AMG

10-12-84

letter/s re:

- Impact of High Density Zoning of Wastewater Facilities in Twp.

pgs. 18

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Pers file

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October 12, 1984

Honorable Eugene Serpentelli
Ocean County Court House
CN 2191
Toms River, New Jersey 08754

RECEIVED
OCT 15 1984
JUDGE SERPENTELLI'S CHAMBERS

RE: WARREN TWP - AMB, SKYTOP, TIMBER
L-23277-80
L-67820

Dear Judge Serpentelli:

Enclosed are composite reports of James Coe, Stanley Kaltnecker and John Christ which were requested by Philip Caton in the above matter.

Very truly yours,

KUNZMAN, COLEY, YOSPIN & BERNSTEIN, ESQS.

JOHN E. COLEY, JR.

JEC:dlc
cc: Mr. Philip Caton
Raymond E. Trombadore, Esq.
Joseph E. Murray, Esq.
J. Albert Mastro, Esq.
Eugene W. Jacobs, Esq.
Glucksman and Weitzman, Esqs.
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27 Bleeker Street, P.O. Box 1008, Millburn, NJ 07041
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Environmental and Hydraulic Engineers

October 12, 1984

Township of Warren
Mountain Boulevard
Warren, New Jersey 07060

Attention: Mr. John Coley

Re: Wastewater Facilities
Township of Warren

Gentlemen:

Please find enclosed our Report Upon the Impact of High Density Zoning on the Wastewater Facilities of the Township.

Respectfully,

ELSON T. KILLAM ASSOCIATES, INC.

Stanley P. Kaltnecker, Jr.

SPK:mfw
Enc.

IMPACT OF HIGH DENSITY ZONING ON WASTEWATER FACILITIES OF THE TOWNSHIP OF WARREN

OCTOBER 1984

ELSON T. KILLAM ASSOCIATES, INC.
Environmental and Hydraulic Engineers
Millburn, New Jersey

IMPACT OF HIGH DENSITY ZONING ON WASTEWATER FACILITIES OF THE TOWNSHIP OF WARREN

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IMPACT OF HIGH DENSITY ZONING ON WASTEWATER FACILITIES OF THE TOWNSHIP OF WARREN

The following evaluates the impact of rezoning tracts of land, presently zoned for .5 to 1.5 acres per unit to a higher density, on the wastewater facilities of the Township.

GENERAL

The disposal of wastewater within Warren Township has been the subject of federally and state funded regional studies on wastewater such as the 208 Water Quality Management Plan, 201 Facilities Plan, and Environmental Impact Statements. These studies evaluated wastewater disposal alternatives, receiving stream capabilities to accept treated wastewater, and set forth populations and sewage quantities for which wastewater facilities could be built within the Township. The New Jersey Department of Environmental Protection requirements provide that all wastewater facilities built within the planning area conform to the Regional 208 and 201 Planning Studies. The population projections provided for in the planning studies were not developed by Warren Township, but were based upon the total population increases for New Jersey developed by federal and state agencies and assigned to the State. The State then disaggregated these populations to the counties, and the counties disaggregated the populations to the various municipalities. These populations were used in the 208 planning studies. In Warren Township the population projections developed for the 208 Water Quality Management Plan are essentially in accordance with the present zoning of Warren Township.

The State-approved 208 Water Quality Management Plan and the 201 Facilities Plan then dictate to the Township of Warren what wastewater

facilities can be built and what capacity these facilities should have. In order to deviate from the Regional Plans, an application requesting such a deviation has to be submitted to the New Jersey Department of Environmental Protection and supported with all necessary engineering documentation. environmental impact analysis, and attempts made to evaluate alternatives to remain in compliance with the 208 Water Quality Management Plan. The New Jersey DEP would then evaluate the submitted data, publish a public notice, and possibly require a public hearing. This is a long and arduous procedure, and in a recent case in Warren Township where a deviation was requested the process took approximately two years.

