GUIDANCE FOR FACILITIES PLANNING

U.S. ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460
January 1974

G U I D A N C E

F O R

F A C I L I T I E S P L A N N I N G

U. S. ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D. C. 20460
JANUARY 1974

F O R E W O R D

The central thrust in EPA implementation of the new water bill (P.L. 92-500) is maximizing environmental effectiveness of actions taken, including those concerning the accelerated program of building new and improved publicly-owned treatment works. The great amount of money that will inevitably be spent for publicly-owned treatment works as a result of the Act should be used to the best effect in meeting its goals.

At the heart of cost-effectiveness is the development and costing of alternatives before construction. These alternatives may variously involve land treatment or reuse of wastewater, flow reduction measures (including the correction of excessive infiltration or inflow), the treatment of overflows, alternative system configurations, phased development of facilities, or improvements in operation and maintenance. EPA will require that such alternatives be considered for any projects it helps to fund.

The alternatives must also be judged in terms of their net environmental effect. Care should be taken that pollutants addressed are germane to the local water quality problem, and that abatement practices to restore surface water do not shift an environmental problem to other, less remediable media.

Facilities planning, as provided for under Federal regulations and this supplemental guidance, is intended to accomplish the above objectives. The planning process features systematic economic and environmental evaluation of feasible alternatives and public involvement in the choice among the alternatives. The plan would provide information needed for EPA preparation of an Environmental Impact Statement which the law requires for federally funded projects. This approach is intended to assure the selection and development of cost-effective and environmentally sound treatment works which will meet the effluent limitations prescribed by the law. To achieve these goals, the facilities planning approach can be neither piece-meal nor short sighted. Rather, the geographic scope of planning should be sufficient to avoid foreclosing consideration of cost-effective alternatives and future facility needs should be forecast so that the facilities developed can be readily modified without undue expense as changes occur.

I expect this guidance to serve continuously as a useful planning tool. Thus, it will be up-dated when necessary to incorporate changes and additional information as developed. To improve the usefulness of this guidance, we need constructive comments and suggestions reflecting your usage experience. Such comments may be furnished to the appropriate EPA Regional Administrator, or to the Director, Water Planning Division (AW-454), Washington, D.C. 20460. Following revisions, you will receive revised pages of this guidance material.

Copies of this guidance and a Facilities Planning Summary may be obtained from the EPA Regional Office in your area.

Robert L. Sansom
Assistant Administrator
for Air and Water Programs (AW-443)

TABLE OF CONTENTS

TABLE OF CONTENTS
(continued)

TABLE OF CONTENTS
(continued)

TABLE OF CONTENTS
(continued)

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

1.1 PURPOSE

Presently, both National and State policies call for high quality water in all the nation's streams, lakes and coastal waters. In this regard, the importance of careful planning has become evident. Without planning, some water quality problems would not be solved and might become worse. In other cases, far more money than necessary would be spent to solve a water quality problem.

The Federal Water Pollution Control Act Amendments of 1972 (the Act) affirm the importance of planning and contain some new provisions intended to help achieve the national objective of clean water. The Water Strategy Paper (reference a) presents the EPA approach and policies for implementating the requirements of the Act. This guidance supplements the Federal regulations on grants for construction of publicly-owned treatment works (reference b) and presents advisory information on the process and procedures for planning such works (facilities planning). The process of facilities planning is emphasized as such guidance allows much more flexibility in meeting local conditions than does guidance prescribing in minute detail what is to be done.

1.2 APPLICABILITY

This guidance applies to entities involved in facilities planning. These include EPA, other Federal agencies, the States, local planning entities and applicants for grants to construct publicly-owned treatment works. works.

1.3 REFERENCES

a. Water Strategy Paper.

b. 40 CFR Part 35, Subpart E (Grants for Construction of Treatment Works-Federal Water Pollution Control Act Amendments of 1972).

c. 40 CFR Part 133 (Secondary Treatment Information).

d. 40 CFR Part 137 (Information on Alternative Waste Management Techniques and Systems to Achieve Best Practicable Waste Treatment).

e. 40 CFR Part 35, Appendix A (Cost Effectiveness Analysis Guidelines).

f. Federal Guidelines, Sewer System Evaluation.

g. 40 CFR Part 130 (State Continuing Planning Process).

h. 40 CFR Part 131 (Preparation of Plans Pursuant to State Continuing Planning Process).

i. Guidelines, Water Quality Management Plans, Section 303(e).

j. 40 CFR Part 35, Subpart B (State and Local Assistance).

k. 40 CFR Part 128 (Pretreatment Standards).

l. 40 CFR Part 35, Subpart E (Grants for Construction of Treatment Works - Federal Water Pollution Control Act Amendments of 1972, User Charges and Industrial Cost Recovery).

m. Technical Information Report, Alternative Waste Management Techniques for Best Practicable Waste Treatment.

n. Survey of Facilities Using Land Application of Wastewater, July 1973 (EPA-430/9-73-006).

o. Wastewater Treatment and Reuse by Land Application, August 1973 (EPA-660/2-73-006 a and b).

p. EPA Policy Statement (Proposed), Acceptable Methods, Based Upon Current Knowledge, for the Ultimate Disposal of Sludges from Publicly-owned Wastewater Treatment Plants.

q. Federal Guidelines; Design, Operation, and Maintenance of Wastewater Treatment Facilities).

r. Technical Bulletin; Design Criteria for Mechanical, Electric, and Fluid System and Component Reliability.

s. Water Resources Council, Water and Related Land Resources, Establishment of Principles and Standards for Planning, Federal Register, Vol. 38, No. 174, Sept. 10, 1973.

t. 40 CFR Part 6 (Preparation of Environmental Impact Statements).

u. 40 CFR Part 105 (Public Participation in Water Pollution Control).

v. OMB Circular A-95.

1.4 OBJECTIVES

The overall facilities planning objective is provision for cost-effective, environmentally sound and implementable treatment works which will meet applicable requirements of Sections 201(g), 301, and 302 of the Act. Facilities plans in effluent limited segments (paragraph 1.7) will provide for secondary treatment (reference c) as a minimum plus, where applicable, provision for application by 1983 of the Best Practicable Waste Treatment Technology (BPWTT) in accordance with reference (d). The latter requirement must be met as a basis for awarding grants for design (Step 2) and for construction (Step 3) of treatment works from funds authorized for FY 1975 and thereafter. Criteria for BPWTT are presented in reference (d) for each of the following waste management technique categories:

a. treatment (biological or physical-chemical) and discharge to receiving waters;
b. treatment and reuse; and
c. land application.

Techniques included in the above categories will be compared under the facilities planning process as described in Chapters 2 and 3. In evaluating alternative techniques for a specific case, any local environmental or water management goals such as the following should be considered:

a. preservation or enhancement of designated surface waters for aesthetics, recreation or fish and wildlife purposes;
b. prevention of saltwater intrusion or enhancement of groundwater supply through groundwater recharge;
c. water conservation through wastewater reuse or recycling; and

d. multiple use of facilities and required lands for such purposes as recreation, aesthetics and fish and wildlife.

Where necessary to meet water quality standards (in water quality segments) pollutants will be reduced as required beyond the minimums of the BPWTT criteria. In these cases, such reductions will be obtained through a higher degree of treatment for dry-weather flows or measures for abating pollution from combined sewer overflows or a combination of both approaches. Within water quality segments the effluent limitations for both municipal and separate industrial sources will be based upon determinations of maximum allowable loads and waste load allocations as required by reference (i).

1.5 CONTENTS OF FACILITIES PLAN

Consistent with reference (b), a facilities plan will include:

a. A description of the treatment works for which construction drawings and specifications are to be prepared. This description shall include preliminary engineering data, cost estimates for design and construction of the treatment works, and a schedule for completion of design and construction. The preliminary engineering data may include, to the extent appropriate, such information as a schematic flow diagram, unit processes, and desigh data regarding detention times, flow rates, sizing of units, etc.

b. A description of the selected complete waste treatment system(s), of which the treatment works is a part. The description shall cover all elements of the system, from the service area and collection sewers, through treatment, to the ultimate discharge of treated wastewaters and disposal of sludge.

c. Infiltration/inflow documentation in accordance with references (b) and (f).

d. A cost-effectiveness analysis of alternatives for the treatment works and for the waste treatment system(s) of which the treatment works is a part, in accordance with reference (e) and this guidance. The selection of the

system(s) and the choice of the treatment works on which construction drawings and specifications are to be based shall reflect the cost-effectiveness analysis. This analysis shall include:

1. The relationship of the size and capacity of alternative works to the needs to be served, including reserve capacity.

2. An evaluation of alternative flow and waste reduction measures.

3. An evaluation of improved effluent quality attainable by upgrading the operation and maintenance and efficiency of existing facilities as an alternative or supplement to construction of new facilities.

4. An evaluation of the capability of each alternative to meet applicable effluent limitations. The treatment works design must be based upon not less than secondary treatment (reference c).

5. An identification of, and provision for applying, BPWTT as required. Where application of BPWTT would not meet water quality standards, the facilities plan shall provide for attaining such standards. Such provision shall consider treating combined sewer overflows as an alternative means of meeting water quality standards.

6. An analysis of the alternative means by which ultimate disposal can be effected for treated wastewater and for sludge materials resulting from the treatment process, and a determination of the means chosen.

7. An adequate assessment of the expected environmental impact of alternatives pursuant to Chapter 5.

e. An identification of effluent discharge limitations, or where a permit has been issued, a copy of the permit for the proposed treatment works as required by the National Pollution Discharge Elimination System.

f. Required comments or approvals of relevant State, interstate, regional and local agencies.

g. A brief summary of any public meeting or hearing held during the planning process, including a summary of the views expressed.

h. A brief statement demonstrating that the authorities which will be implementing the plan have the necessary legal, financial, institutional, and managerial resources available to insure the construction, operation, and maintenance of the proposed treatment works.

1.6 COST-EFFECTIVENESS ANALYSIS

The mandate for cost-effectiveness, as it applies to the planning of publicly-owned treatment works, is set forth by Section 204(a) (5) and 212(2) (A), (B), and (C) of the Act. The concepts of cost-effectiveness are outlined below and the application of these concepts to facilities planning is described in reference (e) and this guidance.

Cost-effectiveness analysis is defined as an analysis featuring systematic comparison of alternatives to identify the solution which will minimize total costs to society over time to reliably meet given goals or objectives. Total costs to society include resources costs plus social and environmental costs. Thus, the purpose of cost-effectiveness analysis is to select an alternative which efficiently uses the nation's resources in meeting adopted goals while minimizing adverse environmental and social impacts. The analysis involves identification and study of the tradeoffs among monetary costs, environmental effects and other aspects of the alternatives leading to selection of the best plan.

Resources costs are the values of goods and services representing primary project inputs and include: capital costs (construction, land, interest during construction and other labor and service); plus operation, maintenance and replacement (O.M.&R.) costs. Resources costs may usually be represented in monetary terms, while environmental and social costs (effects), as described in subsequent chapters, are usually not identifiable in monetary terms. Rather, these costs are usually expressed descriptively using quantitative or qualitative terms. Chapter 4 provides further information governing calculation of monetary costs and Chapter 5 covers evaluation of environmental and social costs.

1.7 RELATIONSHIP OF FACILITIES PLANS TO BASIN PLANS AND OTHER WATER QUALITY MANAGEMENT PLANS

Facilities plans will conform to the State continuing planning process and to applicable basin plans prepared by the States under Section 303 of the Act (references g, h, i). Under the State continuing planning process, water segments have been initially identified and classified as either "water quality" or "effluent limitations". The water quality class includes any segment where it is known that water quality does not meet applicable water quality standards and which is not expected to meet water quality standards even after application of the effluent limitations required by sections 301 (b) (1) (A) and 301 (b) (1) (B) of the Act. (The effluent limitationss required by Section 301 (b) (1) (A) and (B) are base level limitations consisting generally of best practicable control technology currently available (BPT) for industrial point sources and secondary treatment for municipal sources. BPT and secondary treatment are defined in regulations issued and to be issued by EPA.) The effluent limitation class includes any segment where water quality is meeting and will continue to meet water quality standards or where there is adequate demonstration that water quality will meet applicable water quality standards after application of the above effluent limitations. Basin plans should reevaluate and refine these initial classifications. The basin plans will also identify point and non-point waste sources, determine waste characteristics and establish a basis for the State project priority list of needed municipal wastewater facilities (see reference j). For water quality segments, the 303 basin plans, when available, will provide the maximum allowable amounts of pollutants and the waste load allocations among point sources. For those water quality segments not covered by a completed 303 basin plan, wasteload allocations developed for permitting should be used. Where a wasteload allocation has not been made, either the State or the Regional Administrator shall develop such an allocation as a basis for preparing a facilities plan.

The water quality management planning formerly under 40 CFR 35.150-1 and 2 (previously 18 CFR 601.32 and .33), has been superseded by referenced regulation (b). The former regulations covered both basin water quality management plans and the facility oriented metropolitan or regional plans. To avoid duplicative planning, any existing basin, metropolitan or regional plans prepared under the previous guidelines or other wastewater management plans will be used to the maximum practicable extent. Since the former requirements for metropolitan or regional plans closely

resemble many of the requirements presented herein for facilities plans, in some cases simply amending or supplementing existing metro or regional plans may be the most practical approach toward compliance with this guidance. In any event, the facilities planning authorities will carefully review existing wastewater management plans and consult with those who have prepared and approved such plans with a view toward properly incorporating appropriate elements of any existing plan in the facilities plan and preventing unnecessary or duplicative planning.

1.8 RELATIONSHIP OF FACILITIES PLANS TO SECTION 208 AREAWIDE WASTE TREATMENT MANAGEMENT PLANS

Within planning areas designated under Section 208 of the Act, any facilities plans, existing or underway, should be construed as a step toward and supplementary to the more comprehensive 208 plan which, when completed and approved, will supersede any existing facilities plan(s) within the 208 area. The 208 plan will provide for integrated waste treatment management including industrial and non-point source abatement measures and regulatory programs as well as municipal waste treatment facilities. The facilities planning entity should furnish facilities plans prepared pending completion of a 208 plan to the designated 208 planning agency for comments.

