Application of Pennsylvania-American Water Company for Acquisition of the Wastewater Assets of the Borough of Kane Authority
66 Pa. C.S. § 1329
Application Filing Checklist – Water/Wastewater
Docket No. A-2019-3014248

22. Other requirements - demonstrate compliance with the following:

a. For **wastewater** system acquisitions, demonstrate compliance with the DEP-approved Act 537 Official Sewage Facilities Plans for the affected municipalities (including the extent of the requested service territory).

RESPONSE:

a. See enclosed letters from The Borough of Kane and Wetmore Township. The Act 537 Plans are enclosed at **Appendix A-22-b**.

Borough of Kane
112 Bayard Street
Kane, PA 16735

November 22, 2019

Michael Salvo
Senior Manager, Business Development
Pennsylvania American Water Company
852 Wesley Drive
Mechanicsburg, PA 17055

Re: Borough of Kane Authority, McKean County, PA
Act 537 Plan

Dear Mr. Salvo:

Please be advised to the best of my knowledge and belief that all sanitary sewer lines identified in the current Authority's Act 537 Sewage Facilities Plan have been completed and that the Authority is in compliance with that document.

Public water service with the Borough of Kane and portions of Wetmore Township is provided by Pennsylvania American Water Company. Small areas outside the public water service area utilize private wells.

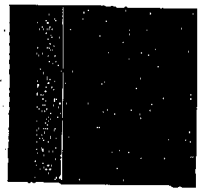
Sincerely,

Donald E. Payne

Telephone: (814) 837-9240
Email: lori@kaneboro.com
Fax: (814) 837-6609
Website: kaneboro.org

Wetmore Township
318 Spring St.
Kane, PA 16735

Phone – 814-837-7490 Fax – 814-837-8529



November 25, 2019

Michael Salvo
Senior Manager, Business Development
Pennsylvania American Water Company
852 Wesley Drive
Mechanicsburg, PA 17055

RE: Wetmore Township, McKean County, PA Act 537 Plan

Dear Mr. Salvo:

Please be advised to the best of my knowledge and belief that all sanitary sewer lines identified in the current Township Act 537 Sewage Facilities Plan have been completed and that the Township is in compliance with that document.

Public water service in portions of Wetmore Township is provided by Pennsylvania American Water Company. Small areas outside the public water service area utilize private wells.

Sincerely,

Elaine Bodistow

Sec./Treas. - Supervisor

Application of Pennsylvania-American Water Company for Acquisition of the Wastewater Assets of the Borough of Kane Authority
66 Pa. C.S. § 1329
Application Filing Checklist – Water/Wastewater
Docket No. A-2019-3014248

22. Other requirements - demonstrate compliance with the following:

b. For **wastewater** system acquisitions, provide a copy of the DEP-approved Act 537 Official Sewage Facilities Plans for the affected municipalities.

RESPONSE:

b. See enclosed a copy of the DEP-approved Act 537 Official Sewage Facilities Plans for Borough of Kane and Wetmore Township attached as **Appendix A-22-b**.

Appendix A-22-b

BOROUGH OF KANE
MCKEAN COUNTY, PENNSYLVANIA

ACT 537
OFFICIAL SEWAGE PLAN

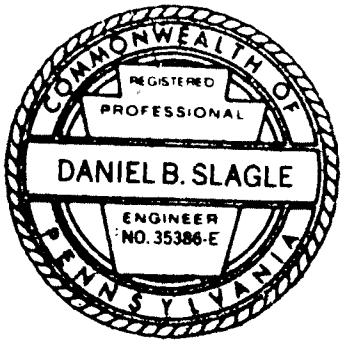
JULY 1990

PREPARED BY

JOHN F. RILEY, P.E.
PROJECT ENGINEER

APPROVED BY

DANIEL B. SLAGLE, P.E.
ASSISTANT VICE PRESIDENT



PLAN ADOPTED BY BOROUGH OF KANE AUGUST 6, 1990

RICHARD F. BLY
PRESIDENT OF COUNCIL

BCM ENGINEERS INC.
5777 BAUM BOULEVARD
PITTSBURGH, PENNSYLVANIA 15206
(412) 361-6000

BCM

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PLAN SUMMARY

A. Final Plan Recommendation

1. Alternatives of Choice

a. Wastewater Treatment

Alternative No. 1, Option B, has been selected as the method of choice to provide adequate wastewater treatment of flows from the Borough of Kane and portions of Wetmore Township. As outlined in Alternative No. 1, the Pine Street and Kinzua Road WWTPs will both be expanded and upgraded to treat tributary flows in accordance with permit effluent limits. Option B utilizes the sequential batch reactor process for removal of carbonaceous and ammonia loadings. Preliminary wastewater treatment unit layouts are shown on Exhibits 8 and 10. Construction Costs, Present Worth Analysis, and User fees are developed in Tables 8, 10, 20, 21, and 22.

b. Onlot Sewage Disposal Systems

Sewage flows from existing onlot sewage disposal systems will be connected to the existing public sewer system.

2. Service Areas

a. Borough of Kane

All portions of the Borough are in the Borough of Kane's service area.

b. Wetmore Township

The Borough of Kane is completely surrounded by Wetmore Township. Many developed portions of the Township near the Borough have inadequate existing onlot wastewater disposal systems. Wetmore Township is currently preparing an Official Sewage Plan which will recommend conveying sewage flows from portions of the Township to the Borough of Kane. The Borough is willing to accept sewage flows from Wetmore Township at selected points on the Borough sewerlines having sufficient hydraulic capacity. The Borough will provide wastewater treatment capacity for Wetmore Township in accordance with the flow projections included in this plan.

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3. Institutional Arrangements

A municipal sewage agreement must be developed between the Borough of Kane and Wetmore Township. This agreement will set forth the manner in which Wetmore Township will compensate the Borough of Kane for conveyance of Township sewage flows within the Borough and treatment of Township sewage flows.

B. Implementation

Adopt and Submit Act 537 Plan to PADER	August 1990
Begin Development of Storm Sewer/Sanitary Sewer Maps	October 1990
Submit Sludge Disposal Module 1 to PADER	October 1990
Initiate Monitoring of All Flows Tributary to WWTPs	November 1990
Receive Comments on Act 537 Plan from PADER	November 1990
Submit Revised Act 537 Plan to PADER	January 1991
Revise Sewer Use Ordinance to Prohibit Onlot Sewage Disposal Systems	January 1991
Begin Removal of Waste Sludge from WWTPs	February 1991
Receive Final Approval for Act 537 Plan	April 1991
Authorize Engineer to Design WWTP Expansion/Upgrade	May 1991
Present Municipal Service Agreement to Wetmore Township	July 1991
Submit Plans and Specifications to PADER for Review	January 1992
Submit PENNVEST Loan Application	February 1992
Receive Part 2 Permit for WWTP Construction	June 1992
PENNVEST Approval or Rejection	June 1992
Arrange Supplemental Funding, if Required	August 1992
Advertise Project for Bids	September 1992
Open Bids	November 1992
Close PENNVEST or Bond Issue	December 1992
Award Contract	January 1993
Issue Notice to Proceed	February 1993
Complete Construction	September 1994
Place WWTPs in Operation	October 1994
Connect All Onlot Disposal Systems to Public Sewers	April 1996
Correct Known Sewerline Capacity Problems	April 1996

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1.0 PLANNING OBJECTIVES AND NEEDS

1.1 PLANNING

1.1.1 Previous Planning Activities

(i) In 1969, a Comprehensive Plan for Water and Sewer Systems was developed for McKean County by PADER. This study anticipated stringent effluent standards for the Pine Street and Kinzua Road wastewater treatment plants (WWTP). Both facilities were recommended to be upgraded in the future. To meet these anticipated stringent effluent standards, portions of Wetmore Township will be served by the Borough of Kane's (Borough) WWTPs. Storm relief sewers may be required for the Borough to accommodate excessive inflow.

(ii) No planning has been performed under the Federal Construction Grants Program.

(iii) The Chapter 94 report submitted in March 1990 discussed the Borough's ongoing multi-year program of infiltration/inflow (I/I) detection, abatement, and flow reduction. This program will run concurrently with the Borough's planning, design, and construction program for wastewater collection and treatment system expansion and upgrading. The I/I Reduction Program is expected to include some areas of physical storm/sanitary sewer system separation and rehabilitation. Initial year tasks now in progress include the following:

- Field weiring of selected collector sewers to quantify wet/dry flow relationships and isolate excessive extraneous flows worthy of corrective actions through reduction/removal.

- Dye tracing of suspect storm sewer inlets to confirm direct connections or excessive flows. Remedial methods will then be taken as appropriate.

Chapter 94 states that an Act 537 Plan will be prepared and submitted.

The hydraulic loading at both the Pine Street and Kinzua Road WWTP facilities is approximately 1.1 mgd average daily flow for the peak month or months of record shown in the Chapter 94 Report.

(iv) Plan (COWAMP) of 1979 recommended expansion of the Pine Street WWTP to treat all Borough sewage flows, construction of a pump station and interceptor sewers to convey flows from the Kinzua Road WWTP to the Pine Street WWTP, and subsequent abandoning of the Kinzua Road WWTP. Following acceptance of the COWAMP Plan, it was determined by the Pennsylvania Department of Environmental Resources (PADER) that the Kinzua Reservoir had a greater ability to assimilate treatment plant effluent than originally believed without degradation of the stream. PADER designated Tionesta Creek as a high-quality fishery stream. Current effluent limits require a greater degree of treatment on West Run, a tributary of Tionesta Creek, than is required for Hubert Run. The environmental priorities and recent stream modeling by PADER have revised the previous position as stated in COWAMP.

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1.1.2 No specific implementation schedules were included in the plans listed above which have not been fulfilled. The recommendations of COWAMP were not fulfilled due to a change in PADER policy concerning the watersheds involved.

1.1.3 No future planning is anticipated beyond this Official Sewage Plan.

1.1.4 This Act 537 Plan is the first Official Sewage Plan for the Borough of Kane.

1.2 COUNTY AND MUNICIPAL LAND USE PLANNING

1.2.1 Plate No. 1 (attached) shows all available undeveloped land and zoning classifications in the Borough. The McKean County Planning Commission developed "Policies for the Future" in 1970, which serves as the Act 247 Plan for the County. Page IV-4 states:

> The provision of adequate public water and sewer systems to areas of development is one of the critical problems and priorities in McKean County. Adequate public water and sewer utilities should be provided for the elimination of health problems in existing built-up areas and as a guide and stimulus for future development activity.

Page IV-5 states:

> Future Needs and Policies
>
> In 1969 McKean County adopted a Comprehensive Plan for Water and Sewer Systems. Overall, the plan called for public sewer and water service to all areas with a concentration of development. This basic goal remains the same--that all concentrations of development be serviced by public water and sewer.
>
> The community utility plan recommends the upgrading and expansion of existing plants, and extension of mains to service nearby areas. Developed areas, particularly if a health hazard exists, should receive priority for new systems.

The 1978 "Comprehensive Plan for the Borough of Kane" complements the County's Act 247 Plan in regard to development of public sewers. Page 40 states:

> Subsequent to the reevaluation of the Borough sewage system, recommendations will be made to extend the sewage and water services to the densely settled areas of outlying municipalities, when feasible. Adoption of a zoning ordinance will allow the Borough Council to control the Borough land use regarding residential, commercial, and industrial development. The ordinance will help create a more attractive community for present residents and prospective residents and industries.

When the County's and the Borough's Act 247 Plans were developed, no zoning ordinance was in effect for the Borough. Subsequently, a zoning ordinance has been developed which is consistent with the objectives of the County's and the Borough's Act 247 Plans. Exhibit 1 shows the existing Borough land use as recorded in the Borough's Act 247 Plan.

1.2.2 No inconsistencies were found in the County's and the Borough's Act 247 Plans which effect proposed sewage service.

1.2.3 Existing sewage facility planning is consistent with the proposed land use.

1.2.4 The Borough enacted their Zoning Ordinance A-808 on October 17, 1980.

Residential District R-1 and R-2: New R-1 residential building lots shall not be less than 7,000 square feet per single or two-family dwelling. New R-2 residential building lots shall not be less than 9,000 square feet per single- or two-family dwelling. Apartments and certain classifications of commercial/institutional developments may be allowed in residential districts by special exception.

Commercial-Residential District C-R: All new C-R building lots shall not be less than 5,000 square feet. Land use is very flexible in these districts, allowing a wide range of residential, commercial, or industrial development.

Central Business District C-1: All new C-1 building lots shall be 5,000 square feet or greater. This zoning classification allows for a wide range of commercial and institutional uses.

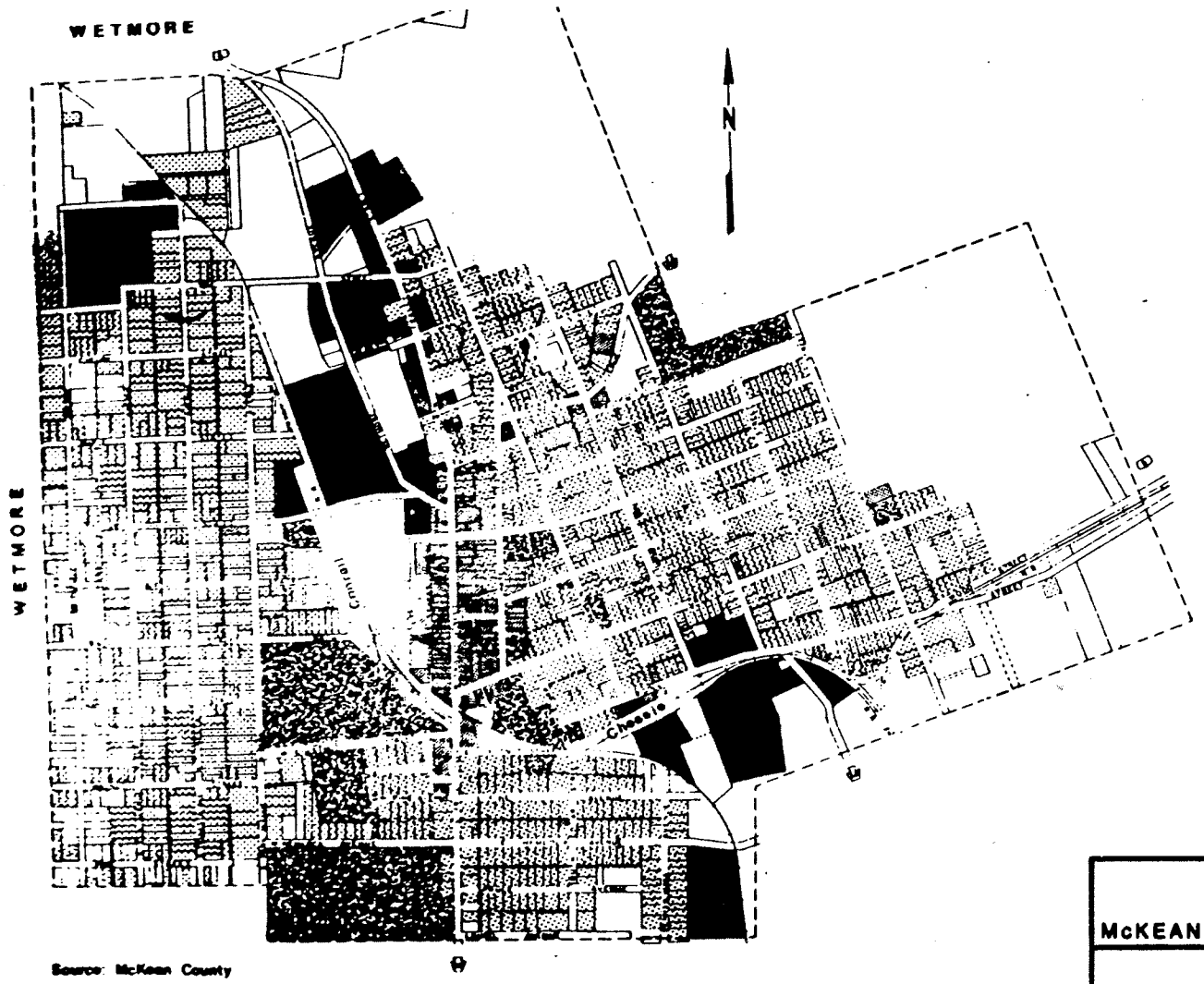
Industrial District I-1: Industrial building lots shall be at least 25,000 square feet. Industrial and some commercial and institutional functions are allowed. By special exception, almost any type of development may be permitted.

Industrial-Commercial District I-C: Each main building shall have a lot of at least 5,000 square feet. Development of all types allowed in C-1 or I-1 zoning and development allowed in I-1 areas by special exception will be allowed.

The Borough is currently planning to modify the existing Sewer Use Ordinance to require that sewage effluent from all new developments in the Borough be connected to the public sewers. Existing buildings not tied into the public sewers will be required to connect.

1.2.5 Undeveloped building lots within existing subdivisions and undeveloped land parcels are shown on Plate No. 1.

Kane Borough Land Use



- Residential Areas
- Commercial Areas
- Industrial Areas
- Public / Recreation
- Vacant

0 400 800 1200
Scale in feet

BOROUGH OF KANE

McKEAN COUNTY PENNSYLVANIA

BOROUGH LAND USE

EXHIBIT 1

BCM Engineers
ENGINEERS, PLANNERS, SCIENTISTS and LABORATORY SERVICES

DRAWN BY: JP PROJECT NO: 00-3495-01
SCALE: AS SHOWN
DATE: JULY 1990 FILE NO: S-3495-01-7

1.2.6 Table 1 lists all available undeveloped residential lots. Tables 2 and 3 list available undeveloped acreage:

TABLE 1

Zoning Classification	Number of Unimproved Building Lots in Existing Subdivisions
R-1	31
R-2	16

Because of the small number of undeveloped lots and the demand for new residential development, we will consider that all existing undeveloped residential lots will be developed by the year 2000.

1.2.7 The Flood Hazard Boundary Maps for Wetmore Township and the Borough were reviewed. There were no special flood hazard areas noted in the entire planning area. There are no known wetland areas at the Kinzua Road WWTP site. Two possible manmade wetland areas exist at the Pine Street WWTP site which may prohibit future construction activities (see Exhibit 8).

1.2.8 No Stormwater Management Plan exists for the Borough. Due to the high elevation of the Borough, there are no development limitations due to flooding.

1.2.9 The proposed WWTP improvement project and restrictions to onlot sewage disposal systems within the Borough may benefit public water sources, recreational water use, groundwater recharge, and the availability of water for industrial use. Open space and recreational opportunities will not be negatively affected by expansion of the existing wastewater treatment facilities on Pine Street or Kinzua Road.

An alternate wastewater treatment site is adjacent to Glenwood Park on property owned by the Borough. Construction of a WWTP at that site would utilize land that could be potentially developed for recreational purposes. Suitable land owned by the Kane Estate and controlled by the Borough is available for recreational use. The construction of a wastewater facility adjacent to Glenwood Park should not be ruled out solely on the basis of potential loss of open space and recreational opportunities.

1.2.10 Historical or Archeological Significance of Project Areas

On May 16, 1990, letters were sent to the Historical Society of Western Pennsylvania, Pittsburgh, Pennsylvania, and to the Historical and Museum Commission, Harrisburg, Pennsylvania, requesting determination of historical and archeological significance of the Pine Street, Kinzua Road, and Glenwood Park WWTP sites. On June 23, 1990, we received a response from the Historical Society of Western Pennsylvania stating that there was no historical significance of the project sites found in the literature search. As of July 25, 1990, we have not received a response from the Historical and Museum Commission.

1.2.11 Pennsylvania Natural Diversity Inventory (PNDI) Search

On May 11, 1990, a PNDI search request was sent to PADER to identify any species of concern which may be impacted by the proposed project. On July 6, 1990, search results were sent to the Borough. The search did not reveal any natural resources of specific concern.

1.2.12 There are no known areas of agricultural significance which will be impacted.

1.3 EXISTING WWTP PLANNING

1.3.1 COWAMP Plan of 1979 recommended expansion of the Pine Street WWTP to treat all Borough sewage flows, construction of a pump station and interceptor sewers to convey flows from the Kinzua Road WWTP to the Pine Street WWTP, and subsequent abandoning of the Kinzua Road WWTP. Following acceptance of the COWAMP Plan, it was determined by the Pennsylvania Department of Environmental Resources (PADER) that the Kinzua Reservoir had a greater ability than previously believed to assimilate treatment plant effluent without degradation of the stream. PADER designated Tionesta Creek as a high-quality fishery stream. Current effluent limits require a greater degree of treatment on West Run, a tributary of Tionesta Creek, than is required for Hubert Run. The environmental priorities and recent stream modeling by PADER have reduced the stringent discharge limits stated in COWAMP for Hubert Run.

1.3.2 The Borough has been informed by PADER that the effluent of the Pine Street plant is tributary to Tionesta Creek, a high-quality fishery stream. PADER will not permit any bypasses of combined sewage in this watershed. Effluent quality required in this watershed will be high.

1.3.3 The Chapter 94 Report states that an Act 537 Plan will be submitted to address wastewater treatment needs. Specifically, Chapter 94 also discusses the ongoing I/I Analysis and Flow Reduction Program currently underway. No other corrective work or scheduling is addressed in the Chapter 94 Report.

