatment works would be subject to a cost/benefit analysis under the AT review guidelines currently under consideration.

We also support the concept that benefits should be "in reasonable relationship to costs". Successful implementation of this recommendation, however, is dependent on our ability to adopt procedures which insure that all costs, whether expressed in monetary or nonmonetary terms, are accounted for equitably. While we are in general agreement with GAO's recommendations, some caution should be exercised in not expecting more than can be delivered from cost/benefit analysis. In a case as complex as the Potomac River, there have been and continue to be a great many uncertainties concerning technical relationships and political feasibility which would have been impossible to treat adequately in before-the-fact cost/benefit analysis.

Sludge Management

The results of a recent study on the applicability of the most current anaerobic digestion technology for the Blue Plains facility should be mentioned in your final report. The study was sponsored by the Agency's Office of Research and Development (ORD). The ORD study considered a new two-step digestion process that has been developed at full scale by the City of New York. The process features the use of the conventional mesophilic process (anaerobic digestion at temperatures at 90 to 100 degrees F.) followed by a thermophilic process (anaerobic digestion operating at 120 to 130 degrees F.).

At that time, the study concluded that the thermophilic process would be most appropriate for application at the Blue Plains Facility. This change in sludge treatment could provide significant cost savings over the present sludge management system. Potential benefits include significant increase in digester capacity, reductions in dewatering requirements and a residual material that is nearly pasteurized. The overall results are reduced sludge volume needing disposal, reduced management cost and an acceptable product for utilization or disposal. This process will be considered along with other sludge management options (funded by EPA) for use at the Blue Plains Facility.

APPENDIX III

A summary of the above referenced study is enclosed for your information. The ORD study provides valuable information for many large cities that have existing sludge digesters and are planning to upgrade their operations. It should also be noted that the new North River Wastewater Treatment Facility (170 MGD) in New York City will be installing the full-scale mesophilic-thermophilic anaerobic digestion process. New York City is currently in the design phase and has been awarded an Innovative/Alternative Construction Program grant for 85 percent funding.

Five of the report's recommendations to EPA (pages 108 and 109) deal with sludge management. We support the first three recommendations, although any regulations developed should define results rather than specific procedures. Assistance to delegated States or local jurisdictions will be dependent upon available resources.

With respect to the recommendation to EPA (on page 109) concerning sludge disposal, we do presently encourage development of a sludge management program simultaneously with planning for the treatment plant portion of a facility. While we will consider adopting a policy which would emphasize the need to develop sludge management programs prior to approval of construction grants, we do not want to lose the flexibility to accommodate a wide variety of situations.

The final recommendation to EPA is that we "Fund no new conveyance projects...prior to obtaining the commitments necessary to construct the receiving treatment systems." Present law and regulations require the grantee, by acceptance of the grant for a new conveyance project, to connect that conveyance to an operable treatment works. Failure to do so can result in the forfeiture of grant funds. Stronger commitments are now required of grantees in Region III than were in effect at the time the grant for the Anacostia interceptor was awarded.

We appreciate the opportunity to comment on the draft report prior to its issuance to Congress.

Sincerely yours,

Joseph A. Cannon

Joseph A. Cannon
Acting Associate Administrator
for Policy and Resource Management

Enclosures

APPENDIX IV

GOVERNMENT OF THE DISTRICT OF COLUMBIA
DEPARTMENT OF ENVIRONMENTAL SERVICES
OFFICE OF THE DIRECTOR

ADDRESS REPLY TO:
5000 OVERLOOK AVENUE, S.W.
ROOM 416
WASHINGTON, D.C. 20032

SEP 25 1981

Mr. William J. Anderson
Director, United States General
Accounting Office
Washington, D.C. 20548

Dear Mr. Anderson:

The draft report "Changes are Needed to Implement Less Costly and More Effective Regional Solutions for Potomac River Pollution" is a good evaluation of the facts as we see them.

Regional cooperation is essential to the survival of any community which shares boundaries and here in the Washington, D.C. metropolitan region we share common facilities which emphasize this.

We are particularly pleased that the report recognizes the limited area of the District and thus its limited ability to land dispose of its waste.

The acknowledgement that there is a limit to the benefits to be gained from extreme standards for sewage treatment shows the understanding of the subject by those who prepared the report. We believe the standards should be no more severe than necessary to correspond to the assimilation capacity of the receiving waters.

It is with some pride that the District places itself as a leader in assisting to develop a tool to be used to evaluate improving the quality of the Potomac and adjusting the several NPDES permits to correspond to the rivers assimilative capability.

We look forward to seeing the new tool (WASP and DEM Models) used to develop cost effective levels of treatment for point sources and control of non-point sources on an integrated regional basis.

We note the comment that the program has been much more costly then expected and must take exception to this for the District's involvement.

APPENDIX IV

If Congress is to require regional program implementation, there must be some authority established with EPA to implement this, since the laws of each jurisdiction differ and political considerations are as they are. One jurisdiction which wants to cooperate should not be penalized by another which does not think regional planning and regional programs are important.

Your report highlights several major issues and makes specific recommendations for future action by the Congress and the Administrator of the Environmental Protection Agency. We agree on the issues: a coupling of regional planning and program implementation mechanisms; and, integrated management of water, land and air interests. You can be assured that the District will actively participate in the necessary dialogue leading to decisions in law and future policy development and implementation.

Sincerely,

William B. Johnson
Director

APPENDIX V

THE PRINCE GEORGE'S COUNTY GOVERNMENT

October 9, 1981

Mr. William J. Anderson
Director
General Government Division
United States General Accounting Office
Washington, D.C. 20548

Re: GAO Draft Report - "Changes Are Needed To Implement Less Costly And More Effective Solutions For Potomac River Pollution"

Dear Mr. Anderson:

We appreciate the opportunity to review and comment on GAO's draft report entitled "Changes Are Needed to Implement Less Costly and More Effective Regional Solutions for Potomac River Pollution."

General Comments

We reviewed the draft report with great interest. Your staff is to be commended for undertaking the research and assessment of a very difficult subject issue affecting this region's local governments. The comments submitted by the Metropolitan Washington Council of Governments in its letter dated September 28, 1981 to you amplified the difficulty and complex process of water quality management planning in the region.

In commenting on the draft report, we wish to indicate our concurrence with the comments expressed in MWCOG's September 28, 1981 letter.

A particularly disturbing element of the draft report is the unquestioning assumption that a regional system - construction of a large regional wastewater treatment facility and a large sludge management facility - is the best and only approach to solve the region's wastewater treatment and sludge management requirements. The report unfortunately fails to prove whether a regional system is actually a better approach to meeting the region's wastewater treatment needs. Had this region accepted a regional system, it is very likely that this region would still be struggling to construct a regional facility, due to the long process in obtaining Federal

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Mr. William J. Anderson

Page 2

EPA funds, would still be struggling to overcome sewer moratoria imposed throughout various segments of the region, and would have lost the advantages of flexibility in water quality management through smaller sub-regional systems. No convincing arguments are presented in the report (or for that matter by EPA) that one or two very large treatment facilities would be more efficient cost-wise and operation-wise (note the rising management cost and operational difficulties being encountered at the Blue Plains Facility).

We are particularly disturbed by the draft report's statement that local jurisdictions have been unable to agree on an overall regional water quality management program. The fact of the matter is the region has progressed considerably in the several years to address the major water quality problems. Specifically, they are:

(1) The removal of several sewer moratoria within the region through expansion of existing sewage treatment plants;

(2) Montgomery County efforts with support by Prince George's County to proceed with the proposed Rock Run Wastewater Treatment facility in which additional treatment capacity would be provided to Montgomery County and possibly to the District of Columbia;

(3) The local jurisdiction's efforts to plan and/or to construct facilities to process sewage sludge generated by various wastewater treatment plants;

(4) The endorsement in principle, of a regional co-disposal (solid waste and sludge) facility to be located at Fox Ferry Point (northwest quadrant of I-295 and I-495) by the Prince George's and the District of Columbia governments;

(5) The undertaking of a comprehensive assessment of the Blue Plains Wastewater Treatment Plant and the Plant's service area requirements via the "201" Step 1 Blue Plains Feasibility Study;

(6) The local jurisdictions participation in assessing and defining the water quality issues via EPA's overall Potomac Strategy Paper;

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(7) The refocusing by local jurisdictions of the 208 planning process toward the problems of non-point source water pollution and the development of control techniques; and

(8) The establishment of the Blue Plains' Chief Administrative Officers Committee (members include D.C., Fairfax County, Montgomery County and Prince George's County) for the purpose of improving and maintaining regional cooperation and coordination.