1.9 RELATIONSHIP OF FACILITIES PLANS TO MUNICIPAL PERMITS

Direct relaticnships exist between municipal permitting and facilities planning. Facilities plans will, as a minimum, meet permit requirements. Where the permit has been completed prior to facilities plan completion, the plan will include a copy of the permit. Otherwise, the facilities plan should include adopted municipal discharge effluent limitations and the abatement schedule. With respect to future growth of waste loads, the aim of both permitting and planning should be to eliminate or preclude the adverse effects of such growth through planning for timely increases in treatment capability or for other measures for regulating growth. Facilities plans will be consistent with EPA policy for permitting municipal facilities under high growth situations.

1.10 STATE RESPONSIBILITIES FOR PLANNING

States will have overall program control for facilities planning. The state will:

a. Determine where and when treatment works will be required through preparation and submission of the State project priority list (see reference j). Development of the list should be based upon applicable Section 303 basin plans, the annual State strategy, the ranking of water segments and the State municipal discharge inventory.

b. Establish priorities and scheduling for facilities planning in accordance with the State priority system under Section 106 of the Act.

c. Develop waste load allocations under the 303 planning process and establish the effluent discharge limitations for municipal point sources.

d. Delineate, as a preliminary basis for planning, the boundaries of the planning areas as described in Chapter 2. The State shall consult with the local officials in making the area and boundary determinations.

e. Review plan of study to insure that (1) the geographic planning area is adequate; (2) the nature and scope of the planning tasks are properly defined and cover only essential work; and (3) planning costs are reasonable.

f. Review facilities plans and certify that (1) the plans conform with the requirements of reference (b); (2) the plan conforms with existing basin plans developed under Section 303; (3) any concerned 208 planning agency has been afforded the opportunity to comment upon the plan; and (4) the plan conforms with applicable approved 208 plans.

CHAPTER 2

FACILITIES PLANNING PROCESS

2.1 INTRODUCTION

Figure 2.1 outlines the facilities planning process. Although Figure 2.1 suggests that the process involves a series of distinct and separate steps, this ordinarily would not be the case. Iteration of the steps would occur and the sequence of the steps may differ from that shown in some cases.

2.2 DELINEATE PLANNING AREAS (STEP 1)

The first step in the planning process--defining the planning area--is one of the more important. It is essential to outline a geographic area sufficient to permit unrestricted analysis of alternatives including waste treatment methods and ultimate disposal options for sludge and treated effluent. Also, each planning area should encompass the entire area where cost savings, other management advantages, or environmental gains may result from interconnection of individual waste treatment systems or collective management of such systems.

In delineating facilities planning areas, consideration should be given to applicable provisions of the regulation, "Preparation of Environmental Impact Statements" (40 CFR, Part 6). This regulation (reference t) provides that an environmental assessment is an integral part of a facilities plan and such assessment must adequately cover the cumulative environmental impacts of proposed treatment works. Thus, the geographic scope of the facilities plan must be sufficient to permit such analysis. Otherwise, the referenced regulation provides that if a number of related facilities plans are submitted in conjunction with applications for grants, EPA may delay approval of these plans and award of a grant until the plans can be reviewed together to allow the agency to properly evaluate their cumulative environmental impact.

Recognizing the considerations discussed above, planning area boundaries for non-metropolitan communities (1970 core city population less than 50,000) should encompass the entire community including those areas subject to future urban development. Where cost savings or other advantages might result from waste treatment system interconnection, joint effluent or sludge disposal

facilities, or collective management for two or more nearby communities, the planning area should encompass the community group. Should a community be isolated sufficiently to preclude such regionalization, the facilities planning area should be confined to that community.

Piecemeal planning for metropolitan areas must be avoided as such planning is likely to foreclose consideration of the range of options necessary to assure a cost-effective solution. However, in some cases single facilities plan coverage of such entire areas may be impracticable for institutional, geographic or other reasons. Where practicable, particularly for those smaller metropolitan areas with a limited number of political jurisdictions or of public bodies having jurisdiction over sewage disposal, facilities planning areas should include the core city plus contiguous urban areas. Where sub-metropolitan planning is necessary, the planning area should encompass contiguous waste treatment systems where such systems may require major new or expanded treatment plants, sludge disposal or effluent disposal facilities and where system interconnection or joint facilities would be feasible alternatives. If these considerations do not apply, facilities planning areas within metropolitan areas should include, as a minimum, the entire waste treatment system.

2.3 PREPARE PLAN OF STUDY (Step 2)

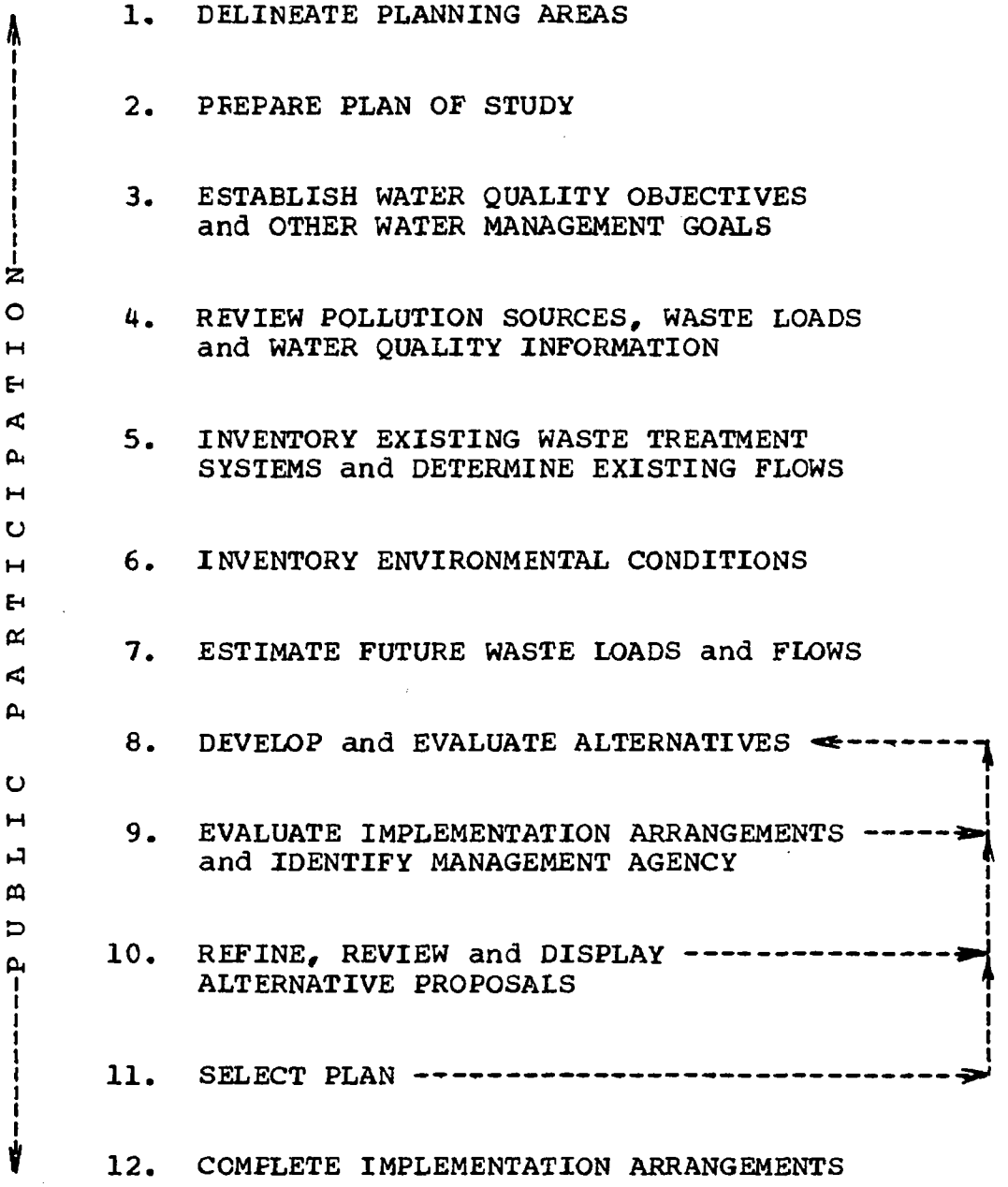
A plan of study will be prepared and approved by the State and EPA prior to initiating a facilities plan. The plan of study will be a brief document presenting the following information:

a. a map delineating the planning area;
b. the responsible planning entities and arrangements for conducting the planning;
c. a description of the nature, scope and detail of the planning effort including the scope of required infiltration/inflow documentation;
d. a breakdown of specific planning tasks and a schedule for their completion; and
e. an itemized estimate of planning costs.

With respect to item c, the recommended plan should have sufficient scope and detail to assure that the water quality goals and technical criteria are met. Interceptors and collection systems will be located and sized; the treatment plant location, site layout and unit process combinations will be displayed; effluent disposal, reuse,

Figure 2.1

FACILITIES PLANNING PROCESS



and sludge disposal facilities will be described and located; and engineering cost estimates will be presented. In addition, the energy and resource requirements and major environmental impacts of the selected plan, as well as the alternative proposals, will be displayed.

The alternative systems will be developed and evaluated in detail sufficient to identify practicable alternatives; effects and other aspects; and to permit realistic comparison of the alternatives.

In view of the large proportion of relatively simple planning cases, the plan of study should identify such cases as particular efforts should be made to restrict planning to that essential. To aid in identifying "simple cases", review to determine whether the situation meets the following guidelines is suggested:

a. the area is not within a Standard Metropolitan Statistical Area;
b. the estimated new investment requirement is less than $5 million;
c. the area growth rate is less than the national average for urban areas;
d. the environmental setting is relatively nonsensitive; and
e. regionalization opportunities do not exist.

The suggestions below provide for simplifying planning specifically for simple cases. It is recognized that each of these suggestions will not be uniformly appropriate for all cases and thus must be reviewed and applied with discretion to each case. The suggestions follow:

a. Limit evaluation of alternative flow and waste reduction measures to infiltration/inflow analysis and any required sewer rehabilitation measures.

b. Limit detailed evaluation to a small number (not more than 3 or 4) of the most feasible alternatives.

c. Limit environmental evaluations to brief summaries of existing conditions and significant effects of each alternative.

The plan of study should identify simple planning situations and, for all situations, briefly describe the

planning scope and detail required including the scope of the infiltration/inflow analysis.

2.4 ESTABLISH WATER QUALITY OBJECTIVES AND OTHER WATER MANAGEMENT GOALS (STEP 3)

Planning of publicly-owned wastewater treatment works will provide, as minimums, for secondary treatment and for scheduled application (prior to 1983) of BPWTT meeting EPA criteria. For most water quality segments, meeting any more stringent effluent limitations corresponding to the established waste load allocations would be the objective. In this case, the need for pollution abatement beyond that obtainable from BPWTT will be determined. If further pollution abatement is needed, the plan will provide for treatment of combined sewer overflows, further treatment of dry weather flows, or a combination of both -- whichever approach is most cost-effective. Plans will include provision for combined sewer overflows wherever and to the degree required to meet water quality standards.

Under this step of the process, other local environmental or water management goals, such as those presented in Chapter 1, should be identified.

2.5 REVIEW POLLUTION SOURCES, WASTE LOADS AND WATER QUALITY INFORMATION (STEP 4)

Where available, Section 303 Basin Plans prepared by the State in accordance with 40 CFR, Part 131 will provide essential information on municipal and industrial point sources, waste loads, effluent limitations and water quality within the water segment(s) receiving wastes from the planning area. Where available, information developed for permitting and established permit conditions would be an additional source of information. At the start of facilities planning these data will be reviewed and supplemented as necessary. Where 303 basin plans have not been completed, effluent limitations for publicly owned treatment works will be determined by the State or Regional Administrator.

2.6 INVENTORY EXISTING WASTE TREATMENT SYSTEMS AND DETERMINE EXISTING FLOWS (STEP 5)

The existing waste treatment systems including flow and waste reduction measures, sewers, treatment plants, effluent disposal measures and sludge disposal measures must be accurately assessed to establish a basis for planning any system modifications. Such assessment will include a

performance evaluation of the wastewater treatment facility. The evaluation of the operational efficiency of a wastewater treatment facility consists of an in depth analysis of basic elements such as the following:

1. plant performance;
2. operational problems;
3. operating personnel;
4. sampling and testing program;
5. laboratory facilities; and
6. maintenance program.

Some causes of poor plant performance are often related to one or more of the following:

1. lack of proper plant operation and control;
2. inadequate plant design;
3. changes in wastewater flow or characteristics; and
4. changes in treatment requirements.

An incorrectly operated or maintained facility cannot consistently perform according to design. No physical upgrading or new construction should be considered before there is thorough documentation that the existing plant is being operated to yield its optimum efficiency.

Average wastewater flows, flow variations, wastewater characteristics and waste loads must be determined as a basis for estimating design flows and waste load reductions. Such data will cover domestic and industrial (industries served by the system) flows, dry-weather flows and combined sewer overflows. The combined sewer overflow information will define the problem and, where practicable, include types and amounts of pollutants, magnitude and frequency of overflows and bypasses, and water quality impacts. Unless the state certifies that excessive infiltration/inflow does not exist, this step will include an infiltration/inflow analysis in accordance with EPA Guidelines for Sewer System Evaluation. Such an analysis involves estimating the infiltration and inflow to the system, approximating, on a preliminary basis, the costs of treating the infiltration/inflow versus the costs of rehabilitating the system to eliminate the problem, and finally, based on comparison of such costs, determining whether the infiltration/inflow is excessive. Should excessive infiltration/inflow be indicated, a more detailed sewer system evaluation survey will be made to specifically define the problems and determine the needed corrective measures and their costs. The scope of the infiltration/inflow analysis should be limited to those waste treatment systems

for which construction drawings and specifications for treatment works are to be prepared immediately following completion of the facilities plan.