1.3.4 The 1980 State Water Plan for the Upper Allegheny River states that the Western Pennsylvania Water Company, Kane District, utilizes 7 springs and 16 wells for existing water supply. The treatment capacity is listed as 1.0 mgd with 0.7 mg treated water storage. Safe yield of supply is listed as 1.14 mgd. The water plan projects yield, storage, and treatment deficiencies for the years 1990 and 2020. The company has since changed their name to the Pennsylvania American Water Company. The Water Company now utilizes 13 wells, 8 wet weather springs, and is developing 2 new wells. During certain times of the year, surface water is taken from Hubert Run. With development of the new wells, safe yield will be 1.5 mgd.

Safe yield of the existing wells is 1.14 mgd. The surface and spring supplies have no safe yield although they do supply about 60 percent of the water used annually. Plans are underway to expand the water treatment plant to 1.2 mgd. Existing treated storage consists of a 0.4 mg standpipe and 0.1 mg clearwell. Within the next five years, the Water Company plans to build an additional 0.8 mg treated water storage tank.

1.3.5 On May 16, 1990, a letter was sent to the PADER Mining Subsidence Regulation Section to determine if the Pine Street, Kinzua Road, or Glenwood Park WWTP site areas had been undermined. The Coal Status Report dated June 16, 1990, states that there are no mining records available for your site.

1.4 GROWTH AREAS AND PROJECTED WASTEWATER FLOWS

1.4.1a Expected increases in sewage flows within the Borough to the Pine Street WWTP are as follows:

TABLE 2

PINE STREET WWTP
PROJECTED SEWAGE FLOW INCREASES

Zoning Classification	Unimproved Bldg. Lots	Undeveloped Acreage	Lots/ Acre	Expected Number of EDUs	Average Sewage Flow/EDUs	Increased Sewage Flows Kane (gpd)
R-1 Lots	31			31	350	10,850
R-1 Acreage		5	3	15	350	5,250
R-2	8			8	350	2,800
C-R						
C-1						
I-1		0.7		3	350	1,050
I-C						
Onlot Systems				4	350	1,400
Total				61		22,000

Due to the small quantity of undeveloped land in the Borough, we will consider 100 percent development of these areas in the ten-year planning period.

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The anticipated sewage flow from Wetmore Township tributary to the Pine Street WWTP, as reported by KLH Engineers, in the year 2000 for 213 EDUs is 75,000 gpd. The total projected increase in sewage flow to the Pine Street plant is 97,000 gpd. The design flow based on existing flow records is approximately 1,150,000 gpd. A projected design flow is estimated at 1,247,000 gpd. A preliminary design flow of 1.4 mgd will be used to account for the bypasses at Pine Street and the limited flow monitoring information.

1.4.1b Expected increases in sewage flows within the Borough to the Kinzua Road WWTP are as follows:

TABLE 3

KINZUA STREET WWTP
PROJECTED SEWAGE FLOW INCREASES

Zoning Classification	Unimproved Bldg. Lots	Undeveloped Acreage	Lots/ Acre	Expected Number of EDUs	Average Sewage Flow/EDUs	Increased Sewage Flows Kane (gpd)
R-1						
R-2 Lots	8			8	350	2,800
R-2 Acreage		138	3	414	350	144,900
C-R						
C-1		0.10		1	350	350
I-1		4.8		20	350	7,000
I-C						
Onlot Systems				2	350	700
Total				445		156,000

The anticipated design year sewage flow from Wetmore Township tributary to the Kinzua Road WWTP, as reported by KLH Engineers, in the year 2000 for 138 EDUs is 49,000 gpd. The total projected increase in sewage flow to the Kinzua Road WWTP is 205,000 gpd. The design flow based on existing flow records is approximately 1,130,000 gpd. Projected design flow is estimated at 1,335,000 gpd, or 1.4 mgd.

1.4.2 Due to the small quantity of undeveloped land, we will consider 100 percent development of these areas in the ten-year planning period. A flow increase of 75 percent is expected within five years and 100 percent is expected within ten years. Population projections for the Borough of Kane are as follows:

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TABLE 4

BOROUGH OF KANE POPULATION PROJECTIONS

Year	Persons
1970	5,001
1980	4,993 Estimated
1990	5,078 Projected actual
2000	5,175 Projected — 4772

Source: 1978 Comprehensive Plan for the Borough of Kane

The proposed WWTP expansion project will be sufficient to accommodate sewage flows at least to the year 2005.

2.0 PHYSICAL DESCRIPTION OF THE PLANNING AREA

2.1 PHYSICAL DESCRIPTION

The Borough is located in southwestern McKean County. Wetmore Township completely surrounds the Borough. A ridge runs north to south, passing through the Borough. Runoff flows on the east side of town are tributary to Hubert Run and the Kinzua Creek. Runoff flows from the west side of the Borough are tributary to West Run and Tionesta Creek. (See Exhibit 2.) The Borough and the Kane Borough Authority have the responsibility of providing sewage service to customers within the Borough. Approximately 65 sewer customers in Wetmore Township are currently served by the Borough. Borough boundaries, stream information, and a drainage basin breakdown are illustrated in Exhibit 2. The recommendations of this Official Sewage Plan will be implemented by the Borough and the Kane Borough Authority.

2.2 SOIL CONDITIONS

At present, there are only six known onlot sewage disposal systems within the Borough. We have been informed by Mr. John Wester, the sewage disposal officer for the Borough, that soil conditions within the Borough are unsuitable for onlot disposal of sewage. A soil map of the Borough is attached as Exhibit 3. This map was developed from the "Soil Survey of McKean County" prepared by the U.S. Department of Agriculture Soil Conservation Service.

An inspection of the soils map for the Borough (Exhibit 3) shows the following soils:

- Brinkerton Silt Loam: 0 to 8 percent and 3 to 8 percent slopes. These soils are fine--silty, mixed, mesic Typic Fragiaqualfs. They are very deep, poorly drained, and located in drainageways, bases of steeper slopes, and in concave basins in broad, upland areas. The seasonal high water table and slow or moderately slow permeability in the fragipan are limitations of this soil for onsite waste disposal.

- Buchanan Series: These soils are fine--loamy, mixed, mesic Aquic Fragiudults. These soils are very deep and moderately well drained to somewhat poorly drained. Their slopes range from 0 to 25 percent. They are located in broad valleys and drainageways. The seasonal high water table and slow permeability in the fragipan and the substratum are limitations for onsite waste disposal.

- Cookport Series: These soils are fine--loamy, mixed, mesic Aquic Fragiudults. These soils are deep and very deep, moderately well drained soils on uplands. Their slopes range from 0 to 25 percent. The seasonal high water table and slow permeability in the fragipan are limitations for onsite waste disposal.

- Hartleton Series: These soils are loamy--skeletal, mixed, mesic Typic Hapludults. These soils are deep and well drained. They are on hillsides, benches, and hilltops. Their slopes range from 3 to 60 percent. Slopes and large stones on the surface are limitations of this soil. Locating absorption fields for onsite waste disposal systems on nearby, less steep soils would be more suitable than these soils.

- Hazleton Series: These soils are loamy--skeletal, mixed, mesic Typic Dystrochrepts. These soils are deep and well drained. They are on nearly level to moderately steep, convex hillsides and hilltops. Slopes range from 0 to 25 percent. If this soil is used for onsite waste disposal systems, the moderately rapid to rapid permeability causes a hazard of groundwater contamination.

Upon investigation of these soils, we would recommend prohibition of onlot wastewater disposal systems in the Borough. The above soils prove to be unsatisfactory for onlot systems.

The Borough will modify their Sewer Use Ordinance to prohibit any future onlot systems. Property owners utilizing existing onlot systems will be required to connect to the public sewer system.

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2.3 GEOLOGIC CONDITIONS

- Pottsville Group--Mostly sandstones and conglomerate with thin shales and coals.
- Allegheny Group--Cyclic sequences of sandstone, shale, limestone, and coal.
- Pocono Group--Predominantly gray, hard, massive, cross-bedded sandstone, and conglomerate with some shale.

There are no known geological features which prohibit onlot waste disposal systems.

2.4 POPULATION PROJECTIONS

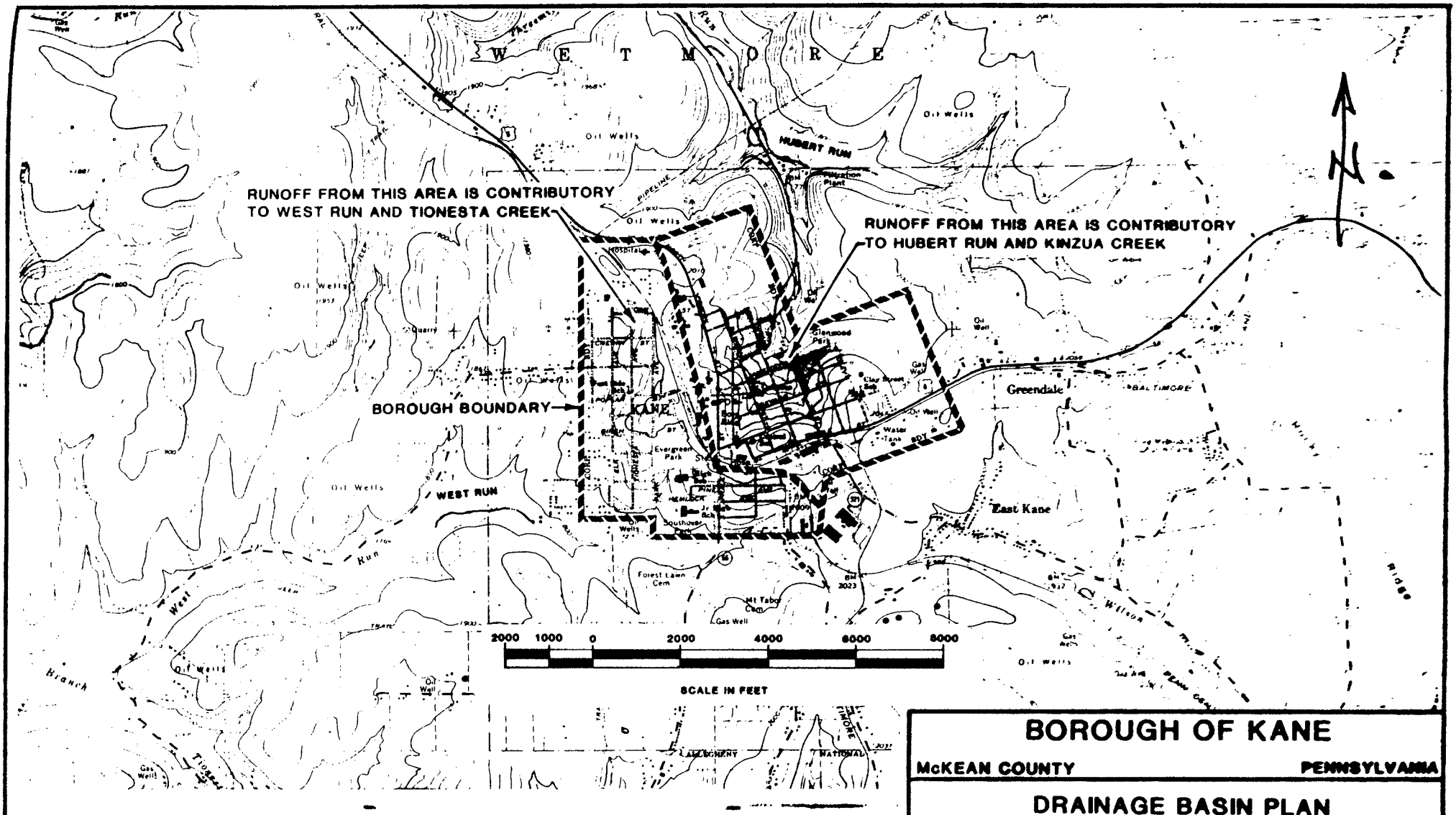
Population projections for the Borough are presented as follows:

TABLE 5

BOROUGH OF KANE POPULATION PROJECTIONS

Year	1978 Comprehensive Plan	PADER
1960	-	5,380
1970	5,001	5,001
1980	4,993 Projected	4,916
1990	5,078 Projected	4,536 Projected
2000	5,175 Projected	4,203 Projected Very Close!
2020	-	3,776 Projected
2030	-	3,635 Projected

Borough population projections are far more optimistic than PADER projections. Modest economic growth being experienced in the area indicates that the Borough's projections are more accurate. The difference between the Borough and PADER population projections is insignificant in terms of changing projected sewage flows. Expansion of the existing WWTPs will be dictated more by the existing flow of the Borough than by flows resulting from modest growth in the Borough and proposed Wetmore Township flows. According to the McKean County Planning Commission, there are no County population projections. Available data is insufficient to determine if growth patterns in recent years have varied significantly from population projections. Data related to available land for development was used to develop projected sewage flow increases within the Borough (see Tables 2 and 3).



BOROUGH OF KANE

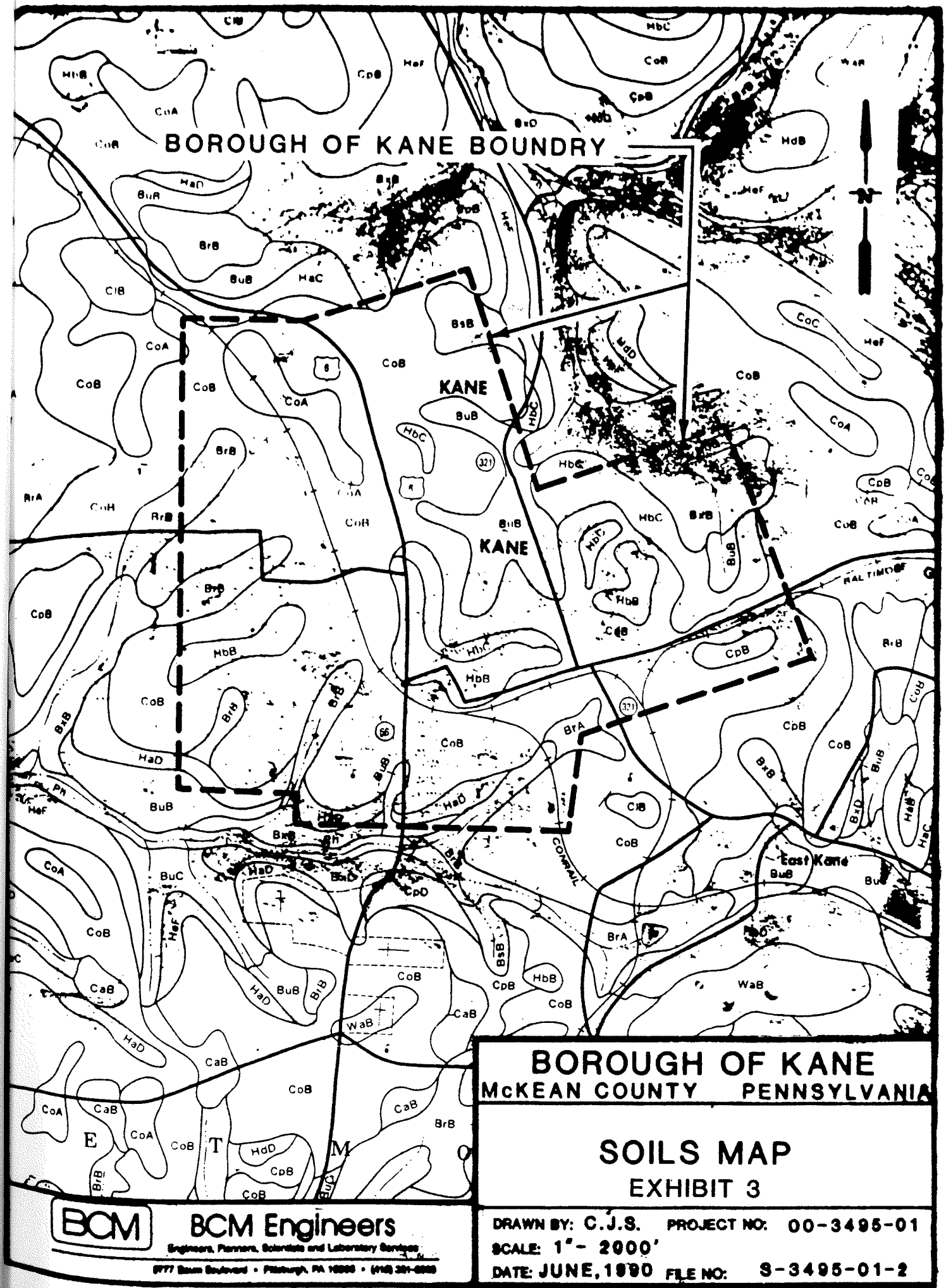
McKEAN COUNTY PENNSYLVANIA

DRAINAGE BASIN PLAN

EXHIBIT 2

BCM Engineers
ENGINEERS, PLANNERS, SCIENTISTS and LABORATORY SERVICES

DRAWN BY: JP PROJECT NO: 00-3495-01
SCALE: AS SHOWN
DATE: JULY 1990 FILE NO: S-3495-01-8


BOROUGH OF KANE BOUNDRY
KANE
KANE
East Kane
CONRAIL
BALTIMORE
BOROUGH OF KANE
McKEAN COUNTY PENNSYLVANIA
SOILS MAP
EXHIBIT 3
BCM Engineers
Engineers, Planners, Scientists and Laboratory Services
DRAWN BY: C.J.S. PROJECT NO: 00-3495-01
SCALE: 1"- 2000'
DATE: JUNE, 1990 FILE NO: S-3495-01-2

BCM

3.0 EVALUATION OF EXISTING WASTEWATER TREATMENT AND CONVEYANCE SYSTEM

3.1 DESCRIPTION OF EXISTING MUNICIPAL SEWAGE FACILITIES

3.1.1 See Plate No. 2 for the locations of the existing Pine Street and Kinzua Road WWTPs, which are owned by the Kane Borough Authority.

3.1.2 Wastewater discharges from the two WWTPs are also shown on Plate No. 2. The Pine Street WWTP discharges to a tributary of West Run, and Kinzua Road WWTP discharges to Hubert Run.

3.1.3 Both discharge locations are eventually tributary to the Allegheny River.

3.1.4 Effluent limits and sample results for the existing facility are attached as Exhibit 4. The Borough has been unable to meet effluent limits for Ammonia, $CBOD_5$, and suspended solids on many occasions. The existing facilities are not capable of continuously meeting effluent limits. Based on discussions with PADER, effluent limits will remain at current levels for both plants if the Kinzua Road WWTP is expanded and upgraded and if the Pine Street WWTP is upgraded or abandoned. More stringent effluent limits are expected if the Pine Street WWTP is expanded (see Exhibit 5).

3.1.5 The Pine Street and Kinzua Road WWTPs are essentially identical. Each facility has one comminutor, one primary clarifier, one rock trickling filter, one secondary clarifier, chlorine contact tank, and one sludge digester. Flow recirculation pumping, grit pumping, sludge pumping, and digester heating facilities are also provided. A schematic drawing of the existing WWTPs is included as Exhibit 6.

3.1.6 The permitted hydraulic capacity for each plant is 0.80 mgd. Continuous flow monitoring data of reported bypasses tributary to the existing WWTPs is unavailable. Large quantities of flow are believed to be bypassed during significant rainfall events. The Kane WWTPs are not technically hydraulically overloaded, but continuous flow monitoring proposed prior to design may reveal a hydraulic overload condition. The Chapter 94 Report projects that both the Pine Street and Kinzua Road WWTPs will be hydraulically overloaded in the planning period.

The permitted organic loading in BOD based on the original design report for each WWTP is 680 lbs/day. According to the 1989 Chapter 94 Report, neither facility is organically overloaded. The Pine Street WWTP is projected to surpass the 680 lbs/day in 1994. The Kinzua Road WWTP is not projected to exceed the 680 lbs/day organic loading in the planning period.

3.1.7 The Chapter 94 Report does not include a schedule for the upgrading or expansion of either the Pine Street or Kinzua Road WWTP facilities. There are no WWTP improvement projects underway.

3.1.8 There is no preallocated wastewater treatment capacity.

3.1.9 The most significant operational problem of both the Pine Street and Kinzua Road WWTP facilities is the lack of any sludge wasting from mid-winter 1989 to the present time.

In May 1985 a tornado caused extensive damage to the Pine Street WWTP. Most damage was limited to structures, and although some treatment capability was interrupted, the mechanical system was not damaged significantly. Tornado damage has been repaired.

Interviewing the Pine Street WWTP operator, Mr. Fred Siggins, resulted in the following list of recommended maintenance items:

- The clarifier drive mechanisms, though functional, have never been rebuilt and may require service.
- The grit removal system, though functional, should be overhauled.
- Trickling filter distributors should be replaced.
- Recirculation pump from the secondary clarifier effluent to the primary clarifier effluent has never been functional due to hydraulic problems.
- Digester floating cover should be inspected.

Interviewing the operator, Mr. David Wedow, for the Kinzua Road WWTP resulted in the following list of maintenance items:

- The clarifier drive mechanisms, though functional, have never been rebuilt and may require service.
- Comminutor should be rebuilt.
- Trickling filter distributors should be replaced.
- Digester floating cover should be inspected.