EXISTING WASTEWATER FACILITIES

The Township of Warren lies within two major wastewater drainage basins. The northern part of the Township lies within the Upper Passaic River Basin, and the southern portion lies within the Upper Raritan River Basin. In all, there are five sewer districts as follows:

A) Upper Passaic River Basin

1) Stage I-II Service Area
2) Stage IV Service Area
3) Stage V Service Area

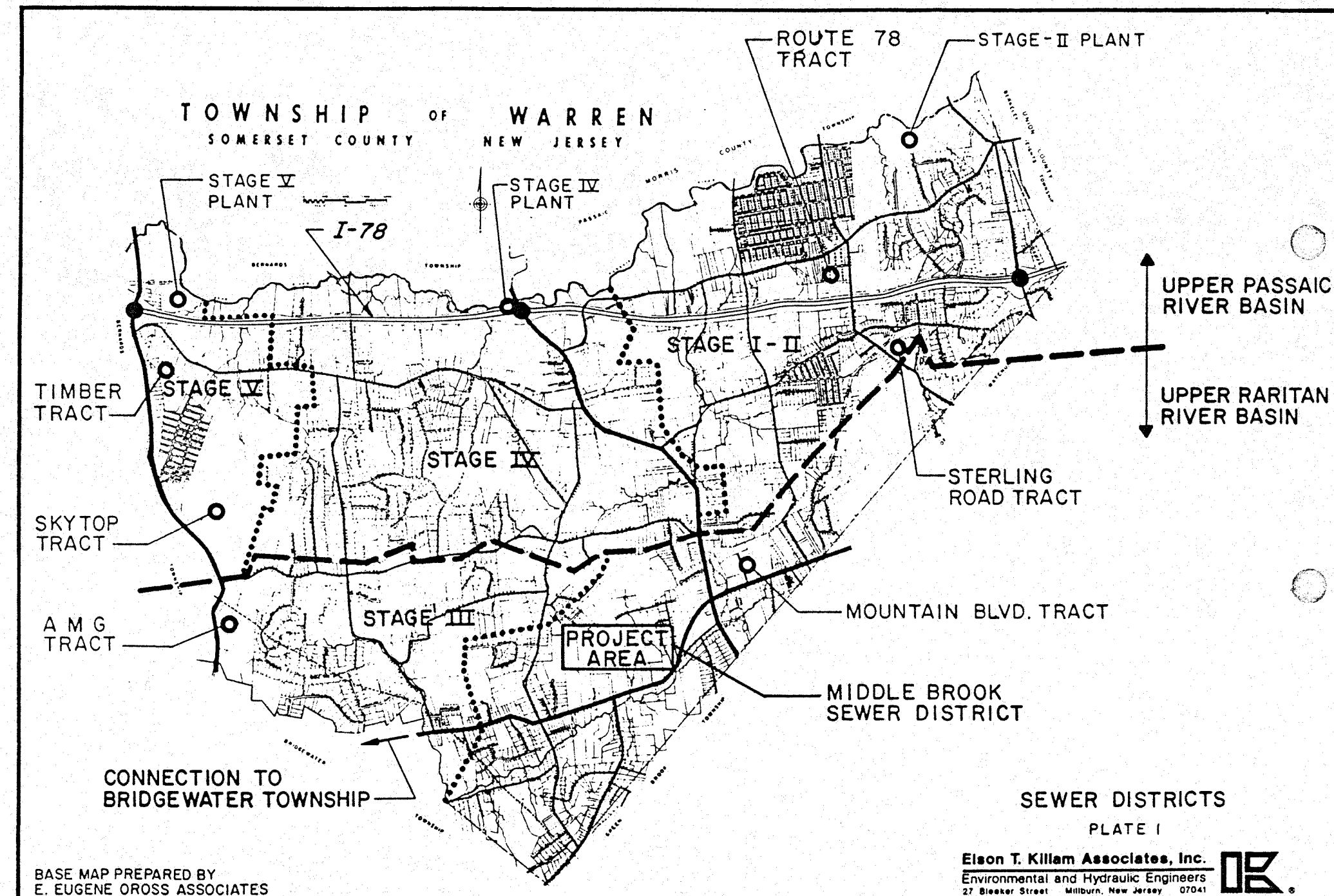
B) Upper Raritan River Basin

1) Stage III Service Area (Dock Watch Hollow)
2) Middlebrook Service Area

The attached map illustrates the service areas and the location of tracts of land for which higher density zoning is being considered.