The Prince George's County government has advocated since 1971 a balanced regional system for water quality management; a balanced region system which is borne by all the jurisdictions within the region and not solely by one or two jurisdictions. It was under this principle that the proposed Dickerson Wastewater Treatment facility and the Piscataway Facility expansion projects were to be undertaken. But, due to EPA's interference with this principle, the region today has not been able to completely resolve key water quality management issues. Nevertheless, local jurisdictions have managed successfully to increase wastewater treatment capacity (thereby reducing existing water pollution problems) and presently, additional treatment capacity is being planned in Montgomery County via the Rock Run STP project. (It should be noted that 5 mgd treatment capacity of the Rock Run facility has been offered to the District of Columbia). In a sense, a balanced regional wastewater treatment system has been established by the local jurisdictions despite the policy inconsistencies and interference by EPA and its continued advocacy of the rejected regional system.

We recognize, of course, that the major problem to resolve involves remedial measures to be taken at the Blue Plains facility. But, here again, it is uncertain what remedial measures are to be taken since water quality management issues have not been adequately defined. As noted in Chapter 6 of the report, the local jurisdictions are questioning the underlying premise of the current stringent effluent standards set forth in the Blue Plains discharge (NPDES) permit. Yet, the local jurisdictions will be actively participating in the Blue Plains Feasibility Study.

Contrary to the observations presented in the draft report, the local jurisdictions, despite numerous EPA obstacles, have managed to develop and/or to implement several politically acceptable solutions to the region's water quality management problems and have continued to seek permanent solutions which are acceptable to them.

We, therefore, do not agree with the report's conclusion that it may be necessary to create a regional organization with the responsibility and authority to decide and implement water quality management policies. Establishment of such an organization runs counter to the evidence, as indicated above, of regional cooperation and participation, and ignores public accountability of local elected officials in water quality management particularly in the area of budget approval and financial management, land use planning/implementation and capital programming. We do not agree to the creation of a regional organization which would have the power to ignore the local jurisdictions' social, economic and environmental objectives.

Specific Comments

There are numerous technical comments and concerns we wish to make with respect to the draft report. Rather than to state them page by page, the comments have been organized below into summary subject categories. Because of the extensive comments generated by our review, it is suggested that GAO staff involved in the preparation of the report meet at a later date with County staff to further discuss in detail the contents of the draft report.

1. The Report's Overall Conclusions (pages vii-x)

We are generally in agreement with the report's identification of the region's water quality management issues which are as follows:

"--The program has been much more costly to develop, operate and maintain than originally expected and the realities of current Federal, State, and local fiscal constraints raise significant concerns regarding the affordability of existing water quality goals and standards;

--The need for the rigorous water quality standards which form the basis for existing programs is as yet unproven and the public benefits to be derived by additional investment to meet the standards are not apparent; and

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--Meeting the standards creates a new environmental problem--sludge disposal--which has not yet been satisfactorily resolved." (See GAO response, p. 131, item 1.)

2. Western Branch Wastewater Treatment Facility

The draft report suggests that sewage flows be diverted from Blue Plains to other sewage treatment plants such as the Western Branch facility. This may sound reasonable from a regional perspective but this would result in "throwing out" several years of local planning and decision-making which led to the construction of Western Branch facility. The Western Branch facility's 30 mgd capacity was designed solely to meet the wastewater treatment requirement within the Western Branch Basin. In fact, sewage treatment capacity allocations have for several years been made to implement the County's land use planning policies for this basin. We find it disturbing that the draft report would advocate regional planning and implementation at the expense of prior local planning efforts and decision-making. We find that approach violates the Clean Water Act's long-range comprehensive planning requirements (Section 208 for example) in order to qualify for Federal funds. In addition, this Potomac River oriented report ignores the problems of the Patuxent River Basin. In the early 1970's the State vetoed a plan to expand the Western Branch STP to treat out of basin flows because of water quality concerns. (See GAO response, p. 131, item 2.)

3. Piscataway Wastewater Treatment Facility

Like the Western Branch Wastewater Treatment facility, the County policy on the Piscataway Sewage Treatment Facility has been clearly established. The facility's 30 mgd capacity was designed solely to meet wastewater treatment requirements within the Piscataway service area over a 20 year time period. Again, sewage treatment capacity allocations have for several years been made to implement the County's land use planning policies within the Piscataway service area.

At one point, the Piscataway facility was to be expanded from 30 to 60 mgd to meet primarily regional wastewater treatment needs to the year 2000. However, the proposed plant expansion was deleted from the County's Ten Year Water and Sewerage Plan

by the County government in early 1980 on the grounds that such an expansion was premature, and unjustified. It is our position that feasible and realistic alternatives to the Piscataway Plant expansion from technical, cost effectiveness, timeliness, water quality/effluent standards and environmental standpoints have not been thoroughly examined. Further, the region's wastewater treatment capacity requirements need to be reassessed. In addition, the policy framework for expanding the Piscataway facility was that it would not alone provide for the additional regional wastewater treatment capacity requirements.

The County government, on several occasions since 1971, has indicated to EPA, the State of Maryland, the District of Columbia and Montgomery County that selection of the Piscataway Plant site as the location of a regional facility is unacceptable and contrary to the County's contention that regional management of wastewater treatment must be borne by all the jurisdictions within the metropolitan Washington area and not solely by one or two jurisdictions.

The District of Columbia government, presently, is proceeding with a feasibility study of the Blue Plains Sewage Treatment Plant to determine the ability of Blue Plains to meet present and future effluent standards, to determine the treatment capacity needs in the Blue Plains Service Area, and to examine the need for expansion of the facility. Montgomery County, as you know, is pursuing the planning and construction of the 20 mgd Rock Run Sewage Treatment Plant of which 5 mgd of its capacity would be made available to the District of Columbia. The Prince George's County government strongly supports these efforts.

But to permit the diversion of Blue Plains' flows to the existing Piscataway 30 mgd facility would greatly disrupt the County's established land use planning policies and, in effect, "throw out" the County's long range planning efforts of the past several years.

Finally, it should be noted that expanding Piscataway could be costly from an environmental and financial standpoint. A new treatment plant site would have to be selected and large residential areas, open space and wetlands within Prince George's County would be adversely impacted by the construction of a sewer force main from the Blue Plains Plant to the Piscataway Plant. The price tag to construct the force main and the additional plant capacity is estimated at approximately $173 million, or $57 million above what it would cost to construct the Rock Run STP.

(See GAO response, p. 131, item 3.)

Mr. William J. Anderson

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4. The Anacostia Force Main Between Prince George's County and Blue Plains

The construction of the Anacostia Force Main is still required regardless of whether the so-called "Piscataway regional capacity expansion" is or is not undertaken. The construction of the Anacostia Force Main was required in order to (1) relieve system restrictions which created raw sewage overflows, and (2) provide adequate transmission capacity in order to gain and utilize the Maryland share of the Blue Plains treatment capacity of 153.3 mgd. The sizing of the Anacostia Force Main provided for flow accommodation from the District of Columbia, Maryland sewage flow forecasted to the year 2000, and potential inter-basin transfer which may be necessary for augmentation if the District of Columbia sewage conveyance system is not permitted. (See GAO response, p. 131, item 4.)

5. The Blue Plains Feasibility Study

We disagree with the report's contention that planning restrictions have been placed on the Blue Plains Feasibility Study. In order to avoid redundant planning, it was decided by this County that active participation in the preparation of the Blue Plains Feasibility Study's Scope of Services was necessary in order to set the Study's direction and focus, and to identify water quality issues which should be examined. No restrictions were placed on the content of the Study.