EXHIBIT 4
PINE STREET TREATMENT PLANT

EFFLUENT LIMITS

Parameter	Monthly Average	Monthly Maximum Average	Monthly Minimum
$CBOD_5$ mg/l (5/1 - 10/31)	20.0	30.0	
$CBOD_5$ mg/l (11/1 - 4/30)	25.0	40.0	
TSS mg/l	30.0	45.0	
NH_3 - N mg/l (5/1 - 10/31)	2.0	3.0	
NH_3 - N mg/l (11/1 - 4/30)	6.0	9.0	
D.O. mg/l			7.0
Fecal Coliform/100 ml (5/1 - 9/30)	200.0		
Fecal Coliform/100 ml (10/1 - 4/30)	2150.0		
pH Standard Units	9.0		6.0

SAMPLE RESULTS

	$CBOD_5$ mg/l (5/1 - 10/31)		$CBOD_5$ mg/l (11/1 - 4/30)		TSS mg/l		NH_3 - N mg/l (5/1 - 10/31)		NH_3 - N mg/l (11/1 - 4/30)	
	Monthly Average	Maximum	Monthly Average	Maximum	Monthly Average	Maximum	Monthly Average	Maximum	Monthly Average	Maximum
A	N/A	N/A	11.4	17.5	10.5	14	N/A	N/A	6.7	10.8
M	9.4	11.3	N/A	N/A	15.2	20	3.2	5.2	N/A	N/A
J	7.8	10.8	N/A	N/A	22.5	29	1.6	2.6	N/A	N/A
J	13.5	21.0	N/A	N/A	33.8	44	5.2	6.7	N/A	N/A
A	16.7	22.2	N/A	N/A	40.8	56	7.5	10.4	N/A	N/A
S	16.9	24.0	N/A	N/A	36.5	48	4.7	6.8	N/A	N/A
O	34.6	102.0	N/A	N/A	37.6	46	7.1	11.8	N/A	N/A
N	N/A	N/A	41.7	51	39.5	76	N/A	N/A	4.6	5.2
D	N/A	N/A	43.1	88.5	38.5	62	N/A	N/A	11.8	18.0
J	N/A	N/A	16.9	28.0	18.8	36	N/A	N/A	4.6	7.0
F	N/A	N/A	17.0							
M	N/A	N/A	25							
TOTAL	98.9	191.3								
AVERAGE	16.48	31.9								

	D.O.	
J	6.	
N		
D		
J		
F		
M		
TOTAL	76.6	
AVERAGE	6.38	

EXHIBIT 4 (Continued)
KINZUA ROAD TREATMENT PLANT

EFFLUENT LIMITS

Parameter	Monthly Average	Monthly Maximum Average	Monthly Minimum
$CBOD_5$ mg/l	25.0	40.0	
TSS mg/l	30.0	45.0	
NH_3 - N mg/l (5/1 - 10/31)	3.0	4.5	
NH_3 - N mg/l (11/1 - 4/30)	9.0	14.0	
D.O. mg/l			6.0
pH Standard Units		9.0	6.0
Fecal Coliform/100 ml (5/1 - 9/30)	200.0		
Fecal Coliform/100 ml (10/1 - 4/30)	2500.0		

SAMPLE RESULTS

$CBOD_5$ mg/l		TSS mg/l		NH_3 - N mg/l (5/1 - 10/31)		NH_3 - N mg/l (11/1 - 4/30)	
Monthly Average	Maximum	Monthly Average	Maximum	Monthly Average	Maximum	Monthly Average	Maximum
9.5	11.2	14.5	24	N/A	N/A	4.4	7.6
9.5	14.0	20.7	38	2.0	3.4	N/A	N/A
8.2	9.4	30.5	38	1.6	2.5	N/A	N/A
12.8	23.0	46.8	74	2.6	3.0	N/A	N/A
12.8	16.0	36.4	44	4.2	5.6	N/A	N/A
14.0	16.0	55.5	68	4.4	5.2	N/A	N/A
17.7	28.0	54.4	78	4.0	4.8	N/A	N/A
47.2	73.0	93.5	104	N/A	N/A	4.9	7.4
50.1	71.5	47.5	66	N/A	N/A	16.7	24.0
26.4	46.0	51.5	102	N/A	N/A	7.0	12.0
23.9	30.3	39.6	56	N/A	N/A	5.3	7.4
34.0	43.7	56.5	92	N/A	N/A	9.7	11.6
AL 266.10	382.10	547.40	784	18.8	24.5	48	70
ERAGE 22.2	31.84	45.62	65.33	3.13	4.08	8	11.67

D.O. mg/l	Fecal Coliform/100 ml (5/1 - 9/30)	Fecal Coliform/100 ml (10/1 - 4/30)	pH Standard Units	
Monthly Minimum	Monthly Average	Monthly Average	Monthly Minimum	Maximum
6.3	N/A	52	6.6	7.4
6.2	94	N/A	6.4	7.1
7.4	20	N/A	6.3	7.1

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
1012 Water Street
Meadville, Pennsylvania 16335
Telephone: A. C. 814/332-6942

May 22, 1990

Subject: Kane Borough, McKean County
537 Update-Preliminary Limits

John F. Riley, P.E.
Project Engineer
BCM Engineers
5777 Baum Boulevard
Pittsburgh, PA 15206

Dear Mr. Riley:

We have evaluated the treatment options you requested during our May 7, 1990 meeting. Assuming flow equalization would be provided, the following limits would be necessary:

Kinzua Road (1.5 MGD, 2.2 MGD and 3 MGD)

Parameter	Monthly Average	Weekly Average	Instantaneous Maximum
$CBOD_5$	25	40	50
TSS	30	45	60
NH_3-N (5/1-10/31)	2	3	4
NH_3-N (11/1-4/30)	6	9	12
DO	Minimum 6 mg/l at all times.		
pH	Minimum 6.0; Maximum 9.0		
Fecal Coliform			
(5/1-9/30)	200/100 ml as a geometric average.		
(10/1-4/30)	2,200/100 ml as a geometric average. (1.5 MGD)		
	2,100/100 ml as a geometric average. (2.2 MGD)		
	2,100/100 ml as a geometric average. (3 MGD)		

Pine Street (1.5 MGD)

Parameter	Monthly Average	Weekly Average	Instantaneous Maximum
$CBOD_5$ (5/1-10/31)	10	15	20
(11/1-4/30)	20	30	40
TSS	30	45	60
NH_3-N (5/1-10/31)	2	3	4
NH_3-N (11/1-4/30)	6	9	12
DO	Minimum 7 mg/l at all times.		
Phosphorus (4/1-10/31)	2	3	4
NO_2-NO_3	10	15	20
pH	Minimum 6.0; Maximum 9.0		
Fecal Coliform			
(5/1-9/30)	200/100 ml as a geometric average.		
(10/1-4/30)	2,200/100 ml as a geometric average.		

The Pine Street plant discharges to West Run. This stream is part of the East Branch Tionesta Creek watershed, which is classified as a High Quality - Cold Water Fishery. High Quality waters are to be protected as they exist. The water quality can only be lowered if the discharge is a result of necessary social or economic development which is of signficant public value. This proposal would require submission of a Social and Economic Justification (SEJ) statement. Part of this statement would have to prove land disposal alternatives (i.e., spray irrigation, overland flow cluster, on-lot system, etc.) are not economically feasible or environmentally sound. SEJ approval by the Department would be needed prior to allowing an increased discharge to this watershed.

Effluent limits for the 0.8 MGD flow option would be the same as the ones contained in the Pine Street plants' current permit.

I have also attached the applicable COWAMP Report pages pertaining to Kane Borough and Wetmore Township. If you need anything else or have additional questions, feel free to call me.

Sincerely,

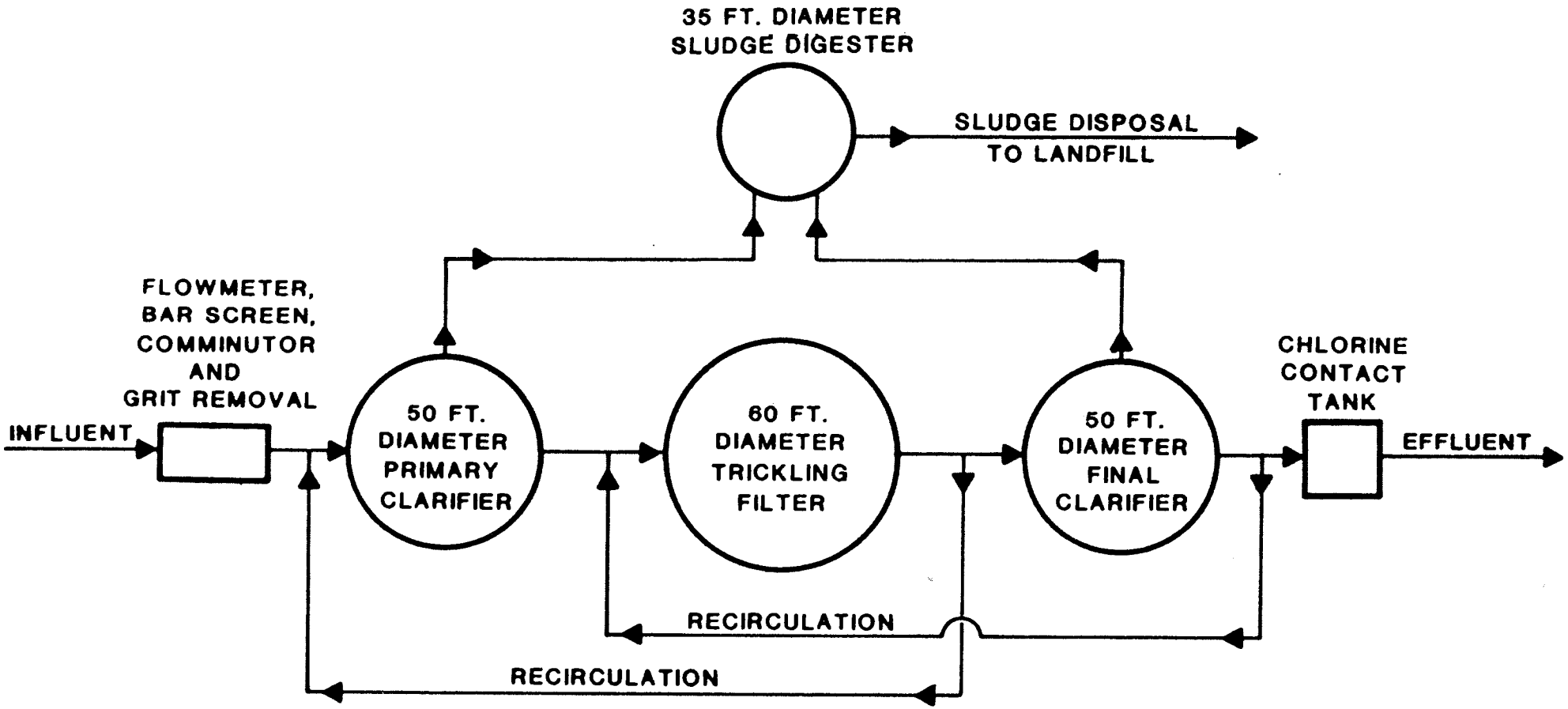
Robert P. Hutchinson

Robert P. Hutchinson
Sanitary Engineer
Bureau of Water Quality Management

RPH/jb

Attachment

cc: Ms. Laura J. Andrusis



BOROUGH OF KANE

McKEAN COUNTY PENNSYLVANIA

EXISTING WASTEWATER TREATMENT PLANT
FLOW SCHEMATIC

EXHIBIT 6

JUN 28 1990

BCM Engineers
ENGINEERS, PLANNERS, SCIENTISTS
and LABORATORY SERVICES

DRAWN BY: JP PROJECT NO: 00-3495-01
SCALE: NONE
DATE: JUNE 1990 FILE NO: S-3495-01-3

BCM

3.2 SEWAGE COLLECTION AND TRANSMISSION SYSTEM

3.2.1 All sewer collection and interceptor sewerlines are owned by the Borough. Line locations are shown on Plate No. 2. There are no wastewater pumping facilities.

3.2.2 There are no known permitted capacities on the sewage collection system. Borough personnel have reported a sewage backup during heavy rainfalls in an area tributary to the Pine Street WWTP near the intersection of Elk and Cherry Streets. It is believed that there is insufficient hydraulic capacity in the 10-inch sewer on Cherry Street between Elk and Smithfield and the 12-inch sewer on Smithfield between Cherry and Maple to carry all tributary flows.

3.2.3 The Chapter 94 Report addresses the efforts currently underway to identify significant sources of infiltration/inflow and the Borough's general plan to institute a multi-year flow reduction plan.

3.2.4 There are no known allocations of sewage conveyance capacity for future use.

3.2.5 Sewage collection system operation and maintenance is the responsibility of the Borough Street Department. Moderately steep pipeline gradients exist over the sewage system serving to minimize the plugging or stopping of collector sewers. The Borough's ongoing preventive maintenance program involves water flushing of certain areas of the sewer system every three weeks. In addition, certain areas receive regular visual inspections at manholes and the addition of chemicals to aid in control of grease and other potential blockages. Where a partial or complete blockage occurs that cannot be cleared by flushing or chemical addition, power rodding is performed.

3.3 EXISTING ONLOT SYSTEMS

3.3.1 There are believed to be only six existing individual onlot systems within the Borough. Because soil conditions in the Borough are not suitable for the use of onlot disposal systems, no additional onlot systems will be allowed and all existing onlot systems will be abandoned within the planning period. Homes or businesses with existing onlot systems will be required to connect to the existing collection system. The locations of the existing onlot systems are shown on Plate No. 1.

In 1985, Mr. John Wester was called to investigate a malfunctioning septic tank at 400 Birch Street. Sewage was being discharged to the lawn surface of 402 Birch Street. Soils were not suitable to allow onsite disposal of septic tank effluent. No modification of the existing onlot system was recommended. A pipeline was installed to relocate the discharge point to a wooded area nearby in accordance with Mr. Wester's recommendation.

3.3.2 There are no existing community onlot systems, and no future systems of this type will be allowed.

3.3.3 There are no known existing sewage holding tanks in the Borough.

3.4 WILDCAT SEWERS OR BOREHOLE DISPOSAL OF SEWAGE

There are no known wildcat sewers or borehole disposal of sewage in the Borough according to the Sewage Enforcement Officer, Mr. John Wester.

3.5 SLUDGE GENERATION, TRANSPORT, AND DISPOSAL

3.5.1 The sources of wastewater sludge are the Pine Street and Kinzua Road WWTPs and the existing onlot disposal septic tanks. All of these facilities are shown on Plate No. 2.

3.5.2 Liquid sludge disposal records for the Pine Street and Kinzua Road WWTPs are presented as follows:

TABLE 6

LIQUID SLUDGE DISPOSAL

Year	Liquid Sludge (Gallons)
1985	144,000
1986	-
1987	210,000
1988	150,000
1989	99,000

Actual percentage of solids was unavailable, but we estimate 1 to 2 percent solids. We have been informed by the treatment plant operators that adequate sludge wasting has not been accomplished for several years.

3.5.3 There are currently no permitted sludge disposal methods. The Borough has applied for, but has not yet received, permits for landfill disposal of dewatered sludge.

Sludge will be dewatered by belt filter press equipment and hauled by truck for landfill disposal. The Borough is currently making arrangements for sludge dewatering and transporting services by an independent company or by a nearby municipality.

3.5.4 The Borough is currently entering into an arrangement which will utilize an independent company or a nearby municipal system for transporting all sewage sludge.

3.5.5 The choice of a sludge disposal site is uncertain at this time.

3.5.6 The choice of a sludge disposal site is uncertain at this time. The Borough is responsible for arranging an environmentally acceptable method of disposing sewage sludge.

BCM

4.0 EVALUATION OF WASTEWATER NEEDS

4.1 AREAS DEPENDENT UPON SUBSURFACE SEWAGE DISPOSAL

4.1.1 There are six onlot sewage disposal systems in the Borough which rely on subsurface disposal. These account for an estimated 1,800 gpd of sewage. There are approximately 280 existing homes in Wetmore Township which may be connected to the Kane sewerage system. These homes may contribute an estimated 124,000 gpd of sewage. Some of these are existing onlot systems.

4.1.2 All soil types listed in the Borough of Kane are severely restricted for subsurface sewage disposal use. Both West Run, a tributary of Tionesta Creek, and Hubert Run, a tributary of Kinzua Creek, could be adversely affected by continued use of subsurface disposal methods in the area.

4.1.3 Sewage collection lines are available within a reasonable distance to all existing subsurface sewage disposal systems (onlot) within the Borough.

4.2 MALFUNCTIONING ONLOT SYSTEMS

4.2.1 The septic tank serving 400 Birch Street is known to discharge water to the surface in an area tributary to West Run. According to Mr. John Wester, Sewage Enforcement Officer, this is the only system known to be malfunctioning.

4.2.2 There are no onlot systems known to discharge directly to a stream.

4.2.3 The presence of soils in the Borough with poor filtering qualities indicates that raw or partially treated sewage may be entering the groundwater.

4.2.4 There are no systems documented as contributing to public health-associated problems or waterborne disease outbreaks.

4.3 SOIL CONDITIONS CAUSING MALFUNCTIONING ONLOT SYSTEMS

The septic tank at 400 Birch Street was malfunctioning because of unsuitable soils. Soils in the Borough are generally not suitable for onlot disposal.

4.4 MALFUNCTIONING ONLOT SYSTEMS WITH SUITABLE SOILS

There are no known septic tanks malfunctioning in areas suitable for onlot sewage systems.

4.5 IDENTIFY ILLEGAL SEWAGE DISPOSAL SYSTEMS

4.5.1 According to Mr. Wester, there are no known wildcat sewers.

4.5.2 There are no known borehole sewage disposal systems according to Mr. Wester.

4.5.3 The septic tank at 400 Birch Street is malfunctioning. Soil conditions prevent correcting the problem by modifying the onlot system. The onlot system malfunctions by allowing partially treated sewage to come to the ground surface. This surface discharge has been directed to a wooded area near the property.

4.6 FEDERAL CONSTRUCTION GRANTS PROGRAM NEEDS ANALYSIS

No work was completed to establish sewage needs under the Federal Construction Grants Program.

4.7 INSTITUTIONAL EFFECT ON SEWAGE NEEDS AREAS

The management structure of the Borough is not causing sewage problems. The new Borough policy requires that all new and existing sewer service lines be connected to the sewer collection system tributary to the WWTPs. Existing onlot sewage disposal systems will be systematically abandoned.

5.0 PLANNING AND FACILITIES ALTERNATIVES, TREATMENT FACILITIES, AND RECOMMENDATIONS

5.1 IDENTIFY AND ANALYZE ALTERNATIVES

5.1.1 Alternatives, Collection, Conveyance, and Treatment

(i) The service area will include the Borough of Kane and portions of Wetmore Township identified in their Act 537 Plan for proper conveyance and treatment by the Kane sewerage system.

(ii) The Borough is willing to construct treatment facilities with reserve capacity to accommodate projected flows from Wetmore Township.

(iii) The only non-municipal treatment facilities within the Borough are six onlot sewage disposal systems. Soil conditions are not suitable for the use of onlot systems within the Borough. These onlot systems will be abandoned and connected to the public sewer system. No future onlot systems will be allowed within the Borough limits.

(iv) The Borough will provide sewer collection lines within a reasonable distance of each existing onlot system to receive their flows. Treatment capacity will be provided for flows from existing onlot systems, growth areas within the Borough, and projected sewage flows from Wetmore Township.

BCM

(v) & (vi) Treatment System Upgrade/Expansion

The Borough will evaluate four major wastewater treatment and alternatives; these are described as follows:

Alternative 1

Expand and upgrade the Pine Street and Kinzua Road wastewater treatment facilities to treat tributary sewage flows. The Pine Street WWTP design flow is 1.4 mgd and has a peak flow of 6 mgd. The Kinzua Road design flow is 1.4 mgd and has a peak flow of 3.5 mgd. Diluted peak flows in excess of this amount will be bypassed to Hubert Run. No peak flows will be bypassed by the Pine Street plant to the tributary of West Run.

Alternative 2

Construct a pump station at the Pine Street WWTP with a capacity of 6 mgd. Install 6,800 LF of 18-inch force main and 4,400 LF of 18-inch interceptor sewer to convey sewage flows tributary to the Pine Street WWTP for treatment at an expanded Kinzua Road WWTP. Kinzua Road WWTP design flow is 2.8 mgd and has a peak flow of 7.0 mgd. Diluted peak flows in excess of 7.0 mgd will be bypassed to Hubert Run. The Pine Street WWTP would be abandoned.

Alternative 3

Upgrade the Pine Street WWTP to adequately treat the current permit design flow of 0.8 mgd and peak flow of 1.5 mgd. Construct a pump station at the Pine Street site to pump peak flows in excess of 1.5 mgd to the Kinzua Road WWTP for treatment. Install 6,800 LF of 16-inch force main and 4,400 LF of 15-inch interceptor sewer to convey peak flows to the Kinzua Road WWTP. Upgrade and expand the Kinzua Road WWTP to a design flow of 2.0 mgd and peak flow of 5.0 mgd. Infrequent diluted peak flows in excess of 5.0 mgd would be bypassed to Hubert Run.

Alternative 4

Replace the Kinzua Road WWTP with a new facility adjacent to Glenwood Park. Low head pumping would be required to transport all sewage flow from the existing 24-inch interceptor sewer to the proposed treatment facility. All new facilities would be required. The effluent discharge point would be near the existing Kinzua Road plant downstream of the Pennsylvania American Water Co. water treatment plant raw water reservoir. The existing Kinzua Road WWTP is located just downstream from the water treatment plant.