UPPER RARITAN RIVER BASIN

Presently, two parcels of land within the Upper Raritan River Basin are being considered for higher density zoning than presently zoned for. One parcel, the AMG tract, lies within Dock Watch Hollow or the Stage


TOWNSHIP OF WARREN
SOMERSET COUNTY NEW JERSEY
ROUTE 78 TRACT
STAGE-II PLANT
STAGE V PLANT
I-78
STAGE IV PLANT
UPPER PASSAIC RIVER BASIN
UPPER RARITAN RIVER BASIN
STAGE I - II
TIMBER TRACT
STAGE V
STAGE IV
STERLING ROAD TRACT
SKYTOP TRACT
MOUNTAIN BLVD. TRACT
A M G TRACT
STAGE III
PROJECT AREA
MIDDLE BROOK SEWER DISTRICT
CONNECTION TO BRIDGEWATER TOWNSHIP
SEWER DISTRICTS
PLATE I
BASE MAP PREPARED BY
E. EUGENE OROSS ASSOCIATES
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27 Bleeker Street Millburn, New Jersey 07041

III District, and the other parcel located off of Mountain Boulevard which is within the Middlebrook Sewer District.

Mountain Boulevard Tract - Middlebrook Sewer District

A central sanitary sewer system for the Middlebrook system was just completed.

NJDEP approval requests for construction of those wastewater facilities have had to demonstrate that the facilities were in accordance with the Regional 208 and 201 Facility Plans. It was necessary to demonstrate to the Federal and Stage agencies that the sewer capacity proposed would serve no more than the population projections developed by the 208 Plan. In addition, the amount of wastewater flow per person was subject to the approval of the Federal and State agencies, and the normal allowance of 100 gallons per day per person was reduced to 80 gallons per day per person on the average. The capacity of the pipelines had to illustrate that the pipe would not be able to carry any more flow than determined by the population projections and the agreed upon wastewater flow per person. The approval process is typical of that applied by the Federal and State agencies to any wastewater project within the Township of Warren. By virtue of that process, the existing facilities are designed to handle wastewater flows as developed in the Regional Plans, which is essentially that which would have been developed based on present zoning. Therefore, any development or densities greater than that presently zoned for cannot be accommodated by the sewer system without denying other land owners use of these wastewater facilities.

The central sewer system of the Middlebrook Service Area will discharge to the Township of Bridgewater and ultimately the Somerset/Raritan

Wastewater Treatment Plant. At present, the system is not tied in to Bridgewater, as Bridgewater has not completed the construction of the necessary facilities to receive Warren's flow, although all facilities are presently under construction. The sizing and construction of the Bridgewater facilities which will receive flow from Warren's Middlebrook system were also based upon 208 and 201 population projections.

The Middlebrook sanitary sewer system was designed to serve about 2,360 equivalent connections which would provide capacity for the population and commercial uses within the Middlebrook Basin in accordance with the present zoning and 208 Water Quality Management Plan. An equivalent connection is defined as the sum of residential single-family dwellings plus commercial flows expressed as equivalent residential connections, and is equivalent to about 280 gallons per day per connection. The 2,360 equivalent connections designed for in the Middlebrook sanitary sewer system would generate an average flow of 660,800 gallons per day (gpd). Within the Middlebrook Basin there presently exists about 760 equivalent connections, or an average of 212,800 gpd. This means that 1600 equivalent connections, or 448,000 gpd capacity, was provided for future growth in accordance with the present zoning.

A tract of land off of Mountain Boulevard is being considered for high density zoning. If this tract were developed at six high density units per acre, a total of about 370 dwellings could be constructed. The high density dwellings generally would consist of a mix of one-, two-, and three-bedroom apartments. The flow from high density dwellings is typically less than that of a single equivalent connection. The wastewater flow from high density dwellings is based upon 182 gpd per unit. The sewer system was

designed to allow for about 38 equivalent dwellings or 10,000 gpd from this tract, or about 2.5 percent of the flow allocated for future growth with full development. The 370 high density units would utilize 67,300 gpd of the 448,000 gpd allowed for future growth, or 15 percent of the total. Since the 448,000 gpd actually allowed for development of all of the existing vacant land as presently zoned within the Middlebrook Basin, some existing land owners would be denied the use of their sewer, as the capacity for the high density would utilize their connections. If the Mountain Boulevard tract was developed with 370 high density units, the remaining vacant lands could therefore be developed to only 85 percent of what they are presently zoned for.

The Mountain Boulevard tract is within 400± feet of the Middlebrook Interceptor. From the approximate connection point of the Mountain Boulevard tract to the interceptor downstream to Bridgewater Township, the new interceptor would have sufficient "unused" capacity at this time after the existing dwellings were tied in. It must be recognized, however, that this "unused" capacity was actually reserved to provide for other vacant lands in accordance with the present zoning and regional studies, and the Mountain Boulevard tract developed at high density would be taking that capacity. The cost of sewering the Mountain Boulevard tract, however, would only be that for the 400 feet or so of connecting pipeline.