The original scope of services when it was first made available to us for comments was written in such a manner that the Piscataway regional expansion was pre-ordained as the Study's conclusion. We objected and requested that the scope of the study be defined to first address the water quality issues related specifically to the Blue Plains facility (Task One Analysis of Study). During the Task Two Analysis, the Study will identify and array the alternatives within and without the Blue Plains service area to the expansion of the Blue Plains Sewage Treatment Plant. In both Task One and Two, the local jurisdictions are involved in the review of the Study's results. (See GAO response, p. 131, item 5.)

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Mr. William J. Anderson

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6. Sludge Management

The draft report failed to mention, in its discussion on current sludge management planning efforts, the recent endorsement by the Prince George's County Council and County Executive of the concept study proposal to establish a solid waste and sludge management facility on a site known as Fox Ferry Point. This proposed site is located at the northwest quadrant of Interstate 95 and Interstate I-295, just south of the Maryland-D.C. line. It is envisioned that the facility would process sewage sludge generated by the Blue Plains Sewage Treatment Plant, as well as WSSC owned sewage treatment plants in Prince George's County, and solid waste generated in both D.C. and the County.

The D. C. government has indicated interest in the proposed concept and is considering the viability of the concept in conjunction with the Blue Plains--Solid Waste/Sludge Co-disposal Management Feasibility Study. (See GAO response, p. 132, item 6.)

This concludes our comments on the draft report. We would be more than willing to meet with your staff to discuss in detail the County comments on the report. Again, we appreciate the opportunity to review and comment on the document.

Sincerely,

Kenneth V. Duncan
Chief Administrative Officer

cc: Lawrence J. Hogan
Parris N. Glendening
Lawrence L. Brooks, Sr.
Johanna S. Norris
Andrew M. Vislosky
Robert S. McGarry
Edmond M. Piesen
Dennis Bigley
Austan S. Librach
J. Hamilton Lambert
Elijah Rogers
Robert Wilson

GAO RESPONSE TO PRINCE GEORGE'S COUNTY TECHNICAL COMMENTS

1. Prince George's County agrees with our overall conclusion regarding the local governments' concerns about the costs of existing programs, the uncertain benefits of further increases in waste water treatment levels, and the problems with sludge disposal.

2. Prince George's County does not believe its Western Branch treatment plant should be considered as a possible means to offload Blue Plains excess flows. Our report does not conclude that the Western Branch waste water treatment plant should be used in this manner but implies it could and should be explored as a temporary measure. Our report, page 64, states that COG recommended that while local jurisdictions are studying ways to offload Blue Plains, that surplus capacity of neighboring treatment plants be used where feasible, and that the Western Branch plant has substantial excess capacity through the year 2000. Consequently, we believe that the Western Branch plant could be considered as one way to offload part of Blue Plains' excess waste water. If environmental analyses show this is not feasible or new population forecasts show the excess capacity is no longer available, then, of course, the project should not be undertaken.

3. Prince George's County stated its reasons for not expanding the Piscataway treatment plant, and we acknowledge them on page 32. They imply, however, that Rock Run--which the county told us will be $57 million less expensive than expanding Piscataway and interconnecting it with Blue Plains--is an alternative to the Piscataway expansion. Rock Run, as discussed in our response to COG's comments (see page 145, item 2), does not solve the current Blue Plains overload problem.

4. Prince George's County believes the Anacostia force main is still required even without any further expansion of its Piscataway treatment plant. We disagree. We have received comments on our analysis of the Anacostia force main from EPA's Office of Inspector General, which support our findings as stated on report pages 49 to 51. The Office of Inspector General stated, on the basis of its own recently completed audit of the project, "As it stands now, the costs for the Anacostia Force Main are considered totally unnecessary and therefore ineligible for Federal participation."

5. Prince George's County disagreed with our report's statement that planning restrictions have been placed on the Blue Plain's feasibility study. We agree and have modified the text to eliminate this statement.

6. Prince George's County states that we failed to recognize in our report recent endorsements by the Prince George's County Council and County Executive of a concept study proposal to establish a solid waste and sludge management facility on a site near Blue Plains on the border of Prince George's County and the District of Columbia. This proposal occurred after we completed our audit work, and because of its still tentative nature, we have not undertaken the work necessary to include it in the report.

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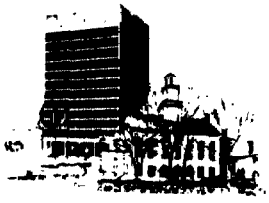

COMMONWEALTH OF VIRGINIA
COUNTY OF FAIRFAX
4100 CHAIN BRIDGE ROAD
FAIRFAX, VIRGINIA 22030

OFFICE OF COUNTY EXECUTIVE

September 22, 1981

Mr. William J. Anderson, Director
United States General Accounting Office
Washington, D. C. 20548

Re: Draft Report - Changes Are Needed to Implement Less Costly and More Effective Regional Solutions for Potomac River Pollution

Dear Mr. Anderson:

Thank you for allowing Fairfax County to review and comment on your draft report entitled "Changes Are Needed to Implement Less Costly and More Effective Regional Solutions for Potomac River Pollution".

Our overall impression is that the report is well written and provides excellent identification and documentation of the problems associated with intergovernmental cooperation in resolving pollution abatement in the Washington Metropolitan area. A review of your report indicates that there were several major decisions made by EPA or other agencies which have significantly reduced the probability of accomplishing regional resolutions of wastewater treatment capacity and sludge disposal issues. The previous decisions referred to are as follows:

- The decision of the Interior Department to not fill in the 50 acre mud flats near Blue Plains which resulted in reducing the planned capacity of Blue Plains from 419 mgd to 309 mgd.

- EPA disapproval of the Dickerson plant, which resulted in a loss of 60 mgd of regional capacity.

- EPA disapproval of incinerator construction at the Blue Plains plant, which resulted in a loss of 1,000 - 2,000 wet tons per day of sludge disposal capacity.

- The decision by Prince George's County to not expand the Piscataway plant to 90 mgd, which resulted in a loss of 60 mgd of regional capacity.

- The decision by EPA to allow continued construction of additional facilities at Blue Plains without requiring a viable sludge disposal facility at the plant to dispose of the District's sludge to be generated by these additional treatment processes.

- The refusal by EPA to immediately review and re-evaluate the Blue Plains plant discharge standards when they were questioned by the region.

We view these as some of the major stumbling blocks in the region's attempt to resolve the sludge and treatment capacity issues, not to mention the myriad of state and federal regulations which have significantly restricted the available alternatives.

We wholeheartedly agree with and support your conclusions; however, it may be impossible to establish a regional wastewater program implementation agency in this area that would have any meaningful authority even though it would appear to be the way to proceed. The local governments in the Washington Metropolitan area are highly sophisticated, complex and carry a great deal of clout within their respective states and with the federal government. Consequently, any agreement to establish an implementation mechanism in this region would result in so many caveats that such an agency would end up completely powerless to resolve problems. An existing prime example in this region is the Washington Suburban Sanitary Commission.

The region has always looked towards the EPA Administrator to aid in resolving disputes in this region, but this has never occurred. The EPA Regional (Region III) Administrator has in the past been reluctant to settle regional disputes despite the wide latitude and flexibility the Regional Administrator and the EPA Administrator have in administering the Clean Water Act. Regional local government cooperation is difficult to achieve in the face of often unyielding federal and state regulatory agencies.

Consequently, we believe the existing regional agencies and local governments are adequate to provide proper wastewater facility planning and implementation given a more cooperative climate from the federal and state governments. We therefore also agree with and support your recommendations to the EPA Administrator as stated in your report.

Insofar as your recommendations for amendments to the Clean Water Act where AWT requirements are concerned, we feel that you have clearly outlined the problem with the statement on p. 105 which reads as follows:

> "Once States set water quality standards, the Federal Water Pollution Control Act does not allow EPA a great deal of flexibility to question the high treatment levels on the basis of the costs of achieving them in comparison to the uncertain or minimal incremental benefits to be achieved, or on the basis of the uncertain environmental impacts created by sludge disposal programs. The act provides that once the Water Quality Standards have been adopted by the States, then it is incumbent on local jurisdictions to meet those standards regardless of cost."