The existing sewage interceptor could be utilized as an outfall sewer. Diluted peak flows would be bypassed through this outfall discharging downstream of the water treatment plant. This option may be utilized if sufficient land is not available at the Kinzua Road WWTP site.

Glenwood Park WWTP design flow is 2.8 mgd and has a peak flow of 7.0 mgd. Infrequent diluted peak flows in excess of 7.0 mgd will be bypassed to Hubert Run near the existing Kinzua Road WWTP site.

General Wastewater Treatment Design Considerations

The Pine Street and Kinzua Road WWTPs are presently unable to consistently remove $CBOD_5$, suspended solids, and ammonia nitrogen to the permit effluent limits in effect. The existing Pine Street and Kinzua Road facilities are nearly identical. Each contains a bar screen, grit removal, one primary clarifier, one rock media trickling filter, one secondary clarifier, chlorine contact tank, and one sludge digester. (See Exhibit 5.) Some units may require covers due to extended periods of sub-zero temperatures experienced in the area and past experience of units freezing. Significant infiltration/inflow may also contribute to depressed sewage flow temperatures. Ambient air and sewage temperatures are an important consideration during WWTP design. Alternatives 1, 2, and 3 will utilize the existing operation buildings, laboratory, and digester of the WWTPs being utilized. (See Plate No. 2 for proposed force main location.) Phosphorus removal will be required only for an expanded Pine Street WWTP.

Alternative 1--Pine Street WWTP will require phosphorus removal. Chemical addition (aluminum sulfate or alum) and chemical mixing will be provided before flow enters the secondary clarifiers. The secondary clarifiers should be equipped with flocculation capability to assure proper floc formation and adequate phosphorus removal.

One sludge digester will be added to the expanded Kinzua Road WWTP, Alternative 2 only. Sludge handling and disposal will be discussed later in this report.

Several treatment methods were considered for use. Two options will be evaluated in detail.

Option A

Expand the treatment facilities in parallel. Modify the existing trickling filters and increase their height. Replace rock media with plastic media, approximately 20 feet high to become bio-towers. Add parallel primary and secondary clarifiers. Replace preliminary treatment, bar screen, and grit removal. Replace chlorine contact tank. Chemical addition will be required.

The general description of the plastic media bio-tower is as follows:

The process consists of a fixed bed of plastic media over which wastewater is applied for aerobic biological treatment. Zooglea slimes form on the media which assimilate and oxidize the wastewater. The bed is dosed by a distributor system, and the treated wastewater is collected by an underdrain system.

The rotary distributor has become the standard because of its reliability and ease of maintenance. Plastic media is comparatively light with a specific weight 10 to 30 times less than rock media. Its high void space (approximately 95 percent) promotes better oxygen transfer during passage through the filter than rock media with its approximate 50 percent void space. Because of its light weight, plastic media containment structures are normally constructed as elevated towers 20 to 30 feet high. Existing rock media containment structures can sometimes serve as a foundation for elevated towers converting an existing facility to plastic media.

The organic material present in the wastewater is degraded by a population of microorganisms attached to the filter media. As the microorganisms grow, the thickness of the slime layer increases. Periodically, the slime layer washes off the media and a new slime layer starts to grow. This phenomenon of losing the slime layer is called sloughing and is primarily a function of the organic and hydraulic loadings on the filter. Filter effluent recirculation is vital with plastic media trickling filters to ensure proper wetting of the media and to promote effective sloughing control compatible with the high organic loadings. This process is radically affected by temperature. Particular attention must be taken during design to account for decreased ammonia nitrogen removal during low temperatures.

Option B

Expand and upgrade the treatment facilities utilizing Sequential Batch Reactors (SBR). Replace preliminary treatment, install fine bar screen, grit removal, and comminutor.

Following the preliminary treatment, flow would enter one of two parallel SBRs for biological activated sludge treatment. Flow discharge decanted from the SBRs would flow directly to the new chlorine contact tank for disinfection and discharge. Waste sludge from the SBR will flow to an integral sludge thickening tank. The sludge digester will be modified for aerobic sludge digestion.

Phosphorus removal at the Pine Street WWTP (Alternative 1) will require provisions for chemical addition, mixing, flocculation, and final clarification following the SBR. Waste sludge from the flocculating clarifiers will flow to the SBR sludge thickening tank area.

BCM

A general description of the SBR process is as follows:

A SBR is a form of the activated sludge treatment process. A SBR facility typically consists of parallel reactor tanks, with aeration/mixing systems, decanters, and sludge withdrawal systems. The SBR treatment process occurs in a five-stage cycle in a reactor tank. The five stages are Fill, React, Settle, Draw, and Idle. During the "Fill" stage, wastewater fills the tanks and mixes with the mixed liquor suspended solids during the last cycle. The tank is typically mixed during the fill stage, and as an option, can be aerated. Organic and nitrogenous oxidation occur primarily during the "React" stage under aerated conditions. Aeration and mixing are stopped during the "Settle" stage to allow solids to settle. Effluent is decanted from the tank during the "Draw" stage followed by periodic solids withdrawal from the bottom of the tank during the "Idle" stage. This stage accounts for the time in which one reactor has finished its cycle and the other reactor(s) has not finished filling.

The following tables and exhibits provide more detailed information of the development of major alternatives and Options A and B:

Description	Cost Analysis Table Number	Preliminary Layout Exhibit Number
Alternative No. 1, Option A--Pine Street	7	7
Alternative No. 1, Option B--Pine Street	8	8
Alternative No. 1, Option A--Kinzua Road	9	9
Alternative No. 1, Option B--Kinzua Road	10	10
Alternative No. 2, Options A & B--Pine Street	11	11
Alternative No. 2, Option A--Kinzua Road	12	12
Alternative No. 2, Option B--Kinzua Road	13	13
Alternative No. 3, Option A--Pine Street	14	14
Alternative No. 3, Option B--Pine Street	15	15
Alternative No. 3, Option A--Kinzua Road	16	16
Alternative No. 3, Option B--Kinzua Road	17	17
Alternative No. 4, Option B--Pine Street	18	11
Alternative No. 4, Option B--Glenwood	19	**
Cost Summary	20	
Present Worth Analysis	21	
Projected User Fees	22	

*These costs were taken from the "EPA Innovative and Alternative Technology Assessment Manual Publication CD-53" fact sheet cost curves, and were adjusted to an anticipated ENR index of 5,000 at time of bidding. The O & M costs taken from the fact sheet curves were adjusted based on our engineering experience to 80 percent of the value shown on the curve and to the ENR index of 5,000.

**The flow schematic for the Glenwood Park WWTP site will be similar to Exhibit 13.

BCM

TABLE 7

ALTERNATIVE 1
OPTION A
PINE STREET WWTP

COST ANALYSIS

Stage	Construction Costs	O & M Costs
Unit Costs		
1. Preliminary Treatment 2.4 mgd (Construction) 1.4 mgd (O & M)	$ 161,600*	$ 16,600*
2. Primary Clarifiers Rehabilitate Existing Unit and Build 60' Diameter Tank 1.4 mgd (O & M)	197,700	13,000*
3. Bio-Towers Modify Existing Tank and Build One New Unit--1.4 mgd	690,000*	10,000
4. Final Clarifiers Build Two 70' Diameter Tanks--1.4 mgd 1.4 mgd (O & M)	506,100	13,000*
5. Chlorination--1.4 mgd	121,200	25,900*
6. Anaerobic Digester--1.4 mgd	-	21,100*
Subtotal	$1,676,600	$ 99,600
Noncomponent Costs		
1. Site Pumping and Junction Boxes (15%)	$ 251,500	$ -
2. Electrical (10%)	167,700	-
Subtotal	$ 419,200	$ -

TABLE 7 (CONTINUED)

ALTERNATIVE 1
OPTION A
PINE STREET WWTP

COST ANALYSIS

Stage	Construction Costs	O & M Costs
Sludge Disposal		
1. Landfill	$ -	$ 25,000
2. Sludge Tank Truck	50,000	4,000
Subtotal	$ 50,000	$ 29,000
Demolition		
1. 50' Diameter Final Clarifiers	$ 10,000	$ -
2. Preliminary Treatment Building	10,000	-
3. Chlorine Contact Tank	5,000	-
Subtotal	$ 25,000	$ -
Total Costs	$2,170,800	$128,600
Administrative, Engineering & Legal (20%)	434,200	-
Construction Contingencies (10%)	217,100	-
TOTAL PROJECT COSTS	$2,822,100	$128,600

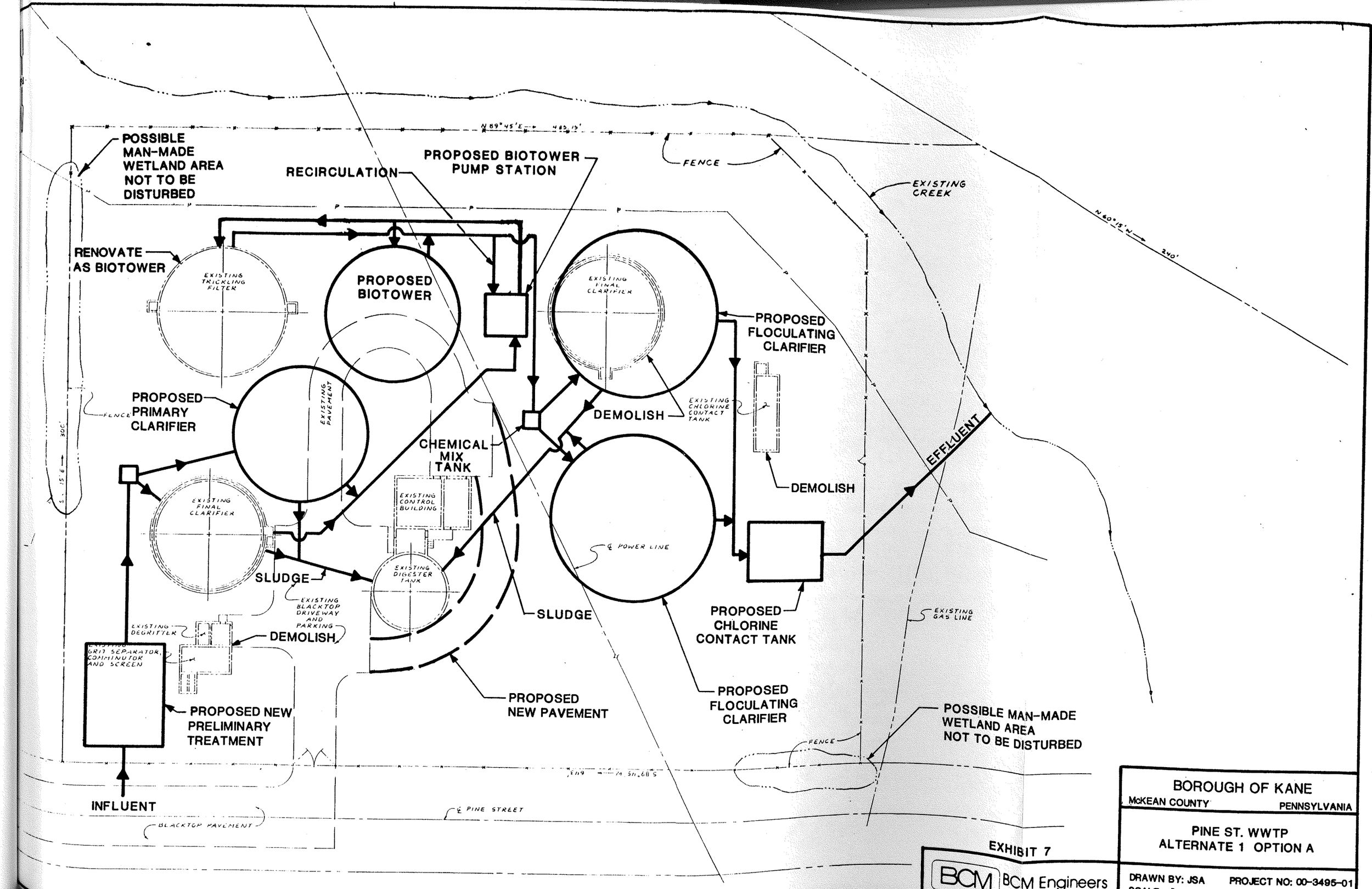


EXHIBIT 7

BCM Engineers
ENGINEERS, PLANNERS, SCIENTISTS and LABORATORY SERVICES

BOROUGH OF KANE
McKEAN COUNTY PENNSYLVANIA

PINE ST. WWTP
ALTERNATE 1 OPTION A

DRAWN BY: JSA PROJECT NO: 00-3495-01
SCALE: 1"= 40'
DATE: JULY 1999

BCM

TABLE 8

ALTERNATIVE 1
OPTION B
PINE STREET WWTP

COST ANALYSIS

Stage	Construction Costs	O & M Costs
Unit Costs		
1. Preliminary Treatment 2.4 mgd (Construction) 1.4 mgd (O & M)	$ 161,600*	$ 16,600*
2. SBR Tank	612,000	36,500
3. Flocculating Clarifiers Two 70' Diameter Tanks 1.4 mgd (O & M)	506,100	13,000*
4. Chlorination 2.8 mgd (Construction) 1.4 mgd (O & M)	181,800*	25,900*
5. Modify Digester 1.4 mgd (O & M)	20,000	21,000*
Subtotal	$1,481,500	$113,000
Noncomponent Costs		
1. Site Pumping and Junction Boxes (15%)	$ 222,200	$ -
2. Electrical (10%)	148,200	-
Subtotal	$ 370,400	$ -
Sludge Disposal		
1. Landfill	$ -	$ 25,000
2. Sludge Tank Truck	50,000	4,000
Subtotal	$ 50,000	$ 29,000

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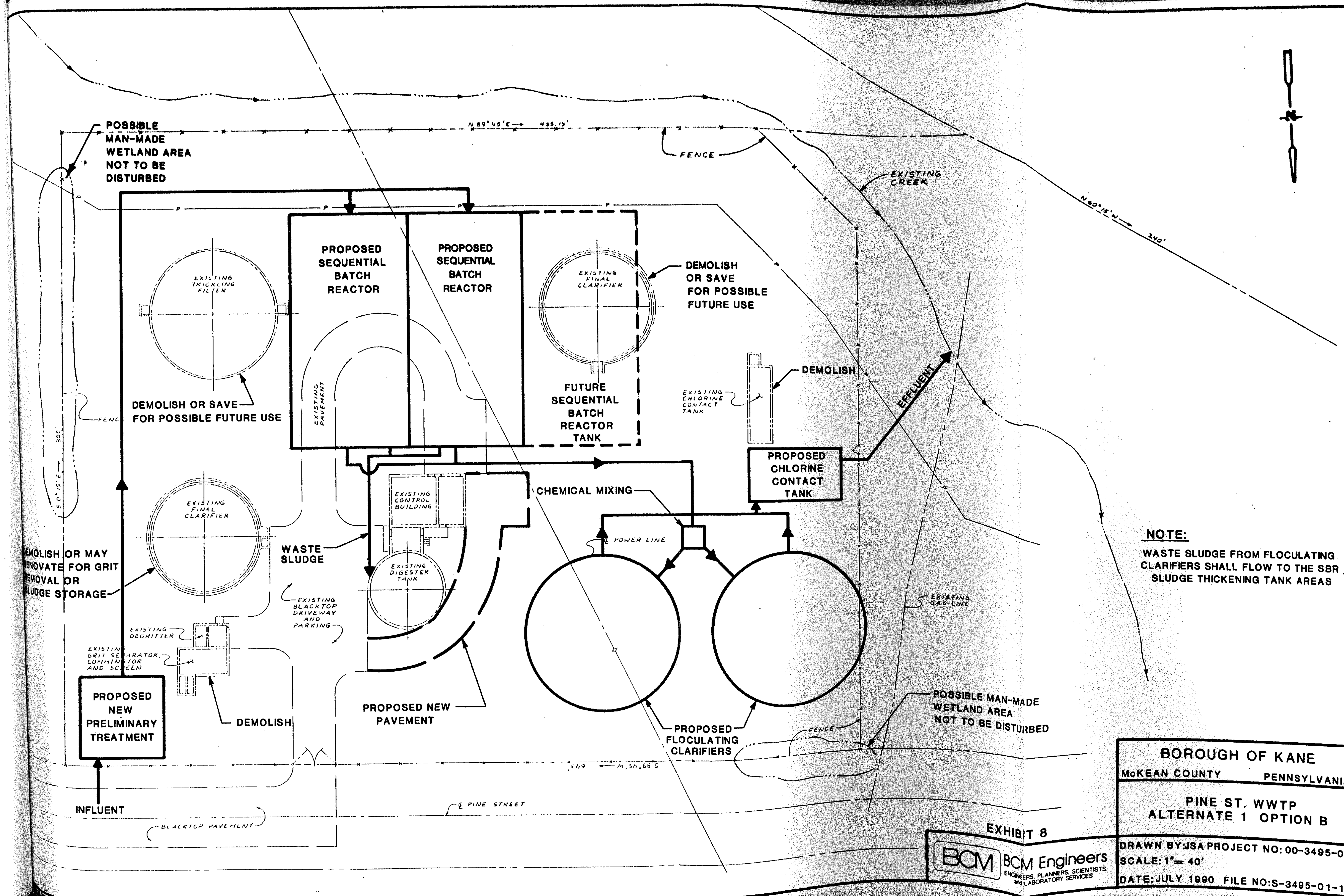
TABLE 8 (CONTINUED)

ALTERNATIVE 1
OPTION B
PINE STREET WWTP

COST ANALYSIS

Stage	Construction Costs	O & M Costs
Demolition		
1. Primary Tank	$ 10,000	$ -
2. Trickling Filter	15,000	-
3. Final Clarifier	10,000	-
4. Chlorine Contact Tank	5,000	-
5. Preliminary Treatment Building	10,000	-
Subtotal	$ 50,000	$ -
Total Costs	$1,951,900	$142,000
Administrative, Engineering & Legal (20%)	390,400	-
Construction Contingencies (10%)	195,200	-
TOTAL PROJECT COSTS	$2,537,500	$142,000


POSSIBLE MAN-MADE WETLAND AREA NOT TO BE DISTURBED
N 89° 45' E — 435.15'
FENCE
EXISTING CREEK
N 60° 15' W — 240'
PROPOSED SEQUENTIAL BATCH REACTOR
PROPOSED SEQUENTIAL BATCH REACTOR
EXISTING TRICKLING FILTER
EXISTING FINAL CLARIFIER
DEMOLISH OR SAVE FOR POSSIBLE FUTURE USE
EXISTING PAVEMENT
FUTURE SEQUENTIAL BATCH REACTOR TANK
DEMOLISH
EXISTING CHLORINE CONTACT TANK
EFFLUENT
DEMOLISH OR SAVE FOR POSSIBLE FUTURE USE
PROPOSED CHLORINE CONTACT TANK
CHEMICAL MIXING
EXISTING CONTROL BUILDING
EXISTING FINAL CLARIFIER
POWER LINE
NOTE:
WASTE SLUDGE FROM FLOCULATING CLARIFIERS SHALL FLOW TO THE SBR SLUDGE THICKENING TANK AREAS
DEMOLISH OR MAY RENOVATE FOR GRIT REMOVAL OR SLUDGE STORAGE
WASTE SLUDGE
EXISTING DIGESTER TANK
EXISTING BLACKTOP DRIVEWAY AND PARKING
EXISTING GAS LINE
EXISTING DEGRITTER
EXISTING GRIT SEPARATOR, COMMINUTOR AND SCREEN
PROPOSED NEW PRELIMINARY TREATMENT
DEMOLISH
PROPOSED NEW PAVEMENT
PROPOSED FLOCULATING CLARIFIERS
POSSIBLE MAN-MADE WETLAND AREA NOT TO BE DISTURBED
FENCE
S 0° 15' E — 300'
INFLUENT
℄ PINE STREET
BLACKTOP PAVEMENT
EXHIBIT 8
BCM Engineers
ENGINEERS, PLANNERS, SCIENTISTS and LABORATORY SERVICES
BOROUGH OF KANE
McKEAN COUNTY PENNSYLVANIA
PINE ST. WWTP
ALTERNATE 1 OPTION B
DRAWN BY: JSA PROJECT NO: 00-3495-01
SCALE: 1" = 40'
DATE: JULY 1990 FILE NO: S-3495-01-10

BCM

TABLE 9

ALTERNATIVE 1
OPTION A
KINZUA ROAD WWTP

COST ANALYSIS

Stage	Construction Costs	O & M Costs
Unit Costs		
1. Preliminary Treatment--1.4 mgd	$ 120,000*	$ 16,600*
2. Primary Clarifiers Rehabilitate Existing Unit and Build 50' Diameter Tank 1.4 mgd (O & M)	168,500	13,000*
3. Bio-Towers--1.4 mgd	690,000*	10,000
4. Final Clarifiers--Build 60' Diameter Tank 1.4 mgd (O & M)	197,700	13,000*
5. Chlorination--1.4 mgd	121,200*	25,900*
6. Anaerobic Digester 1.4 mgd (O & M)	-	21,100*
7. Belt Filter Press	318,000	10,000
Subtotal	$1,615,400	$109,600
Noncomponent Costs		
1. Site Pumping and Junction Boxes (15%)	$ 242,300	$ -
2. Electrical (10%)	161,500	-
Subtotal	$ 403,800	$ -