2.7 INVENTORY ENVIRONMENTAL CONDITIONS (STEP 6)

To establish a baseline (without project) for measuring environmental effects of proposed wastewater facilities, existing environmental values and resources will be determined as described in Chapter 5. This inventory will include identification of plant and animal communities; wildlife habitat including wetlands, stream valleys and other natural areas; community growth patterns; and air and water quality. When practicable, these values will be measured in quantitative terms.

2.8 ESTIMATE FUTURE WASTE LOADS AND FLOWS (STEP 7)

To provide the basis for planning and preliminary design of facilities, forecasts must be made of the future variations of waste loads and flows over the planning period. As described in Chapter 3, such forecasts should be based upon evaluation of land use plans, where available; economic and demographic growth trends for the planning area; and any growth constraints imposed by air quality implementation plans, zoning restrictions or permit conditions. The effects of selected flow and waste reduction measures, including sewer system rehabilitation to correct infiltration/inflow, should also be reflected in the flow forecasts to permit subsequent calculation of waste treatment system cost reductions.

2.9 DEVELOP AND EVALUATE ALTERNATIVES (STEP 8)

Many decisions are required regarding the collection, conveyance, and treatment of wastewater and the reuse or ultimate disposal of treated effluents and sludge. In view of the many available options, planning must be systematic. Initially, upgrading the operating efficiency of existing facilities should be evaluated as an option or supplement to new construction. The base line for subsequent planning shluld be identified as that level of treatment actually attainable by the existing facilities based upon performance evaluation. Subsystem options will be identified and compatible options combined into preliminary treatment systems, with a view toward meeting the adopted water quality goals. Subsystems failing to meet physical constraints of the planning area such as climate, soils, or topography, or those incompatible with air or water quality constraints will be rejected. The reasons for subsystem

rejection should be presented. Rough layouts of each preliminary alternative system will be developed. Using judgement supplemented by rough analysis of monetary costs and environmental effects, the preliminary alternatives will be screened with respect to goal attainment, monetary costs, environmental effects, and physical, legal or institutional constraints. Those alternatives found to be unacceptable with respect to any of these factors should be rejected. The remaining alternatives should then be evaluated in detail to develop a limited number of proposals for public presentation. The diagram (Figure 2.2) suggests an alternative development and evaluation process. Major subsystems and typical options within each are discussed in Chapter 3. Evaluation of monetary costs and environmental effects is presented in Chapters 4 and 5.

Following screening of the system alternatives, evaluation of the remaining alternatives will include the following analyses:

1. contributions to water quality goals and objectives of each alternative;

2. present value or average annual equivalent value of capital and operating costs for overall alternative and subsystem components;

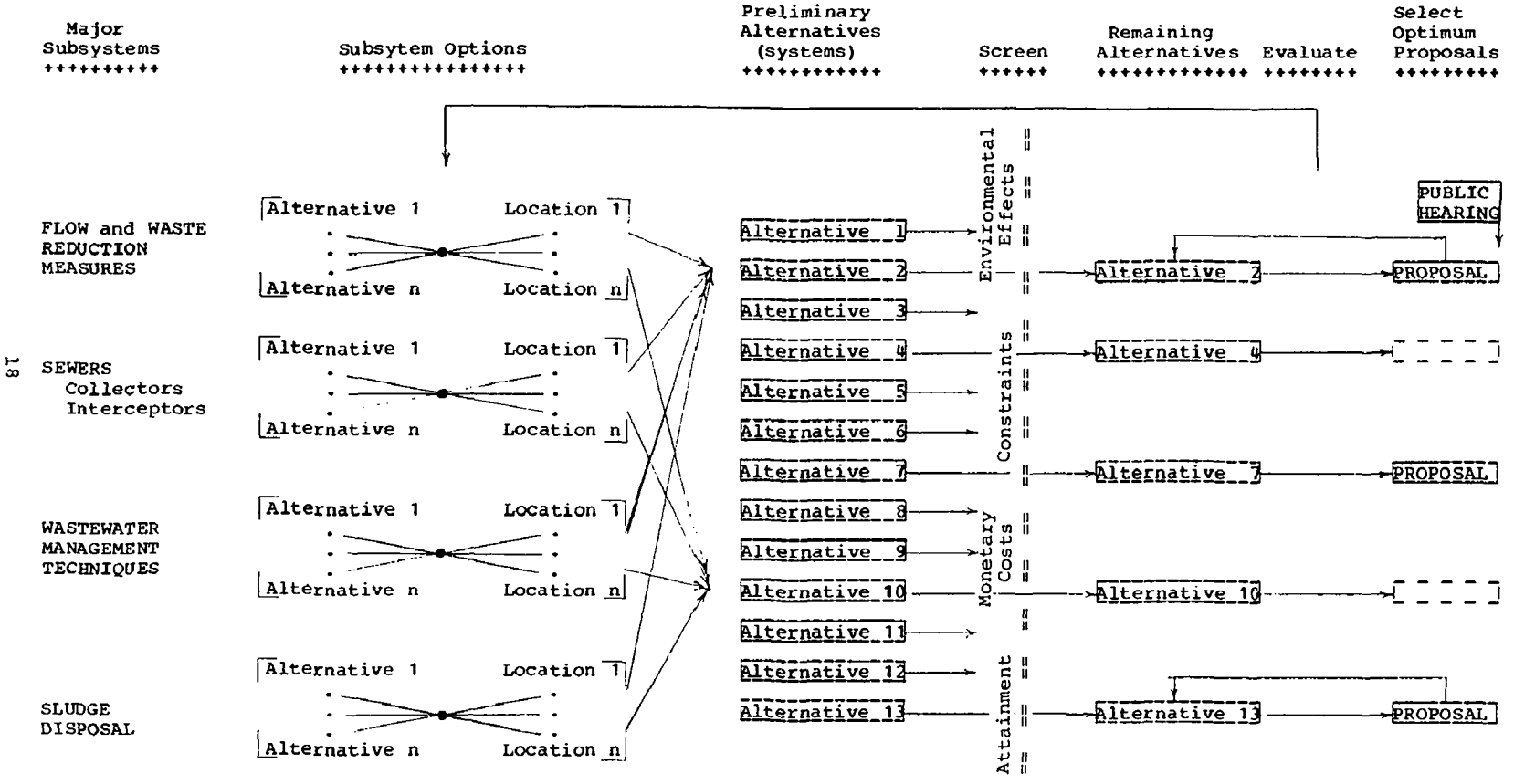
3. significant environmental effects of each alternative consistent with NEPA including a specific statement on future development impacts; and

4. operability, reliability and flexibility of each alternative and subsystems included in each alternative.

Based on the comparative evaluations, the most desirable and undesirable aspects of each alternative will be identified and any clearly inferior alternatives will be rejected. In some cases, new alternatives will be identified and formulated. (See Figure 2.2). Where necessary to better distinguish their relative merits, the proposals will be refined and the comparison repeated. This iterative process will produce a limited and manageable number of proposals for final evaluation and public review as a basis for plan selection.

FIGURE 2.2

ALTERNATIVE DEVELOPMENT AND EVALUATION



2.10 EVALUATE IMPLEMENTATION ARRANGEMENTS (STEP 9)

Prior to selection of a final plan, existing institutional arrangements and the authorities of existing wastewater management agencies must be compared to those required to implement the plan. Further, local financial obligations for each proposal, based on capital and O.M.&R. cost schedules and preliminary cost allocations among local governmental units, should be estimated. These matters, as well as the costs and effects of each proposal, should be discussed with representatives of concerned local governmental units and their views on the plans obtained. Also, a prospective wastewater management entity should be tentatively identified.

Provision must be made to assure proper and efficient operation and maintenance, including the employment of trained management and operations personnel, all in accordance with a plan of operation approved by the state water pollution control agency, or an appropriate interstate agency. There should be assurance that there is adequate legal, institutional, managerial, and financial capability to insure adequate operation and maintenance of any existing or proposed treatment works. Chapter 6 further discusses plan impementation.

2.11 REFINE, REVIEW AND DISPLAY ALTERNATIVE PROPOSALS (STEP 10)

Each alternative proposal will be examined, refined, and modified as needed to define all elements sufficiently to assess realistically costs, reliability and environmental effects. The refinement should include: review of system functions; flexibility; operational reliability; adjustments of facility locations and sizes; analysis of optimum phasing of construction; and evaluation of feasible measures for mitigating probable adverse environmental effects. Following refinement of each alternative, the monetary costs, the environmental effects and the contributions to objectives and goals of each proposal will be reevaluated and compared. Should this review indicate one or more of the plans to be objectionable, the alternative(s) should be restructured and the refinement process repeated. Each alternative proposal, including its costs and environmental effects, will be publicly displayed and the views of affected local governmental units and the general public will be obtained as a basis for plan selection. Chapter 6 further describes this step.

2.12 SELECT PLAN (STEP 11)

A public hearing will be held to explain the alternative proposals and obtain the views of all concerned interests. Reflecting inputs from the public, each alternative proposal will be reviewed as described in Chapter 6 with respect to environmental effects, monetary costs, plan implementation capability, resources and energy use, reliability and public acceptance. Based on consideration of each of these factors, the alternative proposals will be ranked and a plan selected for implementation.

2.13 COMPLETE IMPLEMENTATION ARRANGEMENTS (STEP 12)

Following plan selection, existing institutional arrangements will be reviewed and a financial program and schedule for implementing the plan will be prepared. Finally, necessary agreements among the implementing entities for carrying out the plan should be reached. Even where such agreements have not been completed, the State and the Regional Administrator may approve the plan. Chapter 6 further discusses implementation arrangements.

CHAPTER 3

PLANNING CONSIDERATIONS

3.1 INTRODUCTION

This chapter describes the analyses essential for estimating future municipal waste loads and flows (Step 7) and factors which must be considered in the development and evaluation of waste treatment system alternatives (Step 8).

3.2 ESTIMATE FUTURE WASTE LOADS AND FLOWS (Step 7)

A. Planning Period

The planning period is the time span over which wastewater management needs are forecast, facilities are planned to meet such needs, and costs are amortized. The facilities planning period will extend 20 years beyond the estimated date of initial system operation. The plan should provide for cost-effective phased development of facilities to meet forecast changing conditions over the planning period as described in the subsequent paragraph on phased development.

B. Land Use

Facilities plans must be carefully coordinated with applicable State, local and regional land use management regulations, policies and plans. However, use of land use plans as a conclusive basis for developing treatment systems may be futile, unless the necessary legal and institutional tools to control land use and development are present and vigorously used.

Projected land use patterns and development densities based upon land use plans and zoning codes should be used as an indicator of the capacity and location of facilities. Development controls consistent with projected land use will be necessary to assure the continuing conpatibility of the facilities with community needs over the planning period. Where land use plans are not available for all or portions of the planning area; existing planning agencies, zoning commissions, and public officials should be consulted to assess development patterns and densities for the area.

C. Demographic and Economic Projection

As one basis for estimating future waste loads and flows, economic and population growth projections, based

upon past growth trends for the planning area, should be developed. Such projections must be consistent with those used for air quality control or other environmental planning unless new knowledge or data justifies departures.

For metropolitan areas, economic and population projections (Series E) developed by the Bureau of Economic Analysis (BEA) or comparable projections developed by the State should be used as overall growth projections for the planning area and as a source of information for projections review by EPA. Such projections may be disaggregated for areas served by each system, taking into account land use plans, development policies and other growth constraints for each service area. Economic projections for non-metropolitan communities may be based upon extension of 1960 to 1970 or 1965 to 1970 growth trends. While economic projections of industrial employment and production may be used to roughly assess growth of industrial waste loads, planning for municipal facilities to serve industries should be based upon commitments for each industry and upon cost-effectiveness analysis as subsequently described in this Chapter.

D. Economic Growth Constraints

Economic projections for entire planning areas or for individual service areas should be adjusted to reflect growth constraints imposed by air quality implementation plans, other adopted land use and development controls or growth related permit conditions.

E. Flow and Waste Load Forecasts

The expected economic and population growth patterns for the planning area must be translated into estimates of wastewater flows and waste loads. In turn, a realistic allowance for non-excessive infiltration/inflow should be added.

Available flow records should be obtained for combined sewer overflows and bypasses. Where flow records are lacking, available estimates of flows based upon observations should be used. Waste load estimates should be based on pollutant sampling during dry and wet weather flows and subsequent tests for pertinent parameters such as dissolved oxygen (DO), biochemical oxygen demand (BOD), Ammonia Nitrogen (NH_3-N), total solids (TS), suspended solids (SS), dissolved solids (DS), toxics, and fecal coliform counts. Overflows and waste loads during storm periods should be related to the drainage area tributary to

the combined sewer system. This would permit forecasting overflow and waste load increases resulting from future changes in the nature and extent of the drainage area.

The estimated future changes in flows and wasteloads from industries to be served by the municipal system must reflect application of pretreatment requirements for existing and new industries plus any expected industrial process changes affecting wastewater. Preliminary industrial wastewater flow forecasts should include presently served industries and any additional industries planning to meet pretreatment and industrial cost recovery requirements. Cost-effectiveness analysis described subsequently in this chapter may result in changing the industrial flows to be treated by the municipal waste treatment system.

Wastewater flow forecasts will reflect the effects of applying selected combinations of flow and waste reduction measures. For example, should the infiltration/inflow analysis demonstrate excessive infiltration or inflow, flows will be reduced to account for the estimated effects of corrective measures. Flow forecasts will similarly reflect effects of providing other flow and waste reduction measures.