APPENDIX VI

We believe that this is the area of the Act that should be amended. We believe that many states have established excessively stringent permit discharge standards because the states have no obligation to provide any funding for facilities and operations to achieve these standards. There should be some requirement in the Act to:

- require a certain percentage of state funding rather than 75% federal and 25% local funding.

- establish a maximum level of treatment that would be eligible for EPA funding that would be greater than Secondary but less than full AWT. If full AWT is still required by the state, and if it is fully documented and justified, then the cost differential should be fully funded by the State.

We feel that these changes to the Act would insure that the States would be more careful and responsible in determining their discharge standards.

Consequently, we recommend the following changes to the Federal Clean Water Act:

- Add a paragraph (5) under Section 202(a) to read: "No grant shall be made under this Section for construction of a treatment works in any State unless the proportion of the State contribution is at least 25 per centum of the eligible construction cost".

- Add a paragraph (7) under Section 201(g) to read: "The maximum level of treatment eligible for a grant under this Section is Advanced Secondary Treatment as defined by the Administrator. If full Advanced Wastewater Treatment levels are required by any State, and if it is fully documented and justified, then the grant funding differential shall be fully provided by the State".

- Modify Section 301(b)(1)(c) to read as follows: "Not later than July 1, 1977, any more stringent limitations, including those necessary to meet Water Quality Standards, Treatment Standards, or Schedule of Compliance, established pursuant to any State law or regulations, (under authority preserved by Section 510) or any other Federal law or regulation, or required to implement any applicable Water Quality Standard established pursuant to this Act, except that any more stringent limitation established pursuant to State law or regulations shall not require treatment levels greater than Advanced Secondary Treatment as defined by the Administrator, except that full advanced treatment as defined by the Administrator may be required on a case by case basis

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subject to the approval of the Administrator after consultation with the affected State and Municipality and in accordance with Section 302(b) of this Act, and subject to Section 201(g)(7) of this Act".

Once again, thank you for providing me the opportunity to review and comment on this report. You should be aware that these comments have not been discussed with the Fairfax County Board of Supervisors and therefore represent only a staff opinion.

Sincerely,

J. Hamilton Lambert
County Executive

JHL:lw

cc: Board of Supervisors
Senator John Warner
Representative Frank Wolf
Representative Stan Parris
Chairman John Herrity
Glen G. Ehrich
J. H. Liedl
R. J. Gozikowski
W. B. Rucker

APPENDIX VII

metropolitan washington
COUNCIL OF GOVERNMENTS
1875 Eye Street, N.W., Suite 200, Washington, D.C. 20006 223-6800

September 28, 1981

Mr. William J. Anderson
Director
U.S. General Accounting Office
General Government Division
Washington, D.C. 20548

Dear Mr. Anderson:

Thank you for the opportunity to review and comment on GAO's draft report entitled, "Changes Are Needed to Implement Less Costly and More Effective Regional Solutions for Potomac River Pollution."

The draft report represents a thorough history of efforts to abate pollution in the Potomac over the last twenty-five years. And, in the main, it contains virtually all of the pertinent facts. But, the best feature of the report is its identification of the salient outstanding issues. They are developed in the context of our current situation and the federal water legislation and policies.

We do have some reservations on the draft, however. Our comments in this regard are provided in two parts. The first involves a general response to the findings and recommendations in the draft. Here, we have concentrated on the regional planning and coordination aspects. Our other comments are more specific. They concern extent and accuracy of the fact statements and comment on certain conclusions drawn from analyses of some of the problems addressed in the report.

Before proceeding with our observations, it should be noted that due to the review period provided, we were unable to involve the governing bodies of COG, or its Water Resources Planning Board, in the review. Consequently, the positions set out below are solely those of the staff.

GENERAL COMMENTS

From our regional perspective, the most important aspects of the draft report concerned the findings and recommendations to continue to emphasize the need for regional planning and coordination in the federal water quality program. We strongly support this conclusion. At the same time, we must differ with the recommendation that an independent regional planning and

operational agency be required by federal law for this purpose. This concern is accentuated because the conclusion is based on the experience in the Washington Metropolitan Area.

The draft report does an excellent job in setting forth the actual conditions under which the 208 areawide management planning process and the later, so-called Potomac River strategy planning, are being undertaken. Your depiction of the external forces that have influenced both of these planning activities is vitally important to understand the positions of the governmental parties to these planning efforts. We feel the report fails, however, to adequately account for the influence these external factors had on the actions of the parties. For example, you note that the following federal decisions established the background for the current water quality planning efforts in the metropolitan area:

- The Interior Department's decision not to permit the filling of 50 acres of mud flats near Blue Plains, which restricted the plant expansion from 419 mgd to 309 mgd.

- EPA's disapproval of the Dickerson plant which resulted in a loss of a proposed 60 mgd regional facility.

- EPA's disapproval of incinerator construction at Blue Plains.

- EPA's refusal to reevaluate the Blue Plains discharge permit in 1979 to reflect the uncertainty on whether stringent discharge standards were justified in view of questionable scientific data on the impact of such standards on the Potomac estuary.

All of these conditions influenced the attitude of state and local government participants to regional planning mandated in Section 208 of the Federal Water Pollution Control Act. More specifically, the draft fails to acknowledge the extensive knowledge of EPA in the selection and design of the proposed Dickerson facility. Because of this close involvement, Montgomery County desired to have an affirmation of EPA's support for the Dickerson facility prior to entering into the 208 planning process. As you point out, it conditioned its participation on the incorporation of the Dickerson facility in any 208 plan. Your report fails to indicate, however, that EPA, under Section 208, had to approve the designation and any conditions attendant to the designation of the 208 planning process for the Washington Metropolitan Area. Consequently, when EPA approved COG's designation, it knew of and accepted the condition proposed by Montgomery County. The reasonable inference from this approval was that the Dickerson facility continued to be a viable project in the eyes of EPA. But, despite this action, the project was rejected on new grounds shortly after the 208 designation.

This, and the other cited examples, indicate the ever-changing federal policy and requirements being imposed on the region on a piecemeal and quixotic basis. In view of these actions, it is more rational to justify the position and actions of the local governments in the 208 process. It is the failure of federal leadership and policy, rather than local self-interest, that has limited the achievements of the 208 planning process.

As envisioned under the Clean Water Act, the 208 process requires that the planning and decision-making process involves mutual commitments and obligations among the federal, state, regional and local partners. It envisioned implementation and, accordingly, requires the capital program and financing components. But, EPA has never used the 208 planning as its primary tool for making resource allocation and regulatory decisions.

This is amply manifested in the failure of the Agency to timely implement the 208 process subsequent to the enactment of the Clean Water Act in 1972. It reluctantly proceeded with the 208 program under a court mandate. This response to the Congressional directive and high priority given to 208 planning has influenced the program's effectiveness. In our opinion, a forceful and sympathetic EPA policy on 208 would have changed the prospective and commitment of the local government participants; it could have caused local governments to become much more flexible in negotiating intergovernmental solutions to their water quality problems.

The recommendation that future water quality legislation requires an independent or quasi-independent regional agency capable of implementation of its decisions is not, in our view, the appropriate response to the problems identified in your draft report. Rather, a real commitment to using the strong federal policy currently contained in Section 208 would provide the appropriate remedy to many of the problems identified in the draft. Further, we believe that such an institutional approach will not surmount the intergovernmental problems cited in the draft. Local governments and their citizens will still play a paramount role in regional decisions. But, the most compelling rebuttal to this approach is this; if federal policy is strong enough to entice or compel the development of an independent regional agency, the same enticements and/or sanctions could provide the same response from individual governments working through their own regional mechanism. And, this latter approach is already achievable under 208 if EPA has the will to use its current mandate.