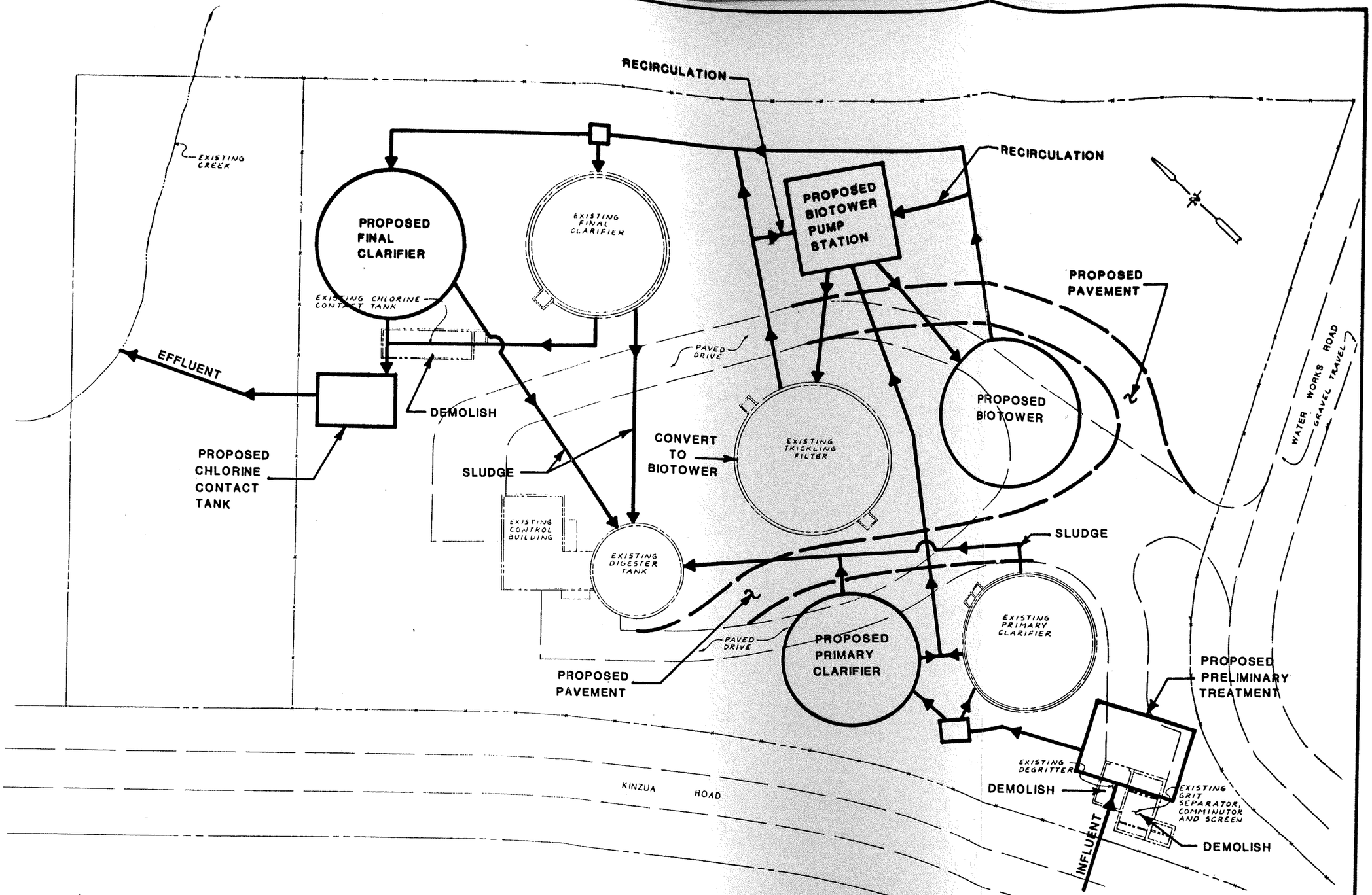
BCM

TABLE 9 (CONTINUED)

ALTERNATIVE 1
OPTION A
KINZUA ROAD WWTP

COST ANALYSIS

Stage	Construction Costs	O & M Costs
Sludge Disposal		
1. Landfill	$ -	$ 25,000
Subtotal	$ -	$ 25,000
Demolition		
1. Preliminary Treatment Building	$ 10,000	-
2. Chlorine Contact Tank	5,000	-
Subtotal	$ 15,000	$ -
Total Costs	$2,034,200	$134,600
Administrative, Engineering & Legal (20%)	406,800	-
Construction Contingencies (10%)	203,400	-
TOTAL PROJECT COSTS	$2,644,400	$134,600



BOROUGH OF KANE

McKEAN COUNTY PENNSYLVANIA

KINZUA ROAD WWTP
ALTERNATE 1 OPTION A

EXHIBIT 9

BCM Engineers
ENGINEERS, PLANNERS, SCIENTISTS and LABORATORY SERVICES

DRAWN BY: C.J.S. PROJECT No.: 00-3495-01
SCALE: 1"= 40'
DATE: JULY, 1990 FILE No.: S-3495-01-11

BCM

TABLE 10

ALTERNATIVE 1
OPTION B
KINZUA ROAD WWTP

COST ANALYSIS

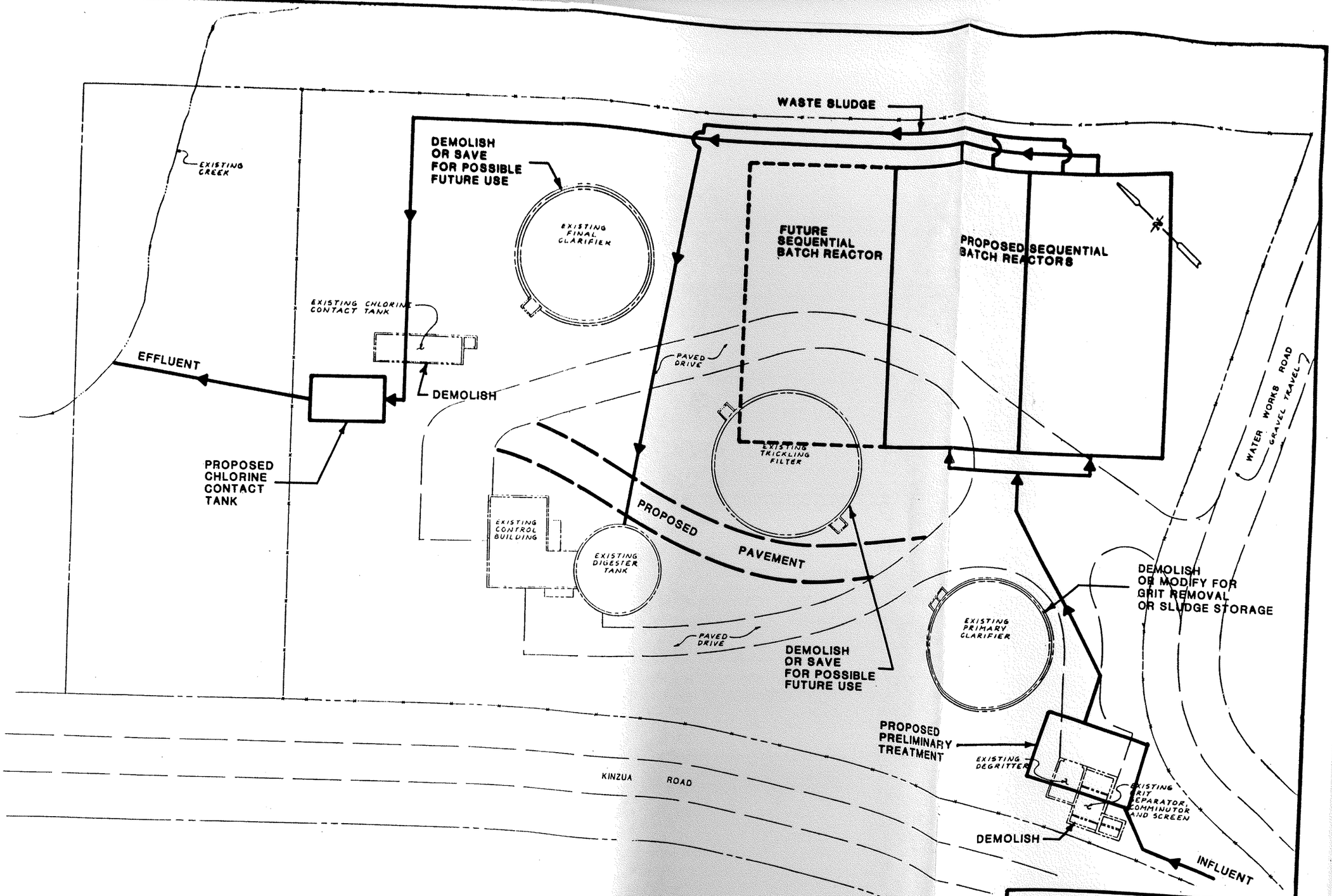
Stage	Construction Costs	O & M Costs
Unit Costs		
1. Preliminary Treatment--1.4 mgd	$ 30,300*	$ 16,600*
2. SBR Tank	612,000	36,500
3. Chlorination 2.8 mgd (Construction) 1.4 mgd (O & M)	181,800*	25,900*
4. Modify Digester 1.4 mgd (O & M)	20,000	21,000*
5. Belt Filter Press	318,000	10,000
Subtotal	$1,162,100	$110,000
Noncomponent Costs		
1. Site Pumping and Junction Boxes (15%)	$ 174,300	$ -
2. Electrical (10%)	116,200	-
Subtotal	$ 290,500	$ -
Sludge Disposal		
1. Landfill	$ -	$ 25,000
Subtotal	$ -	$ 25,000

TABLE 10 (CONTINUED)

ALTERNATIVE 1
OPTION B
KINZUA ROAD WWTP

COST ANALYSIS

Stage	Construction Costs	O & M Costs
Demolition		
1. Primary Tank	$ 10,000	$ -
2. Trickling Filter	15,000	-
3. Final Clarifier	10,000	-
4. Chlorine Contact Tank	5,000	-
5. Preliminary Treatment Building	10,000	-
Subtotal	$ 50,000	$ -
Total Costs	$1,502,600	$135,000
Administrative, Engineering & Legal (20%)	300,500	-
Construction Contingencies (10%)	150,300	-
TOTAL PROJECT COSTS	$1,953,400	$135,000



BOROUGH OF KANE

McKEAN COUNTY PENNSYLVANIA

KINZUA ROAD WWTP

ALTERNATE 1 OPTION B

EXHIBIT 10

BCM Engineers

DRAWN BY: C.J.S. PROJECT No.:00-3495-01

SCALE: 1"= 40'

BCM

TABLE 11

ALTERNATIVE 2
OPTIONS A & B
PINE STREET WWTP

COST ANALYSIS

Stage	Construction Costs	O & M Costs
Raw Wastewater Conveyance		
1. Pump Station--6.0 mgd	$ 600,000	$ 35,000
2. Force Main--6,800 LF of 18" @ $70/LF	476,000	3,000
3. Interceptor Sewer--4,400 LF of 18" @ $60/LF	264,000	3,000
Subtotal	$1,340,000	$ 41,000
Demolition		
1. Preliminary Treatment Building	$ 10,000	$ -
2. Primary Clarifier	10,000	-
3. Trickling Filter	15,000	-
4. Final Clarifier	10,000	-
5. Chlorine Contact Tank	5,000	-
6. Modify/Demolish Oper. Bldg. & Digester	20,000	-
Subtotal	$ 70,000	$ -
Total Costs	$1,410,000	$ 41,000
Administrative, Engineering & Legal (20%)	282,000	-
Construction Contingencies (10%)	141,000	-
TOTAL PROJECT COSTS	$1,833,000	$ 41,000

POSSIBLE MAN-MADE WETLAND AREA NOT TO BE DISTURBED

N 89° 45' E — 435.15'

FENCE

EXISTING CREEK

N 60° 15' W — 240'

EXISTING TRICKLING FILTER

EXISTING FINAL CLARIFIER

DEMOLISH OR SAVE FOR POSSIBLE FUTURE USE

FENCE

DEMOLISH OR SAVE FOR POSSIBLE FUTURE USE

EXISTING PAVEMENT

EXISTING CHLORINE CONTACT TANK

DEMOLISH

EXISTING CONTROL BUILDING

EXISTING DIGESTER TANK

℄ POWER LINE

EXISTING BLACKTOP DRIVEWAY AND PARKING

EXISTING DEGRITTER

EXISTING GRIT SEPARATOR, COMMINUTOR AND SCREEN

DEMOLISH

TO KINZUA RD. WWTP

NOTE:

RENOVATE DIGESTER AND CONTROL BUILDING FOR USE AS A PUMP STATION TO PUMP ALL FLOWS TO THE KINZUA RD. WWTP

EXISTING GAS LINE

POSSIBLE MAN-MADE WETLAND AREA NOT TO BE DISTURBED

FENCE

INFLUENT

BLACKTOP PAVEMENT

℄ PINE STREET

30C'

S 0° 15' E

N

EXHIBIT 11

BCM Engineers
ENGINEERS, PLANNERS, SCIENTISTS and LABORATORY SERVICES

BOROUGH OF KANE
McKEAN COUNTY PENNSYLVANIA

PINE ST. WWTP
ALTERNATE 2 AND 4

DRAWN BY: JSA PROJECT NO: 00-3495-01
SCALE: 1" = 40'
DATE: JULY 1990 FILE NO: 3-3495-01.10

BCM

TABLE 12

ALTERNATIVE 2
OPTION A
KINZUA ROAD WWTP

COST ANALYSIS

Stage	Construction Costs	O & M Costs
Unit Costs		
1. Preliminary Treatment--2.8 mgd	$ 179,800*	$ 24,200*
2. Primary Clarifiers Rehabilitate Existing Unit and Build New 60' Diameter Tank 2.8 mgd (O & M)	197,700	22,600*
3. Bio-Towers Modify Existing Trickling Filter & One New Bio-Tower--2.8 mgd	1,364,500*	15,000
4. Final Clarifiers Build Two 70' Diameter Tanks 2.8 mgd (O & M)	506,100	22,600*
5. Chlorination--2.8 mgd	181,800*	40,400*
6. Anaerobic Digester--1.4 mgd (Construction) 2.8 mgd (O & M)	464,600*	28,300*
7. Belt Filter Press	318,000	10,000
Subtotal	$3,212,500	$163,100
Noncomponent Costs		
1. Site Pumping and Junction Boxes (15%)	$ 481,900	$ -
2. Electrical (10%)	321,300	-
Subtotal	$ 803,200	$ -

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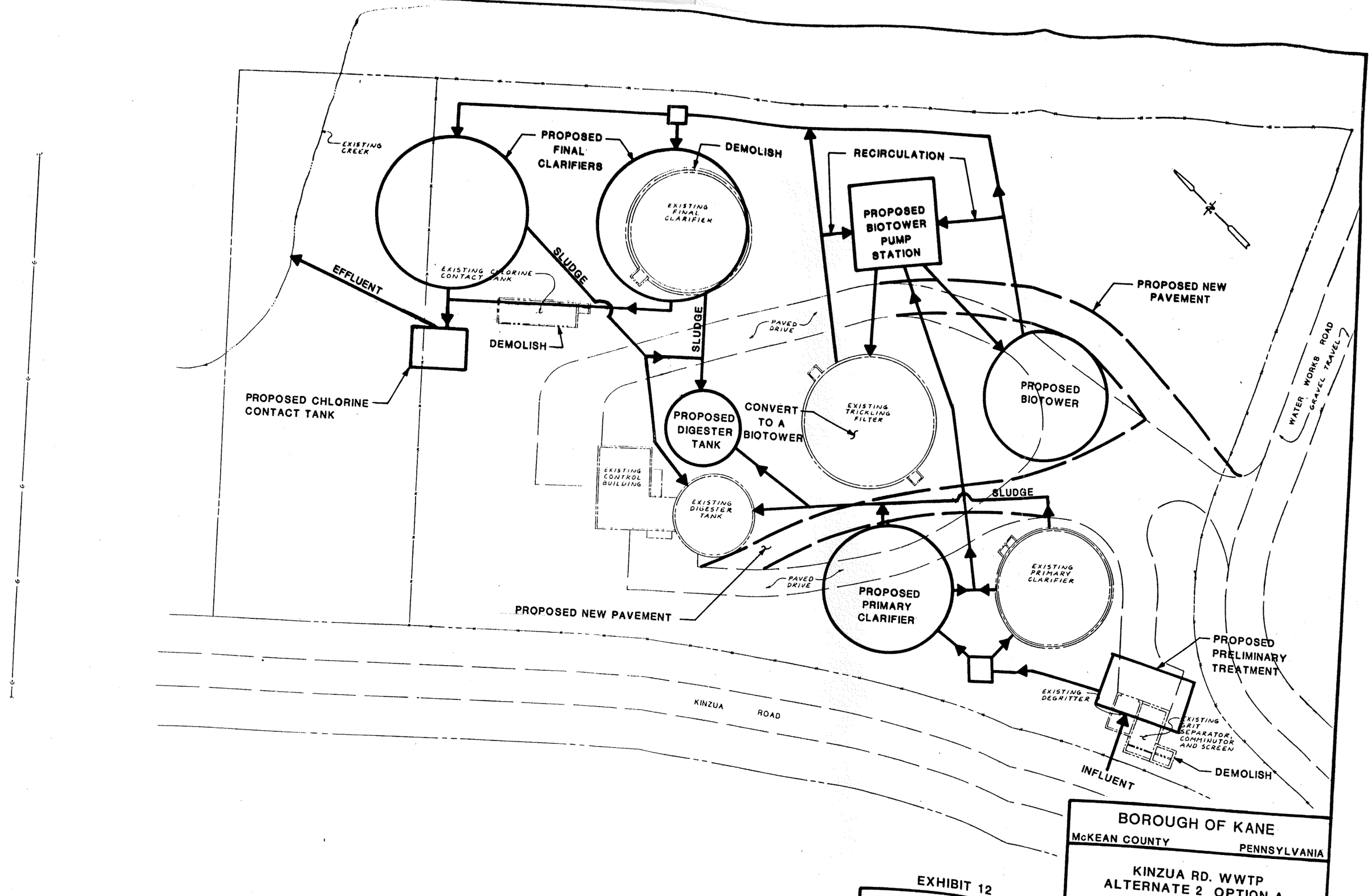
TABLE 12 (CONTINUED)

ALTERNATIVE 2
OPTION A
KINZUA ROAD WWTP

COST ANALYSIS

Stage	Construction Costs	O & M Costs
Sludge Disposal		
1. Landfill	$ -	$ 50,000
Subtotal	$ -	$ 50,000
Demolition		
1. Preliminary Treatment Building	$ 10,000	-
2. Final Clarifier	10,000	-
3. Chlorine Contact Tank	5,000	-
Subtotal	$ 25,000	$ -
Total Costs	$4,040,700	$213,100
Administrative, Engineering & Legal (20%)	808,100	-
Construction Contingencies (10%)	404,100	-
TOTAL PROJECT COSTS	$5,252,900	$213,100


EXISTING CREEK
PROPOSED FINAL CLARIFIERS
DEMOLISH
EXISTING FINAL CLARIFIER
RECIRCULATION
PROPOSED BIOTOWER PUMP STATION
EFFLUENT
SLUDGE
EXISTING CHLORINE CONTACT TANK
DEMOLISH
SLUDGE
PAVED DRIVE
PROPOSED NEW PAVEMENT
PROPOSED CHLORINE CONTACT TANK
PROPOSED DIGESTER TANK
CONVERT TO A BIOTOWER
EXISTING TRICKLING FILTER
PROPOSED BIOTOWER
EXISTING CONTROL BUILDING
EXISTING DIGESTER TANK
SLUDGE
PAVED DRIVE
PROPOSED PRIMARY CLARIFIER
EXISTING PRIMARY CLARIFIER
PROPOSED NEW PAVEMENT
PROPOSED PRELIMINARY TREATMENT
EXISTING DEGRITTER
EXISTING GRIT SEPARATOR, COMMINUTOR AND SCREEN
INFLUENT
DEMOLISH
KINZUA ROAD
WATER WORKS ROAD
GRAVEL TRAVEL
BOROUGH OF KANE
McKEAN COUNTY PENNSYLVANIA
KINZUA RD. WWTP
ALTERNATE 2 OPTION A
EXHIBIT 12

BCM

TABLE 13

ALTERNATIVE 2
OPTION B
KINZUA ROAD WWTP

COST ANALYSIS

Stage	Construction Costs	O & M Costs
Unit Costs		
1. Preliminary Treatment--2.8 mgd	$ 179,800*	$ 24,200*
2. SBR Tank--2.8 mgd	1,179,000	54,800
3. Chlorination 5.6 mgd (Construction) 2.8 mgd (O & M)	262,600*	40,400*
4. Aerobic Digester 1.4 mgd (Construction) 2.8 mgd (O & M)	282,800*	28,300*
5. Belt Filter Press	318,000	10,000
Subtotal	$2,222,200	$157,700
Noncomponent Costs		
1. Site Pumping and Junction Boxes (15%)	$ 333,300	$ -
2. Electrical (10%)	222,200	-
Subtotal	$ 555,500	$ -
Sludge Disposal		
1. Landfill	$ -	$ 50,000
Subtotal	$ -	$ 50,000