AMG Tract - Stage III Sewer District

The Stage III Sewer District is also in the Upper Raritan River Basin and is presently sewered to a small wastewater treatment plant. In accordance with the Regional Plans, this wastewater treatment plant is to be abandoned and an interceptor constructed from the treatment plant to the

Township of Bridgewater's connection with Warren Township. The interceptor design and construction is the responsibility of Bridgewater Township. It is reported that the interceptor has been designed and approved by the Federal and State agencies, although construction has not bee initiated. The same planning process that was experienced for the Middlebrook District was also complied with for the design of the interceptor for the Stage III District.

The Stage III interceptor was designed for 1,140 equivalent connections, or an average wastewater flow of 319,200 gpd, which provides for the population that would be experienced if the basin was developed in accordance with the present zoning and 208 Regional Plans. At the present time there are approximately 180 equivalent connections, or 50,400 gpd of wastewater generated within this district. This means that 960 equivalent connections were provided for future growth, or an average of 268,800 gpd. The AMG tract, which is at the head waters of this sewer district, is proposing 544 high density units which would generate an average wastewater flow of 99,000 gpd. The original design of the sewer system for this tract was based upon 52 equivalent units or 14,600 gpd or about 5.5 percent of the flow provided for future growth. Of the 268,800 gpd reserved for future growth, which would provide for development of the remaining vacant lands in accordance with the present zoning, development of the AMG tract generating 99,000 gpd of wastewater would utilize 37 percent of the "unused" capacity. This means that the remaining land owners could only develop their tracts to 63 percent of what present zoning would allow.

The AMG tract is at the head waters of the Stage III district, and it would appear as though it would have to be sewered through the existing

Dock Watch Hollow Subdivision, down Dock Watch Hollow koad, through the future interceptor to Bridgewater. The future interceptor would be approximately 4,000 feet long. The project is to be EPA funded. In addition, it is likely that the sewer system through Dock Watch Hollow Subdivision will have to be supplemented to handle the additional flow should the AMG tract be developed beyond its present zoning. This could involve the construction of as much as 4,000 feet of additional sewer line. As previously discussed, the wastewater from the Dock Watch Hollow Sewer District also discharges to the Bridgewater sewer system. The sizing of the Bridgewater sewer system was also based upon the wastewater flows generated from Warren Township, as established by the 208 and 201 regional planning facilities.

In the Upper Raritan River Basin, it can be seen that the impact of high density on the Mountain Boulevard tract has less impact on the remaining vacant lands in the Township than development of the AMG tract with high density units in the Dock Watch Hollow District. In addition, the Mountain Boulevard tract is immediately adjacent to the existing interceptor sewer, whereas the AMG tract requires the construction of the Dock Watch Hollow Interceptor and more than likely paralleling the existing sanitary sewer through the Dock Watch Hollow development which AMG abuts.

UPPER PASSAIC RIVER BASIN

In the Upper Passaic River Basin, there are four tracts of land for which higher density zoning is being considered. The Skytop property and the Timber properties both lie within the Stage V Sewer District. The Sterling Road tract and the Route 78 tract both lie within the Stage I-II Sewer District.

Stage V - Sewer District

Back in 1979 only two districts existed in the Upper Passaic River Basin--that is, the Stage IV district and the Stage I-II district. At that time, significant interest had been expressed in developing lands in the northwest section of the Township which abutted the Stage IV Service Area. In 1979 a study entitled "Northwest Warren Township Sewerage Feasibility Study" was undertaken in accordance with the Rules and Regulations of the New Jersey DEP. The Feasibility Study developed wastewater flows and population projections in accordance with the 208 Water Quality Management Plan and evaluated six basic alternatives. One of the alternatives considered was to collect all of the wastewater flow from the northwest area and convey it to the Stage IV Sewer District. Another alternative considered was to construct a treatment plant to serve wastewater generated within this northwest area, as the area could drain by gravity to this proposed plant, whereas conveying the flows to the Stage IV District would involve a pumping station and approximately three miles of pipeline in addition to a plant expansion. The cost analysis clearly indicated that the alternative of providing a treatment plant to serve the northwest area would be the most cost-effective alternative. With this, the Stage V Sewer District was established.