One final general comment. The report's discussion of Blue Plains violations is based on the understanding that the plant's 309 mgd permit limitation applies to all flows to the plant, including flows received from stormwater from the District of Columbia's combined sewer system. Our concern is that the permit limits fail to distinguish between dry weather flow allocations to the plant and flows received during storm events. The NPDES

permit requires maximizing flows from all sources in the plant's treatment and collection system, while maintaining strict compliance with effluent standards that are based on monthly average flows of 309 mgd. The plant was originally designed to meet effluent limitations based on an annual average sanitary flow of 309 mgd, with a peak flow rate capability of 650 mgd. In our view, the failure of permit limitations and requirements to account for treatment of wet weather flows makes the permit incompatible with current design capabilities of the plant.

SPECIFIC COMMENTS:

The following responds to specific facts and conclusions contained in the draft report:

pp. iii, 45, 55 - The citation of $5.3 million in expenditures for areawide 208 planning is misleading in that it tends to imply that all this spending was directed toward waste water treatment and residuals management planning activities. In fact, at EPA's encouragement, approximately $3 million, or well over half of this amount, went towards nonpoint source field studies and water quality monitoring and modeling activities needed as prerequisites to the performance of a technically valid cost-effectiveness assessment of pollution control options available to the region. An additional $112,000 of the $5.3 million figure went to water supply/water conservation planning. Thus, it would be more accurate to say that $2.2 million was spent for regional point source and residuals planning from 1975 - 1981. (See GAO response, p.145, item 1.)

pp. 28, 45, 47 - The draft asserts that the 208 planning process has failed to include any new facility proposals that would alleviate all or part of treatment needs over the next 20 years. It is noted that the 208 plan supplement adopted in April 1981, does contain the proposed 20 mgd facility at Rock Run in Montgomery County. Further, it should be noted that 5 mgd of this plant's capacity will be provided to the District of Columbia. Finally, the conclusion on p.48 that the proposed facility is not currently eligible for federal funding is a legal conclusion that we believe has not been made by EPA or, if it has been made, is subject to challenge. (See GAO response, p.145, item 2.)

p. 59 (Table) - For a more accurate comparison of current Blue Plains plant performance to permitted effluent requirements, the table should also show the Interim II permit allowances which the plant was required to meet in 1980. The table now shows only the final permit conditions, which are not due until 1983. (See GAO response, p. 146, item 3.)

p. 89 - Work on the Blue Plains Feasibility Study was scheduled to begin in August 1981. Realistically, completion cannot be expected before September 1982, at the earliest. (See GAO response, p. 146, item 4.)

The report rightly points out the problems incurred with sludge disposal. There are sections, however, where the discussions should be clarified or rewritten:

pp. 39, 49 - The discussion of the District's Oxon Cove Study does not explain why the project was dropped. If, despite assurances by scientists and public health officials as to the project's safety, Oxon Cove was dropped primarily due to citizen opposition, this should be clarified (as alluded to on p. 17). Moreover, a major contributing factor was the absence of EPA criteria for sludge disposal, as pointed out in other sections of the report. Without such standards, citizens' objections were given greater weight in the political process; there was no norm to which the decision-makers could refer to evince that the citizen concerns were unreasonable. And, specific ad hoc studies did not fill this credibility gap. (See GAO response, p. 146, item 5.)

p. 16 - The statement "sludge is a very undesirable by-product" is an unnecessarily prejudicial and misleading statement which isn't really borne out by findings reported elsewhere in the report. The reference to heavy metals' toxicity should also be clarified. For example, the cadmium content of Blue Plains sludge is reported to be 10 parts per million, well below the limit cited of 20 parts per million recommended by the Food and Drug Administration for use on agricultural land and crops in the food chain (p. 69). (See GAO response, p. 146, item 6.)

p. 59 - A statement is made that the present Blue Plains permit is based on the "assimilative capacity of the Potomac." This is at most true theoretically for a low flow condition only. The existing discharge limits specified in permit were derived from rather arbitrary water quality modeling assumptions that assumed a steady state, minimum stream flow condition (the seven-day, ten-year low flow event). This condition was typically used as a representative "worst case" for calculating allowable treatment plant loadings. Page 75 of the report points out that Potomac flows into the Estuary during the 1970-1980 decade never reached the worst case low flow condition. And, while these flows have indeed occurred on occasion in earlier decades, the permit's focus on one arbitrarily selected worst case event fails to recognize the variability of Potomac flows during different seasons, as well as other factors which affect the Potomac's assimilative capacity. The low flow criteria also tends to understate the importance of tidal influences which are also dominant factors affecting estuary water quality responses in conditions of low fresh water inflow. The permit should be based on assimilative capacity, and as such, should be based on an assessment of the Potomac's response under a wide range of seasonal flow, temperature, and pollution loading conditions that include nonpoint sources, combined sewer overflows and loadings generated upstream of the Washington, D.C. region.

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This assessment is now proceeding as part of the "Potomac Strategy" effort undertaken by EPA, the states and area local governments to update Potomac River modeling tools and consider alternative pollution management options. (See GAO response, p. 146, item 7.)

pp. 93 - The reference to local government "foot-dragging" is misleading and inconsistent with other findings in the report which identified inflexible federal regulatory stances which severely hampered good faith local government efforts to meet their waste treatment and residuals disposal needs. It also tends to ignore the cooperative local, state, federal Potomac modeling efforts now underway as part of the "Potomac Strategy" to determine what pollution loading reductions are actually required to protect the Potomac Estuary; resolve the controversy surrounding current discharge limitations; and identify the most cost-effective and pragmatic pollution management programs for local implementation.

The Potomac Strategy effort was initiated cooperatively by EPA, the states and area local governments upon their concurrence on several points concerning the current permit limitations:

- That the understanding of and ability to predict Estuary responses to pollution loads had vastly improved since the first model calculations established existing Potomac wasteload allocations in 1969.

- That earlier modeling tools and assumptions were inadequate, and that new or refined models needed to be developed and applied in wastewater management decisions that more accurately portrayed eutrophication processes and dissolved oxygen responses to a range of water quality constituents and environmental conditions.

- That with hundreds of millions of dollars at stake, involved agencies should determine the most cost-effective pollution control strategy for the river before implementing and operating expensive treatment components that may ultimately prove unnecessary.

In our view, the present effort amounts to responsible planning needed to arrive at sound decisions on matters which ultimately may involve huge dollar commitments by area governments, the states, and EPA. To characterize the process as "foot-dragging" is just not appropriate. (See GAO response, p. 147, item 8.)

p.93 - It is incorrect to suggest in the report that current controversies surrounding effluent limitations will not be resolved until information is available concerning the ultimate performance of Blue Plains. This position overlooks a general consensus of support among involved government agencies for the need to reassess,

with the aid of updated river models, the Potomac's water quality conditions and determine what the ultimate performance of Blue Plains should be. It is commonly held that the models under development will represent a vast improvement over modeling tools available in 1969. Among the data currently available for consideration is documentation of how the river has responded to substantial reductions in Blue Plains effluent loadings achieved over the last ten years. (See GAO response, p. 147, item 9.)

p. 47 - It is premature, and in part inaccurate, to say that regional planning mechanisms are inadequate or have failed to translate nonpoint source abatement recommendations into enforceable actions. The Occoquan watershed in Northern Virginia is one example where regional nonpoint source assessments and subsequent modeling evaluations were directly applied locally in the consideration of options to protect the Occoquan water supply reservoir, serving close to 700,000 residents. The nonpoint source recommendations developed by these studies resulted in action by the Fairfax County Board of Supervisors to require certain best management practices in areas draining to the reservoir. The Occoquan is thus a prototype of what can be done to apply information and translate recommendations into enforceable actions as they become warranted.