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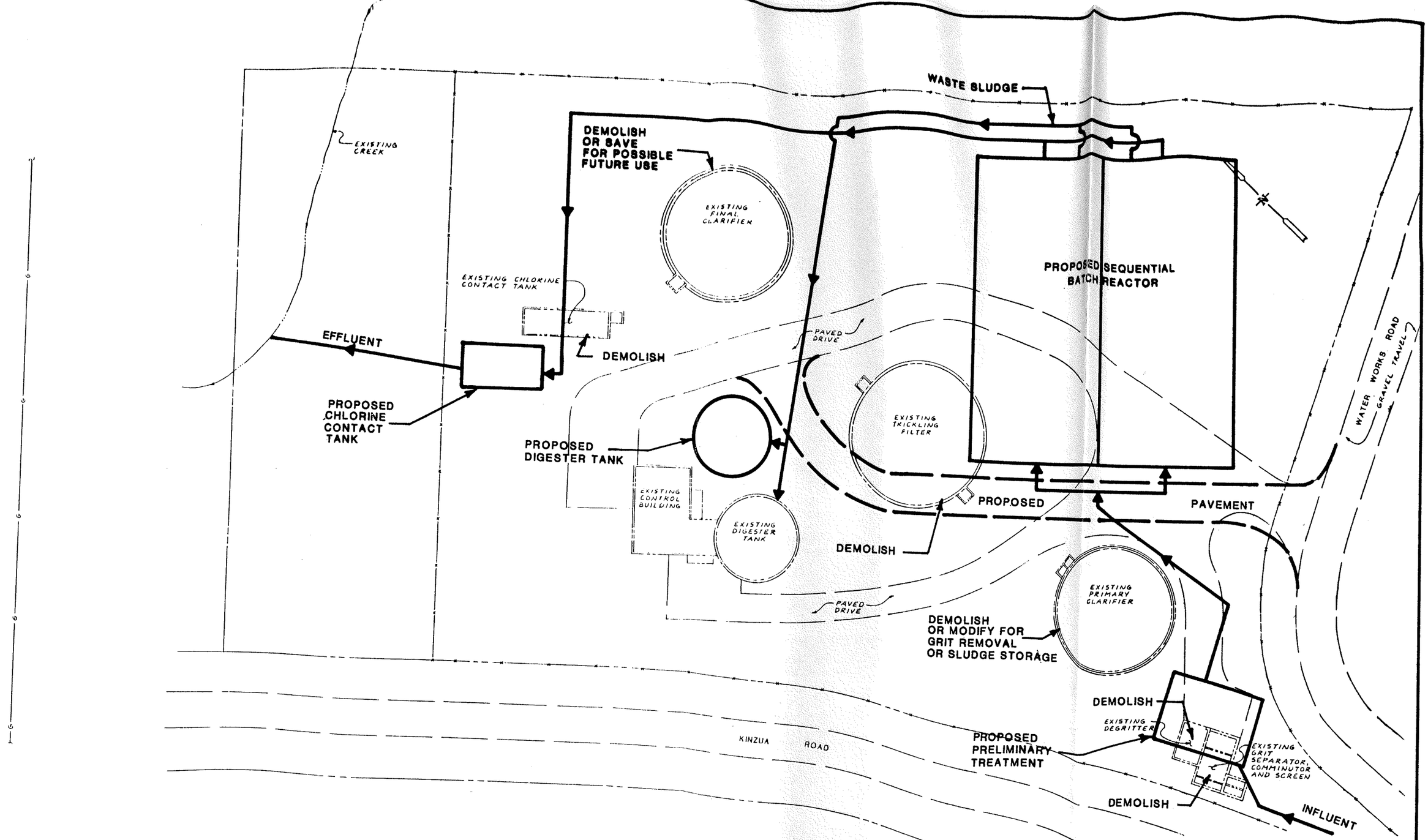
TABLE 13 (CONTINUED)

ALTERNATIVE 2
OPTION B
KINZUA ROAD WWTP

COST ANALYSIS

Stage	Construction Costs	O & M Costs
Demolition		
1. Preliminary Treatment	$ 10,000	$ -
2. Primary Clarifier	10,000	-
3. Trickling Filter	15,000	-
4. Final Clarifier	10,000	-
5. Chlorine Contact Tank	5,000	-
Subtotal	$ 50,000	$ -
Total Costs	$2,827,700	$207,700
Administrative, Engineering & Legal (20%)	565,500	-
Construction Contingencies (10%)	282,800	-
TOTAL PROJECT COSTS	$3,676,000	$207,700



BOROUGH OF KANE

McKEAN COUNTY PENNSYLVANIA

KINZUA ROAD WWTP

ALTERNATE 2 OPTION B

EXHIBIT 13

BCM Engineers

DRAWN BY: C.J.S. PROJECT No.:00-3495-01

SCALE: 1"= 40'

BCM

TABLE 14

ALTERNATIVE 3
OPTION A
PINE STREET WWTP

COST ANALYSIS

Stage	Construction Costs	O & M Costs
Unit Costs		
1. Preliminary Treatment Rehabilitate Existing Units 0.8 mgd (O & M)	$ 20,000	$ 16,300*
2. Primary Clarifiers Rehabilitate Existing Unit and Build 50' Diameter Tank 0.8 mgd (O & M)	168,500	9,700*
3. Bio-Towers Modify Existing Tank and Build One New Bio-Tower--0.8 mgd	341,700	7,400
4. Final Clarifiers Rehabilitate Existing Unit and Build 50' Diameter Tank 0.8 mgd (O & M)	168,500	9,700*
5. Chlorination Renovate Existing Tank 0.8 mgd (O & M)	5,000	19,400*
6. Anaerobic Digester 0.8 mgd (O & M)	-	19,400*
Subtotal	$ 703,700	$ 81,900
Noncomponent Costs		
1. Site Pumping and Junction Boxes (15%)	$ 105,600	$ -
2. Electrical (10%)	70,400	-
Subtotal	$ 176,000	$ -
Sludge Disposal		
1. Landfill	$ -	$ 50,000
Subtotal	$ -	$ 50,000

TABLE 14 (CONTINUED)

ALTERNATIVE 3
OPTION A
PINE STREET WWTP

COST ANALYSIS

Stage	Construction Costs	O & M Costs
Raw Wastewater Conveyance		
1. Pump Station--4.5 mgd	$ 800,000	$ 21,000
2. Force Main--6,800 LF of 16" @ $60/LF	408,000	2,000
3. Interceptor Sewer--4,400 LF of 15" @ $50/LF	220,000	2,000
Subtotal	$1,428,000	$ 25,000
Total Costs	$2,357,700	$130,900
Administrative, Engineering & Legal (20%)	471,500	-
Construction Contingencies (10%)	235,800	-
TOTAL PROJECT COSTS	$3,065,000	$130,900

POSSIBLE MAN-MADE WETLAND AREA NOT TO BE DISTURBED

PROPOSED BIOTOWER PUMP STATION

RECIRCULATION

N 89°45'E → 435.15'

EXISTING CREEK

N 60°15'W → 240'

FENCE

RENOVATE TANK

EXISTING TRICKLING FILTER

PROPOSED BIOTOWER

EXISTING FINAL CLARIFIER

RENOVATE AS A BIOTOWER

FENCE

EXISTING PAVEMENT

PROPOSED PRIMARY CLARIFIER

SLUDGE

PROPOSED FINAL CLARIFIER

EXISTING CHLORINE CONTACT TANK

EFFLUENT

REHABILITATE

EXISTING FINAL CLARIFIER

EXISTING CONTROL BUILDING

SLUDGE

EXISTING DIGESTER TANK

℄ POWER LINE

EXISTING BLACKTOP DRIVEWAY AND PARKING

RENOVATE TANK

EXISTING DEGRITTER

EXISTING GRIT SEPARATOR, COMMINUTOR AND SCREEN

EXISTING GAS LINE

PROPOSED NEW PAVEMENT

POSSIBLE MAN-MADE WETLAND AREA NOT TO BE DISTURBED

OVERFLOW

PROPOSED OVERFLOW WASTEWATER PUMP STATION

FENCE

INFLUENT

OVERFLOW TO KINZUA RD. WWTP

℄ PINE STREET

BLACKTOP PAVEMENT

EXHIBIT 14

BOROUGH OF KANE

McKEAN COUNTY PENNSYLVANIA

PINE ST. WWTP
ALTERNATE 3 OPTION A

BCM Engineers
ENGINEERS, PLANNERS, SCIENTISTS and LABORATORY SERVICES

DRAWN BY: JSA PROJECT NO: 00-3495-01
SCALE: 1"= 40'

BCM

TABLE 15

ALTERNATIVE 3
OPTION B
PINE STREET WWTP

COST ANALYSIS

Stage	Construction Costs	O & M Costs
Unit Costs		
1. Preliminary Treatment Rehabilitate Existing Units 0.8 mgd (O & M)	$ 20,000	$ 16,300*
2. SBR Tank--0.8 mgd	628,000	25,600
3. Chlorination Renovate Existing Tank 0.8 mgd (O & M)	5,000	19,400*
4. Modify Aerobic Digester 0.8 mgd (O & M)	20,000	11,000*
Subtotal	$ 673,000	$ 72,300
Noncomponent Costs		
1. Site Pumping and Junction Boxes (15%)	$ 101,000	$ -
2. Electrical (10%)	67,300	-
Subtotal	$ 168,300	$ -
Sludge Disposal		
1. Landfill	$ -	$ 20,000
2. Sludge Tank Truck	50,000	4,000
Subtotal	$ 50,000	$ 24,000

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TABLE 15 (CONTINUED)

ALTERNATIVE 3
OPTION B
PINE STREET WWTP

COST ANALYSIS

Stage	Construction Costs	O & M Costs
Demolition		
1. Primary Tank	$ 10,000	$ -
2. Trickling Filter	15,000	-
3. Final Clarifier	10,000	-
Subtotal	$ 35,000	$ -
Raw Wastewater Conveyance		
1. Pump Station--4.5 mgd	$ 800,000	$ 21,000
2. Force Main--6,800 LF of 16" @ $60/LF	408,000	2,000
3. Interceptor Sewer--4,400 LF of 15" @ $50/LF	220,000	2,000
Subtotal	$1,428,000	$ 25,000
Total Costs	$2,354,300	$121,300
Administrative, Engineering & Legal (20%)	470,900	-
Construction Contingencies (10%)	235,400	-
TOTAL PROJECT COSTS	$3,060,600	$121,300

POSSIBLE MAN-MADE WETLAND AREA NOT TO BE DISTURBED

DEMOLISH OR SAVE FOR POSSIBLE FUTURE USE

N 89°45'E — 485.15'

FENCE

EXISTING CREEK

N 60°15'W — 240'

PROPOSED SEQUENTIAL BATCH REACTORS

EXISTING TRICKLING FILTER

EXISTING FINAL CLARIFIER

DEMOLISH OR SAVE FOR POSSIBLE FUTURE USE

EXISTING PAVEMENT

EXISTING CHLORINE CONTACT TANK

EFFLUENT

DEMOLISH OR MAY RENOVATE FOR SLUDGE STORAGE

EXISTING FINAL CLARIFIER

EXISTING CONTROL BUILDING

REUSE

WASTE SLUDGE

EXISTING DIGESTER TANK

℄ POWER LINE

EXISTING BLACKTOP DRIVEWAY AND PARKING

EXISTING DEGRITTER

EXISTING GRIT SEPARATOR, COMMINUTOR AND SCREEN

PROPOSED NEW PAVEMENT

EXISTING GAS LINE

PROPOSED OVERFLOW PUMP STATION

POSSIBLE MAN-MADE WETLAND AREA NOT TO BE DISTURBED

FENCE

INFLUENT

BLACKTOP PAVEMENT

℄ PINE STREET

EXHIBIT 15

BOROUGH OF KANE

McKEAN COUNTY PENNSYLVANIA

PINE ST. WWTP
ALTERNATE 3 OPTION B

BCM

TABLE 16

ALTERNATIVE 3
OPTION A
KINZUA ROAD WWTP

COST ANALYSIS

Stage Unit Costs	Construction Costs	O & M Costs
1. Preliminary Treatment--2.0 mgd	$ 141,400	$ 22,600*
2. Primary Clarifiers Rehabilitate Existing Unit and Build 50' Diameter Tank 2.0 mgd (O & M)	168,500	17,800*
3. Bio-Towers Modify Existing Tank and Build One New Bio-Tower--2.0 mgd	929,300	12,000
4. Final Clarifiers Rehabilitate Existing Unit and Build 60' Diameter Tank 2.0 mgd (O & M)	197,700	17,800*
5. Chlorination--2.0 mgd	141,400	32,300*
6. Anaerobic Digester 2.0 mgd (O & M)	-	22,600*
7. Belt Filter Press	318,000	10,000
Subtotal	$1,896,300	$135,100
Noncomponent Costs		
1. Site Pumping and Junction Boxes (15%)	$ 265,100	$ -
2. Electrical (10%)	176,700	-
Subtotal	$ 441,800	$ -

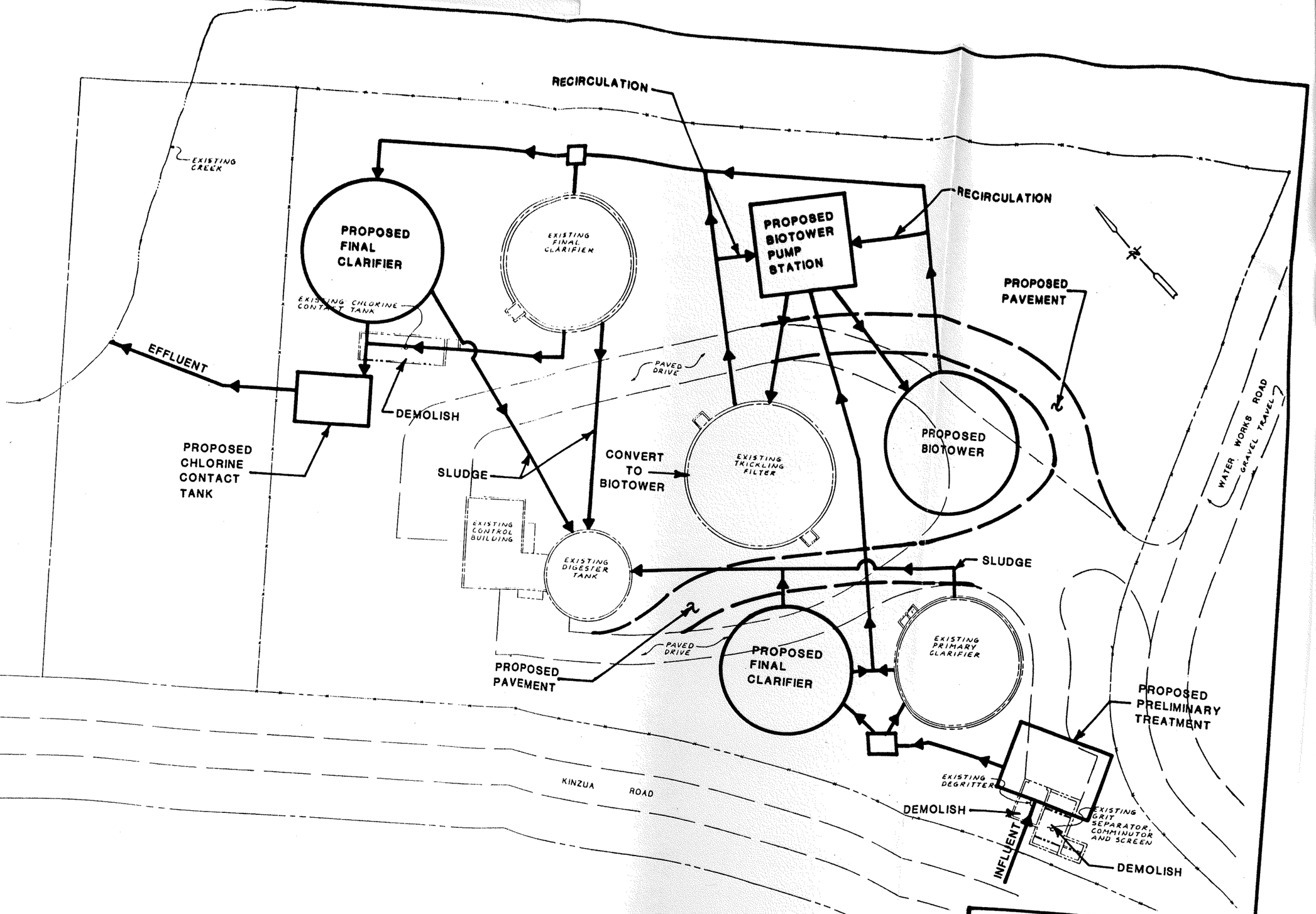
BCM

TABLE 16 (CONTINUED)

ALTERNATIVE 3
OPTION A
KINZUA ROAD WWTP

COST ANALYSIS

Stage	Construction Costs	O & M Costs
Sludge Disposal		
1. Landfill		
Subtotal	$ -	$ 30,000
Demolition	$ -	$ 30,000
1. Preliminary Treatment Building	$ 10,000	$ -
2. Chlorine Contact Tank	5,000	-
Subtotal	$ 15,000	$ -
Total Costs	$2,353,100	$165,100
Administrative, Engineering & Legal (20%)	470,600	-
Construction Contingencies (10%)	235,300	-
TOTAL PROJECT COSTS	$3,059,000	$165,100



BOROUGH OF KANE

McKEAN COUNTY PENNSYLVANIA

KINZUA ROAD WWTP

ALTERNATE

EXHIBIT

BCM

TABLE 17

ALTERNATIVE 3
OPTION B
KINZUA ROAD WWTP

COST ANALYSIS

Stage	Construction Costs	O & M Costs
Unit Costs		
1. Preliminary Treatment--2.0 mgd	$ 141,400*	$ 21,000*
2. SBR Tank--2.0 mgd	960,000	42,000
3. Chlorination 4.0 mgd (Construction) 2.0 mgd (O & M)	222,200*	32,300*
4. Modify Aerobic Digester 2.0 mgd (O & M)	20,000	21,000*
5. Belt Filter Press	318,000	10,000
Subtotal	$1,661,000	$126,300
Noncomponent Costs		
1. Site Pumping and Junction Boxes (15%)	$ 249,200	$ -
2. Electrical (10%)	166,200	-
Subtotal	$ 415,400	$ -
Sludge Disposal		
1. Landfill	$ -	$ 30,000
Subtotal	$ -	$ 30,000

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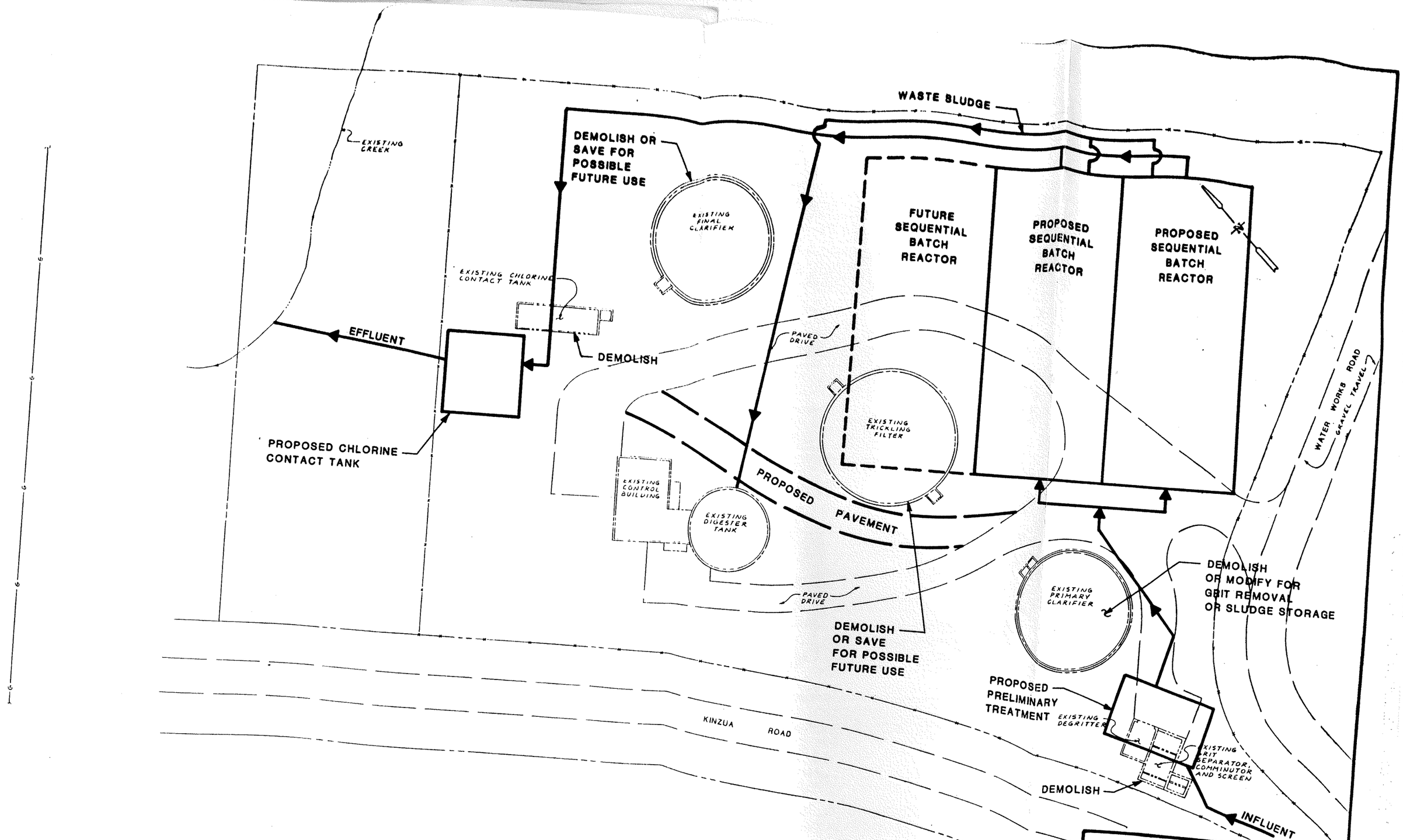
TABLE 17 (CONTINUED)

ALTERNATIVE 3
OPTION B
KINZUA ROAD WWTP

COST ANALYSIS

Stage	Construction Costs	O & M Costs
Demolition		
1. Preliminary Treatment Building	$ 10,000	$ -
2. Primary Clarifier	10,000	-
3. Trickling Filter	15,000	-
4. Final Clarifier	10,000	-
5. Chlorine Contact Tank	5,000	-
Subtotal	$ 50,000	$ -
Total Costs	$2,126,400	$156,300
Administrative, Engineering & Legal (20%)	425,400	-
Construction Contingencies (10%)	212,700	-
TOTAL PROJECT COSTS	$2,764,500	$156,300



BOROUGH OF KANE

McKEAN COUNTY PENNSYLVANIA

KINZUA RD. WWTP
ALTERNATE 3 OPTION B

EXHIBIT 17

BCM BCM Eng...