In summary, many factors affect wastewater flow forecasts, some of which can be identified when planning is initiated. Other factors, such as industrial wastewater flows and flow and waste reduction measures, depend upon cost-effectiveness comparisions and cannot be determined when planning is initiated. For these reasons, a range of wastewater flow forecasts for preliminary planning should be developed to cover several sets of assumed conditions. Such a range of forecasts would subsequently aid in testing the cost-effectiveness of a proposed measure.

3.3 DEVELOP AND EVALUATE ALTERNATIVES (Step 8)

A. General

The following paragraphs describe major factors to be considered and procedures to be applied in the development and evaluation of alternative waste treatment systems.

B. Optimize Operational Efficiency of Existing Plant

Any facilities plan must consider the optimization of the performance efficiency of any existing facilities as an alternative to or integral part of any additional treatment

facilities. Optimization of operational performance may include better operation and maintenance of existing facilities and/or upgrading or modification of such facilities to provide better operational control, flexibility of operation, or a change of treatment process to improve operational efficiency. Upgrading may be undertaken to accommodate higher hydraulic or organic loadings, or to meet higher level treatment requirements.

Economic pressures to optimize pollution abatement expenditures require that a logical and technically sound approach to upgrading be established. Regardless of the purpose for upgrading, it is necessary to first take steps to optimize the operation of existing facilities before considering additions to the treatment plant. This becomes especially significant in instances where improved operation may forego construction for extended periods of time.

C. Industrial Service

Municipal waste treatment systems should be planned to serve industrial users of the area whenever practicable and cost-effective. Because of the unusual economy of scale associated with larger municipal-industrial facilties, as compared to separate municipal and industrial facilities, a joint system will often be cost-effective. In many instances, however, it may be more economical to have separate industrial treatment facilities because of such factors as characteristics and quantities of industrial waste, industrial pretreatment requirements (reference k), and industrial locations and groupings which facilitate joint industrial treatment and/or reuse of industrial wastewater.

Industrial use of municipal facilities will be encouraged where total costs (environmental and monetary) would be minimized. Where industrial flow handled by municipal systems is significant (more than 10 percent of total flow), costs of separate treatment of industrial wastes versus costs of pretreatment plus joint municipal-industrial facilities should be compared. This involves comparing the incremental cost of the municipal facilities required to transport and treat industrial wastes, together with the costs of corresponding pretreatment required, with the cost of separate industrial treatment and disposal of those wastes. In particular, the analysis will cover those industries desiring municipal service and which are not so served when facilities planning is initated.

D. Flow and Waste Reduction Measures

Section 212(2)(B) of the Act encourages the use of methods for preventing, abating, reducing, storing, or disposing of municipal wastes including industrial wastes and storm water runoff in municipal wastewater systems where such methods are cost-efficient. Some types of flow and waste reduction measures are listed below.

1. Measures for reducing sewer system infiltration/inflow.
2. Household water saving devices.
3. Water meters.
4. Water pricing.
5. Land use and development regulations.
6. Industrial reuse and recycling.

Procedures for determing the cost-effectiveness of measures for reducing infiltration/inflow are presented in the EPA Guidelines for Sewer System Evaluation. To determine the cost-effectiveness of water conservation measures, the costs of implementing the measures should be compared with the resultant savings for both waste treatment and water supply. Some of the flow and waste reduction measures will realize multiple purpose values associated with land use control, open space, parks and recreation and floodplain management. The overall values and costs of such multiple purpose measures should be reflected in the analysis.

E. Sewers

Planning of a waste treatment system will include comparision of alternative arrangements of interceptors and trunk lines to assure selection of a cost-effective configuration. In developing areas, sewer planning should be based on land use plans and zoning which reflect expected future land use and development density changes. Planning must provide for cost-effective phased development of sewers, and related facilities, to serve the changing needs of a developing area over the planning period. For planning of interceptors, land use or development changes resulting from the interceptor location will be evaluated. Choice of interceptor and collector pipe sizes should reflect cost-effective analysis of alternative pipe sizes over the planning period. The analysis should reflect the expected useful life of the pipe, all costs related to future pipe installation, and induced growth effects of initial provision of substantial excess capacity.

F. Waste Management Techniques

1. General

As indicated in Chapter 1, alternative waste management techniques will be evaluated based on the BWPTT or, as applicable, more stringent criteria require to meet water quality standards. Since the criteria depend partly on the receiving media (i.e., surface water, oceans, land), selection of a waste management technique relates closely to effluent disposal choices. Facilities planning will include cost-effectiveness comparison of techniques listed in subsequent paragraphs. Preliminary alternative systems featuring at least one technique under each of the three categories below (treatment and discharge, wastewater reuse and land application) will be developed and screened. A final proposal will be prepared for each unless adequate justification for eliminating a technique during the screening process is presented.

Published cost, performance, and other information is available for many alternative treatment technologies including primary and biological processes, physical-chemical processes and land application (reference m). These technologies can be evaluated by comparing logical combinations of unit processes selected to achieve the required results. Preliminary screening of these treatment technologies involves interrelating the costs and relative treatment capabilities of each unit process. The cost information published in the technical literature should be adjusted to reflect regional or local cost levels.

2. Treatment and Discharge

Treatment and discharge techniques include the following:

a. Biological treatment including ponds, activated sludge, trickling filters, nitrification, and denitrification.

b. Physical-Chemical treatment including chemical flocculation, filtration, activated carbon, breakpoint chlorination, ion exchange, and ammonia stripping.

c. Systems combining the above techniques.

d. Storm and combined sewer control measures.

Where meeting water quality standards during dry weather periods requires higher degrees of removal than the BPWTT criteria, biological measures such as longer detention periods or larger clarifiers may be employed. Physical-chemical processes such as carbon adsorption, filtration and chemical addition and precipitation may also be used.

Storm sewer discharges and combined-sewer overflows can be sources of significant quantities of pollutants. Demonstrated technology to cost-effectively control storm sewer discharges does not presently exist although efforts are being made to better define the problem and possible corrective measures. The combined-sewer overflow problem is better defined and EPA research has demonstrated many types of control and treatment techniques. They may be grouped into the following five categories (reference m):

a. Separation of sewage and storm collection systems (generally the most costly approach);

b. Operational control of the existing system, (maximum use of system storage by computerized flow regulation and subsequent treatment at the plant);

c. Storage and subsequent treatment;

d. Dual use (waste treatment plant expansion or modification); and

e. Direct treatment of overflows (in-line high rate treatment methods).

Proper maintenance and control of combined sewers, including maintenance of valves and other flow regulating devices, are included under BPWTT requirements. Where water quality standards criteria would be violated, even with application of BPWTT requirements, during and following storm runoff periods, facilities plans will provide for measures to abate pollution from combined sewer overflows. Where combined sewer overflow pollution abatement measures plus BPWTT would not meet water quality standards, the magnitude and nature of the separate storm sewer problem should be assessed. Possible corrective measures should be indicated.

The monetary costs and environmental effects of the above combined sewer control and treatment methods, including combinations of the methods, should be compared. Generally, the cost comparisons should be based upon the unit costs for each alternative of removing U.O.D. or other

pollutants on an annual basis. Since costs for storing combined sewer flows prior to treatment are generally high, the storage features may typically be designed to only store and treat the initial most highly polluted storm runoff. Design criteria should be developed for each case based on storm and runoff characteristics, system geometry, pollutant loadings during runoff and other factors.

3. Wastewater Reuse

In comparing waste management techniques and alternative systems, wastewater reuse applications should be evaluated as a means of contributing to local water management goals. Such applications are listed below.

a. industrial processes.
b. groundwater recharge for water supply enhancement or preventing salt water intrusion.
c. surface water supply enhancement.
d. recreation lakes.
e. land reclamation.

Wastewater reuse needs should be identified and defined by volume, location and quality. These needs may influence the location of the treatment facilities; the type of process selected; and the degree of treatment required. Wastewater reuse criteria set forth in the BPWTT regulations impose minimal restrictions on wastewater reuse and, at the same time, prevent degradation of the receiving waters through indirect discharge of inadequately treated wastes. The criteria require that the quantity of pollutants and the concentration attributable directly to the publicly-owned treatment works meet the minimum criteria applicable to non-reuse techniques.

The economic and environmental costs (losses and gains) related to wastewater reuse will be included in the monetary cost and environmental evaluations of alternative systems. The monetary costs will include external costs for consumptive use of water diminishing a prior established water use and also the net revenues obtained from reuse.

4. Land Application

The application of wastewater effluents on the land is being practiced at several hundred sites throughout the United States. Land application involves use of the soil through biological action therein plus plant growth, for the breakdown and disposal of pollutants. When wastewater is applied to the land, biological action to break down

pollutants occurs within the topsoil and plants utilize the resulting nutrients. Such treatment generally provides a high degree of removal for both nutrients and organic substances. Much of the treated wastewater is released to the atmosphere, some returns to streams through surface runoff or underdrain systems and the remainder migrates to the permanent groundwater table. The wastewater proportions disposed of in each manner depend upon the type of application and the design and operation of the system. Land application techniques must meet criteria published in the BPWTT regulations for protection of the groundwater resource and, if underdrains are used, surface water discharge criteria as well. Technical information, including cost data on principal Land Application Techniques-irrigation, overland flow and infiltration-percolation--are presented in a referenced publications (m), (n), and (o). Land application techniques include:

a. Irrigation including spray, ridge and furrow and flood.
b. Overland flow.
c. Infiltration-percolation.
d. Other approaches such as evaporation and deep well injection.

G. Sludge Disposal

Sludge disposal will comply with referenced policy statement (p). Acceptable disposal methods include the following:

1. Stabilization

-aerobic and anaerobic digestion
-composting
-chemical methods
-physical methods

2. Final disposal options

-land application
-incineration
-landfill disposal

Some disposal techniques such as soil conditioning and land utilization realize the nutrient value of sludge as fertilizer. The economic and environmental values derived from such uses will be determined. Analysis of the monetary costs and environmental effects of the sludge disposal

option will be included in the evaluation of each alternative system.

Incineration of sludge generates its own particular wastes, including ash and gases. Disposal of incinerated waste is subject to limitations similar to those for land disposal of sludge and to air pollution control regulations as well. Estimated costs of ultimate disposal of incinerated waste should be included in the analysis.

H. Location of Facilities

Evaluation and choice of sites for treatment plants, interceptors, transmission lines, outfalls, pumping plants and other major works should reflect the factors cited below and discussed further in references (q) and (r).

1. Odor, aesthetics--If practicable, treatment plant and sludge disposal sites will be removed sufficiently from either residential or heavily used public areas to preclude problems due to odors or unpleasant visual contrast to the surrounding area. If not practicable, the design and landscaping of the treatment plant and grounds will provide for the features necessary to minimize such problems. Sludge disposal methods to minimize odor problems should be adopted.

2. Future provision for no-discharge goal--Treatment plant sites should, if practicable, be located to facilitate future reuse of the effluent and additional pollution abatement, thus contributing toward future "no discharge" requirements.

3. Discharges to potable, shellfish and recreational waters--Outfalls located close enough to adversely affect public water supply intakes, shellfishing beds, and contact recreational waters should be avoided. Where alternative sites are unavailable, special precautions as prescribed in reference (r). must be taken.

4. Floodplains--Treatments plants and other facilities should be located outside floodplains where unwise economic growth might be induced. Where such location is not

practicable or would lead to excessive costs, the treatment plant and electrical and mechanical equipment will be protected against flooding as described in reference (r). The costs of providing the required minimum levels of flood protection for alternative sites for treatment plants and other works will be included in the evaluation of alternative systems.

5. Wetlands--Siting of treatment works will comply with the EPA Policy to Protect the Nation's Wetlands. The policy, dated May 2, 1973, is published in the Federal Register, Vol. 38, No. 84, Pg. 10834.

I. Regionalization

Regionalization options will be evaluated where appropriate. Monetary costs of feasible combinations of treatment plants, interceptors and other works within a planning area will be assessed. In addition, costs of collective management of individual wastewater systems should be explored where applicable. Frequently because of economies of scale, regional plans involving large waste treatment plant with interconnected systems will have least monetary costs. However, the selection of the best regional system must reflect balanced consideration of environmental and social impacts as well as costs. As an example, interconnected systems, because of their extensive interceptor networks, open up many areas for new or more rapid growth. Particular concern arises because such areas frequently include floodplains, wetlands, valley slopes, forests or natural scenic areas not well suited for intensive development. Thus, the impacts of each alternative plan regarding these factors should be fully examined and presented. Another adverse environmental effect frequently resulting from regionalization is the diversion of treated flows from a stream. The resultant stream flow depletion may inhibit maintenance of a fishery or support of other aquatic life. Accordingly, both the costs and environmental effects of interconnected system alternatives should be evaluated and presented to establish a rational basis for final plan selection.

J. Waste Load Allocation Revision

For water quality segments, waste load allocations, derived in applicable Section 303 basin plans may provide the effluent limitations to be achieved by the planned treatment plants. However, the load allocations depend partly upon the location of discharge points and the distribution of waste loads among these points. The initially determined waste load allocations will generally be based upon existing discharge locations and waste loads, with reasonable allowances for economic growth. However, facilities planning may result in changing the effluent discharge locations, and the waste load distribution among the locations. In this case, the waste load allocation must be reviewed by the State or EPA and modified as necessary to reflect the waste treatment system proposal. Should the revised allocation require different treatment levels or other changes, the proposed works should be modified accordingly. If the load allocation performed in the 303 plan is modified and is approved by the State, this will be reflected in future revisions of the 303 plan.

K. Phased Development

1. General

In examining the cost-effectiveness of a waste treatment system, one important aspect is the alternative of providing sufficient capacity in the initial construction for the entire planning period versus phased construction. The latter option would involve planning to construct facilities at intervals throughout the planning period to accommodate projected increases of waste loads and flows. The factors to be considered are:

a. the service life of the treatment works;

b. the incremental costs;

c. the planning period; and

d. the flow forecasts.