On a regionwide basis, nonpoint source data has been collected and modeling tools are being developed to assist local governments and involved agencies. Once developed, these tools may be used by local governments in master plan considerations and local site planning. Current estuary modeling work is also incorporating nonpoint source information for use by EPA, state agencies and local governments in considering a management strategy for the upper Potomac River estuary. If the cost-effectiveness of nonpoint controls is demonstrated, these studies may result in a regional management program that may, indeed, involve implementation of some combination of wastewater treatment as well as nonpoint source controls. (See GAO response, p. 147, item 10.)

p. 79 - The report points out the severe shortage of adequate qualified maintenance staff at Blue Plains, which may be a significant contributing factor to plant violations. A discussion of this situation, though important, does not appear elsewhere in the report. An expanded discussion of this issue concerning plant operations and maintenance appears warranted. Operations and maintenance costs are expected to increase fourfold as AWT processes become operational. These huge operational expenses should be represented as a factor; indeed, in some circumstances, the controlling factor, in determining the extent our area is required to develop AWT facilities. Operating, as well as facility cost, should be given great weight in examining alternative courses for meeting federal water quality goals. (See GAO response, p. 147, item 11.)

p. 75 - The phrase "when it is raining" should be clarified, as it is not clear whether the writer is inferring that the permit requirements assume contributions from combined sewer overflows

and storm runoff during the low flow event. Our position is that the NPDES permit limitations for Blue Plains at present do not realistically account for the variations in Potomac flows, pollutant loadings to the Estuary and temperature fluctuations that must be considered in appraising point source load reduction needs. Area local governments have proposed that the permit's limitations be reassessed to more accurately account for the extent and impact of these background loads. In fact, EPA has acknowledged the inadequacy of present information on wet weather impacts, and has allocated staff and financial resources over the last two years in an effort to develop a "wet weather" version of its Dynamic Estuary model. The updated model would assess short-term impacts on Potomac dissolved oxygen levels. EPA has also been involved in development of the Water Analysis Simulation Program (WASP) model to assess Potomac eutrophication trends and the seasonal and long-term impacts of rain-induced nonpoint source loads. (See GAO response, p. 147, item 12.)

In closing, we thank you again for the opportunity to review and comment on the draft report.

Sincerely,

John J. Bosley
General Counsel

cc: Stephen H. Detwiler
President, Council of Governments

Carl F. Henrickson
Chairman, COG Board of Directors

Chairman and Members
Water Resources Planning Board

GAO RESPONSE TO COG'S TECHNICAL COMMENTS

1. COG commented that our report incorrectly implies that the entire $5.3 million spent on section 208 planning went toward an unsuccessful attempt to solve area waste water treatment and sludge disposal problems when, in fact, many other issues were addressed. Our report correctly acknowledges on page 46 that the planning activities generated a wealth of data on pollution of the Potomac River, including analyses of both point and nonpoint pollution sources. The 208 effort, however, was intended to develop a comprehensive pollution abatement program with specific recommendations for a combination of pollution control measures--both point and nonpoint--necessary to accomplish water quality standards along with a time schedule for implementing the measures. The planning effort and the entire $5.3 million expenditure did not accomplish the purposes for which they were undertaken. For this reason, we did not attempt to allocate planning costs between point and nonpoint components and are not convinced that we should do so now.

2. COG believes our report states the 208 planning process failed to include any new facility proposals that would alleviate all or part of the treatment needs over the next 20 years. The report, however, states that COG failed to develop acceptable recommendations for such facilities. There is a substantial difference between the terms "recommend" and "include." While the revised 208 plan includes Rock Run because it is being planned by WSSC, the plan does not specifically recommend it. There is no evidence in the plan that COG performed the analysis required to justify such a recommendation. Such an analysis would have included reviewing technically feasible alternatives in the planning area and demonstrating the recommended alternative's desirability through comparative cost-effectiveness analyses, environmental assessments, and public participation.

Furthermore, Rock Run does not solve the Blue Plains overload problem. It is designed to provide Montgomery County with the capacity it needs for projected growth once the county uses up all of its capacity in Blue Plains. The issue which still remains and which our report addresses is, how will the current and growing Blue Plains overload situation be resolved? While Montgomery County has offered the District 5 mgd capacity from the Rock Run plant, this would meet only a very small part of Blue Plains' overload and the District has not accepted the County's offer. And, in our opinion, the District has little incentive to do so. Because WSSC has not gone through the Federal grant application process, Rock Run has not been shown to be eligible for Federal funding, whereas other alternatives the District is exploring in its feasibility study may be eligible for 75 percent Federal funding.

COG also commented that our statement that Rock Run is ineligible for Federal funding may not be correct and is a legal issue. We agree and have revised our statement to reflect the fact that qualifying for Federal funding will be difficult, but we do not consider it an impossibility.

3. COG states that when we compare the Blue Plains plant's performance with its permit requirements it would be more accurate to use the plant's interim permit requirements instead of its final requirements. We disagree. EPA established interim requirements out of administrative necessity, recognizing that at the time it issued the permit, the plant was incapable of meeting final effluent requirements. Our purpose in presenting the data was to compare plant performance with what was necessary to meet water quality standards so that we could demonstrate how far Blue Plains is from achieving its intended pollution control limits. Consequently, Blue Plains' final limits are the most appropriate criteria for comparison.

4. COG believes we should use August 1981, the scheduled starting date adopted by the local governments for the Blue Plains plant's feasibility study, as the most appropriate date to gauge when the study should be completed. Local jurisdictions, however, are under an EPA administrative order which requires that the study be completed by October 1, 1981. The fact that local jurisdictions scheduled the study to begin in August reflects the problems encountered in determining the study's scope. These problems are fully discussed on report pages 89 to 90.

5. COG states that we should further explain why the District decided to drop its Oxon Cove composting project. We are unable to be more explicit than we are in our report. Our report states that there were perceived health risks from a fungal spore emitted in the composting process which could cause respiratory problems in susceptible people, and that the proposed site was near a home for the elderly. We also state there was public opposition to the site. Our review did not reveal any additional reasons why the District withdrew its plans.

6. COG states that we have been unnecessarily negative and misleading in our statement that sludge is a very undesirable by-product of waste water treatment plants. We have eliminated this statement from the text.

7. COG states that our unqualified statement that the Blue Plains plant's permit is based on the assimilative capacity of the Potomac is not completely true. We agree and have revised the text. COG further states the permit should be based on the assimilative capacity of the Potomac after considering the wide range of seasonal flow, temperature, and pollution loading conditions. We fully recognize COG's position on pages 73 through 76.

We cannot conclude, however, as COG does, that the permit should be changed although we agree that such changes should be considered in issuing future permits and that the Potomac River studies now underway should determine if the changes are feasible. We point out on page 76 that EPA has undertaken such studies.

8. COG believes we have been too harsh in characterizing local governments actions as "foot-dragging." We disagree. The history of the area shows that Blue Plains' overload and sludge disposal problems have been studied and restudied without firm commitments by local jurisdictions to take action. Our position, as stated on pages 92 to 93, is that given the uncertainties which still exist regarding area waste water treatment needs and current waste water treatment capabilities, the recommendations of studies currently being conducted may very well be challenged by jurisdictions identified as sites for future facilities. In short, we see no evidence of an increased commitment to action over that which existed in the past. In fact, as discussed on pages 34 to 38, some communities might have less commitment because they have become or are becoming relatively self-sufficient in their waste water treatment programs.

9. COG states that it is incorrect to suggest that current controversies surrounding effluent limitations will not be resolved until information is available concerning the ultimate performance of Blue Plains. We have revised the text to remove this suggestion.

10. COG states that it is premature, and in part inaccurate, to say that regional planning mechanisms are inadequate or have failed to translate nonpoint source abatement recommendations into enforceable actions. Presently, there are no regionwide mechanisms to assure that local jurisdictions will undertake recommended actions, but we agree it is premature to assert that local jurisdictions will not take action some time in the future. Consequently, we revised the text.

11. COG said we should have discussed Blue Plains' staffing shortages and its effect on permit violations in greater detail. While we agree this discussion could have provided greater insight into why Blue Plains is violating its permit, it was not within the scope of our review. Our review focused on intergovernmental problems in implementing water quality programs. EPA's National Enforcement Investigations Center was conducting such a study at the time of our review, and its published report should be available.

12. COG believes we should clarify our use of the phrase "when it is raining" to show more clearly that treating storm

flows is a permit requirement but has not been shown to be necessary by Potomac River water quality models. We have done so.