The wastewater treatment plant for the Stage V Sewer District was paid for by those landowners who subscribed to the plant construction for specific flow allocation. These subscribers accounted for approximately 1350 equivalent connections which would generate an average wastewater flow of 380,000 gpd. The treatment plant was designed for 380,000 gpd and to discharge its effluent to the Dead River. The Dead River is a small, slug-

qish stream which is tributary to the Passaic River. Due to the characteristics of the Dead River and the State's concern over potential pollution of the river, a high degree of treatment was required by the State agencies. The design flow and number of connections for the treatment facilities had to be in accordance with the regional planning studies, and so demonstrated to the State before approval was obtained. The regional planning studies provided for a total of about 1900 equivalent connections ultimately, which would generate a future average flow of 530,000 gpd within the Stage V Service Area. Therefore, since 380,000 gpd of flow was already subscribed to, there is 154,000 gpd of remaining flow that can be generated within the Stage V Sewer District which would meet the requirements of the vacant lands in accordance with the present zoning. However, there is no treatment plant capacity at the Stage V plant at this time for this additional flow.

Timber Tract - Stage V District

The development of the Timber properties, which is located within the Stage V Sewer District for high density development, could result in approximately 850 dwelling units, generating an average wastewater flow of 154,700 gpd. Development of this tract alone would utilize all of the remaining wastewater flow allocation of the vacant lands in the Stage V Sewer District. In preparing the sewer facilities feasibility studies, the Timber tract was allocated 40 equivalent connections in accordance with present zoning which would generate 11,200 gpd or approximately 7.5 percent of the future design wastewater flow to be generated from the Stage V District. The development of the Timber tract for high density units would essentially use all of the remaining capacity so that any remaining vacant lands could not be developed in accordance with present zoning and be in accordance with the 208 Water Quality Management Plan.

Preliminary studies of the Timber properties indicate that the wastewater from the Timber properties would require the construction of about 2,000 to 3,000 feet of additional off-site sewer piping, including a new crossing under Route 78 and expansion of the existing Stage V treatment plant. Since the wastewater flows would exceed that considered in the regional studies, a request to the NJDEP to modify the 208 Water Quality Management Plan would be necessary, which is a long and costly procedure.

Skytop Tract - Stage V District

The SktTop properties, also located within the Stage V Sewer District, proposes 1936 high density units which would generate an average wastewater flow of 352,000 gpd. The number of dwellings under present zoning would be 130 equivalent units or 36,400 gpd of wastewater for this tract, and that was provided for in the regional planning studies in determining the future capacity reserve for the Stage V District, which is 154,000 gpd. It can be seen that the development of the Skytop properties with high density dwellings would result in approximately 2.25 times the wastewater flow than provided for in the regional studies. As previously discussed, the Stage V wastewater plant discharges to the Dead River, which is a small stream over which the State has concern as to its capacity to receive treated plant effluent, and it is questionable that expansion of the plant beyond that evaluated for in the regional studies would even be permitted. This could result in the possibility that the plant effluent, if expanded beyond that provided for in the regional studies is even allowed, would have to be piped to a larger receiving stream such as the Passaic River some 2.5 miles away.

Preliminary studies for sewering the Skytop properties indicate that as much as 6,000 feet of pipe, half of which would parallel the exist-

ing intereceptor, plus significant expansion of the treatment plant would be required, should such an expansion even be allowed by the NJDEP.

Skytop and Timber Tracts

Development of both the Skytop and Timber properties simultaneously could generate additional wastewater flow of 506,700 gpd in addition to the 380,000 gpd already subscribed to by users. There is also additional vacant lands within the Stage V Sewer District aside from those present subscriptions in the Skytop and Timber properties. The total wastewater flow that could then be generated from the Stage V Sewer District is approximately 1,000,000 gpd, which is far in excess of the 530,000 gpd determined in the 208 Water Quality Management Plan and the Environmental Impact Statements. This significant increase may have a detrimental impact on the receiving stream which would have to be evaluated in detail by the New Jersey DEP before such an expansion would even be considered.