A cost analysis for phased development is presented in the Appendix, Chapter 4.

2. Reserve and Excess Capacity

The planning of waste treatment facilities will normally allow for some excess capacity. The system

capacity excess beyond the anticipated average daily flow, however, must be examined from a cost-effective viewpoint. Rather than providing sufficient excess capacity to accommodate wastewater flow increases over the entire planning period, phased construction of facilities, particularly treatment plants, may be more cost-effective. To be considered are such items as:

a. Ease of constructing additional facilities at a later date, e.g., space limitations, disruption of community activities from more frequent construction, environmental impacts;

b. Relative cost of providing excess capacity initially as compared to the discounted cost of deferring provision of capacity until needed;

c. Uncertainties of projecting long term wastewater flows;

d. Difficulty of plant operation at low flows and settlement due to low velocities in gravity sewers; and

e. Future technological advances or adoption of flow and waste reduction measures may limit need for excess capacity.

3. Phased Development of System

Phased development of the system pertaining to sewers and multiple plant construction, is advisable in rapidly growing areas; in areas where the projected flows are somewhat uncertain; or where such phasing would facilitate orderly growth. The phasing must be accomplished so as to provide sufficient excess capacity at the beginning of each construction phase to accommodate expected flow increases during the phase. Phasing of the sewer may involve providing for parallel or multiple systems or extension of a single pipe. The decision should be based on cost comparisons of the options. For example, should the growth projections for a planning period be such that providing a large enough sewer for the total planning period would result in substantial under-capacity initially, a parallel sewer may be more cost-effective. Multiple systems may be advisable in situations where the interceptors will follow rather than lead growth directions.

4. Modular Development of Individual Facilities

Modular development of the individual facilities, pertaining to components of the wastewater treatment plant, is advisable in areas where high growth rates are projected; where the required degree of treatment must be upgraded later during the planning period; or where existing facilities are to be used initially but phased out later.

High growth projections may mean that constructing the plant at the beginning of the planning period to accommodate flows expected at the end of the period would present operating problems. Certain components would be under-utilized for a period of time, and other components would not be operated within an efficient range.

Should a requirement for a higher degree of treatment be expected during the planning period, the provision of all facilities required to provide the anticipated future treatment at the beginning of the planning period would result in idling some facilities until they are needed. This would occur for example, if an industry is expected to join the system of if the water quality standards are expected to be raised. Although cost-effectiveness considerations may preclude initial development of the facilities that may be needed in the future, provisions should be made for such future additions during the design of the initial facilities.

L. Flexibility

Planning of treatment processes and plant facilities should consider plant upgrading resulting from possible future changes of water quality objectives. Such upgrading could be accommodated by incorporating provisions for future addition cf unit treatment processes and associated facilities changes. Planning for the plant and site should also consider providing for facilities layouts and siting arrangements, together with sufficient land, to allow for expansion of the plant to handle unforeseen increases in wastewater flows. Tc the extent practicable, planning of treatment plants and sites will allow for later application of new technologies, including possible future wastewater reuse.

Planning of interceptors and collection systems will facilitate adaptation to unforeseen service area expansions, density changes or growth pattern changes. To accommodate such unforeseen future changes, consideration will be given to such contingencies as provision of extra sewer rights of

way for staged parallel pipes and pipe extensions, staged extension of interceptors and temporary treatment plants.

M. Reliability

There is a risk of failure of any planned wastewater system. With a view toward minimizing this risk, the probability, duration and impact of such failures will be considered for each system and its component parts. Each unit process and the combination of such processes should be designed to reliably treat wide variations of flow and pollutant concentrations. Emphasis on reliability must focus on the most critical processes. Planned facilities should meet the reliability requirements presented in reference (r).

N. Operability

All equipment and controls should be readily accessible to plant personnel. Off-the-shelf equipment is often difficult to combine in various ways without adverse effects on their operability. Some items to consider are: (1) proximity positioning of dependent operations; (2) compactness; (3) considerations for future expansions; and (4) accessibility of principal facilities.

CHAPTER 4

MONETARY COST EVALUATION

4.1 GENERAL

This chapter covers direct resources costs that can be evaluated in monetary terms. Cost-effectiveness analyses will include a monetary cost evaluation of direct project costs to be incurred in the implementation of the plan throughout the planning period (see reference e). These monetary costs are represented by the values of goods and services and include all capital costs; operation, maintenance, and replacement costs; and costs for managing or implementing integral flow and waste reduction measures. Revenue derived from implementation of the plan will be assessed as negative monetary costs. The monetary cost assessment, however, will not extend to the indirect costs or benefits related to the plan. These costs will be included, as appropriate, in the social and economic impact components of the environmental evaluation.

As discussed in Chapter 2, all monetary costs incurred throughout the planning period will be related through a discount rate in determining the present worth or equivalent annual cost over the planning period. Such a cost evaluation will be applied to both the entire system and to the system components.

Monetary costs will be evaluated in terms of actual outlays or expenditures. Cost of each facility will be analyzed over the planning period. Facilities scheduled to function beyond the end of the planning period will be credited for an actual market salvage value at the end of the planning period. The evaluation of monetary costs would not be influenced by adopted financial arrangements such as depreciation, debt retirement, and cost recovery rates and periods.

4.2 ELEMENTS OF CAPITAL COSTS

Capital costs will include:

a. The estimated contract construction costs of all system components including:

   1. Those for collection, treatment, and disposal of wastewater;

2. Modifications required for existing facilities;

3. Components for treatment and disposal of residual wastes, including conveyance to disposal sites;

4. Components for storage and recycling of wastewater including land disposal;

5. Integral flow and waste reduction measures;

6. Pretreatment facilities for industrial wastes (private costs);

7. Storage or control measures for control of domestic wastes and combined sewer overflows; and

8. Any interim facilities needed while more permanent facilities are deferred or under construction plus incremental operation and maintenance costs of the temporary facilities compared with costs of the old facilities.

b. Costs for detailed engineering and design services, field exploration studies, and engineering services during construction.

c. Costs for legal and administrative services associated with implementation of the facilities plan.

d. Costs of all lands, including capitalized costs of leased lands (including publicly-owned lands), rights-of-way, and easements based on appraised market values.

e. Startup costs such as operator training.

f. Interest foregone during facilities construction.

g. Contingency allowances as appropriate to the level of complexity and detail used.

4.3 MAJOR REPLACEMENT COSTS

Major replacements will consist of the periodic replacements of auxiliary equipment included in the system facilities. The service life and interval of replacement of major replacement elements within each facility will be

identified and the discounted costs of all major replacements expected during the planning period included as a cost to the plan. Such replacements may include instruments and control facilities, pumps and electrical motors, various mechanical equipment, and electrical generating facilities. They may also include any probable initial major replacements costs required to fully utilize existing facilities.

4.4 OPERATION AND MAINTENANCE COSTS

The ongoing operation and maintenance costs of a waste treatment management system will consist of the continuous costs of administering and operating the facilities and the costs of providing routine maintenance and minor replacements. These costs should be adequate to insure effective and dependable facility operation at the designed capacity and treatment level. They will include:

a. Ongoing operation and maintenance costs for all collection, storage, treatment (including pretreatment), disposal and recycling facilities and integral flow and waste reduction measures; and

b. Short-term operation and maintenance costs associated with upgrading of existing facilities or development of interim facilities.

c. Costs for a continuing program for personnel training necessary for new entries and to maintain the proficiency of existing staff, including operator certifications, management training, and other specialized training as needed.

4.5 SALVAGE VALUE

Normally, land for treatment works, including land used as part of the treatment process or for ultimate disposal of residues, shall be assumed to have a salvage value at the end of the planning period equal to its prevailing market value at the time of the analysis. Rights-of-way and easements shall be considered to have a salvage value not greater than the prevailing market value at the time of the analysis.

Permanent structures will be assumed to have a salvage value at the end of the planning period if those structures can be expected to continue to fulfill their planned use. Where a structure can be expected to continue to be used as planned, salvage value will be based on the remaining

service life of the structure based on a straight line depreciation over the assumed service life of the structure. The same approach for determining salvage value will apply to process and auxiliary equipment that will have a useable value at the end of the planning period.

4.6 REVENUE PRODUCED

Net revenue (total revenue minus associated costs) anticipated to be accrued from plan implementation, such as revenue from the sale of wastewater, revenue from recovered wastewater constituents, revenue from processed sludge or other residual wastes from the treatment and pretreatment facilities will be evaluated and credited as negative costs (benefits) to the plan. In addition to normal monetary costs associated with wastewater reuse, there may be external costs for diminuation (consumptive use) by evaporation or evapotranspiration of a prior water use or supply. These monetary external costs should be included in the analysis.

4.7 SUNK COSTS

Any investments and cost commitments made prior to or concurrent with the facilities planning study will be regarded as sunk costs and not included as monetary cost for plan evaluation and comparison. Such investments and cost commitments will include:

a. Investments in existing wastewater treatment facilities and associated lands even though incorporated into a plan;

b. Outstanding bond indebtedness; and

c. Cost of preparing the facilities plan.

In summary, monetary costs assigned to a plan will represent only those initial and future costs associated with the implementation of that plan.

4.8 METHOD OF ANALYSIS

For those resources that can be evaluated in monetary terms, the interest (discount) rate stated in Section 4.11 will be used. Monetary costs will be displayed in terms of present worth values or annual value equivalents over the planning period. It will be assumed that funds needed or used during a given year must be totally available at the beginning of the year and that funds received during the

year are not available until the end of the year. See this chapter's appendix for examples of typical cost analyses for selected waste management subsystems.

4.9 ACCURACY OF COST ESTIMATES

The level of accuracies for comparison of treatment processes and system components will be of sufficient detail as to assure the reliable selection of the cost-effective solution. Gross cost estimates will suffice for preliminary screening of alternatives. Generally, cost estimates for comparison of those plans selected for detailed evaluation will be based upon:

a. Unit process costs associated with the different wastewater and sludge treatment processes considered. The unit costs should be applicable to the locality or region.

b. Preliminary engineering layouts, quantity estimates, and unit costs for the sewer lines and appurtenant works. Unit costs used should be the same for each of the alternatives for comparability. Such unit costs should be representative of the area based upon recent comparable projects.

c. Market Value of land or easements required for facilities.

Cost estimates for the selected system will be refined based upon preliminary engineering layouts and designs for the treatment works and residual waste treatment facilities. Should the more refined estimates of the selected system differ considerably from the previous estimates, the prior comparative evaluations of alternatives should be revised to assure the selection of the most cost-effective system.

4.10 PRICES

Monetary costs and possible revenue throughout the planning period will be calculated on the basis of market prices prevailing at the time of the analysis. Inflation of wages and prices shall not be considered in the analysis. The implied assumption is that all prices involved will tend to change over time by approximately the same percentage. Thus, the results of the analysis will not be changed by changes in the general level of prices.

Exceptions to the foregoing will be made if there is justification for expecting significant changes in the relative prices of certain items during the planning period. In such cases, the expected change in these prices should be made to reflect their future relative deviation from the general price level. Also, if market prices do not reflect the actual values of scarce energy or resources, the opportunity costs of such items should be evaluated. Opportunity cost represents the value of the resource in its best alternative use.

4.11 INTEREST (DISCOUNT) RATE

The interest rate to be used for evaluating municipal wastewater facilities will be the Federal discount rate for evaluation of water and related land resources projects as published in reference (s).

4.12 INTEREST DURING CONSTRUCTION

In cases in which capital expenditures can be expected to be fairly uniform during the construction period, interest during construction may be calculated as I x P/2 x C where:

I = the interest (discount) rate
P = the construction period in years
C = the total capital expenditures

In cases in which expenditures will not be uniform, or when the construction period will be greater than three years, interest during construction shall be calculated on a year-by-year basis.

4.13 RISK FACTORS

Risks such as potential additional resources costs and non-use of capacity will be accounted for. Such accounting may be included through additions to cost estimates, descriptions, or combinations of these methods. For example, contingency allowances will be regularly included in engineering cost estimates to allow for estimating errors and for uniform problems related to new or different processes. Costs will also be included to insure a certain degree of reliability in the operation of a system (e.g., technological change; uncertain operating changes; etc.). Additional costs may be incurred and normally included in the cost analysis (see Chapter 3).

There will also be a probability that in the future the capacity of the system will be either under-utilized or undersized. For instance, if projected capacity results in a system that in actuality is underdesigned, extraordinary expense may be incurred to increase capacity. (This risk may, of course, be reduced somewhat through design flexibility). Under-utilization of capacity may occur if growth projections are too optimistic and excess capacity is not used when scheduled. This type of risk and uncertainty will be difficult to quantify and therefore may be best accounted for descriptively.

APPENDIX

CHAPTER 4

PRESENT WORTH AND AVERAGE ANNUAL EQUIVALENT COST CALCULATION EXAMPLES

The following three examples explain the derivation of present worth and average annual equivalent cost for a project such as a sewage treatment plant.

Present worth may be thought of as the sum which, if invested now at a given interest rate, would provide exactly the funds to make all expenditures during the life of the project. Average annual equivalent cost permits expressing a non-uniform series of expenditures as a uniform annual amount, where money has a time value. The calculation of present worth and annual equivalent cost allows the planner or engineer to compare the long run economics of different courses of action. Present worth and annual equivalent cost provide economic answers to questions such as: Should a community construct a sewage treatment plant with the capacity to handle its 20 year projected waste flow? Or should it build a smaller facility now and upgrade it later?

Three cases, as described below, include: a simplistic one, assuming constant O&M costs; a relatively complex case with varying O&M costs; and a third case assuming varying O&M, upgrade expenditures and a positive salvage value. Note that the second and third cases actually compare two alternatives for treating a given community's waste.

In order to perform the following analysis you will need a table of 7.0% compound interest factors and a table of factors to compute the present worth of a gradient series. These tables may usually be found in an engineering economics textbook.