DRAWN BY: JSA PRO...

BCM

TABLE 18

ALTERNATIVE 4
OPTION B
PINE STREET WWTP

COST ANALYSIS

Stage	Construction Costs	O & M Costs
Raw Wastewater Conveyance		
1. Pump Station--6.0 mgd	$ 600,000	$ 35,000
2. Force Main--4,700 LF of 18" @ $70/LF	329,000	3,000
3. Interceptor Sewer--3,900 LF of 18" @ $60/LF	234,000	3,000
Subtotal	$1,163,000	$ 41,000
Demolition		
1. Preliminary Treatment Building	$ 10,000	$ -
2. Primary Clarifier	10,000	-
3. Trickling Filter	15,000	-
4. Final Clarifier	10,000	-
5. Chlorine Contact Tank	5,000	-
6. Modify/Demolish Oper. Bldg. & Digester	20,000	-
Subtotal	$ 70,000	$ -
Total Costs	$1,233,000	$ 41,000
Administrative, Engineering & Legal (20%)	247,000	-
Construction Contingencies (10%)	123,000	-
TOTAL PROJECT COSTS	$1,603,000	$ 41,000

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TABLE 19

ALTERNATIVE 4
OPTION B
GLENWOOD PARK WWTP

COST ANALYSIS

Stage	Construction Costs	O & M Costs
Unit Costs		
1. Preliminary Treatment--2.8 mgd	$ 171,700*	$ 24,200*
2. SBR Tank--2.8 mgd	1,179,000	54,800
3. Chlorination 5.6 mgd (Construction) 2.8 mgd (O & M)	262,600*	38,800*
4. Aerobic Digester--2.8 mgd	424,200*	29,100*
5. Belt Filter Press--2.8 mgd	318,000	10,000
6. Operations Building	300,000	-
Subtotal	$2,655,500	$156,900
Noncomponent Costs		
1. Site Pumping and Junction Boxes (15%)	$ 398,300	$ -
2. Electrical (10%)	265,600	-
Subtotal	$ 663,900	$ -
Sludge Disposal		
1. Landfill	$ -	$ 50,000
Subtotal	$ -	$ 50,000

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TABLE 19 (CONTINUED)

ALTERNATIVE 4
OPTION B
GLENWOOD PARK WWTP

COST ANALYSIS

Stage	Construction Costs	O & M Costs
Demolition		
1. Kinzua Road WWTP	$ 70,000	$ -
Subtotal	$ 70,000	$ -
Raw Wastewater Conveyance		
1. Site Lift Station--6.0 mgd	$ 500,000	$ 13,000*
2. Force Main--800 LF of 18" @ $70/LF	56,000	1,000
3. Interceptor Sewer--800 LF of 18" @ $60/LF	48,000	1,000
Subtotal	$ 604,000	$ 15,000
Total Costs	$3,993,000	$221,900
Administrative, Engineering & Legal (20%)	798,700	-
Construction Contingencies (10%)	399,300	-
TOTAL PROJECT COSTS	$5,191,000	$221,900

TABLE 20

SUMMARY OF PRELIMINARY COST ANALYSIS

	Pine Street Construction	Pine Street O&M	Kinzua Road Construction	Kinzua Road O&M	Glenwood Park Construction	Glenwood Park O&M
Alternative 1--Option A	$2,822,100	$128,600	$2,644,400	$134,600	-	-
Option B	2,537,500	142,000	1,953,400	135,000	-	-
Alternative 2--Option A	1,833,000	41,000	5,252,900	213,100	-	-
Option B	1,833,000	41,000	3,676,000	207,700	-	-
Alternative 3--Option A	3,065,000	132,900	3,059,000	165,100	-	-
Option B	3,060,000	127,900	2,765,100	1156,30	-	-
Alternative 4--Option B	1,603,000	41,000	-	-	$5,191,000	$221,900

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TABLE 21

PRESENT WORTH ANALYSIS

		Total Construction	Total O&M	Present Worth
Alternative 1	Option A	$5,466,500	$263,200	$ 8,485,000
	Option B	4,490,900	277,000	7,668,000
Alternative 2	Option A	7,085,900	254,100	10,001,000
	Option B	5,509,000	248,700	8,362,000
Alternative 3	Option A	6,124,000	298,000	9,542,000
	Option B	5,825,700	284,200	9,085,000
Alternative 4	Option B	6,794,000	262,900	9,809,000

Present Worth Analysis based on interest rate of 6 percent and 20-year life of project (f = 11.4699).

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TABLE 21

PRESENT WORTH ANALYSIS

		Total Construction	Total O&M	Present Worth
Alternative 1	Option A	$5,466,500	$263,200	$ 8,485,000
	Option B	4,490,900	277,000	7,668,000
Alternative 2	Option A	7,085,900	254,100	10,001,000
	Option B	5,509,000	248,700	8,362,000
Alternative 3	Option A	6,124,000	298,000	9,542,000
	Option B	5,825,700	284,200	9,085,000
Alternative 4	Option B	6,794,000	262,900	9,809,000

Present Worth Analysis based on interest rate of 6 percent and 20-year life of project (f = 11.4699).

Several additional treatment processes were considered but not evaluated in detail due to the reasons expressed as follows:

Treatment Process	Reason Detailed Evaluation Not Made
Land Application of Sewage	Insufficient land available.
Aerated Lagoon	Insufficient land available.
Conventional Activated Sludge Single- or Two-Stage Systems	Insufficient land available at Kinzua Road site; process generally more expensive than SBR.
Oxidation Ditch	Insufficient land available at Kinzua Road site; process generally more expensive than SBR.
Rotating Biological Contactor	This type of treatment is generally much more expensive than SBRs. Rotating biological contactors have been plagued with O&M problems.
Break Point Chlorination (Ammonia Removal)	This process is difficult to control and may require an additional dechlorination stage.
Tertiary Filtration (Phosphorus Removal)	This process is more expensive than installing a flocculating clarifier for phosphorus removal.
Biological Phosphorus Removal	This process is not practical for Kane because wastewater is very dilute during wet weather.

Sludge Handling and Disposal

The existing Pine Street and Kinzua Road WWTPs are equipped with a sludge centrifuge for dewatering sewage sludge. Dewatered sludge was then disposed of by land application. The Borough has discontinued the use of this system and has relied on landfill disposal of sludge in recent years. The vacuum filters are no longer operated. As of July 1990, there are no approved permits for disposal of sewage sludge. Borough officials have applied for a permit to have dewatered sewage sludge disposed of by landfilling. This work will be performed by a private contractor or another municipality utilizing their own sludge dewatering equipment. This action is seen as a temporary solution to the Borough's sludge disposal problem.

Permanent Sludge Disposal Options

Option S-1

Purchase one belt filter press to be installed at one of the two treatment plant sites to dewater sewage sludge for landfill disposal. Sewage sludge from the other WWTP with no belt filter press will be hauled by truck to the belt press for dewatering then hauled by truck for landfill disposal.

Option S-2

Haul liquid sludge to a nearby community, such as St. Marys, Warren, or Bradford, for belt press sludge dewatering and landfill disposal; or have sludge dewatered and landfill disposal by a private company.

Option S-3

Install sludge drying beds at the WWTPs and dispose of dewatered sludge by landfilling. This option is not viable due to adverse temperature constraints and inadequate space at the treatment plant sites.

Option S-4

Disposal of liquid sludge by land application--This option is not viable due to long periods of frozen soil conditions and snow cover in the area. Sludge cannot be disposed of by land application when the ground is wet, frozen, or snow covered.

Option S-1 offers greater operator flexibility to control sludge wasting. Option S-2 is generally less costly for a facility of this size. Options S-3 and S-4 are not viable.

(vii) Repair/Replacement of Collection System Components

Very limited information is currently available on the integrity of the sewage collection system. The proposed sewer system mapping and ongoing I/I study will provide data needed to determine where sewer collection system components require rehabilitation.

(viii) Reduction of Organic or Hydraulic Loading

The existing sewer collection system is classified as a combined sewer system conveying both storm runoff and sanitary flows. Available sewer system maps are dated 1936 and vaguely describe the lines as they exist within the system. No maps exist showing storm sewer connections to the system. Very limited flow monitoring information is available for the collection system. Hill Engineers is currently performing flow monitoring work to evaluate the collection system's integrity, quantify peak flows, and isolate bottlenecks. Their recommendations have not been received.

eak wet weather flows tributary to the Pine Street and Kinzua Road
TPs are over ten times the average annual recorded flow.
viously, if all storm sewers connected to the public sewer system
re removed and sewerlines contributing excessive infiltration/
flow were repaired or replaced, the quantity of flow requiring
eatment would be significantly reduced.

noval of french drains and downspouts would also reduce flows to
e WWTPs. The cost of removing all I/I is beyond the financial
ans of the community. An evaluation must be made to determine the
st-effectiveness of removing or treating excessive I/I. At this
ne insufficient mapping and flow monitoring information is
ilable to begin this evaluation. Where judged cost-effective, I/I
oval activities should be initiated.

lowing I/I removal activities, continuous flow monitoring data of
ws tributary to the WWTPs is required to revise design and peak
raulic flow rates at the WWTPs. The stringent time schedule
dated by PADER to upgrade/expand the Pine Street or Kinzua Road
Ps will prohibit a thorough evaluation of I/I, sewer system
abilitation, flow verification prior to starting, and new flow
itoring of design of the treatment facilities.

ection System Improvements and I/I Removal Options

on C-1

tor sewage flows tributary to the existing WWTP to finalize
gn flows. Base design on conveying all flows to the Pine Street
for treatment and discharge to West Run. Treat all flows
utary to Hubert Run at the Kinzua Road WWTP except for occasional
high flows. Perform only remedial work necessary to correct the
up of flows near the intersection of Cherry and Elk Streets.

n C-2

rm in-depth mapping of the storm and sanitary sewer systems and
monitoring within the collection system to determine the
effectiveness of performing I/I removal activities. Monitor
e flows tributary to the existing WWTPs to establish preliminary
n flows. Perform construction activities with the greatest
tial to remove I/I. Monitor flows tributary to the WWTPs to
ish revised design flows before beginning WWTP design, if
le, without delaying the proposed schedule. Perform remedial
necessary to correct the backup of flows near the intersection
rry and Elk Streets.

C-2 is initially more costly than Option C-1 but has the
ial to reduce both construction and O & M costs.

(ix) Use of Alternative Collection/Conveyance to Serve Need Areas Using Existing Sewage Treatment

The need areas within the Borough are limited to the existing onlot disposal systems. Conventional gravity collection will be required to serve all existing properties now served by onlot systems. The Borough will review requests by property owners in the need areas on a case-by-case basis regarding the use of a grinder pump and pressure sewer to tie into the gravity sewer system. The use of vacuum sewers will not be considered because the six properties in the need area are spread out and the high maintenance costs associated with this type of system.

The continual and future use of individual and community subsurface sewage disposal systems will not be permitted in the Borough of Kane. These systems are no longer allowed due to soil insuitability.

There are no areas within the Borough with existing onlot systems where the soil is suitable for their continued use.

The high density of existing homes and businesses within the Borough of Kane prohibits the use of small flow sewage treatment facilities, land treatment alternatives, or package treatment facilities to serve individual homes or clusters of homes. There are no clusters of homes within the Borough which are not connected to the public sewer system.

Use of sewage retaining tanks to contain sewage flows from a property is not necessary since sewers are available to all developed portions of the Borough.

No-Action Alternative

(i) PADER has determined that sewage bypasses at the Pine Street WWTP to a tributary of West Run are causing degradation to West Run, a tributary to Tionesta Creek. Tionesta Creek is a high-quality stream and is extensively used for recreational purposes. The No-Action Alternative is not viable based on water quality and public health considerations.

(ii) Growth potential is limited in the Borough of Kane and Wetmore Township because of inadequate sewage treatment capacity. The No-Action Alternative is not viable.

(iii) Community economic conditions have improved in recent years as the Borough is experiencing a modest economic growth rate. Available sewage treatment capacity is required to sustain economic growth in the Borough. The No-Action Alternative is not viable.

(iv) Recreational opportunities on streams below the Borough WWTPs may be negatively impacted by inadequately treated wastewater. The present facilities cannot adequately treat Borough sewage flows.

(v) Potential use of Hubert Run and West Run as drinking water sources may be negatively impacted by inadequately treated wastewater.

In conclusion, the no-action alternative is not viable.

5.2 EVALUATION OF SEWAGE MANAGEMENT PROGRAMS

5.2.1- 5.2.2 Regular inspection or maintenance of onlot sewage disposal systems within the Borough is not necessary since existing onlot systems are being discontinued.

There are no nonmunicipal treatment facilities within the Borough except for onlot septic systems.

5.2.3 Municipal ownership or management of onlot disposal systems is not necessary because onlot systems will no longer be permitted.

5.2.4 Enforcement of ordinances which require proper operation and maintenance of onlot systems to prohibit malfunctioning will be enforced in cooperation with the sewage enforcement officer and other department officials.

5.2.5 Onlot systems shall be repaired, replaced, or upgraded to prevent continuation of any malfunction which may be discovered.

5.2.6 The establishment of a joint municipal sewage management program is not necessary because the use of nonmunicipal sewage disposal systems is being discontinued.

5.3 NONSTRUCTURAL COMPREHENSIVE PLANNING NECESSARY TO ASSIST IN MEETING EXISTING AND FUTURE SEWAGE DISPOSAL NEEDS

5.3.1 Existing comprehensive planning within the Borough is adequate to develop projections for future sewage disposal needs. Development within the Borough service area is proceeding slowly, and land available for development is limited. Additional planning may be necessary in Wetmore Township. This matter should be addressed in the Wetmore Township Official Sewage Plan.

5.3.2 The Borough has a comprehensive plan to assist in producing sound economic and consistent development.

5.3.3 Municipal ordinances will be revised to prohibit the use of onsite sewage disposal systems.

5.3.4 The Borough subdivision ordinance does not regulate sewage disposal. The Borough will consider modifying subdivision regulations as related to sewage disposal.

5.4 EXISTING LOCAL AGENCY PROGRAM

5.4.1 The Borough of Kane and the Kane Borough Authority have chosen to maintain ownership of the Pine Street and Kinzua Road WWTPs and are willing to upgrade and expand treatment capacity to serve the sewage disposal needs of the Borough and adjacent areas of Wetmore Township, as is economically feasible. Sewerlines constructed by Wetmore Township to convey sewage to the Kane sewage disposal system will not be owned or maintained by the Borough. The Borough will prepare a sewage service agreement to be entered into with Wetmore Township. The Borough will also prepare a sewer use ordinance to be adopted by Wetmore Township.

The option of a joint municipal sewage authority with board members appointed by the Borough of Kane and Wetmore Township has been discussed and rejected by Borough officials.

Administration of the sewage disposal system on the County level is not practical because of the distance from Kane to Smethport and because there are large distances between population centers within McKean County.

5.4.2 It is anticipated that operator training will be necessary to enable current or new WWTP operators to proficiently operate the new wastewater treatment equipment and processes. Administrative personnel should participate in operator training to understand new treatment processes.

5.5 ECONOMIC EVALUATION OF THE ALTERNATIVES

5.5.1-5.5.4 Tables 7 through 19 list project costs and O & M costs for each of the alternatives and options evaluated. Tables 20 and 21 summarize these results and develop a present worth analysis for each option.

5.5.5 Table 22 lists anticipated user fees for each alternative evaluated. This analysis assumes a PENNVEST loan for 100 percent of the project cost of 2 percent for a 20-year term. Grant funding may result in lower user fees; while failure to obtain low interest loans or grants may result in high user fees. Alternative 1, Option B, is least costly and will represent an average user fee of $25.30 per month. Alternative 2, Option A, is the most expensive at an average user fee of $30.00 per month.

TABLE 22

PROJECTED USER FEES
(MONTHLY COST PER CUSTOMER)

	Administration, Line Maintenance, and Existing Debt Service	WWTP O&M	Debt Service WWTP Projects	Monthly User Fee
ternative 1 Option A	$6.00	$ 9.20	$11.70	$26.90
Option B	6.00	9.70	9.60	25.30
ternative 2 Option A	6.00	8.90	15.10	30.00
Option B	6.00	8.70	11.80	26.50
ternative 3 Option A	6.00	10.40	13.10	29.50
Option B	6.00	9.90	12.40	28.30
ternative 4 Option B	6.00	9.20	14.50	29.70

erage user fees are based on 2,110 Borough customers and 280 projected stomers in Wetmore Township. We are assuming that the financial ntribution from Wetmore customers to the Kane system will equal Kane stem's customer contribution.

bt service is based on a 2 percent PENNVEST loan for a 20-year term =0.0612).

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5.5.6 Funding Sources Available

The upward spiraling of construction costs and interest rates has made it exceedingly difficult for small municipalities to construct major capital improvements. It is recognized that the proposed improvements discussed herein cannot proceed without obtaining substantial aid in the form of grants or loans from government agencies. Brief descriptions of various financing methods which may apply to the Borough of Kane's improvement projects are set forth in the following sections.

(i) Grants-in-Aid

The first method of financing available to alleviate partial construction costs is grants-in-aid. A grant is a monetary award to a project without provision for reimbursement. The grant programs which may apply to the Borough are discussed below.

a. McKean County Community Development Block Grant

Community Development Block Grants are awarded to communities within the County for various public works projects. These grants are awarded on an individual project basis to service areas of low and moderate income based on review.

b. Business Infrastructure Development (BID) Program

The Pennsylvania Department of Commerce has recently established several new economic development programs under Pennsylvania's Economic Revitalization Fund. The BID Program provides grants and loans to assist with construction of public and private infrastructure to stimulate employment opportunities through private sector industrial development. The wastewater improvements must be linked to an industrial development project providing employment expansion to acquire this funding.

c. Community Facilities Grant

The Pennsylvania Community Facilities Act (Act 552) provides for the distribution of revenues obtained from a tax on harness racing parimutual wagering in the form of grants for the construction, rehabilitation, alteration, expansion, or improvement to public water and sewage facilities (except treatment plants). At present, grants are provided in the amount of 50 percent of the total project costs, including engineering, administrative, and legal costs up to a maximum award of $50,000. Letters of intent and applications are submitted annually from January to April. These funds may be utilized for the extension of sewerlines to serve properties served by onlot systems or for I/I removal projects.

(ii) Loans

The second method of financing a project is through loans. Loans are repaid at an agreed upon rate of return over a stipulated time period. The loan programs which may apply to private as well as public facilities are discussed below.

a. Commercial or Bank Loans

Bank financing is readily accessible and requires a much shorter time lag from project start to construction. This loan option requires less administrative costs than with a bond issue. The largest disadvantage to a bank loan is that the term usually does not extend beyond 15 years.

b. PENNVEST

PENNVEST (Pennsylvania Infrastructure Investment Authority) has been capitalized by State and Federal funds to provide an innovative approach to financing local infrastructure in Pennsylvania. The revolving loan program will allow financing of over $2.5 billion of new construction within 25 years. The Authority will be managed by a 13-Member Board chaired by the Governor. In May 1988, the voters of Pennsylvania approved a referendum to set in place a $300,000,000 bond issue to provide low-interest loans for the construction of water and sewage projects in the Commonwealth. The interest rates for this program are determined based on prevailing economic conditions. This program has also awarded a number of grants.

(iii) Bond Issues

Bond issues are a common method by which municipalities and authorities obtain money to fund projects. Revenue bond issues are normally calculated to achieve a level annual payment for each year of the issue and are presently issued for a maximum term of 30 years at prevailing interest rates. The annual payment for debt service (interest and principal) is made from annual operating revenues. A disadvantage of bond issues is that investment bankers normally require 10 to 20 percent coverage on top of the average annual debt service cost.