APPENDIX VIII

State of Maryland

OFFICE OF THE SECRETARY

DEPARTMENT OF HEALTH AND MENTAL HYGIENE

201 WEST PRESTON STREET • BALTIMORE, MARYLAND 21201 • Area Code 301 • 383- 7328

Harry Hughes, Governor

Charles R. Buck, Jr., Sc.D. Secretary

October 8, 1981

Mr. William J. Anderson, Director
United States General Accounting Office
441 G Street
Washington, D.C. 20548

Dear Mr. Anderson:

My staff has reviewed Changes Are Needed To Implement Less Costly And More Effective Regional Solutions For Potomac River Pollution, and we have the following comments on the report.

This document is a factual assessment of the problems encountered by the jurisdictions of the Metropolitan Washington area in their efforts to clean up the Potomac River and to meet the requirements of the nation's complex clean waters program. Your approach is unbiased, and you present a good accounting of the frustrations encountered by federal, state, and local agencies involved in the area's pollution control programs.

While we concur with many of the conclusions derived from this report, there are several points with which we cannot agree. These are listed below.

1. Uniqueness of Washington Situation -- While the Washington Metropolitan area does have problems (as discussed in this report) similar to those occurring in other parts of the nation, we believe the atypical arrangement of government structures and processes create many circumstances and environmental issues unique to the Washington area.

2. Significant Impact Assessment -- Under the Advanced Wastewater Treatment review now performed by the Environmental Protection Agency for all POTWs beyond the level of secondary treatment, a case-by-case "significant impact assessment" is in fact being made. Costs and benefits are components of each such review.

3. Cost/Benefit Analyses -- A justification based on cost/benefit analyses for Advanced Wastewater Treatment (AWT) is difficult to establish because the principal benefits are difficult to

quantify. Cost/benefit analyses justification could require the preparation of more costly studies to quantify what is truly "significant water quality" (and significant to whom) and then equate this with a dollar value. It is not clear that a more detailed assessment of the benefits necessarily produces a more "accurate" assessment.

4. Attainment of Water Quality Standards -- In Maryland, the cost of attaining the State's water quality standards has not entered into setting those standards. Of course, we support the selection of sewage treatment systems which represent the most cost-effective means of achieving those standards. We view water quality standards as the mechanism for stating technically the broad goals of the Clean Water Act, and not as means of setting economically feasible targets.

5. Water Quality Benefits -- We feel this document places too much emphasis on cost/benefit analyses, and not enough emphasis on the water quality benefits of the Clean Water Act and its programs.

6. Seasonal Effluent Limitations -- The State of Maryland endorses the practice of seasonal effluent limitations. The State presently has approximately 50 POTWs with permits allowing for seasonal nitrification.

While we view regional water quality planning as a valid concept, we are cognizant of its failure to date to implement optimal solutions for the Washington area in a timely fashion. Institutional arrangements should be formalized, creating an agency with authority to both solve and implement regional solutions, and Congress should stipulate that the Environmental Protection Agency act as a strong mediating force.

It is worthwhile to note that bacterial levels in the Potomac River water in the Washington D.C. vicinity met the federal criteria for swimming during periods of dry summer weather. Improvement has occurred, and the trend is continuing to improve with the performance and current upgrading of the Blue Plains sewage treatment plant. There is documented evidence that sport fish are again making the Potomac their home.

Thank you for the opportunity to review and comment.

Sincerely yours,

William M. Eichbaum
Assistant Secretary for
Environmental Programs

WME:pbs

APPENDIX IX

COMMONWEALTH of VIRGINIA

STATE WATER CONTROL BOARD
2111 Hamilton Street

R. V. Davis, P. E.
Executive Director

Post Office Box 11143
Richmond, Virginia 23230
(804) 257-0056

October 7, 1981

Mr. William J. Anderson
Director
General Government Division
United States General Accounting Office
Washington, DC 20548

Dear Mr. Anderson:

My staff has reviewed your report entitled "Changes are Needed to Implement Less Costly and More Effective Regional Solutions for Potomac River Pollution" and has found it to accurately summarize the history of dealing with point source water quality issues in the immediate Washington area. The bulk of this report deals with Washington, D.C. and Prince George and Montgomery Counties in Maryland. The major references to Virginia are to the small contributions of flow from Fairfax County to Blue Plains and to the disposal of Blue Plains sludge at the Lorton, Virginia landfill. Since very little of the report deals directly with Virginia, coupled with the fact that the Virginia State Water Control Board was not consulted during the development of the report, we feel it is important to note in the report that any conclusions regarding the multitude of problems noted should not be construed to be applicable to Virginia. In general, we feel that although the GAO report does clearly and accurately identify the problems involved in a regional approach to solving water quality problems, it fails to provide recommendations of much substance to correct these problems. Additionally, the report fails to address non-point source pollution problems, which the 208 planning process was supposed to address, and which may contribute significantly to a failure to meet water quality goals.

The State Water Control Board is also concerned over the high economic costs of advanced waste treatment/advanced secondary treatment (AWT/AST) and has established a grant funding procedure for projects requiring these treatment levels. This procedure is to fund secondary treatment facilities in the State before funding AT units. However, there is not a complete prohibition of using construction grant funds for AT facilities. Before the Board agrees to

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Director
General Government Division
United States General Accounting Office
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fund new facilities providing treatment greater than secondary, the Board must be satisfied that advanced treatment is required and will definately result in significant water quality and public health improvements.

Specific comments regarding this report are as follows:

p. ii, para. 1 : Virginia jurisdictions in the D. C. area have not had the problems of siting STP's that Maryland has had. (No GAO response needed.)

p. ii, para. 1 : Sludge disposal has been a problem for those localities sending sewage to Blue Plains. Although Alexandria, Arlington and Prince William Counties have had to make their own arrangements for sludge disposal, they have also had problems meeting State regulations, etc. (No GAO response needed.)

p. v, para. 3 : Since there is a question of the need to consistently meet stringent limits, a tiered permit might be considered for Blue Plains. (No GAO response needed.)

p. 2, Map: Leesburg STP should be 1.3 MGD (will be expanding eventually to 2.5 MGD). Also, UOSA capacity has been increased to 15 MGD. (Change incorporated in text.)

p. 6, para. 3: Why were Maryland and District of Columgia interviewed, but not the Virginia State Water Control Board? (See GAO response, p. 155, item 1.)

p. 30 , para. 2 : GAO says it is too late for EPA enforcement. How can this be true if the regional waste load is still not treated properly to protect water quality? (See GAO response, p. 155, item 2.)

p. 33, para. 1: Why did EPA allow Prince George County to drop Piscataway expansion after Federal grants had paid for connecting projects? (See GAO response, p. 155, item 3.)

p. 35, para. 4: Sewer moritoriums would not affect Maryland, but would adversely affect D. C. What if EPA forced Maryland to take care of its own sewage and Blue Plains only served D.C. unless Maryland cooperated with a regional approach? (See GAO response, p. 155, item 2.)

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p. 37, para. 1: EPA should clarify that storm water should be included in Blue Plains flow. (GAO agreed; this is implicit in the text.)

p. 71, para. 2: We agree that EPA should expedite compost regulations to alleviate the problem of distribution. (No GAO response needed.)

p. 76, para. 4: The statement "...the State Water Control Board, have maintained the effluent requirement are not stringent enough ..." at Blue Plains is misleading in that the reader may infer that we disagree with the physical/chemical limits. Our position has been that we disagree with the removal of the flow limitation which was established in the initial permit. This point is brought out in the following paragraph, however, and we recommend that the misleading statement be removed. (Change incorporated in text.)

p. 78, Table: $11.6M available for Virginia grant funds is too low. The figure should be $63.7M for FY'81 and the percentage should be changed from 28 to 5. 1/

p. 82, para. 1: "the EDF, which has also been monitoring the Potomac ..." -- this statement is misleading because it implies that they have been conducting scientific research and sampling in the Potomac, similar to the USGS. To our knowledge, however, EDF has merely conducted a review of data collected by USGS and EPA, some of which was only preliminary data, not intended for public release. (Change incorporated in text.)

p. 83, para. 2: Research has been done on a national level, as well as in labroatory studies, etc. to determine relationship between water quality parameters and human/aquatic health, etc. Conducting a fish species/diversity study of the Potomac River population would be a lengthly, expensive and relatively questionable, non-quantitative undertaking. (See GAO response, p. 155, item 4.)