Skytop properties has indicated that portions of the tract can be sewered to three different sewer districts. The lower portion of the tract could be sewered to the Stage V treatment plant which would still require off-site piping, new pipe under Route 78, and expansion of the plant. Another portion of the Skytop properties could be sewered to the Stage IV Service District which would require pumping facilities to get it into the Stage IV Service District and possibly construction of additional sewers paralleling the existing sewer system in the Stage IV Service Area to the treatment plant. The concept of sewering the Stage V District, which includes the Skytop properties, was evaluated in the 1979 report when it was determined that it was more expensive to convey wastewater from this Stage V district to the Stage IV plant than it was to build a plant for the Stage V Sewer District. The portion of the Skytop properties which could reportedly

be sewered to the Stage IV district is presently served by a sanitary sewer leading to the Stage V plant. The southernmost portion of the Skytop properties could be sewered to the Dock Watch Hollow Sewer District, as this tract is relatively close to the AMG properties. However, all of the impacts on the sewerage facilities of the AMG property being developed with high density dwellings would be further impounded by adding flow from the Skytop Sewer District to the Middlebrook Basin.

Stage I-II Sewer District

The Sterling Road site and the Route 78 site are both within the Stage I-II Service Area and are under consideration for high density development. In accordance with the regional studies and the present zoning, the Stage I-II Service Area would, upon full development, generate an average daily wastewater flow of 898,400 gpd. The Stage I-II treatment plant has a capacity of 470,000 gpd, and all capacity is either being utilized or has been subscribed to and paid for by land owners so that there is no spare capacity at this plant at the present time. In accordance with the regional wastewater facility plans, approximately 1530 additional equivalent connections can be developed within this Service Area which would generate an additional flow of 428,400 gpd.

Sterling Road Tract - Stage I-II District

The development of the Sterling Road tract could result in 150 high density dwellings on a parcel of land for which originally 42 equivalent connections were planned. The 150 high density units would generate about 27,300 gpd of wastewater, thereby utilizing 6.5 percent of the remaining future flow allowed for in the regional planning studies, hence allowing the remaining lands to be developed to about 92.5 percent of their present zoning. The 42 equivalent connections provided for in the regional planning

would utilize about 11,800 gpd or about 2.8 percent of future flow allowances.

The Sterling Road tract would discharge to the existing Stiles Road Pumping Station which would appear at this time to have just sufficient capacity to handle the additional flow. The pumping station discharges to a gravity sewer to the Stage I-II treatment plant. The capacity of the gravity sewer to the treatment plant is sufficient for the flow from an additional 150 units, except for a 500-foot reach that would have to be paralleled. Expansion of the plant to accommodate the Sterling Road tract for high density development would also be necessary.

Route 78 Tract - Stage I-II Plant

The Route 78 tract could result in the development of 240 high density units and generate an average wastewater flow of 43,700 gpd. Development of this tract in accordance with present zoning and regional planning studies would result in 36 equivalent connections, or an average wastewater flow of 10,000 gpd. As discussed in the preceding paragraph, the regional studies contemplated an allowance of 428,400 gpd from the remaining vacant lands in the Stage I-II Sewer District. Development of this Route 78 tract then with high density units would utilize approximately 10 percent of the remaining connections as allowed for in the regional planning studies, allowing the remaining land to be developed to about 90 percent of its present zoning.

The Route 78 tract is adjacent to an existing sewer system which has sufficient capacity to handle the additional wastewater flow from high density development. However, the treatment plant would require expansion.

Sterling Road and Route 78 Tract

The combined development of the Sterling Road and Route 78 tracts which are both in the Stage I-II Sewer District could result in 390 high density units which would generate an average wastewater flow of 71,000 gpd. Development of these two tracts then would utilize 16.5 percent of the additional future connections provided for in the regional planning studies, allowing the remaining lands to be developed to about 73.5 percent of present zoning allowances. Had the two tracts been developed in accordance with present zoning, a total of 78 equivalent connections would be realized which would generate a wastewater flow of about 21,800 gpd or 5 percent of the total remaining area to be developed.

The receiving stream for the Stage I-II treatment plant which includes the Route 78 Sterling Road properties is the Passaic River. The regional studies provided for an additional average wastewater flow of 428,400 gpd for future development within the Service Area, and since the two proposed tracts would utilize 71,000 gpd, the treated effluent load on the receiving stream would be within that evaluated in the regional plans.

SUMMARY

In summary, the impact of high density development would appear to have a greater impact on those lands located within the Stage V Sewer District of the Upper Passaic Passaic River Basin--namely, the Skytop and Timber properties--than the tracts located in the Upper Raritan River Basin and the Stage I-II Service Area of the Upper Passaic River Basin, both from the viewpoint of potential wastewater flows exceeding those provided for in the regional studies, the improvements required to sewer the tracts, and the potential denial of other vacant land owners from developing their lands in accordance with present zoning and sewering said properties.