The fixed costs of legal services and printing of bonds are substantial. As a rule, bond issues may be considered for total project costs in excess of $500,000.

Water quality in the streams receiving discharge from the Pine Street and Kinzua Road WWTPs is expected to improve significantly as a result of the proposed projects.

The impact on groundwater in the area is uncertain since no direct effect of current POTW sewage discharge or onlot sewage disposal system discharge has been measured.

The alternatives evaluated in detail are each capable of meeting the requirements of the consent order and agreement, State and Federal laws, and violation notices.

Sludge Management

(i) The current sludge management practices are hindering the effective operation of the Pine Street and Kinzua Road WWTPs because of inadequate sludge wasting.

(ii) Arrangements must be made to remove sludge from the digesters. Dewater and dispose of the sludge in an approved landfill.

(iii) The short-term sludge disposal Option S-2 is to arrange for sludge dewatering and disposal services to be performed by an independent company or a nearby municipality. At this time, none of the municipalities contacted have been willing to enter into this arrangement with the Borough.

The long-term sludge disposal Option S-1 is to install a belt filter press at the Kinzua Road WWTP and to haul liquid sludge from Pine Street to that site. All waste sludge would then be dewatered and disposed of in a landfill.

(iv) The Borough currently needs to arrange for landfill disposal of dewatered sludge and a contract sludge dewatering service.

(v) Sludge disposal equipment required:

Pine Street WWTP

A. Sludge Piping Modifications
B. Sludge Pumps
C. Tank Truck for Hauling Liquid Sludge

Kinzua Road WWTP

A. Sludge Piping Modifications
B. Sludge Pumps
C. Belt Filter Press and Appurtenances
D. Dewatered Sludge Holding Container to be Supplied by Landfill or Contract Hauler

(vi) Sludge Disposal Plan Modification

Short-Term Solution (February 1991-October 1995)

Arrange for landfill disposal of dewatered sludge. Belt filter press sludge dewatering to be done by a nearby municipality or contractor.

Long-Term Solution (October 1995)

Install a belt filter press at the Kinzua Road WWTP. Purchase a liquid sludge tank truck for the Pine Street WWTP. Modify WWTPs as necessary. Continue landfill disposal of dewatered sludge.

6.0 INSTITUTIONAL EVALUATION AND RECOMMENDED ALTERNATIVE

IDENTIFY WASTEWATER TREATMENT PROVIDER

The Borough of Kane owns and manages the sewage collection system. The Kane Borough Authority owns the Pine Street and Kinzua Road WWTPs. The WWTPs are operated by the Borough. Financing for the upgrade and expansion of the sewage facilities will be performed by the Kane Borough Authority or the Borough.

EXISTING BOROUGH CAPABILITIES TO IMPLEMENT OFFICIAL SEWAGE PLAN

1 The existing Pine Street and Kinzua Road WWTPs were constructed in the early 1960s. Annual debt service paid for these facilities is approximately $50,000. The average sewer user pays about $2 per month for existing debt service.

2 The Pine Street WWTP is operated by Mr. Fred Siggins. Kinzua Road WWTP is operated by Mr. David Wedow. Both operators are state-certified and have been WWTP operators for many years. With a reasonable amount of training, these men are capable of operating the expanded and upgraded WWTPs. To provide seven days per week, eight hours per day operator coverage, one additional certified operator should be hired. At present, some routine laboratory analysis work is performed by an independent laboratory owned by Hill Engineers. The addition of a third operator should result in the Borough no longer needing to have routine tests performed as an outside service. The WWTP operators report to Mr. Paul Kreckel, Borough Manager. Mr. Kreckel is experienced as a municipal manager overseeing wastewater treatment operations and coordinating sludge disposal activities. No additional administrative staff is necessary to implement this sewage plan.

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2.3 The Borough of Kane is responsible for implementing wastewater planning recommendations.

2.4 The Borough of Kane is responsible for implementing operational, maintenance, inspection, and testing activities related to wastewater treatment.

2.5 The Borough is responsible for setting sewer rates, maintaining offices, and purchasing necessary equipment and supplies.

2.6 The Borough of Kane is responsible for restraining violations of adopted sewer use ordinances and regulations and to revise such ordinances and regulations when necessary.

2.7 The Borough is responsible for negotiating agreements with other municipalities.

2.8 The Borough is responsible for raising capital for construction projects included in this Official Sewage Plan.

3 INSTITUTIONAL ALTERNATIVES

Alternative 1--Maintain Current Institutional Arrangement

The Borough of Kane will continue to operate the sewage disposal system. The Kane Borough Authority will function as directed to acquire financing of some projects, while the Borough may choose to finance some projects directly. Wetmore Township will be a contract customer. A service agreement will be negotiated with Wetmore Township for conveyance and treatment of sewage flows within the Borough.

Alternative 2--Management by Kane Authority

The Kane Borough Authority would have an expanded role to operate and manage the wastewater treatment and conveyance facilities. Wetmore Township will be a contract customer with a role as outlined in Alternative 1.

Alternative 3--Kane/Wetmore Joint Sewage Authority

This arrangement will have an Authority Board with representatives appointed by Kane Borough Council and the Wetmore Township Supervisors. Representation on the Board will be proportional to the number of sewer customers in the Borough and the Township. The initial arrangement could be four members from Kane and one from Wetmore Township. The Joint Sewage Authority will be responsible to finance projects, set rates, and manage all sewage treatment facilities within the Township and Borough.

Advantages and Disadvantages of Each Municipal Arrangement

Alternative 1 would not require duplication of administrative staff, as may be required by Alternatives 2 and 3. Alternative 1 will be suitable from an environmental standpoint because the Borough Council has expressed the commitment to raise sewage rates and construct necessary improvements as outlined in this plan. Alternative 1 will result in significantly lower sewer rates for Borough residents than Alternative 3 because of the large capital cost to serve customers in the Township and the small number of additional customers expected. The cost to install sewage conveyance systems within Wetmore Township's need areas is greater than 50 percent of the cost of the improvements required in Kane, yet only about 13 percent more customers would be added. Significant popular opposition currently exists to the installation of sewers within Wetmore Township. If Alternative 3 is adopted, correction of sewage disposal and conveyance problems within the Borough may be hindered by public opposition in the Township.

The advantage of Alternatives 2 or 3 is that a municipal authority functions independently from the elected political structure and can implement public works improvements without requiring elected officials to raise sewer rates.

3.1 The Borough of Kane has decided to maintain the existing institutional arrangement as outlined in Alternative 1. The Borough will be responsible for the implementation of this Official Sewage Plan.

3.2 No new authorities will be created.

3.3 Alternative 1 will result in the lowest cost of administration because the sewage disposal system will be managed by the existing Borough administrative staff. No additional staff will be required due to these projects.

This Official Sewage Plan can be implemented by the Kane Borough Council. The Council has expressed willingness to raise sewage rates as needed. This administrative arrangement can be responsive to environmental needs.

A joint municipal authority would have the greatest flexibility to react to future demands; however, this advantage is outweighed by the other advantages of Alternative 1. Alternative 1 can react adequately to future demands. The service agreement between the Borough and Wetmore Township must be drafted in such a manner that the Borough has flexibility to react to future demands such as more restrictive effluent limits or growth in the service area beyond projections.

6.4 CHOSEN INSTITUTION ALTERNATIVE

The Borough has chosen implementation of Alternative 1. This alternative will result in the lowest sewer rates for the customers of the Borough and is a practical alternative for fulfilling the implementation of this Official Sewage Plan.

6.5 ADMINISTRATION AND LEGAL ACTIVITIES REQUIRED

This Official Sewage Plan must be adopted by the Borough of Kane and reviewed by the McKean County Planning Commission.

6.5.1 No new authorities will be created.

6.5.2 The sewer use ordinance will be revised to prohibit the installation of any new onlot sewage disposal systems and to require that all existing onlot sewage disposal systems be abandoned within five years of the approval of this plan by PADER.

6.5.3 A sewer service agreement must be entered into between the Borough of Kane and Wetmore Township if the Township chooses the alternative of conveying their need areas' sewage flows to the Borough for conveyance and treatment.

6.5.4 No right-of-way utility easement or land transfers are required.

7.0 SELECTED WASTEWATER TREATMENT AND INSTITUTIONAL ALTERNATIVES

7.1 SEWAGE NEEDS

7.1.1 Onlot Disposal Needs

The Borough will prohibit the construction of new onlot sewage disposal systems and require that all existing onlot disposal systems be connected to the public sewer system within five years of approval of this plan by PADER.

7.1.2 Conveyance Needs

The Borough will begin a multi-year program of flow reduction by removing storm sewer flows from their sewer system, where cost-effective, or where required to provide adequate conveyance capacity. This will be done in accordance with conveyance Option C-2.

1.3 Wastewater Treatment Needs

(i) Technical and Environmental Evaluation

The Borough will implement Alternative 1, Option B. The Pine Street and Kinzua Road WWTPs will both be expanded and upgraded. Both facilities will utilize sequential batch reactor treatment processes. The Pine Street WWTP, which is tributary to a high-quality stream, will be upgraded and expanded to treat all tributary flows based on the new effluent limits developed by PADER. The Pine Street WWTP's design flow is 1.4 mgd and the peak flow is 6.0 mgd. The Kinzua Road WWTP will be expanded and upgraded to treat a design flow of 1.4 mgd and a peak flow of 3.5 mgd. Peak flows in excess of 3.5 mgd will be bypassed to Hubert Run. The treatment units will be arranged in such a manner that additional treatment units can be added to treat all flows tributary to the facility if Kinzua Creek is also upgraded to a high-quality stream in the future. The possibility of Kinzua Creek being upgraded to a high-quality stream in the future is a significant disadvantage to Alternatives 2 and 3. The installation of pumping facilities, force main, and interceptor sewers to transport flows tributary to the Pine Street WWTP and convey them to the Kinzua Road WWTP for treatment and discharge is environmentally sound based on protecting the quality of Tionesta Creek. If Kinzua Creek is upgraded to a high-quality stream, land limitations at the Kinzua Road WWTP will make it impossible to treat all flows tributary to both WWTPs at the Kinzua WWTP to the effluent limits expected. The environmental impact to Kinzua Creek would then be unsuitable. Current wastewater treatment technology can provide for the protection of Tionesta Creek and Kinzua Creek if the two existing WWTPs are upgraded and expanded. The best use of Borough funds is to treat sewage flows contributory to each WWTP to the effluent limits set by PADER for discharge at each facility.

(ii) Economic Evaluation

Alternative 1, Option B, will result in the lowest capital project cost, the lowest sewer rates, and least expense when considering capital and O&M costs on a present worth basis. (See Tables 8, 10, 20, 21, and 22.)

TECHNICAL AND ADMINISTRATIVE NEEDS

A. Technical Needs

The Borough will need one additional certified WWTP operator. Operator training will be required for all new equipment installed and for process control and operation of the sequential batch reactor and belt filter press.

B. Administrative Needs

Sludge disposal and one additional employee will put an additional work load on the administrative staff but will not require additional personnel.

INSTITUTIONAL ARRANGEMENTS

The Borough of Kane will continue to operate the Pine Street and Kinzua Road WWTPs and the sewage collection system. Personnel responsible for the sewage collection and treatment facilities will report to the Borough Manager.

FINANCING PLAN

The Borough is looking to the PENNVEST Program as the principal funding source for construction of the upgraded and expanded wastewater treatment facilities. Community Development Block grants, Department of Community Affairs grants, and Department of Commerce grants will be sought for funding storm sewer separation projects and sewerline extensions to serve existing onlot sewage disposal systems. Collection system improvements and storm sewer separation projects will be performed on a multi-year basis. We recommend that sewer rates be increased prior to construction of the WWTP facilities to pay for some collection system improvement projects and to finance design and permitting phases of the WWTP improvement projects.

FIVE-YEAR PLAN

All need aspects of this plan will be completed within five years of approval of the plan by PADER. The following projects will be performed:

A. Pine Street and Kinzua Road WWTPs expansion and upgrade

B. Abandoning of existing onlot sewage disposal systems and connection to the public sewer system

C. Correction of sewer system capacity problems on Cherry Street and Smithfield Street. Storm sewer separation in this area may be necessary to provide adequate conveyance capacity.

D. Selected storm sewer separation projects are expected in areas that are cost-effective to perform or as may be required to correct inadequate sewer capacity.

7.6 TEN-YEAR PLAN AND GROWTH AREAS

A. Perform selective cost-effective storm sewer/sanitary sewer separation projects.

B. Correct sewer system conveyance problems which may be discovered.

8.0 IMPLEMENTATION

Adopt and Submit Act 537 Plan to PADER	August 1990
Begin Development of Storm Sewer/Sanitary Sewer Maps	October 1990
Submit Sludge Disposal Module 1 to PADER	October 1990
Initiate Monitoring of All Flows Tributary to WWTPs	November 1990
Receive Comments on Act 537 Plan from PADER	November 1990
Submit Revised Act 537 Plan to PADER	January 1991
Revise Sewer Use Ordinance to Prohibit Onlot Sewage Disposal	January 1991
Begin Removal of Waste Sludge from WWTPs	February 1991
Receive Final Approval for Act 537 Plan	April 1991
Authorize Engineer to Design WWTP Expansion/Upgrade	May 1991
Present Municipal Service Agreement to Wetmore Township	July 1991
Submit Plans and Specifications to PADER for Review	January 1992
Submit PENNVEST Loan Application	February 1992
Receive Part 2 Permit for WWTP Construction	June 1992
PENNVEST Approval or Rejection	June 1992
Arrange Supplemental Funding if Required	August 1992
Advertise Project for Bids	September 1992
Open Bids	November 1992
Close PENNVEST or Other Financing	December 1992
Award Contract	January 1993
Issue Notice to Proceed	February 1993
Complete Construction	September 1994
Place WWTPs in Operation	October 1994
Connect All Onlot Disposal Systems to Public Sewers	April 1996
Correct All Known Sewerline Capacity Problems	April 1996

TOWNSHIP OF WETMORE
McKean County, Pennsylvania

ACT 537 PLAN

COMPREHENSIVE SEWAGE FACILITIES PLANNING STUDY

October 1990

Revised June 1991

Revised January 1992

Revised April 1992

Revised August 1992

Revised April 1993

KLH ENGINEERS, INC.
Pittsburgh, PA 15106

PLAN SUMMARY

Alternative of Choice

The recommended Alternative to correct the sewage problems within the Wetmore Township planning area is Alternative B. This Alternative utilizes conventional gravity sewers and a small number of grinder pump units and low pressure sewers in the six sewer districts with conveyance by gravity or pumping into the Kane Borough sewer system for treatment. The total construction cost for this option is $3,795,000 and total project cost of $4,764,500, and approximately 397 existing equivalent dwelling units within the Township planning area will be serviced by the proposed facilities.

The funding for this project will come in the form of PENNVEST and Farmers Home Administration grants and loans. Wetmore Township as a whole or specific Sewer Districts does not qualify for FmHA grant funding but when coupled with Kane Borough the Township becomes eligible. The funding package as described previously in the text or as described in the BCM Engineers letter in Appendix VII, will create approximately a $30 average monthly user fee with an approximate one time $500 tap-in fee/customer in the Township. This is a cost effective project considering these user fees.

A summary of all project costs and the proposed funding package is as follows:

Kane Facilities Project Costs	$ 9,700,000
Wetmore Facilities Project Costs	4,800,000
Total Project Costs	$14,500,000
Local Funding Share	200,000
Balance to Finance	$14,300,000
<u>Funding Breakdown</u>	
PENNVEST Loan (1% for 20 yrs.)	$ 5,000,000
FmHA Grant	4,000,000
FmHA Loan (5.0% for 40 yrs.)	5,300,000
Annual Debt Service Payments and O & M Costs	
PENNVEST Loan	$ 277,000
FmHA Loan	309,000
Annual Operation and Maintenance	386,000
TOTAL ANNUAL COSTS	**$ 972,000**
Total Equivalent Customers 397 Wetmore + 2345 Kane	2742
Average Monthly User Fee/EDU	Approximately $30/month

The project will be financed through the Kane Borough Authority and initially will be operated and maintained by Kane Borough employees. Kane Borough will handle the billing of all new sewer customers in the Township. All debt service payments will be made by the Kane Borough Authority with proceeds from Township and Borough sewer service revenues.

Wetmore Township Supervisors have sought and obtained equitable representation on the Kane Borough Authority. Representation on the Authority and Committee will ensure that the residents of the Township are treated equitably when it comes to making decisions regarding sewage matters.

Service Areas

As described in the body of the study, the planning area was broken down into six sewer districts. The Wetmore Township Area is unique in that it is at the headwaters of several watersheds and therefore all gravity flow is directed away from the existing wastewater treatment plant's in Kane Borough and facilitates the need for several pumping stations located throughout the planning area to pump sewage collected in the planning area into the Kane Borough system.

The planning area was broken into six sewer districts as listed below:

District 1	West Kane
District 2	Ten Commandments JoJo Road
District 3	Old Mill Road West Wind Road Grandview Estates Carlson Heights
District 4	East Kane
District 5	Greendale
District 6	Route 6 Corridor/North Kane

Institutional Arrangements

The Township must adopt and enforce the Holding Tank Ordinance in Appendix IV.

Funding Source

The funding for this project will come in the form of PENNVEST and Farmers Home Administration grants and loans. Wetmore Township is ineligible for FmHA grants standing alone but when combined with the Kane Borough population the median income level is reduced to a level where Wetmore Township becomes eligible. The proposed average monthly user fee for Wetmore and Kane customers will be $30/month/EDU, with a one time $500 tap in fee for Township customers.

Implementation Schedule

DATE	TASK
August 1992	Prepare and enter into intermunicipal agreement between Kane Borough Authority and Kane Borough to finance, maintain and operate sewerage facilities within Wetmore Township.
August 1992	Commence preparation of Contract Documents for construction of collector sewers and pump stations to serve all six Sewer Districts.
November 1992	Assist Kane Borough Authority in securing $5,000,000 PENNVEST Loan 1% for 20 yrs. secured at July 1992 PENNVEST Board Meeting.
April 1993	Receive Commitment from FmHA for funding package for joint Kane/Wetmore Project.
May 1993	Adopt and Submit Final Act 537 Plan to DER.
June 1993	Receive approval on Act 537 Plan from DER.
June 1993	Submit Part II Application and contract documents to DER for review.
July 1993	DER review comments received on submitted Part II Permit Application and contract documents.
July 1993	Submit final contract documents to DER for approval.

August 1993	Receive Water Quality Management Permit, Part II.
August 1993	Advertise for construction bids for proposed facilities in Sewer District Nos. 1 through 6.
September 1993	Receive construction bids.
October 1993	Award contracts for collector sewer lines and pump stations construction to serve all six Sewer Districts.
December 1994	Adopt zoning ordinances in accordance with recommendations of the overall Township Planning Study.
December 1994	Commence Facility operation.

MUNICIPAL ADOPTION OF PLAN AND ASSOCIATED ORDINANCES

The adopted ordinances governing on-lot management and use of holding tanks is included in Appendix IV. The resolution for adoption of this Act 537 Planning Study is included in this report in Appendix V.

REVIEW OF PRIOR FEASIBILITY AND RELATED STUDIES AND PLANS

Introduction

Role of Sewage Facilities Plan in Community Development

The collection of wastewater and its treatment is a vital function in the community planning. Todays rules and regulations promulgated by the various governmental bodies, allow no growth to occur legally without addressing wastewater collection and treatment. Rules and regulations of governmental bodies, mountainous terrain and the soil conditions in this part of the State make conventional on-lot treatment and disposal systems use questionable in areas of dense population. Unregulated developer construction of collector sewers and treatment plants result in poorly constructed sewers and treatment facilities which discharge inadequately treated effluents to adjacent streams. In most treatment systems owned by private developers, the emphasis on the

profit motive results in neglect of the facilities resulting in further degradation of the receiving stream. Without planning, developers sewers and treatment facilities are sometimes not sized adequately to account for future development.

With a sewage facilities plan, provisions can be made in development construction to accommodate future needs. Regardless of whether a community desires development or wishes to discourage development makes no difference in the need for such sewage facilities planning. The purpose of this plan is to identify present problems and address their correction and to set forth various alternatives for future plans. It also recommends the necessary management actions that must be taken to implement the plan.

Comprehensive Water Quality Management Plan - Upper Allegheny River Basin. Study Area 8 (COWAMP)

This report was prepared for the Commonwealth of Pennsylvania Department of Environmental Resources by; North Central Pennsylvania Regional Planning and Development Commission, Ridgway, PA; Northwest Pennsylvania Regional Planning and Development Commission, Franklin, PA; and Green International, Inc., Sewickley, PA. This broad based study evaluated water quality management planning for an eleven county area in northwest Pennsylvania. The existing problems outlined in this study included mine drainage from strip mining, industrial discharges, complete lack of or inadequate or outdated sewage treatment facilities, poor soil suitability for on-lot disposal systems resulting in malfunctioning systems, oil and gas extraction contaminants; siltation from lumbering operations, agricultural runoff; and lack of enforcement of existing water quality laws and regulations.

This report is very general in nature and does not detail site specific improvements that should be undertaken by individual areas or communities in the study area. The summary of alternatives portion of this report states that secondary treatment will be sufficient for most treatment plant alternatives for McKean County. The report also states that conventional or alternative on-lot systems will be adequate for most of the smaller communities such as East Kane. This report did not recommend any one alternative over another for specific areas within McKean County.