1/Although the figures in the table are correct, the table heading was unclear. We have corrected this.

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Director
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United States General Accounting Office
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p. 90, para. 1: No mention is made of the fact that COG, through its efforts in the 208 planning process, has already defined capacity needs for Blue Plains user jurisdictions in enough detail to conduct a feasibility study. Some of the "Phase I" efforts will be duplicative, so why spend more money in this area? (See GAO response, p. 156, item 5.)

p.107, para. 1: GAO's belief that costs and benefits should be weighed in approving water quality programs is valid, as is the conclusion that the total picture (air, water, land) should be evaluated in assessing the problem of sludge disposal. (No GAO response needed.)

If you have any questions concerning these comments, please feel free to contact Mr. Thomas M. Schwarberg, Regional Director, Northern Regional Office at 703-750-9111.

Sincerely,

R. V. Davis, P.E.
Executive Director

dc

GAO RESPONSE TO VIRGINIA STATE WATER CONTROL BOARD TECHNICAL COMMENTS

1. Officials at the State Water Control Board asked why we had not interviewed them when conducting our analysis. We did interview officials at its Northern Virginia Office on November 24, 1980, but unintentionally failed to include them in our scope of work section. We have corrected this oversight.

2. The State Water Control Board stated that we had concluded that it is too late for an EPA enforcement action; the Board believes this is not correct because our report shows the region's waste water is not being adequately treated and EPA must, therefore, take corrective action. We did not conclude that it is too late for an EPA enforcement action--only that moratoria and/or fines would tend to penalize jurisdictions which presently have no identified way to solve the problem. EPA most certainly could seek much broader forms of injunctive relief. For example, the State Water Control Board suggests that EPA could attempt to force Maryland to take its own sewage and require that Blue Plains serve only the District's needs unless Maryland cooperated with a regional approach. While EPA can seek such relief from the courts, we have no way of knowing if it would be granted. We believe, however, that EPA would seriously question whether such an approach is practical given the fact that the regional governments are participating in another series of studies to solve the Blue Plains problem and are operating within the stipulations of a consent decree entered into by EPA and the local jurisdictions.

3. The Virginia State Water Control Board asks why EPA allowed Prince George's County to drop plans to expand Piscataway when Federal grants were given for connecting projects. In our analysis, EPA did not have much choice because it did not require Prince George's County to expand the plant as a grant condition for the connecting projects. We believe this was a costly oversight on EPA's part.

4. The Virginia State Water Control Board commented that research has been done on a national level to determine the relationship between water quality parameters and human/acquatic health and believes little can be added by local studies to conduct a fish species/diversity study of the Potomac. We show on pages 83 to 84 that the Potomac estuary has improved although waste water treatment levels are far below requirements and water quality standards are not being met at all times. We believe decisionmakers need to know more precisely what they will be receiving from additional expenditures to complete area programs. Since the major goal toward which these programs are being undertaken is improved fishing, we believe the decisionmakers need to know how the fish population will improve by further incremental

improvements in water quality so that they can reasonably assess what further expenditures are needed.

5. The State Water Control Board asks why EPA has authorized another full scale feasibility study when COG has already answered many of the pertinent questions in its 208 study. The existing contractor's scope of work provides that it review available reports and use them in completing the current analysis. It was not within the scope of our study to review the contractor's work, and we consequently cannot assess whether it duplicates work already performed.

APPENDIX X

Montgomery County Government

ROCKVILLE, MARYLAND 20850

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County Executive
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TTY 279-1083

October 27, 1981

Mr. William J. Anderson, Director
General Government Division
U. S. General Accounting Office
Washington, D. C. 20548

Dear Mr. Anderson:

I have received the draft report entitled "Changes Are Needed to Implement Less Costly and More Effective Regional Solutions for Potomac River Pollution." I appreciate the opportunity to review and comment on the report.

In general, the report fairly describes the dilemma that continues to confront the metropolitan area in providing adequate sewerage and sludge facilities as part of the effort to clean up the Potomac River. It is true that some of the responsibility for the failure to accommodate regional needs rests with the local governments and their reluctance to accept permanent regional facilities. However, the Federal Government's historic role in simply denying or granting approvals rather than participating as a partner has greatly contributed to the lack of progress. These five to ten-year decision processes demand full and active participation at the Federal level. Periodic changes in Federal policy also have caused significant problems with these long-term planning processes.

The basic recommendation of the report is that due to the lack of local government cooperation in the past in dealing with Potomac River clean up, a new regional organization is needed with heavy Federal involvement, including the power to implement its decisions. While your solution is attractive on the surface, I believe the destruction of federalism as we now know it would result, and this is too high a price to pay for the ideal solution. Decisions on sewage and sludge pollution control facilities made in Philadelphia or Washington can rarely be as sensitive and responsive to local circumstances as decisions made by the local governments. Also, the "carrot" behind any such regional organization would have to be Federal construction grants, but, in light of the current uncertainty of such funds, I doubt this will long remain a significant inducement.

As an overall strategy, I would support, instead, the strengthening of existing institutional arrangements. Positive actions could include:

1. Placing more power in the hands of the few local jurisdictions that have the responsibility for implementing the solutions;

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2. More Federal and state support for locally-derived decisions in the face of community opposition;

3. More active role on the part of the states in effecting compromises between local jurisdictions, and if required, carrying on negotiations among the states; and

4. More active Federal participation in proposing constructive solutions, as opposed to simply acting in a regulatory role.

Alternatively, consideration of a "River Master" agent, as suggested in the Report, has merit as the final arbitor. However, the concept would require more development prior to its implementation. Perhaps a Federal study committee with the participation of the affected local jurisdictions and states could present an acceptable proposal.

Two major premises of the report are that no local jurisdiction is willing to have a regional treatment facility located within its borders, and that constructive action to deal with pollution normally only takes place as a result of court action. This ignores the fact that Montgomery County has been attempting to construct a regional treatment facility, first in Darnestown, then in Dickerson, and now at Rock Run, for almost ten years, and no Court order has been necessary to insist that Montgomery County pursue these facilities. Even today, we are completing the final planning for the Rock Run AWT, 25% of whose capacity, 5 mgd, has been offered to the District of Columbia. According to the 208 Plan, 5 mgd represents over one-third of the District's future needs through the Year 2000. Recognizing the difficulty the District faces, Montgomery County has offered, since 1978, to construct one-third of the District's needs, and we continue that commitment. While I will admit that this spirit of cooperation is not universal throughout the region, where it exists, it must be recognized.

I share your quandary over the need for ever more sophisticated and expensive wastewater treatment at Blue Plains and other regional facilities in light of the significant improvement in the Potomac River at current treatment levels. I agree with your suggestion for a cost-effectiveness analysis of higher treatment levels before we commit ourselves to these expensive treatment processes. Additionally, a rapid conclusion to the water quality modeling efforts now ongoing concerning the Potomac Estuary is urged to provide us necessary technical data to back up any decisions. The lack of such substantiated data in the past is well noted in your report.

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The report is inconsistent in its discussion of the utility and safety of sewage sludge and compost originating in the region. We are fortunate that our sludge is relatively free of most undesirable materials, and that an excellent, safe, soil additive can be produced from composting. Our interim Dickerson Composting Facility and our permanent facility near the Montgomery Industrial Park (so-called Site 2) will enable us to finally manage sludge as a resource out of place, which it is. In addition, some credit should be given to Montgomery County for its tireless efforts to see that the region's first permanent sludge composting facility is constructed, against formidable odds, and without Federal funding -- although I believe the facility to be eligible for it in principle.

I have enclosed several pages of detailed editorial comments and factual corrections for your consideration in drafting your final report.

Thank you again for this opportunity to comment, and I again urge you to give further thought to strengthening local and state institutions as a means of dealing with the environmental problems facing the Washington area.

Sincerely,

Charles W. Gilchrist
County Executive

CWG:hfr

Enclosure

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