1st Case

GIVEN:

sewage treatment plant #1

capacity: 10 mgd

average flow through plant: 9 mgd

planning period: 20 years

salvage value at the end of 20 years: $0

initial cost of plant: $3 million

average annual operation and maintenance cost: $190,000

interest rate: 7.0%

DETERMINE:

Present worth and average annual equivalent cost of this plant over 20 years.

METHOD:

Present worth equals initial cost plus the present worth of the operating and maintenance costs. Average annual equivalent cost equals the present worth times the appropriate capital recovery factor.

Step 1

Initial cost = $3,000,000

Step 2

Present worth of annual O&M cost equals annual O&M cost times the uniform series present worth factor @ 7.0% for 20 years. Thus:

$190,000 (10.594) = $2,013,000

Step 3

Sum of numbers obtained in the above steps yield present worth

initial cost = $3,000,000

present worth of O&M cost = $2,013,000

present worth = $5,013,000

Step 4

To find average annual equivalent cost multiply present worth obtained above times the capital recovery factor @ 7.0% for 20 years. Thus:

$5,013,000 (.09439) = $ 474,000

is the average annual equivalent cost of the plant over 20 years.

2nd Case

GIVEN:

sewage treatment plant #2

capacity: 10 mgd

average flow through plant: increases linearly from 2 mgd to 10 mgd over 20 years

planning period: 20 years

salvage value at end of 20 years: $0

initial cost of plant: $3,000,000

constant annual operation and maintenance cost: $126,000

variable annual operation and maintenance cost: increases linearly from $0 to $68,000 in year 20

interest rate: 7.0%

DETERMINE:

Present worth and average annual equivalent cost of this plant over 20 years.

METHOD:

Present worth equals the sum of initial cost, present worth of constant O&M cost, and the present worth of the gradient series of the variable O&M cost. Average annual equivalent cost is derived as in the first case.

Step 1

Initial cost = $3,000,000

Step 2

To find the present worth of operating costs it will be necessary to calculate the present worths of the constant costs and the variable costs separately.

a. Present worth of constant annual costs equals that cost times the uniform series present worth factor @ 7.0% for 20 years. Thus:

$126,000 (10.594) = $1,335,000

b. Present worth of a variable cost increasing linearly is found by first finding the amount of increase per year. This amount is $68,000/20 years or $3,400 per year. This increase is known as a gradient series. This series times the correct gradient series present worth factor @ 7.0% for 20 years yield the present worth of the variable cost. Thus:

$3,400 (77.5091) = $ 264,000

Step 3

Sum of numbers obtained in the steps above yields present worth:

present worth of constant O&M costs = $1,335,000

present worth of variable O&M cost = $ 264,000

present worth = $4,599,000

Step 4

As before the present worth just derived times the capital recovery factor @ 7.0% for 20 years will yield the average annual equivalent cost. Thus:

$4,599,000 (.09439) = $ 434,100

which is the average annual equivalent cost of the plant for 20 years.

3rd Case

GIVEN:

sewage treatment plant #3

capacity: year 1-10, 5 mgd; year 11-20, 10 mgd

average flow through plant: increases linearly from 2 mgd to 10 mgd over 20 years

planning period: 20 years

salvage value at the end of 20 years: $750,000

initial cost of plant (5 mgd): $2,000,000

cost to upgrade at year 10 to 10 mgd: $1,500,000

operation and maintenance cost:

a. constant annual O&M cost year 1-10: $84,000

b. variable annual O&M cost year 1-10: increases linearly from 0 to $29,000 in year 10

c. constant annual O&M cost year 11-20: $165,000

d. variable annual O&M cost year 11-20: increases linearly from 0 to $29,000 in year 20

interest rate: 7.0%

DETERMINE:

Present worth and annual equivalent cost of this plant over 20 years.

METHOD:

Present worth is derived as in the previous example: however, this time calculate O&M costs from year 1 to 10 and O&M costs from year 11-20 separately. It is necessary also to add the present worth of the expansion and subtract the present worth of the salvage value from the present worth of the costs. Average annual equivalent costs are calculated as before.

Step 1

Initial cost = $2,000,000

Step 2

Calculate the present worth of the O&M costs as follows:

a. Present worth of constant annual cost years 1-10 equals given cost times uniform series present worth factors @ 7.0% for 10 years. Thus:

$84,000 (7.024) = $ 590,000

b. Present worth of the variable O&M cost years 1-10 equals the gradient series ($2900) times the present worth factor of a gradient series @ 7.0% for 10 years. Thus:

$2900 (27.7156) = $ 80,400

c. The present worth of the constant O&M costs year 11-20 are first calculated as in (a) above using the given cost for years 11-20. This, however, yields present worth in year 11 which must be converted to present worth in year 1. This is accomplished by multiplying times the single payment present worth factor @ 7.0% for 10 years (.5083). Thus present worth in year 1 equals:

$165,000 (7.024) (.5083) = $ 589,100

d. The present worth of the variable O&M costs year 11-20 are first calculated as in (b) above using the gradient series for years 11-20 which is $2900. This yields the present worth in year 11 which again must be converted to present worth in year 1 by multiplying the present worth (year 11) times the single payment present worth factor @ 7.0% for 10 years (.5083). Thus:

$2900 (27.7156) (.5083) = $ 40,900

Step 3

To determine the present worth of the upgrade cost which occurs at year 10, multiply the upgrade cost times the single payment present worth factors @ 7.0% for 10 years. Thus:

$1,500,000 (.5083) = $ 763,000

Step 4

The present worth of the salvage value at the end of 20 years equals that value times the single payment present worth factor @ 7.0% for 20 years. Thus:

$750,000 (.2584) =	$ 194,000

Step 5

The sum of the values obtained in Steps 1, 2 and 3 minus the value obtained in Step 4 will equal the present worth of the plant. Thus:

initial cost =	$2,000,000
present worth of constant O&M year 1-10 =	590,000
present worth of variable O&M year 1-10 =	80,400
present worth of constant O&M year 11-20 =	89,100
present worth of variable O&M year 11-20 =	40,900
present worth of upgrade at year 10 =	763,000
TOTAL	$4,063,400

Subtract from the total the present worth of salvage value

present worth of salvage value =	- 194,000
present worth of plant =	$3,869,400

Step 6

As before the present worth just derived times the capital recovery factor @ 7.0% for 20 years will yield the average annual equivalent cost thus:

$3,869,400 (.09439) =	$ 365,200

which is the average annual equivalent cost of the plant over 20 years.

CHAPTER 5

ENVIRONMENTAL EVALUATION

5.1 PURPOSE

This chapter presents guidance intended to meet the letter and intent of Section 102(2)c of the National Environmental Policy Act of 1969. To meet this objective, this chapter provides guidance for integrating environmental evaluation into the facilities planning process in a manner that will influence planning decisions. Thus, the facilities plan will serve as an environmental assessment and will provide the information needed to facilitate preparation of an Environmental Impact Statement by EPA (reference t).

5.2 RELATIONSHIP OF THE ENVIRONMENTAL EVALUATION TO THE FACILITIES PLANNING PROCESS

The environmental evaluation will be an integral part and major tool of the facilities planning process. The environmental evaluation, together with the monetary cost evaluation and consideration of systems performance, will comprise the major analysis of alternatives which results finally in selection of a facilities plan (see Chapter 2). The environmental evaluation should pervade the entire planning process, beginning early enough to impact the initial goal setting and alternative screening decisions as well as the final decisions. The steps in the environmental evaluation process will generally conform with corresponding steps in the total planning process as described in Chapter 2. Much of the data gathering, analytical work, and public involvement should be done concurrently to avoid duplication and conserve time and resources. Attempting to delay an environmental evaluation until after the selection of a plan must be avoided as such an approach may result in reformulation of the plan. The orderly and timely integration of environmental considerations into facilities planning will be described and presented in the planning report in accordance with this guidance.

5.3 ENVIRONMENTAL EVALUATION PROCESS

A. Inventory Environmental Conditions (Step 6)

The purpose of this step is to provide baseline environmental data against which projected environmental

changes attributable to the various management alternatives may be evaluated. The environmental inventory will encompass, as a minimum, the delineated planning area, and will be expanded as alternatives are developed, to include locations of plan components which may be outside the planning area. Examples of such components include land disposal sites for effluent or sludge, other wastewater reuse sites, and outfall sites.

Historic base data should be reviewed and briefly included to establish a "natural condition" as well as the existing condition. Such information will be of assistance in estimating trends. Data for both the current and historical inventories may be available from the appropriate local, State, and Federal agencies, and from local and State level environmental, historical, sporting and cultural organizations (e.g., Audubon Society, Garden Clubs, Rod and Gun Clubs, and Historical and Anthropological Societies).

The environmental inventory may include but will not necessarily be limited to the following:

1. topography, including topographic maps;

2. climate and precipitation;

3. geology (brief description related to ground and surface waters);

4. ground and surface water hydrology, quality, water uses;

5. plant and animal communities, particularly:

   -- aquatic biota in receiving water
   -- ecosystems
   -- endangered or locally threatened species (See U.S. List of Endangered Native Fish and Wildlife - published in the Code of Federal Regulations, Title 50, Part 17, May 19, 1972.)
   -- other wildlife;

6. unique or vulnerable environmental features such as wildlife refuges;

7. unique archeological, historic, scientific or cultural areas, parks, wetlands, stream corridors;

8. community growth patterns and land use trends;

9. air quality; and

10. aesthestics.

The above information will complement and not duplicate information presented elsewhere in the facilities planning report.

The inventory will include identification of adopted environmental goals and pertinent environmental constraints. Such goals might typically include:

1. preservation of high quality surface waters;

2. protection or enhancement of groundwater resources and recharge areas including prevention of salt water intrusion;

3. preservation of coastal or other wetlands;

4. preservation of river corridors or other natural areas; and

5. preservation or enhancement of fish and wildlife.

Examples of environmental constraints include:

1. air quality regulations and implementation plans;

2. local climate, topography, soils, etc.; and

3. restrictions on floodplain use or other land uses.

B. Develop and Evaluate Alternatives (Step 8)

As described in Chapter 2, environmental evaluation and screening will be a major integral element of this planning step. Environmental evaluation will be applied to the screening and evaluation of each alternative. The impact of the alternative on the environment will be evaluated with a view toward noting significant impacts and failures to meet environmental goals or constraints. The noted impacts may require further study. Adverse impacts could be a basis for rejecting an option, thus reducing the number of

alternatives. Major impacts and reasons for option rejection should be indicated.

For example, such primary effects of a waste treatment system as the following should be described and estimated, where possible, in quantitative terms.

1. Temporary or long-term construction effects:

   -- land erosion damage
   -- stream damage due to bank and stream bed erosion and sedimentation
   -- aesthetics, noise, odor, dust
   -- air pollution
   -- plant and animal life including endangered species
   -- unique or vulnerable environmental features such as wildlife refuges, parks, unique ecosystems, wetlands, stream corridors
   -- unique archeologic, historic, scientific or cultural areas
   -- dislocation of individuals, businesses, or local governmental services
   -- significant employment changes;

2. Operational effects:

   -- groundwater contamination
   -- groundwater depletion and wetland degradation
   -- streamflow depletion where treated effluents are intercepted and conveyed to other locations.

Secondary effects, primarily induced land use changes and increased development, will be assessed. Such analysis will be based upon identification of zoned and unzoned land use and development categories (e.g., open space, sparse residential, dense residential, commercial, etc.) and the predicted future land use and density changes of each category with and without the proposed system.

C. Refine, Review and Display Alternative Proposals (Step 10)

Contributions toward goals and environmental effects will be reviewed in detail as a basis for refinement of the alternatives. Features to offset or mitigate adverse environmental impacts of a plan will be added, where practicable, to each alternative. Sites of major facilities will be reviewed and located more closely and preliminary phased construction schedules will be developed with a view

toward minimizing environmental effects as well as costs. Finally, the alternative proposals will be publicly displayed, together with expected environmental effects of each.

D. Select Plan (Step 11)

Through public hearings and other measures (see Chapter 7) the views of the public will be obtained. Any suggested additions or changes of environmental effects will be reviewed and the impact analyses will be modified accordingly. Where necessary to avoid unacceptable adverse impacts, a proposal will be modified through repetition of Step 8. Using inputs from public review, the significant environmental effects as well as cost and performance of each alternative will be displayed and compared. A descriptive list of the nature and degree of the most important environmental effects should be developed. Finally, the environmental aspects will be considered along with other factors as described in Chapter 6 to develop a composite ranking for the proposals.

5.4 ENVIRONMENTAL EFFECTS OF THE SELECTED PLAN

Following selection and detailing of the plan, its environmental effects will be summarized. Any unavoidable adverse impacts will be noted as well as any measures adopted to prevent or mitigate adverse impacts. Such mitigating features might include measures to control sedimentation from construction and monitoring of plant influents, effluents and receiving water quality. Consumption of energy and resources for construction and operation will also be estimated.

CHAPTER 6

PLAN SELECTION AND IMPLEMENTATION

6.1 PLAN SELECTION

A. Introduction

This Chapter discusses the principal considerations in selecting a plan. The discussion presumes that each of the alternatives being compared would, if implemented, result in meeting all regulatory requirements applicable to the plan (i.e., effluent limitations and load allocations, compliance schedules, etc.). Local authorities may add their own additional water management goals appropriate to the planning area. Plan selection would include evaluation of the contributions of each proposal to these additional goals as well as the regulatory requirements.

B. Comparision of Proposals

There is no rigorous analytical method of choosing the most cost-effective proposal, recognizing that cost-effectiveness covers environmental and social as well as resource costs and that common units are lacking for measuring all such costs. Also, individual perceptions of relative values may vary widely. Other factors, including public acceptance, reliability, and implementation must be considered and they will influence choice of the plan. Under these circumstances, plan selection will involve making reasoned chcices among the alternatives based upon display of all significant costs and effects of each. This will aid in identifying tradeoffs between the alternatives and will also facilitate effective involvement in the selection process of representatives of concerned interest groups and organizations. Such involvement is essential to obtain general agreement on the best plan and the measures needed for plan implementation. Figure 6.1 provides an example of the display of costs and effects of alternative proposals to permit ready comparison of the proposals and the tradeoffs among them. The effects should be presented, whenever possible, in quantitative terms. The display should include any facts obtained from Citizens Advisory Groups, governmental representatives or other sources.

Figure 6.1

COSTS AND EFFECTS OF ALTERNATIVE PROPOSALS

SIGNIFICANT EFFECTS	PROPOSALS A	B	C	D
1. Environmental Effects				
a. Aquatic biota				
b. Terrestrial				
c. Wildlife habitat (including wetlands)				
d. Cultural areas				
e. Groundwater and surface pollution				
f. Air pollution				
g. Aesthetics, noise odor, and dust				
h. Land use				
i. Social factors				
1. dislocation				
2. employment changes				
j. Other effects				
2. Monetary Costs				
a. Capital costs (including schedule of deferred costs)				
1. public				
2. total				
b. O.M.&R. costs				
1. public				
2. total				
c. Net revenue (public)				
d. Average annual costs				
1. public				
2. total				

Figure 6.1

COSTS AND EFFECTS OF ALTERNATIVE PROPOSALS (continued)

SIGNIFICANT EFFECTS	PROPOSALS A	B	C	D
3. Contributions to Water Quality Objectives and Other Water Management Goals				
4. Implementation Capability				
a. Institutional				
b. Financial				
c. Legal				
5. Energy and Resources Use				
a. Energy (power)				
b. Chemicals				
c. Land commitment for planned features				
6. Reliability				
a. Frequency of plant upsets				
b. Frequency of spills				
c. Frequency and effects of combined sewer overflows				

C. Ranking of Alternative Proposals

Analysis of the display should be followed by ranking the proposals. Ranking will be based on evaluation of the effects and costs presented in the display table and the supporting analyses. To assist with this procedure, an analysis similar to that presented in Figure 6.2 may be used. The steps for a suggested ranking procedure follow.

1. Review each alternative proposal, its effects and relative merits.

2. Rank all alternatives with respect to one factor and then proceed to the next factor. Briefly describe reasons for ranking of alternatives for each factor. Assistance of a Citizens Advisory Group (see Chapter 7) may help in attaining a balanced judgement as to appropriate rankings.

3. Add the factor rankings for each plan and translate this sum into a composite ranking of the alternative plans.

4. Review the ranking by re-evaluation of the effect of each plan and the tradeoffs among the plans (see Figure 6.1).

As a note of caution, the proposal ranking determined through the above numerical procedure should not necessarily be regarded as the final ranking. Rather, the procedure should be used only to assist in evaluating the display of effects and selecting the final plan. There is no substitute for specific evaluation of the tradeoffs displayed in Figure 6.1. As indicated in Chapter 7, representatives of concerned interests (the public) should be involved in the tradeoff evaluation process.

D. Evaluation Factors

The following comments apply to the evaluation factors and sub-factors shown in Figure 6.2. Since use of this specific table is not required, the comments are advisory in nature.

1. Environmental Effects - This factor reflects analysis of Figure 6.1. All significant effects must be considered and weighed to derive an overall value judgement as to the net

Figure 6.2

RANKING OF FINAL ALTERNATIVE PROPOSALS

	Rank of Alternative Proposals			
	P-1	P-2	P-3	P-4
1. Environmental Effects				
2. Monetary Costs (least total costs)				
3. Implementation Capability				
4. Contributions to Objectives and Goals				
5. Energy and Resources Use (overall appraisal)				
6. Reliability				
7. Public Acceptability				
8. Totals				
9. Composite Ranking				

overall effect on the environment relative to other plans.

2. Monetary Costs - In this case public costs and total costs are not identical. The public cost represents the total of capital and operating and maintenance costs over the period which are paid by Federal, State and local governments. The total costs include the cost of private pollution abatement such as pretreatment of industrial discharges and privately financed flow and waste reduction measures. Although total costs will be the primary monetary cost factor in determining cost-effectiveness of a plan, the relationship between total and public costs should be displayed.

3. Implementation Capability - The ability of and agreement among the State, local governmental units or management agencies to implement a plan are critical. This means that necessary institutions must exist or that they can actually be created in time to carry out the plan, and the local governmental unit must be capable of bearing the local share of the costs. Subsequent paragraphs discuss this matter more fully.

4. Contributions to water quality objectives and other water management goals - Although each plan must meet the basic regulatory requirements of the Act, the actual contributions of the proposals to the objectives and goals will differ. This variation will be analyzed and assessed.

5. Resources Use and Energy Consumption - Resources use, particularly those in short supply, and energy consumption are important in plan evaluation. Excessive use of such resources or energy to achieve a goal should be avoided.

6. Reliability - The measures included in the plan must reliably provide the required abatement actions over time as discussed in Chapter 3. The probability and duration of plant upsets or spills should be minimized.

7. Public Acceptability - The plan should be acceptable to the public in general, particularly those affected by the plan, their elected representatives, and community leaders. While total concensus is impracticable, the degree of general acceptability is a vital factor in future implementation of the plan.

E. Preliminary Design

Preliminary engineering designs and design data will be developed in accordance with references (q) and (r) for those treatment works proposed for initial construction and scheduled for preparation of construction drawings and specifications. As appropriate, such information would include a schematic flow diagram, unit processes, plant site plans, sewer pipe plans and profiles, and design data regarding detention times, flow rates, sizing of units, etc. Cost estimates for design and construction of the treatment works together with a schedule for completion of design and construction will be presented.

F. Operation and Maintenance

Suitable arrangements for effective operation and maintenance must be provided for and thoroughly described in the plan of operation. This should include, but not be limited to, items such as the provision of adequate sampling and analysis for process control, an appropriate staffing complement, a training and/or re-training program, required upgrading to meet effluent limitations in operating permits, and various activities related to effective maintenance management.

6.2 PLAN IMPLEMENTATION

A. Introduction

No plan is complete without the agreements among responsible entities essential to carry out the plan. The following paragraphs discuss the arrangements necessary to provide for developing the essential implementation agreements.

B. Public Support

Implementation of a facilities plan, particularly for a complex area, may require the solution of difficult problems affecting many interests and involve substantial local costs to be repaid by the people in the planning area. Thus, a

broad base of public support, including the assistance of elected officials and other community leaders, usually must be obtained to implement a facilities plan. To achieve the necessary public support, the public should be kept informed and should have an opportunity to express its views at key points throughout the planning period, including identification of the goals and discussion of the alternatives. In some cases, representatives of concerned interests should be actively involved in planning through participation in Citizens Advisory Groups. The various means of obtaining effective public participation in planning are described further in Chapter 7.

C. Institutional Arrangements

The existing public sewerage agencies or other wastewater management authorities, together with their legal authorities, will be reviewed. Next, to provide orderly and economical implementation of the plan, the necessary authorities and the extent of centralization of the wastewater management agency(ies) must be determined. Then, the capability of existing institutions to meet these requirements should be assessed along with the need for modification of local ordinances or State legislation. If existing institutions cannot carry out the plan, the necessary arrangements must be made to create a new agency fully empowered to finance, operate and maintain the proposed works. As a basis for EPA approval of a facilities plan, the plan should include copies of resolution(s) accepting the plan, assuring that it will be carried out, and stating the legal authorities for financing, operating and maintaining the proposed works.

D. Financial Program and Schedules

The facilities plan will include a schedule of the estimated annual non-Federal expenditures (financial costs) required for implementing the first stage of the plan (see Figure 6.3 for example).

Where the facilities plan provides for service to industrial users, a preliminary estimate will be made of the revenues obtainable from the industries to aid in defraying the non-Federal financial costs. To determine industry cost-sharing, costs will be allocated between industrial users and other users of the proposed wastewater management system in accordance with reference (1). These regulations would require that all grantees recover from industrial users that portion of the grant amount allocable to the treatment of wastes from such users.

Figure 6.3

SCHEDULE OF NON-FEDERAL REVENUES

Year	Capital Requirement ($1,000)	Annual Expenditures ($1,000) Capital	Operating	Total
1974				
1975				
1976				
1977				
1978				
1979				
1980				
1981				
1982				
1983				

E. Steps for Plan Implementation

Each facilities plan report will specifically outline all steps necessary for implementation of the first stage of the plan.

CHAPTER 7

PUBLIC INVOLVEMENT IN FACILITIES PLANNING

7.1 INTRODUCTION

Public involvement is necessary for effective facilities planning and should be incorporated into the planning process in accordance with references (b) and (u).

Wastewater management affects a wide range of economic, social, environmental and institutional interests, and it must be planned and implemented in a manner which meets with public satisfaction. When properly developed, public involvement in the facilities planning process facilitates the identification of public preferences and fosters the development of and choice among alternative solutions for satisfying public needs.

Public involvement should commence with the earliest possible steps of the planning process and continue throughout. Such involvement must emphasize identifying affected public interests and providing opportunities for those interests to be expressed and considered by other publics, planners and elected officials. The integration of public involvement with the planning process increases the probability of actual plan implementation. It encourages the timely recognition and handling of public interest conflicts so that greater public support and understanding may be generated for the plans.

7.2 PUBLIC INVOLVEMENT PROGRAM ELEMENTS

A. Public Involvement Program Objectives

The public involvement program is an integral part of the planning process. The program should affect the transmittal of information and elicit feedback in a timely manner for decision-making. While particular public involvement program objectives must be formulated in recognition of the specific situations, a list of public involvement program objectives with general applicability follows:

1. Increased Awareness

In order to generate public support and understanding of proposed plans, it is necessary that the public be made aware of the needs for abatement of municipal and industrial

pollution and the implications of meeting these needs. The substantive water quality problems should be outlined in a manner which is understandable to the public.

2. Information and Feedback

In order to develop viable alternative solutions and to conduct realistic plan evaluations, it is necessary to open avenues for direct planner-public communications. The program should assist planners in identifying local interests and in understanding perceptions of problems and needs. Public assessments of appropriate institutional arrangements should be sought, as well as public reactions to and preferences for alternatives.

3. Resolution of Conflict

In order to realize plan implementation, it is necessary to minimize the level of plan opposition. The public involvement program should be responsive to a representative cross-section of opinions in order that concerned interests can be identified, conflicts can be addressed, and decision-making by general agreement can be achieved.

4. Trust and Commitment

In order to develop a viable public involvement program in which the public maintains interest, it is necessary that the public reach a commitment to the final plan through actual involvement in the planning process. The program should be characterized by frank and open interaction among planners and the various publics.

B. The Role of the Planner

The role of the planner in a public involvement program changes during the sequential steps of the planning process. The planner must not only inform the public as to the alternative solutions, but must also play the roles of coordinator, catalyst and advocate planner as appropriate. Specific activities which the planner should accomplish include:

1. The definition of issues and the analysis of information in a manner which clarifies the relative costs and benefits of various alternatives. Such clarification can increase the possible bases for compromise and negotiation.

2. The identification of alternative proposals' impacts vis-a-vis defined goals in addition to the assessment of the technical feasibility of the plan. Planners can assist the public in prioritizing their values by means of tradeoff analysis and mutual accommodation between interests.

3. The representation of the interests of persons who are not actively represented in the planning process. The planner should see that the consequences of alternatives for persons unaware of the plan, including future area residents, are considered in the evaluation process.

4. The prediction of future area development and the description of probable long-range consequences of present actions. Discussions of future development and alternative consequences can bring out new issues and highlight additional needs, including alternative institutional arrangements.

C. The Levels of Public

In developing a public involvement program, it is important that the planning agency identify and interact with a variety of individuals, groups and the interests that collectively compose the interested public in its area. The public can be visualized as falling into three general sectors. These are:

1. Level I, comprised of government institutions and pollutant dischargers. This level of public is directly responsible for water pollution control; government institutions plan, operate and enforce the water quality program; the dischargers must respond to government regulations.

2. Level II, comprised of special interest groups and opinion leaders. Specialist publics are exemplified by conservation and environmental groups, academic interests (especially those in engineering, ecology, and social policy), professional societies (practicing architects, engineers and geologists) and other groups with well-developed interest in water quality issues.

3. Level III, comprised of the general public. It is important that the planner involve a representative cross-section of the public so as to ensure that the interests of all persons affected by the plan are considered. It is important to maintain equitable balance during the planning process between the clearly articulated concerns of well-organized interest groups and the relatively undeveloped concerns of unorganized publics. Means of accomplishing this equitable balance of interests include:

   a. Establishing an adequate information base among the publics;

   b. Providing a variety of public participation opportunities; and

   c. Providing motivational incentives to the publics to elicit their time and energy.

D. Public Involvement Functions

Public involvement in the planning process can be described in terms of three types of relationships between the public and the planning agency. They are:

1. The one-way output relationship in which the planning staff disseminates information (and obtains feedback from the public);

2. The one-way input relationship in which the public generates a flow of ideas and data into the planning process (and obtains feedback from the planners); and

3. The two-way interactive relationship in which the public and the planner interact during the planning process.

E. Public Involvement Mechanisms

There are various mechanisms which can be utilized during a public involvement program.

One-Way Output Mechanisms
- Depositories
- Exhibits
- Mailings
- Newsletters

- News Media
- Publications
- Speeches
- Seminars

One-Way Input Mechanisms
- Information Solicitation
- Public Hearings
- Surveys

Interaction Mechanisms
- Advisory Groups
- Correspondence
- Informal Contacts
- Interviews
- Liaison with Citizen Groups
- List Development
- Public Meetings
- Simulation and Games
- Task Forces
- Workshops

7.3 PUBLIC INVOLVEMENT PROGRAM FOR FACILITIES PLANNING

This section discusses public involvement mechanisms which may be used during each step of the facilities planning process as outlined in Chapter 2. Depending upon the planning agency's manpower and funding resources, the use of additional public involvement mechanisms is encouraged. Some of the planning process steps have been grouped together, where possible, to combine public involvement efforts.

A. For Steps 1-5 of the planning process (see Chapter 2) the following public involvement mechanisms are recommended:

1. Development of a List of concerned and affected area publics.

2. Information Solicitation to identify new sources of information and expertise. This involves the dispatching of direct mail pieces to possible sources of information, such as college and department chairmen, presiding officers of professional organizations and librarians. It is not meant to be addressed to planning and management agencies which are known to have information on water quality management planning.

3. Newspaper Articles to inform the public about the procedures for delineating planning areas and determining pollution sources, waste loads and water quality problems and to encourage the public to participate in determining area goals and objectives.

4. Interviews with State and local political leaders, related planning agency and special purpose district officials, newspaper and television executives and local opinion makers to determine their views on the water quality objectives and goals of the area.

5. Public Meetings, particularly at the stage when water quality objectives and other waste management goals are being determined. These meetings should be held in accordance with reference (u). Notice of the meetings should be given at least fifteen days before the meetings are to take place and records must be maintained. The meetings should be held at convenient locations throughout the planning area. Summaries of the public meetings should be prepared and maintained.

B. For Steps 6-9 of the planning process, the following public involvement mechanisms are recommended:

1. Advisory Committee, having the necessary expertise and representing the affected publics, to work with the planning agency in evaluating and selecting flow reduction techniques, projecting future waste loads and flows and developing and evaluating alternatives.

2. Informal Contacts with locally elected officials and planners to obtain their views and assure continuity with other wastewater management studies.

3. Newspaper Articles to inform the public on the development of alternatives.

4. Mailings to interested and affected publics, obtained from the lists generated in the initial planning phases, which discuss the major alternatives being evaluated and request the public's view and comment.

The public can be extremely helpful in advising the planner as to the feasibility of the initial set of alternatives. It is extremely important that the planner have access to a well-informed and representative public during this stage so that the best possible set of alternatives can be presented for final evaluation and selection.

C. For Step 10 of the planning process (Refine, Review and Display Alternative Proposals), the following public involvement mechanisms are recommended:

1. Depositories in convenient locations throughout the planning area to display the major alternative proposals.

2. Mailings to interested publics to obtain their comments and views.

3. Interviews with locally elected officials to obtain their comments and views.

4. Radio and Television spots to announce major alternative proposals.

D. For Steps 11 and 12 of the planning process, the following public involvement mechanisms are recommended:

1. Public Hearing(s) to be held prior to the adoption of the facilities plan by the planning entity or grant applicant (references b and u). A public hearing must be held during the plan selection step unless received in advance by EPA. In determining the locations and times for the hearing(s), consideration should be given to easing travel hardship and to facilitating attendance and testimony by a cross-section of interested or affected persons and organizations. Notice of the hearing(s) will generally be given at least thirty calendar days before the hearing(s) is to take place. The purpose of the public hearing is to obtain formal comments of all concerned interests on the alternative proposals. A record of the hearing must be kept.

2. Advisory Group to assist in the review of testimony obtained from the public hearings(s) in evaluating the proposed alternatives and in the selection of the plan.

3. Informal Contacts with local political leaders and planners to obtain their views and comments on implementation arrangements.

4. Speeches to be made throughout the planning area explaining the alternative proposals.

7.4 SUMMARY PUBLIC PARTICIPATION REPORT

A Summary of Public Participation must be prepared and submitted as part of the Facilities Plan. The Summary must describe the measures taken to provide for, encourage, and assist public participation in the facilities planning process; the public response to such measures; the significant suggestions and views of concerned interests; and the disposition of the issues raised.

CHAPTER 8

REPORTS

8.1 REPORT STRUCTURE

The planning report should typically consist of a main report with supporting appendices containing the following information:

a. Preliminary Designs, Technical Data and Cost Estimates for Alternatives;

b. Agreements, Resolutions and Comments; and

c. Supplemental engineering feasibility data on the features included in the first stage development of the adopted plan.

For a simple planning situation, the information included in Items (a) and (c) may be incorporated in the main report.

A typical outline for the main report is presented in the following section. The report Appendix (a) will present in an orderly manner the back-up, including cost and design data, essential to support the functions and costs of each alternative plan and the selected plan. This material will include preliminary design criteria for subsystems and their estimated costs; unit processes and their costs; analysis of sewer system sizes, configurations, and costs; and breakdowns of comparative cost estimates presented in the main report.

Appendix (b) will include copies of agreements and resolutions from implementing entities and the views of concerned local governmental units, agencies, interests, organizations, and individuals on the plan and the alternatives.

The main report generally cannot and should not provide sufficient details or supporting engineering feasibility analyses necessary for preparing the subsequent construction drawings and specifications required for the first stage development of the adopted plan. For these reasons, the main report should normally be accompanied by one or more technical appendices, as noted above in Item (c), covering the first stage measures, particularly the treatment works

to be implemented first, in greater detail. The appendices should include, but not necessarily be limited to:

1. collection system and interceptor configurations, profiles, sizes, and cost breakdowns;

2. treatment plant data including site plan, layouts of unit processes, flow charts, design and performance data;

3. sludge handling and disposal facilities information including design and performance data, disposal site layouts, and sludge conveyance facilities details;

4. effluent disposal data including layouts and profiles of outfalls for either inland surface waters or oceans and descriptions and illustrations of deep well injection facilities or land disposal facilities; and

5. wastewater reuse facilities data.

8.2 MAIN REPORT OUTLINE

The following outline for a main report is suggested. However, items inapplicable to a specific case may be deleted.

I. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

II. INTRODUCTION

- A. Study Purpose and Scope
- B. Planning Area Description (map)
- C. Planning Participation and Coordination

III. WATER QUALITY OBJECTIVES AND OTHER WATER MANAGEMENT GOALS

- A. Water Quality Objectives (State whether objective is BPWTT or providing for greater pollutant reductions based on waste load allocations required to meet Water Quality Standards)
- B. Other Water Management Goals

IV. SUMMARY OF POLLUTION SOURCES, WASTE LOADS, AND WATER QUALITY

A. Locations of Municipal and Industrial Point Sources (Map)

B. Municipal Waste Loads

C. Industrial Waste Loads

D. Summary of Receiving Water Quality

V. EXISTING WASTE TREATMENT SYSTEMS AND FLOWS (see Chapter 2.6)

VI. ENVIRONMENTAL INVENTORY (See Chapter 5)

VII. FUTURE WASTE LOADS AND FLOWS

A. Land Use

B. Economic Activities (Include growth constraints and other factors affecting future growth)

C. Population

D. Flow and Waste Load Forecasts

VIII. ALTERNATIVES

A. Preliminary Alternatives (Brief description of each including component subsystems and operation and maintenance measures for optimizing efficiency of existing facilities)

B. Screening of Preliminary Alternatives (See Figure 2.2) (Include reasons for rejecting each)

C. Evaluation (monetary, environmental, implementation)

D. Description of Proposals (Map and display of proposal effects)

IX. PLAN SELECTION

A. Views of Public and Concerned Interests

B. Tradeoff Evaluation and Ranking of Proposal

C. Selected Plan and Reasons for Selection

X. THE SELECTED PLAN

A. Description and Maps

B. Phasing of Development

C. Operation and Maintenance Requirements

D. Cost Estimates (Total and Public)

E. Summary of Environmental Effects

F. Summary of Public Participation

XI. IMPLEMENTATION

A. Institutional Responsibilities

B. Implementation Steps

C. Construction Implementation Schedule

D. Financial Requirements

E. Continuing Data Collection and Monitoring

CHAPTER 9

REVIEW, CERTIFICATION AND APPROVAL OF PLANS

9.1 PURPOSE

This chapter describes the administrative procedures and requirements regarding the submission of facilities plans (and revisions thereof) to State receiving agencies and EPA, together with State and EPA actions regarding such submissions.

9.2 LEVELS OF REVIEW

Three levels of review are required to gain approval of a facilities plan or for the determination that Step 2 or Step 3 grant applications are consistent with an approved plan. These three levels are (1) Clearinghouse review procedures for grant applications established under the requirements of OMB Circular A-95; (2) State water pollution control agency technical and policy review for compliance with State requirements and for certification that the plan meets with requirements set forth in 40 CFR, Part 35, Subpart E; and (3) EPA review for compliance with requirements of the Act and the above regulations. The State will have primary responsibility for non-Federal reviews. The sewer system evaluation elements of a facilities plan, including the infiltration/inflow analysis and, when appropriate, the sewer system evaluation survey plan, may be reported and reviewed separately in accordance with procedures set forth in 40 CFR, Part 35, Subpart E.

9.3 COMPLIANCE WITH OMB CIRCULAR A-95

A. Plans

No completed plans shall be accepted for review for approval by EPA unless the agency submitting the grant application, together with the plan, to EPA and the State shall have first complied with all applicable requirements of OMB Circular A-95.

B. Determination of Project Compliance with Plan

No application for Step 2 or Step 3 projects will be reviewed by EPA for certification of complicance with an approved plan unless the agency requiring such certification shall have first complied with all applicable requirements

of OMB Circular A-95. Further, all such applications will be consistent with applicable plans.

9.4 SUBMISSION OF PLAN FOR REVIEW

A. Submission to State

The Agency desiring review and approval of a facilities plan shall submit the following document to the State Water Pollution Control Authority:

1. 4 copies of the facilities plan.

2. 2 copies of all relevant documents required under OMB Circular A-95.

3. 1 original and one copy of a letter from the chief official of the agency preparing the plan requesting review and approval and stating:

   a. that the agency has met all requirements for public participation relating to the plan.

   b. the names of all jurisdictions within the planning area which either oppose the plan or have failed to approve the plan.

B. Submission to EPA

EPA will review for approval only those facilities plans which, having received State approval, are properly submitted to the appropriate EPA regional office by the chief official of the State water pollution control authority having jurisdiction over the planning area. In order to obtain EPA approval of a facilities plan, the State will submit the follcwing for the approval of EPA Regional Administrator:

1. A letter signed by the chief official of the State water pollution control authority requesting review and approval and certifying that:

   a. the plan conforms with the requirements of 40 CFR Part 35, Subpart E.

   b. the facilities plan conforms with the applicable basin plan developed or being developed in response to 40 CFR 131.

c. the concerned Section 208 planning agency has been afforded the opportunity to comment upon the plan and the plan conforms with any approved 208 plan.

2. 2 copies of the plan

3. 1 copy of the letter from the local agency to the State required under paragraph 9.4A(3).

9.5 PLAN REVISION

Outdated plans or those which have been superseded by changed conditions provide no valid basis for the investment of public funds in municipal wastewater management facilities. Thus, the planning process must be flexible and continuous rather than simply a one-time effort which produces a plan diminishing in value as time progresses and conditions change. To provide the required basis for review of construction grant applications, such plans should be reviewed regularly and updated as required by changing conditions. As a minimum, a facilities plan which has served as the basis for the award of a Step 2 or Step 3 grant shall be reviewed by the State prior to application for any subsequent Step 2 or 3 grant to determine if substantial changes have occurred which warrant revision or amendment of the plan. The plan shall then be revised or amended as necessary and submitted for review in accordance with the procedures described herein. The plan revision process shall include preparation of a statement on the status of implementation of the plan as of the date of plan revision. Such a statement will accompany the modified planning report and will summarize recommended actions accomplished or underway to date, pending actions on recommendation, and changes in recommended actions or schedules accomplished or pending, and any new plan changes resulting from plan review. The appropriate EPA Regional Administrator(s), A-95 Clearinghouse(s), and State(s) will be notified at least 30 days in advance of initiating plan modification. Processing of revised plans will follow the procedure indicated above.

9.6 EPA REVIEWING PROGRAM OFFICE

The Air and Water Programs Division, including the water planning unit or other office designated by the Regional Administrator shall be responsible for the review of all facilities plans properly submitted by the States.

9.7 CONTENT OF REVIEW AND EVALUATION

The purpose of the review and evaluation is to determine whether the plan, if implemented, will result in meeting the regulatory requirements of the Act in an environmentally sound and cost-effective manner. The basic requirements are found in Sections 201, 204 and 212 of the Act and in 40 CFR 35, Subpart E.

The EPA review will ascertain that requirements of the Act and applicable regulations are met, including specific determinations that:

1. The plan is consistent with existing State and NPDES permits.

2. The plan is consistent with the requirements of the applicable basin plan developed or being developed under 40 CFR 131.

3. The plan is consistent with any areawide plan developed under Section 208 of the Act.

4. All requirements for public participation regarding plan development and approval have been met.

5. The plan will provide for secondary treatment as a minimum, appropriate application of BPWTT in accordance with technical criteria established by EPA or for application of any more stringent effluent limitations required to meet water quality standards.

6. The plan is cost-effective and environmentally sound.

7. Excessive infiltration/inflow does not exist or that a detailed sewer evaluation survey and necessary sewer rehabilitation measures will be accomplished.

8. Implementation of the plan is institutionally feasible within the time period proposed.

9. The plan shall be compatible with plans developed for contiguous areas of other States.

9.8 APPROVING AUTHORITY

The EPA Regional Administrator shall have authority to approve any facilities plan submitted to him by a State within his Region.

9.9 EPA APPROVAL

After review of a properly submitted plan or amendment, the EPA Regional Administrator will promptly notify the chief official of the appropriate State water pollution control authority of his concurrence and approval or his non-concurrence and disapproval of the State's recommendation and the plan.

In the event the Regional Administrator finds it necessary not to concur with the State's recommendation and disapprove the plan, he will specify his reasons for doing so in detail and make recommendations for correcting the plan so that it would be approvable.

*U.S. GOVERNMENT PRINTING OFFICE:1974 546-315/243 1-3